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# MATERIALS FOR A FLORA OF TURKEY XXXV:
## Primulaceae and Scrophulariaceae

COMPILED BY P. H. DAVIS

ABSTRACT. New Turkish taxa are described in the following genera of Scrophulariaceae: *Chaenorhinum* (1 species, 1 subspecies and notes on other species), *Digitalis* (1 subspecies), *Linaria* (1 species, 1 subspecies, 1 variety, and notes on *L. genistifolia* and *L. kurdica*), *Scrophularia* (3 species, 1 subspecies, 7 varieties, and notes on 3 other species) and *Verbascum* (1 variety). In Primulaceae, 1 new variety of *Cyclamen* is described and an account given of variation in *Androsace villosa* in Anatolia. New combinations and/or new names are published in *Chaenorhinum* (which is lectotypified), *Linaria* and *Scrophularia*, and an account given of *Parentucellia latifolia*.

## INTRODUCTION

This is the last instalment of the 'Materials' relating to *Flora of Turkey* vol. 6 [cf. *Notes R.B.G. Edinb.* 35:39–59 (1976); 297–314 (1977)]. Unless otherwise indicated, all specimens cited have been examined. Additional comments, synonymy and specimen citations will appear in the Flora, together with some additional new combinations and names. The authors of this part of the 'Materials' are P. H. Davis, I. C. Hedge, A. Huber-Morath, J. M. Lamond, R. D. Meikle, and R. R. Mill. The contribution of the last named was prepared under a grant from the Science Research Council (United Kingdom) in support of the *Flora of Turkey* project.

## PRIMULACEAE

### Androsace

J. M. LAMOND

**Androsace villosa** L., Sp. Pl. 142 (1753).

Syn.: *A. dasyphylla* Bge. in Ledeb., Fl. Alt. 1:218 (1829).
*A. olympica* Boiss., Diagn. ser. 1, 4:37 (1844).
*A. villosa* var. *congesta* Boiss., Fl. Or. 4:14 (1879).
*A. villosa* var. *dasyphylla* (Bge.) Kar. & Kir. f. *glabrata* (Trautv.) Knuth in Engler, Pflanzenreich 22 (IV. 237):193 (1905).
*A. phrygia* Gand. in Bull. Soc. Bot. Fr. 65:58 (1918).
*A. villosa* var. *fallax* Rech. f. in Symb. Bot. Ups. 11, 5:37 (1952).

Many subspecific taxa and binomial segregates have been recognised throughout the range of *A. villosa*, based on leaf and indumentum characters, height of scape, number of flowers in the inflorescence, length of pedicels, etc. In Turkey many examples can be found of plants with short, 1–2 flowered scapes corresponding to Boissier's *A. olympica* (later reduced by Boissier himself to a synonym of var. *dasyphylla*, originally described from the Altai region). There is a tendency for these few-flowered plants to be at the western end of the species' distribution within Anatolia. Plants from the North-East generally have longer scapes with 2–5 flowers. However, examples can be cited with 1–2-flowered heads and fairly long (–17 mm) scapes [*D.* 14862 from A2(A) Ulu Da.] or with 2–4-flowered heads and comparatively short (2–5 mm) scapes (*Balls* 1417 from B5 Kayseri: Erciyas Da, 2440 m), while *Rix* 1691 (A8 Erzurum: Tortum to Oltu, 2000–2500 m) shows, in the one gathering, scapes varying from 2–20 mm and bearing 1–5 flowers. There is considerable variation in the indumentum of the leaves and, in Turkey, this does not correlate with distribution or with other morphological characters.

## Cyclamen

R. D. MEIKLE*

**Cyclamen cilicium** Boiss. & Heldr. var. **intaminatum** Meikle, **var. nov.**

A varietate typica floribus minoribus, corollae lobis 10–15 mm longis, basi immaculatis differt.

Turkey. B3 Eskişehir: 53 km from Kütahya to Çukurhisar, 1000 m, 4 x 1975, *T. Baytop* ISTE 33888 (holo. K).

This variety has been in cultivation since 1934 without a name, or with the incorrect and invalid epithet *alpinum*. It is well illustrated in *Bot. Mag.* 171: t. 307 (1955) from specimens said to be descendants of *E. K. Balls* 669a from C5 Içel: Bürücek. Plants with blotched and unblotched corollas have been collected in the same areas (both are represented in Herb. K by specimens from C3 Antalya: Akseki). In the circumstances it is questionable if the plant with unblotched corollas deserves more than varietal status.

## SCROPHULARIACEAE

## Chaenorhinum

P. H. DAVIS

TYPIFICATION. The name *Chaenorhinum* was first used by De Candolle, *Fl. Fr.* ed. 3, 5:410 (1815), who recognised it as a natural group intermediate between *Linaria* and *Antirrhinum* but formally treated it as *Linaria* Sect. *Chaenorhinum* DC. De Candolle's original spelling should therefore be retained, not '*Chaenorrhinum*' of several later authors. Among the 7 species included by De Candolle in his Sect. *Chaenorhinum* were *L. origanifolia* (L.) Cav. and *L. minor* (L.) Desf.

Reichenbach (*Consp.* 123, 1828) raised De Candolle's section to generic rank, *Chaenorhinum* (DC.) Reichb., though he wrongly spelt it '*Chaenarrhinum*' and without mentioning any species.

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Chavannes (*Monographie des Antirrhinées* 92, 1833) accepted De Candolle's *Linaria* Sect. *Chaenorhinum*. He fully illustrated only *L. origanifolia* (L.) Cav., which he included in the first of his two informal groups on capsule differences; his smaller second group included only *L. minor* (L.) Desf. and *L. litoralis* Willd.

Endlicher (*Gen. Pl.* 673, 1839) carried Chavannes' treatment further. He not only accepted *Linaria* Sect. *Chaenorhinum* DC., citing Chavannes' plate of *L. origanifolia*, but also separated from it Sect. *Microrrhinum* Endl. based on *Antirrhinum minus* L. (=*Linaria minor* (L.) Desf.). The latter section was later raised to generic rank as *Microrrhinum* (Endl.) Fourreau (*Ann. Soc. Linn. Lyon nov. sér.* 17:126, 1869). Recently Speta (*Candollea* 32:145, 1977) in a paper on the presence or absence of protein bodies in the cell nuclei, resurrected *Microrrhinum* as a separate genus, and made two new combinations within it [*M. litorale* (Willd.) Speta and *M. idaeum* (Rech. fil.) Speta].

It should be clear that, by the time Endlicher's work was published (1839), the die was cast: *Chaenorhinum* had been informally typified by *L. origanifolia*, and *L. minor* excluded from *Chaenorhinum*. But unfortunately the matter did not rest there. In America Britton & Brown (1913), in the 2nd edition of their illustrated Flora of the Northern United States etc., chose *Chaenorhinum minus* (L.) Lange (*Antirrhinum minus* L.) as lectotype of the genus. Their opinion was endorsed by Pennell (1943) in his treatment of Himalayan Scrophulariaceae (*Monogr. Acad. Nat. Hist. Philad.* 5:61). This was an arbitrary and unjustified choice, taking no account of the careful work undertaken a century earlier. *Chaenorhinum origanifolium* (L.) Fourreau (*Ann. Soc. Linn. Lyon nov. sér.* 17:127, 1869) must be accepted as the lectotype of *Chaenorhinum*.

This typification, historically justified, has added advantages. In any future sectional revision of *Chaenorhinum* it would enable the name *Chaenorhinum* to be applied to the largest section of the genus. On the other hand, if *C. minus* were the type, the name *Microrrhinum* would be illegitimate, being a homotypic synonym. A new infra-generic name would be needed for the larger part of *Chaenorhinum*, and *Microrrhinum*, at sectional or generic rank, would become *Chaenorhinum*.

**Chaenorhinum minus** (L.) Lange in Willk. & Lange, Prodr. Fl. Hisp. 2:577 (1870) subsp. **anatolicum** P. H. Davis, **subsp. nov.**

A subsp. *minore* seminibus minoribus, 0·5 mm longis, costis fere ad basin obtuse triangulari-dentatis (magnificatione ×110), capsula minore 3–4 mm longa, bracteis quam pedicellis fructiferis plerumque brevioribus. *Fl.* Jun.–Aug.

Turkey. A4 Ankara: Baghloum, N of Ankara, 15 viii 1907, *Frères de l'École Chrétien* 413 (holo. G). A7 Gümüşane: Sobran to Yağmurdere, *Sint.* 1894: 5753. B4 Ankara: Beynam, 1100 m, *Davis* 13062. C6 Gaziantep: Aintab (Gaziantep), vi 1884, Hb. G. Post (BM).

The type gathering was determined by Aznavour as '*Linaria rubrifolia* Rob. & Cast. subsp. *anatolica* Azn. ms.'. Though accompanied by a manuscript description in French, the name was never published. Under a ×10 lens the seeds appear almost verrucate, and thus easily mistaken for those of

*C. rubrifolium* (Robill. & Cast. ex Lam. & DC.) Fourr. However, in other respects the plant is much better treated as a subspecies of the variable *C. minus* (L.) Lange, of which subsp. *minus* is widespread (though local) in the western half of Turkey, west of the 'Anatolian Diagonal'.

**Chaenorhinum litorale** (Willd.) Fritsch, Exkursionsfl. Österr. 494 (1897) subsp. **pterosporum** (Fisch. & Mey.) P. H. Davis, **comb. et stat. nov.**

Syn.: *Linaria litoralis* [Bernh. ex] Willd., Enum. Hort. Berol. 641 (1805) var. *pterospora* Fisch. & Mey. in Ind. Sem. Horti Petrop. 4:40 (1837).

*L. pterospora* (Fisch. & Mey.) Boiss., Fl. Or. 4:384 (1879).

