

MATERIALS FOR A FLORA OF TURKEY, XIV: CARYOPHYLLACEAE

A. HUBER-MORATH, J. MCNEILL & H. REEVE

In the following account, Huber-Morath (Basel) is responsible for *Gypsophila* & *Bolanthus*, McNeill (Hartley Botanical Laboratories, University of Liverpool) for *Arenaria* & *Minuartia*, and Reeve (Department of Pacific Studies, National University of Australia, Canberra) for *Dianthus*. All specimens cited have been examined.

ARENARIA & MINUARTIA

Since the publication of a revision of the species of *Arenaria* and *Minuartia* in the *Flora Orientalis* area (McNeill, 1963)*, the author has had the opportunity to examine the herbaria of A. Huber-Morath and of B. V. D. Post and G. V. Aznavour, as well as the extensive recent collections of P. H. Davis, M. J. E. Coode, B. M. G. Jones, and F. Sorger. This paper presents those taxonomic changes, resulting from the examination of this additional material, which will be incorporated in the accounts of *Arenaria* and *Minuartia* to be published in Volume 2 of the *Flora of Turkey*.

Arenaria kotschyana Fenzl subsp. **stenophylla** (Bornm.) McNeill, **comb. et stat. nov.**

Syn.: *A. tmolea* Boiss. forma *stenophylla* Bornm. in Feddes Rep. Beih. 89: 254 (1940).

A. tmolea Boiss. var. *stenophylla* (Bornm.) McNeill in Notes R.B.G. Edinb. 24: 259 (1963).

This infra-specific taxon is endemic to Amasya in Northern Anatolia and is geographically isolated from other races of *A. tmolea* and *A. kotschyana*. The narrow leaves, the sparsely glandular pubescence, and the shorter ovate-elliptical clawed petals suggest that it is better associated with *A. kotschyana* (Cilician Taurus to Upper Euphrates) than with the SW Anatolian endemic, *A. tmolea*.

A. pamphylica Boiss. et Heldr. subsp. **alpestris** (McNeill) McNeill, **stat. nov.**

Syn.: *A. pamphylica* var. *alpestris* McNeill in Notes R.G.B. Edinb. 24: 280 (1963).

In the revision of the Orient species of *Arenaria* (McNeill, 1963), five varieties of *A. pamphylica* were recognised and these were divided between two subspecies distinguished largely on the basis of petal size. The additional material now available suggests that this division into two subspecies is rather artificial, and that three fairly distinct infra-specific groups can in fact be recognised: one (subsp. *kyrenica* McNeill) in N Cyprus and the Levant Coast, one (subsp. *pamphylica*) on the Coastal plain (sea level to 215 (-800 m) of S Anatolia from Lycia to Isauria, and one (subsp. *alpestris* (McNeill) McNeill on the southern slopes of the Taurus mountains (Pisidia to Cilicia)

* McNeill, J. (1963) Taxonomic studies in the Alsinoideae. II. A revision of the Orient. *Notes R. B. G. Edinb.* 24: 241-404.

between 500 and 2000 m. The distinction in flower size previously maintained between var. *pamphylica* and var. *maritima* McNeill (within subsp. *pamphylica*) is probably untenable, as the type of *A. pamphylica* seems to be merely a collection of extremely early flowering (and therefore small-flowered?) plants. On the other hand, the recognition within subsp. *pamphylica* of var. *turcica* (previously included in subsp. *kyrenica*) with short petals, seems justified; this parallels the recognition of vars. *rhodia* and *macropetala* in the closely related *A. rhodia* subsp. *rhodia* from the coastal plain of Caria and Lycia to the west of the range of *A. pamphylica*.

The following table and key will clarify the position and circumscription of the infra-specific taxa of *A. pamphylica*.

