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MATERIALS FOR A FLORA OF TURKEY: X

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The following paper comprises a collection of new taxa, new combinations, notes, etc., made necessary by the preparation of the first volume of the Flora of Turkey. The authorship of each section of the paper is given, as the authors have worked separately and in combination. During this work Coode & Cullen were supported by a D.S.I.R. Research Grant at Edinburgh University.

PINACEAE

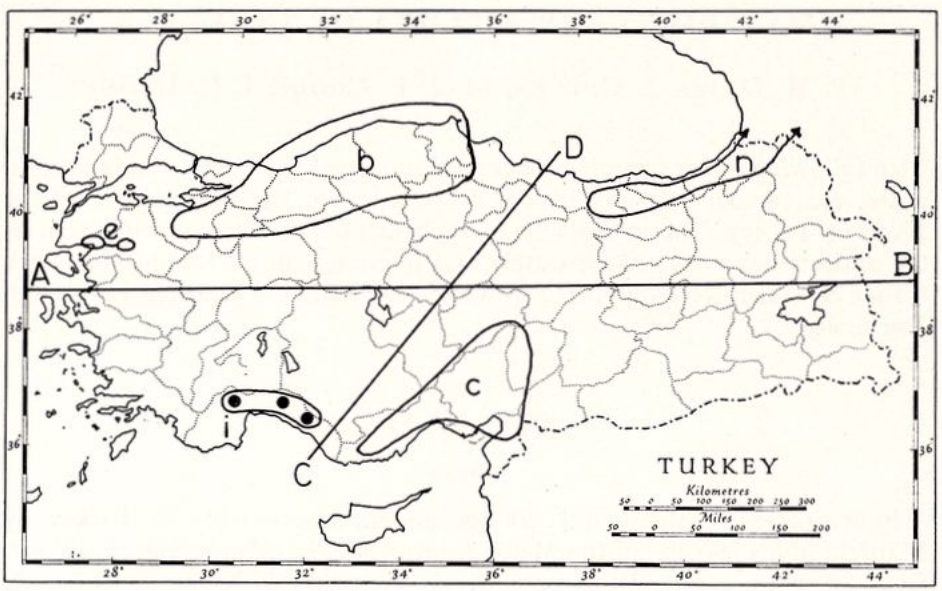
ABIES

Four species of this genus are recognised as occurring in Turkey by Mattfeld in his revision of the Mediterranean species (Mitt. Deutsch. Dendr. Ges. 35: 1–37, 1925). These are: *A. cilicica* (Ant. & Kotschy) Carr.; *A. nordmanniana* (Stev.) Spach; *A. bornmuelleriana* Mattf.; *A. equi-trojani* (Aschers. & Sint. ex Boiss.) Mattf.

The distinctions between them are shown in the table:

	Cones	*Young shoots*	*Buds*	*Leaves*
cilicica	Bract scales not exserted	Glabrous or hairy	Resinous or not	Obtuse to emarginate
nordmanniana	Bract scales exserted	Hairy	Not resinous	Obtuse to emarginate
bornmuelleriana	Bract scales exserted	Glabrous	Resinous	Obtuse to emarginate
equi-trojani	Bract scales exserted	Glabrous	Not resinous	Somewhat acute

Mattfeld regards these taxa as having non-overlapping distributions—*A. cilicica* occurring in S. Turkey; the other 3 in the North, *A. equi-trojani* with a limited distribution in the West (Mysia), *A. nordmanniana* in the East (Lazistan) and *A. bornmuelleriana* occurring between them, in Bithynia and Paphlagonia. It will be seen from the table that the variation within *A. cilicica* in shoot and bud characters is the same as that found in *A. nordmanniana* and *A. bornmuelleriana* considered together. We have found that in *A. cilicica* the variation is geographically based, specimens with hairy shoots and non-resinous buds occurring in the eastern part of the range, those with glabrous shoots and resinous buds occurring in the western part. The correlations between these characters are not absolutely complete in either case, as some specimens show different combinations of characters. In the northern species the correlation with geography is also incomplete; occasional specimens with hairy shoots and non-resinous buds (*nordmanniana*) occurring in the



Map 1. Distribution of *Abies* in Turkey. b, *A. nordmanniana* subsp. *bornmuelleriana;* c, *A. cilicica* subsp. *cilicica;* e, *A. nordmanniana* subsp. *equi-trojani;* i, *A. cilicica* subsp. *isaurica* (the known localities shown by dots); n, *A. nordmanniana* subsp. *nordmanniana.* For further explanation, see text.

area of *bornmuelleriana* and *vice versa*. We therefore propose to treat *nordmanniana* and *bornmuelleriana* as subspecies of one species, and, as the variation in *A. cilicica* is similar, we propose to divide this also into 2 subspecies, using the same characters to distinguish them as separate *nordmanniana* and *bornmuelleriana*. Map 1 (based on specimens studied and forestry records) shows the distributions of these taxa. The line AB on the map shows the division on cone characters, specimens North of the line having exserted bract scales; those South of the line having the bract scales included. The line CD shows the division on the indumentum of the shoots and presence or absence of resin on the buds; specimens East of the line usually having hairy shoots and non-resinous buds and those West of it usually having glabrous shoots and resinous buds.

The position of *A. equi-trojani* is somewhat anomalous; it has both glabrous shoots and non-resinous buds. It also differs from all other Turkish *Abies* in usually having more acute leaves. This character is rather variable even on the isotype specimen we have seen. Aytug, in Pollen et Spores 1(2): 273–278 (1959), has suggested that *A. equi-trojani* is a product of hybridisation between *A. bornmuelleriana* and the Greek *A. cephalonica* Loud., with which it shares the character of acute leaves. Certainly *A. equi-trojani* is rather intermediate between these two species and forms part of a replacement series from the Caucasus to W. Europe: *A. nordmanniana—A. bornmuelleriana—A. equi-trojani—A. cephalonica—A. borisii-regis* Mattf.—*A. alba* Miller. In spite of its resemblance to *A. cephalonica*, which, to say the least, is based on a rather variable character, we propose to treat *equi-trojani* as a third subspecies of *A. nordmanniana*.

A. cilicica (Ant. & Kotschy) Carr., Traité Gén. Conif., 229 (1855).
subsp. **cilicica**

Syn.: *Pinus cilicica* Ant. & Kotschy in Oest. Bot. Wochenbl. 3: 409 (1853).
A. kotschyana Fenzl in Tchihatcheff, Asie Min. Bot. 2: 495 (1866).
Distribution in Turkey: Cilician Taurus, Anti-Taurus, Amanus.

subsp. **isaurica** Coode & Cullen, **subsp. nov.**

A subsp. *cilicica* ramulis junioribus glabris, alabastris resinosis differt.

TURKEY: Prov. Antalya, distr. Gebiz (Pisidia), Bozburun Dağ between Boğaz Azzi & Tozlu Çukur, 1600 m., 24 vii 1949, *Davis* 15505 (holo. E); between Durbanas and Derince Dere, 1000 m., *Davis* 14470. Prov. Konya: between Geyik Dağ and Bozkir, 2000 m., *Davis* 14632.

Confined to the Isaurian Taurus, at an altitude of 1000–2000 m.

A. nordmanniana (Stev.) Spach, Hist. Veg. Phan. 11: 418 (1842).
subsp. **nordmanniana**

Syn.: *Pinus nordmanniana* Stev. in Bull. Soc. Nat. Mosc. 1838: 45, t. 2 (1883).
Distribution: Lazistan, W. Caucasia.

subsp. **bornmuelleriana** (Mattf.) Coode & Cullen, **comb. nov.**

Syn.: *A. bornmuelleriana* Mattfeld in Not. Bot. Gart. Berl. 9: 239 (1925).
Distribution in Turkey: Bithynia, Paphlagonia.

subsp. **equi-trojani** (Aschers. & Sint. ex Boiss.) Coode & Cullen, **comb. nov.**

Syn.: *A. equi-trojani* (Aschers. & Sint. ex Boiss.) Mattf. in Mitt. Deutsch. Dendr. Ges. 25: 29 (1925)!
A. pectinata DC. var. *equi-trojani* Aschers. & Sint. ex Boiss., Fl. Or. 5: 701 (1884)!
Distribution in Turkey: Mysia.

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RANUNCULACEAE

NIGELLA

N. latisecta P. H. Davis, **sp. nov.**

Icon: Fl. Armenia 1: f. 38 (1954).

Valde affinis *N. oxypetalae* Boiss. sed floribus et fructibus haud involucratis, laciniis foliorum paucioribus et latioribus, sepalis latioribus recedit.

Herba annua, 5–45 cm alta, glabra. *Caulis* erectus, pauciramosus, sulcatus. *Folia* 1–2-pinnatisecta, inferiora petiolata, caetera sessilia, laciniis 7–30, lineari-lanceolatis, terminalibus 2–6 mm latis quam lateralibus majoribus. *Flores* solitarii, 12–22 mm lati, pedunculis nudis (in fructu elongatis) suffulti. *Sepala* virescenti-flava, late ovato-elliptica brevissime unguiculata, glabra. *Petala* longe stipitata (stipo 2–3 mm longo), labio superiore ovato brevi, labio inferiore in lobos semiovatos profunde fisso, in appendices 2 filiformes longissimos ciliatos calyce superantes producto. *Stamina* in serie unica disposita, antheris flavescentibus submucronatis. *Folliculi* 2–13, oblongi, 18–40 × 7–11 mm, ad $\frac{1}{2}$–$\frac{3}{4}$ coaliti, compressi, laeves, dorso trinervi apice rotundato-truncati, stylis 8–14 mm longis divergentibus. *Semina* orbicularia 1·5–6 mm diam., plano-compressa, punctulata, fusca, tenuiter marginata. Fl. Mai.-Jul.

TURKEY: Prov. Kastamonu: at Kavak Çesme, *Sintenis* 1892: 4138. Prov. Gümüşane: N. of Bayburt, 1500 m, fallow field, *Davis* 31982. Prov. Ankara: Angora (Ankara), W. of the tumulus, 20 vi 909, *Frères des E.C.* Prov. Malatya: Arga to Malatya, *B.V.D. Post* 1906: 71. Prov. Kayseri, 1250 m, waste land, *Balls* 1127a (holo. E! iso. K!). Prov. Tunceli: Hozat, 1700 m, rocky limestone slopes, *Davis* 21125; Tunceli to Pülümür, 30 miles W. of Tunceli, 1300 m, river bank, *Davis* 29253. Prov. Elaziğ: Kharput, nr. Erzuruk, *Sintenis* 1889: 808. Prov. Erzincan: Pigana, between Paschtasch (Paştaş ?) & Chostu on Euphrates, *Sintenis* 1889: 995. Prov. Erzurum: W. of Ilica, 20 km from Erzurum, 1850 m, *Davis* 30856.

SYRIA: nr. Aleppo, fields, *Kotschy* 217.

This neglected species has had a curious history. It was believed by Brand (Helios 13: 14, 1896) to represent the typical form of *N. oxypetala* Boiss. (as var. *typica* Brand). This interpretation is wrong. The true *oxypetala* is a rather variable species that has been described several times, as *N. persica* Boiss., *N. noeana* Boiss., *N. oxypetala* var. *tenuifolia* Boiss. and *N. involucrata* Brand (cf. Brand. *op. cit.* for references). Examination of the type material of all these taxa shows them to be synonymous with *N. oxypetala*, while the plant described above as *N. latisecta* has usually been treated as a variant of *oxypetala*. Rechinger (Ark. for Bot. ser. 2, 5 (1): 133, 1957), however, considered the two to represent different species, but applied the name *N. noeana* to the true *N. oxypetala*, and *N. oxypetala* to what I have now described as *N. latisecta:* he gives photographs (*op. cit.* t. 8) of both species under these misapplied names.

Although I have been unable to detect any constant difference in petal shape, other differences between these two taxa seem sufficient to warrant specific recognition. Despite a considerable geographical overlap in E. Anatolia, there is very little morphological overlap. *N. latisecta* may be distinguished by its naked flowers and fruits, leaves with usually fewer

laciniae, the terminal ones being broader and manifestly larger than the lateral ones, and broader sepals with a very short and more distinct claw. *N. oxypetala* has been seen from Turkey (Mesopotamia and Upper Euphrates), Iran, N. Iraq, the Syrian Desert and Anti-Lebanon. *N. latisecta* is commoner in Turkey (C. & E. Anatolia), and extends into the N.W. Syrian Desert and (*fide* Fl. Armenia: 134, 1954) Soviet Armenia (Erivan). Both are Irano-Turanian species.

N. arvensis L.
var. **tauricola** P. H. Davis, **var. nov.**

Affinis var. *microcarpae* Boiss. sed caule erecto, foliis dense aspero-pubescentibus, sepalis angustioribus, folliculis haud transverse rugosis recedit.

Caulis glaber, ramis stricte ascendentibus paucis provisus. *Folia* inferiora emarcida, caetera sessilia, parva, dense aspero-pubescentia, in lobos oblongo-spathulatos obtusos tripartita. *Pedunculi* ± foliosi sed floribus haud involucratis. *Flores* c. 12 mm lati; sepala late elliptica, breviter acuminata, longe et sensim unguiculata, caerulascenti-albida; antherae breviter apiculatae. *Folliculi* oblongi, 8–12 mm longi, ad $\frac{1}{2}$–$\frac{2}{3}$ coaliti, dense tuberculati, dorso trinervii sed haud transverse rugulosi, stylis folliculos aequantibus erectis vel divergentibus.

