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GERALD PAROLLY & ÖZKAN EREN (ed.)

Contributions to the flora of Turkey, 1.

Abstract

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Starting a series of miscellaneous contributions, by various authors, in the fields of taxonomy, nomenclature, site ecology and chorology of vascular plants of Turkey, the first instalment deals with 30 taxa of the families *Alliaceae, Aristolochiaceae, Asteraceae, Brassicaceae, Caryophyllaceae, Hypericaceae, Poaceae, Scrophulariaceae, Valerianaceae* and *Violaceae,* for which important range extensions and taxonomic considerations are included. The *Barbarea minor* agg. is revised and considered to comprise only one polymorphic species, *B. brachycarpa,* with four subspecies and four varieties and a diversity centre in Turkey. Four taxa from S Anatolia are described as new to science: *Arenaria dianthoides* subsp. *tuncbasi, Barbarea brachycarpa* var. *ilicifolia, B. brachycarpa* subsp. *minor* var. *pilicarpa* and *Hypericum saxifragum* subsp. *eglandulosum.* Five new combinations are validated in the genera *Barbarea, Minuartia* and *Noccaea*. Six mostly very recently described local endemics of the Taurus Mts of the genera *Allium, Arenaria, Barbarea* and *Helichrysum* are sunk in synonymy. For *Silene sumbuliana* an alternative sectional classification is proposed. A first chromosome count is given for *Viola dirimliensis,* with $2n = 8$ reported in the genus for the first time. *Verbascum rupicola,* previously known only from the type gathering in 1912, is rediscovered.

Key words: angiosperms, *Barbarea minor* agg., *Barbarea brachycarpa,* taxonomy, distribution, S Anatolia.

Introduction

This first instalment starts a series, to be published in regular intervals, of miscellaneous contributions, by various authors, dealing with the vascular plant flora of Turkey. The series aims at providing a platform for smaller contributions in the fields of taxonomy, nomenclature, site ecology and chorology of vascular plants, which would otherwise be scattered in a wide range of publication organs. The series may help to provide material for another supplement to the Flora of Turkey (Davis 1965-85, Davis & al. 1988, Güner & al. 2000) or, in the longer run, for a new edition of this Flora.

The first instalment concentrates geographically on southern Anatolia; this is largely due to the main working areas of the editors, who inevitably had to provide the majority of the contributions to push the series on. Although the focus of the series is and will be on Turkey, contributions may also cover adjacent parts of the Near East in order to unify the nomenclature and taxonomy of taxa that have received different treatments in the different floras.

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All colleagues are cordially invited to send their contributions to the editors. In the first instalment, contributions, apart from those of the editors, come from Prof. Dr Zeki Aytaç (Ankara), İlker Çinbilgel (Antalya), Prof. Dr Hayri Duman (Ankara), Prof. Dr Mustafa Gökçeoğlu (Antalya), Serdar Gökhan Şenol (İzmir), Birgit Nordt, Eckhard von Raab-Straube, Dr Thomas Raus and Prof. Dr Hildemar Scholz (all Berlin).

Explanations

Contributions suitable for the series may include, in accordance with the Supplements to the Flora of Turkey (Davis & al. 1988, Güner & al. 2000): (1) The description of new taxa or other additions to the Flora of Turkey by first records, (2) changes in circumscription or nomenclature, (3) reports on taxonomically relevant chromosome numbers. Although beyond the scope of the Supplements, we feel the urgent need also to include: (4) the deletion of records, (5) phytogeographically important internal chorological records, (6) amended descriptions and improved keys based on new characters.

Criterion for the inclusion of chorological data is that the range extension of a taxon recorded must be substantial, i.e. the record changes our understanding of its biogeography. The pure citation of new grid square records is excluded. Acceptable contributions may, e.g., comprise the discovery of outposts of occurrences hundreds of kilometres apart from the next known station, but in the case of narrow endemics, a first record beyond a clear biogeographical border can also be of interest (see examples for these extreme cases in this instalment). In addition, the protologues of recently described "local" endemics (e.g., *Secale leptorhachis*) occasionally deserve chorological amendments in the light of new gatherings.

In style and typography, the series follows the guidelines of Willdenowia. Citations of specimens should accord with the geographical reference system of the Flora of Turkey ("Flora of Turkey-grid", Davis 1965-85). Subdivisions of the Taurus range follow Parolly (1995a, 2004); the biogeographically perfectly supported line Aksu Çay - Kovada Gölü separates the western from the central Taurus (see Louis 1941).

The sequence of the taxa is alphabetical within the conveniently used major divisions *Pteridophyta, Dicotyledoneae* and *Monocotyledoneae*. References and acknowledgements are compiled at the end of the instalment. For brevity, the many Flora of Turkey contributions are not listed separately in the "References" but cited in the text with reference to the Flora (see examples).

An electronic supplement offers the opportunity to illustrate the taxa treated by colour photographs.

Abbreviations used. – D. = Dağ, Dağı (Turkish: mountain); Da. = Dağları (Turkish: mountains); T. = Tepe, Tepesi (Turkish: hill); Y. = Yayla, Yaylası (Turkish: summer pasture). – The abbreviations of herbaria follow Holmgren & Holmgren (1998-), with the most recent addition of AKDU (= Herbarium of the Akdeniz University Antalya).

Dicotyledoneae

Aristolochiaceae

Aristolochia lycica P. H. Davis & Khan

New records of *Aristolochia lycica* extend its range in S Anatolia eastward into the central Taurus and show that it is by far not restricted to ancient Lycia (western Taurus range) but has a Lycian-Isaurian distribution. In addition, the new records allow to amend and complete the original description for previously unknown fruit and root characters. For a general description of the plant, see Davis & Khan (1961, and in Davis 1982: 557-558).

Rootstock vertical, cylindrical. *Fruit* a septicidal capsule, obovoid, 3-4 × 2-2.4 cm, with six pale brown valves, puberulous. *Seeds* uniseriately arranged, 7-10 per loculus, triangular, pale brown, 4-6 × 4-7.5 mm, testa reticulate-rugose.

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TURKEY: C3 ANTALYA: Termessos Milli Parkı, 900 m, clearings in macchie, limestone, 11.5.2004, *Eren 30/04 & Şirin* (conf. Malyer, AKDU); İbradı, Altınbeşik Mağarası Milli Parkı, around Değirmenderesi, 770 m, clearings in macchie, limestone, 37°03'N, 31°36'E, 13.4.2003, *Çinbilgel 1602* (conf. Malyer, AKDU); ibid., 9.4.2004, *Çinbilgel & al. 2080* (conf. Malyer, AKDU); ibid., around Çuvallı T., 780 m, clearings in macchie, 23.5.2004, *Çinbilgel 2285* (conf. Malyer, AKDU); Akseki, Çimi köyü to Çimi Y., 1475 m, open mixed mountain forest, limestone, 37°00'N, 31°54'E, 16.4.2004, *Eren 19/04 & Çinbilgel* (flowering, AKDU); ibid., 18.7.2004, *Eren 308/04 & Çinbilgel* (fruiting, AKDU); ibid., 25.6.2005, *Çinbilgel 2550* (fruiting, AKDU).