Mainly confined to W & S Anatolia, where it replaces the Adriatic subsp. *litorale*. The latter is treated by R. Fernandes (*Fl. Europaea* 3:226) as *C. minus* (L.) Lange subsp. *litorale* (Willd.) Hayek, but the larger, broadly oblong seeds with truncate ends and broadly winged ribs do not occur elsewhere in the *C. minus* group. Indeed, *C. litorale* subsp. *pterosporum* only differs from subsp. *litorale* in having longer pedicels ± equal to the bracts, and shorter sepals, the latter not usually exceeding the capsule.

**Chaenorhinum cryptarum** (Boiss. & Hausskn.) P. H. Davis, **comb. nov.**

Syn.: *Linaria cryptarnm* [sic] Boiss. & Hausskn. in Boiss., Fl. Or. 4:383 (1879).

Still only known from the Anatolian type gathering from caves on Bey Dağ in B7 Malatya.

**Chaenorhinum calycinum** (Banks & Sol.) P. H. Davis, **comb. nov.**

Syn.: *Antirrhinum calycinum* Banks & Sol. in Russell, Aleppo 2:256 (1794).
*Linaria persica* Chav., Monogr. Antirrh. 173 (1833).
*Antirrhinum rytidospermum* Fisch. & Mey. in Ind. Sem. Horti Petrop. 2:27 (1835).
*Chaenorrhinum persicum* (Chav.) O. & B. Fedtsch., Consp. Fl. Turkest. 5:84 (1913).

Eig (*J. Bot.* 75:186, 1937) considered the type of *Linaria calycina* Banks & Sol., collected by Russell from near Aleppo, to be in too bad a condition to assess its status. However, although the specimen is depauperate and lacks a corolla spur (apparently nibbled off), I am in no doubt that this plant provides the earliest epithet for this rather variable Irano-Turanian species to which the names *Linaria persica* or *Chaenorhinum persicum* have usually been applied. Later gatherings of *Chaenorhinum calycinum* (e.g. *Kotschy* 194) have been seen from Aleppo.

**Chaenorhinum huber-morathii** P. H. Davis, **sp. nov.**

Affinis *C. calycini* (Banks & Sol.) P. H. Davis sed calcare multo longiore, filiformi recto differt; ut videtur pedicellis in fructu longioribus, seminibus costis longitudinis angustioribus divergit.

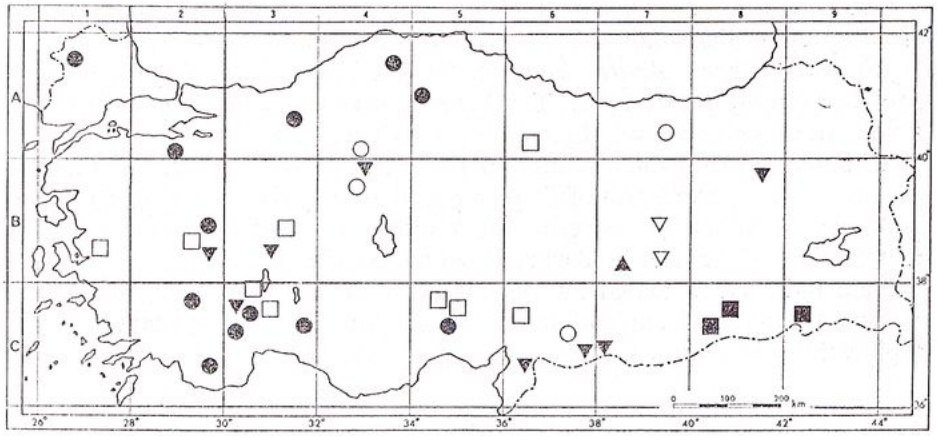

FIG. 1. Distribution of *Chaenorhinum* in Turkey: ● *C. minus* subsp. *minus*; ○ *C. minus* subsp. *anatolicum*; □ *C. litorale* subsp. *pterosporum*; ■ *C. rubrifolium*; ▲ *C. cryptarum*; ▼ *C. calycinum*; ▽ *C. huber-morathii*.

*Herba* annua, 3·5–25 cm, erecta. *Caulis* simplex vel sparse et breviter ramosus, crassiusculus, pilis ad 0·5 mm longis septatis molliter pubescens. *Folia* infima pauca, opposita, ovata vel ovato-oblonga, 12–23 mm × 5–10 mm, breviter petiolata, superiora alterna angustiora subsessilia pubescentia. *Flores* (saltem in plantis bene evolutis) in racemum deinde laxum dispositi. *Bracteae* foliaceae, elliptico-oblongae vel superne oblongo- vel lanceolato-lineares, 10–20 × 2–5 mm, pubescentes. *Pedicelli* ad anthesin 4–5 mm longi, in fructu crassi 5–7 mm longi bracteis 2–3-plo breviores, dense hirti. *Calyx* ut videtur ad basin fissus; segmenta lineari-oblonga, versus basin angustata, lamina pubescentia et praeter ad marginem villosa. *Corolla* (calcare excluso) 12–15 mm longa, violaceo-caerulea, ad 1/3 bilabiata; labium superius ad medium bifidum lobis obtusissimis, labium inferius brevius inflexe trilobatum; calcar rectum, albidum, (9–)10–12 mm longum, subulatum, acutissimum. *Capsula* sphaerica calyce 2–3-plo brevior, dense crispe pubescens, apice abrupte breviter rostrata (rostro 2 mm), ut videtur indehiscens. *Semina* pallide grisea, conico-oblonga, ad apicem truncata vel etiam depressa, 1·4 mm longa, ad 1 mm lata; costae longitudinales crassae (e cellulis erectis clavato-columnaribus obtusis inaequalibus fastigiato-compositae), costis transversis humilioribus connexae; semina inter costis longitudinalibus et lateralibus profunde foveata. *Fl.* Mai–Jun.

E Anatolia. B7 Tunceli: Pertek to Tunceli, 25 miles (c. 40 km) from Elaziğ, 1400 m, igneous gully, 6 vi 1957, *Davis & Hedge, D.* 29111 (holo. E). Elaziğ: Çilemelek Da., 25 km S of Elaziğ, 1060 m, 24 v 1956, *Huber-Morath* 14073.

The new species appears to be a local endemic that has arisen within the much wider range of *C. calycinum* (Banks & Sol.) P. H. Davis [*C. persicum* (Chav.) O. & B. Fedtsch.], differing from the latter mainly in its remarkably long straight spur. The other differences cited in the diagnosis need testing against additional fruiting material. It is a pleasure to name this handsome plant after its discoverer, Dr A. Huber-Morath.

*Chaenorhinum calycinum* and *C. huber-morathii* evidently belong to the same group as the Iranian *C. microcentron* Bornm. (*Feddes Repert.* 40:335, 1936) and perhaps *Antirrhinum ceratotheca* Náb. (*Publ. Fac. Sci. Univ. Masaryk* (*Brno*) 70:31, 1926). The latter species was placed by Nábělek in a new monotypic section: *Antirrhinum* Sect. *Ceratotheca* Náb.

Scanning electron micrographs of the seeds of Turkish taxa of *Chaenorhinum* (with the exception of *C. cryptarum*) are illustrated on Plate 1. Seeds in the same gathering, however, often show some variation in detail. The distribution of the taxa in Turkey is shown on Fig. 1.

I am indebted to David Sutton (BM) for some points included in these notes on *Chaenorhinum* and to Mr B. L. Burtt for his guidance on the typification of the genus.

## Digitalis

P. H. DAVIS

**Digitalis leucophaea** Sm. in Sibth. & Sm., Prodr. Fl. Graec. 1:439 (1809) subsp. **ikarica** P. H. Davis, **subsp. nov.**

A subsp. *leucophaea* bracteis lineari-oblongis latioribus, 4–5 mm latis, corolla lobo mediano labii inferioris oblongo (haud suborbiculari), 6·5 mm longo, 4 mm lato, obtusissimo differt.

Greece. Is: Ikaria, 2 km ESE of Mesaria, canyon with a rivulet, field edges, 300 m, 24 iv 1958, *Runemark & Snogerup* 6881 (holo. LD).

In facies, bracts and indumentum this gathering from Ikaria comes closer to *D. leucophaea* from Mt Athos (Greece) than to *D. cariensis* which grows on the same island. The broader (though still parallel-sided) ciliate bracts, and especially the shape of the more elongate lower lobe of the corolla, seem to justify distinguishing it as a subspecies of *D. leucophaea*. In the latter the lower lobe is suborbicular and the linear bracts narrower.

## Linaria

P. H. DAVIS

**Linaria genistifolia** (L.) Miller, Gard. Dict. ed. 8 no. 14 (1768).

In the *Flora of Turkey* vol. 6, reasons will be given for excluding *L. grandiflora* Desf. and *L. dalmatica* (L.) Miller from *L. genistifolia*. Over 300 Turkish specimens of *L. genistifolia* have been examined, resulting in the recognition of six weakly delimited subspecies.

subsp. **genistifolia.**

Lectotype designated here: Hb. Linn. 767/40. Described from Siberia. In Turkey most common in the N, but scattered further S in Anatolia, C & SE Europe to Siberia.

Raceme lax, at least in fruit. Corolla bright yellow (lutea).

subsp. **confertiflora** (Boiss.) P. H. Davis, **stat. nov.**

Syn.: *Linaria monochroma* Boiss. & Heldr., Diagn. ser. 1, 12:41 (1853).
*L. genistifolia* (L.) Miller var. *confertiflora* Boiss., Fl. Or. 4:377 (1879).