Prov. Içel: Ferhenk nr. Anamur, 100 m, flowers blue-greyish white, 19 viii 1949, *Davis* 16328 (holo. E). Prov. Antalya: Alanya, 23 viii 1947, *Davis* 14485.

The description of this new variety can only be considered as a provisional way of coping with a well-marked variant of the polymorphic *N. arvensis* L. In its small fruits and short leaf divisions, the S. Anatolian var. *tauricola* resembles var. *microcarpa* Boiss. from Crete, Khios (*Platt* 354) and Rodhos (*Rech.* 8408). It is approached by some variants of var. *glauca* Boiss. from S.W. Anatolia (Muğla: nr. Köyceğiz, *Davis* 13580 distr. Marmaris, Pinarbük, *Khan et al.* 144B), in which, however, the leaf divisions are consistently linear. In its small, gradually clawed sepals it resembles the diminutive *N. degenii* Vierh. from the Cyclades, from which it differs in habit, leaf characters and longer petal appendages.

DELPHINIUM

D. ilgazense P. H. Davis, **sp. nov.** Pl. 17

Affinis *D. cyphoplectro* Boiss. sensu lato sed statura nana, racemo brevi, bracteolis in parte superiore pedicelli affixis, calcare sepalis sesquilongiore differt.

Herba perennis, radicibus fasciculatis tuberosis. *Caulis* 16–20 cm altus, 2 mm latus, simplex, teres et striatus, inferne sparsim crispule puberulus, superne in inflorescentia patentim glanduloso-pubescens. *Folia* radicalia et caulina inferiora longe petiolata, petiolo in vagina angusta ciliata sensim ampliato, lamina ambitu orbiculari, 2–3 cm lata, palmatisecta, adpresse pubescenti, segmentis in lacinias lineares c. 0·5 mm latas obtusiusculas profunde multisecta; caulina superiora brevius petiolata, laciniis paucioribus.

Racemum densum (vel flore infimo distante), breviter oblongum, 2·5–5 cm longum, c. 2·5 cm latum, 4–7-florum. *Bracteae* infimae trisectae vel omnes integrae, lineari-lanceolatae, anguste membranaceo-marginatae, viscido-pilosae, *pedicellis* aequales vel longiores. *Pedicelli* erecti, 5–7 mm longi, sepalis breviores. *Bracteolae* in parte superiore pedicelli affixae, linear-lanceolatae, membranaceo-marginatae, 2·5–4·5 mm longae, ad basin floris aequantes vel paulo superantes. *Flores* saturate violaceo-caerulei; sepala divergentia, ovato-oblonga, extus patentim viscido-pilosa, 7–10·5 mm longa, calcare 13–14 mm longo tenui sensim attentuato acuto horizontali; petala superiora breviter exserta, limbo oblongo glabro breviter bifido; petala inferiora limbo late ovato deflexo profunde bifido superne barbato unguem aequante. *Ovarium* adpresse pubescens. *Fructus* ignotus. Fl. Aug.

Prov. Kastamonu: N. side of Ilgaz Dağ, 2200 m, rocky limestone slopes, flowers dark violet-blue, glandular-pubescent, 28 viii 1962, *Davis, Coode & Yaltirik, D.* 38373 (holo. E, iso. K).

The discovery of this very rare plant in Paphlagonia (N. Anatolia) demonstrates that a new species may sometimes be found on a mountain that has been visited by numerous botanists. In this case the species is apparently confined to inaccessible rocky slopes among the limestone cliffs on the N. side of Ilagaz Dağ—a perhaps unbotanised part of the mountain.

D. ilgazense is apparently most closely allied to *D. cyphoplectrum* sensu lato (see below), which in Turkey is confined to E. Anatolia. From all forms of this polymorphic species it differs in its dwarf stature, short, few-flowered raceme, bracteoles attached near the top of the pedicels, and spur longer than the sepals. It is perhaps less close to *D. carduchorum* Chowdhuri & Davis (endemic to Turkish Kurdistan), differing from it in its terete (instead of angled and sulcate) stems, much narrower leaf laciniae, shorter raceme, bracts and bracteoles, and spur one and a half times as long as the sepals.

D. cyphoplectrum Boiss., Diagn. ser. 1 (6): 7 (1845).

A broad view is taken here of this very polymorphic species, widespread in parts of Iran, Transcaucasia and N. Iraq, and of local occurrence in E. Anatolia. It may be distinguished from allied species in Turkey by the bracteoles being inserted near the base (rarely near the middle) of the pedicels. *D. talychensis* Tzvel. and *D. nachiczevanicum* Tzvel. (both recently described from Transcaucasia) are conspecific with *D. cyphoplectrum* as interpreted here, which evidently comprises a series of variable geographical races which need field study. Stem indumentum and spur shape shows considerable variability within a single locality. It is not clear to me whether *D. cyphoplectrum* sensu stricto (apparently described from a shade form) is specifically distinct from *D. tuberosum* Aucher ex Boiss.; the latter has been collected at the *locus classicus* of *D. cyphoplectrum* in Iran and provides an earlier name.

Three taxa may be distinguished in Turkey, and varietal rank is provisionally assigned to them here.

var. **stenophyllum** Boiss., Fl. Or. 1: 81 (1876).

Syn.: *D. hybridum* var. *laxiusculum* Boiss., Fl. Or. 1: 89 (1876)!

D. laxiusculum (Boiss.) Nevski in Fl. URSS 7: 175 (1937)!

In Turkey only seen from the province of Kars (Kağizman, *Levandovsky*, LE!).

Transcaucasia, N. & W. Iran. This variety apparently differs from var. *cyphoplectrum* in its narrower leaf laciniae, more pointed sepals and attenuated spur, and usually less branched stems.

var. **vanense** (Rech. fil) Davis, **comb. et stat. nov.**

Syn.: *D. vanense* Rech. fil. in Symb. Bot. Upsal. 9 (5): 8 (1952)!

Endemic to Turkish Kurdistan.

var. **pallidiflorum** (Freyn) Davis, **comb. et stat. nov.**

Syn.: *D. pallidiflorum* Freyn in Bull. Herb. Boiss. ser. 2, 1: 254 (1901).

Turkish Kurdistan. *D. quercetorum* Boiss. & Hausskn., described from N. Iraq, is probably synonymous, the plant showing considerable variation in indumentum, spur shape and bracteole position.

D. virgatum Poiret, Encycl. 10: 458 (1811).

Syn.: *D. peregrinum* L. var. *virgatum* (Poiret) Huth in Bot. Jahrb. 20: 475 (1895).

Icon: Delessert, Ic. Pl. 1: t. 55 (1820).

PALESTINE: Afuleh, *Meyers & Dinsmore* 2099b. Galilee, Boiss., *Jerusalem.* Meyer 99 & 6099. Jaouni, *Meyers & Dinsmore* 99b. N. side of J. Adirtha (N. of J. Jermak), *Davis* 4801. Lake Tiberias, 1877, *J. Ball.*

SYRIA: Syria, *Labillardière* (holo. FI). Prope Rachaya, *Kotschy* 227. Syria, *Aucher.* Below Falita (nr. Neb'k), 1700 m, *Davis* 9913. Suwayda, *Dinsmore* 10099.

TURKEY: Prov. Antalya: Burdur to Antalya, 220 m, *Dudley, D.* 3570; Kara Da., *Little* (K).

In a recent revision of the European species of *Delphinium* (Fragmenta Flor. Geobot. Ann. 9 (4): 429–446, 1963), Pawłoski has revised the Continental microspecies that centre round *D. peregrinum* L. and *D. halteratum* Sibth. & Sm. When their Turkish counterparts were being revised, it was found that this group was represented by four species in Anatolia: *D. peregrinum* L. (widespread), *D. bithynicum* Davis (see below), *D. venulosum* Boiss. (Central Anatolia) and *D. virgatum* Poiret; it is possible that *D. balcanicum* Pawł. may occur in Turkey-in-Europe. All these taxa, with the exception of *D. peregrinum*, have often been referred to *D. halteratum* Sibth. & Sm., a species which, in the narrow sense, is a west Mediterranean plant.

D. virgatum was based on Labillardière's specimen from Syria, now in the Florence Herbarium. Dr. Guido Moggi has kindly examined this for me and sent me a drawing of the petals. It is clear that the name *D. virgatum* must be applied to a neglected species which has often been misidentified as *D. peregrinum* or *D. halteratum*, and is in fact intermediate in petal shape between these two species. The antero-lateral petals are subexserted, the limb broadly ovate with a very widely cuneate base, abruptly contracted into a claw 2–2½ times as long as the limb. It is, in fact, very close to the W. Mediterranean *D. gracile* DC., differing from it in its petal shape, slightly smaller flowers and usually shorter leaf laciniae.

The glabrous and glaucous habit, used by Boissier (Fl. Or. 1: 88, 1867) to characterise *D. virgatum* Poiret, does not always serve to distinguish it from forms of *D. peregrinum* L. which is very variable in the Near East. From the latter species, *D. virgatum* may always be distinguished by its petal shape (the lower petals of *D. peregrinum* having an obovate limb attenuate into a ± equal claw) and brighter blue flowers. Its distribution overlaps that of *D. peregrinum*, but almost replaces the latter in Palestine.

The *D. peregrinum-D. halteratum* complex still requires revision in North Africa before the status of its component taxa—several of which might be better treated as subspecies—can be firmly established.

D. bithynicum P. H. Davis, **nom. nov.**

Syn.: *D. sintenisii* Freyn in Öst Bot. Zeitschr. 43: 374 (1893)!, non Uechtr. (1880).

Endemic to N. Turkey (Bithynia and Paphlagonia). Closely allied to *D. balcanicum* Pawł. (*op. cit.* 439) but differing in its glabrous inflorescence and carpels (except for the sparingly crisped-pubescent sepals) and exserted lower petals.

CONSOLIDA

If consistency of treatment is an important consideration in the recognition of genera, there seems every justification for treating *Consolida* as separate from *Delphinium*—a view which may not have found general recognition owing to the widespread belief that *Delphinium* should be typified by *D. consolida* L. *Delphinium* should, in fact, be typified by *D. peregrinum* L., and *Consolida* by *D. consolida* (i.e. *Consolida regalis* S. F. Gray). The genus differs from *Delphinium* in being entirely annual, in having a gamopetalous corolla with a single spur, fewer stamens (cf. Pawłowski in Fragm. Flor. Geobot. Ann. 9 (4): 429–446, 1963), and a single follicle. *Consolida* grows throughout the Mediterranean region and the Near East, extending into Central Asia, but finds its maximum concentration of species in the Irano-Turanian region of Anatolia. Of the 23 species recognised in the Flora of Turkey, 10 (and 1 subspecies) are probably endemic to our area.

The genus would no doubt be amenable to sectional division, and deserves revision throughout its range. Many of the species, previously described in *Delphinium*, have already been combined in *Consolida* by Schrödinger (Abhandl. Zool.-Bot. Ges. Wien 4(5): 62, 1909), etc.; other Turkish species are combined below. The group of species allied to *Consolida aconiti* Lindley has already been referred to a separate genus, *Aconitopsis* Kem.-Nath. (Trav. Inst. Bot. Tbilisi 7: 125, 1940), and this distinctive natural group might be treated as a subgenus or section of *Consolida* in which it is included here.

C. samia P. H. Davis, **sp. nov.** Pl. 18

Affinis *C. hellesponticae* (Boiss.) Chater sed statura nana, indumento subpatente, ramis 1–2-floris, floribus pallidioribus, calcare sepalis fere duplo longiore differt.

Herba annua, 4–6 cm alta, fere basin pauciramosa. *Indumentum* caulium et foliorum breviter tomentellum. *Rami* 1–2-flori. *Folia* trisecta, laciniis linearibus 10–12 mm longis vix 1 mm latis acutis. *Bracteae* trisectae vel lineares. *Bracteolae* subopppositae, lineares, 6–10 mm, longae, ad basin floris aequantes. *Flores* lilacini, longe pedicellati. *Sepala* ovata vel oblongo-ovata, patentia, extus adpresse pubescentia, 8–11 mm longa; calcar tenuiter attenuato-cylindricum, acutum, 15–17 mm longum, horizontale vel subascendens. *Limbus corollae* subtrilobus, c. 8 mm longus et 10 mm latus, lobo mediano late oblongo purpureo-venoso, lobis lateralibus obtuse triangularibus paulum deflexis. *Carpellum* pubescens. *Fructus* ignotus. Fl. Mai.

GREECE: Is. Samos, S.W. slope of Mt. Kerki, steep screes of limestone, c. 800 m, 26 v 1963, *Runemark & Snogerup* 19592 (holo. LU).

The new species is morphologically closest to *C. hellespontica* (Boiss.) Chater (Feddes Rep. 69 (1): 55, 1964), based on *Delphinium hellesponticum* Boiss. This species includes *D. macedonicum* Hal. & Charrel, *D. campylopodum* Freyn and *D. paphlagonicum* Huth, and is widespread in Inner Anatolia W. of 40° E; it extends into N.E. Greece and N.W. Syria, but does not occur in the Aegean islands. It appears to be almost exclusively a segetal species, whereas *C. samia* is confined to open limestone scree in W. Samos. *C. samia* may be distinguished from *C. hellespontica* by its dwarf stature, more spreading tomentellous indumentum, very reduced inflorescence (its ally having 3–14-flowered racemes), and paler (lilac) flowers with a relatively longer spur. Fruiting material is needed to show whether the pedicels (as seems most likely) are refracted downwards in fruit, as in *C. hellespontica*, *C. tomentosa* (Aucher) Schröd. (including subsp. *oligantha* (Boiss.) Davis) and *C. sulphurea*, or remain ascending, as in *C. armeniaca* (Huth) Schröd. and *C. olopetala* (Boiss.) Hayek.

