STUDIES IN THE FLORA OF AFGHANISTAN III*
AN ACCOUNT OF SALVIA

IAN C. HEDGE

THE following account contains a key to the Afghan species of *Salvia*, gives their known distribution and includes general remarks about the taxonomy and phytogeography of the genus in the Afghanistan area. Two new species and one new variety are described; one other new species is recognised but not formally described.

Since Professor K. H. Rechinger published the first account of Afghan Labiatae in Symbolae Afghanicae I (Dan. Biol. Skr. 8, 1, 1954), much fresh material has greatly added to our knowledge of the family. In this paper 12 species of *Salvia* are added to the number that were dealt with in Rechinger's paper. A total of 22 species are recognised.

In addition to covering most of collections made in Afghanistan including the recent ones of Rechinger, Gilli, Furse and Hedge & Wendelbo, I have examined a quantity of W Pakistan gatherings of *Salvia* and cited specimens where they are pertinent to the Afghan distribution. Not all the gatherings examined are cited; only those which give an adequate idea of the plant and its distribution.

Specimens of the following collectors have been seen from the cited herbaria:

Burtt, Halcro-Johnston, Hedge & Wendelbo, J. W. Johnston, Lace, Watt—Edinburgh (E).

Codrington, Stainton, Bowes Lyon, Thesiger—British Museum (BM).

Aitchison, Baillie & Dunsheath, Collett, Griffith, Hay—Kew (K).

Lindberg—Lund (LD).

Amsel, Edelberg, Gilli, Honigberger, Kerstan, Koeie, Koelz, Neubauer, Rechinger, Repp—Vienna (W).

Dick-Peddie, Schmid, R. R. Stewart, Yayaka—Rawalpindi (RAW).

I am indebted to the directors of these institutes for the loan of specimens.

DISCUSSION

Salvia is not a large genus in Afghanistan and few of the species are common. In the relatively small number of species, Afghanistan compares poorly with, for example, Turkey and the Caucasus where almost five times as many species occur. Nor in Afghanistan is there a high concentration of endemics in particular sections such as occurs in Turkey in the pinnate leaved species of sect. *Eusphace* or in sect. *Gongrosphace*. But of the c. 14 sections of the genus in SW and C Asia, 10 of them are represented in Afghanistan in contrast to 8 in Turkey. This is one of the highest, if not the highest, sectional concentrations in a particular area in the Old World. In

* The previous parts have been published in the following periodicals:
I. Arbok Univers. Bergen, Mat.-Naturv. ser., 1963, 18: 1–56 (1964).
II. Nytt Mag. Bot. 12: 123–134 (1965).

order to give a clearer overall picture of character variation, the sections and their species are briefly discussed.

The section *Physosphace* and the allied subgenus *Macrosphace* are characterised by a staminal structure in which the connectives are very short and both thecae are equally well developed and bear fertile pollen. The stems are usually 6-sided and there is a tendency to trifid branching. Most of the species are very long-lived perennials with thick woody rootstocks. In stamen structure, these groups must be considered as among the most primitive and least specialised of all the Old and New World sections. They are centred in, and mostly restricted to, the Pamir-Alai—Tian Shan area. *S. pterocalyx* and *S.* "*sp. nov*" belong to sect. *Physosphace; S. tetrodonta* to subgen. *Macrosphace*. These Afghan representatives are rare endemics only known from a few recent gatherings. All have been described within the last five years. It is possible that, as the botanical investigation of Afghanistan proceeds, other species may be discovered in the same general alliance.

In sect. *Eusphace*, the staminal structure is slightly more advanced. The connectives are longer, the posterior theca is smaller than the anterior but bears fertile pollen; the corolla tube is clearly annulate towards the base. Sect. *Eusphace* has its maximum concentration of species in Turkey. Outside this area, the number of species drops rapidly. The only Afghan species is *S. cabulica* from the Afghan-Pakistan frontier regions. This woody semi-shrub is, geographically and morphologically, a distinct and somewhat anomalous member of the section.

Sect. *Hymenosphace* contains woody semi-shrubs with a relatively primitive staminal structure, similar to the previous section. The most characteristic feature of the section is found in the calyx which after anthesis greatly enlarges. It usually only contains one or two large nutlets; the others not reaching maturity. Pobedimova (Fl. URSS 21: 363, 1954) put the Soviet species of this section in a separate genus *Schraderia* Medik. The largest number of species in sect. *Hymenosphace* grows in Turkey but other members grow in Iran and as far east as the Pamir-Alai. Certain S African species have a very similar facies to SW Asiatic *Hymenosphace* and, at one time, were regarded as members of that section. In Afghanistan, there are two species—*S. bucharica* and *S. maymanica*.

Sections *Homalosphace*, *Gongrosphace* and *Plethiosphace* can be conveniently considered together. The species in all these sections are herbaceous perennials with an advanced staminal structure. The connective is very long and the posterior theca is reduced to a flat plate of sterile tissue united with the other posterior theca. The corolla tube is either straight, and annulate or exannulate, or invaginated with a broad plate of tissue within ('nectary plate') and pouched above. The floral and staminal structure is among the most advanced in the Old World sections. The three sections contain a large number of species mostly in SW Asia.

Section *Drymosphace* is another section of herbaceous perennials with a staminal structure similar to the preceding sections. The corolla tube is markedly pilose-annulate. The limits and position of this section have varied in the treatments of different authors. In the broad sense, the section extends from Japan and China to the Himalaya and as far west as Europe. *S. nubicola* Sweet is the sole representative of the section in Afghanistan. It is a mesophytic species growing either in woods or at streamsides.

Sections *Notiosphace* and *Eremosphace* have a comparable floral structure. In both the flowers are small (5–7 mm) with a straight upper lip. The posterior theca is either theca-like but sterile or is reduced to callous tissue; the sterile ends do not cohere. Although with a similar floral structure, the two sections are markedly different in habit. Sect. *Notiosphace* with *S. plebeia* contains erect annuals, distributed in E tropical and temperate Asia. Sect. *Eremosphace* is a very distinct section of specialised habit whose members are all much branched dwarf semi-shrubs, with few-flowered verticils and short-lived flowers. They are essentially desert or semi-desert species, stretching from N Africa to Arabia, Baluchistan and the NW Frontier Provinces.

This brief review of the sections and their characteristics shows that although none of the sections contain more than six species, there is, in Afghanistan, a considerable range of morphological types. A detailed study of *Salvia* on a geographical-morphological basis would probably be a rewarding task, especially carried out on a world basis. In the area under discussion, it seems that a fairly large number of characters is associated with a relatively small number of species. The facts can be interpreted in different ways, but because there are considerable numbers of 'primitive' types endemic to the Afghan—C Asiatic region and the 'advanced' types are mostly poorly represented in this area relative to their probably secondary centres of development, there are reasons for believing that the Afghan—C Asia region might be the centre of origin of the group.

DISTRIBUTION PATTERNS

Five different types of distribution can be recognised in the Afghan species of *Salvia*. They are broad, somewhat overlapping, groups based on the overall distribution of the species and also on the distribution of closely allied species. They are designated by informal geographical terms.

1) "Himalayan": species which grow in E Afghanistan (Nuristan) and extend eastwards to the NW Frontier provinces and Himalayas. *S. nubicola*, *S. plebeia*, *S. moorcroftiana*.
2) "Turko-Iran": usually widespread species of the Irano-Turanian phytogeographical region that are reaching their eastermost limits in the Afghanistan-W Pakistan region. *S. spinosa*, *S. macrosiphon*, *S. compressa*, *S. ceratophylla*, *S. sclarea*, *S. virgata*.
3) "Pamir-Alai—Tian Shan": species whose closest allies are from that region or whose distribution extends to there. *S. tetrodonta*, *S. pterocalyx*, *S. "sp. nov."*, *S. bucharica*, *S. maymanica*.
4) "Khorassan—Afghan—Baluchistan" endemics. *S. leriifolia*, *S. cabulica*, *S. rhytidea*, *S. ariana*.
5) "Sahara—Arabia—Kalat": the desert species of sect. *Eremosphace*. *S. macilenta*, *S. aegyptiaca*, *S. santolinifolia*, *S. trichocalycina*.

Although these groupings have been made rather arbitrarily and possibly intuitively, similar distribution patterns occur in other Afghan genera that I have studied, such as in the Cruciferae and other Labiatae. In fact, the only other common type that I have come across in other genera and not exemplified in *Salvia* is the "Amu-Darya". An example of this type is *Hypogomphia turkestana* Bge. which grows in the lower plains of N Afghanistan and extends into the Amu-Darya lowlands.

