

TAXONOMIC STUDIES IN STACHYS I:

NEW SPECIES AND INFRA-SPECIFIC TAXA FROM TURKEY

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ABSTRACT. Various aspects of the taxonomy of Turkish species of *Stachys* are dealt with: seven new species and several new infra-specific taxa are described; infra-specific classifications are given for such polymorphic species as *S. germanica* L., *S. setifera* C. A. Meyer, *S. lavandulifolia* Vahl, *S. iberica* Bieb., *S. annua* (L.) L. and *S. officinalis* (L.) Trevisan; some species are recorded from Anatolia for the first time; other misunderstood taxa are discussed.

The new taxa described here are among the seventy species of *Stachys* (including *Betonica*) found to occur in Turkey during my revision of the genus in that area undertaken at Edinburgh**. I am indebted to Dr A. Huber-Morath (Basel) for the loan of his rich collection, and for co-authorship in several new taxa recognised by him. The species are arranged in the order to be adopted in the *Flora of Turkey*, vol. 7. All specimens cited have been seen, unless indicated to the contrary. An exclamation mark after a synonym means that type material has been seen.

A later contribution will introduce a new infra-generic classification of *Stachys* as it occurs in Europe, N Africa, and SW Asia.

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S. germanica L., Sp. Pl. 581 (1753).

- 1 Flowering stem and calyx with eglandular hairs; calyx teeth erect in fruit 3
- + Flowering stem and calyx with glandular hairs, sometimes flowering stem without glandular hairs; calyx teeth recurved in fruit 2
- 2 Flowering stem glandular above; calyx teeth ovate-triangular, slightly recurved in fruit subsp. *bithynica*
- + Flowering stem eglandular; calyx teeth triangular-lanceolate, strongly recurved in fruit subsp. *tymphaea*
- 3 Lowest floral leaves triangular-ovate, cordate, widest at base subsp. *lusitanica*
- + Lowest floral leaves cuneate at base, not cordate, widest above the base 4
- 4 Calyx teeth c. $\frac{1}{2}$ as long as tube subsp. *germanica*
- + Calyx teeth c. $\frac{1}{3}$ as long as tube subsp. *heldreichii*

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** R. Bhattacharjee. 1973. Taxonomic studies in the genus *Stachys* with particular reference to the Near East. Ph.D. thesis, University of Edinburgh.

subsp. **germanica**Syn.: *S. lanata* Crantz, Stirp. Austr. ed. 2, fasc. 4:267 (1769).*S. penicillata* Heldr. & Sart. in Boiss., Diagn. ser. 2, 4:37 (1859)!*S. sublanata* Fleisch. ex Nyman, Consp. Fl. Eur. 577 (1881)!*S. heterodonta* Zefirov in Not. Syst. (Leningrad) 14:341 (1951)!

Distribution: Widespread in Europe and SW Asia, but not seen from Turkey.

It is possible that some other binomials in the *S. germanica* complex may be referable to this subspecies.

subsp. **heldreichii** (Boiss.) Hayek, Prodr. Fl. Balc. 2:285 (1931).Syn.: *S. heldreichii* Boiss., Fl. Or. 4:721 (1879).

Distribution: S part of the Balkan peninsula and SW Anatolia (rare).

subsp. **bithynica** (Boiss.) Bhattacharjee, **comb. et stat. nov.**Syn.: *S. bithynica* Boiss., Diagn. ser. 1, 5:28 (1844)!*S. germanica* L. var. *bithynica* (Boiss.) Boiss., Fl. Or. 4:720 (1879)!*S. pisidica* Boiss. & Heldr. in Boiss., Diagn. ser. 1, 12:75 (1853)!

Distribution: Greece, Crimea, N Turkey & SW Anatolia.

subsp. **tymphaea** (Hausskn.) Bhattacharjee, **comb. et stat. nov.**Syn.: *S. tymphaea* Hausskn., Mitt. Thür. Bot. Ver. ser. 1, 5:70 (1886); Tutin et al., Fl. Europaea 3:153 (1972).*S. reinertii* Heldr. ex Halácsy, Cons. Fl. Gr. 2:521 (1902).

Distribution: C & S Italy; W part of Balkan peninsula.

subsp. **lusitanica** (Hoffmanns. & Link) Coutinho, Fl. Port. 520 (1913).

Distribution: S part of Iberian peninsula.

S. germanica L. is a widespread polytypic species growing throughout Europe and SW Asia. It forms a more or less coherent group together with the closely allied *S. alpina* L. and *S. balansae* Boiss. & Kotschy (q.v.); sometimes considerable difficulty arises in separating these species due to the large amount of character overlap.

The main character by which *S. germanica* L. is separated from *S. tymphaea* Hausskn. (cf. Fl. Europaea 3:153, 1972) is the glandulosity of the indumentum, the former being eglandular throughout and the latter with glandular calyx teeth. Again, *S. bithynica*, at first treated as a distinct species (Boiss., Diagn. ser. 1, 1844) and later as a variety (Boiss., Fl. Or. 1879) of *S. germanica* L., has glandular hairs on the stem and calyx teeth, though on the stem they are not readily apparent, being concealed under long and dense eglandular hairs. So it is quite obvious that the presence or absence of glandular hairs is not sufficient to separate *S. germanica* L., *S. tymphaea* Hausskn. and *S. bithynica* Boiss. at specific rank, as other characters such as leaf shape, length and shape of calyx teeth and mucro, density of indumentum and of verticillasters show different degrees of overlap throughout the whole range of distribution. For a consistent and more practical treatment, it is better to assign them subspecific rank. Eglandular forms of *S. germanica* are mainly restricted to the western part of its range (Europe eastwards to the Balkan peninsula), and fall into 3 subspecies, viz. *lusitanica*, *heldreichii* and *germanica* as recognised in Fl. Europaea 3:153 (1972); the form with glandular calyces, reported from C & S

Italy and W part of the Balkan peninsula and maintained as a distinct species, *S. tymphaea*, should be considered as a subspecies *S. germanica* ssp. *tymphaea*, and the glandular *S. bithynica*, mainly restricted to the eastern part, particularly NW Turkey, should be treated as *S. germanica* ssp. *bithynica*.

Subspecies *bithynica* in Anatolia, particularly distinct in NW Anatolia, shows an affinity with the eastern species *S. balansae* Boiss. & Kotschy, from which it is mainly distinguished by its broadly ovate-oblong cauline leaves and dense and adpressed-floccose indumentum on the lower leaf surface. But where these two taxa approach each other geographically in N Anatolia (Kastamonu and Amasya), these distinguishing characters break down to a considerable extent (*Sinten* 4286B and *Darrah* 64 from Ilgaz Dağ, and *Bornmüller* 2873 from Amasya). The possible hybrid origin of these specimens is suggested by their high percentage of sterile pollen and no apparent seed output. Subsp. *heldreichii* has been seen only once from Muğla (*Davis* 13564) where its occurrence may be due to chance introduction from the mainland of S Greece.

***S. alpina* L. subsp. *macrophylla* (Albow) Bhattacharjee, comb. et stat. nov.**

Syn.: *S. macrophylla* Albow, Prodr. Fl. Colch. 1:202 (1895).

S. masanderana Bornm. & Gauba in Feddes Rep. 49:269 (1940).

Turkey. A5 Sinop: Çangal Da. above Ayancik, 900 m, *Davis* 38177.

Distribution: Caucasia, N Iran.

