

A REVISION OF THE LABIATEAE.

OF

THE INDIAN EMPIRE.

THE S I S

PRESENTED FOR THE DEGREE OF Ph.D.

by

SUSIL KUMAR MUKERJEE.

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SUSIL KUMAR
MUKERJEE

F O R E W O R D.

The present work was taken up by me in October 1936, at the suggestion of Professor Sir William Wright Smith, and it has been done under his guidance and supervision. Recently the Labiatae of Asia, specially of the eastern parts have been thoroughly studied by Merrill, Ridley, Kudo and others. A revision of the Indian Labiatae, therefore, will provide us with a complete account of the family for the whole of the south-eastern part of Asia.

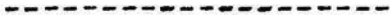
For this revision I have examined about 20,000 sheets of Indian Labiatae. In the Royal Botanic Garden, Edinburgh, where the whole of the work has been carried out, I examined all the sheets of Indian Labiatae in the general herbarium and also in Sir George Watt's Indian collections. From the Royal Botanic Garden, Sibpore (Calcutta), a large quantity of material amounting to more than 8,000 sheets, was sent on loan for my work. For this I am greatly indebted to Mr C. C. Calder (late superintendent) and to Dr. K. Biswas (present superintendent); and I owe thanks particularly to the latter for much important information and for many suggestions regarding my work, as well as for other assistances.

In May 1937 and in January 1938, I visited London, and worked for a month in the Herbaria at the Royal Botanic Garden, Kew, and at the British Museum, where I examined all the Indian sheets of Labiatae; while material was also kindly sent to Edinburgh on loan from Kew for further study. I desire to express my thanks to Mr. Cotton and to Mr. C. E. C. Fischer of Kew, as well as to Mr. Ramsbottom and to Dr. G.

Taylor of the British Museum for all their help. Dr. Taylor gave me much information about the literature, and some useful hints in making the key to the genera.

In Edinburgh, my thanks are due to Professor Smith, for all possible help and for opportunities made available for my work; also to Dr. J. M. Cowan, Mr. W. E. Evans, Dr. H. R. Fletcher and Mr. Johnstone in all of whom I always found readiness to remove any difficulty I might encounter.

I have included Burma and Baluchistan within the scope of my enquiry, and I have also taken in the Andaman islands as well as the Nicobars, Maldives and Laccadives. I have also taken account of a few plants which have been found just beyond the Sikkim - Tibet border, and which may yet be found within the actual boundaries of the Indian Empire.



... and ... species. ... also ...
... papers ... species, for the
of ... India. The ... have
... (1936) by ... the ...
... in that genus. ...
... (1937); while most of the other ...
... at least in part, by the authors of
... species have ...
... Haines, F. Wright, ... Fischer ...
... the course of this investigation.

I N T R O D U C T I O N .

Since the publication of the Flora of British India by Sir Joseph D. Hooker, there have been many expeditions on the borders of the country, and also in the interior. Many new species have been described; and many plants, thought to be non-Indian, have been recorded as occurring within Indian boundaries. Thus the list of Indian plants has been increased very much and most of the families require revision.

After Bentham's monograph of the family (1836), the Indian Labiates were dealt with by Hooker in Vol. IV of his Flora (1885), and many new local floras have been published with further accessions to the list, but there has so far been no complete revision of the Family as it occurs in India since Hooker's time.

Of the later works, Frain's contributions (1890-1904) towards the subject are by far the most important. In addition to revising two genera in full, he described three new genera and many new species. He also called attention in various papers to numerous species, for the first time recorded from India. The Himalayan *Salvias* have been revised recently (1936) by Peter Stibal, who has described several new species in that genus. *Lavendula* has been studied in full by Chaytor (1937); while most of the other genera have been reviewed at least in part, by the authors of local floras. Further, new species have moreover been described by Duthie, Gamble, Haines, W. Wright Smith, Fischer and others.

In the course of this investigation, I found ten new species and a new variety which, after careful comparison, in the herbaria referred to, I have named and described. Of

these, five species and the variety, are endemic to Burma, one is common to Burma and Assam, one occurs only in Assam, one in S. India, one in Baluchistan, and one in Tibet on the border of Sikkim. I have dealt with these in a short paper, entitled "A Decade of New Species of Labiatae, from India, Burma, and Tibet", and it is being published in the "Notes of Royal Botanic Garden, Edinburgh, now in the press. As this paper is not available in the printed form at present, I have attached a typed copy to the main thesis. For the variety, I have appended a Latin description, along with the English in the text. Certain other specimens which I have seen, may yet prove to represent new species, but the material of these is not adequate for definite description.

As a result of my survey, I find that 139 species have been added to the list of Indian Labiates enumerated in the Flora of British India, bringing the record to a total of ⁴²⁴425, which is about 13% of the 3300 species (approximately) in the family for the whole world. The additional genera that have been counted as having Indian species are 13 in number, and are only met with in India only on the borders. These genera^{are}:- *Nosema* Prain, *Ceratanthus* Muller ex G. Taylor, *Zataria* Boiss., *Satureia* Linn., *Ziziphora* Linn., *Chamaesphacos* Schrenk, *Mollucella* Benth., *Lagochilus* Bunge, *Microtoena* Prain, *Paralamium* Dunn, *Paraphlomis* Prain, *Rubiteucris* Kudo and *Eurysolen* Prain. It is interesting to note that of these 13 genera, those that were pre-existing at the time of publication of Flora of British India, have entered India from the N.W. side, and those that were published later are entirely east-Asiatic. The two genera *Paraphlomis* and *Rubiteucris* are however founded upon species previously included in *phlomis* and *Teucrium* respectively.

Of the Indian Labiates, the following genera come first as regards the number of species occurring in India.

Leucas	43,	=	39.0%	of the spp. in the genus.
Nepeta	41,	=	27.3%	" " "
Plectranthus	32,	=	29.0%	" " "
Pogostemon	28,	=	62.2%	" " "
Salvia	24,	=	4.36%	" " "
Scutellaria	22,	=	11.0%	" " "
Gomphostemma	22,	=	73.3%	" " "
Dysophylla	17,	=	77.2%	" " "
Teucrium	17,	=	17.0%	" " "
Anisochilus	14,	=	77.7%	" " "
Elsholtzia	14,	=	46.6%	" " "

Those other genera represented in India, by a higher percentage of their world total contain however, very few species. These are:- *Perowskia*, *Meriandra*, *Crainiotome*, *Anisomeles*, *Colquhounia*, *Eriophyton*, *Paralamium*, *Roylea*, *Motochaete*, *Rubiteucris*, *Eurysolen*, and *Cymaria*. None of these are endemic in India, except *Roylea*, with its single species *R. calycina* Briq., which is found in the Himalayas.

The other bigger genera, e.g. *Orthosiphon*, *Coleus*^{ly}, *Hyptis*, *Stachys*, etc., have fewer Indian species. Of these moreover all species of *Hyptis* and a few of *Coleus* are introduced.

A glance at Table I, will show how the species in each of the Indian genera are distributed in the surrounding countries. The Tribe *Ocimoideae*, with the exception of *Lavandula*, as one can easily see is confined to the East and to tropical Africa, and is almost entirely absent in other parts of the world. Of the other tribes, *Pogostemon*, *Dysophylla*, *Colebrookia*, *Perilla*, *Elsholtzia* & *Mosla* of the tribe *Saturineae*;

Craniotome, Anisomeles, Eriophyton, Leucas, Microtoena, Paralamium, Paraphlomis, and Notochaete of Stachydeae; Prasieae with one genus Gomphostemma, and Leucosceptrum, Rubiteucris, Eurysolen and Cymaria of Ajugoideae, are mostly east-Asiatic. Mentha, Salvia, Scutellaria, Brunella, Teucrium and Ajuga are more or less equally distributed in countries east and west of India, while the rest of the genera have most of their species in W. & N. Asia, and Europe.

There are altogether 213 species endemic to India which is about 50.1% of the total Indian species. These are distributed in 33 genera of which the following 10 may be mentioned as having the greatest number of Endemic species:-

Leucas	32,	=	74.4%	of the total in India.
Pogostemon	22,	=	78.5%	" "
Plectranthus	22,	=	68.7%	" "
Gomphostemma	17,	=	72.2%	" "
Nepeta	14,	=	34.1%	" "
Dysophylla	12,	=	75.8%	" "
Scutellaria	12,	=	54.5%	" "
Anisochilus	11,	=	78.5%	" "
Orthosiphon	11,	=	84.6%	" "
Teucrium	9,	=	52.9%	" "

Most of these endemic species, are confined to different larger areas in India, and few of them cross their respective boundaries. Thus all found there are 50 endemic species in the Himalaya, 52 in Assam - Burma, and 64 in S. India. The others which are 47 in number spread over more than one of the above areas. Scutellaria andamanica Prain, is only endemic in Andamans.

The distribution of the Indian species of Labiatae, within the country and outside, is shown in the Table II. The Labiatae as a whole are a Family of hill-plants. It is in the Himalaya therefore, and its side ranges that we should expect the majority of Asiatic Labiatae to be found. On the Indian side of these mountains, about 200 species of Labiatae are growing. Of the rest of the Indian species the majority are also in the hills, scattered over S. India, Chota-Nagpur, Assam, etc. Of those that are found in plains many belong to the tribe Ocimoideae of which, however, *Plectranthus* and *Lavandula* are almost entirely restricted to the hills; while *Orthosiphon*, *Geniosporum*, *Coleus* and *Anisochilus* have some members in the hills and some in the plains. The two small genera *Paralamium* and *Cymaria* are also in the plains, while *Dysophylla*, *Meriandra*, *Anisomeles*, *Leonurus*, *Leucas*, *Gomphostemma* and *Teucrium*, have their species both in plains and hills. The rest of the genera have all or nearly all species in the hills.

Of the 208 species in the Himalaya 51 are eastern and 106 are entirely western; while the other 51 species occur in both eastern and western Himalaya. Between the Himalayan species there will be about 120 which do not come down to continental India, while the other 88 species are found also in other hilly parts of India. Of these 88, about 50 are found in Burma and Assam, and of the rest, a few are S. Indian.

There are 39 small genera, entirely restricted to the Himalaya, none of which contain more than 3 species. These are as follows:- *Perilla*, *Mosla*, *Mentha*, *Lycopus*, *Origanum*, *Thymus*, *Zataria*, *Hyssopus*, *Satureia*, *Micromeria*, *Calamintha*, *Melissa*, *Perowskia*, *Meriandra*, *Ziziphora*, *Lallemantia*, *Brunella*, *Marrubium*, *Chamaesphacos*, *Craniotome*, *Achyrospermum*, *Galeopsis*,

Lamium, Molucella, Lagochilus, Roylea, Otostegia, Notochaete, Eriophyton, Leucosceptrum, and Rubiteucris. Of these only Notochaete, Eriophyton and Rubiteucris are strictly eastern, while there are 17 genera only in the west and 11, are common to both regions.

Of other larger genera, those predominant in the Himalaya are:-

	No. of spp. in India.	No of spp. in Hima.	No of spp. in W. Him.	No of sp In E.Him.	Common to both.
Elsholtzia	14	9	8	8	7
Salvia	24	16	8	10	2
Nepeta	41	40	37	3	0
Dracocephalum	9	9	7	3	1
Scutellaria	22	12	12	4	4
Stachys	10	6	6	2	2
Phlomis	11	10	6	7	3
Eremostachys	6	6	6	0	0

Besides these, Plectranthus, Pogostemon, and Dysophylla, also have a fair number of representatives in the Himalaya but the majority of their species are non-Himalayan.

In S. India there are altogether 139 species, contained in 26 genera. Of these only Platystoma (with a single species) and Lavandula (with two species) are entirely S. Indian. A few of the genera having a greater number of S. Indian species, may be mentioned:-

In Assam the number of species of Labiatae recorded up till now is 95. Many more, however, may be expected to occur in the hills and dense forests of this province, when

	Total in S. India.	Total in India.	Endemic in S. India.
Leucas	33	43	18
Plectranthus	17	22	12
Pogostemon	16	28	11
Anisochilus	12	14	9
Orthosiphon	8	13	3
Dysophylla	8	17	5
Coleus	6	8	X
Ocimum	5	6	X

Of the S. Indian species that spread beyond the limits of S. India, 29 are found in Burma, and 45 are found in other parts of India. There are about 30 species common to both S. India and Ceylon.

In Burma there are 96 species in 31 genera. Most of these are small, or have very few species in that area. Five genera viz:- Nosema, Ceratanthus, Paralamium, Eurysolen and Cymaria, have no other Indian representative except those occurring in Burma. Some of the other genera have a greater number of Burmese species and are:-

B. Asia.		12
Afghanistan.	Gomphostemma	12.
Tibet.	Leucas	10.
Ceylon.	Pogostemon	9.
Malay peninsula.	Plectranthus	8.
Malaya islands.	Elsholtzia	7.
Indo-China & Siam.		70
China.		85
Philippines.		27
INDIA		474

In Assam the number of species of Labiatae recorded up till now is 95. Many more, however, may be expected to occur in the hills and dense forests of this province, when

fully explored.

In the hills of Chota Nagpur and thereabouts, some 50 species are known, while the vast plain from Bengal to Oudh contains even less than that number. Still fewer have been recorded from the desert areas of Sind and Rajputana, regions which are botanically very little known.

India with her 424 species of Labiatae may be classed among those countries of the world which are very rich in plants of this Family. But, if we take into consideration the vast area of India, the proportion of species to the area is low in comparison with those countries in the Mediterranean area, and in W. Asia. A comparison of the number of species of Labiatae in the surrounding countries is given below.

	<u>Total</u>	<u>Common with India.</u>
Egypt.	37	6
Arabia.	40	11
Syria, Palestine & Asia Minor.	251	17
Persia.	250	48
Arolo-caspian & Turkestan.	75	17
N. Asia.	88	21
Afghanistan.	76	53
Tibet.	47	39
Ceylon.	50	31
Malay peninsula.	34	7
Malaya islands.	40	16
Indo-China & Siam.	134	79
China.	269	82
Japan	90	15
Formosa	49	23
Philippines	70	27
INDIA	424	

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bract-like, forming spikes or racemes, which are often paniculate. Flowers almost always hermaphrodite, highly irregular, 5-merous, with 5 sepals and 5 petals and carpels. Calyx persistent, and accrescent in fruit, strongly gamosepalous, tubular or campanulate or ovoid, bilabiate, or 5- (rarely more) toothed. Corolla usually strongly bilabiate, often 5- rarely 4-lobed; lobe of corolla sometimes annulate. Stamens 4, (the 5th being entirely suppressed) didynamous, the 2 pairs usually inserted at different levels in the corolla-tube; in some cases only 2 stamens are present; the anther-balls often separated from one another and placed at an angle with each other. Disk prominent, sometimes lobed, bifid or produced in front. Ovary superior, bicarpellary, syncarpous, originally 2-celled, divided into 4 loculi by false partition walls; the loculi, each with an erect orthotropous ovule, project so strongly that the ovary becomes deeply 4-lobed, and the single style becomes gynobasic. Fruit of 4, usually dry nutlets, smooth or rugose, glabrous or hairy; areola basal, or lateral; the embryo is directed downwards.

LABIATAE.

Chiefly aromatic herbs or shrubs, (rarely arboreous, e.g. *Leucosceptrum*). Stem usually square, bearing the leaves on the flat sides. Leaves exstipulate, opposite, often whorled, usually simple and pinniveined. Floral whorls or verticillasters are double unipared scorpioid cymes, situated in the axils of foliage leaves, or where the subtending leaves are bract-like, forming spikes or racemes, which are often paniclea. Flowers almost always hermaphrodite, highly irregular, 5-merous, with reductions in the stamens and carpels. Calyx persistent, and accrescent in fruit, strongly gamosepalous, tubular or campanulate or ovoid, bilabiate, or 5- (rarely more) toothed. Corolla usually strongly bilabiate, often 5- rarely 4-lobed; tube of corolla sometimes annulate. Stamens 4, (the 5th being entirely suppressed) didynamous, the 2 pairs usually inserted at different levels in the corolla-tube; in some cases only 2 stamens are present; the anther-cells often separated from one another and placed at an angle with each other. Disk prominent, sometimes lobed, uniform or produced in front. Ovary superior, bicarpellary, sincarpous, originally 2-celled, divided into 4 loculi by false partition walls; the loculi, each with an erect orthotropus ovule, project so strongly that the ovary becomes deeply 4-lobed, and the single style becomes gynobasic. Fruit of 4, usually dry nutlets, smooth or rugose, glabrous or hairy; areola basal, or lateral; the embryo is directed downwards.

KEY TO THE TRIBES.

- A. Stamens declinate; (perfect stamens 4 or 2, anther-cells confluent; ovary 4-partite; nutlets dry; basal scar small. I. Ocimoideae.
- A. Stamens straight or descending.
- B. Nutlets with a small basal scar or areola, which is not oblique (or sometimes oblique in Prasieae).
- C. Nutlets dry, neither thick nor fleshy.
- D. Perfect stamens 2, or 4, subequal or the upper pair longer.
- E. Anthers 1- or 2-celled, not separated; connective not filiform II. Saturineae.
- E. Anther-cells solitary or separated by a filiform connective III. Monardeae.
- D. Stamens 4, lower pair longer, (upper pair longer in Anisomeles).
- E. Calyx 15 nerved IV. Nepeteae.
- E. Calyx 5-10 nerved V. Stachydeae.
- C. Nutlets thick or fleshy VI. Prasieae.
- B. Nutlets with a very large, oblique or lateral areola VII. Ajugoideae.

Key to the Genera.

Tribe I. Ocimoideae.

- A. Lower lip of corolla 1-lobed; stamens usually exserted; basal scar of nutlets not oblique.
- B. Lower lip of corolla flat or nearly so.
- C. Calyx deflexed in fruit, upper lobe recurved, margin decurrent on the tube.
- D. Corolla-tube not exceeding the calyx stigma 2-fid 1. *Ocimum*
- D. Corolla tube exceeding the calyx stigma entire 2. *Orthosiphon*.
- C. Calyx suberect or declinate in fruit, upper lobe not recurved, margins not decurrent.
- D. Flowers in globose heads, or in simple spikes or racemes.
- E. Upper filaments toothed at the base 3. *Mesona*
- E. Filaments toothless.
- F. Calyx narrowly tubular in fruit.
- G. Calyx suberect, upper lip 1-lobed, lower lip entire or 4-toothed 4. *Acrocephalus*
- G. Calyx usually declinate, upper lip 1-lobed, with the lateral and lower teeth free, or the lateral teeth united with the upper lobe 5. *Geniosporum*.

- F. Calyx widely campanulate
 in fruit 6. *Platystoma*.
- D. Flowers in paniculate racemes .. 7. *Moschosma*
- B. Lower lip of corolla conspicuously
 concave or boat-shaped.
- C. Posterior stamens inserted at the
 base of the corolla-tube, the ant-
 erior stamens, inserted at the
 mouth of corolla.
- D. Lower lip of calyx orbicular;
 corolla not spurred 8. *Nosema*.
- D. Lower lip of calyx truncate;
 corolla spurred at the base ... 9. *Ceratanthus*
- C. Stamens inserted at the base
 of the corolla-tube.
- D. Corolla distinctly 2-lipped,
 lower lip longer than the upper.
- E. Upper lip of calyx rounded,
 deflexed; or the calyx
 subequally 5-toothed.
- F. Stamens free 10. *Plectranthus*
- F. Stamens connate 11. *Coleus*.
- E. Upper lip of calyx beaked or
 truncate, curved downwards
 to close the mouth, or the
 calyx 1-lipped, the upper
 lip absent 12. *Anisochilus*
- D. Corolla 5-lobed, the lowest
 lobe shorter or equalling the
 other lobes 13. *Hyptis*.
- A. Lower lip of corolla 3-fid; stamens

included; basal scar of nutlets

oblique 14. Lavendula.

Tribe II Satureineae.

A. Stamens 4.

B. Stamens subequal not didynamous.

C. Anthers 1-celled.

D. Calyx 5-toothed, teeth neither feathery nor longer than the tube.

E. Corolla sub-2-lipped, lower lip longer 15. Pogostemon.

E. Corolla equally 4-fid 16. Dysophylla.

D. Calyx 5-partite, segments feathery, longer than the tube 17. Colebrookia

C. Anthers 2-celled.

D. Fruiting calyx 2-lipped; corolla 5-lobed 18. Perilla.

D. Fruiting calyx 5-toothed; corolla 4-lobed 19. Mentha.

B. Stamens didynamous.

C. Anther-cells at length confluent, (2-celled when young) 20. Elsholtzia.

C. Anther-cells never confluent.

D. Calyx 5-nerved 21. Zataria.

A. Stamens 2. D. Calyx 15-nerved 22. Hyssopus.

B. Posterior anther-cells 15-nerved.

E. Corolla subequally 4-lobed, 23. Rosita

B. Anterior anther-cells 15-nerved; or obscurely 2-lipped; calyx-throat villous, mouth closed 24. Lycopus.

- by the villi.
- F. Whorls many-flowered, capitate;
bracts conspicuous forming
an involucre 23. *Origanum*
- F. Whorls few-flowered, not
capitate; bracts minute,
not forming an involucre 24. *Thymus*.
- E. Corolla distinctly 2-lipped,
calyx-throat glabrous or hairy
mouth not closed.
- F. Corolla-tube straight.
- G. Calyx subequally 5-
toothed, or obscurely
2-lipped; corolla-tube
not exceeding the calyx.
- H. Calyx usually 10-nerved
(in Indian species, leaves
linear-oblong) ... 25. *Satureia*.
- H. Calyx usually 13-nerved;
(leaves broadly ovate
in Indian species) . 26. *Micromeria*.
- G. Calyx distinctly 2-lipped
corolla-tube exceeding
the calyx 27. *Calamintha*.
- F. Corolla-tube recurved and
ascending 28. *Melissa*.
- A. Stamens 2.
- B. Posterior stamens perfect, anther-
cells divaricate 29. *Mosla*
- B. Anterior stamens perfect, anther-
cells parallel 30. *Lycopus*.

Tribe III, Monardeae.

- A. Mouth of fruiting calyx not closed, teeth not connivent.
- B. Anther-cells equal, attachment to the filaments basilar, or pendulous from the connective.
- C. Anther-cells contiguous; corolla 2-lipped... .. 31. *Perowskia*
- C. Anther-cells distant; corolla equally 4-lobed 32. *Meriandra.*
- B. Anther-cells very unequal or solitary, basifixed to the connective 33. *Salvia.*
- A. Mouth of fruiting calyx closed by the connivent teeth 34. *Ziziphora.*

Tribe IV, Nepeteae.

- A. Calyx-teeth all acuminate, or acute; of the upper 3, the lateral teeth not on the face of the central.
- B. Calyx equally 5-toothed; nutlets smooth or granulate.. 35. *Nepeta*
- B. Calyx 2-lipped or equally or unequally 5-toothed; nutlets smooth ... 36. *Dracocephalum*
- A. The 3 upper calyx teeth obtuse, the laterals on the face of the central ... 37. *Lallemantia.*

Tribe V, Stachydeae.

- A. Calyx deeply 2-lipped; mouth of fruiting

- calyx closed by the lips.
- B. Lips of calyx entire, upper lip with
a broad plate 38. Scutellaria
- B. Upper lip of calyx 3-toothed, without
any plate, lower lip 2-toothed 39. Brunella.
- A. Calyx tubular or campanulate, 5-10
toothed, or obscurely 2-lipped, mouth
not closed.
- B. Upper lip of corolla flat, not
hooded.
- C. Stamens included in the corolla-
tube 40. Marrubium
- C. Stamens exerted from the corolla-
tube.
- D. Anthers 2-celled, cells divaricate,
not transverse.
- E. Fruiting calyx campanulate, not
villous within, teeth setaceous 41. Chamaesphacos
- E. Fruiting calyx subglobose,
villous within, teeth lanceo-
late 42. Cranistome.
- D. Anthers of lower stamens, 1-
celled, or 2-celled, cells
parallel and transverse; of
the upper dimidiate 43. Anisomeles
- D. Anther-cells confluent.
- E. Nutlets crowned with dense
scale-like or chaffy hairs .. 44. Achyrosperman
- E. Nutlets winged at the top,
not crowned with scale-
like hairs 45. Colquhounia

- B. Upper lip of corolla hooded. 53. *Tropaeolum*
- C. Calyx with a very widely expanded limb, with sinuate margin. 54. *Microseris*
- D. Limb of calyx very much produced on the anterior side, 2-lipped 46. *Otostegia*
- D. Limb of calyx equal or produced on the posterior side, not 2-lipped 47. *Molucella*.
- C. Calyx limb not expanded, 5-lobed, or 5-10-toothed. 55. *Stachys*
- D. Anthercells hairy.
- E. Anther-cells transverse; nutlets compressed 48. *Galeopsis*
- E. Anther-cells not transverse; nutlets triquetrous.
- F. Filaments not thickened at the base.
- G. Filaments coherent below, villous 49. *Lagochilus*.
- G. Filaments free, glabrous 50. *Lamium*.
- F. Filaments thickened at the base 51. *Eriophyton*.
- D. Anther-cells glabrous.
- E. Calyx-teeth much shorter than the tube. 51. *Erigeron*
- F. Calyx 8-10 toothed. 51. *Erigeron*
- G. Upper lip of corolla hooded shorter than the lower. 52. *Leucas*.
- G. Upper lip of corolla

Tribe VI. *Fragariae*

longer than the lower 53. Leonotis
F. Calyx 5-toothed, or -lobed.

G. Upper filaments not ap-
pendiculate at the base.

H. Anther-cells not trans-
verse, (leaves not
sected).

Tribe VII. *Alajagoides*

A. Corolla 5-lobed, largest ...

I. Filaments hairy ... 54. Microtoena

I. Filaments glabrous ..

A. Corolla 2-lipped, lower 3-lobed ...

J. Nutlets not

triquetrous. ... 55. Stachys

A. Corolla 2-lipped, or 2-fid, lower 3-lobed

J. Nutlets tri-
quetrous.

B. Upper lip of corolla as long as the lower lip each shorter.

K. Corolla annulate

within ... 56. Paralamium

K. Corolla not

annulate 57. Paraphlouis.

C. Leaves palmate, 2-lipped

H. Anther-cells transverse

(leaves much sected) ... 58. Leonurus

B. Leaves simple, 3-toothed

G. Upper filaments appen-
dicate at the base.

B. Upper lip of corolla squalling the lower lip

H. Nutlets glabrous.. ... 59. Phlomis.

C. Stamens exserted, slightly shorter

H. Nutlets densely hairy

at the top 60. Eremostachys

E. Calyx-teeth, or -lobes as long
as or longer than the tube.

C. Stamens included, tube

F. Calyx-lobes obovate-oblong,

not hooked ... 61. Roylea.

F. Calyx-teeth slender, subulate,

hooked at the top. ... 62. Notochaete.

Tribe VI, Prasieae.

Nutlets thick or fleshy 63. Gomphostemma.

Tribe VII, Ajugoideae.

- A. Corolla 5-lobed, upper-most lobe
largest 64. Leucoscep-
trum
- A. Corolla 1-lipped, upper lip absent,
lower 5-lobed 65. Teucrium.
- A. Corolla 2-lipped, upper entire
or 2-fid, lower 3-lobed.
- B. Upper lip of corolla 2-fid, half
as long as the lower lip or
much shorter.
- C. Leaves palmate; calyx deeply
2-lipped... .. 66. Rubiteucris.
- C. Leaves simple; calyx subequally
5-toothed 67. Ajuga.
- B. Upper lip of corolla entire, almost
equalling the lower lip, or
slightly shorter.
- C. Stamens exserted; corolla-tube
gibbous at the lower side,
near the middle 68. Eurysolen
- C. Stamens included; corolla-
tube straight.... .. 69. Cymaria.

Ocimum Linn .

Gen.n. 732; Endlicher Gen. Pl. 608; Benth. Lab. Gen. et Sp. 1; DC. Prod. XII 31; Benth. ex Hook. Gen. Pl. II 1171; Boiss. Fl. Orient. IV 539; Ledeb Fl. Ross. III 334; Hook.f. Fl. Brit. Ind. IV ~~532~~ 607; Briq. in Engl. u. Pr. Nat. Pfl.-fam. IV 3 a 369; Baker in Thesleton-Dyer Fl. Trop. Afr. V 334; Ridley Fl. Malay Penin. II 643; Prain Beng. Pl. 842; Cooke Fl. Bomb. Pr. II 439; Duthie Fl. Upp. Gang. Pl II 233; Gamble. Fl. Madras 1109; Haines Bot. Bih. & Oriss. 727; Kudo in Mem. Fac. Sc. & Agri. 2 II (1929) 112.

Herbs, undershrubs or shrubs ; strongly aromatic. Leaves opposite or whorled, usually toothed; petioled. Whorls 6-10-fld., in elongate spikes or racemes, sometimes panicled; pedicels recurved; bracts and floral leaves small, caducous. Calyx ovoid or campanulate, deflexed and usually enlarged in fruit, 2-lipped; upper lip broad, flat, decurrent; lower lip with (i) 4 teeth, the 2 middle ones longest; or (ii) only 2 teeth at the middle, and the margins fringed or sinuate on both sides. Corolla 2-lipped, tube short, exannulate; upper lip subequally 4-lobed; lower lip entire, declinate, equal to or slightly longer than the upper lip. Stamens 4, didynamous, declinate, exserted, free or the lower connate below; upper often with a tooth or hairy at the base; anthers confluent; Disk entire or 3-4-lobed; Ovary 4-partite, style slender, bifid; lobes subulate or flattened. Nutlets 4, dry, smooth or subrugose, mucilagenous when wetted; basal scar small.

A. Calyx hairy within.

B. Fruiting calyx 3mm.long; corolla 6 mm.long. canum

B. Fruiting calyx 6 mm.long; corolla 10-12 mm. Basilicum

A. Calyx glabrous within.

B. Pedicel as long as calyx.....sanctum

B. Pedicel minute.

C. Flowers 12 mm.long(Burma)..... exsul

C. Flowers 5 mm.long

D. Leaves strongly serrate..... gratissimum

D. Leaves \pm entire adscendens

1. Ocimum canum Sims. Bot. Mag. t, 2452; Benth. Gen. et Sp. 3, and in DC. Prodr. XII 32; Wall. Cat. 2714 A; ~~Ferb.~~ Hook.f. Fl. Brit. Ind. IV 607; Prain Beng. Pl. 843; ~~Cooke~~ Fl. Bomb. 440; Gamble Fl. Madras 1111; Haines Bot. Bot. Bih. & Oris. 728; Kudo; in Mem. Fac. Sc. & Agri. 2 II (1929) 113.

O. americanum Linn. Amer. Acad. iv 276; and Sp. Pl. 833, not of Jacq.

O. album. Roxb. Hort. Beng. 44, and Fl. Ind. iii 15, not Linn.

Erect much branched herb, 30-60 cm. high; stem subquadrangular, striate; pubescent. Leaves petioled, elliptic-lanceolate, narrowed to both ends, almost glabrous, gland-dotted, margin entire, or faintly toothed; lamina, 2- 3.5 cm. long, petiole 1-2.5 cm. long. Flowers subsessile, in more or less closely set whorls, in a spiciform raceme, 7--20 cm. long; bracts pedicelled, elliptic-lanceolate, awned, ciliate with long white hairs; smaller than the calyx. Calyx villous within, slightly pubescent outside, 3 mm. long in fruit; the upper calyx-tooth broad and rounded, awned, ciliate; the other 4 teeth lanceolate, subulate; the lateral shorter than the central pair which are longer than the first tooth. Corolla 5-6 mm. long, white; upper lip 4-toothed, subtrun-

O. canum (contd.)

-cate; lower lip longer and narrower than the upper, oblong, obtuse. Stamens exserted, filaments twice as long as the corolla, slender, hairy at the knee, the upper toothed at the base.

Nutlets narrowly ellipsoid, punctulate, black.

Habitat:- N.W. India; Cutch; Bombay; Central India; Behar; Chota Nagpur; Tippera; Khasi hills; Up. Burma; throughout S. India except Nilgiris; Nicobar isls.

Distribution:- China; Java; W.Asia; Trop. Africa; Madagascar; America (cultivated).

Flowers in July - December.

2. Ocimum Basilicum Linn. Sp. Pl. 597; Benth. Lab. Gen. et Sp. 4; and in DC. Prod. XII 32; Boiss. Fl. Orient. IV 539; Rox. Fl. Ind. iii 17; Ledeb. Fl. Ross. III 334; Hook. f. ^{Fl.} Brit. Ind. IV 608; Forb. et Hemsl. Ind. Fl. Sim. II 266; Prain. in Jour. As. Soc. Beng. LXXXIV 702; and in Beng. Pl. 842; Cooke. Fl. Bomb. 442; Gamble. Fl. Madagas 1111; Haines Bot. Bih. & Oriss. 728. Kudo Mem. Fac. Sc. & Agri. 2 II (1929) 113; Lamk. Ill. t. 514; Heyne Gew. xi t. 31; Wall. Cat. 2713 and 2714 (O. canum in part).

O. minimum Burm. Fl. Ind. 129, not of Linn.

O. hispidum Lamk. Dict. i 384.

O. pilosum Willd. Enum. Hort. Berol; Roxb. Fl. Ind. iii 16; Fleming in Asiat. Res xi 173.

O. menthaefolium Benth, in DC. Prod. XII 32 (the Indian plant.)

O. ciliatum Hornem. Hort. Haf. ii 565.

O. americanum Jacq. Hort. Vind. iii T 86, not of Linn.

O. album Linn. Mant. 85, not of Rox.

O. integerrimum Willd. Sp. PL. iii 162.

O. caryophyllatum Rox. Hort. Beng. 45 and Fl. Ind. iii 16.

O. thursiflorum Linn. Mant. 84; Jacq. Hort. Vind. iii t. 72.

O. Barrelieri. Roth. Nov. Sp. 278.

O. monanthum Linn. Mant. 85.

O. Basilicum (Continued).

Plectranthus Barrelieri Spreng. Syst. ii 691; Rheede. Hort. Mal. x f. 87;

O. Basilicum, var. thyrsiflorum, Wight. Ic. t. 868; Benth. in Wall. Pl. As. Rar. ii 13; Wall. Cat. 2715.

Erect herbaceous plants, almost glabrous, 60- 300 cm. high. Leaves petiolate, ovate-lanceolate, acuminate, toothed ~~ee~~ entire, base angustate, glabrous on both surfaces; lamina 4-6 cm. long; petiole 1-2 cm, ciliate. Racemes simple or much branched, often thyrsoid; bracts petioled. Calyx 2-4 mm. long, 6 mm. in fruit; villous within; the 2 middle teeth of the lower lip awned, longer than the rounded uppermost tooth; lateral teeth shorter than the lower ones. Corolla white, 10- 12 mm. long. Stamens exserted, filaments toothed at the base. Nutlets pitted.

Habitat:- In the plains of Norther India, from Baluchistan to Burma; Sikkim; Bhotan, 915 metre; Tippera hill; Khasi hills; Cutch; Gowalior; all over S. India.

Distribution:- Malay peninsula and islands; China; Formosa; Polynesia.

3. Ocimum sanctum Linn. Mant. i 85; Benth. Lab. i Gen. et Sp. 11; and in DC. Prod. XII 38; Fl. Austr. IV 74; Boiss. Fl. Orien. IV 539; Hook. Fl. Brit. Ind. IV 609; Miq. Fl. Ind. Bat. II 939; Forb. et Hemsl. Ind. Fl. Sim. II 266; Henry List. Pl. Formos. 72; Rox. Fl. Ind. iii 14; Thwaites Enum.. 236; Prain. in Journ. As. Soc. Beng. lxxiv 699, and Beng. Pl. 843; Watt Dict. Econ. Prd. V 443; Cooke Fl. Bomb. Pr. II 440; Gamble Fl. Madras 1111; Haines. Bot. Bih. & Oriss. 729; Kudo Mem. Fac. Sc. & Agri. 2 II (1929) 114; Wall. Cat. 2716.

O. monachorum Linn. Mant. 85.

Ocimum sanctum (Continued).

O. tenuiflorum Linn. Sp. Pl. 833; Benth. in DC. Prodr. XII 39.

O. inodorum Burm. Thes. Zeyl. 174, t. 80, F. 2; and Fl. Ind. 130, not of ~~Fr~~ Koenig. -Burm. Thes. Zeyl. 174, t. 80 F. 1; Rump. Herb. Amb. V t 92, f. 2.

Annual much branched herb, 30- 75 cm. high, erect and softly hairy; stems and branches purplish, subquadrangular, sometimes woody below. Leaves petioled, elliptic-oblong, acute or obtuse, entire or serrate, narrowed at the base, pubescent on both sides; minutely gland dotted; lamina 15-20 cm. long; petiole 1-2.5 cm. long. Racemes 15-20 cm. long; whorls close; bracts sessile, broadly ovate, acuminate, ~~pubescent~~ ciliate; pedicels of flowers as long as fruiting calyx, slender and pubescent. Calyx slightly enlarged in fruit, broadly campanulate, membranous, pubescent; uppermost calyx-tooth broadly obovate, much ^ereflexed and very shortly apiculate; the 2 lateral teeth broadly ovate and shortly awned; the 2 lower central teeth with long slender awns which projects beyond the upper lip and are much curved upwards. Corolla purplish, 5 mm. long; upper lip pubescent on the back. Stamens exserted; filaments slender, the upper pair with a small bearded appendage at the base. Nutlets subglobose or broadly ellipsoid, slightly compressed, nearly smooth, pale brown/or reddish, with small black markings.

Habitat:- Assam; Burma; Bengal; U.P; Bombay; Madras Presidency; Pulnye hills; Himalayas 1830 metre; Andaman and Nicobar islands.

Distribution:- Malay peninsula and islands; China; Pacific islands; Australia; Western Asia; Arabia; Japan.

4. Ocimum gratissimum Linn. Sp.Pl. 1197; Jacq. Ic. Pl. Rar. iii t. 495; Wall. Cat. 2720; Rox. Fl. Ind. iii 17; Benth. in DC. Prodr. XII 34(excel. syn.); Hook. f. Fl. Brit. Ind. VI 608; Trim. Fl. Ceylon iii 367; Prain Beng. Pl. 843; Cooke Fl. Bomb. Pr. II 441; Watt. Dict. Econ. Prod.V 443; Gamble Fl. Madras 1111; Haines Bot. Bih.& Oriss. 728.

O.citronatum Ham. and O. robustum Heyne in Herb.Wall.

Tall perennial shrub, 1-2.5 metre high, much branched and woody below; pubescent on the younger parts. Leaves ovate, acute, coarsely crenate-serrate, cuneate at the base; gland-dotted, pubescent on both surfaces; lamina 2-6cm. long; petiole as long as the lamina, slender, pubescent. Racemes short, slender, simple or branched, woolly; whorls moderately close; bracts sessile, lanceolate, awned from a rounded base, ciliate, decussate and squarrose in the young inflorescence; longer than the calyx; pedicels shorter than the calyx, slightly pubescent. Calyx pubescent, glandular, 2.5 mm. long, twice enlarged in fruit; the uppermost calyx teeth rounded, longer than the lower ones, curved upwards in fruit; the lateral calyx teeth are shorter and broader than the 2 central subulate teeth of the lower lip. Corolla-5mm. long, pale greenish yellow, pubescent ~~on~~ outside; upper lip with 4 teeth, more twice as broad as the lower lip, which is longer than the upper. Stamens exserted; upper filaments with a bearded tooth at the base. Nutlets subglobose, rugose, brown, with a glandular depression, not mucilaginous when wetted. Flowering in July- October.

Habitat:- Assam; Bengal; Poona; All over S. India; N.Kanara; Orissa; Laccadive islands; E.Nepal; Gujrat.

Distribution.:- Ceylon; Java; Trop. America; Trop. Africa.

5. Ocimum adscendens Willd. Sp.Pl. III L166; Wall. Cat. 2719; Benth. in DC. Prodr. XII 35; Hook.f. Fl. Brit. Ind. IV 609; Trim. Fl. Ceylon. iii 691; Cooke Fl. Bomb. Pr. II 441; Gamble Fl. Madras 1112.

O. indicum Roth. Nov. Sp. 273.

O. cristatum Roxb. Hort.Beng. 45, and Fl. Ind. iii 19.

O. verticillatum Heyne in Herb. Rottle.

Electranthus indicus Spreng. Syst. ii 691.

Annual herb. 15-35 cm. high, erect or prostrate with ascending and spreading branches. Leaves 1.5 -2.5 cm. long, shortly petioled, oblong-ovate, obtuse, entire or faintly toothed, base tapering; glabrous, gland dotted. Racemes short, with distant whorls; bracts 12 mm. long, linear or oblong-lanceolate, with a small gland at the base, caducous; pedicels shorter than the calyx. Calyx in fruit 6-8mm. long; upper lip broad obovate, slightly decurved; lower lip with 2 aristate teeth, and the margin slightly wavy or fringed. Corolla 5mm. long, light rose coloured. Filaments twice as long as the corolla; the upper with a dilated appendage at the base; all hairy. Nutlets subglobose, smooth reddish brown.

Habitat: U.P.; Central India; Nellore; Madras Presidency.

6. Ocimum exsul Collet & Hemsl. Journ. Linn. Soc. XXVIII(1890) 112.

Perennial herb, with erect simple stem, faintly and hispidly hairy or downy. Leaves shortly petioled, 2.5-3.5 cm. long, narrowly obovate-lanceolate, obtuse, narrowed to the base, margin remotely and obscurely dentate or entire; faintly roughly pubescent beneath, glabrous above. Racemes terminal; whorls 4-6flowered, about 1.5 cm. apart; bracts coloured, minute, caducous. Calyx in fruit about 6 mm. or more, membranous, hirsute, campanulate, upper lip rounded, slightly recurved,

Ocimum exsul(continued).

lower lip with 2 aristate teeth in the middle, and the margin of the lip is fringed or sinuate. Corolla 12 mm. long or more, blue, puberulous; tube slender. Stamens far exserted; filaments naked, upper pair slightly toothed at base, The stamens roll themselves up, and disappear in the corolla tube after the pollen is shed. Nutlets ovate-orbicular, pale smooth. 1174; Hook. f. Fl. Brit.

Habitat:- Burma.

Yucca 1175; Brit. in Herb. Mus. Pr. Mianmari, IV 30, 372; Bur-
ma in Chamberlain-Dyer Fl. Trop. Africa 363; Ridley Fl. Malay
Penin. II 543; Frein Trans. Fl. 241; Hook. f. Fl. Burm. Pr. I 142;
Boiss. Fl. Alp. Fl. Ind. Arch. Fl. Madag. 1118; Palms
Bot. Sib. & Orie. 728; Fudo in Mem. Pac. Soc. & Agri. II 2. (1859)
115; Hutchinson & Dalz. Fl. N. Trop. Africa 11238; Doan Fl. Can.
Indo-Chine IV 8, (1913) 374.

Shrubs, undershrubs or herbs, some with woody rootstocks.
Leaves opposite; bracts usually small and reflexed, rarely large
and coloured. Inflorescence usually terminal with axils of 6
flowers or less. Calyx ovoid, campanulate or tubular, deflexed
in fruit, 5-toothed, the upper tooth very broad, ovate, membra-
nous, recurved with margins decurrent on the tube; the 4 lower
teeth subulate or awn, slightly exserted out. Corolla 2-
-lipred; upper lip 2-4-lobed; lower 2-lobed, entire or notched;
tube usually longer than the calyx, often slender, straight
or incurved. Stamens 4, declinate; filaments free, without any
basal appendage; anther-cells confluent. Disk usually gibbous.
Style slender, with a minute capitate or clavate, entire or
slightly notched stigma. Follicle 4, dry, ovoid or orbicular,
usually smooth; basal part small.

Orthosiphon Benth.

in Bot. Reg. sub. t. 1300; Lab. Gen. et Sp. 25; DC. Prod. XII 49; Benth. ex Hook.f. Gen. Pl. II 1174; Hook.f. Fl. Brit. Ind. IV 612; Briq. in Engl. und Pr. Pflanzenf. IV 3a, 372; Baker in Thiselton-Dyer Fl. Trop. Africa 365; Ridley Fl. Malay Penin. II 645; Prain Beng. Pl. 843; Cooke Fl. Bomb. Pr. II 442; Duthie Fl. Upp. Gang. Pl. II 236; Gamble Fl. Madrs. 1112; Haines Bot. Bih. & Oris. 729; Kudo in Mem. Fac. Sc. & Agri. II 2, (1929) 115; Hutchinson & Dalz. Fl. W. Trop. Africa II 286; Doan Fl. Gen. Indo-Chine IV 8, (1936) 934.

Shrubs, undershrubs or herbs, some with woody rootsticks. Leaves opposite; bracts usually small and reflexed, rarely large and coloured. Racemes simple usually terminal with whorls of 6 flowers or less. Calyx ovoid, campanulate or tubular, deflexed in fruit, 5-toothed, the upper tooth very broad, ovate, membranous, recurved with margins decurrent on the tube; the 4 lower teeth subulate or awned, slightly connate or not. Corolla 2-lipped; upper lip 3-4-fid; lower declinate, entire concave; tube usually longer than the calyx, often slender, straight or incurved. Stamens 4, declinate; filaments free, without any basal appendage; anther-cells confluent. Disk usually gibbous. Style slender, with a minute capitate or clavate, entire or slightly notched stigma. Nutlets 4, dry, ovoid or orbicular, usually smooth; basal scar small.

1. *Orthosiphon diffusus* Benth. in DC. Prod. XII 53; Hook. f. Bot. Beechey, Voy. Pacific, 1: 123, t. 11, f. 11. Madras 1813.
- A. Stamens included,
 - B. Calyx-throat with long hairs. *diffusus*
 - B. Calyx-throat naked,
 - C. Corolla-tube as long as the calyx. *pallidus*
 - C. Corolla-tube much longer than the calyx,
 - D. Bracts inconspicuous, smaller than or as long as the calyx,
 - E. Leaf-base rounded or cordate,
 - F. Leaves mostly glabrous, petiole 2.5 cm. long or more. *glabratus*
 - F. Leaves distinctly hairy, petiole 1-2 cm. or less. *viscosus*
 - E. Leaf-base cuneate,
 - F. Leaves petiolate,
 - G. Petiole 1.5- 7.5 cm. long, slender, slightly winged. *incurvus*
 - G. Petiole 1-2 cm. long, stout, not winged (Assam only). *robustus*
 - F. Leaves sessile or subsessile. *rubicundus*
 - D. Bracts conspicuous, much larger than the calyx. *comosus*
 - A. Stamens exerted,
 - B. Calyx 3 mm. long in flower,
 - C. Leaf-base rounded. *Parishii*
 - C. Leaf-base cuneate,
 - D. Filaments exerted about 5 cm. beyond the mouth of the corolla. *aristatus*
 - D. Filaments exerted about 1 cm. beyond the mouth of the corolla. *scapiger*
 - B. Calyx 6 mm. long in flower,
 - C. Leaves not lobed. *glandulosus*
 - C. Leaves deeply lobed. *Wattii*

1. *Urtica* *diffusa* Benth. in DC. Prodr. XI: 191. Hook. f.
- A. Stamens included,
- B. Calyx-throat with long hairs. *diffusus*
- B. Calyx-throat naked,
- C. Corolla-tube as long as the calyx. *pallidus*
- C. Corolla-tube much longer than the calyx,
- D. Bracts inconspicuous, smaller than or
as long as the calyx,
- E. Leaf-base rounded or cordate,
- F. Leaves mostly glabrous, petiole
2.5 cm. long or more. *glabratus*
- F. Leaves distinctly hairy, petiole
1-2 cm. or less. *viscosus*
- E. Leaf-base cuneate,
- F. Leaves petiolate,
- G. Petiole 1.5- 7.5 cm. long,
slender, slightly winged. *incurvus*
- G. Petiole 1-2 cm. long, stout,
not winged (Assam only). *robustus*
- F. Leaves sessile or subsessile. *rubicundus*
- D. Bracts conspicuous, much larger than the
the calyx. *comosus*
- A. Stamens exerted,
- B. Calyx 3 mm. long in flower,
- C. Leaf-base rounded. *Parishii*
- C. Leaf-base cuneate,
- D. Filaments exerted about 5 cm.
beyond the mouth of the corolla. *aristatus*
- D. Filaments exerted about 1 cm.
beyond the mouth of the corolla. *scapiger*
- B. Calyx 6 mm. long in flower,
- C. Leaves not lobed. *glandulosus*
- C. Leaves deeply lobed. *Wattii*

1. Orthosiphon diffusus Benth. in DC. Prod. XII 50; Hook.f. Fl. Brit. Ind. IV 613; Gamble Fl. Madras 1113.

Ocimum(?) diffusum Benth. in Wall. Cat. 2718, and in Wall. Pl. As. Rar. ii 14.

O. hirsutum Wall. Cat. 2717 in part.

Diffusely branched undershrub, about 20 cm. high; viscidly tomentose; stem woody at the base, stout and cylindric; branches straggling. Leaves petioled, ovate or elliptic, obtuse, crenate, rounded at the base, tomentose on the both surfaces; lamina 1.5 cm. long; petiole about 1 cm. long, or less. Racemes 7-10 cm. long, stout or slender, whorls rather distant, 2-4-flowered; bracts minute. Calyx pubescent, ribbed in fruit; 2 lower lobes rigid, subulate; throat villous with long hairs. Corolla tube slightly exserted, about 6 mm. long. Stamens included. Nutlets oblong, obscurely reticulate, brown in colour.

Habitat:- Deccan peninsula, in dry rocky places, alt. 1000 mtr.

var;- hispida Hook.f. Fl. Brit. Ind. IV 613.

O. hispidus Benth. in DC. Prod. XII 50.

Tomentose or villous; branches longer and more slender; leaves slightly larger, more or less narrowed to the base.

Habitat:- Nilgiri; Cuddapah.

N.B. According to Gamble this is just a luxuriant form of O. diffusus Benth. grown on better soil.

2. Orthosiphon pallidus Benth. Lab. Gen. et Sp. 708; Royle ex Benth. in Hook. Bot. Misc. iii 370; Benth. in DC. Prod. XII 50; Boiss. Fl. Orient. IV 539; Hook. f. Fl. Brit. Ind IV 613; Prain Beng. Pl. 844; Cooke Fl. Bomb. Pr. II 443.

O. verticillatus Heyne in Herb. Rottle.

O. inodorus Koen. Roxb. Ic. ined. in Herb. Kew, not of Fl. Ind. iii 19.

Orthosiphon pallidus(Contd.)-

Small diffusely branched undershrub, 15-35 cm. high; branches numerous from a stout woody rootstock, quadrangular, glabrous or slightly pubescent. Leaves petioled, inodorous, ovate, obtuse or often acute, coarsely toothed or crenate, base entire shortly cuneate, glabrous or nearly so, gland-dotted; lamina 1-4 cm. long, petiole about 1 cm. Racemes short; whorls 6-flowered, distant; bracts very minute, hairy; pedicels pubescent, as long as the flowering calyx. Calyx 3 mm. in flower, doubly enlarged in fruit, hairy outside in the lower part; throat naked; the 2 lowest calyx teeth with long upcurved awns. Corolla white or pale lilac; tube as long as the calyx; upper lip shorter than the suborbicular concave lower lip. Stamens included or scarcely exerted beyond the lower lip. Nutlets subglobose, compressed, nearly smooth, yellowish brown in colour. Flowers in June- Oct.

Habitat:- Kashmir; Punjab; Behar; Singbhum; S. India, common; Nilgiris, 1000 mtr.; Baluchistan; N.W. Fr. Province.

3. Orthosiphon viscosus Benth. in Wall. Pl. As. Rar. ii 14, Lab. Gen. et Sp. 27, and in DC. Prod. XII 51; Wall. Cat. 2723. Gamble Fl. Madras 1114.

O. tomentosus, var viscosus Hook.f. Fl. Brit. Ind. IV 614.

O. tomentosus Benth. in Wall. Pl. As. Rar. ii 14, Lab, Gen. et Sp. 27, and in DC. Prod. XII 51.

O. tomentosus, var typica Hook.f. Fl. Brit. Ind. IV 613.

Erect herb, 30- 50 cm. high, glandular, viscidly pubescent tomentose with spreading hairs. Leaves petioled, ovate, obtuse or subacute, crenate, rounded or often cordate at the base, viscus pubescent, and glandular punctate; lamina 1.5-6 cm. long, petiole slender 1-1.8 cm. long. Racemes long, bracts ovate.

DISTRICTS - Ceylon.

Orthosiphon viscosus Benth. (Contd.)-

Calyx 6 mm. long, puberulous without, throat naked; 4 lower calyx teeth awned. Corolla pale purple, 12-18 mm. long, puberulous without; tube subincurved. Stamens included. Nutlets subglobose, compressed, pale brown, nearly smooth.

Habitat:- Nilgiris, W.Ghats, and in most of the districts in S.I.

var;- rubiginosus Gamble Fl. Madras 1114.

O. tomentosus var rubiginosa Clarke ex Hook.f. Fl. Brit.

Ind. IV 614.

Branches and leaves beneath clothed with a fine rusty pubescens; petioles longer.

Habitat:- S. India.

4. Orthosiphon glabratus Benth. Wall. Pl. As. Rar. ii 14, and DC. Prod. XII 50; Wall. Cat. 2724; Gamble Fl. Madras 1114 ;

O. tomentosus Benth. var glabratus Hook.f. Fl. Brit. Ind. IV 614; Cooke Fl. Bomb. II 443;

Erect herb about 30- 60 cm. high; stem usually slender, branched, woody at the base, sharply quadrangular, quite glabrous or sparsely patently hairy. Leaves petioled, usually broadly ovate-cordate, acute, coarsely serrate, base usually acute, rarely rounded, glabrous; lamina 1-2cm. long; petiole slender, as long as the blade. Racemes 8-20 cm. long; whorls distant; bracts minute, ovate, acute. Calyx 6 mm. long, glabrous or slightly pubescent outside, not villous within; the 2 lower central teeth with upcurved awns. Corolla slightly pubescent, tube much longer than the calyx; lower lip ovate, obtuse, concave, longer than the 3-lobed upper lip. Stamens included. Nutlets ellipsoid or subglobose. Flowers in April-Sept.

Habitat:- Gujrat; S. India, about 1000mtr. in the hills.

Distribution:- Ceylon.

var;- parviflorus(Benth)Gamble Fl. Madras 1114.

O. tomentosus, var;-parviflora Benth. in DC.Prod. XII 51.
Hook.f. Fl.Brit. Ind. IV 614.

Leaves smaller, ovate. Calyx and corolla much smaller.

Habitat:- Nilgiris; W. Ghats.

5. Orthosiphon incurvus Benth. in Wall. Pl. As. Rar. ii 15,
and in DC. Prod. XII 52; Wall. Cat. 2725; Hook.f. Fl. Brit.
Ind. IV 614; Haines Bot. Bih. & Oris. 730;

Shrubs or undershrubs 30-100 cm. high, puberulous or to-
mentose; stem ascending, 4-angled, rarely branched. Leaves
ovate or ovate-lanceolate, coarsely crenate, hirsute on both
surfaces or nearly glabrous above, sometimes fine purplish
beneath; lamina 5-8 cm. long; petiole 1.5-7.5 cm. long. Racemes
cm. long; whorls 4-6-flowered or less; bracts ovate. Calyx
8 mm. in fruit; throat naked; lateral teeth triangular hardly
awned, lower teeth awned and incurved. Corolla blue or purple,
1.5- 2.5 cm..long; tube about three times as long as calyx,
straight or incurved; finely pubescent on the outer surface.
Stamens included. Nutlets broadly ellipsoid, compressed, as-
perulous.

Habitat:- Nepal; Sikkim; Darjilling; Khasia and Naga hills;
Chittagong hill tracts; Burma.

var;- elata Hook,f. Fl. Brit. Ind. IV 614.

Tall much branched shrub; leaves much larger, ovate-
-lanceolate, scaberulous. Racemes densely tomentose, bracts
longer than the pedicels. Corolla 1.5 cm. long; tube slender.
Habitat:- E. Nepal, 1500-2000 mtr.

6. Orthosiphon robustus Hook.f. Fl. Brit. Ind. IV 614.

Tall shrubs with robust terete stem, clothed uniformly
with a fine pubescens, dark rusty when dry. Leaves short-

Orthosiphon robustus (Contd.)-

-petioled, oblong-lanceolate, subacute, obscurely crenate, cuneate at the base; lamina 10-15 cm. long and half as broad; petiole 1-1.8 cm. long, stout. Racemes stout with distant whorls; bracts ovate, acute. Calyx in fruit 1.2 cm. long, throat naked; the lowest teeth awned. Corolla about 2.5 cm. long. Stamens included. Nutlets elliptical, brown, nearly smooth.

Habitat:- Assam.

7. Orthosiphon rubicundus Benth. in Wall. Pl. As. Rar. ii 14, Lab. Gen. et Sp. 26, and in DC. prod. XII 51; Hook. Ic. Pl. t. 459; Wall. Cat. 2721 and 2722; Hook.f. Fl. Brit. Ind. IV 614; Gamble Fl. Madras 1114; Haines Bot. Bih. Oris. 730; Kudo in Mem. Fac. Sc. Agri. II 2 (1929) 116; Duthie Fl. Upp. Gan. Pl. 236.

Ocimum tuberosum Roxb. Fl. Ind. iii 18; P

Plectranthus rubicundus, and P. virgatus Don. Prod. 116.

Lumnitzera rubicunda, and L. virgata Spreng. Syst. Cur. post 223.

Erect shrub 30- 60 cm. high, from a woody rootstock, glabrate, or tomentose. Leaves sessile or subsessile, 5-10 cm. long, ovate or ovate-lanceolate, acute, coarsely toothed, cuneate at the base. Racemes long, slender; whorls distant; bracts minute. Calyx 4-6 mm. long, throat naked; the 4 lower calyx teeth subulate. Corolla twice as long as the calyx or less, white or pinkish, pubescent. Stamens included. Nutlets punctulate, suborbicular, compressed, nearly smooth. Flowers in April-June.

Habitat:- Kashmir to Nepal; Behar; W.Bengal; Burma; S.India.

var;- rigida Benth. Lab. Gen. et Sp. 26, and in DC. Prod. XII 51; Hook.f. Fl. Brit. Ind. IV 615; Prain Beng. Pl. 844; Haines Bot. Bih.& Oris. 730.

Leaves shortly petioled.

Habitat:- Behar; Chota Nagpur; W. Bengal(?).

Orthosiphon rubicundus Benth.

var; - Hohenackeri Hook.f Fl. Brit. Ind. IV 615. Gamble Fl. Madras 1114.

Smaller herb, much branched from a stout rootstock, laxly tomentose. Leaves 2.5 cm. long. Calyx and corolla smaller; calyx densely hispid.

Habitat:- Nilgiri hills.

var; - macrocarpa Prain Jour. As. Soc. Beng. lxvi 520; (1897).

Leaves petioled, 25-30 cm. long, 12-16 mm. broad; petiole 5-7 cm. long. Calyx in fruit 15 mm. long, 7 mm. wide; throat naked.

Habitat:- Burma, Attaran Brandis 856.

As Prain pointed out, this should be raised to the specific rank, but material is still wanting to have a full description.

8. Orthosiphon comosus Wight ex Benth. in DC. Prod. XII 52; Wight Ic. t 1428; Hook.f. Fl. Brit. Ind. IV 615; Gamble Fl. Madras 1114.

Small erect shrub; branches opposite, terete or subterete; tomentose. Leaves sessile, close set, 2-4 cm. long, oblong or obovate-oblong, obtuse, crenate, cuneate at base; rugose. Racemes short, stout; bracts conspicuous, sessile, deciduous, the upper ones very large, about 3 cm. long, coloured; flowers about 6 in a whorl, suberect. Calyx about 1 cm. long, tubular, throat naked; lips subequal, the upper tooth orbicular, straight, the 4 lower teeth subulate. Corolla 2.5-3.5 cm. long, pubescent; tube very slender; lips short. Stamens included. Nutlets ellipsoid, about 3 mm. long, pale brown, smooth and glossy, with 3 vertical marks near the base due to the compression of adjacent nutlets.

Habitat: Shevagheri and Tinnevelly hills; Travancore.

9. Orthosiphon aristatus (Blume) Miq. Fl. Ind Bat. 2, (1858) 943;

Orthosiphon stamineus Benth. in Wall. Pl. As. Rar. ii 15, Lab. Gen. et Sp. 29, and in DC. Prod. XII 52; Wall. Cat. 2727; Bot. Mag. t. 5833; Miq. Fl. Ind. Bat. ii 944; Hook.f. Fl. Brit. Ind. IV 615; Gamble Fl. Madras 1115; Doan in Fl. Gen. Indo-Chine IV 8 (1936) 939.

O. grandiflorus Haines Bot. Bih. & Oris. 731.

Ocimum aristatum Blume Bijdr. (1825) 833.

O. grandiflorum Blume Bijdr. (1825) 835, not of L'Herit.

O. longiflorum Ham. in Wall. Cat. 2727.

Clerodendranthus stamineus Kudo in Mem. Fac. Sc. & Agri. II 2, (1929) 117.

Slender erect shrub, 30-60 cm. high or more often about 120 cm., glabrous or pubescent. Leaves in distant pairs, petioled, ovate, acuminate, coarsely toothed, cuneate at the base, nearly glabrous; lamina 5-10 cm. long; petiole half as long as the blade or more. Racemes lax-flowered, often forming a short panicle. Calyx 4 mm. long, campanulate, throat naked; the two lowest teeth subulate. Corolla about 20 mm. long, white or purplish, glabrous; tube slender; upper lip 4 lobed, lower entire. Stamens far exserted, filaments twice as long as the corolla or more. Nutlets broadly oblong, compressed, rugulose.

Habitat:- S. India; Assam; Burma.

Distribution:- Nicobar islands; Malaya islands; Philippines; Australia.

10. Orthosiphon scapiger Benth. Wall. Pl. As. Rar. ii 15, Lab. Gen et Sp. 28, and in DC. Prod. XII 52; Wall. Cat. 2726; Hook.f. Fl. Brit. Ind. IV 615.

Small shrubs, with short woody rootstock and glabrous stem. Leaves subradical, petioled, oblong, obtuse, coarsely crenate; lamina 5-10 cm. long, narrowed to a short or long, sle

Orthosiphon scapiger(Contd.)-

slender petiole. Racemes about 30 cm. long, slender and strict, puberulous. Calyx 4 mm. long, campanulate, throat naked; 4 lower teeth subulate. Corolla 8-12 mm. long, blue; tube short, campanulate; upper lip short, 4-toothed; lower lip longer, concave. Stamens far exserted; filaments twice as long as the limb of corolla. Nutlets oblong, rugulose.

Habitat:- Nepal; Kumaon.

11. Orthosiphon Parishii Prain Journ. As. Soc. Beng. lix (1890), 295.

Small herb, with a short nodular woody rootstock, and a short stem, 12-20 cm., sometimes branched, puberulous. Leaves in 1-4 pairs, generally at the base of the stem, or the leafy part much elongated with long internodes; lamina usually ovate, acute, or orbicular and obtuse, distinctly serrate or sinuate, often entire, base truncate, rounded or cuneate; length of the lamina varying from 3-13 cm., the middle pair of leaves being the largest; petiole 2-5 cm. long, the upper leaves often sessile. Racemes 6-14 cm. long; whorls 6-flowered, distant; bracts narrowly ovate, acuminate, slightly exceeding the pedicels. Calyx 4 mm. long, 7.5 mm. in fruit, campanulate, hirsute, throat naked; the lowest teeth subulate. Corolla blue, tube slender, about 4 times as long as the calyx; upper lip 3-lobed, lower narrow, concave. Stamens far exserted, about twice as long as corolla; filaments naked, inserted below the apex of the corolla tube. Nutlets broadly oblong, compressed, minutely reticulately rugulose.

Habitat:- Burma; - Tenasserim, Parish; Shan Hills Terai, Collet; Meiktila, Prager; Maymyo, King's Collector.

12. Orthosiphon Wattii Prain in Journ. As. Soc. Beng. lxvi (1897) 520.

Small erect herb, with a woody rootstock and short stem,

Orthosiphon Wattii (Contd.)-

6-10 cm. long, often with short branches. Leaves few, generally at the base of the stem; the middle pair of leaves larger than those above or below; the smaller leaves almost sessile, the larger long petioled; lamina broadly ovate-cordate, subacuminate, deeply and broadly lobed, the lobes again irregularly crenate-serrate at the margin; both surfaces slightly puberulous or almost glabrate; the larger leaves sometimes 45 cm. long, and 30 cm. broad, with a petiole 8-10 cm. long. Racemes simple or subpaniculate; whorls 6-flowered; bracts broadly cordate, acuminate; much exceeding the pedicels. Calyx 5 mm. long, campanulate, puberulous, throat naked; the two lowest teeth subulate. Corolla externally pubescent; tube short slender, lips spreading, the upper 3-lobed, lavender coloured, lower concave, deep purple. Stamens far exerted; the filaments conspicuously deep-purple coloured, about 6 cm. long or more. Nutlets not seen.

Habitat:- Assam; - Manipur Watt 7188; Lushai Hills Watt 11558; Kohima Wegner.

13. Orthosiphon glandulosus C.E.C. Fischer Kew Bull. 1930, p.240.

Small undershrub, stem obtusely 4-angled. Leaves large, petioled, broadly ovate, acuminate, margin broadly dentate with abruptly acuminate teeth, base cuneate or subcordate, with yellowish glands on both surfaces and scattered white multicellular hairs above; lamina 15-18 cm. long, about 10 cm. broad; petiole varying from 0.6 cm. to as long as 8 cm. Racemes puberulous with fine brown hairs; whorls 4-6 flowered; bracts ovate acuminate, 6-12 mm. long. Calyx narrowly campanulate, 6 mm. long or more, dotted with yellowish glands

Orthosiphon glandulosus(Contd.)-

outside; the upper tooth rounded or shortly acuminate, the 4 lower teeth narrowly awned. Corolla white, tube very slender, 2-2.5 cm. long; upper lip 3-fid. Stamens far exerted, inserted near the mouth of the corolla tube; filaments purple in colour, 6-8 cm. long. Nutlets ellipsoid, slightly compressed, brown.

Habitat:- Lushai hills, 800 mtr., Wenger.

Mesona Blum.

Bijdr. 838; Benth. Lab. Gen. et Sp. 22, in DC. Prodr. XII 46; Benth. ex Hook.f. Gen. Pl. II 1172; Hook.f. Fl. Brit. Ind. IV 611; Briq. in Engl. und Pr. Pfl.-fam. IV 3 a 365; Kudo in Mem. Fac. Sc. & Agri. II 2 (1928) 106;

Erect or procumbent annual herbs. Flowers in terminal racemes or spikes; bracts caducous. Calyx campanulate, tubular in fruit, declinate, 2-lipped; tube deeply pitted between the nerves, and fenestrate with tranverse bars; lips membranous coloured, upper 3-fid, lower entire. Corolla-tube short, upper lip truncate, or 4-toothed; lower oblong, longer than the upper. Stamens 4, didynamous; filaments exerted free, the upper pair toothed at the base. Style shortly unequally 2-fid. Disc. gibbous, produced in front. Nutlets ellipsoid or ovoid.

Habitat: - Bengal:

Mesona parviflorum Briq. in Engl. und Pr. Nat. Pfl.-fm. IV 3 a
365.

Mesona Wallichiana Benth in DC. Prod. XII 46; Hookif. Fl. Brit.
Ind. IV 610.

Geniosporum parviflorum Wall. Cat. 2750; Benth. Lab. Gen. et
Sp. 20; Wall. Pl. As. Rar. ii 18.

Slender erect rigid annual herb, 30-60 cm. high, branching
upwards; sparsely hairy. The plant smells like Patchouli. Leaves
petiolate, 2.5- 7.5 cm. long, ovate-lanceolate, narrowed to the
petiole, margin serrate, pubescent with scattered hairs on the
upper surface and on the veins beneath. Racemes terminal or
axillary, slender, erect, 7-18 cm. long; bracts deflexed, ovate,
purplish. Calyx hairy outside, naked within; fruiting calyx
4.5 mm. long, deeply pitted and fenestrate; pedicells longer,
slender and rigid. Corolla purple; tube very short; upper lip
truncate; lower much longer, concave. Stamens exerted. Nutlets
very minute, dark brown, obovate, flattened.

Habitat;- E. Bengal; Assam; Burma.

Acrocephalus Benth.

Bot. Reg. sub. tt. 1282, 1300; Lab. Gen. et Sp. 23, and in DC. Prod. XII 47; Benth. ex. Hook. F. Gen. Pl. II 1173; Hook. f. Fl. Brit. Ind. IV 611; Briq. in Eng. und Pr. Nat. Pflanzenf. IV 3 a, 365; Ridle. Fl. Malay Penin. II 443; Duthie Fl. Upp. Gang. Pl. II 237; Gamble Fl. Masras 1115; Haines Bot. Bih. & Oris. 732.

Annual herbs; leaves usually petioled, often sessile or subsessile. Flowers very small, sessile; whorls in dense terminal or axillary heads or spikes; bracts imbricating. Calyx ovoid in flower, tubular in fruit, base gibbous, upper lip, larger, flat, entire or serrate; lower lip entire or 4-toothed; throat naked. Corolla-tube very short, subequally 4-lobed. Stamens 4, declinate, filaments free, included; anthers scarcely exerted. Disk small, gibbous. Ovary 4-partite, style shortly 2-fid. Nutlets smooth or minutely tuberculate, basal scar small.

Leaves 3-4 cm. long, ovate or lanceolate, serrate, glabrous; base de-

A. Leaf-margin serrate, flowers in terminal globose or cylindrical heads.

B. Leaves glabrous or nearly so; bracts spreading leaves at the base; calyx acuminate, about 2 mm. broad. *verbenaeifolius*

B. Leaves scabrid on both sides; bracts spreading leaves at the base. Calyx 2.6 mm., nearly mucronate, about 7 mm. broad, side; upper lip entire rounded; lower lip 4-toothed.

C. Leaves linear or narrowly lanceolate, 3-8 cm. long, 0.2-0.5 cm. broad. *palniensis*

C. Leaves ovate or obovate, 2-4.5 cm. long, 0.5-1.2 cm. broad. *axillaris*

Habitat: All over India, ascending up to 1500 mtr. in the Himalayas, but not in Rajputana, Sind, Baluchistan, and the N.W. Frontier Province.

Dist: Malaya peninsula and islands; China.

1. Acrocephalus indicus O.Kunz. Rev.Gen.II(1891) 511; Kudo, in Memo. Fac.Sc.& Agri.II (1929) 109.

A. indicus Briq. in Engl. & Prantl. Nat. Pfl.-fam.IV 3a 367; Gamble Fl. Madr. 1115.

A. capitatus Benth. Bot.Reg. sub.tt. 1282, 1300; in Wall.Pl.As Rar.II 18; Lab et Sp. 23; and in DC. Prodr.XII 47; Hook.Icon.Pl V t.456; Hook.f.Fl.Br. Ind.IV 611; Prain Beng.Pl.844; Collett Fl. Sim. 384; Cooke Fl.Bomb.ii443; Duthie Fl.Upp. Gang.Pl.II 237 Haines Fl. Bih.& Oris. 733.

Prunella indica Brum. Fl. Ind.(1768) 130.

Ocimum capitalatum L.F. Suppl. 276.

O. capitatum Roth. Nov.Spec. 276.

O. Acrocephalum Blu.Bijdr. 834.

Lumnitzera capitata Spr. Syst. II 687.

Acrocephalus Blumei Benth.Lab.Gen.& Sp.23; Dalz.& Gibs.Bomb.Fl.204

A. scariosus Wall. Cat. 1563.

Ocimum Chandra Ham.in Herb. Wall.

A slender annual with simple or branched stem, often branched from the base, 15--30 cm. high; stem obtusely quadrangular, glabrous or nearly so; branches ascending or descending. Leaves 2-4 cm. long, ovate or lanceolate, subacute, coarsely serrate, glabrous; base decurrent to the short petiole. Flowers in terminal globose or cylindrical heads, 6--18 mm. in diam. often with 2 spreading leaves at the base; bracts beneath the approximated whorls broadly ovate, about 2 mm. in diam., shortly acuminate, cuneate at the base. Calyx 2.6 mm., nearly double in fruit, pubescent outside; upper lip entire rounded; Lower lip with 4 lanceolate teeth, shorter than the upper lip. Corolla 3 mm. long, suberect, pale-purple. Nutlets minute oblong-ellipsoid, compressed, smooth, brownish black.

Habitat;- All over ~~the~~ India, ascending up to 1500 mtr. in the Himalayas. But not in Rajputana, Sind, Baluchistan, and the N.W. Front. Province.

Dist;- Malaya peninsula and islands; China.

2. Acrocephalus verbenaefolius Watt Mss., descript. Mukerjee, in Notes of R.B.G. Edinb.

Erect herbs, 50-70 cm. high; stem with long internodes, quadrangular, grooved, scabrid. Leaves opposite, sometimes appearing as whorled due to the presence of another pair on a lateral branch, subsessile or sessile, 3-8 cm. long, 0.2-0.5 cm. wide, linear or narrowly lanceolate, acute or acuminate, serrate with distant teeth, base narrowed, slightly sheathing, both surfaces scabrid and with glandular pits, veins equal in number to the teeth, prominent beneath. Spikes terminal, uninterrupted, densely villous, 1-3 cm. long or much more, sometimes up to 10 cm. long, 6-12 mm. in diam.; bracts sessile, membranous, broadly ovate, mucronate, 5 mm. long, 7 mm. wide, pubescent and glandular, each subtending 5-9 flowers. Calyx 2 mm. long, campanulate, gland-dotted, densely villous outside; upper lip larger with serrate margin, lower with 4 acuminate, erect, subequal teeth, all ciliate; fruiting-calyx tubular, 5-6 mm. long, slightly dilated at the middle. Corolla white or pale yellow in colour, 2.5 mm. long, tube slightly exerted; upper lip subequally 4-lobed, lower entire. Filaments free, not toothed at the base, glabrous; anterior filaments 1.5 mm. long, posterior 1 mm.; anther-cells confluent, globose. Style 2 mm. long, shortly 2-fid at the apex. Nutlets 0.7-0.8 mm. long, ovoid, dark brown, minutely tuberculate.

Habitat:- Manipur Watt (Kongal thana) 6632, and Meebold 6100; Burma, Shweli valley A.Rodger 108, Darn Uka Lt. Sidney Toppin R, 4197, Kachin hills Shaik Mokim 45, and Meebold 7643; Cachar, Prazer; E.Bengal Griffith.

This plant differs from A. indicus O.Kunz. in much more robust habit; very long linear leaves strongly scabrid on both sides, and so narrow that the petiole is scarcely distinct from the lamina; spikes very long, from 2.5-10 cm.; bracts in the middle of spikes conspicuous. The nearest ally would appear to

Acrocephalus verbenaefolius (Contd.)-

be A. spicatus C.B. Robinson, from Philippines (Philippine Jour. Sc. VI 356), which is somewhat similar in habit, but has almost smooth stem, and leaves glabrous or almost so; and also from the description, differs in the inflorescence, and in the details of the flowers.

3. Acrocephalus palniensis Mukerjee in Notes of R.B.G. Edinb.

Erect herb, 20-40 cm. high, woody below; stem and branches quadrangular, grooved, puberulous. Leaves shortly petioled below, sessile above, 2-4.5 cm. long, 0.5-1.2 cm. broad, narrowly ovate or obovate, acute or obtuse at the apex, cuneate at the base, margin serrate, slightly scabrid on both surfaces, densely on the veins beneath; petiole 0.1-0.3 mm. long, slightly winged. Flowers in terminal, compact, densely villous, spicate, pyramidal heads, 10-20 mm. long, 6-10 mm. broad; bracts ovate, mucronate, 6 mm. long, 7 mm. broad, densely hairy and glandular; each bract subtending 12-15 flowers. Calyx campanulate, 2 mm. long, glandular and densely pubescent outside; upper lip entire, ovate; lower lip much shorter, with 4 acuminate teeth, of which the lateral slightly longer than the lower pair; all teeth ciliate; fruiting-calyx tubular, 4 mm. long, slightly dilated in the middle and narrowed towards the mouth. Corolla-tube slightly exserted, 2.5 mm. long; upper lip 4-fid, lobes equal, acute; lower lip entire, narrow, acute. Filaments of stamens hairy at the base; anterior filaments 1.5 mm. long, posterior pair 1 mm. long; anthers 1-celled, reniform. Style 2 mm. long, stigma subclavate. Nutlets 0.7-0.8 mm. long, ovoid, dark brown in colour, striate and punctulate.

Habitat:- S. India, Upper Palnis Fischer 3001, and 3064.

This differs from A. indicus O. Kunz. by leaves very scabrid and of somewhat thick texture, leaf-base much broader, upper leaves nearly sessile, spikes usually more elongate, and larger bracts.

4. Acrocephalus axillaris Benth. in DC. Prod. XII 48; Hook.f. Fl. Brit. Ind. IV 612.

Slender erect herb, about 30 cm. high; stem pubescent, unbranched. Leaves in distant pairs, sessile, 1.5 cm. long, or less, scarcely longer, lower oblong, upper orbicular, margin entire, glabrous above, pubescent beneath; nerves many, prominent beneath, forming salient parallel ribs. Flowers in sessile, axillary heads, 6-8 mm. in diam. Fruiting calyx 3 mm. long, upper lip entire, rounded, lower with 4 lanceolate teeth, shorter than the upper. Corolla not seen.

Habitat:- Assam.

Except the 2 sheets of this plant in Kew Herbarium, no other specimen has been collected.

Geniosporum, Wall.ex Benth.

Bot. Reg. t. 1300; Lab. Gen. et Sp. 19; and in DC.Prod. XII 44; Benth et Hook.f. Gen. Pl. II 1172; Hook.f. Fl. Brit. Ind. IV 609; Briq. in Engl. & Prtl. Nat. Pfl.- fam. IV 3 a 367; Prain Beng. Pl. 844; Duthie FL. Upp. Gang. Pl, II 238; Haines Fl. Bih. & Oriss. 731; Gamble Fl. Madras 1115.

Herbs, erect or procumbent. Leaves opposite or whorled, toothed floral leaves bract-like, often coloured. Flowers small; whorls many -fld., in long terminal dense or lax spikes or racemes; bracts caducous. Calyx in flower ovoid, tubular in fruit; tube constricted above, 10- nerved and often transversely ribbed; teeth 5, in 2 short lips; the uppermost larger, not decurrent. Corolla small, 2-lipped; tube short; upper lip 4-lobed, lower entire, declinate. Stamens 4, filaments free, not appendiculate; anthers 1- celled. Disk tumid, gibbous. Ovary 4- partite; style slender, bifid at the apex, lobes usually flattened. Nutlets ovoid or oblong, smooth or slightly punctate.

Habitat: - Khasi, Garo, Jaintia, Assam, Manipur, Nagal.
Khasi & Nag hills, N. Cachar, Burma.
Dist. Yunnan.

Fruiting calyx 5--8 mm. long; leaves large, 5--12 cm. long, and 2--4 cm. broad - - - - - coloratum.

Fruiting calyx about 2 mm. long; leaves small, 2--5 cm. long and 0.6--1.5 cm. broad

Calyx throat naked - - - - - indicum.

Calyx throat with a ring of hairs - - prostratum.



1. Geniosporum coloratum. O.Kuntz Rev. Gen. II (1891) 517.

Geniosporum coloratum Briq. Pfl.-fam. IV 3 a 367.

G. strobiliferum Wall Pl. As. Rar. ii(1831) 18; Benth. Lab. Gen. et Sp. 20; and in DC. Prodr. XII 45.; Hook. Icon. V t 462; Hook.f. Fl. Brit. Ind. IV 610; Duthie Fl. Upp. Gang. PL. II 238; Kudo in Memo. Fac. Sc. & Agri. II 2, (1929) 111.

Plectranthus coloratus Don Prodr (1825). 116.

Erect Herbs 60-- 100 cm. high, puberulous; stem obtusely quadrangular. Leaves petioled, 5--12 cm. long, lanceolate, acuminate, coarsely serrate, cuneate or rounded at the base, puberulous on both sides; petiole stout, 1-2 cm. long. Spikes terminal, 5--12 cm. long, flowers pedicelled, lax or dense; bracts white, deciduous longer than the flowers. Calyx with 2 black glands on the lower lip, pubescent outside, throat glabrous; fruiting calyx 5--8 mm. long, erect, tubular, deeply pitted, long-pedicelled. Corolla 6--7 mm. long, white with purple veins, pubescent; lower lip narrow. Filaments exerted. Nutlets ellipsoid, black smooth, hispid on the top.

Habitat;- Kumaun, Garhwal, Nepal, Sikkim, Darjilling, Bengal, Khasi & Naga hills, N.Cachar, Burma.

Dist. Yunnan.

2. Geniosporum indicum Briq. Nat. Pfl.-fam. IV 3 a 367. Gamble Fl. Madr. 1116.

G. elongatum Benth. Lab. Gen. et Sp. 21; and in DC. Prodr XII 45; Thwaites Enum. 236; Hook.f. Fl. Brit. Ind. IV 610.

Rhinanthus indica Linn; Burm. Fl. Ind. 131, t. 39. f. 1.

Slender erect or ascending herb, 30- 60 cm. high, pubescent. Leaves in distant pairs, subsessile, 2.5- 5 cm. long, narrowly lanceolate, crenate-serrate, acuminate or acute, cuneate at the base, hirsute on both sides. Spikes terminal, 7--12 cm. long; bracts white in colour, orbicular-ovate, subpersistent; lower bracts exceeding the flowers. Calyx minute, hirsute outside, throat naked; fruiting calyx about 2 mm. long, ovoid, narrowed at both ends, strongly ribbed and pitted; lobes short, Corolla very

Geniosporum indicum Briq. (Contd),

small, hairy. Filaments exserted. Nutlets smooth, brown in colour.

Habitat;- N. Circars, Jeypur hills, Central provinces.

Distribution;- Ceylon.

3. Geniosporum prostratum Benth, in Bot. Reg. sub. t 1300; in Wall. Pl. As. Rar. ii 18; Lab. Gen. & Sp. 21 708; and in DC. Prod. XII 45; Wall. Cat. 2751; Grah. Cat. Bomb. Pl. 148; Thwaites Enum. 237; Hook. f. Fl. Brit. Ind. IV 610; Prain. Beng. Pl. 845; Cooke Fl. Bomb. Pr. II 444; Gamble Fl. Madras II 1116.

Ocimum menthoides Burm. Fl. Ind. 129.

O. prostratum Linn Mant. 166.

O. machrostachyum Poir. Suppl. i 492; Benth. Lab. Gen. & sp. 16.

O. tenuiflorum Heyne in Herb. Rottl. not of Benth. ? of Linn.

Mentha ocimoides, Lamk Diet iv 102.

Elsholtzia ocimoides Pres. Syn ii 114.

Lumnitzera prostrata Spreng. Syst ii 687.

Thymus indicus Burm. Fl. Ind. 129.

Slender annual; stem and branches diffuse, ascending, prostrate and rooting, or quite erect; glabrous or hirsute. Leaves distant, sessile, 2--5 cm. long, obovate-lanceolate or linear, acute or subacute, sparingly toothed, decurrent at the base, hirsute on both sides with scattered hairs. Racemes elongated, slender, 5--15 cm. long; whorls close or distant; bracts sessile, thick, 3 mm. long, broadly ovate acuminate, pubescent, gland dotted. Fruiting calyx 2 mm. long, subcampanulate, ribbed and pitted, pubescent outside and with a ring of hairs in the throat; the upper tooth oblong, subtruncate, mucronate, lateral teeth triangular acute, lower teeth lanceolate and awned. Corolla pink or white, 3mm. long, hairy; upper lip with 4 triangular teeth; lower lip ovate, obtuse, rather longer than the upper. Stamens exserted. Nutlets ellipsoid,

Geniosporum prostratum Benth(contd.)

compressed, smooth, glossy, brownish black; very minute.

Habitat;--S. India; Karachi D.Hooper.

Distribution;- Ceylon.

var:- gracile Thwaites Enum. 237; Hook.f. Fl. Brit. Ind. IV 610;
Gamble. Fl. Madras 1116.

Nearly glabrous; leaves narrow, 2.5 cm. --4 cm. long, 3 mm.
broad; racemes panicled; the lateral calyx teeth ovate like the
upper one, the lower teeth small.

Habitat;-- S.India.

Distribution;-- Ceylon.

Platystoma Beauv.

(Platostoma).

Benth. et Hook.f. Gen. Plan. II 1172; Hook.f. Fl. Brit. Ind. IV 611; Briq. in Eng. und Pr. Nat. Pfl.-fam. IV 3 a 365; Thiselton-Dyer Fl. Trop. Africa V 349; Cooke Fl. Bomb. Pr. II 445; Gamble Fl. Madras 1117; Hutchinson and Dalz. Fl. W. Trop. Africa. II 289.

Small annual herbs; leaves petioled. Racemes slender, terminal; whorls many-flowered; bracts caducous. Calyx campanulate, deflexed in fruit, deeply 2-lipped; upper lip not decurrent, with a small tooth on each side at the base; lower lip ovate, obtuse, shortly concave. Corolla-tube short, widely campanulate; upper lip 4-lobed; lower entire, scarcely longer, slightly concave. Stamens 4, declinate; filaments ~~filaments~~ free, dilated at the base; anthers 1-celled. Disk swollen, gibbous, glandular. Style shortly bifid. Nutlets ovoid, minutely reticulated.



Platystoma africanum Beauv. Fl. Owar. t. 95, fig. 2; Baker in Thiselton & Dyer Fl. Trp. Africa V 349; Briq. in Eng. und Pr. Pfl.-fam. IV 3 a 370; Cooke Fl. Bomb. Pr. II 445.

P. flaccidum Benth. Hook. f. Fl. Brit. Ind. IV 611; Gamble Fl. Madras III 7

Slender, erect, annual herb, 10-30 cm. high; simple or branched; sparingly pubescent; stem weak, quadrangular. Leaves membranous, short petioled, 1.5-4 cm. long, ovate, acute, serrate, glabrous or nearly so, base narrowed down to the petiole. Racemes slender, strict; half as long as the whole plant; whorls dense-flowered; bracts small, deltoid ovate, acute. Calyx 2.5 mm. in fruit; upper lip rounded, some times apiculate, obtusely toothed at each sides near the base; lower lip shorter and narrower, obovate-oblong, rounded or truncate at the apex, inflexed. Corolla scarcely longer than the calyx, pale lilac. Nutlets brown or black, ovoid minutely reticulated.

Habitat:- Bombay; Dharwar; N. Kanara; Mysore.

Distribution:- Trop. Africa.

M o s c h o s m a Reichb.

Consp.(1828) 171; Benth. Lab. Gen. et Sp. 24, and in DC. Prod. XII 48; Benth ex Hook.f. Gen. Pl. III 173; Hook.f. Fl. Brit. Ind. IV 612; Briq. in Eng. & Pr. Nat. Pfl. -fam. 1V 3 a 368; Ridley Fl. Malay Penin. II 644; Prain Beng. Pl. 845; Cooke Fl. Bomb. Pr. II 445; Gamble Fl. Madras 1117; Kudo in Mem. Fac. Sc. & Agri. 112 (1929) 110;

Annual or perennial herbs; leaves petioled. Racemes slender axillary and terminal; bracts small. Calyx ovoid or campanulate, deflexed, 2-lipped; upper lip 1-lobed and lower lip 4-lobed, or upper lip 3-lobed and lower 2-lobed; margin not decurved; throat of calyx naked. Corolla 2-lipped; upper lip shortly 4-lobed, lower 4-lobed. Stamens 4, declinate, filaments free, not appendiculate; anther-cells confluent. Disk uniform, or produced in front. Style clavate-capitate, shortly 2-fid at the tip. Nutlets compressed smooth, ovoid.



Moschosma polystachyum Benth. Wall. Pl. As. Rar. ii 13; Lab. Gen. et Sp. 24, and 708; in DC. Prod. **XII** 48; Hook. f. Fl. Brit. Ind IV 612; Reichb. in Wall. Cat. 2711; Prain Beng. Pl. 845; Cooke Fl. Bomb. Pr. II 446; Gamble Fl. Madras. 1117; Kudo in Mem. Fac. Sc. & Agri. **II**, 2 (1929) 111.

Ocimum tenuiflorum Burm. Fl. Ind. 129, excl. syn. Rumph., and not of Linn.

O. polystachyum Linn. Myant. 567; Roxb. Fl. Ind. iii 18.

Basilicum polystachyon Monch. Menth. Suppl. 143; Daon in Fl. Gen. Indo-Chine IV 8, (1936) 926.

Plectranthus parviflorus Br. Prod. 506 not of Willd.