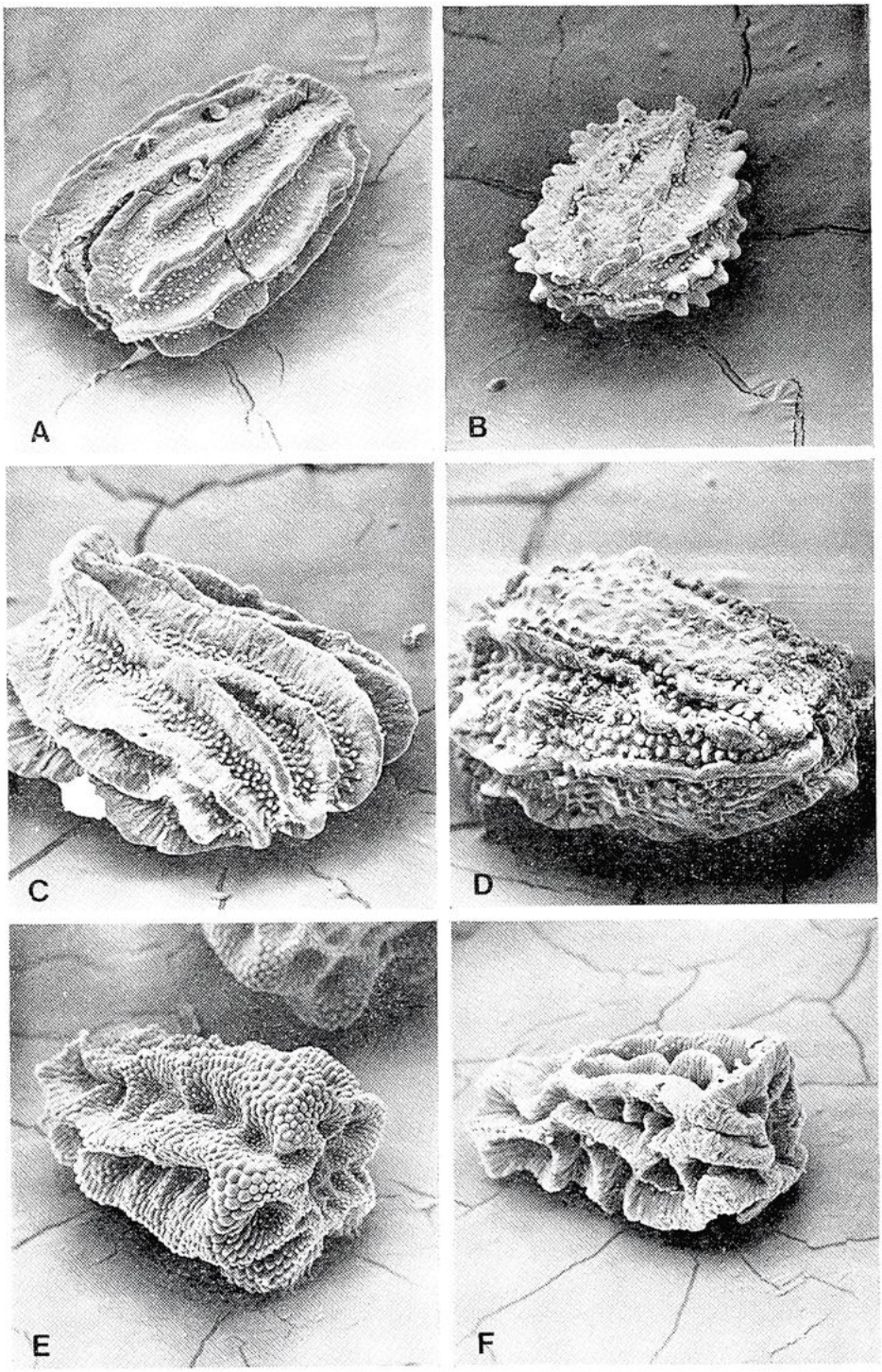


PLATE 1. Scanning electron micrographs of seeds of Turkish species of *Chaenorhinum*: A, *C. minus* subsp. *minus* (*D.* 36863); B, *C. minus* subsp. *anatolicum* (*Frères E.C.* 413); C, *C. litorale* subsp. *pterosporum* (Mt Sipylos, *Boissier* s.n.); D, *C. rubrifolium* (*D.* 28529); E, *C. calycinum* (*Balansa* 196); F, *C. huber-morathii* (*D.* 29111). A, B & C ×70; D ×140; E & F ×35.

Mainly Inner & S Anatolia. Endemic. Differing from subsp. *genistifolia* in its dense racemes (even in fruit) and paler yellow (flavous) flowers, at least when dried.

subsp. **linifolia** (Boiss.) Davis, **stat. nov.**

Syn.: *Linaria concolor* Griseb., Spic. 2:21 (1844).
*L. syspirensis* C. Koch in Linnaea 22:717 (1849).
*L. genistifolia* (L.) Miller var. *linifolia* Boiss., Fl. Or. 4:378 (1879).

Lectotype designated here: [Turkey A8 Rize] valle Djimil (Cimil), 1830 m, [1866], *Balansa* (holo. G).

Mainly on mountain slopes and screes, scattered in NW and Inner Anatolia. The leaves are narrower than those of the first two subspecies, being linear to linear-filiform, and usually 2–4 mm broad. The habit is often ascending and the flowers bright brassy yellow.

subsp. **praealta** (Boiss.) Davis, **comb. et stat. nov.**

Syn.: *Linaria praealta* Boiss. & Bal. in Boiss., Diagn. ser. 2, 3:162 (1856).
*L. balansae* Boiss. & Reuter in Boiss., *l.c.* 163.
*L. genistifolia* (L.) Miller var. *venosa* Boiss., Fl. Or. 4:378 (1879) *pro parte*.

Cilician Taurus, Amanus, S Anti-Taurus, Mardin. Endemic.

The type of Boissier's *L. praealta* was an aberrant, very tall, apparently biennial plant washed downstream from the Bulgar Dağ above Güzel Dere. Although Boissier described the flowers as concolorous (unveined), all the other material is reddish-veined (as often mentioned in the field notes); however, this venation sometimes fades out on drying. The corolla is proportionally broader than in the other subspecies, and the spur often proportionally shorter.

subsp. **polyclada** (Fenzl) Davis, **comb. et stat. nov.**

Syn.: *Linaria polyclada* Fenzl in Tchihatcheff, Asie Min. Bot. 2:23 (1860).
*L. genistifolia* (L.) Miller var. *venosa* Boiss., Fl. Or. 4:378 (1879).

C & adjacent S Anatolia. Endemic.

As Boissier's *L. genistifolia* var. *venosa* covered two taxa, it seems better to adopt *L. polyclada* Fenzl as basionym, typified by *Kotschy* 1836:399 from Güllek on Bulgar Dağ (C5 Içel). It is distinguished from subsp. *linifolia* by its very narrow linear-filiform leaves (0·5–1·5 mm broad, usually involute), and palish, flavous flowers.

subsp. **artvinensis** P. H. Davis, **subsp. nov.**

*Folia* mediana ovata vel lanceolata, 15–35 × 5–10 mm, 3-nervia. *Racemus* laxus. *Bracteae* ovatae, pedicellos 1–2 mm longos aequantes. *Calyx* lobis late ovatis, c. 2 mm × 1·25–1·75 mm. *Corolla* (calcare excluso) 6–7 mm longa, lutea (vel flava?), labiis rubrovenosis; calcar 7–8 mm longum. *Fl.* Apr.–Aug. Turkey. A8 Çoruh: Artvin, 400 m, crevices in rocks, corolla yellow marked with red, 28 iv 1960, *Stainton* 8290 (holo. E); above Artvin, 600 m, dry roadsides, leaves slightly glaucous, 5 viii 1974, *J. R. Akeroyd* 188.

Despite its red-veined flowers (a feature of subsp. *praealta*), subsp. *artvinensis* is perhaps more closely related to subsp. *genistifolia*, of which I have not seen material from east of A7 Trabzon. It is possible that *L. adzharica* Kem.-Nath. [*Zam. Sist. Geogr. Rast. Tbilisi* 23:40 (1963)] is synonymous, but the type has been grazed and is thus aberrant.

**L. chalepensis** (L.) Miller var. **brevicalyx** P. H. Davis, **var. nov.**

A var. *chalepense* lobis calycis brevioribus (in fructu 4–5 mm), anguste oblongo-spathulatis subobtusis capsulam ± aequantibus, bracteis brevioribus longitudine ½–1 pedicelli partes aequantibus. Turkey. C3 Antalya: Karanlik Sokak, 150 m, *Tengwall* 249. C4 Antalya: Alanya promontory, 100 m, rocky limestone slopes, flowers white with greyish veins, 11 iv 1956, *Davis & O. Polunin, D.* 25855 (holo. E; iso. BM, K).

In its short broad sepals and shorter bracts, this taxon approaches *L. armeniaca* Chav., but in other characters is better treated as a variant of *L. chalepensis*, with which its range overlaps. *L. armeniaca* (from Caucasia and easternmost Anatolia) is distinguished from *L. chalepensis* sensu lato by its narrower linear-filiform leaves, longer pedicels and lavender-blue corolla with a longer spur. Sterile basal shoots (a very common feature in *L. chalepensis*) are apparently lacking in *L. armeniaca*. One specimen on the sheet of *Tengwall* 249 (K) is intermediate in calyx characters between the two varieties, the others being typical of var. *brevicalyx*.

**L. kurdica** Boiss. & Hoh. in Boiss., Diagn. ser. 1, 4:73 (1844).

Like *L. genistifolia* (L.) Miller (from which it differs in its discoid winged seeds and usually marginate calyx lobes), this is a species that shows invasive weedy tendencies, which may account for some blurring of the morphological limits of the subspecies recognised here, several of which have previously been treated as species.

subsp. **kurdica.**

Type: [N Iraq] in declivibus calcareis montis Gara Kurdistaniae, *Kotschy* 591 (holo. G; iso. K).

Common in Inner Anatolia.

subsp. **araratica** (Tzvelev) P. H. Davis, **comb. et stat. nov.**

Syn.: *Linaria araratica* Tzvelev in Not. Syst. (Leningrad) 19:17 (1959).