This subspecies is the only representative of *S. alpina* L. in Turkey and has only been collected once. From the typical subspecies which grows in W, C & S Europe, it differs in having floral leaves abruptly shorter than the cauline leaves, being only as long as the verticillasters or even shorter, and by its smaller bracts and flowers. The variation present in *S. alpina* L., however, does not justify treating subsp. *macrophylla* as a distinct species, as is done in Fl. URSS 21:208 (1954). Cf. under *S. balansae* below for distinctions between that species, *S. alpina* subsp. *macrophylla* and *S. germanica* subsp. *bithynica*.

***S. balansae* Boiss. & Kotschy in Boiss., Fl. Or. 4:723 (1879).**

- 1 Leaves sericeous-pilose on upper surface; median cauline leaves narrowly oblong-lanceolate, length/breadth ratio 2.5-4

subsp. *balansae*

- + Leaves glabrescent on upper surface; median cauline leaves oval to broadly elliptic, length/breadth ratio 1.6-1.7

subsp. *carduchorum*

subsp. *balansae*

Syn.: *S. terekensis* Knorr. in Not. Syst. (Leningrad) 15:342 (1953).

Distribution: E Anatolia, Crimea, Caucasia & W Iran.

subsp. *carduchorum* Bhattacharjee, subsp. nov.

A typo caulibus et foliis glabrescentibus, foliis caulinis medianis ovalibus vel late ellipticis recedit.

Turkey. B9 Bitlis, d. Kotum: Karz Da. above Kemer, 2200 m, *Davis* 24593; Van, d. Şatak: Kavuşşahap Da., D. 23214; Artos Da. above Gevaş, 3000 m, *McNeill* 751. C9 Hakkari: Cilo Da., in gorge between Cilo Yayla and Diz deresi, 2438 m, 10 viii 1954, *Davis* & *O. Polunin*, D. 24265 (holo. E).

This subspecies is endemic to SE Anatolia. *S. balansae* is closely allied to *S. germanica* L. ssp. *bithynica* (Boiss.) Bhattacharjee and to *S. alpina* L. ssp. *macrophylla* (Albow) Bhattacharjee. From the former it is distinguished by having oblong to oblong-lanceolate basal and cauline leaves, less dense stem indumentum, lower surface of lamina not densely floccose-tomentose, and leaf-margin crenate-serrate. It differs from *S. alpina* in not having broadly ovate leaves, and fruiting calyces not being distinctly nerved and teeth not patently recurved in fruit. Davis 22366 from Bitlis approaches *S. germanica* in having dense stem indumentum and the lower leaf surface densely floccose-tomentose, but in leaf shape and in geographical distribution it is closer to *S. balansae*.

***S. rizeënsis* Bhattacharjee, sp. nov.**

Affinis *S. balansae* Boiss. & Kotschy sed caulibus inferne procumbentibus, foliis ovato-ellipticis minoribus basi rotundatis obscure crenulatis recedit.

Herba perennis caudicibus subterraneis. *Caules floriferi* ascendentes erecti, 30-40 cm longi, 0.15-0.25 cm lati, prope basin ramosi, inferne pubescentes, superne villosi, pilis eglandulosis cum pilis brevioribus glandulosis mixtis. *Folia caulina* ovato-elliptica vel ovata, 1.5-3.5 cm longa, 0.6-2.5 cm lata, leviter crenulata, obtusa, basi subcordata vel rotundata, subtus $\pm$ rugosa, supra sparsim sericea, petiolo 0.8-2 cm longo, adpresse tomentosa. *Folia floralia* subsessilia vel sessilia, ovato-oblonga vel rhomboideo-lanceolata, 1.3-5 $\times$ 0.3-1.8 cm, subintegra, apice obtusa vel acuta, basi cuneata, superne verticillastris aequilonga. *Verticillastri* remoti, 1.2-4 cm distantes, 8-10-flori. *Bracteeae* lanceolatae vel lineari-lanceolatae, 0.5-1.2 cm longae, herbaceae, pilosae, apice haud spinescentes. *Pedicelli* 2-3 mm longi. *Calyx* subbilabiatus, subcampanulatus, 10-11 cm longus, sericeo-tomentosus; dentes subaequales, ovato-lanceolati, apice mucronatis. *Corolla* 15-18 mm longa, roseo-purpurea; tubus 7-10 mm longus, subexsertus, intus annulatus; galea retusa vel emarginata, 6-8 mm longa; labium inferius 8-10 mm longum. *Stamina* usque ad medium galeae exserta. *Nuculae* ignotae. *Fl.* 8.

Turkey. A8 Rize: d. Ikizdere, Baltaş Tepe, 3200 m, dioritic screes, 30 viii 1952, Davis & Dodds, D. 21114 (holo. E; iso. K).

This alpine scree species shows a close affinity with *S. balansae* Boiss. & Kotschy, but differs from it in habit (the subterranean caudices penetrating among the stones), leaf shape and ecology; *S. balansae* grows in mesophytic habitats at lower altitudes.

***S. huber-morathii* Bhattacharjee, sp. nov.**

Affinis *S. alpinae* L. et *S. balansae* Boiss. sed ab ambabus foliis basalibus crassis $\pm$ rugosis ovato-oblongis basi truncatis vel cuneatis, indumento ad nodos et ad basin calycis dense villosa differt.

Herba biennis vel perennans foliorum rosulis basalibus. *Caulis floriferus* erectus, crassus, 20-50 cm longus, 0.3-0.7 cm latus, simplex vel superne interdum sparsim vel breviter ramosus; indumentum ad internodos sparsim e pilis brevibus patentibus glandulosis et eglandulosis consistens sed ad nodos dense villosum, pilis c. 6-8 mm longis. *Folia basalia* oblonga vel ovato-oblonga,

2-1.5 cm longa, 1-7 cm lata, rugosa, crenata, apice $\pm$ obtusa, basi truncata vel cuneata, supra sericeo-tomentosa, subtus sparsim tomentosa, petiolo 2-6 cm longo. *Folia caulina* pauca, 2-3-binata, ovata vel raro ovato-lanceolata, 3-7 cm longa, 2-4.5 cm lata, apice acuta, sessilia vel subsessilia. *Folia floralia* sessilia, ovata, 1-4.5 cm longa, 0.7-3.5 cm lata, superne verticillastris aequilonga. *Verticillastri* 8-15-nati, 14-16-flori, inferiores remoti, 2-4.5 cm distantes, superiores approximati. *Bracteae* lanceolatae vel lineari-lanceolatae, 8-14 mm longae, herbaceae, pilosae, apice nec spinescentes. *Pedicelli* 1.5-4 mm longi. *Calyx* subbilabiatus, subcampanulatus, 14-16 mm longus, basi villosus; dentes inaequales, ovati vel oblongo-acuminati, in fructu recurvati; dentes superiores 4-5 mm, inferiores, 3-4 mm, ad marginem pilis glandulis obsiti, mucrone 0.8-1 mm longo. *Corolla* 17-19 mm longa, rosea, tubo 9-11 mm longo, subexserto; labium superius 5-6.5 mm longum, inferius 8-9 mm longum. *Nuculae* obovatae, 2.8 $\times$ 2.2 mm, basi subalatae. *Fl.* 5-7.

Turkey. A5 Çorum: Kirkdili Boğazi, Quercetum 22 km N von Çorum, 1120-1250 m, 24 vi 1955, *Huber-Morath* 14187, *Simon* (holo. herb. Hub.-Mor.; iso. herb. Simon, Basel). A5/6 Samsun: Ladik Istasyon, Karadağ, 900 m, *Tobey* 1100, 1100A (E).