C. stenocarpa (Davis & Hossain) Davis, **comb. nov.**

Syn.: *Delphinium stenocarpum* Davis & Hossain in Notes R.B.G. Edinb. 22: 413, f.l.b, c (1958)!

Endemic to Central Anatolia.

C. saccata (Huth) Davis, **comb. nov.**

Syn.: *Delphinium saccatum* Huth in Bull. Herb. Boiss. 1: 328, t. 16 (1893)!

In Turkey only known from Mardin. N. Iraq.

C. phrygia (Boiss.) Soó in Öst. Bot. Zeitschr. 71: 245 (1922).

Key to subspecies

1. Sepals 7–11 mm, whitish, pink or mauve; corolla with the upper lobe shorter than the lateral lobes; lower bracts scarcely leaf-like, about as long as pedicels . . . . . subsp. *phyrgia*

1. Sepals 10–17 mm, light violet: corolla with the upper lobe as long or a little longer than the lateral lobes; lower bracts multisect, leaf-like, much longer than pedicels . . . . . subsp. *thessalonica*

subsp. **phrygia**

Syn.: *Delphinium phrygium* Boiss. in Ann. Sci. Nat. 16: 363 (1841).
Consolida orientalis (Gay) Schröd. subsp. *phrygia* (Boiss.) Chater in Feddes Rep. 68: 193 (1963).

W. & S.W. Anatolia.

subsp. **thessalonica** (Soó) Davis, **comb. et stat. nov.**

Syn.: *C. orientalis* (Gay) Schröd. var. *thessalonica* Soó in Öst. Bot. Zeitschr. 71: 239 (1922).

Greece, Turkey-in-Europe (prov. Istanbul: Domuzdere, Mandra, 9 iv 1901, *Aznavour*, as *Delphinium orientale* Gay.

Chater (*op. cit.*) has treated *Consolida phrygia* as a subsp. of *C. orientalis*, and (by implication) included var. *thessalonica* Soó within subsp. *phrygia*. I am unable to accept this view, particularly as he seems to have overlooked the follicle differences which distinguish *C. phrygia* (including *thessalonica*) from the very widespread *C. orientalis* (cf. B. L. Burtt in Bot. Mag. 169: t. 186, 1952–53). *C. phrygia* sensu lato may be distinguished from *C. orientalis* by its laxer, fewer-flowered racemes, shorter pedicels, paler flowers with the spur as long as the sepals (instead of shorter), and follicle rounded but not gibbous above, with a longer flexuous beak inserted (as in *C. ambigua* (L.) Ball & Heywood, i.e. *Delphinium ajacis* auct. non L.) laterally, but not below the apex as it is in *C. orientalis*. *C. phrygia* is not as well known from Anatolia as one could wish, and if more material becomes available it is possible that the recognition of two subspecific taxa may not be tenable; the only gathering of this species from Cyprus is intermediate between the subspecies recognised here.

C. regalis S. F. Gray, Nat. Arr. Brit. Pl. 2: 711 (1821) subsp. **paniculata** (Host.) Soó in Öst. Bot. Zeitschr. 71: 23 (1922) var. **divaricata** (Ledeb.) Davis, **comb. et stat. nov.**

Syn.: *Delphinium divaricatum* Ledeb. in Eichwald, Caspio-Cauc. 2: 16, t. 16 (1831).

N. Balkans, Turkey (rare), S. Russia, Caucasia, N. & N.W. Iran, Transcaspia. This taxon, generally recognised as a species, differs from subsp. *paniculata* only in having adpressed-pubescent (instead of glabrous) follicles. In W. Asia it extends further east and replaces the latter in Iran and Transcaspia, so that it seems to deserve at least varietal status, despite some geographical overlap in Europe.

C. cornuta (Davis & Hossain) Davis, **comb. nov.**

Syn.: *Delphinium cornutum* Davis & Hossain in Notes R.B.G. Edinb. 22: 424, f. 4e (1958)!

Endemic to the Armenian Highlands of N.E. Anatolia.

C. cruciata (Davis & Hossain) Davis, **comb. nov.**

Syn.: *Delphinium cruciatum* Davis & Hossain in Notes R.B.G. Edinb. 22: 422, f. 4c (1958)!

Endemic to S. Anatolia (Cilicia).

C. sulphurea (Boiss. & Hausskn.) Davis, **comb. nov.**

Syn.: *Delphinium sulphureum* Boiss. & Hausskn. in Boiss., Fl. Or. 1: 81 (1867)!

Turkey (Anti-Taurus, W. Mesopotamia) and Syrian Desert.

C. tomentosa (Aucher) Schröd. in Abhand. Zool.-Bot. Ges. Wien 4(5): 62 (1909).

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

Syn.: *Delphinium oliganthum* Boiss., Fl. Or. 1: 80 (1867)!

Turkey (Mesopotamia), N. Iraq, and probably the Syrian Desert.

C. oligantha (Boiss.) Schröd. is reduced here to a subsp. of *C. tomentosa* on the basis of some intermediate material from Syria. Subsp. *oligantha* is distinguished from subsp. *tomentosa* by its shorter spur (about half as long as the posterior sepal, instead of ± equal to it) and in having the lateral lobes of the corolla horizontal, instead of somewhat deflexed. *C. tomentosa* sensu stricto grows in the Syrian Desert and N. Iraq, and has been recorded from several localities in Anatolia, but its presence in Turkey remains very doubtful. The species has often been confused with the more widespread *C. hellespontica* (Boiss.) Chater, from which it differs in its smaller flowers, shorter spur and different corolla shape.

ANEMONE

Anemone narcissiflora L. Sp. Pl. 542 (1753).

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

Syn.: *A. umbellata* Willd., Sp. Pl. 2: 1284 (1800), non Lam. (1778)!
A. narcissiflora var. *willdenovii* Boiss., Fl. Or. 1: 14 (1867)!

N.E. Anatolia, Soviet Armenia; altitudinally vicarious with subsp. *narcissiflora* (*A. fasciculata* L.).

RANUNCULUS

R. millefolius Banks & Sol. in Russell, Aleppo ed. 2, 2: 254 (1794).

subsp. **millefolius**

Syn.: *R. orientalis* L., Sp. Pl. 555 (1753)!, non sensu Boiss. et auct.—nomen confusum.
R. myriophyllus DC., Syst. 1: 257 (1817).
"*R. myriophyllus* Russ." in Boiss., Fl. Or. 1: 36 (1867).
R. malabailae Boiss., Fl. Or. 1: 37 (1867)!

Turkey (Isaurian Taurus to E. Mesopotamia), N. Iraq, Syrian Desert, Cyprus, ? N.W. Iran.

subsp. **hierosolymitanus** (Boiss.) Davis, **comb. nov.**

Syn.: *R. hierosolymitanus* Boiss., Fl. Or. 1: 36 (1867)!
"*R. myriophyllus* Russ." var. *hierosolymitanus* Post, Fl. Syria 40 (1896)!
R. orientalis L. subsp. *hierosolymitanus* (Boiss.) Davis, Notes R.B.G. Edinb. 23: 150 (1960)!

Lebanon, Palestine, ? Turkey (Hatay: Osmaniye).

In view of the persistent wrong usage of the name *R. orientalis* L. for *R. isthmicus* Boiss. sensu lato (cf. Davis in Notes R.B.G. Edinb. 23: 149–150, 1960), it seems preferable to treat the former as a *nomen confusum*, and to take up the name *R. millefolius* Banks & Sol. for the species with adpressed sepals called "*R. myriophyllus* Russ." in Boissier's *Flora Orientalis*.

R. thracicus Azn. in Bull. Soc. Bot. France 46: 136 (1899).

Syntypes: [Turkey, prov. Istanbul] Fossés et depressions des bois, Beuyeuk Bend in Belgrad Keuy, *Aznavour* (G); env. du village d'Alem dagh, *Aznavour* (G).

N.W. Turkey (Bosporus area). Greece (Agrapha (Dolopia veterum), in frigid. oroped. Neuropolis, 1885, *Haussknecht*, E).

Having seen Aznavour's material, there seems no doubt that *R. thracicus* is specifically distinct from *R. ophioglossifolius* Vill. and is closely allied to *R. revelieri* Boreau (Corsica, S. France) and *R. longipes* Cut. (Spain, Portugal), as Aznavour claimed when he described his new species.

Previously considered as endemic to the Bosporus area, Haussknecht's specimen from Greece (previously determined as *R. ophioglossifolius*) constitutes a considerable extension of its range; it should be looked for elsewhere in Greece.

P. H. Davis.

PAEONIACEAE

Paeonia turcica Davis & Cullen, **sp. nov.**

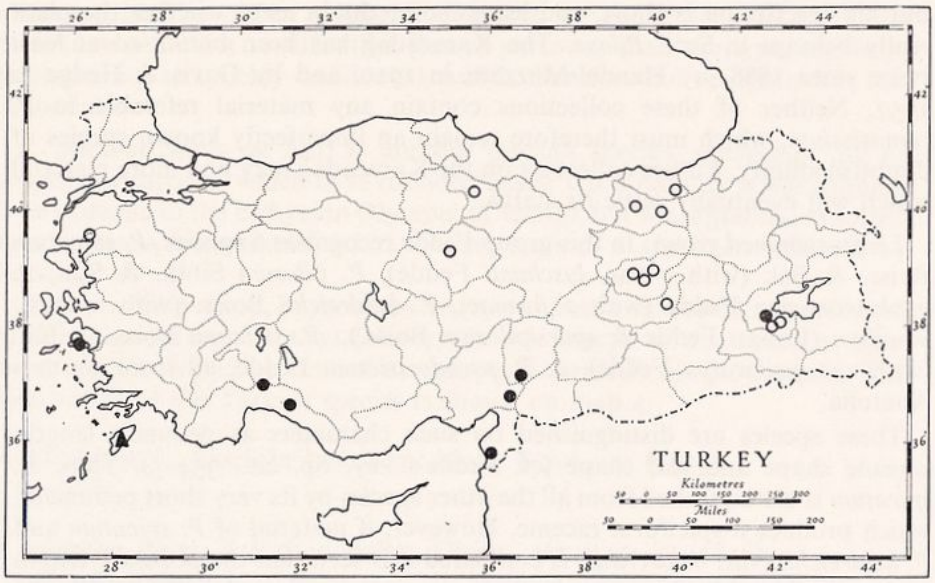
A *P. kesrouanensi* Thiébaut stylo et stigmate brevioribus, stigmate latiore magis circinato recedit.

Herba perennis, 40–60 cm alta. *Caules* herbacei, inferne c. 8 mm lati. glaberrimi, pallide glauci. *Folia* 5–6, inferiora biternata e foliolis 9–11 composita; foliola elliptica vel ovato-elliptica, terminalibus petiolulatis 9–14 × 5–7 cm (lateralibus minoribus subsessilibus), breviter et late acuminata, plana, superne viridia, pagina inferiore glauca (nervis eburneis vix prominentibus glabris exclusis) manifeste et equaliter albo-pilosa. *Sepala* late oblonga, obtusa, in fructu reflexa. *Petala* 3·5–4 cm longa, obovata, verosimiliter rubra. *Carpella* glaberrima, 2–5 in stylum vix 2 mm longum attenuata; stigma 2·5 mm latum undulato-cristatum infra medium circinatum. *Folliculus* (fere maturus) 25–35 mm longus, oblongo-ellipsoideus, etiam subfalcatus, intus carmineus.

Prov. Denizli: Boz Dağ above Abbas, 1500-1800m, in steep *Pinus nigra* forests above Geyran yayla, local, flowers said to be red, 16 vii 1941, *Davis* 13359 (holo. K, iso. E). Prov. Antalya: Finike, Orhan Uzum köy, vii 1948, *Heilbronn* (ISTF). Lycia, *Forbes* (K).

This sparsely represented new species is apparently confined to S.W. Anatolia (Caria and Lycia). It is certainly very closely related to *P. kesrouanensis* Thiébaut from Lebanon, Latakia and the Amanus, from which it differs in its somewhat shorter style and stigma, the stigmatic portion curved from near the base, instead of circinate only at the apex. The leaflets of *P. kesrouanensis* are usually broader at the base (even subcordate) than in *P. turcica*, but neither species is well enough represented for this character to be

Map 2. Distribution of *Paeonia* in Turkey. ○ *P. daurica;* ● *P. peregrina;* ▲ *P. turcica;* ▼ *P. kesrouanensis.*



Map 3. Distribution of *Paeonia* in Turkey. ○ *P. mascula* subsp. *arietina;* ● *P. mascula* subsp. *mascula;* ▲ *P. rhodia.*

relied on for separation. In both species the carpel is tapered into the style, instead of abruptly contracted into a coiled sessile stigma, as it is in *P. mascula* L. which grows in the same area. *P. turcica* differs further from the latter in having the leaflets pilose below and the carpels glabrous. More material is required. The distribution of all Turkish peonies is shown on maps 2 and 3.

P. H. Davis & J. Cullen.

PAPAVERACEAE

PAPAVER SECT. PILOSA

In a previous contribution to the taxonomy of the genus *Papaver* in Turkey, no mention was made of the species of this section, even though they are taxonomically very difficult (cf. Cullen in Notes Roy. Bot. Gard., Edinb., 25: 41–44, 1963). This present note makes good the omission.