It is, of course, too early to make generalisations, with so little data available, about phytogeographical divisions in Afghanistan but the species of *Salvia* are probably good examples of the simpler types of distributional patterns or elements in the flora.

Key to the Afghan species of Salvia

1. Annual; erect; corolla c. 5 mm long . . 22. *S. plebeia* R.Br.
+ Perennial herbs or semi-shrubs; habit various; corolla 5–40 mm long 2
2. Corolla less than 7 mm; dwarf woody semi-shrubs . . . 3
+ Corolla more than 15 mm; more or less tall-growing herbaceous perennials or woody semi-shrubs 6
3. Plant glabrous except for calyx; stem ± leafless 21. *S. macilenta* Boiss.
+ Plant with an all-over indumentum; stem leafy . . . 4
4. Calyx with a short hirsute indumentum; verticils distinct from each other . . . . . 18. *S. aegyptiaca* L.
+ Calyx hispid-plumose; verticils not clearly separated . . 5
5. Calyx ovate, 4 mm . . . . . 19. *S. santolinifolia* Boiss.
+ Calyx tubular to funnel-shaped, 6 mm 20. *S. trichocalycina* Benth.
6. Leaves lyrate to pinnately divided 7
+ Leaves simple, margins entire, lobed or serrate . . . 11
7. Leaves clearly pinnate; calyx much expanded after anthesis, open; verticils 6–10-flowered 8
+ Leaves lyrate to pinnatisect; calyx expanded after anthesis, closed; verticils 2–5-flowered 9
8. Stems with few or many, long, white hairs up to 3 mm; calyx with obtuse lobes . . . . . 5. *S. bucharica* M. Pop.
+ Stems without long white hairs; calyx with acute lobes 6. *S. maymanica* Hedge
9. Corolla yellow; tube with a nectary plate . 13. *S. ceratophylla* L.
+ Corolla purplish-lilac; tube without a nectary plate but with a thin line of hairs 10
10. Leaves pinnatifid with a terminal segment, much larger than laterals; calyx winged, pendant in fruit . . 2. *S. pterocalyx* Hedge
+ Leaves deeply pinnatisect with all segments of similar size 3. *S.* "*sp. nov.*"*
11. Upper lip of fruiting calyx concave, bisulcate; corolla violet or purplish, c. 15 mm long . . . . . 17. *S. virgata* Jacq.
+ Fruiting calyx not as above; corolla clearly more than 15 mm or, if less, corolla rose 12
12. Corolla tube invaginated with a broad scale within, saccate above; upper lip of corolla falcate 13
+ Corolla tube not invaginated and without a broad scale within, straight; upper lip of corolla not falcate 14
13. Floral leaves c. 2 × 2 cm; fls. white . . 14. *S. sclarea* L.
+ Floral leaves less than 1 × 1 cm; fls. with a bluish upper lip and a yellowish white labellum . . . . . 15. *S. rhytidea* Benth.
14. Fls. yellow; leaves regularly cordate-hastate 16. *S. nubicola* Sweet

* This specimen is not known in flower and it is only conjecture that it should key out here.

\+ Fls. rose, purple, lilac or white; leaves truncate, cuneate or irregularly cordate 15

15. Leaves ± orbicular, short-petiolate; verticils c. 2-flowered 4. *S. cabulica* Benth.

\+ Leaves ovate or oblanceolate, long-petiolate; verticils 5–10-flowered 16

16. Stems glabrous, 6-sided; calyx conical, 4-toothed 1. *S. tetrodonta* Hedge

\+ Stems with a thick indumentum, 4-sided; calyx tubular or funnel-shaped, 5-toothed 17

17. Calyx much expanding in fruit, membranous; fls. c. 15 mm 7. *S. compressa* Vahl

\+ Calyx not or little expanding in fruit, herbaceous; fls. more than 20 mm 18

18. Fls. white or lilac-white; floral leaves green 19

\+ Fls. rose or violet; floral leaves rose, purple or violet . . . 21

19. Calyx funnel-shaped, hoary-white, eglandular; fls. lilac-white 8. *S. leriifolia* Benth.

\+ Calyx tubular-cylindrical, green, glandular; fls. white . . . 20

20. Leaves ovate; calyx teeth, prickly in fruit 10. *S. spinosa L.*

\+ Leaves oblong to oblong-ovate; calyx teeth not prickly in fruit 9. *S. macrosiphon* Boiss.

21. Calyx 8–10 mm long; corolla c. 25 mm; leaves with a denser indumentum on ventral surface . . . . . 11. *S. moorcroftiana* Benth.

\+ Calyx 20–22 mm long; corolla c. 30 mm; leaves with an equally dense indumentum on both surfaces . . 12. *S. ariana* Hedge

Systematic Arrangement of the Species

Subgenus	*Section*	*Species*
Macrosphace Pobed.		1. *S. tetrodonta* Hedge
Salvia	*Physosphace* Bge.	2. *S. pterocalyx* Hedge
		3. *S.* "*sp. nov.*"
	Eusphace Benth.	4. *S. cabulica* Benth.
Schraderia (Mönch) Briq.	*Hymenosphace* Benth.	5. *S. bucharica* M. Pop.
		6. *S. maymanica* Hedge
Sclarea (Mönch) Benth.	*Homalosphace* Bge.	7. *S. compressa* Vahl
		8. *S. leriifolia* Benth.
		9. *S. macrosiphon* Boiss.
		10. *S. spinosa* L.
		11. *S. moorcroftiana* Benth.
		12. *S. ariana* Hedge
	Gongrosphace Bge.	13. *S. ceratophylla* L.
		14. *S. sclarea* L.
		15. *S. rhytidea* Benth.
	Drymosphace Benth.	16. *S. nubicola* Sweet
	Plethiosphace Benth.	17. *S. virgata* Jacq.
Viasala Briq.	*Eremosphace* Bge.	18. *S. aegyptiaca* L.
		19. *S. santolinifolia* Boiss.
		20. *S. trichocalycina* Benth.
		21. *S. macilenta* Boiss.
Leonia (Llav. & Lex.) Benth.	*Notiosphace* Benth.	22. *S. plebeia* R. Br.

1. **S. tetrodonta** Hedge in Notes R.B.G. Edinb. 23: 164–165 (1960).

AFGHANISTAN: Kabul, 12 miles below Panjao, bare hillside, 2600 m, 27 viii 1954, *Thesiger* 103.
General distribution: endemic.

Although I had hoped to re-collect *S. tetrodonta* when Wendelbo and I were in the Panjao area during several days in July 1962, our careful searching was not successful. It is, therefore, not yet possible to amplify the incomplete original description or to re-assess the sectional position of this most interesting species. It is provisionally placed in subgenus *Macrosphace* Pobed.

2. **S. pterocalyx** Hedge in Notes R.B.G. Edinb. 23: 163–164 (1960).

AFGHANISTAN: Qataghan, Mirza Atbili pass, SE of Samangan, steep soil slopes and under Pistacia vera, calyces reddish purple, fls. pale purplish pink—a long lived perennial, 1350 m, 23 v 1962, *Hedge & Wendelbo* W. 3557; young flowers with trace of beige, fruiting calyces closed, pendant, *Hedge & Wendelbo* W. 4003; *Rechinger* 16431.
General distribution: endemic.

With the new and more adequate material of this remarkable, handsome and very distinct species, it has been possible to reconsider its sectional position. In the original description, *S. pterocalyx* was not assigned to any section but considered as a possible member of sect. *Physosphace* Bge. Bunge originally described this section to include one species—the W Iranian *S. aristata* Benth. Pobedimova (Fl. URSS 21: 272, 1954) slightly emended the sectional description and included 6 central asiatic species—all of which are much more closely allied to each other than to *S. aristata*. *S. pterocalyx* shares with *S. aristata* and the central asiatic species the following characters: both thecae of each stamen fertile, a calyx that inflates after anthesis, six-sided stems with a tendency to trifid branching, pinnatifid leaves, a thin line of hairs in the upper part of the corolla tube and very large nutlets with a similar seed coat-structure. For these reasons, *S. pterocalyx* should be included in sect. *Physosphace* although, specifically, it has no close allies in the section.