In addition to the characters cited in the diagnosis, the species differs further from *S. alpina* in the fruiting calyx not being distinctly nerved. In general habit this shaggy species is very distinct from *S. alpina* and *S. balansae*; the solitary stems bear verticillasters nearly to the base.

S. bayburtensis Bhattacharjee & Huber-Morath, sp. nov.

Species valde distincta, affinis *S. huetii* Boiss. sed caulibus multiramosis tenuioribus, foliis caulinis parvis basin cuneatis vel attenuatis, verticillastris magis approximatis, calycis dentibus brevioribus differt.

Herba perennis, caudicibus $\pm$ subterraneis, ramosis. *Caules floriferi* ascendentes, graciles, 30-35 cm longi, 0.25 cm lati, valde ramosi, dense foliati. *Caules* inferne breviter sparsim tomentelli, superne densius vestiti pilis eglandulosis et glandulosis sparsis subsessilibus. *Folia caulina* inferiora oblonga vel ovato-oblonga, 1.6-2.5 cm longa, 0.3-1.2 cm lata, basi cuneata vel attenuata, obtusa, leviter crenulata, rugosa, sparsim adpresse pilosa, petiolo 1.2-2 cm longo; mediana similia sed breviora. *Folia floralia* subsessilia vel sessilia, oblongo-lanceolata, 0.8-1.5 cm longa, 0.5-0.8 cm lata, leviter crenulata vel subintegra, basi attenuata, verticillastris paulo longiora. *Verticillastri* 2-4-nati, remoti, 1-3.5 cm distantes, 6-8(-10)-flori. *Bracteae* lineares vel lanceolatae, 4-8.5 mm longae, herbaceae, dense pilosae, apice molliter spinulescentes. *Pedicelli* 1-2 mm longi. *Calyx* $\pm$ regularis, subcampanulatus, 8.5-10.5 mm longus, basin versus dense adpresse tomentosus superne sparsim vestitus; dentes $\pm$ aequales, erecti, triangulari-lanceolati, longitudine dimidium tubi aequantes, apice spinescentes, mucrone 0.8-1.2 mm longo, ad marginem pilis eglandulosis obsiti. *Corolla* 10.5-14.5 mm longa, in sicco flavescens; tubus exsertus, 5-7.5 mm longus, intus annulatus; galea leviter retusa, 3-4.5 mm longa; labium inferius 6-7 mm longum. *Stamina* usque ad medium galeae exserta. *Nuculae* ignotae. *Fl.* 6-7.

Turkey. A8 Gümüşane: Bayburt, Kop Da., Bayburt-Aşkale, 2050-2100 m, 5 vii 1955, *Huber-Morath* 14186 (holo. herb. Hub.-Mor.).

Although the few-flowered verticillasters and smaller cauline leaves give the new species a superficial resemblance to *S. ballotiformis* Vatke and its allies, overall resemblances clearly place it in Sect. *Eriostomum* (Hoffmanns. & Link) Dumort., particularly in the vicinity of *S. huetii* Boiss. and *S. spectabilis* Choisy. After examining the type material of *S. huetii* from the Geneva herbarium and from Kew, I have no hesitation in placing *S. bayburtensis* in its proper systematic position. Though very distinct, it shows resemblance to *S. huetii* in the nature of its indumentum, ascending habit, and $\pm$ regular and erect calyx teeth without glandular hairs.

***S. cataonica* Bhattacharjee & Huber-Morath, sp. nov.**

Valde affinis *S. pumilae* Banks & Sol. sed pedunculo et calyce patenter piloso differt.

Herba perennis suffrutescens basi rosulis densis sterilibus provisa. *Caules floriferi* 7-24 cm longi plerumque haud ramosi. *Pedunculi* sparsim patenter pilosi, pilis glandulosis et eglandulosis obsiti. *Folia basalia* oblongo-elliptica vel ovato-oblonga, 2.5 cm longa, 1.3 cm lata, crenulata, apice obtusa, basi cordata vel subcordata; petiolus 1.5-3 cm longus. *Folia caulina* 1-2-binata, breviter petiolata vel subsessilia, petiolo 0.2-1.5 cm longo, foliis basalibus similia sed breviora, 0.5-2.5 cm longa, 0.3-1.5 cm lata. *Folia floralia* sessilia vel subsessilia, foliis caulinis similia, 1-3 cm longa, 0.4-1.5 cm lata, verticillastros aequantia vel paulo longiora. *Indumentum foliorum* et petiolorum e pilis paucis patentibus compositum. *Verticillastri* 2-5-nati plerumque remoti, 1-7 cm distantes, 8-12-flori. *Bracteae* oblongo-lanceolatae, 3-6.5 mm longae, herbaceae. *Pedicelli* 0.8-2 mm longi. *Calyx* subbilabiatus, subcampanulatus, 7-9 mm longus, molliter pilosus; dentes triangulari-lanceolati, 2-2.5 mm longi, glandulis sessilibus et pilis eglandulosis et saepe glandulosis patenter pilosi. *Corolla* 12-14 mm longa, flavida; tubus subexsertus, 5.5-6 mm longus; galea 4.5-5 mm longa, concava, apice angustata, integra; labium inferius 5.5-6 mm longum. *Stamina* usque ad medium galeae exserta. *Nuculae* obovatae, 1.2 $\times$ 1.2 mm. *Fl.* 6-7.

Turkey. B6 Malatya: d. Akçadağ, Akçadağ-Darende, Kalkfelsen 9 km ob Akçadağ, 1350 m, 19 vi 1949, *Huber-Morath* 8960 (holo. herb. Hub.-Mor.). B6 Malatya: Darende to Akçadağ, 1524 m, *Davis* 21902; Kavak Avghatch (Akçadağ) to Arga, 16 vii 1906, *B. Post* 891.

This new species is geographically separated from the rest of the species in Boissier's group *Infrarosulares* (1879). Although the closely related *S. pumila* (Taurus & Amanus) is a very variable species, it never has the indumentum characteristic of *S. cataonica*. From *S. rupestris* Mont. & Auch. ex Benth. the new species is distinguishable by its smaller calyx and bracts.

***S. citrina* Boiss. & Heldr. apud Benth. in DC., Prodr. 21:490 (1848).**

- 1 Indumentum densely white-tomentose; calyx teeth shortly triangular, $\frac{1}{4}$ - $\frac{1}{3}$ as long as tube subsp. *citrina*
- + Indumentum sparsely tomentose; calyx teeth triangular-lanceolate, c. $\frac{1}{2}$ as long as tube subsp. *chamaesideritis*

subsp. *citrina*

Distribution: S Anatolia (Cilician Taurus).

subsp. *chamaesideritis* (Boiss.) Bhattacharjee, **stat. nov.**

Syn.: *S. chamaesideritis* Boiss. & Bal. in Boiss., Diagn. ser. 2, 4:41 (1859).

S. citrina Boiss. & Heldr. var. *chamaesideritis* Boiss., Fl. Or. 4:744 (1879).

Distribution S and adjacent C Anatolia (mainly Anti-Taurus and Bulgar Da.).

S. setifera C. A. Mey., Verz. Pfl. Cauc. 94 (1831).

- 1 Stem sparsely and retrorsely adpressed-pilose to pubescent; median cauline leaves usually narrowly oblong lanceolate with weakly crenate-serrate to subentire margin subsp. *setifera*
- + Stem densely and patently pilose; median cauline leaves usually broadly ovate-oblong to ovate-elliptic with distinctly serrate margin subsp. *lycia*

subsp. *setifera*

Syn.: *S. daenensis* Gandoger in Bull. Soc. Bot. Fr. 65:68 (1918)!