In his revision of the genus (Pflanzenreich 40 (IV. 104): 288–386, 1909), Fedde recognises 8 species of this section as occurring in Turkey. These eight species may be divided into 2 groups, the first of plants with subscapose stems, the second of plants with leafy stems:

Subscapose group: Fedde recognises 2 species—*P. lateritium* C. Koch from Lazistan, and *P. ramosissimum* Fedde from Karacadağ near Diyarbakir (i.e. both from eastern Anatolia). *P. lateritium* is a well-defined species, whose taxonomy in Turkey is uncomplicated, though in the Caucasus it is not clearly separable from *P. oreophilum* Rupr. and *P. monanthum* Trautv. It has gained popularity as a garden plant in recent years. *P. ramosissium* was treated by Fedde as a "*species non satis nota*", based on a specimen without flowers or fruit collected by Sintenis in 1888 (No. 859)—a specimen which I have not been able to trace. Fedde notes that it is easily distinguished from *P. lateritium* by its diffusely branched stems and shorter peduncles, but his description is short, and leaves some doubt as to whether the plant really belongs in Sect. *Pilosa*. The Karacadağ has been botanised at least twice since 1888, by Handel-Mazzetti in 1910, and by Davis & Hedge in 1957. Neither of these collections contain any material referable to *P. ramosissium*, which must therefore remain an imperfectly known species of doubtful affinity. Future collectors on the Karacadağ may find more material which will eventually settle its status.

Leafy-stemmed group: In this group Fedde recognises 6 species, *P. spicatum* Boiss. & Bal. (with a var. *luschanii* Fedde), *P. pilosum* Sibth. & Sm., *P. apokrinomenon* Fedde (with 2 *formae*), *P. heldreichii* Boiss. (with 2 vars., *pumilum* (Boiss.) Fedde & *sparsipilosum* Boiss.), *P. strictum* Boiss. & Bal. (with var. *psilocalyx* Fedde), & *P. pseudostrictum* Fedde, all from western Anatolia.

These species are distinguished on such characters as peduncle length, capsule shape and leaf shape (cf. Fedde's key, op. cit., 354–5). Thus, *P. spicatum* is distinguished from all the other species by its very short peduncles, which produce a spiciform raceme. However, if material of *P. spicatum* and *P. heldreichii* (var. *heldreichii*) is compared it is seen that the peduncle length varies considerably from specimen to specimen collected within the same general area, and even from plant to plant within the same gathering. These taxa differ in no other essential respect, and it is therefore proposed to combine them under the name *P. spicatum*. *P. heldreichii* var. *pumilum* represents a dwarf, few-flowered variant of this species, and is probably only a habitat modification; var. *sparsipilosum* is dealt with below under *P. apokrinomenon*. *P. spicatum* var. *luschanii* is noted by Fedde as the only taxon in this section in which the fruits are hairy. I have not seen the type of this taxon (collected by Luschan in Lycia), but plants which match its description perfectly have been collected by Davis and by Khan, Prance

and Ratcliffe from the same general area, and I have no hesitation in recognising it as a distinct variety of the emended *P. spicatum*. The two poppies described by Schwarz (in Feddes Rep., 53: 76–77, 1944) are also conspecific with *P. spicatum* in this emended sense (cf. isotypes at Kew).

P. apokrinomenon Fedde, described on the basis of plants collected by Bornmüller on Sultan Dağ near Konya, differs from the taxa discussed above in details of leaf shape, capsule shape, and much less dense indumentum. In this latter characteristic it resembles *P. heldreichii* var. *sparsipilosum* Boiss. Much material of this taxon has been collected in recent years, from a very wide area of Turkey, and examination of this material has shown that the variability of leaf and capsule shape is much greater than Fedde had supposed, and that the range of variation now known includes that of *P. apokrinomenon*. Therefore, although the specimens available show a North/South geographical disjunction (which is not correlated with any morphological variation), I propose combining these two taxa as a species clearly distinct from *P. spicatum*, for which the earliest name at the specific level is *P. apokrinomenon*. By these reorganisations the name *P. heldreichii* is reduced to synonymy, which is perhaps rather unfortunate, as the name has been widely used in the literature.

P. strictum Boiss. & Bal. is a clearly marked species, differentiated from the others in the section by its deeply pinnatifid leaves and strigose-setose indumentum. The variety *psilocalyx* described by Fedde does not seem any more than a habitat modification (leaves narrower than the type, sepals ± glabrous, not so quickly deciduous), and is therefore not recognised in this treatment.

P. pilosum Sibth. & Sm. is another distinct species, recognised by its subglobose capsules which have rounded bases. Until recently it was thought to be endemic to the Bithynian Olympus (Uludağ), but Markgraf has reported its occurrence from near Çankiri, on the basis of a specimen collected by Nowack.

The remaining taxon, *P. pseudostrictum*, was based on a specimen collected by Sintenis at Tosya in 1892 (No. 4756). An isotype of this taxon at Kew shows that it should be treated as conspecific with *P. apokrinomenon*. The distribution of the Turkish species is shown on map 4.

P. lateritium C. Koch in Ind. Sem. Hort. Berol., 14 (1853).
Lazistan.

P. spicatum Boiss. & Bal. in Boiss., Diagn., sér. 2, 5: 14 (1856).
var. **spicatum.**
Syn.: *P. heldreichii* Boiss., Fl. Or., 1: 108 (1867) excl. var. ! *P. feddei* Schwarz in Feddes Rep., 53: 76 (1944) ! *P. pannosum* Schwarz, *op. cit.*, 77!
Lydia, Lycian, Pisidian and Isaurian Taurus.
var. **luschanii** Fedde, Pflanzenreich, 40 (IV. 104): 355 (1909).
Lycian Taurus.

P. pilosum Sibth. & Sm., Prodr. Fl. Graec., 1: 360 (1806).
Bithynia (Olympus), and near Çankiri.

Map 4. Distribution of *Papaver* Sect. *Spicatum* in Turkey.
● *P. spicatum* var. *spicatum;* ○ *P. spicatum* var. *luschanii;* p, *P. pilosum;* a, *P. apokrinomenon;* s, *P. strictum;* l, *P. lateritium;* r, locality of *P. ramosissimum.*

P. apokrinomenon Fedde, Pflanzenr. 40 (IV. 104): 358 (1909).

Syn.: *P. heldreichii* var. *sparsipilosum* Boiss., Fl. Or. 1: 108 (1867) ! *P. pseudostrictum* Fedde *op. cit.*, p. 360.

Scattered in Turkey W. of 34°E. (Bithynia, Paphlagonia, Galatia, Pisidia, Lycia, Lycaonia).

P. strictum Boiss. & Bal. in Boiss., Diagn., sér. 2 (6): 8 (1859).

Mysia, Phrygia, Pisidia.

Species imperfectly known

P. ramosissimum Fedde, Pflanzenr. 40 (IV. 104): 363 (1909).

TYPE: (Turkey, prov. Urfa) Kurdistan, Karadja-Dagh bei Diarbekir, 1888, *Sintenis* 859.

Key to the species

1. Plant subscapose; inflorescence 1–3-flowered . . . *P. lateritium*
+ Plant not subscapose; inflorescence 6-many-flowered. . . . 2
2. Stems and leaves densely white-pannose 3
+ Stems and leaves hirsute to hispid-setose, rarely glabrous, not pannose 5
3. Capsule rounded at the base, subglobose; disc flat with a slight umbo *P. pilosum*
+ Capsule tapered to the base, obconic-clavate; disc somewhat pyramidal (*P. spicatum*) 4.
4. Capsule glabrous . . . . *P. spicatum* var. *spicatum*
+ Capsule shortly setose . . . . *P. spicatum* var. *luschanii*

PLATE 17. Holotype of *Delphinium ilgazense* P. H. Davis.

facing p. 180

PLATE 18. Holotype of *Consolida samia* P. H. Davis.

5. Leaves deeply dentate to pinnatifid; stems and leaves with an indumentum of straight, somewhat adpressed, setae . . . *P. strictum*

\+ Leaves crenate-serrate; stems and leaves with an indumentum of contorted, somewhat spreading, soft hairs . . *P. apokrinomenon*

J. CULLEN.

CRUCIFERAE

CRAMBE

C. orientalis L., Sp. Pl. 671 (1753)

var. **alutacea** (Hand.-Mazz.) Hedge & Hub.-Mor., **comb. et stat. nov.**

Syn.: *Crambe alutacea* Hand.-Mazz. in Ann. Nat. Hofm. Wien, 27: 52 (1913).

Turkey (Mesopotamia) and Syrian Desert.

C. tataria Sebeök, Dissert. Inaug. de Tatar. 7 (1779)

var. **parviflora** (Hub.-Mor. & Reese) Hedge & Hub.Mor., **comb. et stat. nov.**

Syn.: *Crambe parviflora* Hub.-Mor. & Reese in Feddes Rep. 48: 276 (1940)!

Turkey: Prov. Uşak; between Uşak and Salikli, *Reese & Wall.*

Only known from this gathering.

COLUTEOCARPUS

Although this distinct bladder-fruited genus is often regarded as containing two species, I prefer to recognise it as monotypic with two easily discernible subspecies.

C. vesicaria (L.) Holmboe in Aarb. Berg. n. 13, 6 (1907).

subsp. **vesicaria**

Syn.: *Alyssum vesicaria* L., Sp. Pl. 910 (1753).
C. reticulatus Boiss. in Ann. Sci. Nat. 17: 162 (1842).

Turkish Armenia and Kurdistan, Caucasia, 1200–2700 m.

subsp. **boissieri** (O. E. Schulz) Hedge, **comb. et stat. nov.**

Syn.: *C. reticulatus* Boiss. var. *boissieri* Hausskn. ex Bornm. in Beih. Bot. Centralbl. 19: 207 (1906).
C. boissieri (Hausskn. ex Bornm.) Schulz in Pflanzenfam. ed. 2, 176: 428 (1936).

Lebanon, Turkish Kurdistan, N. Iraq, N.W. Iran, 3000–3300 m.

Usually clearly distinguished from the type subspecies in the broader basal leaves (rhomboid to spathulate as opposed to linear), 1–2 seeds and a marginal septum (4–12 seeds and an entire septum in the type subspecies). There is some overlap between the two subspecies in morphological characters and in geographical distribution.

AETHIONEMA

Prior to Boissier's time, about a dozen species of *Aethionema* were recognised throughout the range of the genus. Since then, the total has been more than quadrupled, most of these new species having been described from Turkey, the centre of the genus. With the much better material now available for study, it is clear that many of the species recognised in the *Flora Orientalis*, or described since, are not worth recognition. There are many available taxonomic characters in the genus, but because undue emphasis has been placed on them for recognition of specific and supra-specific taxa it is of value to consider their variation, citing examples from different species:

a) *petal size and shape:* in *Ae. grandiflorum* Boiss. & Hohen. the petal size ranges from 5–11 mm (the smaller size of the petal was the feature used by Boissier and Huet to distinguish *Ae. pulchellum* from *Ae. grandiflorum*) and in shape from obovate with a clearly differentiated claw and blade to a more or less oblong, undifferentiated petal. Although this is an unusual range of petal size, species known from many gatherings tend to show a comparable variation, e.g. *Ae. trinervium* (DC.) Boiss. ranges from 6 to 10 mm. In almost all species, the petals are trinerved at the base of the claw but occasionally single-nerved forms occur, as is the case in the little known and doubtful *Ae. sintenisii* Hausskn. & Bornm., where it is apparently a diagnostic feature.

b) *filaments:* in *Ae. membranaceum* DC. the filaments are either dentate or more often not (dentate filaments was given as diagnostic for the species in the original description); in *Ae. schistosum* Boiss. & Ky. the filaments are either loosely connate at the base or free.

c) *honey glands:* although the presence or absence of honey glands at the base of stamens is generally constant within a species, in *Ae. oppositifolium* (Pers.) Hedge median honey glands are either present or absent. In Schulz's treatment of the *Lepidieae* (Pflanzenfam. ed. 2, 17b: 1936), the genus *Eunomia* was separated from *Aethionema* on the basis of the former always having median honey glands.

d) *number of ovules:* this is generally more or less constant within a species, each loculus containing one or two ovules, rarely three or four.

e) *loculus:* the species *Ae. lepidioides* Huber-Morath, *thesiifolium* Boiss. & Heldr. (?), *elongatum* Boiss., *eunomioides* (Boiss.) Hedge and *polygaloides* DC. have the common characteristic of unilocular and single-seeded silicules. This apparently distinctive character does occasionally occur in species that are generally bilocular (it also is a regular feature of the heterocarpic species, e.g. *Ae. heterocarpum* J. Gay). In some of the unilocular species, e.g. *Ae. eunomoides*, bilocular forms sometimes occur.

f) *silicule:* in all species, the size, shape, presence or absence of wings and the degree of dentation of the wings are most variable—cf. *Ae. trinervium* below.

g) *radicle:* in *Ae. grandiflorum* Boiss. & Hohen. the radicle position is either accumbent or incumbent.

In general, the more gatherings there are of a particular taxon, the greater the range of variation, the fewer gatherings the more constant it appears.

Future gatherings in Turkey and Iran may clearly show that some of the currently recognised species are no more than local forms of other species.

As is clear from the above brief mention of some of the variation in characters used in the classification of *Aethionema*, precise definition and delimitation of species is unusually difficult. There are several fairly natural and definable species groups that contain species that are much harder to define and are separated from each other by rather nebulous criteria. For example, the '*coridifolium*' group of species is characterised by having linear leaves, winged silicules and elongated fruiting racemes. Within the group, five (at least) species can be recognised, based to a large extent on habit and facies characters.