The Amsel type gathering was a young flowering specimen and no nutlets had developed. In 1962, I was fortunate enough to see and collect flowering and fruiting specimens. The most interesting feature of the fruiting plant in the field was that the four-winged, inflated calyces were pronouncedly pendant; in addition, usually only 1 nutlet reaches maturity (this is also a feature of many members of sect. *Hymenosphace*). This single nutlet is compressed triquetrous, dark brown and very large, c. $7 \times 4{\cdot}5$ mm.

The four known gatherings of *S. pterocalyx* were all made at the same locality—the Mirza Atbili pass between Pol-i-Khomri and Haibak (Samangan) where it is not a common plant. It may also occur in other *Pistacia vera* ('Pistalek' communities) in N Afghanistan.

3. **S. "sp. nov."** (sect. *Physosphace* Bge.)

AFGHANISTAN: Prov. Ghorat: Dolaini, Darreh Garmak, inter Qala Chahrak (Sharak) et Naourak, c. 34° N, 64°45′ E, c. 2540 m, 27 vii 1962, *Rechinger* 18915.

PLATE 38. Type specimen of *Salvia maymanica* Hedge.

PLATE 39. Type specimen of *Salvia ariana* Hedge var. *ariana*.

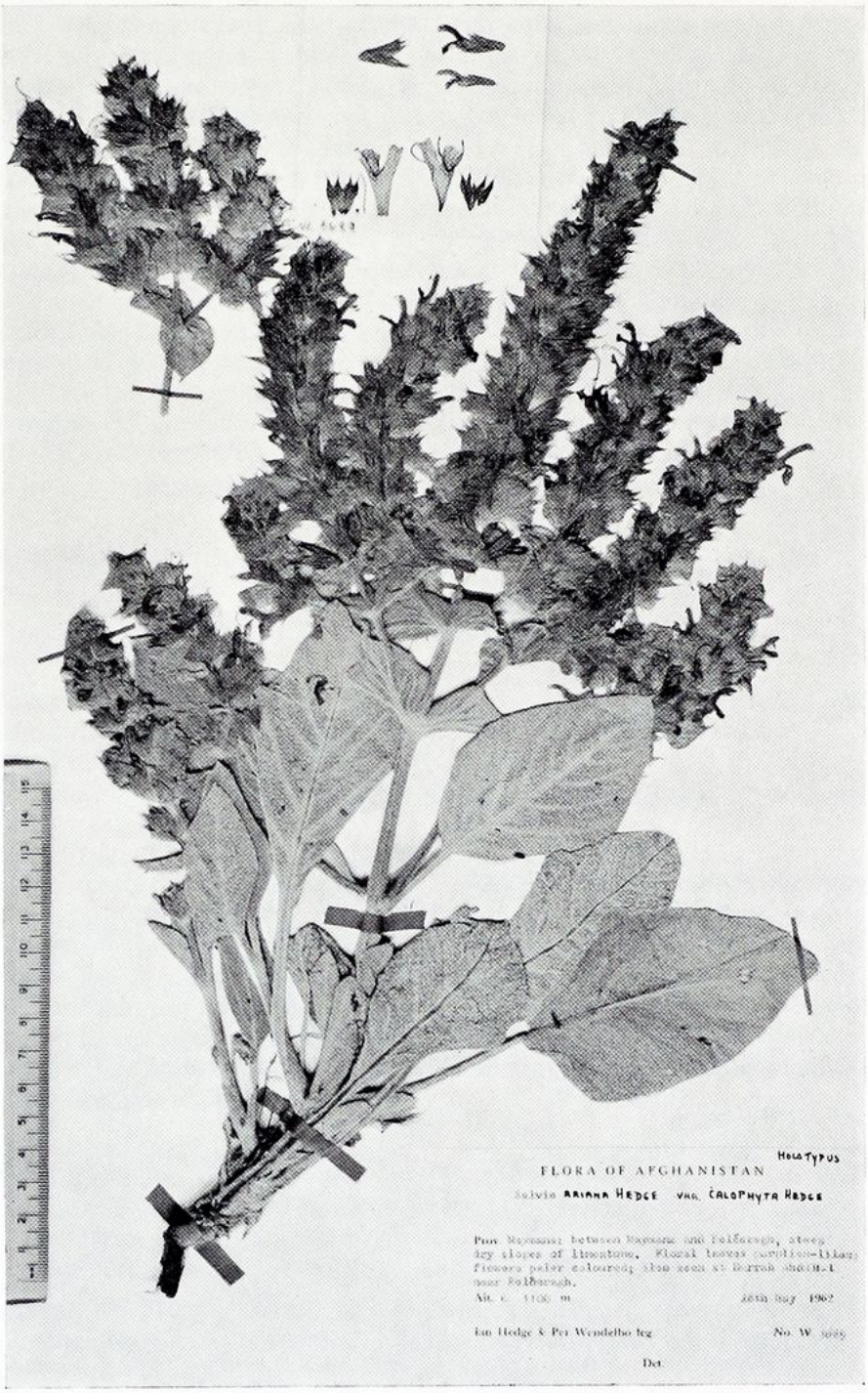

PLATE 40. Type specimen of *Salvia ariana* Hedge var. *calophyta* Hedge.

This specimen consists only of the basal parts and inflorescence stems without any floral parts. It belongs to sect. *Physosphace* on the basis of the following characters: thick woody rootstock, crowded, pinnatisect, basal leaves, few cauline leaves and six-sided, unbranched flowering stems. It does not match any of the known species in the section and must, therefore, be considered as a new species. Sect. *Physosphace* contains 6 central asiatic species, 1 species in Afghanistan (*S. pterocalyx*) and 1 in Iran (*S. aristata* Benth.). The new species resembles in general facies the Tian Shan endemic *S. trautvetteri* Regel, but in the latter species the leaf segments are broader and distinct and the thin leaf indumentum consists of glandular hairs; in contrast, the leaf segments are narrower and indistinct and the dense indumentum is of eglandular hairs in the new species. Furthermore, the long, black-headed capitate, glandular hairs on the inflorescence axis of the new species do not occur in *S. trautvetteri*.

The formal description of this most interesting new species will be withheld till a complete specimen is available.

4. **S. cabulica** Benth. in DC., Prodr. 12: 268 (1848).

AFGHANISTAN: Kabul, gorge of Kabul river, SE Sarobi, 1050 m, corolla violet-blue, 28 vi 1951, *Gilli* 3488. Nangrahar: (Bharowul and) Puschut (Pashat) *Griffith*.

W PAKISTAN: Quetta, Ziarat nr. Quetta, 2400 m, *Watt* 4008; Hanna, cliffs, 1820 m, *R. R. Stewart* 28042. Khyber pass (R. R. Stewart in litt.).
General distribution: E Afghanistan, W Pakistan.

S. cabulica is a common plant in the Bolan pass, Quetta, Ziarat and Loralai area.

As is the case with many Griffith types, there are difficulties in citing the type gathering of *S. cabulica*. *Griffith* 471, cited by Bentham in the Prodromus as the type of *S. cabulica* 'in Regno Cabulico' without precise locality, does not correspond with the plant cited under that number in Griffith's Itinerary Notes, which is given as '*Polygonum*'. Boissier in Flora Orientalis (4: 594, 1884) cites the type as 'in Regno Cabulico ad Bharowul et Puschut' without citing a number. The number in Griffith's Notes which agrees best with *S. cabulica* is No. 65 from "on the barren mountains above Pushut, common". This is probably the type locality.

5. **S. bucharica** M. Pop. in Trans. Sc. Soc. Turk. 1: 46 (1923).

Syn.: *Schraderia bucharica* (M. Pop.) Nevski in Acta Inst. Bot. Acad. Sc. URSS, ser. 1, 4: 327 (1937).
Salvia honigbergeri Rech. f. in Ann. Nat. Mus. Wien, 51: 48 (1941).

AFGHANISTAN: Kabul: Kabul, Sher Darwasa, fls. slightly fragrant, 2000 m, 13 v 1962, *Hedge & Wendelbo* W. 3152; Lataband pass, 28 vi 1951, *Gilli* 3490; Tang-i Gharu, c. 30 cm high, forming large tufts, 27 iv 1962, *Hedge & Wendelbo* W. 2759; Maidan, *Hay* 571; Shaikhabad to Gardez, 2440 m, *Furse* 5707. Parvan: Panjshir valley, 2400 m, *Hedge & Wendelbo* W. 5306; Ghorband valley, 2280 m, *Furse* 5738. Ghazni: in jugo Sardalu, W Qarabagh, 2300–2500 m, *Rechinger* 17345; distr. Jaghuri, in jugo Kotal-e Ketschru, NW Sang-i Masha, 2880 m, *Rechinger* 17527; Saiyadabad, Shinaz valley,

iv 1880, *Collett* 89-21. E*: Jagdalek, 1670 m, fls. rose-purple, *Koelz* 8257.