S. sintenisii Gandoger, loc. cit. (1918)!

S. shirini Parsa in Kew Bull. 1948, 226 (1948)!

S. iranica Rech. fil. in Öst. Bot Zeit. 99:44 (1952)!

Distribution: E Anatolia, Transcaucasus, Iran, Afghanistan.

subsp. *lycia* (Gandoger) Bhattacharjee, **comb. et stat. nov.**

Syn.: *S. lycia* Gandoger in Bull. Soc. Bot. Fr. 65:68 (1918)!

Distribution: mainly C and SW Anatolia.

Subspecies *lycia* was originally treated as a species by Gandoger (1918), together with some other species such as *S. sintenisii*, *S. daenensis* and *S. bornmülleri*, and described in a dichotomous Latin key. The types of all these species except *S. bornmülleri* have been examined by me and I have no doubt that they belong to the variable species *S. setifera* s.l. Considering SW & C Anatolian material, *S. lycia* seems to deserve formal subspecific rank, while the other species have been included in the typical subspecies. *Sintenis* 1392 from Urfa and *Aberdeen Univ. Exped.* no. 1934 from Adana are intermediate between subspecies *lycia* and *S. menthoides* Kotschy & Boiss. (E Anatolia) in indumentum and inflorescence characters.

S. pseudopinardii Bhattacharjee & Huber-Morath, **sp. nov.**

Affinis *S. longiflorae* Boiss. et *S. pinardii* Boiss.; a priore verticillastris 4-6-floris $\pm$ 2 cm distantibus differt; ab altera inflorescentia laxa et labiis corollae minoribus recedit.

Herba perennis, basi indurata lignescens. *Caules floriferi* graciles, 30-55 cm, pendentes, basi fragiles, $\pm$ simplices superne pauciramosi. *Indumentum* parce et patentim pilosi, pilis glandulosis et longis eglandulosis. *Folia caulina* ovata vel ovato-orbiculata, 1.5 $\times$ 0.8-4.5 cm, $\pm$ obtusa, basi cordata, crenato-dentata, textura tenuia, paginis sparse pubescentibus vel glabrescentibus; petiolus 2-5 cm longus. *Folia floralia* ovata, 0.5-3 cm longa, 0.4-2.8 cm lata, dentata, acuta, basi cordata vel cuneata, brevissime petiolata vel subsessilia, superne

verticillastris gradatim breviora; petiolus 0.2-1.3 cm longus. *Verticillastri* remoti, 1.3-5 cm distantes, superiores 2-3 approximati, ebracteati. *Pedicelli* 1-2 mm longi. *Calyx* subbilabiatus, subcampanulatus, 9.5-10.5 mm longus (fructu ad 12 mm longus), herbaceus, sparsim pilifer vel glabrescens; dentes inaequales, triangulares, apice molliter spinulescentes; dentes superiores 1.5-2.5 mm longi, inferiores 3-4 mm longi, longitudine dimidium tubi aequantes; faux rectus, glabrescens. *Corolla* alba, 20-22 mm longa; tubus subexsertus, 15-18 mm longus; galea 5 mm longa; labium inferius 3 mm longum. *Stamina* fauce corollae paulo exserta. *Nuculae* elongatae, trigonae, 3×1.6 mm, apice rotundatae. *Fl.* 5-6.

Turkey. C4 İçel: Gilindire, Gilindire-Gülnar, Kalkfelsen beim Dorf Yeni-yürük, 16 km N von Gilindire, 550 m, 6 vi 1950, *Huber-Morath* 10141 (holo. herb. Hub.-Mor.); Kesliturkmenli, $\pm$ 65 km SW of Mersin, 50 m *Hennipman* 1075.

The new species belongs to a small group of closely related S Anatolian chasmophytes.

S. megalodonta [Hausskn. & Bornm. ex] Davis subsp. ***mardinensis*** Bhattacharjee, **subsp. nov.**

A typo caulibus dense foliosis, foliis minoribus brevius petiolatis, verticillastris minus distantibus (1-2.5 cm) recedit.

Turkey. B8 Bitlis: Kambos Da. above Hurmuz, 1524 m, *Davis* 23448; southern slope of Kambos Da. above Tutu, 1000 m, *McNeill* 613. C8 Mardin: Khurs (Kavs) in parietibus rupium, 13 vi 1888, *Sintenis* 1030 (holo. LD); between Diyarbakir and Mardin, 7 vi 1971, *A. & T. Baytop* 20069. C9 Hakkari: Elkiyayala Da., above pass between Marunis and Beytüşşebap (Beytis), 2550 m, *Davis* 45342.

With the discovery of this subspecies, *S. megalodonta* is recorded from Turkey for the first time. The Turkish subspecies is distinguished from the typical subspecies (N Iraq) in having smaller leaves with shorter petioles, densely foliate flowering stems, and verticillasters 1-2.5 cm apart throughout. Subspecies *mardinensis* is somewhat intermediate between *S. glechomifolia* Nábělek and *S. megalodonta* subsp. *megalodonta*, and is partly sympatric with the former. Though it resembles *S. glechomifolia* in habit, it is easily assignable to *S. megalodonta* in the presence of copious subsessile to sessile glands and in the absence of patently pilose eglandular and glandular hairs on the surface of flowering stems.

S. kurdica Boiss. & Hohen. in Boiss., *Diagn. ser. 1*, 5:31 (1844).

- 1 *Calyx* teeth broadly triangular, $\frac{1}{2}$ - $\frac{3}{4}$ as long as tube var. *brevidens*
- + *Calyx* teeth broadly oblong-lanceolate, as long as or slightly less than the tube var. *kurdica*

var. ***kurdica***

Syn.: *S. subnuda* Montb. & Auch. var. *kurdica* (Boiss. & Hohen.) Boiss., *Fl. Or.* 4:734 (1879).

Distribution: SE Anatolia, N Iraq, W Iran.

var. **brevidens** [Bornmüller ex] Bhattacharjee, **var. nov.**

A typo calycis dentibus late triangularibus, tubo multo ($\frac{1}{3}$ - $\frac{1}{4}$ plo) brevioribus divergit.

Type: [N Iraq] Kurdistania: Riwandous (ad fines Pers.) in m. Sakri Sakran, 2200 m, 23 vi 1893, *Bornmüller* 1670 (K, LD).

Turkey. C9 Hakkari: Zap Gorge below Hakkari, 1250 m, *Davis* 45361.

S. kurdica is closely allied to *S. subnuda* from which it differs in having oblong-lanceolate median cauline leaves and broadly triangular to oblong-lanceolate calyx teeth with herbaceous, blunt and non-rigid apices. Var. *brevidens*, apparently unpublished before, seems quite distinct in the key characters given; it occurs mainly in N Iraq.

S. lavandulifolia Vahl, *Symb. Bot.* 1:42 (1790).

Three varieties of this variable species can be recognised in Turkey.

- 1 Calyx teeth/tube ratio 1-1.2; indumentum on leaf shortly whitish tomentose; cauline leaves oblanceolate with $\pm$ obtuse apices
var. *brachyodon*
- + Calyx teeth/tube ratio 2-3.8; indumentum on leaf sericeous-tomentose or absent; cauline leaves lanceolate with acute apices 2
- 2 Leaf and stem $\pm$ glabrescent with few subsessile to sessile glands
var. *glabrescens*
- + Leaf and stem sericeous-tomentose with glandular hairs
var. *lavandulifolia*

var. ***lavandulifolia***

Syn.: *Zietenia orientalis* Gléd. in Mem. Acad. Berl. 22:9 (1766) non *Stachys orientalis* L. (1753).