New combinations in the genus and the reduction to synonymy of species that I consider untenable are listed below.

Ae. elongatum Boiss., Diagn. ser. 1 (6): 17 (1845).

Syn.: *Ae. szowitsii* Boiss., Fl. Or. 1: 345 (1867)!
Ae. lipskyi Busch, Fl. Cauc. Crit. 3, 4: 131 (1907).
Ae. schelkovnikowii Bordz. in Bull. Gard. Bot. Kiev 12–13: 112 (1931)!
Ae. woronowii Schisch. in Sched. Herb. Fl. Cauc. fasc. 10: (1931)!

N.W. and W. Iran, Caucasia, Turkish Armenia.

This is a very variable species in which it might seem that several subspecific taxa could be recognised. Study of fairly abundant material shows, however, that it is best to recognise one polymorphic species with numerous intergrading local forms. The main area of distribution of the species is West Persia where it is represented by an erect, unbranched and lax-inflorescenced form. This is the typical (type) form of *Ae. elongatum*. In the Transcaucasian region the species is represented by dense-racemed forms with ascending or erect, usually branched, stems. The Turkish plant, similar to the Transcaucasian forms and only known from a few gatherings, was originally described as *Ae. woronowii*.

Ae. eunomoides (Boiss.) Bornm. in Beih. Bot. Centralbl. 28, 535 (1911).

Syn.: *Crenularia eunomoides* Boiss. in Boiss. Diagn. ser. 2, 5: 41 (1859)!

Endemic to the Cilician Taurus, Paphlagonia and the Upper Euphrates.

This distinctive-looking species from limestone cliffs and crevices may be considerably more widespread in Turkey than the few known gatherings would suggest. The relationship of this species with *Ae. spicatum* Post can only be properly established when there is more material available of both species.

Ae. glaucescens (Boiss.) Bornm. in Beih. Bot. Centralbl. 28, 535 (1911).

Syn.: *Iberis glaucescens* Boiss. in Tchihat., Asie Min. Bot. 3, 1: 325 (1860)!
Crenularia glaucescens (Boiss.) Boiss., Fl. Or. 1: 337 (1867)!

Endemic to the Cilician Taurus.

Only known from one gathering, it is impossible to assess accurately the status of this species.

Ae. oppositifolium (Pers.) Hedge, **comb. nov.**

Syn.: *Iberis oppositifolia* Pers., Syn. Plant. 2: 186 (1807).
Ae. rubescens (Schott & Ky.) Boiss., Fl. Or. 1: 343 (1867)!
Ae. bourgaei Boiss., Fl. Or. 1: 343 (1867)!
Turkey, Syria, Lebanon, Caucasia.

Although within this species, as I recognise it, there is much variation in fruit size and shape, number of ovules and radicle position, there is, with the material now at hand, no justification for recognising, as Boissier did, four separate species. The Caucasian species, *Ae. rotundifolium* (C.A.M.) Boiss., is closely related to *Ae. oppositifolium*. Further exploration may reveal that intermediates exist between the two species.

Ae. trinervium (DC.) Boiss., Fl. Or. 1: 342 (1867).

Syn.: *Ae. salmasium* Boiss., Fl. Or. 1: 350 (1867)!
N.W., S. and N. Iran, Armenia and Kurdistan, Caucasia.

The separation of *Ae. salmasium* and *Ae. trinervium* into separate sections (Boissier in *Flora Orientalis*) and different genera (Schulz in *Pflanzenfamilien*) was a result of over-emphasising the characters of fruit and honey-glands respectively. *Ae. trinervium* was placed by Schulz in *Eunomia*—recognised by the presence of median honey glands. This character, rarely a very clear or convincing one, does not hold true for *Ae. trinervium*. In it, as in *Ae. salmasium*, median honey glands are absent but the laterals coalesce to give the impression of median glands. Boissier separated *Ae. trinervium* into Sect. *Iberidella* on the basis of wingless fruits, whereas *Ae. salmasium* of Sect. (*Eu-*) *Aethionema* was winged. This character, normally important in the *Lepidieae*, is variable throughout *Aethionema* and in the complex of forms within *Ae. trinervium* there is an overlapping range of fruits from clearly winged to wingless and in shape from obcordate to oblong.

THLASPI

Sect. **Syrenopsis** (Jaub. & Spach) Hedge, **comb. et stat. nov.**

Syn.: *Syrenopsis* Jaub. & Spach, Illustr. Pl. Or. 1, 6: t. 3 (1842).

Described as a new genus on the basis of an inadequate gathering from Bithynian Olympus, *Syrenopsis* was maintained by Boissier in *Flora Orientalis* and by Schulz in the *Pflanzenfamilien* who placed it in the *Lepidieae-Cochleariinae*. With the adequate material now available, it is clear that there are slender technical reasons for maintaining the genus and that the correct taxonomic position for *Syrenopsis* must be within or close to *Thlaspi*. By assigning it to the *Cochleariinae* on account of the scarcely compressed fruits, it appears to occupy an isolated position, but when regarded as a *Thlaspi* its affinities become clear. In fruit shape, Sect. *Syrenopsis* has similarities to Sect. *Apterygium* but in more general characters, habit, leaf and life-form, it is closest to Sect. *Carpoceras*.

T. bornmuelleri (Rech. fil.) Hedge, **comb. nov.**

Syn.: *Syrenopsis bornmuelleri* Rech. fil. in Ann. Nat. Hofmus. Wien 49: 264 (1939).
Turkish endemic: Kurdistan, Upper Euphrates.

T. jaubertii Hedge, **nom. nov.**

Syn.: *Syrenopsis stylosa* Jaub. & Spach., Illustr. Pl. Or. 1, 6: t. 3 (1842).

Turkish endemic: N. Anatolia, Phrygia.

A new specific epithet is necessitated by an earlier *Thlaspi stylosum* Reichb., Ic. Fl. Germ. 2, 3: t. 6 (1837–38).

Sect. **Thlaspi**

T. annuum C. Koch in Linnaea 15: 258 (1841).

Syn.: *Thlaspi natolicum* Boiss. in Ann. Sc. Nat. ser. 2, 17: 180 (1842).

Aegean Islands, Cyprus, W. Syria, Turkey, Caucasia.

Although *T. annuum* and *T. natolicum* are generally considered as synonyms, a photograph of paratype material and good herbarium material from Erevan of *T. annuum* show a larger flowered plant than Turkish, Syrian and Cyprus *T. annuum*. The floral dimensions of *T. annuum* given in Fl. U.R.S.S., Grossheim's Fl. Kavkaza and Busch's Fl. Cauc. Crit. agree, however, with the smaller-petalled Turkish and Syrian plant. As petal size in *Thlaspi* is generally fairly constant within a particular species, there may be some reasons for considering that two taxa are involved—'*natolicum*' for the small-petalled Anatolian plant—'*annuum*' for the Georgian plant.

NESLIA

Although the differences between the two taxa of this genus are few, I prefer to retain them as separate species and not regard them as subspecies, as did Ball in a recent paper (Feddes Rep. Sp. 64: 11–13, 1961). The fruit characters separating them are maintained throughout their natural geographic distribution, although in Europe, where both taxa occur as weeds of cultivation, intermediates sometimes occur, due possibly to hybridisation. In general, the two species have largely distinct geographic areas.

N. paniculata (L.) Desv. in Journ. Bot. 3: 162 (1814).

C. Europe, N. Africa, S. Russia, E. Turkey, Caucasus, Tian Shan.

N. apiculata Fisch. Mey & Avé-Lall., Ind. Sem. Hort. Petrop. 8: 68 (1842)

S. Europe, N.W. Africa, throughout S.W. and C. Asia.

Widespread and common in S.W. and C. Asia and fairly constant in characters.

I. C. HEDGE.

DRABA SECT. AIZOPSIS

Schulz, in his recent monograph of *Draba* (Pflanzenr. 89 (IV. 105): 1–340, 1927), recognises four species of this section as occurring in Turkey. In the light of much recent material, we find that we can recognise only two species, the distinctions given by Schulz not being maintained consistently in the specimens we have. Of the two species we recognise, one, *D. bruniifolia*, is very polymorphic, and we have divided it into six subspecies (one further divided into two varieties); their distribution is shown on map 5. The other species, *D. rigida*, is clearly distinguished from *D. bruniifolia* sensu lato by its numerous ovules and glabrous fruits. We accept the two varieties of *D. rigida* proposed by Boissier (Fl. Or. 1: 297, 1867).

The variation within *D. bruniifolia* is reticulate (cf. Table 1). New combinations and synonymy are given below.

D. bruniifolia Stev. in Mém. Soc. Nat. Mosc. 3: 268 (1812).

subsp. **bruniifolia**

Syn.: *D. olympica* sensu Boiss., Fl. Or. 1: 295 (1867) excl. vars. *genuina* & *heterocoma*.

D. diversifolia Boiss. & Huet in Boiss., Diagn. sér. 2(5): 30 (1856)!

D. bruniifolia var. *diversifolia* (Boiss. & Huet) Boiss., Fl. Or. Suppl. 54 (1888)!

D. bruniifolia prol. *diversifolia* (Boiss. & Huet) Schulz, Pflanzenr. 89 (IV. 105): 65 (1927)!

D. bruniifolia var. *incana* Boiss., Fl. Or. Suppl. 54 (1888).

D. bruniifolia prol. *incana* (Boiss.) Schulz, *loc. cit.*

D. natolica Boiss. in Ann. Sci. Nat. 17: 163 (1842).

Scattered in N. & E. Turkey, Caucasia, N. Iran.

Map 5. Distribution of *Draba bruniifolia* Stev. in Turkey.
b, subsp. *bruniifolia;* a, subsp. *armeniaca;* o, subsp. *olympica;* h, subsp. *heterocoma* var. *heterocoma;* n, var. *nana;* ●, subsp. *archipelagi;* k, subsp. *kurdica*.

subsp. **armeniaca** Coode & Cullen, **subsp. nov.**

A subsp. *bruniifolio* indumento silicularum solum e pilis simplicibus composito, foliis 11–12 (non 8–10) mm longis differt.

Prov. Çoruh: distr. Ardanuç, Kordevan Dağ, 2700 m, dry turf, perennial, fls. yellow, 28 vi 1957, *Davis & Hedge* (*D.* 30383—holo. E). Prov. Gümüşane: Soğanli Dağ, north of Bayburt, 2600 m, *Stainton* 8355. Prov. Kars: Yalnizçam Dağ, 2500 m, *Davis & Hedge* (*D.* 29694).

Endemic.

Table 1. Characters of the subspecies of *D. bruniifolia* sensu lato

Taxon	*Hairs on leaf lamina*	*Scape*	*Hairs on fruit*	*Inflorescence*
bruniifolia	branched	villose	short, branched and long, simple	7-many-flowered, lax
armeniaca	branched	villose	short, straight, simple	7-many-flowered, lax
olympica	none	villose	long, simple only	3-8-flowered, contracted
heterocoma var. *heterocoma*	none	glabrous	long, simple only	7-many-flowered, lax
heterocoma var. *nana*	simple and few branched	glabrous	long, simple only	7-many-flowered, lax
archipelagi	none	glabrous	long, simple only	3-8-flowered, contracted
kurdica	branched	glabrous	short, crisped	7-many-flowered, lax

subsp. **olympica** (Sibth. ex DC.) Coode & Cullen, **comb. nov.**

Syn.: *D. olympica* Sibth. ex DC., Syst. 2: 336 (1821).
D. aizoides sensu Sibth. & Sm., Prodr. Fl. Graec. 2: 4 (1813), non L.
D. olympica var. *genuina* Boiss., Fl. Or. 1: 295 (1867).

Scattered in Turkey, Caucasia.

subsp. **heterocoma** (Fenzl) Coode & Cullen, **comb. nov.**

var. **heterocoma**

Syn.: *D. heterocoma* Fenzl, Pug. 13 (1842)!
D. olympica var. *heterocoma* (Fenzl) Boiss., Fl. Or. 1: 295 (1867)!

Very scattered in Turkey; doubtfully recorded from Transcaucasia.

var. **nana** (Stapf) Schulz, Pflanzenr. 89 (IV. 105): 63 (1927).

Syn.: *D. nana* Stapf in Denk. Akad. Wiss. Wien Math.-Nat. Kl. 51: 361 (1886).

South Turkey.

subsp. **archipelagi** (Gilg ex Schulz) Coode & Cullen, **comb. nov.**

Syn.: *D. archipelagi* Gilg, *nom. nud.*
D. heterocoma var. *archipelagi* Gilg ex Schulz, Pflanzenr. 89 (IV. 105): 63 (1927)!

Samos; Karpathos?

subsp. **kurdica** Coode & Cullen, **subsp. nov.**

A subsp. *bruniifolio* scapo glabro, indumento silicularum solum e pilis brevibus crispulis composito differt.

Prov. Van: distr. Gevaş, Artos Da., 4000 m, rocks and scree on summit ridge, 15 vii 1954, *Davis & Polunin* (*D.* 22884a—holo. E); *ibid.*, *Davis & Polunin* (*D.* 22866); Ağri: Ararat, 4000–4100 m, *Post* 2188.

Endemic? *D. bruniifolia* prol. *buhsei* Schulz (Pflanzenr. 89 (IV. 105): 66, 1927) from Iran and perhaps Transcaucasia is, from the description, very similar to this subspecies. We have seen no authentic material of prol. *buhsei*, however, and have, therefore, not cited it as a synonym.