Present treatment	McNeill (1963)
subsp. <i>pamphylica</i> var. <i>pamphylica</i>	subsp. <i>pamphylica</i> var. <i>pamphylica</i> subsp. <i>pamphylica</i> var. <i>maritima</i>
subsp. <i>pamphylica</i> var. <i>turcica</i>	subsp. <i>kyrenica</i> var. <i>turcica</i>
subsp. <i>alpestris</i>	subsp. <i>pamphylica</i> var. <i>alpestris</i>
subsp. <i>kyrenica</i>	subsp. <i>kyrenica</i> var. <i>kyrenica</i>

- | | | |
|----|---|---|
| 1. | Sepals 3-5 mm, linear-lanceolate, acuminate, the outer 4-5 × as long as broad | 2. |
| — | Sepals 2.5-3.5 mm, lanceolate, acute, the outer 3-4 × as long as broad | 3. |
| 2. | Sepals 4-5 mm; petals oblanceolate, much longer than sepals | subsp. <i>alpestris</i> |
| — | Sepals 3-4 mm; petals oblong, scarcely longer than sepals | subsp. <i>kyrenica</i> |
| 3. | Petals oblanceolate, much longer than sepals | subsp. <i>pamphylica</i> var. <i>pamphylica</i> |
| — | Petals oblong, scarcely longer than sepals | subsp. <i>pamphylica</i> var. <i>turcica</i> |

A. ledebouriana Fenzl var. **armeniaca** McNeill, var. nov.

Syn.: *A. ledebouriana* var. *parviflora* sensu McNeill in Notes R.B.G. Edinb. 24: 305 (1963), pro parte.

Planta caespitosa, glabra. *Caules* erecti, e caudiculi emergentes, inferiora folia bina 3-5 fasciculos axillares subtendentia superius folia bina 2-3 axillis nudis gerentes, in inflorescentia exeuntes. *Folia* 1-2 cm. *Inflorescentia* laxa, 10- vel 50-flora; bractae superiores 1.5-2 mm, ovato-lanceolatae; pedicelli 3-10 mm. *Sepala* 2.5-3.5 mm, carinata, membranaceo- vel scarioso-marginata; extimum ovato-lanceolatum, longe acutum, nervo herbaceo mediano latitudine sepali tertius angustiore. *Petala* 4-6 × 1-1.5 mm, anguste oblonga vel anguste oblanceolata.

TURKEY: Prov. Muş, Muş-Solhan, Passhöhe östlich ob Solhan, Quercetum, 1800 m, 14 Juli 1951, *A. Huber-Morath* 11088 (holo. Hb. Hub.-Mor.). Prov. Muş: S. foot of Bingöl Da., Goşkar near Varto (Gümgüm), 1830 m, *Kotschy* 377.

The extremely narrow petals readily distinguish this variety from all other taxa referable to Section *Sclerophyllae*. The narrow herbaceous keel of the sepals also serves to separate it from other varieties of *A. ledebouriana*. In sepal shape and in the laxity of the inflorescence it resembles var. *parviflora*, while in the tufted habit, the rather long narrow bracts and the narrow sepal keel it shows an approach towards *A. acutisepala* Hausskn. ex Williams, from which it can readily be distinguished by the shorter, broader sepals as well as by the narrow petals.

Minuartia mesogitana (Boiss.) Hand.-Mazz. in Ann. Nat. Hofm. Wien 27: 148 (1912).

subsp. **lydia**.

subsp. **kotschyana** (Boiss.) McNeill, **comb. nov.**

Syn.: *Alsine lydia* var. *kotschyana* Boiss., Diagn. ser. 2 (1): 86 (1853).

Alsine tenuifolia subsp. *kotschyana* (Boiss.) Holmboe, Veg.

Cyprus 70 (1914) (quoad basionom., nec quoad descr., nec quoad spec. cit.).

M. mesogitana subsp. *lydia* (Boiss.) McNeill var. *kotschyana* (Boiss.) McNeill in Notes R.G.B. Edinb. 24: 388 (1963).

subsp. **turcomanica** (Schischk.) McNeill, **comb. et stat. nov.**

Syn.: *M. turcomanica* Schischk. in Acta Inst. Bot. Acad. Sci. URSS ser. 1, 3: 168 (1937).

M. mesogitana subsp. *lydia* var. *turcomanica* (Schischk.) McNeill in Notes R.B.G. Edinb. 24: 388 (1963).

M. mesogitana subsp. *lydia* was previously regarded as containing three varieties (*lydia*, *kotschyana* and *turcomanica*). These now seem to be better recognised as distinct subspecies, each of which has a distinct geographical range. Subsp. *lydia* in this new restricted sense is confined to a small area in Lydia and Caria, subsp. *kotschyana* extends from Greece (and possibly Bulgaria, and Ukraine) through SW and C Anatolia, while subsp. *turcomanica* is widespread from the Syrian Desert eastwards through N Iraq and W Iran to Turkestan and Afghanistan. It has not been recorded from Turkey, but it may occur in the extremities of SE Anatolia.