W PAKISTAN: Quetta, Urak, *Gertraud Repp*, *Lace* 3746.

General distribution: Pamir Alai, E and C Afghanistan, W Pakistan (Quetta).

A characteristic and conspicuous plant on hillsides near Kabul, *S. bucharica* is easily recognised by the tuft-forming habit, the long white hairs (up to 3·5 mm) at the base of the stem, the reddish-purple floral leaves, calyces and corollas and the large, expanded, fruiting calyces.

S. bucharica belongs to the species-group that contains *S. hydrangea* DC. (E Turkey, N & W Iran), *S. sheilei* Boiss. (S & W Iran), *S. dracocephaloides* Boiss. (Transcaucasus, NW Iran) and *S. maymanica* Hedge (Afghanistan). These five species are all very closely related and together form a very natural alliance. *S. bucharica* is closest to *S. hydrangea* but differs in the larger calyces with obtuse lobes and the larger cordate or rhombic floral leaves. With the exception of *S. dracocephaloides* and *S. hydrangea* where there is a slight geographical overlap, the five species mentioned have distinct distributions.

6. **S. maymanica** Hedge, **sp. nov.** (Plate 38).

Valde affinis *S. bucharicae*. M. Pop. sed caulibus altioribus magis lignosis sine pilis longis albis eglandulosis, pedicellis longioribus (ad 8 mm longis), lobis calycorum acutis calycibus corollisque fere duplo majoribus differt.

Suffrutex ad 80 cm altus, ramis erectis lignosis ± simplicibus quadrangularibus basi glabris superne ad inflorescentiam pilis brevibus eglandulosis praeditis. Folia petiolata, pinnata; segmentum terminale oblongo-ellipticum (ad 55 × 27 mm), margine integrum, apice acutum, utrinque pilis brevibus eglandulosis et glandulis punctatis praeditum, concolor, pilosum; nervatura utrinque prominens; segmenta lateralia 2–3, segmento terminali multo breviora, basin versus decrescentia, oblongo-elliptica, stipitata. Petiolus ad 20 mm longus, pilosus. Folia superiora in folia floralia sensim transeuntia. Inflorescentia simplex vel parce ramosa. Verticillastra 3–6-nata, 6–8-flora, inferiora c. 6 cm distantia superne approximata. Folia floralia inferiora oblongo-lanceolata, attenuata vel cordata, superne decrescentia. Bracteae pedicellis longiores, lineari-oblongae. Pedicelli ad 8 mm longi, pilis albis brevibus eglandulosis dense provisi. Calyx purpureus, 20–23 mm longus, 14-nervosus, tubuloso-infundibularis ad medium bilabiatus, labiis divergentibus, pilis albis brevibus eglandulosis; labium inferius in lobos duos ovatos acutos fissum; labium superius trilobatum, lobo mediano longiore, vel subintegrum, acutum. Calyx in fructu valde expansus, membranaceus, reticulato-nervosus. Corolla ad 40 mm longa, purpurea; tubus exsertus, intus c. 10 mm a basi duobus fasciculis pilorum provisus, ad 30 mm longus; galea c. 10 mm longa, bifida; labellum galea paulo longius. Connectivum antherarum c. 6 mm longum, sterilia cohaerentia; loculus fertilis 3 mm longus. Staminodia evoluta. Stylus exsertus. Nuculae ignotae. Floret Mai.

AFGHANISTAN: Maymana, between Maymana and Belčeragh, very steep dry limestone slopes; taller and woodier than plants of *S. bucharica* around Kabul, 1100 m, 28 v 1962, *Hedge & Wendelbo* W. 3690 (holo. E, iso. BG).

* Rechinger in Symbolae Afghanicae 1, 4 (1954).

7. **S. compressa** Vent., Jard. Cels. 59 (1800).

AFGHANISTAN: Farah, Farah to Shin Dand, Jija, 1000 m, *Koeie* 3826! Kandahar, pass to Dair Haj, *Griffith* 568!
General distribution: Iraq, W & SE Iran, Afghanistan.

A distinct species without close allies, *S. compressa* reaches its most easterly station at Kandahar.

8. **S. leriifolia** Benth. in DC., Prodr. 12: 287 (1848).

AFGHANISTAN: Parvan, 22 km above Gulbahar in Panjshir valley, stony slopes and cliffs, 1750 m, 4 v 1962, *Hedge & Wendelbo* W. 3007. Kabul: Kabul, Sher Darwasa, 2 v 1962, *Hedge & Wendelbo* W. 2927: SE of Sarobi, 1430 m, *Gilli* 3503; 40 miles N of Ghazni, 2440 m, *Furse* 5697. Herat: Herat, 1000 m, *Koeie* 3556; Herat to Kushk 1060 m, fls. violet and white, *Furse* 5407.

IRAN: Khorassan, Kuh Sangi prope Meshed, 1000 m, *Rechinger* 4870.
General distribution: NW and E Afghanistan, NE Iran.

A handsome, long-lived perennial with a thick woody rootstock easily recognised by the dense white pannose indumentum on the leaves and the large, lilac-white corollas. Although it grows in E and NW Afghanistan, it has not been recorded from the central part of the country. In E Afghanistan it often grows in association with *S. bucharica*.

The type gathering of *S. leriifolia* is a Griffith gathering 'in regno Cabulico'. The number cited by Bentham is *Griffith* 478. This does not correspond with 478 in Griffith's Itinerary Notes which is 'Crucifera' from the Koshuk pass between Quetta and Kandahar. The type locality is therefore uncertain.

9. **S. macrosiphon** Boiss. in Boiss., Diagn. Pl. Orient. 1 (5): 11 (1844).

Syn.: *S. macrosiphon* var. *cabulica* Benth. in DC., Prodr. 12: 282 (1848).
S. macrosiphon var. *kotschyi* (Boiss.) Boiss., Fl. Orient. 4: 615 (1884).
S. macrosiphon var. *brachycalycina* Bornm. in Engler, Bot. Jahrb. 66: 238 (1934).

AFGHANISTAN: Kabul, Koh-i-Asamai, stony slopes, fls. white, common, 1900 m, 10 v 1962, *Hedge & Wendelbo* W. 3122; Sher Darwasa, 1810 m, *Gilli* 3507. Parvan: Panjshir valley, between Dasht-e-Revat and Darrah Khauvak, dry slopes, c. 2300 m, 20 vii 1962, *Hedge & Wendelbo* W. 5330. Qataghan: Aliabad district, 760 m, *Furse* 6060. Badakshan: Faizabad district, 1060 m, *Furse* 6179. Qataghan: between Pol-i-Khomri and Samangan, near cultivation, 900 m, 23 v 1962, *Hedge & Wendelbo* W. 3528. Mazar-i Sharif: in faucibus SE Taschkurgan versus Samangan (Haibak), 600–700 m, 9 vi 1962, *Rechinger* 16365. Kandahar: Kandahar, 1 v 1962, *Lindberg* 32/1962. Herat: Hari rud valley, between frontier and Herat, 900 m, *Furse* 5383. Farah: Shin Dand to Farah, 1210 m, *Furse* 5508.

W PAKISTAN: Baluchistan, Quetta, *Schmid* 1593, *Dick-Peddie* 216; Maslakh range, *Yahaya* 35; below Bolan pass, 1520 m, *R. R. Stewart* 28047; Hanna valley, 2130 m, *Lace* 3777.
General distribution: W, SE and NE Iran, Baluchistan, Soviet C Asia.

This is a most variable species in which several varieties have been recognised. Field observations and study of herbarium material have clearly

shown a continuous range in the characters used for defining the varieties; the fruiting calyx varies from 13–23 mm and the calyx indumentum varies from eglandular to more or less densely glandular.

The two cited Furse gatherings from Herat and Farah are anomalous in that the leaves are entire-margined, almost round to broadly elliptic, and the floral leaves are coloured or whitish.