J. Cullen & M. J. E. Coode.

ARABIS ALPINA

This is a highly complex and widely distributed aggregate of taxa showing reticulate variation. It is usually divided into two widespread species, *A. alpina* L. in Europe and *A. caucasica* in the Middle East and elsewhere, and a varying number of other fairly local species.

The last account of the group as it occurs in Turkey was given by Boissier (Fl. Or. 1: 174–177, 1867), who recognised five species: *A. caucasica* Willd. (*A. albida* Stev.), *A. deflexa* Boiss., *A. aubrietioides* Boiss., *A. flaviflora* Bunge and *A. ionocalyx* Boiss.; *A. caucasica* was divided into six varieties. Much material of the complex has now been collected, and in revising it for the Flora of Turkey I have recognised four species—those cited above, with the exception of *A. flaviflora*, which I regard as a depauperate, high-alpine variant of *A. caucasica*. I have divided *A. caucasica* into two largely allopatric subspecies; intermediates between them occur only in one area, where, however, they are common (cf. map 6).

The most obvious distinctions between *A. alpina* and *A. caucasica* are in the flowers (petals 6–10 mm in *alpina*, 12–18 mm in *caucasica*) and leaves (many-toothed in *alpina*, few-toothed in *caucasica*). *A. aubrietioides* agrees with *A. caucasica* in these characters, differing mainly in its petal colour; *A. deflexa* is similar to *A. alpina* in flower size, but more like *A. caucasica* in vegetative features, differing from both in its deflexed fruits; *A. ionocalyx* agrees with *A. caucasica* in flower size, and with *A. alpina* in vegetative characters, differing from both in its less compressed fruits and purplish sepals. Specimens from the islands of Rodhos and Kalimnos are similar to *A. caucasica* in flower and to *A. alpina* vegetatively, but appear to lack any other distinguishing characteristics. These specimens resemble the Sicilian representatives of the complex, and remain something of an anomaly.

The Turkish species may be recognised as follows:

1. Petals pink to violet . . . . . *A. aubrietioides*
\+ Petals white (usually drying yellowish) 2
2. Petals 8–10 mm; siliquae deflexed . . . . . *A. deflexa*
\+ Petals 10–18 mm; siliquae erect or spreading 3
3. Sepals violet; siliquae slightly compressed; biennial or short-lived perennial . . . . . *A. ionocalyx*
\+ Sepals white, yellowish or greenish; siliquae strongly compressed; perennial . . . . . 4. (*A. caucasica*)

4. Lower leaves distinctly petiolate, lamina orbicular or orbicular-ovate; siliquae erect on incurved pedicels . *A. caucasica* subsp. *brevifolia*

\+ Lower leaves not or obscurely petiolate; lamina usually oblong or oblong obovate; siliquae spreading or strict, pedicels not incurved *A. caucasica* subsp. *caucasica*

A new combination is necessary for subsp. *brevifolia:*

Map 6. Distribution of *Arabis caucasica* in Turkey.
○, subsp. *caucasica;* ●, subsp. *brevifolia;* ◐, intermediates.

A. caucasica Willd., Enum. Hort. Berol. Suppl. 45 (1813).

subsp. **brevifolia** (DC.) Cullen, **comb. nov.**

Syn.: *A. brevifolia* DC., Syst. 2: 218 (1821).
A. albida var. *brevifolia* (DC.) Boiss., Fl. Or. 1: 175 (1867).

South Anatolia, Lebanon. Usually clearly distinguished from the type subspecies, which has a more northern and eastern distribution; intermediates occur in the Anti-Taurus (cf. map 6).

J. CULLEN.

BARBAREA

B. lutea Coode & Cullen, **sp. nov.** Pl. 19

A *B. grandiflora* Busch (e descr. et photo.) siliquis strictis, petalis minoribus 8–12 (non 12·5–13·5) mm longis, luteis (non intense aureis); a *B. plantaginea* DC. petiolis non alatis, siliquis angustioribus strictis differt.

Herba perennis, glabra, radicibus fibrosis. *Caules* erecti, 50 cm alti. *Folia basalia* longe petiolata, foliolis lateralibus 1–2, parvis, foliolo terminali magno, 3·0–4·5 cm longo, integro vel subcrenato. *Folia caulina superiora* sessilia, auriculata, ovata, pinnatifida vel profunde dentata, lobis 7–10, anguste lanceolatis, acutis. *Inflorescentia* densa, floribus 15–25, ebracteata. *Sepala* 5–6 mm longa, interiora saccata. *Petala* lutea (in sicco albo-lutea vel

alba), spathulata, lamina in unguem sensim contracta, 8–12 mm longa, 4–5 mm lata. *Siliquae* strictae, teretes, 15–25 mm longae, 0·5–1 mm latae. *Stylus* 2·5–3·5 mm longus. *Stigma* capitatum.

Prov. Kars: S.W. slope of Kisir Dağ, 2300 m, by stream, flowers 'lutea', vii 1957, *Davis & Hedge* (*D.* 30549—holo. E).

This new species apparently resembles *B. grandiflora* Busch from Daghestan. Unfortunately we have not seen any authentic material of this species, and have had to rely on Busch's description and a photograph of a specimen in the Leningrad herbarium. In the diagnosis given above we have included the characters which separate *B. lutea* from *B. plantaginea* DC. which is a common species in Turkey, and which may serve as an easily obtainable basis for comparison when material of *B. grandiflora* is not available.

B. auriculata Hausskn. ex Bornm. in Mag. Bot. Lap. 30: 55 (1931).
var. **paludosa** Coode & Cullen, **var. nov.**

A var. *auriculata* caulibus inferne et petiolis foliorum inferiorum retrorse hispido-setosis differt.

Prov. Erzincan: Tercan to Askale, above Tercan, 1650 m, *Davis & Hedge* (*D.* 29537—holo. E).

B. auriculata is a little-known species characterised by the very large auricles of its stem leaves. It is known only from the type gathering (Armenia turcica, Egin, *Sintenis* 1890: 2460), a locality about 170 km W.S.W. of the locality of our new variety. The only difference between var. *paludosa* and var. *auriculata* is the presence of short, stiff retrorse setae on the petioles and the lower part of the stem of the former. Bornmüller described the flowers of *B. auriculata* as white; this is probably a mistake, as the flowers of almost all species of *Barbarea*, yellow when living, dry white. Our variety definitely has yellow flowers.

B. minor C. Koch in Linnaea 19: 55 (1847).
var. **robusta** Coode & Cullen, **var. nov.**

A var. *minore* caulibus elatioribus robustioribus 22–30 (non 5–16) cm altis differt.

Prov. Van: distr. Gevaş, Artos Dağ, 3000 m, by stream, perennial, fl. lutea, 15 vii 1954, *Davis & Polunin* (*D.* 22858 E). Prov. Hakkari: Cilo Tepe, 3100 m, flushes, fl. lutea, 8 viii 1954, *Davis & Polunin* (*D.* 24087). Prov. Bitlis: Pelli, 2200 m, damp bank in steppe, 6 vi 1954, *Davis & Polunin* (*D.* 22396—holo. E).

B. minor is a polymorphic species; in Turkey three intergrading varieties occur: var. *minor*—small, glabrous, delicate plants with a rather scattered distribution in Syria, S. & E. Turkey, Soviet Armenia and Iranian Azerbaijan; var. *eriopoda* Busch (Fl. Cauc. Crit. 3(4): 318, 1909)—differing from var. *minor* only in the petioles and lower parts of the stem being retrorsely setose, and having a very scattered distribution in Turkey and Adzharia; and our new variety from Turkish Kurdistan, which differs from var. *minor* only in its more robust growth. It is likely that var. *robusta* will occur in adjacent parts of Iran and Iraq, but we have seen no material from these areas.

M. J. E. Coode & J. Cullen.

AUBRIETA CANESCENS

This very polymorphic species, widely distributed in Turkey, was first described by Boissier as a variety of *A. deltoidea* (L.) DC. Boissier's concept of this species, which included the type variety, var. *canescens*, and two other varieties, *microphylla* and *cilicica*, is much broader than is accepted today, the name *deltoidea* now being used only for those plants with simple setae as well as furcate hairs on the fruit. This agrees with Boissier's var. *deltoidea*; his other varieties (with the possible exception of var. *microphylla*—see below) are now segregated from *A. deltoidea* and placed elsewhere.

In revising the Turkish members of the complex, I have recognised three subspecies. Subsp. *canescens* agrees with Boissier's description of *A. deltoidea* var. *canescens*; of the three syntypes he cites under this variety I have seen two—"in alpinis montis Akdagh Lyciae, *Bourgeau*" and "in fissuris rupium montis Berit Dagh Cataoniae, *Hausskn.*" The first of these agrees well with Boissier's description, but the second deviates in leaf size and shape, and flower size. I propose to include this Haussknecht specimen in a new subspecies, subsp. *macrostyla*. I have not seen the third syntype of var. *canescens:* "in Cadmo supra Geyre, *Boiss.*", but from its locality in S.W. Turkey there seems to be no reason to suppose that it also will prove to be subsp. *macrostyla*, as this subspecies has not been collected west of prov. Konya. The third subspecies is subsp. *cilicica*, which corresponds with Boissier's *A. deltoidea* var. *cilicica*.

I have not seen any of the specimens cited by Boissier under var. *microphylla*; however, from its description ('folia minora, elliptico-linearia, saepius integra') it could refer to depauperate specimens of any of the three subspecies of *A. canescens*, or even of *A. deltoidea sens. str.*

A. canescens (Boiss.) Bornm. in Feddes Rep. Beih. 89(1): 44 (1936).

subsp. **canescens**

Syn.: *A. deltoidea* var. *canescens* Boiss., Fl. Or. 1: 252 (1867) pro parte!, excl. planta in Cataonia lecta.

Lycia, Caria, Pisidia.

subsp. **cilicica** (Boiss.) Cullen, **comb. nov.**

Syn.: *A. deltoidea* var. *cilicica* Boiss., Fl. Or. 1: 252 (1867)!

Taurus, Anti-Taurus, scattered elsewhere in Turkey.

subsp. **macrostyla** Huber-Morath & Cullen, **subsp. nov.**

Syn.: *A. deltoidea* var. *canescens* Boiss. pro parte!, quoad planta in Cataonia lecta.

A subsp. *canescenti* fructu 1·5–2 mm lato inflato, stylo 6–10 (non 3·5–6) mm longo differt.

Selected specimens: Prov. Maraş: dist. Göksun, Binboğa Dağ in ravine above Yalak, 1500 m, calc. rocks, 14 vii 1952, *Davis, Dodds & Çetik* (*D*, 19939—holo. E). Prov. Çankiri: Ilgaz Dağ above Karakol, 2000–2150 m, *Bornmüller* 13810. Prov. Kayseri: Gürün to Pinarbaşi, 1650 m, *D.* 21988. Prov. Malatya: Venk, 5 km E. of Malatya, 1330 m, *Hub.-Mor.* 9256. Prov. Adiyaman: Perveri to Sürgü, 1400 m, *Balls* 2269. Prov. Maraş: Ahir Dağ. 2000 m, *Haradjian* 1690.

Widely distributed in Turkey and in the Lebanon.

I am indebted to Dr. A. Huber-Morath of Basel, who independently discovered this new taxon, for joining with me in its publication.

HESPERIS

H. matronalis L. A widespread, polymorphic species, which has frequently been subdivided. In Turkey four subspecies are recognisable. These are:

subsp. **matronalis**

Syn.: *H. matronalis* L., Sp. Pl. 663 (1753).
Distribution in Turkey: Lazistan, Armenia, Amanus.

subsp. **woronowii** (Busch) P. W. Ball in Feddes Rep. 68: 194 (1963).

Syn.: *H. woronowii* Busch in Tr. Bot. Inst. AN. S.S.S.R., ser. 1, 3: 358 (1936).
H. matronalis var. *runcinata* Boiss., Fl. Or. 1: 233 (1867).
Distribution in Turkey: Lazistan.

subsp. **adzharica** (Tzvelev) Cullen, **comb. nov.**

Syn.: *H. adzharica* Tzvelev in Not. Syst. Leningrad 19: 144 (1959)!
Distribution in Turkey: Lazistan (Artvin), Upper Euphrates (nr. Tunceli).

subsp. **cilicica** (Siehe ex Bornm.) Cullen, **comb. nov.**

Syn.: *H. silvestris* Crantz subsp. *cilicica* Siehe ex Bornm. in Feddes Rep. Beih. 89(1): 37 (1936)!
Distribution in Turkey: Taurus (prov. Antalya & Içel).

A monograph of this genus was published in 1866 by M. E. Fournier (Bull. Soc. Bot. Fr. 13: 326–362). This study was not taken into account by Boissier in preparing *Hesperis* for the *Flora Orientalis*, and seems also to have been neglected by later workers. The Director of the Muséum National d'Histoire Naturelle, Paris, kindly sent on loan several of Fournier's plants, and examination of these has made necessary a few name-changes. These are:

H. bottae Fourn., *op. cit.*, 352.

Syn.: *H. ixodes* Hausskn. & Schulz in Not. Bot. Gart. Berl. 10: 556 (1930)!

H. cappadocica Fourn., *op. cit.*, 351.

Syn.: *H. thyrsoidea* Boiss., Fl. Or. 1: 234 (1867)!

H. microcalyx Fourn. (*op. cit.*, 351), is probably the same as *H. schischkinii* Tzvel. (Bot. Mat. 21: 146, 1961), but the specimen on which it is based (*Aucher* 109) is so scrappy and broken that it is impossible to be certain.