Taking a broader view than Tzvelev, this subspecies extends from the vicinity of Doğubayazit to Hakkari, and so may well occur in NW Iran and Soviet Armenia. Its median leaves are only 1–4 mm broad. The plant from Ararat mapped as *L. lineolata* Boiss. in Grossheim, *Fl. Kavkaza* 7: map 536 (1967) should be referred to *L. kurdica* subsp. *araratica*. *L. lineolata* Boiss. (described in flower) is probably confined to N Iran (Elburz) and was placed by its author in the wrong seed group; it has discoid, winged (not angled, wingless) seeds, as in *L. kurdica*.

subsp. **aucheri** (Boiss.) P. H. Davis, **comb. et stat. nov.**
Syn.: *Linaria aucheri* Boiss., Diagn. ser. 1, 7:44 (1846).
*L. caelesyriaca* Boiss., *l.c.* 12:41 (1853).
Lectotype designated here: [Lebanon] in Libano, *Aucher* 1906 (G).
Scattered in Central Anatolia, Lebanon and Anti-Lebanon.

The corolla is apparently dirty yellow('buff') and often brown-veined in this subspecies, and the calyx lobes are obtuse. The Turkish material differs from the type in lacking minute pubescence on the calyx lobes.

subsp. **pycnophylla** (Boiss. & Bal.) P. H. Davis, **comb. et stat. nov.**
Syn.: *Linaria pycnophylla* Boiss. & Bal. in Boiss., Diagn. ser. 2, 6:129 (1859).
Mainly Inner Anatolia. Endemic.

The calyx lobes are crisply tomentellous, the hairs being eglandular (as in Balansa's type from Erciyas Dağ), or sometimes glandular; however, the presence or absence of glandular hairs does not correlate with any other differences or distinctive distribution.

subsp. **eriocalyx** P. H. Davis, **comb. et stat. nov.**
Syn.: *Linaria pycnophylla* Boiss. & Bal. var. *eriocalyx* Boiss., Fl. Or. 4:372 (1879).
Endemic to SW Anatolia, C3 Antalya (Lycia). It differs from subsp. *pycnophylla* mainly in its densely white tomentose (snowy white) calyx and distinct distribution.

**L. sintenisii** P. H. Davis, **sp. nov.**
Affinis *L. kurdicae* Boiss. & Hohen. sed calyce majore lobis 4–6 mm longis, ovato-lanceolatis vix vel obscure marginatis, breviter laxe villosis recedit.
*Herba* perennis, 40–60 cm. *Caules* erecti, dense foliati, superne paniculati. *Folia* mediana ovata, 35–60 mm × 10–25 mm, ± acuminata vel pungentia, 5-nervia, glauca, firma, glabra, ea ramorum abbreviata saepe lanceolata. *Racemus* 3–13 cm × 1·7–2 cm, saltem in statu florentia valde densus. *Bracteae* lineari-lanceolatae, pedicellos 2–3 mm longos 1–2-plo longiores. *Calyx* lobis ovato-lanceolatis acutis, 4–6 mm longis, vix vel obscure anguste marginatis, e pilis multicellularibus breviter et laxe villosis. *Corolla* (in sicco) lutescens, 12–14 mm (calcare excluso), erecto-ascendens, palato pubescenti, ad $\frac{2}{5}$ bilabiata, labiis vix divergentibus; calcar rectum deorsum, c. 10 mm longum, acutum. *Capsula* subsphaerica, c. 7 mm longa, superne sparse puberula. *Semina* discoidea, 2·5 mm lata, disco minute tuberculato. *Fl.* Jun.–Aug.
Turkey. A7 Gümüşane: Kirkpauli, in herbidis, *Sintenis* 1894:6069 (holo. LD); Stadodopi, 10 vii 1894, *Sintenis* 6279; above Istavros, *Sintenis* 1890: 1728.

The Sintenis material of this new species was wrongly determined by Freyn as *Linaria pyramidata* (Lam.) Sprengel var. *kotschyana* Boiss. It is, in fact, closely related to the variable *L. kurdica*, particularly subsp. *pycnophylla* (Boiss. & Bal.) Davis, from which it is distinguished by the features of the calyx cited in the diagnosis.

## Parentucellia

I. C. HEDGE

**Parentucellia latifolia** (L.) Caruel in Parl., Fl. Ital. 6:842 (1885).

This widespread and relatively oligomorphic annual can be divided into two distinct colour variants which have discrete scarcely overlapping geographical ranges. The western, essentially Mediterranean subspecies (subsp. *latifolia*) has almost constantly reddish-purple or pink corollas, whereas the eastern, Irano-Turanian subspecies (subsp. *flaviflora*) is uniformly yellow. In Turkey both taxa are present: subsp. *latifolia* in European Turkey, the western parts of Anatolia and along the Black Sea coast; subsp. *flaviflora* in south—east Anatolia and adjacent southern districts.

Fig. 2 shows the overall distribution of the species and its two subspecies. There is an apparent overlap of the taxa in Cyprus, Lebanon and Palestine, where studies of flower-colour populations would be worthwhile, but otherwise their ranges are remarkably clear-cut.

In recent Soviet Central Asiatic Floras (e.g. *Fl. Uzbek.*, *Fl. Turkmen.* and *Fl. Kazakhstan*) and in determination lists from Afghanistan (e.g. Symbolae Afghanicae in *Dansk Biol. Skr.* 10), the eastern plant has been recognised at specific level as *P. flaviflora* (Boiss.) Nevski. In these Floras, in addition to flower colour, such extra characters as corolla size (smaller) and stem thickness (more slender) have been used to substantiate specific separation. However, with the material that I have seen, these supporting characters do not hold true. There are, for example, specimens from NW Afghanistan (corresponding to '*P. flaviflora*') which are indeed smaller, less glandular, more slender-stemmed with smaller corollas than plants from the shores of the Mediterranean (i.e. *P. latifolia* subsp. *latifolia*) but these differences—as the descriptions in regional Floras verify—are not constant. All the available evidence points to only one, not two, species being involved.

Throughout the range of subsp. *latifolia*, white-flowered forms occur sporadically (as in Morocco, S Europe, Cyprus and Crete) but within the area of subsp. *flaviflora* there seem only to be records of yellow flowers.

Colour variation involving combinations of purple and yellow within a species is, in general, not a rare phenomenon in flowers (it occurs in *Scutellaria* and *Salvia*), but this instance is of particular interest because of the two

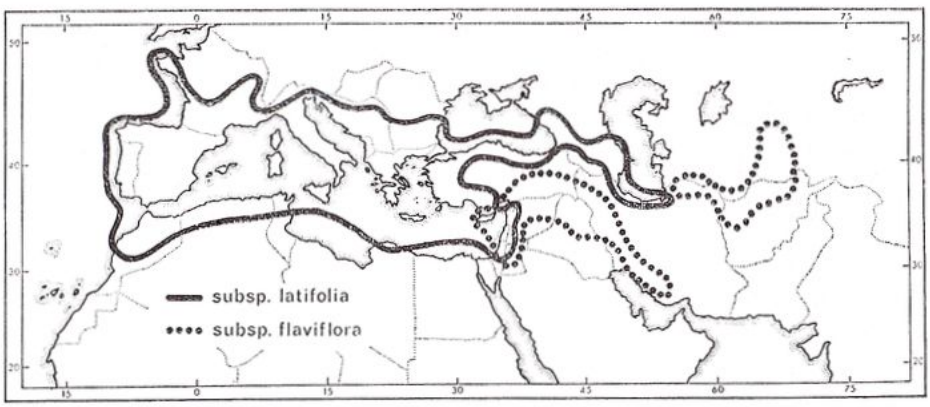


FIG. 2. Total distribution of the two subspecies of *Parentucellia latifolia*.

definite geographical ranges involved within an overall range of about 4500 miles and 2(–3) phytogeographical regions. Although it is largely a matter of opinion whether the two taxa should be recognised at varietal rank, as some authors in the past have done, or subspecific rank, I have considered that the latter is more suitable when the taxa are reviewed throughout the range of the species. They can be keyed out as follows:—

1. Corolla purplish red, pink or crimson, with or without two yellow patches on lower lip; fls occasionally white . . subsp. *latifolia*
+ Corolla uniformly pale yellow . . . . subsp. *flaviflora*

subsp. **latifolia.**

Type. 'Hab. in Apulia, Italia, Montpelii' (LINN 759/1—photo!).

SW, S, SE Europe, NW Africa (Tell), Cyrenaica, Turkey-in-Europe, Outer Anatolia, Cyprus, Caucasia, N Iran. Naturalised in Australia (N.S.W., Victoria, S Australia).

subsp. **flaviflora** (Boiss.) Hand.-Mazz. in Ann. Nat. Hofmus. Wien 27:16 (1913).

Syn.: *Eufragia latifolia* L. var. *flaviflora* Boiss., Fl. Or. 4:473 (1879).
*Parentucellia latifolia* var. *flaviflora* (Boiss.) Bornm. in Beih. Bot. Centralbl. 31:247 (1914).
*Eufragia flaviflora* (Boiss.) Pavl. in Sov. Bot. 1934, 1:27 (1934).
*Parentucellia flaviflora* (Boiss.) Nevski in Trudy Bot. Inst. Akad. Nauk SSSR 4:321 (1937).

Ic.: Komarov, Fl. URSS 22: t. 32, f. 2 (1955).

Type. Iran (Fars). In rupestribus graminosis prope Gere, *Kotschy* 43, (G, E).

Cyprus, W Syria, Syrian Desert, SE Anatolia, N Iraq, W and NE Iran, N and NW Afghanistan, Soviet C Asia (Syr Darya, Pamir-Alai, montane Turkmenia).

Allied to *P. latifolia* is the little-known type species of the genus, *P. floribunda* Viv. (Viv., *Fl. Libyce Spec. Pl. Enum.* 32, t. 21, f. 2, 1824). Apparently endemic to Libya (Cyrenaica), it clearly differs in the larger corolla (15 mm compared to 8–10 mm) with clearly exserted tube and broader lower lip; the flower colour is purple.