P. micranthus Spreng. Syst. ii 691.

Erect annual herb, 60-100 cm. high; stem slender much-branched, sharply 4-angled, nearly glabrous, often scabrid at the angles. Leaves petioled, ovate, acute, irregularly crenate-serrate, rounded or subcordate at the base, glabrous; lamina very membranous, 1-2.5 cm long; petioled as long as the blade, very slender. Racemes slender, 7-15 cm. long, some times in panicles; whorls close or distant; bracts minute, lanceolate caducous; pedicells shorter than the calyx. Calyx 2-3 mm. long, slightly enlarged in fruit; pubescent outside; upperlip broad, entire, suborbicular, reflexed; lowerlip with 4 lanceolate, acute, teeth; the lateral teeth ovate, lower cuspidate. Corolla pale pink or lilac. Stamens included. Nutlets minute, broadly ellipsoid, compressed smooth brown in colour. The plant flowers in November.

Habitat:- Gujrat; Konkan; Deccan; Bengal; Behar; Burma.

Distribution:- Trop. Africa; China; Ceylon; Java; Philippine I islands; Australia.

Nosema grandiflora (Hook.) Baker & G. Don, bot.

Nosema grandiflora Baker & G. Don, Journ. As. Soc. Beng. 19 (1920),

Erect robust herb, 1-1.5 m. high; root woody, quadrangular

Nosema Prain.

Journ. As. Soc. Beng. lxxiii 20; Kudo in Mem. Fac. Sc. Agri.
II 2 (1929) 108.

Erect herbs. Flowers in a whorl, in terminal spikes or racemes;
bracts usually persistent. Calyx ovate, tubular in fruit, 2-lipped;
lips membranous coloured, upper entire or with 2 short teeth at
the sides, lower orbicular, entire, deciduous or persistent. Corolla
short, cylindric, much dilated above; upper lip shortly 3-lobed;
lower entire, oblong, concave. Stamens 4, didynamous; filaments
free, exserted; upper pair acutely toothed at the base; anthers
unilocular. Disc produced in front. Style shortly bifid; lobes
unequal. Nutlets ovoid or elliptic.

Habitat: - Rangoon, Burma, China, etc.

.....

Distribution: - Indo-China.

Nosema grandiflora (Daon) Mukerjee comb. nov.

Mesona grandiflora Daon in Fl. Gen. Indo-Cine IV 8 (1936), 108.

Erect robust herb, 40- 100 cm. high; stem woody, quadrangular, densely hispid, with adpressed hairs. Leaves petioled, narrowly lanceolate, obtuse, entire, cuneate at the base, hispid with scattered hairs on both surfaces; lamina 6-10 cm. long, 1-1.5 cm. broad; petiole 0.5-1.5 cm. long. Raceme terminal, interrupted; whorls many-flowered; bracts persistent, sessile, ovate or lanceolate, rose-coloured at the base; pedicells longer than the flowers; Calyx 2.5 mm. long, campanulate, densely villous on the tube and on the orbicular, entire lower lip; upper lip ovate, serrate with 2 short teeth at the sides; fruiting calyx 5-6 mm. long. Corolla violet-coloured, 5mm. long; much dilated, externally pubescent on the lips; upper lip truncate, 3-lobed; lower lip longer, concave. Filaments hairy, long exerted. Nutlets 0.7 mm. long, elliptic, minutely tubercular, glabrous.

Habitat:- Burma, Taungoo Chin No. 4313, (Alt.

Distribution:- Indo-China.

Stamens 4, declinate, hardly exerted; filaments free, posterior pair inserted at the base of the corolla and often minutely pubescent at the base gradually thickened and decurrent into the spur; the anterior filaments glabrous, inserted near the throat of the corolla; anthers kidney-shaped, 1-locular, attached at the middle. Disk produced to a gland on the anterior side. Style glabrous, hardly exerted, declinate at the base; apex shortly 2-lobed, lobes slightly thickened, obtuse. Nutlets basifixed, oblong or oblong-ellipsoid, minutely furrowed.

Ceratanthus palmarum G. Taylor, in Journ. Botany LXXIV (1936) 33.
Plectranthus palmarum Howell, in Hook. Journ. Bot. XVII 2671.
Pennisetum palmarum Wedd in Journ. Bot. Soc. Agri. II 2 (1829) 143.

Ceratanthus, Muell ex G. Taylor

in Journ. of Bot. lxxiv (1936) 33.

Herbs, annual or perennial, sometimes subcaulescent and stoloniferous. Whorls 4-10-flowered; flowers small, pedicelled. Calyx shortly campanulate, more or less densely glandular-pubescent on the outside; the lips in flower wide open, in fruit accrescent and closed; the posterior lip subquadrate to suborbicular, margin ciliate; the anterior lip concave, quadrate, truncate or emarginate at the apex, ciliate at the margin; lateral teeth more or less triangular. Corolla with a long, straight or slightly curved spur; tube elongate, cylindrical; limb bilabiate, posterior lip subquadrate, 4-lobed, lobes subequal, obtuse; anterior lip somewhat spoon-shaped. Stamens 4, declinate, hardly exerted; filaments free, posterior pair inserted at the base of the corolla and often minutely pubescent at the base gradually thickened and decurrent into the spur; the anterior filaments glabrous, inserted near the throat of the corolla; anthers kidney-shaped, 1-locular, attached at the middle. Disk produced to a gland on the anterior side. Style glabrous, hardly exerted, declinate at the base; apex shortly 2-lobed, lobes slightly thickened, obtuse. Nutlets basifixed, oblong or oblong-ellipsoid, minutely furrowed.

Ceratanthus calcaratus G. Taylor. in Jour. Botany LXXIV (1936) 40.

Plectranthus calcaratus Hemsl. in Hook. Icon. Pl xxvii 2671.

Hemsleia calcarata Kudo in Mem. Fac. Sc. Agri. II 2 (1929) 143.

Perennial herb with ascending subflexuous stem. Leaves petiolate, ovate-lanceolate, or ovate, acute, crenate or subentire, base cuneate and decurrent to the petiole; sparsely pubescent with short appressed hairs. Racemes terminal, whorls 4-flowered; bracts minute, ovate-lanceolate; pedicells slender densely pubescent. Calyx glandular, pubescent. Corolla purple, glandular outside, glabrous within; about 2 cm. long with the spur. Posterior filaments pubescent, anterior ones glabrous. Style glabrous, slightly exceeding the corolla.

Habitat:- Burma, Shan States Mac.Gregor No. 841.

Distribution:- China.

Corolla 2-lipped, tube exserted, straight or decurved, smooth or gibbous or often obtusely angled at the base; upper lip usually broad, 2-4-lobed, recurved, each shorter than the calyx, lobes -shaped, usually narrow lower lip, which is stipitate at the base. Stamens 4, didynamous, declinate; filaments free, not toothed, usually glabrous; anther-sells usually confluent. Pistil produced in front. Ovary 4-partite; style slender, subequal 2-lobed at the tip. Style 4, dry, orbicular, oval or oblong, smooth, or granulate or punctate.

Ceratanthus calcaratus G. Taylor. in Jour. Botany LXXIV (1936) 40.

Plectranthus calcaratus Hemsl. in Hook. Icon. Pl xxvii 2671.

Hemsleia calcarata Kudo in Mem. Fac. Sc. Agri. II 2 (1929) 143.

Perennial herb with ascending subflexuous stem. Leaves petiolate, ovate-lanceolate, or ovate, acute, crenate or subentire, base cuneate and decurrent to the petiole; sparsely pubescent with short appressed hairs. Racemes terminal, whorls 4-flowered; bracts minute, ovate-lanceolate; pedicells slender densely pubescent. Calyx glandular, pubescent. Corolla purple, glandular outside, glabrous within; about 2 cm. long with the spur. Posterior filaments pubescent, anterior ones glabrous. Style glabrous, slightly exceeding the corolla.

Habitat:- Burma, Shan States Mac.Gregor No. 841.

Distribution:- China.

Plectranthus L' Herit.

Stirp. 1, 85; Benth. Lab. Gen. et Sp. 29, and in DC. Prod. XII 55; Benth. ex Hook.f. Gen. Pl. II 1175; Hook. f. Fl. Brit. Ind. IV 616; Briq. in Eng. und. Pr. Nat. Pflanzenf. IV 3,a, 352; Prain Beng. Pl. 846; Collet Fl. Sim. 385; Cooke Fl. Bomb. Pr. II 446; Duthie Fl. Upp. Gang. Pl. II 238; Gamble Fl. Madras 1118; Haines Bot. Bih. & Oris. 734; Doan In Fl. Gen. Indo-Chine IV 8, (1936) 943.

Herbs or undershrubs; leaves usually opposite, petioled or often sessile or sessile. Cymes or racemes usually in spreading panicles, rarely simple. Calyx equally or subequally 5-toothed, or distinctly 2-lipped, with (i) 3-toothed upper lip and 2-toothed lower lip, or (ii) upper lip entire and lower lip 4-toothed. Corolla 2-lipped, tube exserted, straight or decurved, equal or gibbous or often obtusely spurred at the base; upper lip usually broad, 2-4-fid, recurved, much shorter than the entire, boat-shaped, usually narrow lower lip, which is stipitate at the base. Stamens 4, didynamous, declinate; filaments free, not toothed, usually glabrous; anther-cells usually confluent. Disk produced in front. Ovary 4-partite; style slender, subequally 2-fid at the tip. Nutlets 4, dry, orbicular, ovoid or oblong, smooth, or granulate or punctate.

1. Leaf-margin regularly
crenate or crenulate. . . . rivularis

F. Fruiting calyx subequally 5-toothed,
2.5-4 mm. long.

G. Leaves broadly ovate.

H. Calyx completely hidden by
dense covering of multicellular
hairs.

- A. Leaves in whorls of 3-4; (fruiting calyx erect, tubular; nutlets trigonus.) ternifolius
- A. Leaves opposite; (fruiting calyx declinate, \pm campanulate; nutlets \pm oblong.)
 - B. Corolla-tube 2 cm. long, or more. macranthus
 - B. Corolla-tube 1 cm. long, or less.
 - C. Calyx subequally 5-toothed, or 2-lipped, with a 3-toothed upper lip and 2-toothed lower lip.
 - D. Leaves not white beneath.
 - E. Base of corolla equal, tube straight.
 - F. Fruiting calyx distinctly 2-lipped, 5-6 mm. long.
 - G. Leaves 4-10 cm. in breadth, (Himalayan) scrophularioides
 - G. Leaves 1-2 cm. in breadth, (S. Indian).
 - H. Leaves ovate; the middle tooth of upper calyx-lip larger. nigrescens
 - H. Leaves lanceolate; teeth of upper calyx-lip equal.
 - I. Leaf-margin irregularly serrate. Walkeri
 - I. Leaf-margin regularly crenate or crenulate. rivularis
- F. Fruiting calyx subequally 5-toothed, 2.5-4 mm. long.
 - G. Leaves broadly ovate.
 - H. Calyx completely hidden by dense covering of multicellular hairs.

- I. Lower lip of corolla as long as or longer than the tube (Assam & Burma). . . hispidus
- V. Apex I. Lower lip of corolla much shorter than the tube (S. India). nilghericus
- H. Calyx \pm glabrescent, sometimes hispid but not hidden; hairs unicellular.
- I. Leaves usually as broad as long, broader near the base, which is cordate or rounded (S. India). Wightii
- I. Leaves usually longer than broad, broader at the middle, base \pm cuneate.
- J. Usually tall erect herb (N. India to Burma). striatus
- J. Weak decumbent annual (S. India). Stocksii
- G. Leaves narrowly lanceolate.
- H. Axis of inflorescence glabrescent, (N.W. Himalaya). Stracheyi
- H. Axis of inflorescence hispid or pubescent (Burma). Brandisii
- E. Base of corolla gibbous or obtusely spurred; tube usually declinate or abruptly decurved (All confined to N. India except P. coetsa).
- F. Apex of leaf long acuminate.
- G. Fruiting calyx twice as long as broad, teeth acute. Coetsa

- G. Fruiting calyx $\frac{2}{3}$ as long as
broad, teeth obtuse. Maddeni
- F. Apex of leaves obtuse or rounded.
 - G. Leaves 3-7 cm.; petiole 2-7 cm.;
corolla obtusely spurred, 4-5 mm.
 - H. Leaf-base cordate or subcordate;
petioled not winged. repens
 - H. Leaf-base cuneate; petiole
winged. Kurzii
- G. Leaves 1-2.5 cm. long; petiole
.5 cm. or less; corolla gibbous
not spurred, 7-9 mm.
- H. Tall herbs; fruiting calyx
indistinctly 2-lipped(Assam). melissoides
- G. H. Dwarf shrubby plants;
fruiting calyx subequally
- F. Fruit 5-toothed (Phari)... pharica
- D. Leaves beneath with a dense stellate
down. rugosa
- C. Calyx 2-lipped; upper lip of fruiting
calyx broad, entire, reflexed; lower lip
with 4 acute, awned or subulate teeth.
- D. Teeth of lower calyx-lip unequal,
the 2 middle teeth much longer. Parishii
- E. Calyx about 10 mm. long;
petiole slender. incanus
- E. Calyx 6-7 mm. long; petiole
thick and fleshy (S.India). urticifolius
- D. Teeth of lower calyx-lip \pm equal.
 - E. Succulent plants; leaves fleshy,
nearly as broad as long(All S.India
except P.Parishii) Heboldii

- F. Fruiting calyx \pm 6 mm. long.
- G. Calyx-lips equalling the tube; corolla 12-18 mm. long.
- H. Leaf-blade 8-12 cm. or more; petiole 5-10 cm. or more; margin distinctly crenate or lobulate.
- I. Leaves coarsely lobulate; tomentose beneath. fruticosus
- I. Leaves crenate; pubescent beneath. coleoides
- H. Leaf-blade 2-4 cm; petiole .5-1.5 cm.; margin \pm obscurely crenulate in upper half. . . . Bourneae
- G. Calyx lips much shorter than the tube; corolla \pm 4 mm. long. . subincisus
- F. Fruiting calyx \pm 3 mm. long.
- G. Petiole shorter than the blade; corolla lilac, tube shorter than lower lip (S.India). Bishopianus
- G. Petiole much longer than the blade; corolla blue, tube longer than the lower lip (Burma). Parishii
- E. Not succulent; leaves twice as broad as long or longer. (Assam & Burma).
- F. Leaves \pm ovate, rounded or cordate at the base.
- G. Leaves acute or acuminate at the apex. Griffithii
- G. Leaves rounded at the apex (Burma). Meeboldii

F. Leaves narrowly lanceolate,
cuneate at the base (Burma).

G. Leaves very densely
fulvous-tomentose on
both sides. fulvescens

G. Leaves \neq glabrescent at
least on the lower surface. . Helfer

1. Plectranthus ternifolius D. Don. Prod. Fl. Nep. 117; Wall.
Cat. 2748; Benth. Lab. Gen. et Sp. 44, in Wall. Pl. As. Rar.
ii 17, and in DC. Prod. XII 61; Hook. f. Fl. Brit. Ind. IV 621;
Hook. Ic. Pl. t. 460; Collet Fl. Sim. 386; Prain Beng. Pl. 846;
Duthie Fl. Upp. Gang. Pl. II 239; Doan in Fl. Gen. Indo-China
IV 8, (1936) 944.

Ocimum ternifolium Spreng Syst. Cur. post. 224.

Elsholtzia Thomsoni Hook. f. Fl. Brit. Ind. IV 643.

Isodon ternifolius Kudo in Mem. Fac. Sc. Agri. II 2,
(1929) 140.

A tall robust bushy shrub, 100-160 cm. high. with strict
erect branches, densely tomentose; tomentum often white. Leaves
thick, subsessile, 5-12 cm. or more, usually in whorls of 3 or 4,
rarely opposite, lanceolate, acuminate, serrate, acute at the
base, tomentose or hispid on both surfaces, rugose above. Spikes
cylindric, dense, villous, often paniculate; cymes subsessile,
dense-flowered; bracts lower foliaceous, upper minute. Fruiting
calyx 5-7 mm. long, straight, erect, tubular, subequally 5-toothed;
teeth rounded. Corolla very short, villous, white, with pink spots
at the base of the upper lip; tube inflated and decurved, base g
gibbous. Stamens included. Nutlets trigonus, acuminate.

Habitat:- Kashmir to Bhotan; Bengal; Paresnath; Assam; Burma.

Distribution:- S. China; Indo China.

2. Plectranthus macranthus Hook.f. Fl. Brit. Ind. IV 616;
Doan in Fl. Gen. Indo-China IV 8, (1936) 946.

Isodon macranthus Kude in Mem. Fac. Sc. & Agri. II, 2,
(1929) 138.

Small herbs, 15-30 cm. high, simple or branched, weak,
sparsely hairy. Leaves petioled, membranous, ovate-lanceolate,
coarsely serrate narrowed towards both ends, sparsely hairy
or glabrescent; lamina 7-12 cm. long, petiole 1-2 cm. long.
Racemes slender, 15-20 cm. long; bracts ovate-lanceolate,
persistent; flowers opposite, pedicelled; pedicels 6 mm. long.
Calyx in fruit 10 mm. long, wide-open, deeply 2-lipped; upper
lip very broad with 3 distant spinous teeth, lower with 2 long
subulate teeth. Corolla tube straight, 2-2.5 long; lips short,
subequal, rounded, white in colour, pale purplish on the upper
side; tube of corolla very wide towards the mouth. Nutlets
globose, 2 mm. in diam.

Habitat:- Sikkim; Chola; Khasia; Burma, 1500-2000m.

Distribution:- S. China.

Distribution:- Ceylon.

3. Plectranthus scrophularioides Wall. Pl. As. Rar. ii 16, and
Cat. 2738; Benth. Lab. Gen. et Sp. 40, and in DC. Prod. XII 55;
Hook. Ic. Pl. t. 464, in part; Hook.f. Fl. Brit. Ind. IV 616;

Tall and slender shrub, 60-120 cm. or more high, nearly
glabrous. Leaves long petioled, broadly ovate, acuminate,
crenate, cordate or cuneate at the base, glabrous; lamina
7-18 cm long, 4-10 cm. broad; petiole slender, 3-10 cm. long.
Cymes in broad open slender panicles. Calyx in fruit 6 mm.,
distinctly 2-lipped; upper lip subequally 3-toothed, lower
2-toothed; teeth obtuse. Corolla pale rose, 8 mm. long; tube
straight, broad, about twice as long as the lower lip; upper
lip minute; lower lip short, narrow, acute, hardly cymbiform.
Stamens exserted. Nutlets subglobose, smooth.

Habitat:- Kumaon to Sikkim, 2500-3000m.

4. Plectranthus nigrescens Benth. Lab. Gen. et Sp. 710, and in DC. Prod. XII 58; Thwaites Enum. 237, excl. syn. *P. Walkeri*; Hook.f. Fl. Brit. Ind. IV 617; Gamble Fl. Madras 1120.

P. montanus Herb. Wight.

P. hians, and P. scaberullus Benth. in DC. Prod. XII 57 and 58.

Erect herbs, with stout or slender stem, simple or branched, usually finely pubescent, or pubescence variable, rarely subvillous; blackish when dry. Leaves petioled, ovate, acuminate, crenate, rounded or slightly cordate at the base, glabrescent or sparsely hispid with scattered hairs, quite smooth or very much scabrid; lamina 3-6 cm. long,, 1-3 cm. broad; petiole 1-2 cm. long. Cymes narrow, usually in terminal panicles. Calyx in fruit 4-5 mm., slightly scabrid, distinctly 2-lipped; upper lip 3-toothed, the middle one larger than the 2 lateral, teeth obtuse or acute. Corolla 4 mm. long, white with red spots; tube short; lips sub-equal, short, upper 4-lobed. Stamens shortly exserted, or included. Nutlets suborbicular.

Habitat;- S. India.

Distribution:- Ceylon.

5. Plectranthus Walkeri Arn. in Nov. Act. Nat. Cur. XVIII, (1836) 354; Pugill. Fl. Ind. Or. 36; Hook.f. Fl. Brit. Ind. IV 617; Gamble Fl. Madras 1120. Prod. XII 57; Wall. Cat. 2741.

Small herbs, 30-45 cm. high; stem subsimple, ascending, leafy-pubescent, blackish when dry, decurrent below. Leaves petioled, narrowly lanceolate, acute, serrate above the middle, cuneate, glabrous, or puberulous on the nerves; lamina 3-8 cm. long, about 1 cm. broad or much less; petiole short, about 5 mm. long. Cymes few-flowered, narrow, in long terminal lax panicles. Calyx in fruit about 4 mm. long, nearly glabrous, distinctly 2-lipped; upper lip subequally 3-toothed, lower 2-toothed; teeth obtuse. Corolla-tube short, about 3 mm. long, rather broad; lips subequal, shorter than the tube.

Plectranthus Walkeri (Contd.)-

Stamens shortly exserted. Nutlets broadly oblong, brownish black.

Habitat:- Deccan peninsula.

Distribution:- Ceylon.

6. Plectranthus rivularis Wight ex Hook.f. Fl. Brit. Ind. IV 617; Gamble Fl. Madras 1120.

P. nigrescens, scaberullus Wight Kew. Distr. 2093.

Slender erect herbs, leafy pubescent. Leaves petioled, lanceolate, acuminate, crenate, base entire, cuneate, glabrate or pubescent on both surfaces; lamina 3-7 cm. long, about 1-1.5 cm. broad; petiole slender 1.5-3 cm. long. Racemes terminal and axillary, narrow, pubescent. Fruiting calyx nearly glabrous, distinctly 2-lipped; upper lip subequally 3-toothed, lower 2-toothed; teeth suberect, acute or obtuse. Corolla-tube about 3 mm. long, straight, rather broad, longer than the subequal lips. Stamens shortly exserted. Nutlets oblong.

Habitat:- Nilgiri and Anamallay hills.

7. Plectranthus hispidus Benth. in Wall. Pl. As. Rar. ii 17; Lab. Gen. et Sp. 41, in DC. Prod. XII 57; Wall. Cat. 2741; Hook.f. Fl. Brit. Ind. IV 618.

Stout herbs, densely pubescent or villous all over. Leaves subsessile, 3-6 cm. long, ovate, acute or acuminate, serrate, tomentose beneath, base rounded or cordate; Cymes in terminal or axillary panicles, densely villous. Calyx very minute in flower, about 2 mm. in fruit, decurved, densely woolly with multicellular hairs, indistinctly 2-lipped, shortly 5-toothed. Corolla tubular, pubescent; lower lip much longer than the upper, boat-shaped, white speckled with red. Nutlets very minute,

Plectranthus hispidus (Contd.)-

ellipsoid, smooth, pale brown.

Habitat:- Assam; Burma.

8. Plectranthus nilghericus Benth. in DC. Prod. XII 57; Hook.f. Fl. Brit. Ind. IV 619; Gamble Fl. Madras 1121;

P. bullatus Benth. in DC. Prod. XII 57.

Herbs with robust, very much villous stem; the whole plant becomes yellowish brown when dry. Leaves petioled, rather thick, broadly ovate-cordate, acuminate, crenate, rugose and villous; lamina 3-10 cm. long, nearly as broad; petiole stout, very short, or often as long as the lamina. Cymes in pyramidal panicles; flowers crowded. Calyx in fruit 2-3 mm. long, completely hidden by dense covering of multicellular hairs, shortly 5-toothed, or indistinctly 2-lipped. Corolla white, pubescent at the lobes; tube straight, equal at the base. Nutlets suborbicular, pale brown. Habitat:- W. Ghats; Nilgiris; Anamallay hills.

9. Plectranthus Wightii Benth. Lab. Gen. et Sp. 41, and in DC. Prod. XII 56; Wight. Ic. t. 1429; Hook.f. Fl. Brit. Ind. IV 619; Gamble Fl. Madras 1120.

P. pulneyensis Hook.f. Fl. Brit. Ind. IV 617.

P. nepetaefolius Benth. in DC. Prod. XII 57; Hook.f. Fl. Brit. Ind. IV 619.

P. striatus Herb. Wight. 2096.

Tall robust herbs, 30-60 cm. high, branched or simple, glabrous or pubescent, often villous; stem often purple. Leaves petioled, ovate-cordate, acute, crenate, pubescent or nearly glabrous, slightly leathery in texture; lamina 3-8 cm. long, nearly as broad; petiole slender or stout, about as long as the lamina, or much shorter. Cymes lax-flowered, in branched panicles, often covered by small leafy bracts. Calyx in fruit

Plectranthus Wightii (Contd.)-

2.5 mm. long, scaberulous or pubescent, decurved, shortly 5-toothed, or indistinctly 2-lipped; teeth obtuse. Corolla about 6 mm. long, tube short, broad, straight, base equal; lips short, subequal, white with purple spots. Nutlets oblong. Habitat:- Nilgiris; Pulney and Anamallay hills.

10. Plectranthus striatus Benth. in Wall. Pl. As. Rar. ii 17, and in DC. Prod. XII 56; Wall. Cat. 2740; Hook.f. Fl. Brit. Ind. IV. 618; Doan in Fl. Gen. Indo-Chine IV 8, (1936) 948.

P. Gerardianus Benth. in Wall. Pl. As. Rar. II 17, Lab. Gen. Sp. 40, and in DC. Prod. XII 56; Hook.f. Fl. Brit. Ind. IV 617; Wall. Cat. 2742.

P. oblongifolius Wall. Pl. As. Rar. ii 16, and Cat. 2739; Benth. Lab. Gen. et Sp. 40, and in DC. Prod. XII 56.

P. Gerardianus, var brachyantha Hook.f. Fl. Brit. Ind. IV 618.

Usually small herbs, 30-50 cm. high, glabrous, pubescent, or villous, and of a flaccid habit. Leaves shortly petioled, ovate, acuminate, crenate, subcordate or rounded at the base, softly pubescent on both surfaces; lamina 4-8 cm. long or more, and half as broad; petiole stout or slender. Cymes usually in long slender panicles. Calyx in fruit 2.5 mm. long, decurved, hispid or glabrous, shortly 5-toothed or indistinctly 2-lipped; teeth obtuse. Corolla white or purplish, about 5 mm. long, tube subcylindric, broad or narrow, straight, equal at the base, lips subequal. Stamens exserted. Nutlets oblong or ellipsoid.

Habitat:- Kashmir to Bhotan, 1000-4000 m.; Assam; Burma.

Distribution:- Indo-China.

var. graciliflora (Hook.f.)

P. graciliflora Benth. in DC. Prod. XII 56.

Leaves scabrid above, usually red-brown when dry.

Habitat:- Nepal; Sikkim; Khasia Mts.

11. Plectranthus Stocksii Hook.f. Fl. Brit. Ind. IV 618;
Gamble Fl. Madras 1120.

P. striatus, and P. concan Herb. Ind. Or. Hook.f. & T.T

P. Wightii Grah. Cat. Bomb. Pl. 148.

An erect annual, 30-60 cm. high, with slender quadrangular stem, simple or branched, glabrous or sparsely hairy. Leaves membranous, petioled, ovate, acute, crenate or coarsely serrate, sparsely hairy with scattered hairs above and on the nerves beneath, conspicuously gland-dotted; lamina 3-7 cm. long, about half as broad or more; petiole slender, 1-5 cm. long. Cymes in much branched panicles; bracts minute, situated at the base of the peduncles. Calyx pubescent or scaberulous, covered with minute red glands, about 4 mm. in fruit, incurved, striate, shortly 5-toothed, or indistinctly 2-lipped; teeth subacute. Corolla 6 mm. long, white with purple spots; tube short, broad, straight, equal at the base. Stamens exserted. Nutlets 1 mm., broadly ellipsoid, smooth, darkbrown in colour. Flowering time, - Sept.-Nov.

Habitat:- Deccan peninsula.

12. Plectranthus Stracheyi Benth. ex Hook. f. Fl. Brit. Ind. IV 618.

Erect herbs, 50-80 cm. high, with simple leafy stem, usually puberulous. Leaves short-petioled, 10-12 cm. long, narrowly lanceolate, acuminate, serrate above the middle, base decurrent to the short petiole, puberulous or glabrescent. Cymes in terminal narrow panicles; axis of inflorescence glabrescent. Calyx very minute, about 2.5 mm. in fruit, scaberulous, indistinctly 2-lipped, or 5-toothed, teeth acute, or the lower obtuse. Corolla short, lips subequal. Stamens exserted. Nutlets narrowly ovoid.

Habitat:- W.Himalaya; Kumaon

13. Plectranthus Brandisii Prain Journ. As. Soc. Beng. LIX (1890), II, 296.

Herbs, 40-80 cm. high; stem slender, simple or branched, ascending, obtusely angled, puberulous; branches spreading, sometimes about 25 cm. long. Leaves shortly petioled, narrowly lanceolate, acuminate, serrate above the middle, base entire, narrowed to the short petiole, subglabrous above, puberulous beneath; lamina 3-13 cm. long, 1.5-3 cm. broad. Cymes in pyramidal panicles, with slender branches. Calyx in fruit 2.5 mm. long, scaberulous, punctate with red glands, shortly 5-toothed; teeth acute, or the lower sometimes obtuse. Corolla short, broad; lips subequal, white specked with red. Stamens far exserted. Nutlets narrowly ovoid. The plant flowers in January.

Habitat:- Burma.

N.B. After a careful examination of the type specimens of this plant and P. Stracheyi Benth, kindly sent to me from Calcutta and Kew respectively, I fail to find any good distinguishing character, but as they are separated by the most remarkable distribution, I prefer to keep them as two distinct species.

14. Plectranthus Coetsa Buch.Ham. ex D.Don. Prod. Fl. Nepal 117; Benth. in Wall. Pl. As. Rar. ii 17, Lab. Gen. et Sp. 42, and in DC. Prod. XII 58; Wall. Cat. 2743; Hook.f. Fl. Brit. Ind. IV 619; Trim. Fl. Ceylon iii 372; Cooke Fl. Bomb. Pr. II Gamble Fl. Madras 1121.

P. menthoides Benth. in Wall. Pl. As. Rar. ii 17, Lab. Gen. et Sp. 42, and in DC. Prod. XII 59; Wall. Cat. 2744; Hook. f. Fl. Brit. Ind. IV 620.

P. Macraei Benth. Labb Gen. et Sp. 42, and in DC. Prod. XII 59; Wight. Ic. t. 1430.

Plectranthus Coetsa (Contd.)-

P. rugosus, tomentosus Benth. in Wall. Fl. As. Rar. 117;
Wall. Cat. 2745/B.

Ocimum Coetsa Spreng Syst. Cur. post. 223.

Scutellaria japonica Burm. Fl. Ind. 130.

Tall erect, perennial undershrub, 1-2.5 m. high, usually much branched, pubescent or glabrate, strongly aromatic. Leaves petioled, ovate, acuminate, serrate, cuneate at the base, softly pubescent, often hoary beneath; lamina 3-10 cm. long; petiole about half as long as the lamina, slightly winged. Cymes in axillary and terminal panicles, subsecund; pedicels slender, deflexed, pubescent. Calyx about 2 mm. long in flower, slightly enlarged in fruit, hoary-pubescent, 10-ribbed; tube cylindrical, curved above the middle; lips indistinct, 5-toothed; teeth sub-equal, acute. Corolla about 5 mm. long, pale violet, pubescent outside; tube deflexed, much shorter than the large saccate, boat-shaped lower lip; upper lip very short, erect, broad, with shallow rounded lobes. Stamens included in the lower lip. Nutlets oblong or subglobose, or variable.

Habitat:- Murree to Mishmi in the Himalayas, 1000-2500 m.; Khasia; Burma; Central Provinces; Deccan peninsula.

Distribution:- Ceylon.

var, Hookeri Hook.f. Fl. Brit. Ind. IV 620.

P. Hookeri Clarke mss.

Usually taller herbs, with leaves upto 12 cm. long, glabrous or puberulous. Fruiting calyx 6-8 mm. long, very broad, teeth longer, more acute. Nutlets twice as long as those of the type.

Habitat:- Khasia Mts.

(P. Macrei Benth. described by Gamble as a variety of P. Coetsa, seems to be just a form of this very variable plant.)

15. Plectranthus Maddeni Benth. ex Hook.f. Fl. Brit. Ind. IV 620.

Stout, erect, branched or simple herbs, nearly glabrous. Leaves long-petioled, ovate, long-acuminate, crenate, cuneate at the base, more or less glabrescent on both sides; lamina 7-15 cm. long, 4-7 cm. broad; petiole slender, winged above, 4-8 cm. long. Cymes in lax-flowered racemes, axillary and terminal. Fruiting calyx campanulate, nearly as broad as long, glabrous; teeth obtuse; lips indistinct. Corolla purple or pale lavender coloured; tube much shorter than the saccate lower lip, base usually gibbous. Stamens purple. Nutlets subglobose.

Habitat:- Kumaon to Sikkim, 1500-3000 m.

16. Plectranthus repens Wall. Pl. As. Rar. ii 17, and Cat. 2746; Benth. Lab. Gen. et Sp. 43, and in DC. Prod. XII 58; Hook.f. Fl. Brit. Ind. IV 619.

Small herbs, 10-15 cm. high, with short stem, prostrate below, pubescent or villous. Leaves long petioled, membranous, broadly ovate- or orbicular-cordate, obtuse or rounded at the apex, pubescent with spreading hairs; lamina 3-7 cm. in diam.; petiole slender, 2-7 cm. long. Cymes in narrow paniced racemes, solitary and terminal, or often axillary, about 20 cm. long or more. Fruiting calyx 2 mm. long, scaberulous, longer than broad, indistinctly 2-lipped, or subequally 5-toothed. Corolla 4 mm. long, tube nearly straight, cylindrical, obtusely spurred at the base above. Stamens included. Nutlets broadly oblong.

Habitat:- Nepal; Sikkim, 2000-3000 m.

17. Plectranthus Kurzii Prain. in Journ. As. Soc. Beng. lix, (1890) II,

Small herbs, 30-40 cm. high; stem simple ascending,

Plectranthus Kurzii (Contd.)-

rather bluntly 4-angled, flaccid and glabrous. Leaves petioled, membranous, orbicular, obtuse, very broadly serrate above the middle, the terminal tooth largest, often very broad and blunt, base narrowed to the short winged petiole, almost glabrous on both surfaces; lamina 3-4.5 cm. in diam. Cymes in narrow paniced racemes, terminal or a few axillary, 6-10 cm. long, rather lax-flowered. Fruiting calyx glabrous, teeth subequal, subacute, Corolla tube nearly straight, cylindric, obtusely spurred above at the base. Stamens included; posterior filaments pubescent. Nutlets small, broadly ovoid.

Habitat:- Sikkim, 800-1500 m.

18.. Plectranthus mellissoides Benth. Lab. Gen. et Sp. 39, and in DC. Prod. XII 62; Wall. Cat. 7122; Hook.f. Fl. Brit. Ind. IV 620.

Strict erect herbs, 30-60 cm. high, rather slender, tomentose or puberulous. Leaves small, 1-2.5 cm. long, sessile or shortly petioled, ovate or rounded, crenate, glabrate, or very densely tomentose beneath or on both surfaces, base narrow. Cymes in lax-flowered, long, slender, strict racemes. Calyx in fruit 4 mm. long, broadly campanulate, subhispid, 2-lipped, upper lip 3-toothed, lower 2-toothed; teeth acute; pedicels about 6 mm. long. Corolla 6 mm. long, pink; tube short broad, gibbously hemispheric, lips short. Nutlets globose.

Habitat:- Hills of Assam, 1000-2000 m.

19. Plectranthus pharicus Prain in Journ. As. Soc. Beng. LIX, (1890) II 297.

Small shrubby plants, 15-30 cm. high, with woody stems very stout and terete below, 4-angled above, tomentose or pu-

Plectranthus pharicus(Contd.)-

berulous. Leaves sessile or subsessile, 1-1.25 cm. long, less than 1 cm. broad, ovate or rounded, crenate, glabrate above, tomentose at least on the nerves beneath. Cymes in axillary racemes, rather dense but few-flowered. Calyx 4 mm. long, nearly double in fruit, subhispid, strongly nerved, subequally 5-toothed, teeth acute, the 2 lower teeth longer; the fruiting calyx is contracted above the nutlets. Corolla-tube short, declinate, abruptly decurved; lips large and wide, the lower lip longer than the tube. Nutlets oblong, pale, faintly reticulated, smooth, 2.5 mm. long, 1.5 mm. broad.

Habitat:- Phari; (may yet be found in extreme N.Sikkim).

Distribution:- Tibet.

20. Plectranthus rugosus Wall. Pl. As. Rar. ii 17, and Cat. 2745; Benth. Lab. Gen. et Sp. 43, and in DC.Prod.XII 59; Hook. f. Fl.Brit. Ind. IV 620.

An erect shrub, with slender strict branches, hoary with stellate down. Leaves short petioled, 1.5-4cm. long, ovate or elliptic, obtuse, crenate, subcordate rarely acute at at the base, rugose and finely reticulated above, densely white-tomentose beneath, slightly thick and leathery in texture. Cymes axillary, lax-flowered, paniced in a leafy raceme; peduncles and pedicels slender. Calyx in fruit 4-5 mm. long, decurved, hoary, subequally 5-toothed, or very shortly 2-lipped; teeth subequall, acute or obtuse. Corolla 4 mm. long, white with rose or purple spots; tube very short, declinate or abruptly decurved, base usually gibbous; lips large, lower longer. Nutlets oblong.

Habitat:- Baluchistan; Kurram valley; Kashmir to Garhwal; Bhootan; Mt. Aboo.

Distribution:- Affghanistan.

21. Plectranthus incanus Link. Enum. Hort. Berol. ii 120; Benth. Lab. Gen. et Sp. 35, in Wall. Pl. As. Rar. ii 16, and in DC. Prod. XII 66; Wall. Cat. 2736; Hook.f. Fl. Brit. Ind. IV 621; Prain in Beng. Pl. 447; Cooke Fl. Bomb. Pr. II 447; Gamble Fl. Madras 1121.

P. cordifolius Don. Prod. 116.

P. secundus Roxb. Hort. Beng. 45, and Fl. Ind. iii 20.

P. divericatus Weinm in Syll. Pl. Soc. Ratisb. i 68, and in Flora 1826, 174.

P. mollis Spreng. Syst ii 690.

Ocimum molle. Ait. Hort. Kew ii. 322.

O. mayporensis Roth. Nov. Sp. 271; Rheede Hort. Mal. X, t. 84.

Herbs, 30-50 cm. high; stem subsimple, robust, fleshy below, pale or hoary with a fine pubescence. Leaves long petioled, ovate-cordate, acute or acuminate, crenate, finely pubescent on both surfaces or almost glabrous above; lamina 5-10 cm. long, and nearly as broad; petiole slender 3-8 cm. long. Cymes lax-flowered, in slender racemes, 10-20 cm. long, paniculately branched below; bracts small, ovate, cuneate; pedicells 3-4 mm. in flower, 6-8 mm. in fruit. Calyx in fruit about 10 mm. long, erect, broadly campanulate, 2-lipped; upper lip short, rounded, entire, reflexed, lower with 4 acutely pointed teeth, longer than the upper lip; the middle teeth of lower lip longer than the lateral ones. Corolla about 10 mm. long, pale lilac or light blue; tube slightly decurved, not gibbous at the base, longer than the short hemispheric boat-shaped lower lip, white pubescent. Stamens included. Nutlets 2 mm. in diam. subglobose, smooth, pale brown, dotted with dark spots.

Habitat:- Simla to Sikkim, 1750 m; Khasia Mts; C. India; Konkan; Deccan

22. Plectranthus urticifolius Hook.f. Fl. Brit. Ind. IV 622;
Gamble Fl. Madras 1122.

Robust herbs, with short stems, glabrous except the puberulous panicle. Leaves petioled, broadly ovate, obtusely acuminate, regularly and obtusely crenate or lobulate, cordate at the base, gland-dotted beneath, some times minutely puberulous above; lamina 7-15 cm. long, 5-12 cm. broad; petiole very thick and fleshy, 2-5 cm. long, some times much more. Cymes in very large, stout and branched panicles; branches suberect. Calyx in fruit 6-7 mm. long, 2-lipped; the upper lip large rounded, reflexed, orbicular-ovate; teeth of lower lip subulate-lanceolate, 2 lowest teeth longest and incurved. Corolla about 12 mm. long, tube cylindric, decurved, equalling the narrow lower lip; upper lip very broad, lower narrowly cymbiform, curved upwards, coming closer to the upper lip. Stamens quite free, included in the lower lip. Nutlets large, orbicular-oblong, brown, smooth and shining.

Habitat:- Deccan peninsula.

23. Plectranthus fruticosus Wight ex Hook.f. Fl. Brit. Ind. IV 623; Wight. Cat. 2524; Gamble Fl. Madras 1122.

Coleus fruticosus Benth. in DC. Prod. XII 78.

Stout robust shrubs, about 100 cm. high or more, with spongy stems of more than 1 cm. thickness; branches and leaves beneath densely tomentose. Leaves petioled, very large, rounded or ovate-cordate, obtusely acuminate, coarsely lobulate, pubescent above, softly tawny-tomentose below; lamina 8-25 cm. long, 5-16 cm. broad; petiole 2-5 cm. long, very stout, almost woolly. Racemes in thyrsoid panicles, 15-25 cm. long; rachis and primary branches woody, glandular pubescent; flowers alternate and secundly arranged, shortly pedicelled. Calyx in fruit about 6 mm. long, 2-lipped; upper lip large ovate, reflexed; lower with 4 acuminate teeth.

Plectranthus fruticosus (Contd.)-

Corolla about 18 mm. long, pubescent; tube deflexed or declinate, base gibbous or not; lips wide apart. Filaments slightly exerted, free.

Habitat:- S. India.

24. Plectranthus coleoides Benth. in DC. Prod. XII 64; Bot. Mag. t. 5841; Hook.f. Fl. Brit. Ind. IV 622; Gamble Fl. Madras 1122.

Coleus Wightii Benth. Lab. Gen et Sp. 58, in DC. Prod. XII 78; Wight. Ic. t. 1433.

C. glabratus Benth. Lab. Gen. et Sp. 58, and in DC. Prod. XII 78.

C. paniculatus Benth. in Wall. Pl. As. Rar. ii 79, and in DC. Prod. XII 78; Wall. Cat. 2734.

Stout herbs, 60-100 cm. high, with succulent branches, glandular-tomentose or glabrate. Leaves long petioled, ovate or orbicular-ovate, obtuse, crenate; lamina 3-10 cm. in diam., fleshy; petiole as long as the blade. Racemes on a huge pyramidal, thyr-soid panicle, sometimes about 30 cm. across; younger racemes completely covered with deciduous orbicular-ovate bracts. Calyx in fruit about 6 mm. long, very variable, broad straight and campanulat, or narrowed and curved, 2-lipped; upper lip rounded, lower with 4 equal lanceolate, acuminate teeth. Corolla about 12 mm. long, or more, lilac, pubescent; tube deflexed or declinate, equalling the ciliate lower lip, base of corolla gibbous or not. Stamens included. Nutlets oblong, black and shining.

Habitat:- Nilgiri and Annamalaya hills, 2000m.; W.Ghats; Travancore.

Habitat:- Travancore; Tinnevely Dt.

25. Plectranthus Bourneae Gamble in Kew Bull. 1924, 264, and Fl. Madras 1122.

A large succulent undershrub, with thick stems. Leaves

Plectranthus Bourneae (Contd.)

shortly petioled or sessile, thick, orbicular or ovate, obtuse, obscurely crenulate in the upper half, base entire, cuneate, whitish or tawny tomentose on both surfaces or glabrate above; leaf-blade 2-4 cm. long, and nearly as broad; petiole .5-1 cm. long, sometimes upto 1.5 cm. long. Racemes 2-4 cm. long, in thyrsoid panicles, up to 25 cm. long; flowers close and secundly arranged. Calyx in fruit about 6 mm. long, tawny villous, 2-lipped; upper lip entire, lower with 4 equal, lanceolate, acuminate teeth. Corolla 12-18 mm. long, lilac; lower lip acute. Nutlets minute, black or dark brown in colour, smooth, glossy, slightly flattened.

Habitat:- W.Ghats; Pulney hills; Nilgiris, 2000 m.

26. Plectranthus subincisus Benth. in Wall. Fl. As. Rar. ii 16; in Lab. Gen. et Sp. 36, and in DC. Prod. XII 66; Wall. Cat. 2737; Hook.f. Fl. Brit. Ind. IV 621; Gamble. Fl. Madras 1122.

Erect flaccid herb, about 30 cm. high, glabrous or puberulous. Leaves long petioled, flaccid, orbicular ovate, obtuse, sinuate-crenate, rounded at the base, glabrous; lamina 3-6 cm., or sometimes upto 10 cm. in diam.; petiole as long as the leaf-blade. Cymes few-flowered, in elongated racemes, forming a large panicle. Calyx in fruit about 6 mm. long, campanulate, dimorphic; lips short, upper rounded, large and reflexed, lower 4 short teeth with subulate tips. Corolla about 4 mm. long, pubescent; tube slender, decurved, longer than the short lower lip, deflexed or declinate, base gibbous or not. Nutlets globose, deeply pitted, brown or pale smooth.

Habitat:- Travancore; Tinnevely Dt.

(The above description has been compared with the material kind^y sent from Kew.)

27. Plectranthus Bishopianus Gamble in Kew Buul. 1924, 265,,
and Fl. Madras 1122.

A large erect, slightly fleshy undershrub. Leaves long-
petioled, broadly ovate, acute or obtuse, crenate in the upper
part, base rounded, minutely puberulos on both surfaces; lamina
5-8 cm. long, about 3-6 cm. broad; petiole 2.5-4 cm. long.
Racemes slender, in thyrsoid panicles, upto 25 cm. long; rachis
and peduncles villous. Calyx in fruit 3 mm. long, villous at the
base, 2-lipped; upper lip entire, lower 4-lobed or toothed, teeth
acute. Corolla 15 mm. long; lower lip obtuse, lilac.
Habitat:- W. Ghats; Pulney hills.

28. Plectranthus Parishii Hook. f. Fl. Brit. Ind. IV 622.

Annual herb, 15-25 cm. high, flaccid, puberulous. Leaves
long-petioled, orbicular-ovate, obtuse, narrowed in to the
petiole, coarsely crenate or lobulate, nearly glabrous; lamina
2-5 cm. in diam., petiole about twice as long as the leaf-blade,
slightly winged. Cymes in lax-flowered racemes; peduncles and
pedicells pubescent. Calyx minute, about 3 mm. in fruit, broadly
campanulate, shortly and subequally 2-lipped; upper lip entire,
lower with 4 subulate teeth. Corolla pale blue, 15 mm. long;
tube very slender below, inflated near the throat, much longer
than the narrow lower lip. Stamens included in the lower lip.
Nutlets minute, pale.

Habitat:- Burma, Tenasserim;

(I have seen the type sheet, kindly sent from Kew; a
very old sheet of Parish from the same locality and another
of Prain, both in Herb. Cal., seem to be altogether two
different plants, quite distinct from Parishii, but the mate-
rials are too poor to be given a description).

29. Plectranthus Griffithii Hook.f. Fl. Brit. Ind IV 623.

Plectranthus crenulatus Hook.f. Fl. Brit. Ind. IV 623.

Erect herbs, rather woody below, hirsutely tomentose all over. Leaves petioled, ovate, acuminate, crenate or crenulate, rounded or slightly cordate at the base; lamina 7-14 cm. long, 5-10 cm. broad; petiole 2-4 cm. long. Cymes sessile, in long slender racemes, sometimes upto 25 cm, long, rather dense-flowered; rachis very densely hirsute; flowers pedicelled. Calyx in fruit about 4 mm. long, sparsely hairy, contracted above the swollen base, campanulate; lips subequal, upper entire, broad rounded, lower with 4 acuminate teeth. Corolla about 5 mm. long; tube slender declinate, curved, white; lips subequal, pale rose coloured. Nutlets orbicular, smooth, black and granulate. Habitat:- Assam; Burma.

(After examining the type sheet of P. crenulatus Hook.f., kindly sent to me from Kew, I fail to find any satisfactory character by which it can be separated from P. Griffithii Hook.f.)

30. Plectranthus Meeboldii W.W. Smith Rec. Bot. Surv. Ind. VI (1914) 39.

Dwarf annuals, erect or suberect, sometimes almost stemless, about 15 cm. high, simple, more or less densely fulvus tomentose. Leaves petiolate, ovate-oblong, rounded at the apex, subrotundate or abruptly cordate at the base, regularly crenate, subscabrid on the upper surface, fulvus tomentose below; lamina 6-12 cm. long, 4-6 cm. broad; petiole 3-8 cm. long. Racemes short, few-flowered, forming a slender panicle, about 5-8 cm. long. Calyx very minute, about 3 mm. in fruit, straight; teeth of lower lip acute, equal. Corolla about 4 mm. long, white.

Habitat:- Burma.

(I have seen the type sheet, kindly sent from Kew.)

31. Plectranthus fulvescens Prain in Journ. As. Soc. Beng. lxvi, 521.

Coleus fulvescens Kurz. Mss.

Erect herbs, stem branched or simple, 4-angled, glabrous below. Leaves membranous, narrowly lanceolate, acuminate or acute, margin finely crenate, base entire, narrow and decurrent to the long or short petiole, both surfaces densely fulvous-tomentose; lamina 10-15 cm long, 1.5-2.5 cm. broad. Racemes 10-16 cm. long, slender, narrow, rather dense-flowered, hirsutely fulvous-tomentose; whorls 6-flowered, flowers pedicelled. Calyx in fruit 6 mm. long, densely hirsute with spreading hairs, 2-lipped; upper lip entire broad, rounded; lower with 4 teeth, the 2 middle teeth acute, lateral ovate, faintly serrate; the tube of fruiting calyx slightly contracted above the nutlets. Corolla 8 mm. long; tube slender, declinate, curved, longer than the lower lip, white in colour; lips short, pale blue. Nutlets oblong, brown, shining.

Habitat:- Burma.

32. Plectranthus Helferi Hook.f. Fl. Brit. Ind. IV 623.

Erect herbs, 30-60 cm. high, woody below; stem and branches puberulous. Leaves shortly petioled, 3-7 cm. long, narrowly lanceolate, acute or subacute, crenate above the entire base, which is decurrent to the petiole, both surfaces glabrous or puberulous when young. Cymes short, subsessile, in branched glandular-tomentose racemes. Calyx in fruit about 4 mm. long, glandular hairy; upper lip entire, orbicular, lower lip with 4 subulately pointed teeth. Corolla-tube deflexed or declinate, base gibbous or not. Nutlets not seen.

Habitat:- Burma, Tenasserim.

(I have seen the type sheet, kindly sent from Kew.)

Coleus Lour.

Fl. Cochinch. 372; Benth. Lab. Gen. et Sp. 47, and in DC. Prod. XII 71; Benth. & Hook.f. Gen. Pl. II 1176; Hook.f. Fl. Brit Ind. IV 624; Briq. in Eng. U. Pr. Pfl Nat. Pfl- fam. IV 3, a, 359; Prain Beng. Pl. 846; Collet Fl. Sim. 386; Cooke Fl. Bomb. Pr. II 448; Gamble Fl. Madras 1123; Haines Fl. Bih & Oris. 735; Kudo ~~XX~~ in Memo. Fac. Sc. & Agri. II 2, (1929) 144.

Herbs or undershrubs, usually aromatic, often fleshy. Flowers in lax or dense paniculate or racemose, 6--8 -fld. cymes. Floral leaves and bracts caducous. Calyx subcampanulate, declinate or reflexed in fruit; tooth of upper lip ovate; lower lip with 4 acuminate teeth, or the 2 lateral teeth obtuse. Corolla 2-lipped, tube exserted, decurved in the middle, often obliquely swollen at the throat; upper lip short, broad, slightly 4-lobed, recurved; lower much longer, entire, boat-shaped, stipitate or narrowed at the base. Stamens 4, didynamus, connate below in a sheath round the style separate from the corolla; anther-cells confluent. Disk enlarged in front. Ovary 4-partite; style slender, 2-fid at the tip. Fruit of 4 orbicular or ovoid, smooth, dry nutlets; basal scar small.

C. Zatarbendi Balx. & Gila. Bomb. Pl. 206; Benth. Lab. Gen. et Sp. 50.

Placustrans mosabellus Haydn n. sp.; Rox. Hort. Beng. 45; and Fl. Ind. III 38.

P. caninus Roth. Nov. Sp. 273.

Coleus mosabellus Roth. Nov. Sp. 257.

C. Zatarbendi Korak. Pl. sin. Arab. 107.

A. Calyx-throat villous within

B. Spikes uninterrupted..... *spicatus*.

B. Spikes much interrupted..... *Forskohlii*.

A. Calyx-throat glabrous within

B. Leaves deeply cut and divided..... *laciniatus*.

B. Leaves serrate γ crenate only

C. Leaves very fleshy, \pm obtuse

D. Leaves villous or tomentose,

petiole one cm. or less..... *amboinicus*.

D. Leaves \pm glabrous, petiole

2-5 cm. long *parviflorus*.

C. Leaves \pm membranous, long acute

D. Corolla \pm 15 mm. long..... *malabaricus*.

D. Corolla 6-8 mm. long

E. Calyx \pm glabrous..... *scutellarioides*

E. Calyx \pm hirsute..... *Blumei*.

1. *Coleus spicatus* Benth. Wall. Pl. As. Rar. ii 15; Lab. Gen. et Sp. 49; DC. Prod. XII 71; Wight. Ic. t 1431; Wall. Cat. 2729; Hook. f. Fl. Brit. Ind. IV 624; Cooke Fl. Bomb. Pr. II 449; Gamble Fl. Madras 1123.

C. Heynii, Benth. Lab. Gen. & Sp. 50; DC. Prodr. XII 71.

C. Zatarhendi Dalz. & Gibs. Bomb. Fl. 206; ? Benth. Lab. Gen. et Sp. 50.

Plectranthus monadelphus Heyne mss; Rox. Hort. Beng. 45; and Fl. Ind. iii 22.

P. caninus Roth. Nov. Sp 279.

Ocimum monadelphum Roth. Nov. Sp. 267.

?*O. Zatarhendi* Forsk. Fl. Alg. Arab. 109.

Coleus spicatus(contd.)

Perrennial fleshy herb, about 39 cm. high. strongly aromatic; stem very stout, villous with long spreading soft hairs or glabrate. Leaves subsessile, 2-5 cm. long, obovate, ovate or orbicular, entire or crenate, glabrous, or pubescent, gland-dotted beneath; base of leaves narrow. Flowers densely crowded in a cylindric woolly spike, 10-20 cm. long; bracts deciduous, broadly ovate, acute, ciliate, thinly membranous, about 6 mm. long. Calyx 4 mm. long, tube hairy outside, and with a ring of hairs at the throat; upper lip broad, truncate, crenulate, slightly shorter than the lower lip, which ^{is} 4-toothed; all teeth ciliate. Corolla pale lilac; tube slender, upper part of the tube bent downwards almost at a right angle; upper lip broadly obovate, 4-lobed; lateral lobes shorter; lower lip longer, concave, joined to the tube by a short neck. Style deeply bifid. Nutlets subglobose, smooth shining, black.

Habitat;- Deccan peninsula; Southern parts of Bombay Presidency; Burma.

2. Coleus Forskohlii Briq. in Engl. u. Pr. Pfl- fam IV 3 a, 359 ; Haines Fl. Bih. & Oris. 735.

Coleus barbatus Benth. Wall. Pl. As. Rar. ii 15; Lab. Gen. et Sp. 49; and DC. Prodr. XII 71; Wall. Cat 2728; Grah. Cat. Pl. Bomb. 148; Dalz. & Gibs. Bomb. Fl. 205; Wight. Ic. t 1432; Hook. f. Fl. Brit. Ind. IV 625; Prain Beng. Pl. 846; Cooke Fl. Bomb. Pr. II 448; Gamble Fl. Madras 1124.

C. Schimperi Vatke Linnaea xxxvii 320.

Plectranthus barbatus Andr. Bot. Rep. t 494.

P. cosmos Bot. Mag. t 2381.

P. Forskohlii Willd. Sp. Pl. iii 169; Bot. Mag. t 2036.

P. asper Spreng. Syst. ii 690.

Coleus Forskohlil, (contd.)

P. mysorensis Heyne mss.

Germania Forskohlil Poir. Dict ii 764.

Ocimum asperum Roth. Nov. Sp. 268.

O. cinerum Brown in Salt. Abyss. App.

O. saccharoides Willd. fid. Heyne.

Perennial herb, 30- 60 cm. high; stem ascending, stout, woody at the base and arising from thick, fleshy rootstock. Leaves slightly thick, short petioled, 5- 10 cm. long, ovate or obovate, obtuse, crenate, narrowed at the base; densely pubescent on both sides; lower surface faintly gland-dotted. Racemes spiciform, 15- 30 cm. long; ~~stout~~ rachis stout, densely hairy and glandular; whorls 6- 10-fld. close at first, afterwards 2-3 cm. apart; bracts conspicuous, about 2.5 cm. long, broadly ovate, mucronate, pubescent and ciliate, deciduous. Fruiting calyx about 8 mm. long, hairy and glandular outside, and with a ring of hairs within; upper lip ovate acuminate, slightly longer than the lower; lower lip with 4 triangular, narrow, subulately pointed teeth, all pungent. Corolla bluish, with red glands outside, 2 cm. long; tube bent at a right angle, upperlip short, subequally 4-lobed; lower lip boat shaped, joined to the tube by a narrow neck. Anthers blue with red pollens. Nutlets smooth, dark brown.

Habitat;- Deccan peninsula; Konkan; Gujrat; Simla; Mussouri; Kumaun; Gharwall; Nepal; Chota Nagpur.

Distribution;- Ceylon; Trop. E. Africa.

3. Coleus amboinicus Lour, Fl. Coch. 372; Gamble Fl. Mad. 1123.

C. aromaticus Benth. Wall. Pl. As. Rar. ii 16; Lab. Gen. et Sp. 51; and DC. Prod. XII 72; Wall. Cat. 2730; Wight. Ill. ii t. 175; Grah. Cat. Bomb. Pl. 148; Dalz. & Gibs. Bomb. Fl. Suppl. 66; Bot. Reg. t 1520; Hook. f. Fl. Brit. Ind. IV 625.

C. crassifolius Benth. in Wall. Pl. As. Rar. ii 13; and Lab. Gen. et Sp. 52; Wall. Cat. 2731.

Plectranthus aromaticus Rox. Hort. Beng. 45; and Fl. Ind. iii 22.

Fleshy shrubs, strongly aromatic, 60— 100 cm. high, hispid. Leaves fleshy, short- petioled, broadly ovate, cordate or rounded at the base, crenate, densely villous or tomentose; lamina 3--6 cm. long, petiole 1 cm. long or less. Flowers very small, densely crowded in distant whorls; bracts minute. Calyx glabrous at the throat; upper calyx- lip ovate acute, lower acuminate; fruiting calyx succulent. Corolla pale purple in colour, tube short not decurved, throat inflated, lips short. Stamens slightly exserted.

Habitat:- Deccan and most of the provinces in N. India, also in Rajputana (cultivated and wild).

Distribution:- Malaya peninsula and islands (Native).

4. Coleus parviflorus Benth. Dc. Prod. XII 72; Hook. f. Fl. Brit. Ind. IV 625; Gamble . Fl. Madras 1124 .

C. Tuberosus Benth. Lab. Gen. et Sp. 59.

Plectranthus tuberosus Blume.

Softly fleshy herb, 30-- 60 cm. long, prostrate or ascending, with tuberous roots. Leaves long petioled, glandular beneath, rounded or broadly ovate, obtuse,

Habitat:- Cultivated in gardens in west of the provinces.
Distribution:- Malaya (Native); Australia

Coleus parviflorus (contd.)

coarsely crenate, glabrous or nearly so; petioles of lower leaves as long as 5 cm., shorter upwards. Racemes slender, pubescent, whorls dense-flowered. Calyx glandular; ~~whorls-dense~~ upper calyx lip ovate, teeth of lower lip obtuse, or the lowest pair of teeth mucronate; throat glabrous. Corolla decurved, gland-dotted.

Habitat:- S. Deccan; Central Province; Abor Dt. in Assam. (Cultivated for tubers.)

Distribution:- Ceylon.


5. *Coleus scutellarioides* Benth., in Wall. Pl. As. Rar. II 16; Lab. Gen et Sp. 53; and in DC. Prodr. XII 73; Wall. Cat. 2723 2732; Hook.f. Fl. Brit. Ind. IV 626; Prain Beng. Pl. 846; Haines Bot. Bih. & Or'is. 736.

Ocimum scutellarioides Linn; Burm. Fl. Ind. 130; Bot. Mag. t. 1446.

Plectranthus scutellarioides Br. Prodr. 506; Roxb. Fl. Ind. iii 21.

P. nudiflorus Willd. Sp. Pl. iii 168.

Germania nudiflora Poir. Dict. Suppl. ii 763.

Tall slender herbs, 60--100 cm. high, glabrous or minutely hairy. Leaves membranous, petioled, 3- 7 cm. long, ovate  ovate-lanceolate, acuminate, ~~xx~~ crenate, base rounded or cuneate, glabrous on both surfaces, gland-dotted beneath, purplish in colour. Flowers crowded in distant whorls in a puberulous raceme. Calyx gland-dotted, glabrous outside as well as within; upper lip ovate, lower lip with 2 lateral obtuse and 2 middle acute teeth; fruiting calyx 3 mm. long. Corolla about 15mm. long, white with a blue lower lip, tube abruptly decurved.

Habitat:- Cultivated in gardens in most of the provinces.

Distribution:- Malaya i/slands (Native); Australia

6. Coleus Blumei Benth. Lab. Gen. et Sp. 56; DC. Prod. XII 75; Cooke Fl. Bomb. Pr. II 449; Gamble. Fl. Madras 1124; Haines Fl. Bih. Oris. 736; Kudo in Mem. Fac. Sc. & Agri. II, 2 (1929) 144.

Plectranthus scutellarioides Blume Bijdr. 537, non R.Br.

Herbs with erect slender stem, puberulous above, glabrescent below, sometimes with a ring of long dense hairs at each node. Leaves petioled, 5- 10 cm. long, ovate, acute or acuminate, obtusely serrate, base rounded or shortly cuneate; pubescent on both sides, more densely below; petiole 2- 4 cm. long, usually slender. Inflorescence racemose, simple or branched, slender, faintly puberulous; flowers in short secondary branches; bracts minute, imbricate, deciduous, ovate, acuminate. Calyx very minute in flower, densely pubescent outside, glabrous within; upper lip entire; ~~lower~~ lower lip trilobed, the lateral short truncate, the median lobe longer than the upper lip, bifid with 2 short triangular acuminate teeth; fruiting calyx 5- 7 mm., finely tubercular, hairy only at the base. Corolla bluish in colour, tube bent in the middle; upper lip short 4-fid, lower concave. Stamens slightly exserted. Nutlets subglobose flattened, smooth, shining.

Habitat:- Bombay Precy.; S. India; Assam; Tippera; U. Burma; and other provinces. (Cultivated).

Distribution:- Java (Native); Formosa.

7. Coleus laciniatus Benth. Lab. Gen et Sp. 56 and DC. Prod. XII 76; Haines Fl. Bih. & Oris. 736.

Herbs erect, stem usually unbranched, puberulous above. Leaves petiolate, 7- 12 cm. long, ovate, acute or acuminate, cuneate at the base, deeply and irregularly cut and divided; glabrescent on both surfaces, hairy on the nerves and on the

(*Coleus laciniatus* Bth. contd.)

petiole; petiole slender, 1- 4 cm. long. Racemes slender simple or branched, about ~~2.5~~ 25 cm. long; flowers in short secondary branches. Calyx minute in flower, densely hairy outside, glabrous within, upper lip ovate mucronate, lower lip trilobed, the lateral lobes short truncate, median lobe with 2 acute teeth, shorter than the upper lip in flower, longer in fruit. Corolla tube bent in the middle, upper lip short, 4-fid, lower lip concave.

Habitat:- Naga hills(introduced).

Distribution:- Malaya peninsula and islands(Native); Yunan.

8. *Coleus malabaricus* Benth. Wall. Pl. As. Rar. ii 16; Lab. Gen. et Sp. 57, and DC. Prodr. XII 76; Wall. Cat. 2735; Thwaites Enum. 238; Hook.f. Fl. Brit. Ind. IV 626; Gamble Fl. Madras 1124.

Coleus ovatus Macrei, in Benth. Lab. Gen. et Sp. 57, and DC. Prodr. XII 76.

C. Macrei in Bot. Mag. t 4690;

C. Walkeri Benth, in DC. Prod. XII 77.

Tall herbs, 60--100 cm. high, hairy or glabrescent; stem dark purple. Leaves long petioled, dark purple beneath, 7--15 cm. long, ovate or lanceolate, acute or acuminate, base rounded, cuneate or narrowly cordate, margin crenate; glabrous or ~~na~~ almost so; petiole as long as the lamina or longer. Cymes in pyramidal panicles; whorls distant; flowers about 2.5 cm. long, bracts caducous. Calyx dark purple, 6mm. long, glandular, glabrous outside as well as within; fruiting calyx broad, membranous; upper lip large, rounded, acute; lower lip longer with 4 acuminate teeth. Corolla glandular, tube pale lilac, abruptly decurved, throat inflated; upper lip short crenate, dark blue; lower boat-shaped, acute pale.

(*Coleus malabaricus* contd.)

Stamens included. Nutlets not seen.

Habitat:- In the hills of S. India, up to 1828 mtr.

Distribution:- Ceylon.

.....

Herbs or undershrubs, with opposite or whorled, petioled or sessile leaves. Spikes usually terminal, dense-flowered, cylindrical or 4-angled; bracts caducous. Calyx tubular, inflated below the middle, 2-lipped or 5-toothed, rarely 1-lipped; upper lip entire or slightly toothed, deflexed and lobed-like, closing the mouth, or short; lower lip short and truncate, entire or obscurely toothed. Corolla 2-lipped; tube slender, inflated at the throat; upper lip short, entire or 2- or 4-lobed; lower elongate concave. Stamens 4, declinate, ditynamous, the posterior pair longer; filaments free; anthers confluent. Disk 4-lobed, the anterior lobe larger. Ovary 4-partite, style 2-fid at the apex. Nutlets 4, dry, smooth, woody; basal scar small.

Anisochilus Wall.

Pl. As. Rar. ii 18; Benth. Lab. Gen. et. Sp. 59, and in DC. Prod. XII 80; Benth. ex Hook.f. Gen. Pl. II 1177; Hook.f. Fl. Brit. IV 627; Briq. in Eng. und Pr. Nat. Pflanzenf. IV, 3, a, 350; Baker in Thiselton-Dyer Fl. Trop. Afr. V 446; Prain Beng. Pl. 847; Cooke Fl. Bomb. Pr. II 450; Duthie Fl. Upp. Gang. Pl. II 239; Gamble Fl. Madras 1124; Haines Bot. Bih. & Oris. 733; Kudo in Mem. Fac. Sc. & Agri. II, 2, (1929) 141; Doan in Fl. Gen. Indo-Chine IV, 8, (1936) 941.

Herbs or undershrubs, with opposite or whorled, petioled or sessile leaves. Spikes usually terminal, dense-flowered, cylindric or 4-angled; bracts caducous. Calyx suberect, inflated below the middle, 2-lipped or 5-toothed, rarely 1-lipped; upper lip entire or minutely toothed, deflexed and beak-like, closing the mouth, or short; lower lip short and truncate, entire or obscurely toothed. Corolla 2-lipped; tube slender, inflated at the throat; upper lip short, entire or 3- or 4-fid; lower elongate concave. Stamens 4, declinate, didynamous, the posterior pair longer; filaments free; anther-cells confluent. Disk 4-lobed, the anterior lobe larger. Ovary 4-partite, style 2-fid at the apex. Nutlets 4, dry, smooth, ovoid; basal scar small.

B. Calyx 2-lipped; upper lip entire or 3-notched, lower short, truncate. (S. Ind.)

C. Leaves 1-2 cm. broad.

D. Corolla 12 mm. long. verticillatus

E. Corolla 6 mm. or less.

F. Spikes axillary; leaves 2-3 cm. long.

G. Spikes short-peduncled, axillary

- A. Mouth of fruiting calyx closed by the deflexed upper lip.
- B. Leaves lanceolate; upper lobe of calyx 3-toothed. pallidus
- B. Leaves ovate, oblong or orbicular; upper lobe of calyx entire.
- C. Upper surface of leaves glabrous, or pubescent with minute hairs.
- D. Petiole \pm 2.5 cm. long.
- E. Calyx glabrous or pubescent with minute hairs. carnosus
- E. Calyx villous with long white hairs. eriocephalus
- D. Petiole \pm 1 cm. long. paniculatus (see also below)
- C. Upper surface of leaves as well as lower surface densely and softly hoary tomentose.
- D. Spikes few much longer than broad.
- E. Spikes oblong, narrow, several times longer than broad; calyx white-villous Wightii
- E. Spikes narrowly cone shaped, twice as long as broad; calyx brownish hairy. scaber
- D. Spikes numerous, very short, as broad as long. paniculatus
- A. Mouth of fruiting calyx not closed.
- B. Calyx 2-lipped; upper lip entire or 3-notched, lower short, truncate. (S. Ind.).
- C. Leaves 1-2 cm. broad.
- D. Corolla 12 mm. long. verticillatus
- D. Corolla 6 mm. or less.
- E. Spikes many; leaves 2-5 cm. long.
- F. Spikes short-peduncled, axillary and terminal; leaves not clustered

and terminal; leaves not clustered

at apex.....

G. Leaves opposite, well distributed

..... *dysophylloides*

G. Leaves 3-whorled, densely crowded

..... *sericeus*

F. Spikes long-peduncled, all in terminal

racemes; leaves clustered at apex

..... *suffruticosus*

E. Spike solitary; leaves 1.5-2 cm. long.

F. Spike slender, \pm 3 mm. in diam.

..... *plantageneus*

F. Spike about 7-10 mm. in diam..... *argenteus*

C. leaves 5-10 cm. broad or more..... *robustus*

B. Calyx 1-lipped, lip 5-toothed (Trop. Him., Assam,

Burma)..... *polystachyus*

1. Anisochilus carnosus Wall. Pl. As. Rar. ii 18, and Cat. 2753; Benth. Lab. Gen. et Sp. 59, and in DC. Prod. XII 81; Wight. Ill. t. 1766, f. 1; Hook. f. Fl. Brit. Ind. IV 627; Prain Beng. Pl. 847; Cooke. Fl. Bomb. Pr. II 450; Gamble Fl. Madras 1126; Haines Bot. Bih. & Oris. 733.

A. crassus Benth. in DC. Prod. XII 81.

A. glaber Schrad. Ind. Sem. Hort. Goett. 1833, 1.

A. rupestris Wight Cat. 2521.

Plectranthus strobiliferus Roxb. Hort. Beng. 45, and Fl. Ind. iii 23.

P. carnosus Smith in Rees. Cyclop. V 27.

P. dubius Spreng Syst. ii 691.

Lavandula carnosa Linn. Amoen. Acad. X 56, and t. 3.

Origanum wateriense Ic. Roxb.—Rheede Hort. Mal. X t. 90.

Anisochilus carnosus Wall. (Contd.)-

Erect annual herb, 30-60 cm. high, with stout 4-angled stem, glabrous or finely pubescent, often with a red tinge. Leaves petioled, broadly ovate, oblong or rounded, obtuse, crenate, somewhat fleshy, rugose and slightly pubescent or glabrous above, tomentose beneath; lamina 3- 8 cm. long and nearly as broad; petiole as long as the blade or longer. Spikes dense and compact, 4-gonous at first, ultimately becoming cylindric and much elongated in fruit; bracts caducous, ovate, acuminate, pubescent and glandular. Calyx glandular, glabrous or pubescent; upper entire, acute, ciliate, deflexed and concealing the mouth of the calyx in fruit; lower lip truncate, obscurely toothed, ciliate, in fruit turned back appressed to the tube by the pressure of the upper lip; tube of calyx swollen and curved. Corolla about 8 mm. long, pale purple, pubescent outside; tube narrow below, inflated above; upper lip short erect, faintly lobed; lower lip longer, concave. Nutlets suborbicular, compressed, smooth, shining, brown in colour.

Habitat:- All over the country, from W. Himalya to Burma and S. India.

Distribution:- Ceylon.

2. Anisochilus eriocephalus Benth. in DC. Prod. XII 81; Hook. f. Fl. Brit. Ind. IV 627; Gamble Fl. Madras 1127; Haines Bot. Bih. & Oris. 734.

A. carnosus, var, eriocephalus Cooke Fl. Bomb. Pr. II 451.

A. decussetus Dalz. & Gibbs. Bomb. Fl. 206.

Slender annuals, 30- 60 cm. high, glabrous or puberulous.

Leaves thick, petioled, orbicular-ovate, obtuse, cordate, crenations shallow; lamina about 5 cm. long and as broad, puberulous on both surfaces and glandular beneath. Spikes very dense, cylindric, on slender peduncles. Calyx glandular villous or wooly with long white hairs; upper lip broadly ovate, acuminate, deflexed in

Anisochilus eriocephalus (Contd.)-

fruit, concealing the mouth and the truncate lower lip; tube inflated in the middle, and curved. Corolla pale lilac.

Habitat:- Bombay; S. India; Behar; Bengal; U.P.

3. Anisochilus scaber Benth. in DC. Prod. XII 81; Hook.f. Fl. Brit. Ind. IV 627; Gamble Fl. Madras 1127.

Erect or ascending herb, with woody stem, rooting at the nodes below; hoary tomentose. Leaves thick, petioled, ovate, obtuse, crenulate, rounded or attenuated at the base, softly and densely hoary tomentose on both surfaces; lamina 2.5-5 cm. long, 1.5-3 cm. broad; petiole stout 1-5 cm. long. Spikes narrowly cone-shaped, very dense, 2-5 cm. long, and half as broad; peduncles stout, 3-12 cm. long. Calyx densely villous, tube short; upper lip glabrous except the ciliate margin, obtuse and broad, entire, deflexed in fruit, concealing the mouth and the truncate obscurely toothed lower lip; the dry calyx turn purplish, giving the whole spike a fine purplish colour; fruiting calyx 2-3 mm. long. Nutlets shining, deep brown.

Habitat:- S. India.

4. Anisochilus Wightii Hook.f. Fl. Brit. Ind. IV. 628; Gamble Fl. Madras 1127.

An erect herb, densely pubescent. Leaves slightly thick, short petioled, 2.5-5 cm. long, oblong or ovate, obtuse, crenate, cuneate at the base, densely hoary tomentose. Spikes narrowly cylindrical, 3-6, in a long-peduncled panicle. Calyx minute, villous; upper lip short, deflexed in fruit, concealing the mouth; the calyx turns black when dry so that the whole spike looks black; fruiting calyx 2 mm. long. Corolla much bent. Nutlets shining, brownish black.

Habitat:- S. India.

5. Anisochilus paniculatus Benth. in DC. Prod. XII 82; Hook.f. Fl. Brit. Ind. IV 628; Gamble Fl. Madras 1127.

A stout erect herb, hoary-tomentose or puberulous. Leaves shortly petioled, thick, about 6 cm. long, and so broad, ovate or orbicular, obtuse, cordate or rounded at the base, margin crenulate, hoary tomentose on both surfaces. Spikes short, as long as broad, numerous in short panicles with divergating peduncles. Calyx very short, tomentose or hispidly hairy; upper lip small, deflexed over the mouth, obtuse, ciliate. Corolla pale white.

Habitat:- S. India.

Distribution:- Ceylon.

6. Anisochilus dysophylloides Benth. in Wall. Pl. AS. Rar. ii 19; Lab. Gen. et Sp. 60, and in DC. Prod. XII 82; Wall. Cat. 2756; Wight. Ic. t. 1434; Hook.f. Fl. Brit. Ind. IV 628; Gamble Fl. Madras 1128.

A. albidus Wight Ic. t. 1435 and t. 1436.

A stout undershrub, with thick, decumbent, silky-tomentose stem and erect branches. Leaves thick, subsessile, 2-5 cm. long, obovate or oblong-obtuse, entire or crenulate, narrowed to the base, fulvous tomentose on both surfaces. Spikes terminal or axillary, cylindrical; peduncles short, stout. Calyx woolly, 2.5 mm. in fruit; upper lip broad, entire or 3-notched, recurved or hooded, not concealing the mouth in fruit; lower lip truncate. Corolla white or purple; tube very short, included; lips spreading.

Habitat:- W. Ghats; Nilgiris; Anamallayas.

var. - purpureus Gamble Fl. Madras 1128;

A. purpureus Wight. Ic. t. 1436.

A. dysophylloides, var, - purpureus(Contd.)-

Leaves shorter and broader, often orbicular; spikes stout, silky-villous; corolla white, streaked with pink.

Habitat:- Coonoor; Pykara.

7. Anisochilus plantagineus Hook.f. Fl. Brit. Ind. IV 628; Gamble Fl. Madras 1127.

Dwarf undershrub, with a stout rootstock; stem decumbent, giving out short erect, stout leafy branches, bearing the spikes. Leaves about 2 cm. long, sessile, whorled near the spike, ob-ovate, obtuse, entire, villous on both surfaces; main nerves 3-4 pairs, obliquely impressed, no prominent midrib. Spikes terminal and solitary on each branch, 5-8 cm. long, very narrow and slender, about 2-3 mm. in diam.; bracts 3-lobed; peduncles very stout, tomentose. Calyx minute, woolly; upper lip obscurely lobed, broad, recurved, not concealing the mouth of the tube. Corolla tube exserted, much curved.

Habitat:- S. India.

8. Anisochilus argenteus Gamble Fl. Madras 1127, and in Kew Bull. 1924, 265.

Small undershrub, with erect silvery branches. Leaves opposite or whorled, 2 cm. long, sessile, oblanceolate, acute, entire, densely silvery- or tawny-tomentose; nerves nearly parallel. Spikes solitary and terminal on the branches, cylindrical, 5-10 cm. long, and about 1 cm. in diam., densely white-villous on the bracts and calyces; peduncle very long in fruit. Calyx in fruit minute; upper lip short, entire, rounded, not concealing the mouth; lower lip truncate, recurved. Corolla short, white.

Habitat:- Pulney hills; Travancore.

9. Anisochilus suffruticosus Wight Ic. t. 1437; Hook.f.
Fl. Brit. Ind. IV 628; Gamble Fl. Madras 1128.

Erect shrubs, about 100 cm. in height, with perennial woody rootstocks, giving out annual, stout, densely tomentose branches, covered with broad scars. Leaves towards the ends of the the branches, 3-5 cm. long, shortly petioled, ovate-lanceolate, subacute, entire, tomentose on both surfaces; petiole and midrib very stout; nerves prominent and close beneath. Spikes many, long-peduncled, all in terminal racemes, rusty brown when dry. Calyx pubescent, both lips very short and truncate. Corolla tube exserted, sharply declinate from above the base, whitish with pale lilac at the ends of the lips.

Habitat:- W. Ghats; Nilgiris.

10. Anisochilus serceus Benth. in DC. Prod. XII 82; Hook.f.
Fl. Brit. Ind. IV 629; Gamble Fl. Madras 1128.

A. stout undershrub, with strong, erect stem, covered all over with leaves, densely tomentose. Leaves rather thick, densely crowded and overlapping, about 5 cm. long or more, sessile, linear-oblong, obtuse, subcrenate or entire, narrowed at the base; nerves parallel. Spikes slender, short-peduncled, 3-8 cm. long, and about 5 mm. in diam., or less; bracts ovate, acute, 4 mm. long, imbricating over the much smaller flowers. Calyx and corolla both very minute; upper lip of corolla incurved.
Habitat:- W. Ghats; Tinnevely; Pulney hills.

11. Anisochilus robustus Hook.f. Fl. Brit. Ind. IV 629;
Gamble Fl. Madras 1128;

Tall shrubby plants, very robust, with stems about 1.5 cm. in diam., densely woolly tomentose. Leaves soft and thick, very large, generally 15 cm. long and 8 cm. broad,

Anisochilus robustus (Contd.)-

sometimes double this size or even larger, ovate, acute or obtuse, crenulate or the lower leaves deeply crenate, base rounded, densely woolly beneath; petiole stout, 2-5 cm. long, woolly. Spikes slender, in terminal panicles, about 25 cm. long, with a stout woolly rachis, and short peduncled. Calyx small, tube ventricose, minutely hairy and glandular outside; upper lip of fruiting calyx erect or recurved or deflexed, entire or emarginate, not concealing the mouth; lower lip reflexed, short, bifid. Corolla tube bent in the middle and broad above; upper lip incurved, the lower deflexed. Nutlets oblong.

Habitat:- W.Ghats; Tinnevely, about 2000 mtr.

12. Anisochilus verticillatus Hook.f. Fl. Brit. Ind. IV 629; Cooke Fl. Bomb. Pr. II 451; Gamble Fl. Madras 1127.

Erect herbs, about 50 cm. high, with silkily villous stout stem, grooved when dry. Leaves in whorls of 4-6, 5-8 cm., sessile, spreading and recurved, narrowly lanceolate, obtuse or acute, crenulate or entire, densely silky-villous. Spikes terminal on a long peduncle; bracts about 10 mm. or smaller, lanceolate. Fruiting calyx about 4 mm. long, pubescent; tube shortly cylindrical; mouth small transverse, not concealed; lips short, truncate. Corolla pale blue, about 12 mm. long, pubescent; tube expanded near the mouth, lips spreading..

Habitat:- Concan; Hyderabad; Mysore.

13. Anisochilus pallidus Wall. Pl. As. Rar. ii 18, and Cat. 2754; Benth. Lab. Gen. et Sp. 60, and in DC. Prod. XII 82; Hook.f. Fl. Brit. Ind. IV 629; Kudo in Mem. Fac. Sc. & Agri. II, 2, (1929) 141; Doan in Fl. Gen. Indo-Chine IV, 8 (1936) 942.

Erect annual herb, 60- 100 cm. high, with puberulous

Anisochillus pallidus (Contd.)-

branched stems. Leaves 8-20 cm. long, membranous, lanceolate, acuminate, dentate, base narrowed to a slender petiole of 2-5 cm. long; both surfaces quite glabrous. Spikes many in terminal panicles, longpeduncled, very dense, narrowed upwards in flower, cylindrical in fruit. Calyx very minute, enlarged to about 5 mm. in fruit, inflated in the middle and much narrower at the mouth; the upper lip narrow 3-toothed, the middle one being subulate and bent in the form of a beak, closing the mouth. Corolla bluish, tube slender; upper lip inflated, minutely toothed; lower lip longer obtuse.

Habitat:- Sikkim; Darjilling; Kohima; Manipur; Khasia; Burma.

Distribution:- Yunnan; Indo-china.

14. Anisochilus polystavhys Benth. in Wall. Pl. As. Rar. ii 19, Lab. Gen. et Sp. 66, and in DC. Prod. XII 82; Wall. Cat. 2755; Hook.f. Fl. Brit. Ind. IV 630; Prain Beng. Pl. 847; Haines Bot. Bih. & Oris. 734.

Tall annual herb, with strict stems about 1-3 metre high, finely tomentose below. Leaves subsessile, membranous, 7-15 cm. long, lanceolate, acuminate, serrate, much narrowed at the base, glabrous on both surfaces. Spikes 2-4 cm. long, in branched panicles, hoary tomentose; peduncles long, stout, stiff and suberect; fruiting spikes thickened and cylindrical. Calyx in fruit 4-5 mm. long, tomentose, curved upwards, so that the mouth becomes vertical; slit in front, 1-lipped; lip decurved with 5 subequal teeth, mouth **not** closed. Corolla cream-coloured; tube slender; upper lip inflated, minutely toothed; lower longer, linear and obtuse. Nutlets ellipsoid.

Habitat:- Nepal; Sikkim; Assam.

Flowers in dense globose heads.

Leaves lanceolate or oblanceolate, about

4-times as long as broad. brevipes

Leaves broadly H y p t i s Jacq.

broad. capitata

Benth. Lab. Gen. et Sp. 64, in DC. Prod. XII 85, in Fl. Austral. V 80; Benth. ex Hook.f. Gen. Pl. II 1178; Hook.f. Fl. Brit. Ind. IV 630; Briq. in Eng. und Pr. Nat. Pflanzenf. IV 3,a, 333; Prain Beng. Pl. 848; Gamble Fl. Madras 1128; Haines Bot. Bih. & Oris. 736; Kudo in Mem. Fac. Sc. & Agri. 11,2,(1929) 146; Doan in Fl. Gen. Indo-Chine LV, 8 (1936) 959.

Herbs or shrubs; leaves opposite. Inflorescences various, often capitate. Calyx ovoid, campanulate, or tubular, subequally 5-toothed, or 5-lobed; often accrescent. Corolla 5-lobed or slightly 2-lipped, with 4-lobed upper/lip; the lower lobe or lip abruptly deflexed, saccate, contracted at the base. Stamens 4, declinate; anther-cells confluent; filaments free. Disk entire, or glandular in front. Ovary 4-partite; style shortly bifid or subentire at the tip. Nutlets 4 dry, smooth or rugulose; basal scar small.

and denticulate. cordate, pubescent villous or tomentose. Flowers secund in short umbels, axillary or terminal, sometimes in panicles; or flowers even solitary; bracts minute setaceous.

Calyx glandular and hispid outside, villous at the mouth, striate; teeth erect, subulate. Corolla small, blue in colour. Nutlets generally 2, blackish brown in colour, flat, ovoid, notched at the apex, and with a white mark on either sides of the pointed base.

Habitat:- Deccan; Chota Nagpur; Bengal; Assam; Burma; Andaman and Nicobar islands.

Distribution:- Trop. America (Native); Africa; Malaya Islands; Siam; Indo-China; Philippines; Formosa.

Flowers in dense globose heads,

Leaves lanceolate or oblanceolate, about
4-times as long as broad. brevipes

Leaves broadly ovate, twice as long as
broad. , capitata

Flowers not in globose heads,

Calyx 8-10 mm. long in fruit. suaveolens

Calyx 3 mm. long in fruit. pectinata



1. Hyptis suaveolens Poit. Ann. Mus. Par. VII (1806) 472,
t. 29, f. 2; Benth. Lab. Gen. et Sp. 124, in DC. Prod. XII
126, and Fl. Austr. V 80; Hook.f. Fl. Brit. Ind. IV 630; Miq.
Fl. Ind. Bat. II 958; Prain Beng. Pl. 848; Cooke Fl. Bomb.
Pr. II 476; Gamble Fl. Madras 1129; Haines Bot. Bih. Oris.
736; Kudo in Mem. Fac. Sc. & Agri. II,2, (1929) 147; Doan in
Fl. Gen. Indo-Chine IV, 8, (1936) 960.

A sweet-smelling rigid annual 60-100 cm. high, with tetra-
gonal hispid stem and branches. Leaves petioled, very variable
in size, being from 2.5-11 cm. long, broadly ovate, sinuate
and denticulate, cordate, pubescent villous or tomentose. Flowers
secund in short umbels, axillary or terminal, sometimes in pa-
nicles; or flowers even solitary; bracts minute setaceous.
Calyx glandular and hispid outside, villous at the mouth, striate;
teeth erect, subulate. Corolla small, blue in colour. Nutlets
generally 2, blackish brown in colour, flat, ovoid, notched at
the apex, and with a white mark on either sides of the pointed
base.

Habitat:- Deccan; Chota Nagpur; Bengal; Assam; Burma; Andaman
and Nicobar islands.

Distribution:- Trop. America (Native); Africa; Mal^a islands;
Siam; Indo-China; Philippines; Formosa.

2. Hyptis brevipes Poit. Ann. Mus. Par. vii (1806) 465; Benth. Lab. Gen. et Sp. 105, and in DC. Prod. XII 107; Hook.f. Fl. Brit. Ind. IV 630; Prain in Journ. As. Soc. Beng. LXXIV, 704; Ridley Fl. Malay Penin. II 645; Merrill Enum. Philip. Fl. Pl. III 416; Kudo in Mem. Fac. Sc. Agri. II, 2, (1929) 147; Doan in Fl. Gen. Indo-Chine IV, 8, (1936) 960.

An erect annual herb, usually glabrate. Leaves 4-8 cm. long, 1-2 cm. broad, shortly petioled, or sessile, lanceolate or oblanceolate, serrate, cuneate at the base, hispid on the upper surface and on the nerves beneath, or glabrous; lower surface gland-dotted. Flowers very small, clustered in axillary or terminal globose heads, about 7 mm. in diam. in fruiting; bracts narrowly lanceolate, 6-7 mm. long, 8-12 in number at the bottom of each head. Calyx tube glandular and pubescent outside; teeth erect and ciliate. Corolla as long as the calyx. Nutlets minute, dark brown or blackish.

Habitat:- Andamans, Dr. King.

Distribution:- Trop. America (Native); Trop. Africa; Malaya peninsula and archipelago; Annam; Formosa; Philippines.