J. CULLEN.

ANCHONIUM ELICHRYSIFOLIUM

This species, which has its centre of distribution in Anatolia, has long been known to be variable; various authors (notably Bornmüller, Feddes Rep. Beih. 89 (1): 39 (1936)) have attempted to divide it into infraspecific units. Much good material of the species is now available at Edinburgh and Kew, and we have found it possible to distinguish 6 subspecies whose distribution is shown on map 7.

Map 7. Distribution of *Anchonium elichrysifolium* in Turkey.
a, subsp. *canescens;* c, subsp. *cilicicum;* e, subsp. *elichrysifolium;* g, subsp. *glandulosum;* p, subsp. *persicum;* v, subsp. *villosum.*

subsp. **elichrysifolium**

Syn.: *Sterigma elichrysifolium* DC., Syst. 2: 581 (1821).
A. tournefortii Boiss. in Ann. Sci. Nat. 17: 386 (1842).

Pisidia & Cilician Taurus, Anti-Taurus, Upper Euphrates, Kurdistan, N. Iran, Iraqi Kurdistan. We find it impossible to separate *A. tournefortii* Boiss. from subspecies *elichrysifolium*; Boissier himself in the *Flora Orientalis* treated it as a synonym of *A. elichrysifolium.*

subsp. **persicum** (DC.) Coode & Cullen, **comb. et stat. nov.**

Syn.: *Matthiola persica* DC., Syst. 2: 168 (1821).
A. elichrysifolium var. *persicum* (DC.) Bornm. in Feddes Rep. Beih. 89 (1): 39 (1936).

Kurdistan, N. Iran. We have not seen the type of this high alpine race, but the description given by De Candolle leaves no doubt that it is similar to specimens from S.E. Turkey and N. Iran which are available to us.

subsp. **cilicicum** (Siehe ex Bornm.) Coode & Cullen, **comb. et stat. nov.**

Syn.: *A. elichrysifolium* subvar. *cilicicum* Siehe ex Bornm. in Feddes Rep. Beih. 89(1): 39 (1936)!

Lycian and Cilician Taurus.

subsp. **glandulosum** Coode & Cullen, **subsp. nov.**

A subsp. *elichrysifolio* non canescenti, caulibus foliatis superne ramosis, pilis maxime glandulosis differt.

Prov. Erzincan: foot of Keşiş Dağ above Cimin, 2500 m, *Davis & Hedge* (*D.* 31693—holo E) *ibid.*, 2600 m, *Davis & Hedge* (*D.* 31757). Prov. Hakkari: Cilo Tepe, 3300 m, *Davis & Polunin* (*D.* 24062).

A well marked subspecies, easily recognised by the indumentum of the stems and leaves being composed almost entirely of glandular hairs.

subsp. **canescens** (Hausskn. ex Bornm.) Coode & Cullen, **comb. et stat. nov.**

Syn.: *A. elichrysifolium* subvar. *canescens* Hausskn. ex Bornm. in Feddes Rep. Beih. 89(1): 39 (1936).

Endemic to Çamlibel Dağ in prov. Sivas. Although we have not seen the type specimen of this race, we have seen a plant from the *locus classicus* (*Bornmüller* 1890: 1919) which agrees completely with Bornmüller's diagnosis. This subspecies is easily recognised by the dense, white-pannose indumentum of the leaves, which persists while the leaves are mature (in all the other subspecies a similar indumentum may be present on the young leaves, but is soon deciduous).

subsp. **villosum** Coode & Cullen, **subsp. nov.**

A subsp. *elichrysifolio* siliquis (immaturis) dense villosis, petalis 6–8 mm (non 10–13 mm) longis differt.

Prov. Bitlis: Kambos Dağ above Hurmuz, 2000–2300 m, rocky places, fl. aurea, 31 vii 1954, *Davis & Polunin* (*D.* 23460—holo. E).

Subsp. *villosum* is known only from the type-gathering. Unfortunately mature fruit is not present, but the young fruits have a dense indumentum of very long, white hairs—a remarkable feature in *Anchonium*, as the fruits of all the other taxa known have a rather sparse indumentum, frequently of glandular hairs. The petals of subsp. *villosum* are also smaller than is usual in this species, and it may be that this plant represents a new species, quite separate from *A. elichrysifolium*. However, until more material (preferably with mature fruit) has been collected it seems better to retain it under *A. elichrysifolium*.

Except for subsp. *villosum*, intermediate specimens occur between the subspecies. The following key should, however, provide the means for identifying most specimens:

1. Petals 6–8 mm; siliquae villous . . . . . subsp. *villosum*
+ Petals 10–13 mm; siliquae sparsely pilose to glabrescent . . 2

2. Whole plant densely white-pannose . . . subsp. *canescens*
+ At most the young leaves white-pannose 3

3. Stems unbranched, usually scapose . . subsp. *elichrysifolium*
+ Stems branched above, usually leafy 4

4. Plants completely eglandular . . . . subsp. *persicum*
+ Plants with glandular hairs at least on the stems and pedicels . 5

5. Plants canescent with some glandular hairs . . subsp. *cilicicum*
+ Plants not canescent, most hairs glandular . subsp. *glandulosum*

J. CULLEN & M. J. E. COODE.

ERYSIMUM

E. deflexum Cullen, **sp. nov.** Pl. 20

Ab *E. szowitsiano* Boiss. floribus majoribus, siliquis deflexis torulosis, indumento pilorum trifidorum obsitis differt.

Herba perennis. *Caules* inferne indurati, basibus foliorum obsoletorum obtecti, ascendentes vel erecti, circa 20 cm alti, indumento pilorum bifidorum obsiti. *Folia basalia* longe petiolata, oblanceolata, acuta, subintegra. *Folia superiora* sessilia, angustissime elliptica, integra vel dentata. *Folia omnia* indumento pilorum bifidorum (vel rarius trifidorum) obsita. *Pedicelli* in tempore florendi erecti, demum horizontales vel deflexi, 4–5 mm longi. *Sepala* 7–8 mm longa, interiora saccata. *Petala* flava, longe exserta, lamina in unguem sensim attentuata, 16–20 mm longa. *Siliquae* teretes, aliquid torulosae, valvis 55–80 mm longae, 1–1·5 mm latae, indumento pilorum trifidorum obsitae. *Stylus* 3–6 mm longus. *Stigma* capitatum.

Prov. Trabzon: Miriamana Monastery, 1400 m, growing on walls and cliffs surrounding the old monastery, 11 vi 1933, *E. K. Balls* 373 (holo. E—as *E. perofskianum* Fisch. & Mey.).

E. deflexum is a very distinct species, clearly separated from its nearest ally, the Transcaucasian *E. szowitsianum* Boiss., by characters of the flowers and fruits. It may be the same as *E. pseudocheiri* Boiss. (Fl. Or. 1: 201, 1867), described on the basis of an incomplete specimen collected by Calvert on Tech Dağ near Erzurum. I have seen this specimen (kindly sent on loan by the Director of the Boissier Herbarium, Geneva), which consists only of the upper part of a plant with flowers and young fruit. The flowers and young fruits of this specimen match *E. deflexum* well, but nothing is known of the leaves or mature fruits of Calvert's plant, and its exact identification therefore remains in doubt.

E. hakkiaricum Cullen, **sp. nov.**

Ab *E. nano* Boiss. & Hoh. habitu dense caespitoso, floribus minoribus differt.

Herba perennis, pumila, dense caespitosa. *Caules* ascendentes vel erecti, 2–4 cm alti in tempore florendi, demum longiores. *Folia* omnia basalia (vel rarius 1–2 caulina parva) rosulantia, oblanceolata vel spathulata, obtusa, incana, indumento pilorum bifidorum obsita. *Inflorescentia* condensata, demum elongata. *Sepala* 3–4·5 mm longa. *Petala* pallide lutea, obovato-spathulata, 7–8·5 mm longa, 2–3 mm lata, lamina in unguem abrupte attenuata. *Siliquae* erectae vel patentes, 8–15 mm longae, circa 1 mm latae, incanae, indumento pilorum bifidorum obsitae. *Stylus* 2–4 mm longus. *Stigma* capitatum.

TURKEY: Prov. Hakkari: Cilo Dağ, 10 km W. of Cilo Tepe, 3300 m, rocky slopes near snow, often with *Draba* 24133 (*D. thylacocarpa*), fl. 'lutea', 16 viii 1954, *Davis & Polunin* (*D.* 24160—holo. E); Kara Dağ, 3500 m, fl. 'lutea', 16 viii 1954, *Davis & Polunin* (*D.* 24418).

IRAQ: Distr. Erbil (Kurdistan) Montes Qandil ad confines Persiae, ca. 36° 30′ N. 45° E., in saxosis calc. summorum montium ca. 3500–3700 m, 28 vii—1 viii 1957, *K. H. Rechinger* 11164 (as *E. alpestre* Kotschy ex Boiss.); Montes Helgurd ad confines Persiae, ca. 36° 40′ N. 44° 50′ E., in declivibus

occidentalibus summi montis, ca. 3000–3800 m, substr. schist. metamorph. et serpentin. 10–14 viii 1957, *K. H. Rechinger* 11447 (as *E. alpestre* Kotschy ex Boiss.).

A high alpine species very similar to the Persian *E. nanum* Boiss. & Hoh., but differing in its much more densely tufted habit, and smaller, paler flowers. From *E. alpestre* Kotschy ex Boiss., to which Rechinger referred the two gatherings from Iraq cited above, it differs in its smaller flowers and siliquae with an indumentum of bifid (not stellate) hairs.

Map 8. Distribution of *Erysimum thyrsoideum*.
○, subsp. *thyrsoideum*; ●, subsp. *ponticum*.

E. thyrsoideum Boiss. in Ann. Sci. Nat. 17: 79 (1842).
subsp. **ponticum** (Hausskn. & Bornm.) Cullen, **comb. nov.**

Syn.: *E. ponticum* Hausskn. & Bornm. in Mitt. Thür. Bot. Ver. 20: 1 (1904–5)!

The differences between *E. ponticum* and *E. thyrsoideum* given by Haussknecht and Bornmüller (indumentum, leaf shape, stigma shape) are all very slight, and break down to some extent when copious material is examined. Subsp. *ponticum* replaces subsp. *thyrsoideum* in North Anatolia (cf. map 8).

J. CULLEN.

CAMELINA

C. hispida Boiss. var. **grandflora** (Boiss.) Hedge, **comb. et stat. nov.**

Syn.: *C. grandiflora* Boiss. in Diagn. ser. 1(5): 82 (1844)!
C. subappressa Hausskn. & Bornm. in Mitt. Thur. Bot. Ver. n.s. 20: 7 (1905)!

PLATE 19. Holotype of *Barbarea lutea* Cullen & Coode.

facing p. 196

PLATE 20. Holotype of *Erysimum deflexum* Cullen.

Endemic to Turkey. Distinguished from var. *hispida* by having adpressed fruiting pedicels and from var. *lasiocarpa* (Boiss. & Bl.) Post by the glabrous fruit valves. *C. hispida* is a very variable species in which it may be possible, with further gatherings, to recognise other subspecific, or even specific, taxa. The relationship of *C. hispida* with the Transjordan species, *C. persistens* Rech. fil. (Arkiv för Bot. 1: 304, 1950), requires further investigation.

I. C. HEDGE.

CAPPARACEAE

CLEOME ORNITHOPODIOIDES

Treatment of this complex differs widely from author to author (e.g. Boissier, Fl. Or. 1: 411 (1867); Grossheim, Fl. Kavk. 4: 252 (1950); Tsvelev in Not. Syst. Leningrad 22: 122–134 (1963)). We find in the Turkish material only one very variable species.

The characters which vary are:

fruit indumentum (present or absent); gynophore length (in fruit); petals entire or denticulate, cuneate or spathulate; sepals ovate or lanceolate; seed number; habit (short and robust or taller, lax); ratio of pedicel length to fruit + gynophore length; length of fruit beak; indumentum, especially of pedicels and rachis.

Variation in these characters is not well correlated, nor is it usually geographically significant. The specimens can be divided up in many different ways, producing a number of one- or two-character variants. If one variant is formally recognised, many others would equally have to be recognised—we do not consider this useful.

In two areas of Turkey the specimens form rather more distinct groups in terms of a larger number of characters:—

i) Specimens from the arc of mountains North of Mesopotamia:

Malatya: Darende to Kavak Aghatch (Agaç), *Post* 1906: 5. Elaziğ: Malatya to Harput, *Post* 1906: 764. Elaziğ: Maden to Hazar Gölü, *D.* 22055. Malatya: Malatya to Elaziğ, *D.* 24807. Diyarbakir: Diyarbakir to Bitlis, *McNeill* 514.

These specimens have consistently glabrous, ± sessile fruits (this combination being peculiar to them among the Turkish material), usually ovate sepals and entire petals.

ii) Specimens from the Istanbul area:

Istanbul: Beşiktaş, 24 vii 1902; Bebek, 16 ix 1894; Ihlamour (Flamour), 10 vii 1893; Ortaköy, 7 viii 1889; Üsküdar, 27 vii 1893—all collected by *Aznavour*.

These specimens are all low, have comparatively long pedicels, petals usually a little denticulate, fruits hairy and sepals lanceolate. Most European plants seem to agree with these.

The rest of the Turkish specimens show many different combinations of these characters, with apparently random distributions. This is also true of the specimens we have seen from Iran and the Caucasus. The best that can be said of these remaining specimens is that plants with long (over 4 mm) gynophores are usually lax, and tend to occur in the East.