## Scrophularia L.

R. R. MILL

The Turkish species of *Scrophularia* were last revised by S. S. Lall (unpublished Ph.D. thesis, 1970*; see also *Notes R.B.G. Edinb.* 30:129–140, 1970). Since that time a considerable amount of new material has become available for study. This has resulted in the recognition of several new species. The *S. libanotica–S. rupestris* species complex has also been critically re-assessed; *S. rupestris* Bieb. and *S. libanotica* Boiss. are here treated as distinct species, with several new infraspecific taxa described under *S. libanotica*. *S. cinerascens* Boiss., *S. pinardii* Boiss., *S. xylorrhiza* Boiss. & Bal. and *S. depauperata* Boiss. are all considered to be specifically distinct from *S. variegata* Bieb.

* *Taxonomic Studies in the Genus Scrophularia.* Ph.D. thesis, Edinburgh University.

NEW TAXA AND COMBINATIONS

**Scrophularia carduchorum** R. Mill, **sp. nov.** (Sect. *Scrophularia*). Fig. 3A.

Species *S. luridiflorae* affinis sed cymis multifloris ramis irregulariter dichotomis fractiflexis, corollis capsulisque multo brevioribus differt.

*Herba* perennis, multicaulis, molliter villosa. *Caules* 100 cm alti vel ultra, acute quadrangulares, purpureo-virides. *Folia* infima ignota; mediana breviter petiolata (petiolum ad 2 cm longum), lamina ovata, 4–6 × 2·5–4 cm, basi truncata vel subcordata, margine obscure duplicato-crenato-mucronata. *Inflorescentia* paniculata foliata. *Bracteae* inferiores ovatae vel late ovatae, sessiles, 15–25 × 12–16 mm, margine serrato-mucronatae, superiora gradatim minores, minutae, anguste ovatae. *Cymae* oppositae, 8–23-florae; rami cymarum tenues, fractiflexi, valde irregulariter et iterum atque iterum dichotomi. *Pedunculi* 2 cm longi, glandulosi. *Bracteolae* 3–6 mm, lineares, glandulosae. *Pedicelli* glandulosi, alares 1–2·5 mm longi. *Lobi calycis* ovati ad suborbiculares, glabri, 2–2·5 × 1·5–2 mm, margine albo-scarioso 0·2 mm lato. *Corolla* marronina, 3·5–5 mm longa, lobis superioribus brevioribus. *Stamina* inclusa; filamenta pilis glandulosis capitatis rotundatis praedita. *Staminodium* transverse oblongum, apice retusum. *Capsula* straminea, ovata, 2·5 mm longa rostro 1 mm longo tenue inclusa. *Fl.* Jul.–Aug.

Turkey. B9 Bitlis: d. Kotum, Karz Da. above Kamer, 2000 m, banks of stream, erect many-stemmed perennial, plant softly hairy, flowers maroon, 24 viii 1954, *Davis & O. Polunin, D.* 24577 (holo.E).

Known only from the type gathering, this new *Scrophularia* is apparently most closely related to *S. luridiflora* Fisch. & Mey. (N & adjacent C & E Anatolia), but differs by its many-flowered cymes which repeatedly branch dichotomously in a very characteristic zig-zag manner, and by the much smaller corolla and capsule. There are also relationships with *S. pegaea* Hand.-Mazz. from E Anatolia and N Iraq (which, however, has pedicels exceeding the bracteoles) and with *S. scopolii* [Hoppe ex] Pers., which usually has a less dense indumentum.

**Scrophularia paphalagonica** R. Mill, **sp. nov.** (Sect. *Scrophularia*). Fig. 3B.

*S. capillari* Boiss. & Bal. affinis sed foliis villosis, pedicellis alaribus brevioribus et lateralibus haud patentibus, staminodio canale dorsali proviso, capsulis multo minoribus differt.

*Herba* biennis e parte superiore foliis basalibusque tantum cognita. *Caulis* purpureo-brunneus, quadrangularis, tenuis, villosus pilis laxis eglandulosis, in parte florifero sparse glandulosis. *Folia basalia* petiolo purpureo-nigrescente villoso 5–10 cm longo; lamina ovata, 5–8 × 3–4·5 cm, tenuis, utrinque venis villosis cetera subglabra, basi truncata usque subcuneata, margine irregulariter crenato-mucronato; *caulina* ignota. *Inflorescentia* foliata ramosissima ramis longissimis rigidis divaricatim patentibus usque adscendentibus. *Bracteae* inferiores breviter petiolatae, lamina c. 1·5 × 1·5 cm, rhombico-ovata margine crenato-mucronato; superiores sessiles anguste ovatae subintegrae vel inferne acute dentatae. *Pedunculi* tenues, c. 2·3 cm, glabri vel sparse glandulosi. *Cymae* 5–10-florae, dichotomae vel plerumque uno ramulo suppresso, altero undulato vel fractiflexo. *Bracteolae* linearilanceolatae, c. 2 × 0·2 mm, glabrae. *Pedicelli* capillares glandulosi, alares 9·5–10·5 mm longi bracteolas excedentes. *Lobi calycis* late ovati. 2·5 mm,

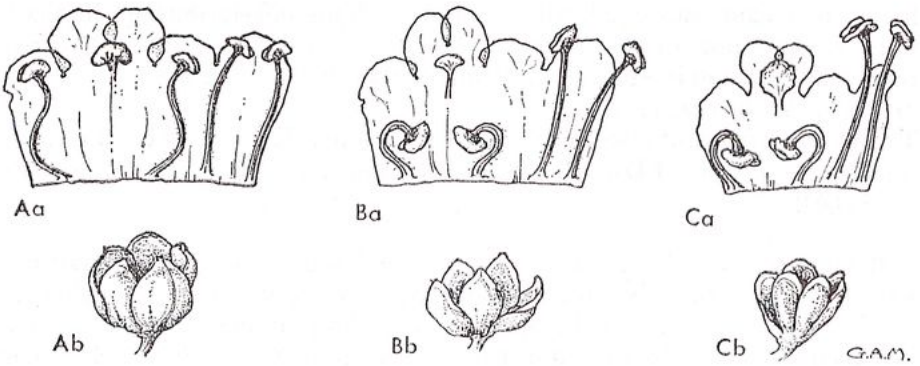


FIG. 3. A, *Scrophularia carduchorum*, *D.* 24577; B, *S. paphlagonica*, *Sint.* 5048; C, *S. erzincanica*, *Sint.* 2182. a, corolla opened out; b, calyx. All ×4.

glabri, margine albido-scarioso 0·2 mm lato. *Corolla* 5 mm longa, in sicco viridi-rosea, lobis superioribus purpurascentibus. *Stamina* inclusa vel paulo exserta, filamenta glandulis pilis capitatis rotundatis. *Staminodium* transverse oblongum, 0·4 × 0·8 mm, apice emarginato, canale dorsali depresso aperto provisum. *Capsula* ferruginea, 4 mm, apice mucronato vel breviter apiculato. *Fl.* Jul.–Aug.; fr. Aug.

Turkey. A4 Kastamonu: Küre-Nahas, Enzisler (Ersizlerdere), ad muros, 25 viii 1892, *Sintenis* 5048 (holo. LD).

Known only from the type gathering, which lacks the middle portion of the stem. Related to *S. capillaris* Boiss. & Bal. (NE Anatolia, Transcaucasia), from which it differs by its much shorter pedicels, much smaller capsules, and leaves with villous indumentum. The staminode is also very distinct, having an open dorsal channel.

**Scrophularia erzincanica** R. Mill, **sp. nov.** (Sect. *Scrophularia*). Fig. 3C.

Ex affinitate *S. lucidae* L. sed corolla urceolata subaequilobata marginibus loborum superiorum flavidis, staminodio spadiciforme vel ovato numquam reniforme, stamina paulo exserta, forma glandulorum inflorescentiae distinguitur.

*Herba* biennis pluricaulis, 23–25 cm alta, tota (floribus exclusis) in sicco nigrescens. *Caules* subtereti, inferne parce glandulosi, inflorescentia glandulis pluribus praedita; glanduli caulis brevistipitati luteo-albidi; inflorescentia glandulos ferrugineos stipitatos capitatis permagnis ferens, et fasciculo pilorum tenuissimorum apice glandulo hyalino parvo. *Folia basalia* late ovata usque suborbicularia, c. 32 × 28 mm, indivisa, margine crenata; *caulina* crassa bipinnatisecta, inferiora longe petiolata (petiolum ad 65 mm), superiora petiolo breviore; lamina ad 40 mm, segmenta ultima oblonga usque obovata marginibus dentatis vel pinnatifidis. *Inflorescentia* aphylla cymis alternatis 2–7-floris; *bracteae* infimae profunde trisectae, 7 mm longae, superiores lineares 1·5 mm longae. *Pedunculi* parce glandulosi, infimi ad 13 mm longi. *Bracteolae* lineari-lanceolatae, 1 mm longae, glabrae. *Pedicelli* glandulosi, alares 2–2·5 mm longi, quam bracteolae longiores. *Lobi calycis* ± obovati, glabri, c. 2 × 1·2 mm, margine scarioso albido 0·2 mm lato. *Corolla* c. 5 mm

longa, urceolata, subaequilobata, lobis lateralibus inferioribusque in sicco viridi-roseis, superioribus purpureis anguste flavido-marginatis. *Stamina* paulo exserta; staminodium purpureum ovatum vel spadiciforme, 0·8 × 0·8 mm. *Capsula* ignota, *Fl.* Mai.
Turkey. B7 Erzincan: inter Sürek (Sarek) et Albuschik, in herbidis, 6 v 1890, *Sintenis* 2157 (holo. LD); Chama, nr Ausschin (Avşin), 8 v 1890, *Sintenis* 2182 (LD).