Sideritis calycantha Bieb., Fl. Taur.-Cauc. 3:393 (1819).

Stachys orientalis C. Koch in Linnaea 21, 1:694 (1848) non Linn. (1753).

S. zurandica Rzazade in Fl. Azerb. 7:611 (1957).

Distribution: Anatolia, Caucasia, Iran, Afghanistan.

var. ***brachyodon*** Boiss., Fl. Or. 4:743 (1879).

Syn.: *S. tomentosa* Bunge, Lab. Pers. 71 (1873) non Benth. (1834)

S. boissieri Kapeller in Not. Syst. Geogr. Inst. Bot. Tblisi, fasc. 16:17 (1951).

Distribution: E Anatolia, NW & W Iran, Transcaucasia.

var. ***glabrescens*** Bhattacharjee & Huber-Morath, **var. nov.**

A var. *lavandulifoliae* foliis et caulibus glabriusculis, glandulis paucis sessilibus et subsessilibus recedens.

Turkey. B7 Erzincan: Egin (Kemaliye), Pashtash ad Euphratem, *Sint.* 1889:947. B9 Van: Hügel Toprak ob Van, 1900 m, 30 v 1949, *Huber-Morath* 8969 (holo. herb. Hub.-Mor.); Pelli Dağ, 54 km WSW of Van, 2500 m, *Edmondson* 622.

External distribution: N Iran, NW Iran.

S. iberica Bieb., Fl. Taur.-Cauc. 2:51 (1808).

- 1 Corolla creamy yellow to white with pink markings; flowering stems usually erect, rarely ascending; calyx teeth usually $\pm \frac{1}{2}$ as long as tube or less, aristae 0.2-1 mm subsp. *stenostachya*
- + Corolla mauve to pink; flowering stems usually ascending, rarely erect; calyx teeth as long as or slightly less than tube, aristae 0.5-2 mm 2
- 2 Plant $\pm$ erect, slender and elongate, c. (24-)38-65 cm, paler green in colour; median cauline leaves lanceolate with acute apices subsp. *georgica*
- + Plant ascending, stout and dwarfish, c. 13-35(-45) cm, darker green in colour; median cauline leaves oblanceolate with obtuse apices 3
- 3 Median cauline leaves usually distinctly crenate to crenate-dentate, leaves and stems sparsely hairy; corolla dark mauve to purple subsp. *iberica* var. *iberica*
- + Median cauline leaves usually entire to subentire; leaves and stems densely hairy; corolla pale pink subsp. *iberica* var. *densipilosa*

subsp. *iberica* var. *iberica*

Syn.: *S. congesta* Urv. in Mém. Soc. Linn. Par. 1:324 (1822).

S. arenaria Benth., Lab. Gen. et Sp. 557 (1834) non Vahl (1791).

S. caucasica C. Koch in Linnaea 21:693 (1848).

Distribution: Turkey (mainly NE & S Anatolia), N Syria, Caucasia, Crimea and Greece.

subsp. *iberica* var. *densipilosa* Bhattacharjee, var. nov.

A var. *ibericae* foliis angustioribus (13-30 mm) subintegris, indumento caulium et foliorum densiore recedit.

Turkey. A3 Bolu: Abant Gölü, 17 vii 1960, *B. V. D. Post* (holo. G). A4 Bolu: Ala Da. on Kartal Kaya tepe, 2100-2200 m, *D. 37349*. Kastamonu: 1 km W of town, 850 m, *Edmondson* 551. Çankiri: 46 km S Karabük, 800 m, *Sorger* 69-8-36. B3 Konya: Sultan Da. above Akşehir, 1900 m, *Huber-Morath* 8151. C3 Isparta: Dedegöldag, 1500 m, *Sorger* 65-43-142.

subsp. *georgica* Rech. fil. in Feddes Rep. 53:84 (1944).

Distribution: E Anatolia, Transcaucasia, Iran.

subsp. *stenostachya* (Boiss.) Rech. fil. in Feddes Rep. 53:84 (1944) quoad typ. (Cassius, *Boissier*!) haud specim. alter.

Syn.: *S. iberica* var. *memorabilis* (haud nomen) apud Bieb., Fl. Taur.-Cauc. 3:400 (1819).

S. stenostachya Boiss. in Diagn. ser. 2, 4:41 (1859)!

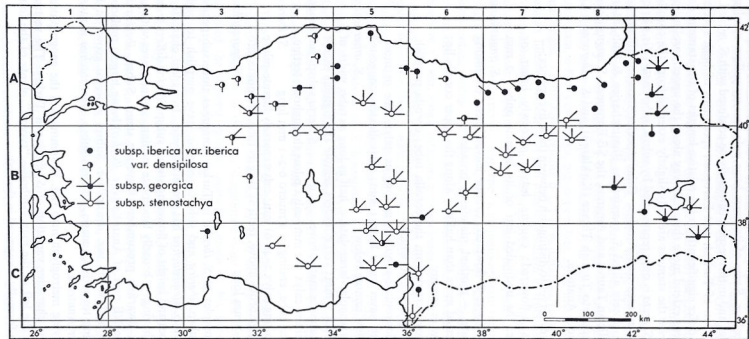
S. iberica var. *brachyodonta* Boiss., Fl. Or. 4:731 (1878)!

S. iberica var. *pallidiflora* Boiss., Fl. Or. 4:731 (1879) p.p. excl. typ., nomen illegit.

S. euphratica Hayek in Feddes Rep. 21:258 (1925)!

S. memorabilis Klok. in Fl. Ukr. RSR 9:643 (1960).

Distribution: Inner & S Anatolia, Caucasia, Crimea.

FIG. 1. Metroglyph analysis and distribution of *S. iberica* in Turkey. Key to symbols:—

<u>Stem length</u>	<u>Leaf shape</u>	<u>Leaf margin</u>	<u>Leaf length/breadth ratio</u>	<u>Corolla colour</u>	<u>Leaf indumentum</u>	<u>Stem</u>
10–36 cm ○	oblanceolate ○	crenate ○	less than 6 ○	purple ●	dense ♀	erect ○
more than 36 cm ∩	lanceolate ∩	subentire ∩	more than 6 —○	cream ○	sparse ○	procumbent ○
		serrate —○		pale pink ●		

S. iberica Bieb. is a most variable species in leaf shape, density of indumentum and flower colour. Some of its races have pale creamy yellow corollas with pink markings and in this respect can easily be confused with *S. recta* L. However, comparison of Turkish and European specimens of both species showed that they differ significantly in the relative lengths of the stamens. In *S. recta* the stamens extend more than half way along the upper corolla lip, whereas in *S. iberica* the stamens are only slightly exserted from the corolla tube. In Turkey, *S. recta* is only represented by subsp. *subcrenata* (Vis.) Briq. from the Bosphorus area and Antalya. Other species showing affinity to *S. iberica* are the closely allied *S. sparsipilosa* Bhattacharjee & Hub.-Mor. endemic to the Cilician Taurus and Amanus, the SE European *S. angustifolia* Bieb. which extends into Turkish Thrace (Kirkklareli), and *S. atherocalyx* C. Koch from NE and E Anatolia.