S. macrosiphon is a common roadside and field plant throughout much of Afghanistan though it does also occur on stony hillsides. It has a pleasant fragrance which, in the field, was noted as being similar to fresh lemons.

S. macrosiphon is very closely related to *S. spinosa* and in the juvenile state can readily be confused with it. *S. macrosiphon* can be distinguished by the narrower fruiting calyces with non-prickly teeth, gradually acuminate floral leaves and the oblong or oblong-ovate leaves. In Mukerjee's 'Revision of the Labiatae of the Indian Empire' (Records Bot. Survey India 14: 109, 1940) the two species are confused and the specimens from the Kurram valley cited as *S. spinosa* are probably *S. macrosiphon*.

S. macrosiphon is also related to *S. moorcroftiana* but the latter species can usually be easily distinguished by the sturdier habit with thicker stems, the denser leaf indumentum, and the coloured floral leaves. It is possibly that in areas where the two species grow together—e.g. Quetta—they may hybridize.

10. **S. spinosa** L., Mant. 511 (1771) (Described in Mant. p. 26 under the name *S. aegyptiaca* and changed to *S. spinosa* in the Supplement because of an earlier *S. aegyptiaca* L.).

AFGHANISTAN: Maymana, c. 30 km W Maymana, edge of corn field, 500 m, 27 v 1962, *Hedge & Wendelbo* W. 3647. Herat: Herat to Sauzak, 1200 m, *Koeie* 3912.
General distribution: Palestine, S Turkey, Syria, Lebanon, Iraq, Transcaucasus, Iran, NW Afghanistan, Transcaspia.

Very closely allied to the previous species (see discussion above), *S. spinosa*, in Afghanistan, is apparently confined to the north-west. Like *S. macrosiphon*, it usually grows in fallow fields, near cultivation or roadsides.

11. **S. moorcroftiana** [Wall. ex] Benth. in Wall., Plant. As. Rar. 1: 67 (1830).

AFGHANISTAN: E Mamakhel, 1200 m, dry plain, fls. pale purple-blue, *Koelz* 11575; Ghazni to Shasgo, 1879–1880, *J. W. Johnston*.

W PAKISTAN: Kurram valley, Thal to Habibkalla, very common on exposed open plains up to 2100 m, iv and v, *Aitchison* 20, 56, 180. Quetta, Ziarat, *Lace* 3402.
General distribution: W Nepal, Kashmir, Punjab, NW Frontier provinces, E Afghanistan.

A variable species varying greatly in stature according to habit. The floral leaves and flowers vary from mauve to rose to almost white. The characteristic features of *S. moorcroftiana* are the discolorous leaves, white pannose below and green above, and the coloured floral leaves.

A common and sometimes abundant species in upper W Pakistan, usually growing near cultivation, disturbed habitats or roadsides, less commonly on

rocky slopes, *S. moorcroftiana* reaches the westernmost limit of its range in E Afghanistan.

12. **S. ariana** Hedge, **sp. nov.**

Affinis *S. moorcroftianae* Benth. et *S. seravschanicae* Regel & Schmalh.; a priore foliis angustioribus utrinque floccoso-tomentosis, calycibus et floribus longioribus divergit; ab altera foliis floralibus et calycibus majoribus recedit.

var. **ariana** (Plate 39).

Herba perennis, multicaulis. Caules floriferi 30–40 cm alti, erecti, quadrangulares, in dimidio superiore racemosi, in parte inferiore pilis eglandulosis provisi, in regione inflorescentiae pilis longis eglandulosis et pilis brevius glandulosis praediti. Folia pro maxime parte basalia. Folia inferiora petiolata; lamina oblongo-lanceolata, c. 9 × 3 cm, margine irregulariter crenulata, basi inaequaliter truncata, apice acuta vel obtusa, utrinque dense floccoso-tomentosa subtus glandulis sessilibus aureis; nervatura plana. Petiolus 5–10 cm, pilis eglandulosis longis obsitus. Folia caulina minora, 2–4-paria, sessilia. Verticillastra 8–12-nata, 4–6-flora, inferiora c. 2 cm distantia, superiora approximata. Folia floralia magna, late rotundato-ovata, membranacea, cordata, ad 17 × 23 mm, violacea vel albo-violacea suffusa, apice ± abrupte attenuata. Bracteae desunt. Pedicelli 0·5–1 mm. Calyx 20–22 mm longus, 13-nervosus, tubulosus, herbaceus, viridis vel viridi-violaceus ad tertiam partem bilabiatus, labiis vix divergentibus, pilis eglandulosis et pilis brevioribus capitatis et glandulis sessilibus praeditus; labium superius tridentatum, dente intermedio valde reducto, dentibus mucronatis acuminatis; labium inferius in dentes duos lineares acuminatos fissum. Corolla c. 30 mm, albo-violacea; tubus curvatus, exannulatus; galea curvata vix falcata, breviter retusa, c. 13 mm longa; labium inferius galea brevius, trilobatum, lobo mediano rotundato-dilatato, lobis lateralibus linearibus. Filamentum antherarum c. 11 mm longum; connectivum antherarum c. 18 mm, curvatum; theca fertilis c. 2 mm longa. Staminodia evoluta. Stylus exsertus, lobis valde inaequalibus. Nuculae laeves, trigonae, c. 3 mm longae. Floret Mai-Julio.

AFGHANISTAN: Prov. Bamian: west of Panjao, Godar, steep slatey screes; fls. ranging from pale bluish violet to white tinged violet; calyx from purplish to green, c. 2750 m, 2 vii 1962, *Hedge & Wendelbo* W. 4966 (holo. E, iso. BG). Prov. Maymana: Darrah Belčeragh, stony slopes, 1200 m, 30 v 1962, *Hedge & Wendelbo* W. 3766; Darrah Zang near Belčeragh, steep slopes and on cliff ledges, floral leaves purplish-lilac, fls. pale violet, 1400 m, 29 v 1962, *Hedge & Wendelbo* W. 3754. Prov. Kabul: Sar-e-Cheshme, steep slate scree, fls. dirty lilac, 2250 m, 23 vi 1962, *Hedge & Wendelbo* W. 4455; in faucibus inter Mollah Jakub et Dahan-e Siah Darreh, 4 km E Panjao (c. 34° 25′ N, 67° 10′ E), substr. Flysch, c. 2800 m, in glareosis, 23 vii 1962, *Rechinger* 18635! Prov. Ghazni: in faucibus Say Khoshkak (Nawar Kotal) inter Okak et Behzud (Diwal Kol), (c. 33° 53′ N, 67° 50′ E), c. 3150 m, in saxosis calc., 6 vii 1962, *Rechinger* 17857!; distr. Jaghuri, in jugo Kotal-e Ketschru, NW Sang-i Masha (c. 33° 20′ N, 67° 00′ E), in glareosis mobilibus, c. 2880 m, 2 vii 1962, *Rechinger* 17529!

var. **calophyta** Hedge, **var. nov.** (Plate 40).

Differt a var. *ariana* foliis ovatis, marginibus integris, inflorescentia densiore.

AFGHANISTAN: Maymana, between Maymana and Belčeragh, steep dry limestone slopes, floral leaves purplish-lilac, fls. paler coloured, c. 1100 m, 28 v 1962, *Hedge & Wendelbo* W. 3689 (holo. E, iso. BG).

The closest relatives of *S. ariana* are *S. moorcroftiana* Benth. and *S. seravschanica* Regel & Schmalh. It clearly differs from the former in the larger calyces and flowers and the oblong-lanceolate or ovate leaves with a dense white indumentum on both surfaces. *S. seravschanica* differs from *S. ariana* in the considerably shorter floral leaves and the shorter calyces. Although the geographic area of *S. moorcroftiana* (see above) is much closer to that of the new species than is the Pamir-Alai endemic *S. seravschanica*, it is to the latter species that *S. ariana* is more closely allied.

There is considerable variation in leaf size, density of indumentum, density of inflorescence and calyx size in the new species. The most anomalous gathering is the specimen that has been described as a new variety. It is a much more handsome plant than the others, with white-pannose, ovate leaves with entire margins and a very dense, compacted, showy inflorescence. In the field and after initial examination in the herbarium, I was of the opinion that it was a new species but after examining the range of variation in *S. ariana* I came to the conclusion that it was better given a lower status. It is however a very different looking plant from *S. ariana*, although in floral structure it is not significantly different, and further botanical exploration in NW and C Afghanistan might well show that it should be accorded a higher rank.