İ. Çinbilgel, Ö. Eren, M. Gökçeoğlu & G. Parolly

Asteraceae

Helichrysum chasmolycicum P. H. Davis

= *Helichrysum orbicularifolium* Sümbül & al. in Bot. J. Linn. Soc. 141: 251. 2003, **syn. nov.**

Recent field work and the material cited below revealed that the two species making up the *Helichrysum chasmolycicum* group, viz. *H. chasmolycicum* and *H. orbicularifolium,* merely represent two extremes of one species linked by clinal variation and a wide range of intermediate forms. Plants matching or approaching *H. orbicularifolium* occur mainly E of Antalya, while the Isparta populations are completely intermediate. At the type locality of *H. orbicularifolium* (Altınbeşik Mağarası Milli Parkı) *H. chasmolycicum*-like individuals can also be found together with plants that cannot be identified as one of the two "species". Several characters (e.g., length of sterile shoots, number of capitula, shape of involucrum or compactness of synflorescence) used by Sümbül & al. (2003) to distinguish *H. orbicularifolium* are affected by seasonal or ontogenetical effects or site conditions, and seem to be only weakly correlated. We also cannot confirm that all florets of *H. orbicularifolium* are always hermaphrodite and that the marginal florets of *H. chasmolycicum* are all female. In addition, we never came across herbarium specimens, other than the holotype, or plants in the field, with basal leaves of 4-5 cm width (as given in the diagnosis for *H. orbicularifolium*), and attribute this to an unusual specimen with leaves developed very early in the year (the holotype was collected on 16.2.2001, while the flowering period is indicated as June to August by Sümbül & al. 2003).

TURKEY: C3 ANTALYA: İbradı district, Ürünlü village, in humid calcareous rock crevices and limestone cliffs, 400 m, 16.2.2001, *Sümbül 5755* (holotype, AKDU); ibid., 600 m in humid calcareous rock crevices and limestone cliffs, 600 m, 8.6.2001, *Göktürk 4636 & Dinç Düşen* (paratype, AKDU); ibid., Ürünlü Köyü, Altınbeşik Mağarası Milli Parkı, arı kayası civarı, kaya üzeri, 640 m, 14.6.2002, *Çinbilgel 1080* (AKDU); ibid., 12.6.2004, *Çinbilgel 2376* (AKDU); ibid., 9.11.2003, *Eren & al.* (obs. and photographs); Feslikan Y., *Cedrus libani* forest, rocky slopes, limestone, 16.6.2002, *Eren 5371* (AKDU, B, herb. Parolly); Bozburun-Massiv, 30 km nördlich von Gebiz, steile, S-exponierte Kalkfelswände mit *Quercus coccifera* und einzelnen *Juniperus foetidissima*-Bäumen, 1550 m, 3.10.1984, *Schwarz & al. 2425* (B); etwa 31 km N Çandır (Serik), 870 m, senkrechter Kalkfels, Exp. N, 22.5.2003, *Ulrich 3/18* (herb. Parolly). – C3 ISPARTA: Isparta - Antalya main road, above Kazak Tüneli, on rocks, 1135 m, 3.8.2004, *Eren & Şirin 377/4* (AKDU, B, herb. Parolly). (ed.)

Lactuca glareosa Boiss.

≡ *Prenanthes glareosa* (Boiss.) C. Jeffrey

The isolated relic *Lactuca glareosa* is one of the most distinct and frequent elements of the Prenantho glareosae-Scrophularietum rimarum Parolly 1995, a scree plant community endemic to the eastern Bolkar Da. (Parolly 1995a). The eponymous species, too, was recorded hitherto only from this area (Jeffrey in Davis 1975: 763-766, Parolly 1995b) until it was found in the Aladağları, the neighbouring massif in the NE, first in 1999, in the upper Yalak Deresi at a single place on the big stadial moraine, where the valley widens again, forming a striking, dense patch below a frequently used path (for a photograph see www.bgbm.org/willdenowia/willd36/parolly+eren.htm). Before,

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this locality was comprehensively studied by Kürschner (1982) and Parolly (1995a). Even when sterile, *L. glareosa* can neither be overlooked nor mistaken, which leaves only one convincing explanation: *L. glareosa* is a very recent introduction in the Aladağları, dispersed by hikers, who had earlier visited the Bolkar Da. (especially Karagöl area). Indeed, hikes to both areas in the two mountains are frequently combined in the tours offered by local mountaineering companies and guides.

TURKEY: C5 NIĞde: Aladağları, upper Yalak Deresi, terminal moraine shortly above Yalak Boğazı [gorge], 2750 m, steep, mobile scree-slope with Heracleetum humilis, limestone and dolomite, 9.8.1999, *Parolly & al. 7106* (B, herb. Parolly). G. Parolly

Brassicaceae

Arabis lycia Parolly & P. Hein

Hitherto known only from the extremely small type population (Eren & al. 2004a, Parolly & Hein 2000), a second population of *Arabis lycia* has been found on a neighbouring summit, a few kilometres distant from Bakırlı D., comprising at least six large clumps.

TURKEY: C3 ANTALYA: Beydağları, Çalbalı D., 2000-2150 m, limestone cliffs, 10.7.2004, *Eren 209/4 & Taylan* (AKDU). (ed.)

Barbarea brachycarpa Boiss.

The taxon treated as *Barbarea minor* K. Koch in most of the SW Asian standard Floras such as Flora of Turkey (Coode & Cullen in Davis 1965: 433-438), Flora Iranica (Hedge 1968), Flora of Iraq (Hedge & Lamond 1980), Flora Armenii (Avetisjan 1966), Flora Aserbajana (Komarov 1953), Nouvelle Flore du Liban et de la Syrie (Mouterde 1986), Flore Libano-Syrienne (Thiébaut 1936) and Flora SSSR (Buš 1939) actually represents an unexpectedly highly polymorphic species, which received an inadequate taxonomic treatment in Flora of Turkey in the light of the material now available. This led us to propose a drastically revised infraspecific classification. The species is correctly named *B. brachycarpa* Boiss., since this name takes priority over *B. minor,* as already indicated by Greuter & al. (1986). Our study of the type material of both taxa reconfirmed that they are conspecific.

The protologue of *Barbarea brachycarpa* and Boissier's treatment in Flora Orientalis (Boissier 1867) mentioned that the species can have up to 2 pairs of lateral leaflets and fairly broad siliquae, at least often broader than 1 mm. Some standard Floras, including Flora of Turkey, however, indicate for *B. brachycarpa* only 0-1 pair of lateral leaflets. This is the reason for the misidentification of a number of specimens in the herbaria as "*B. intermedia* Bor." (see the remarks, below, under *B. sicula*), because there are populations of *B. brachycarpa* in Turkey that ± regularly have 2-3(-4) pairs of leaflets.