The following key serves to distinguish between these five species:—

- 1 Verticillasters 2-flowered; cauline leaves narrowly linear or pinnatipartite, the undivided leaf or its laciniae only 1–2 mm broad *S. angustifolia*
- + Verticillasters (2–)4–8-flowered; cauline leaves linear to oblong or oblanceolate, $\pm$ toothed, manifestly broader 2
- 2 Stamens exserted more than halfway along the upper corolla lip; corolla yellow or creamy 3
- + Stamens little-exserted from the corolla tube; corolla purplish, pink or creamy yellow to white 4
- 3 Calyx teeth lanceolate-subulate, as long as calyx tube or more, width of teeth never more than 1 mm; verticillasters congested except for a few remote below *S. atherocalyx*
- + Calyx teeth triangular-lanceolate, c. half as long as tube, width of teeth more than 1 mm; verticillasters remote throughout except for a few $\pm$ approximate above *S. recta* subsp. *subcrenata*
- 4 Pedicel of fruiting calyx 1–2 mm; calyx pilose throughout, teeth c. half as long as tube, ending in a mucro 0.2–1 mm long *S. iberica*
- + Pedicel of fruiting calyx 2–4(–6) mm; calyx sparsely hirsute-pilose in lower half, glabrous above, teeth as long as tube, attenuate into a mucro 0.5–2 mm long *S. sparsipilosa*

The variable complex of *S. iberica* in Turkey comprises three subspecies. Two of them, subsp. *iberica* and subsp. *georgica*, have purplish to pink corollas, while subsp. *stenostachya* has creamy flowers. In its leaf characters (particularly shape) and height of flowering stems, subsp. *iberica* differs from the other two in having $\pm$ broadly lanceolate median cauline leaves with an obtuse apex and dwarfish procumbent flowering stems. Subsp. *iberica* is commonest in the NE part of Anatolia (var. *iberica*) being largely replaced towards the NW and W by var. *densipilosa*. Subsp. *georgica* grows in E Anatolia, extending towards Caucasia, whereas subsp. *stenostachya* is most abundant in Inner Anatolia.

The accompanying metroglyph map (fig. 1) summarises the geographical distribution of the character variation of *S. iberica* in Turkey. The metroglyphs shown on the left of the map symbolise "typical" plants of the four infra-specific taxa formally recognised in the text.

***S. sparsipilosa* Bhattacharjee & Huber-Morath, sp. nov.**Syn.: *S. leucoglossa* Griseb. var. *anatolica* Boiss., Diagn. ser. 2, 4:41 (1859)!*S. iberica* Bieb. var. *pallidiflora* Boiss., Fl. Or. 4:731 (1879) nom. illegit.

Affinis *S. ibericae* Bieb. sed in fructu pedicellis longioribus, calyce inferne sparse piloso superne glabro, dentibus longioribus acuminato-aristatis tubum aequantibus recedit.

Herba perennis, suffrutescens, caudicibus lignosis. *Caules floriferi* erecti vel erecto-ascendentes, 30–60 cm longi. *Caules* inferne dense vel sparsim pilosi, superne glabrescentes. *Folia caulina* inferiora et superiora oblanceolata vel lanceolata, 2.5–5 cm longa, 0.3–0.8 cm lata, crenato-serrata vel subintegra, basi attenuata, apice obtusa, superiora acuta. *Folia floralia* lanceolata vel lineari-lanceolata, 0.8–2.5 cm longa, 0.2–0.3 cm lata, apice mucronata; mucro 0.5–1 mm longus. *Verticillastri* remoti, 0.5–3.5 cm distantes, (2–)4–6-flori. *Bractee* paucae, lineari-setaceae, 1–3 mm longae. *Pedicelli* in fructu 2–4(–6) mm longi. *Calyx* subbilabiat, turbinate-campanulatus, 6–8 mm longus, inferne sparsim hirsuto-pilosus, superne glabrescens; dentes lanceolati, 2.5–4.6 mm longi, glabri, in fructu recurvi, superne acuminato-aristati (mucrone 0.5–2 mm longo). *Corolla* 12.5–14 mm longa, malvina vel pallide rosea, rare albida roseo-notata; tubus subexsertus, 7–8.5 mm longus; galea 4.5 mm longa; labium inferius 5.5–6.5 mm longum. *Stamina* tubo corollae subexserta, paria exteriora 3.2 mm longa, interiora 2.7 mm longa. *Nuculae* obovatae, 2–2.3 mm longae, 1.8 mm latae, trigonae, versus basin subalatae. *Fl.* 5–7.

Steep limestone slopes, undergrowth of *Pinus brutia* forest, 400–1000 m.

Turkey. C5 İçel: Gülek Boghaz, coteaux dominant le village de Gülek Boghas, près du défilé des Portes Ciliciennes, 24 vi 1855, *Balansa* 513 (holo. E; iso. K, syntype of *S. leucoglossa* Griseb. var. *anatolica* Boiss., 1859); Monte Tauro, *Kotschy* 1836:443 (syntype of *S. leucoglossa* var. *anatolica* Boiss., 1859); Gülek Depe, 1100 m, *Siehe* 1896:444. Cilician Taurus, Bürücek, 1000 m, *Balls* 1244. C6 Adana d. Bahçe: Osmancik-Fevzipaşa, 23 km E above Osmancik, 400 m, *Huber-Morath* 14188.

This confused and overlooked species was first described as *S. leucoglossa* Griseb. var. *anatolica* by Boissier in 1859 and re-named *S. iberica* var. *pallidiflora* Boiss. in 1879—an illegitimate name because Boissier should have adopted the varietal epithet '*anatolica*' given in his synonymy. In 1944, Rechinger (Feddes Rep. 53:84, 1944) in a revision of *S. iberica* recognised and described subsp. *stenostachya* (Boiss.) Rech. fil. based on *S. stenostachya* Boiss. (1859) described from Mt. Cassius (G!). The specimens seen and cited by Rechinger are, however, not conspecific with the type of *S. stenostachya* which he had not examined. As shown above in the account of *S. iberica*, *S. stenostachya* (in its original sense) is accepted as a subspecies of *S. iberica*. *S. sparsipilosa* is therefore described here to cover the material seen and cited by Rechinger under the name "*S. iberica* subsp. *stenostachya*". The distinctions between the two species are given in the key under *S. iberica*.

***S. distans* Benth. var. *cilicica* Bhattacharjee & Huber-Morath, var. nov.**

A typo dentibus calycis longioribus lanceolato-subulatis longius mucronatis, indumento caulium, foliorum et calycium albo-tomentoso recedit.

Turkey. C4 İçel: Silifke-Mersin, ausgetrocknetes Bachbett 41 km östlich Silifke, beim römischen Aquaedukt am Meer, 17 vi 1950, *Huber-Morath* 10142 (holo. herb. Hub.-Mor.); 27 km E Silifke, 10 m, *Sorger* 71-13-7.

With the discovery of this variety, *S. distans* Benth. has been reported from Turkey for the first time. It is distinguished from var. *distans*, var. *oxyodonta* Boiss. and var. *teucriifolia* Boiss. by the nature of its calyx teeth and indumentum. The calyx teeth are narrowly lanceolate-subulate with a 1.8-2 mm mucro, the teeth being as long as or slightly longer than the calyx tube. The indumentum is eglandular and adpressed-white-tomentose throughout the plant body. In other varieties the upper part of the plant is usually glabrescent and the calyx is either glabrescent or glandular with short teeth.