3. Hyptis capitata Jacq. Coll. i 102, Ic. Rar. 1, t. 114; Benth. Lab. Gen. et Sp. 104, in DC. Prod. XII 106; Miq. Fl. Ind. Bat. II 958; Prain in Journ. As. Soc. Beng. LXXIV, 2, 705, and Beng. Fl. 648; Ridley Fl. Malay Penin. II 645; Merrill Enum. Philpp. Fl. Pl. III 416; Kudo in Mem. Fac. Sc. & Agri. II, 2, (1929) 147.

Erect annual herb with glabrous stem and leaves. Leaves petioled, broadly ovate-oblong, incised-serrate, shortly cuneate, glabrous or minutely puberulous on the nerves beneath; lamina 6-10 cm. long, 3-5 cm. broad; petiole 2-3 cm. long. Flowers in globose heads about 2 cm. in diam., in fruit; peduncles larger than the floral heads; bracts ovate-lanceolate, reflexed and often hidden. Calyx glabrous, teeth erect, sub-

Hyptis capitata (Contd.)-

late, shorter than the tube. Corolla longer than the calyx.

Habitat:- Lower Bengal, Kurz etc.

Distribution:- Trop. America (Native); Formosa; Philippines.

4. Hyptis pectinata Poit. Ann. Mus. Par. VII (1806) 474, t. 30; Prain in Journ. As. Soc. Beng. lxvi

Erect perennial shrub, rigid below, about 60-100 cm. high, glabrous or pubescent. Leaves vary variable, 2-8 cm. long, petioled, ovate, acute or acuminate, base rounded, margin serrate or more often crenate-serrate or widely crenate; usually densely tomentose below and sparsely above, or glabrous on both surfaces. Racemes with many-flowered cymes, secund, densely congested towards apex, lax below, simple or panicled; cymes in flower laxly subcapitate, later elongated, pectinate, incurved; bracts laxly setaceous, crinite. Calyx tubular, hoary tomentose, truncate at the mouth, throat villous within; teeth setaceous, subrigid, subulate and crinite, shorter than the tube. Corolla small, pale purple or pale yellow with purple spots on the lips. Nutlets small, oblong, smooth, black in colour.

Habitat:- Madras presidency; Bengal; Assam;

Distribution:- Trop. America (Native); Trop. Africa and Asia.

L a v a n d u l a Linn.

Benth. Lab. Gen. et Sp. 146, and in DC. Prod. XII 143;
Hook.f. Fl. Brit. Ind. IV 630; Benth. ex Hook.f. Gen. Pl. II
; O.Kuntze Rev. Gen. Pl. 521; Briq. in Engl. und Prl. Nat.
Pflanzenf. IV 3 a, 228; Prain Beng. Pl. 848; Cooke Fl. Bomb.
Fr. II 452; Duthei Fl. Upp. Gang. Pl. II 240; Gamble Fl. Madr.
1129; Haines Bot. Bih. Oris. 737; Miss Chaytor in Journ. Linn.
Soc. li, No. 338 (1937) 199.

Perennial aromatic herbs. Leaves entire or toothed, or
singly or doubly pinnate. Spikes terminal; bracts persistent,
membranous or not, often coloured. Calyx sessile or shortly
pedicellate, cylindrical or urceolate, often enlarged in fruit;
5-toothed; the posterior tooth often enlarged and appendiculate.
Corolla tube more or less exceeding the calyx, slightly dilated
at the throat; lobes 5, almost uniform or 2-lipped; the posterior
lip 2-lobed, usually larger, upright; the anterior lobe 3-lobed,
often reflexed. Stamens 4, included, anterior pair longer; an-
thers reniform. Disk equally 4-lobed; the lobes corresponding
to the lobes of the ovary. Ovary 4-partite; style shortly 2-fid
at the apex, with flattened lobes. Nutlets elliptic or somewhat
oblong; smooth or slightly rough; basal scar slightly oblique.

Bracts 5-7 mm. broad, concealing the calyx. *Gibsoni*
Bracts 2 mm. broad, not concealing the calyx. *bipinnata*

In Journ. Linn Soc. 1.

L. bipinnata, var. - *Formosa* G. Don. Rev. Gen. Pl. 521.

1. Lavandula Gibsoni Grah. Cat. Bomb. Pl. 149; Dalz. & Gibs. Bomb. Fl. 206; Hook.f. Fl. Brit. IV 631; Cooke Fl. Bomb. Pr. II 451; Gamble Fl. Madras 1129; Miss Chaytor, in Journ. Linn. Soc. li No. 338, (1937) 198.

L. Perottetii Benth. in DC. Prod. XII 147.

L. Lawii Wight. Ic. t. 1439.

A tall undershrub, 60-100 cm. high, densely villous all over; stem quadrangular, usually unbranched. Leaves lower long petioled, upper sessile or almost so; lamina 15- 20. cm. long, deeply pinnatisect or pinnatifid with oblong, acute or obtuse lobes, which are in turn again toothed, pinnatifid; both surfaces softly villous. Spikes 3- 10 cm. long, dense, softly and densely villous; bracts one-flowered, 5-7 mm. long and so broad, persistent, ovate, shortly acuminate, ciliate, strongly parallel nerved, imbricating, and covering the flowers. Calyx tube ribbed, glandular and hispid without, teeth equal acute ciliate; fruiting calyx 6 mm. long. Corolla tube slender below, slightly dilated above; upper lip 2-lobed, lower lip 3-lobed. Nutlets ellipsoid oblong, black, with a white areole on the dorsal side; the nutlet is covered by a a white transparent very thin membrane, which becomes mucilagenous when wetted. The plant flowers in Winter, and up to late Spring.

Habitat:- Bombay; Poona; Concan; Sattara Dts.; Poorundharpur; W.Ghats; Cooma Ghat; Nilgiris.

2. Lavandula bipinnata O. Kze. Rev. Gen. Pl. 521; Gamble Fl. Madras 1129; Haines Bot. Bih. & Oris. 737; Miss Chaytor in Journ. Lin Soc. li No. 338, (1937) 199.

L. bipinnata, var;- Burmanni O.Kze. Rev. Gen. Pl. 521.

L. Burmanni Benth. Lab. Gen. et Sp. 151, and in DC. Prod. XII 147; Hook.f. Fl. Brit. Ind. IV 631; Prain Beng. Pl. 848; Cooke Fl. Bomb. 452; Duthie Fl. Upp. Gang. Pl. II 240.

L. multifida Burm. Fl. Ind. 126. ("The figure has been generally considered to represent L. cornopifolia, but almost certainly represents L. bipinnata, var- Burmanniana." Miss Chaytor).

Bisteropogon bipinnatus Roth Nov. Sp. 255.

Chaetostachys multifida Benth. in Wall. Fl. As. Rar. ii 19, and in Wall. Cat. 2757.

Erect, stout or slender herb, 60-100 cm. high; stem simple or branched, quadrangular pubescent. Leaves sessile or almost so, 5-12 cm. long, and so broad, pinnatipartite or very deeply pinnatisect; segments linear, entire or cut; glabrous or pubescent, pale beneath. Spikes solitary, or many arranged in a subumbellate manner; bracts glandular pubescent, persistent, about 2 mm. long and so broad, ovate, acuminate, each subtending one flower. Calyx tubular, 4-6 mm. long, slightly curved, finely hoary-pubescent, and glandular; teeth equal, lanceolate, acute with penicellate tips. Corolla about 12 mm. long, blue or white, pubescent outside; tube slender bellow, slightly dilated above. Nutlets minute, black, smooth, oblong ellipsoid, with a large white areole on the dorsal side, very mucilagenous when wetted. Flowering time, -Oct.-Nov.

Habitat:- Concan

var;- Rothiana O.Kze. Rev. Gen. Pl. 521; Miss Chaytor in Journ. Linn. Soc. li, No. 338, (1937) 200.

Bracts ovate or lanceolate, apex long aristate, longer

L. bipinnata, var.- Rothiana (Contd).-

than the calyx.

Habitat:- Rajputana; Indore; Bombay; Salsette; Concan; Dowlatabad; Hyderabad; Aurangabad; Ellora; Canara; Mysore; Bellary; Madras.

var.- intermedia O.Kze. Rev. Gen. Pl. 521; Miss Chaytor in Journ. Linn. Soc. li, No. 338, (1937) 200.

Bracts lanceolate, shortly acuminate, almost equalling the calyx.

Habitat:- Bombay; Concan; Central Provinces; Sonawani Range; Palamau; Chagpul; Chota Nagpur; Bengal(?).

A. Filaments of stamens bearded.

B. Inflorescence panicled.

C. Bracts over Pogostemon Desf. concealing the calyx.

Mem. Paris II 146, f. 6; Benth. Lab. Gen. et Sp. 152, and in DC. Prod. XII 151; Benth. ex Hook.f. Gen.Pl. II 1179; Hook.f. Fl. Brit. Ind. IV 631; Briq. in Eng. und Pr. Nat. Pflanzenf. IV 3,a, 328; Prain Beng. Pl. 848; ~~C~~oke Fl. Bomb. Pr. II 453; Duthie Fl. Upp. Gang. Pl. II 241; Gamble Fl. Madras 1131; Haines Bot. Bih. & Oris. 737; Kudo in Mem. Fac. Sc. & Agri. II 2, (1929) 50; Doan in Fl. Gen. Indo-Chine IV 8, (1936) 971.

Hrebs, undershrubs or shrubs, often aromatic. Leaves opposite, rarely ternate. Spikes or racemes solitary or panicled; bracts and bracteoles persistent. Calyx usually tubular, subequally 4-5-toothed. Corolla more or less 2-lipped, upper lip 3-lobed, lower longer, 1-lobed; tube of corolla exerted or included. Stamens 4, subequal or the upper pair longer, straight or declinate; filaments exerted, usually bearded; anther-cells confluent. Disk equal, subentire. Ovary⁴⁻partite; style slender, shortly 2-fid at the tip with equal subulate lobes. Nutlets 4, dry, smooth, ovoid or oblong; basal scar small.

D. Bracts narrow, lanceolate, not imbricating, not concealing the calyx.

D. Leaves -----lanceolate hairs. tuberculatus

D. Leaves not scabrid.

E. Spikes more or less continuous;

about 1 cm. broad. purpurascens

F. Spikes much interrupted, 5-6 cm.

broad. Heyneanus

- A. Filaments of stamens bearded.
- B. Inflorescens panicled.
 - C. Bracts ovate, imbricating, \pm concealing the calyx.
 - D. Leaves \pm coarsely incised; flower-clusters \pm rounded.
 - E. Spikes slender, one-sided. paniculatus
 - E. Spikes stout, not one-sided. Gardneri
 - D. Leaves \pm regularly serrate; flower-clusters elongate.
 - E. Leaves below glabrous or finely pubescent.
 - F. Stems and leaves nearly glabrous.
 - G. Flowers purple(N.India). parviflorus
 - G. Flowers white(S.India). pubescens
 - F. Stems and leaves below hoary-
-puberulous. plectranthoides
 - E. Leaves below rusty or rufus-hispid.
 - F. Bracts and calyx silky or villous; leaves glabrous or minutely villous above. villosus
 - F. Bracts and calyx hispid; leaves adpressedly hispid above. hispidus
- C. Bracts narrow, lanceolate, not imbricating, not concealing the calyx.
 - D. Leaves scabrid with stellate hairs. tuberculatus
 - D. Leaves not scabrid.
 - E. Spikes more or less continuous, about 1 cm. broad. purpurascens
 - E. Spikes much interrupted, 5-6 mm. broad. Heyneanus
 - E. Leaves subsessile. strigosus

C. Bracts minute.

D. Spikes 5-6 mm. broad, much interrupted;
calyx glabrescent. amarantoides

D. Spikes about 10 mm. broad, ± continuous;
calyx hairy.

E. Leaves ovate. glaber

E. Leaves narrow-lanceolate.

F. Calyx finely grey-tomentose. elsholtzioides

F. Calyx with spreading bristly
hairs. Griffithii

B. Inflorescens- simple spikes or racemes, not
panicled.

C. Undershrubs; leaves thick, ± orbicular,
densely tomentose on both sides. (S. Ind.).

D. Calyx teeth softly tomentose; corolla-
-tube longer than the calyx. vestitus

D. Calyx teeth with long bristles;
corolla-tube as long as the calyx.

E. Petioles 7-12 mm. long.

F. Leaves orbicular to ovate,
usually 1.25-2.5 cm. long,
obtuse. mollis

F. Leaves ovate, upto 5 cm.
long, subacute. nilagiricus

E. Petioles upto 25 mm. long. rotundatus

C. Herbaceous; leaves thin ovate to
lanceolate.

D. Racemes lax-flowered; pedicels
± equalling the calyx. fraternus

D. Racemes or spikes dense-flowered;
pedicels very short or absent.

E. Leaves sessile. strigosus

- E. Leaves distinctly petioled (1-4 cm.).
- F. Leaves ovate as broad as long (S. India).
- G. Leaves hirsute; spikes continuous; fruiting calyx-tube glabrescent. Wightii
- G. Leaves ± glabrous; spikes interrupted; fruiting calyx-tube ± villous. paludosus
- F. Leaves twice as long as broad.
- G. Bracts minute (Assam)..... Wattii
- G. Bracts extending beyond the flower-clusters(Burma). . . . MacGregori
- A. Filaments of stamens glabrous or nearly so.
- B. Calyx entirely glabrous(S.India). travancoricus
- B. Calyx strigose on teeth(S.India). speciosus
- B. Calyx densely villous.
- C. Leaves below inflorescens long-petioled, (S. India). atropurpureus
- C. Leaves below inflorescens subsessile, (Assam, Burma). brachystachyus

S. Bomb. Pr.; Malabar; Burma (may be a variety.).

Excoecaria Garçonii Hook.f. Fl.Brit. Ind. IV 630; Gamble
 Malabar, 1173.
 Erect and stout herb, with soft branches; all parts very
 villous. Leaves membranous, long petioled, ovate, acuminate,
 base cuneate, softly pubescent or villous on
 both sides; lamina about 3 cm. long; petiole as long as or half
 as long as the blade. Spikes dense and stout, in axillary or
 terminal panicles, whorls globose, usually close, or sometimes

1. Pogostemon paniculatus Benth. in Wall. Pl. As. Rar. ii 30, Lab. Gen. et Sp. 153, and in DC. Prod. XII 151; Wall. Cat. 1561; Hook.f. Fl. Brit. Ind. IV 631; Cooke Fl. Bomb. Pr. II 453; Gamble Fl. Madras 1132.

Elsholtzia paniculata Willd. Sp. Pl. iii 59.

Hyssopus cristatus Lamk. Dict. iii 187; Rheede Hort. Mal. X, t. 65.

An erect herb, about 130 cm. high; branches slender, laxly hairy or villous. Leaves usually in unequal pairs, petioled, membranous, ovate, acuminate, irregularly inciso-serrate, base cuneate, pubescent with appressed hairs; lamina 6-12 cm long; petiole short. Spikes slender, 10-20 cm. long, forming lax panicles, axillary or terminal; clusters of flowers somewhat rounded, secund and distant on the spikes; flowers usually arranged in a row, covered on either sides by parallel walls of imbricating bracts; bracts membranous, broadly and obliquely ovate or orbicular, pubescent and ciliate, about as long as the calyx. Calyx 5 mm. long, membranous, narrowly tubular, pubescent; teeth lanceolate, ciliate. Corolla white, tube very slender, as long as the calyx. Filaments bearded. Nutlets minute, broadly ovoid, smooth and shining, brownish black in colour. The plant flowers in winter.

Habitat:- S. Bomb. Pr.; Malabar; Burma (may be a variety.).

2. Pogostemon Gardneri Hook.f. Fl. Brit. Ind. IV 632; Gamble Fl. Madras. 1133.

Erect and stout herb, with soft branches; all parts very villous. Leaves membranous, long petioled, ovate, acuminate, inciso-serrate, base cuneate, softly pubescent or villous on both sides; lamina about 8 cm. long; petiole as long as or half as long as the blade. Spikes dense and stout, in axillary or terminal panicles, whorls globose, usually close, or sometimes

Pogostemon Gardneri (Contd.)-

separate in the terminal spikes; bracts oblong-lanceolate, membranous, ciliate, longer than the calyx. Calyx-teeth, much shorter than the tube, ciliate. Filaments of stamens bearded.

Habitat:- In the hills of S. India.

3. Pogostemon parviflorus Benth. in Wall. Pl. As. Rar. i 31, Lab. Gen. et Sp. 154, and in DC. Prod. XII 152; Wall. Cat. 1531; Hook.f. Fl. Brit. Ind. IV 633; Prain Beng. Pl. 849; Cooke Fl. Bomb. Pr. II 453

P. frutescens Grah. Cat. Bomb. Pl. 149.

P. purpuricaulis Dalz. in Hook. Kew Journ. ii 336; Dalz. & Gibs. Bomb. Fl. 207.

P. intermedius Wall. Cat. 2327.

Erect stout suffruticose herbs, 100-200 cm. high; glabrous, pubescent or scaberulous, not hoary; stem and branches usually purple. Leaves petioled, 10-18 cm. long, or more; ovate or ovate-lanceolate, acute or acuminate, coarsely and irregularly crenate-dentate, or serrate, base cuneate, glabrous or slightly pubescent on both surfaces, or sometimes velvety beneath. Spikes short, cylindrical or one-sided, in short pyramidal lax panicles, softly hairy; whorls dense-flowered, subglobose, closely arranged; bracts elliptic-ovate, exceeding the calyx, imbricating over the younger flowers. Calyx 1.5 mm. long, pubescent, glandular, usually purplish; tube pentagonal, narrow; teeth short, triangular, lanceolate, ciliate. Corolla white, with purple spots in the upper lip; upper lip 3-lobed, lower entire. Filaments purple, bearded with purple hairs. Style also purple, with white sigmatic portion. Nutlets very small, ellipsoid, smooth and shining.

Habitat:- Kumaon to Bhootan; Assam; Burma; Concan.

4. Pogostemon pubescens Benth. in DC. Prod. XII 152; Gamble Fl. Madras 1133,

P. parviflorus Benth. in Hook. f. Fl. Brit. Ind. IV 632 in part.

Stout erect herb, nearly glabrous. Leaves long petioled, chartaceous, ovate or ovate-lanceolate, acuminate, rounded or slightly cuneate at the base, singly or doubly crenate-serrate, glabrous or nearly so; lamina about 9 cm. long; petiole about as long as the blade. Spikes in large panicles, densely packed with confluent whorls; bracts imbricating, longer than the calyx; bracteoles shorter; whorls globose, subsecund, pubescent. Calyx 4 mm., tube pentagonal, pubescent outside; teeth short, lanceolate. Corolla white with purple spots on the upper lip. Filaments with purple, with purple hairs.

Habitat:- Hills of S. India.

5. Pogostemon plectranthoides Desf. Anns. Mus. Par. ii, (1803) 155; Wall. Cat. 1530; Benth. in Wall. Pl. As. Rar. i 31, Lab. Gen. et Sp. 153, and in DC. Prod. XII 151; Hook. f. Fl. Brit. Ind. IV 632; Prain Beng. Pl. 849; Cooke. Fl. Bomb. Pr. II 454; Duthie Fl. Upper. Gang. Pl. II 241; Gamble Fl. Madras 1133.

Origanum Benghalense Burm. Fl. Ind. 128, t. 38, f. 3(?).

O. indicum Roth. Nov. Sp. 265.

Mentha secunda Roxb. Hort. Beng. 44?

M. fruticosa Roxb. Fl. Ind. iii 6 (not of his drawings).

A large erect, aromatic bushy shrub, grey-tomentose on younger parts; branches often dark purple. Leaves petioled, 5-10 cm. long, chartaceous, ovate, acute, doubly serrate, rounded or cuneate at the base, glabrous or pubescent, sometimes velvety beneath. Spikes stout, villous or hoary-pubescent, axillary or terminal, forming a paniculate inflorescence;

Pogostemon plectranthoides(Contd.)-

whorls many-flowered, close; bracts 8 mm. long, ovate, acute, softly pubescent, imbricating; each bract subtending a fascicle of sessile flowers, with small narrow membranous bracteoles, tinged often with purple. Calyx hirsute or glandular, about 5 mm. long; tube slender, subcylindric; teeth lanceolate, acute, ciliate; upper part of the calyx often tinged with purple. Corolla pink or white, tube slender; upper lip large, 3-lobed; lower lip smaller narrow and entire. Filaments bearded. Nutlets minute, broadly ellipsoid, smooth and shining, brownish in colour.

Habitat:- Simla; Behar; Bengal; Chota Nagpur; S. India.

6. Pogostemon villous Benth. Lab. Gen. et Sp. 153, and in DC. Prod. XII 152; Hook.f. Fl. Brit. Ind. IV 632.

Elsholtzia villosa Roxb. Fl. Ind. iii 4.

Stout erect shrubby plants, villous all over. Leaves petioled, ovate acute, crenulate, or subsinuate, and crenate, lamina 12-18 cm. long, and 5-10 cm. broad; petiole about half as long as the lamina. Spikes stout, 5-8 cm. long, cylindrical, forming short dense panicles; whorls confluent, not one-sided; bracts ovate, imbricating, larger than the calyx. Calyx 5mm. long, narrow, silky or villous; teeth shortly lanceolate. Filaments bearded.

Habitat:- Assam.

7. Pogostemon hispidus Prain Kew Bull. 1908, 254.

P. parviflorus var hispidus Benth. in DC. Prod. XII 152.

P. glaber Hook.f.(in part) Fl. Brit. Ind. IV 633, not of Benth.

P. glaber var hispidus Hook.f Mss. in Herb.Kew

Erect branching herbs, 75-100 cm. high, sparsely pubescent;

Pogostemon hispidus (Contd.)-

stem robust, obscurely 4-gonous, purple in colour. Leaves petioled, membranous, ovate, acute or acuminate, doubly and irregularly inciso-serrate, base entire, cuneate, adpressedly pubescent on both surfaces, specially on the nerves; lamina 6-8 cm. long; petiole 1.5-2.5 cm. long. Spikes 1.5-4.5 cm. long, paniculate at the ends of the branches; whorls aggregate, interrupted below; bracts ovate or ovate-lanceolate, 8 mm. long or shorter. Calyx narrowly campanulate, 4 mm. long, hispid outside; teeth triangular, acute, subequal, a third as long as the tube. Corolla 7 mm. long, pale lilac in colour, glabrous; lobes subequal. Filaments lilac in colour, hairy. Nutlets broadly ovoid, glabrous.

Habitat:- Assam; Burma.

8. Pogostemon tuberculatus Benth. Wall. Pl. As. Rar. i 31; Lab. Gen. et Sp. 154, and in DC. Prod. XII 152; Hook.f. Fl. Brit. Ind. IV 633.

Stout erect shrubby plants; stem and branches woody, terete, striate, scabrid with stellate hairs. Leaves long-petioled, ovate or deltoid ovate, acuminate, doubly toothed, base cuneate, scabrid on both surfaces; lamina 7-12 cm. long, petioled about half as long as the blade or more. Spikes in slender panicles, 15-25 cm. long; whorls small, subglobose, many-flowered, distant or close; bracts scabrid, very minute. Calyx obovoid, very small, scabrid; teeth short, triangular, ciliate. Corolla twice as long as calyx, purple. Filaments bearded.

Habitat:- Nepal; Bhootan.

9. Pogostemon purpurascens Dalz. Hook. Kew Journ. ii (1850) 337; Dalz. & Gibs. Bomb. Fl. 207; Hook.f. Fl. Brit. Ind. IV 632; Cooke Fl. Bomb. Pr. II 455. Gamble Fl. Madras 1133; Doan

Pogostemon purpurascens (Cont.)-

in Fl. Gen. Indo- Chine IV, 8, (1936) 974.

An erect herb, with furrowed stems pubescent with soft spreading hairs. Leaves sometimes in unequal pairs, petioled, membranous often tinged with purple, ovate or ovate-lanceolate, incisedly serrate, cuneate, softly hairy on both surfaces; lamina upto 12 cm. long or more; petiole 1.5-5 cm. long. Spikes 7-20 cm. long, paniculate, long-peduncled, villous; whorls globose, quite close in the upper part of the spike, separate below; bracts 5 mm. long, ovate, acute, slightly falcate, ciliate. Calyx 5 mm. long, pubescent; tube pentagonal; teeth as long as the tube, lanceolate, acute, ciliate and with peniculate tips. Corolla white with purple upper lip. Stamens bearded. Nutlets minute, ovoid, compressed, smooth and shining, black when ripe. Habitat:- S. India; Manipur; Burma.

Distribution: Annam.

10. Pogostemon Heynianus Benth. in Wall. Pl. As. Rar. i 31, in Lab. 154; and in DC. Prod. XII 153; Wight Ic. t 1440; Prain in Journ. As. Soc. Beng. lxxiv (1907) 707, and in Kew Bull. (1908) 78; Trim. Fl. Ceylon II 378; Gamble Fl. Madras 1133; Merrill Philipp. Fl. Pl. III 414.

P. Patchouli Hook.f. in Fl. Brit. Ind. IV 633, not of Pellet.

12. Erect herbs 60-100 cm. high, with more or less softly hairy stem. Leaves petioled, membranous, ovate, acute acuminate or obtuse, crenate or singly or doubly toothed, or incised, base cuneate, sparingly puberulous or almost glabrous; lamina 5-8 cm. long; petiole 1.5-3.5 cm. long. Spikes in slender panicles, 7-15 cm. long, whorls manyflowered, distant, about 12 mm. in diam.; bracts lanceolate acute, as long as the calyx or shorter. Calyx pubescent or tomentose, teeth

Pogostemon Heyneanus Benth(Contd.)-

triangular, acute, ciliate. Corolla very small, tube shortly exerted, glabrous outside except for a few hairs on the margin of the lower lip. Filaments bearded.

Habitat:- Kanara; W. Ghats; Nilgiris;

Distribution:- Ceylon; Sumatra; Java; Philipines.

This plant has the odour of the Patchouli plant of commerce, and is known as the Indian Patchouli plant; the vernacular name is Pach-pat.

11. Pogostemon amarantoides Benth. DC. Prod. XII 153; Hook.f. Fl. Brit. Ind. IV 634.

A tall erect herb, glabrous or minutely pubescent. Leaves membranous, long-petioled, ovate or oblong, acuminate, singly or doubly, and incisedly serrate, cuneate at the base, glabrous or puberulous; lamina 7-13 cm. long, petiole 2.5-5 cm. long. Spikes 5-15 cm. long, narrow, paniced; whorls small, few- or many-flowered, close or distant; bracts short elliptic. Calyx small, terete, campanulate, glabrous or hoary; teeth short, triangular, pubescent within, margin finely hairy, but not ciliate. Corolla minute, white or pink. Filaments purple, bearded.

Habitat:- Sikkim; Khasia.

12. Pogostemon glaber Benth. in Wall. Pl. As. Rar. i 31, Lab. Gen. et. Sp. 154, and in DC. Prod. XII 152; Hook.f. Fl. Brit. Ind. IV 633; Kudo in Mem. Fac. Sc. & Agri. II 2, (1929) 51; Doan Fl. Gen. Indo-Chine IV 8, (1936) 973; Wall. Cat. 1533.

Erect herbs, with green or purple stem, sometimes very dark; glabrous or sparsely hairy. Leaves long-petioled, ovate or ovate-lanceolate, acuminate, doubly toothed or serrate, more or less scabrid on both surfaces. Spikes slender, ciliate;

Pogostemon glaber (Contd.)-

whorls confluent, dense-flowered, small and subglobose; bracts very minute. Calyx ovoid, small, about 2.5 mm. long; teeth triangular, shortly ciliate. Filaments bearded.

Habitat:- Nepal; Sikkim; Khasia.

Distribution:- Siam; Indo-China; China.

13. Pogostemon elsholtzioides Benth. in DC. Prod. XII 153; Hook.f. Fl. Brit. Ind. IV 634.

Small herbs, with slender branches; younger parts hoary-tomentose. Leaves shortly petioled, 10-15 cm. long, lanceolate, long acuminate, serrulate, glabrous on both sides, or densely puberulous above with minute and adpressed hairs. Spikes 7-10 cm. long, slender, paniced, hoary-tomentose; whorls small, many-flowered, secund or subsecund, separate or confluent. Calyx small terete, finely grey-tomentose; teeth narrow, subacute, not ciliate. Corolla very small, purple. Filaments sparingly hairy.

Habitat:- Assam; Bhotan;

Distribution:- Tibet.

14. Pogostemon Griffithii Prain in Kew Bull. 1908, 181.

Erect herbs, 50-100 cm. high; stem and branches slender, obscurely 4-gonous, adpressedly puberulous or pubescent. Leaves shortly petioled, about 10 cm. long, membranous, ovate- or oblong-lanceolate, acuminate, margin serrate, base entire, cuneate, both sides adpressedly and sparsely hairy or rather densely below, at least on the nerves. Spikes paniced, 5-15 cm. long, 8 mm. broad; whorls close above, about 5 mm. apart below. Calyx 4 mm. long, narrowly campanulate, sparingly pubescent outside; teeth subequal, acute triangular, half as long as the tube. Corolla 7 mm. long, glabrous; anterior

Pogostemon Griffithii Prain(Contd.)-

lobe a little larger than the others. Filaments bearded, somewhat ascending. Nutlets ovoid, glabrous.

Habitat:- Burma. (I have seen the type sheet kindly sent from kew.).

15. Pogostemon vestitus Benth. in Pl. As. Rar. i 31, Lab. Gen. et Sp. 155, and in DC. Prod. XII 155; Wall. Cat. 1534; Hook.f. Fl. Brit. Ind. IV 636; Gamble Fl. Madras 1134.

Small herbs, about 50 cm. high, with stout, terete branches, densely white-woolly; branches often bearing long tufts of soft shining hairs. Leaves short-petioled, thick, ovate, or ovate-oblong, obtuse, crenate or crenulate, base rounded or cordate, both surfaces equally softly and densely woolly; lamina 2.5-4 cm. long; petiole stout, varying in length from 2.5-25 mm. Spike simple, thick and densely woolly, 5-10 cm. long; whorls confluent; bracts and bracteoles linear-subulate; rachis stout. Calyx 6 mm. long or more, terete, densely villous; teeth triangular, lanceolate, woolly, not ciliate. Corolla lilac in colour, tube a little longer than the calyx. Filaments bearded in the middle.

Habitat:- W. Deccan.

16. Pogostemon mollis Benth. Lab. Gen. et Sp. 155, and in DC. Prod. XII 154; Hook.f. Fl. Brit. Ind. IV 635; Gamble Fl. Madras 1134.

A much branched low-growing undershrub, with a woody base, very variable in hairyness, - villous or softly tomentose or finely pubescent; hairs on branches not reflexed. Leaves thick, short-petioled, orbicular or oblong-ovate, obtuse or rounded at the apex, crenate, base rounded, to-

Pogostemon mollis (Contd.)-

mentose on both surfaces; lamina usually 1.25-2.5 cm. long; petiole 7-12 mm. long. Spike simple, 8-18 cm. long, cylindrical, dense-flowered; whorls crowded, or the lower laxly arranged; bracts and bracteoles linear; rachis stout. Calyx villous, terete; teeth short, subulate-lanceolate, ciliate. Corolla white, tube as long as the calyx. Filaments bearded in the middle.

Habitat:- S. India.

17. Pogostemon nilagiricus Gamble Fl. Madras 1134.

P. rotundatus Wight Ic. t. 1441.

A low undershrub, with white woolly hairs on the stem. Leaves broadly ovate, subacute, crenate, rounded at the base, tawny villous or tomentose on both surfaces with shining hairs; lamina up to 5 cm. long, petiole 7-12 mm. long. Racemes simple, stout, 7-12 cm. long; whorls quite close; bracts lanceolate, bracteoles linear. Calyx tubular, villous like the leaves; teeth acuminate. Filaments bearded.

Habitat:- Nilgiris.

This is very closely allied to the above species, from which it is difficult to distinguish.

18. Pogostemon rotundatus Benth. in Wall. Pl. As. Rar. i 31, Lab. Gen. et Sp. 155, and in DC. Prod. XII 155; Wall. Cat. 1535; Hook. f. Fl. Brit. Ind. IV 636; Gamble. Fl. Madras 1134.

A small undershrub, with erect ascending branches from a procumbent base; villous, hairs not reflexed; branches usually only two. Leaves petiolate, orbicular, obtuse, doubly crenate or crenate-serrate, base rounded or truncate or sometimes cordate, both surfaces laxly or densely hairy; lamina 2.5-5 cm. long; petiole up to 2.5 cm. long. Spike simple, stout, 7-12 cm.

Pogostemon rotundatus (Contd.)-

long, about 18 mm. in diam.; whorls densely many-flowered, close but distinct; rachis stout; bracts and bracteoles linear-subulate. Calyx 6 mm. long, villous; tube angular; teeth triangular-lanceolate, ciliate. Corolla tube as long as the calyx. Filaments bearded.

Habitat:- Deccan.

19. Pogostemon fraternus Miq. Fl. Ind. Bat. ii 963; Hook.f. Fl. Brit. Ind. IV 635; Kudo in Mem. Fac. Sc. & Agri. II 2, (1929) 51; Doan Fl. Gen. Indo-Chine IV 8, (1936) 976.

Herbs with numerous straggling branches, 60-100 cm. high; the upper portions of the branches glandular-tomentose or hirsute. Leaves petioled, ovate, acute, singly or doubly crenate, or serrate, base cordate, rounded or narrowed, hirsute on both sides; lamina 2.5 -5 cm. long, petiole as long as the blade or smaller. Raceme simple, 8-15 cm. long, about 12 mm. in diam., glandular-tomentose or hirsute; whorls many-flowered, close and distinct; bracts and bracteoles linear; pedicels of flowers nearly as long as the calyx. Calyx 5 mm. long; tube angular, hirsute; teeth long, lanceolate, ciliate, the 3 upper teeth shorter than the lower. Corolla funnel-shaped, about 6 mm. long. Filaments about 12 mm. in length or more, long-exserted, hairy towards the base.

Habitat:- Sikkim; Khasia; Burma.

Distribution:- Java; Siam; China.

20. Pogostemon strigosus Benth. in DC. Prod. XII 155; Hook.f. Fl. Brit. Ind. IV 636.

Dysophylla strigosa Benth. in Wall. Pl. As, Rar. i30, and Lab. Gen. et Sp. 157; Wall. Cat. 1549.

Erect herbs, 60-100 cm. high; branches strigose with

Pogostemon strigosus (Contd.)-

erect hairs. Leaves generally opposite, sometimes ternately whorled, 5-7.5 cm. long, lanceolate, acuminate, serrate, narrowed to a very short stout petiole, densely strigose on both surfaces. Spike simple, slender, 7-12 cm. long, about 12 mm. in diam.; rachis stout; whorls close, or lax below; bracts and bracteoles long, slender. Calyx hirsute; tube terete; teeth subulate, ciliate, unequal, the 3 upper shorter. Corolla very small, tube hardly exerted, lobes sparingly hairy. Filaments bearded in the middle.

Habitat:- Khasia.

21. Pogostemon Wightii Benth. Lab. Gen. et Sp. 155, and in DC. Prod. XII 154; Hook.f. Fl. Brit. Ind. IV 635; Gamble Fl. Madras 1134.

P. petiolaris Benth. in DC. Prod. XII 154.

P. hirsutus Wight Ic. t. 1442, not of Benth.

An erect herb, about 60 cm. high, with spreading branches, hirsute with long scattered often glandular hairs. Leaves petioled, ovate, acute, doubly crenate, sublaciniate or incised, rounded or shortly cuneate at the base, rarely subcordate, hispid on both surfaces with long scattered hairs; lamina about 5 cm. long, petiole nearly half as long as the blade; leaves turn black when dry. Spike simple, 5-10 cm. long, stout, cylindrical, dense-flowered with compact whorls, of which the lower ones sometimes laxly arranged; bracts and bracteoles short, linear. Calyx membranous, tube inflated, terete, contracted at the mouth, glabrescent at least in fruit; teeth triangular, short, subequal, ciliate. Corolla white, tube very short. Filaments bearded with tufted of purple hairs.

Habitat:- S. India.

22. Pogostemon paludosus Benth. in DC. Prod. XII 154; Hook. f. Fl. Brit. Ind. IV 635; Gamble Fl. Madras 1134.

Slender erect herbs, sparingly pubescent or glabrescent; stem and branches somewhat blackish in colour. Leaves broadly ovate, obtuse, coarsely crenate, base rounded or slightly, cuneate, sparingly hairy above and on the nerves beneath; lamina about 5 cm. long, petiole about 1 cm. Spike simple, stiff, erect, 7-13 cm. long, narrow, with distant few-flowered whorls; bracteoles minute; rachis hispid with spreading hairs. Calyx very small; tube terete, villous, with triangular, subulate, ciliate teeth. Filaments bearded.

Habitat:- S. India.

23. Pogostemon Wattii C. B. Clarke. Journ. Lin. Soc. XXV, (1889) 59; Prain in Journ. As. Soc. Beng. LIX 298.

Small herbs, 40-60 cm. high, with slender terete stem, puberulous with reflexed hairs. Leaves petioled, elliptic-ovate, acuminate, dentate, base decurrent to the petiole, above sparingly puberulous, densely on the nerves, glabrous except nerves beneath; lamina 6-9 cm. long, petiole 3-4 cm. Spikes simple, slender, 5-8 cm. long, axillary or terminal, sparingly and softly hairy; whorls close or shortly separated; bracts minute linear. Calyx tubular, 5 mm. long, distinctly pedicelled, sparingly hirsute outwards; upper lip 3-toothed, slightly smaller than the 2-toothed lower lip; teeth much shorter than the tube, not ciliate. Corolla 7 mm. long, tube exserted, annulate within, with star-like processes; lobes puberulous. Filaments sparingly puberulous. Nutlets on a very minute gynophore.

Habitat:- Assam.

24. Pogostemon MacGregori W.W. Smith Rec. Bot. Surv. Ind. VI, (1913) 39.

Tall herbs, 60-90 cm. high, stem stout erect, more or

Pogostemon MacGregori (Contd.)-

less densely adpressedly hairy with minute soft hairs. Leaves petioled, ovate-lanceolate, acute, serrate, rounded at the base, or rarely cuneate, sparsely hairy on both sides, densely on the veins beneath; lamina about 10 cm. long, petiole 2 cm. or shorter. Spike simple, 12 cm. long, interrupted; whorls many-flowered, generally arranged in opposite globose heads; bracts linear, much extending the flower-clusters, shortly ciliate at the margin. Calyx tubular pubescent, very small; teeth subulate, equal to the tube, ciliate. Corolla 3 mm. long; tube shortly exserted or not; lobes subequal, glabrous. Filaments exserted, subequal, hairy in the middle.

Habitat:- Burma, S. Shan States Mac Gregor.

25. Pogostemon travancoricus Bedd. Ic. Pl. Ind. Or. i 34;

Hook.f. Fl. Brit. Ind. IV 637; Gamble Fl. Madras 1135.

27. A small shrubby plant, quite glabrous, about 60 cm. high, with smooth stem woody below. Leaves petioled, ovate, acute, doubly serrate or crenate, base rounded or cuneate, almost glabrous on both surfaces; lamina about 8-12 cm. long; leaves turn black when dry. Racemes lax-flowered, 7-15 cm. long, tapering upwards; flowers reflexed, on slender pedicels; bracts minute; the whole inflorescence turns black when dry. Calyx glabrous, terete, about 6 mm. long; teeth triangular not ciliate. Corolla funnel-shaped, tube exserted, lobes pubescent. Filaments glabrous, about 12 cm. long.

Habitat:- S. India. about 60 cm. long, terete, velvety; teeth triangular, short, obtuse, ciliate; throat villous. Corolla

26. Pogostemon speciosus Benth. in Wall. Pl. As. Rar. i 31,

Lab. Gen. et Sp. 156, and in DC. Prod. XII 155; Wall. Cat.

2328; Wight Ic. t. 1443; Hook.f. Fl. Brit. Ind. IV 637; Gamble

Fl. Madras 1134.

A small shrubby plant, about 100 cm. high, with woody

Pogostemon speciosus (Contd.)-

stem, sparsely hairy; branches above hirsute at the nodes with long spreading glandular hairs. Leaves petiolate, ovate, acute, doubly crenate, rounded or cordate at the base, sparsely hairy on both sides; lamina 6-8 cm. long, and nearly as broad, petiole 2-4 cm. long; leaves turn black when dry. Spikes very stout, dense, about 7-12 cm. long, and 2.5 cm. broad; hirsute with long glandular hairs; whorls confluent; bracts minute; the whole inflorescence turns black when dry. Calyx membranous, tube short, angular, glabrous or hairy, teeth very narrow, subulate, ciliate or not. Corolla white, tinged with pink; tube not exerted. Filaments about 12 mm. long, glabrous. "The very long stamens give a bottle brush appearance to the racemes" Gamble.

Habitat:- S. India.

27. Pogostemon atropurpureus Benth. in DC. Prod. XII 154; Hook.f. Fl. Brit. Ind. IV 637; Gamble Fl. Madras 1134.

P. imberbe Wight Mss.

Small undershrubs, with terete woody branches, velvety with reflexed hairs. Leaves shortly petioled, about 10 cm. long, ovate, acute, doubly crenulate, base subequally cuneate, velvety on both surfaces, dark brown when dry. Spikes about 20 cm. long, and 2.5 cm. broad, rachis very stout; whorls very close, except one or two in the lower part; bracts and bracteoles minute setaceous; the whole inflorescence turns rusty-black when dry. Calyx tube about 6 mm. long, terete, velvety; teeth triangular, short, obtuse, ciliate; throat villous. Corolla dark purple, tube slender, exerted. Filaments glabrous.

Habitat:- S. India.

28. Pogostemon brachystachyus Benth. in DC. Prod. XII 153;
Hook.f. Fl. Brit. Ind. IV 637.

A low straggling much-branched herb; branches procumbent and rooting below, pubescent with reflexed hairs, or variable in hairyness. Leaves shortly petioled, 3-6 cm. long, very variable in form, usually ovate, rarely oblong-lanceolate, subacute, doubly crenate, hirsute or finely tomentose. Spikes 3-10 cm. long, narrow, densely villous; whorls dense-flowered, confluent, or the lower separate; bracts minute linear. Calyx minute, hirsute or hispid; teeth subulate, ciliate. Corolla very small, dull purple; tube as long as the calyx; lobes hirsute. Filaments 4 mm. long, glabrous or nearly so.

Habitat:- Assam; Burma.

Annual or perennial herb, often growing in wet places. Leaves ovate or whorled, sessile or petioled. Spikes or racemes terminal, dense-flowered, flowers minute; bracts and bracteoles many, small. Calyx campanulate or ovoid, very minute, equally 5-toothed; throat glabrous within. Corolla very small, equally 4-lobed; tube exerted or included. Stamens 4, straight or sub-declinate; filaments long exerted, bearded with long hairs; anther cells confluent. Disk equal subentire. Ovary 4-partite; style slender, 5-rid; lobes equal subulate. Seeds dry, ovoid or oblong, smooth or rough; basal scar small.

Dysophylla Bl.

Bijdr. 826; Benth. Lab. Gen. et Sp. 158, and in DC. Prodr. XII 156; Benth. ex Hook.f. Gen. Pl. II 1180; Hook.f. Fl. Brit. Ind, IV 637; Briq. in Engl. und Pr. Nat. Pflanzenf. IV 3,a, 330; Collett Fl. Sim. 381; Prain Beng. Pl. 849; Cooke Fl. Bomb. Pr. II 455; Duthie Fl. Upp. Gang. Pl II 242; Gamble Fl. Madras 1135; Haines Bot. Bih. & Oris. 738; Kudo in Mem. Fac. Sc. & Agri. II 2, (1929) 46; Doan in Fl. Gen. Indo-Chine IV 8, (1936) 962;

Annual or perennial herbs, often growing in wet places. Leaves opposite or whorled, sessile or petioled. Spikes or racemes terminal, dense-flowered, flowers minute; bracts and bracteoles many, small. Calyx campanulate or ovoid, very minute, equally 5-toothed; throat glabrous within. Corolla very small, equally 4-lobed; tube exserted or included. Stamens 4, straight or sub-declinate; filaments long exserted, bearded with long hairs; anther cells confluent. Disk equal subentire. Ovary 4-partite; style slender, 2fid; lobes equal subulate. Nutlets dry, ovoid or oblong, smooth or rough; basal scar small.

- A. Calyx tube terette or nearly so,
- B. Leaves opposite,
 - C. Stem silky-tomentose; leaves thick, rugose.
 - D. Leaves sharply toothed on the upper half. mysuroides
 - D. Leaves subentire or ~~re~~ crenate. rugosa
 - C. Stem \neq bristly; leaves membranous, not rugose.
 - D. Stem sparingly bristly; leaves linear-lanceolate. salicifolia
 - D. Stem very densely bristly; leaves \neq oblong. auricularia
- B. Leaves whorled.
 - C. Stem and leaves on both sides long-villous or densely tomentose.
 - D. Leaf-margin flat, not revolute.
 - E. Leaves shortly petioled, narrow at the base; spikes stalked. quadrifolia
 - E. Leaves sessile, broad and truncate at the base; spikes sessile. Andersonii
 - D. Leaf-margin revolute. cruciata
 - C. Stem and leaves pubescent or \neq glabrous.
 - D. Leaves numerous (5-20) in a whorl; internodes short, about 5mm. stellata
 - D. Leaves few (3-5) in a whorl; internodes long, 2 cm. or more.
 - E. Calyx-teeth in ripe fruit widely spread. verticillata
 - E. Calyx-teeth in fruit bent inwards or erect.
 - F. Stem and leaves with appressed hairs (Pegu). peguana
 - F. Stem and leaves \neq glabrous or with a few spreading hairs.

- G. Calyx-teeth in fruit usually strongly bent inwards. crassicaulis
- G. Calyx-teeth in fruit erect.
- H. Leaves 4 in a whorl.
 - I. Spike 6-10 mm. broad; calyx-tube glabrous. . . linearis
 - I. Spike 3-4 mm. broad; calyx-hairy all over. . Helferi
 - H. Leaves 3 in a whorl. . . . kachinensis
- A. Calyx-tube deeply 5-grooved, with 5 elevated ridges.
- B. Leaves 6-20 in a whorl; \pm 1.5 cm. long. . . Stocksii
- B. Leaves 4 in a whorl or fewer; 2-4 cm. long.
- C. Calyx pubescent all over, angles obtuse; nutlets solitary. pentagona
- C. Calyx glabrous in the tube, angles acute; nutlets 4. Griffithii

habitats: Southern India.

This is distinguished with difficulty from the former plant by its smaller and stouter spikes, and the leaves are not sharply toothed in the upper half only.

1. Dysophylla myosuroides Benth. in Wall. Fl. As. Rar. i 30; Lab. Gen. et Sp. ; DC. Prodr. XII ; XX Hook.f. Fl. Brit. Ind. IV 638; Cooke Fl. Bonb. Pr. II 456; Gamble Fl. Madras 1136.

Erect much branched perennial herb, 20- 40 cm. high, with a woody rootstock; stem terete, silky- or tomentose, specially on the younger parts. Leaves opposite, subsessile 2.5-4 cm. long, thick, linear oblong, obtuse or subacute, silky-villous on both surfaces; nerves conspicuous; margin denticulate, entire near the base. Spikes slender, 7- 12 cm. long, shortly peduncled, tomentose; whorls close and confluent; bracts minute, linear-oblong, ciliate. Calyx minute, densely tomentose.

Corolla

Habitat:- Southern India.

2. Dysophylla rugosa Hook.f. Fl. Brit. Ind. IV 638; Gamble Fl. Madras 1136.

Erect perennial herb, 20- 40 cm. in height; stem and branches woody, fulvus woolly, with appressed hairs. Leaves about 3 cm. long, opposite, subsessile, linear-oblong, obtuse, crenate or subentire, fulvus-pubescent. Spikes about 5 cm. long, slender, tomentose; flowers minute; bracts small, oblong. Calyx very minute, turbinate, gland-dotted; ~~with~~ teeth very short triangular and ciliate. Corolla tube included.

Habitat: Southern India.

N.B. This is distinguished with difficulty from the former plant by its smaller and shorter spikes, and the leaves are not sharply toothed in the upper half only.

3. Dysophylla salicifolia Dalz. ex Hook. F. Fl. Brit. IV 638; Cooke Fl. Bort. Ind. II 457.

Erect much branched herb, 30-60 cm. high, branches slender, often woody, younger parts pubescent with appressed or silky hairs. Leaves 2.5 - 8cm. long, opposite, sessile or petioled, membranous, linear-lanceolate, subentire, or distantly serrate; appressedly hairy when young; base of the very acute. Flowers in dense slender villous spikes, 2.5- 10 cm. long, on short slender peduncles; whorls confluent; bracts about 4 mm. long, narrowly lanceolate, acute, hairy. Calyx short, villous; teeth erect, triangular, almost as long as the tube; fruiting calyx about 2mm. long. Corolla purple, as long as the bracts or less; tube slightly exceeding the calyx; lobes sparsely hairy. Nutlets ellipsoid, smooth and shiny. Flowering time? - Jan. - April.

Habitat: - Southern part of Bombay presidency; Poona.

4. Dysophyssa auricularia Blume Bijdr. 826; Benth. Lab. Gen. et Sp. 158; Wall. Pl. As. Rar. i 30; DC. Prod. XII 156; Hook. f. Fl. Brit. Ind. IV 638; Prain. Beng. Pl. 849; Cooke Fl. Bomb. II 456. Gamble Fl. Madras 1136; Haines Bot. Bih. & Oris. 738.

Leave A slender erect flaccid herb, 30 -60 cm. high; villous or hirsute with spreading hairs, often shaggy. Leaves opposite, subsessile or shortly petioled, 2.5- 7 cm. long, elliptic-oblong, subacute, serrate, base rounded; hairy on both sides. Flowers in slender spicate racemes, 5- 10 cm. long; bracts about 3mm. long, lanceolate, acute, densely pubescent with long hairs; peduncles short. Calyx very minute, turbinate; teeth triangular, acute, inflexed in fruit. Corolla smaller than the bracts, pale lilac in colour; tube exerted; lobes ovate acute, hairy at the back. Filaments very villous. Nutlets very small, broadly

Dysophylla auricularia(Contd.).

ellipsoid, smooth. Flowering time Sept.- Nov.

Habitat:- Sikkim; E. Bengal; Assam; Burma; Singbhum; Poona; S. India.

Distribution: Ceylon; Malay peninsula and islands; China; Philipines.

5. Dysophylla quadrifolia Benth. Wall. Pl. As. Rar. i 30; Lab. Gen. et Sp. 158; and DC. Prod. XII 157; Hook.f. Fl. Brit. Ind. IV 639; Cook Fl. Bomb. Pr. II 457; Prain. Beng. Pl. 850; Gamble Fl. Madras 1137; Haines Bot. Bih. & Oris. 739.

Stout erect perennial undershrub, 60-120 cm. high, with a woody rootstock; tomentose or softly pubescent; the plant smells camphor. Leaves 4 in a whorl, 2.5 - 10 cm. long, shortly petioled, linear-oblong or linear-lanceolate, acute or obtuse, usually serrate or ~~entire~~ subentire; softly pubescent on both sides; base narrowed. Spikes slender 7- 16 cm. long, tomentose or pubescent; whorls close or separate near the base; bracts minute, linear, spatulate. Calyx short, obconic, pubescent or glabrate; teeth half as long as the tube, triangular, ciliate. Corolla 3 mm. long, rose-coloured; lobes obtuse, oblong. Nutlets ~~xx~~ very minute, black, broadly ellipsoid or subglobose, microscopically papiloso-rugulose (Cooke). Flowering time, - March-April.

" There are two forms, one with long leaves drying nearly black and subglabrous, other grey-pubescent when dry, with leaves shorter! Gamble.

Habitat:- S. India; Singbhum; Chittagong; Khasia Mts.; Burma.

6. Dysophylla Andersonii Prain. Journ. & As. Soc. Beng. lix (1891) II 298; Haines Bot. Bih. & Oriss. 738.

A dwarf herb attaining only about 15 cm.; stem erect, stout, woody, adpressedly pubescent. Leaves mostly in whorls of 3 or 4, sometimes the lower ones opposite; sessile, lanceolate or oblong-lanceolate, quite entire; tomentose. Spikes short, about 5 cm. long, stout, softly tomentose; whorls confluent. Calyx

Dysophylla Andersonii (contd.)-

short, glabrescent; tube terete or obscurely angled; teeth half as long as tube, erect, hirsute, bluntly triangular. Corolla tube included; lobes sparingly hairy. Nutlets globose, smooth, shining, reddish brown in colour. Flowering in winter.

Habitat:- Sikkim; Singbhum; Burma(Kachin Hills).

7. *Dysophylla cruciata* Benth. in Wall. Pl. As. Rar. i 30, Lab. Gen. et Sp. 158, and in DC. Prod. XII 157; Hook.f. Fl. Brit. Ind. IV 639; Prain Beng. Pl. 850; Gamble Fl. Madras 1137; Haines Bot. Bih. & Oris. 739.

Stout and strict herb, 30-50 cm. in height; stem simple, erect, densely hirsute. Leaves 3-6 in a whorl, sessile, 2.5 -4 cm. long, erect, linear, obtuse, revolute at the margin which is quite entire; both surfaces densely hirsute. Spikes about 10 cm. long or more, about 13 mm. in diameter; villous; whorls confluent. Calyx minute, villous. Corolla lilac or pale purple, tube scarcely exerted; lobes glabrous. Filaments bearded with pink or purple hairs. Nutlets minute, black, polished, broadly elliptic-oblong, with minute attachment-points. Flowering time,- Oct-March.

Habitat:- Kumaon; Garhwal; Nepal; Behar; Chota Nagpur; Bengal; Kachin hills; Nilgiris ("Perhaps Malabar",- Gamble.).

8. *Dysophylla stellata* Benth. in Wall. Pl. As. Rar. i 30; Hook. f. Fl. Brit. Ind. IV 640; Cooke Fl. Bomb. Pr. II 457; Gamble Fl. Madras 1137.

Low herbaceous water-plant, about 20 cm. high, with much branched stem, decumbent or creeping below; branches ascending, flexuous, with very short internodes. Leaves many in a whorl, about 5-20, very small, scarcely 10 mm. long, sessile, narrowly linear, obtuse or acute, margin entire, revolute; slightly pubescent or not. Spikes slender, densely villous, 2.5-6 cm. long; whorls close and crowded; bracts as long as the flowers, linear or clavellate on a filiform pubescent stalk as long as the blade,

Dysophylla stellata (Contd.)-

persistent even after the fruit falls. Calyx very minute, hemispheric or campanulate, pubescent; teeth erect, or incurved in fruit. Corolla pink in colour, minute, 2 mm. long; lobes ovate-oblong, hairy outside. Filaments exserted, bearded with purple hairs. Nutlets very small, ellipsoid, yellowish brown, smooth and shining. Flowering time, - Nov.-Jan.

Habitat:- Canara; Travancore.

var; tomentosa Cooke Fl. Bomb. Pr. II 458.

Dysophylla tomentosa Dalz. in Hook. Kew Journ. ii (1850) 337; Hook.f. Fl. Brit. Ind. IV 641.

Stout erect herb, 25-30 cm. high; softly pubescent all over with long hairs. Bracts linear; spikes stout, villous, Calyx subcampanulate.

Habitat:- Concan.

var;- gracilis Cooke Fl. Bomb. Pr. II 458; Gamble Fl. Madras 1137.

Dysophylla gracilis Dalz. in Hook. Kew Journ. ii (1850) 337; Hook. f. Fl. Brit. Ind. IV 641.

Dysophylla erecta Dalz. in Hook. Kew Journ. ii (1850) 337; Hook.f. Fl. Brit. Ind. IV 641.

Tall herb, 30-100 cm. high; stem thick, with prominent nodal scars. Spikes slender, 2-5 cm. long, villous; bracts often appear filiform in consequence of the blades having been broken. Calyx much smaller, densely villous; teeth erect.

Habitat:- Canara; Mysore.

9. Dysophylla verticillata Benth. in Wall. Fl. As. Rar. i 30; Lab. Gen. et Sp. 159, and in DC. Prod. XII 157; Hook. f. Fl. Brit. Ind. IV 639; Prain Beng. Pl 851; Haines Bot. Bih. & Oris. 739.

Erect annual herb, about 60 cm. high; very variable in habit, sometimes thick-stemmed and much branched, or slender and

Dysophylla verticillata (Contd.),

almost simple; stem hollow, and often decumbent near the base; glabrous or very sparsely hairy. Leaves 4-10 in a whorl, sessile, 2.5-7 cm. long, spreading and deflexed, linear or linear-lanceolate, entire or obscurely crenate-serrate, glabrous or nearly so. Spikes slender, 2.5-7 cm. long, very densely tomentose or villous. Calyx minute, densely villous; teeth of fruiting calyx stellately spreading and disclosing the nutlets; the open calyces look like large holes in the solid spike. Corolla minute, pubescent; tube included. Hairs on the filaments very long. Nutlets pale brown. Flowering time, - Nov.-Dec.

Habitat:- Chanda Dt.; Basti Dt.; Manbhum; Behar; Bengal; Sikkim; Assa; Burma;

Distribution:- Ceylon; Malay archipelago; China; Philippines; Australia.

10. *Dysophylla peguana* Prain in Journ. As. Soc. Beng. LIX, ii, (1891) 299.

Slender erect herb, 30-40 cm. high, simple or branched, adpressedly puberulous. Leaves 4 in a whorl, sessile, 2.5-4 cm. long, linear, entire, adpressedly puberulous. Spikes 2.5-4 cm. long, slender, compact, tomentose. Calyx tube terete or obscurely angled; teeth of fruiting calyx erect. Corolla pink, about 2 mm. long; tube very short, limb villous. Filaments far exserted. Nutlets narrowly ovate, pale, shining.

Habitat:- Burma, - Pegu, Moulmain.

N.B. Specimens from S. Shan States collected by MacGregor No. 759 and No. 760, are not the same as *D. peguana* Prain, and may well be of a new species.

11. *Dysophylla crassicaulis* Benth. in Wall. Pl. As. Rar. I 30; Lab. Gen. et Sp. 159, and in DC. Prod. XII 158; Hook.f. Fl. Brit. Ind. IV 640; Prain Beng. Pl. 851; Haines Bot. Bih. & Oris. 740.

Dysophylla crassicaulis (Contd.), -

Small stout annual herb, growing in rice fields and swamps; stem decumbent and much thickened below; glabrous. Leaves 4-6 in a whorl, sessile, about 1.5 cm. long, very variable in breadth, linear, linear-oblong or linear-lanceolate, obtuse, subentire or distantly serrate; rounded, subcordate or acute at the base; glabrous. Spikes 3-12 cm. long, about 1 cm. in diameter, glabrate or pubescent; bracts oblanceolate. Calyx purple in colour, campanulate; teeth triangular, erect or conniving in fruit; shortly hairy. Corolla 4mm. long; tube exserted; lobes glabrous. Nutlets very small, orbicular, compressed, shining. Flowering time, -Nov.-Jan. Habitat:- Kashmir to Sikkim; Purneah; Bengal; Assam; Burma.

var, - pumila Hook.f. Fl. Brit. Ind. IV 640; Prain Beng. Pl. 851; Duthie Fl. Upp. Gang. Pl. II 242.

Dysophylla pumila Benth. In Wall. Pl. As. Rar. i 30; Wall. Cat. 1540.

Dwarf slender herb of wet places, 7-10 cm. high. Leaves 4 in a whorl, narrowly oblong or oblanceolate, distantly and rather coarsely toothed. Spikes 1-3 cm. long; bracts longer than calyx. Filaments bearded with bluish moniliform hairs. Habitat:- Kashmir to Sikkim, Bengal; Assam(?).

12. *Dysophylla linearis* Benth. in DC. Prod. XII 157; Hook.f. Fl. Brit. Ind. IV 639.

Erect annual herb, sparsely hairy or glabrate; stem usually simple. Leaves 4 in a whorl, sessile, 3-7 long, linear or linear-lanceolate, obtuse, margins revolute, entire or sparingly toothed; glabrous. Spikes short, 1.5-5 cm. long, 1.2-2 cm. in diameter; bracts oblong-lanceolate, more or less equalling the calyx. Calyx glabrous; teeth erect in fruit. Corolla 4 mm.; tube exserted. Nutlets twice as long as that of *D. cruciata*. Habitat:- Assam; Bhotan.

Distribution:- Yunnan.

13. Dysophylla Helferi Hook.f. Fl. Brit. Ind. IV 640.

Dwarf annual herb, 10-15 cm. in height; stem and branches erect, slender, glabrous. Leaves 4 in a whorl, 1.5-2.5 cm. long, sessile, linear-oblong, obtuse, serrate, glabrous. Spikes slender, 1.5- 3.5 cm. long, pubescent; bracts minute linear-lanceolate. Calyx very minute, campanulate, membranous, sparsely pubescent; teeth lanceolate, erect in fruit; fruiting calyx 2 mm. long. Corolla pink or purple, 2 mm. long puberulous; tube very slender, exserted; lips spreading. Nutlets 0.5 mm., orbicular oblong, dark brown in colour, smooth and shining.

Habitat:- Burma; Sikkim Kurz.

Distribution:- Indo-Cina(?).

14. Dysophylla kachinensis Mukerjee in Notes of R. B. G. Edin. XIX 95, (1938) in ed.

Dwarf erect herb, about 20 cm. high, or smaller; stem and branches slender, strict, glabrous. Leaves in whorls of 3, sessile, 8-13 mm. long, lanceolate, acute, margin distantly serrate, revolute, glabrous on both surfaces, densely glandular below. Spikes many, terminal at the ends of branches, 1-2.5 cm. long, about 3 mm. broad; bracts lanceolate, densely pubescent, 1 mm. long. Calyx pubescent, campanulate; teeth triangular, half as long as tube; fruiting calyx 1 mm. long. Corolla reddish in colour, 8 mm. long, pubescent, tube campanulate, slightly exserted; lips short, the upper longer. Nutlets 0.3 mm. long, orbicular, brown, smooth and shining.

Habitat:- upper Burma, Kachin hills- Metkina Shaik Mokim 34, and Nakharan Shaik Mokim 52.

15. Dysophylla Stocksii Hook.f. Fl. Brit. Ind. IV 642; Cooke Fl. Bomb. Pr. II 458.

Stout erect herb, often decumbent below; nearly glabrous. Leaves 9-20 in a whorl, 1-2 cm. long, sessile, narrowly linear

Dysophylla Stocksii(Contd.)-

obtuse, margin recurved, almost glabrous. Spikes 5-8 cm. long, slender, dense-flowered; rachis pubescent; bracts filiform, with club shaped tips. Calyx minute, strongly 5-ribbed, densely pubescent all over; lobes triangular, obtuse, as long as the tube; completely closing the mouth. Corolla tube very short; lobes obtuse, nearly glabrous. Nutlets minute, narrowly oblong-ellipsoid, smooth, shining, brown in colour.

Habitat:- Concan.

16. *Dysophylla pentagona* C.B.Clarke ex Hook.f. Fl. Brit. Ind IV 641; Prain Beng. Pl. 851; Haines Bot. Bih. & Oris. 740.

Small much branched herb of wet place, 30-45 cm. high or much smaller; nearly glabrous. Leaves 4 in a whorl, 1-3.5 cm. long, sessile, linear, obtuse, erecto-patent, margin somewhat revolute, entire, base acute or obtuse. Spikes slender, 5-8 cm. long; rachis hirsute; bracts linear. Calyx densely pubescent all over; tube deeply 5-grooved with 5 elevated ridges, globose, narrowed at both ends; teeth minute, obtuse, closing the mouth. Corolla pink, with white flat obtuse lobes. Nutlet solitary, linear-oblong, completely enveloped by the closed calyx-tube. Flowering in Oct.- Nov.

Habitat:- Chota Nagpur; Singbhum.

17. *Dysophylla Griffithii* Hook.f. Fl. Brit. Ind. IV 641; Prain Beng. Pl. 851; Haines Bot. Bih. & Oris. 740.

Small much branched herb, 30-50 cm. high; branches slender, erect, nearly glabrous. Leaves 4 in a whorl, or the upper leaves opposite, sessile, 1.5-2.5 cm. long, linear obtuse or subacuminate; pubescent. Spikes slender, 2-5 cm. long, pubescent; bracts linear, exceeding the flowers. Calyx obconic, acutely 5-angled; tube glabrous, brown and shining below; teeth incurved, villous with

Colebrookia oppositifolia Sm. Exot. Bot. II 111, t. 115;

Hook. f. Fl. Brit. Ind. IV 642; Galtsof Fl. Sib. 388; Prain Beng. Fl. 851; Cooke Fl. Bomb. Pr. II 458; Duthie Fl. Upp. Gang. Fl. II 242; Gamble Fl. Madras 1137; Haines Bot. Bih. Oris. 740; Kudo in Mem. Fac. Sc. & Agri. II, 2, (1929) 45; Doan Fl. Gen. Indo-Chine IV, 8, (1936) 961.

Colebrookia Smith.

Exot. Bot. II 111; Benth. Lab. Gen. et Sp. 165, and in DC. Prod. XII 158; Benth. ex Hook. f. Gen. Pl. II 1180; Hook. f. Fl. Brit. Ind. IV 642; Briq. in Eng. und. Pr. Pflanzenf. IV, 3, a, 331; Prain Beng. Pl. 851; Cooke Fl. Bomb. Pr. II 458; Duthie Fl. Upp. Gang. Pl. II 242; Gamble Fl. Madras 1137; Haines Bot. Bih. Oris. 740; Kudo in Mem. Fac. Sc. & Agri. II, 2, (1929) 45; Doan Fl. Gen. Indo-Chine IV, 8, (1936) 961.

Densely hoary or woolly shrub. Leaves opposite or 3-nate, petioled. Spikes panicled, whorls dense-flowered, bracts connate; flowers functionally dioecious. Calyx campanulate, tube very short; teeth subulate, much elongated in fruit, capillary and feathery. Corolla small, tube short, lobes 4, subequal, or the upper larger. Stamens 4, exserted in ♂ flowers, included in ♀; filaments glabrous; anther-cells confluent. Disc uniform. Ovary 4-partite; style bifid at the tip, lobes subulate. Nutlets sometimes solitary, dry, ovoid, hairy on the tip; basal scar small.

Colebrookia oppositifolia Sm. Exot. Bot. II 111, t. 115; Hook.f. Fl. Brit. Ind. IV 642; Collet Fl. Sim. 388; Prain Beng. Pl. 851. Cooke Fl. Bomb. Pr. II 459; Duthie Fl. Upp. Gang. Pl. II 243; Gamble Fl. Madras II 1138; Haines Bot. Bih. & Oris 741. Kudo in Mem. Fac. Sc. & Agri. II, 2, (1929) 46; Doan Fl. Gen. Indo-Chine IV 8, (1936) 962.

A very large spreading shrub, attaining a height of 2-3 m.; branches stout, grooved, softly white-tomentose. Leaves opposite or in whorls of 3; petioled, oblong-lanceolate, acute or acuminate, crenate or serrulate, base acute, softly pubescent on both sides; lamina 10-20 cm. long, petiole 2-4 cm. long, Flowers functionally dioecious, crowded in terminal panicles, and axillary spikes, slender, 5-10 cm. long; bracts minute, linear, pubescent; sometimes a whorls of bracteoles present at the base of the spike. Calyx in flower about 3 mm. long, 5-partite; teeth deeply grooved, subulate, plumose with hairs, which elongate in fruit up to 6 mm., giving the whole spike a conspicuous plmose appearance. Corolla very small, white, upper lobe emarginate. Filaments of stamens exserted in the flowers, included in . Nutlets often solitary, ovoid, hairy at the tip. The plant flowers in early spring. Habitat:- All over India, in the hilly parts, from Peshawar to Burma, and Simla to Travancore.

Perilla, Linn.

Gen. n. 578; Benth. Lab. Gen. et Sp. 166, and in DC. Prodr. xii 163; Benth. ex Hook. f. Gen. Pl. II 1182; Hook. f. Fl. Brit. Ind. iv 648; Briq. in Eng. & Pr. Nat. Pflanzenf. iv, 3, a, 326; Kudo in Mem. Tac. Sc. & Agri. ii, 2, (1929) 71; Doan in Fl. Indo-Chine. iv, 8 (1936) 983.

Herbaceous annuals; leaves opposite. Whorls 2-flowered, in secund axillary and terminal, simple or paniced racemes; bracts small. Calyx campanulate, 5-toothed, 2-lipped in fruit, gibbous at the base; upper lip dilated, 3-toothed, lower with 2 narrowteeth. Corolla campanulate at the tube, limb 5-lobed. Stamens perfect, subequal, erect, distant, included or slightly exserted; anthers 2-celled, parallel, at length diverging. Disc with a large anterior gland. Style equally 2-fid at the apex, lobes subulate. Nutlets globose, reticulate or smooth.

Habitat:- Kashmir to Shetan, 400-3,500 m; Khasi hills; Chittagong, (cult.); Champaran; Burma; China; Japan.

1. Perilla ocimoides, Linn. Gen. ed. VI. 578; Hook. f. Fl. Brit. Ind. iv 646; Collett Fl. Sim. 390; Prain Beng. Pl. 851; Haines Fl. Bih. Oris. 742; Doan in Fl. Indo-Chine iv, 8 (1936) 983.

P. frutescens Britt. in Mem. Torrey. Bot. v. 277; Kudo in Mem. Fac. Sc. Agri. ii, 2 (1929) 71.

A coarse strongly scented, bushy annual, 30-120 cm. high, villously hairy, often shaggy, with 4-gonous and grooved branches. Leaves 5-15 cm. long, broadly ovate, acuminate, coarsely serrate, or crenate, base rhomboid or cuneate, hairy above and on the nerves beneath; petiole 1.5-6 cm. long, closely villous. Racemes axillary and terminal, erect, 3-12 cm. long, lax; whorls 2-fl'd. bracts lanceolate, as long as the flowers or smaller. Calyx minute, enlarged to about 6-8 mm. in fruit; upper lip with 3 oblong obtuse teeth, lower lip with 2 lanceolate teeth, equalling the tube, fruiting calyx villous or nearly glabrous outside and with a ring of hairs in the throat. Corolla 4 mm, villous, white, tube slightly exserted, limb spreading, upper lip 4-lobed, lower lip with one broad, subtruncate lobe. Stamens erect, included, 2-celled anthers. Nutlets 1.5-2 mm. long, rounded, pale brown, with reticulate marks.

Habitat:- Khashmir to Bhotan, 400-3,500 m; Khasi hills; Chittagong, (cult.); Champaran; Burma; China; Japan.

A. Leaves serrated at the base; flowers in axillary capitata whorls arvensis.
B. Leaves cordate or rounded at the base; flowers in terminal spikes spicataria.

1. Mentha arvensis Mentha, Linn. 577.

Herbs 30-50 cm. high, hairy or glabrous. Leaves 2-3-5 cm. long, lanceolate ovate or elliptic, acute, very sharply toothed, rounded or cordate at the base; pubescent above, hairy tomentose below. Spikes terminal, 3-5 cm. long, slender, hairy, bracts lanceolate; flowers shortly pedicelled, pedicels hairy; whorls dense or capitate. Calyx bell-shaped, hairy; teeth triangular or lanceolate, acute. Corolla small, 11-13 mm in diameter, tube as long as the calyx, hairy outside. Stamens protruding, filaments naked. Petals pale smooth or sometimes brown and conspicuously delicately reticulated.

Gen. Pl. 291; Endlicher Gen. Pl. 613; Benth. Lab. Gen. et Sp. 168, and in DC. Prodr. xii 166; Hook. f. Fl. Brit. ind. iv 647; Benth. ex Hook. f. Gen. Pl. II, 1182; Briq. in Engl. & Pr. Nat. Pflanzenf. iv, 3, a, 317; Kudo in Mem. Fac. Sc. & Agri. II, 2, (1929) 86; Post in Fl. Syria etc. II, 329.

Herbs, usually copiously dotted and strongly scented. Flowers small, in false-whorls usually densely rarely few-flowered, all axillary or, forming terminal spikes, with the floral leaves reduced to bracts. Bracts within the false-whorls minute, or rarely subulate and as long as the calyx. Calyx regular or slightly 2-lipped, 5-toothed. Corolla-tube not at all or scarcely exceeding the calyx; limb 4-lobed, the lobes all equal and spreading or the upper one broader and notched. Stamens, 4, equal, erect, distant; filaments glabrous; anthers with 2 parallel cells. Style shortly bifid. Nuts smooth.

is sometimes present. Leaves very shortly petioled, 3-5 cm. long, lanceolate ovate or elliptic, acute, very sharply toothed, rounded or cordate at the base; pubescent above, hairy tomentose below. Spikes terminal, 3-5 cm. long, slender, hairy, bracts lanceolate; flowers shortly pedicelled, pedicels hairy; whorls dense or capitate. Calyx bell-shaped, hairy; teeth triangular or lanceolate, acute. Corolla small, 11-13 mm in diameter, tube as long as the calyx, hairy outside. Stamens protruding, filaments naked. Petals pale smooth or sometimes brown and conspicuously delicately reticulated.

- A. Leaves decurrent at the base; flowers in axillary capitate whorls arvensis.
- A. Leaves cordate or rounded at the base; flowers in terminal spikes sylvestris.

Habitat:- Kashmir; Kanton; Charsal; Punjab.
Dist.:- N. & S. Asia; Afghanistan; Europe.

1. Mentha arvensis Linn. Sp. Pl. 577.

Herbs 30-60 cm. high, hairy or glabrous. Leaves 2.5-5 cm., shortly petioled, or sessile, oblong ovate, or lanceolate, acute, obtusely or acutely serrate, cuneate at the base, sparsely hairy with minute hairs or almost glabrous. Flowers in axillary capitate whorls, bracts acute shorter than the flowers, pedicels as long as the calyx. Calyx campanulate, hairy, teeth triangular or lanceolate, acuminate, fruiting calyx scarcely enlarged, pink in colour. Corolla white, puberulous on both sides, tube as long as the calyx or slightly exserted, lobes spreading. Stamens exserted. Style far exserted.

Habitat:- Kashmir; Punjab; Kumaon; Garwhal.

Dist.:- Afghanistan, W. & N. Asia; China; Europe.

2. Mentha sylvestris Linn. Sp. Pl. ed. II, 804; Hook. f. Fl. Brit. Ind. iv 647; Collett Fl. Sim. 390.

Erect or diffuse herbs with a strong aromatic odour, 30-100 cm. long, hoary tomentose stem; a creeping rootstock is sometimes present. Leaves very shortly petioled, 3-8 cm. long, lanceolate ovate or oblong, acute, very sharply toothed, rounded or cordate at the base; pubescent above, hoary tomentose below. Spikes terminal, 3-8 cm. long, slender, hoary, bracts lanceolate; flowers shortly pedicelled, pedicels hairy; whorls close or separate. Calyx bell-shaped, hairy; teeth triangular or lanceolate, acute. Corolla small, lilac in colour, tube as long as the calyx, hairy outside. Stamens protruding, filaments naked. Nutlets pale smooth or sometimes brown and conspicuously delicately reticulated.

Habitat:- Kashmir; Kumaon; Gharwal; Punjab.

Dist.:- W. & N. Asia; Afghanistan; Europe.

Mentha sylvestris, var. (i) incana Hook. f. Fl. Brit. Ind. iv 647.

M. incana Willd. Hort. Berol, 609; Benth. Lab. Gen. et Sp. 170, and in DC. Prodr. xii 169.

Uniformly hoary tomentose, spikes much interrupted, calyx very small, teeth short, (spikes sometimes capitate - Hooker, Peshwar sp.).

Habitat:- Kashmir; Punjab.

Mentha sylvestris, var. (ii) Royleana Hook. f. Fl. Brit. Ind. iv 647.

M. Royleana Benth. in Wall. Pl. As. Rar. i, 29, Cat. 1537; Lab. Gen. et Sp. 171, and in DC. Prodr. xii 169.

Uniformly hoary-tomentose, spikes stout, usually continuous, calyx-teeth lanceolate or triangular with subulate lips.

Habitat:- Kashmir.

Elsholtzia Willd.

(including Aphanochilus Benth.)

Spec V 3, 59; Endlicher Gen. Pl. 612; Benth. Lab. Gen. et Sp. 160, and in DC. Prod. XII 159; Benth. ex Hokk.f. Gen. Pl. II 1181; Hook.f. Fl. Brit. Ind. IV 642; Briq. in Engl. und Pr. Nat. Pflanzenf. IV 3, a, 327; Doan in Fl. Gen. Indo-Chine IV 8, (1936) 976.

Herbs or undershrubs. Leaves opposite, usually petioled. Spikes simple or paniced, slender or stout, cylindric or secund; flowers usually minute; bracts variable, minute or larger than the flowers. Calyx 5-toothed, ovoid or campanulate, erect and often enlarged in fruit. Corolla tube usually shortly exserted, straight or incurved; limb 4-lobed, oblique or sub-2-lipped; the upper lobe or lip erect, notched; the lower lobes spreading. Stamens 4, divergent or distant, sometimes unequal; filaments naked; anther-cells divergicate or at length confluent. Disk produced behind the ovary. Style subequally 2-fid with subulate lobes. Nutlets minute, ovoid, smooth or tuberculate.

- A. Bracts very narrow, setaceous or subulate.
- B. Corolla 5-6 mm. long, (undershrubs).
 - C. Leaf-blade 8-18 cm. long, 5-12 cm. broad,
 - not hoary(Himalaya, Khasia). flava
 - C. Leaf-blade 2.5-6 mm. long, 1-2 cm. broad,
 - hoary beneath (U.Burma). rugulosus
- B. Corolla 2-3 mm. long.
 - C. Bracts very conspicuous, subulate, ciliate.. . . pilosa
 - C. Bracts \pm inconspicuous.
 - D. Petiole \pm equalling blade of ovate leaf,
 - (under herb). incisa
 - D. Petiole much shorter than the blade of lanceolate or ovate leaf.
 - E. Leaves more or less lanceolate, regularly serrate.
 - F. Leaves not hoary.
 - G. Undershrubs with leaves
 - 3-15 cm. long.
 - H. Leaves subsessile; calyx-teeth much shorter than the tube, triangular. polystachya
 - H. Leaves shortly but distinctly petioled, calyx-teeth \pm equalling the tube, lanceolate. blanda
 - G. Herbaceous plants with leaves
 - \pm 3 cm. long. Griffithii
 - F. Leaves hoary on both sides. Beddomei
 - E. Leaves oblong, coarsely crenate. communis
- A. Bracts broadly ovate, orbicular or obcuneate.
 - B. Bracts rounded or truncate at the apex.
 - c. Fruiting calyx not hidden by the small bracts.

- D. Flowers lilac. densa
- D. Flowers yellow. eryostachya
- C. Fruiting calyx hidden by large imbricating
bracts. strobilifera
- B. Bracts cuspidate.
- C. Leaves small, 1-2 cm. kachinensis
- C. Leaves large 2.5-10 cm. cristata

1. Elsholtzia flava Benth. Lab. Gen. et Sp. 161; Hook.f. Fl. Brit. Ind. IV 642.

A tall shrubby annual, 100-150 cm. high; branches scaberulous, obtusely 4-angled, often mucronate. Leaves long-petioled, broadly ovate, or rhombic ovate, caudate acuminate, dentate, rounded or slightly cordate at the base, glabrous or nearly so; lamina 8-18 cm. long, 5-12 cm. broad; petiole about as long as the blade or shorter. Spikes axillary and terminal, 7-10 cm. long, stout, puberulous; bracts deciduous, ovate-lanceolate; flowers shortly pedicelled. Calyx 2.5 mm. long, tubular, inflated below; teeth erect; fruiting calyx 5-6 mm. long. Corolla 5-6 mm. long, yellow in colour, puberulous. Nutlets dark brown, ellipsoid, shining.

Habitat:- Kumaon; Gharwal; Nepal; Assam.

2. Elsholtzia rugulosa Hemsl. in Journ. Lin. Soc. XXVI (1890) 278.

Aphanochilus rugulosus Kudo

Bushy plants; stem much branched, woody, tomentose with white or greyish crisp hairs. Leaves rather thick, petioled,

Elsholtzia rugulosa (Contd.)-

ovate, or oblong-ovate, acute, distinctly and obtusely serrulate, base cuneate and entire, upper surface hispid and rugulose, white- or greyish tomentose beneath; lamina 2.5-6.5 cm. long, nearly 2 cm. broad or less; petiole 6-12 mm. long. Spikes elongated, 5-8 cm. long, nearly flexuous or erect; whorls few-flowered, interrupted; bracts minute shorter than the calyx. Calyx short, pedicelled, densely whitish tomentose, deeply cleft; teeth subulate. Corolla 5 mm. long, and about 3 mm. wide at the mouth; puberulous without. Stamens and style exserted. Nutlets oblong, reddish.

Habitat:- Burma, Hpiew R.A.

Distribution:- Yunnan.

3. Elsholtzia pilosa Benth. Lab. Gen. et Sp. 163; Hook.f.

Fl. Brit. Ind. IV 644.

Stout or slender herbs 30-60 cm. high, coarsely hairy with flaccid hairs. Leaves petioled, membranous, ovate, obtuse, coarsely crenate, cuneate at the base; lamina 3-6 cm. long, petiole about 1 cm. long. Spikes 2.5-4 cm. long, stout, terete, very dense-fl., hispid; bracts rigid, subulate, awned, ciliate, larger than the flowers, and very conspicuous. Calyx urceolate, 1.5 mm. long, hispid; teeth lanceolate, very unequal. Corolla 2.5 mm. long; lobes hairy very short.

Habitat:- Kumaon to Sikkim; Khasia Mts.

4. Elsholtzia incisa Benth. Lab. Gen. et Sp. 162; Hook.f.

Fl. Brit. Ind. IV 644; Collet Fl. Sim. 388; Haines Bot. Bih. & Oris. 741.

A slender herb, 30-100 cm. high, strongly aromatic, puberulous with adpressed hairs. Leaves membranous, broadly ovate, obtuse or acute, coarsely crenate-dentate or deeply serrate,

Elsholtzia incisa (Contd.)-

puberulous, and with conspicuous glands beneath; base of leaf cuneate; lamina 2-4 cm. long, petiole as long as the blade, very slender. Spikes very slender, 5-10 cm. long, terminal, cylindrical; bracts minute, linear; whorls confluent. Calyx short, tube urceolate, glandular pubescent; teeth erect lanceolate or subulate. Corolla white, tubular, 2 mm. long, densely pubescent, lobes glabrous. Lower stamens sometimes imperfect. Nutlets oblong-ellipsoid, brown shining, attached by a very minute base. The flowers in July- Oct.

Habitat:- In Himalaya, from Kashmir to Mishmi; Chittagong; Burma; Chota Nagpur.

var:- major Hook.f. Fl. Brit. Ind. IV. 644.

Tall and stout herbs, with soft and spreading hairs. Spikes stout; about 1.5 cm. in diam. in fruiting. Calyx in fruit 4-6 mm. long.

Habitat:- Kumaon; Sikkim.

5. Elsholtzia polystachya Benth. Lab. Gen. et Sp. 161; in DC. Prod. Xii 159; Hook.f. Fl. Brit. Ind. IV 643; Collet Fl. Sim. 388.

Bushy plants, 100-130 cm. high; branches obscurely 4-angled, puberulous or hoary tomentose. Leaves subsessile, 8-15 cm. long, rigid, lanceolate or elliptic-lanceolate, acuminate, serrate or deeply toothed or crenate, base acute; glabrous or nearly so. Spikes slender, 10- 25 cm. long, often fascicled; bracts minute. Calyx minute, about 3 mm. in fruit, shortly pedicelled, narrowly tubular, ribbed to the base; teeth short triangular, erect acute. Corolla white or pale yellow, 3 mm. long, villous. Nutlets narrow, shining.

Habitat:- Kashmir; Simla; Kumaon; Khasia; Sikkim.

Habitat:- Upper Burma.

This I believe should be raised to the rank of a species.

6. Elsholtzia blanda Benth. in Wall. Pl. As. Rar. i 19, Lab. Gen. et Sp. 162, and in DC. Prod. XII 160; Wall. Cat. 1550; Hok.f. Fl. Brit. Ind. IV 643; Bot. Mag. t. 3091.

Perilla elata Don Prod. 115.

Mentha blanda Wall. Mss.

Bushy undershrubs, with slender branches, 60-160 cm. high, puberulous or hoary. Leaves short petioled, 3-10 cm. long, elliptic lanceolate, acuminate serrate; base narrowed; glabrous or nearly so. Spikes slender, 5-12 cm. long, panicled, secund; whorls close or widely apart; bracts lanceolate, smaller than the flowers. Calyx minute in flower, about 3 mm. in fruit, pedicelled, urceolate, glandular pubescent; teeth erect, lanceolate; mouth of fruiting calyx contracted. Corolla white, 2.5 mm. long, sparingly pubescent. Nutlets broadly ellipsoid, shining.

Habitat:- Nepal; Sikkim Khasia; Burma.

Distribution:- Sumatra.

7. Elsholtzia Griffithii Hook.f Fl. Brit. Ind. IV 644.

Small erect hoary-pubescent herbs. Leaves rigid, shortly petioled, 3-4 cm. long, lanceolate, obtuse or subacute, serrate, cuneate at the base. Spikes 2-5 cm. long, terete, dense-flowered, about 6-7 mm. in diam.; bracts setaceous, exceeding the flowers. Calyx 1 mm. long, tube narrow, hoary-pubescent. Corolla 2 mm. long, blue-purple, lobes pubescent.

Habitat:- Assam; Upper Burma.

var:- sacra Prain in Journ. As. Soc. Beng. lix 299.

Tall and rigid herbs, rather glabrate. Leaves narrower, often sessile. Spikes numerous, 5-6 cm. long; bracts not exceeding the calyx. Calyx 2 mm. in flower, 4-5 mm. in fruit, mouth oblique.

Habitat:- Upper Burma.

This I believe should be raised to the rank of a species.

8. Elsholtzia Beddomei C.B. Clarke ex Hook.f. Fl. Brit. Ind. IV 643.

Shrubby plants with nearly terete branches, hoary-tomentose. Leaves shortly petioled, rather thick, rugulose above, narrowly oblong-lanceolate, obtuse, crenulate, base entire, narrowed to the petiole; lamina 5-8 cm. long, hoary on both surfaces, petiole about 1 cm. long, or less. Spikes 5-8 cm. long, slender, terete, densely villous and hoary; bracts minute lanceolate; whorls separated. Calyx minute, tubular, villous, 2 mm. long in fruit; teeth lanceolate. Corolla twice as long as the calyx; tomentose, white; tube incurved. Nutlets shining.

Habitat:- Burma.

9. Elsholtzia communis (Collet & Hemsl.) Diels in Notes R.B.G. Edin. XXXI 47; Dunn in Notes R.B.G. Edin XXXVIII 150.

Dysophylla communis Collet & Hemsl. in Journ. Lin. Soc. XXVIII (1891) 114.

Lophanthus Cypriani Pavolini in Nuov. Giorn. Bot. Ital. n.s. XV (1908) 434.

Elsholtzia alopecuroides Lev 1 et Vut. in Fedde. Rep. VIII 424.

Pogostemon Cyperini Pamp. in Nuov. Giorn. Bot. Ital. n.s. XVII (1910) 708.

Elsholtzia incisa Hemsl. in Forb. et Hemsl. Ind. Fl. Sim. II, not of Benth. Tibet.

Aphanochilus communis Kudo in Mem Fac. Sc. Agri. II, 2, (1929) 62.

Slender herbs, about 30 cm. high, with stem and branches densely puberulous with curling hairs. Leaves petioled, membranous, oblong, obtuse, widely and obtusely crenate, base cuneate and decurrent to the petiole, minutely puberulous

Elsholtzia communis (Contd.)-

above, glabrous beneath; lamina 3-9 cm. long, petiole about 2 cm. long, or less. Spikes very dense, cylindrical and elongated, sessile or shortly peduncled; bracts and bracteoles linear-subulate, minute. Calyx cylindrical, puberulous, equally 5-toothed. Corolla rose-coloured, pubescent outside, tube hardly exerted. Stamens shortly exerted. Nutlets oblong-ellipsoid, dark purple, puberulous, very minute.

Habitat:- U. Burma, Shan hills.

Distribution:- China; Siam.

10. Elsholtzia densa Benth. Lab. Gen. et Sp. 714, and in DC. Prod. XII 162; Hook.f. Fl. Brit. Ind. IV 645.

Small annual herbs, 15-45 cm. high, some times much smaller, sparsely pubescent; stem slender or stout. Leaves shortly petioled, 3-8 cm. long, oblong lanceolate, rarely ovate or elliptic, acute or obtuse, serrate, base cuneate, softly pubescent. Spikes 2-4 cm. long, stout, cylindrical, villous; bracts broad, rounded, shorter than the flowers; whorls distant, or in the upper part of the spike quite close. Calyx minute in flower, cupular, about 6 mm. long in fruit, membranous, campanulate, inflated; teeth short, rounded. Corolla minute, lilac in colour; tube very short, villous. Nutlets ellipsoid, opaque, 2.5 mm. long.