The habitat of *S. ariana* is either mobile screes or very steep stony slopes.

13. **S. ceratophylla** L., Sp. Plant. 27 (1753).

AFGHANISTAN: Herat, Badghis, in the low sandstone hills near Gulran, 900 m, *Aitchison* 530; Herat, *Koeie* 3854.
General distribution: Turkey, Transcaucasus, W and N Iran, NW Afghanistan.

Aitchison observed in his field notes that "*S. ceratophylla* was a characteristic but occasional species of the low Badghis sandstone hills". The collections from Herat are the most easterly records of the species.

S. semilanata Czerniak. (Feddes Rep. 27: 278, 1929–30) was described from the Soviet side of Kopet Dagh and separated from *S. ceratophylla* on the following differences; verticils widely separated and 1–3-fld., floral leaves gradually acuminate and white flowers. One of the specimens cited as *S. semilanata* by Czerniakowska was *Aitchison* 530. There is no justification for regarding the Aitchison specimen as different from *S. ceratophylla* and although I have not seen the type specimen, the sole difference in the description between *S. semilanata* and typical *S. ceratophylla* is the white corolla in the former; in *S. ceratophylla* the corolla is yellow, sulphur or yellowish white.

14. **S. sclarea** L., Sp. Plant. 27 (1753).

AFGHANISTAN: Herat: Tschischt, *Lindberg* 43/1962. Kabul: Paghman, 2180

m, *Koeie* 2305; Kabul: Kabul, fls. mauve, 1700 m, *Hay* 194. Parvan: Salang valley, 2130 m, fls. white, *Furse* 6556. Bamian: Ajar valley W Doab, fls. white, 12 vi 1962, *Hedge & Wendelbo* W. 4128. NE*: distr. Khash, *Koelz* 12917. Badakshan: Faizabad, 1100–1200 m, *Edelberg* 1608.
General distribution: Throughout most of Europe, SW and C Asia.

The colour of the floral leaves and flowers varies from mauve to white.

15. **S. rhytidea** Benth. in DC., Prodr. 12: 280 (1848).

Syn.: *S. edelbergii* Rech. f. in Dan. Biol. Skr. 8 (1): 63 (1954).
S. polychroma Rech. f. & Edelberg, l.c. 66.
S. polyclada Rech. f., l.c. 69.

AFGHANISTAN: Herat: Obeh, *Lindberg* 63/1962. Ghorat: in jugo Shutur Khan Kotal inter Qala Ahangaran et Qala Sharak, 2500 m, *Rechinger* 18848; in declivibus borealibus montis Kuh-Tscheling-Safed-Daraq (Pirestan) a Parjuman (Partcheman) meridiem versus, 2400 m, *Rechinger* 19097. Bamian: between Shahtu and Panjao, stony slopes, very common, 3000 m, 30 vi 1962, *Hedge & Wendelbo* W. 4874; Bamian valley, dry and irrigated ground, very common, *Hay* 390; Darrah Siakar near Bulola, hood blue-violet, labellum yellowish, 2000 m, *Hedge & Wendelbo* W. 4166; Shibar to Dushi, *Furse* 5886; between Bamian and Ghulgola, 2500 m, *Gilli* 3500; Band-i Amir ad lacum Band-i Panir, 2800 m, *Rechinger* 18346; Band-i Amir, *Lindberg* 221/1957; Band-i Amir, rich limestone steppe vegetation, 2900 m, *Hedge & Wendelbo* W. 4747. Kabul: Unai pass, 3100 m, *Gilli* 3501, *Neubauer* 502, *Rechinger* 18556; Farakalum, 2800 m, *Koeie* 3390; Sar-e Cheshme 2250 m, *Hedge & Wendelbo* W. 4466; Shibar pass, 2400 m, 22 viii 1939, *Koelz* 13507a (type of *S. polyclada* Rech. f.); Shibar pass, *Amsel, Koelz* 12160. Ghazni: distr. Behzud (Diwal Kol), Dahan-e Abdila, 35 km E Sar-e Chashma, 2800 m, *Rechinger* 17991; Okak, NE altoplanitiei Dasht-e Nawar (Naour), 3000 m, *Rechinger* 17764; in jugo Sardalu W Qarabagh, in declivibus saxosis, 2300–2500 m, *Rechinger* 17344; in valle fluvii Arghandab prope Sang-i Masha, 2400 m, *Rechinger* 17519. Parvan: Panjshir valley, Mukeni, streamside, labellum almost always spotted, frequent, usually in undisturbed habitats, 2500 m, *Hedge & Wendelbo* W. 5116; Panjshir valley area, 3900 m, *Baillie & Dunsheath* 15. Nangrahar: Minjan, Nau, 2700 m, field border, *Edelberg* 1437 (type of *S. polychroma* Rech. f. & Edelberg); Minjan, Ptili, 2700 m, *Edelberg* 1300 (type of *S. edelbergii* Rech. f.); Daulatshah, 2100 m, *Koelz* 11633; Tera Kotal, 2400 m, *Koelz* 11888; Schingar in Porande valley, 2220 m, *Gilli* 3499. Paktia: above Gardez, 2400 m, *Koelz* 11971. Afghanistan, provenance uncertain, *Griffith* (type of *S. rhytidea* Benth.).

W PAKISTAN: Kurram valley, common from Kurram to Alikhel, *Aitchison* 474. Chitral: Lutko, 2560 m, *Bowes Lyon* 802.
General distribution: Afghanistan, W Pakistan.

Study of abundant herbarium material and observations in the field have led me to the conclusion that only one variable species can be recognised. When Rechinger described *S. polyclada*, *S. polychroma* and *S. edelbergii*, there were good reasons for regarding them on morphological and distributional grounds as new species but since then the numerous new gatherings from all over Afghanistan show that they can only be regarded as local forms

* Cf. the map given by Rechinger in Symbolae Afghanicae 1: 4 (1954).

of *S. rhytidea*. There is great variation in density of leaf indumentum, calyx size, the length and shape of the calyx teeth, floral leaf size and flower size.

In Afghanistan, *S. rhytidea* is the commonest species of *Salvia*. In parts of the Hazarajat, it is often one of the dominant species in areas that have been over-grazed and where the vegetation is now reduced to a few species such as *Leucopoa karatavica* (Bge.) Krecz. & Bobr., *Eremurus kaufmannii* Regel, *E. stenophyllus* (Boiss. & Buhse) Baker and spiny *Astragalus*, *Cousinia* and *Acantholimon* species. *S. rhytidea* is usually found in or near disturbed habitats such as over-grazed slopes, roadsides, edges of fields and irrigation ditches and only seldom grows in more natural habitats. Although, when in Afghanistan in 1962, I formed the impression that towards the east of its distributional range the plant tended to grow in natural habitats, had a thinner indumentum on the upper leaf surface and had larger floral leaves and could possibly be recognised taxonomically, this impression has not been substantiated during detailed examination of a large number of herbarium specimens and I find it impossible to recognise a separate taxon in the Nuristan region.

S. rhytidea appears to be a rapidly spreading weed throughout Afghanistan. It generally grows above 2000 m and is found up to almost 4000 m. Although *S. rhytidea* is a common and often abundant plant in Afghanistan, it has a very limited distribution elsewhere; the only records, to date, are from Chitral and the Kurram valley.

The species group to which *S. rhytidea* belongs is characterised by the exannulate, swollen, invaginated corolla tube, the blue-violet hood and yellow labellum. The other species all grow to the west of Afghanistan: the seldom collected *S. khorassanica* Bge. from NE Iran, *S. lasearica* Rech. f. from SE Iran, *S. sahendica* Boiss. & Buhse and *S. gilliatii* Turrill from Irani-Ajerbaidjan and *S. chrysophylla* from SW Turkey. *S. rhytidea* is most closely allied to *S. lasearica*.

16. **S. nubicola** [Wall. ex] Sweet, Brit. Flower Garden 2: 140 (1825–27).

AFGHANISTAN: Parvan: Panjshir valley, Mukeni, stream side, fairly common along the stream, 2500 m, 16 vii 1962, *Hedge & Wendelbo* W. 5114; Ruka, 2100 m, 10 x 1948, *Koeie* 2957. E: Schechan, 2200 m, 12 ix 1951, *Gilli* 3498. NE: Basarak, 2050 m, 26 viii 1950, *Gilli* 3497.