For Turkey, being the centre of diversity of *Barbarea brachycarpa,* which is a (high) mountain species mainly growing at damp to humid places, Coode & Cullen (l.c. under *B. minor*) recognised three intergrading varieties, viz. var. *minor,* var. *eriopoda* N. Busch and var. *robusta* Coode & Cullen. Later, a local serpentinophyte, var. *anfractuosa* Hartvig & Strid, was added (Hartvig & Strid 1987). By identifying the rich collections of the species from the Taurus range made within the PONTAURUS project (Parolly 2004), we often faced the problem that many populations largely consist of intermediate plants making an identification at varietal rank almost impossible. This concerns especially the distinction of var. *minor* from var. *eriopoda,* which are said to be separated only by the absence or presence of a sparse to dense indumentum on the (lower) leaves and the stem (Coode & Cullen l.c., but see Mouterde 1986). However, the indumentum is not only variable within an individual plant and may also be influenced by the site conditions, since winter leaves (and also the primary leaves) are often considerably more hairy than the subsequent leaves in the following spring and summer (see also Bornmüller 1898). A closer study of the type of the name of *B. minor* revealed that it is sparsely hairy (although described as "glaberrima" in the protologue by Koch 1847) and that there was thus never a solid

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taxonomic ground for establishing var. *eriopoda,* the oldest validly published but mostly overlooked name of which is anyway var. *libanotica* Bornm. (cf. Thiébaut 1936).

Largely based on the texture and the venation of (the basal) leaves, we propose a new infraspecific classification of *Barbarea brachycarpa.* We restore, partly based on other grounds and at subspecies level, Boissier's separation of *B. brachycarpa* and *B. minor*. We upgrade two varieties (var. *anfractuosa* and var. *robusta*) to subspecies rank. By contrast, we consider *B. hedgeana* Kit Tan & Gemici conspecific with *B. brachycarpa* s.str.

In general, our taxonomy reflects the ecogeographical differentiation of the species throughout its range in Anatolia, Lebanon, W Syria, NW Iran, Armenia, the Caucasus area and parts of Central Asia (Coode & Cullen l.c., Hedge & Lamond 1980).

The characters used to distinguish the infraspecific taxa of *Barbarea brachycarpa* s.l. are summarised in the following detailed key:

1. Plants ± distinctly xeromorphic. (Basal) leaves coriaceous, shining, terminal lobe with 1-4 pairs of obtuse, or more often, acute to sharply pointed teeth on either side and a ± acute apex; veins very prominent, reticulate, forming a distinct (sub)marginal thickening; lateral leaf lobes filiform, linear or very narrowly lanceolate. Inflorescence (mostly) unbranched, lowest flowers often bracteate. Siliquae short and to 2 mm wide, beak long (2-4 mm) . . . . . (subsp. *brachycarpa*) 2
– Plants meso- or hygromorphic. (Basal) leaves never coriaceous, herbaceous to fleshy, dull; terminal lobe, if not with entire margin and rounded apex with 1-3 blunt teeth and a various apex; veins conspicuous or not, but never reticulate and forming distinct (sub)marginal thickenings, not reaching the leaf margin; lateral leaf lobes lanceolate to ovate. Inflorescence often branched, always ebracteate. Siliquae various, but normally not wider than 1.2 mm and beak rather short 3
2. Plants moderately xeromorphic; terminal lobes of basal leaves fairly small (mostly <1 × 0.8 cm), with 1-2 teeth on either side; fruiting pedicels ± patent-erect, c. 4-6 mm long . . . . . subsp. *brachycarpa* var. *brachycarpa*
– Plants strongly xeromorphic; terminal lobes of basal leaves larger (1.5-2.3 × 1-1.5 cm), with 3-4 teeth on either side; fruiting pedicels arcuate-ascending, (8-)10-22 mm long . . . . . subsp. *brachycarpa* var. *ilicifolia*
3. Basal and stem leaves fleshy, subsucculent, often lyrate, terminal lobes entire or weakly lobed; completely glabrous or pilose; veins (except mid vein) inconspicuous or almost invisible; stem leaves indistinctly auriculate. Stem and inflorescence (in flower) distinctly zig-zag, siliquae <1mm wide and multi-seeded (5-9), beak short (-1.5 mm) . . . . . subsp. *anfractuosa*
– Basal and stem leaves thin, herbaceous; various in shape, veins conspicuous; stem leaves distinctly auriculate. Stem and inflorescence (in flower) straight or more often flexuous, but never distinctly zig-zag. Siliquae various, but beak always >1.5 mm 4
4. Plants hygromorphic, glabrous in all parts. Stems hollow, >20 cm. Leaves only rarely pinnatifid, mostly undivided, (mostly) all >1.5 cm wide. Petiolar remains absent . . . . . subsp. *robusta*
– Plants mesomorphic, glabrous or pilose in lower parts. Stems solid, 3-20 cm. At least stem leaves lyrate to pinnatifid, basal and stem leaves (mostly) <1.2 cm wide. Petiolar remains present, often distinct . . . . . (subsp. *minor*) 5
5. Siliquae glabrous . . . . . subsp. *minor* var. *minor*
– Siliquae pilose . . . . . subsp. *minor* var. *pilicarpa*

Barbarea brachycarpa Boiss., Diag. Pl. Orient., ser. 1, 5: 80. 1844

Barbarea brachycarpa splits into geographically and site-ecologically distinct subspecies with subsp. *minor* spread throughout the distribution area of the species, on a wide range of basiphytic to neutrophytic, at least seasonally damp, habitats and a preference for places with a long-lasting snow-cover (character species of the Trifolio-Polygonetalia). The xerophytic type subspecies

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seems to be centred in the mountains encircling the Anatolian Plateau, always on the side facing inner Anatolia; all records of var. *brachycarpa* concentrate in two areas (Uludağ and especially the mountains in SW edge of Inner Anatolia [B2 grid]). The E and S (E) Anatolian subsp. *robusta* forms part of humid Euro-Siberian vegetation units (especially Scheuchzerio-Caricetea fuscae and Molinio-Arrhenatheretea) developed on high mountains within vast Irano-Turanian areas or in close contact to it (the hygrophytic high mountain vegetation of the Bolkar Da. displays many Irano-Anatolian elements, Parolly 2004). In contrast, subsp. *anfractuosa* and the new subsp. *brachycarpa* var. *ilicifolia* indicate speciation activities on ultramafic soils in two different parts of the Taurus Mts.

1. subsp. ***brachycarpa***

Balansa 1256 is a mixture of two gatherings from two different mountains. The plants in flower from Murat D. (cited as *1256a* below) approach subsp. *minor* in their weakly veined leaves and ± mesophytic habit. The same holds largely true for *Barbarea hedgeana* (holotype, EGE). Due to this intergrading we decided to apply infraspecific rank rather than separating this otherwise easy-to-recognise taxon specifically. Such intermediate forms (see also below the specimens cited under subsp. *minor* var. *minor*) were also known to Bornmüller (1936: 29). Based on his wide field experience he wrote: "Sehr eigenartig ist, daß *B. minor* an Plätzen, die im Sommer bei zunehmender Trockenheit auf längere Zeit völlig ausdörren, Rosetten treibt, deren Blattkonsistenz äußerst dünn ist, sodass die Nervatur netzartig hervortritt, wie dies bei der spezifisch durchaus verschiedenen *B. brachycarpa* Boiss. (Bal. exsicc. vom Murad-dagh!) der Fall ist. Gleichzeitig sind alsdann die Blätter der Rosette dicht abstehend behaart". In subsp. *brachycarpa,* we never observed such a very thin leaf consistency as mentioned by Bornmüller for *B. minor* (s.str.). Considering all characters and its particular distribution area, subsp. *brachycarpa* seems to be more than an eco-type and there is thus a reasonable support for the suggested taxonomy.