Habitat:- Kashmir to Kumaon.

Distribution:- W. Tibet.

11. Elsholtzia eriostachya Benth. Lab. Gen. et Sp. 163; Hook.f. Fl. Brit. Ind. IV 645.

Small annual herbs, 15-45 cm. high, possessing a strong odour; branches many 4-angled, suberect, softly hairy. Leaves 2.5- 4 cm. long, shortly petioled, oblong or ovate-oblong,

Elsholtzia eriostachya (Contd.)-

obtuse, denticulate, cuneate or rounded at the base, softly hairy on both surfaces, sometimes tomentose. Spikes 2-4 cm., solitary at the end of the stem, cylindrical, stout, villous or softly pubescent, about 1 cm. in diam. in fruiting; bracts short, ovate; whorls confluent with imbricating flowers. Calyx very minute in flower, about 4 mm. in fruit, membranous, campanulate; teeth minute, triangular. Corolla very minute, yellow. Nutlets very small, ellipsoid, opaque.

Habitat:- Kumaon; Nepal; Sikkim.

var:- pusila Hook.f. Fl. Brit. Ind. IV 645.

Elsholtzia pusila Benth. Lab. Gen. Sp. 714, and in DC. Prod. XII 162.

Dwarf herbs, about 15 cm. high, with simple and slender stem. Leaves 1-2 cm. long. Spike 1.5-3 cm. long. Fruiting calyx smaller.

Habitat:- Kashmir; Sikkim; W. Tibet.

12. Elsholtzia strobilifera Benth. Lab. Gen. et Sp. 163; Hook.f. Fl. Brit. Ind. IV 645; Collet Fl. Sim. 389.

Small annuals, very variable in habit, usually simple, often much-branched, 10-45 cm. high, sparsely hairy. Leaves petioled, ovate, obtuse, crenate or serrate, slightly cuneate at the base, sparingly hairy on both surfaces; lamina 1-3 cm. long, petiole 0.2-1 cm. Spikes 1.5-5 cm. long, stout, villous or pubescent; bracts sessile, membranous, very broad, truncate, obcuneate, imbricating all round the spike, concealing the flowers. Calyx membranous, narrow, tubular, 2.5 mm. in fruit; teeth lanceolate. Corolla purple, tube slender, much longer than the calyx; lobes minute, glabrous. Nutlets very small, oblong, red-brown.

Habitat:- Simla to Sikkim, 2000-4500 m.

13. Elsholtzia kachinensis Prain in Journ. As. Soc. Beng. lxxiii 206; Kudo in Mem. Fac. Sc. & Agri. II,2,(1929) 69.

A prostrate herb, stem 15- 35 cm. long, pubescent, rooting below. Leaves shortly petioled, 1-2 cm. long, ovate, acute, crenate, base entire, cuneate, glabrous on both surfaces except the puberulous midrib above. Spikes short, 1-2 cm. long, stout, pubescent; bracts subsecund, ovate or orbicular, membranous, cuspidate, imbricating; whorls confluent. Calyx minute, fruiting about 5 mm. long, campanulate, slightly vesicular, glabrous; teeth 5, short, triangular. Corolla pinkish purple, tube exserted, curved; upper lip ciliate at the margin; the gland in the disk, very large and clavate. Nutlet solitary, filling the inflated fruiting calyx with sometimes three other abortive nutlets.

Habitat:- Burma, Kachin hills, Sima, 2000 m.

Distribution:- Yunnan.

14. Elsholtzia cristata Willd Sp. Pl. iii 29; Hook.f. Fl. Brit. Ind. IV 645; Collet Fl. Sim. 389.

Erect atomatic herbs, 15 -60 cm. high, simple or branched, nearly glabrous. Leaves long-petioled, membranous, ovate-lanceolate or lanceolate, acuminate, coarsely serrate, base cuneate; lamina 2.5-8 cm. long, petiole half as long as the blade or longer. Spikes 2.5-8 cm. long, stout, flat, bearing flowers only on one side, pubescent or villous; bracts shortly petioled, orbicular, abruptly pointed. Calyx minute in flower, about 6 mm. in fruit, vesicular; teeth triangular. Corolla pink or purplish, tube exserted, curved, villous. Nutlets minute, oblong, smooth.

Habitat:- Kashmir to Mishmi, 400-3000 m.; Nilgiris(introduced).

Distribution:- Tibet; China; Japan; N. Asia; Europe.

Zataria, Boiss.

1. Zataria multiflora
Orient. iv 561, Benth. ex Hook.
t. 1480.

Diagn. Ser. I, v, 18, and Fl. Orient. iv, 561; Benth. ex Hook.
f. Gen. Pl. II 1186; Briq. in Eng. & Pr. Nat. Pflanzenf. iv, 3, a,
313; Prain in Journ. As. Soc. Beng. lix (1890) 300.

Undershrubs with small orbicular leaves shortly petioled
distinctly glandular punctulate, whorls axillary sessile or in
pedunculate cymes and paniculate towards the ends of the branches,
flowers very small. Calyx 5-nerved ovate equally 5-toothed, teeth
erect, mouth hirsute. Corolla tube sub-included, limb 2-lipped
upper entire lower 3-lobed. Stamens 4 included lower slightly
longer, anther-cells distinct parallel, at length diverging. Style
shortly 2-fid upper lobe slightly shorter. Nutlets smooth.

2. Zataria bracteata -----
An. Soc. Beng. lix, 1890, p. 302.

- 1. multiflora Benth. in Gen. Plant. II 1186.
- 2. multiflora var. bracteata Boiss. Fl. Orient. iv, 561.

- A. Flower-whorls sessile multiflora.
- A. Flower-whorls long peduncled bracteata.

... ..
bracteata linear longer than the calyx.
erect, slightly shorter than the tube; mouth of calyx
rolls tube slightly exserted, upper lip very short, entire; lower
trilobed lobes longer than the upper lip.
tinctly stalked.

Habitat:- Gilgit, Gilgit.

Dist:- Afghanistan.

1. Zataria multiflora Boiss., Diagn. Ser. I, v, 18, and Flora Orient. iv 561; Benth. in DC. Prodr. xii 183; Hook. Ic. Pl. xv, t. 1428.

Diffuse much branched undershrubs, branches slender, white puberulous. Leaves small orbicular, very shortly petioled, margin entire, puberulous and glandular-punctate on both surfaces. Flowers in dense sessile whorls, usually axillary, bracts oblong equalling the calyx, bracteoles shorter. Calyx ovate, teeth minute, mouth of calyx hirsute. Corolla tube slightly exserted, upper lip obtuse entire or marginate, lower lip tri-lobed, lobes rounded, middle one longer than the upper lip. Ovary subsessile.

Habitat:- Beluchistan; Assigned districts, Quetta, Lace No. 3936; Pab-Jhalawar, R. H. Buller No. 19495; etc.

Dist.:- Persia.

Undershrub; bracts sessile, entire. Whorls few or many-flowered, secund, axillary and in terminal spikes.

2. Zataria bracteata Boiss., Diagn. Ser. 2, iv 12; Prain in Journ. As. Soc. Beng. lix, 1890, p. 300.

Z. multiflora Benth. in Gen. Plant. ii 1186.

Z. multiflora var. elatior Boiss. Fl. Orient. iv, 562.

Dwarf much branched undershrub, branches slender rigid, brown, glabrous. Leaves 1-1.5 cm. long, or shortly petioled, orbicular margin entire, glabrous and glandular punctate. Whorls peduncled spicate, spikes paniculate, bracts ovate acute longer than the flowers; bracteoles linear longer than the calyx. Calyx ovate, teeth equal, erect, slightly shorter than the tube; mouth of calyx hirsute. Co-
rolla tube slightly exserted, upper lip very short, entire; lower trilobed lobes longer than the upper lip. Ovary shortly but distinctly stalked.

Habitat:- Gilgit, Giles.

Dist.:- Afghanistan.

Hyssopus officinalis Linn. in DC. Prodr. xii 251; Hook. f. Fl. Brit. Ind. iv 649.

Small woody plant, 30-60 cm. high, with numerous branches from a woody stem; branches erect or diffuse. Leaves sessile, 8-25 cm. long, oblong-linear or lanceolate, obtuse, entire. Hyssopus, Linn. or terminal, whorls many-flowered, secund, flowers slightly pedicelled. Calyx tubular, 5-toothed, Gen. 709; Endl. Gen. Pl. 617; Benth. Lab. Gen. et Sp. 356, and in DC. Prodr. xii 251; Boiss. Fl. Orient. iv 584; Hook. f. Fl. Brit. Ind. iv 649; Benth. ex Hook. f. Gen. Pl. II, 1187; Briq. in Eng. & Pr. Nat. Pflanzenf. iv, 3, a, 306; Kudo in Mem. Fac. Sc. & Agri. II, 2, (1929) 74. Dist.:- Kashmir to Kumaon.

Dist.:- Europe; W. Asia.

Undershrub; leaves sessile, entire. Whorls few- or many-flowered, secund, axillary and in terminal spikes. Calyx tubular, 5-nerved, 5-toothed, naked at the throat. Corolla-tube as long as the calyx; limb bilabiate; upper lip flat, erect, emarginate; lower 3-lobed, spreading mid-lobe large. Stamina 4, exerted, diverging, lower longer. anther-cells linear, divaricate. Disk equal. Style subequally 2-lobed at the tip, lobes subulate. Nutlets ovoid, triquetrous.

Hyssopus officinalis Linn.; Benth. in DC. Prodr. xii
251; Hook. f. Fl. Brit. Ind. iv 649.

Small shrubby plants, 30-60 cm. high, with numerous
branches from a woody stem; branches erect or diffuse.
Leaves sessile, 8-25 mm. long, oblong-linear or lanceolate,
obtuse, entire. Spikes axillary or terminal, whorls many-
flowered, secund, flowers slightly pedicelled. Calyx funnel-
shaped, 6 mm. long, slightly enlarged in fruit, puberulous
outside, glabrous within, teeth triangular acute. Corolla
bluish purple; upper lip erect notched, lower spreading 3
lobed. Stamens exserted. Nutlets narrow, trigamous, smooth,
dark brown.

Habitat:- Kashmir to Kumaon.

Dist.:- Europe; W. Asia.

Origanum vulgare Linn. Sp. Pl. 590; Benth. in DC.
Prodr. xii 191; Hook. f. Fl. Brit. Ind. iv 648; Collett
Fl. Syr. 321.

Erect or Origanum, Linn. scabrous stem, 30-100 cm.
long, sometimes dichotomously or corymbosely branched, vil-
lous. Gen. n. 726; Endl. Gen. Pl. 617; Benth. Lab. Gen. et
Sp. 334, and in DC. Prodr. xii 191; Hook. f. Fl. Brit. Ind.
iv 648; Benth. ex Hook. f. Gen. Pl. II, 1185; Briq. in
Eng. & Pr. Nat. Pflanzenf. iv, 3, a, 308; Kudo in Mem. Fac.
Sc. & Agri. II, 2, (1929) 90; Post Fl. Syria etc. II, 332.

Perennial herbs or shrub, usually aromatic. Leaves
entire or toothed. Cymes in corymbose heads or dense spikes;
bracts large imbricating. Calyx campanulate or turbinate,
10-13-nerved, bilabiate, split down in front, or equally
subequally 5-toothed, throat villous. Corolla-tube included
or exserted, obscurely 2-lipped, upper lip straight, retuse
or 2-fid; lower lip spreading 3-fid. Stamens 4, distant,
ascending, exserted; anthers with 2 distinct, divergent cells.
Disk equal or with glandular projection in front. Style 2-fid
at the apex, lobes unequal, acute. Nutlets ovate or oblong,
smooth.

Origanum vulgare Linn. Sp. Pl. 590; Benth. in DC.
Prodr. xii 193; Hook. f. Fl. Brit. Ind. iv 648; Collett
Fl. Sim. 391.

Erect or prostrate, with stoloniferous stem, 30-100 cm.
long, sometimes dichotomously or corymbosely branched, vil-
lous or glabrate. Leaves petioled, 1.5-2.5 cm. long,
broadly ovate obtuse entire, rarely toothed, rough on both
surfaces more so above. Cymes 7-25 mm. long, corymbose,
ovoid, 4 gamous sometimes forming panicles; bracts large
imbricating, green or purplish, lanceolate or ovate, obtuse
or acute. Flowers poligamous, larger ones bisexual, and
smaller ones pistillate. Calyx bell-shaped, enlarged in
fruit, teeth short; throat hairy at the mouth. Corolla
pink, tube longer than the calyx, upper lip flat, notched,
lower 3-lobed spreading. Stamens in unequal pairs, lower
longer slightly protruding. Nutlets smooth, brown.

Habitat:- Kashmir to Sikkim.

Dist.:- Europe; N. Africa; W. and N. Asia.

Thymus serpyllifolius Linn.; Benth. in DC. Prodr. xii 300;
Hook. f. Fl. Brit. Ind. iv 649; Collett Fl. Sin. 391.

Small much branched shrubs, 10-25 cm. long, branches
prostrate or ascending, hairy or glabrous, strongly aromatic;
woody rootstock. Leaves small 6-18 mm., subsessile, oblong-
ovate or lanceolate Thymus, Linn. ovate, base cuneate, nerves
prominent beneath, conspicuously gland dotted on both surfaces.

Flower Gen. n. 727; Endl. Gen. Pl. 617; Benth. Lab. Gen. et
Sp. 340, and in DC. Prodr. xii 197; Boiss. Fl. Orient. iv
550; Hook. f. Fl. Brit. Ind. iv 649; Benth. ex Hook. f. Fl.
Gen. Pl. II, 1186; Briq. in Eng. & Pr. Nat. Pflanzenf. iv,
3, a, 311; Kudo in Mem. Fac. Sc. & Agri. II, 2, (1929) 91;
Post Fl. Syria etc. II, 335.

Habitat:- Kashmir to Yunnan.

Strongly aromatic undershrubs or perennial herbs;
Dist.:- Europe, W. Africa, W. and Central Asia.
leaves entire. Cymes few-flowered, in dense or interrupted
spikes; bracts minute. Calyx 10-13- nerved, 2-lipped,
throat villous; upper lip with 3 triangular or lanceolate
teeth, lower with 2 subulate teeth. Corolla-tube included
or exserted, naked within; limb somewhat obscurely 2-lipped,
upper lip straight nearly flat, retuse; lower 3-fid. Stam-
ens 4, distant, straight, lower pair longer; anther-cells
parallel or divergent. Disk equal or produced in front.
Style shortly 2-fid at the tip, lobes equal subulate. Nut-
lets ovate or oblong, smooth.

Thymus serpyllum Linn.; Benth. in DC. Prodr. xii 200;
Hook. f. Fl. Brit. Ind. iv 649; Collett Fl. Sim. 391.

Small much branched shrubs, 10-25 cm. long, branches prostrate or ascending, hairy or glabrous, strongly aromatic; woody rootstock. Leaves small 6-18 mm., subsessile, oblong-ovate or lanceolate, obtuse, entire, base cuneate, nerves prominent beneath, conspicuously gland dotted on both surfaces. Flowers polygamous, in compact capitate spikes, male flowers larger. Calyx hairy outside and at the mouth within, upper lip 3 toothed, lower 2 toothed, teeth linear ciliate. Corolla purple, tube as long as the calyx. Stamens subequal or lower pair longer; filaments exerted. Nutlets smooth, mounted upon a short gynophore.

Habitat:- Kashmir to Kumaon.

Dist.:- Europe; N. Africa; W. and Central Asia.

Satureia hortensis Linn.; Benth. in DC. Prodr. xii 208.

Small erect herbs, 20-35 cm. high, with slender pinkish branches, woody below, finely hispid with white hairs.

Leaves 1.5-4 cm. long, oblong-linear or lanceolate, acute or obtuse, base narrowed in a short petiole, glabrous above and sparsely hairy Satureia, Linn. pitted glands on both sides.

Flowers in small axillary cymes, bracts minute-linear oiliate.

Gen. n. 707; Benth. Lab. Gen. et Sp. 351 and in DC. Prodr. xii 208; Benth. ex Hook. f. Gen. Pl. II, 1187; Briq. in Eng. & Pr. Nat. Pflanzenf. iv, 3, a, 296; Kudo in Mem. Fac. Sc. & Agri. II, 2, (1929) 97; Post Fl. Suria, etc. II, 338.

Annual herbs or shrubby perennials; whorls axillary or the terminal spiked. Calyx campanulate, either obscurely 10-13-nerved and equally 5-toothed, or obscurely bilabiate with somewhat unequal teeth. Corolla-tube included or exserted, naked within, the upper lip erect, flat, entire or retuse, the lower 3-cleft. Stamens 4, connivent under the upper lip, or exserted and somewhat divaricate, anthers with parallel or divergent cells.

Satureia hortensis Linn.; Benth. in DC. Prodr. xii 209.

Small erect herbs, 25-35 cm. high, with slender pinkish branches, woody below, finely hispid with white hairs. Leaves 1.5-4 cm. long, oblong-linear or lanceolate, acute or obtuse, base narrowed to a short petiole, glabrous above and sparsely hairy below, with deep pitted glands on both sides. Flowers in small axillary cymes, bracts minute linear ciliate. Calyx campanulate, hairy and glandular, with 5 subequal aristate teeth; teeth ciliate. Corolla short, sparsely pubescent, upper lip broad, bifid, much shorter than the lower, lower trilobed, middle one larger. Stamens 4, perfect, inferior pair shorter, all included; anther cells wide apart. Stigma shortly bifid. Nutlets black, minute.

Habitat:- Kashmir, Kargil, Dr. Stoliczka; Eastern side of Deccan (Heyne)?.

Dist.:- Afghanistan; W. Asia; Europe; America; S. Africa.

A. Leaves 1-2 cm. long, margin thick

whorls 2-3 flowered

A. Leaves 11-15 cm. long, margin

not thick

B. Flowers 3-4 cm. long

B. Flowers 10 cm. long

Micromeria, Benth.

in Bot. Reg. 15 and calc. n. 1282, Lab. Gen. et Sp. 368, and in DC. Prodr. xii, ; Hook. f. Fl. Brit. Ind. iv, 649; Benth. ex Hook. f. Gen. Pl. II, 1188; Baker in Thiselton-Dyer, Fl. Trop. Afric. v, 452; Muschler Fl. Egypt, II, 822; Gamble Fl. Madras 1138; Haines Bot. Bih. & Oriss. 742; post Fl. Syria etc., II, 339.

Herbs or undershrubs with usually small, entire or toothed leaves and small flowers in axillary whorls, sometimes whorls spicate or paniced. Calyx 10-13- nerved, 5-toothed or 2-lipped. Corolla 2-lipped, upper lip erect flattish, entire or notched, lower spreading 3-lobed. Stamens 4, lower longer ascending, incurved with diverging tips; anther cells distinct, parallel, at length diverging, connective usually thickened. Disk equal or reduced to an artiouous gland. Style-lobes equal or upper very short, lower recurved flattened.

2. Micromeria capitellata Benth. in DC. Prodr. xii, 315; Hook. f. Fl. Brit. Ind. iv, 649; Frain Beng. Fl. 562; Jooker Fl. Bomb. II, 489; Duthie Fl. Upp. Gang. Pl. II, 244; Haines Fl. Bih. Oris. 742; Gamble Fl. Madras, 1139.

A. Leaves 6 mm. long, margin thick; whorls 2- few-flowered ... biflora

A. Leaves 12-25 mm. long, margin not thick.

B. Flowers 3-4 mm. long ... capitellata

B. Flowers 15 mm. long ... hydaspidis.

floral leaves, the whole forming a spicate raceme; the lower cymes pedunculata, upper sessile, floral leaves smaller upwards.

1. Micromeria biflora Benth. Lab. Gen. et Sp. 378; Hook. f. Fl. Brit. Ind. iv, 650; Prain Beng. Pl. 852; Haines Fl. Bih. Oris. 743; Gamble Fl. Madras, 1138.

Dwarf herbs 5-10 cm. up to 30 cm. high, with numerous tufted wiry branches, and a stout woody rootstock, glabrous hairy or puberulous. Leaves small, 6 mm. or less, sessile or subsessile, ovate or oblong subacute, margin entire thickened a few long hairs present at the base of the petiole or leaf-blade. Cymes axillary 2-4- flowered, or flowers often solitary pedicelled. Calyx hirsute, tube strongly nerved, teeth setaceous, subulate. Corolla pink, upper lip notched or bilobed, lower lip spreading, 3 lobed. Stamens slightly exerted, lower pair longer.

Habitat:- Kashmir to Bhutan; Chota Nagpur; Nilgiris; Anamallay Hills.

2. Micromeria capitellata Benth. in DC. Prodr. xii, 218; Hook. f. Fl. Brit. Ind. iv, 649; Prain Beng. Pl. 652; Cooke Fl. Bomb. II, 459; Duthie Fl. Upp. Gang. Pl. II, 244; Haines Fl. Bih. Oris. 742; Gamble Fl. Madras, 1139.

A slender herb, very aromatic, 30-60 cm. high, with a woody rootstock, stem erect quadrangular, pubescent, sometimes tinged purple. Leaves shortly petioled, 12-25 mm. long, ovate or ovate oblong, obtuse, entire or crenate-serrate, base rounded or cuneate, pubescent on above and on the nerves beneath. Flowers in distant cymose whorls in the axils of floral leaves, the whole forming a spicate raceme; the lower cymes pedunculate, upper sessile, floral leaves smaller upwards,

bracteoles linear-lanceolate, hairy. Calyx small, villous, throat with ring of hairs, teeth as long as the tube, erect subulate, fruiting calyx 4 mm. Corolla 3-4 mm. long, violet coloured, hairy outside, tube as long as the calyx or a little longer. Stamens included. Nutlets minute elliptic-oblong, brown, smooth. Fl. time, - April, May.

Habitat:- Kumaon; Dehradun; Chota Nagpur; W. Ghats; Concan; Nilgiris.

3. Micromeria hydaspidis Falc. ex Benth. in DC. Prodr. xii, 224; Hook. f. Fl. Brit. Ind. iv, 650.

Small shrub 30-45 cm. high, with erect rather stout stem, pubescent. Leaves 12-18 mm. long, shortly petioled, ovate, obtuse minutely toothed; rounded at the base, sparingly pubescent with very minute hairs. Flowers clustered in cymose whorls forming a spicate inflorescence. Whorls close or separate, shortly peduncled, flowers pedicelled. Calyx 8 mm. long, erect puberulous; teeth lanceolate. Corolla 12-15 mm. long; hairy outside, tube slightly exerted. Stamens included. Nutlets elliptic, 1 mm., smooth, brown.

Habitat:- Kashmir.

I have seen the type sheet at Kew.

Micromeria Perrottetii Gandoger, which I have not seen is from the description probably a form of M. biflora, Benth.

A. Leaf base rounded.

B. Stam. leaves and calyx pubescent

with long spreading hairs.

C. Bracts as long as calyx,

forming an involucre; corolla

12-15 mm. long

Calamintha, Moench.

Meth. 408; Benth. Lab. Gen. et Sp. 386, and in DC.

Prodr. xii, 226; Hook. f. Fl. Brit. Ind. iv, 650; Benth.
ex Hook. f. Gen. Pl. II, 1190; Prain Beng. Pl. 853; Duthie
Fl. Upp. Gang. Pl. II, 244; Gamble Fl. Madras 1139; Haines
Bot. Bih. & Oris. 743; Ridl. Fl. Mal. Pen. II, 648; Doan
in Fl. Gen. Indo-Chine, iv, 8, (1936) 988.

Herbs or shrubs. Flowers small or medium, in dense
axillary or loose spicate or racemose or panicled whorls.
Calyx 13-nerved, 2-lipped; lower lip 2-toothed, teeth narrow;
upper lip 3-toothed, teeth wider and more highly connate;
throat naked or villous. Corolla-tube straight, throat
villous; lower lip spreading, 3-lobed; upper lip erect, the
upper pair sometimes imperfect; anther-cells parallel or
divaricate. Disk uniform, entire. Style-lobes equal or the
upper smaller. Nutlets minute, subglobose, smooth.
Petioles, acute or obtuse, rounded at the base, entire or
slightly toothed, laxly hairy on both surfaces and densely on
the nerves beneath; petiole slender hairy about 12 mm. long
or less. Flowers in dense globose whorls, axillary and
terminal; bracts filiform as long as the calyx, forming an
involucre. Calyx 8 mm. usually curved, hispid with short
glabular hairs in the lower part and longer hairs on upper
part and on the teeth; teeth all very slender and subulate.

- A. Leaf base rounded. ... the lower calyx-teeth
- B. Stem, leaves and calyx pubescent ... 15-25 mm. long,
with long spreading hairs. ... gymptere, subglobosa
- C. Bracts as long as calyx,
forming an involucre; corolla
12-18 mm. long ... clinopodium
- C. Bracts shorter than calyx
not forming an involucre;
corolla 6-8 mm. long ... umbrosa
- B. Stem, leaves and calyx glabrescent. ... gracilis
- A. Leaf base cuneate. ... Fl. 850; ... Fl. Upp. Gange ...
- B. Calyx straight, 8 mm. long... longicaulis
- B. Calyx curved, 4 mm. long ... debilis

Leaves 1.5-3 cm. long, ovate, serrate, acute or obtuse, base rounded, petiole short, slender. Flowers in dense or lax axillary whorls, bracts shorter or as long as the calyx, filiform, not forming an involucre. Calyx 4-5 mm. long,

1. Calamintha clinopodium Benth. DC. Prodr. xii, 253; Hook. f. Fl. Brit. Ind. iv, 650; Collett Fl. Sim. 292.

Erect branching herbs with woody and stoloniferous root-stock; branches softly hairy. Leaves ovate, 2.5-3.5 cm. long, petioled, acute or obtuse, rounded at the base, entire or slightly toothed, laxly hairy on both surfaces and densely on the nerves beneath; petiole slender hairy about 12 mm. long or less. Flowers in dense globose whorls, axillary and terminal; bracts filiform as long as the calyx, forming an involucre. Calyx 8 mm. usually curved, hispid with short glandular hairs in the lower part and longer hairs on upper part and on the teeth; teeth all very slender and subulate, pubescent, rooting below. Leaves opposite, membranous, glabrous on both sides, dark-green above, paler beneath.

3 in the upper lip and 2 in the lower; the lower calyx-teeth slightly longer than the upper. Corolla 15-25 mm. long, purple, hairy. Nutlets on a small gynophore, subglobose smooth, pale brown in colour.

Habitat:- Kashmir; Punjab; Kumaon;

Dist.:- W. & N. Asia; N. Africa; Europe; America.

2. Calamintha umbrosa Fisch. & Mey. Ind. Sem. Hort. Petrop. vi, 6; ix Suppl. 8; Hook. f. Fl. Brit. Ind. iv, 650; Collett Fl. Sim. 393; Prain Beng. Pl. 853; Duthie Fl. Upp. Gang. Pl. II, 244; Gamble Fl. Madras, 1139.

A small herb, procumbent or decumbent, laxly hairy. Leaves 1.5-3 cm. long, ovate, serrate, acute or obtuse, base rounded, petiole short, slender. Flowers in dense or lax axillary whorls, bracts shorter or as long as the calyx, filiform, not forming an involucre. Calyx 4-6 mm. long, upper lip with 3 triangular teeth, lower with 2 very narrow teeth slightly longer than the upper, tube laxly hairy outside with long hairs, and naked within. Corolla white or purplish, hairy; 6-8 mm. long, tube included or shortly exerted. Nutlets very small subglobose, pale brown, smooth, seated on a small gynophore.

Habitat:- Kashmir to Bhutan; Assam; Burma.

3. Calamintha gracilis Benth. in DC. Prodr. xii, 232; Ridl. Fl. Mal. Pen. II, 648.

Slender prostrate herb. Stems 20-30 cm., faintly puberulous, rooting below. Leaves opposite, membranous, glabrous on both sides, dark-green above, paler beneath,

ovate-subacute; base rounded or shortly cuneate, entire; margin elsewhere serrate; 10-15 mm. long, 6-12 mm. wide; petiole 6 mm. long, puberulous. Flowers in lax many-flowered whorls in axils of uppermost leaves, and there remote or aggregated in racemose or subcapitate terminal racemes, with rachis sparsely pubescent; bracteoles subulate, finely puberulous, half as long as slender pedicels. Calyx 3 mm. (in fruit 4 mm) long; tube slightly inflated below; lower teeth subulate, ciliate, incurved; upper lip shortly 3-toothed, recurved; teeth ovate; pedicels 3 mm. long, puberulous. Corolla 5 mm. long. Nutlets .5 mm., pale-brown, smooth.

Habitat:- Assam, Dibrugarh Clarke 37710/E.

Dist.:- Malay peninsula; Java. The Chinese plant C. confinis Hance, is probably the same as this.

4. Calamintha longicaulis Benth. in DC. Prodr. xii, 234. Hook. f. Fl. Brit. Ind. iv, 651.

Slender erect or decumbent herbs, 60-100 cm. high, woody below, softly hairy. Leaves 1.5-2.5 cm. long, shortly petioled, ovate-lanceolate, obtuse quite entire or faintly crenate; cuneate at the base. Flowers in lax-flowered, subsecund whorls towards the ends of the branches, bracts very minute. Calyx 8 mm. straight, hispid outside, glabrate or hairy within, teeth short subequal, not $1/3$ the length of the tube. Corolla violet, 18-20 mm. long, tube slender, twice as long as the calyx.

Habitat:- Nepal.

5. Calamintha debilis Benth; in DC. Prodr. xii, ;

Slender unbranched or with few branches, 10-15 cm. long. Leaves shortly petioled, 1.5-2.5 cm. long, oblong-obovate, obtuse, cuneate at the base and decurrent to the petiole, margin entire or faintly serrate; glabrous on both surfaces. Flowers in lax axillary whorls, bracts minute, pedicels as long as the calyx. Calyx pubescent, slightly curved, 4 mm. long in fruit, teeth much shorter than the tube, ciliate. Nutlets 1 mm., elliptic, smooth, dark brown.

Habitat:- Ali Khee, Kurrum valley, Aitchison 545.

Dist.:- Siberia.

Herb, slender, branching herbs; leaves opposite, obovate. Whorls axillary, secund, few-flowered. Calyx tubular-campanulate 13-ribbed, 2-lipped; upper lip 3-toothed, slightly flattened, lower lip 2-lobed. Corolla-tube recurved and ascending, dilated above, glabrous within; upper lip erect, entire; lower flat, spreading, 3-lobed. Stamens 4, ascending and conniving under the upper lip of corolla; anthers 2-celled, cells at length divaricate. Disc equal. Style subsqually 2-pid at the apex, lobes subulate. Nutlets narrowly obovoid, smooth, dark.

- A. Corolla 6-8 mm. long, tube very slender ... parviflora.
A. Corolla 15-20 mm. long, tube broad ... flava.

1. Melissa parviflora Benth. Wall. Pl. As. Rar. i, 65, Lab. Gen. et Sp. 394, and in DC. Prodr. xii 241; Wall. Cat. 2126; Hook. f. Fl. Brit. Ind. iv 651; Melissa, Linn. Kudo in Mem. Fac. Sc. & Agri. II, 2, (1929) 96; Kudo in Fl. Gen. Indo-China, iv, 3, (1936) 922.

Gen. n. 728; Benth. Lab. Gen. et Sp. 383, and in DC. Prodr. xii 240; Benth. ex Hook. f. Pl. II 1191; Boiss. Fl. Orient. iv 584; Hook. f. Fl. Brit. Ind. iv 651; Briq. in Eng. and Pr. Nat. Pflanzenf. iv, 3, a, 395; Kudo in Mem. Fac. Sc. & Agri. II, 2, (1929), 96.

Erect, slender, branching herbs; leaves opposite, crenate. Whorls axillary, secund, few-flowered. Calyx tubular-campanulate 13-ribbed, 2-lipped; upper lip 3-toothed, slightly flattened, lower lip 2-fid. Corolla-tube recurved and ascending, dilated above, glabrous within; upper lip erect, entire; lower flat, spreading, 3-lobed. Stamens 4, ascending and conniving under the upper lip of corolla; anthers 2-celled, cells at length divaricate. Disc equal. Style subequally 2-pid at the apex, lobes subulate. Nutlets narrowly obovoid, smooth, dark.

Dist.: Java.

2. Melissa flava Benth. in Wall. Pl. As. Rar. i, 65, Lab. Gen. et Sp. 394, and in DC. Prodr. xii 241; Wall. Cat. 2126; Hook. f. Fl. Br. Ind. iv 651.
A. Corolla 6-8 mm. long, tube very slender ... parviflora.
A. Corolla 15-20 mm. long, tube broad ... flava.

Erect herbs, 60-90 cm. high, pubescent or glabrate. Leaves 3-5 cm. or much longer, petiolate, ovate or lanceolate, acute, base rounded or slightly cuneate, margin crenate, glabrous or hispid, sometimes purple beneath. Flowers in few- or many-flowered, axillary whorls, pedicells slender, bracts linear. Calyx 10 mm. long, hispid outside on the lower part and on the

1. Melissa parviflora Benth. Wall. Pl. As. Rar. i 65, Lab. Gen. et Sp. 394, and in DC. Prodr. xii 241; Wall. Cat. 2825; Hook. f. Fl. Brit. Ind. iv. 651; Kudo in Mem. Fac. Sc. & Agri. ii, 2 (1929) 97; Doan in Fl. Gen. Indo-Chine, iv, 8, (1936) 922.

Geniosporum axillare Benth. in Wall. Pl. As. Rar. II 18; Wall. Cat. 2752.

Erect herbs 60-100 cm. high, pubescent or glabrate. Leaves usually about 2-3 cm. sometimes as long as 10 cm, ovate or ovate-lanceolate, acute, base acute, rounded or cordate, margin crenate; petiole slender .5-2.5 cm. long; leaves glabrous or pubescent above and on the nerves below, sometimes purple beneath. Flowers in few or many flowered whorls axillary, pedicels half as long as calyx or shorter, bracts narrow. Calyx 6-8 mm. long, hispid on the ribs outside, tube narrow, teeth short, the upper 3 teeth triangular, lower 2 narrow, all very variable in length of acute points, and ciliate;. Corolla 6-8 mm. long, white or pale pink, rarely yellow; tube slender. Stamens and style included. Nutlets on a short stock, narrowly obovoid, dark, rugulose.

Habitat:- Sikkim; Darjeeling; Assam.

Dist.:- Java.

2. Melissa flava Benth. in Wall. Pl. As. Rar. i, 65, Lab. Gen. et Sp. 394, and in DC. Prodr. xii 241; Wall. Cat. 2126; Hook. f. Fl. Br. Ind. iv 652.

Erect herbs, 60-90 cm. high, pubescent or glabrate. Leaves 3-5 cm. or much longer, petiolate, ovate or lanceolate, acute, base rounded or slightly cuneate, margin crenate, glabrous or hispid, sometimes purple beneath. Flowers in few- or many-flowered, axillary whorls, pedicels slender, bracts linear. Calyx 10 mm. long, hispid outside on the lower part and on the

ribs; tube broad; upper lip with 3 short teeth, lower lip with 2 larger teeth; all teeth acute and ciliate. Corolla yellow, pubescent outside, 15-20 mm. long, tube broad, lips extended.

Stamens slightly exerted; style exerted much more. Nutlets on a short stock, narrowly obovoid, dark and rugulose.

Habitat:- Almora; Kumaon; Nepal; Sikkim.

Duchesne Fl. Hpp. Congo. Pl. 12 257; Doan in Fl. Gen. Indo-China IV. 8, (1936) 904.

Annual fragrant herbs. Leaves petioled. Racemes terminal or axillary, secund; whorls 2-flowered; bracts minute, or the lower larger and leafy. Calyx campanulate, gibbous at the base, subequally 5-toothed or 2-lipped, with upper lip truncate or 1-toothed, lower lip longer, 2-toothed; throat of calyx pubescent with a ring of hairs. Corolla more or less exerted, tube annulate within or not; lips short, the upper notched, lower 3-lobed. Stamens 2, perfect, posterior; staminodes 2, anterior; anther-cells 2, divergent. Disk glandular, produced in front. Style more or less deeply subequally bifid. Nutlets globose, reticulate or smooth.

M o s l a Buch.-Ham.

Maxim. in Bull. Acad. Petersb. XX, 457, and in Mel. Biol. IX 430; Benth. ex Hook.f. Gen. Pl. II 1182; Hook.f. Fl. Brit. Ind. IV 646; Briq. in Engl. und Pr. Pflanzenf. IV 3, a, 326; Duthie Fl. Upp. Gang. Pl II 257; Doan in Fl. Gen. Indo-Chine IV 8, (1936) 984.

Annual fragrant herbs, Leaves petioled. Racemes terminal or axillary, secund; whorls 2-flowered; bracts minute, or the lower larger and leafy. Calyx campanulate, gibbous at the base, subequally 5-toothed or 2-lipped, with upper lip truncate or 3-toothed, lower lip longer, 2-toothed; throat of calyx pubescent with a ring of hairs. Corolla more or less exserted, tube annulate within or not; lips short, the upper notched, lower 3-fid. Stamens 2, perfect, posterior; staminodes 2, anterior; anther-cells 2, divergent. Disk glandular, produced in front. Style more or less deeply subequally bifid. Nutlets globose, reticulate or smooth.

Herb slender, 30-100 cm. high, strongly aromatic; stem quadrangular, sparsely pubescent. Leaves petioled, 1.5-3.5 cm. long, ovate, acute, serrate, base entire, mucate; conspicuously glandular beneath. Racemes slender, terminal, lax-flowered, 3-10 cm. long; bracts small, lanceolate, sessile or subsessile. Calyx very minute in flower, much enlarged in fruit to about 4 cm. in length; throat pubescent with a ring of hairs; upper lip 3-toothed; lower 2-toothed, longer than the upper. Corolla 3 mm. long; white or purplish. Nutlets minute, reticulate, brown or black. Flowering period, -Sept.-Oct.

Habitat: - Kashmir to Bhutan; Khasia Mts.; Chittagong, B. Bengal; Burma.

Distribution: - China; Indo-China.

Mosla ocymoides Buch. Ham. ex Benth. in Wall. Fl. As. Rar. i, 66; Duthie in Fl. Upp. Gan. Pl II 257.

Mosla dianthera Maxim. in Bull. Acad. Imp. Saint Petersburg. IX 430; Hook.f. Fl. Brit. Ind. IV 647; Doan Fl. Gen. Indo-Chine IV 8, (1936) 986.

Hedeoma nepalensis Benth. Lab. Gen. et Sp. 366, and in DC. Prod. XII 244; Dcne. in Jacq. Voy. Bot. 133, t. 138.

Melissa nepalensis Benth. in Wall. Fl. As. Rar. i 66; Wall. Cat. 2124.

Moschosma ocimoides Reichb. in Wall. Cat. 2712.

Lycopus dianthera Ham. in Roxb. Fl. Ind i 144.

Cunila Buchanani Spreng. Syst. I 54.

C. nepalensis Don Prod. 107.

Ocimum punctatum Thunb. Fl. Jap. 249, non L.f.

O. scabrum Thunb. in Trans. Linn. Soc. II 338; Willd. Spec. Pl. III 1, 163; Benth. Lab. Gen. et Sp. 17, and in DC. Prod. XII 43.

Orthodon punctatum Kudo in Mem. Fac. Sc. & Agri. II 2, (1929) 80.

Erect slender herb, 30-100 cm. high, strongly aromatic; stem quadrangular, sparsely pubescent. Leaves petioled, 1.5- 3.5 cm. long, ovate. acute, serrate, base entire, cuneate; conspicuously glandular beneath. Racemes slender, terminal, lax-flowered, 3-10 cm. long; bracts small, lanceolate, sessile or subsessile. Calyx very minute in flower, much enlarged in fruit, to about 4 mm, in length; throat pubescent with a ring of hairs; upper lip 3-toothed; lower 2-toothed, longer than the upper. Corolla 3 mm. long; white or purplish. Nutlets minute, reticulate, brown or black. Flowering period, -Sept.-Oct.

Habitat:- Kashmir to Bhootan; Khasia Mts.; Chittagong. N. Bengal; Burma.

Distribution:- China; Indo-China.

Lycopus surculosus Linn; Benth. in DC. Prodr. xii 179;
Hook. f. Fl. Brit. Ind. iv 648; Collett Fl. Sim.

Lycopus, Linn.

Perennial herbs, 30-100 cm. high, with creeping
or stoloniferous rootstocks. Leaves 5-10 cm. long, sub-
Gen. n. 33; Benth. Lab. Gen. et Sp. 184, and in DC.
Prodr. xii 177; Boiss. Fl. Orient, iv, 545; Hook. f. Fl.
Brit. Ind. iv 648; Benth. ex Hook. f. Gen. Pl. II, 1183;
Briq. in Engl. & Pr. Nat. Pflanzenf. iv, 3, a, 316; Kudo in
Mem. Fac. Sc. & Agri. II, 2, (1929) 82; Post Fl. Syria,
etc. II, 331.

Perennial herbs, often growing in marshes. Leaves
usually cut, or toothed. Whorls densely many-flowered,
globular, axillary; bracteoles minute. Calyx campanulate,
equally 4-5-toothed, throat naked. Corolla campanulate,
subequally 4-lobed; tube included. Stamens 2, perfect, ex-
serted; anther-cells parallel; staminodes 2, included, often
absent. Disk equal. Style 2-lobed at the tip, lobes dilated.
Nutlets with callous margins, obovate, compressed, smooth.

Habitat:- Kashmir.

1. Lycopus europaeus Linn; Benth. in DC. Prodr. xii 179;
Hook. f. Fl. Brit. Ind. iv 648; Collett Fl. Sim.

Perennial marsh plants, 30-100 cm. high, with creeping
or stoloniferous rootstocks. Leaves 5-10 cm. long, sub-
sessile, lanceolate or elliptic-oblong deeply sinuate toothed
or serrate, or sometimes pinnatifid. Flowers sessile crowd-
ed in axillary whorls. Calyx bell-shaped, deeply 5-toothed;
teeth equal narrowly lanceolate, acute. Corolla bluish white
dotted with purple; tube slightly exerted, 4-lobed, hairy
within. Stamens 2 slightly protruding, staminodes minute.
Nutlets longer than the calyx tube.

Habitat:- Kashmir.

Dist.:- W. N. and Central Asia.

var. exaltata Hook. f.

L. exaltatus Linn; Benth. in DC. Prodr. xii 179.

Stouter; leaves more deeply pinnatifid. Staminodes
capitellate.

Habitat:- Kashmir.

Perowskia, Karel.

in Bull. Soc. Imp. Nat. Mosc. 1841, 15, t. 1; Benth.
in DC. Prodr. xii, 261; Hook. f. Fl. Brit. Ind. iv, 652;
Benth. ex Hook. f. Gen. Pl. II, 1193; Briq. in Eng. & Pr.
Nat. Pflanzenf. iv, 3, a, 288.

Erect undershrubs, hoary and usually with stellate scurf;
strongly aromatic, dioecious. Leaves opposite, incised or
crenate. Whorls few-flowered, distant, in simple or panicled
spikes. Calyx tubular, shortly 2-lipped; upper lip 2-3
toothed, lower 2-toothed. Corolla-tube exerted, piloso-
annulate within; upper lip broad, spreading, erect 3- to 4-fid;
lower lip oblong, entire. Stamens 2, lower perfect, erect,
diverging; 2 upper minute, imperfect; anther cells linear,
parallel, contiguous, pendulous from the connective. Disk
swollen in front. Style shortly 2-fid at the apex; lobes
membranous, cuneate. Nutlets ovoid, oblong, obtuse, smooth.

Perowskia atriplicifolia Benth. in DC. Prodr. xii, 261
Hook. f. Fl. Brit. Ind. iv, 652; Boiss. Fl. Orient. iv, 657.

P. arborescens Boiss. Diagn. Ser. II, iv, 15.

A rigid undershrub, 60-100 cm. high, with white stellate
A. Leaves deeply incised or pinna-
or tiseet; calyx softly woolly ... abrotanoides
A. Leaves crenate serrate, rarely shortly
sp. incised; calyx hispid ... atriplicifolia
densely hispid, with long white hairs, 4 mm. long. Corolla
twice as long, lavender-coloured or sometimes pure white;
upper lip 3-lobed broader, notched; lower
lip entire.

Habitat: Kashmir; Baluchistan.

Dist.: Afghanistan.

1. Perowskia abrotanoides Karel. in Bull. Mosc. 1841, 15, t. 1; Boiss. Fl. Orient. iv, 589; Hook. f. Fl. Brit. Ind. iv, 652.

Shrub or undershrubs, 60-120 cm. high with numerous stiff branches, and woody below, clothed with white or grey stellate scurf. Leaves 2.5-5 cm., subsessile, incised or pinnatisect or sometimes bipinnatisect, linear oblong, crenatures or lobes or segments obtuse. Plants are dioecious, inflorescence is a simple spike or a panicle. whorls distant, 2- or many-flowered. Calyx densely clothed with long woolly hairs, upper lip minutely 2-3-toothed, lower lip 2-toothed. Corolla blue or purple, tube exceeding the calyx, with ring of hairs within, upper lip broad spreading, erect, 3-lobed, lower lip entire. Nutlets pyriform, smooth.

Habitat:- Kashmir; Baluchistan.

Dist.:- Afghanistan; Persia; Turkestan.

2. Perowskia atriplicifolia Benth. in DC. Prodr. xii, 261; Hook. f. Fl. Brit. Ind. iv, 652; Boiss. Fl. Orient. iv, 587.

P. artemisioides Boiss. Diagn. Ser. II, iv, 15.

A rigid undershrub, 60-100 cm. high, with white stellate scurf. Leaves 2.5-5 cm., subsessile, rigid, rugose, ovate or lanceolate, subacute, crenate-serrate or incised; cuneate at the base. Plants dioecious; inflorescence is a simple spike or a panicle; whorls 2-6- flowered, distant. Calyx densely hispid, with long white hairs, 4 mm. long. Corolla twice as long, lavender-coloured or sometimes pure white; upper lip 3-lobed, the middle lobe broader, notched; lower lip entire.

Habitat:- Kashmir; Baluchistan.

Dist.:- Afghanistan.

1. Meriandra Meriandra, Benth. *Fl. Ind. Beng.* 1853: 29.

in Bot. Reg. 15, ad calc. n. 1282, Lab. Gen. et Sp. and in DC. Prodr. xii, 261; Hook. f. Fl. Brit. Ind. iv, 652; Benth. ex Hook. f. Gen. Pl. II, 1194; Briq. in Eng. & Pr. Nat. Pflanzenf. iv, 3, a, 287; Baker in Thiselton-Dyer v, 456.

Erect shrubs, hoary or woolly, aromatic. Leaves rugose, crenulate. Whorls many, dense-flowered, in stout, terminal spikes, or spikes small, paniced and catkin-like; bracts imbricating. Calyx ovoid or broadly campanulate, 10-nerved; upper lip 3-toothed or subentire, concave, lower 2-fid; throat naked. Corolla-tube short, funnel-shaped; limb equally 4-lobed, lobes flat, upper entire or 2-fid. Perfect stamens 2, lower, short, stout, erect, distant; anther-cells separate, stipitate, pendulous; the upper stamens represented by 2 small staminodia. Disk equal. Style subequally 2-fid at the apex. Nutlets ovoid, smooth, brown.

- Salvia bengalensis Roxb. Fl. Ind. 1, 145.
- S. dianthera Roth. Fl. Ind. 1, 145.
- S. abyssinica, Br. in Append. Salt's Travels.
- S. Schimperiana Hook. f. in Schimp. Iter. Abyss. n. 1761.

- A. Spikes uninterrupted strobilifera
 - A. Spikes with distant clusters of flowers bengalensis
-
- terminal spikes, bracts inconspicuous or absent, whorls 12-18 mm. in diam., villous. Fruiting calyx club-shaped, with

1. Meriandra strobilifera Benth. ll. cc. 1282; 29.

An erect shrub 60-150 cm. high, tomentose or flocculently woolly; branches obscurely 4-angled. Leaves 5-10 cm. long, thick, shortly and stoutly petioled, lanceolate or oblong-linear, obtuse or acute, base sagitate or cordate, margin crenate, pubescent and rugose on the upper surface, white tomentose lower. Whorls of flowers very densely crowded in erect tomentose 4-angled spikes, 2.5-5 cm. long, with imbricating adpressed broadly ovate bracts. Calyx tubular 2.5 mm. woolly; upper lip concave entire, lower 2-toothed. Corolla tube as long as the calyx with lower and spreading, 4 lobes. Stamens 2, with anthers protruding.

Habitat:- Himal. (Western); Simla, Kumaon, 1,500-2,000 m.

2. Meriandra bengalensis Benth. Lab. Gen. et Sp. 189, in Wall. Pl. As. Rar. i, 29, and in DC. Prodr. xii, 262; Wall. Cat. 1526; Hook. f. Fl. Brit. Ind. vi, 653; Prain Beng. Pl. 853.

Salvia bengalensis Roxb. Fl. Ind. i. 145.

S. dianthera Roth. Nov. Sp. 18.

S. abyssinica, Br. in Append. Salt's Travels.

S. Schimperiana Hochst. in Schimp. Iter. Abyss. n. 1781.

A large straggling shrub with camphoraceous odour; branches cylindrical; finely tomentose or hoary. Leaves 5-12 cm. long, oblong-lanceolate, obtuse, finely crenulate, base rounded or cordate, upper surface rugulose, lower reticulate; petiole 12 mm. long or more. Flowers in globose whorls, in interrupted terminal spikes, bracts inconspicuous or absent, whorls 12-18 mm. in diam., villous. Fruiting calyx club-shaped, with

narrow base and broad round apex, hispid outside, membranous, mouth closed, teeth acute subequal. Corolla white, lips spreading or recurved. Nutlets usually solitary, 2.5 mm. long, pale brown, obovate oblong, smooth.

Habitat:- In most of the provinces, cultivated.

Dist.:- Africa.

Herb, undershrub or shrub; leaves opposite, often whorled below, usually simple, rarely compound, petioled or subsessile. Stipules or bracts usually in terminal panicles; whorls distant; bracts small or large, sometimes coloured. Calyx campanulate or tubular, 2-lipped; mouth naked; upper lip entire or 2-toothed, lower 2-lobed. Corolla 2-lipped; upper lip erect, usually hooded; lower lip 3-lobed, central lobe usually larger, entire or emarginate; tube of corolla annulate within or naked. Perfect stamens 2, inferior; the upper pair represented by small small staminodes, or obsolete; filaments short, articulating with a slender connective, and sometimes produced beyond the joint; connective linear, transverse, with an upper ascending arm bearing a linear fertile anther-cell, and a lower straight or deflexed arm without any, or with an abortive or fertile anther-cell. Lip usually enlarged in front. Style shortly 2-lobed; lobes usually subulate, equal or the lower longer, sometimes flattened. Nutlets 4, dry, ovoid, somewhat trigonous, smooth.

Salvia Linn.

Gen. n. 39; Benth. Lab. Gen. et Sp. 190, and in DC. Prod. XII 262; Benth. ex Hook.f. Gen. Pl. II 1194; Endlicher Gen. Pl. 614; Hook.f. Fl. Brit. Ind. IV 658; Briq. in Eng. und. Pr. Nat. Pflanzenf. IV 3, a, 270; Kudo in Mem. Fac. Sc. Agri. II 2, (1929) 155; Doan in Fl. Gen. Indo-Chine IV 8, (1936) 993.

Herbs, undershrubs or shrubs; leaves opposite, often whorled below, usually simple, rarely compounded, petioled or sessile. Spikes or racemes usually in terminal panicles; whorls distant; bracts small or large, sometimes coloured. Calyx campanulate or tubular, 2-lipped; mouth naked; upper lip entire or 3-toothed, lower 2-fid. Corolla 2-lipped; upper lip erect, usually hooded; lower lip 3-lobed, central lobe usually larger, entire or emarginate; tube of corolla annulate within or naked. Perfect stamens 2, inferior; the upper pair represent by small ~~small~~ staminodes, or obsolete; filaments short, articulating with a slender connective, and sometimes produced beyond the joint; connective linear, transverse, with an upper ascending arm bearing a linear fertile anther-cell, and a lower straight or deflexed arm without any, or with an abortive or fertile anther-cell. Disk usually enlarged in front. Style shortly 2-fid; lobes usually subulate, equal or the lower longer, sometimes flattened. Nutlets 4, dry, ovoid, somewhat triquetrous, smooth.

- A. Leaves compounded.
- B. Leaflets entire; calyx about 20 mm. long,
 much expanded at the mouth. hydrangea
- B. Leaflets crenate or serrate, calyx 4-7 mm.
 long, not expanded at the mouth. plectranthoides
- A. Leaves simple.
- B. Small shrubs or under shrubs; leaf-blade
 usually .5-2 cm long.
- C. Corolla 15-25 mm. long. cabulica
- C. Corolla 5-7 mm. long.
- D. Leaves more or less linear, subsessile,
 shortly petioled.
- E. Calyx with gland-tipped hairs;
 corolla annulate within. aegyptiaca
- E. Calyx with very long, eglandular
 hairs; corolla exannulate. santolinaefolia.
- D. Leaves triangular-ovate, petiole as
 long as leaf-blade. Lacei
- B. Herbs; leaf-blades usually much exceeding 2 cm.
- C. Leaves \pm thick, rugose or rugulose; calyx-
 -teeth \pm spinous.
- D. All leaves \pm sessile, oblanceolate. lanata
- D. All, or lower leaves petiolate,
 ovate to oblong.
- E. Calyx 20-25 mm. long, in fruit.
- F. Leaves subentire or serrate;
 bracts usually whitish. macrosiphon
- F. Leaves coarsely dentate or lobed;
 bracts usually green. spinosa
- E. Calyx 10-15 mm. in fruit.
- F. Bracts \pm equalling the calyx.
- G. Leaves above very scabrid with
 hairy-wart-like excrescences,
 (calyx very scabrid). asperata

G. Leaves above ± smooth to the touch.

H. Leaves below very loosely

woolly; flowers rose or lilac...

..... moorcroftiana

H. Leaves adpressed tomentose;

flowers white. rhytidea

F. Bracts much shorter than calyx;

(flowers violet). virgata

C. Leaves membranous, neither rugose nor rugulose; calyx teeth not spinous.

D. Corolla 10-15 mm. long.

E. Calyx in flower 3-5 mm. long.

F. Leaves broadly ovate, cordate

at base; petiole longer than

the blade. saxicola

F. Leaves lanceolate, cuneate at

the base; petiole shorter than

blade. plebia

E. Calyx 8-10 mm. in flower. Roborowskii

D. Corolla 20-40 mm. long.

E. Corolla-tube curved.

F. Leaf-blade 20-40 cm. long;

corolla dark-purple (Nepal). castanea

F. Leaf-blade 3-8 cm. long;

corolla yellow (Deli valley

beyond N. Assam). mecongensis

(var, assamica)

E. Corolla--tube straight.

F. Calyx 20-22 mm. long. amplicalyx.

F. Calyx 10-15 mm. long.

G. Flowers yellow; (corolla

annulate).

H. Leaves ± hastate,

(N. W. Him.). glutinosa

H. Leaves ovate-cordate.

I. Inflorescence much

branched. campanulata

I. Inflorescence ±

simple. sikkimensis

G. Flowers purple or violate.

H. Corolla 40 mm. long,

annulate within. hians

H. Corolla 20-25 mm. long,

exannulate (Burma). schizocalyx

1. Salvia hydrangea DC. ex Benth. in Lab. Gen. et Sp. 717, and in DC. Prod. XII 271; Prain in Journ. As. Soc. Beng. LIX, 301.

Shrubby plants, 60-100 cm. high, with erect simple stems, woody below, adpressedly hoary. Leaves shortly petioled, 5-8 cm. long, pinnate; the lateral segments 3-4 on each side, oblong-lanceolate or linear, smaller than the elliptic-oblong terminal one; margin of leaflets entire; both surfaces hirsute, or finely pubescent. Whorls 6-10-flowered, distant; flowers shortly pedicelled. Calyx rose-pink in colour, 20 mm. long, with a very wide mouth, membranous, sparingly hairy on the nerves; upper lip broad blunt, sinuate, emarginate; lower 2-fid, lobes ovate, subacute. Corolla-tube slightly exserted, annulate within; upper lip suberect or falcate. Connective with an imperfect cell behind. Nutlets about 3 mm. long, subglobose, smooth.

Habitat:- Baluchistan; W. Punjab; N.W. Frontier province.

Distribution:- Afghanistan; Persia.

2. Salvia plectranthoides Griffith. Notul. IV 199; Hook.f.

Salvia plectranthoides (Contd.)-

Fl. Brit. Ind. IV 655; Peter-Stibral in Sond. Fedd. Repert. XXXIX (1936) 186.

Herbs, with slender stem and rootstock, about 50 cm. high, sparsely hairy. Leaves mostly radical, membranous, 7-15 cm. long, pinnate; lateral segments 2-5 pairs, ovate-lanceolate, sessile or almost so; terminal segment 5-8 cm. long, ovate or broadly oblong-cordate; margin of leaflets crenate or serrate. Whorls few-flowered, in simple and slender spikes. Calyx pedicelled, nodding, glandular-hairy; upper lip entire, lower 2-toothed. Corolla flesh coloured, tube hairy, exserted, annulate within; upper lip entire, curved, lower lip with a notched, orbicular middle lobe, and smaller erect lateral lobes. Connectives recurved; stamens coherent by arms below.

Habitat:- Bhutan; Darjiling Clarke 8947.

Distribution:- S.W.China.

Clarke's Darjilling plant (No. 8947) has been quoted by Dr. Stibral as the Indian representative of the typical *S. japonica* Thunb., which is found in Japan only; I think it is just *S. plectranthoides* Griffith.

3. Salvia cabulica Benth. in DC. Prod. XII 268; Prain in Journ. As. Soc. Beng.

Small bushy shrubs 60-100 cm. high, with slender rigid branches; older parts with white flaking barks. Leaves petiolate, ovate-orbicular, crenate, cordate at the base, rugulose, softly villous; lamina 1-2 cm. in diam.; petiole .5-1.5 cm. long. Whorls 2-4-flowered, few, subterminal or axillary. Calyx pedicelled, 10 mm. long, campanulate; upper lip shortly 3-toothed, lower 2-toothed; teeth all mucronate. Corolla 15-25 mm. long, tube exserted, annulate within; upper lip erect emarginate. Nutlets about 3 mm long, suborbicular, mucilaginous when boiled.

Salvia cabulica (Contd.)-

Habitat:- Punjab frontier; Baluchistan.

Distribution:- Affghanistan.

4. Salvia aegyptiaca Linn. Sp. Pl. 23; Hook.f. Fl. Brit. Ind. IV 656; Cooke Fl. Bomb. Pr. II 474; Peter-Stibral in Sond. Fedd. Repert. XXXIX 182.

Dwarf much branched undershrubs; branches strangling, divericate, rigid, hoary or scaberulous. Leaves rigid, small, subsessile, 2 cm. long, linear-lanceolate, acute, crenate, cuneate at the base, rugose and hairy,, nerves prominent beneath. Whorls 2-4-flowered, in long racemes. Calyx bent downwards, pubescent with gland-tipped hairs; upper lip 3-toothed, the side teeth bent towards the middle one; lower lip 2-toothed, longer than the upper; fruiting calyx 6 mm. long. Corolla 5 mm. long; tube annulate within; upper lip slightly notched; lower lip 3-lobed, the middle one larger. Stamens very small, whitish; connectives distant in front, acute, or bearing an empty anther. Nutlets minute, black and slightly bluish, oblong-ellipsoid, smooth.

Habitat:- Baluchistan; Punjab; N.W. Frontier province.

Distribution:- Affghanistan; Persia; N. Africa.

var, intermedia Peter-Stibral Sond. Fedd. Repert XXXIX, (1936) 183.

Stem and calyx with fine whitish hairs, intermixed with shorter glandular hairs. Leaves obovate, subrotundate, base cuneate and often with 1-2 minute lobes

Habitat:- Punjab.

5. Salvia santolinaefolia Boiss. Diagn. Pl. Orien. Ser. I 13, and Fl. Oriens. IV 632; Hook.f. Fl. Brit. Ind. IV 656;

Salvia santolinaefolia (Contd.)-

Peter & Stibal in Fedd. Repert. XXXIX (1936) 182.

Salvia pumila Benth. in DC. Prod. XII 356, in part.

S. aegyptiaca, var pumila Hook.f. Fl. Brit. Ind. IV 656, in part.

A dwarf undershrub with numerous branches, hoary. Leaves very small, rigid and rugose, subsessile or shortly petioled, linear, pectinately lobed; lobes rounded, margin revolute.

Whorls 2-3-flowered, usually distant in very slender spikes;

bracts persistent, elliptic, acute. Calyx hispid with long, usually white hairs, not gland-tipped; tube campanulate; upper lip 3-toothed, lower 2-toothed; teeth all equal, acute.

Corolla about 5 mm. long, not annulate within. Connectives distant in front.

Habitat:- Punjab; Sind; Baluchistan.

Distributio:- Affghanistan; Persia.

6. Salvia Lacei Mukerjee in Notes R. B. G. Edin.

Dwarf undershrubs, with strict much branched stem, appearing to be 20 cm. high; branches slender, hoary in younger parts.

Leaves small, petioled, slightly rugose and thick, deltoid-ovate, obtuse, crenate, minutely hispid on both sides, and conspicuously glandular beneath; lamina 3-5 mm. long, 2-4 mm. broad; petiole

of lower leaves as long as the lamina, shorter upwards. Flowers in short terminal racemes, sometimes forming panicles; bracts

ovate, ciliate, about 1.5 mm. long. Calyx tubular-campanulate, 3.5 mm. long in flower, 5-6 mm. in fruit; villous with very

long hairs and covered with sessile glands; upper lip 3-toothed, lower 2-toothed; teeth all triangular, straight, much shorter

than the tube. Corolla 6-7 mm. long, tube exerted, not annulate within. Nutlets 1.75 mm., elliptic-obovate, black, smooth.

Habitat:- Baluchistan, Chappar Rift, Lace 3967.

7. Salvia lanata Roxb. Hort. Beng. 80, and Fl. Ind. i, 146. Wall. Pl. As. Rar. i 67, and ii 11; Benth. Lab. Gen. et Sp. 228, and in DC. Prod. XII 286; Hook.f. Fl. Brit. Ind. IV 654; Wight. Ic. II t 325; Peter & Stibral Sond. Fedd. Repert. XXXIX 185.

Salvia integrifolia Hardw. in As. Res. VI 349. not of Ruiz et Pavon.

S. cana Wall. Cat. 2145.

Stenarrhena lanata Don. Prod. Fl. Nepal 111.

Small robust perennial herbs, sometimes with many stems, 30-50 cm. high, densely and softly woolly. Leaves mostly radical, sessile, 13-17 cm. long, narrowly oblanceolate, obtuse, crenate, narrowed to the base; upper surface tomentose or glabrous, rugose; lower surface white tomentose or villous. Whorls 6-8-flowered, distant in a long spike; bracts about 10 mm. long, orbicular, abruptly pointed, viscidly hairy. Calyx 6-8 mm. long, in flower, and so in fruit; campanulate, viscidly hairy; upper lip 3-toothed, lower 2-toothed, teeth all spinous. Corolla about 18 mm. long, greyish blue; tube slender, not annulate within; throat inflated, upper lip as long as the tube, curved; lower small. Connectives callous tips deflexed backwards; imperfect cells abruptly dilated. Nutlets small, brown, globose.

Habitat:- Nepal; Kumaon; Garhwal; Simla; Kashmir; Punjab.

8. Salvia macrosiphon Boiss. Diagn. Ser. I, V 11; Benth. in DC. Prod. XII 282; Prain. in Journ. As. Soc. Beng. LIX 302.

S. macrosiphon, var cabulica Benth. in DC. Prod. XII 282;

S. macrosiphon, var Kotschyi Boiss. Fl. Orient. IV 615;

S. Kotschyi Boiss. Diagn. Ser. I, VII 46.

Slender herbs, 40-65 cm. high; branches hirsute. Leaves 7-13 cm. long, oblong, obtuse, rounded at the base, margin subentire, rugose and densely hirsute on both surfaces; petiole

Salvia macrosiphon (Contd.)-

2-5 cm. long. Whorls distant, 2-4 flowered; bracts membranous, ovate, long-acuminate, shorter than the calyx. Calyx 20-25 mm. long, tubular, teeth straight lanceolate, acute; the central tooth of the upper lip smaller than the lateral. Corolla white, 30-35 mm. long; tube exserted; upper lip suberect. Nutlets orbicular-ovate, subcompressed, pale green, shining with dark reticulations.

Habitat:- Punjab frontier; Baluchistan.

Distribution:- Affghanistan; Persia.

9. Salvia spinosa Linn. Mant. ii 511; Benth. in DC. Prod. XII 281; Boiss. Fl. Oriens. 613.

Herbs with a stout short stem, villous. Leaves 10-18 cm. long, ovate, acute, rounded or cordate at the base, margin crenate or incised, or irregularly lobed; rugose and glabrescent above, greyish tomentose and glandular-punctate beneath; petiole of radical leaves 4-7 cm. long, villous; cauline leaves sessile. Whorls 6-10-flowered, distant in spreading panicle, 14-20 cm. long; bracts sessile, broadly ovate, acuminate, about 15 mm. long, sparsely hairy, margin entire. Calyx tubular, viscidly hairy, 13-17 mm. long; teeth acuminate spinous. Corolla white, 20-22 mm. long; tube slender exserted; upper lip falcate, compressed; lower lip 3-lobed. Nutlets flattened, pale, with reticulated marks.

Habitat:- Kurrum valley (N.W.Fr. Province), Harsukh No.s 14681, 15453, 15452; and Aitchison 474.

Distribution:- Affghanistan; Persia; Asia minor.

10. Salvia asperata Falc. ex Benth. in DC. Prod. XII 282; Bot. Mag. t. 4884; Hook.f. Fl. Brit. Ind. IV 654; Peter & Stibal in

Salvia asperata (Contd.)-

Sond. aus Fedd. Repert. XXXIX (1936) 185.

Stout erect perennial herb, with coarse branches, sparsely glandular-hispid. Leaves long petioled, oblong-ovate, obtuse, crenate, cordate at the base; rugose above, glabrescent or hairy on both surfaces; lamina 15-30 cm. long; petiole stout, 7-15 cm. long. Whorls 6-10 flowered, distant in long, branching or simple raceme; bracts larger than the calyx. Calyx 12 mm. long, hispid, broadly campanulate, rigid; teeth spinous; the central tooth of the upper lip smaller. Corolla 20 mm. long, white; tube short slender, not annulate within; throat slightly inflated; upper lip long, narrow, curved; lower shorter, 3-lobed. Connectives with callous tips deflexed backwards; imperfect cells abruptly dilated. Nutlets small, subglobose, brown in colour, marked with reticulations.

Habitat:- Kashmir.

11. Salvia moorcroftiana Wall. ex Benth. in Wall. Pl. As. Rar. i, 67; Benth. Lab. Gen. et Sp. 228, and in DC. Prod. XII 286; Hook.f. Fl. Brit. Ind. IV 654; Collet Fl. Sim. 394; Peter & Stibal in Sond. aus Fedd. Repert. XXXIX (1936) 185.

Tall robust herbs, usually densely woolly. Leaves thick, long, petioled, oblong or ovate, obtuse, rarely acute, base rounded or cordate, margin lobulate, doubly crenate or sharply toothed; upper surface rugose and laxly woolly or sparsely pubescent, sometimes glabrescent; lower surface and the petiole densely covered with white wool; petiole very stout, 10-15 cm. long, or much longer. Whorls 6-10-flowered, distant, in a long spike; bracts ovate, acuminate. Calyx 8 mm. long in flower, 16 mm. in fruit; campanulate, scabrid; teeth equal, spinous. Corolla 25 mm. long, pale blue, or lilac or nearly white; tube slender, not annulate within; upper lip narrow; lower lip

Salvia moorcroftiana (Contd.)-

3-lobed, middle lobe larger. Connectives with callous tips deflexed backwards; imperfect cell abruptly dilated. Nutlets subglobose, pale green with dark reticulations.

Habitat:- Kashmir; Punjab; N.W. Fr. Province.

12. Salvia rhytidea Benth. in DC. Prod. XII 280; Boiss. Fl. Orien. 640.

Tall herbs, faintly tomentose or pubescent, viscid upwards. Leaves petioled, triangular-ovate, obtuse or acute, cordate or subhastate, at the base, irregularly toothed at the margin; up-surface rugose and glabrescent, hoary tomentose beneath; lamina 8-16 cm. long; petiole 6-7 cm. long, in lower leaves, much shorter upwards. Whorls 2-6 flowered, in lax simple or panicled racemes; bracts sessile broadly ovate acuminate. Calyx campanulate 7-10 mm. long, hirsute; upper lip, shortly 3-toothed, lower lip with 2 aristate teeth, slightly longer than the upper. Corolla 20-22 mm. long, glandular and pubescent; tube short, not annulate within; upper lip, concave and curved, much longer than the 3-lobed lower lip. Nutlets ovate, compressed, brown, marked with reticulations.

Habitat:- Kurrum valley.

Distribution:- Affghanistan.

13. Salvia virgata Jacquin. Hort. Bot. Vind. I 14, t. 37 (1770); Linne'. Syst. veget. ed. 14, 70; Ait. Hort. Kew. ed. 1, I, 39; Peter & Stibal in Sond. aus Fedde. Repert. XXXIX (1936) 184.

S. Sibthorpii Sm. in Prod. Fl. Graec. I 15 (1806), and Icon. t. 22, not of Bory et Chaub.

S. dumetorum Hook.f. Fl. Brit. Ind. IV 655, not of Andr.

S. pratensis L. var, Sibthorpii Fedtsch. et Fler. Fl. Europ. Russl. 825.

f. campestris Peter-Stibal in Sond. aus Fedde. Repert.

Salvia virgata (Contd.)-

XXXIX (1936) 184.

Tall, robust herbs, 40-90 cm. high; branches hirsute. Leaves 3-10 cm. long, ovate or oblong, obtuse, rounded or cordate at the base, doubly crenate, glabrescent on both sides, rugulose above; petiole of lower leaves 3-4 cm. long, upper leaves shortly petioled or sessile. Whorls 6-flowered, distant, in racemes of about 15-25 cm. in length; bracts rounded, cuspidate, 5 mm. long; axis of inflorescence hirsute with retrorse white stiff hairs, eglandular. Calyx shortly pedicelled, viscid 7 mm. long; pedicels white tomentose. Corolla blue, 12-16 mm. long; tube exerted, inflated at the throat, not annulate within. Nutlets obovoid, dark brown or black.

Habitat:- Kashmir.

Distribution:- Persia; Armenia.

14. Salvia saxicola Wall. ex Benth. in Wall. Pl. As. Rar. i, 68, and Cat. 2147; Hook.f. Fl. Brit. Ind. IV 655; Peter & Stibal in Sond. aus Fedd. Repert. XXXIX (1936) 186.

Dwarf, subscapigerous herbs, with woody rootstocks. Leaves mostly radical, with a broadly oblong-cordate or rounded lamina, 2.5-5 cm. in diam., and a slender petiole twice as long as the blade; margin of leaf coarsely crenate. Whorls of flowers usually distant, rarely crowded above, on a slender raceme, with a long stalk. Calyx 4 mm. in flower, 6 mm. in fruit, glandular hairy, bent downwards. Corolla 10-11 mm. long, pale purple, lips short. Connectives with the antheriferous arms decurved, the others shorter, acute. Nutlets small, ellipsoid.

Habitat:- Nepal; Khasia Mts.

15. Salvia plebeia R.Br. Prod. 501; Hook.f. Fl. Brit. Ind. IV 655; Prain Beng. Pl. 859; Cooke Fl. Bomb. Pr. II 474;

Salvia plebeia (Contd.)-

Gamble Fl. Madras 1155; Peter & Stibal in Sond. aus Fedd. Repert. XXXIX (1936) 181.

Small erect annuals, 15-45 cm. high, stem suffruticose, fastigiately branched, obtusely 4-angled and grooved. Leaves oblong-lanceolate, ovate, crenate, base narrow, sparsely hairy or glabrous;

Whorls in panicles of slender spicate racemes; bracts small, narrow. Fruiting calyx 3 mm.; upper lip entire obtuse, shorter than the lower, reflexed; lower lip obtusely 2-toothed. Corolla white or lilac, 5 mm. long, tube exerted, annulate within; upper lip oblong-obtuse; lower 3-lobed, the middle one much larger. Stamens very small, whitish; connectives distant in front, acute or bearing an empty empty anther. Nutlets minute, ovoid, brown, mucilaginous when wetted.

Habitat:- All over India in plains, and upto 1700 m. in hills.

Distribution:- Affghanistan; China; Malaya peninsula and islands; Australia.

16. Salvia Roborowskii Maxim. in Mel. Biol. XI 302 (1881); Stibal in Acta Hort. Gothoburg. IX (1934) 138; Peter & Stibal in Sond. aus Fedd. Repert. XXXIX (1936) 181.

Erect herbs, 20-60 cm. high, hirsute and viscid. Leaves mostly cauline, petiolate, triangular-ovate, acute, crenate, truncate or rarely cordate at the base, pubescent on the upper surface and on the nerves beneath; lamina 3-7 cm. long; petiole 1-5 cm., rarely about 8 cm. long in the lower leaves. Whorls 6-flowered, distant in terminal or axillary racemes, simple or branched; bracts lanceolate or oblong, densely pubescent. Calyx campanulate, 8 mm. long, densely hairy and glandular; upper lip with 3 minute teeth at the apex, lower lip with 2 broad triangular teeth; fruiting calyx 10-12 mm. long. Corolla

Salvia Roborowskii (Contd.)-

pale yellow in colour, hairy, 15 mm. long; tube narrow, slightly exserted; upper lip hooded, shortly emarginate; lower lip 3-lobed, median lobe ovoid, emarginate. Stamens coherent by the lower arms; inferior anthers fertile. Nutlets obovoid, compressed, pale yellow, with dark punctate marks.

Habitat:- Sikkim; Phari; Bhotan.

Distribution:- Tibet; China.

17. Salvia castanea Diels in Not. Bot. Gard. Edinbg. V (1912) 233; Kudo in Mem. Fac. Sc. & Agri. II, 2, (1929) ; Stibal in Acta. Hort. Gothoburg. IX, (1934) 134; Peter & Stibal in Sonderb. Fedd. Repert. XXXIX (1936) 181.

Erect herbs, 40-60 cm. high, with robust stem and stout rhizome; pubescent on upper parts. Leaves mostly at the base of the stem, very long petioled, narrowly triangular-ovate or lanceolate, obtuse, rounded or cordate at the base, margin faintly and irregularly crenate, upper surface pilose, pale beneath; lamina 20-40 cm. long; petiole 14-16 cm. long. Whorls distant, 4-6-flowered, laxly arranged in racemes which are usually simple, or with many short branches at the base; bracts with violet-coloured margin, densely glandular, ciliate, broadly obovate or ovate. Calyx campanulate, fuffuraceous, purplish in colour; upper lip longer than the lower, entire or 3-fid; tube of calyx 18 mm. long, and so broad at the mouth. Corolla about 35-40 mm. long, pubescent, purplish maroon in colour, reddish yellow at the base; tube narrow, curved, gradually expanding; median lobe of lower lip elliptic with a lobulate margin; lateral lobes broadly ovate; upper lip hood shaped.

Habitat:- Nepal, Toonebooh Lall Dhowj 205.

Distribution:- Tibet.

18. Salvia mekongensis Stibal in Acta Hort. Gothoburg. IX, (1934)-136.

var. assamensis Peter & Stibal Sond. aus Fedd. Repert. XXXIX (1936) 181.

Perennial herbs, about 25-60 cm. high shortly villous, more or less glabrescent below. Leaves elongate-ovate, 3-8 cm. long, cordate or hastate at the base, crenate-dentate at the margin, glandular punctate, puberulous above, faintly tomentose or glabrescent beneath; petiole shortly villous. Whorls 2-flowered, in lax, branching racemes; bracts broadly ovate, cuneate at the base, pubescent beneath with long hairs. Calyx campanulate, 12-15 mm. long, and nearly as broad; ciliate, and with sessile gland all over except the nerves where they are stalked; upper lip broad ovate subtruncate, shortly 3-toothed; lower lip 2-toothed, teeth deltoid, 3-4 mm. long, mucronate. Corolla yellow, 22-25 mm. long, glandular hairy; tube curved, hairy and annulate within; lower lip 3-lobed, minutely ciliate. Connectives bent in a semicircle, sparsely hairy; arms subequal; lower anthers fertile, shorter than the upper, coherent at the apex.

Habitat:- Delei valey, N. Assam, (actually this locality is beyond the borders of Assam).

19. Salvia amplicalyx Peter ex Stibal in Sond. aus Fedd. Repert. XXXIX (1936) 180.

Erect herbs, with robust quadrangular stem, striate, often furrowed, densely covered with short brown hairs, glabrescent downwards. Leaves mostly on the lower parts of the stem, petioled, broadly ovate-cordate, acute, margin regularly crenate; upper surface covered with adpressedly rough hairs, lower surface pale, densely glandular punctate, hairy on the nerves; petiole stout, .5-4.5 cm. long, densely covered with short brown hairs; lamina 4-15 cm, long. Whorls distant, 2-4-

Salvia amplicalyx (Contd.)-

-flowered, in simple or branched racemes; bracts sessile, ovate, 10-15 mm. long, base cuneate, apex abruptly constricted and caudate clypeate, margin entire, ciliate. Calyx broadly campanulate, 20-22 mm. long, and 15-17 mm. wide, truncate, densely hairy and glandular; upper lip broad, sharply triangular, trinerved; lower lip 2-toothed, teeth broad triangular, acute. Corolla yellow, tube shortly exerted, 25 mm. long, subglabrous; upper lip extended, 8-9 mm. long, ovate, entire, pubescent with long hairs; lower lip 3-lobed, as long as the upper lip; lateral lobes reflexed, rounded, shortly ciliate, median lobe somewhat obcordate. Connectives curved, faintly hairy; inferior anther cells shorter and fertile.

Habitat:- Sikkim, Lachen 3500 m., Hooker 9.VII. 1949.

20. Salvia glutinosa Linn. Sp. PL. 26; Benth in DC. Prod. XII 276; Hook, f. Fl. Brit. Ind. VI 653; Collet Fl. Sim. 394; Peter & Stibral in Sond aus Fedd. Repert. XXXIX (1936) 183.

Tall robust herbs, 60-100 cm. high, viscidly hairy, possessing a strong odour. Leaves petioled, ovate-oblong, and more or less hastately prolonged at the base, rarely cordate, apex acute or subacute, margin crenate, both sides sparsely pubescent, glandular; lamina 8-20 cm. long; petiole 3-8 cm. or more. Whorls few flowered, distant in a large and spreading panicle. Calyx 12 mm. long, tubular-campanulate; upper lip entire, ovate, acute; lower 2-lobed, lobes ovate, acute. Corolla yellow, 25-30 mm. long; throat dilated; upper lip falcate, spreading. Nutlets 3 mm. long, elliptic ovate, smooth, compressed.

Habitat:- N.W. Frontier province; Kashmir; Punjab; Kumaon; Gharwal; Sikkim; Bhootan

Distribution:- Tibet; W.Asia; Europe.

21. Salvia campanulata Wall. ex Benth. in Wall. Pl. As. Rar. i 67; and in DC. Prod. XII 276; Hook. f. Fl. Brit. Ind. IV 654.

S. campanulata, var. typica Peter-Stibral in Sond. aus Fedd. Repert. XXXIX (1934) 179.

Robust herbs, 60-80 cm. high, or more, viscidly hairy with tufts of brown, articulated on the stem and branches.

Leaves long-petioled, broadly ovate-cordate, toothed, acute or or obtuse; lamina 10-18 cm. long, 8-15 cm. broad; petiole 7-15 cm. long. Whorls few, few-flowered, distant in lax panicle or racemes. Calyx 13 mm. long, broadly and shortly campanulate, mouth wide. Corolla yellow, 20-25 mm. long; tube exserted, inflated, annulate within; lips short. Connective with an imperfect cell behind. Nutlets 4 mm. , elliptic-obovate, compressed.

Habitat:- Nepal.

Distribution:- Yunnan.

var, (i) pilinophylla Peter-Stibral in Sond. aus Fedd. Repert. XXXIX (1934) 179.

Tufts of hairs on stem and branches absent. Lower surface of leaves brownish arachnoid-tomentose. Inflorescences densely glandular-pilose. Nutlets deep dark brown, tuberculate.

Habitat:- Sikkim; Nepal.

var, (ii) fissa Peter-Stibral in Sond. aus Fedd. Repert. XXXIX (1934) 179.

Tufts of hairs on stem and branches absent. Calyx distinctly bilabiate, upper lip 12-15 mm. long, trilobed; lobes triangular, 5 mm. long. Nutlets pale brown, with a downy surface.

Habitat:- Kumaon; Garhwal; Sikkim.

var, (iii) nepalensis Peter-Stibral in Sond. aus Fedd. Repert. XXXIX (1934) 179.

Tufts of hairs on stem and branches absent. Calyx tubular or campanulate, truncate in flower, 8-10 mm. long. Surface of leaves especially on the nerves beneath finely

Salvia campanulata (Contd.)-

and adpressedly strigillose. Nutlets dark coloured, tubercled, surface shining.

Habitat:- Nepal.

var, (iv) hirtella Peter-Stibal in Sond. and Fedd. Repert. XXXIX (1934) 179.

Leaves and stem somewhat hairy, hairs not tufted. Calyx bilabiate; bracts with long appendages. Nutlets pale, yellowish brown, smooth.

Habitat:- Nepal; Sikkim; Bhootan.

var, (v) codonantha Peter- Stibal in Sond. aus Fedd. Repert. XXXIX (1934) 180.

Salvia codonantha Stibal in Acta Hort. Gothburg. IX 127 (1934).

Tufts of hairs on stem and branches absent, Leaves subglabrous on both surfaces except on the nerves above, which are densely pilose, and on the margins which are ciliate. Calyx shortly bilabiate or subtruncate; bracts acuminate or acute.

Habitat:- Burma.

Distribution:- Yunnan.

22. Salvia sikkimensis Peter-Stibal in Sond. aus Fedd. Repert. XXXIX (1934) 177.

Perennial herbs, 20-60 cm. high, with 1-2 simple stems, erect or ascending from a long and stout rootstock with a number of triangular scaly leaves; all parts softly hairy. Radical leaves numerous, long-petioled, triangular-ovate or broadly lanceolate, cordate or subhastate at the base, acute obtuse at the apex, margin crenate; lamina 2-12 cm long; petiole more or less twice as long as the blade; cauline leaves few with shorter petiole. Whorls 2-6-flowered, much distant or close above in racemes, which are 15-25 cm. long, usually simple or with 2 short branches at the base; axis densely

Salvia sikkimensis(Contd.)-

covered with brownish glandular hairs; bracts ovate, acute, densely glandular pilose. Calyx campanulate, or more or less unequally bilabiate, densely pilose, 10-15 mm.; upper lip ovate, triangular, acute, shortly mucronate; lower lip 2-toothed, teeth triangular, broad, mucronate. Corolla 20- 25 mm. long, yellow or purple, tube narrow or cylindrical at the base, gradually becoming wider upwards, annulate within; upper lip extended slightly compressed, emarginate, pilose; lower lip trilobed, shortly ciliate; the mid-lobe largest, somewhat trapeziform, gently emarginate; lateral lobes ovate. Connectives curved in a semi-circle; filaments scarcely dilated, hairy or glabrous at the of insertion.

Habitad:- Sikkim.

var, chaenocalyx Peter-Stibal in Sond. aus Fedd. Reprt. XXXIX (1936) 178.

Larger than the type in all parts. Calyx in flower 2 cm. long, much dilated upwards from a narrow base; bilabiate, gaping at the mouth.

Habitat:- Sikkim; Bhotan.

Distribution:- Tibet.

23. Salvia hians Royle ex Benth. in Hook. Bot. Misc. iii (1833) 373; Hook.f. Fl. Brit. Ind. IV 653; Peter & Stibal in Sond. aus Fedd. Reprt. XXXIX (1936) 177.

Robust herbs, 30-100 cm. high, viscidly hairy. Leaves very large, with a lamina about 10- 17 cm. long, and a petiole of 12- 25 cm. in length; ovate, hastate or cordate at the base, acute at the apex, margin toothed. Whorls lax-flowered, distant in a slender simple or branched raceme. Calyx broadly and shortly campanulate, 12-15 mm. long; upper lip entire or toothed. Corolla blue, 40 mm. long, tube

Salvia hians (Contd.)-

much swollen at the throat; lips short, upper falcate, compressed; corolla annulate within above the base. Connectives with an imperfect cell behind. Nutlets 4 mm. long, elliptic-obovate, compressed, smooth.

Habitat:- Kashmir; Garhwal.

var, exannulata Peter-Stibral in Sond. aus Fedd. Repert.

XXXIX (1936) 17%.

Corolla-tube glabrous within, not annulate.

Habitat:- Kashmir.

24. Salvia schizocalyx Stibral in Acta Hort. Gothoburg. IX (1934) 123.

Perennial herbs, 20-35 cm. high, branching at the base; stem erect, ascending, densely covered with short yellowish hairs. Leaves few, cauline, triangular-ovate, obtuse or rounded at the apex, irregularly crenate, cordate or subhastate at the base, sparsely hairy on both sides, densely on the nerves beneath, glandular-punctate above; lamina 2-5 cm. long, and as broad; petiole about 5-7 cm. long, in the intermediate leaves, shorter in cases of upper or lower leaves. Whorls 2-4-flowered, close or distant in simple racemes; bracts as long as the calyx, broadly ovate or rhomboid; pedicells 2-4 mm. long; the whole inflorescence densely villous with short rusty-brown hairs. Calyx broadly campanulate, 10-12 mm. long, glandular-punctate, densely hairy on the nerves, ciliate on the margin; upper-lip subtruncate shortly mucronate, lower lip with 2 long ovate-lanceolate-lanceolate teeth. Corolla purple or violate, 20-25 mm. long, minutely hairy, tube not annulate within. Connectives semicircularly curved, lower arm slightly shorter than the upper; inferior anther fertile, coherent on the apex.

Habitat:- Burma, N'Maikha-Salwin divide, Forrest 26856; Chimili Pass, R.A.

1. Ziziphora clinopodioides Bieb. in Pl. Trau. Cauc. 1, 17;
Benth. in DC. Prodr. xii, 364; Boiss. Fl. Orient. iv, 585.

2. clinopodioides var. rigida Boiss. Fl. Orient. iv, 585,
(1879); Prain in Journ. of As. Soc. Beng. Vol. lix, Part II,
No. 4, 303 (1890).

3. clinopodioides var. Benthani Prain in Journ. of As. Soc.
Beng. Vol. lix, Part II, No. 4, 303 (1890).

Ziziphora, Linn.

4. clinopodioides Boiss. in Pl. Or. iv, 585
(1879);

Gen. n. 36; Benth. Lab. Gen. et Sp. 320, and in DC. Prodr.
xii 364; Benth. ex Hook. f. Gen. Pl. II 1198; Boiss. Fl. Orient.
iv. 585; Briq. in Eng. & Prant. Nat. Pflanzenf. iv, 3, a, 292;
Prain in Journ. of As. Soc. Beng. lix (1890) 302.

Dwarf shrubby plants, 10-30 cm. high, with numerous branches

Dwarf annual herbs or spreading perennial small shrubs with
rigid stems, often hoary-tomentose, with small entire or slightly
toothed leaves, floral like cauline or shorter and broader, whorls
few-flowered axillary often crowded towards the apex of the stem,
flowers subsessile or shortly pedicelled, bracteoles very small,
calyx tubular elongated 13-nerved 2-lipped (upper 3- lower 2-toothed),
throat villous, teeth in fruit subconnivent, corolla small, tube
hardly exserted glabrous within somewhat dilated upwards, upper lip
erect entire, lower spreading 3-fid, mid-lobe emarginate; stamens,
2 perfect (anterior), ascending under upper lip or subexserted,
anthers linear perfect or with the lower cell empty, upper staminodes
small or 0, disc uniform, style 2-fid lower lobe longer, nutlets
ovoid, smooth.

5. Ziziphora tenuior -----; Benth in Lab. Gen. et
Sp. 322 and DC. Prodr. xii, 366; Boiss. Fl. Orient. iv, 587; Hitch.

- A. Flowers in capitulate whorls at the ends
of branches clinopodioides.
- A. Flowers in axillary spicate whorls, along
the whole length of the stem tenuior.