W PAKISTAN: Chitral: Brumboret, SW Chitral, edge of fields, 2740 m, 5 ix 1958, *Stainton* 3214; Laspur river, 2450 m, *Bowes Lyon* 97; Brep, N of Mastuj, 2430 m, *Stainton* 3076. Kurram valley: dry water courses, *Aitchison* 594. Swat: Utror (c. 35° 35′ N, 72° 25′ E), in apertis *cedretarum*, 2500 m, 23 viii 1962, *Rechinger* 19584. Quetta: between Kach and Chauter, stony watercourses, *Lace* 3370.

General distribution: Bhutan, Sikkim, Nepal, Kashmir, Tibet, Chamba, NW Frontier provinces, Chitral, Baluchistan, E Afghanistan.

The confusion of this species and *S. glutinosa* L. has been discussed in a previous paper (Hedge in Notes R.B.G. Edinb. 23: 205–208: 1961). In Afghanistan, *S. nubicola*, a representative of the "Himalayan" floral element, is a good marker-species for the Nuristan area whose vegetation, because of the heavier rainfall, is clearly different from the rest of the country.

17. **S. virgata** Jacq., Hort. Vindob. 1: 14 (1770).

AFGHANISTAN: Kabul: Paghman, 4 viii 1950, *Neubauer* 697.
General distribution: S Europe, Balkans, SW and C Asia.

Possibly an introduced weed at Paghman, its only recorded station in Afghanistan.

18. **S. aegyptiaca** L., Sp. Plant. 23 (1753).

AFGHANISTAN: Nangrahar: between Jalalabad and Laghman, 650 m, corolla whitish spotted blue, *Gilli* 3509.

W PAKISTAN: Khyber pass, 1200 m, *Halcro-Johnston* 113. Kurram valley, Thal to Badish-khel, *Aitchison* 499.
General distribution: N Africa, Arabia, Iraq, S Iran, Afghanistan, W Pakistan, Punjab.

Probably more widespread in W and S Afghanistan than the solitary Afghan record would suggest. There is little justification for recognising var. *intermedia* Stibal (Feddes Rep. 39: 182, 1935–36) which was based on plants with long, spreading, eglandular calyx hairs. All intermediates occur between this form and the adpressed eglandular calyx hairs of the typical form.

19. **S. santolinifolia** Boiss. in Boiss., Diagn. Pl. Orient. 1 (5): 13 (1844).

AFGHANISTAN: Kandahar: desert north of Kandahar, 1070 m, 4 vi 1949, *Gilli* 3510; Pirzada, 900 m, 18 vi 1948, *Koeie* 2033.

W PAKISTAN: Peshawar: Jamrud to Bara fort, 31 v 1958, *Burtt* 704. Quetta (R. R. Stewart in litt.).
General distribution: S Iran, Pakistan, Baluchistan, Peshawar, SE Afghanistan, Punjab, Sind.

Very closely related to this species, and doubtfully different, is *S. lacei* Mukerjee (Notes R.B.G. Edinb. 19: 304, 1938). This species was described from one gathering, *Lace* 3967, from Chappar Rift near Quetta. The only important difference between it and *S. santolinifolia* is leaf shape; ovate-deltoid, flat in *S. lacei* and linear with revolute margins in *S. santolinifolia*. Field observations are necessary to determine whether this difference is constant or is merely a casual habitat form. *S. lacei* was collected in November and this may account for the anomalous leaf shape.

20. **S. trichocalycina** Benth. in DC., Prodr. 12: 356 (1848).

AFGHANISTAN: Kandahar: Turnuk, *Griffith* 528 (?791 see note below). Kabul: 12–15 km W Sarobi, very dry, steep conglomerate hills, semi-shrub, fls. violet, fragrant, 1100 m, 27 iv 1962, *Hedge & Wendelbo* W. 2794.
General distribution: endemic.

S. trichocalycina is closely related to *S. santolinifolia* but differs in the longer pedicels and floral leaves, leafier stems and the calyx size and shape. In *S. trichocalycina*, the calyx is tubular to funnel-shaped, c. 6 mm long; in *S. santolinifolia*, the calyx is ovate to campanulate, c. 4 mm long.

The specimen collected by Wendelbo and myself is apparently the first re-gathering since Griffith's original find.

As is not unusual with the citation of Griffith specimens, there is doubt about the collector's number. In the original description, Bentham cites *Griffith* 528. The specimen with this number at Kew is *S. trichocalycina* with the specific name written on by Bentham but with no locality given other than 'Afghanistan'. On a separate sheet at Kew without a Griffith number (but with the East India Company herbarium no. 3984) is the same species with, in presumably Griffith's handwriting, "Limestone hills near Turnuk". In Griffith's Itinerary Notes, no. 528 is 'Heliotropioides' and does not agree with *S. trichocalycina* Griffith, but 791 agrees well with the species under discussion and is from Turnuk. It is probable that this is the correct number of the type gathering.

21. **S. macilenta** Boiss. in Boiss., Diagn. Pl. Orient. 1 (5): 13 (1844).

AFGHANISTAN: Farah: Farah, 700 m, *Koeie* 4067.
General distribution: Oman, Irani Balucistan, SW Afghanistan.

A very distinct species easily recognised by the long twiggy branches, long internodes and few very narrow leaves.

22. **S. plebeia** R. Br. in Prodr. Fl. Nov. Holl. 501 (1810).

W PAKISTAN: Chitral: Drosh, 1300 m, edge of fields, 10 v 1958, *Stainton* 2389. Peshawar: near Akora, common weed, 15 iv 1958, *Burtt* 550. Kurram valley: Shinnak, common, *Aitchison* 36.
General distribution: Australia, China, Malaysia, Himalayan region, throughout India, W Pakistan.

Although not yet recorded from Afghanistan, it is probable that this widespread annual weed with very small calyces and mauve flowers will be found in the eastern part of the country.

DISTRIBUTION MAPS

The following 'spot' maps give the distributions of all known species of *Salvia* in the area. It is hoped that their obvious incompleteness will act as a spur to collectors in Afghanistan to make them more complete.

FIG. 1. Map of Afghanistan to show provinces and main towns.

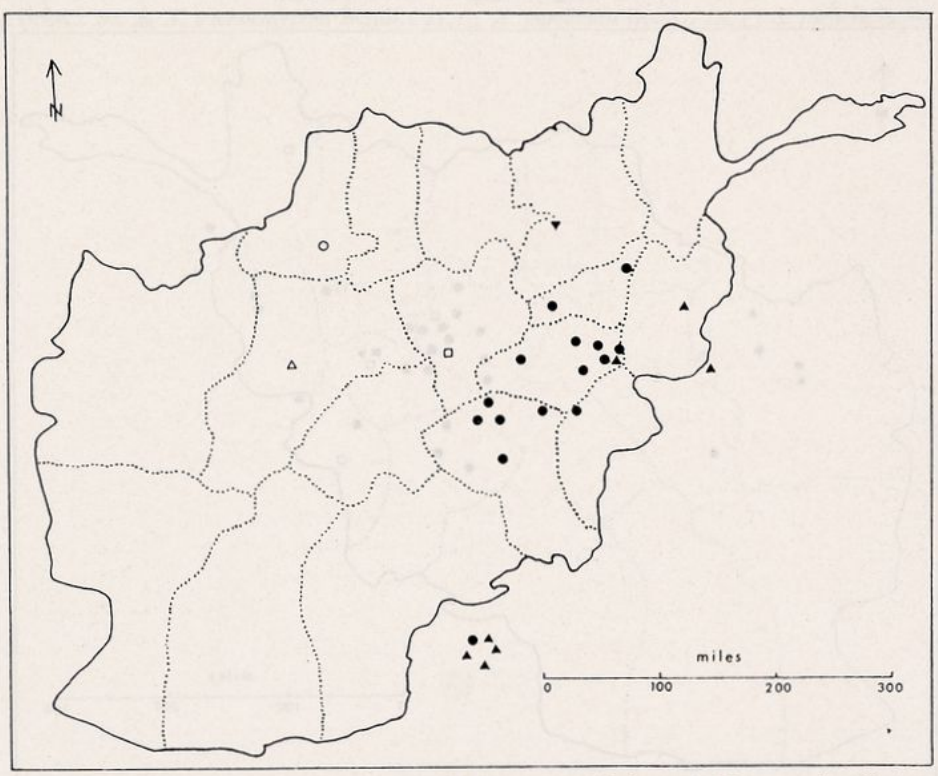

FIG. 2. Distribution in Afghanistan of: 1. □ *S. tetrodonta* Hedge: 2, ▼ *S. pterocalyx* Hedge: 3, △ *S.* "*sp. nov.*": 4, ▲ *S. cabulica* Benth.: 5, ● *S. bucharica* M. Pop.: 6, ○ *S. maymanica* Hedge.