Barbarea hedgeana was distinguished on account of "its acutely dentate serrate basal leaves, pinnatisect cauline leaves, broader siliquae and white petals" (Tan & Gemici 1990). All but the latter character, which is almost certainly an artefact (*B. brachycarpa* petals often become white after anthesis in the field), are clearly within the compass of *B. brachycarpa* s. str. (compare Fig. 1A-B). The figure of *B. hedgeana* accompanying the original description is somewhat misleading concerning stem and fruit shape.

1a. var. ***brachycarpa***

= *Barbarea minor* var. *libanotica* Bornm. in Verh. Zool.-Bot. Ges. Wien 48: 550. 1898, **syn. nov.**
= *Barbarea minor* var. *eriopoda* N. Busch, Fl. Cauc. Crit. 3(4): 318. 1909.
= *Barbarea hedgeana* Kit Tan & Gemici in Edinburgh J. Bot. 47: 287. 1990, **syn. nov.**

TURKEY: B2 KÜTAHYA: Région alpine du Mourad Dagh (Murat D.), 27.6. 1857, *Balansa 1256a* (flowering, approaching subsp. *minor*, B). – B2 U AK: Région sous-alpine de l'Alma-Dagh au nord d'Ouchak, 10.6.1857, *Balansa 1256* (fruiting, B). – B2 DENIZLI: Çivril, Akdağ, dry stony limestone slopes, c. 1900 m, 24.5.1984, *Gemici 2690* (holotype of *B. hedgeana*, EGE).

1b. var. ***ilicifolia*** Parolly, Nordt & Eren, **var. nov.** – Fig. 1C

Holotype: Turkey, C3 Konya, kurz nach der Abzweigung von der Hauptstraße Manavgat - Seydişehir in Richtung Bozkır, 1460 m, offener Serpentinhang, Exp. NE, 30.6.2003, *Ulrich 3/10* (B; isotypes: AYDN, GAZI, herb. Parolly).

A varietate *brachycarpa* foliis basalibus lobis terminalibus 3-4-dentatis (non 1-2-dentatis), pedicellis fructiferis longioribus (8-22 non 4-6 mm) et habitu xeromorpho differt.

This very distinct variety comes from dry serpentine slopes in the western Central Taurus near Bozkır. It grows on dry, sun-exposed serpentine, partly in open, fairly barren slopes, partly under an open canopy of *Pinus nigra* var. *caramanica* (Rehder) Loudon forests. The slopes are N-, NE- and W-exposed. Typical associated species include *Noccaea camlikensis* Aytaç & al. (2006), *Polygonum karacae* Ziel. & Boratyński and *Pseudosempervivum sempervivum* (Boiss. & Bal.) Pobed., all endemics from ultramafic soils. In addition, Robert Ulrich (in litt.) recorded a number

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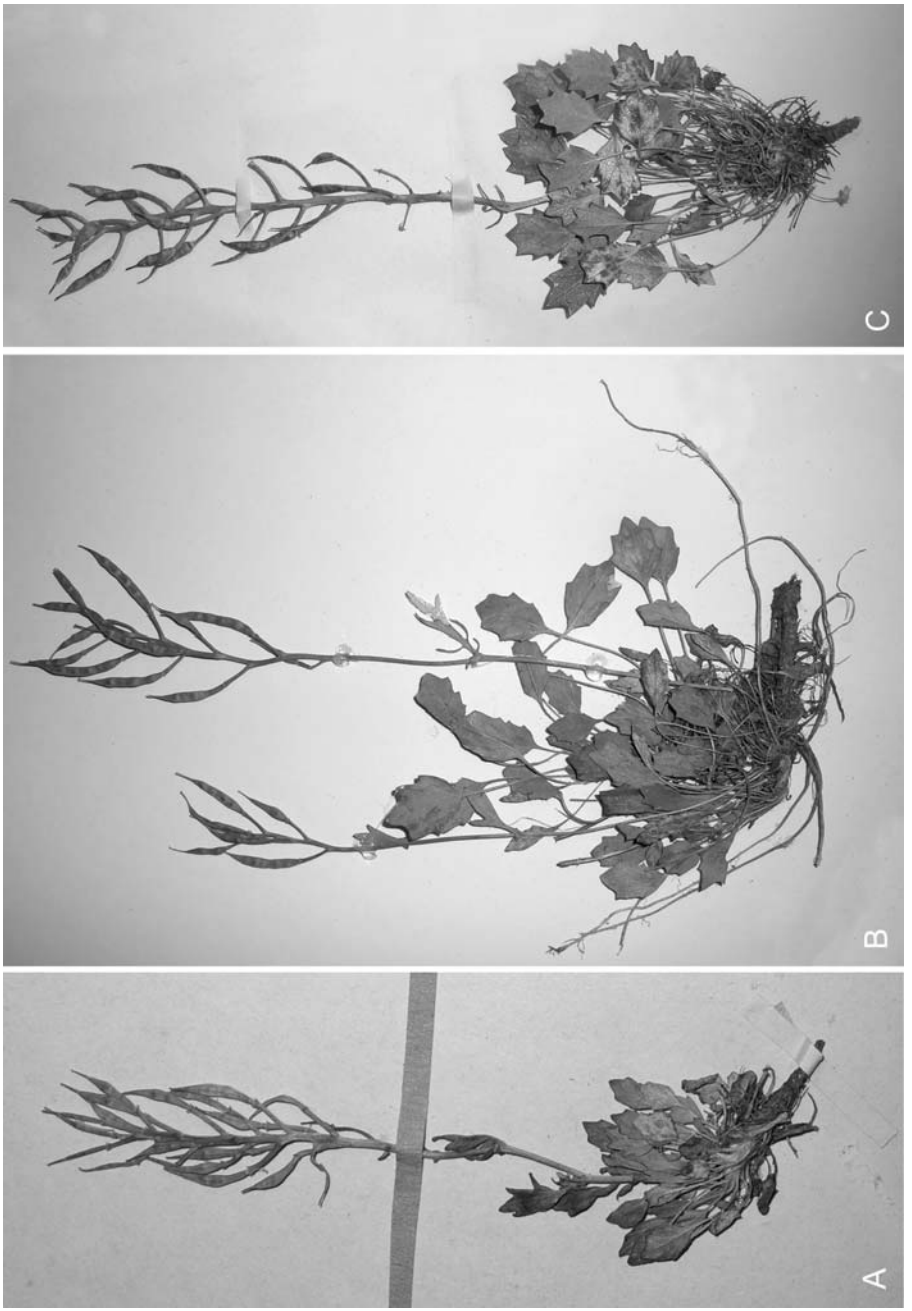


Fig. 1. A-B: *Barbarea brachycarpa* subsp. *brachycarpa* var. *brachycarpa* – holotype at EGE of *B. hedgeana* (A), *Balansa 1256* at B (B); C: *B. brachycarpa* subsp. *brachycarpa* var. *ilicifolia* – holotype at B.