DIANTHUS

Dianthus strictus Banks & Sol. (1794).

var. **strictus**

var. **subenervis** (Boiss.) Reeve, **comb. nov.**

Syn.: *D. multipunctatus* Ser. var. *subenervis* Boiss., Fl. Or. 1: 483 (1867).

var. **gracilior** (Boiss.) Reeve, **comb. nov.**

Syn.: *D. multipunctatus* Ser. var. *gracilior* Boiss., Fl. Or. 1: 483 (1867).
var. *axilliflorus* (Fenzl) Reeve, **comb. nov.**

Syn.: *D. axilliflorus* Fenzl, Pug. 10 (1842).

D. multipunctatus Ser. var. *axilliflorus* (Fenzl) Boiss. Fl. Or. 1: 483 (1867).

D. strictus var. *gracilior* can be distinguished from var. *strictus* and var. *subenervis* by its slender habit and small cuneate petals. *D. strictus* var. *subenervis* is separated from var. *strictus* and var. *gracilior* by its enervate calyx tube. The taxa intergrade with one another in habit, petal shape, and calyx texture, and there appears to be no marked geographical separation between them. Varietal rank has therefore been adopted.

D. strictus var. *axilliflorus* is easily distinguished from the others by its sessile flowers with 8–12 bracteoles. Some observations on herbarium material suggest that this growth pattern may occur after the main shoot of a plant has been damaged. There is also some evidence to suggest that all of the other three varieties may sometimes grow in this way! However, as experimental evidence is lacking the variety has been retained.

***D. leucophaeus* Sibth. & Sm. var. *patens* Reeve, var. nov.**

A var. *leucophaeus* apicibus bracteolarum viridibus subulatis patentibus, petalis distincte dentatis laete roseis recedit.

TURKEY: Prov. Niğde, Ala Dağ, 2500 m, scree, Wood & Gibson UT 221 (holo. E).

***D. elegans* d'Urv. (1822).**

var. *elegans*.

var. *actinopetalus* (Fenzl) Reeve, **comb. nov.**

Syn.: *D. actinopetalus* Fenzl, Pug. 11 (1842).

var. *cous* (Boiss.) Reeve, **comb. nov.**

Syn.: *D. cous* (Boiss., Diagn. ser. I (1): 20 (1843).

D. elegans d'Urv. is very variable. In the past, two or three species have been recognised, as can be seen in the above synonymy. In the broader concept adopted here, *D. elegans* provides an earlier name than the more familiar *D. actinopetalus* used by Boissier.

D. elegans var. *elegans* is a short erect plant with stiffish, dark green leaves. It has a long calyx and long calyx-teeth; and of the 4–6 bracteoles the outer are longer than the inner ones and have long, green, aristate points. *D. elegans* var. *cous* is a tall flexuous glaucous plant. It has a short calyx with short teeth, and up to 20 bracteoles which become smaller outwards. However only a few of the specimens seen fit either of these two extremes, and there are many intermediates including the type specimen of *D. actinopetalus* Fenzl.

Since both the extremes and the intermediates are partially sympatric and all grow close to one another, in the province of Antalya, they have been separated only as varieties. The retention of var. *actinopetalus* seems useful as so many specimens can be confidently assigned to it.

D. brevicaulis Fenzl subsp. **setaceus** Reeve, subsp. nov.

A subsp. *brevicaule* bracteolis ovatis membranaceis pallidis in aristam setaceam sensim attenuatis differt.

Turkey: Prov. Antalya, Elmali, 2500 m, scree, *Khan et al.* 280 (holo. E). Prov. Kütahya, Şaphane Da., 1900–2100 m, *Davis* 18454.

D. zonatus Fenzl (1852).

var. **zonatus**

var. **aristatus** (Boiss.) Reeve, **comb. nov.**

Syn.: *D. aristatus* Boiss. in Tchihat., Asie Min. Bot. 1: 222 (1860).

var. **hypochlorus** (Boiss. & Heldr.) Reeve, **comb. nov.**

Syn.: *D. hypochlorus* Boiss. & Heldr. in Boiss., Diagn. ser. 1 (8): 67 (1849).