Related to *S. lucida* L. but easily distinguished by its urceolate corolla with short, subequal lobes, the upper having a narrow yellow margin which is similar to that of *S. canina* L. subsp. *bicolor* (Sm.) Greuter. The occurrence of subequal corolla lobes is unusual in Sect. *Scrophularia*. The only other Turkish species of this Section having subequal lobes is *S. subaequiloba* Lall, which is distinguished from *S. erzincanica* by its unique staminode which has a ± closed dorsal canal (Lall, *op. cit.* 135, f. 13, 1970).

**Scrophularia scopolii** [Hoppe ex] Pers. var. **parryi** R. Mill, **var. nov.**
A var. *adenocalyx* Somm. & Lev. stamina obcordata, folia pallide griseo-virentia, calyce margine anguste scarioso 0·2–0·3 mm lato differt.
*Folia mediana* 7·5 cm longa, pallide griseo-virentia, basi cordata. *Lobi calycis* glandulosi, 3·5–4 × 2·7–3 mm, margine anguste scarioso albo vel pallide brunneo 0·2–0·3 mm lato. *Pedicelli* 10 mm longi. *Corolla* 5·5–8·5 mm longa. *Staminodium* obcordatum, apice emarginato.
Turkey. C5 Niğde: Ala Da., Arpalik gorge, by water, 2190 m, 26 vi 1963, *Elisabeth Parry* 155 (holo. E).

Known only from the type specimen. Easily distinguished from both var. *adenocalyx* and var. *burdurensis* (H. Peşmen) R. Mill (see below) by the smaller, obcordate staminode and pale grey-green leaves. From var. *adenocalyx* (which, in Turkey, is restricted to NE Anatolia), it is additionally distinguished by the much narrower (0·2–0·3 mm broad), white to pale brown scarious margin to the calyx lobes.

var. **burdurensis** (H. Peşmen) R. Mill, **comb. et stat. nov.**
Syn.: *S. burdurensis* H. Peşmen in Türk. Biol. Derg. 20:122 (1970).
Turkey. C2 Burdur: d. Gölhisar, between Divre and Karincabeli, 1450 m, 17 vi 1967, *H. Peşmen* 2036 & *Leblebici* (holo. EGE).

Peşmen related *S. burdurensis* to *S. catariifolia* Boiss. & Heldr. on the basis of its glandular habit and allegedly similar staminode, and also noted a possible affinity with *S. scopolii*. As *S. scopolii* and *S. catariifolia* are usually classified in different infrageneric groups, it seemed desirable to investigate the true affinity of *S. burdurensis*. Comparison of the type specimen with material of *S. scopolii* and *S. catariifolia* has led me to consider it to be conspecific with *S. scopolii*. Within that polymorphic species, it deserves the rank of a variety on account of its glandular calyx (otherwise known in *S. scopolii* only in the geographically widely separated varieties var. *adenocalyx* Somm. & Lev. and var. *parryi* R. Mill), the narrow scarious margin to the calyx lobes, and the very strongly foliate inflorescence.

**Scrophularia libanotica** Boiss., Diagn. ser. 1, 12:36 (1853). Fig. 4.

Lall (in *Notes R.B.G. Edinb.* 30:136, 1970) reduced this species, and *S. mesogitana* Boiss., to varieties of *S. rupestris* Bieb. Examination of Crimean material of *S. rupestris* has led me to conclude that it is much more closely allied to *S. cretacea* [Fischer ex] Sprengel from the Ukraine than to *S. libanotica*, which is here recognised as a distinct species. *S. rupestris* is readily distinguished by its densely leafy stems and ± dense, regularly dichasial cymes. Some forms of *S. libanotica*, especially those from N Anatolia, do approach *S. rupestris* in having narrow, oblong staminodes and ± dichotomous cymes, but they always have longer internodes and thus relatively fewer leaves.

*S. libanotica* is extremely polymorphic in Turkey, particularly in characters of indumentum, corolla colour and staminode shape. Examination of a very large quantity of material has shown that the variation is on a fairly narrow geographical basis. Accordingly, 9 distinct groups are distinguished here and awarded varietal rank (within subsp. *libanotica*), while one particularly striking group is recognised as a separate subspecies. The distribution of the infraspecific taxa is shown in Fig. 4.

1. Staminode 3–5-lobed, subrounded in outline . . subsp. *armena*
\+ Staminode not lobed, linear to suborbicular (rarely transversely reniform) in outline (subsp. *libanotica*) . . . . . 2

2. Corolla greenish pink . . . . . 3
\+ Corolla maroon . . . . . 6

3. Plants densely glandular . . . . . 4
\+ Plants glabrous to sparingly glandular . . . . . 5

4. Leaves with subcordate to truncate base, lyrate-pinnatisect or undivided with coarsely dentate margin; staminode transversely reniform . . . . . var. *mesogitana*
\+ Leaves with cuneate to truncate base, ovate, undivided, margin crenate or acutely dentate; staminode suborbicular . var. *sivasica*

5. Ripe capsules dark buff to chestnut; staminode ± linear var. *pontica*
\+ Ripe capsules buff to red-brown; staminode broadly ovate-spathulate, often with acute apex . . . . var. *libanotica*

6. Plants glabrous to sparingly glandular . . . . . 7
\+ Plants densely glandular . . . . . 8

7. Staminode spathulate to linear; leaves not glaucous; cymes reduced, 1–2-flowered . . . . . var. *oligantha*
\+ Staminode ovate to orbicular; leaves often glaucous; cymes dichasial, with 3 or more flowers . . . . var. *australis*

8. Calyx lobes glandular . . . . . var. *nevshehirensis*
\+ Calyx lobes glabrous . . . . . 9

9. Staminode ovate to spathulate; leaves often bright green when dry . . . . . var. *urartuënsis*
\+ Staminode spathulate to linear; leaves dull dark green when dry . . . . . var. *cappadocica*

subsp. **libanotica**

var. **libanotica**

Syn.: *Scrophularia urvilleana* sensu Decne. in Ann. Sci. Nat., ser. 2, 2:252 (1834) non Wydler (1828).

*S. variegata* Bieb. var. *libanotica* (Boiss.) Boiss., Fl. Or. 4:418 (1879).

*S. rupestris* Bieb. var. *libanotica* (Boiss.) Lall in Notes R.B.G. Edinb. 30:136 (1970).

Plant 15–60 cm, ± glabrous. *Leaves* subsessile or shortly petiolate, lamina 18–45 × 5–20 mm, glabrous, usually not glaucous. *Branches of dichasia* equal, cymes usually 3-flowered. *Corolla* greenish- to brownish-pink. *Staminode* broadly ovate-spathulate, sometimes with acute apex. *Capsules* buff to red-brown.

Lectotype designated provisionally by Heywood in *Notes R.B.G. Edinb.* 21:80, 1952: [Turkey C6 Hatay/Syria] montis Cassii (Akra Da.), 1846, *Boissier* (K). B1 Manisa: Manisa Da., 3 km E of Akpinar, 210 m, *K. Buttler* 12635 (hb. Buttler). B5 Kayseri: Develi, *Davis* 19174. B6 Maraş: 3 km W of Elbistan, 1100 m, *Davis* 27628. Adana: d. Saimbeyli, Bozoğlan Da. above Obruk Y., 2100 m, *Davis* 19730. C5 Içel: nr Gülek boğazi, 1070 m, *Kotschy* 1853:100. C6 Maraş: Ahir Da. above Maraş, valley nr Kandil, 1100 m, *Davis* 27488 (approaching *S. amana* Lall). Malatya: 31 km N of Gölbaşi, 1250 m, *Sorger* 71–44–15 (hb. Sorger).

Latakia, Lebanon, Palestine.

A specimen from B9 Bitlis (Pelli Da. above Pelli, 3050 m, *Davis* 22446) may belong to this variety. It is intermediate between *S. libanotica* and *S. bitlisica* Lall, differing from the latter by its glabrous habit and ovate staminode. The lowest leaves, which in *S. bitlisica* usually have 1–2 free basal segments, have not been collected.

var. **australis** R. Mill, **var. nov.**

*Caules* (15–)27–55 cm alti, ± glabri, rariore sparse glandulosi. *Folia* petiolata; lamina ± ovata, haud glauca, glabra, margine dentata usque subintegra. *Cymae* 3–5-florae ramis dichasiorum aequalibus vel una reducta floribusque 1–2. *Calyx* glaber. *Corolla* marronina. *Staminodium* orbiculare vel ovatum. *Capsula* bubulina vel ferruginea. *Fl.* Mai–Jul.

B5 Nevşehir: Kayseri to Ankara, 110 km SE of Ankara, 26 vii 1971, *Shmida & Luria* (HUJ). C4 Konya: Korasch (Koraş), *Siehe* 1912:546; Karapinar, *Birand & M. Zohary* 3102 (HUJ). C5 Niğde: Ala Da., Ulupinar Y. to Kara G., 2650 m, *Spitzenberger* 71 (WU). Içel: Güllek Tepe, *Siehe* 1896:452. C6 Hatay: Amanus, 915–2135 m, *Haradjian* 4577 (holo. E); ibid., 2500 m, *Haradjian* 585; Kassab Da., 1220–1676 m, *Haradjian* 3148. Maraş: Zeytun (Süleymanli), 915 m, *Balls* 1097.

The variety possibly also occurs in N Syria.

var. **nevshehirensis** R. Mill, **var. nov.**

Saxatilis caulibus ramosis dense glandulosis 17–25 cm altis vel ultra. *Folia* ovata, petiolata, glandulosa. *Cymae* dichotome ramosae, 3–12-florae. *Calyx* glandulosus. *Corolla* rubescens vel marronina. *Staminodium* ovatum vel anguste ovatum ad spathulatum. *Capsula* bubulina vel ferruginea. *Fl.* Mai.