1. Ziziphora clinopodioides Bieb. in Fl. Trau. Cauc. i, 17;
Benth. in DC. Prodr. xii, 364; Boiss. Fl. Orient, iv, 585.

Z. clinopodioides var. rigida Boiss. Fl. Orient. iv, 586,
(1879); Prain in Journ. of As. Soc. Beng. Vol. lix, Part II,
No. 4, 303 (1890).

Z. clinopodioides var. Benthami Prain in Journ. of As. Soc.
Beng. Vol. lix, Part II, No. 4, 303 (1890).

Z. clinopodioides var. canescens Boiss. in Fl. Or. iv, 585
(1879);

Z. canescens Benth. Lab. Gen. et Sp. 621 (1833), and DC.
Prodr. xii, 365 (1848); Aitch. & Hemsl. Trans. Linn. Soc. n. 5.
iii, 96 (1888).

Dwarf shrubby plants, 10-30 cm. high, with numerous branches
from the base, and a stout woody rootstock; branches pubescent
with minute adpressed hairs. Leaves 0.5-2 cm. long, very shortly
petioled, ovate, oblong or lanceolate, acute, base rounded or cun-
eate, margin entire, sometimes ciliate; both surfaces glabrous or
scarcely pubescent, glabular punctate. Whorls capitulate, at the
ends of branches. Calyx tubular, narrow, 8 mm. long, hirsute with
adpressed white hairs or glabrous, teeth short, linear-lanceolate,
blunt, upper rather longer. Corolla-tube slightly exserted. Anther-
cells equal. Nutlets minute, pale brown in colour, very finely
tuberculate.

Habitat:- N. W. Frontier; Beluchistan; Afghanistan; Persia;
Armenia.

2. Ziziphora tenuior Linn. in Sp. Pl. 21; Benth in Lab. Gen. et
Sp. 322 and DC. Prodr. xii, 366; Boiss. Fl. Orient. iv, 587; Aitch.
& Hemsl. Trans. Linn. Soc; n. s. iii, 96.

Ziziphora tenuior (Cont.)

Z. persica Bunge. Lab. Pers. 39.

Faldermannia parviflora Trautv. Bull. Ac. Imp. Petersb. vii, 21.

Annual herbs, simple or branching from the base, 10-15 cm.

high. Leaves 1.5-2.5 cm. long, shortly petioled, linear or lanceolate, with a pair or two of ovate or obovate leaves at the base; apex acute, base cuneate, scabrid, ciliate at the margins. Flowers in lax or dense axillary whorls along the whole length of the stem. Calyx tubular narrow, 8 mm. long, hirsute teeth very short triangular, ovate, blunt. Corolla-tube slightly exerted. Lower anther-cell small and empty. Nutlets minute, obovoid, dark pinkish in colour, minutely tuberculate.

Habitat:- N. W. Frontier Province; Beluchistan; Afghanistan; Persia; Asia Minor; Turkestan; Soongana.

Disc entire or faintly 4-lobed, produced in front or not. Style-lobes subulate. Nutlets 4, obovoid, smooth or granulate.

A. Flowers in continuous spikes, heads;
 basal clusters rarely distinct.
 B. Leaves linear to lanceolate, acute
 or acuminate, glabrous on
 both surfaces.

6. Calyx-teeth Nepeta, Linn. as

(incl. Glechoma).

Gen. n. 710, and Gen. Pl. 622; Benth. Lab. Gen. et sp.
 464, and in DC. Prodr. xii, 370; Benth ex Hook. f. Gen. Pl. 11
 1199; Hook. f. Fl. Brit. Ind. iv, 228; Collett. Fl. Sim. 396.

Erect or ascending herbs; leaves opposite, sessile or
 petioled. Flowers in continuous terminal spikes, or in terminal
 heads, or in distinct clusters, either axillary or forming
 interrupted spikes or panicles. Calyx tubular, 15 nerved,
 5-toothed; teeth equal or not. Corolla-tube not annulate
 within, inflated at the throat; upper lip erect, concave,
 emarginate or bifid; lower lip 3-fid, the midlobe largest,
 entire or crenulate, narrow at the base, lateral lobes small,
 usually reflexed. Stamens 4, ascending under the upper lip,
 rarely exserted, upper pair longer; anther cells diverging.
Disc entire or faintly 4-lobed, produced in front or not.
Style-lobes subulate. Nutlets 4, obovoid, smooth or gran-
 ulate.

lobe usually shorter than the
 blade ----- as the
 calyx.

N. Calyx sessile, mouth not
 oblique.

O. Stem terete, densely
 villous; leaves pec-
 tinately crenate ... elliptica

P. Stem 4 quadrangular,
 glabrous or minutely
 puberulous; leaves
 serrate 217 coarsely

- A. Flowers in continuous spikes, or heads;
basal clusters rarely distinct.
- B. Leaves linear to lanceolate, acute
or acuminate, ± glabrous on
both surfaces.
- C. Calyx-teeth about $\frac{1}{2}$ as long as
the tube, or less linearis.
- C. Calyx-teeth about as long as
the tube.
- D. Calyx distinctly pedicelled .. connata.
- D. Calyx sessile.
- E. Leaf-apex acuminate, lamina
5-10 cm. long, 5-18 mm.
broad nervosa.
- E. Leaf-apex acute, lamina
1-3 cm. long, 2-5 mm.
broad. podostachys.
- B. Leaves ovate, obtuse or rounded at the
apex, (acute in *N. coerulescens*), hairy
on both surfaces or at least beneath.
- C. Calyx-teeth subulate ± equalling
the tube, awns long.
- D. Leaf-base cordate or truncate,
margin crenate or serrate, pet-
iole usually shorter than the
blade; bracts ± as long as the
calyx.
- E. Calyx sessile, mouth not
oblique.
- F. Stem terete, densely
villous; leaves pec-
tunately crenate ... elliptica
- F. Stem ± quadrangular,
glabrous or minutely
puberulous; leaves
serrate or coarsely

- or obtusely crenate.
- G. Calyx-tube and teeth
glabrous or scabrid;
(leaves all sessile) ... *campestris*
- G. Calyx-tube hispid or
villous, teeth long-
ciliate.
- H. Leaves sessile or
shortly petioled;
calyx-teeth plumose ... *supina*
giving glistening
appearance to spike. ... *eriostachya*
- H. Leaves distinctly
petioled; calyx-teeth
ciliate; spike not
glistening. ... *raphanostigma*
- I. Lamina 2.5-10 cm. ... *spathulifera*
long; calyx scabrid
or hispid *spicata*
- I. Lamina 1-2.5 cm. long;
calyx softly villous ... *discolor.*
- E. Calyx pedicelled, mouth
oblique. (E. Himalaya). ... *lamiopsis.*
- D. Leaf base cuneate, margin
lobulate, petiole longer than
or equalling the blade; bracts
about twice as long as the
calyx. *longibracteata.*
- C. Calyx-teeth \neq lanceolate, half
as long as tube, awns 0 or
very short. (W. Kashmir) ... *alvaina*
- D. Spikes globular almost entirely
hidden by conspicuous coriaceous
bracts (Beluchistan) ... *bracteata*
- D. Spikes \neq elongated, not hidden
by prominent bracts.

- E. Leaves twice as long as broad
bracts ovate, longer than
calyx coerulescens
- E. Leaves as broad as long,
bracts lanceolate, shorter
than the calyx. tibetica
- F. Calyx 8 mm; corolla 15 mm.
long; leaves subsessile or
shortly petioled.... .. supina
- F. Calyx 5 mm; corolla 8 mm.
petiole as long as lamina.
G. Calyx sparingly pubescent;
root-tuber very large and
conspicuous raphanorhiza
- G. Calyx hoary-villous, root-
tuber absent spathulifera
- A. Flowers in distinct clusters either
axillary, or forming interrupted
spikes or panicles. leucolaema
- B. Leaves sessile; (floral clusters
axillary).
- C. Tall plants 50-70 cm. high;
leaves pectinately inciso-ser-
rate, apex acute glutinosa
- C. Dwarf plants, 8-15 cm. high;
leaves obtusely crenate, rounded
at the apex.
- D. Calyx teeth narrow and very
acute. Filaments long ex-
serted. (W. Kashmir) nivalis
- D. Calyx teeth broad and obtuse
Filaments included. (Tibet
N. of Sikkim border) pharica
- B. Leaves distinctly petioled.
- C. Leaves broader than long.

- floccosely wooly.
- D. Flowers about 8 mm. long
 floral clusters in \pm
 paniculate inflorescence. ... floccosa
- D. Flowers about 20 mm. long;
 floral clusters axillary. .. thibetica
- C. Leaves longer than broad,
 pubescent or villous, or
 tomentose, but not floccosely
 wooly.
- D. Calyx 5-toothed.
- E. Corolla 15-25 mm. long;
 calyx-teeth \pm triangular.
- F. Stem and leaves on both
 sides densely hoary-
 tomentose.
- G. Calyx covered allcover
 with a dense stellate
 down. leucolaena
- G. Calyx scaberulous or
 hirsute, mainly on the
 nerves; no stellate
 hairs. salviaefolia
- F. Stem and leaves finely
 pubescent or \pm glab-
 rescent, not hoary.
- G. Leaves twice as long
 as broad, acute at
 the apex.
- H. Corolla yellow Govanina
- H. Corolla blue.
- I. Corolla 20-25mm.
 nutlets broadly
 oblong erecta
- I. Corolla 15-20mm.

- mm. in fruit.
- nutlets linear ... Clarkei
- G. Leaves nearly as long
as broad, rounded or
obtuse at the apex... distans
pinetorum
- E. Corolla about 10 mm.
long; calyx-teeth
linear-subulate. Prainii
- F. Calyx-mouth oblique;
teeth unequal; bract
neither rigid nor spinous.
- G. Whorls all sessile,
rarely short peduncled;
(Leaves often rugose,
frequently hoary-
tomentose below).
- H. Leaves .7-2 cm., as
broad as long; hoary
on both sides.
- I. Calyx teeth $\frac{1}{2}$ as
long as the tube
or less ... glomerulosa
- I. Calyx teeth as
long as the tube ... lagopsis
- H. Leaves 2-3 cm. long,
longer than broad, leucophylla
upper surface not
hoary.
- I. Calyx villous with long
hairs, 5-6 mm. in fruit. Cataria
- J. Bracts ovate to
lanceolate... mollis
J. Bracts linear... ciliaris
- I. Calyx scabrid or
sparsely hispid, 7-8

mm. in fruit.

J. Leaves not rugose,
 nerves beneath ±
 obscure. distans

J. Leaves ± rugose,
 nerves beneath
 prominent Prainii

G. Whorls ± peduncled, the
 lower conspicuously so;
 (leaves not rugose,
 rarely tomentose below).

H. Stem and branches stout;
 leaves about twice as
 long as broad, petiole
 usually much shorter
 than the lamina.

I. Upper whorls sub-
 sessile or very
 shortly peduncled;
 leaves cordate or
 truncate at the base

J. Stem and leaves
 densely hoary-
 tomentose; leaf-
 apex obtuse leucophylla

J. Stem and leaves
 pubescent; leaf-
 apex acute or
 acuminate Cataria

I. All whorls long-
 peduncled, leaf-base
 ± cuneate micrantha

H. Stem and branches

slender; leaves usually
as broad as long,
petiole usually as long
as the lamina.

I. Hairs on stem and
leaves very long and
spreading; calyx 6mm.
long - (Concan and
Aboo) bombaiensis

I. Hairs on stem and
leaves minute; calyx
4 mm. long.
J. Whorls dense-flowered,
subglobose; calyx \neq
sessile hindostana

J. Whorls very few-
flowered, in very
loose panicles;
calyx long-pedi-
celled graciliflora

F. Calyx mouth not oblique,
teeth subequal; bracts rigid
spine tipped (Baluchistan
and Chitral) Chenopodiifolia

D. Calyx entire at the mouth, no
teeth, (Kurrum valley and
Tirah) suavis

1. Nepeta linearis Royle ex Benth. Hook. Bot. Misc. iii
(1833) 377; Hook. f. Fl. Brit. Ind. iv. 657; Collett Fl.
Sim. 396.

Erect herbs, 20-40 cm. high; stem stout or slender, with rounded tuberous rootstock. Leaves sessile linear acute or obtuse entire, glabrous or puberulous; 3-8 cm. long, and 5-6 mm. broad. Spikes 2-5 cm. long, ovoid or oblong, terminal not interrupted; bracts linear, lanceolate or subulate, ciliate at the margin. Calyx tubular, 5-6 mm. long, hairy, mouth hairy within; teeth subequal, more or less $\frac{1}{2}$ as long as the tube, spinescent and acuminate. Corolla 13-15 mm. long, tube very slender, much dilated at the throat, lips short, pubescent outside. Stamens included, anther cells divergent. Nutlets smooth, reddish-brown in colour, ovoid, slightly flattened in one side.

Habitat:- Kashmir; Hazara; Tehri; Garhwal; Pangee; Simla; altitude 2,000-3,500 m.

2. Nepeta connata Royle ex Benth. Hook. Bot. Misc. iii
(1833) 378. Fl. Brit. Ind. iv. 657.

Tall and stout herbs, 30-60 cm. high, with simple erect stem, and tuberous rootstock; glabrous or hairy. Leaves sessile, 5-12 cm. long, linear-narrowly lanceolate, acuminate or acute, base cordate or truncate, margin entire or sometimes sinuate toothed; glabrous or sparsely hairy, coriaceous. Spikes 3-12 cm. long, terminal, cylindrical, uninterrupted, with sometimes one or two axillary whorls below the main spike; the lowest bracts large ovate, upper narrow, all aristate. Calyx 10-12 mm. long, very shortly pedicelled, hairy, teeth as long as the tube, very slender and long-awned. Corolla 25 mm. long,

blue or bluish-purple, dilated at the mouth, lips short, upper lip galeate, deeply bipid. Stamens included, anthers divergent. Nutlets minute, orbicular, compressed, brown, smooth.

Habitat:- W. Himalaya; Kashmir; Dalhousie; Hazara; Zirat; altitude 2,500-4,000 m.

3. Nepeta nervosa Royle ex Benth. Hook. Bot. Misc. iii (1833) 378. Lab. Gen. et Sp. 469, and in DC. Prodr. xii. 372; Hook. f. Fl. Brit. Ind. iv. 658;

N. campestris Herb. Ind. Or. Hk. f. & T.

Tall herbs, 30-60 cm. high, stem subsimple glabrous, from a woody rootstock. Leaves shortly petioled or sessile, 5-10 cm. long, linear-lanceolate, acuminate serrate, rounded or cordate at the base; glabrous on both sides. Spikes terminal robust cylindric, 3-9 cm. long; whorls dense-flowered, confluent; bracts ovate or lanceolate, mucronate, longer than the calyx. Calyx membranous, 6 mm. long, villous; teeth filiform, acuminate, as long as the tube. Corolla pale blue, 12 mm. long. Stamens included.

Habitat:- Kashmir, alt. 2,000-3,500 m.

N. nervosa, var. lutea Hook. f. Fl. Brit. Ind. iv. 658.

Flowers yellow.

Habitat:- Karakoram, 4,500 m.

Dist.:- West Tibet.

4. Nepeta podostachys Benth. in DC. Prodr. xii. 372; Boiss. Flor. Orient. iv, 639; Prain in Journal of As. Soc. Bengal.

Erect herbs, 40-60 cm. high, with subsimple glabrescent

stem, and prostrate and elongated rootstock. Leaves 1-3 cm. long, 2-5 mm. broad, sessile or shortly petioled; narrowly lanceolate, acute, base cuneate, coarsely serrate margin entire near the base, sparsely hairy or glabrous on both surfaces.

Spikes narrow, 2-8 cm. long, sometimes interrupted below; bracts linear or linear-lanceolate, 5 mm. long, villous. Calyx 8 mm. long, hispid outside tube villous at the throat, teeth slender, as long as the tube on a little shorter; sparingly ciliate.

Corolla 12-15 mm. long. Nutlets - smooth, obovate, dark coloured with pale brown on the sides.

Habitat:- Kashmir, 3,050 m.

Dist.:- Afghanistan.

5. Nepeta elliptica Royle ex Benth. in Hook. Bot. Misc. iii, 378, Lab. Gen. et Sp. 470, and in DC. Prodr. xii, 372; Hook. f. Fl. Brit. Ind. iv, 658; Collett. Fl. Sim. 397.

N. podostachya Benth, in Hook. Bot. Misc. iii, 378.

Small herbs, 30-60 cm. high, stem branched, ascending, villous, often flexuous. Leaves sessile or subsessile, 1-3 cm. long, oblong or oblong-ovate, obtuse or acute, cordate at the base, pectinately crenate with small regular, close-set, acute teeth; sparsely or densely pubescent on both sides, slightly rugose above. Spikes terminal on the main stem and secondary branches, long, slender, often interrupted below, bracts ovate or lanceolate, awned. Calyx sessile, 6-7 mm. long, tubular-campanulate, sparsely pubescent at the tube, ciliate at the teeth; teeth linear-lanceolate, acuminate, almost as long as the tube or slightly smaller. Corolla, 12 mm. long, pale blue, tube exserted. Nutlets, 1.5 mm, narrow, oblong, brown, smooth.

Habitat:- Kashmir; E. Punjab; Kumaon.

6. Nepeta campestris, Benth. Lab. Gen. et Sp. 734, and DC. Prodr. xii, 372; Hook. f. Fl. Brit. Ind. iv, 658; Collett Fl. Sim. 397.

Tall herb with erect subsimple stem 30-60 cm. high, sparsely pubescent. Leaves sessile, 3-5 cm. long, ovate or oblong-lanceolate, acute or subacute, serrate, cordate or truncate at the base; pubescent on both sides. Spikes slender, terminal or axillary, 5-20 cm. long; whorls sessile, close and confluent, often interrupted below; bracts all ovate and mucronate. Calyx sessile, 6 mm. long, pubescent; teeth very slender, linear-lanceolate, nearly as long as the tube, glabrous or ciliate. Corolla about 15 mm. long, blue or purple (?); tube very slender, exerted, widely dilated at the mouth. Nutlets 1.5 mm. in diam.; orbicular, deep brown, smooth. Habitat:- Kashmir; Punjab; Kumaon.

7. Nepeta eriostachys Benth. Lab. Gen. et Sp. 734, and DC. Prodr. xii. 371. Hook. f. Fl. Brit. Ind. iv, 657.

Small herbs with subsimple ascending stem, 15-25 cm. high, sparsely hairy. Leaves, sessile or petioled, 1-2 cm. long, ovate or ovate-cordate, obtuse at the apex, crenate, pubescent on both sides or glabrous above. Spikes cylindric, 2-7 cm. long, villous, dense-flowered, bracts orbicular-ovate, ovate or obovate-lanceolate, ciliate; 5-7 mm. long. Calyx 7 mm. long, membranous, villous, teeth slender as long as the tube, softly ciliate. Corolla 12-15 mm. long, bright blue in colour. Stamens included; anther-cells divergent.

Habitat:- Kashmir; Garwhal.

8. Nepeta spicata Benth. Wall. Pl. As. Rar. i, 64, and

Nepeta spicata (Contd.) -

Lab. Gen. et Sp. 470, and in DC. Prodr. xii, 372. Wall. Cat. 2083; Bot. Mag. t. 6405; Hook. f. Fl. Brit. Ind. iv, 659; Collett Fl. Sim. 397.

Betonica laevigata Don Prodr. 110.

Erect herb, 30-100 cm. high, glabrous or pubescent, often hoary; branches often spreading. Leaves long-petioled, ovate or deltoid, acute or acuminate, crenate or sharply toothed, cordate at the base, glabrous or pubescent, petiole as long as the blade or smaller, lamina 3-10 cm. long. Spikes dense terminal, about 10 cm. long; whorls sessile close and confluent sometimes interrupted below; bracts ovate or lanceolate, awned. Calyx 6 mm. tube slender, scabrid, teeth linear-lanceolate, acute, ciliate, as long as the tube. Corolla pale blue, 12-15 mm, tube slender exerted. Nutlets 1.5 mm, oblong, smooth, shining brown in colour.

Habitat:- Kashmir; Punjab; Kumaon; N.W. Front. Province.

Dist.:- Afghanistan.

9. Nepeta discolor Royle ex Benth. in Hook. Bot. Misc. iii, (1833) 378, and Lab. Gen. et Sp. 470, and in DC. Prodr. xii, 373; Hook. f. Fl. Brit. Ind. iv, 659.

Nepeta Sabiei, T. A. Schmidt in Trim. Journ. Bot. (1868) 238, t. 82, f. 1-4.

Ascending herb about 30-45 cm. high, with an elongated woody rootstock, tomentose or glabrescent. Leaves petioled, broadly ovate, obtuse or subacute, crenate, cordate or rounded, rugose and glabrescent or laxly villous above, and beneath densely villous, or adpressedly white-tomentose; lamina .5-1.5 cm. long, petiole half as long as the leaf-blade. Spikes

ovoid or cylindrical, villous, very dense and interrupted, sometimes with one or two whorls below the main inflorescence; bracts elliptic or linear, mucronate, ciliate, as long as the calyx. Calyx 6-8 mm. sessile, narrowly tubular, villous, teeth filiform equalling the tube. Corolla white or pale blue, 10mm. long, tube shortly exerted.

Habitat:- Kashmir; Punjab; Kumaon; Garhwal.

Dist:- Afghanistan.

10. Nepeta lamiopsis Benth. ex Hook. f. Fl. Brit. Ind. iv. 659

Flaccid herb, with ascending subsimple stem, 15-45 cm. high, sparsely hairy. Leaves sessile or petioled, broadly ovate-cordate obtuse, obtusely crenate, sparsely hairy; petiole absent except to 1 cm. long. Whorls dense flowered, lower axillary upper in ovoid uninterrupted spike, 1.5-3 cm. long; floral leaves large; bracts orbicular and crenate, or lanceolate or linear. Calyx about 10 mm. long, pubescent, mouth oblique, teeth linear, acuminate, diverging, nearly as long as the tube. Corolla deep blue or purplish, tube slender exerted, twice as long as the calyx, limb small. Nutlets 1.5 mm. broadly oblong, black smooth and shining.

Habitat:- Sikkim; Chumbi; Phari;

Dist:- Tibet.

11. Nepeta longibracteata, Benth. Lab. Gen. et Sp. 737; DC.

Prodr. XII 392; Dene in Voy. Bot. 132, t. 137; Hook. f. Fl.

Brit. Ind. iv, 660.

Dwarf strongly aromatic herb, 8-15 cm. long; stems diffuse, prostrate or ascending, from a long stout rootstock; softly pubescent or villous. Leaves petioled, fan-shaped or obovate,

cuneate at the base, crenate or lobulate, softly villous, lamina 5-12 mm. in diam.; petiole flat, as long as the blade or shorter. Flowers crowded in subglobose capitate heads about 20-25 mm. in diam; bracts foliaceous, fan-shaped, pectinately lobed, villous with long silky hairs, larger than and covering the calyx.

Calyx 8 mm. long, silky, teeth subequal, filiform, nearly as long as the tube. Corolla blue, 20 mm. long, tube much exerted, curved, slender below, funnel-shaped, limb small. Stamens included. Nutlets, about 1 mm, oblong.

Habitat:- Kashmir, 6,000 m.

Dist.:- W. Tibet.

12. Nepeta bracteata Benth. DC. Prodr. xii, 395. Boiss. Fl. Orient. iv, 667; Prain in Journ. As. Soc. Beng. lix, II. No. 4, (1890) 304;

Zataria humilis Benth., in DC. Prodr. xii, 183;

Dwarf annual herb branching from the base, 5-15 cm. long, branches very slender, spreading, subrigid. Leaves petioled, oblong or rhomboid ovate, acute, distantly toothed, base cuneate, lamina 1.5-2 cm. long, about 1 cm. broad. Flowers in dense terminal heads, surrounded by sessile floral leaves; bracts numerous, 8 mm. long, oblong or ovate, submucronate, entire, prominently nerved. Calyx 6.5 mm. long, straight, teeth subulate, ciliate, half as long as tube. Corolla 8 mm. long; tube included. Nutlets oblong shining smooth; 2.5 mm. long.

Habitat:- Beluchistan.

Dist.:- Persia

13. Nepeta coerulescens Maxim. Mel. Biol. xi, 306 (1881)

Forbes et Hemsl., Journ. Linn. Soc. xxvi 289 (1890). Prain

Nepeta Thomsonii Benth. ex Hook. f. Fl. Brit. Ind. iv. 658.

Short stout herb, 15-30 cm. high, stem leafy, simple or branching usually from the base; finely pubescent. Leaves sessile or shortly petioled, 2.5-5 cm. long, oblong-cordate, obtuse or acute, crenate, puberulous or sparsely hairy on both sides; petiole 0-5 mm. long. Flowers crowded in a short, stout, ovoid or conical spike, 3 cm. in diam., bracts much longer than the calyx, green and leafy, crenate, bracteoles membranous, linear lanceolate. Calyx 6 mm, scaberulous teeth ovate lanceolate, much shorter than the tube; fruiting calyx about 10 mm. long. Corolla yellow, 12 mm; tube exerted, very slender below, broader towards the mouth, lips short. Nutlets, about 2 mm. obovate, smooth.

Habitat:- Sikkim.

Dist.:- Tibet.

14. Nepeta supina, Stev. Mem. Soc. Nat. Mosq. iii 365; Benth. Lab. Gen. et Sp. 473 and in DC. Prodr. xii. 374; Boiss. Fl. Orient. iv, 482. Hook. f. Fl. Brit. Ind. iv. 658.

Slender herbs 20-45 cm. high, stem and branches ascending, prostrate below, finely pubescent. Leaves subsessile, 1-2.5 cm. long, ovate obtuse crenate, rounded or truncate at the base, tomentose, tomentose, slightly rugose above. Whorls dense-flowered, lower axillary, upper in ovoid terminal sessile spike 2-3 cm. long; bracts, lanceolate nearly as long as the calyx or smaller. Calyx, about 8 mm. long, narrow, tubular, slightly curved, villous, mouth oblique; teeth setaceous, shorter than the tube. Corolla about 15 mm. long; tube slender curved, dilated at the mouth, lips short, sparingly hairy. Nutlets 2 mm. long, linear trigonous, smooth, brownish-black in colour.

Habitat:- Gilgit; Maree; Garwhal.

Dist.:- Tibet, Palmir, Caucasus.

15. Nepeta raphanorhiza Benth, Lab. Gen. et Sp. 734. DC. Prodr. xii. 373; Hook. f. Fl. Brit. Ind. iv, 659.

Diffuse or ascending herb, 15-45 cm. high, with few or many stems, usually slender, from a black globose tuberous rootstock; glabrous or villous. Leaves petioled broadly ovate, obtuse crenate or toothed, cordate or rounded at the base, lamina 1-2 cm. long, petiole as long as the lamina or half as long; very slender. Whorls dense-flowered; axillary and in short ovoid terminal spikes, bracts ovate or lanceolate, pubescent or villous, longer than or equalling the calyx. Calyx 5 mm. long, sessile, pubescent, teeth lanceolate or linear ciliate, shorter than the tube. Corolla blue-purple, tube twice as long as the calyx, slender below, dilated near the mouth, lips short. Nutlets orbicular oblong, 1-5 mm. in diam., purplish-brown, smooth.

Habitat:- Kashmir; N.W. Fr. Province.

Dist.:- Afghanistan.

16. Nepeta spathulifera Benth., in DC. Prodr. xii, 380; Boiss. Fl. Orient. iv, 668.

Dwarf herbs, much-branched from the base; branches slender straight, leafy below. Leaves long petioled, ovate or orbicular, incise-crenate, softly hoary pubescent; lamina 8-12 mm. long and nearly as broad, Spikes short, very dense, subglobose, hoary, terminating each branch, with sometimes a small whorl much below the main spike; bracts stipitate, ovate or elliptic-lanceolate

acuminate, equalling the calyx or longer. Calyx membranous hoary, 5 mm. long in fruit; teeth minute, equal, lanceolate-subulate, acuminate, not ciliate. Corolla short, tube as long as the calyx. Nutlets minute.

Habitat:- Beluchistan.

Dist.:- Afghanistan.

17. Nepeta glutinosa Benth. Lab. Gen. et Sp. 735; DC. Prodr. xii, 377; Hook. f. Fl. Brit. Ind. iv. 660.

Erect aromatic herb, 30-60 cm. high; stem stiff, leafy, simple or branched, glandular pubescent; often with a number of imbricating scaly leaves at the base. Leaves sessile, 1-4 cm. long, ovate, pectinately serrate and incised, base cordate or rounded, often semiamplexicaul; sparsely hairy on both surfaces, often rugose and scabrid. Flowers axillary towards the ends of the stem; whorls shortly peduncled, few-flowered; bracts linear-oblong, aristate, equalling the calyx or smaller. Calyx 10 mm. long, pedicelled, glutinous, densely hirsute, tube slender, slightly widening near the mouth; teeth ovate acute, much shorter than the tube. Corolla 18-20 mm. long, white or blue, tube slender, funnel-shaped, curved, much exserted, limb small. Nutlets 3.5 mm., linear oblong.

Habitat:- Kashmir.

Dist.:- W. Tibet.

18. Nepeta nivalis Benth. Lab. Gen. et Sp. 737 and in DC. Prodr. xii, 391; Hook. f. Fl. Brit. Ind. iv. 664.

Small herbs, 8-15 cm. high; stem covered by crowded leaves, erect from a creeping rootstock. Leaves 1-2 cm. in diam. rugose,

sessile, orbicular, rounded or cordate at the base, margin crenate; densely pubescent or tomentose. Cymes all axillary, few-flowered, shortly peduncled; bracts minute. Calyx 10 mm. long, pubescent, curved, teeth subequal lanceolate, half as long as the tube. Corolla 15 mm. long, pale blue, tube very slender, resupinate, and upcurved, slightly dilated at the throat, limb short. Filaments exerted. Nutlets 3 mm., linear-obovate, smooth, dark brown.

Habitat:- E. Kashmir.

Dist.:- Tibet.

19. Nepeta pharice Prain. Journ. As. Soc. Beng. lix (1890) II 306. :- Tibet; Eastern Turkestan; Afghanistan.

Dwarf erect herb, 4-15 cm. high, stems usually many from a creeping rootstock. Leaves close-set, sessile, 1.5-2 cm. in diam., orbicular or broadly ovate-cordate, rugose, and villous, usually with white hairs, margin crenate. Cymes axillary, sessile, few-flowered, covered by the leaves; bracts minute; Calyx 9 mm. long; tubular campanulate, softly tomentose outside and villous within; shortly 2-fid; upper lip slightly lower and 3-toothed, the teeth of upper lip wider but less deeply divided than the lower teeth. Corolla 16 mm. long, tube straight, slightly dilated at the throat. Stamens included. Nutlets 2.75 mm. linear-oblong, smooth.

Habitat:- Phari.

Dist.:- Tibet.

Habitat:- Kashmir; Lonjar (N. of Kumaon).

20. Nepeta floccosa Benth. Lab. Gen. et Sp. 736, and in DC. Prodr. xii, 380; Hook. f. Fl. Brit. Ind. iv. 662.

N. rotundifolia Benth. in DC. Prodr. xii, 392.

Marmoritis rotundifolia, Benth. Lab. 490.

Erect ascending herb, usually about 30 cm. high, sometimes 60-100 cm., floccose with white wool; stems many, obtusely quadrangular. Leaves thick, long-petioled, orbivular cordate, crenate, or sinuate; lamina 3-8 cm. in diam; petiole stout 5-10 cm. long or smaller. Inflorescence paniced, slender or spreading, whorls dense-flowered, distant, terminating short branches, woolly, sometimes coloured, bracts linear. Calyx 6-8 mm. long, villous, mouth oblique, teeth much shorter than the tube. Corolla 12 mm. long, tube slender, mouth wide, lips short. Nutlets 2.5 mm. long, linear oblong, smooth, black in colour.

Habitat:- Kashmir, 2,500-6,000 m.

Dist.:- Tibet; Eastern Turkestan; Afghanistan.

21. Nepeta thibetica Benth. Lab. Gen. et Sp. 737; DC. Prodr. xii, 392; Hook. f. Fl. Brit. Ind. iv, 664.

Small prostrate herb, softly tomentose; stem 8-15 cm. long, from a slender and branching rootstock. Leaves close set, petioled, subreniform or orbicular, crenate, cuneate at the base; rugose and hoary-tomentose on both sides; lamina 1-2 cm. diam., petiole 1 cm. or less. Flowers few, in axillary cymes, sessile or subsessile, bracts filiform. Calyx 10-12 mm. long, straight, villous with white hairs; teeth subequal lanceolate, about half as long as the tube. Corolla 2 cm. long, white, tube straight, broad, funnel shaped, lips short. Stamens included. Nutlets 3 mm. linear-oblong, smooth.

Habitat:- Kashmir; Lunjar (N. of Kumaon).

Dist.:- Tibet.

22. Nepeta leucolaena Benth. ex Hook. f. Fl. Brit. Ind. iv, 662.

Erect herb, 60-100 cm. high, white-tomentose; stem simple or branched, subterete. Leaves shortly petioled or sessile, 1-3 cm. long, ovate, acute or obtuse, subcordate at the base, white-tomentose on both sides or only below. Whorls few-flowered, lower axillary, upper forming a much interrupted spike; lower whorls shortly peduncled upper sessile; bracts linear-lanceolate, shorter than or equalling the calyx. Calyx about 5 mm. long, tube narrow, villous, mouth oblique, teeth much shorter than the tube, upper triangular slightly longer than the lower subulate teeth. Corolla 15-20 mm. long, tube slender curved, limb funnel-shaped, lips short. Nutlets 1.5 mm. long, linear-oblong, smooth.

Habitat:- Eastern Kashmir, 3,500-4,500 m.

Dist.:- Tibet.

23. Nepeta salvaefolia Royle ex Benth. in Hook. Bot. Misc. iii (1833) 379 and in DC. Prodr. xii 388. Hook. f. Fl. Brit. Ind. iv. 664.

Erect slender herb 30-60 cm. high, white-tomentose all over; stem terete. Leaves thick and rugose, shortly petioled, oblong or ovate-oblong, obtuse, crenate, rounded or cordate at the base, lamina 3 cm. long, densely tomentose above, closely beneath; petiole .5-1 cm. long. Cymes dense-flowered, peduncled, distant, in long terminal raceme, sometimes forming axslender panicle; bracts minute, subulate. Calyx 6 mm. long, pedicelled, scaberulous, mouth slightly oblique; the subequal, shorter than the tube. Corolla pale blue or white, 15-18 mm. long; tube very slender, slightly dilated near the mouth, lips short. Nutlets 2 mm. oblong, black, smooth.

Habitat:- Kashmir, 2,000-4,000 m.

Dist.:- Tibet; Eastern Turkistan.

24. Nepeta Govaniana Benth. Lab. Gen. et Sp. 482; DC. Prodr. xii, 388; Hook. f. Fl. Brit. Ind. iv. 663; Collett Fl. Sim. 399. Dracocephalum Govanianum Wall. Pl. As. Rar. ii, 65 and Cat. 2127.

Tall erect herb, 60-120 cm. high, finely pubescent. Leaves large, petioled, ovate or ovate-oblong, acute, crenate, rounded at the base, the upper leaves rarely crenate, finely pubescent or glabrate; lamina 5-15 cm. long, 3-8 cm. broad; petiole 2-5 cm. long. Cymes few-flowered, distant, long-peduncled, in axillary and terminal racemes forming loose panicles; bracts minute. Calyx 6-8 mm, pedicelled, puberulous, tube straight, cylindrical; teeth triangular much shorter than the tube. Corolla about 2.5 cm. yellow, tube curved, slender below, greatly dilated above. Nutlets 1.5 mm, broadly oblong, very minutely granular. Habitat:- Kashmir, Hazara, Kumaon, 2,500-3,500 m.

25. Nepeta erecta Benth. Lab. Gen. et Sp. 482; DC. Prodr. xii 388; Hook. f. Fl. Brit. Ind. iv. 663; Collett Fl. Sim. 399. Dracocephalum erectum Royle ex Benth. in Hook. Bot. Misc. iii 380.

27. Nepeta macrantha Lid. Herb. Ind. Or. H. f. & T. xix 181. Tall erect herbs, 30-100 cm. high, finely pubescent, stem obtusely quadrangular. Leaves petioled, ovate or oblong, acute, crenate, rounded or subcordate at the base, finely puberulous or glabrate on both sides; lamina 5-8 cm. long, petiole 1-2 cm. long. Whorls many-flowered, distant, lower ones axillary, upper forming a long terminal spike; lower whorls peduncled, bracts minute, linear; flowers pedicelled. Calyx 8 mm. long; pubescent curved, cylindrical or tubular-campulate, mouth oblique; teeth triangular, much shorter than the tube. Corolla blue, 2-2.5 cm.

long, curved; sparingly hairy; tube very slender below, abruptly dilated at the mouth; lips short. Nutlets broadly oblong, 2 mm. smooth, deep brown in colour.

Habitat:- Kashmir; N. W. Fr. Province; Punjab; Kumaon.

26. Nepeta Clarkei Hook. f. Fl. Brit. Ind. iv. 663.

Tall erect plants, 60-100 cm. high; stem strict, obtusely quadrangular, finely pubescent or villous. Leaves petioled, ovate-oblong or -lanceolate, acute, more or less obtusely crenate, cordate or truncate at the base, densely or sparsely puberulous; lamina 2-5 cm. long, petiole 1-2 cm. long. Whorls dense-flowered, distant, in long terminal spikes, lower often peduncled; bracts longer than or equalling the calyx, outer bracts lanceolate, inner linear. Calyx 8 mm. long, shortly pedicelled, pubescent, nearly straight, mouth oblique; teeth subequal triangular acute, much shorter than the tube. Corolla 15 mm. long, blue, tube slender, mouth dilated, lips small. Nutlets 2 mm. long, linear, smooth.

Habitat:- Kashmir; N.W. Fr. Province.

27. Nepeta pinetorum, Aitchison & Hemsley. Journ. Linn. Soc. xix 183.

Erect or ascending perennial herb, 30-60 cm. high; stem and branches slender, glabrous, glossy, slightly greenish in colour. Leaves shortly petioled, slightly thick, cordate-ovate, or cordate-orbicular, obtuse, broadly toothed, puberulous on both sides, lamina 2.5 cm. in diam., petiole .5-1.5 cm. long. Whorls axillary or terminal sometimes forming a short spike, lower whorls long peduncled, upper sessile; bracts minute, setaceous. Calyx 7 mm. long, slightly curved, glandular hirsute outside, pilose at the throat, teeth much shorter than the tube, acute triangular.

Corolla 17-20 mm. long, tube slender, lips short, subequal, upper shortly bipid, lower sinuate. Nutlets oblong, dark brown, minutely tubercular, 2 mm. long.

Habitat:- N. W. Frontier.

Dist.:- Afghanistan.

28. Nepeta glomerulosa Boiss. Diagn. ser. 1. V. 21; Benth. in DC. Prodr. xii 379; Boiss. Fl. Orient. iv. 651; Prain Journ. As. Soc. Beng. lix, II No. 4 (1890) 305.

N. juncea Benth., in DC. Prodr. xii 379; Boiss. Fl. Orient. iv. 651.

N. glomerata Herb. Ind. Or., not of Monch and Auch.

Dwarf shrubby plants, much branched from the woody base, 20-50 cm. high; branches slender, hoary tomentose. Leaves slightly thick rugose, petioled below, sessile above, deltoid-ovate, obtuse crenate, truncate or subcordate at base, lamina .7-1.5 cm. long; petiole shorter. Whorls small, few-flowered, lower pedunculate, distant, upper sessile in interrupted narrow spikes forming branching panicles; bracts membranous ovate acute entire, equalling the calyx, or shorter. Calyx 5 mm. long, hirsute, mouth oblique, teeth lanceolate shorter than the tube. Corolla 7 mm. long. Nutlets 2 mm. long, minutely tuberculated.

Habitat:- Punjab frontier; Beluchistan.

Dist.:- Afghanistan; Persia.

29. Nepeta lagopsis Benth. in DC. Prodr. xii 397; Boiss. Fl. Orient. iv 640; Prain in Journ. As. Soc. Beng. lix, II. no. 4. 305.

Much branched, erect or prostrate herb, branches slender, 10-40 cm. long; softly hirsute all over with spreading white hairs. Leaves short petioled, ovate obtuse, coarsely and obtusely toothed;

lamina 1-1.5 cm. in diam., petiole .5-.75 cm. long. Flowers in dense axillary whorls; whorls distant, subsessile or shortly peduncled, bracts subulate as long as the calyx. Calyx 5 mm. long, softly hairy, teeth subulate, nearly as long as the tube. Corolla 8 mm. long.

Habitat:- Western Punjab.

Dist.:- Afghanistan.

30. Nepeta mollis Benth. Lab. Gen. et Sp. 734; DC. Prodr. xii 378; Hook. f. Fl. Brit. Ind. iv. 660.

Erect slender herb, 15-45 cm. high, with a woody rootstock, softly tomentose. Leaves petioled, ovate obtuse cordate or truncate at the base, crenate or subcrenate, finely puberulous, slightly rugose above, hoary tomentose beneath; lamina 2-5 cm. long, and nearly as broad; petiole slender 1-1.5 cm. long, or much shorter. Cymes few-flowered, forming a long slender interrupted spike often confluent above; lower whorls sometimes axillary; bracts elliptic ovate or lanceolate, awned. Calyx 6 mm. long, villous, often decurved, mouth oblique, teeth lanceolate shorter than the tube. Corolla rose-coloured, tube shortly exerted, limb small. Nutlets 1.5 mm. long, oblong-ovate, dark brown in colour, minutely tuberculate.

Habitat:- Kashmir; Punjab; N. W. Fr. Province; Kurran Valley.

31. Nepeta ciliaris Benth. Wall. Pl. As. Rar. i. 64; Lab. Gen. et Sp. 475, in DC. Prodr. xii 379; Wall. Cat. 2082; Hook. f. Fl. Brit. Ind. iv. 661; Collett Fl. Sim. 397.

Erect slender herb about 30-100 cm. high, softly tomentose. Leaves petioled, ovate obtuse crenate, base cordate or truncate,

puberulous above, hoary tomentose below; lamina 2-4 cm. long and nearly as broad, petiole 1-2 cm., orvshorter. Spikes 10-20 cm. long, villous, much interrupted, whorls peduncled or sessile, sometimes secund, bracts lanceolate, or linear, often tinged with purple. Calyx 5-6 mm. long in fruit; densely villous, tube curved, teeth linear lanceolate, shorter than the tube. Corolla hairy lilac, 8 mm. long, tube slender, shortly exserted. Nutlets 1.5 mm. long, broadly ellipsoid, dark brown, minutely tubercular.

Habitat:- Kashmir; Punjab; Garwhal.

32. Nepeta distans Royle ex Benth. Hook. Bot. Misc. iii, 379.

Lab. Gen. et Sp. 475, and in DC. Prodr. xii 378; Hook. f. Fl. Brit. Ind. iv. 660; Collett Fl. Sim. 397.

Erect herb often tufted from a woody base, 15-50 cm. high; stem slender, tube below, quadrangular above, softly tomentose. Leaves petioled, ovate-cordate or oblong or lanceolate, obtuse, crenate, hirsute or tomentose, sometimes slightly thick and rugose; lamina, 1.5-3 cm. long, petiole .5-1 cm. long, shorter upwards. Spikes terminal, short or long, usually interrupted, whorls sessile or subsessile; bracts narrowly linear. Calyx glabrous or nearly so, 7-8 mm. long, curved, mouth oblique, teeth linear-lanceolate, acute, much shorter than the calyx. Corolla tube much longer than the calyx, pale lilac in colour. Nutlets 1.5 mm. oblong-ovate, dark brown, minutely tubercular.

Habitat:- Kumaon; Punkab; N.W. Fr. Province; Kurrum Valley.

33. Nepeta Prainii Duthie. Ann. Bot. Gard. Calc. ix 63.

Erect herb, 30-45 cm; stems many from a woody rhizome, scabrous, lower portions hispid with stiff spreading hairs.

35. Nepeta Cataria Linn. Sp. Pl. 570. Benth. in DC. Prodr. xii 303; Boiss. Fl. Orient. iv 643; Reichl. Ic. Fl. Germ. xviii f. 1242; Hook. f. Fl. Brit. Ind. iv. 662.

N. calaminthoides Benth. in DC. Prodr. xii 383 in parts.

N. ruderalis var. clinopodioides Herb. Ind. Or. H.f. and T.

N. ruderalis Boiss. Fl. Orient. iv 644.

Erect perennial herb 60-100 cm. high, stem and branches acutely quadrangular, hoary pubescent. Leaves petioled, ovate acute, cordate or truncate at the base, coarsely crenate, finely tomentose on both sides, often slightly hoary beneath; lamina 2-5 cm. long; petiole 1-2 cm. long or shorter. Spikes terminal, strict, narrow, 10-20 cm. long or more, forming panicles, cymes peduncled, dense-flowered, bracts subulate equalling the calyx or shorter; flowers pedicelled. Calyx 6 mm. long, pubescent, curved, mouth oblique, teeth subulate, subequal shorter than the tube. Corolla 12 mm. long, dotted with purple, tube exserted. Nutlets 1.5 mm. broadly oblong, smooth, brownish black.

Habitat:- Kashmir; N.W. Fr. Province; Kurrum Valley; Beluchistan.

Dist.:- Afghanistan.

36. Nepeta micrantha Bunge in Ledeb. Fl. Alt. 2. 401, and Lab. Persic. 56; Benth Lab. Gen. et Sp. 470, and in DC. Prodr. xii 382; Boiss. Fl. Orient. iv 664; Ledeb. Icon. tab. 412.

N. Meyeri Benth. Lab. 478.

N. pallida C. Koch Linn. XXI 675.

Erect annuals, 30-60 cm. high, or smaller, simple or branching below, finely pubescent. Leaves petiolate, ovate, acute serrate, rounded or cuneate at the base; lamina 2-4 cm. long, 1-2 cm. broad; petiole .5-2 cm. cymes opposite, lower long peduncled, upper sessile, forming a paniculate inflorescence, bracts linear-lanceolate, 1/3 as

long as the calyx. Calyx 6mm. in fruit, pubescent, striate,
Leaves ovate-lanceolate, obtuse, rounded or cordate at the base,
coarsely crenate, rugose above, prominently veined beneath; lower
leaves long-petioled, upper smaller and sessile. Spikes inter-
rupted; whorls many flowered, lower ones much distant and pedi-
celled, upper ones close, sessile; bracts smaller than the calyx,
linear lanceolate or setaceous, hispid with stiff spreading hairs.
Calyx hispid with spreading hairs; tube cylindrical, curved, red-
dish-purple; mouth oblique, villous within; teeth lanceolate
acuminate, much shorter than the tube, fruiting calyx 7-8 mm.
Corolla exserted, upperlip erect, obcordate, lower deeply 3-lobed,
hairy inside; sidelobes rounded, midlobe large lobulate, stamens
slightly exserted, anterior pair attached lower down; filaments
hairy below. Nutlets about 2 mm. long, oblong-ovate, muriculate.
Habitat:- N. W. Frontier, Kurrum Valley; - Duthie's collection
No. 15432! Samana range, E. C. Hare.

34. Nepeta leucophylla Benth. Lab. Gen. et Sp. 476; DC. Prodr.
xii 381; Wight Ill. t. 176, bis. f. 6.; Hook. f. Fl. Brit. Ind.
iv. 662; Collett Fl. Sim. 398.

Erect or ascending slender herb, 60-100 cm. high, hoary
tomentose. Leaves shortly petioled ovate, obtuse or acute,
crenate, base cordate or truncate or sometimes rounded, rugose
or glabrescent above, densely white-tomentose below. Spikes
villous, very long, interrupted, whorls dense-flowered, lower
whorls distinctly peduncled, upper sessile; bracts subulate,
as long as the calyx. Calyx 6 mm. villous, mouth oblique, teeth
linear-lanceolate, shorter than the tube. Corolla lilac, or blue,
12 mm. long, tube exserted. Nutlets, 1.5 mm. oblong, smooth.
Habitat:- Simla; Kumaon. Duthie Fl. Upp. Gang. Pl. II 254.

N. secundata Wall. Cat. 3122.

N. calamitoides Benth. in DC. Prodr. xii, in part.

long as the calyx. Calyx 6mm, in fruit, pubescent, striate, subincurved or oblique; teeth lanceolate about $\frac{1}{4}$ as long as the tube, the upper slightly longer, lower but in front. Corolla 8 mm.; tube exerted. Nutlets dark brown, faintly granular punctate, oblong 1.5 mm. long.

Habitat:- Beluchistan.

Dist.:- Persia, W. Asia.

• Nepeta bombaiensis Dalz. in Dalz. & Gibs. Bomb. Fl. 209; Hook. f. Fl. Brit. Ind. iv. 66; Cooke. Fl. Bomb. II. 473.

Small erect herbaceous plant about 30 cm. high, stem and branches obtusely quadrangular tomentose or laxly villous with soft white hairs. Leaves petioled, rounded-ovate, cordate, or subcordate at base, coarsely crenate, finely pubescent on both sides; lamina 3-5 cm. long; petiole 1.5-3 cm. long. Cymes pedunculate, axillary, 6-8-flowered, peduncles about 2.5 cm. long; bracts elliptic-lanceolate, acuminate, pedicels as long as the calyx. Calyx 6-8 mm. long, laxly pubescent; teeth much shorter than the tube; the upper 3 broad, triangular, acute, 2 lower subulate, smaller than the upper. Corolla very small, pale blue with purple spots. Nutlets 1.5 mm. narrowly ellipsoid, smooth, dark brown, dotted with white.

Habitat:- Bombay, Concan only.

38. Nepeta hindostana (Roth) Haines, Fl. Bihar & Oriss. 744.

Nepeta ruderalis Buch. Ham. Benth. in Wall. Pl. As. Rar i. 64; Lab. Gen. et Sp. 475, and in DC. Prodr. xii 381; (Hook. f. Fl. Brit. Ind. iv. 661; Collett. Fl. Sim. 398; Prain. Beng. Pl. 857; Cooke Fl. Bomb. 472; Duthie Fl. Upp. Gang. Pl. II 254.

N. secunda Wall. Cat. 2122.

N. calaminthoides Benth. in DC. Prodr. xii, in part.

N. clinopodioides Royle ex Benth. in Hook. Bot. Misc. iii 379; Lab. Gen. et Sp. and in DC. Prodr. xii 382.

Glechoma hindostana Roth. Nav. sp. (1821) 259.

Glechoma indica Spr. Syst. ii (1825) 727.

Glechoma erecta Roxb. Fl. Ind. ii 7.

Thymus nepetoides Don. Prodr. 113.

Erect or ascending annual 15-40 cm; stem robust or slender, obtuse angled; grooved; branching from the base, finely pubescent or hoary. Leaves petioled, broadly ovate- or orbicular, obtuse, crenate, cordate at the base; greenish or hoary on both sides; lamina 1.5-6 cm. long; petiole 1-2 cm. long. Flowers in dense, usually long-peduncled cymes, about 2 cm. in diam. forming a slender panicle or an interrupted spike; bracts setaceous. Calyx 4 mm. long, villous, oblique at the mouth; the 3 upper teeth triangular aristate, 2 lower filiform, smaller than the upper. Corolla blue-purple, 6 mm. long; tube shortly exserted; upper lip, flat, oblong, 2-fid, hairy; lower lip with 2-fid lateral lobes and a large emarginate and slightly obtusely crenate midlobe. Stamens slightly exceeding the upper lip of corolla; Nutlets, 1 mm. broadly oblong, brown with white dots.

Habitat:- Bengal; Bihar; U. P.; Kumaon; N. W. Fr. Province; Rajputana; Concan.

Dist.:- Afghanistan.

39. Nepeta graciliflora Benth. Wall. Pl. As. Rar. i 65. Lab. Gen. et Sp. 476; and in DC. Prodr. xii 382; Wall. Cat. 2123; Collett Fl. Sim. 399; Duthie Fl. Upp. Gang. Pl. II 255.

Very slender, erect or ascending herb, stems many, 30-100 cm. long, branching from the base, pubescent or nearly glabrous. Leaves long-petioled, triangular-ovate, acute, cordate or truncate at the base, coarsely serrate or crenate, glabrescent on both sides;

lamina 1.5-2.5 cm. long; petiole slender, as long as the lamina. Whorls few-flowered, long peduncled, axillary and terminal forming loose, drooping panicles with very slender branches; bracts setaceous, minute. Calyx 4 mm. long, pubescent or glabrous, mouth slightly oblique; teeth aristate, shorter than the tube, upper lip slightly longer than the lower. Corolla 6-8 mm. long; lilac or rose in colour. Nutlets 1 mm., oblong, granulate.
Habitat:- Punjab, Gharwal, Kumaon, 1,525 m.

40. Nepeta chenopodiifolia Stapf in Deutschr. Acad. Wien. 1, (1885) 46; Bourkill in Fl. Pl. Baluch. 60.

N. pungens Benth. Lab. Gen. et Sp. 487; Boiss. Fl. Orient. iv. 666, excluding the synonyms N. pussila and Zizyphore pungens.

Erect herbs, about 15 cm. high, branching from the base, glabrescent or sparsely hairy. Leaves petiolate, slightly fleshy, ovate, acute, acutely toothed, decurrent to the petiole, glabrate or slightly hoary; petiole slightly thickened near the base. Racemes subsimple, lower whorls distant, close above; bracts foliaceous, prominently nerved, acute, rigid and subspinous, longer than the calyx. Calyx tubular, mouth almost equal, pubescent outside, throat villous, teeth linear, rigid, subequal, pubescent; fruiting calyx 6 mm.; slightly inflated below. Corolla slightly longer than the calyx; tube slender not inflated in the mouth; upper lip ovate entire, lower 3-lobed, the mid-lobe crenate.

Habitat:- Baluchistan; Chitral, Harris 16501.

Dist.:- Afghanistan, Persia.

41. Nepeta suavis Stapf. in Kew Bull. 1896, 19.

Afridia Nepetaeformis Duthie. in An. R. B. G. Cal. ix (1901) 64, and Pl. 78.

Hoary under shrub, 30-60 cm. high, usually branching from the base, simple above. Leaves shortly petioled, 1.5-5 cm. long, ovate or ovate-lanceolate, obtuse, crenate, cordate at the base, rugose above, prominently veined beneath. Whorls dense-flowered, close, forming a terminal spike; bracts leaf-like; bracteoles membranous, shorter than the calyx, ovate, acute or acuminate; flowers dimorphic, hetero-styled. Calyx 6 mm. long, tubular, laxly villous, slightly tinged with reddish purple; mouth oblique, entire. Corolla pale yellow, tinged with lilac, 10 mm. long, hairy outside; tube slender, curved, slightly exserted, not hairy within. Stamens subequal, exserted in the short-styled form, included in long-styled one. Nutlets obovoid, minutely tuberculate.

Habitat:- Kurrum Valley; Samana Range and Tirah.

Dist.:- Afghanistan.

Herbs, annual or perennial, often suffruticose; leaves entire or pinnatisect. Whorls many-flowered; axillary or in terminal spikes; bracts entire or with long teeth. Calyx tubular 5-lobed, erect, rarely incurved, 2-lipped; upper lip 2-lobed, teeth connate at base; lower lip 2- or 4-lobed. Corolla-tube slender at the base dilated above, exserted, naked within; limb bilabiate; upper lip erect, entire, concave; lower lip 3-lobed, central lobe larger, notched. Stamens 4, upper longer, parallel, ascending under the upper lip; anthers 2-celled with divergent cells, or unilocular, or obsolete. Disk dilated in front. Style equal bifid at the apex. Nutlets smooth.

A. Calyx distinctly bilabiate and deeply cleft;
upper lip 3-toothed.

B. Bracts with long-toothed teeth.

C. Leaves pinnatifid Rapaostil

D. Leaves crenate or serrate.

E. Calyx 8-9 mm.; corolla blue. Meliavisa

Dracocephalum, Linn.

F. Calyx Corolla

white heterophyllum

Gen. n. 729; Endl. Gen. Pl. 620; Benth. Lab. Gen. et
Sp. 490, and in DC. Prodr. xii 396; Boiss. Fl. Orient. iv,
671; Hook. f. Fl. Brit. Ind. iv, 664; Benth. ex Hook. f.
Gen. Pl. II, 1199; Briq. in Eng. & Pr. Nat. Pflanzenf. iv, 3,
a, 238; Kudo in Mem. Fac. Sc. & Agri. II, 2, (1929) 237.

Herbs, annual or perennial, often suffruticose; leaves
entire or pinnatisect. Whorls many-flowered, axillary or
in terminal spikes; bracts entire or with long teeth. Calyx
tubular 15-nerved, erect, rarely incurved, 2-lipped; upper
lip 3-fid, teeth connate at base; lower lip 2- or 4-fid.
Corolla-tube slender at the base dilated above, exserted, naked
within; limb bilabiate; upper lip erect, entire, concave;
lower lip 3-fid, central lobe larger, notched. Stamens 4,
upper longer, parallel, ascending under the upper lip; anthers
2-celled with divergent cells, or unilocular, or obsolete.
Disk dilated in front. Style equal bifid at the apex. Nut-
lets smooth.

- A. Calyx distinctly bilabiate and deeply cleft; upper lip 3-toothed.
 - B. Bracts with long-awned teeth.
 - C. Leaves pinnatifid Ruprechtii
 - C. Leaves crenate or serrate.
 - D. Calyx 8-9 mm.; corolla blue. ... Moldavica
 - D. Calyx 15-25 mm.; corolla white heterophyllum
 - B. Bracts entire.
 - A. Calyx scarcely bilabiate, shortly cleft; upper tooth much the largest.
 - B. Leaves orbicular-ovate, 3-6 cm. in breadth or more speciosum
 - B. Leaves ovate or oblong, about 1 cm. in breadth or less nutans
 - A. Calyx not bilabiate, teeth all equal or subequal.
 - B. Leaves long-petioled stamineum
 - B. Leaves sessile.
 - C. Leaves pinnatisect tanguticum
 - C. Leaves entire Hemsleyanum

Erect branching shrub. Leaves 3-7 cm. long, sessile or petioled, lanceolate, serrate, obtuse or rounded at apex, glabrous. Petiole slender. Flowers in axillary whorls, forming a leafy interrupted spike 10-25 cm. long; flowers pedicelled; bracts lanceolate sessile, serrate, teeth with long awns. Calyx 8-9 mm. long, glabrous, distinctly 2-lipped, upper lip broad, with 3 short ovate mucronate teeth; lower lip narrower, with 2 long lanceolate, acuminate teeth. Corolla 2-3 cm.

1. Dracocephalum Ruprechtii Regel Deset. Act. Hort. Petrop. vi (1879) 363; Hook. f. Fl. Brit. Ind. iv, 666.

D. bipinnatum, Rupr. Serf. Thianschen, 65 (ex Regel).

Erect herbs with simple or branched rigid stems, woody at the base, 20-40 cm. long. Leaves 2-3.5 cm., sessile, rarely the one or two pairs of the lower leaves have short winged petioles; pinnatifid, with linear lobes, glabrous. Flowers in long spikes with distant whorls, bracts linear-oblong with long-awned teeth; flowers shortly pedicelled. Calyx 12-15 mm. long, glabrous, often purple, upper lip broad larger than the lower, 3-toothed, teeth short broadly ovate mucronate; lower lip with 2 lanceolate acuminate teeth. Corolla 25-35 mm. long, pubescent, blue in colour. Stamens included. Nutlets oblong, truncate pale yellow, 3 mm. long. Habitat:- Kashmir, Gilgit & Astor. Dist.:- Western Tibet; Turkestan.

2. Dracocephalum Moldavica Linn. Sp. Pl. 595. Europ; As. bor. Benth. in DC. Prodr. xii, 401; Hook. f. Fl. Brit. Ind. iv, 665.

Erect branching annuals, 30-60 cm. high, glabrous. Leaves 2-7 cm. long, sessile or petioled lanceolate, serrate, obtuse or rounded at the apex, base cuneate or rounded; glabrous, petiole slender. Flowers in axillary whorls, forming a leafy interrupted spike 10-20 cm. long; flowers pedicelled; bracts lanceolate sessile, serrate, teeth with long awns. Calyx 8-9 mm. long, glabrous, distinctly 2-lipped, upper lip broad, with 3 short ovate mucronate teeth; lower lip shorter, with 2 long lanceolate, acuminate teeth. Corolla 20-25 mm.

long, blue; tube slender below greatly dilated at the throat. Stamens slightly exerted or included. Nutlets about 2 mm. oblong, dark brown, truncate.

Habitat:- Kashmir; N. W. India.

Dist.:- N. Asia; Europe.

3. Dracocephalum heterophyllum Benth. Lab. Gen. et Sp. 738 and in DC. Prodr. xii 401; Hook. f. Fl. Brit. Ind. iv, 665. D. acanthoides, Edgw., ex Benth. in DC. l.c.

Small herbs 15-25 cm. high; stem usually simple, stout, ascending, glabrous or scaberulous. Leaves 2-6 cm. long, petioled, oblong ovate subcordate, obtuse, crenate, or sometimes serrate, glabrescent, glandular punctate below; petiole slender, 1-3 cm. long. Spikes large, dense-flowered, about 3 cm. in diam., much interrupted or with closer whorls above; bracts green and membranous, obovate, teeth long-awned. Calyx 15-25 mm. long, membranous, distinctly 2-lipped, glabrous or pubescent; upper lip broad larger than the lower lip, 3-toothed teeth short broadly ovate, aristate; lower lip 2-toothed, teeth lanceolate acuminate. Corolla 2-3 cm. long, white, densely hairy pubescent, tube slender, mouth inflated, lower lip short. Stamens included. Nutlets 3-5 mm. long, narrowly obovate, truncate and often crenulate at the top, rusty brown in colour.

Habitat:- N. W. Himalaya - Pangri, (Rev. A. W. Hyde) 11-16500, Sikkim - 1600, Giagong- (Smith & Cave, Prain).

Dist.:- Tibet; Eastern Turkestan.

4. Dracocephalum glechomifolium Dunn. Kew Bull. 1921, 122.

Erect herbs about 30 cm. high, with numerous short branches, fewer below. Leaves petiolate, broadly ovate, rotundate subcordate, closely and regularly crenate, nerves somewhat prominent, lamina 1.5-2 cm., petiole as long as the blade, suddenly attenuated. Flowers crowded in terminal globose spicate heads, sometimes interrupted below; bracts linear or linear lanceolate, membranous at the margin. Calyx 1 cm. long, hoary pubescent, bilabiate, upper lip with 3 narrowly lanceolate teeth, lower lip 2-toothed, teeth similar. Corolla yellow, hoary pubescent; tube exserted, narrow, expanded above; throat glabrous, lips extended, upper erect oblong, bilobed; lower broadly ovate, 3-lobed. Stamens included under the upper lip.

Habitat:- N.W. Frontier, Chitral, Madaglast, Toppin 564.

5. Dracocephalum speciosum Benth. Wall. Pl. As. Rar. ii, 65. Lab. Gen. et Sp. 494, and in DC. Prodr. xii 399; Hook. f. Fl. Brit. Ind. iv, 665.

Tall/robust herbs, with erect simple stem and very thick and fleshy fibrous roots. Leaves orbicular ovate, subcordate, crenate, sparsely hairy on both sides densely on the nerves beneath; leaf blade about 3-10 cm.; petiole slender, 10-30 cm., in radical leaves much shorter or almost none in cauline leaves. Flowers in large compact terminal spicate heads; or small axillary clusters; bracts small orbicular. Calyx coriaceous, 12-13 mm. long, distinctly bilabiate, ovate, acute, lower lip 2-4-toothed, lanceolate. Corolla 2.5 cm. long, tubular, lips short, pubescent, blue purple with dark spots. Stamens slightly exserted. Nutlets 4 mm. long, linear oblong,

truncate and crenate at the top, dark brown in colour.

Habitat:- Alpine Himalaya; Simla; Garhwal; Nepal
Sikkim; Bhutan; Tibet.

6. Dracocephalum nutans Linn. Sp. Pl. 596; Benth. Lab.
Gen. et Sp. 499, and in DC. Prodr. xii, 400; Hook. f. Fl.
Brit. Ind. iv, 665.

Zorina nutans Moench. Meth. 411; Gmel. Fl. Sibir. iii,
231, t. 49.

Scaberulous herbs with ascending, simple or branched, 4-
angled stems; 15-30 cm. high. Leaves slightly thick, 1.5-
3 cm. long, ovate or oblong, obtuse, crenate, glabrescent on
both sides; petiole 2 cm. long or much shorter. Spikes
5-10 cm. long, interrupted, or compact above, whorls dense-
flowered; lower whorls axillary; bracts ovate or oblong;
flowers sessile or shortly pedicelled. Calyx coriaceous,
puberulous tubular, 7-8 mm. long; 5-toothed, with a broad
ovate upper tooth, larger than the 4 lower setaceous, calyx
often purple. Corolla about 15 mm. long, bright blue; tube
slender. Stamens included. Nutlets 2 mm. long, linear-
oblong, greenish yellow.

Habitat:- Kashmir; N. W. India, Zirat, Hazara.

Dist.:- Central Asia.

7. Dracocephalum stamineum Kar & Kir Bull. Soc. Nat. Mosc.
xv (1842) 423; Hook. f. Fl. Brit. Ind. iv, 666.

Small diffuse herbs with numerous ascending branches
from the base; branches often purple. Leaves few, long
petioled, oblong orbicular or sometimes reniform, deeply

crenate; lamina 1-1.5 cm. in diam., or less, sometimes rugose, glabrous or pubescent, petiole 2-5 cm. long or in lower leaves sometimes as long as 10 cm., very slender. Flowers in dense terminal heads, with one or two whorls more, lower on the stem; bracts minute, entire or toothed, the lower teeth often awned. Calyx 6-8 mm., tomentose, tubular, subequally 5-toothed, teeth ovate lanceolate aristate. Corolla 9-11 mm. long, dark blue in colour, finely pubescent, tube shortly exserted, limb short. Stamens exserted, filaments sometimes twice as long as the corolla tube. Nutlets 2 mm.; oblong, dark brown.

Habitat:- Kashmir;

Dist.:- Tibet; Turkestan; Siberia.

8. Dracocephalum tanguticum Maxim. Bull. Acad. Petersb. xxvii (1881) 530; Mel. Biol. xi, 307; Kudo in Mem. Fac. Sc. & Agri. II, 2, (1929) 238; Prain. Journ. of As. Soc. Beng. lix (1890), 306.

D. Hookery Clarke ex Hook. f. in Fl. Brit. Ind. iv, 666.

Small erect herbs, with usually simple stem, densely puberulous. Leaves 2-3 cm. long, sessile, pinnatisect, segments few, spreading, narrowly-linear, obtuse, margins revolute. Flowers in terminal spicate heads, or dense spikes interrupted below; bracts pinnatisect shorter than the calyx. Calyx tubular-campanulate, slightly curved 12-16 mm. long, pubescent, 5-toothed, teeth shorter than the tube lanceolate acuminate; sinus thickened. Corolla bright violet, 25-30 mm. long, tube narrow, inflated at the throat; upper lip bifid, lower 3-lobed the median lobe largest. Stamen included or subexserted. Nutlets 3 mm. long, black, obovate oblong, slightly trigonous,

truncate at the apex.

Habitat:- Sikkim.

Dist.:- Tibet; China.

Lallemantia Fisch. ex May.

9. Dracocephalum Hemsleyanum in Journ. Linn. Soc. Vol. XLVIII, (1929) 218. Fl. Brit. Ind. iv, 656; Benth. ex Hook.

Nepeta Hemsleyana Oliver ex Hemsl. apud Frain in Journ. As. Soc. Beng. lix, 305. Fl. Brit. Ind. ii, 336.

Tall erect herbs, much branched above, 60-80 cm. high, finely pubescent or tomentose. Leaves sessile, 5 cm. long, narrowly ovate lanceolate, acute, base cuneate, margin entire rarely or distantly serrate, densely or sparingly hairy on both surfaces. Flowers in axillary whorls, peduncled; bracts and bracteoles linear. Calyx tubular, 12 mm. long, finely hirsute, teeth subequal, triangular acute. Corolla 2.5 mm. long, bluish violet, tube very slender below, gradually expanded to a wide limb. Stamens included or slightly exerted; filaments prolonged beyond the anthers. Nutlets narrowly ovate, 2 mm. long. Date. Nutlets ovoid, smooth.

Habitat:- Bhutan, Lungtiya J. C. White; S. E. Thibet, - King's collector, Capt. H. J. Walton; Capt. F. K. Ward, 6174. Lama Ujgen Gyatska, No. 93.

Lallemantia Boyliana Benth. in DC. Prodr. xii, 404;
Boiss. Fl. Orient. iv, 574; Hook. f. Fl. Brit. Ind. iv 667.

Dracopis Boyliana Benth. in Wall. Pl. As. Bar.

1, 65, and Lallemantia Fisch. ex May. Cat. 2129.

D. indurata Kar & Kir in Bull. Soc. Imp. Mosc. xv. 424.

Ind. Sc. Hort. Petrop. vi, 52; Benth. in DC. Prodr.
xii, 404; Hook. f. Fl. Brit. Ind. iv, 666; Benth. ex Hook.
f. Gen. Pl. II, 1200; Briq. in Eng. & Pr. Nat. Pflanzenf. iy,
3, a, 240; Post. Fl. Syria, etc. II, 366.

Annual or biennial herbs; leaves petioled, floral
sessile. Whorls few-flowered, axillary; bracts ciliate-
dentate. Calyx tubular, 15-nerved, mouth somewhat oblique,
5-toothed, the uppermost tooth broader. Corolla-tube included
or slightly exserted, slender below, slightly dilated above;
upper lip concave, emarginate or notched, furnished with 2
arched folds near the sides; lower lip spreading 3-fid, cent-
ral lobe larger. Stamens 4, ascending, close, upper longer;
anthers 2-celled, cells diverging. Disk equal or shortly
produced to an anterior gland. Style shortly 2-fid at the
apex; lobes subequal, subulate. Nutlets ovoid, smooth.

Habitat: - Hunan; The Punjab; Baluchistan; N. W. Pr.
Province.

Dist.: - Afghan-----Turkestan.

Lallemantia Royleana Benth. in DC. Prodr. xii, 404;
Boiss. Fl. Orient. iv, 674; Hook. f. Fl. Brit. Ind. iv 667.

Dracocephalum Royleanum Benth. in Wall. Pl. As. Rar.
i, 65, and Lab. Gen. et Sp. 497; Wall. Cat. 2129.

D. inderiense Kar & Kir in Bull. Soc. Imp. Mosc. xv, 424.

Nepeta erodifolia Boiss. Diagn. v, 24.

Erect annuals, 15-45 cm. high, stem branched or simple,
hoary pubescent or glabrate. Leaves petioled, 2-5 cm. long
ovate or oblong, obtuse, coarsely crenate, base cordate
rounded or narrowed to the petiole; petiole 1-2 cm. or shorter
slender. Flowers in numerous whorls in long interrupted
spikes; flowers shortly pedicelled, pedicels flat, slightly
enlarged and very hard in fruit; flowers and especially the
pedicels adpressed to the rachis; bracts small, deciduous,
oblong or lanceolate with long awned teeth at the margin.
Calyx 6-8 mm. long, erect, tubular shortly 2-lipped, upper lip
with 3 teeth, lower two toothed, teeth erect with incurved
margins. Corolla pale lilac, tube hardly exerted, lips
short. Stamens included. Nutlets 2.5 mm., black, smooth,
narrowly oblong.

Habitat:- Kumaon; The Punjab; Baluchistan; N. W. Fr.
Province.

Dist.:- Afghanistan; Persia; Turkestan.

Scutellaria, Linn.

Gen. n. 493; Endl. Gen. Pl. 620; Benth. Lab. Gen. et Sp. 419, and in DC. Prodr. xii 412; Boiss. Fl. Orient. iv 681; Hook. f. Fl. Brit. Ind. iv 667; Benth. ex Hook. f. Gen. Pl. II 1201; Briq. in Eng. and Pr. Nat. Pflanzenf. iv, 3, a, 225; Baker in Thiselton & Dyer Fl. Trop. Afr. v 461; Kudo in Mem. Fac. Sc. Agri. 2, ii (1929) 250; Doan in Fl. Gen. Indo-Chine, iv, 8, (1836) 999.

Herbs or under shrubs, base often very stout and woody; leaves usually petioled, rarely sessile or sessile. Flowers in terminal, short or long, dense or lax spikes, or in axillary whorls; bracts conspicuous and foliaceous or minute. Calyx short, campanulate, 2-lipped; lips entire, two upper with a pouch- or shield-like protuberance on the back; fruiting closed by the lips, or the upper lip deciduous. Corolla-tube very long, usually sharply recurved above the base, erect, not annulate within; limb bilabiate, often dilated, lips short, upper entire or notched, or emarginate; lower lip 3-lobed, the laterals more or less united with upper lip, the mid-lobe slightly concave, emarginate at the apex. Stamens 4, ascending, lower pair longer; anthers conniving, ciliate, of lower stamens 1-celled, of upper 2-celled. Disc elongate, tubular. Ovary oblique on a short, incurved gynophore; style 2-fid at the apex, upper lobe shorter. Nutlets minute, smooth, granulate or slightly hispid.

- A. Flowers interterminal inflorescence
- B. Flowers in short leafy terminal spikes; bracts conspicuous, foliaceous.
 - C. Leaves crenate or serrate.
 - D. Calyx very densely covered with long white hairs Heydi
 - D. Calyx pubescent with minute hairs, not white
 - E. Petiole equalling the lamina prostrata
 - E. Petiole much shorter than lamina teucrifolia
 - C. Leaves entire Stocksii
- B. Flowers in long narrow racemes; bracts not foliaceous.
 - C. Dwarf, tufted under shrubs, with a stout woody rootstock, (all N. W. Himalayan).
 - D. Leaves linear linearis
 - D. Leaves ovate.
 - E. Leaf-blade about 1 cm. long, petiole .5 cm. long multicaulis
 - E. Leaf-blade 2-3 cm. long, petiole 1-3 cm. long petiolata
 - C. Erect or suberect herbs.
 - D. Leaves oblong-lanceolate, much longer than broad, base cuneate.
 - E. Petioles 0-5 mm. long glandulosa
 - E. Petioles 1-5 cm. long andamanica
 - D. Leaves ovate or elliptic, base broad.
 - E. Corolla 2.5 cm. long.

- F. Stem strongly 4 angled ... scandens
- F. Stem terete assamica
- E. Corolla 1.2-1.8 cm. long.
- F. Stem freely branched; leaves ovate; mostly cauline.
- G. Bracts shorter than combined pedicels & calyx (all S. Indian except violacea var. sikkimensis)
- H. Leaves ovate, regularly crenate, usually hirsute.
- I. Petioles 2.5 cm. Wightiana
- I. Petioles 2.5-7.5 cm. violacea.
- H. Leaves deltoid, repand-crenate, minutely pubescent on both sides... Colebrookiana
- G. Bracts longer than combined pedicel & calyx. (All Himalayan & Khasian)
- H. Lips of corolla equalling the tube ... repens.
- H. Lips of corolla much shorter than the tube.
- I. Leaf-base truncate or subcordate; bracts ovate entire (W. Him) grossa
- I. Leaf base cuneate or rounded; bracts obovate-cuneate, crenate (Khasia) .. Khasiana

hairs. Corolla F. Stem rarely branched; leaves 1 cm.
 long. elliptic to orbicular, rarely
 Habitat:- N. W. ovate, mostly radical ... discolor

- A. Flowers axillary.
- B. Corolla 3 cm. long, white Kingiana
- B. Corolla 2 cm. long or less; blue
or lilac.

C. Bracts entire; corolla 1 cm. long rivularis

- C. Bracts serrate or crenate;
corolla 2 cm. long.
- D. Pedicels equalling
the calyx (Bumma) semicircularis
- D. Pedicels much shorter than
the calyx, often absent
(Kashmir) galericulata

Habitat:- Kashmir; Punjab.

1. Scutellaria Heydei Hook. f. Fl. Brit. Ind. iv 667.

Dwarf prostrate much branched herbs, 10-18 cm. high; not
 branches slender, densely woolly. Leaves petioled, ovate
 or orbicular-ovate, cordate or cuneate at the base, crenate,
 densely and softly woolly; lamina 1 cm. or less, petiole
 slender varying in length from 1.5 cm. to about .5 cm. or less.
 Flowers few in short terminal spicate racemes; bracts ovate,
 margin ciliate with long white hairs; pedicels flat, ad-
 pressed to the stem, very short in flower, slightly enlarged
 in fruit. Calyx short, densely pubescent with long white
 hairs. Corolla yellow, tipped with violet, 1.5 cm.
 Petals hispidulous.

hairs. Corolla yellow, tipped with rose or blue; 2 cm. long.

Habitat:- N. W. Himalay; Zankasar, Gilgit etc, 3,500-5,500 m.

Dist.:- Afghanistan.

2. Scutellaria prostrata Jacquem ex Benth. Lab. Gen. et Sp. 733, DC. Prodr. xii 413; Hook. f. in Fl. Br. Ind. iv 667.

Dwarf prostrate much branched herbs, woody below, 10-25 cm. high; stem flexuos, subterete, tomentose; rootstock stout. Leaves petioled, 1.5-3.5 cm. long, ovate obtuse or acute, cuneate or cordate at the base, margin coarsely and acutely toothed; pubescent on both surfaces; petiole 1-1.5 cm. long. Flowers clustered in short spicate racemes, bracts ovate, pedicels very short in flower flat and adpressed to the rachis; fruiting pedicel about 5 mm. long. Calyx pubescent hairs minute. Corolla yellow, tipped with violet, 2.5 cm. Nutlets hispidulous.

Habitat:- Kashmir; Kumaon.

3. Scutellaria teucrifolia Dunn. Kew Bull. 1924, 386, (not of J. E. Smith in Rees. Cycle No. 15 32).

Small sub-shrubby herbs, 20-30 cm. high, with short hairs; stem numerous ascending. Leaves 1.5-2.5 cm. long, petioled, ovate, or oblong-ovate, obtuse, margin very closely regularly and obtusely crenate from base to apex; petioles 4-5 mm. long in the lower leaves, shorter upwards. Flowers clustered in a short spike at the ends of the stem; bracts sessile, ovate, acute, entire, sometimes violet coloured; conspicuously nerved, decussate and imbricate; very shortly pedicelled, pedicel flattened and adpressed to the stem.

Calyx pubescent with minute hairs, Corolla yellow, violet upwards; 2 cm. long, tube narrow below, gradually expanding upwards. Nutlets minute, hispidulous punctate.

Habitat:- N. W. India; N. Punjab; W. Kashmir, 500-3,500 m. Harriss, Toppin, etc.

4. Scutellaria Stocksii Boiss. Diagn. Ser. II, iv 28, Journ. of As. Soc. Beng. lix, 307 (1890).

Dwarf herbs about 10 cm. high, much branched, woody at the base; old branches prostrate, young ascending, stem jointed, or with deep transverse furrows at the nodes; softly and densely hairy all over. Leaves shortly petioled, 1-1.5 cm. long, elliptic-oblong, acute, cuneate at the base, margin entire, pubescent on both surfaces. Flowers few, in spicate heads; bracts 8-10 mm. long, elliptic oblong, softly hairy, pedicels of flower very short, flattened and adpressed to the rachis. Calyx minute, pubescent with very short hairs. Corolla about 20 mm. long, pubescent. Nutlets very minute, round or slightly kidney-shaped, pale yellowish in colour. Habitat:- Beluchistan, Stocks, Lace, etc.

5. Scutellaria linearis Benth. Wall. Pl. As. Rar. i 66, and in Lab. Gen. et Sp. 435, DC. Prodr. xii 423; Hook. f. Fl. Brit. Ind. iv 670; Collett Fl. Sim. 400.

Dwarf tufted herbs 10-20 cm. high, much branched stem from a woody stout rootstock, prostrate and ascending puberulous. Leaves sessile, or shortly petioled, linear rarely narrowly oblong-lanceolate, obtuse, margin entire,

recurved, densely pubescent with minute soft hairs.

Racemes about 2-3 cm. long, villous, bracts about 1 cm.

long ovate entire, pubescent; pedicels flat and adpressed to the rachis. Corolla purple, 2-2.5 cm. long, tube short slender, almost straight, abruptly much inflated at the throat.

Nutlets puberulous.

Habitat:- Kumaon; Simla; Kashmir; Hazara.

Dist.:- Afghanistan.

6. Scutellaria multicaulis Boiss. Diagn. Ser. i, vii 61; Benth. in DC. Prodr. xii 414; Prain in Journ. As. Soc. Beng. lix (1890) 307.

S. nepetaefolia Benth. in DC. Prodr. xii 414.

Perennial herbs, much branched from a woody base, branches slender, virgate erect and usually simple, shortly puberulous. Leaves shortly petioled, 1-1.5 cm. long, ovate, acute, cuneate or rounded at the base, margin dentate or crenate, glabrous above, hoary tomentose beneath. Flowers few laxly arranged in a slender raceme, pedicels short, round, not adpressed to the stem; bracts minute, 3.5 mm. long. Calyx minute, densely pubescent with very short hairs. Corolla 25 mm. long, yellowish with purple spots, puberulous, tube slender, lips short.

Habitat:- Gilgit; Hindookush.

Dist.:- Afghanistan; Persia.

upper lip hooded broad, lower shorter, lips wide apart.

Filaments glabrous. Nutlets globose.

7. Scutellaria petiolata Hemsl. ex Lace & Prain. Journ. As. Soc. Beng. lix (1890) II 308, Journ. Linn. Soc. xxviii (1891) 326.

Perennial herbs, 13-25 cm. high, with slender stems

tufted from a thick woody rhizome. Leaves petioled, ovate acute or obtuse, base rounded or truncate, margin crenate, quite glabrous on both surfaces, lamina 2-3 cm, petiole 1-3 cm., very slender. Flowers in long slender raceme, bracts ovate entire petioled, 8 mm. long, or shorter upwards, pedicels slender round, not adpressed to the stem, 2 mm. long or shorter. Calyx sparsely pubescent with very minute hairs. Corolla 25 mm. long, tube slender, limbs short. Nutlets 2 mm. long, dark brown, elliptic very prominently granulate. Habitat:- Beluchistan - assigned districts, Mr. Duthie's collection, R. P. Banerjee, etc. Dist.:- S. Afghanistan and Ziarat, Lace 4006.

8. Scutellaria glandulosa Hook. f. Fl. Brit. Ind. iv 669; Doan in Fl. Gen. Indo-Chine, iv, 8, (1936) Burma p. 1003.

Small erect herb, 30 cm. high, simple or branched, glandular hairy. Leaves shortly petioled, subsessile rarely sessile, 3-7 cm. long, lanceolate, or oblong-lanceolate, acute rarely obtuse or rounded, base cuneate, margin subserrate; almost glabrous or sparsely hairy on both surfaces. Racemes about 15 cm. long, slender, erect, simple or branched, lax-flowered, flower opposite; pedicels about 2 or 3 times as long as the flowering calyx, round, not adpressed to the stem; bracts small. Corolla 1.5 cm, tube short slender curved; upper lip hooded broad, lower shorter, lips wide apart. Filaments glabrous. Nutlets globose.

Habitat:- Burma.

Dist.:- Siam.

9. Scutellaria andamanica Prain Journ. As. Soc. Beng. lix (1890) 307.

Dwarf perennials; stems numerous from a woody root-stock, simple or unbranched, erect and rigid, quite glabrous; clusters of fibrous roots present at the bottom of the root-stock. Leaves long petioled, oblong-lanceolate, obtuse, base cuneate, margin crenate dentate, entire at the base; lamina 4-4.5 cm. long, glabrous on both surfaces; petiole 3-4 cm. long slender. Flowers in long narrow racemes, opposite or the lower whorls with flowers; pedicels round, not adpressed to the stem, bracts 3 mm. long. Calyx 3 mm. long. Corolla 16 mm. long, blue with white in the lips. Nutlets pale brown, scabrid, 1 mm. long. Habitat:- S. Andaman.

10. Scutellaria scandens Don. Prodr. Fl. Nep. 110, (1825); Benth., Lab. Gen. et Sp. 444 (1834).

S. angulosa Benth. in Wall. Cat., 2139 (1828), Pl. As. Par. i, 67, (1830), DC. Prodr. xii, 430 (1848); Hook. f. Flor. Brit. Ind., iv, 669 (1885).

S. celtidifolia A. Ham., Monogr. Scutell., 27 (1832).

Tall herbs, stem stout, with long diffuse branches rambling for several feet; stem and branches acutely 4-angled; sparsely hairy. Leaves shortly petioled, 3-8 cm. long ovate or lanceolate, acute, coarsely crenate or serrate, base rounded or subcordate; glabrous or sparsely hairy; often purple beneath; petiole .5-1 cm. long. Racemes about 10 cm. long, lax-flowered, glandular and tomentose; bracts foliaceous below, ovate, acute or acuminate, serrate; upper smaller entire, pedicels slender, (flat, adpressed to the stem). Corolla white or pale yellow, sometimes tinged

with purple at the tip, 2.5 cm. long, tube slender at the base, much dilated upwards; upper lip broad hooded. Nutlets granulate.

Habitat:- Kashmir; Kumaon. Simla; Nepal.

11. Scutellaria assamica Mukerjee in Notes, R. B. G. Edin., No. 95 (1938) in ed.

This differs from Scutellaria Khasiana, Clarke ex Hook. f., in erect and unbranched habit; the leaf-apex more or less acuminate, and the margin serrate; the bracts lanceolate, entire and ciliate; and in longer corolla. From S. scandens Don., a W. Himalayan species it is readily distinguished by more or less teretecostem.

Slender erect herb, usually unbranched, 30-45 cm. high; glabrescent or sparsely hairy. Leaves petioled, narrowly ovate, acuminate, or acute, serrate, rounded at the base, sparsely hairy on both sides, densely on the nerves beneath; lamina 3-6 cm. long, or smaller; petiole slender, usually about .5-1 cm. long, sometimes as long as 3 cm. Flowers few opposite and secund, in lax terminal racemes; bracts lanceolate, entire, ciliate, lower 5-7 mm. long, shorter upwards; pedicels 2 mm. long, about 4 mm. in fruit. Calyx densely pubescent, 2.5 mm. long in flower. Corolla about 2.5 cm. long, glabrous, purplish white in colour; tube straight, slender below, gradually broadening above; lips short. Filaments glabrous. Nutlets 1 mm. in diam.; black, granulate.

Habitat:- Assam; Kohima; Naga hills, King's Collector; Konoma, Naga hills, Prain (1524 mtr.); Kapon; Manipur; Meebold 6464 (2132 mtr.); Lushai Hills, Mrs. Parry.

12. Scutellaria Wightiana Benth. Wall. Pl. As. Par. i 67;
Gamble Fl. Madras II, 1142.

S. violacea, Heyne, var. hispidior Benth. in DC. Prodr.
xii 418; Hook. f. Fl. Brit. Ind. iv, 668.

Erect stiff herb, stem simple or branched, often root-
ing below, pubescent or hispid. Leaves ovate, acute, cord-
ate or rounded at the base, crenate-serrate, hispid often
purple beneath, lamina 2.5-5 cm. long; petiole slender
about 2.5 cm. long. Racemes erect, slender usually un-
branched about 15 cm. long, bracts minute, pedicels short,
round not adpressed to the stem. Corolla 1.5 cm. long,
white or rose. Nutlets granulate.

Habitat:- W. Ghats; Nilghiris.

13. Scutellaria violacea Heyne ex Benth. in Wall. Pl. As.
Par. i 66, Lab. 429 & DC. Prodr. xii 418; Wight. Ic. t.
1449 et Ill. p. 176; Hook. f. Fl. Brit. Ind. iv. 668;
Gamble Fl. Madras, 1142; Doan in Fl. Gen. Indo-Chine, iv
8, (1936) 1007.

Weak straggling herb, branches slender flaccid and
flexuous, usually glabrous. Leaves long petioled, mem-
branous, ovate, subacute, rounded or cordate at base, broad-
ly crenate, glabrous; lamina 4-8 cm. long; petiole slender
2-6 cm. long. Racemes lax about 15 cm. long; bracts
minute; petiole round not adpressed to the stem. Corolla
blue with white marks on lips; about 1.5 cm. long. Sta-
mens included puberulous. Nutlets spinulose.

Habitat:- S. India; Burma.

Dist.:- Java; Siam.

14. Scutellaria violacea var. sikkimensis Hook. f. Fl.

Brit. Ind. iv. 668.

Tall, rambling, much-branched.

Habitat:- Sikkim; Darjeeling.