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of species, which are indifferent to the substrate, such as *Aethionema cordatum* (Desf.) Boiss. (frequent), *Cerastium macranthum* Boiss., *Chamaecytisus pygmaeus* (Willd.) Rothm., *Cheilanthes maranthae* (L.) Domin, *Eryngium polycephalum* H. Wolff, *Inula montbretiana* DC., *Leontodon asperrimus* (Willd.) Ball, *Pelargonium endlicherianum* Fenzl and *Polygala pruinosa* Boiss. subsp. *pruinosa*.

Barbarea brachycarpa var. *ilicifolia* resembles var. *brachycarpa* in general appearance, but the plants are much more xeromorphic, stouter and often taller. Well-developed basal leaves have 3-4 acute to pointed teeth on either side of the terminal lobe (not 1-2). The terminal lobes are on average much larger (1.5-2.3 × 1-1.5 cm), while leaves of var. *brachycarpa* only rarely attain a length of about 1 cm. The most striking characters are the long, arcuate-ascending pedicels, in fruiting stage (8-)10-22 mm long (versus c. 4-6 mm). Already in flower, the pedicels exceed 5 mm and even the youngest siliquae rapidly develop pedicels of about 1 cm. The name is derived from strongly leathery and dentate leaves, reminiscent of those of *Ilex aquifolium* L. or *Quercus coccifera* L.

Paratypes. – TURKEY: C3 KONYA: Type locality, etwa 3 km auf dem von der Hauptstraße Manavgat - Seydişehir abzweigenden Sträßchen in Richtung Bozkır, 1570 m, offener Serpentinhang, Exp. W, 17.6.2002, *Ulrich 2/41-2/44* (herb. Parolly); ibid., 2 km, 1560 m, 19.10.2002, *Ulrich 2/86* (sterile rosette with simple, entire winter leaves, herb. Parolly); ibid., 1560 m, wenig bewaldeter Serpentinhang, 18.5.2003, *Ulrich 8a* (postfloral, herb. Parolly); ibid., 30.6.2003, *Ulrich 3/8b* (B, herb. Parolly); kurz nach der Abzweigung von der Hauptstraße Manavgat - Seydişehir in Richtung Bozkır, 1460 m, offener Serpentinhang, Exp. NE, 18.5.2003, *Ulrich 3/10a* (postfloral, AYDN, B, herb. Parolly); ibid., 1480 m, Serpentinhang, 18.5.2003, *Ulrich 3/9* (flowering, herb. Parolly). – If not otherwise indicated, the material is in fruit.

2. subsp. ***anfractuosa*** (Hartvig & Strid) Parolly & Eren, **comb. & stat. nov.** ≡ *Barbarea minor* var. *anfractuosa* Hartvig & Strid in Bot. Jahrb. Syst. 108: 316. 1987.

The distinguishing characters given in the protologue hold only in part: dwarf and stout stems can also occur in subsp. *brachycarpa* and subsp. *minor*. The name-giving feature, the zig-zag stems and inflorescences, is only distinct in flowering stage, but hardly seen in fruit, because the stems are accrescent. In contrast, the short beak of the siliquae, c. 1 mm, seems to be a good and constant character.

The present collections comprise exclusively plants with fairly long (-22 mm), straight or curved, but narrow siliquae (-1.2 mm wide). All show in fruit, unusually for *B. brachycarpa* and *Barbarea* in general, a nearly prostrate habit with often strongly flexuous racemes. Glabrous and hairy forms occur together. A striking character, easily also to be observed in herbarium material, are the thick, fleshy leaves with indistinct nerves, a character that becomes more distinct with increasing age. Subsp. *anfractuosa* marks melt-water and snow-patch communities in the summit region of Sandras D., but successfully penetrates into the montane Black Pine forest lower down, where it has to with-stand a longer summer drought. The combination of characters together with its narrow range and substrate preference (serpentine) set this taxon clearly apart and justifies its subspecific rank.

TURKEY: C2 MUĞLA: Sandras D., W side of the summit area, snow-bed meadows and rock slopes, serpentine, 2100-2200 m, 7.7.1984, *Strid & al. 23347* (isotypes, E, EGE); ibid., above Ağla, Çıralı, below Altınsivri, 37°03'N, 28°48'E, 1800 m, flat alluvial gravelly plain with scree and fine soil-rich ophiolitic soil, Trifolio-Polygonetalia community, 19.6.1999, *Parolly & al. 6040* (B, herb. Parolly); ibid., 22.6.1999, *Parolly & al. 6128 &* (B, herb. Parolly); ibid., ascent from Çıralı to Çiçekbaba T. (main summit), valley below the eastern slope of the summit, 37°04'82"N, 28°49'91"E, 1900-1950 m, ophiolite, snow-bed meadows and melt-water communities, 21.6.1999, *Parolly & al. 6083* (B, ISTE, herb. Parolly); Köyceğiz, Ağla - Eskere arası, 1700 m, karaçam ormanı açıklığı, serpantin alanı, 7.6.1992, *Güner & al. 10626* (GAZI); ibid., 1650 m, *Pinus nigra* forest, by stream in wet ground, 28.5.1995, *Güner & al. 11827* (E).

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3. subsp. ***robusta*** (Coode & Cullen) Parolly & Eren, **comb. & stat. nov.** ≡ *Barbarea minor* var. *robusta* Coode & Cullen in Notes Roy. Bot. Gard. Edinburgh 26: 190. 1965.

Distinct on account of its hygromorphic habit, hollow stems (a newly observed character), the large and wide leaves, never pinnatifid or pinnatisect stem leaves, and its ecology – growing at permanently damp to wet places (flushes). Siehe's specimens from the Bolkar Da. represent a puzzling gathering already mentioned by Coode & Cullen (in Davis 1965), combining the characters of this taxon, including the hollow stem, with the auricles of *B. auriculata* Hausskn. ex Bornm. It is far disjunct geographically from the SE Anatolian localities.

TURKEY: C5 IÇEL: Bolkar Da., an Bächen, Gusgutathal, 1400 m, 1896, *Siehe 243* (B); südostl. Kleinasien, genauerer Standort unbekannt, *Siehe 42* (quite likely also from the Bolkar Da., B). – B9 BITLIS: Adilcevaz-Söte Y., Yeşiltepe mezrası, 3200 m, 24.6.1987, *Behçet* (EGE). – B9 VAN: Gürpınar distr., Van - Hakkari road, Kepirdağı T., Güzeldere Geçidi, 2750-2900 m, limestone, low-sedge fens and flushes along creeks and runnels, 12.6.2002, *Kürschner 11390 & Parolly 02-72* (herb. Kürschner, herb. Parolly); Gevas, Artos D., 10000 ft., by stream, 15.7.1954, *Davis 22858 & Polunin* (E). – C10 HAKKARI: Sat D., NW of Sat Gölü, by stream, 28.6.1966, *Davis 45492* (E).

4. subsp. ***minor*** (K. Koch) Parolly & Eren, **comb. & stat. nov.** ≡ *Barbarea minor* K. Koch in Linnaea 19: 55. 1847.