Var. *aristatus* is distinguished by the presence of aristate bracteoles which are more than half the calyx length, and var. *hypochlorus* by its small flowers. But the three varieties intergrade and show no geographical separation.

GYPSOPHILA & BOLANTHUS

Gypsophila leucochlaena Hub.-Mor., spec. nov. (Sect. *Capituliformes* F. N. Williams).

Planta perennis glaucescens glaberrima, 60–80 cm alta. Caules erecti rigidi teretes, ad nodos incrassati, prope basin 5–8 mm crassi, laxe foliati, a medio dichotome ramosi. Folia linearia glauca, supra convexa, subtus planiuscula, in sectione transversale $\pm$ subtriquetra, acuta sed non pungentia, 30–100 $\times$ 1–2 mm; folia radicalia et rosulae steriles dense congestae, folia caulina inferiora similia, opposita, superiora reducta. Internodiis 3–7 cm longis. Inflorescentia oblonga multiramosa. Pedunculi 5–30 mm longi. Flores numerosi, subsessiles, in capitulum hemisphaericum 7–12 mm latum dense congesti. Bracteae albo-membranaceae obovatae obtusae vel indistincte apiculatae. Calyx campanulato-turbinatus, 2–2.5 mm longus, ad $\frac{1}{3}$ divisus, indistincte tuberculatus, phyllis albis obtusis emarginatis obcordatis late hyalino-marginatis. Petala alba obtusa oblongo-cuneata, 3–4 mm longa. Capsula ignota.

TURKEY: Prov. Malatya, Darende to Kavak Aghatch (Akçadag), 14. vii. 1906, *B.V.D. Post* 39 (holo. G); Kalkmergel-Hügel 1 km E ob Darende, 1000–1050 m, *Huber-Morath* 12649.

A very distinct species, next to the Caucasian *G. capitata* Bieb.; without near allies in Anatolia, remarkable for its large emarginate white calyx teeth.

G. paniculata L. var. **araratica** Hub.-Mor., var. nov.

A var. *paniculata* differt foliis angustioribus, longius acuminatis, 10–50 $\times$ 1–5 mm longis latis, inferioribus pilis longis glanduliferis dense tectis, superioribus glabris.

TURKEY: Prov. Kars, Sardar Bulak, Mt. Ararat, 10 viii 1910, *B.V.D. Post* 2068 (holo. G); Ağrı Dağ, NE foot, 1550 m, *Demiriz* 3338.

Only this variety of the species occurs in Anatolia (on Mt. Ararat near the Russian frontier); var. *paniculata* is widely distributed in E and C Europe, Caucasus, W Siberia and Central Asia; var. *adenopoda* Borbas (with the lower parts of the stem and the lower leaves pubescent, the floral region glandular) has been described from Hungary.

G. sphaerocephala Fenzl ex Tchihat. var. *syriaca* (Schischk.) Hub.-Mor., **comb. et stat. nov.**

Syn.: *G. syriaca* Schischk. in *Candollea* 3: 476 (1928).

G. sphaerocephala is a polymorphic species. In Turkey three intergrading varieties occur: var. *sphaerocephala*—robust plants with a scattered distribution in the southern mountain range from W Anatolia to N Iraq; var. *cappadocica* Boiss.—differing from var. *sphaerocephala* in having glandular-hairy calyx and bracts and larger leaves, distributed mainly in the steppes of E Anatolia; var. *syriaca* (Schischk.) Hub.-Mor.—low, with smaller, few-flowered heads, endemic to the Amanus.

G. tuberculosa Hub.-Mor., **spec. nov.** (Sect. *Rokejeka* (Forsk.) A. Braun).

Syn.: *G. virgata* sensu Barkoudah in *Wentia* 9: 116 (1962) quoad plantam anatolicam, non Boiss.