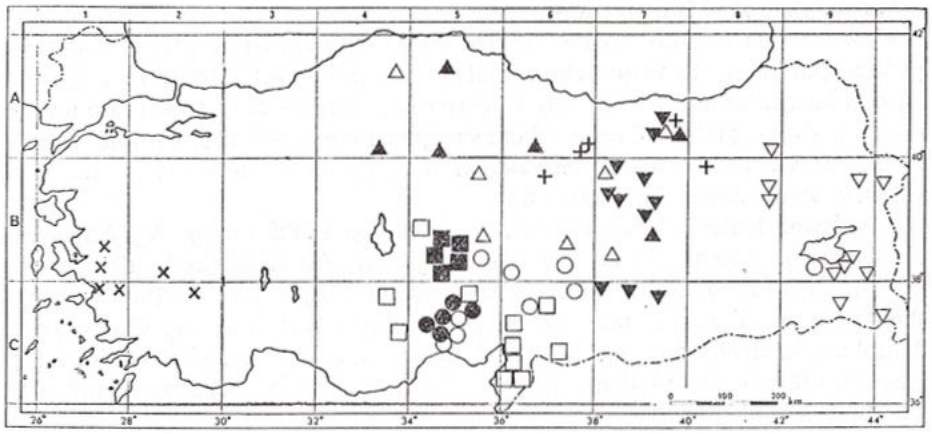

FIG. 4. Distribution of varieties of *Scrophularia libanotica* subsp. *libanotica*: ○ var. *libanotica*; ● var. *oligantha*; □ var. *australis*; ■ var. *nevshehirensis*; △ var. *cappadocica*; ▲ var. *pontica*; ▽ var. *urartuënsis*; + var. *sivasica*; × var. *mesogitana*. ▼ Distribution of *S libanotica* subsp. *armena*.

B5 Nevşehir: c. 5 km N of Derinkuyu, 1600 m, exposed rock and shale, crevices, flowers reddish, 21 v 1965, *Coode & Jones* 1268 (holo. E); Göreme valley nr Göreme, 24 vii 1971, *Shmida & Luria* (HUJ); Ürgüp camp site, 1250 m, *Sorger* 70–37–32 (hb. Sorger); 18 km S of Şahinefendi köyü to Güzelgöz, 1460 m, *K. & E. Buttler* 20120 (hb. Buttler).

Apparently endemic to Nevşehir vilayet.

var. **cappadocica** R. Mill, **var. nov.**

Glanduloso-pubescens. *Folia* breviter petiolata, lamina ovata vel oblonga, margine crenata vel serrata. *Cymae* ramis dichasiorum ± bene evolutis, aequalibus, 3–7-florae. *Calyx* glaber. *Corolla* marronina. *Staminodium* spathulatum ad oblongum, ± angustum. *Capsula* ferruginea. *Fl.* Mai (-Aug.). A4 Kastamonu: 5 km W of Kastamonu, 1900 m, *Davis* 38773. B5 Kayseri: Erdschias Dagh (Erciyas Da.), 2400 m, v 1902, *Zederbauer* (WU). Yozgat: Sorgun to Çekerek, 32 km from Sorgun, 1200 m, rocky valley with mixed serpentine, conglomerate and limestone, in crevices, flowers dark red with paler tips, 27 v 1965, *Coode & Jones* 1590 (holo. E). B6 Sivas: Kizildağ, 2150 m, *Lamond* 5049 (exceptionally late-flowering). Malatya: SE of Malatya to Elaziğ, *Alava* 6846.

Endemic.

var. **oligantha** Heywood in Notes R.B.G. Edinb. 21:80 (1952).

Sparingly glandular to glabrous. *Calyx lobes* glabrous. *Cymes* reduced, 1–2-flowered. *Corolla* maroon to brownish-purple. *Staminode* broadly to narrowly ovate or ± linear. *Capsule* red-brown. *Fl.* May–Jul.

Turkey. C4 Konya: Serai-daigh (Saray Da.), nr Konya, c. 1600 m, v 1902, *Zederbauer* (WU). C5 Niğde: d. Ulukişla, Taurus, reg. alp., au dessus de Boulgarmaden (Bolkar Maden), 22 vi 1885, *Balansa* 679 (holo. K; iso. E). Kizil Tepe, 2800 m, *Siehe* 1896: 525. Ala Da. on Demirkazik, 2590 m, 27 viii 1965, *Findlay* 103. Içel: Bolkar Da., 3700 m, *Peat et al.* 183–8–76.

var. **pontica** R. Mill, **var. nov.**

*Caules* 17–21 cm alti, sparse vel dense glandulosi, rariore glabri. *Folia* ± glauca, parva, ovata usque rhomboidea, subsessilia vel inferiora petiolo c. 10 mm longo, lamina 10–20(–30) × 5–10 mm, margine crenato vel duplicato-crenata. *Calyx* glaber. *Cymae* (dichasia) plerumque 3-florae. *Corolla* viridi-rosea vel viridi-brunnea. *Staminodium* ± anguste ovatum ad ± lineare. *Capsula* atrobrunnea. *Fl.* Apr.–Jun.

A4 Ankara: Kalecik, Baytuş boğazi, *T. Baytop* ISTE 11279. A5 Amasya: Amasya, 400–900 m, *Bornmüller* 1889: 595. Samsun: Kizilirmak, after Asar, 300 m, *Tobey* 1799. Çorum: Boğazkale, 1000 m, *Sorger* 71–7–88 (hb. Sorger). A6 Tokat: nr Tokat, c. 600–700 m, *Bornmüller* 1893: 3465. A7 Gümüşane: Taltaban, in declivibus saxosis, 18 vi 1894, *Sintenis* 1894: 5840 (holo. LD; iso. E). Gümüşane, 1400 m, *Stainton* 8327. B7 Elaziğ: Kharput (Harput), Buslutasch, *Sintenis* 1889:404.

var. **sivasica** R. Mill, **var. nov.**

A var. *pontica* dense glandulosis, caulibus 30 cm altis vel ultra, foliis lamina 15–28 × 8–15 mm, ovata, margine acute dentato vel crenato, staminodio suborbiculare parvo, differt.

A6 Sivas: c. 2 km N of Arapça koprüsü (Avşar köyü), 1570 m, 14 vii 1969, *K. Buttler* 14003 (holo. hb. Buttler); Karabayir geçidi, 2000 m, *K. Buttler* 15648 (hb. Buttler). A7 Gümüşane: Eski Gümüşane, 1400 m, *A. & T. Baytop* ISTE 15403.

Endemic.

var. **urartuënsis** R. Mill, **var. nov.**

*Caules* 14–35 cm, ± dense albo-glanduloso-puberulentes. *Folia* breviter petiolata, lamina ovata vel oblonga, margine acute dentata, crenata vel ± integra, plerumque pallide viridia. *Rami dichasiorum* plerumque bene evoluti, aequales, saepe tenues et divaricati. *Cymae* (1–)2–7-florae. *Calyx* glaber. *Corolla* marronina, rariore purpureo-rosea. *Staminodium* ovatum (saepe apice acuminato) vel spathulatum. *Capsula* ferruginea vel bubulina. *Fl.* Mai.–Jun.

B8 Erzurum: 10 km N of Hinis, 1630 m, 12 vii 1966, *Davis* 46234; 20 km from Hinis to Pasinler, N side of pass, 1900 m, 12 vii 1966, *Davis* 46344. B9 Van: N side of Erek Da., above Değirmenköy, 2300 m, igneous rocks, perennial, flowers pink, 6 vi 1966, *Davis* 44440 (holo. E); 2 km NE of Van, 1800 m, 5 vi 1966, *Davis* 44279; distr. Başkale, Ispiriz Da., 2900 m, 31 vii 1954, *Davis* 23738. B9/10 Ağri: Ağri to Doğubayazit, 1750 m, 31 v 1966, *Davis* 43936; *ibid.*, *M. Zohary & Plitmann* 2261–15 (HUJ). C9 Hakkari: Elkiyayla Da. above pass between Marunis and Beytüşşebap (Elki), 2550 m, 21 vi 1966, *Davis* 45344; Cilo Da. below Cilo Y., 2745 m, 7 viii 1954, *Davis* 23968.

var. **mesogitana** (Boiss.) R. Mill, **comb. nov.**

Syn.: *Scrophularia mesogitana* Boiss., Fl. Or. 4:407 (1879).
*S. rupestris* Bieb. var. *mesogitana* (Boiss.) Lall in Notes R.B.G. Edinb. 30:136 (1970).

Densely glandular. *Leaves* broadly ovate with deeply and irregularly dentate margin. *Pedicels* longer than bracteole. *Staminode* reniform, ovate or oblong.

B1 Manisa: Manisa Da., 3 km E of Akpinar, 210 m, *K. Buttler* 12635 (hb. Buttler). B2 Manisa: d. Demirci, Akçakertik geçidi between Demirci and Simav, 1300 m, *Huber-Morath* 13995 (hb. Hub.-Mor., *n.v.*). C1 Aydin: in rupestribus calcareis regionis mediae montis Mesogis Lydiae (Aydin Da.), 1842, *Boissier* (holo. G). C2 Denizli: Honaz Da., N slope, 900–1100 m, *Reese* 2734 (hb. Hub.-Mor., *n.v.*).

subsp. **armena** R. Mill, **subsp. nov.**

*Caules* 25–60 cm alti vel ultra, glabri. *Folia caulina* inferiora breviter petiolata vel subsessilia, lamina ovata (20–)30–70 × (11–)22–30 mm, plerumque glabra et ± glauca, margine obtuse vel acute crenato-dentato. *Calyx* glaber (rarissime glandulosus). *Corolla* viridis lobis superioribus brunnescentibus, rariore marronina. *Staminodium* in ambitu orbiculare, plerumque lobis duobus lateralibus magnis et apice late obtuseque emarginato, rariore lobis 3–5 circum ambitus ornatum. *Capsula* atrocastanea vel atrobubulina.