4a. var. ***minor***

= *Barbarea alpina* K. Koch in Linnaea 19: 319. 1847, **syn. nov.**

In flower, the identification of single extreme individuals of *Barbarea brachycarpa* subsp. *minor* with basal leaves having 3(-4) pairs of leaflets and strongly pinnatifid stem leaves can cause considerable trouble, if to be separated from the biennial *B. sicula,* respectively *B. intermedia* (see below). However, the perennial habit with the oblique rhizome provides a reliable distinguishing character against *B. sicula*. In addition, other plants of such populations mostly have basal leaves with 0-2 leaf lobes, so that scanning the whole gathering may be necessary for their correct identification. The often simple to weakly divided leaves, which were considered to be so typical of *B. brachycarpa* subsp. *minor,* are frequently found in the primary leaves (and thus reflect the ontogeny) and also in spring leaves of sterile rosettes. They are (often) replaced by more divided leaves. In general, it must be noted that too much stress should not be placed on the number of lateral leaflets (0-2)[-4] and on the character states of the leaf margin (entire, erose-dentate, erose-sinuate or dentate with up to 3 teeth on either side).

The name *Barbarea alpina,* of which we traced original material at B, is ignored in all standard Floras and checklists. A part of the specimens of *B. alpina* approaches subsp. *anfractuosa* in having somewhat fleshy and lyrate basal and stem leaves. For tracing the locality of *B. alpina* the compilations of Koch's itinerary by Edmondson & Lack (1977) and Lack (1978; locality no. 125) were used, with the modified place name spelling taken from the herbarium label.

Under the number *Siehe 1896: 243* two obviously different plants were distributed in two series. The one, stamped as *1895,* but (in B) rightly corrected to *1896* by the hand of Wagenitz (because *Siehe 1895: 243* refers to a *Hypericum*), clearly belongs to subsp. *minor* var. *minor* (cited here as *243b*). The other, much taller individuals with hollows stems are treated above under subsp. *robusta*.

TURKEY: Litus aust. Pontus Euxini, *Thirke 32* (type, B). – A3 BOLU: Sebendağ bei Bolu, an kleinem See auf Hochfläche, in Weide, feucht, 12.5.1955, *Walter & al. 4573* (det. Huber-Morath as *B. longirostris* Vel., B). – A5 AMASYA: Amasya, 5.1994, *Manisadjan 7836* (B). – A5 KASTAMONU: Paphlagonia, Wilajet Kastambuli, Tossia (Tosya), Küsentshehair (Kösençayır), in pratis, 29.5.1892, *Sintenis 4033* (B). – B1 IZMIR: Smyrna (İzmir), Yamanlardağ orientalis supra Palamutköy, in locis fontanis graminosis, 1000-1100 m, 5.5.1933, *Schwarz 503* (det. Haussknecht as *B. sicula,* B). – B1 MANISA: Manisa D. (Spil D.), Atalanı güneyi, 1270 m, 9.4.1984, *Duman 1621* (GAZI); Atalanı Mevkii, 1300 m, 4.5.1984, *Seçmen 2870* (approaching subsp.

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brachycarpa, EGE); ibid., Çörçil mevkii, 1250 m, 22.5.1984, *Duman 1736* (approaching subsp. *brachycarpa* in leaves with slight marginal thickening and a tendency towards reticulate veins, GAZI). – C2 ANTALYA: Avlan, S of Avlan Gölü (c. 80 km SW of Antalya), NE mountain slope, with *Cedrus* forest (slope 15°-30°), stony, loamy soil, c. 1300 m, 29.4.1959, *Hennipman & al. 814* (as *B. sicula,* B). – C3 KONYA: Beim Abzweig Richtung Bozkır von der Hauptstraße Manavgat-Seydiþehir, 1440 m, Kalkhang und Bachrand, Exp. N., *Ulrich 3/17* (herb. Parolly). – C4 ANTALYA, Geyik Da., foothills of Büyük Geyik D., plateau between the Geyik D. and the Akdağı, 36°55'61"N, 32°08'81"E, 2030-2050 m, limestone, dolines, snow-patch meadows, 21.7. 1999, *Parolly & al. 6809* (B, ISTE, herb. Parolly). – C5 IÇEL: Bolkar D., Gusgutathal, *Siehe 1896: 243b* (B). – C5 MERSIN: Tarsus-Aslanköy-Dömbelek Y., 2000-2200 m, 25.5.1989, *Gemici 4332* (EGE). – C5 NIĞDE: Distr. Ulukişla, Bolkar Da., basin and adjoining slopes around tarn Karagöl, 37°24'24", 34°33'50"E, 2620-2670 m, damp, grazed and trampled turfs (Trifolio-Polygonetalia), dolomitic and ophiolitic deposits, 30.7.1999, *Parolly & al. 6972* (B, herb. Parolly); Ala D., Tekneli Y., 2700 m, Quellflur, 19.6.1979, *Carle & Kürschner 1812* (herb. Kürschner). – C6 ADANA: Bahçe (N Amanos), Dumanli D. near Haruniye, 1100 m, metamorphic rocks, 19.4.1957, *Davis 26857 & Hedge* (E). – C6 HATAY: Amanos, 1800 m, 6.1906, *Haradjian 708* (E). – C6 KAHRAMANMARA : Göksun, Fındıklıkoyak köyü, 1500-1600 m, *Pinus nigra* açıklığı, 22.4.1992, *Ekici 1019* (GAZI); Engizek D., Akpınar - Büyükyasıl arası, 2200-2250 m, sulak yerler, 1.6.1988, *Duman 3983* (GAZI); ibid., Büyükyasıl muk., 2300 m, sulak yerler, 23.6.1988, *Duman 4080* (GAZI); Ahır D., Yedikuyunlar mevkii, 1800 m, 3.5.1991, yüksek d. stebi, nemli yerler, *Aytaç & Duman 3526* (GAZI).

ARMENIA: An Quellen in den Höhen des unteren oder armenischen Kaukasus, auf den Höhen des Kaikuli-Kasantschi, 13.5.1837, *K. Koch* (type of *B. alpina,* B); rec. 5.1867, *Calvert & Zohrab* (E).

LEBANON: Weit el Beida, 4700 ft, damp grassy meadow by rivulet, 15.5.1943, *Davis 6050A* (E).

4b. var. ***pilicarpa*** Parolly & Eren, **var. nov.**

Holotype: Turkey, C3 Antalya, Beydağları, Feslikan Yaylası above Geyikbayırı, 1800-1900 m, doline with Trifolio-Polygonetalia community, 10.5.2006, *Eren 54/6* (AYDN; isotypes: B, E, EGE, GAZI, HUB, herb. Parolly).

A varietate *minore* siliquis pilosis differt.

This variety with hairy valves underlines the polymorphism of *Barbarea brachycarpa* s.l. The material comes from montane dolines with typical Trifolio-Polygonetalia Quézel 1973 vegetation of three different localities in the Beydağları in the Lycian Taurus (W Taurus Mts).