14. Scutellaria Colebrookiana Benth. Wall. Pl. As. Par. i, 67, DC. Prodr. xii 418; Gamble in Fl. Madras, II, 1142.

S. violacea var. Colebrookiana Hook. f. in Fl. Brit. Ind. iv. 668.

Weak straggling herbs, stem much branched soft, thinly pubescent. Leaves rather thick, petioled, deltoid, acute, truncate or cordate at base, margin crenate or wavy; minutely tomentose on both surfaces; lamina 2-3 cm. long and as broad, petiole 1-2 cm. Racemes about 15 cm. long, slender, simple or branched; flowers laxly arranged, bracts minute, pedicels round not adpressed to the stem. Corolla 1.5 cm. long, lower lip larger. Nutlets minutely tuberculate.

Habitat:- S. India - in Western Ghats, Pulney Hills and hills of Tinnevely.

15. Scutellaria repens Buch. & Ham. ex D. Don. Prod. Fl. Nep. 110; Benth. in Lab. Gen. et Sp. 443, DC. Prodr. xii 429. Hook. f. Fl. Brit. Ind. iv. 669.

Stout much branched herbs, branches diffuse, ascending, pubescent or tomentose. Leaves petioled, 1.5-5 cm. long, ovate acute, crenate-serrate, or subentire, truncate or rounded at the base, rarely subcordate, both surfaces rough with minute stiff hairs; petiole slender .5-1.5 cm. long (flat and adpressed to the stem). Racemes simple or branched, slender

or stout, 10-30 cm. long, curved, glandular hairy; bracts ovate, acute, entire or crenate, 5-8 mm. densely pubescent. Corolla 1.5-2 cm. long, puberulous; tube short, slender, sharply recurved, dull, yellow, or purple; lips equalling the tube. Nutlets minutely granulate.

Habitat:- Kashmir; Sikkim; Burma.

16. Scutellaria grossa Wall. Pl. As. Par. i 67; Benth. in DC. Prodr. xii 419; Hook. f. Fl. Brit. Ind. iv 669; Collett Fl. Sim. 400.

Annual herb, 30-60 cm. high, slender ascending, creeping below; pubescent. Leaves petioled, 3-8 cm. long, ovate or deltoid, acute, coarsely crenate, base truncate or subcordate, rarely rounded, sparsely hairy, petiole slender .5-2.5 cm. long. Raceme slender, 8-15 cm. long, bracts elliptic lanceolate, lower about 1 cm. long, smaller upwards, pedicels round, not adpressed to the stem. Corolla 1.5-2 cm. long, pubescent, blue purple; lips short. Nutlets puberulous.

Habitat:- Kashmir; Kumaon; Simla; Dalhousie; Mussourie; Gharwal; Jhelum dist.

17. Scutellaria Khasiana Clarke ex Hook. f. Fl. Brit. Ind. iv. 669.

Rambling herb, 60-100 cm. long, branched; branches slender glabrous. Leaves membranous, petioled, 3-8 cm. long, ovate acute or obtuse, crenate, entire near the base, base cuneate or rounded, glabrous on both surfaces; petiole slender, 1-2.5 cm. long. Racemes slender lax-flowered, 5-10 cm. long; bracts small, obovate, cuneate rounded at the apex, crenate, pedicels round not adpressed to the stem. Corolla 1.5-2 cm.

long, pale blue; throat inflated, tube slender, lips short. Nutlets granulate.

Habitat:- Khasia Mts.; Assam.

18. Scutellaria discolor Colebr. Wall. Pl. As. Par. i 66. Benth. in DC. Prodr. xii 417; Hook. f. Fl. Brit. Ind. iv. 667; Cooke in Fl. Bomb. II 462; Heyne in Fl. Brit. Oris, 745; Gamble Fl. Madras, 1142; Doan in Fl. Gen. Indo-Chine, iv, 8, (1936) 1000.

S. indica Blume. Bijdr. (1826) 839 (not of Linn; S. indica Linn. being a Chinese plant).

Annual, 30-60 cm. high, simple, rarely branched, stem, ascending from a creeping rootstock, pubescent or tomentose. Leaves chiefly radical or subradical rarely cauline, long petioled, broadly elliptic, rarely orbicular, obtuse, rounded or cordate at the base; crenate, pubescent and often purple beneath; lamina 4-15 cm. by 2-7 cm; or sometimes smaller; petiole stout, 2-8 cm. long; the cauline leaves usually sessile. Flowers laxly scattered on a slender raceme 5-20 cm. long, simple or rarely branched; bracts minute, pedicels about 2 mm. long, round, not adpressed to the rachis. Corolla 1.5-2 cm. long; pale blue. Nutlets brown, minutely tuberculate. Habitat:- Subtropical Himalaya, Kumaon, Nepal, Sikkim, Darjeeling; Poona; Malabar; Mysore. Dist.:- Java; Indo-China; China.

19. Scutellaria Kingiana Prain in Journ. of As. Soc. Beng. lix, (1890) p. 307, and in Anns. R. B. G. Cal. ix,

Small herbs 20-25 cm. high; stems many woody below, subterete, 4-angled above and grooved; rootstock woody with

puberulous; stems sometimes creeping. Leaves petioled, ovate, or orbicular, obtuse crenate, base rounded entirely, pubescent on both surfaces; lamina 1.5-2 cm. long, .8-1.5 cm. broad, petiole .5 cm long. Flowers axillary, pedicelled; pedicels short. Calyx 4 mm. long, 3 mm. at the mouth, puberulous outside. Corolla white, 3 cm. long, puberulous; limb short, 5 mm. in diam. Filaments glabrous. Nutlets, not seen. The plant flowers in August.

Habitat:- N. Phari.

Dist.:- Tibet.

20. Scutellaria rivularis Wall. Pl. As. Par. ii 66; Benth. Lab. Gen. et Sp. 437, and in DC. Prodr. xii 426; Hook. Fl. Brit. Ind. 670; Gamble in Fl. Madras 1142; Kudo in Mem. Fac. Sc. & Agri. 2, II, (1929) ; Doan in Fl. Gen. Indo-Chine, iv, 8, (1936) 1005.

S. peregrina Don. Prodr. Fl. Nep. 109.

S. squamulosa, A. Ham. Monogr. Scutell. 35.

S. minor, indica, Benth. in DC. Prodr. xii 427.

Much branched herbs, stem rooting and creeping below, ascending 15-20 cm. high or drawn out to 30-40 cm. Leaves variable, lower shortly petioled, upper sessile, ovate or lanceolate, obtuse, cordate or rounded at the base entire or crenate; glabrous or sparsely hairy. Lower flowers axillary; upper ones in lax spike, the leaves being reduced in size upwards; pedicels short, bracts minute ovate or lanceolate entire. Corolla 8-12 mm. long, lilac or blue; tube nearly straight, lips short. Filaments pubescent below; Nutlets granular.

Habitat:- Khasia Mt; Burma; Nilghiri Hills;

Dist.:- China; Formosa; Indo-China; Siam.

21. Scutellaria semicircularis S. Moore Journ. Bot. 1905, 146.

Small herbs, stem simple densely pubescent with somewhat spreading hairs. Leaves about 2 cm. long, shortly petioled, ovate obtuse, rounded at the base, crenate-serrate at the margin; upper surface scaberulous, lower surface pubescent. The upper part of the stem gradually becoming a long slender raceme; flowers opposite secund, lower flowers axillary; bracts foliaceous, descending, about 1 cm. long, smaller upwards; pedicels 2-4 mm. long, round, not adpressed to the stem. Calyx pubescent with glandular hairs. Corolla blue, about 2 cm. long, glandular-pubescent; tube slightly curved at the base, dilated at the throat; the posterior lip comparatively larger, much curved and semicircular; lateral lobes joined to the back. Nutlets depressed, hispidulous.

Habitat:- Burma, Shan States; Hopong, Major Melville.

22. Scutellaria galericulata Linn. Sp. Pl. 599; Benth in DC. Prodr. xii 425; Hook. f. Fl. Brit. Ind. iv. 670.

Erect herbs 70-100 cm. high, stem creeping below. Leaves shortly petioled, 2-5 cm. long, ovate-lanceolate, acute, base cordate, margin crenate or shortly serrate, upper often entire, upper surface glabrous or sparsely hairy, lower scabrid. Flowers axillary, or those on upper part of the stem, in slender spikes by the leaves being much reduced upwards, pedicels short. Corolla 1.5-1.8 cm. long, blue, tube slender below, inflated at the throat. Nutlets granular.

Habitat:- Kashmir.

Dist.:- Cent. & N. Asia; Europe; N. Africa and N. America.

Brunella vulgaris Linn. sp. 837; Benth. in Lab. Gen. et Sp. 417, and in DC. Prodr. xii, 410; Boiss. Fl. Orient. iv, 591; Hook. f. Fl. Brit. Ind. iv, 670; Gallet Fl. Sin. 248; Kudo in Mem. Fac. Sc. & Agri. II, 2, (1929) 248; Doan in Fl. Gen. Indo-Chine, iv, 8, (1936) 1000.

Brunella, Linn.

Gen. Pl. ed. 1, 177; Benth. Lab. Gen. et Sp. 416, and in DC. Prodr. xii, 409; Endl. Gen. Pl. 620; Hook. f. Fl. Brit. Ind. iv, 670; Benth. ex Hook. f. Gen. Pl. II, 1203; Briq. in Eng. & Pr. Nat. Pflanzenf. iv, 3, a, 241; Kudo in Mem. Fac. Sc. & Agri. II, 2, (1929) 248; Doan in Fl. Gen. Indo-Chine, iv, 8, (1936) 1007.

Perennial herbs, often with creeping roots. Whorls in dense heads or short compact spikes, bracts broad, imbricating. Calyx tubular-campanulate, reticulate, compressed and closed in fruit; upper lip flat, truncate, shortly 3-toothed; lower 2-fid; throat naked. Corolla-tube annulate within at the base; upper lip galeate; lower lip 3-lobed, central lobe large, concave, laterals oblong, deflexed. Stamens 4, lower longer; the upper bidentate, the lower tooth bearing an anther; anthers conniving, cells diverging. Disk equal. Style 2-fid at the apex; lobes subulate. Nutlets oblong, smooth.

var. hispidula ----- DC. Prodr. xii, 410; Hook. f. in Fl. Brit. Ind. iv, 671; Gamble Fl. Madras, 1143.

Stem and leaves hispidly hairy.

Habitat:- Sikkim; Khasia hills and hills of S. India.

Brunella vulgaris Linn. sp. 837; Benth. in Lab. Gen. et Sp. 417, and in DC. Prodr. xii, 410; Boiss. Fl. Orient. iv, 691; Hook. f. Fl. Brit. Ind. iv, 670; Collet Fl. Sim. 248; Kudo in Mem. Fac. Sc. & Agri. II, 2, (1929) 248; Doan in Fl. Gen. Indo-Chine, iv, 8, (1936) 1008.

Erect or ascending herb, 15-35 cm. high, glabrous or sparingly hairy; rootstock creeping. Leaves petiolate, 3-7 cm. long, ovate or oblong, sometimes ovate-lanceolate, acute or obtuse, entire or toothed, base rounded, truncate or slightly cuneate, glabrous or sparingly pubescent on both sides; petiole 1-2 cm. long, or longer in the lower leaves, gradually becoming shorter upwards to completely sessile leaves. Flowers 6 in a whorl, crowded in erect cylindrical terminal spikes, 3-6 cm. long; bracts broadly ovate-cordate, acute or apiculate, margin often coloured purple; flowers dimorphic, larger ones bisexual, smaller female. Calyx tinged with purple, campanulate, upper lip 3-toothed, lower 2-toothed; teeth awned or not; mouth of calyx closed in fruiting. Corolla 2 cm. long, white or violet-purple. Filament with a small tooth below. Nutlets smooth, oblong.

Habitat:- Himalayas up to 3,500 m.; hills of S. India.

Dist.:- In most of the temp. region, of N. Hemisphere, Australia

var. hispida, Benth. in DC. Prodr. xii, 410; Hook. f. in Fl. Brit. Ind. iv, 671; Gamble Fl. Madras, 1143.

Stem and leaves hispidly hairy.

Habitat:- Sikkim; Khasia hills and hills of S. India.

1. Marrubium vulgare Linn. Sp. Pl. 383; Benth. in DC. Prodr. xii, 447; Marrubium, Linn. Mant. iv, 703; Hook. f. Fl. Brit. Ind. iv, 671.

Gen. n. 721; Benth. Lab. Gen. et Sp. 585, and in DC. Prodr. xii, 447; Endl. Gen. Pl. 627; Hook. f. Fl. Brit. Ind. iv, 671; Benth. ex Hook. f. Gen. Pl. II, 1206; Briq. in Eng. & Pr. Nat. Pflanzenf. iv, 3, a, 230; Kudo in Mem. Fac. Sc. & Agri. II, 2, (1929) 246; Post. Fl. Syria etc. II, 371.

Perennial or annual herbs, usually tomentose or woolly. Whorls axillary densely many-flowered, bracts subulate. Calyx tubular- 5-10- nerved, 5-10- toothed; teeth equal, short, erect, subspinescent. Corolla short, tube included or slightly exserted, naked or annulate within; upper lip erect, retuse or bifid; lower lip spreading, 3-fid. Stamens 4, included, lower longer; anthers glandular, cells divaricate, Disk equal or with a small glandular swelling at the front. Style 2-fid at the top, with short, obtuse lobes. Nutlets obtuse.

2. Marrubium lanatum Benth. Lab. Gen. et Sp. 567, and in DC. Prodr. xii, 448; Hook. f. Fl. Brit. Ind. iv, 671.

Dwarf herbs 10-15 cm., stems many ascending from a stout rootstock; densely clothed all over with long soft

A. Tall herbs, flowers in axillary whorls ... vulgare

A. Dwarf herbs; flowers in terminal

spikes lanatum

Flowers densely crowded in a terminal cylindrical, thickly woolly spike; bracts linear or setaceous. Calyx 3 mm. long, membranous, woolly outside, throat naked; teeth 5, scicular spreading and recurved. Corolla very small, upper lip short, entire. Nutlets 2 mm. long, hoary.

Habitat:- Garhwal; Pangi (N. W. Hin.).

Dist.:- Tibet; E. 277 stan, northwards up to Siberia.

1. Marrubium vulgare Linn. Sp. Pl. 583; Benth. in DC. Prodr. xii, 153; Boiss. Fl. Orient. iv, 703; Hook. f. Fl. Brit. Ind. iv, 671.

M. propinquum Benth. in DC. Prodr. xii, 153.

Tall robust herbs, 60-120 cm. high, shortly woolly. Leaves petiolate, leathery or thick, 2-4 cm. in diam., orbicular or elliptic-ovate, crenate, rounded, cordate or cuneate at the base, villous on both sides, rugose or wrinkled; petiole stout 1-2 cm. long. Flowers in dense axillary whorls; whorls depressed, villous; bracts linear. Calyx about 5 mm. long, coriaceous, villous; teeth 10, subulate, spreading and recurved, often hooked at the end; throat of calyx woolly. Corolla about 1 cm. long, white, pubescent with minute hairs; tube slender, upper lip longer, bifid. Nutlets 2 mm. long, faintly rugose.

Habitat:- Kashmir; N. W. Frontier; Baluchistan.

Dist.:- Afghanistan westwards to Europe; N. Africa.

2. Marrubium lanatum Benth. Lab. Gen. et Sp. 587, and in DC. Prodr. xii, 448; Hook. f. Fl. Brit. Ind. iv, 671.

Dwarf herbs 10-15 cm., stems many ascending from a stout rootstock; densely clothed all over with long soft white hairs. Leaves very thick, petiolate, 2-3 cm. in diam., rounded or ovate, pinnatifid or deeply lobed, tomentose or villous; petiole 1-3 cm. long, stout or slender. Flowers densely crowded in a terminal cylindrical, thickly woolly spike; bracts linear or setaceous. Calyx 3 mm. long, membranous, woolly outside, throat naked; teeth 5, acicular spreading and recurved. Corolla very small, upper lip short, entire. Nutlets 2 mm. long, hoary.

Habitat:- Garhwal; Pangi (N. W. Him.).

Dist.:- Tibet; E. Turkestan, northwards up to Siberia.

Chamaesphacos drabifolius Aitch. ex Kunt. Trans. Hb. Soc. 3, 3, 111, 97; Prain in Journ. of As. Soc. Beng. lix (1890) 309.

Dwarf slender herbs, 5-15 cm. high, usually much branched from the base, villous. Leaves 2.5-3.5 cm. long, lanceolate, acute or acuminate narrowed in to a sharp petiole, entire villous or sparingly hairy. Flowers axillary, solitary. Chamaesphacos, Schrenck. Calyx 8 mm. long, campanulate densely villous outside with spreading hairs; teeth triangular.

Enum. Pl. Nov. i, 27; Benth. in DC. Prodr. xii, 459; Benth. ex Hook. f. Gen. Pl. II, 1207; Briq. in Eng. & Pr. Nat. Pflanzenf. iv, 3, a, 267; Prain in Journ. As. Soc. Beng. lix, (1890), 309. Frontier, Salween range, Duke; Peshin

Annual dwarf erect branching herbs. Leaves shortly petioled; whorls 2-flowered. Calyx campanulate subequally 5-toothed, 10-nerved with ring of hairs at limb within, subinflated in fruit, corolla-tube exerted or included, throat hardly widened, upper lip erect emarginate, lower spreading 3-lobed. Stamens exerted or sub-included, anther-cells confluent, oblong. Style subequally 2-fid. Nutlets oblong narrowed.

Chamaesphacos brahuicus Aitch. ex Hemsl. Trans. Linn. Soc. n. 3, iii, 97; Prain in Journ. of As. Soc. Beng. lix (1890) 309.

Dwarf slender herbs, 6-15 cm. high, usually much branched from the base, villous. Leaves 2.5-3.5 cm. long, lanceolate, acute or acuminate narrowed in to a sharp petiole, entire villous or sparingly hairy. Flowers axillary, solitary, shortly pedicelled. Calyx 8 mm. long, campanulate, densely villous outside with spreading hairs; teeth triangular, lanceolate, subulate acuminate, shorter than the tube. Corolla pink, 10 mm. long, tube slightly exserted. Nutlets oblong, 3.5 mm. long.

Habitat:- Punjab frontier, Saleiman range, Duke; Peshin valley, Lace; Beluchistan, Duke.

Dist.:- Afghanistan.

Craniotome versicolor Reichb. Ic. Enot. I, 39; Benth. in Wall. Pl. As. Bar. I 94; Lab. Gen. et Sp. 704, and in DC. Prodr. xii, 454; Hook. f. Fl. Brit. Ind. iv, 672; Kudo in Mem. Fac. Sc. & Agri. II, 2, (1929) 182.

Erect perennial herb, 36-70 cm. high, softly hirsute; stem stout or slender. Leaves long-petioled, 5-10 cm. long, broadly ovate, serrate or toothed; densely or sparingly hirsute on both sides; petiole slender.

Craniotome, Reichb.

Icon. Bot. Enot. I, 39; Benth. Lab. Gen. et Sp. 704, and in DC. Prodr. xii, 454; Hook. f. Fl. Brit. Ind. iv, 671; Benth. ex Hook. f. Gen. Pl. II, 1207; Briq. in Eng. & Pr. Nat. Pflanzenf. iv, 3, a, 268; Kudo in Mem. Fac. Sc. & Agri. II, 2, (1929) 182.

Erect perennial branched herb; leaves long-petioled. Racemes slender, lax, paniced. Calyx ovoid, globose in fruit, equally 5-toothed, throat constricted, villous within. Corolla-tube slender, slightly exserted; upper lip minute, concave, entire; lower longer, spreading 3-fid. Stamens 4, lower longer, ascending under the upper lip; anther 2-celled, cells diverging. Disk equal. Style subequally 2-fid. Nutlets minute, subglobose, smooth.

Craniotome versicolor Reichb. Ic. Enot. i, 39; Benth. in Wall. Fl. As. Rar. i 64; Lab. Gen. et Sp. 704, and in DC. Prodr. xii, 455; Hook. f. Fl. Brit. Ind. iv, 672; Kudo in Mem. Fac. Sc. & Agri. II, 2, (1929) 182.

Erect perennial herb, 35-70 cm. high, softly hirsute; stem stout or slender. Leaves long-petioled, 5-10 cm. long, broadly ovate-cordate, acuminate, crenate or toothed, densely or sparingly hirsute on both sides; petiole slender, 2-4 cm. long. Flowers numerous; crowded in small, somewhat subsecund stalked cymes, forming terminal panicles; bracts subulate. Calyx ovoid, 2 cm. in fruit, equally 5-toothed, throat constricted, villous within. Corolla-tube much exerted, white, pink or yellow; upper lip very short, erect, wood-like, lower longer spreading. Stamens 4, in unequal pairs. Nutlets minute, subglobose, pale, shining.

Habitat:- N. W. Himal - (Serahan) - Nepal; Simla; Sikkim; Dalhousie; Bhutan; Khasia hills.

Dist.:- China; Indo-China.

N.B. Haines pointed out that in this genus the posterior are longer and this I have found quite correct.

A. Leaves membranous, glabrate or
sparsely hairy; flowers white Hainona

A. Leaves thick, lementous or densely
woody, flowers purple.

Anisomeles, R. Br.

B. Leaves broad india
B. Leaves elongate-triangular.

Prodr. Fl. Nov. Holl. 503; Benth. Lab. Gen. et Sp. 701,
and in DC. Prodr. xii; Hook. f. Fl. Brit. Ind. iv 672; Benth.
ex Hook. f. Gen. Pl. II, 1207; Briq. in Engl. Pr. Nat.
Pflanzenf. iv, 3, a, 268; Prain Beng. Pl. 853; Cooke Fl.
Bomb. II, 460; Duthie Fl. Upp. Gang. Pl. II, 245; Gamble Fl.
Madras 1130; Haines Bot. Bih. & Oriss. 745; Ridley Fl. Mal.
Pen. II, 649; Kudo in Mem. Fac. Sc. Agri. II, 2, (1929) 178;
Doan in Fl. Gen. Indo-Chine, iv, 8 (1936) 1012.

Erect branching coarse herbs. Flowers purplish in
axillary whorls or lax flowered branched paniced cymes.
Calyx ovoid or tubular, straight, equally 5-toothed. Corolla
with short tube annulate with a ring of reflexed hairs within,
upper lip erect entire, lower broad, spreading, midlobe notched.
Stamens exserted, anthers conniving, of the posterior longer
pair 1-celled, of the shorter 2-celled, cells transverse paral-
lel. Style subequally 2-fid. Nutlets smooth.

N.B. Haines pointed out that in this genus the posterior
are longer and this I have found quite correct. Cymes few,
flowered, secund, pedunculate, peduncles of the lower cymes
about 3 cm. long, upper shorter; flowers shortly pedicelled;
bracts linear about 5 mm. long. Calyx 7-8 mm. hispid outside
with scattered hairs, hairs swollen at the base; inside of
the calyx hairy with long slender white hairs; teeth acuminate,
strongly reticulate; margin fringed. Corolla white or
greenish-white, 2 cm. long, lower lip tinged with pink, tube

- A. Leaves membranous, glabrate or
 sparsely hairy; flowers white Heyneana
- A. Leaves thick, tomentose or densely
 woody, flowers purple.
- B. Leaves broadly ovate indica
- B. Leaves oblong-lanceolate.
- C. Stem acutely 4-angled,
 nutlets black (Burma). candicans
- C. Stem terete or obtusely
 4-angled; nutlets pale
 brown (S. Ind.). malabarica

1. Anisomeles Heyneana Benth. Wall. Pl. As. Rar. i 59,
 and in DC. Prodr. xii 455; Hook. f. Fl. Brit. Ind. iv 672;
 Cooke Fl. Bomb. Pr. II, 460; Gamble Fl. Madras 1140.

Tall erect herb, about 150 cm. high, stem and branches
 slender, acutely 4-angled, glabrous or sparsely hairy. Leaves
 thin, petioled, 5-8 cm. long, ovate-lanceolate, or ovate,
 acuminate, cuneate at the base, margin crenate-serrate, glab-
 rous or sparsely hairy; petiole 1-3 cm. long. Cymes few,
 flowered, secund, pedunculate, peduncles of the lower cymes
 about 3 cm. long, upper shorter; flowers shortly pedicelled;
 bracts linear about 5 mm. long. Calyx 7-8 mm. hispid outside
 with scattered hairs, hairs swollen at the base; inside of
 the calyx hairy with long slender white hairs; teeth acuminate,
 strongly reticulate; margin fringed. Corolla white or
 greenish-white, 2 cm. long, lower lip tinged with pink, tube

annulate within. Filaments bearded. Nutlets 2 mm. or less broadly oblong, dark brown, shining.

Habitat:- Deccan Peninsula and S. part of Bombay presidency.

2. Anisomeles indica, O. Kze. Haines Bot. Bih. Oriss.

745; Gamble Fl. ~~xxx~~ Madras 1140.

A. ovata R. Br. Ait. Hort. Kew, ed II, ii 364; Hook.

f. Fl. Brit. Ind. iv, 672; Collett Fl. Sim. 402; Prain Beng. Pl. 853; Cooke Fl. Bomb. 461; Duthie Fl. Upp. Gang. Pl. II, 245.

A. ovata, var. mollissima Prain Beng. Pl. 853.

Suffruticose herbs 120-200 cm. high, sparingly hairy or densely pubescent, sometimes almost woolly; stem acutely 4-angled. Leaves slightly thick, petioled, 4-10 cm. long, broadly ovate, acute, crenate serrate, base truncate, rounded or subcordate, rarely cuneate; softly pubescent on both sides; petiole 1-4 cm. long; densely hairy. Flowers crowded in whorls, axillary and interrupted below, close above to form a dense spicate inflorescence; bracts 4-5 mm. long linear, pubescent. Calyx about 6 mm. hirsute, teeth about as long as the tube; lanceolate acute ciliate. Corolla 2 cm. long, bluish purple, sometimes yellow; upper lip ciliate; tube annulate within. Filaments bearded. Nutlets 2.5 mm. long, smooth and shining, black. The plant has a strong scent of camphor; it flowers after the rainy season; it is very variable in habit.

Habitat:- Throughout India, ascending to 1,500 m. in the Himalayas.

Dist.:- Ceylon; Malay peninsula & archipelago; China; Philippines.

3. Anisomeles candicans Benth. Wall. Pl. As. Rar. i 59, and in DC. Prodr. xii 456; Hook. f. Fl. Brit. Ind. iv 673.

A. malabarica, nigrescens, Benth. in DC. l.c. 457.

Shrubby plants about 150 cm. high or more, softly tomentose; stem acutely 4-angled. Leaves shortly petioled, thick, 5-15 cm. long, narrowly lanceolate or oblong, acute, base rounded, or truncate rarely subcordate or cuneate, margin serrate, densely and minutely tomentose below, glabrescent and slightly rugulose above, or tomentose. Flowers in dense or lax whorls, axillary and in terminal spikes, bracts linear tomentose 5 mm. long. Calyx about 8 mm. long, hirsute, reticulated; teeth triangular acute or acuminate. Corolla purple, about 2 cm. long, tube short annulate within. Filaments pubescent or almost glabrous. Nutlets 2 mm. long, black smooth and shining.

Habitat:- Up. Burma, Prazer, Proma Wallich.

4. Anisomeles malabarica R. Br. ex Sims; Bot. Mag. t. 2071; Benth. in Wall. Pl. As. Rar, i 59, Lab. Gen. et Sp. 702, and in DC. Prodr. xii 456; Hook. f. Fl. Brit. Ind. iv 673; Cooke Fl. Bomb. 461; Gamble Fl. Madras 1140.

Tall shrubby plants about 200 cm. in height, densely tomentose or thickly woolly with white adpressed hairs, stem terete or obtusely 4-angled. Leaves thick, petioled, 8-12 cm. long, lanceolate or oblong-lanceolate, acute or acuminate, rounded at the base, crenate-serrate tomentose, pale above, white below; petiole stout 1-2 cm. long, softly woolly; the smaller leaves are obtuse at the apex and entire or subentire, oblong. Flowers in dense whorls often about 4 cm. in diam., forming an interrupted spike; bracts about 12 cm. long or more,

linear, densely softly woolly. Calyx about 10 mm. long, densely villous, teeth narrow acuminate, villous on both sides, ciliate. Corolla pale purple, 22 mm. long, slightly pubescent outside, tube annulate within. Filaments hairy. Nutlets about 2 mm. long, pale brown, smooth and shining. The plant flowers in Oct. - Nov.

Habitat:- Deccan peninsula.

Dist.:- Malay Peninsula, Ceylon, Mauritius.

Fl. Brit. Ind. iv, 673; Benth. ex Hook. f. Gen. Pl. II, 1808; Briq. in Eng. & Pr. Nat. Pflanzensf. iv, 3, 2, 268.

Herbs: leaves petioled, broad. Whorls usually 6-flowered, in terminal or axillary spikes; bracts ovate. Calyx tubular-campanulate, straight or incurved, subequally 3-toothed or slightly bilabiate. Corolla-tube included or exserted, straight or incurved, slightly dilated above, not annulate within; upper lip, short, erect, emarginate or 2-fid; lower lip longer, 3-fid, lobes rounded, the central lobe large, emarginate or notched. Stamens 4, ascending under the upper lip, lower longer; anthers 2-celled with divaricate cells, or cells confluent. Disk equal. Style 2-fid at the apex, upper lobe or both lobes minute. Nutlets obovoid, crowned with dense scales-like or chaffy hairs.

Achyrospermum Wailichiana Benth. ex Hook. f. Fl.

Brit. Ind. iv, 673.

Small undershrub, 30-100 cm. high, stem rigid, terete, simple or branched, tomentose or hairy, stem rooting below. Leaves membranous, long-petioled, 15-25 cm. long, elliptic-ovate, acuminate, serrate, base entire.

Achyrospermum Blume.

Bijdr. 840; Benth. in DC. Prodr. xii, 458; Hook. f. Fl. Brit. Ind. iv, 673; Benth. ex Hook. f. Gen. Pl. II, 1208; Briq. in Eng. & Pr. Nat. Pflanzenf. iv, 3, a, 268.

Herbs; leaves petioled, broad. Whorls usually 6-flowered, in terminal or axillary spikes; bracts ovate. Calyx tubular-campanulate, straight or incurved, subequally 5-toothed or slightly bilabiate. Corolla-tube included or exserted, straight or incurved, slightly dilated above, not annulate within; upper lip, short, erect, emarginate or 2-fid; lower lip longer, 3-fid, lobes rounded, the central lobe large, emarginate or notched. Stamens 4, ascending under the upper lip, lower longer; anthers 2-celled with divaricate cells, or cells confluent. Disk equal. Style 2-fid at the apex, upper lobe or both lobes minute. Nutlets obovoid, crowned with dense scale-like or chaffy hairs.

Habitat:-- Burma Gokteik Gorge in the Shan Hills Yeebold 8077.

Achyrospermum Wallichiana Benth. ex Hook. f. Fl.

Brit. Ind. iv, 673.

Small undershrubs, 30-100 cm. high, stem rigid, terete, simple or branched, tomentose or hoary, stem rooting below. Leaves membranous, long-petioled, 10-15 cm. long, elliptic-ovate, acuminate, serrate or crenate-dentate, base entire cuneate; sparsely pubescent on both surfaces. Flowers in dense spikes, terminal, 5-10 cm. long, cylindric, glabrous or villous; bracts membranous orbicular, acuminate, about 10 mm. Calyx 7-8 mm. long, membranous, teeth short triangular reticulate. Corolla about 15 mm., white or purple. Nutlets 2 mm. long, obtusely trigonous, faintly hairy and rugose, truncate and somewhat irregularly fringed above.

Habitat:- E. Himalayas from Sikkim to Bhutan; Mishmi hills, Khasia, Jayentea & Nagahills and Upper Burma.

var. gokteikense W. W. Smith. in Rev. Bot. Surv. Ind. vi, 2, (1913) 40.

Small herbs 10-20 cm. high, stem slender usually unbranched, tomentose. Leaves long-petioled, elliptic-lanceolate. or oblong, acute or obtuse, crenulate, base cuneate.

Habitat:- Burma Gokteik Gorge in the Shan Hills Meebold 8077.

Colquhounia Wall.

Trans. Linn. Soc. XIII 603; Benth. Lab. ~~et~~ Gen. et Sp. 644, in DC. Prodr. XII 457, and in Benth. ex Hook.f. Gen. Pl. II 1208; Hook.f. Fl. Brit. Ind. IV 674; Prain in Journ. As. Soc. Beng. LXII 35; Briq. in Eng. und Pr. Pfl.- Fam. IV ~~3~~ a 267; Kudo in Memo. Fac. Sc. & Agri. II 2 (1929) 179.

Tall, robust, rambling herbs with rounded branches. Leaves petioled, ovate, acute or acuminate, dentate or crenate at the margins, base cuneate, rarely truncate or cordate, tomentose with simple or stellate hairs. Flowers in axillary whorls or in dense or lax spikes or racemes. Calyx distinctly 10-nerved, equally 5-toothed, throat glabrous. Corolla tube incurved, not annulate, throat inflated; galea entire or more rarely notched, shorter than the almost equally 3-lobed lower-lip. Stamens 4, ascending under the lower lip, the lower pair longer; anthers conniving in pairs, the cells divergiccate, confluent. Disc equal. Style 2-fid, lobes subequal. Nutlets oblong, compressed winged at the top.

.....

- Tomentum of stellate hairs; wings of nutlets sublaciniate, not longer than the body of the nut..... coccinia
- Tomentum of simple hairs; wings of nutlets entire, longer than the body of the nut..... elegans

..... DC. Prodr. XII 457, excl. the Assam plant; Hook.f. Fl. Brit. Ind. IV 674, the Kumaon only.

Erect or semi-erect; Tomentum dense, floccose, white. Leaves crenate, - crenations large, base sometimes subcordate. Flowers pink.

Habitat: - Cachmir; Sino 290 Bhutan; Chumbi.

1. Colquhounia coccinia Wall. Trans. Lin. Soc. xiii (1822) 608; Tent. Fl. Nap. i (1824) 13, fig. excl.; Cat. No. 2058/1(1829); Benth. Bot. Reg. XV sub. 1292; Lab. Gen. et Sp. 644; DC. Prod. XII 457; Walp. Ann. iii 268; Hook.f. Fl. Brit. Ind. IV 647;

C. coccinia var. α Typica Prain Journ. As. Soc. Beng. lxii 35.

C. coccinia var. β major Benth. in Wall. Cat. No. 2085/B(1829)

C. vestita Wall. Tent. Fl. Nap. i(1829) 14; and Pl. As. Rar.

iii 43(1832) in part and excluding the Kumaon locality and the figure.

A tall shrub about 9 metre high, often semiscandent and sprawling; usually sparsely tomentose with white stellate hairs. Leaves petioled, 6-12 cm. long, ovate, acute, or acuminate, dentate-crenate, rounded or subcuneate at the base; sparsely tomentose with stellate hairs. Flowers in axillary or terminal spikes. Calyx about 10 mm. long, hoary; teeth triangular. Corolla pink or red, 2.5-3 cm. long; tube slender below, throat inflated; pubescent with multicellular hairs, glandular at the tip. Nutlets about 4 mm. long, winged; wing oblique, truncate, sublaciniate, not longer than the body of the nut

Habitat:- Nepal; Sikkim; Singlila; Bhutan; Bhutan; Khasia.

C. coccinia var(i) vestita Prain. in Journ. As. Soc. Beng.

lxii 36.

C. vestita Wall. in Tent. Fl. Nap. i(1824) 14, in part, the Kumaun plant only; Pl. As. Rar. iii 43, t 267(1832) as to fig.; Wall. Cat. No. 2086; Benth. Bot. Reg. XV sub 1292(1829); Lab. Gen. et Sp. 644 (1834); DC. Prodr. XII 457, excl. the Assam plant; Hook.f. Fl. Brit. Ind. IV 674, the Kumaon only.

Erect or semiscandent; Tomentum dense, floccose, white.

Leaves crenate, - crenations large, base sometimes subcordate.

Flowers pink.

Habitat:- Cashmir; Kumaon; Bhutan; Chumbi.

Colquhounia coccinia var. (ii) parviflora Benth. in Wall. Cat. No. 2085/ (1829); Lab. Gen. et Sp. 644; and DC. Prod. XII 457; Prain in Journ. As. Soc. Beng. lxii 36 (1893).

C. coccinia Wall. Tent. Fl. Nap. i t. 6 (1824), the fig. only; Hook. Bot. Mag. t.4515 (1850).

Scandant; toment rusty. Leaves smaller; crenations large. Flowers orange or golden yellow, with orange red lobes. Habitat:- Nepal.

C. coccinia var (iii) mollis Prain in Journ. As. Soc. Beng. lxii 37 (1893); Kudo in Mem. Fac. Sc. & Agri. II 2, (1929) 181;

C. mollis Schlecht Linnaea xxiv (1851) 681; Walp. An. V (1858) 689.

C. tomentosa Houllet Rev. Hort. (1873) 131.

C. vestita Benth. in DC. Prod. XII 457 not of Wall, the Assam plant only; Hook. f. Fl. Brit. Ind. IV 674, excluding the Kumaon plant, not of Wall; Collett and Hemsley Journ. Linn. Soc. xxviii 116 (1890), not of Wall.

C. vestita var rugosa C.B. Clarke mss.

Stout shrub, virgate; tomentum dense, rusty. Leaves crenate, crenations very small. Flowers very large, orange red. Nutlets with very short wings.

Habitat: Sikkim; Bhutan; Mishmi; Assam.

Distribution:- China.

2. Colquhounia elegans Wall. Cat. No. 2084 (1829); Benth. Bot. Reg. XV, sub. 1292 (1829); Wall. Pl. As. Rar. iii 43, t. 268 (1832); Lab. Gen. et Sp. 645 (1835); DC. Prod. Xii 457; Hook. f. Fl. Brit. Ind. IV 674; Collett and Hemsley in Journ. Lin. Soc. xxviii 116; Prain in Journ. As. Soc. Beng. lxii (1893) 37.

T
Tall shrub, about 3 mtr. high, branches often rambling; densely and softly tomentose all over with simple long hairs. Leaves shortly petioled, 10- 15 cm. long, ovate, acute, or acuminate, margin serrate, rounded or cuneate at the base, rough above,

Colquhounia elegans(contd.)

densely tomentose below. Flowers in many flowered axillary racemes. Calyx 8 mm. long, teeth acute. Corolla dark red or salmon-coloured, sometimes with crimson spots; tube long, throat wide; pubescent out side, hairs few-celled, glandular at the base. Nutlets with entire wings, which are longer than the body of the nut.

Habitat: $\frac{3}{4}$ Manipur; Burma.

C. elegans var(i) pauciflora Prain in Journ. As. Soc. Beng. lxii (1893) 38; Kudo in Mem. Fac. Sc. & Agri. II 2 (1929) 180.

C. Coccyinia Hemsl. Journ. Lin. Soc. xxvi (1890) 299, not of Wall.

Always scandant; almost glabrous throughout; stems and branches slender. Flowers few in loose axillary heads. Corolla red, tube very short, throat wide.

Habitat:- Burma.

Distribution: S. China.

C. elegans var (ii) tenuiflora Prain in Journ. As. Soc. Beng. lxii (1893) 38; Kudo in Mem. Fac. Sc. & Agri. II 2 (1929) 180.

C. tenuiflora Hook.f. Fl. Birt. Ind. IV 674;

C. elegans Kurz for Fl. Brit. Burma ii (1877) 277, not ~~fa~~ of Wall.

C. marbanica(martabanica?) Kurz Mss.

Scandant with slender stem and branches; sparsely hairy ~~thru~~ throughout. Flowers in loose many flowered long axillary racemes; corolla red; tube very long, throat narrowed.

Habitat:- Burma.

Distribution:- Yunnan.

Molucella Linn. stem slender, 4-angled.

Benth. Lab. Gen. et Sp. 639, and in DC. Prod. XII 513; Boiss. Fl. Orien. IV 768; Benth. ex Hook. f. II ; Prain in Journ. As. Soc. Beng. lix, ii, (1890) 311; Briq. in Eng. und Pr. Pfl. fam. IV 3, a, 258.

Annual or perennial herbs. Leaves petioled or sessile, incised, crenate or serrate, or entire. Whorls many-flowered, all axillary; bractioles subulate pungent. Calyx obliquely campanulate below, striately 5-10-nerved, dilated above into a broad reticulated limb elongated behind, and marginally 5-mucronate or 5-10-spined. Corolla tube included, obliquely annular within, slightly enlarged upwards; limb 2-lipped; upper lip erect, concave, entire or emarginate; lower 3-lobed, lateral lobes oblong suberect, mid-lobes spreading, obcordate. Stamens 4, ascending, didynamous; lower longer; anthers conniving, 2-locular. Disk equal. . Style 2-lobed; lobes subequal, subulate. Nutlets triquetrous, truncate, smooth.

- - - - -

Molucella otostegioides Prain in Journ. As. Soc. Beng.

lix (1890) 311.

Erect glabrous herb, stem and branches slender, 4-angled. Leaves sessile, 4 cm. long, lanceolate, acute and sharply pointed ~~at~~ at the apex, quite entire, base narrowed; glabrous on both sides. Whorls axillary, distant, many-fld.; bracts 3-partite, subulate, spinescent; Calyx glabrous, rigidly coriaceous; tube 8mm. long; throat naked; limb 2-lipped, prolonged behind as an erect spinescent tooth, and in front as a spreading, 3-parted lip, with smaller radiating marginal lateral spines. Corolla 7 mm. long, tube short, obliquely annular within, upper lip entire villous. Stamens exserted; anthers glabrous. Nutlets triquetrous, truncate, smooth.

Habitat :- N.W. Frontier Province, -Suleiman Range, Stewart.

Otostegia limbata Boiss. Fl. Orient. iv 776; Benth. ex Hook.
in Fl. Brit. Ind. iv 679.

Otostegia limbata DC. Gen. et Sp. 743, and in DC. Prodr.
i 321.

Otostegia, Benth.

Dwarf spiny shrub, also terete hairy-tomentose. Leaves

Lab. Gen. et Sp. 601, and in DC. Prodr. xii 522;

Benth. ex Hook. f. Gen. Pl. II 1213; Boiss. Fl. Orient.

iv 776; Hook. f. Fl. Brit. Ind. iv 679; Briq. in Eng.

& Pr. Nat. Pflanzenf. iv 258.

Small shrubs; leaves sessile or very shortly petioled.

Whorls axillary many flowered; bracteoles lanceolate or

subulate, often spinescent. Calyx 10-nerved, membranous,

very much expanded at the mouth, with a sinuate margin, pro-

duced on the anterior side, indistinctly 2-lipped. Corolla-

tube included, annulate within; upper lip erect, hooded, very

much villous; lower lip spreading, 3-fid, midlobe large.

Stamens 4, ascending, lower pair longer; anthers conniving;

cells at length divaricate. Disc equal. Style subequally

2-fid at the apex. Nutlets dry, obovoid, obtuse.

Shrub spiny bush, branching below, glabrous; branches slender

angled. Leaves subsessile, 2.5 cm. long, elliptic-lanceolate

or oblanceolate, acute with spinescent tips quite entire, base

sheath glabrous above, pubescent below. Whorls axillary, distant,

5-10 flowered. Bracts subulate spinescent. Calyx sparsely hairy.

Whorls naked, limb 5-lobed, broad membranous, oblique, 5-lobed,

lower lobes very large rounded spine tipped. Corolla 1.5 cm. long,

tube short, upper lip short emarginate villous. Stamens exerted.

Nutlets 3 mm. long, flattened, smooth.

Habitat:- Baluchistan; Daks, Laks etc.

Dist.:- Persia.

1. Otostegia limbata Boiss. Fl. Orient. iv 778; Benth. ex Hook. f. in Fl. Brit. Ind. iv 680.

Ballota limbata Benth. Lamb. Gen. et Sp. 743, and in DC. Prodr. xii 521.

Dwarf spiny shrub, stem terete hoary-tomentose. Leaves subsessile, 2-3 cm. long, elliptic-lanceolate or oblanceolate, obtuse, cuneate at the base, margin entire, hoary on both surfaces. Whorls axillary, 6-10 flowered, distant; bracts spinescent, the upper ones dilated or winged. Calyx villous, bearded in the throat, tube short strongly ribbed, limb membranous, broad turbinate, 5-toothed, much expanded and oblique in fruit, forming a 5-lobed cup 1.5 cm. in diam., often toothed at the margin. Corolla 2 cm. long, yellow, tube short, upper lip very long, villous. Stamens exserted. Nutlets flat 3 mm. long, ribbed.

Habitat:- Punjab, Falconer etc; Kashmir, Clarke; Chitral; Hazara, Inayat, etc; Burma; Fort Stedham, Milne, A.M. 119.

2. Otostegia Aucheri Boiss. Diagn. Ser. I, V, 40, and in Fl. Orient. iv 778; Benth. in DC. Prodr. xii 523; Jaub. et Spach. Ill. Pl. Or. iv 124 t. 382; Prain in Journ. As. Soc. Beng. lix (1890) 312.

Erect spiny bush, branching below, glabrous; branches slender 4-angled. Leaves subsessile, 2.5 cm. long, elliptic-lanceolate or oblanceolate, acute with spinescent tips quite entire, base cuneate, glabrous above, puberulous below. Whorls axillary, distant, 6-10 flowered; bracts subulate spinescent. Calyx sparsely hairy, throat naked, limb turbinate, broad, membranous, oblique, 5-lobed, lower lobes very large rounded spine tipped. Corolla 13 mm. long, tube short, upper lip short emarginate villous. Stamens exserted. Nutlets 3 mm. long, flattened, smooth.

Habitat:- Beluchistan; Duke, Lace etc.

Dist.:- Persia.

Galeopsis Tetrahit Linn. Sp. Pl. 579; Benth. in Lab. Gen. et Sp. 524, and in DC. Prodr. xii, 495; Hook. f. Fl. Brit. Ind. iv, 677; Kudo in Mem. Fac. Sc. & Agri. II, 2, (1929) 204.

Erect herb, Galeopsis, Linn. hispid with spreading and deflexed hairs, nodes thickened and densely hispid.

Gen. n. 717; Benth. Lab. Gen. et Sp. 523, and in DC. Prodr. xii 497; Endl. Gen. Pl. 625; Hook. f. Fl. Brit. Ind. iv, 677; Benth. ex Hook. f. Gen. Pl. II, 1209; Briq. in Engl. & Pr. Nat. Pflanzenf. iv, 3, a, 252; Kudo in Mem. Fac. Sc. & Agri. II, 2, (1929) 204.

Herbs with spreading branches, Whorls 6- to many-flowered, axillary or in terminal leafy spike. Calyx tubular campanulate, 10-nerved, subequally 5-toothed; teeth subspinescent. Corolla-tube exserted, straight, exannulate, or imperfectly annulate within, slightly dilated at the throat; upper lip ovate, concave, lower 3-fid, the central lobe obcordate, or slightly 2-fid; "palate with erect teeth at the union of the lips." Stamens 4, exserted; anthers 2-celled; cells opposite, 2-valved, inner valve ciliate, outer layer naked. Disk with a small glandular swelling in from. Style subequally 2-fid. Nutlets rounded, compressed, slightly reticulate.

Galeopsis Tetrahit Linn. Sp. Pl. 579; Benth. in Lab. Gen. et Sp. 524, and in DC. Prodr. xii, 498; Hook. f. Flor. Brit. Ind. iv, 677; Kudo in Mem. Fac. Sc. & Agri. II, 2, (1929) 204.

Erect herb, about 100 cm. high, hispid with spreading and deflexed hairs, nodes thickened and densely hispid. Leaves petioled, 3-10 cm. long, ovate or ovate-lanceolate, acute or acuminate, coarsely serrate, cuneate at base, hispid on both sides, petiole, 1-2 cm. long, slender. Whorls many-flowered, axillary or in terminal spikes. Calyx 1.5 cm. long, broadly campanulate, hispid, teeth as long as the tube or longer, straight narrow and spinescent. Corolla 2-3 cm. long, yellow and purple. Nutlets rounded, plano-convex, 3 cm. in diam., subreticulate, brown with pink spots.

Habitat:- Sikkim, J.D.H. and others; Kashmir, Duthie No. 11938.

Dist.:- Tibet, N. & W. Asia, Europe.

Lagochilus callicarpus Benth. in DC. Prodr XII 513; Boiss. Fl. Orient. IV 768; Prain in Jour. As. Soc. Beng. lix 311.

Lagochilus Bunge.

Benth. Lab. Gen. et Sp. 640; DC. Prod. XII 514; Boiss. Fl. Orient. IV 768; Benth. ex Hook.f. Gen. Pl. II ; Prain in Jour. As. Soc. Beng. lix, ii (1890) 311; Briq. in Eng. und Pr. Pflanzenf. IV 3,a, 257.

Smooth, rigid herbs or undershrubs. Leaves incised; lobes often spine-tipped. Whorls axillary, few-flowered; bracts foliar, decreasing upwards; bracteoles acicular, often spinescent. Calyx tubular-campanulate, 5-nerved; mouth oblique or equal; teeth 5, subspinescent, or with the upper prolonged. Corolla tube often shortly exserted, annular-pilose within, slightly enlarged upwards; limb 2-lipped; upper lip erect, oblong, 2-fid, subconcave; lower 3-fid; lateral lobes short, acute, erect; central spreading, wide emarginate. Stamens 4, didynamous; lower longer, ascending; filaments adherent; anthers 2-locular; lobes parallel or divergent; margins ciliate. Style 2-fid; lobes subequal, subulate. Disk equal. . Nutlets 3-quetrous, apex truncate.

Lagochilus cabulicus Benth. in DC. Prodr Xii 515; Boiss.
Fl. Orien. IV 769. Prain in Jour. As. Soc. Beng. lxx 312.

Erect spinous herb, 18-25 cm. high; stem 4-angled smooth, white pubescent or glabrous; the lower barren spines 8-10 mm. long, glabrous, with a pair of minute lateral suberect spinules near the base; the upper floral spines 22-25 mm. long, hispid, setose or glabrous, with the lateral spinules 10 mm. long. Leaves petioled, 2 cm. long, palmately 3-5-fid, lobes entire or incised, obtuse or acute, sometimes mucronate; glabrescent; petiole 1 cm. long. Flowers few in axillary whorls; bracts acicular often spinescent. Calyx glabrous or hairy; tube 5 mm. long; limb of 5 oblong lobes; lobes 8 mm. long, subcuneate, obtuse, mucronate, margin hispid. Corolla-tube short; upper lip villous. Nutlets triquetrous, truncate.

Habitat:- Kashmir, Gilgit, Giles.

Distribution:- Afghanistan; Turkistan.

4. Stem and leaves densely velvety all over ... rhomboidum
 1. Stem and leaves glabrous or hairy not
 velvety.
 B. Leaves orbicular, 1-2 cm. ... amphioxanthum
 B. Leaves ovate Lamium, Linn. ... album.

Gen. 716; Benth. Lab. Gen. et Sp. 507, and in DC. Prodr. xii 504; End. Gen. Pl. 624; Hook. f. Fl. Brit. Ind. iv, 678; Benth. ex Hook. f. Gen. Pl. II, 1210; Briq. in Eng. & Pr. Nat. Pflanzenf. iv, 3, a, 254; Kudo in Mem. Fac. Sc. & Agri. II, 2, (1929) 198; Post in Fl. Syria etc. II, 385.

Annual or perennial herbs, erect or procumbent. Leaves usually crowded. Whorls densely many-flowered, axillary or in leafy heads; bracteoles absent or subulate. Calyx tubular or campanulate, 5-nerved, 5-toothed, mouth equal or oblique. Corolla-tube usually exserted, annulate or not, dilate at the throat; upper lip arched, entire, retuse or bifid; lower spreading, 3-lobed, the lateral lobes truncate or angled, sometimes appendaged, the median somewhat stipitate, entire or 2-lobed. Stamens 4, parallel, ascending under the upper lip, lower longer; anthers conniving, cells divergent. Disk equal or slightly produced in front. Style equally 2-fid at the tip lobes subulate. Nutlets acutely triquetrous, truncate at the tip. anthers almost smooth.

Habitat:- (Kashgar, Xinjiang, Sinkiang, Turkestan, etc.).

Dist.:- Afghanistan; Turkestan; E. Tibet.

2. Lamium amphioxanthum Linn. Wall. Cat. 2074; DC. Prodr. xii; Benth. in DC. Prodr. xii, 508; Boiss. Fl. Orient, iv 760; Reicheb. Ic. Pl. Germ. 1204, f. 2; Hook. Fl. Brit.

A. Stem and leaves densely velvety all over ... rhomboideum
A. Stem and leaves glabrous or hairy not velvety.

B. Leaves orbicular, 1-2 cm. amplexicaulis
B. Leaves ovate cordate, 5-10 cm. album.

1. Lamium rhomboideum Benth. Lab. Gen. et Sp. 509, and in DC. Prodr. xii, 504; Hook. f. Fl. Brit. Ind. iv, 678.

Erianthera rhomboidea Benth. in Hook. Bot. Misc. iii 380.

Dwarf herb 15-30 cm. densely softly velvety; stem very stout upwards, more slender below, flexuous densely tomentose, rarely branched. Leaves petioled, widely rhomboid, lower small, upper 5-10 cm. in diam; deeply or shallowly crenate, base abruptly decurrent on the very thick woolly petiole; densely velvety on both sides, slightly rugose above, veins palmately reticulate; petiole about 3 cm. long below, much shorter above. Flowers few, subsessile in axillary whorls, bracts subulate woolly. Calyx 1.5-2 cm. long, densely woolly, teeth lanceolate acuminate, ciliate. Corolla purplish 3-4 cm. long; tube straight naked within, galea broad woolly. Anthers hirsute. Nutlets obovoid, 5 mm. long flattened, brown, almost smooth.

Habitat:- Kashmir, Punjab, (Bashahr Dt.).

Dist.:- Afghanistan; Turkestan; W. Tibet.

2. Lamium amplexicaule Linn. Wall. Cat. 2074; Don Prodr. iii; Benth. in DC. Prodr. xii, 508; Boiss. Fl. Orient, iv 760; Reichb. Ic. Fl. Germ. t. 1204, f. 2; Hook. Fl. Brit.

Ind. iv, 679; Collett Fl. Sim. 403.

Decumbent herb, branching from the base, 10-30 cm. high, hairy or glabrescent, stem and branches slender. Leaves long petioled below, subsessile or sessile above, orbicular, inciso-crenate, lower almost lobulate, base rounded or cordate, glabrous or minutely hairy, lamina 1-2 cm. across; petiole very slender about 3 cm. long, much shorter upwards. Flowers many or few in distant axillary whorls. Calyx about 5 mm. long, villous, teeth as long as or shorter than the tube, narrow, acuminate, converging in fruit. Corolla about 2 mm. long, purple red, tube very slender, lips short. Nutlets about 2 mm. long, brown with very prominent scaly marks all over.

Habitat:- Kashmir; Peshawar; The Punjab; Kumaon; Sikkim.

Dist.:- Tibet; Afghanistan to W. & N. Asia; N. Africa; Europe.

3. Lamium album Linn. Sp. Pl. 579; Benth. in DC. Prodr. xii 510; Boiss. Fl. Orient. iv 763; Reichb. Ic. Fl. Germ. t. 1205; Hook. f. Fl. Brit. Ind. iv, 679; Collett Fl. Sim. 403.

L. petiolatum Royle ex Benth. in Hook. Bot. Misc. iii, 381, Lab. Gen. et Sp. 513, and in DC. Prodr. xii 509.

Ascending or decumbent perennial herb, 25-50 cm. long, with a creeping rootstock, glabrous or hispidly hairy. Leaves petioled, ovate-cordate, crenate or serrate, acuminate rarely acute, glabrescent or sparingly hairy; lamina 5-10 cm. long, petiole slender 5 cm. or longer in lower leaves, much shorter upwards. Flowers many in axillary whorls; whorls distant below, crowded above; bracts linear longer than the calyx.

Calyx 12 mm. long, hispid with long hairs or glabrous, tube short, teeth linear longer than the tube, ciliate or not.

Corolla 2-2.5 cm. long, white or pale pink, tube curved, gibbous at the base, incompletely annulate within, sometimes with a small tooth, upper lip villous. Nutlets about 4 mm. long, smooth, black or dark brown, with or without scaly marks.

Habitat:- Kashmir; The Punjab; Kumaon; Hazara.

Dist.:- N. & W. Asia; N. Africa; Europe.



Eriophyton Wallichianum Benth. in Wall. Pl. As. Rar.
i 63, Lab. Gen. et Sp. 638, and in DC. Prodr. xii 549; Wall.
Cat. 2070; Hook. f. Fl. Brit. Ind. iv 695.

Dwarf herb, 10-20 cm. high, densely clothed with long
white wool, stem simple, stout, naked below, rootstock stout;
Eriophyton, Benth.
wool about 5 mm. long, more, very soft. Leaves shortly

petiolated or sessile, rounded or rhomboid and acute serrate,
in Wall. Pl. As. Rar. i 63, Lab. Gen. et Sp. 638, and
cuneate at the base; densely woolly on both sides; petiole
in DC. Prodr. xii 549; Hook. f. Fl. Brit. Ind. iv 695;
Benth. ex Hook. f. in Gen. Pl. II, 1215; Briq. in Eng. &
Pr. Nat. Pflanzenf. iv, 3, a, 245; Kudo in Mem. Fac. Sc. &
Agri. II, 2, (1929) 217.

Dwarf perennial herb, thickly woolly. Leaves rhomboid
or rounded, close set. Whorls axillary, 6-flowered; flow-
ers large. Calyx campanulate, membranous, 10-nerved, deeply
5-lobed; lobes acuminate equalling the tube. Corolla-tube
included; limb bilabiate; upper lip large, galeate, com-
pressed, arching over the short 3-lobed lower lip. Stamens
4, lower longer; the upper filaments thickened at the base;
anthers conniving, villous; cells divaricate. Disk equal.
Style subequally 2-fid at the apex. Nutlets large, broadly
obovoid, triquetrous, truncate, glabrous.

Eriophyton Wallichianum Benth. in Wall. Pl. As. Rar. i 63, Lab. Gen. et Sp. 638; and in DC. Prodr. xii 549; Wall. Cat. 2070; Hook. f. Fl. Brit. Ind. iv 695.

Dwarf herb, 10-20 cm. high, densely clothed with long white wool, stem simple, stout, naked below, rootstock stout; wool about 5 mm. long or more, very soft. Leaves shortly petioled or subsessile, rounded or rhomboid and acute serrate, cuneate at the base; densely woolly on both sides; petiole flat; lamina 3-5 cm. in diam., venations palmately reticulate. Whorls axillary, 6-flowered; bracts filiform. Calyx about 2.5 cm. long, 5-lobed, lobes triangular, finely acuminate. Corolla 3-3.5 cm. long, yellow or pinkish yellow, tube included, galea pubescent. Filaments thickened at the base, anthers villous. Nutlets 4 mm. long, broadly obovoid, truncate.

Habitat:- Nepal; Sikkim; Bhutan.

Dist.:- Tibet.

Leucas, R. Br.

Prodr. 504; Benth. Lab. Gen. et Sp. 603, and in DC. Prodr. xii 523; Boiss. Fl. Orient, iv 778; Hook. f. Fl. Brit. Ind. iv 680; Benth. ex Hook. f. Gen. Pl. II 1213; Briq. in Engl. and Pr. Nat. Pflanzenf. iv, 3, a, 450; Prain Beng. Fl. 854, and in Journ. As. Soc. Beng. lxxiv (1907) 717; Cooke Fl. Bomb. Pr. II 463; Duthie Fl. Upp. Gong. Pl. II 248; Gamble Fl. Madras 1143; Haines Bot. Bit. Oris 7 Ridley in Fl. Malay Penin. II 650; Kudo in Mem. Fac. Sc. Agri, II, 2, (1929) 205; Doan in Fl. Gen. Indo-Chine IV, 8, (1936) 1018.

Herbs or undershrubs. Flowers medium or small, in dense axillary, usually distant, less often terminal whorls. Calyx 10-nerved, often striate; mouth equal or oblique; teeth 6 to 10, usually unequal. Corolla-tube not exerted, annulate or not within; lower lip 3-fid, spreading, mid-lobe large; upper lip erect, concave, villous externally. Stamens 4, didynamous, the upper pair shorter, ascending under upper lip; anthers connivent; cells divaricate, ultimately confluent. Disk entire or lobed, uniform or enlarged anteriorly. Style subulate; upper lobe minute or obsolete. Nutlets ovoid, triquetrous, obtuse.

- A. Calyx-tube bent, mouth oblique.
- B. Calyx-mouth produced on the lower
(anterior) side urticaefolius
- B. Calyx-mouth produced on the upper
(posterior) side.
- C. Calyx-mouth glabrous within or
minutely pubescent (all leaves
linear or narrowly lanceolate).
- D. Calyx-mouth wide, teeth
equal (Himalaya and N.
India). hyssopifolia
- D. Calyx-mouth contracted,
uppermost tooth longest.
- E. Bracts equalling the calyx,
with long marginal bristles;
calyx distinctly ribbed ... aspera
- E. Bracts smaller than the calyx,
without bristles.
- F. Leaves 4-8 mm. broad, margin
not revolute, flowers in
dense heads lavandulae-
folia.
- F. Leaves 1-3 mm. broad, margin
revolute (canara) flowers
1-5 together angustissima
- C. Calyx mouth hairy, within.
- D. Bracts 1.5-2.5 cm. long, imbricating
and forming an involucre, covering
the floral heads cephalotus
- D. Bracts about 1 cm. long, neither
imbricating nor forming an
involucre.

- E. Calyx-tube very much bent in the middle to curve outwards or downwards.
- F. Upper calyx-tooth very long; bracts linear spinous; stem finely pubescent martinicensis
- F. Calyx teeth equal; bracts lanceolate foliaceous; stem densely tawny-hispid nutans.
- E. Calyx-tube erect.
- A. Calyx-tube straight, mouth never oblique.
- B. Leaf-margin entire.
- C. Leaves linear to oblong, 2-10 mm. in breadth.
- D. Slender herbs, scaberulous or minutely and sparsely hispid in all parts; whorls axillary, (Concan & Poona). longifolia
- E. Calyx-teeth 2.5 mm. long, the upper tooth much longer.
- F. Erect herbs; annual; corolla annulate within.
- G. Stem patently hirsute, (South India, Burma). stricta
- G. Stem adpressed pubescent (Parasnath) Clarkei
- F. Procumbent herbs, base woolly, corolla not annulate within (Mt. Abu). macrantha
- E. Calyx-teeth 1 mm. long, almost subequal;

- C. Leaves lanceolate, 1-2.5 cm.
 F. Calyx-mouth truncate not
 oblique (S. India). *diffusa*.
 F. Calyx-mouth very oblique.
 G. Corolla 18 mm. long;
 lower lip longer than
 the tube *zeylanica*
 G. Corolla 10 mm. long,
 lower lip shorter than
 the tube *Wightiana*
- D. Low shrubs conspicuously tomentose
 or strigose in all parts; whorls
 usually terminal (globose, many-
 flowered).
 E. Leaves and stem covered with
 long patent bristle-like
 hairs; peduncles very long
 10-20 cm., *suffruticosa*
 E. Leaves and stem strigose or
 tomentose with minute ad-
 pressed hairs; peduncles
 about 5 cm. or less.
 F. Bracts linear-lanceolate,
 all parts strigose *rosmarinifolia*
 F. Bracts setaceous, half as
 long as the calyx or short-
 er; all parts softly to-
 mentose.
 G. Leaves linear, 2-4 mm. *prostrata*
 D. Leaves broad *ternifolia*
 G. Leaves linear-oblong,
 with a ... 5-10 mm. in breadth *helianthemifolia*.

C. Leaves lanceolate, 1-2.5 cm.

in breadth lanceaefolia.

B. Leaf-margin crenate or serrate.

C. Whorls few, at apex of shoots.

(Calyx densely villous at the throat).

D. Leaves ovate (except sometimes
in *L. ciliata*); teeth of calyx
 $\frac{1}{2}$ - $\frac{1}{3}$ the length of the tube,
ciliate with spreading erect hairs.

E. Hairs on the upper lip of corolla
rufous-brown; leaves narrowed to
the base.

C. Whorls F. Leaves lanceolate, (Him.,

note. (Assam, Burma). *ciliata*
(see also below)

throat or sparsely hairy).

F. Leaves ovate.

D. Hairs on stem and branches erect

G. Leaves glabrescent

or spreading.
(S. Indian forms

only) *ciliata*

nearly as broad as long.

G. Leaves tawny villous

F. Leaves distinctly

(S. India) *vestita*

E. Hairs on the upper lip of corolla
white; leaf base rounded

F. Tall shrubby plants; leaves

5-10 cm. long or more, vil-

lous, soft to the touch *lamiifolia*

G. Flowers sessile; calyx-

teeth 2 mm. long; Burma.

F. Leaves sessile, succulent.

G. Corolla annulate; leaves
touch *prostrata*

D. Leaves narrowly lanceolate; calyx

teeth $\frac{1}{4}$ - $\frac{1}{8}$ the length of the tube,

with a few silky hairs.

- E. Leaves leathery & rigid,
 obtuse, very scabrid hirta
- E. Leaves hispid or tomentose, chartaceous, flexuous, acute at the apex.
- F. Leaves chartaceous;
 bracts pectinately villous obscuring the calyces eriostoma
- F. Leaves membranous; bracts filiform, hairy, calyces not obscured stelligera
- C. Whorls numerous, all axillary, remote. (Calyx usually naked at the throat, or sparsely hairy).
- D. Hairs on stem and branches erect or spreading.
- E. Leaves ovate to orbicular, nearly as broad as long.
- F. Leaves distinctly petioled, membranous.
- G. Flowers distinctly pedicelled; calyx teeth minute, not exceeding 1 mm. (S. India) nepetaefolia
- G. Flowers sessile; calyx-teeth 2 mm. long; Burma . Helferi
- F. Leaves sessile, coriaceous.
- G. Corolla annulate; leaves ovate lanata
- G. Corolla not annulate; leaves suborbicular (Burma). Collettii

- E. Leaves narrowly lanceolate,
 about 4 times as long as
 broad (Chota Najpur)... .. helicterifolia
- D. Hairs on stem and branches reflexed.
- E. Stem terete; leaves tomentose
 below (Burma only) teres
- E. Stem quadrangular; leaves
 tomentose below or not.
- F. Leaves membranous, never
 densely tomentose below,
 generally glabrate or softly
 pubescent; calyx hispid on
 the ribs but not hoary.
- G. Calyx 6 mm. long (Burma).
- H. Perennial plant (leaf-
 apex acute) pilosa
- H. Flaccid annual (leaf-
 apex obtuse) flaccida
- G. Calyx 10 mm. long (S. India
 & to Burma).
- H. Whorls 2-4-flowered; stem
 procumbent, very slender.. biflora
- H. Whorls 6- many-flowered;
 stem stout, erect or
 ascending (S. India).
- I. Bracts minute, subulate,
 shortly hispid; leaf-
 apex acute angularis
- I. Bracts lanceolate,
 as long as the calyx,
 ciliate; leaf-apex
 obtuse pubescens

- F. Leaves chartaceous, densely
white or grey-tomentose below,
(except in some varieties of
L. mollissima); calyx hoary or
hispid.
- G. Bracts equalling the
calyx (S. India)... .. *marrubioides*
- G. Bracts very minute.
- H. Calyx 10 mm. long,
mouth abruptly dilated
(S. India) *chinensis*
- H. Calyx 6 mm. long, mouth
not dilated.
- I. Leaves sessile, rounded
at the apex, base cord-
ate (Burma). *ovata*
- I. Leaves usually petioled,
acute or obtuse, base
rounded or cuneate.
- J. Leaves obtuse, rounded
at the base, petiole very
short *montana*
- J. Leaves acute, cuneate
at the base, petiole up
to 2.5 cm. *mollissima*.
-

1. Leucas urticaefolia R. Br. Prod. 504; Benth. in DC. Prodr. xii 524; Wight Ill. t. 176b. f. 10, and Ic. t. 1451; Boiss. Fl. Orient. iv 778; Hook. f. Fl. Brit. Ind. iv 680; Baker in Thiselton & Dyer, Fl. Trop. Afric. v. 489; Prain Beng. Pl. 855; Cooke. Bomb. Fl. II, 464; Duthie Fl. Upp. Gang. Pl. II 249; Gamble. Fl. Madras 1149; Haines Bot. Bih. & Oriss. 747.

An erect hoary annual herb, 15-60 cm. high, with square stem. Leaves petioled, ovate, or often lanceolate, obtuse coarsely serrate, cuneate at base, softly pubescent or hoary or often glabrous; lamina 3-5 cm. long; petiole .5-1 cm. long. Whorls many-flowered, dense, globose, usually axillary; bracts almost equalling the calyx, ciliate. Calyx membranous, cylindrical, 8-12 mm. long, reticulated, pubescent or villous outside, sparsely hairy within; mouth oblique, split above, produced on the anterior side; ribs ending into minute spinulose teeth. Corolla white, tube slender, not annulate. Nutlets truncate and glandular at the top, 1.5 mm. long. Habitat:- From Beluchistan and Punjab to Behar; Sind; Gujrat; Rajputana; Central and S. India. (Mostly in plains). Dist.:- Arabia; Nubia.

2. Leucas hyssopifolia Benth. Wall. Fl. As. Par. i 60; Lab. Gen. et Sp. 615, and in DC. Prodr. xii 531; Wall. Cat. 2044; Hook. f. Fl. Brit. Ind. iv 690; Collett Fl. Sim. 405; Prain Beng. Pl. 855; Duthie Fl. Upp. Gang. Pl. II, 250; Haines Bot. Bih. Oriss. 751.

Perennial suffruticose herb, with many stems and branches from a stout woody rootstock, very much hispid. Leaves sessile, 3-7 cm. long, linear, obtuse, margin entire and

usually recurved, pubescent with stiff hairs on both surfaces. Whorls small, terminal and axillary; bracts slender and subulate, spinulose, almost equalling the calyx. Calyx about 6 mm. long, obconic, glabrous; mouth wide truncate glabrous within; teeth erect, very minute, mucroniform. Corolla white, tube slender, scarcely longer than the calyx, pubescent above. Nutlets 3 mm. long, greyish brown, glandular-punctate, truncate at the top.

Habitat:- Jamu (Kashmir?); Simla; Dehra Dun; N. Oudh; Sikkim; Sambalpur Dt.; Burma.

3. Leucas aspera Spreng. Syst. ii 743; Benth. Lab. Gen. et Sp. 615, and in DC. Prodr. xii 532; Miq. Fl. Ind. Bat. 982; Hook. f. Fl. Brit. Ind. iv 690; Prain Beng. Pl. 855; Cooke Fl. Bomb. Pr. II 645; Duthie Fl. Upp. Gang. Pl. II 250; Gamble Fl. Madras 1150; Haines Bot. Bihar & oriss. 751; Merrill Enum. Philip Fl. Pl. 410; Doan in Fl. Gen. Indo-Chine iv, 8, (1936) 1019.

Phlomis aspera Will in Link. Enum. Hort. Berol ii, 113.

Leucas Prunkenetii Benth. in Wall. Pl. As. Par. i, 60; Wall. Cat. 2522.

L. dimidiata Benth. in DC. Prodr. xii 532.

Phlomis Plunkenetii Roth. nov. sp. 261.

P. esculenta Roxb. Fl. Ind. iii, 10.

Erect or diffuse annual, with much-branched stem, 30-60 cm. high, hispid or scabrid. Leaves shortly petioled or sessile, 3-8 cm. long, linear, or narrowly oblong-lanceolate, obtuse, base narrow, margin entire or obscurely crenate, more or less pubescent on both surfaces. Whorls terminal or axillary, very dense- and many-flowered; bracts linear, ciliate,

subspinulose, almost equalling the calyx. Calyx 8-12 mm. long, tubular, curved, constricted above the nutlets, usually smooth and glabrous below, ribbed and scabrid or hispid above; mouth small, very oblique, produced on the upper side, glabrous within or pubescent; teeth short, triangular, spinulose, ciliate, the upper one largest. Corolla about 10 mm. long, white. Nutlets 2.5 mm. long, smooth, brown.

Habitat:- Punjab to Sikkim, Behar, Bengal, Assam, Burma; Bombay Pr.; Central and S. India.

Dist.:- Mauritius; Java; Indo-China; Philippines.

4. Leucas lavendulaefolia Rees Cyclop. XX. n. 2 (1819); Prain in Journ. As. Soc. Beng. lxxiv, 2, 719; Ridley Fl. Mal. 650.

L. linifolia Spreng. Syst. ii 743; Hook. f. in Fl. Brit. Ind. iv 690; Prain Beng. Pl. 856; Cooke Fl. Bomb. Pr. II, 465; Duthie Fl. Upp. Gang. Pl. II, 250; Gamble Fl. Madras 1149; Haines Bot. Bih. & Oris 751.

Phlomis linifolia, Roth Nov. Sp. 260 (1821).

P. zeylanica, Roxb. Fl. Ind. III. 9; Jacq. Ic. Pl. Rar. I. 11, t. 111 (not of Linn.).

Leonurus indicus, Burm. Fl. Ind. 127.

Herba admirationis, Rumph. Herb. Amboin. VI. t. 16, f. 1.

An erect, slender, annual herb, 30-60 cm. high, usually branching. Stems and branches 4-angled, finely adpressed-puberulous. Leaves opposite, herbaceous, finely puberulous on both surfaces, rather pale-green, linear-lanceolate, less often lanceolate, subacute; base tapering gradually from about the middle, entire; margin elsewhere entire in linear-lanceolate leaves, sometimes remotely and sparingly serrate

in lanceolate ones; petiole usually very short or obsolete, rarely as much as .15 cm. long. Flowers subsessile or shortly pedicelled, in axillary and terminal but always leafy whorls, and always towards apex of stem and branches; bracts 8 mm. long, narrowly linear, subspinescent, finely puberulous. Calyx 9 mm. (in fruit 11 mm.) long behind, 5-7 mm. long in front, sparingly puberulous or glabrous externally; tube curved; mouth pubescent within with adpressed white short hairs, contracted, very oblique, rounded below, and forming above a large acute lobe much produced forward and tipped by a minute spinescent tooth; the remaining teeth variable in number, also minute, distant, erect along the oblique margin, usually 3, occasionally 4, sometimes only 2 on each side, with often a small tooth in the centre of the rounded sinus opposite the acute posterior lobe. Corolla white, medium, 12 mm. long; tube 7 mm. long, annulate within near the middle; lower lip patent, the mid-lobe large, obovate, rounded, lateral lobes small; upper lip oblong, white-woolly. Nutlets 2 mm. long, oblong, rounded at apex; inner face angular, outer-rounded; pale-brown, dull.

Habitat:- Concan; S. India; Behar; Dehra; Dum; Bengal; Assam; Burma.

5. Leucas angustissima Sedgwich Journ. Ind. Bot. ii 123 (1921).

Erect herb of rocky places, about 30 cm. high, with a stout woody rootstock, branching from the base. Leaves very narrow, linear, up to 3 cm. long, and 3 mm. broad, margin revolute. Whorls few-flowered, all axillaries; pedicels very short. Calyx 6 mm. long, slightly curved, and trumpet-shaped;

minutely hispid outside, glabrous within, mouth oblique, not hairy, projected above; the upper tooth slightly longer, other teeth very short. Corolla conspicuous, about 15 mm. long, upper lip short, white-villous, lower lip spreading, about twice as long as the tube, deflexed, puberulous outside, 3-lobed, the lateral lobes narrow, decurved, the middle lobe about 7 mm. broad, emarginate.

Habitat:- Canara, at Gairsoppa Falls and at Siddhapur.

6. Leucas cephalotus Spreng. Syst. ii 743; Benth. in Wall. Pl. As. Par. i 60, Lab. Gen. et Sp. 616, and in DC. Prodr. xii 532; Wall. Cat. 2043; Wight Ic. t. 337; Boiss. Fl. Orient. iv 779; Hook. f. Fl. Brit. Ind. iv 689; Collett Fl. Sim. 405; Prain Beng. Pl. 856; Cooke Fl. Bomb. Pr. II, 466; Duthie Fl. Upp. Gang. Pl. II, 251; Gamble Fl. Madras 1150; Haines Bot. Bih. Oris. 750.

Leucas capitata Desf. Mem. Mus. Par. xi (1824) 8, t. 4.

Phlomis cephalotus Roth. Nov. Sp. 262; Roxb. Fl. Ind. iii, 10.

Erect, stout annuals, 30-100 cm. high, scaberulous or pubescent with spreading hairs. Leaves shortly petioled, 3-10 cm. long, narrowly ovate, or ovate-lanceolate, subacute, crenate-serrate, base cuneate, softly pubescent with soft hairs above, rather long and spreading hairs beneath; lower surface glandular-punctate. Whorls globose, very large, about 3-5 cm. in diam., usually terminal, dense- and many-flowered; bracts 1.5-2.5 cm. long, numerous, imbricating, and forming an involucre, covering the floral heads, lanceolate, acute and awned, rigidly ciliate. Calyx about 2 mm. long, tubular, curved, glabrous below, pubescent above on the

outside and also within; mouth oblique, produced on the upper side; teeth short, subulate. Corolla about 2.5 cm. long, white; lower lip slightly longer than the upper. Nutlets 3 mm. long, smooth brown.

Habitat:- Throughout India from Said to Assam, and Kashmir to Deccan.

Dist.:- Afghanistan.

7. Leucas martinicensis R. Br. Prodr. 504; Benth. in Wall. Pl. As. Rar. i 60, Lab. Gen. et Sp. 617, and in DC. Prodr. xii 533. Hook. f. Fl. Brit. Ind. iv 688; Baker in Thiselton - Dyer, Fl. Trop. Afric. v. 479; Prain Beng. Pl. 856, and in Journ. As. Soc. Beng. lxxiv II, 718; Cooke Fl. Bomb. Pr. II, 467; Gamble Fl. Madras 1149; Haines Bot. Bih. & Oris. 750.
L. polycephala Wall. Cat. 2051.

Phlomis martinicensis Sw. Prodr. Veg. Ind. Occ. 88.

A tall, stout annual herb, 60-120 cm. high, more or less branched. Stem and branches hirsute, 4-angled and 4-grooved, angles rounded. Leaves opposite, membranous, hirsute above and below, ovate, oblong or wide-lanceolate, obtuse; base cuneate, rarely rounded, entire; margin elsewhere widely and rather deeply crenate; 6-9 cm. long, 2.5-4 cm. wide; petiole hirsute, 10-18 mm. long. Flowers sessile, in numerous, distant, axillary, globose, many-flowered whorls which are 2-3 cm. across; the floral leaves decreasing upwards, especially in width of blade and length of petiole; bracteoles green, 6-9 mm. long, narrowly-linear-lanceolate or subulate, spinescent at their tips with pale slender awns. Calyx 10 mm. (in fruit 15 mm.) long, tubular, sigmoid, pubescent externally; tube within glabrous and closely reticulate; mouth with a few short

villi within, oblique; teeth 10, all lanceolate, ciliate, with fine spinescent tips; the uppermost largest, 5 mm. long; the others alternately longer and shorter. Corolla white, small, about 1 cm. long; tube 5 mm. long, not annulate within; lower lip spreading, the lateral lobes oblong rounded, wider than the oblong 2-fid central; upper lip erect, white-villous. Nutlets 2.5 mm. long, obovoid-oblong, obliquely truncate at apex, angular on inner face, rounded on outer, dark-brown, shining.

Habitat:- All over S. India.

Dist.:- Trop. Africa; Malay Peninsula; Trop. America.

8. Leucas nutans Spreng. Syst. ii, 743; Benth. Lab. Gen. et Sp. 616, and in DC. Prodr. xii 532; Hook. f. Fl. Brit. Ind. iv 688; Prain Beng. Pl. 865; Cooke Fl. Bomb. II, 466; Duthie Fl. Upp. Gang. Pl. II, 251; Gamble Fl. Madras 1149; Haines Bot. Bih. & Orissa. 750.

L. decurva Benth. in Wall. Pl. As. Par. i, 60, and Cat. 2050.

Phlomis nutans Roth. Nov. Sp. 263.

Dwarf annual herb, 10-30 cm. high, often with straggling and diffuse branches; laxly hairy. Leaves shortly petioled, often sessile, 2-5 cm. long, oblong or oblong-lanceolate, obtuse, closely serrate or subserrate, pubescent with short hairs, on both surfaces and with long hairs on the nerves beneath. Whorls terminal or subterminal, many-flowered; bracts lanceolate, ciliate, almost equalling the calyx or shorter. Calyx 8-10 mm. long, membranous, falcately decurved in the middle, strongly ribbed above, hispid outside and pubescent within; mouth oblique; teeth subequal, lanceolate, ciliate longer than the hairs of the mouth. Corolla white, about

15 mm. long; tube slender annulate near the base; lower lip longer than the upper. Nutlets 3 mm., narrowly oblong ellipsoid; smooth, brown.

Habitat:- From Sind to Burma and Punjab to S. India; mostly in plains.

9. Leucas Wightiana Benth. Wall. Pl. As. Par. i 60; Wall. Cat. 2520; Hook. f. Fl. Brit. Ind. iv 690; Gamble Fl. Madras 1150.

L. aspera, var. Wightiana, Benth. Lab. 616, and in DC. Prodr. xii 532.

A small erect annual herb, 15-25 cm. high, with short branches, scabrid. Leaves sessile, 2-5 cm. long, linear, obtuse, margin entire, or very distantly and obscurely serrate, flat or recurved, scabrid or adpressedly hairy on both surfaces. Whorls small, axillary and terminal, close above, often forming a cylindrical spike; bracts slender, densely hispid, almost equalling the calyx or shorter. Calyx 6 mm. long, membranous below, striated above; tube erect, not constricted in the middle, hispid outside, and villous at the very oblique and wide mouth; teeth triangular, sharply pointed, irregular, upper longer. Corolla very small, the lips almost equal. Nutlets 2 mm. long, covered with a thin greyish colour.

Habitat:- S. India, from Carnatic to C. Courosin of Travancore.

10. Leucas stricta Benth. in Wall. Pl. As. Rar. i 61, Lab. Gen. et Sp. 614, and in DC. Prodr. xii 531; Wall. Cat. 2045; Hook. f. Fl. Brit. Ind. iv. 688; Prain Beng. Pl. 856; Cooke

Fl. Bomb. Pr. II, 467; Gamb. Fl. Madras 1150; Haines Bot. Bih. & Oriss. 750.

Erect slender annual, 15-25 cm. high, hispidly hairy; branches often diffuse. Leaves sessile, linear or linear-oblong, obtuse, usually entire, narrowed to the base, hispid on both sides, glandular beneath. Whorls solitary and terminal, on the branches, or sometimes another is present below the terminal one; bracts filiform, rigid, ciliate. Calyx about 10 mm. long, tube narrowly funnel-shaped, erect, nearly straight, shortly and closely pubescent or somewhat glabrescent; mouth oblique densely villous within; teeth sometimes as long as the tube, very slender, ciliate. Corolla white; lower lip large, obtuse, much longer than the upper lip; tube of corolla included. Nutlets 3 mm. long, rounded at the top, smooth brown.

Habitat:- Bombay; Central & S. India; Orissa; Burma.

11. Leucas macrantha Blatter & Halb. Journ. Ind. Bot. ii, 47 (1921).

Procumbent herb, woody at the base, sparsely hirsute; stem and branches ascending, quadrangular, grooved. Leaves sessile or subsessile, about 4 cm. long, 0.8 cm. broad, lanceolate or linear-lanceolate, subacute, entire, cuneate at the base, sparsely hirsute sometimes only on the margin and nerves beneath. Flowers in more or less continuous whorls, usually terminal; whorls dense, about 20-flowered; pedicels minute; bracteoles numerous, acicular, equalling the calyx, long hirsute. Calyx tubular, slightly inflated in front, 10-nerved, about 10 mm. long, delicately pubescent outside, hirsute on the

nerves and teeth, glabrous inside except with a ring of hairs in the throat, teeth 10, needle-shaped, the uppermost tooth largest; mouth oblique. Corolla white, 22 mm. long, tube subincluded, glabrous within; upper lip straight, concave, densely white-villous; lower lip 3-lobed, flat; the median lobe much larger, lateral minute, revolute, acute. Nutlets ovoid, triquetrous, 3 mm. long, longitudinally-rugose.

Habitat:- Rajputana, Mt. Aboo, 1200 m., Hallberg.

12. Leucas Clarkii Hook. f. Fl. Br. Ind. iv 688; Prain Beng. Pl. 856, Haines Bot. Bih. & Oris. 750.

Slender annuals, 30-60 cm. high, with long ascending simple branches from the base, sparsely and adpressedly hairy with deflexed hairs. Leaves sessile or subsessile, 3-6 cm. long, linear or linear-lanceolate, obtuse, entire or subserrate, narrowed to the base, adpressedly hispid with scattered long bristle-like hairs above or scabrid, hirsute on the lower surface. Whorls terminal, subglobose; bracts very slender, ciliate, as long as the tube. Calyx 6 mm. long, slightly decurved, pubescent; mouth wide, oblique, densely villous; teeth slender, 3 uppermost much the longest, scabrid, acicular at the tips. Corolla-tube included, upper lip short, narrowly oblong, lower very wide, about 10 mm. long. Nutlets 2 mm. long, rounded at the apex, smooth.

Habitat:- Chota Nagpur.

13. Leucas zeylanica R. Br. Prodr. 504; Benth in Wall. Pl. As. Rar i 60, Lab. Gen. et Sp. 614, and in DC. Prodr. xii 531; Wight. Ill. t. 176; Hook. f. Fl. Brit. Ind. iv 689;

Cooke Fl. Bomb. Pr. II, 465; Prain in Journ. As. Soc. Beng. lxxiv, 2, 718; Ridley Fl. Mal. Pen. II, 650; Merrill Enum. Philipp. Fl. Pl. III, 411; Gamble Fl. Madras, 1150; Kudo in Mem. Fac. Sc. & Agri. II, 2, (1929) 208; Doan Fl. Gen. Indo-Chine iv, 8, (1936) 1020).

L. involucrata Benth. in Wall. Cat. 2047; Prain Beng. Pl. 856.

L. diffusa Woodr.

Phlomis zeylanica Linn. Sp. Pl. 820.

Leonurus marrubiastrum Burm. Fl. Ind. 127, not of Linn.

Nepeta hirsuta Lour. Fl. Coch., 366, not of Linn.

An erect annual herb, 15-50 cm. in height, simple or branched. Stems and branches 4-angled, hispidulous with scattered spreading hairs. Leaves opposite, decussate, membranous, dark-green above, uniformly but sparsely beset with spreading hispidulous hairs, paler and subglaucescent beneath, with spreading hispidulous hairs on the nerves, the hairs on both sides curved towards leaf-apex, ovate-lanceolate, or occasionally lanceolate, acute; base long-cuneate, entire; margin elsewhere entire or remotely and sparingly serrate; 3-7 cm. long, 5-12, rarely 15 mm. wide; petiole 2.5-5 mm. long, hispidulous. Flowers sessile or subsessile, in terminal usually 6- to 8-leaves whorls 12-20 mm. across, occasionally also axillary whorls occur below; bracts 5 mm. long, linear, spinescent, hispidulous along the margin with stiff spreading hairs. Calyx 5 mm. (in fruit 8 mm.), long, turbinate, slightly curved; the tube below glabrous or faintly pubescent externally, above beset with scattered, spreading, hispidulous hairs; the mouth subcampanulate, oblique, distinctly transversely veined between the 10 nerves, and sparingly pubescent within with short white hairs, the uppermost of which project

beyond the limb; teeth 8, the uppermost 1.5 mm. long, slightly longer than the others, all subulate, spinescent at the tip.

Corolla white, medium, 12 mm. long; tube 5-6 mm. long, glabrous below, enlarged upwards where pubescent externally, annulate within near the middle; lower lip patent, the mid-lobe large, shortly widely clawed, the lateral lobes small; upper lip obovate, white-woolly. Nutlets 3.5 mm. long, obovoid-oblong; apex subtruncate; inner face angular, outer rounded; dark-brown or black, shining.

Habitat:- Assam; Chittagong; S. India.

Dist.:- Ceylon; Malay Peninsula and islands; China.

14. Leucas diffusa Benth. Lab. Gen. et Sp. 615, and in DC. Prodr. xii 531; Gamble Fl. Madras 1150.

Small diffusedly branched annual, hispid or hirsute; branches slender, ascending. Leaves sessile, 1.5-3.5 cm. long, linear or linear-oblong, obtuse, subentire, narrowed to the base, hispid with long bristle-like hairs above and on the mid-rib beneath, lower surface tomentose. Whorls solitary and terminal on the end of branches, few-flowered; bracts slender ciliate, shorter than the calyx. Calyx 6 mm. long, curved, smooth and glabrous below, ribbed and hispid above with long scattered hairs, mouth wide, more or less truncate, villous within; teeth small, subulately triangular, subequal. Corolla large, white. Nutlets 2.5 mm. long, rounded at the top, smooth, brown.