Geographically this new variety is intermediate between other varieties of *S. distans* Benth. growing in Syria, Lebanon and Palestine on one side, *S. aleurites* Boiss. and *S. bombycina* Boiss. on the other, both endemic to SW Anatolia.

S. annua (L.) L., Sp. Pl. ed. 2, 813 (1763).

- | | | |
|---|--|-------------------------|
| 1 | Plant perennial or sometimes biennial | 2 |
| + | Plant annual | 3 |
| 2 | Calyx tube patently pilose in lower part with c. 2 mm long hairs | |
| | subsp. <i>annua</i> var. <i>lycaonica</i> | |
| + | Calyx tube adpressed pubescent throughout and with few patent hairs | |
| | subsp. <i>annua</i> var. <i>annua</i> | |
| 3 | Stem erect, patently glandular haired throughout | subsp. <i>cilicica</i> |
| + | Stem procumbent, glabrescent below, adpressed pubescent above with glandular hairs or sessile glands, or glabrescent throughout | 4 |
| 4 | Stem glabrescent with sessile glands; calyx teeth lanceolate-subulate with a shortly haired spinescent tip 0.5-1 mm long | |
| | subsp. <i>annua</i> var. <i>annua</i> | |
| + | Stem glabrescent below adpressed pubescent above with few glandular hairs; calyx teeth triangular subulate with a densely setulose tip 1-2 mm long | subsp. <i>ammophila</i> |

subsp. *annua* var. *annua*

Syn.: *Betonica annua* L., Sp. Pl. ed. 1, 573 (1753)!

S. betonica Crantz, Stirp. Austr. ed. 2, 4:264 (1769).

S. pubescens Ten., Fl. Nap. 1, Prodr. 34 (1811). Ic. vol. 5: 14, tab. 239 (1835)!

S. balbissi Link, Enum Hort. Berol. 2:110 (1821).

S. maritima Urv. in Mém. Soc. Linn. 1, 324 (1822) non L. (1767).

S. decumbens Willd. ex Benth. in Linnaea 11:336 (1837) non Pers. (1806).

S. micrantha C. Koch in Linnaea 21:690 (1848).

S. adenocalyx C. Koch, *op. cit.* (1848).

S. neglecta Klok. apud. Koccko in Fl. BSSR 4:289 (1955).

Distribution: W, C, S & E Europe & SW Asia; widespread in Turkey, but almost absent from C Anatolia.

subsp. *annua* var. *lycaonica* Bhattacharjee, var. nov.

Herba perennis, a var. *annua* calycis tubo inferne patenter villosa pilis c. 2 mm longis divergit.

Turkey, mainly Central Anatolia. A2 Bilecik: 14 km N Bilecik, 600 m, *Sorger* 62-17-11. A3 Ankara: Ankara to Beypazari, 700 m, *Akman* 962. A4 Ankara: Ankara, *Bornmüller* 1893:3090. B2 Kütahya: Gediz to Kütahya, 18 km S of Kütahya, 1100 m, limestone gorges and slopes, 7 vii 1962, *Davis & Coode*, D. 36929 (holo. E). B3 Eskişehir: 3 km W Sivrihisar, 1100 m, *Sorger* 64-32-33. B5 Nevşehir: Göreme, 1130 m, *Davis* 42224. B6 Sivas: Divriği, 2 vi 1968, *T. Baytop* 13004. C2 Denizli: Kizilcaböyük to Denizli, 1000 m, *Dudley*, D. 35339b. C3 Konya: 61 km S of Konya, 1350 m, *Sorger* 70-42-11. C4 Konya: Beyşehir to Konya, 4 km from Beyşehir, 1100 m, *Dudley*, D. 35841. C5 Adana: at Siambeyli (Hadjin), *Manissadjian* 33b.

External distribution: W Iran.

subsp. *ammophila* (Boiss. & Bl.) Samuels, in *Ark. Bot.* 5:376 (1957).

Syn.: *S. annua* (L.) L. var. *ammophila* Boiss. & Bl. in Boiss., *Diagn. ser.* 2, 4:43 (1859).

Distribution: Turkey (S Anatolia), NW Syria, Lebanon, often on sandy soils.

subsp. *cilicica* (Boiss.) Bhattacharjee, stat. nov.

Syn.: *S. cilicica* Boiss., *Diagn. ser.* 2, 4:42 (1859).

S. annua (L.) L. var. *cilicica* (Boiss.) Boiss., *Fl. Or.* 4:746 (1879).

Turkey. N & S Anatolia (A5 & C5); rocky places.

Much confusion has arisen regarding the taxonomic limits of the widely distributed and variable *S. annua*. Linnaeus (1753) described the species first under *Betonica* and later (1763) transferred it to *Stachys*. He mainly diagnosed the species on its annual and glabrescent habit and lanceolate 3-nerved leaves with a cuneate base. Later Tenore (1815) described *S. pubescens* from Italy, which he separated on its perennial habit with sterile basal rosettes, dense indumentum, and ovate basal leaves with a cordate base.

In the present investigation I was dealing with a huge and variable collection from Anatolia and adjacent regions, and found that the distinguishing characters between the two 'species' break down, including annual versus perennial habit. Intermediate habit forms (even in the same gathering) are common, many specimens appearing to be biennial; cultivation experiments are obviously needed to elucidate this phenomenon. With a view to coming to a practical taxonomic conclusion, I extended my studies to all the available European material traditionally referred to *S. annua* or *S. pubescens*, including the respective type material in the Linnaean herbarium (London) and the British Museum. The retrorsely adpressed hairs on the stem and the very characteristic calyx shape (the lower teeth curved inwards and the upper teeth $\pm$ curved outwards in fruit) seem to be the most constant character throughout the whole range of distribution. In typical *S. annua* (described from Europe), though the stem is $\pm$ glabrescent, the insertion of the hairs is the same as that of *S. pubescens*, which has densely pubescent stems. To me these two well-known but much confused taxa (maintained as separate species in

Flora Europaea 3: 156, 157) are undoubtedly conspecific. Annual forms seem to have been derived from perennial races of *S. annua* (found mainly in mountainous and steppic habitats) in response to adaptation to temporary and disturbed habitats, such as cultivated and fallow fields.

Two annual subspecies (*ammophila* and *cilicica*) and a perennial variety (subsp. *annua* var. *lycaonica*) have been recognised here, based upon a few correlated characters, whereas subsp. *annua* var. *annua* (including *S. pubescens*) remains a variable taxon including annual, biennial and perennial plants with glabrescent to densely pubescent stems and with or without sterile basal rosettes of variable leaves. A few specimens of var. *annua* from Bursa and Bolu are more glandular throughout the plant body (Dudley, D. 34792, Sorger 71-2-6, etc.), though some amount of overlap is detectable in the provinces of Samsun, Kastamonu and Zonguldak, particularly in the glandulosity of the calyx tube and teeth.

SW Asia, particularly Anatolia, is the area where the diversification of *S. annua* is greatest, rendering its taxonomy very difficult. In Europe the species has lost much of its variability, being represented only by var. *annua*, with the annual and perennial forms seeming to remain more distinct than in Turkey.

S. maritima Gouan is taxonomically very close to *S. annua*, and extends into NW Turkey where it grows on maritime sands and dunes. It is constantly perennial, and differs from *S. annua* s.l. in having shorter calyx teeth and a congested spicate inflorescence.

***S. munzurdagensis* Bhattacharjee, sp. nov.**

Affinis *S. inani* Hausskn. & Bornm. sed habitu perenni, caulibus minus ramosis, foliis basalibus ad basin cuneatis vel rotundatis, foliis floralibus ovato-rhomboides, verticillastris 4-6-floris, calycibus longioribus valde differt.