TURKEY: C3 ANTALYA: Kemer, Beydağları, Tahtalı D., W side (ascent from Yukarı Beycik), summit region above timberline, 36°32'59"N, 30°25'95"E, 1800 m, dolines, 8.7.1999, *Parolly & al.* (herb. Parolly); Tahtalı D., 1600 m, dolines, 6.2002, *Eren 4871*(AKDU, AYDN, herb. Parolly); Beydağları, Bakırlı D. above Saklıkent, 1800-2200 m, dolines, 6.1998, *Eren 6110* (AKDU, AYDN, herb. Parolly). (ed.)

Barbarea sicula C. Presl

– *B. intermedia* sensu Fl. Turkey, non Bor.

Judging from the range and the herbarium material seen at B, EGE and GAZI, in Turkey *Barbarea intermedia* is, as in Greece, almost certainly replaced by *B. sicula*. The natural distribution of *B. intermedia* is in W and SW Europe (Fernandes 1993, Hegi 1958, Tan 2002; these references also provide descriptions of the two taxa). It thus seems that the name *B. intermedia* was misapplied in Flora of Turkey (Coode & Cullen in Davis 1965: 433-438) and must be deleted from the flora of Turkey, returning to the taxonomic concept of the pre-Flora of Turkey era (Boissier 1867).

TURKEY: B1 IZMIR: Bergama, Kozak Kıranlı orman deposu yanı, 780 m, 24.4.1986, *Seçmen 3180* (as *B. intermedia,* EGE). – C3 ANTALYA: Akseki, Akseki - Beysehir main road, 1100 m, road side, wet places, 2.5.2006, *Eren 93/6* (AYDN, B, GAZI).

GREECE: THESSALIA - EPIRUS: Montes Pindus, in jugo Katara prope Metsovo, substr. serpentine, c. 1700 m, 10.5.1961, *Rechinger 23164* (B). – NOM. FLORINIS: Mt Varnous (Peristeri), ridge be-

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tween summit 2177 and Kortsa Toumba (summit 2334), alpine grassland and rock outcrops, granite, 27.6.1981, *Strid & al. 18247* (B). (ed.)

Noccaea sintenisii subsp. ***crassum*** (P. H. Davis) Parolly, **comb. & stat. nov.**
≡ *Thlaspi crassum* P. H. Davis in Fl. Turk. 10: 235. 1988 ≡ *Thlaspi sintenisii* subsp. *crassum* (P. H. Davis) Parolly

For generic concepts in *Thlaspi* s.l., see Meyer (1991) and Aytaç & al. (2006); for specimens seen as well as data concerning the morphology and ecosociology of *Noccaea sintenisii* subsp. *crassum,* see Parolly (1995b). G. Parolly

Noccaea sintenisii (Hausskn. ex Bornm.) F. K. Mey. subsp. ***sintenisii***
≡ *Thlaspi sintenisii* Hausskn. ex Bornm.

Before this species was first recorded for the western Taurus on Kızlar Sivrisi, Beydağları (Parolly 1995b), *Noccaea sintenisii* s. str. was believed to be an endemic of the high mountain screes of NE Anatolia (Hartvig & Strid 1987, Hedge in Davis 1965: 337). A new record from the Lycian Akdağları confirms that it has a much wider distribution in the Taurus range than previously assumed. This view is supported by an additional record from the Pisidian Davras D., representing the first gathering from the Central Taurus. All collections and observations are, as expected, from fairly moist screes. The occurrences in the Akdağları are a range extension of the Ranunculo brevifolii-Thlaspietum sintenisii scree plant association, which hitherto had on Kızlar Sivrisi its type and only locality (Parolly 1995a).

Turkey: C2 Muğla: Lycian Akdağları above Gömbe, Akdağ, between Şubaşı Y. and an unnamed lateral summit N of Uyluk T., 36°33'42"N, 29°35'75"E, 2600-2900 m, limestone scree, 27.6.1999, *Parolly & al. 6217* (B, ISTE, herb. Parolly). – C3 Isparta: Davras Da., Büyük Davras D. [ascent from the Kır Y.], N-facing cirque and summit region above the yayla, i.e. the main ridge between Oğlaktaşı T. and Ulparçukur T. [= main summit, 2635 m], 37°45"77"N, 30°44'64"E; 2400-2550 m, limestone scree, 28.6.2000, *Eren & Parolly 7646* (B, ISTE, herb. Parolly). (ed.)

Caryophyllaceae

Arenaria angustifolia McNeill
= *Arenaria yunus-emrei* Aytaç & H. Duman in Ann. Bot. Fenn. 41: 213-214. 2004, **syn. nov.**

The recently described *Arenaria yunus-emrei* was hitherto known only from a single gathering in the Central Taurus. *A. yunus-emrei* was separated from *A. angustifolia*, which grows in the same area, mainly on account of its glandular indumentum and a number of additional characters (Aytaç & Duman 2004). However, they all have no relevance in the light of the (originally mixed) new collection made close to the type locality of *A. yunus-emrei*. This gathering includes both glabrous and strongly glandular plants (mounted on different sheets, numbered *Eren & Parolly 7870* and *7870a*), which show in all other respects not the slightest difference, and fall completely within the range of characters of *A. angustifolia*. In Flora of Turkey, *A. angustifolia* is described as "glabrous or sparsely hairy" (McNeill l.c.: 23-24). Considering the low taxonomic significance of the indumentum, *Parolly 7870a* was annotated and distributed as a hairy variant of the latter. Glandular-pilose populations of *Arenaria* species have been differently treated at variety or subspecific rank, depending on a particular distribution area or ecology (e.g., McNeill l.c.: 36). Since *A. angustifolia* and *A. yunus-emrei* grow sympatrically and syntopically (in the same Campanulion isauricae rock community), even the rank of a variety seems inappropriate. This view is also supported by the collections kept in the GAZI herbarium.

Turkey: C4 Karaman: Ermenek to Hadim, Adiller, close to the junction of the roads to Sarıveliler/Alanya, 36°42'60"N, 32°37'84"E, 1700 m, limestone cliffs, shady, partly overhanging rocks, "Balmen", 10.7.2000, *Eren & Parolly 7870a* (AKDU, B, herb. Parolly); Ermenek, Tekeçatı - Damlaçal arası, 1400 m, uçurum kayalıktan, 6.7.1978, *Vural 911* (GAZI); Damlaçalı, *Cedrus*

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libani ormanı, kaya üzerinden, 1730 m, 7.7.1978, *Vural 986* (GAZI); Tekeçatı, Kamişdere, 1400 m, uçurum kaya, 26.8.1992, *Vural & al. 6151* (glandular-hairy plants, GAZI); Ermenek -Karaman yolu, Kamişdere, 1500 m, 28.6.1996, *Koyuncu & Erdurak* (GAZI); Ermenek - Hadim, Başyayla, 1500 m, on rocks, 30.7.1998, *Güner & al. 12652* (type of *A. yunus-emrei*, holo GAZI, iso E).
G. Parolly, Ö. Eren, Z. Aytaç & H. Duman

Arenaria (sect. *Glomeriflorae)* ***dianthoides*** subsp. ***tuncbasi*** Eren & Parolly, **subsp. nov.**

Holotype: Turkey, C3 Antalya, Beydağları, Çalbalı Dağı, ascent from Feslikan Yaylası, 1900 m, thorn-cushion community, 6.6.2003, *Eren 37/3 & Şirin* (GAZI; isotypes: AKDU, AYDN, B, herb. Parolly). – Fig. 2.