Habitat:- Deccan peninsula, mostly on the eastern parts.

15. Leucas longifolia Benth. Lab. Gen. et Sp. 744, and in DC.

Prodr. xii 527; Hook. f. Fl. Brit. Ind. iv 684; Cooke
Fl. Bomb. Pr. II, 468.

Erect rigid annuals, 20-50 cm. high, branching on the upper part of the stem; glabrous below, scaberulous or sparsely hispid above, with erect or spreading hairs. Leaves sessile, 3-6 cm. long, narrowly linear, obtuse, entire, narrowed to the base, more or less pubescent on both surfaces. Whorls usually axillary, few-flowered; bracts minute, subulate, pubescent. Calyx 6 mm. long, sessile, hispid; mouth truncate wide, villous within; teeth 10, very small. Corolla 16 mm. long; tube slender, exserted, annulate within; upper lip very short, lower much longer and very wide, 3-lobed. Nutlets 2.5 mm. long, rounded at the top.

Habitat:- Konkan; Poona; Belgaun.

Dist.:- Ceylon.

15. Leucas suffruticosa Benth. Lab. Gen. et Sp. 611, and in DC. Prodr. xii 528; Wight Ic. t. 1454; Hook. f. Fl. Brit. Ind. iv 685; Gamble Fl. Madras 1152.

A low undershrub, much branched from a very long and stout rootstock; branches slender, rigid, terete, ascending, densely fulvus-tomentose or hispid. Leaves sessile, 1.5-3 cm. long, coriaceous, linear obtuse, margin entire and recurved, upper surface hispid with conspicuous, long, erect, bristle-like hairs, white tomentose beneath. Whorls few, terminal on a very long peduncle, about 10-20 cm. in length; bracts setaceous, half as long as the calyx. Calyx 6 mm. long, villous; mouth not oblique, villous within; teeth erect, spinulose, longer than the hairs at the mouth; the calyx and the long peduncle very fine golden yellow in colour. Corolla

white; tube included; the upper lip conspicuously white-bearded, galea densely villous. Nutlets 3 mm. long, terete, smooth.

Habitat:- S. India.

16. Leucas rosamarinifolia Benth. x Wall. Pl. As. Rar. i 61; Lab. Gen. et Sp. 612, and in DC. Prodr. xii 528; Wall. Cat. 2521; Wight Ic. t. 1455; Hook. f. Fl. Brit. Ind. iv 685. Gamble Fl. Madras 1152.

A small much-branched shrub, with woody, terete stem, strigose with erect hairs. Leaves fascicled, sessile, 2-3 cm. long, linear, obtuse, margin entire, revolute, upper surface strigose with minute erect hairs, greyish tomentose beneath. Whorls often solitary, usually on peduncles, which are up to 5 cm. long; bracts linear, rigid, strigose, almost equalling the calyx. Calyx sessile, about 6 mm. long, campanulate, hispid or villous, straight; mouth not oblique, villous within; teeth minute erect, triangular. Corolla white, Nutlets 3 mm. long, obtuse, yellowish brown.

Habitat:- W. Ghats; Nilgiri hills.

17. Leucas ternifolia Desf. in Mem. Mus. xi 4, t. 1. f. 2; Benth. Lab. Gen. et Sp. 612, and in DC. Prodr. xii 529; Gamble Fl. Madras 1152.

L. helianthemifolia Hook. f. Fl. Brit. Ind. iv 685, in part.

A small much-branched undershrub, with a stout rootstock; pubescent with subsilky, yellow hairs; branches terete, slender. Leaves usually in whorls of 3, often opposite,

sessile, 2-3 cm. long, narrowly linear, obtuse or subacute, margin entire and revolute, upper surface and the mid-rib beneath densely tomentose with adpressed hairs, lower surface covered with a greyish down. Whorls usually 2 at the end of each branch, flowers usually few in each whorl; bracts subulate, half as long as the calyx. Calyx about 6 mm. long, campanulate, straight, densely and finely tomentose; mouth straight, rather truncate, villous within; teeth minute. Nutlets 2 mm. long, chocolate brown, truncate and hairy (?) at the top.

Habitat:- W. Ghats; Travancore; Anamalaya and Pulney hills.

18. Leucas helianthemifolia Desf. Mem. Mus. Par. xi (1824) 2. t. 1, f. 1. Benth. Lab. Gen. et Sp. 612, and in DC. Prodr. xii 528; Hook. f. Fl. Brit. Ind. iv 665 (in part); Gamble Fl. Madras 1152.

Leucas ternifolia Wight Ic. t. 1453, not of Desf.

A small shrub, about 30 cm. high or more, with woody, terete, much branched stem, densely & softly villous, very white, specially on the inflorescence; hairs erect or spreading. Leaves usually ternate or the upper ones opposite, sessile, coriaceous, 2-5 cm. long, 5-10 mm. broad, linear-oblong, obtuse, sometimes narrowed downwards from the middle, margin entire and revolute, upper surface green, fulvous-tomentose or villous, lower surface covered with white or tawny wool. Whorls chiefly terminal, few or many, often crowded; bracts subulate, almost as long as the calyx, tomentose. Calyx straight, sessile 6 mm., turbinate, densely woolly, mouth not oblique; throat densely villous with ring

of long hairs; teeth 10, minute erect. Corolla very short, white, upper lip clothed with a very thick white wool. Nutlets about 3 mm. long, oblong.

Habitat:- W. Ghats; Nilgiri; Pulney and Anamallaya.

19. Leucas lanceaefolia Desf. in Mem. Mus. Par. xi (1824) 5, t. 2, f. 2; Benth. Lab. Gen. et Sp. 612, and in DC. Prodr. xii 529; Wight Ic. t. 1452; Hook. f. Fl. Brit. Ind. iv 685; Gamble Fl. Madras 1153.

L. lanciformis Wall. Cat. 2759.

A tall bushy plant, about 200 cm. high or more; stem and branches stout, terete, rufus-tomentose with erect hairs. Leaves short petioled, coriaceous, lanceolate, subacute, cuneate at the base, margin entire and slightly revolute; upper surface scaberulous, white-tomentose beneath; lamina 7-10 cm. long, 1-2.5 cm. broad; petiole .5-1 cm. long, rather stout. Whorls axillary, many- and dense-flowered, about 2.5 cm. in diam.; bracts linear-lanceolate, shorter than the calyx. Calyx about 6 mm. long, campanulate, tomentose, straight, not oblique at the mouth; throat minutely villous; teeth minute spreading, spinulose. Corolla white, small, tube included.

Habitat:- W. Ghats; Nilgiri; Pulney hills.

20. Leucas ciliata Benth. Wall. Pl. As. Rar. i 61; Lab. Gen. et Sp. 614, and in DC. Prodr. xii 530; Wall. Cat. 2046; Hook. f. Fl. Brit. Ind. iv 687; Cooke Fl. Bomb. Pr. II, 471; Gamble Fl. Madras 1153.

A tall sub shrubby herb, 30-100 cm. high, with straggling

branches; stem and branches obtusely 4-angled, hirsute with deflexed and spreading hairs. Leaves shortly petioled, 5-12 cm. long, ovate or lanceolate, acute, coarsely serrate, base narrowed, sparsely pubescent with rather coarse hairs, or more or less glabrate, petiole 5-15 mm. long. Whorls large, globose, densely many-flowered, terminal and axillary; bracts nearly as long as the calyx, very slender, ciliate, spinulose. Calyx 12-17 mm. long, tubular, straight, hairy outside and with a ring of hairs at the mouth; teeth 3-4 mm. long, linear or lanceolate, ciliate, spinulose, stellately spreading in fruit. Corolla 20-22 mm. long, tube annulate within; upper lip densely bearded with rufous-brown hairs. Nutlets 3.5 mm. long, smooth, brown.

Habitat:- Nepal; Sikkim; Khasia Mts.; Bhutan; W. Ghats; Konkan; Canara; Coorg; Mysore; Travancore.

21. Leucas vestita Benth. Wall. Pl. As. Rar. i 61; Lab. Gen. et Sp. 613, and in DC. Prodr. xii 530; Wight Ic. t. 338; Hook. f. Fl. Brit. Ind. iv 687; Gamble Fl. Madras 1153.

A tall herb, tawny villous with spreading hairs; branches square. Leaves shortly petioled, 5-10 cm. long, ovate-lanceolate, acute, crenate-serrate, narrowed to the base, villous on both surfaces with somewhat stiff hairs; petiole hirsute. Whorls usually solitary, terminal, many- and dense-flowered; bracts nearly as long as calyx, narrowly linear, densely ciliate with long, somewhat bristle-like hairs. Calyx about 15 mm. long, tubular, straight, villous outside and at the throat, mouth not oblique; teeth short, slender, erect or spreading. Corolla large, upper lip densely bearded with rufous-brown hairs. Nutlets 3 mm. long,

brown, smooth and shining.

Habitat:- Travancore; Tinnevelly and Palni Hills; Mysore (?).

22. Leucas lamiifolia Desf. Mem. Mus. Par. xi (1824) 4, t. 2, f. 1; Hook. f. Fl. Brit. Ind. iv 686; Gamble Fl. Madras 1153.

Tall shrubby plant, about 250 cm. high, with somewhat straggling, very stout branches, tawny villous in the spreading hairs. Leaves shortly petioled, ovate, subacute, crenate serrate, rounded at the base, rarely cordate, villous above, densely tomentose beneath; lamina 7-12 cm. long, 3-6 cm. broad. Whorls subglobose, many- and dense-flowered, usually terminating each branch; bracts linear-lanceolate, equalling the calyx. Calyx membranous, about 10 mm. long, campanulate, straight, villous outside and at the throat; mouth not oblique; teeth about 1/3 the length of the tube, slender, erect. Corolla small, tube included. Nutlets 3 mm. long, oblong.

Habitat:- W. Ghats; Nilgiris.

23. Leucas prostrata Gamble Fl. Madras 1154 (1924)
L. hirta, var. prostrata Hook. f. Fl. Brit. Ind. iv 687.

Low slender herbs, with long prostrate or ascending branches from a "knotty" rootstock, pubescent with spreading hairs. Leaves usually few, petioled, ovate, obtuse, rounded at the base, obtusely and distantly crenate, tawny hispid on both sides with scattered, more or less bristle-like hairs; lamina 2-4 cm. long, 1-2 cm. broad; petiole .5-10 mm. long.

Whorls terminal, densely many-flowered; bracts subulate, nearly as long as the calyx, ciliate. Calyx about 10 mm. long, tubular, straight, hispid outside and villous at the mouth; teeth slender, stellately spreading, rather stiff and ciliate with stiff hairs. Nutlets about 3 mm. long, oblong, smooth, dusty yellowish in colour.

Habitat:- W. Ghats; Nilgiris, above 1,750 m.; Anamalaya; and Shivaroy Hills.

24. Leucas hirta Spreng. Syst. ii 743; Benth. Lab. Gen. et Sp. 613, and in DC. Prodr. xii 530; Hook. f. Fl. Brit. Ind. iv 687; Gamble Fl. Madras 1153.

L. helianthemifolia Benth. in Wall. Pl. As. Rar. i 61, and Wall. Cat. 2053, not of Desf.

L. rufescens Benth. in Wall. Cat. 2053.

Phlomis hirta Heyne in Roth. Nov. Sp. 264.

A subshrubby herb, with a stout rootstock; stem woody below, branching above, scabrid. Leaves shortly petioled or sessile, narrowly lanceolate, or linear-oblong, obtuse, obscurely crenate, narrowed to the base, very much scabrid on both surfaces; lamina 3-7 cm. long. Whorls terminal, at the ends of branches, rarely axillary; bracts linear, ciliate, as long as the calyx. Calyx 8-12 mm. long, tubular-campanulate, straight, ribbed above, tomentose or villous outside, mouth wide and very densely villous; teeth short, recurved and stellately spreading, upper lip of corolla densely bearded with white pairs. Nutlets 4 mm. long, smooth and shining, deep brown in colour.

Habitat:- Deccan, from Cuddapah to S. Kumara, and to Pinnevelly.

24. Leucas hirta var. Beddomei Hook. f. Fl. Brit. Ind. iv 687; Gamble Fl. Madras 1153.

Hairs on stem and leaves rather soft. Whorls usually many; calyx-mouth less villous; upper lip of corolla bearded with brownish (?) hairs.

Habitat:- Wynaad.

25. Leucas stelligera Wall. Pl. As. Rar. i 61; Benth. Lab. Gen. et Sp. 61, and in DC. Prodr. xii 529; Hook. f. Fl. Brit. Ind. iv 686; Cooke Fl. Bomb. Pr. II, 470; Gamble Fl. Madras 1154.

L. eriostoma var. longifolia Hook. f. Fl. Brit. Ind. iv 686.

L. hamatula Arn. Pugill. Pl. Ind. Or. 37; Benth. in DC. Prodr. xii 529.

Erect branching herb, 60-100 cm. high, softly pubescent or villous, with erect and spreading hairs. Leaves shortly petioled, narrowly lanceolate, obtuse or subacute, serrate, base usually entire, narrowed to the petiole; lamina 7-12 cm. long, 1-2 cm. broad; petiole .5-1 cm. long. Whorls terminal and axillary, densely many-flowered, bracts linear, ciliate, half as long as the calyx or shorter. Calyx 6-12 mm. long, tubular-campanulate, straight, constricted in the middle, pubescent or tomentose, slightly ribbed above, glabrescent and smooth below; mouth not oblique, densely villous; teeth short, recurved and stellately spreading. Corolla white, short; tube annulate within; upper lip densely bearded with white hairs. Nutlets 3 mm. long, smooth, shining.

Habitat:- Concan; Canara; Mysore; Nilgiris.

26. Leucas eriostoma Hook. f. Fl. Brit. Ind. iv 686; Gamble Fl. Madras 1154.

A lone, stout undershrub, with terete branches, pubescence various. Leaves shortly petioled, narrowly lanceolate, obtuse, coarsely serrate, base narrow, hispid on both sides with spreading brownish hairs; lamina 3-10 cm. long, .5-2 cm. broad. Whorls many in the upper axils, dense-flowered; bracts as long as the calyx, linear, pectinately ciliate. Calyx 6-12 mm. long, tubular campanulate, straight, glabrous below, villous above the middle; mouth not oblique, densely villous with a ring of white hairs; teeth very minute, subulate, stellately spreading. Corolla very small, tube included, piloso-annulate. Nutlets about 2 mm. long, oblong.

Habitat:- Wynaad; Nilgiris; S. Kanara; Concan(?).

27. Leucas eriostoma var. (I) latifolia Hook. f. Fl. Brit. Ind. iv. 686; Gamble Fl. Madras 1154.

More robust in habit, with broader leaves. Whorls more numerous, and larger.

Habitat:- Nilgiris.

Leucas eriostoma var. (ii) lanata Hook. f. Fl. Brit. Ind. iv 686; Gamble Fl. Madras 1154.

L. lepistoma Herb. Wight.
Hairs upon stem and inflorescence, very dense, white, spreading and soft. Leaves oblong-lanceolate, villous. Whorls smaller.

Habitat:- Mysore; Nilgiris.

27. Leucas nepetaefolia Benth. in Wall. Pl. As. Rar. i 62, Lab. Gen. et Sp. 609, and in DC. Prodr. xii 527; Wall. Cat. 2526; Hook. f. Fl. Brit. Ind. iv 681; Gamble Fl. Madras 1150.

A small shrubby plant, with slender terete branches, slightly hoary; hairs erect and spreading. Leaves petioled orbicular-acute, obtuse, coarsely crenate, rounded or sub-cordate at the base, pubescent above, tomentose beneath, lamina about 2.5 cm. in diam.; petiole very slender, about 1 cm. Whorls many, axillary, few-flowered; bracts setaceous. Calyx about 10 mm. long, obconic, straight, ribbed, villous outside; teeth short, triangular. Corolla small, white, lips nearly equal, the upper bearded with white hairs. Nutlets about 2 mm. long, greyish in colour.

Habitat:- Deccan; Hyderabad and Guntur.

28. Leucas Helferi Hook. f. Fl. Brit. Ind. iv 681.

Perennial plants with sparingly branched procumbent stem, very slender and flexuous, but with wire-like tenacity, 30-60 cm. long, floccose with soft, very fine, long, spreading white wool, which is easily removable, or stem and leaves often glabrate. Leaves short-petioled, membranous, ovate, obtuse, crenate, sometimes silky beneath; lamina 1.5-2.5 cm. long, petiole very slender, about 1 cm. or shorter. Whorls usually many, axillary, few-flowered; bracts narrow. Calyx about 6 mm. long, villous, straight, mouth subequal, throat naked; teeth 10, very minute, subulate, spreading. Corolla very small.

Habitat:- Burma; Tenasserim.

29. Leucas lanata Benth. in Wall. Pl. As. Rar. i 61, Lab. Gen. et Sp. 607, and in DC. Prodr. xii 525; Wall. Cat. 2055; Hook. f. Fl. Brit. Ind. iv 681; Collett Fl. Sim. 405; Prain Beng. Pl. 856; Cooke Fl. Bom. Pr. II, 468; Duthie Flor. Upp. Gang. Pl. II, 252; Gamble Fl. Madras 1151; Haines Bot. Bih. & Oriss. 747; Doan in Fl. Gen. Indo-Chine, iv, 8, (1936) 1022..

L. collina Dalz. in Hook. Kew Journ. ii, 338; Dalz. & Gibs. Bomb. Fl. 211.

Marrubium mollissimum Don. Prodr. 112.

Erect perennial herb, much branched from a stout rootstock, softly woolly or subsilky, with erect and spreading hairs.

Leaves sessile or subsessile, rather thick, ovate, obtuse or acute, crenate-serrate, rounded or cuneate at the base, softly tomentose or silky on both surfaces; lamina 3-6 cm. long, 1.5-3 cm. broad. Whorls densely many-flowered, axillary; bracts setaceous, densely hairy, much shorter than the calyx. Calyx about 8 mm. long, tubular campanulate, straight, densely silky-villous outside, pubescent within on the upper part; mouth truncate; teeth minute, alternately shorter, triangular-subulate. Corolla white, tube annulate within. Nutlets 1.5 mm. long, oblong-ovoid, obliquely truncate at the apex.

Habitat:- Kashmir; Punjab; Kumaon; Garhwal; Nepal; Darjeeling; Burma; Chota-Nagpur; S. India, from Konkan to Carnatic and to the Nilgiri hills.

Dist.:- Siam; Indo-China.

30. Leucas Collettii Prain. Journ. As. Soc. Beng. lix (1890) ii 313; Kudo in Mem. Fac. Sc. & Agri 2, 11, (1929) 206.

Herbs with a perennial woody rootstock, and short stout stem, 8-15 cm. high, bluntly angled and distinctly grooved;

all parts densely silky-villous with soft spreading hairs.
Leaves thick, close-set, sessile, 1.5 cm. long, 1.25 cm. broad, ovate, acute, coarsely serrate, entire near the truncate or subcordate base. Whorls many-flowered; bracts short, linear. Calyx 5 mm. long, straight, densely silky-villous outside, hairy within, truncate at the mouth; teeth 10, minute erect. Corolla 7 mm. long; tube not exerted, annulate.

Habitat:- Upp. Burma.

Dist.:- S. China.

31. Leucas helicterifolia Haines Kew Bull. 1922, 188, and Bot. Bih. & Oris. 748.

Herbs with many subdiffuse stems, 30-50 cm. long; branches quadrangular, densely hispid with long and short, suberect hairs. Leaves shortly petioled, or subsessile, lanceolate, or narrowly oblong-lanceolate, acute, serrate, pubescent above, the hairs swollen at the base, lower surface densely villous, specially on the nerves; petiole of lower leaves up to 5 mm. long. Whorls axillary, many-flowered; flowers sessile; bracts setaceous, 2-4 mm. long, pubescent. Calyx tubular 7-9 mm. long, tube straight or slightly incurved, outside pubescent on the 10 very prominent nerves, and sparsely silky hairy within; mouth equal; teeth minute erect, triangular, acute, ciliate. Corolla white; tube 9-10 mm. long, pubescent; lobes shorter than the tube, the lower longer pubescent beneath.

Habitat:- Ramnagar hills (Chota Nagpur) 300-600 m. Haines 4995.

32. Leucas teres Benth. Wall. Pl. As. Rar. i. 62, Lab. Gen.

et Sp. 608, and in DC. Prodr. xii 526; Hook. f. Fl. Brit. Ind. iv 580; Wall. Cat. 2060.

Perennial shrubby plants, with slender long terete branches, hoary-pubescent with deflexed hairs. Leaves shortly petioled, 1.5-2.5 cm. long, elliptic obtuse subserrate, scaberulous above, tomentose beneath. Whorls numerous, few-flowered, axillary; bracts minute, setaceous. Calyx shortly pedicelled, 4-6 mm. long, straight, mouth subequal, throat naked; teeth 10, very minute, subulate. Corolla very small. Nutlets 1.5 mm. long.

Habitat:- Burma.

34. Leucas pilosa Benth. in Wall. Pl. As. Rar. i 62, Lab. Gen. et Sp. 609, and in DC. Prodr. xii 526. encl. var. pubescens; Wall. Cat. 2058; Hook. f. Fl. Brit. Ind. iv. 683.

Perennial herbs, with long slender ascending branches, and a stout rootstock; pubescent with adpressed and deflexed hairs, mixed with scattered long spreading hairs. Leaves petioled, membranous, ovate, acuminate or acute, rounded at the base, coarsely serrate, sparsely hispid on both surfaces or glabrate; lamina 3-7 cm. long, 1.5-3 cm. broad; petiole 1-3 cm., shorter upwards. Whorls few-flowered, many, axillary, bracts usually much shorter than the calyx, densely hispid. Calyx about 6 mm. long, campanulate, straight, densely hispid outside glabrous within; teeth short, acicular at the tips, alternately shorter. Corolla small, white; tube exserted, lips very short, subequal. Nutlets 1.5 mm. long, truncate at the top, slightly covered with a brownish down.

Habitat:- Burma.

35. Leucas flaccida R. Br. Prod. 585; Benth. Lab. Gen. et Sp. 609, and in DC. Prodr. xii 526; Hook. f. Fl. Brit. Ind. iv. 684.

L. parviflora Benth. in Wall. Pl. As. Rar. i 62; Wall. Cat. 2061.

L. melissaefolia Benth. in Wall. Pl. As. Rar. i 62.

L. melissaeflora Benth. in Wall. Cat. 2062.

L. decendulata Smith in Rees Cyclop; Benth. in DC. Prodr. xii 526.

Phlomis moluccana Roxb. Hort. Beng. 95, and Fl. Ind. iii, 11.

A slender flaccid annual herb, 15-20 cm. high, with rather weak branches from the base, pubescent or tomentose with deflexed hairs. Leaves long-petioled, membranous, ovate or oblong, obtuse or subacute, crenate, cuneate at the base, pubescent or more or less glabrate; lamina 2.5-5 cm. long; petiole very slender, 1-2.5 cm. long. Whorls few-flowered, many, axillary; bracts minute, hispid. Calyx very shortly pedicelled, about 6 mm. long, pubescent or villous outside, straight or slightly curved; teeth about $1/3$ the length of the tube or shorter, triangular subulate, spinulose, alternately shorter. Corolla white, tube much exerted.

Habitat:- Burma.

36. Leucas biflora R. Br. Prod. 504; Wall. Cat. 2529; Benth. in Wall. Pl. As. Rar. i, 62, Lab. Gen. et Sp. 610, and in DC. Prodr. xii 527; Wight Ic. t. 866; Hook. f. Fl. Brit. Ind. iv 683; Trim. Fl. Ceylon, iii, 386; Cooke Fl. Bomb. Pr. II, 469; Gamble Fl. Madras 1150.

Phlomis biflora Vahl. Symb. iii, 77; Roxb. Fl. Ind.

Leucas biflora (Cont.).

iii 12. pedicels and shorter teeth.

Nepeta indica Burm. Fl. Ind. 126, and Thes. Zeyl. t. 63, f. 1.

Slender procumbent herbs, with long branches, often ascending or climbing, from a woody rootstock, pubescent with deflexed hairs. Leaves petioled, ovate, elliptic or oblong, obtuse, coarsely serrate or crenate, rounded at the base, pubescent on both sides; lamina 1.5-5 cm. long, .5-2 cm. broad; petiole .6-1 cm. long. Whorls 1-4- flowered, rarely more, axillary; bracts setaceous, minute. Calyx 8-9 mm. long, distinctly pedicelled campanulate; ribbed, hispid outside, sparsely hairy within except below the middle; teeth triangular-subulate, subequal, ciliate, about 1/3 the length of the tube. Corolla white, tube annulate within. Nutlets 1.5 mm. long, truncate at the apex, irregularly prominently tuberculate, brown in colour.

Habitat:- Gujrat; Konkan to Carnatic, and southwards to Travancore.

Dist.:- Ceylon.

L. biflora, var. procumbens (Desf.) Gamble in Fl. Madras 1151.

L. procumbens Desf. in Mem. Mus. xi 7, t. 3; Benth. in Wall. Pl. As. Rar. i 62, Lab. Gen. et Sp. 610, and in DC. Prodr. xii 527, in part; Hook. f. Fl. Brit. Ind. iv 683; Prain Beng. Pl. 857; Cooke Fl. Bomb. Pr. II, 470; Haines Bot. Bih. & Oriss. 749.

L. biflora Wall. Cat. 2063 in part.

Phlomis biflora Roxb. Fl. Ind. iii, 12, in part.

L. marrubioides Wall. Cat. 2514.
Usually almost glabrous; leaves narrower. Calyx with

longer pedicels and shorter teeth.

Habitat:- Kanara; Mysore; Palaman; Bengal.

37. Leucas angularis Benth. in Wall. Pl. As. Rar. i, 62, Lab. Gen. et Sp. 608, and in DC. Prodr. xii 526; Hook. f. Fl. Brit. Ind. iv 684; Gamble Fl. Madras 1151.

L. marrubioides var. pulneyensis Hook. f. Fl. Brit. Ind. iv 684.

L. pubescens Thwaites Enum. 240.

Perennial herbs, with slender, very long, straggling, ascending or erect stem and branches, pubescent or tomentose with deflexed hairs. Leaves shortly petioled, triangular-ovate, acute, coarsely crenate or serrate, truncate, rounded or subcordate at the base, pubescent on both surfaces; lamina 3-7 cm. long, 1.5-3 cm. broad; petiole about 1 cm. or slightly longer. Whorls few- or many-flowered, axillary; bracts subulate, about $\frac{1}{2}$ as long as the calyx. Calyx pedicelled, about 12 mm. long, tube cylindric, straight, hispid outside, sparsely hairy within; teeth very slender nearly $\frac{1}{3}$ the length of the tube, ciliate. Corolla white. Nutlets 1.5 mm. long, truncate at the top, greyish brown.

Habitat:- W. Ghats; Travancore, Nilgiris; Pulney hills;

Dist.:- Ceylon.

38. Leucas pubescens Benth. Lab. Gen. et Sp. 610, and in DC. Prodr. xii 628; Hook. f. Fl. Brit. Ind. iv 684; Gamble Fl. Madras 1152.

L. marrubioides Wall. Cat. 2524.

Leucas pubescens (Cont.).

Stout erect herbs, pubescent or tomentose with deflexed hairs. Leaves petioled, ovate or orbicular, broadly and coarsely crenate, obtuse at the apex, truncate or slightly cuneate at the base, rarely subcordate, pubescent on both sides or softly villous beneath; lamina 2-4 cm. in diam.; petiole 1-1.5 cm. long. Whorls axillary densely many-flowered; bracts narrowly lanceolate, or somewhat spatulate, acuminate, almost equalling the calyx. Calyx about 10 mm. long, shortly pedicelled, campanulate, straight, hispid outside on the ribs, glabrous with or with very few scattered hairs; teeth subequal, subulate, ciliate, about $\frac{1}{3}$ the length of the tube. Corolla white; upper lip bearded with white hairs; lower lip slightly longer than the upper. Nutlets 1.5 mm. long, truncate at the top, brown, irregularly and minutely granulate. Habitat:- Nilgiri and Pulney hills.

39. *Leucas marrubioides* Desf. Mem. Mus. Par. xi (1824) 6. t. 3, f. 1; Benth. in Wall. Pl. As. Rar. i 61, Lab. Gen. et Sp. 611, and in DC. Prodr. xii 528; Thwaites Enum. 240; Hook. f. Fl. Brit. Ind. iv 683; Gamble Fl. Madras 1152.

Stout perennial herbs, 30-60 cm. high, simple or with straggling branches, densely white tomentose with deflexed hairs. Leaves sessile or shortly petioled, thick, ovate, or rounded, obtuse, crenate, base rounded or cordate, velvety above, densely white woolly beneath, often rugose on the upper surface; lamina 2.5-5 cm. in diam. Whorls densely many-flowered, axillary; bracts filiform, villous with long, soft silky hairs, nearly as long as the calyx. Calyx tubular-campanulate, straight, densely silky-villous outside, glabrous

within except the teeth; teeth unequal filiform, ciliate, about $\frac{1}{3}$ the length of the tube. Corolla white, tube annulate within. Nutlets 1.5 mm. long, obtuse at the apex, brown, smooth and shining.

Habitat:- W. Ghats, from Concan to Travancore, Mysore, Coimbatore, Nilgiris; Pulney Hills.

Dist.:- Ceylon.

40. Leucas chinensis R. Br. Prod. 504; Benth. in DC. Prodr. xii 524; Wall. Cat. 2527; Hook. f. Fl. Brit. Ind. iv 681; Gamble Fl. Madras 1151.

A straggling subshrubby herb, very densely white tomentose, or sometimes only hairy. Leaves petioled usually thick or coriaceous, rarely membranous, broadly ovate, acute or obtuse, crenate, base cuneate, softly pubescent or tomentose; lamina 2.5-6 cm. long, 1-3 cm. broad; petiole 1-3 cm., slender; often the upper ones sessile. Whorls few-flowered, axillary; bracts setaceous, very minute. Calyx distinctly pedicelled, about 10-15 mm. long, funnel-shaped, abruptly dilated at the mouth which is about 6-8 mm. wide; tube slightly ribbed, densely softly white-villous outside, hairy or almost glabrous within; teeth broadly triangular, spreading, equal or not, spinulose at the tip. Corolla white, lower lip longer than the upper. Nutlets 1.5 mm. long, obtusely truncate at the top, brown, minutely tubercular.

Habitat:- W. Ghats; Malabar hills; Anamalaya and Pulney hills.

The distribution of this plant in China does not seem to be correct.

41. Leucas ovata Benth. in Wall. Pl. As. Rar. i, 61, Lab. Gen. et Sp. 607, and in DC. Prodr. xii 525; Wall. Cat. 2057; Hook. f. Fl. Brit. Ind. iv 682.

Tall perennial herbs, about 100 cm. high, branched or simple, with quadrangular stem and branches, tomentose or villous with deflexed hairs. Leaves sessile, slightly thick, broadly ovate, obtuse, crenate, cordate at the base, hispid or scabrid above, villous or tomentose beneath; lamina 2-4 cm. long, 1.5-3 cm. broad. Whorls numerous, densely many-flowered, axillary; bracts minute, or often $\frac{1}{2}$ as long as the calyx or more, linear-subulate, densely hispid. Calyx about 6 mm. long, tubular, straight, ribbed, densely hispid or villous outside, minutely puberulous within on the upper part; teeth short, triangular with acicular tips. Corolla white, tube included and slightly exerted, annulate within; lips short.

Habitat:- Burma; Shan States; Khomi; Rubi Mines.

42. Leucas montana Spreng. Syst. ii, 742; Wall. Cat. 2056; Benth. in Wall. Pl. As. Rar. 61, Lab. Gen. et Sp. 607 and in DC. Prodr. xii 525; Hook. f. Fl. Brit. Ind. iv 682; Prain Beng. Pl. 856; Cooke Fl. Bomb. Pr. II, 469; Gamble Fl. Madras 1151; Haines Bot. Bih. & Orris. 748.

A small shrubby plant, with straggling branches, densely softly woolly or tomentose with deflexed hairs. Leaves very shortly petioled, thick, ovate or slightly orbicular, obtuse, rounded at the base, crenate, silky above, or often almost glabrescent; lamina 2.5-5 cm. long, 1.5-3 cm. broad; petiole, 3-8 mm. long. Whorls few- or many-flowered, axillary; bracts

minute, linear, densely villous. Calyx subsessile, 6-8 mm. long, tubular-campanulate, straight, silky-villous outside, finely pubescent within on the upper half; teeth minute, triangular-subulate, alternately shorter. Corolla white, tube annulate within.

Habitat:- Purandhar (Poona); Bhor; N. side of Nilgiris; Bellary; Kambakam; Vizagapatem, N. Circars; Orissa; Behar; Chota-Nagpur.

var. (i) Wightii Hook. f. Fl. Brit. Ind. iv 682; Gamble Fl. Madras 1151.

Calyx funnel-shaped, 10-12 mm. long. Whorls many-flowered. Leaves strigose on the upper surface. Habitat:- S. India.

var. (ii) Hamiltoniana (Wall) Haines Bot. Bih. & Oriss. 749.

L. Hamiltoniana Benth. in Wall. Pl. As. Rar. 61; Lab. Gen. et Sp. 607, and in DC. Prodr. xii 525.

Hairs on stem retrorse; petiole of leaves about 9 mm. long, calyx sometimes slightly curved.

Habitat:- Munghyer hills.

var. (iii) parviflora Haines Bot. Bih. & Oriss. 794.

Leaves small, ovate-lanceolate, 5-15 mm. long. Whorls numerous, 8-10-flowered; flowers shortly pedicelled; calyx 5 mm. long.

Habitat:- Angul (Orissa) Chatterjee.

43. Leucas mollissima Wall. Pl. As. Rar. i, 62, and Cet. 2054; Benth. Lab. 607, and in DC. Prodr. xii 525; Hook. f. Fl. Brit. Ind. iv 682; Prain Beng. Pl. 856; Cooke Fl. Bomb. Pr. II, 469; Trim. Fl. Ceylon, III, 385; Duthie Fl. Upp. Gang. Pl. II, 252; Gamble Fl. Madras 1151; Merrill Enum. Philipp. Fl. Pl. III, 411; Kudo in Mem. Fac. Sc. & Agri. II, 2, (1929) 207; Doan in Fl.-Gen. Indo-Chine, iv, 8, (1936) 1023.

L. montana, var. mollissima Haines Bot. Bih. & Oriss. 748.

L. Benthamiana Hook. et Arn;

Ballota pilosa Lour. Fl. Coch. var., 364.

Weak slender herbs, with straggling or often climbing branches, 100-140 cm. long, pubescent or hoary-tomentose with adpressed hairs. Leaves petioled, ovate, or ovate-lanceolate, acute, serrate, cuneate at the base, somewhat strigosely villous above, white tomentose beneath; lamina 3-8 cm. long or more, 1.5-3.5 cm. broad; petiole sometimes up to nearly 2.5 cm. Whorls many-flowered, distant, axillary; bracts minute, linear, villous. Calyx subsessile, 6-8 mm. long, tubular, straight, softly silk-villous outside, pubescent within on the upper part; teeth minute, triangular-subulate, subequal, or alternately shorter. Corolla white, tube annulate within. Nutlets 2 mm. long, obliquely truncate at the top, brown. Habitat:- Kumaon, Nepal; Khasia Mts.; Bengal; Behar; Chota-Nagpur; Orissa, Central India; Concan. Dist.:- Ceylon; China, Indo-China; Malaya.

var. (i) scaberula Hook. f. Fl. Brit. Ind. iv 682; Gamble Fl. Madras 1151.

Almost glabrous; calyx hispid.

Habitat:- Khasia Mts.; Central India; N. Circars;
Godavari valley; Mysore; Chota Nagpur, N. W. Himalaya,
Delhi, Sikkim, Burma.

var. (ii) angustifolia Hook. f. Fl. Brit. Ind. iv. 682.

L. angustifolia Wall. Pl. As. Rar. i 62, Cat. 2064;

Benth. in DC. Prodr. xii 527.

Slender; leaves membranous, narrowly lanceolate;
whorls few-flowered.

Habitat:- Nepal; Burma.

var. (iii) strigosa Hook. f. Fl. Brit. Ind. iv, 682.

L. strigosa Benth. in Wall. Pl. As. Rar. i 62, Lab.

Gen. et Sp. 608, and in DC. Prodr. xii 526; Wall. Cat. 2059.

Slender, strigose; leaves sessile, elliptic- or linear-
lanceolate, subacute. Whorls few-flowered.

Habitat:- Burma.

var. (iv) pilosa (Haines).

L. pilosa, var. pubescens Benth. in Wall. Pl. As. Rar. i
62, and in DC. Prodr. xii 525.

L. montana, var. pilosa Haines Bot. Bih. & Oriss. 749.

Leaves thinly hairy above, tomentose beneath; hairs
with thickened base; calyx-teeth about 2 mm. long.

Habitat:- Rajmahal Hills.

Leonotis nepetalifolia L. Fr. Prodr. 404 and in Alt.

Hort. Kew, 111, 409; Benth. in Wall. Fl. An. Bar. 1, 89, 180; Gen. et Sp. 418, and in DC. Prodr. xii 535; Wall. Cat. 2642; Wright Ill. ii t. 176, fig. f, 11 and 12 t. 857; Hook. f. Fl. Brit. Ind. iv 691; Prain Beng. Fl. 287; Cooke Fl. Bomb. ii 471; Tuttle Fl. Ypp. Gang. 31, 11, 233; Gamble Fl. Madras 1186; Palace Bot. Bihar & Oris. 713.

Leonotis nepetalifolia Roxb. Fl. Ind. iii, 8.

Leonurus glaberrimus Wimmer, Metn. 400.

Leonotis, Pers.

Tall erect annual, 150-200 cm. long, stem about, 4-

Syn. ii, 127; Benth. in DC. Prodr. xii 535; Hook. f. Fl. Brit. Ind. iv, 691; Benth. ex Hook. f. Gen. Pl. II, 1214; Briq. in Eng. & Pr. Nat. Pflanzenf. iv, 3, a, 246; Baker in Thiselton & Dyer, Fl. Trop. Afr. v, 490.

Coarse, tall, annual or perennial herbs. Leaves petioled, ovate, crenate. Whorls very dense, axillary. Flowers white or yellow. Calyx-tube funnel-shaped, arcuate, 8-10 ribbed; throat oblique; teeth 8-10, more or less unequal, the upper the largest. Corolla-tube as long as the calyx; limb bilabiate; upper lip elongated, concave, hairy outside; lower short, deflexed, with 3 subequal lobes. Stamens 4, didynamous, arcuate; lower pair longest; anthers 2-celled; cells divaricate, subconfluent. Disk equal. Style shortly bifid. Nutlets ovoid-triangular, obtuse or truncate, glabrous.

and southern India.

Dist.:- Ceylon; Tropical Asia; Trop. America and Africa.

L. Leonurus, a S. African plant, commonly grown in gardens of Bengal and E. India and other places, is readily distinguished by its shortly petioled, narrowly oblong-lanceolate leaves, few-flid, whorls and much longer corolla.

Leonotis nepetaefolia R. Br. Prodr. 504 and in Ait. Hort. Kew, iii, 409; Benth. in Wall. Pl. As. Rar. i, 59, Lab. Gen. et Sp. 618, and in DC. Prodr. xii 535; Wall. Cat. 2042; Wight Ill. ii t. 176, bis f. 11 and Ic. t. 867; Hook. f. Fl. Brit. Ind. iv 691; Prain Beng. Fl. 857; Cooke Fl. Bomb. ii 471; Duthie Fl. Upp. Gang. Pl. II, 253; Gamble Fl. Madras 1155; Haines Bot. Bih. & Oris. 752.

Phlomis nepetaefolia Roxb. Fl. Ind. iii, 8.

Leonurus globosus Moench. Meth. 400.

Tall erect annual, 150-200 cm. long, stem stout, 4-angled, puberulous. Leaves large, membranous long petioled, up to 20 cm. long, broadly ovate, acute, coarsely crenate-serrate, base cuneate, puberulous on both sides. Flowers numerous densely crowded in globose axillary heads, 4-7 cm. in diam., floral leaves, deflexed lanceolate; bracts linear deflexed, spine-tipped; pedicels short. Calyx 2-3 cm., tube incurved, ribbed, puberulous below, densely hispid above with long hairs, mouth oblique, throat glabrous; teeth unequal, spine-tipped, upper tooth 8 mm. long, ovate acuminate; lower teeth smaller triangular. Corolla orange-red, about 2-5 cm. long, glabrous below, densely villous above, as well as the long upper lip, tube hairy inside with 3 parallel rings of white hairs, lower lip short. Nutlets 4 mm. long, linear-oblong, obliquely truncate.

Habitat:- Punjab and all the hotter provinces of northern and southern India.

Dist.:- Ceylon; Tropical Asia; Trop. America and Africa.

L. leonurus, a S. African plant, commonly grown in gardens of Bengal and S. India and other places, is readily distinguished by its shortly petioled, narrowly oblong-lanceolate leaves, few-fld., whorls and much longer corolla.

Microtoena, Prain.

Journ. As. Soc. Bengal, lix (1890) 310.

Perennial erect branching herbs. Leaves long petioled; cymes paniculate or thyrsoid. Calyx ovoid, fruiting globose, usually 5-toothed, 12-nerved; throat constricted glabrous within. Corolla, upper lip large galeate concave entire, lower spreading 3-fid mid-lobe smaller than lateral. Stamens ascending under the upper lip; anther-cells divaricate when young, at length confluent explanate. Style bifid, upper lobe very short. Nut-
lets very minute, apices ovate subtriquetrous, below smooth.

Stems in lax cymes sometimes loosely paniculate irregularly branched. Calyx 2-5 mm. long, teeth triangular, equal or the upper longer. Corolla yellow, 15 mm. long, upper lip hooded, lower than in slender tube, lower lip spreading 3-fid, the central narrowly elliptic, lateral spreading. Pollen grains smooth, elliptic, 1.5 mm. long.

- Stem and leaves more or less densely hairy; cymes lax-flowered. insuavis.
- Stem and leaves more or less glabrous; cymes dense-flowered Griffithii.

Microtoena Griffithii Prain in Journ. As. Soc. Beng. lix (1890) p. 310.

Erect herbs 40-100 cm. high, glabrescent. Leaves membranous, petioled, ovate, acute or acuminate, base cuneate, doubly crenate,

1. Microtoena insuavis (Hance), Prain ex Dunn in R. B. G. Edinburgh, No. xxviii, p. 128; Kudo in Mem. Fac. Sc. & Agri. II, 2, (1929) 183.

M. cymosa Prain in Hook. Ic. Plant. xix (1889) t. 1872; Journal of As. Soc. Bengal, lix (1890) p. 310; Forbes & Hemsl. Journ. Linn. Soc. xxvi 306 and xxviii, 116;

Gomphostemma insuave Hance, Journ. of Bot. (1884) p. 231.

Plectranthus Patchouli Clarke in Hook. f. Fl. Br. Ind. iv, 624 and Jour. Linn. Soc. xxv, 58.

Erect branching herbs, 40-100 cm. high, minutely tomentose. Leaves long petioled, broadly ovate, acute, base rounded or subcordate, margin crenate-dentate; adpressedly pubescent on both surfaces; lamina 4-7 cm. long; petiole slender 2-7 cm. long. Flowers in lax cymes sometimes loosely paniculate irregularly branched. Calyx 2-5 mm. long, teeth triangular, equal or the upper longer. Corolla yellow, 15 mm. long, upper lip hooded, longer than in slender tube, lower lip spreading 3-fid, the central narrowly elliptic, lateral spreading. Pollen grains smooth. Nutlets elliptic, 1.5 mm. long.

Habitat:- Assam;- Nagahills Jenkins, Manipore Clarke, Khasia hills Clarke, Mann, Tippera, Agartala Debbarman; Burma;- Shan States, Collett, MacGregor, Abdul Huk.

The cultivated plants smell strong of Patchouli, the Burmese plants are devoid of smell.

2. Microtoena Griffithii Prain in Journ. As. Soc. Beng. lix (1890) p. 310.

Erect herbs 40-100 cm. high, glabrescent. Leaves membranous, petioled, ovate, acute or acuminate, base cuneate, doubly crenate,

glabrous on both surfaces, lamina, 7-9 cm. long, petiole, 4-5
cm. Flowers in short thyroid cymes; rather dense. Calyx
6 mm. long, teeth deltoid, acuminate. Corolla 16 mm. long,
tube slender about 11 mm. long, lips short; lateral lobes
of lower lip rounded, half exceeding the ovate central. Pollen
rugulose. Nutlets 3 mm.

Habitat:- Assam ("Probably Mishmi hills," Prain) Griffith, No.
4059; Dibroo Mukh, Masters. (seen the type sheet in Kew).

Ends in Mem. Bot. Soc. & April. II, 3, (1903) 127.

Annual or perennial herb or low shrub. Leaves sessile
or petioled, entire or toothed. Stems axillary or cymes
into terminal racemose panicles. Calyx-tube funnel-shaped,
5-10-ribbed; teeth 5, subequal. Corolla-tube included
or exserted; limb bilabiate; upper lip spreading, oblong,
concave; lower reflexed, 2-lobed. Stamens 4, didynamous,
arcuate; lower pair the longest; anther-sacs 2, parallel
or divergent. Disk usually equal. Style 1-2 at the
apex. Nutlets ovoid or oblong, obtuse.

Stachys, Linn.

Gen. n. 716; Benth. Lab. Gen. et Sp. 525, and in DC. Prodr. xii 456; Boiss. Fl. Orient. iv 714; Hook. f. Fl. Brit. Ind. iv 675; Benth. ex Hook. f. Gen. Pl. II 1208; Endl. Gen. Pl. 625; Briq. in Eng. & Pr. Nat. Pflanzenf. iv, 3, a, 260; Baker in Thiselton-Dyer Fl. Trop. Afr. v, 645; Kudo in Mem. Fac. Sc. & Agri. II, 2, (1929) 187.

Annual or perennial herbs or low shrubs. Leaves sessile or petioled, entire or toothed. Whorls axillary or crowded into terminal racemose panicles. Calyx-tube funnel-shaped, 5-10-ribbed; teeth 5, subequal. Corolla-tube included or exerted; limb bilabiate; upper lip ascending, oblong, concave; lower deflexed, 3-lobed. Stamens 4, didynamous, arcuate; lower pair the longest; anther-cells 2, parallel or divaricate. Disk usually equal. Style bifid at the apex. Nucules ovoid or oblong, obtuse.

- A. Stem and leaves beneath densely white woolly.
- B. Leaves petiolate, cordate or subcordate, margin crenulate... .. floccosa
- B. Leaves sessile cuneate or rounded at the base, margin entire or serrate parviflora
- A. Stem and leaves densely or sparingly hairy, but not woolly.
- B. Leaf-margin crenate or serrate, not lobed.
- C. Leaves ovate, twice as long as broad; corolla-tube exserted.
- D. Petiole 2 cm. or shorter, margin crenate.
- E. Calyx-teeth sharply spinous, (N. W. Him.) sericea
- E. Calyx-teeth not spiny.
- F. Hairs on stem soft spreading.
- G. Calyx-teeth triangular (E. Him.) melissaefolia
- G. Calyx-teeth long acuminate (Upper Burma) Sieboldii
- F. Stem scabrid with reversed hairs scaberula
- Habitat: D. Petiole 4 cm. or longer, margin serrate sylvatica
- C. Leaves narrowly oblong or ovate-lanceolate, 3-4 times as long as broad; corolla tube included.
- D. Stem coarsely hairy; leaves petioled, densely hairy or villous oblongifolia

D. Stem scabrid; leaves sessile or
subsessile, glabrescent or

sparingly hairy palustris

B. Leaf margin entire or irregularly

lobed tibetica

Habitat:- Peshawar; Hazara; Hazara; Kurram valley.
Dist.:- Afghanistan.

1. Stachys floccosa Benth. Lab. Gen. et Sp. 739, and in DC.
Prodr. xii 465; Hook. f. Fl. Brit. Ind. iv 675.

Tall erect herb about a metre high; stem stout, thick.
below, usually simple, obtusely 4-gonous, densely clothed with
soft white wool. Leaves slightly thick, petioled, 7-10 cm.
long, ovate, or ovate-lanceolate, subcordate or cordate, acute,
crenulate softly pubescent above, densely woolly below; petiole
stout 1.5-2.5 cm. Flowers in axillary whorls and terminal
spikes, whorls many flowered, bracts as long as the calyx.
Calyx 6 mm. long, 9 mm. in fruit, villous, teeth triangular
spinescent, spinous point coloured. Corolla woolly, tube
shortly exserted. Nutlets oblong black, 2 mm. long.

Habitat:- Kashmir; Chitral; Hazara; Kurram valley.

Dist.:- Afghanistan.

2. Stachys parviflora Benth. in DC. Prodr. xii 490; Boiss.
Fl. Orient. iv 740; Hook. f. Fl. Brit. Ind. iv 677.

Erect subshrubby herbs, 30-60 cm. high, stem and branches
stout, terete or nearly so, densely clothed with flocculent
white wool. Leaves thick sessile or shortly petioled, 3-9

cm. long, lanceolate or oblong-ovate, acute, cuneate or rounded at the base, margin entire or serrate, glabrous or villous above, densely woolly below. Whorls 2-4 flowered, lower axillary, upper forming long interrupted spikes. Calyx 5 mm. long, cupular or campanulate densely woolly, teeth short acute, incurved in fruit closing the mouth. Corolla small, red-purple, lips short. Nutlet usually one, 3 mm. long rounded, obovoid, with 2 or 3 ridges, smooth, pale brown.

Habitat:- Punjab; Wazirista; Hazara; Baluchistan.

Dist.:- Afghanistan.

3. Stachys sericea Wall. Pl. As. Rar. i 64; Cat. 2077; Benth. Lab. Gen. et Sp. 537, and in DC. Prodr. xii 465; Hook. f. Fl. Brit. Ind. iv 675; Collett Fl. Sim. 403.

S. vestita Benth. ll.c. in part.

S. splendens, Wall. l. c. and Cat. 2075, Benth. ll.c. and in DC. l.c. 466 in part.

Tall erect herb about a metre high or more, stem stout acutely 4-gamous, more or less densely villous with long hairs. Leaves shortly petioled, about 8 cm. long or more, ovate, cordate, acute, crenate, densely or sparsely hirsute with soft hairs. Flowers in axillary whorls and terminal spikes, whorls many-flowered; bracts as long as the calyx. Calyx 7-8 mm. long, villous, teeth much shorter than the tube, triangular spinescent, spines coloured. Corolla pale pink with purple spots; tube scarcely exerted. Nutlets oblong brown, 2 mm. long.

Habitat:- Kashmir; Kumaon; Nepal.

Dist.:- Afghanistan; W. & C. Asia.

4. Stachys melissaefolia Benth. Lab. Gen. et Sp. 535, and in DC. Prodr. xii 466, in part.

S. oblongifolia Benth. in part (Nepal specimens only).

S. splendens, Wall. in part.

Slender, erect herb, tomentose or villous with silky hairs. Leaves sessile or shortly petioled, 5-8 cm. long, ovate or oblong, acute, cordate at the base, crenate, villous or pubescent on both sides. Whorls many-flowered, axillary, distant or close above, forming terminal spikes. Calyx about 6 mm. long, broad; teeth triangular, acute or with a thickened tip, not spinescent. Corolla pink or blue, tube exserted or not. Nutlets 2 mm. long.

Habitat:- Kashmir; The Punjab; Nepal; Sikkim; Bhutan.

Dist.:- Tibet.

This is very like S. sericea Wall., and I think it should be reduced to a variety of that species.

5. Stachys sieboldii Miq. in Ann. Mus. Bot. Lugd. Bat. II, 112; Kudo in Memo. Sc. Agri. II, (1929) 191.

S. affinis Franch. in Mem. Soc. Sc. Nat. Cherbourg, xxiv 243.

S. tubifera Naud. Bull. Soc. Nat. d'Aeclim, France (1887) 394, nomen tantum.

S. cordifolia Prain in Journ. As. Soc. Beng. lix, 310, non E. Koch.

S. cardiophylla Prain ex Dunn.

Lamium kouyangense Vnt. Bull. Acad. Geogr. Bot. xiv, 175.

Stachys Franchetiana Levi. Fiddle, Repert. Nov. Sp. ix, 246.

S. kouyangense Dunn Notes R. B. G. Edin., No. XXVIII, 130.

Stachys sieboldii (Cont.).

Erect or procumbent herbs, stem sparsely hirsute with long spreading white hairs, rootstock slender creeping. Leaves petioled, radical leaves small, cauline, ovate, obtuse or acute, deeply cordate at the base, margin crenate, hispid on both surfaces with long hairs; petiole about 2 cm. long or shorter, hispid; lamina 3.5 cm. long, and 2.5 cm. across. Whorls 4-6-flowered, axillary. Calyx about 5 mm. long, broadly campanulate, slightly oblique, glandular pubescent, teeth triangular acute, shorter than the tube. Corolla pink or purple, 12 mm. long, tube exserted. Nutlets 2 mm. long, rugulose, black, elliptic slightly compressed.

Habitat:- Up. Burma, Manayne, Anderson; Hlawgaw, Forrest, No. 24806.

Dist.:- China.

6. Stachys scaberula Vatke, Bot. Zeit. xxxvii (1875) 462; Hook. f. Fl. Brit. iv, 676.

Erect herbs 30-60 cm. high, with a slender creeping rootstock; stem acutely 4-angled, scabrid and with a ring of long hairs at the nodes. Leaves petioled, 3-5 cm. long, broadly ovate-cordate, acuminate, crenate, pubescent, subscaberulous beneath; petiole about 1 cm. long, scabrid. Whorls 3-6-flowered, axillary, distant or close above; bracts minute. Calyx 7 mm. long, broadly campanulate glandular-pubescent, teeth short, triangular acuminate. Corolla 1.5 cm. long, white with pink spots, pubescent, tube exserted. Nutlets subglobose, smooth.

Habitat:- Khasia Mts,

7. Stachys sylvatica Linn Sp. Pl. 580; Benth. in DC. Prodr. xii 469; Boiss. Fl. Orient. iv 726; Hook. f. Fl. Brit. Ind. iv 676; Bamber, Punjab. pl. 213.

Tall erect herb about 100 cm. high, with a creeping stoloniferous rootstock; stem rather slender, 4-angled, hispid with long stiff hairs. Leaves long-petioled, 5-10 cm. long, broadly ovate-cordate, serrate, acuminate at the apex; softly pubescent; petiole 4 cm. long. Flowers in few-flowered axillary whorls; bracts minute, glandular hairy. Calyx 8 mm. long, teeth triangular, spinescent; tube broad; teeth as long as tube. Corolla about 1.5 cm. long, pink, tube exserted. Nutlets subglobose, dark brown or black.

Habitat:- Kashmir (Falconer, Strachey & Winterbottom, No. 405, Drawa.).

Dist.:- N. Asia; Europe.

8. Stachys oblongifolia Wall. Cat. n. 2076; (in part); Benth. in Wall. Pl. As. Rar. i 64, Lab. Gen. et Sp. 547, and in DC. Prodr. xii 474; Hook. f. Fl. Brit. Ind. iv 676; Kudo in Mem. Fac. Sc. & Agri. ii, 187, (1929);

Erect herbs 40-70 cm. high, pubescent or villous, scabrid below. Leaves shortly petioled, 5-8 cm. long, oblong-lanceolate or linear-oblong, subacute, base broader, subcordate, margin crenate-serrate, densely hirsute on both sides or villous below; petiole 1-2 cm. long. Flowers in axillary whorls, above; bracts minute, whorls 2-6-flowered, distant. Calyx about 8 mm. long, villous, teeth triangular broad or narrow, tips setaceous. Corolla small, pink, tube included. Nutlets 2mm. subglobose, dark brown.

Habitat:- Bengal, Hook, 676; Assam. as long as the tube.
Dist.:- China; Formosa; Korea. Corolla 1-2 cm. long,
pink, pubescent. Tube three as long as the calyx, upper lip
much longer. Valvula about 3 cm. broadly obovoid oblong.

9. Stachys palustris Linn. Sp. Pl. 580; Benth. in DC. Prodr.
xii 470; Boiss. Fl. Oriss. iv, 726; Reichb. Ic. Fl. Gem. t.
1211; Hook. f. Fl. Brit. Ind. iv, 676.

Erect herb, 50-70 cm. high; stem 4-gonous; scabrid or
hispid with longer hairs on the 4 angular ridges and shorter
hairs elsewhere or subsessile. Leaves sessile, 6-10 cm. long,
narrowly oblong- or ovate-lanceolate, acute or acuminate, serrate
base rounded or cordate, glabrescent or sparingly hairy. Whorls
of about 6 flowers, distant and axillary; bracts minute. Calyx
about 8 mm. long, hispid, teeth lanceolate as long as the tube,
tips spinescent. Corolla small pink, tube included. Nutlets
broadly obovoid, smooth, brown.

Habitat:- Kashmir.

Dist.:- N. and W. Asia; Europe; N. America.

10. Stachys tibetica Vatke, Bot. Zeitschr. xxxiii (1875) 447;
Hook. f. Fl. Brit. Ind. iv 676.

Much branched undershrubs about 30 cm. high with stout
woody rootstock and slender terete branches, glabrous, pub-
erulous or tomentose. Leaves shortly petioled or sessile,
1.5-3 cm. long, oblong, ovate or lanceolate, obtuse entire or
irregularly lobed, base shortly cuneate, glabrous or densely
hirsute. Flowers sessile, 1-3 in each whorl, whorls axillary;
bracts converted into stiff spines 3-5 mm. long; shorter than
the calyx. Calyx about 8-9 mm. long, broadly campanulate,

glabrous or villous; teeth triangular as long as the tube, tips spinescent, erect or spreading. Corolla 2-3 cm. long, pink, pubescent, tube thrice as long as the calyx, upper lip much longer. Nutlets about 3 mm. broadly obovoid oblong.

Habitat:- Kashmir.

Dist.:- Western Tibet; Khasgar.

Paralaminia, Dunn.

in Notes S. S. C. Edin. No. XXVII. 165; Yedo in Mem. Fac. Sc. & Agr. 11, 2, (1929) 202.

erect herb; leaves petiolate, serrate. Stems compact, 1/2 elongate, squamulose, spikes: flowers shortly pedicelled. Calyx broadly campanulate, 5-toothed: upper teeth broad orbicular, somewhat ovate-deltoid, fruiting only prominently 4-nerved and transversely ribbed. Corolla tube slender, slightly dilated above, exantherate; upper lip erect, oblong, slightly concave; lower lip 3-lobed. Stamens 4, erect parallel above, lower longer; anthers 2-celled, cells divaricate, at length confluent. Disk equal. Style shortly bifid at the apex; lower unequal. Nutlets smooth.

Paralium gracile Dunn in Notes of R. B. G. Edin. VII. (1918) 168; Kudo in Mem. Fac. Sc. & Agri. II, 2, (1929) 203.

Perennial herb 40-60 cm. high, stem erect obtusely quadrangular, densely and softly hirsute. Leaves long-petioled, membranous, ovate- or orbicular-elliptic, acuminate, cordate at the base, margin crenulate, hirsute on the upper surface, pubescent below. Lamina about 40 mm. long, and

Paralium, Dunn.

10 cm. broad; petiole flexuous, hirsute about 8 cm. long. in Notes R. B. G. Edin. No. XXXVII. 168; Kudo in Mem. Fac. Sc. & Agri. II, 2, (1929) 203.

Erect herbs; leaves petiolate, crenate. Whorls compact, in elongate, subpaniculate, spikes; flowers shortly pedicelled. Calyx broadly campanulate, 5-toothed; upper teeth broad orbicular, somewhat ovate-deltoid; fruiting calyx prominently 5-nerved and transversely ribbed. Corolla-tube slender, slightly dilated above, exannulate; upper lip erect, oblong, slightly concave; lower lip 3-lobed. Stamens 4, erect parallel close, lower longer; anthers 2-celled, cells divaricate, at length confluent. Disk equal. Style shortly bifid at the apex; lobes unequal. Nutlets smooth,

Paralamium gracile Dunn in Notes of R. B. G. Edin. VIII, (1913) 168; Kudo in Mem. Fac. Sc. & Agri. II, 2, (1929) 203.

Perennial herb 40-60 cm. high, stem erect obtusely quadrangular, densely and softly hirsute. Leaves long-petioled, membranous, ovate- or orbicular-elliptic, acuminate, cordate at the base, margin crenulate, hirsute on the upper surface, puberulous beneath; lamina about 20 cm. long, and 10 cm. broad; petiole flexuous, hirsute about 8 cm. long. Racemes slender, 10-15 cm. long, forming terminal panicles; whorls few-flowered, distant; bracts linear minute, pedicels shorter than the calyx. Calyx 3 mm. long, campanulate puberulous, glabrescent in fruit; upper tooth broadly orbicular, larger than the 4 lower ovate acute teeth. Corolla deep dull red, 7-8 mm. long, tube exserted, lips short. Nutlets black, triangular-globe.

Habitat:- Burma.

Dist.:- China.

Paraphlomis, Prain.

Ann. Bot. Gard. Calc. ix, p. 60 et Journ. As. Soc. Beng. lxxiv
791; Ridley Fl. Mal. Pen. II 651; Kudo in Mem. Fac. Sc. & Agri.
ii 2, (1929) 209; Doan in Fl. Gen. Indo-Chine iv, 8, 1014;

Erect herbs often suffruticose. Flowers in dense axillary
whorls; bracts many, ovate, lanceolate or linear. Calyx 10-nerved,
tubular-campanulate, subequally 5-toothed. Corolla-tube annulate
within; limb bilabiate, upper lip erect, narrow, rounded at the
apex, pubescent outside, glabrous within; the lower lip 3-lobed;
Stamens 4, didynamous, not appendaged at the base. Style sub-
equally bifid. Nutlets ovoid, triquetrous.

long, slender, whorls few- or many-flowered, distant, about
1 cm. in diam.; some of the flowers in a whorl are often situated
below the leaves. Calyx 8-10 mm. long, coriaceous, funnel-shaped,
glabrous or hispid, 1/5 of the length of the tube,
very slender, triangular at the base. Corolla white or yellowish,
pubescent, upper lip narrow. Petal 5-6 mm., obovate, rounded at
the apex, brown, slightly wrinkled.

Habitat:— Sikkim; Bhutan; Mishmi; Assam;

District:— Malaya Peninsula and islands; Siam; Indo-China;
China; Philippines.

Paraphlomis rugosa Prain, in Ann. Bot. Gard. Cal. ix 60 and pl. 74; Ridley Fl. Mal. Pen. II 651; Kudo in Mem. Fac. Sc. & Agri. ii, 2, (1929) 209; Doan in Fl. Gen. Indo-Chine, iv, 8 (1936) 1015.

P. rugosa Wall. Pl. As. Rar. i. 63; Lab. Gen. et Sp. 634; DC. Prodr. xii 545; Wall. Cat. No. 2067; Hook. f. Fl. Brit. Ind. iv. 694.

Gomphostemma membranifolium Miq. Fl. Ind. Bot. ii 988.

Tall erect herb, almost 100 cm. high, stem 4-angled, slender or stout sometimes woody; nearly glabrous. Leaves long petioled, membranous, elliptic or oblong-ovate, acuminate, minutely toothed, or crenate-serrate, base rounded or slightly cuneate glabrous, or almost so; lamina 15-20 cm. long, 10-12 cm. broad; petiole 8-12 cm. long, slender. Whorls few- or many-flowered, distant, about 2 cm. in diam.; some of the flowers in a whorl are often situated below the leaves. Calyx 8-10 mm. long, coriaceous, funnel-shaped, glabrous or hispid, teeth half the length of the length of the tube, very slender, triangular at the base. Corolla white or yellowish, pubescent, upper lip narrow. Nutlets 5-6 mm., obovoid, rounded at the apex, brown, slightly wrinkled.

Habitat:- Sikkim; Bhutan; Mishmi ; Khasia;

Dist.:- Malay Peninsula and islands; Siam; Indo-China; China; Philippines.

A. Upper lip of corolla densely villous.

midlobe of lower lip entire

A. Upper lip of corolla tomentose, midlobe

of lower lip obtusate or 2-fid.

1. Leonurus cardiaca Linn. Sp. Pl. 844; Benth. in DC. Prodr. xii, 499; Endl. Gen. Pl. 625; Hook. f. Fl. Brit. Ind. iv, 677; Benth. ex Hook. f. Gen. Pl. II, 1210; Briq. in Eng. & Pr. Nat. Pflanzenf. iv, 3, a, 256; Ridl. Fl. Mal. Pen. II, 651; Kudo in Mem. Fac. Sc. & Agri. II, 2, (1929) 195; Doan in Fl. Gen. Indo-Chine, iv, 8 (1936) 1027.

Leonurus, Linn.

Gen. n. 724; Benth. Lab. Gen. et Sp. 517, and in DC. Prodr. xii, 499; Endl. Gen. Pl. 625; Hook. f. Fl. Brit. Ind. iv, 677; Benth. ex Hook. f. Gen. Pl. II, 1210; Briq. in Eng. & Pr. Nat. Pflanzenf. iv, 3, a, 256; Ridl. Fl. Mal. Pen. II, 651; Kudo in Mem. Fac. Sc. & Agri. II, 2, (1929) 195; Doan in Fl. Gen. Indo-Chine, iv, 8 (1936) 1027.

Stout, erect, leafy herbs, with lobed leaves. Flowers small, in densely congested, axillary distant whorls. Calyx turbinate, 5-nerved, with 5 spreading spinescent teeth. Corolla-tube naked or annulate within; lower lip 3-fid, with obcordate mid-lobe; upper lip entire, erect. Stamens 4, didynamous, ascending under upper lip, lower pair longer; anthers connivent; the cells parallel, transverse. Disk uniform. Style equally 2-fid; the lobes obtuse or subulate. Nutlets smooth, dry, truncate at the apex.

var. (1) pubescens Hook. f. Fl. Brit. Ind. iv, 678.

L. pubescens Benth. in DC. Prodr. xii, 499, Wall. Cat. 2072.

Gen. et Sp. 518, and in DC. Prodr. xii, 499, Wall. Cat. 2072.

Leaves smaller, elliptic-lanceolate, coarsely serrate,

- A. Upper lip of corolla densely villous,
midlobe of lower lip entire cardiaca
- A. Upper lip of corolla tomentose, midlobe
of lower lip obcordate or 2-fid. sibiricus.

Leonurus Royleanus Benth. Il. v. 1; Wall. Cat. 2073.

Leaves ovate-lanceolate, orboid or orbicular or

obovate, pinnatifid, base rounded or cordate, white tomentose beneath.

Habitat: Kashmir; Chitral; Srinagar(?)

1. Leonurus cardiaca Linn. Sp. Pl. 584; Benth. in DC. Prodr. xii, 500; Boiss. Fl. Orient. iv, 753; Reichb. Ic. Fl. Germ. t. 1232, 1233; Hook. f. Fl. Brit. Ind. iv, 678; Collett Fl. Sim. 402.

Stout erect herb, stem quadrangular, pubescent, about 100 cm. high or more; rootstock stout. Leaves petioled, 8-15 cm. long, ovate-cordate, deeply and irregularly lobed, lobes coarsely toothed, upper leaves lobed or irregularly serrate, pubescent or villous beneath; petiole slender about 5 cm. long or more in lower leaves, shorter upwards. Whorls axillary, dense-flowered, bracts spinous. Calyx 4 mm. long, tube short, teeth triangular spreading, spinous. Corolla pink or white, 12 mm. long; tube annulate within, upper lip flattened, narrowed at the base, densely villous; lower lip spreading 3-lobed, midlobe entire. Nutlets smooth. Habitat:- Kumaon; Kashmir; The Punjab; Hazara; Kurrum valley.

Dist.:- W. and N. Asia; Europe.

var. (i) pubescens Hook. f. Fl. Brit. Ind. iv, 678.

L. pubescens Benth. in Wall. Pl. As. Rar. i, 63, Lab. Gen. et Sp. 518, and in DC. Prodr. xii, 499, Wall. Cat. 2072.

Leaves smaller, elliptic lanceolate, coarsely serrate, finely pubescent, base cuneate.

Habitat:- Kashmir; Kumaon; Dalhousie.

var. (ii) Royleana Hook. f. in Fl. Brit. Ind. iv, 678.

Leonurus Royleanus Benth. ll.c.; Wall. Cat. 2073.

Leaves ovate-lanceolate, rhomboid or orbicular or obovate, pinnatifid, base rounded or cordate, white tomentose beneath.

Habitat:- Kashmir; Chitral; Scinde(?).

2. Leonurus sibiricus, Linn. Sp. Pl. 584; Benth. in DC. Prodr. xii, 501; Wall. Cat. 2071; Hook. f. Fl. Brit. Ind. iv, 678; Prain Beng. Pl. 854; Cooke Fl. Bomb. ii, 463; Duthie Fl. Upp. Gang. Pl. ii, 246; Gamble Fl. Madras Heynes Fl. Bih. & Oris. 746.

Stout erect herb, 100-200 cm. high, stem bluntly 4-angled, grooved, glabrous or pubescent or haary tomentose. Leaves long-petioled, 5-10 cm. long, pinnati- or palmati-partite, segments linear, incised, glabrous above, pubescent or tomentose beneath; petiole slender, up to 5 cm. long. Whorls axillary below, forming long interrupted spike above, dense-flowered; bracts spinous. Calyx 7-8 mm. long, glabrous or slightly pubescent, tube short, teeth triangular, spreading, spinescent. Corolla red, pink or blue, 15 mm. long, tube naked or imperfectly annulate within; upper lip hooded, tomentose, midlobe of lower lip obcordate or 2-fid, spreading. Nutlets 2 mm., smooth.

Habitat:- Bengal; Bihar; Assam; Burma; Mysore; Coory.

Dist.:- Trop. Asia; Africa; America.

Phlomis, Linn.

Syst. ed. 1; Benth. Lab. Gen. et Sp. 620, and in DC. Prodr. xii 537; Boiss. Fl. Orient. iv, 779; Hook. f. Fl. Brit. Ind. iv, 691; Benth. ex Hook. f. Gen. Pl. II, 1214; Briq. in Eng. & Pr. Nat. Pflanzenf. iv, 3, a, 248; Kudo in Mem. Fac. Sc. & Agri. II, 2, (1929) 211; Post Fl. Syria, etc. II, 393.

Herbs or undershrubs or shrubs, generally woolly or fleecy; leaves undivided. Whorls few- or many-flowered, axillary or in terminal spikes; bracteoles usually numerous, narrow. Calyx tubular, striate, 5-10 nerved; mouth equal, truncate, 5-toothed; teeth usually spinous, minute or conspicuous. Corolla-tube included, usually annulate below the middle; limb bilabiate, upper lip concave villous, inferior patently 3-fid. Stamens 4, lower longer, upper often appendaged at the base; anthers indistinctly 2-celled, cells divaricate, at length confluent. Disk equal. Style 2-fid at the top, lobes subulate, lower longer. Nutlets ovoid or obovoid, triquetrous or not.

- A. Leaves not rotately spreading, petiole 1-5 mm. broad, round.
- B. Stem and branches terete; leaves thick, rugose; hairs on stem and under surface of leaves conspicuously stellate.
- C. Lower surface of leaves completely covered with grey velvety tomentum, (N. W. Him.).
- D. Leaves broadly ovate, 5-20 cm. broad *spectabilis*
- D. Leaves lanceolate-oblong, 1-5 cm. broad
- E. Herbaceous; leaf base truncate. Calyx-teeth 5-8 mm. long *cashmiriana*
- E. Undershrub; leaf base cuneate. Calyx-teeth 2-3 mm. long *Stewartii*
- C. Lower surface of leaves rusty-pilose only on the veins, (Phasi and Tibet northwards) *youngusbandii*
- B. Stem and branches 4-angled, leaves membranous, not rugose; hairs generally simple.
- C. Stamens and style exceeding the corolla tube, (mostly Sikkim to N. W. Him.).
- D. Bracts hard and rigid, ending in a conspicuous spine.
- E. Bracts shorter than the calyx; nutlets rounded at the top. *macrophylla*
- E. Bracts equalling or longer, than the calyx, nutlets truncate at the top *setigera*

hairy at D. Bracts soft, not rigid; spines
 absent or inconspicuous.
 E. Calyx nearly as broad as long,
 glabrate; leaf-apex
 narrowly acuminate breviflora
 E. Calyx more than twice as long
 as broad, usually villous;
 leaf-apex acute or obtuse.
 F. Calyx & corolla with white
 or pale-brown hairs; calyx-
 teeth pilose (N. W. Him.) bracteosa
 F. Calyx & corolla with deep-
 black hairs; calyx-teeth
 naked, (E. Him.) tibetica
 C. Stamens and styles shorter than
 and included in the corolla
 tube (Burma).. burmanica
 A. Leaves fan-shaped, rotately spreading,
 petiole 10 mm. broad or more rotata.

1. Phlomis spectabilis Falc ex Benth. in DC. Prodr. xii
 543; Hook. f. Fl. Brit. Ind. iv 692.

Tall herb 100-200 cm. high, stem very stout, terete, finely
 hoary-tomentose or loosely covered with stellate down; often
 glabrous. Leaves larger, long petioled, broadly ovate-cordate,
 obtuse at the apex, crenate or sublobulate, rugose and sparingly

hairy above and stellately tomentose beneath; lamina 10-20 cm. long and as broad, sometimes larger, petiole as long as the blade or shorter above. Whorls many-flowered, 3-4 cm. in diam., bracts filiform rigid with acicular tips, hispid. Calyx about 15 mm. long, pubescent, teeth spiny, about 5 mm. long. Corolla pink, 2-2.5 cm. long, upper lip villous and fringed with white hairs. Nutlets 5 mm. long.

Habitat:- Kashmir, westwards to Baluchistan.

Dist.:- Afghanistan.

2. Phlomis cashmiriana Royle Ill. 303, t. 75A.; Benth. in Hook. Bot. Misc. iii (1833) 382, Lab. Gen. et Sp. 630, and in DC. Prodr. xii 542; Hook. f. Fl. Brit. Ind. iv 692.

Erect herb with several stems from a stout rootstock, 60-100 cm. long; stem terete, densely clothed with stellate white flocculent wool. Leaves radical and cauline, petioled, rugose, coriaceous, linear-oblong, obtuse, crenate or crenulate, base cordate or subcordate, finely pubescent above, flocculently woolly with stellate hairs beneath, lamina 10-18 cm. long, 2-5 cm. broad; petiole 10-15 cm. long, much shorter upwards, densely woolly. Whorls many-flowered, 2-3 cm. in diam., bracts numerous 1.5 cm. long, filiform, tomentose and ciliate, tips acicular. Calyx 15-20 mm. long, plicate tomentose, teeth spiny, 5-8 mm. long. Corolla pale purple, 2-3 cm. long, lips large, tomentose, lower bent at right angles to the tube.

Habitat:- Kashmir; N. W. Fr. Province.

Dist.:- Afghanistan.

3. Phlomis Stewartii Hook. f. Fl. Brit. Ind. iv 692.

Phlomis Stewartii (Cont.).

Small shrubby plants, 20-30 cm. high; stem and branches terete, stout, densely covered with flocculent stellate wool. Leaves shortly petioled, coriaceous, 6-12 cm. long, linear-lanceolate, acute, crenulate cuneate at the base; rugose or scaberulous above, densely woolly beneath; petiole .5-1.5 cm. long. Whorls many-flowered, about 2.5 cm. in diam., bracts filiform, tomentose. Calyx about 12 mm. long densely woolly, teeth short spiny, recurved. Corolla 2 cm. long, upper lip tomentose. Nutlets very small.

Habitat:- Western Punjab; Baluchistan.

4. Phlomis Youngusbandii Mukerjee in Notes of R. B. G. Edin. No. 95 (1938), in ed.

Erect herb 20-35 cm. high, or smaller; stem terete, rigid, with a stout and woody rootsrock, finely tomentose with brown stellate or simple hairs. Leaves petioled, slightly thick, rugose, elliptic, or oblong, obtuse, base rounded or truncate, often cuneate, rarely cordate; margin crenate; densely pubescent above and sparsely below with brown stellate hairs; lamina 3-5 cm. long or more, 2-3 cm. broad; petiole 3-5 cm. long, much shorter upwards. Whorls 2-2.5 cm. broad; bracts linear, ciliate, as long as the calyx. Calyx truncate, 10-12 mm. long, densely pubescent; teeth triangular 2 mm. long. Corolla 15 mm. long, villous outside; tube slender, as long as the calyx, annulate within; galea densely bearded with long white or brownish hairs. Nutlets obovate, 2 mm. long, black.

Habitat:- Tibet; Thibet, Dr. King's collectors, 1882.

Khamba Jong, Youngusband No. 106, (Typus in Herb. Cal.; also in Herb. Edin. and Kew); Kambajong, Major Prain; Gyantse Walton;

Dochin Hills, Stewart; Hills above, Lasha, Walton; Phari
Gould, No. 21.

5. Phlomis macrophylla Wall. Pl. As. Rar. i, 62, and Cat.
2065; Benth. Lab. Gen. et Sp. 631 and in DC. Prodr. xii 543;
Hook. f. Fl. Brit. Ind. iv, 692.

Tall herbs 150-200 cm. high, stem very stout hirsute or
glabrate, 4-angled. Leaves long petioled broadly ovate or
oblong, acute, crenate, cordate at the base, rarely rounded or
cuneate; sparingly or rarely densely hispid on both sides;
lamina 10-15 cm. long, 8-12 cm. broad; petiole nearly as long
as the blade. Whorls many-flowered, 2-4 cm. in diam.; bracts
linear, slender rigid, ciliate, with spinescent tips; shorter
than the calyx. Calyx 1.5 mm. long, sparsely hairy, teeth
spinous, short. Corolla white or red, tube included, galea
villous with white hairs. Nutlets 4 mm. long obovate cuneate,
black or dark brown, minutely tubercular, rounded at the top.
Habitat:- Kumaon; Nepal; Sikkim, 3,500-4,500 m.; Basahr
Dist. of Punjab.

6. Phlomis setigera Falc. ex Benth. DC. Prodr. xii 543;
Hook. f. Fl. Brit. Ind. iv 693.

Tall erect herb, nearly 150 cm. long, or more, stem very
stout, 4-angled, almost glabrous or sparingly pubescent. Leaves
petioled, ovate, acuminate crenate, or serrate, base rounded
or cordate rarely shortly cuneate, glabrescent or hispid on both
sides, lamina 12-18 cm. long, 8-12 cm. broad; petiole 2-5 cm.
long. Whorls many-flowered, 2-3 cm. in diam.; bracts rigid

lanceolate, 12 mm. long, ciliate, spinous at the tip. Calyx about 10 mm. long, hairy outside and at the rim, mouth slightly contracted, teeth short, erect, subulate, ciliate. Corolla pink, tube included, pubescent below, villous on the upper lip, with white hairs. Nutlets 5 mm. long, obovoid, truncate and slightly fringed at the top; brown in colour, slightly wrinkled. Habitat:- Nepal; Sikkim; Darjeeling; Kashmir; Kumaon; Hazara; Chitral; Chumli and Phasi.

7. Phlomis breviflora Benth. in Wall. Pl. As. Rar. i 62; Lab. Gen. et Sp. 631, and in DC. Prodr. xii 543; Hook. f. Fl. Brit. Ind. iv 693.

P. parviflora Benth. in Wall. Cat. 2066.

Tall erect herb, about 150 cm. high, glabrous or slightly pubescent, stem 4-angled. Leaves long petioled, broadly ovate, deeply cordate rarely subcordate, acuminate, crenate, glabrescent or sparingly hairy on both sides; lamina 10-18 cm. long and 7-12 cm. broad; petiole 5-10 cm. long. Whorls many or few-flowered, 2-3 cm. in diam., bracts about 1 cm. long, slender, ciliate. Calyx 8-10 mm. long, nearly glabrous, teeth minute. Corolla blue (?) or purple (?), tube included, galea villous. Nutlets 4-5 mm. in diam., rounded, black, slightly wrinkled. Habitat:- Nepal; Sikkim; Darjeeling; Up. Burma, (Ward 1869, Forrest 28622). Dist.:- Tibet.

8. Phlomis bracteosa Royle ex Benth. Hook. Bot. Misc. iii (1833) 383, Lab. Gen. et Sp. 633, and in DC. Prodr. xii, 545. Hook. f. Fl. Brit. Ind. iv 693.

P. lamifolia Royle ex Benth., ll.c.

P. latifolia Royle ex Benth., ll.c.

P. simplex Royle ex Benth., ll.c.

P. cordata Royle ex Benth., ll.c.

A tall stout herb, simple or branched, stem 4-angled, pubescent; hairs on the stem and branches spreading or deflexed. Leaves petioled, ovate, obtuse, crenate, base broadly cordate, sometimes truncate, both surfaces finely tomentose with straight often mixed with stellate hairs or almost glabrous; lamina 5-10 cm. long, petiole 3-8 cm. long, or smaller. Whorls many-flowered, 2-3 cm. in diam., bracts erect, membranous, ciliate, as long as the calyx, lanceolate or linear, the inner ones much narrower. Calyx 10-12 mm. long, hispid or glabrate, teeth 5 mm. long or shorter, slender and ciliate. Corolla blue-purple; galea fringed with white hairs. Nutlets 3 mm., obovoid, tip rounded.

Habitat:- Kumaon; Kashmir.

9. Phlomis tibetica Marquand & Shaw, Journ. Linn. Soc. xlvii, 218.

Small erect herb, about 25 cm. high, simple or branched from the base, stem obtusely 4-angled, sparsely hairy or villos. Leaves mostly at the base of the stem, long petiole, ovate-cordate, obtuse crenate, adpressedly pubescent; lamina 5-7 cm. long, 4-6 cm. broad, petiole about 7 cm. long or more, pubescent. Whorls many-flowered, about 3 cm. in diam., bracts as long as the calyx, linear, covered with black erect hairs. Calyx 12 mm. long, truncate, pubescent with black spreading flexuous hairs, teeth spinous 2-3 mm. long or shorter. Corolla pink; tube annulate, longer than the calyx, upper lip broad,

sparsely villous or pubescent outside, densely bearded inside with black hairs, margin denticulate. Nutlets 3 mm. long, obovoid, rounded at the tip, dark brown.

Habitat:- Sikkim, - Dr. King's collectors; Nathung, King 4341; Singalilah, Gammie 80; Lochung Valley, Gammie 953; Guatong, Ribu and Rhomos 4618; Woods above Changu, W.W. Smith 3214; Chola Valley, W. W. Smith 3738, Harman 8299; Bhutan, Chumbi-Dungboo, Pit-see-la Dungboo, La-ree-tung K.C.; La-ree, Dungboo, Reding-oing Dungboo.

Dist.:- Tibet, - Anderson 1113, 4,500-5,000 m. Cave 996; Below S. of Kapap, Cooper 165; Changu, Cooper 52; Tiamphoong-Jongei, Dr. King's collectors.

10. Phlomis burmanica Mukerjee in Notes of R. B. G. Edin. No. 95 (1938) in ed.

Small erect herb, 20-30 cm. high, simple or much-branched from the stout rootstock; stem and branches obtusely quadrangular, sparsely pubescent or villous. Leaves long petioled broadly ovate-cordate, rounded at the apex, margin crenate; pubescent or villous with spreading hairs; lamina 4-7 cm. in diam.; petiole pubescent, 5-9 cm. long or smaller. Whorls about 2.5 cm. in diam.; bracts linear, as long as the calyx, villous. Calyx 10 mm. long, truncate, pubescent with brown hairs; teeth triangular, not spinous, 1.5 mm. long. Corolla lavender-coloured; 14-17 mm. long, sparsely pubescent outside and densely villous on the inside of the upper lip by white hairs; tube slender, exannulate; upper lip 6-8 mm. broad, margin fringed. Filaments included within the corolla tube, the lower 2 mm. long, upper 1 mm. long. Style straight, 6 mm. long, shortly 2-fid at the tip; lobes equal and divergent.

Habitat:- Upper Burma; Plants of 8-10 in. Flowers exterior, pale-rose. Alpine meadows, 2743 m, Htawgaw Bum, north of Htawgaw, Lat. 26° 10' N, Long. 98° 25' E, Forrest No. 24538, (Type in Herb. Edin.); N. Maikha-Salwin divide, N. of Chini-li, 26° 35' N., 98° 48' E, Forrest No. 26812, alt. 3655 m.; Hpawshi Bum, R.A. 1061, alt. 3707 m.; Nawng Chawng, Nawai Divide, Ward 1800, alt. 3655-3909 m.

11. Phlomis rotata Benth. ex Hook. f. Fl. Brit. Ind. iv, 694.

Dwarf plants, stem very short, stout, unbranched, with very long and stout tap root. Leaves few, large, thick and coriaceous, rotately spreading, orbicular or reniform, crenate, abruptly cuneate and decurrent to a flat and very broad petiole; lamina 8-15 cm. in diam., rugose, tomentose, nerves palmately reticulate, thick and conspicuous; petiole 2-5 cm. long and about 1 cm. broad or more. Flowers in a dense sessile terminal head or in a long or short terminal spike; whorls in the spike quite close or much distant; bracts filiform ciliate at the margin, tips acicular. Calyx 8-10 mm. long, membranous, funnel-shaped, sparsely hispid, teeth spinescent, very short. Corolla purple, small, tube included, galea pubescent densely fringed with white hairs. Nutlets 3 mm. long, black smooth, obovoid, rounded at the apex.

N.B. P. Burmanica, Mukerjee (No. 10) is so different in the character of stamens and style that it could be conveniently transferred to a new genus.

A. Flowers in spikes with dense whorls.

B. Spikes not white-woolly; hairs on
calyx usually stellate.

C. Bracts & involucres not spiny, much

short. Eremostachys, Bunge.

D. Petioles densely white-woolly

Bunge, in Lideb. Fl. Altaie. II, 414; Boiss. Fl. Orient.
iv 792; Benth. Lab. Gen. et Sp. 636, and in DC. Prodr. xii
547; Hook. f. Fl. Brit. Ind. iv 694; Benth. ex Hook. f. Gen.
Pl. II, 1215; Briq. in Eng. & Pr. Nat. Pflanzenf. iv, 3, a,
246; Muschler Fl. Egypt, II, 835; Post. Fl. Ser. etc., II, 398.

Erect perennial herbs, with many large radical leaves,
and a long or short terminal spike, or a lax spreading panicle.
Cymes close or distant, densely many-flowered, or in the pan-
icle 1-flowered only; floral leaves large or small, bracts
and bracteoles usually linear. Calyx tubular-campanulate,
limb sometimes expanded, 5-lobed; lobes broad apiculate, often
spinescent. Corolla-tube included, upper lip erect, hooded,
bearded within; lower 3-lobed, spreading. Stamens 4, ascending
under the upper lip; upper filaments appendaged at the base;
anthers conniving, cells divaricate. Disk equal. Style
equally 2-fid at the apex or the upper lobe short. Nutlets
triquetrous, truncate and densely hairy at the top.

1. Eremostachys vicaryi Benth. Arch. bot. Pl. Punjab et
Bolnde 119; Hook. f. Fl. Brit. Ind. iv 695.

Erect herb, with a simple or branched very stout stem
100-150 cm. high. Leaves mostly radical, petioled, 30-40
cm. long, pinnatifid; segments again pinnatifid, sessile
glabrous; petioles stout, woolly at the base; cauline leaves
smaller, oblong, lobulate. Spikes 30-25 cm. long; whorls

- A. Flowers in spikes with dense whorls.
- B. Spikes not white-woolly; hairs on calyx usually stellate.
- C. Bracts & bracteoles not spiny, much shorter than calyx, all free.
- D. Petioles densely white-woolly at the base.
- E. Bracts & bracteoles subulate, equally $\frac{1}{4}$ of calyx Vicaryi
- E. Bracts & bracteoles obscure loasaefolia
- D. Petioles not white-woolly at the base... .. labiosa
- C. Bracts & bracteoles spine-tipped, equalling calyx; bracteoles connate below in groups of 3 acanthocalyx
- B. Spike & particular calyces covered with dense white wool; no stellate hairs superba
- A. Flowers in a loose panicle, not whorled thyrsoflora

1. Eremostachys Vicaryi Benth. Aitch. cat. Pl. Punjab et Scinde 119; Hook. f. Fl. Brit. Ind. iv 695.

Erect herb, with a simple or branched very stout stem 100-150 cm. high. Leaves mostly radical, petioled, 30-40 cm. long, pinnatisect; segments again pinnatifid, sessile glabrous; petiole stout, woolly at the base; cauline leaves smaller, oblong, lobulate. Spikes 20-25 cm. long; whorls

many-flowered, distant; rachis very stout; bracts smaller than calyx, subentire; bracteoles minute. Calyx 1.5 mm. long, campanulate, scaly tomentose, mouth truncate, cut into 5 shallow lobes with apiculate tips. Corolla 2 cm. long, tube included, galea villous and fringed with white hairs. Nutlets 5-6 mm. long, black.