Faced with this situation, we do not feel able to recognise any formal taxa within the complex. However, on Cyprus, *fide* Meikle *in litt.*, two

reasonably distinct variants occur, both of which can be matched by individual specimens in the Turkish material. The same may be true in the Caucasus.

Further intensive study may reveal that the two groups mentioned above are worthy of recognition. For the present, we are content to offer these as a guide to future workers.

J. CULLEN & M. J. E. COODE.

CISTACEAE

THE HELIANTHEMUM NUMMULARIUM/CHAMAECISTUS COMPLEX

The complex of taxa known collectively as either *H. chamaecistus* or *H. nummularium* is notorious for its taxonomic difficulty. Most of the work on the complex has been done by botanists dealing with the European Flora; the Orient material has been treated only by Boissier (Fl. Or. 1: 446 (1867) under *H. vulgaris* Gaertner) and Grosser (Cistaceae, Pflanzenr. 14 (IV. 193): 81 1903). Both these accounts seem to us unsatisfactory.

In preparing the account for the Flora of Turkey, we have tried to correlate the Turkish groups we recognise with taxa described from surrounding regions. This has necessitated the comparison of many accounts in Floras and revisions, the most important of which have been: Grosser (cited above); Janchen, Die Cistaceen Österreich-Ungarns in Mitt. Nat. Ver. Univ. Wien 7: 41–75 (1909); Schinz & Thellung in Hegi, Ill. Fl. Mittel-Eur. 5 (1): 565–571 (1925); Hayek, Prodr. Fl. Balc. 1: 493–495 (1925); Juzepczuk in Fl. URSS 15: 334–335 (1949). The comparison of these accounts reveals the most amazing confusion and inconsistency, which we have tried to clear up—at least as regards the Turkish material. The discussion may be conveniently divided under 2 headings: taxonomy and nomenclature.

Taxonomy. Most of the authors cited above are agreed that the group in question should be divided into 5 major units, with a variable (and often large, cf. Janchen, Grosser) number of smaller subdivisions. Most authors define these major groups in much the same way, using characters of leaf size and indumentum, sepal size and indumentum, and petal size. There is, however, little agreement between the various authors as to the rank to be assigned to the units. Thus Grosser recognises one species with 2 varieties, and many subsidiary taxa. Janchen recognises 5 species with numerous varieties and subsidiary taxa (no subspecies). Schinz & Thellung recognise 1 species with 5 subspecies; Hayek 3 species, 2 of them divided into 2 subspecies. Juzepczuk recognises 4 species in his area.

After careful consideration of all the European and Orient material at Edinburgh, we have come to the conclusion that the treatment given by Schinz & Thellung is by far the most satisfactory—i.e. that the complex should be treated as consisting of 1 species divided into a number of subspecies. Of the 5 subspecies Schinz & Thellung recognise, 3 have been found to occur in Turkey: we have also discovered a hitherto unnamed member of the complex in Central Turkey, and describe it as a new subspecies below.

Nomenclature. The first problem is that of the oldest name for the aggregate (or, as we intend to treat it, species). Most authors seem to favour *H.*

chamaecistus Miller. Janchen, for instance, in his 1909 paper, refers to "die Sammelart *Helianthemum chamaecistus* Miller, d.i. der Arten *nummularium, tomentosum, hirsutum, grandiflorum* und *nitidum*"—thus calling the aggregate species *chamaecistus*, but the segregate species by different names. Grosser also refers to *H. chamaecistus* as the name for the whole group. This usage, by the two authors most influential in *Helianthemum* taxonomy, has been taken up in many other Floras and lists. However, Schinz & Thellung use the name *H. nummularium* (L.) Miller for the whole group, and Hayek also uses this name for part of it (he does not give a name to the group as a whole). The name *nummularium* (Linnaeus, 1753) is certainly older than *chamaecistus* (Miller, 1768) and we have not found any author who maintains, in the same account of the genus, *nummularium* and *chamaecistus* as separate species (Schinz & Thellung explicitly treat *chamaecistus* as a synonym of *nummularium*). We therefore propose to adopt the usage given by Schinz & Thellung (in Hegi) and use the name *H. nummularium* for the broad species.

The nomenclature of the constituent units is also confused, because there are so many names available in the literature. Tracing the earliest combinations at subspecific level has also been very difficult, and we therefore do not consider the nomenclature used below as final.

H. nummularium (L.) Miller, Gard. Dict. ed. 8, No. 12 (1768).

Syn.: *Cistus nummularius* L., Sp. Pl. 527 (1753).
Cistus helianthemum L., Sp. Pl. 528 (1753); *H. chamaecistus* auct. mult. non (?) Miller, Gard. Dict. ed. 8, (1768).

In Turkey we recognise 4 subspecies, which may be distinguished as follows:

1. Leaves green on both surfaces . . . . subsp. *ovatum*
\+ Leaves white-tomentose, at least beneath 2
2. Stems and upper leaf surfaces white-tomentose . subsp. *lycaonicum*
\+ Stems and upper leaf surfaces green 3
3. Petals 8–13 mm; leaves (3–)5–8 mm broad . subsp. *tomentosum*
\+ Petals 6–9(–10) mm; leaves 3–5(–7) mm broad subsp. *nummularium*

subsp. **nummularium**

Syn.: *H. vulgare* Gars., Les Fig. des Pl. Anim. d'Usage en Médecin, 3: t. 297 (1764).
H. vulgare var. *discolor* Reichb., Fl. Germ. Exc., 714 (1832).
H. nummularium subsp. *vulgare* (Gars.) Hayek, Prodr. Fl. Balc. 1: 493 (1925).
H. chamaecistus subsp. *nummularium* (L.) Gross., Pflanzenr. 14 (IV 193): 84 (1903) p.p.

Distribution in Turkey: Bithynia, Paphlagonia, Cappadocia, Cilicia, Amanus; E. Aegean Islands.

subsp. **tomentosum** (Scop.) Schinz & Thellung in Hegi, Ill. Fl. Mittel-Eur. 5(1): 567 (1925).

Syn.: *Cistus tomentosus* Scop., Fl. Carn. ed. 2, 1: 376 (1772).
H. tomentosum (Scop.) Spreng., Syst. Veg. 2: 592 (1825).
H. vulgare var. *grandiflorum* sensu Boiss., Fl. Or. 1: 446 (1867).

Distribution in Turkey: Lazistan, Paphlagonia, Amanus and adjacent Cilicia. Probably frequently misidentified as subsp. *grandiflorum* (Scop.) Schinz & Thellung, which has very much larger flowers (petals 10–18 mm long) and lacks dense stellate hairs on the leaves.

subsp. **ovatum** (Viv.) Schinz & Thellung in Hegi, Ill. Fl. Mittel-Eur. 5(1): 568 (1925).

Syn.: *Cistus ovatus* Viv. Ann. Bot. 1(2): 174 (1804).

Cistus hirsutus Thuill., Fl. Env. Paris 266 (1799).

H. hirsutum (Thuill.) Merat, Nouv. Fl. des Env. Paris, ed. 1, 204 (1812).

H. chamaecistus subsp. *barbatum* var. *hirsutum* (Thuill.) Grosser, Pflanzenr. 14 (IV 193): (1903).

H. ovatum subsp. *hirsutum* (Thuill.) Hayek, Prodr. Fl. Balc. 1: 494 (1925).

H. ovatum subsp. *grandiflorum* sensu Bornm. in Feddes Rep. Beih. 89(1): 86 (1936).

H. vulgare var. *virescens* Boiss., Fl. Or. 1: 446 (1867) ?

Distribution in Turkey: Bithynia (?), Paphlagonia. The records given by Boissier (Fl. Or. 1: 446, 1867) for *H. vulgare* var. *virescens* Boiss. almost certainly belong here (*e descr.*) but we have not seen any of the specimens.

subsp. **lycaonicum** Coode & Cullen, **subsp. nov.**

A subspeciebus alteris habitu saepe erecto, caulibus foliisque dense et breviter canis pilis stellatis obsitis differt; foliis oblongis vel anguste oblongis vel rarius ellipticis, petalis 8–10 mm longis.

Type: Prov. Konya, Steppe bei Korasch (Koraş), 1660 m, Ende Juni 1912, Lycaonia, *Siehe* 456 (holo. E, as *H. kotschyanum* Boiss.).

Scattered in Central Anatolia. Prov. Çankiri: Çankiri, 800 m, *D.* 21527. Prov. Kütahya: Emet, 1100 m, *D.* 36551. Prov. Eskişehir: Sivrihisar to Eskişehir, 1100 m, *Dudley*, *D.* 36042A. Prov. Ankara: Ankara, *Bornmüller* 3207. Prov. Malatya: Gürün to Darende, 1500 m, *D.* 21858 p.p.!

This taxon has frequently been misidentified as *H. kotschyanum* Boiss. The distinctions between *H. nummularium* sensu lato and *H. kotschyanum* Boiss., Diagn. sér. 2(1): 53 (1853) appear to have been frequently confused. *H. kotschyanum* was described on the basis of a specimen collected by Kotschy in Mesopotamia, between Aleppo and Urfa. We have seen an isotype at Kew, and other good material from Mesopotamia which matches it perfectly. Various authors, however, e.g. Grosser (*op. cit.*: 87–88) and Bornmüller (Feddes Rep. Beih. 89(1): 86, 1936), have recorded the species from other areas of Turkey—notably from near Ankara and in Paphlagonia. On the basis of the specimens we have seen, these records must be referred to *H. nummularium* sensu lato. We regard *H. kotschyanum* as a similar though distinct species, endemic to Mesopotamia and adjacent areas, distinguished by its upright, virgate habit, and sepals without any stellate hairs. The character of long setae on the sepals, considered by Bornmüller as diagnostic, also occurs in *H. nummularium*.

M. J. E. Coode & J. Cullen.

H. antitauricum Davis & Coode, **sp. nov.**

Affinis *H. strickeri* Grosser sed flores in racemos dispositi, longitudine foliorum quam latitudine (2·4–) 2·7–3·4-plo longiore differt; a *H. germanicopolitano* Bornm. caulibus procumbentibus, internodiis foliis plerumque brevioribus, stipulis inferioribus persistentibus confertis brevissimis, inflorescentia pauciflora, pedicellis plerumque articulatis, sepalis interioribus majoribus saepe asymmetricis recedit.

Fruticulus humilis, multicaulis, inferne valde lignosus, caulibus tortuosis procumbentibus ramosis, internodiis infimis brevissimis stipulis 0·5–2 mm longis persistentibus, primum breviter et adpresse cano-stellato-pilosis. *Folia* oblongo-elliptica, 7–12 mm longa, 3–5 mm lata, breviter petiolata, stipulis lineari-lanceolatis 3–5 mm longis petiolo duplo longioribus basi persistentibus, internodiis plerumque longiora, obtusa vel acutiuscula margine subrevoluta, utrinque indumento brevissime cano-stellato provisa, subtus densius vestita, ea axillaria valde revoluta eis caulis duplo breviora. *Inflorescentia* subsimplex, terminalis, 1–3-laxiflora, 1–3 cm longa, interdum paniculata usque ad 9-flora, pedicello calyce duplo longiore articulato, vel interdum subaequilongo haud articulato, pilis simplicibus longis pilis stellatis intermixtis. *Sepala* externa linearia internis dimidio breviora, interna sub anthesi 7 mm longa, 4–5 mm lata, plerumque symmetrice 4–5 nervosa interdum asymmetrice parte una dilatiore subreticulato-nervosa, nervis vix prominentibus, utrinque brevissime stellato-pilosa ad nervos et marginem pilis simplicibus longis mollibus intermixtis, in fructu late elliptica obtusa vel acutiuscula, 8–12 mm longa, 6–8 mm lata. *Petala* flava sepalis circa duplo longiora. *Capsulae* 5–7 mm longae, 4–5 mm latae, fulvescentes, dense et breviter stellato-pubescentes, ad angulos breviter piloso-tomentosae. *Semina* parva, fulva, pruinosa.

Prov. Adana (Seyhàn): distr. Saimbeyli, Bozoğlan Dağ above Obruk Yayla, 2000–2100 m, 7 vii 1952, *Davis* 19719 (holo. E). Prov. Kayseri: Bakir Dağ near Akoluk yayla, above Kisge, 1800–1900 m, *D.* 19378.

The species described above is a member of Sect. *Helianthemum* (Sect. *Euhelianthemum* Dunal). It closely resembles *H. strickeri* Grosser (placed by Grosser in his Sect. *Pseudomacularia* with *H. soongoricum* Schrenk, on account of the apparently solitary, axillary flowers); both *H. antitauricum* and *H. strickeri* have only been found in the S. of Turkey, from the Anti-Taurus and Cilician Taurus respectively. *H. antitauricum* also is similar to *H. germanicopolitanum* Bornm., described from near Çankiri in Paphlagonia; this was referred by Bornmüller to Sect. *Polystachyum* Willk., centred in the W. Mediterranean, on account of its corymbose inflorescence. Be that as it may, there can be little doubt that *H. antitauricum* is best placed in Sect. *Helianthemum*.

P. H. Davis & M. J. E. Coode.

Tuberaria guttata (L.) Fourr. var. **clandestina** (Vierh.) Davis & Coode, **stat. et comb. nov.**

Syn.: *T. guttata* forma *clandestina* Vierhapper in Öst. Bot. Zeitschr. 64: 468 (1914).

P. H. Davis & M. J. E. Coode.

Note.—All specimens cited have been examined.