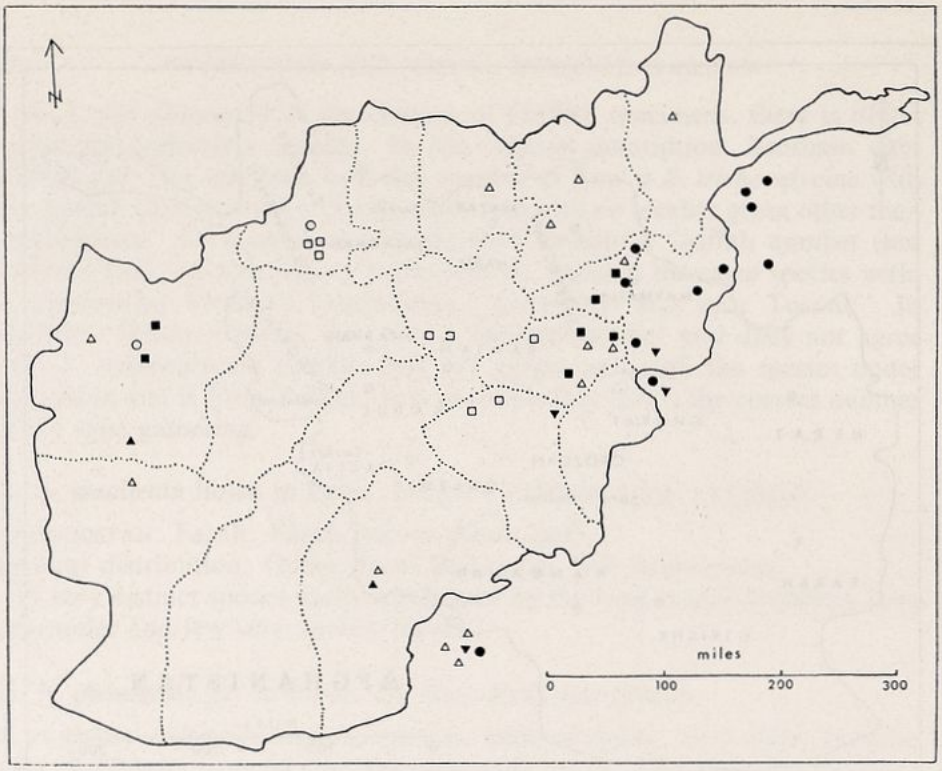

FIG. 3. Distribution in Afghanistan of: 7, ▲ *S. compressa* Vahl: 8, ■ *S. leriifolia* Benth.: 9, △ *S. macrosiphon* Boiss.: 10, ○ *S. spinosa* L.: 11, ▼ *S. moorcroftiana* Benth.: 12, □ *S. ariana* Hedge: 16, ● *S. nubicola* Sweet.

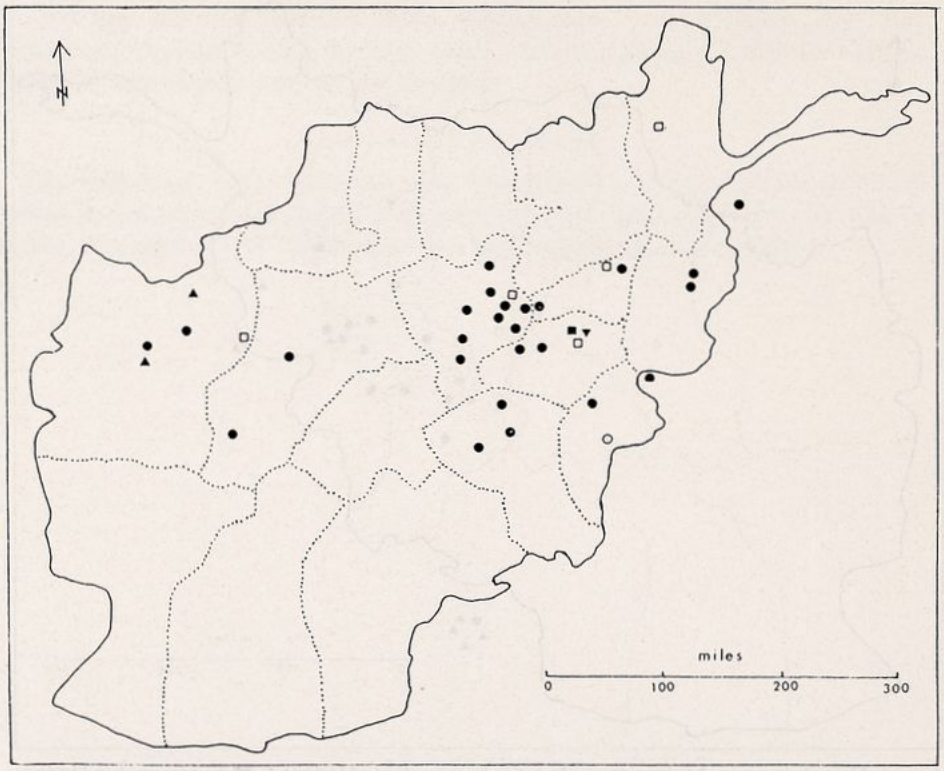

FIG. 4. Distribution in Afghanistan of: 13, ▲ *S. ceratophylla* L.: 14, □ *S. sclarea* L.: 15, ● *S. rhytidea* Benth.: 17, ▼ *S. virgata* Jacq.

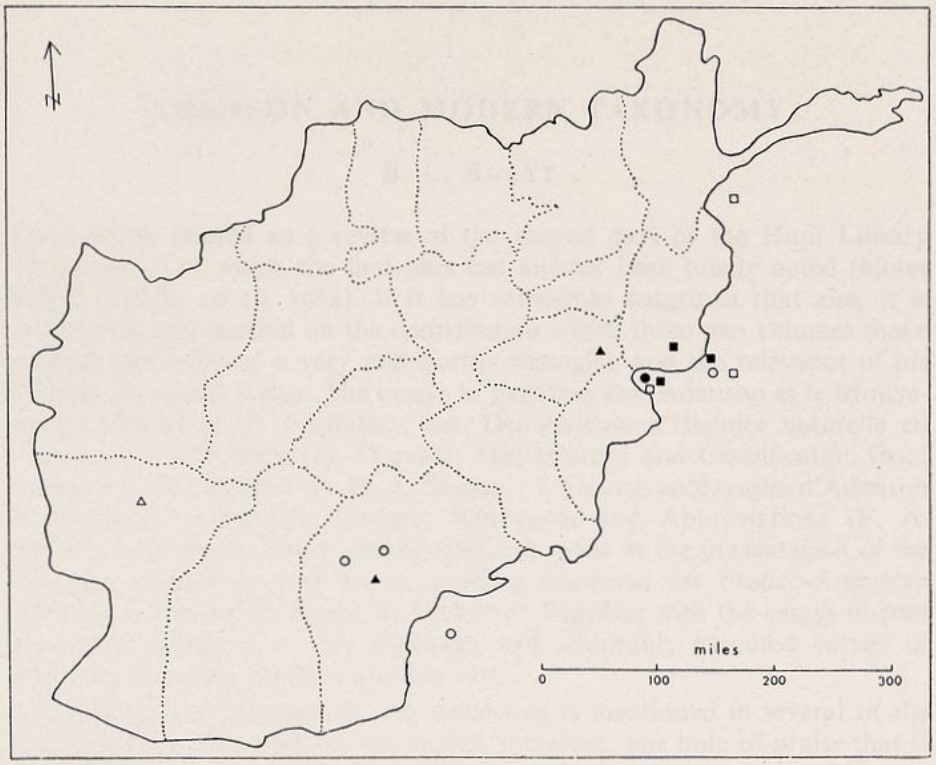

FIG. 5. Distribution in Afghanistan of: 18, ■ *S. aegyptiaca* L.: 19, ○ *S. santolinifolia* Boiss.: 20, ▲ *S. trichocalycina* Benth.: 21, △ *S. macilenta* Boiss.: 22, □ *S. plebeia* R. Br.