B7 Erzincan: Egin (Kemaliye), Szanduk (Sandik), in declivibus saxosis, 17 v 1890, *Sintenis* 1890: 2337 (holo. LD; iso. WU); 4 km below W side of Sakaltutan geçidi, 1970 m, *K. Buttler* 15703 (hb. Buttler). Tunceli: Hozat, 1700 m, *Davis* 31110. C7 Adiyaman: Nemrut Da., nr Kahta, 1600–2200 m, *Handel-Mazzetti* 2078 (WU). Urfa: E of Siverek, 800 m, *Davis* 28293. Malatya: 1·3 km N of Reşadiye geçidi, 1460 m, *K. & E. Buttler* 20267 (hb. Buttler).

This new endemic subspecies is clearly delimited from all varieties of subsp. *libanotica* by its taller habit, resembling *S. pulverulenta* Boiss. & Noë, and by the 3–5-lobed staminodes. The usually large and glaucous leaves are also characteristic. Specimens from A7 Gümüşane (Karahissartasch, *Sintenis* 1894: 5550; Ardas to Paschklisse (Başkilise), *Sintenis* 1889:88) and B7 Elaziğ (Szanduk, *Sintenis* 1890: 2252) differ in having smaller, more rhomboidal leaves. They may be considered transitional to subsp. *libanotica* var. *pontica*, with which they are partly sympatric. The specimen from Elaziğ also differs from all the others seen by having a densely glandular stem.

NOTES ON OTHER TURKISH SPECIES

**Scrophularia heterophylla** Willd., Sp. Pl. 3:274 (1802).

Willdenow described this species from Crete, based on a collection by Tournefort ('Scrophularia cretica frutescens folio vario et carnoso', *Tournefort*, holo. P—Tourn. 905, photo. seen; iso. BM). The isotype material at BM exactly matches the type description, although it lacks lower leaves; it is in fruit and flowers are not present.

The staminode, which is of critical importance for the determination of many species of *Scrophularia*, was not described by Willdenow, probably because flowers were not available to him for dissection. A consequence of this is that the circumscription of *S. heterophylla* has altered with each successive revision of the genus.

Wydler (*Essai Monographique Scrofularia* 43, 1828) accepted *S. heterophylla* more or less in the sense of Willdenow, but included it in a subgroup implicitly characterised by oblong-linear staminodes. Bentham (in DC., *Prodr.* 10:310, 1846) took a much broader view of the species and included three taxa (*S. olivieriana* Wydler, *S. urvilleana* Wydler and *S. micrantha* d'Urv.) as synonyms. The staminode of all these taxa was described as orbicular. Boissier (*Fl. Or.* 4:408, 1879) followed Bentham in including *S. urvilleana*, *S. micrantha* and *S. olivieriana* as synonyms of *S. heterophylla*, and cited *S. caesia* Sibth & Sm. as an additional synonym. He described the staminode as 'appendice reniformi transverse sublatiori', a view accepted by Halácsy (*Consp. Fl. Gr.* 2:403, 1902), Hayek (*Prodr. Fl. Balc.* 2:151, 1929) and Rechinger (*Fl. Aegaea* 479, 1943). The staminode of *S. caesia* is reniform and was probably the source of Bentham's description. Lall (*op. cit.*, 1970) apparently restricted *S. heterophylla* to those specimens having a reniform staminode as he accepted *S. caesia* as the only authentic synonym and excluded *S. urvilleana*, *S. micrantha* and *S. olivieriana*. This view would seem to be incorrect. On the basis of the staminode, he also excluded *S. heterophylla* from the Flora of Turkey area, maintaining that it was confined to mainland Greece, the Cyclades and Crete. Specimens from Turkey and the E Aegean Islands were referred by him to a variety of taxa, principally *S. variegata* Bieb. subsp. *pinardii* (Boiss.) Lall (=*S. pinardii* Boiss.) and *S. rupestris* Bieb. var. *libanotica* (Boiss.) Lall (=*S. libanotica* Boiss.). These two taxa are in fact not closely related to *S. heterophylla*. Richardson (*Fl. Eur.* 3:219, 1972) described the staminode as reniform to orbicular, and followed Hayek (*op. cit.*, 1911) in recognising two subspecies, subsp. *heterophylla* (S Greece and Aegean) and subsp. *laciniata* (Waldst. & Kit.) Maire & Petitmengin (Albania, Bulgaria, Jugoslavia, Romania, Crimea, most of Greece except extreme south). It is clear that Richardson's concept of *S. heterophylla* was broad and possibly heterogeneous.

Comparison of the available material with the isotype at BM has led to the following conclusions:

1. Material from the E Aegean Islands so closely matches the type that it must be considered conspecific and the species admitted to the Flora of Turkey area. All the material examined from the E Aegean Islands has an ovate to broadly ovate, never reniform, staminode.
2. Material from the Cyclades also matches the Cretan gathering, as does a small proportion of material from mainland Greece, and should be considered conspecific.
3. Most specimens from Greece differ from the type to a greater or lesser extent. This is particularly true of specimens referred to subsp. *laciniata*. Richardson (*op. cit.*, 1972) related *S. heterophylla* to *S. olympica* (NW, NE & E Anatolia, Iran; doubtfully recorded from Crimea). Specimens of subsp. *laciniata* closely resemble *S. olympica* and, like it, have a reniform staminode; their taxonomic status is uncertain. True *S. heterophylla* is unrelated to *S. olympica*; its affinities are with *S. lucida* L. (S Europe to Anatolia).

Representative specimens of *S. heterophylla*:

Greece. Above Kalabaka, 1885, *Haussknecht*. Ad rupes prope Lebadian, 12 vii 1858, *Guicciard*. Attica: Athenas, ad rupes, Acropoleo, 21 iv 1854, *Heldreich*. Gytheon, (Laconia), rocks, 15 ii 1940, *Davis* 1153. Cyclades: Sikinos, 28 ix 1939, *Davis* 910. Amorgos, 180 m, 6 x 1939, *Davis* 957.

Crete, unlocalised, *Tournefort* (Scrophularia cretica frutescens folio vario et carnoso, holo. P—Tourn. 905, photo. seen; iso. BM).
Turkey. No specimens have yet been seen from the Turkish mainland. Islands: Ikaria, c. 250 m, *Runemark & Snogerup* 7061 (LD). Samos, s.l.–150 m, *Runemark & Snogerup* 18713 (LD). Aykathonisi, *Runemark & Bothmer* 46814 (LD). Lipsoi, 50–300 m, *Runemark & Bothmer* 46618 (LD). Leros. *Runemark & Bothmer* 46309 (LD). Nisiros, Mandrakion, *Papatsou* 481.

The following specimens almost certainly also belong to *S. heterophylla* but have not been seen:
Islands: Khios, 1931, *Guiol*; Kalimnos, *Forsyth-Major* 742; Kos, *Davis* 40475.

**Scrophularia floribunda** Boiss. & Bal. in Boiss., Diagn. ser. 2, 3:158 (1856). Syn.: *S. canina* L. var. *floribunda* (Boiss. & Bal.) Boiss., Fl. Or. 4:419 (1879). B1 Izmir: prope Smyrnam (Izmir) in agris derelictis, 1842, *Boissier* (syntype G, not seen); *ibid.*, in collibus calcareis, 1854, *Balansa* 338 (syntypes E, G); Kemalpaşa to Karabel, 21 iv 1967, *Peşmen & Aydar* EGE 12617; nr Burnabad (Bornova), 4 v 1906, *Bornmüller* 1906: 9834; nr Çeşme, 10–50 m, 26 iv 1965, *Davis* 41816. C1 Izmir: N foot of Samsun Da., W of Güzelçamli, s.l.–50 m, 24 iv 1965, *Davis* 41712. Muğla: nr Selimiye, 170 m, *Davis* 40722.
Islands: Samos, Pyrgos, 29 iv 1940, *Davis* 1610.

A specimen from C2 Antalya (Elmali to Çiglikara, c. 500 m, 28 iv 1968, *Peşmen & Oflas* EGE 12618) may be conspecific but is taller (40–44 cm) and has calyx lobes with a narrower scarious margin (only 0·5 mm broad).

This taxon has usually been included in *S. canina* L., either as a variety (as by Boissier, 1879) or as a synonym. Examination of syntype material and recently collected specimens from W and SW Anatolia has led me to conclude that Boissier's earlier view (that it should be recognised as a distinct species) is correct.

*S. floribunda* can be distinguished from *S. canina* by the following characters: plant less tall (20–45 cm) ± unbranched; leaves usually smaller, 2–3-pinnatisect with numerous small segments; bracts shorter; calyx with broader (0·7–1·2 mm) scarious margin; cymes 2–7-flowered; stamens generally with long filaments exserted to 1½–2 x length of corolla; staminode slightly shorter and more narrowly linear. Atypical forms of *S. canina* flowering in the first year may be unbranched with poorly developed inflorescence and could be confused with *S. floribunda*, but *S. canina* has a narrower scarious margin to the calyx lobes (0·4–0·5 mm broad) and 1–2-pinnatisect leaves with coarser segments.

**Scrophularia mersinensis** Lall in Notes R.B.G. Edinb. 30:133, plate 8B, fig. 3Aa–Ac (1970).

The original type citation of this species stated that the holotype was at E, and the isotype at K. Examination of the relevant material has shown, however, that the Kew specimen must be taken as the holotype, since the description and photograph given by Lall clearly refer to the Kew specimen, which bears the word 'Holotype' in Lall's handwriting on the top right-hand corner of the label.

## Verbascum

A. HUBER-MORATH*

**Verbascum spectabile** Bieb., Fl. Taur.-Cauc. 3:158 (1819) var. **isandrum** Hub.-Mor., **var. nov.**

A typo speciei differt antherae anticae reniformes, mediofixae, 2·5 mm longae, filamenta antica in tertia parte superiore nuda.

Turkey. A4 Zonguldak: Karabük, Baklabostan to Yenice, 24 v 1970, *Bozakman & Fitz* 769 (holo. W).

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