Herba valde perennis, suffrutescens caudicibus inter lapidos ramosis et lignosis. *Caulis floriferi* plures, erecti, graciles, 30-45 cm longi, usque 0.25 cm lati, ad basin pauciramosi, internodiis 2-6 cm longis, inferne $\pm$ glabrescentes glandulis paucis subsessilibus, superne dense pruinosi glandulis subsessilibus vel substipitatis et pilis sparsis minutis patentibus eglandulosis obsiti. *Folia basalia* rosulas densas steriles facientia; petiolus 1.5-4.5 cm longus; lamina oblonga, basi cuneata vel rotundata, leviter crenata, apice rotundata, subglabra, glandulis paucis sessilibus et pilis sparsissimis brevibus eglandulosis utrinque provisa. *Folia caulina* pauca, inferiora oblonga vel oblanceolata, obtusa, 1.5-2.5 cm longa (petiolo 2-3.5 cm excluso), basi cuneata vel attenuata, distante leviter crenato-serrato; mediana subsessilia, oblanceolata vel anguste oblongo-elliptica vel oblongo-lanceolata, 8-14.5 $\times$ 2-3.8 mm, integra, basi attenuata, apice obtusa; *folia floralia* inferiora medianis caulinis similia, superiora rhomboides-ovatescentia, 6-8 $\times$ 2-3.5 mm, apice obscure mucronata, verticillastros aequantia vel paulo breviora. *Verticillastri* 4-6-flori, remoti, ebracteati, inferiores 3-4.5 cm distantes, superiores 2-3 approximati. *Pedicelli* 1-1.5 mm longi. *Calyx* $\pm$ regularis, tubulosus, 6-7 mm longus, $\pm$ glabrescens vel sparsim pruinoso-glandulosus, pilis sparsissimis eglandulosis ubique obsitus, fauce glabra, dentes $\pm$ aequales, erecti, ovato-triangulares, breviter mucronati; dentes superiores 2-2.5 mm, inferiores 2.8-3 mm longi;

calyx in fructu 8–8.5 mm longus. *Corolla* alba (in sicco pallide flavescent), 10.5–12 mm longa; tubus subexsertus, obliquus, 7–7.5 mm longus, extus sparse et brevissime pubescens, intus annulatus; galea 6.5 mm longa, concava, ovata, integra, extus glabrescens. *Stamina* fauce corollae paula exserta; paria exteriora 3 mm longa, interiora 2.5 mm longa. *Nuculae* obovatae laeves, fuscae, 2–3 mm longae. *Fl.* 6–7.

Turkey. B7 Tunceli: Munzur Da., above Ovacik, on limestone screes, 1800 m, 16 vii 1957, *Davis & Hedge*, *D.* 31164 (holo. E; iso. K, BM).

Known only from the type gathering, but so distinct that there is no difficulty in distinguishing it from the apparently biennial *S. inanis* Hausskn. & Bornm. from the province of Erzincan; both have the median cauline leaves markedly different from the rosette leaves.

***S. pseudosideritis* Bhattacharjee & Huber-Morath, nom. nov.**

Syn.: *Sideritis balansae* Boiss., *Diagn. ser. 2*, 4:35 (1859) non *Stachys balansae* Boiss. & Kotschy (1879).

Type: Turkey C5 Içel: hab. in Gülek Boghaz Ciliciae, *Balansa* (type of *Sideritis balansae* Boiss. n.v.).

This species from Anatolia, Syria and Lebanon was wrongly placed by Boissier in *Sideritis* Sect. *Hesiodia* Benth. (as *Sideritis balansae* Boiss.). The main diagnostic characters of *Sideritis* being, a) stamens included in corolla tube and b) both stigmatic lobes unequal and different in shape, this species cannot be accommodated in that genus. Boissier presumably failed to observe that the stamens are exserted beyond the mouth of corolla tube and the stigmatic lobes are terete-subulate and subequal—generic features which refer the species to *Stachys*.

Stachys pseudosideritis is very distinctive but shows some resemblance to *S. obscura* Boiss. from which it is readily distinguished by its obovate leaves with attenuate bases, linear-lanceolate bracts, short and included corolla, and downwardly deflexed calyx.

***S. ramosissima* Montb. & Auch. in Ann. Sci. Nat. ser. 2, 6:50 (1836).**

- 1 Plant dwarf and slender, 2–12 cm; lower cauline leaves narrowly oblanceolate, 9–10 times longer than broad . . . var. *ramosissima*
- + Plant elongate and thicker, 20–35 cm; lower cauline leaves broadly oblanceolate, 4–5 times longer than broad . . . var. *elazigensis*

var. *elazigensis* Bhattacharjee, var. nov.

A typo caulibus longioribus et crassioribus, foliis caulinis late oblanceolatis differt.

Turkey. B7 Elazığ: Harput (Harput), in planitie ad Mezra, 18 vi 1889, *Sinten* 788 (holo. LD.); Gunutschair, *Sinten* 1889:702; Khan Kimoor to Harput, *B. Post* 630; environs de Harput, *B. Post* 331.

Var. *ramosissima* is more widespread in E Anatolia, whereas var. *elazigensis* is only known from the province from which it takes its name. *B. Post* 331 from Harput differs from other material of var. *elazigensis* in being more glandular-pubescent, and in having a densely hairy calyx tube.

S. officinalis (L.) Trevisan, Prosp. Fl. Euganea 26 (1842).

- 1 Corolla bright reddish-purple; calyx teeth $\frac{1}{3}$ – $\frac{1}{4}$ as long as tube . subsp. *officinalis*
 + Corolla white; calyx teeth $\frac{1}{3}$ to as long as tube . subsp. *balcanica*

subsp. **officinalis**

Syn.: *Betonica officinalis* L., Sp. Pl. 2:573 (1753).

Stachys betonica Benth., Lab. Gen. et Sp. 532 (1834) non Crantz (1769)
 nec Scop. (1772); incl. *S. bulgarica* (Degen. & Nejc.) Hayek, Prodr.
 Fl. Balc. 2:281 (1931).

Distribution: Most of Europe, USSR (east to Central Asia), Caucasia, N Anatolia, & N part of Iran.

subsp. **balcanica** (P. W. Ball) Bhattacharjee, **comb. et stat. nov.**

Syn.: *Betonica haussknechtii* Uechtr. ex Hausskn. in Nym., Consp. Fl. Eur.
 Suppl. 2, 2:251 (1890).

Stachys haussknechtii (Uechtr. ex Hausskn.) Hayek, Prodr. Fl. Balc.
 2:281 (1931) non Vatke (1875).

S. balcanica P. W. Ball in Bot. Journ. Linn Soc. 65:262 (1972); Tutin et
 al., Fl. Europaea 3:152 (1972).

Distribution: C Greece & SE Bulgaria, N (mainly NW) Anatolia.

As shown by its synonymy, subspecies *balcanica* was formerly treated as a distinct species under three different binomials. The distinguishing characters of *S. balcanica* P. W. Ball (1972), i.e. white corolla and calyx teeth/tube ratio 1:1, may remain distinct in the Balkan peninsula, but in Turkey, particularly in the province of Bolu, the calyx differences break down in different populations. Besides that, typical *S. officinalis*, occurring towards the central part of N Anatolia, is replaced by *S. balcanica* to the north-west. Considering the range of *S. officinalis* as a whole, it seems justifiable to reduce *S. balcanica* to subspecific rank.