Habitat:- Western Punjab; Baluchistan.

This is doubtfully distinct from the next species.

Further material may show that they represent the same species.

2. Eremostachys loasaefolia Benth. in DC. Prodr. xii 547; Boiss. Fl. Orient, iv 795.

E. Stocksii Boiss. Diag. Ser. II, 4, 48.

Erect herb, usually with a simple stem, densely shaggy villous on the upper parts. Leaves mostly radical, petioled, oblong, lyrate-pinnatifid; the terminal segment much the largest, ovate-oblong, deeply lobed; the cauline leaves sessile, lanceolate, toothed; all leaves glabrescent on the upper surface, villous beneath with long hairs; petiole 5-10 cm. or more, densely woolly at the base. Spikes 15-30 cm. long, whorls 6-8-flowered, distant; bracts ovate, subdentate, slightly shorter than the calyx; bracteoles subulate, much shorter. Calyx 12-15 mm. long, minutely and densely tomentose; teeth shorter than the tube, ovate, abruptly and shortly spinulose. Corolla about 25 mm. long. Nutlets 5 mm. long, black.

Habitat:- Baluchistan.

Dist.:- Afghanistan.

3. Eremostachys labiosa Bunge. Lab. Persic 79, var. canescens Regl. Act. Hort. Petrop. vi (1879) 382 and Vol. ix (1886) 535;

Aitch. Trans. Linn. Soc. Vol. III, Ser. 2nd. (1888) 98.

Burkill, List of Fl. Pl. Baluchistan, 61.

A handsome herb, 10-40 cm. high with a solitary ascending rarely erect stem, laxly villous or hirsute with minute hairs. Leaves mostly radical, petioled, ovate, lanceolate or oblong, entire or pinnately lobed or even lyrate-pinnatifid, 15-30 cm. long, more or less glabrescent above, sparsely hirsute below; cauline leaves sessile, smaller, incised or toothed. Spikes stout, 10-25 cm. long; whorls 6-flowered or more, distant, or close above, bracts lanceolate, bracteoles linear-subulate, much shorter than the calyx. Calyx 18-20 mm. long, campanulate, truncate, stellately tomentose; teeth minute. Corolla 30 mm. long or more, white, with a yellow lower lip, galea villous and tinged with white hairs. Nutlets not seen. Flowering time - April, May.

Habitat:- Baluchistan, Lace.

Dist.:- Afghanistan; Turkestan.

4. Eremostachys acanthocalyx Boiss. Diagn. Ser. II, iv, 49 and Fl. Orient. iv 795; Hook. f. Fl. Brit. Ind. iv 695.

E. laciniata Aitchison, Cat. Pl. Punjab & Scinde 118 (not of Bunge.)

Stout erect herb, about 1.5 m. high, stem very stout, simple or branched, glabrous below. Leaves mostly radical 15-25 cm. long, petioled, pinnatisect, segments pinnatifid or lobulate, glabrous above hispid below, upper leaves shorter subsessile or sessile. Spike about 20 cm. long, whorls 6-8 flowered, 3-4 cm. in diam., distant below; bracts broad sessile, concave, as long as flowers, deciduous; bracteoles

shorter than calyx, linear-lanceolate, very stiff, spinescent; usually 2 or 3 shortly joined below to each other and to the base of the calyx. Calyx 2 cm. long, campanulate, pubescent with long straight hairs and minute stellate hairs, mouth shortly 5-lobed, lobes with a dorsal spinescent tooth. Corolla 2.5 cm. long, tube exserted, galea pubescent, fringed with white hairs. Nutlets 4 mm. long, black.

Habitat:- West Punjab; Baluchistan.

Dist.:- Afghanistan, (Lace's no. 3852, from Kan Baluchistan, may be a new species).

ex Benth.

5. Eremostachys superba Royle/in Hook. Bot. Misc. iii (1833) 381, Lab. Gen. et Sp. 637, and in DC. Prodr. xii 548; Hook. f. Fl. Brit. Ind. iv. 695; Duthie Fl. Up. Gang. Pl. II, 248.

E. laciniata Bunge, var. superba Regl. Act. Hort. petrop. ix (1886) 554.

E. speciosa Rupr. Ser. Thiansh, 68.

Erect robust herb, 50-70 cm. high, stem usually unbranched very thick, softly hairy. Leaves mostly radical, petioled, 20-30 cm. long, pinnatisect, segments lobulate, lobes broad obtuse; cauline leaves few, smaller, pinnatifid. Spike 15-25 cm. long, stout, densely woody, whorls many-flowered, close and confluent, bracts deciduous. Calyx 2 cm. long, campanulate, densely woolly, mouth truncate, shortly 5-lobed, lobes broad, apiculate. Corolla 3-4 cm. long, yellow, tube included, galea 1 cm. long or more, villous. Nutlets 4 mm. long, black, hairs on tip very dense and long.

Habitat:- Garhwal, Shialik range, Kangra; Peshwar.

Dist.:- Turkestan.

6. Eremostachys thyrsiflora Benth. in DC. Prodr. xii 248; Boiss. Fl. Orient. iv 797; Bunge, Lab. Pers. 79; Regl. Acta Hort. Petrop. vi 381, and ix 567 (Monogr. Eremostach. 41), t. 9, f. 4, 5; Prain in Journ. As. Soc. lix 313.

Stout erect herb, 20-30 cm. high, unbranched, with a woolly rootstock; hoary pubescent or glabrate. Leaves mostly radical, obtusely incised, toothed, decurrent to the long petiole; lamina 5-12 cm. long, 3-4 cm. wide; petiole 3-8 cm. long, flat, slightly winged below. Flowers in lax cymes forming a large spreading panicle; cymes 3-7 flowered, flowers at end of the cymes sessile; bracts sessile oblong denticulate, lower as long as the flowers, shorter above; bracteoles linear subulate, as long as the calyx or longer, softly hairy, margin ciliate. Calyx 2-2.5 cm. long, campanulate, hoary-tomentose, broadly 5-lobed; lobes with a spine, about 5 mm. long. Corolla 3 cm. long, galea fringed with white hairs; lower lip longer than the upper. Nutlets 3 mm. long, black. Habitat:- Western Punjab, Duke, Hamilton, Lace; Baluchistan, Stocks, Lace, Duthie, Elliot, Haroukh.

Dist.:- Afghanistan.

Roylea, Wall.

Pl. As. Rar. i 57; Benth. in Lab. Gen. et Sp. 601, and in DC. Prodr. xii 516; Hook. f. Fl. Brit. Ind. iv 679; Benth. ex Hook. f. Gen. Pl. II, 1212; Briq. in Eng. & Pr. Nat. Pflanzenf. iv, 3, a, 260; Duthie Fl. Upp. Gang. Pl. II, 247.

A tall hoary shrub or undershrub. Leaves shortly petioled, deeply crenate-toothed or lobed. Whorls axillary, 6-10-flowered; bracteoles small, subulate. Calyx-tube cylindrical, 10-nerved; lobes 5, large, obovate-oblong, obtuse, rigid, reticulate-veined. Corolla white or pinkish; tube included, cylindrical, annulate within; upper lip erect, hooded, entire; lower spreading, 3-fid; midlobe longest, entire. Stamens didynamous, lower pair longer; anthers conniving, the cells diverging. Style-lobes subequal, subulate. Nutlets ovoid-oblong, obtuse, smooth.

Roylea calycina Briq. in Engl. & Pr. Pflanzenf. iv, 3, a, 260; Duthie Fl. Upp. Gang. Pl. II, 217.

R. elegans Wall. Pl. As. Rar. i 57; t. 74 and Cat. 2069; Benth. Lab. Gen. et Sp. 601, and in DC. Prodr. xii 516; Hook. f. Fl. Brit. Ind. iv, 679; Collett Fl. Sim. 404.

Phlomis calycina Roxb. Fl. Ind. iii, 2.

Ballota cinerea, Don. Prodr. 111.

Erect branching shrub, 100-160 cm. high; branches slender, terete, finely tomentose. Leaves shortly petioled, 2-4 cm. long, ovate acute or acuminate crenate or dentate, base rounded, glabrescent above, tomentose beneath. Flowers in short axillary umbellate whorls; bracts minute linear. Calyx 10-15 mm. long, cylindric, puberulous or tomentose, tube deeply ribbed, 5-lobed above, lobes as long as the tube, broadobtuse, reticulately veined. Corolla white tinged with pink, tube included or scarcely exerted. Anterior pair of stamens longer. Nutlets 2 mm. long, dark brown, smooth.

Habitat:- Kashmir; Kumaon; Simla.

Notochaete, Benth.

in Wall. Pl. As. Rar. i 63, Lab. Gen. et Sp. 635, and
in DC. Prodr. xii 547; Hook. f. Fl. Brit. Ind. iv 694;
Benth. ex Hook. f. Gen. Pl. II, 1215; Briq. in Engl. & Pr.
Nat. Pflanzenf. iv, 3, a, 249; Kudo in Mem. Fac. Sc. &
Agri. II, 2, (1929) 218.

Erect herb, with long-petioled leaves. Whorls densely
many-flowered, globose, axillary, bracts slender. Calyx
membranous, tubular, 5-nerved, equally 5-toothed; teeth
with long spines, hooked at the tip. Corolla small, tube
included, not annulate; upper lip erect, concave; lower
lip spreading, subequally 3-lobed. Stamens 4, ascending,
lower pair longer; anthers conniving, cells divaricate.
Disk equal. Style lobes minute, subequal. Nutlets oblong,
triquetrous, truncate, smooth.

Notochaete hamosa Benth. in Wall. Pl. As. Rar. i 63, Lab. Gen. et Sp. 636 and in DC. Prodr. xii 547; Wall. Cat. 2068; Hook. Ic. Pl. t. 1217; Hook. f. Fl. Brit. Ind. iv 694.

An erect herb, 100-140 cm. high, stem stout 4 angled, creeping at the base, glabrous or pubescent. Leaves membranous, about 15-20 cm. long or more, broadly ovate, acuminate dentate, rounded or subcordate at the base, sparingly hairy on both sides, the hairs stellate beneath, petiole 5-8 cm. long. Flowers many in densely crowded in axillary globose heads, about 3 cm. in diam., bracts longer than the calyx, slender stiff and spiny, villous below, hooked at the ends. Calyx tubular, 5-toothed, teeth short with long spines affixed at the back below the tips; tube about 10 mm. long, membranous villous, hard and 4-valved in fruit, spines about 12 mm. long, hooked at the end. Corolla 15 mm. long, white, upper lip erect villous, lower lip subequally 3-lobed. Nutlets about 3 mm. long, oblong.

Habitat:- Nepal, Wallich; Sikkim, J.D.H. etc.; Darjeeling Anderson, Clarke, etc.; Naga hills, Clarke, Prain; Burma, Kachim Hills, Shaik Mokim. (This is densely hairy).

Gomphostemma, Wall.

Benth. in Wall. Pl. As. Rar. II 12, Lab. Gen. et Sp. 646,
and in DC. Prodr. xii 550; Benth. ex Hook. f. Gen. Pl. II 1216;
Hook. f. Fl. Brit. Ind. iv 696; Briq. in Eng. & Pr. Nat. Pflanz-
gef. iv, 3, a, 223; Prain in Ann. R. B. G. Cal. iii 242; Ridley
Fl. Malay Penin. II 652; Kudo in Mem. Fac. Sc. & Agri. II 2,
(1929) 272; Doan in Fl. Gen. Indo-Chine iv, 8, (1936) 1030.

Erect or decumbent, suffruticose herbs; leaves opposite,
petioled. Whorls few- or many-flowered, sessile or pedunculate,
axillary, extra-axillary or in terminal spikes; bracts ovate or
lanceolate; bracteoles linear. Calyx campanulate, 10-nerved,
equally 5-toothed. Corolla-tube slender exerted; limb dilated,
bilabiate; upper lip hooded, entire or emarginate, lower lip
broad, 3-fid. Stamens 4, ascending, didynamous, lower pair
longer; anthers 2-celled, cells parallel, transverse. Disc
equal or with a glandular swelling in group. Ovary 4-partite,
glabrous or pubescent; style glabrous, 2-fid at the apex, lobes
subulate, subequal, or the upper shorter. Nutlets glabrous or
pubescent, rugose with a thick and slightly fleshy pericarp.

H. Corolla 3 cm. long, calyx teeth
shorter than the tube.

F. Leaves subsessile, glabrescent

above niveum

F. Leaves distinctly petioled,

hirsute.

G. Apex of leaves acuminate

or long acute parviflorum

G. Apex of leaves broad

and rounded laoti

H. Corolla 3 cm. ³⁹¹ long, calyx teeth

longer than the tube.

Gomphostemma, Wall.

- A. Corolla-tube hirsute within (pogosiphon Prain).
- B. Flowers on the main stem and branches.
- C. Whorls in terminal spikes.
 - D. Corolla large, 22 mm. long or more.
 - E. Stem stout, spikes very elongate, erect.
 - F. Bracts cordate Wallichii
 - F. Bracts cuneate strobilinum
 - E. Stem slender, spikes about 3 cm. long, slightly drooping... .. nutans
 - D. Corolla small, 12-15 mm. long Heyneanum
 - C. Whorls axillary Hemsleyanum
 - B. Flowers on a distinct scape inspinatum
- A. Corolla glabrous within.
 - B. Corolla-tube slender, straight, limb very short; nutlet solitary (stenostoma Prain).
 - C. Stem erect.
 - D. Calyx hairy within, nutlets glabrous.
 - E. Corolla 2 cm. long, calyx teeth shorter than the tube.
 - F. Leaves sessile; glabrescent above niveum
 - F. Leaves distinctly petioled, hirsute.
 - G. Apex of leaves acuminate or long acute parviflorum
 - G. Apex of leaves broad and rounded Lacei
 - E. Corolla 3 cm. long, calyx teeth longer than the tube.

- F. Flowers in axillary and extra
axillary clusters, calyx-teeth
mm. long Thomsonii
- F. Flowers only in axillary
cymes, calyx teeth - mm.
long crinitum
- D. Calyx glabrous within, nutlets
hairy eriocarpa
- C. Stem decumbent aborensis
- B. Corolla tube incurved, broad, limb very
wide; nutlets usually 4. (*Eugomphostemma*
Prain).
- C. Ovary densely villous, at least when
young.
- D. Nutlets hispid.
- E. Corolla 6 mm. long, style hispid
above Scortechinii
- E. Corolla 4.5 cm. long, style
glabrous, or hirsute when young.
- F. Corolla yellow, sparingly
pubescent outside oblongum
- F. Corolla white, villous outside
D. Nutlets glabrous rugosum.
lucidum
- C. Ovary glabrous.
- D. Calyx-tube glabrous within; corolla
2-5 cm. glabrous pedunculatus
- D. Calyx-tube hirsute within; corolla
3 cm. or more, hairy.
- E. Leaf-blade 3-6 cm. long, velvety
tomentose above, corolla villous
outside velutinum
- E. Leaf-blade 7-12 cm. or more,

sparingly pubescent or glabrous

corolla puberulous outside.

F. Calyx purple, teeth much

longer than the tube; bracts

all shorter than the calyx ... Mastersii

F. Calyx not coloured, teeth

as long as the tube or

shorter; outer bracts long-

er than the calyx.

G. Outer bracts crenate-

serrate, upper lip of

corolla entire ovatum

G. Outer bracts entire,

upper lip of corolla

notched melissifolium

1. Gomphostemma Wallichii Prain. in Journ. As. Soc. Beng. lix
(1890) 314, and in Ann. R. B. G. Cal. iii 245.

G. strobilinum var. elatus Benth. in Wall. Cat. n. 2151/2
and Pl. As. Rar. ii, 12.

G. strobilinum Benth. Lab. Gen. et Sp. 647 and in DC. Prodr.
xii 500; Walp. Rep. iii 892; Miq. Flor. Brit. Ind. Bot. ii
989 (all in part and not G. strobilinum Wall. Cat. n. 2151/2.

G. strobilinum var. typica Hook. f. Fl. Brit. Ind. iv. 696
(in part).

G. elatus Wall. Mss.

Stout erect herbs, 200-250 cm. high, densely tomentose.

Leaves shortly petioled, 10-15 cm. long, rugose, elliptic ovate, acute, serrate, truncate or subcordate at the base, densely tomentose beneath. Spikes terminal, erect uninterrupted, tomentose, sometimes 30 cm. long; bracts sessile truncate, cordate at the base, regularly minutely serrate up to the base or subentire, 4 cm. long, smaller upwards. Calyx 11 mm. long, lobes triangular, acute. Corolla about 3 cm. long, white or pale yellow, rarely pink; tube hirsute within. Style glabrous. Nutlets

Habitat:- Assam; Kohima; Burma.

2. Gomphostemma strobilinum Wall. Cat. n. 2151/1 (1828); Benth. in Wall. Pl. As. Rar. ii, 12, (1831), Lab. Gen. et Sp. 647, in part, and in DC. Prodr. xii 550, in part; Walp. Rep. iii, 896, in part; Miq. Fl. Ind. Bot. ii 989.

G. strobilinum var. typica Hook. f. Fl. Brit. Ind. iv 696, in part.

G. strobilinum var. typica Prain in Ann. Roy. B. G. Cal. iii 246.

Robust herb, 40-130 cm. high; stem deeply grooved, obtusely 4-angled, scabrid. Leaves subsessile or shortly petioled, 16-40 cm. rugose, elliptic-ovate, acute, margin serrate, base attenuate, upper surface hispid, lower surface, as well as the petiole, tomentose or glabrescent. Spikes erect interrupted near the base, bracts all equal, 15-18 mm. long, ovate-lanceolate, longer than the calyx, base cuneate, margin irregularly dentate above, entire near the base; bracteoles linear-lanceolate, 6-8 mm. long. Calyx 11 mm. long, teeth shorter than the tube. Corolla yellow, twice as long as the calyx, slightly incurved, tube hirsute within, upper lip sparingly pubescent outside, other parts of corolla glabrous. Style glabrous. Nutlets 5 mm. brown, rugose, glabrous.

Habitat:- Burma.

Habitat:- Assam, Burma.
G. strobilinum Wall. var. (i) acaulis Prain An. R. B. G. Cal.
iii 247.

G. acaule Kurz ex Hook. f. Fl. Brit. Ind. iv 696.

Small herb, 3-12 cm. high, stem shallowly grooved. Leaves distinctly petioled, petiole 3-6 cm. long; base sometimes abruptly cuneate. Bracts acute or obtuse at the base, regularly toothed, entire below.

Habitat:- Lower Burma; Arracan.

G. strobilinum var. (ii) viridis Hook. f. Fl. Brit. Ind.
iv. 696; Prain in Ann. R. B. G. Cal. iii 247.

G. viride? "G. strobilius valde affine" Wall. Cat. n. 2153.

G. viride Wall ex Benth. in Wall. Pl. As. Rar. ii 12, Lab. Gen.
et Sp. 647 and in DC. Prodr. xii 550; Walp. Rep. iii 896; Miq. Fl.
Ind. Bat. ii 989.

Small herb, 7-25 cm. high, stem deeply grooved. Leaves not rugose, puberulous only on the nerves beneath, other parts glabrous.

3. Gomphostemma nutans Hook. f. Fl. Brit. Ind. iv 697; Prain in
Anns. R. B. G. Cal. iii 248. and Pl. 81.

Tall herb, 30-90 cm. high, stem subterete, slender, slightly grooved. Leaves sessile, or shortly petioled, 5-10 cm. long, ovate, acute, serrate, cuneate at the base, hispid above, shortly tomentose below. Spikes terminal, dense short, slightly drooping; bracts longer than the calyx, ovate or ovate-lanceolate, margin entire; bracteoles linear 4 mm. long. Calyx 13 mm. long, lobes lanceolate, longer than the tube. Corolla yellow, about 3.5 cm. long, tomentose outside, tube hirsute within on the middle. Style glabrous. Nutlets 5 mm. long, rugose, glabrous, black.

Habitat:- Assam; Burma.

4. Gomphostemma Heyneanum Wall. Cat. 2152/1 and 2152/B; Benth. in Wall. Pl. As. Rar. ii 12. Lab. Gen. et Sp. 647 ans in DC. Prodr. xii 551; Walp. Rep. iii 896; Wight, Ill. Ind. Bot. 222, t 176b, f. 9. and Icones iv. t. 1496; Prain in Anns. R. B. G. Cal. iii 248 and t. 79; Gamble Fl. Madras, 1157.

G. strobilinum var. Heyneana Hook. f. Fl. Brit. Ind. iv 696.

Stachys tomentosa Heyne. Mes. syn. ex Wall. in Cat. n. 2151/1; Benth. in Wall. Pl. As. Rar. ii 12.

S. indica Wight. Mss. in Wall. Cat. quoad n. 2152/B tantum.

Tall robust subshrubby herb, 60-100 cm. high; stem erect, obtusely tetragonous, slightly grooved, densely tomentose with stellate hairs. Leaves petiolate, elliptic-ovate, subacute, closely serrate, base abruptly cuneate and decurring on the petiole; lamina 16-24 cm. long, slightly rugose, and shortly hirsute above, flocculently tomentose beneath; petiole 4 cm. long. Spikes terminal, interrupted near the base; bracts ovate or ovate-lanceolate, acute, rounded at the base, longer than the calyx; bracteoles linear. Calyx about 11 mm. long, teeth shorter than the tube, lanceolate, acuminate. Corolla yellow, or blue with purple tinge; 12-15 mm. long, tube as long as the calyx, slightly incurved above, hirsute in the middle within; mouth broad, upper lip short, tomentose. Style glabrous. Nutlets 5 mm. long, black, rugose, glabrous.

Habitat:- S. India; W. Ghats; Anamalai Hills; Travancore; Tinnevelly hills.

G. Heyneanum var. Rottleri Prain in Anns. R. B. G. Cal. iii 249 and t. 80; Gamble Fl. Madras 1157.

G. Heyneanum Wall. Cat. n. 2152/c.

Stachys indica Wall. syn, in Cat. quoad no. 2152/c, vix Wight.

S. orientalis Rottler Mss. in Herb. Madr.

Stem distinctly grooved, subscabrid. Leaves obtuse at the apex, margin crenate, upper surface less hirsute. Bracts ovate, obtuse, cuneate at the base.

Habitat:- S. India; W. Ghats; Mudumalai; Anamalai; Travancore; Tinnevelly.

5. Gomphostemma Hemsleyanum Prain ex Collett et Hemsl. Journ.

Linn. Soc. xxviii (1890) 116; Ann. Roy. Bot. Gard. Calcutta iii 250; Journ. As. Soc. Beng. lix 315.

Erect herb about 60 cm. high, hoary tomentose. Leaves petioled, 10-20 cm. long, rugose, elliptic-ovate, acute, serrate, cuneate at the base, hirsute above, densely hoary-tomentose beneath, petiole 1-3 cm. long. Whorls axillary, many-flowered, sessile, bracts lanceolate or linear, shorter than the calyx. Calyx 14 mm. long, teeth longer than the tube. Corolla yellow, hirsute outside; as long as the calyx tube, incurved, hirsute within. Style glabrous. Nutlets subglobose, 5-6 mm. in diam; rugose, glabrous, black.

Habitat:- Upper Burma.

6. Gomphostemma inspinatum Prain in Journ. of As. Soc. Beng. lxix 172.

Small herb, with several stems, about 30 cm. high, from a rootstock, with numerous tufted woody, branching slender roots; stems ascending, rooting below, obtusely 4-angled, densely tomentose with stellate hairs mixed with largely spreading long hairs. Leaves distinctly petioled, broadly ovate acute, finely crenate except near the rounded or slightly cuneate base, velvety on both surfaces with stellate and interspersed with longer simple hairs only on the upper surface; petiole 2-4 cm. long. Flowers in

dense uninterrupted spikes, borne on independent leafless scapes; sometimes with a pair of floral leaves below the flowers; bracts within the spikes obovate, about 1 cm. long, smaller upwards, dentate, sparsely and stellately pubescent, tinged with pink; bracteoles obovate-lanceolate, 5 mm. long, reddish. Calyx 12 mm. long, broadly campanulate, pubescent outside with stellate hairs, glabrous within, limbs 5-lobed, lobes claret or purple, triangular broad. Corolla about 20 mm. long, throat inflated, hairy within, upper lip subentire, midlobe of lower lip slightly emarginate. Stamens exserted; filaments hairy at the base. Nutlets reddish, glabrous, with a thick or coriaceous wall when dry.

Habitat:- Burma.

7. Gomphostemma niveum Hook. f. Fl. Brit. Ind. iv 697. Prain in Anns. R. B. G. Cal. iii 250 and t. 83.

G. parviflorum Herb. Ind. Or. H. f. & T.T. not of Wall.

Stout erect herb, 80-120 cm. high, stem obtusely tetragonus, grooved, white tomentose. Leaves subsessile, 20-40 cm. long, elliptic-oblongate, acuminate, serrate, base attenuate, slightly rugose and glabrescent above, and densely white tomentose beneath. Whorls axillary dense, many-flowered, bracts ovate, lanceolate or linear, membranous, longer than the calyx. Calyx 10 mm. long, white tomentose, teeth shorter than the tube. Corolla yellow, almost straight, about 20 mm. long, sparingly hirsute outside. Style glabrous. Nutlets usually solitary, 5 mm. long, oblong-ovate, pale brown, glabrous; often solitary or 2-3.

Habitat:- Assam; Mishmi; Khasi Mts.

8. Gomphostemma parviflorum Wall. Cat. n. 2158/1 and n. 2158/E;

Benth. in Wall. Pl. As. Rar. ii, 12, in part; Hook. f. Fl. Brit. Ind. iv. 697, in part; Prain in Beng. Pl. 859.

G. parviflorum var. typica Prain, in Anns. of R.B.G. Cal. iii 252, and t. 86.

G. dichotomum Zoll. et Mos. Syst. Verzeichu 54; Walp. Rep. vi, 684; Benth. in DC. Prodr. xii 553; Miq. Fl. Ind. Bat. ii 986

G. multiflorum Herb. Linn. Soc., quoad Wall. Cat. n. 2158/1 et 2158/E vix multiflorum Benth.

Tall robust herb, 250-300 cm; stem woody, subterete. Leaves petiolate, rugose, elliptic-ovate acute or acuminate, rounded or slightly cuneate at the base, margin serrate upper surface hirsute, lower laxly white tomentose; lamina 18-25 cm. long, petiole 2-4 cm. long. Flowers in lax or dense axillary cymes, bracts lanceolate, acute, about 15 mm. long. Calyx 10-12 mm. long, densely and adpressedly white-tomentose, teeth slightly shorter than the tube, lanceolate. Corolla yellow, 20-22 mm. long, straight, sparsely puberulous outside. Style glabrous. Nutlets usually solitary, 6 mm. long, glabrous, brown in colour. Habitat:- Assam, Khasi Hill 1,500 m; Manipur; Chittagong; Burma.

Dist.:- Malay Peninsula; Java; Siam.

var. farinosa Prain Anns. of R. B. G. Cal. iii 253 and t. 87; Gamble Fl. Madras 1157.

G. parviflorum Wall. Cat. n. 2158/2, in part and n. 2158/D; Benth. in Wall. Pl. As. Rar. ii 12, in part; Hook. f. Fl. Brit. Ind. iv 697, in part.

G. multiflorum Benth. Lab. Gen. et Sp. 648, and DC. Prodr. xii, 552; Walp. Rep. iii 897.

Leonurus farinosus Ham. Mss. en Wall. syn in Cat.

Lith. (2158/D).

Leaf margin slightly irregularly serrate, Bracts ovate, acute or obtuse, calyx teeth triangular, much shorter than the tube.

Habitat:- Sikkim; Mungpu; Assam.

9. Gomphostemma Lacei Mukerjee in Notes R. B. G. Edin., No. 95 (1938) in Ed.

Erect herb, greyish tomentose with stellate hairs; stem woody, obtusely 4-angled, deeply grooved. Leaves long petioled, orbicular, or elliptic-ovate, obtuse or rounded at the apex, abruptly cuneate at the base, margin subentire or obscurely and sinuately toothed; hirsute on both surfaces with simple hairs above and stellate hairs beneath; lamina 15-28 cm. long, 9-16 cm. broad; petiole 9 cm. long or shorter, stout, tomentose with stellate hairs. Flowers shortly pedicelled, laxly arranged in axillary and terminal, 3-4 cm. long spikes, bracts 10-12 mm. long, obovate-cuneate glabrescent above tomentose beneath, serrate entire near the base; bracteoles linear. Calyx 8-9 mm. long, campanulate tomentose outside, pubescent within; teeth lanceolate slightly shorter than the tube. Corolla 20-24 mm. long, sparsely puberulous outside; tube straight, 12 mm. long; limb 4 mm. wide; upper lip 5 mm. long, lower lip 6 mm. long, 7 mm. wide. Style glabrous.

Nutlets not seen.

Habitat:- Burma, N. Shan States (near Masam Falls), Lace 1322.

10. Gomphostemma Thomsoni Benth. ex Hook. f. Fl. Brit. Ind.

iv 698. Prain in Anns. R. B. G. Cal. iii 251 and t. 85.

Erect herb 60-100 cm. high, stem thick subterete, woody below; hoary pubescent. Leaves petioled, oblong-ovate, acute, margin crenulate, attenuate at the base, lamina 12-25 cm. long, membranous, hirsute above, tomentose below; petiole 4-7 cm. long. Flowers crowded in axillary clusters, or extra axillary on the stem; bracts linear-lanceolate entire 10-12 mm. long. Calyx 14 mm. long, sparingly hairy, teeth longer than the tube, linear-lanceolate, triangular at the base, shortly ciliate. Corolla pale yellow, about 30 cm. long, sparingly puberulous outside, glabrous within, tube very long limb short. Style glabrous. Nutlets usually solitary, 6 mm. long, oblong, brown, glabrous.

Habitat:- Assam.

11. Gomphostemma crinitum Wall. Cat. n. 2159/1 and 2159/2; Benth. in Wall. Pl. As. Rar. ii 12; Lab. Gen. et Sp. 648 and in DC. Prodr. xii 552; Walp. Rep. iii, 897; Miq. Fl. Ind. Bat, ii 987; Hook. f. Fl. Brit. Ind. iv 698, in part.

G. crinitum var. typica Prain in Anns. R. B. G. Cal. iii 254; and t. 88 and 89A.

G. parviflorum Wall. Cat. n. 2158/2 in part and n. 2158/C.

Erect herb, 40-60 cm. high, stem slightly grooved. Leaves petiolate, slightly rugose, elliptic-ovate abruptly decurrent to the petiole, or oblanceolate, acute base, margin serrate or subentire, hirsute on the upper surface, densely greyish-tomentose below; lamina 25-30 cm long, 12 cm. broad, petiole about 4 cm. long, slightly winged. Flowers in dense or lax axillary cymes, bracts linear-lanceolate, acute,

slightly shorter than the calyx. Calyx 17-20 mm. long, greyish tomentose, or minutely puberulous, teeth linear-subulate, hispid, much longer than the tube. Corolla yellow, nearly straight, about 3 cm. long, tube slender, mouth short. Style glabrous. Nutlets usually solitary, 6 mm. long, glabrous brown in colour.

Habitat:- Assam; Burma.

Dist.:- Malay Peninsula.

12. Gomphostemma eriocarpon Benth. in Wall. Cat. n. 2710 and Fl. As. Rar. ii 12; Lab. Gen. et Sp. 649, and in DC. Prodr. xii 552; Walp. Rep. iii 897; Hook. f. Flor. Brit. Ind. iv 698; Prain in Anns. R. B. G. Cal. iii 258 and t. 90. Gamble Fl. Madras 1157.

G. oblongum Wight Icones iv, t. 1457; Miq. Fl. Ind. Bat. ii, 986, in part, not of Wall.

Leonurus tomentosa, Herb. Madr. syn in Wall. cat.

14. Gomphostemma eriocarpon, var. Prainii Prain in Ann. R. B. G. Cal. iii 258 and t. 90. Slender erect herb, 90-120 cm. high, stem subterete, tomentose with straight or stellate hairs. Leaves shortly petioled, 8-15 cm. long, elliptic-oblong or lanceolate, acute, sharply and distantly toothed, base attenuate, sparingly hispid above, softly tomentose beneath. Cymes axillary, not pedunculate; bracts 10-14 mm., ovate-lanceolate or linear, minutely toothed or entire. Calyx 12 mm. long, teeth slender lanceolate, filiform above as long as the tube. Corolla yellow, about 3 cm. long, tube nearly straight, villous outside, lips short. Style glabrous. Nutlets usually solitary, 5 mm. long, densely tomentose black.

Habitat:- S. India.

13. Gomphostemma aborensis Dunn. Kew Bull. 1920, 135.

Habitat:- Burma; Tenasserim, Helfer 4043 (in Herb. Kew).

Gomphostemma aborensis (Cont.).

Decumbent herb, finely tomentose, stem obtusely quadrangular, prostrate below. Leaves petioled, slightly thick, 5-8 cm. long, broadly ovate obtuse, crenate-serrate, base shortly and abruptly cuneate, minutely pubescent above reticulate and tomentose beneath; petiole 2-3 cm. long. Flowers 4-8 in a whorl, whorls axillary, sessile, bracts minute. Calyx 1 cm. long, narrowly campanulate, tomentose outside and within, teeth as long as the tube, triangular, campanulate. Corolla 2.5 cm. long, yellow, pubescent outside; upper lip erect, narrowly ovate; lower lip 3-lobes. Upper pair of stamens inserted at the throat, the lower pair rising from a little below the tube. Style glabrous. Nutlets usually 1, fleshy (?).

Habitat:- Aboor Hills; Janamukh; Pongging (at the mouth of the Yamsae river), Burkill 37269.

14. *Gomphostemma Scortechinii*, var. *Helferi* Prain in Ann.

R. B. G. Cal. iii 260.

G. oblongum Wall. var. *Helferi* Hook. f. Fl. Brit. Ind. iv. 697.

Stout erect herb, 60-100 cm. high, stem subterete, tomentose. Leaves subsessile, 20-30 cm. long, elliptic-oblong or obovate, acute, crenate, base slightly narrowed, sparsely hirsute above, minutely tomentose below. Flowers distinctly pedicelled, numerous in axillary whorls, bracts subulate, as long as the pedicels or slightly longer, rusty tomentose. Calyx 22 mm. long, rusty tomentose; teeth lanceolate acute longer than the tube. Corolla yellow, 6 cm. long, tomentose outside glabrous within; mouth very broad, lips short, upper lip 2-toothed. Style hispid above, ovary villous. Nutlets 8 mm. long, 5 mm. broad, ovoid hispid on the top, brown.

Habitat:- Burma; Tenasserim, Helfer 4043 (in Herb. Kew).

15. Gomphostemma oblongum Wall. Cat. n. 2154; Benth. in Wall. Pl. As. Rar. ii 12; Lab. Gen. et Sp. 648 and in DC. Prodr. xii, 551, in part; Walp. Rep. iii 896; Miq. Fl. Ind. Bat. ii 986 in part; Hook. f. Fl. Brit. Ind. iv 697; Prain in Ann. R. B. G. Cal. iii 261 and t. 95.

Stout erect herb, 60-100 cm. high, stem subterete or obtusely tetragonous, tomentose. Leaves petioled, elliptic oblong, acute, base narrowed, or subtruncate, margin crenate or crenate-serrate, hispid above, densely tomentose beneath; lamina 15-30 cm. long, petiole 1-2.5 cm. long. Whorls dense, axillary, 7-8 flowered, bracts minute, ovate lanceolate. Calyx sessile, 15 mm. long, greyish tomentose, teeth as long as the tube, lanceolate, acute. Corolla white 4.5 cm. long, slightly curved in front, sparingly pubescent outside, glabrous within, limb wide, upper lip rotundate entire. Ovary villous. Style glabrous or hirsute when young. Nutlets, 6 mm. long, pilose.

Habitat:- Burma; Andaman.

16. Gomphostemma rugosum Prain in Ann. R. B. G. Cal. iii (1891) 262.

G. lucidum Wall. Cat. n. 2156/1 and Benth. in Wall. Pl. As. Rar. ii 124, in part.

Stout erect suffruticose herb 60-100 cm. stem terete, woody, covered with rusty wool. Leaves petioled, elliptic-ovate, acute serrate, slightly cuneate at the base, upper surface shining, hispid with minute hairs when young, glabrous afterwards; lower surface densely covered with reddish wool; lamina 18-25 cm. long, petiole 3-6 cm. long. Flowers in shortly pedunculate, dense axillary whorls; bracts 10 mm. long, outer ones ovate-lanceolate, serrate, inner ones lanceolate, subulate, entire.

Calyx 14-15 mm. long, densely covered with reddish wool, teeth shorter than the tube, acuminate. Corolla yellow, 4.5 cm. long, villous outside limb much wide, upper lip obtuse, truncate, ovary villous. Style glabrous. Nutlets 6 mm. long, brown, hispid.

Habitat:- Burma.

Dist.:- Java.

17. Gomphostemma lucidum Wall. Cat. n. 2156/2; Benth. Wall. Pl. As. Rar. ii 12, Lab. Gen. et Sp. 648 and in DC. Prodr. xii 551; Walp. Rep. iii 897; Hook. f. Fl. Brit. Ind. iv 697.

G. lucidum, var. typica Prain Ann. R. B. G. Cal. iii 263 and t. 94.

Erect robust herb, 60-100 cm. high, stem terete, woody hirsute. Leaves short petioled, oblanceolate or lanceolate, acute margin serrate base attenuate, upper surface shining, hispidly hairy when young and glabrous afterwards, hirsute beneath, reddish tomentose on the nerves, lamina 18-25 cm. long, petiole 1-3 cm. Flowers many in dense axillary whorls; bracts lanceolate or subulate, serrate or entire, shorter than the calyx. Calyx 14-15 mm. long, reddish and shining, teeth triangular acute, much shorter than the tube. Corolla yellow, 4 cm. long, densely villous outside, limb much wide, upper lip mucronate. Style hairy above, ovary at first tomentose, glabrous afterwards. Nutlets 6 mm. glabrous, white.

Habitat:- Assam; Burma.

Dist.:- Yunnan.

var. canescens Prain in Ann. R. B. G. Cal. iii 263.

Leaves elliptic ovate, uniformly white-tomentose beneath.

var. *canescens* (Cont.).

Habitat:- Eastern Himalaya; Daphla hills, Lister n. 86; Upper Assam; Lakhimpore, Griffith n. 4038 Kew Dist. (in part), Masters; Dibrugarh, Clarke n. 37719.

18. Gomphostemma pedunculatum Benth. ex Hook. f. Fl. Brit. Ind. iv 696; Prain in Ann. R. B. G. Cal. iii 266 and t. 91.

Flexuous herb, stem 100 cm. long or more, tomentose, prostrate below, rooting at the base. Leaves long-petioled, broadly ovate acute, serrate, base rounded or shortly cuneate, hirsute above, densely tomentose beneath; lamina 7-30 cm. long, 4-15 cm. broad; petiole 3.5-5 cm. long. Flowers crowded in short axillary or terminal pedunculate heads or spikes, some times lower below on the stem, bracts reddish broadly ovate, about 1.5 cm. long, serrate, longer than the calyx, bracteoles oblong-lanceolate, slightly oblique below. Calyx 12 mm. long, reddish brown, minutely hirsute outside, teeth broad, triangular ovate, shorter than the tube. Corolla pale yellow, 2.5 cm. long, glabrous, limb much wide, upper lip truncate, shortly 2-toothed. Style glabrous. Nutlets 6 mm. subglobose, glabrous, rugose.

Habitat:- Assam.

19. Gomphostemma velutinum Benth. Wall. Cat. n. 2709; Wall. Pl. As. Rar. ii 13, Lab. Gen. et Sp. 649, and in DC. Prodr. xii 552. Walp. Rep. iii 898, Hook. f. Fl. Brit. Ind. iv 699; Prain in Ann. R. B. G. Cal. iii 269 and t 98A.

Dwarf herb, 8-12 cm. high, stem slender, sometimes prostrate below, rooting, distinctly grooved, densely velvety-tomentose.

Habitat:- Assam.

Leaves long-petioled, ovate, acute, crenate base entire cuneate or rounded, densely velvety-tomentose on both sides with stellate hairs, lamina 3-6 cm. long, petiole thick 1-4 cm. Whorls dense, few-flowered, axillary, outer bracts oblong, inner lanceolate, all shorter than the calyx, bracteoles linear, minute. Calyx 13 mm. long, densely and softly hirsute, teeth lanceolate as long as the tube. Corolla yellow, 3 cm. long, villous outside, limb wide, shortly 4 lobed, lobes obtusely truncate. Style glabrous. Nutlets glabrous.
Habitat:- Lower Assam.

20. Gomphostemma Mastersii Benth. ex Hook. f. Fl. Brit. Ind. iv 699; Prain in Ann. R. B. G. Cal. iii 268 and t. 98 Band 99.

G. melissifolium Wall. Cat. n. 2157, in part.

Prasium melissifolium Roxb. excl.

Small variable herb, 6-25 cm. high, stem slender, erect or prostrate below, slightly grooved, scabrid, rootstocks fusiform. Leaves long petioled, ovate-oblong, acute, crenate-serrate, base cuneate or rounded, upper surface hirsute with stellate and simple hairs, sparingly tomentose beneath densely on the nerves; lamina 7-14 cm. long, petiole 3-7 cm. long. Whorls few flowered, axillary, sometimes shortly pedunculate, bracts shorter than the calyx, the outer ones oblong obtuse, the inner ones lanceolate, bracteoles linear minute. Calyx 18 mm. long, purple in colour, hirsute, teeth linear-lanceolate, subulate much longer than the tube. Corolla yellow, 4 cm. long, puberulous outside, limb very wide, upper lip truncate or broadly obtuse. Style glabrous. Nutlets 6 mm. long, black, glabrous, smooth on the outer surface, and rugose on the other.

Habitat:- Assam.

21. Gomphostemma ovatum Wall. Cat. n. 2155; Benth. in Wall. Pl. As. Rar. ii 12, Lab. Gen. et Sp. 649 and in DC. Prodr. xii 552. Walp. Rep. iii 897; Hook. f. Fl. Brit. Ind. iv 699.

G. ovatum, var. typica Prain and t. 96.

Small suberect herb, 15-30 cm. high, stem slender slightly grooved scabrid. Leaves long petioled, membranous broadly ovate-elliptic, obtuse rounded at the base rarely shortly cuneate, margin crenate dentate, sparingly hispid or glabrescent above, softly tomentose below, lamina 14-16 cm. long, 10-12 cm. broad, petiole 2-4 cm. long or more. Whorls axillary many flowered dense, outer bracts foliaceous, 18 mm. long, ovate obtuse, crenate-serrate, cuneate at base, inner bracts smaller ovate, acute; bracteoles linear. Calyx 10 mm. long, pubescent outside and also within, teeth lanceolate shorter than the tube. Corolla yellow, 4 cm. long, puberulous outside, limb, much wide, upper lip truncate entire Style glabrous. Nutlets 6 mm. long, brown, glabrous, smooth on the outer surface, rugose on the other.

Habitat:- Nepal; Sikkim; Assam.

var. flaccida Prain in Ann. R. B. G. Cal. iii 270.

Leaves flaccid when young, lower surface glabrous, petiole sparingly puberulous. Exterior bracts glabrous except on the nerves.

22. Gomphostemma melissifolium Wall. Cat. n. 2157. Benth. in Wall. Pl. As. Rar. ii 12 (in part, up to Prasium melissifolium Roxb.); Lab. Gen. et Sp. 149, and in DC. Prodr. xii 552; Walp. Rep. iii 897 in part; Hook. f. in Fl. v Brit. Ind.

iv. 698; Prain Ann. R. B. G. Cal. iii 270 and t. 100A and B.

Prasium melissifolium Roxb. Hort. Beng. 45, Flor. Ind.

iii. 26, and Icon. in ed, x. t. 119.

Scandent or prostrate herbs, 50-250 cm. long, stem, slender, distinctly grooved, scabrid, rooting below. Leaves shortly petioled, membranous, 7-12 cm. long, elliptic acute, minutely crenate, cuneate at the base, glabrous on both sides except outer nerves beneath. Flowers fine in dense axillary whorls, exterior bracts ovate acute entire, much longer than the calyx, inner bracts shorter than the calyx, lanceolate, bracteoles minutely linear. Calyx 10 mm. long puberulous, teeth as long as the tube, lanceolate. Corolla 35 mm. long, or purple, puberulous outside, limb much wide, upper lip slightly notched. Style glabrous. Nutlets 4 mm. long, red, glabrous, smooth on all sides.

Habitat:- Khasia; L. Assam; Sylhet; Cachar.

Leucosceptrum Sm. Bot. Beech. Bot. 11, 113, t. 119.
Benth. in Wall. Fl. Ab. Bar. 1 38; Wall. Cat. 2030; Hook.
1. Fl. Brit. Leucosceptrum, Smith. in Mem. Mus. Sc. 3 Agr.
2. 11. (1929) 301.

Enot. Bot. II, 113; Hook. f. Fl. Brit. Ind. iv, 679;
Briq. in Eng. & Pr. Nat. Pflanzenf. iv, 3, a, 215; Kudo in
Mem. Fac. Sc. & Agri. II, 2, (1929); Doan in Fl. Gen. Indo-
Chine. iv, 9, (1936) 1044.

Large shrubs, often arboreous, tomentose or villous.
Leaves usually large, petiolate. Spikes dense, cylindric,
terminal; bracts broad, caducuous. Calyx campanulate,
decurved, equally 5-toothed; teeth short, broad, rounded
at the apex. Corolla minute, 5-lobed; lobes rounded, upper
lobe larger; tube included. Stamens 4, long exserted, str~~ucture~~
straight, diverging, pubescent below; lower pair longer;
anthers reniform, unilocular, very short. Disk equal.
Style minute 2-fid, lobes subulate. Nutlets cuneate, tri-
quetrous; areole large, lateral.

Corolla about 10 mm. long, white or pinkish
red, tubular campanulate, 5-lobed, upper longest, tomentose
at the margin. Stamens long exserted; filaments yellow,
pubescent below, involute. Nutlets 3 mm. long, brown.

Habitat:- Khasia; Nepal; Sikkim; Siam; Assam

Burma.

Dist.:- China (Yunnan).

Leucosceptrum canum Sm. Exot. Bot. ii, 113, t. 116.
Benth. in Wall. Pl. As. Rar. i 58; Wall. Cat. 2030; Hook.
f. Fl. Brit. Ind. iv 699; Kudo in Mem. Fac. Sc. & Agri
2, II, (1929) 301.

Teucrium macrostachyum Wall. in Benth. Lab. Gen. et
Sp. 664, and Benth. in DC. Prodr. xii 574.

Chrodendron Leucosceptrum Don. Prodr. Fl. Nepal. 103.

An arboreus shrub or a small tree, sometimes about
10 m. in height; trunk short, branches stout, terete,
densely or laxly, white tomentose, or woolly, rarely glab-
rous. Leaves petioled, 15-30 cm. long, elliptic-lanceolate,
acuminate, cuneate at the base, margin subentire or obscurely
crenate, glabrous above densely tomentose beneath, with white
or greyish or brown tomentum, rarely green and glabrate,
petiole stout 2-4 cm. long, densely tomentose. Spikes
terminal, 8-15 cm. long, whorls dense-flowered, close; bracts
caducous, subreniformvimbicating, white tomentose. Calyx
6 mm. long, campanulate, decurved, hairy or tomentose, both
short, rounded. Corolla about 10 mm. long, white or pinkish
red, tubular campanulate, 5-lobed, upper longest, tomentose
at the margin. Stamens long exserted; filaments yellow,
pubescent below, involute. Nutlets 5 mm. long, brown.

Habitat:- Kumaon; Nepal; Sikkim; Bhutan; Assam;
Burma.

Dist.:- China (Yunnan).

Teucrium, Linn.

Syst. ed. 1735; Benth. *Herb. Gen. et Sp.* 660, and in DC. *Prodr.* xii 574; Endl. *Gen. Pl.* 631; Boiss. *Fl. Orient.* iv, 805; Maxim. in *Mel. Biol.* ix, 823; Hook. f. *Fl. Brit. Ind.* iv, 700; Benth. ex Hook. f. *Gen. Pl.* II, 1221; Briq. in *Eng. & Pr. Nat. Pflanzenf.* iv, 3, a, 210, Baker in *Thiselton-Dyer Fl. Trop. Africa*, v, 500; Prain *Beng. Pl.* 857.

Herbs or shrubs; leaves usually petioled, serrate, lobed, or often entire. Whorls 2-6- flowered, axillary or in axillary or terminal, simple or panicled, racemes or spikes, or in heads. Calyx tubular or campanulate, 10-nerved, 5-toothed; teeth equal or the upper much longer. Corolla deciduous, tube not annulate within; limb slit behind, to form a 5-lobed lower lip, the upper lip absent; the lowest lobe largest, concave. Stamens 4, exserted, lower longer; anthers reniform, cells divergent, at length confluent. Disk equal. Style subequally 2-fid at the apex, lobes subulate. Nutlets ovoid, reticulately rugose, oblique.

- A. Calyx teeth equal or subequal.
 - B. Leaves pinnatisect with linear segments... .. scindicum
 - B. Leaves not divided.
 - C. Flowers in axillary whorls.
 - D. Leaves oblong elliptic, truncate or rounded at the apex scordium
 - D. Leaves lanceolate acute at the apex serratum
 - C. Flowers in terminal heads or short spikes.
 - D. Corolla about 8 mm. long Stocksianum
 - D. Corolla about 16 mm. long.
 - E. Leaves sessile; flowers yellow Toppinii
 - E. Leaves shortly petioled; flowers white. incanum
- A. Calyx teeth unequal, the upper tooth very broad, rounded lateral short, obtuse, lower lanceolate, acuminate.
 - B. Calyx glabrous at the throat viscidum
 - B. Calyx setose at the throat.
 - C. Corolla tube twice as long as calyx, (N. W. Himalaya)... .. Royleanum
 - C. Corolla tube shorter or as long as calyx.
 - D. Bracts deltoid ovate, truncate or cordate at the base.
 - E. Leaves slightly thick, rugose above, ovate-cordate; bracts longer than the calyx.

F. Leaves distinctly petioled,
lamina 4-8 cm. long quadrifarium

F. Leaves subsessile, 2-3
long quadrifarium,
var. Annandalei.

E. Leaves membranous, not
rugose, oblong or elliptic-
oblong, bracts equalling
the calyx burmanicum

D. Bracts lanceolate, or linear-
lanceolate, base cuneate.

E. Leaves thick and rugose;
(branches short and stout,
not diffusing - S. India) ... Wightii

E. Leaves[†]membranous, not
rugose.

F. Stem and leaves beneath
hoary tomentose (S. India) .. tomentosum

F. Stem and leaves beneath
hirsute or villous with
rusty brown hairs or
glabrous.

G. Corolla pink or purple,
branches diffusing.

H. Petiole 1-1.5 cm. long;
lamina up to 7 cm.
long, rounded or sub-
cordate at the base ... laxum

H. Petiole 5-7 cm. long;
lamina up to 12 cm.
long, cuneate at the
base Wattii

2. Teucrium G. Corolla white or yellowish,
 branches erect, not dif-
 fusing.
- H. Stem and leaves densely
 brown-tomentose; leaf
 margin regularly and
 closely serrate (Burma)... shanicum
- H. Stem and leaves glabrous
 or almost so.
- I. Leaves ovate, base
 truncate (S. India) ... plectranthoides
- I. Leaves lanceolate,
 base cuneate
 (Burma) bidentatum

1. Teucrium scindicum Prain Journ. As. Soc. Beng. lxi (1890)
 II, 316.

Erect hoary tomentose perennial herb, 30-40 cm. high;
 stems reddish, many from a thickened rootstock. Leaves sessile,
 about 1.5 cm. long, pinnatisect, with short narrowly linear
 segments, margin recurved. Racemes simple or paniced, lax-
 flowered, pedicels 8 mm. long, bracts minute, much shorter
 than the pedicels. Calyx 5 mm. long, shortly campanulate,
 subglabrous, equally 5-toothed. Corolla 1.5 cm. long; the
 central lobe very large. Nutlets 2.5 mm. elliptic, slightly
 rugulose pruinose.

Habitat:- Scinde.

2. Teucrium scordium Linn. Sp. Pl. 790; Benth. in DC. Prodr. xii, 586; Boiss. Fl. Orient, iv, 812; Reichb. Ic. Fl. Germ. t. 1239; Hook. f. Fl. Brit. Ind. iv, 702.

Tomentose or glabrate perennial herb, stem leafy, stoloniferous. Leaves sessile 2-4 cm. long, oblong-elliptic truncate or rounded at the apex, obtusely toothed, entire and cuneate near the base; sparsely pubescent on both sides. Flowers few in axillary whorls; pedicels as long as or longer than the calyx. Calyx 3 mm. long, glandular pubescent, shortly campanulate, base gibbous, teeth triangular subequal. Corolla rose purple, 7-8 mm. long, sparsely pubescent. Nutlets oblong, rugose, 1 mm. in diam.

Habitat:- Kashmir.

Dist.:- Afghanistan; N. & W. Asia; N. Africa.

3. Teucrium serratum Benth. in DC. Prodr. xii 586; Boiss. Fl. Orient. iv, 813; Prain in Journ. As. Soc. Beng. lxx (1890) II, 317.

Perennial herb, sparingly hairy or glabrate, stems leafy, 25-40 cm. high, rootstock slender. Leaves sessile, 3-4.5 cm. long, lanceolate, acute, serrate, base cuneate, entire, glabrous or nearly so. Whorls axillary 2-4-flowered, pedicels 9-11 mm. Calyx 6 mm. long, campanulate, gibbous, teeth triangular subequal. Corolla 8 mm. long, purple in colour. Nutlets small glabrous orbicular, distinctly rugulose.

Habitat:- Kashmir; N. W. Frontier.

Dist.:- Afghanistan.

4. Teucrium Stocksianum Boiss. Diagn. Ser. II, iv 58 and

Fl. Orient. iv, 821; Prain in Journ. As. Soc. Beng. lix (1890) II, 317.

T. leucocladum Herb. Ind. Or. Hook. f. and T., not of Boiss.

Dwarf suffruticose herb with tufted habit, 10-20 cm. high, densely hoary pubescent, rootstock stout, woody. Leaves small, sessile or subsessile, 10-13 mm. long, elliptic-ovate, or obovate, obtuse or truncate at the apex, subentire or shallowly crenate on the upper part, base entire, cuneate; tomentose on both sides. Flowers sessile in terminal few-flowered heads, or short dense spikes; bracts 5-6 mm. long, ovate, entire or slightly crenate at the apex. Calyx 6.5 mm. long, tubular campanulate, villous; teeth subequal, short obtuse. Corolla 8 mm. long, yellow in colour. Nutlets 1.5 mm. long, ovoid, brown, glabrous rugulose; sometimes solitary.

Habitat:- Western Punjab; N. W. Frontier; Baluchistan.

Dist.:- Afghanistan.

5. Teucrium Toppinii Dunn & R. Williams in Kew Bull, 1921 122.

Dwarf suffruticose herb, 20 cm. high, hoary-tomentose. Leaves sessile, 1.2-1.5 cm. long, obovate-cuneate, upper half conspicuously crenate, entire below, hoary-tomentose. Whorls many-flowered, in terminal heads; bracts crowded below, forming an involucre, crenate, bracteoles entire. Calyx tubular-campanulate, teeth subequal, each tooth slightly serrate at the apex. Corolla 16 mm. long, yellow; tube as long as the calyx; the lip about 8 mm. long, and as broad. Habitat:- Chitral.

6. Teucrium incanum Aitch. & Hemsl. Journ. Linn. Soc. xix, 184.

Much branched suffruticose herb, about 60 cm. high or less, white tomentose; stem terete. Leaves subsessile, slightly thick, about 1 cm. long, obovate-oblong, rounded at the apex, crenate above, entire and cuneate at the base. Flowers few, crowded in terminal heads at ends of branches. Calyx 6 mm. long, broadly tubular campanulate, gibbous, pubescent outside as well as within; teeth subequal, slightly shorter than the tube. Corolla dull white in colour, 13 mm. long tube included(?). Nutlets not seen.

Habitat:- N. W. Fr. Province, - Eastside of Kurran river from Thal to Tirah.

7. Teucrium viscidum Bl. Bizdr. (1826) 827; Merrill. Enum. Philipp. Fl. Pl. III, 409; Kudo in Mem. Fac. Sc. & Agri. II, (1929) 295.

T. stoloniferum Rox. Hort. Beng. (1814) 44, nom. nud., and Fl. Ind. iii, 3 (1832); Benth. in Wall. Pl. As. Rar. i, 58, Lab. Gen. et Sp. 674, and in DC. Prodr. xii, 583; Maxim. in Bull. Acad. Petersb; Mel. Biol. ix, 825; Hook. f. Fl. Brit. iv, 700; Prain Beng. Pl. 860; Duthie Fl. Upper Gang. Pl. II, 258; Haines Bot. Bih. & Oris. 752.

T. elevatum Benth. in Wall. Cat. 2026.

T. philippinense, Merrill in Philipp. Journ. Sc. vii, Bot. 100.

Erect perennial herb 30-60 cm. high, glabrous or puberulous; stoloniferous, sometimes woody below. Leaves petioled, ovate or oblong-ovate acute, truncate or shortly

cuneate at the base, margin deeply crenate, sparingly pubescent on both sides; lamina 5-7 cm. long; petiole 1-2 cm. long, slender. Racemes slender, lax-flowered, simple or paniced; bracts lanceolate longer than the calyx; pedicels in fruit longer than the calyx. Calyx about 3 mm. long or shorter, campanulate, declinate, glandular-pubescent outside, upper tooth longest, lower teeth obtuse. Corolla pink, or white with purple tinge; tube included, limb very small. Nutlets almost smooth; enclosed in the globose fruiting calyx.

Habitat:- M. Oudh; Bengal; Sikkim, up to 1524 m., Khasi Hills; Burma.

Dist.:- Java; Luzon; China; Japan; Formosa.

8. Teucrium Royleanum Wall. Cat. n. 2027; Benth. in Wall. Pl. As. Rar. i, 58, Lab. Gen. et Sp. 675, and in DC. Prodr. xii 583; Hook. f. Fl. Brit. Ind. iv, 700; Collett Fl. Sim. 406.

Slender herbs, 30-50 cm. high, pubescent or tomentose, stem ascending prostrate and rooting below, stoloniferous. Leaves petioled, ovate or oblong-ovate acute, serrate, cordate or subcordate at the base, pubescent above, densely tomentose beneath; lamina 5-7 cm. long; petiole slender, 1-2.5 cm. long. Racemes usually simple, axillary and terminal, secund; bracts lanceolate, longer than the pedicels. Calyx 4-5 mm. long, campanulate, declinate, villous outside and at the throat; upper tooth largest, rounded and acute, 2 lower lanceolate, acuminate, lateral shorter; the upper tooth and the 2 lower teeth incurved. Corolla white yellowish, 10-15 mm. long; tube twice as long as the calyx. Nutlets slightly rugose,

enclosed in the globose fruiting calyx.

Habitat:- Kashmir; Kumaon; Punjab; N. W. Fr. Province,
alts. 3350 m.

Dist.:- Afghanistan.

9. Teucrium quadrifarium Buch. Ham. in Don. Prodr. Fl. Nep.
108; Wall. Cat. 2024; Benth. in Wall. Pl. As. Rar. i, 58,
Lab. Gen. et Sp. 675, and in DC. Prodr. xii, 583; Maxim.
in Mel. Biol. ix, 827; Hook. f. Fl. Brit. Ind. iv, 701;
Collett Fl. Sim., 406; Kudo in Mem. Fac. Sc. & Agri, II,
(1929) 292.

T. Fortunei, Benth. in DC. Prodr. xii, 583.

T. fulvum, Hance. in Walp. Ann. lll, 270.

T. fulvo-aureum Levl. in Fedde, Repert. Nov. Sp. viii, 426.

T. kouytchense, Levl. l.c.

Stout erect herb, 60-120 cm. high, tomentose or villous.
Leaves short petioled, broadly ovate or oblong-ovate, acute,
serrate or serrulate, cordate at the base, hirsute and slightly
rugose above, greyish tomentose beneath; lamina 4-8 cm. long,
petiole 1 cm. long or shorter. Racemes terminal, paniced,
8-15 cm. long; bracts imbricating, much larger than the calyx,
broadly ovate-cordate, acuminate, sometimes purple in colour.
Calyx 4 mm. long, campanulate, declinate; upper tooth largest,
rounded, the 2 lower teeth lanceolate, pubescent outside and
with a ring of hairs at the throat. Corolla pink or purple,
scarcely twice as long as the calyx; tube included. Nutlets
triquetrous, rugose.

Habitat:- Kashmir; Simla; Kumaon; Nepal; Sikkim;
Khasi; Burma, 1250-2500 m.

Dist.:- China.

Teucrium quadrifarium Buch.-Ham. var. Annandalei

Mukerjee, var. nov.

Varietas haec foliis minoribus sessilibus vel subsessilibus magis obtusis utrinque dense canescenti-tomentosis, corolla longiore, nuculis globosis a typo recedit. Fortasse species propria sed materies aliquatenus imperfecta.

Erect herb, stem densely villous. Leaves thick, subsessile, 2-3 cm. long, ovate, obtuse, serrate, subcordate at the base, densely hoary-hirsute on both sides, rugose below. Racemes dense-flowered, terminal forming short and compact panicles, sometimes axillary below the main panicle; bracts longer than the calyx, densely villous, ovate, acuminate, truncate at the base, lower ones larger than the upper; pedicels shorter than the calyx. Calyx 5-6 mm. long, tubular campanulate, declinate, villous outside, sparingly hispid at the throat; upper tooth rounded apiculate lateral teeth shorter, obtuse, the lower lanceolate acuminate, slightly longer than the upper tooth. Corolla 14 mm. long, glabrous tube included, upper and lateral lobes, obtuse, the lower lobe large, rounded. Filaments glabrous. Nutlets globose, 1 mm. in diam., rugose, glabrous, dark brown.

Habitat:- Burma, - on the road from Thamakan to Heho,

Annandale No. E. B. 138.

10. Teucrium burmanicum Mukerjee in Notes of R. B. G. Edin. No. 95 (1938) in ed.

Slender erect herb, apparently 30 cm. high or more, stem densely rusty tomentose; obtusely quadrangular or subterete. Leaves petioled, membranous, narrowly oblong or

elliptic-oblong, acute or obtuse, serrate, rounded or subcordate at the base, minutely hirsute on both sides; lamina 3-7 cm. long, 1.5-2.5 cm. broad; petiole 1-2.5 cm. long. Racemes lax-flowered, terminal or axillary; forming panicles 10-16 cm. long; bracts ovate cordate acuminate, villous on the under surface glabrous above, smaller than or equalling the calyx. Calyx 5 mm. long, tubular-campanulate, declinate villous outside and sparingly hairy at the throat; uppermost tooth rounded apiculate, lateral teeth obtuse, lower lanceolate, acuminate. Corolla white, 12 mm. long, tube included, the upper and lateral lobes acute, lower much larger ovate apiculate. Filaments glabrous. Nutlets globose, 1 mm. in diam., rugose, glabrous, brownish black in colour. Habitat:- Burma, Madoe hill, C. Mundul, No. 103 (Type), Makhaye Hill, Dr. King's collector.

11. Teucrium Wightii Hook. f. Fl. Brit. Ind. iv, 701.

Gamble Fl. Nadras 1158.

T. quadrifarium Herb. Wight (Kew Dist. 2168)

T. tomentosum, Wight Ic. t. 1458.

T. n. sp. Benth. Pl. Hohenack, n. 1396.

Robust herbs with short branches, densely villous with tawny hairs, 30-60 cm. high. Leaves thick, short petioled, ovate obtuse, rounded or cordate at the base, crenate at the margin; upper surface rugose, and sparsely pubescent, densely beneath; lamina 2-3.5 cm. long and as broad; petiole stout, 5-12 mm. long. Racemes terminal paniced, 7-10 cm. long, bracts shorter than the calyx, lanceolate acute, base cuneate, Calyx 6 mm. long, villous, outside and at the throat, campanulate declinate; upper tooth largest rounded, apiculate, 2

lower lanceolate. Corolla purple, 12 mm. long, puberulous, tube included. Nutlets minutely reticulate, subglobose, glistening.

Habitat:- Nilghiri Hills and W. Ghats, alt. 200-2,500 m.

12. Teucrium tomentosum Hayne in Wall. Cat. n. 2025; Benth. in Wall. Pl. As. Rar. i, 58, Lab. Gen. et Sp. 674, and in DC. Prodr. xii 582; Thwaites Enum. 241; Gamble Fl. Madras 1158.

T. paniculatum Herb. Madras in Wall. Cat. sub. 2025.

Erect herb, 70-100 cm. high, pubescent tomentose or woody. Leaves petioled, membranous, broadly ovate or rhomboid, obtuse, singly or doubly serrate or crenate, base entire truncate or cuneate, finely pubescent above, greyish tomentose beneath; lamina 5-9 cm. long, 4-6 cm. broad; petiole slender 2-3.5 cm. long. Flowers many in terminal racemes, forming close panicles; bracts lanceolate, base narrow, inflorescence villous with tawny often glandular hairs. Calyx 6 mm. long, villous outside and at the throat, campanulate, declinate, upper tooth longest, lower teeth triangular acuminate. Corolla yellowish, tube included, limb small, the upper and side lobes short and rounded. Nutlets very small, globose, granulate.

Habitat:- Decca peninsula.

Dist.:- Ceylon.

13. Teucrium laxum D. Don Prodr. Fl. Nep. 109; Benth. Lab. Gen. et Sp. 675, and in DC. Prodr. xii 582; Hook. f. Fl. Brit. Ind. iv, 701.

Slender erect diffusely branching herb 25-35 cm. high, villous or glabrate. Leaves petioled, ovate acute or acuminate

serrate, rounded or subcordate at the base; sparingly pubescent on both surfaces or villous beneath; lamina 4-7 cm. long, petiole slender, 1-1.5 cm. long. Flowers few in axillary whorl, or in lax, axillary and terminal racemes, racemes short often recurved; bracts lanceolate, cuneate, shorter than the calyx; pedicel as long as calyx. Calyx 4-5 mm. long, campanulate, declinate, pubescent outside, villous at the throat, upper tooth largest, rounded, acute, 2 lower lanceolate acute. Corolla pink, tube about as long as the calyx. Nutlets rugulose, enclosed in fruiting calyx.

Habitat:- Nepal; Kumaon; Lashai hills, Tui-pang, Mrs. Parry 453.

14. Teucrium Wattii Prain Journ. As. Soc. Beng. lxx (1890) II, 317.

Straggling herb, 80-120 cm. long, stem stout, and diffusely branched, terete below, rusty villous with spreading hairs. Leaves long petioled, membranous, oblong-ovate, acute, sharply and irregularly toothed, base cuneate, entire; hirsute on both surfaces; lamina up to 12 cm. long or more, 5-7 cm. broad; petiole, densely villous 5-7 cm. long. Racemes paniced, lax-flowered, villous; bracts linear-lanceolate, base cuneate, 6-7 mm. long; pedicels 6 mm. long. Calyx 7 mm., campanulate, declinate, villous outside, setose at the throat, upper tooth rounded apiculate, lateral teeth obtuse, lower pair connivent lanceolate acute. Corolla purple, 13 mm. long, tube included, terminal lobe ovate, the 4 upper lobes obtuse. Filaments sparingly hairy. Nutlets rugulose.

Habitat:- Assam; Manipore.

15. Teucrium shanicum Mukerjee in Notes of R. B. G. Edin. No. 95 (1938) in ed.

Slender erect herb, about 35 cm. high; stem subterete, densely brown-tomentose. Leaves petioled, ovate or oblong acute, or obtuse, sharply serrate, rounded at the base; puberulous above, hirsute beneath; lamina about 5-9 cm. long, 2-5 cm. broad; petiole stout, 1-1.5 cm. long. Flowers few in terminal and axillary racemes, about 6-7 cm. long; bracts lanceolate, acute, cuneate at the base, pubescent below, glabrous above, lower bracts about 6 mm. long, much shorter upwards; pedicels shorter than the calyx. Calyx 5 mm. long, tubular campanulate declinate, densely pubescent outside with simple and intermixed with gland-tipped hairs; throat sparingly hispid with long hairs; the uppermost tooth broadly rounded, the lateral shorter triangular, obtuse, the lower lanceolate acute slightly longer than the upper tooth; fruiting calyx 7 mm. long. Corolla yellow, 12 mm. long; tube included, the upper and side lobes acute, the lower lobe ovate apiculate. Filaments puberulous. Style slightly swollen near the tip, puberulous. Nutlets globose, 1 mm. in diam., dark brown.

Habitat:- Burma; Shan states, Abdul Huk.

16. Teucrium plectranthoides Gamble Kew Bull. 1924, p. 266, and in Fl. Madras 1158.

Slender erect herb 50 cm. high, with 4-angled stem, almost glabrous. Leaves petioled, membranous, ovate acute, deeply and irregularly serrate, base entire truncate subcordate, sometimes slightly decurrent, glabrescent above minutely puberulous beneath; lamina up to 5 cm. long; petiole slender

1-2 cm. long. Racemes lax-flowered, in slender spreading panicles, terminal or axillary, bracts linear-lanceolate, longer than the slender pedicels. Calyx 5-7 mm. long, campanulate, sparsely glandular hairy outside; throat pubescent with long hairs; upper tooth rounded apiculate, slightly shorter than the 2 lanceolate lower central teeth. Corolla about 1cm. long, tube included, upper lobes acuminate, curved, side lobes acute. Nutlets not seen.

Habitat:- S. India; Tinnevely Dist.

17. Teucrium bidentatum Hemsl. in Journ. Linn. Soc. xxvi, 312; Dunn in Notes of R. B. G. Edin. xxviii, 192.

Vinostemon bidentatum Kudo in Mem. Fac. Sc. & Agri. II, 2, (1929) 298.

Stout erect perennial herb, 60-120 cm. high, glabrous or almost so. Leaves membranous shortly petioled, 8-12 cm. or more, long, lanceolate, acuminate, broadly serrate-dentate, cuneate at the base, glabrous on both surfaces, puberulous on nerves. Racemes lax-flowered, axillary and terminal; simple or paniced; bracts narrowly lanceolate; pedicels slender. Calyx 5 mm. membranous, glabrous, outside, throat sparsely hairy with long hairs, upper lip trilobed, the median lobe, ovate acute, lateral orbicular; lower lip with 2 short deltoid teeth. Corolla yellow or white, 8 mm. long, puberulous; tube included. Nutlets minute, glabrous, puberulous.

Habitat:- Burma.

Dist.:- China.

Rubiteucris Kudo. In Mem. Fac. Sc. & Agri.
II, 2, (1929) 297.

Rubiteucris Kudo. In Mem. Fac. Sc. & Agri.
II, 2, (1929) 297; Bot. of Nepal. Ind. Pl. Sin. II, 515; Dunn, in
Notes of R. B. S. Sin. xviii 191.

Rubiteucris, Kudo.

Blender erect, 1-2 dm. high, puberulous above,
glabrate below.

Kudo in Mem. Fac. Sc. & Agri. II, 2, (1929) 297.

Herbs, leaves trifoliolate. Whorls 2-flowered, in
paniculate racemes. Calyx campanulate, bilabiate, prom-
inently 5-nerved; upper lip 3-toothed, lower lip with 2
lanceolate teeth. Corolla-tube short, exannulate within,
limb bilabiate; upper lip 2-lobed, lobes ovate-deltoid;
lower lip 3-lobed, lateral lobes oblique, ovate-deltoid,
central lobe large, oblong-ovate, slightly saccate at the
apex. Stamens 4, lower longer; anthers 2-celled, cells
divaricate. Disk equal. Style deeply 2-lobed at the apex,
lobes filiform, upper much longer. Nutlets subglobose,
glabrous, slightly reticulate.

Habitat:- Sikkim, 3,750-3,200 m.

Dist.:- China (Yunnan).

Rubiteucris palmata Kudo. in Mem. Fac. Sc. & Agri.
II, 2, (1929) 297.

Teucrium palmatum Benth. ex Hook. f. Fl. Brit. Ind.
iv 702; Forb. et Hemsl. Ind. Fl. Sin. II, 313; Dunn, in
Notes of R. B. G. Edin. xxviii 191.

Slender erect herb, 30-60 cm. high, puberulous above,
glabrate below; stem stoloniferous. Leaves long petioled,
3-foliolate; leaflets membranous 3-7 cm. long, narrowly
rhomboid-ovate, acuminate serrate with broad teeth, entire
and cuneate at the base; glabrous or sparsely hairy on both
sides; petiole slender 3-8 cm. long. Flowers few in term-
inalracemes, bracts linear, as long as or shorter than the
flowering pedicels, pedicels much elongated in fruit. Calyx
3-4 mm., enlarged to about 10 mm. in fruit, campanulate, deeply
bilabiate, upper lip with 3 triangular acute teeth, lower with
2 lanceolate acuminate, slightly longer than the upper.

Corolla 12-13 mm. long, puberulous outside, tube included,
upper lobe oblong concave, obtusely 2-fid, shorter than the
lower 3-lobed lip. Nutlets 2 mm. in diam., globose.

Habitat:- Sikkim, 2,750-3,250 m.

Dist.:- China (Yunnan).

Ajuga, Linn.

Endl. Gen. Pl. 362; Benth. Lab. Gen. et Sp. 690, and in DC. Prodr. xii 595; Boiss. Fl. Orient. iv, 793; Hook. f. Fl. Brit. Ind. iv, 702; Benth. ex Hook. f. Gen. Pl. II, 1222; Briq. in Eng. & Pr. Nat. Pflanzenf. iv, 3, a, 209; Baker in Thiselton-Dyer Fl. Trop. Africa, v, 501; Prain Beng. Pl. 860; Duthie, Fl. Upp. Gang. Pl. II, 258; Gamble Fl. Madras 1158; Kudo in Mem. Fac. Sc. & Agri. II, 2, (1929) 276; Doan in Fl. Gen. Indo-Chine, iv, 8, (1936) 1043.

Annual or perennial herbs, often stoloniferous. Leaves usually crenate. Whorls 2- or many-flowered, axillary or forming terminal racemes bracteate by much reduced leaves. Calyx-tube campanulate, 10-ribbed; teeth 5, equal. Corolla-tube included or exserted; limb bilabiate; upper lip very short; lower longer, 3-lobed, deflexed. Stamens 4, didynamous, arcuate, usually protruding beyond the upper lip of the corolla; lower pair longest; anther-cells divergent, finally confluent. Disk equal or oblique. Ovary shortly 4-lobed; style subequally forked at the tip. Nucules obovoid, reticulated, obliquely attached.

A. Corolla tube not inflated, straight.

B. Stamens exerted.

C. Leaves cordate, sinuately lobed. ... lobata

C. Leaves cuneate, toothed or

subentire bracteosa

B. Stamens included.

C. Calyx tubular, teeth lanceolate

as long as the tube parviflora

C. Calyx obconic, teeth rounded,

much shorter than the tube brachystemon

A. Corolla inflated at the base geniculate

above the swelling macrosperma

1. Ajuga lobata D. Don Prod. Fl. Nepal, 108; Wall. Cat. 2034; Benth. in Wall. Pl. As. Rar. i 59; Lab. Gen. et Sp. 692, and in DC. Prodr. xii 595; Hook. f. Fl. Brit. Ind. iv. 702; Kudo, in Mem. Fac. Sc. & Agri. Vol. ii, 2, (1929) 277.

Slender stoloniferous herb, stem flexuous, prostrate or creeping 30-60 cm. long, softly hairy or glabrous, rooting at the nodes. Leaves flaccid in distant pairs, long petioled, or bicular or broadly oblong-ovate, cordate, sinuately lobed, pubescent on both sides; lamina 2-4 cm. in diam; petiole slender 2-5 cm. long, villous. Flowers in axillary whorls or in erect axillary spikes; bracts ovate-oblong. Calyx 6 mm.; teeth long, lanceolate, acute. Corolla 2.5 cm. long, lilac or violet, pubescent outside, tube thrice as long as the calyx, straight, slender, not inflated at the base;

upper lip very short, lower large, mid-lobe very broad dilated and notched at the centre. Stamens exerted.

Habitat:- Nepal, Bhotan, Sikkim; In the hills of Assam and Burma, alt. 1,000-3,500 m.

Dist.:- China.

2. Ajuga bracteosa Wall. Cat. 2032; Benth. in Wall. Pl. As. Rar. i 59, Lab. Gen. et Sp. 696, and in DC. Prodr. xii. 598; Maximov Mel. Biol. xi 818, and xii 922; Hook. f. Fl. Brit. Ind. iv 702; Collett Fl. Sim. 406; Duthie Fl. Upp. Gang. Pl. II, 258; Merrill, Enum. Philipp. Fl. Pl. III, 408; Kudo in Mem. Fac. Sc. & Agri, II, 2, (1927) 286.

A. remota Benth. in Wall. Pl. As. Rar. i 59, Lab. Gen. et Sp. 694 and in DC. Prodr. xii 597; Maximov in Mel. Biol. xi 817; Dunn in Notes R. B. G. Edin. xxviii, 195.

Dwarf herb of a tufted habit, 9-30 cm. high, stems numerous from the rootstock, not stoloniferous, softly villous or glabrate. Leaves 3-10 cm. long; lower ones petioled, upper sessile, oblanceolate or subspathulate, obtuse, sinuately toothed, cuneate at the base, pubescent on both sides. Flowers crowded in axillary whorls or short dense spikes; bracts foliaceous, ovate or obovate-cuneate, much longer than the spikes. Calyx 4.5 mm. long, villous; teeth half as long as the tube, ovate-lanceolate, acute. Corolla 10 mm. long, pale blue or lilac, pubescent outside, tube straight, annulate within, base not inflated, upper lip erect 2-fid. Stamens exerted. Nutlets 2 mm. long, ellipsoid, deeply rugose.

Habitat:- N. W. Frontier province; Kashmir; Punjab; Kumaon; Nepal.

Dist.:- Afghanistan; Tibet; China; Japan; Abyssinia.

Ajuga bracteosa, var. densiflora Hook. f. Fl. Brit.

Ind. iv 703.

A. densiflora Wall. Cat. 2031; Benth. in Wall. Pl. As. Rar. i 59, Lab. Gen. et Sp. 696 and in DC. Prodr. xii 598; Haines in Bot. Bih. & Oriss. 753.

Stoloniferous from the woody stock, lower leaves obovate-oblong, obtuse, subentire; upper leaves oblong. Corolla shortly exserted, base globose round the ovary; pink or white. Nutlets smooth and shining when fresh, rugose and pitted when dry.

Habitat:- Nepal; Chota Nagpur.

3. Ajuga parviflora Benth. in Wall. Pl. As. Rar. i 59, Lab. Gen. et Sp. 696, and in DC. Prodr. xii 598; Hook. f. Fl. Brit. Ind. iv 703; Collett Fl. Sim. 407.

Dwarf herbs with numerous branching stems, from a woody rootstock, not stoloniferous; softly villous. Leaves sessile or shortly petioled; radical, 5-7 cm. long or more, oblanceolate or obovate-spathulate, obtuse, crenate or entire; cauline leaves smaller, obovate or oblong. Spikes 5-10 cm. long, whorls close, lower sometimes distant, bracts ovate or oblong, much longer than the flower. Calyx 2.5-3 mm. long, teeth lanceolate as long as the tube. Corolla blue, 5 mm. long, glabrous or hairy, tube straight slender hardly exserted; upper lip very short, 2-lobed; the 3 lobes of the lower lip subequal or midlobe largest. Stamens included. Nutlets 1 mm. rugosely pitted.

Habitat:- Kashmir to Kumaon.

Dist.:- Afghanistan.

Ajuga parviflora var. adpressa Hook. f. Fl. Brit. Ind. iv 703.

A. depressa Maximov Mel. Biol. xi, 826.

Densely villous, branches depressed, the whole plant lies flat on the ground.

Habitat:- Kumaon, Jaunsar Dt.

4. Ajuga brachystemon Maxim. Bull. Acad. Petersb. xxvii (1883) 192; Hook. f. Fl. Brit. Ind. iv, 703.

Dwarf herb with a very short stem, about 3-5 cm. high, from a small woody rootstock. Leaves 2-4 cm. long, obovate obtuse crenate or crenulate, cuneate at the base; radical leaves shortly petioled cauline sessile. Spike about 2 cm. long, subsessile; bracts ovate, larger than the spike. Calyx obconic, 2.5 mm. long, teeth very short, rounded ciliate.

Corolla 4 mm. long; tube straight, shortly exserted; upper lip short, 2-lobed; lateral lobes of lower lip linear-oblong, obtuse; mid-lobe broad, dilated, retuse. Stamens included.

Habitat:- Kumaon.

5. Ajuga macrosperma Wall. ex Benth. Wall. Pl. As. Rar. i 58, Lab. Gen. et Sp. 697, and in DC. Prodr. xii 599; Maxim. Mel. Biol. xi 823; Hook. f. Fl. Brit. Ind. iv 704; Prain Beng. Pl. 860; Duthie Fl. Upp. Gang. Pl. II, 257; Haines Fl. Bih. Oriss. 753; Kudo in Mem. Fac. Sc. & Agri. II, 2, (1929) 290.

A. repens, Roxb. Fl. Ind. iii, 3.

A. geniculata, Maxim. Mel. Biol. xi, 821.

A. genevensis, var. pallescens Matsum et Hyata, Enum. Pl. Formos. 193, not of Maxim.

A. genevensis Hyata, Gen. Index Fl. Formos 56; Icon. Pl. Formos VIII, 84.

Ajuga macrosperma (Cont.).

Much variable herb, with procumbent stem and branches, 15-60 cm. long, often rooting, thick, terete, usually grooved, sparingly or densely hairy below, usually villous near the inflorescence; branches sometimes ascending. Leaves variable in size, petioled, ovate-oblong or obovate, obtuse, sinuate-crenate, rarely lobed or cut, base decurrent to the petiole; lamina 4-15 cm. long, petiole 1-5 cm. or more. Spikes 3-20 cm. long, whorls continuous or interrupted; lower bracts foliaceous, upper ovate, shorter than the calyx. Calyx short; teeth minute obtuse. Corolla blue, usually glabrous; tube twice as long as the calyx, inflated at the base, geniculate above the swelling; upper lip erect, 2-lobed; lobes of lower lip subequal or the middle one broader. Stamens exerted. Nutlets about 1.5 mm. in diam., deeply rugosely pitted.

Habitat:- Kumaon to Bhotan; Assam; Burma.

var. (i) Thomsonii Hook. f. Fl. Brit. Ind. iv 704.

A. Thomsonii Maxim. Mel. Biol. xi, 821.

Stem slender, flaccid, rooting, prostrate, glabrous. Calyx-teeth very short, rounded, Corolla glabrous tube exerted.

Habitat:- Sikkim.

var. (ii) breviflora Hook. f. Fl. Brit. Ind. iv 704.

A. decumbens Don Prodr. 108;

A. sikkimensis Miq. Prolus. Fl. Jap. 46; Maxim. Mel.

Biol. xi 822.

Smaller in habit, branches very slender. Corolla often hairy, tube as long as the calyx or slightly longer than the calyx.

Habitat:- Khasia Mts; Sikkim; Chota Nagpur.

Eurysolen, Prain

Prain in Sc. Mem. Medi. Offic. xi (1896) 43; Kudo in Mem. Fac. Sc. & Agri. II, 2, (1929) 275.

Scandent shrub, leaves ovate, acute, cuneate at the base. Flowers small, condensed in terminal or axillary spikes; bracts minute. Calyx tubular-campanulate, 10-nerved, 5-toothed, the 2 anterior teeth distinctly longer than the 3 posterior, but not forming a bilabiate calyx; sparsely puberulous outside, glabrous within; teeth erect in fruit, and tube slightly urceolate. Corolla-tube exserted, annulate within; portion of the tube below the annulus, slender and straight, gibbous above; limb 2-lipped, upper lip erect slightly concave retuse at the apex; lower lip longer 3 lobed; lateral lobes smaller than the middle one. Stamens 4, didynamous, lower longer; all ascending under the upper lip and all exserted; the anthers ovate-reniform, 1-locular, those of the upper stamens slightly smaller than the others; the filaments puberulous with whitish hairs. Disk uniform. Style 2-fid at the apex, lobes equal, acute. Nutlets papillose-glandular on the upper and mesial surface. Only one species.

Eurysolen gracilis Prain in Sci. Mem. Medic. Offic. Ind. xi (1896) 44; Ann. Roy. Bot. Gard. Cal. IX, 61 and Pl. 75. Kudo in Mem. Fac. Sc. & Agri. II, 2, (1926) 276.

A slender scandent shrub with cylindric branches, puberulous with coarse set, adpressed, reflexed hairs. Leaves membranous, short petioled, ovate, acute coarsely serrate, cuneate and entire at the base, glabrous except the nerves beneath; the young leaves sparsely pubescent above with adpressed hairs. Flowers small, condensed in axillary and terminal spikes, 2.5-4 cm. long and 1 cm. across; bracts hardly exceeding the 1.5 mm. long pedicels. Calyx tubular-campanulate, 4 mm. long, 10-nerved, sparsely puberulous externally, glabrous within; 5-toothed, the two anterior teeth slightly longer than the rest; in fruit, the teeth erect and the tube slightly urceolate. Corolla 7 mm. long, tube exerted, slender and straight near the base, gibbous above, annulate within just at end of the straight portion of the tube, upper lip erect slightly concave and retuse at the tip, the lower longer and spreading, 3-lobed, the mid-lobe larger than the laterallobes. Filaments exerted, puberulous, the lower pair longer; anthers ovate-reniform, 1-celled. Ovary substipitate, lobes acute, smooth towards periphery, papillose-glandular on their upper and mesial aspects. Nutlets in fruit not seen.

Habitat:- Burma; Kachin Hills, Prain's Collectors.

Cymaria, Benth.

Bot. Reg. 15, Lab. Gen. et Sp. 705, and in DC. Prodr. xii 602; Hook. f. Fl. Brit. Ind. iv, 704; Ridley Fl. Mal. Pen. II, 654; Doan in Fl. Gen. Indo-Chine, iv, 9, (1936) 1041.

Shrubs. Flowers small, in lax, many-flowered, peduncled, raceme-like cymes, all axillary, or the upper ones forming a terminal thyrsoïd panicle. Calyx erect, 10-nerved, the intermediate nerves weaker than the other, 5, equally 5-toothed; the tube in fruit urceolate; the throat within naked or with a few setose hairs. Corolla-tube straight, exserted; limb 2-lipped; lower lip 3-lobed, spreading, the mid-lobe larger than the lateral; upper lip arched, erect. Stamens 4, ascending under the upper lip, didynamous, the upper pair shorter; anthers connivent, the cells divaricate. Disk equal, entire. Style-arms unequal, the upper very short. Nutlets subglobose or obovoid, rugosely pitted; hilum very large, lateral.

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- A. Slender stem, finely pubescent; leaves
 - membranous, petioled dichotoma
 - A. Stem densely haory, tomentose, leaves
 - thick, sessile elongata
-

1. Cymaria dichotoma Benth. in Wall. Pl. As. Rar. i 64, Lab. Gen. et Sp. 705, and in DC. Prodr. xii 603; Wall. Cat. 2080; Hook. f. Fl. Brit. Ind. iv 705.

Strict erect herbs 50-100 cm. high, or more, stem slender woody, terete, finely pubescent. Leaves petioled, membranous, ovate or rhomboid subacute, faintly crenate, cuneate glabrous above, finely pubescent beneath; lamina 7-10 cm. long, 3-5 cm. broad and petiole about 1 cm. long. Cymes laxly many-flowered, axillary long peduncled. Calyx 3 mm. long, teeth triangular acute as long as the tube. Corolla minute, tube included or slightly exerted. Stamens included. Nutlets 0.7 mm. long, rugose.

Habitat:- Burma.

Dist.:- Perak.

2. Cymaria elongata Benth. in Wall. Pl. As. Rar. i 64; Lab. Gen. et Sp. 705, and in DC. Prodr. xii 603; Wall. Cat. 2079; Hook. f. Fl. Brit. Ind. iv, 705.

Robust herb with long branches, densely hoary tomentose. Leaves thick subsessile 3-5 cm. long, ovate obtuse, subcrenate, finely tomentose above, densely hoary beneath. Cymes short-peduncled, dense-flowered, in a long terminal panicle; flowers stoutly pedicelled. Calyx 3 mm. long, tomentose, teeth as long as the tube. Nutlets 1 mm., obovate rugose. Habitat:- Burma, Taong Dong, Wallich.