Planta e basi suffrutescens multicaulis, 20–40 cm alta. Caudex ramosus gracilis, in rosulas steriles et caules floriferos numerosos abiens. Caules floriferi adscenderet-erecti, a medio ramosi, graciles teretes, supra nodos glanduloso-pilosi, ramulis erecto-patulis brevibus. Folia radicalia et rosulae steriles ± dense congestae, coriaceae glaucae glabrae, ad margines papillosae, nervis salientibus percursae, anguste lanceolatae vel oblanceolatae, sessiles, acutae subpungentiae, 5–15 mm longae, 0.5–3 mm latae; folia caulina pauca, similia sed media et superiora valde reducta, opposita, basi breviter membranaceo-connata. Inflorescentia oblonga, 5–20 cm longa, laxa, dichotome divaricatim cymosa, cymulae ± congestae, 3–10 florum. Bractee albo-membranaceae, lanceolatae acutae glabrae, crystallis albis prominentibus insertae. Pedicelli capillares, 1–4 mm longi glabri. Calyx campanulatus albus viridivittatus glaberrimus, crystallis prominentibus dense instructus, 2–2.5 mm longus, phyllis 1 mm longis, ovato-oblongis, acutis vel acuminatis. Petala alba, 3 mm longa, oblongo-linearia, apice obtusa vel obtusiuscula. Capsula ignota.

TURKEY: Prov. Erzincan, Erzincan to Selepur, dry river beds 22 km E of Erzincan, 1270 m, 6. viii. 1955, *Huber-Morath* 13140 (holo. Hb. Hub.-Mor.); Erzincan to Refahiye, 27 km NW of Erzincan, 1600 m, *Rech.* 15142, *Hub.-Mor.* 12650; Sipikör Dağ Erzincan to Kelkit, 25 km above Erzincan, 1870 m, *Hub.-Mor.* 12651; foot of Keşiş Dağ above Cimin, 1700 m, *P. H. Davis & Hedge*, *D* 31683.

This new Anatolian endemic grows frequently round Erzincan. *G. tuberculosa* has been confused with the Iranian *G. virgata* Boiss., from which it differs mainly in having smaller leaves and acute to acuminate, not obtuse, calyx teeth with prominent calcium oxalate druses.

Bolanthus minuartioides (Jaub. et Spach) Hub.-Mor., **comb. nov.**

- Syn.: *Heterochroa minuartioides* Jaub. et Spach, Ill. Or. 1: 25, t. 12 (1843);
Jordania minuartioides (Jaub. et Spach) Boiss., Diagn. Ser. 1(8): 94 (1849);
Gypsophila minuartioides (Jaub. et Spach) Boiss., Fl. Or. 1: 558 (1867);
Acanthophyllum minuartioides (Jaub. et Spach) Bark. in Wentia 9: 183 (1962).

B. spergulifolius (Jaub. et Spach) Hub.-Mor., **comb. nov.**

- Syn.: *Heterochroa spergulifolia* Jaub. et Spach, Ill. Or. 1: 28, t. 12 (1843);
Jordania spergulifolia (Jaub. et Spach) Boiss. et Heldr., in Boiss., Diagn. Ser. 1 (8): 94 (1849);
Gypsophila spergulifolia (Jaub. et Spach) Boiss., Fl. Or. 1: 559 (1867);
G. jaubertiana Boiss., Fl. Or. Suppl. 89 (1888);
Acanthophyllum spergulifolium (Jaub. et Spach) Bark. in Wentia 9: 182 (1962).

The two species above seem to fit much better in the genus *Bolanthus* than in *Acanthophyllum*. They both possess an ovary with 8–20 ovules, a capsule dehiscent by four teeth, they are not spiny and the stamens are not exserted. The following key shows the differences between the genera *Acanthophyllum* and *Bolanthus*:

- Fruit 1–4-seeded, indehiscent or rupturing irregularly at the base; leaves, bracts and calyx teeth $\pm$ spiny; stamens exserted *Acanthophyllum*
 Fruit 8–28-seeded, dehiscent by valves or teeth; leaves, bracts and calyx never spiny; stamens included *Bolanthus*

Bolanthus minuartioides and *B. spergulifolius* belong to the E Mediterranean genus *Bolanthus*, whose distribution extends from Greece along S Anatolia to Syria and Palestine, while *Acanthophyllum* is an Irano-Turanian genus, extending from Transcaucasia and E Anatolia through Iraq and Iran to Afghanistan and Beluchistan.