A subspecie typica inflorescentiis laxe 2-4-floribus (non dense 6-12-floribus), vagina foliorum caulinorum mediorum 8-10 mm (non 12-25 mm), internodiis ad 3.5 cm (non 4 cm) longis et foliis surculorum 2-5 cm (non 6-15 cm) longis differt.

The name of the subspecies commemorates the promising young biologist Olcay Tunçbaş (1981-2006), MSc student at the Adnan Menderes University Aydın, Turkey, who met such an untimely death.

The new disjunct subspecies of *Arenaria dianthoides* Sm. is surprising in two respects. First, the type locality and its only station is among the famous mountain summits of the Lycian Taurus, which is a well-botanized place with a list of visitors that reads like a "Who's who" in oriental botany (see, e.g., Davis 1955, 1965-85, Davis & al. 1988, Güner & al. 2000, Hartvig & Strid 1987). Second, it is obvious that subsp. *tuncbasi* is geographically strongly isolated, because the type subspecies occurs in E and SE Anatolia (especially Erzurum, Van and Ağrı provinces) and the Flora Iranica area (Georgia, Armenia, NW Iran; McNeill in Davis 1967: 32, Rechinger 1988, Šiškin & Avetisjan 1956). It is noteworthy that all species of *A.* sect. *Glomeriflorae* Fenzl ex Williams exhibit such an eastern distribution pattern, as do in general all species of *A.* subg. *Eremogyne* (Fenzl) Fenzl with grass-like leaves distinctly longer than 2 cm.

Detailed studies on herbarium specimens revealed some slight east-western clinal variation of subsp. *dianthoides*. The plants from Iranian populations (see also Rechinger 1988) are often taller than those from Turkish populations ([20-]30-55 versus 12-35[-45] cm) and tend to have more flowers, very densely compacted into large terminal heads (E Anatolian plants rarely have more than 8-10 flowers). Our measurements are all based on Turkish material (see also McNeill l.c.). A comparison of subsp. *tuncbasi* with Iranian specimens of subsp. *dianthoides* would separate the plants from the W Taurus even more. For figures of subsp. *dianthoides* see Rechinger (1988: t. 9) and Šiškin & Avetisjan (1956: t. 20).

With our present knowledge, there appears to be a clear hiatus between the western population on Çalbalı D. and the E Anatolian populations of the species, and subspecific rank seems appropriate to express the differentiation as provided in the following key:

1. Inflorescence lax, (2-)3-4-flowered; leaves of sterile shoots 2-4(-5) cm long; sheaths of middle cauline leaves 8-9(-10) mm long; internodes ≤ 3.5 cm long . . . subsp. *tuncbasi*
– Inflorescence dense, (6-)9-10(-12)-flowered; leaves of sterile shoots (6.5-)7-12(-15) cm long; sheaths of middle cauline leaves 12-25 mm long; internodes ≥ 4 cm long . . . . . subsp. *dianthoides*

Specimens of subsp. dianthoides seen. – TURKEY: A9 KARS: Çildız Göldalı - Melikköy arası, taşlık, korunmuş step, 2100 m, 24.7.1986, *Ocakverdi 2615* (GAZI). – B9 VAN: Hoşap - Başkale arası, Güzeldere Geçidi, Karayolları bakımevi üstü, 2700-2850 m, *Demirkuş 6053 & Koyuncu 12616* (GAZI); ibid., 2800 m, alpin çayır, 18.8.1993, *Altan 5544* (GAZI). – B10 AĞRI: Tendürek D., 2000 m, offene Felssteppe am Ostfuß des Vulkans an der Straße Muradiye - Doğubeyazit, 21.7.1981, *Raus 4183* (B).
IRAN: Azerbaijan orient., Kiyamaki Protected Region, Kiyameki Dagh ad boreo-orientum a pago Miab, 2500-2600 m, 17.6.1977, *Rechinger 56864* (B); ibid., 2600-2900 m, *Rechinger 56918* (B); ibid., Montes Sabalan, in declivibus borealibus saxosis supra pagum Qotur-Su, 2300-2800 m, 13.7.1971, *Lamond 4675 & Termé* (B). (ed.)

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Fig. 2. *Arenaria dianthoides* subsp. *tuncbasi* – isotype at AYDN.

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Arenaria eliasiana Kit Tan & Sorger

Previously only known from its type locality on open rocky scree slopes on Susuz D. SW of Elmalı (C2 Antalya) in the W Taurus (Davis & al. 1988). The taxon may have a wider distribution in the western part of the Beydağları as revealed by three new gatherings.

TURKEY: C2 ANTALYA: Beydağları, Uzunkarış D., 2000-2150 m, limestone, on rock, 10.7.2004, *Eren 209/4 & Taylan* (AKDU); Beydağları, between Susuz D. and Kofu D., Bozkaya T., 1400-2250 m, limestone rocks, 6.2002, *Eren 5446* (AKDU, herb. Parolly). – C3 ANTALYA: Pozan D., 2100 m, limestone rocks, 15.7.2005, *Eren & Çinbilgel* (photograph). (ed.)

Minuartia elmalia (Aytaç) Aytaç, Parolly & Eren, **comb. & stat. nov.**

≡ *M. dianthifolia* subsp. *elmalia* Aytaç in Ann. Bot. Fenn. 41: 216. 2004.

After the revision of the *Minuartia dianthifolia-M. pestalozzae* complex in S Anatolia (Eren & al. 2004), the second author had the opportunity to study the type material of *M. dianthifolia* subsp. *elmalia* in the GAZI herbarium. Within *M.* sect. *Lanceolatae* (Fenzl) Graebn., *M. dianthifolia* and *M. pestalozzae* form a pair of closely related, although morphologically quite distinct species, which very rarely and locally hybridize (Eren & al. 2004a). The plant previously known as *M. dianthifolia* subsp. *elmalia* is more distantly allied to them and clearly specifically distinct from *M. dianthifolia* by characters given in the protologue (e.g. the much taller habit, longer cauline leaves and distinctly glandular-hirsute nodes) and its habitat requirements (*M. elmalia* is known from the steppic foothills [1500 m] of the W Taurus, while *M. dianthifolia* is recorded only from subalpine and alpine elevations; see Aytaç & Duman 2004 and Eren & al. 2004a). Z. Aytaç, G. Parolly & Ö. Eren

Silene sumbuliana İ. G. Deniz & O. D. Düşen

Silene sumbuliana was recently described from Avlankuzu D. near Elmalı in the W Taurus (Deniz & Düşen 2004). Our new gatherings extend the range of that species and clearly confirm its novelty. However, in its protologue *S. sumbuliana* was wrongly related to *S. papillosa* Boiss. and thus placed in *S.* sect. *Lasiocalycinae* (Boiss.) Chowdh. (see Coode & Cullen in Davis 1966: 179-242). This section comprises pubescent and often hirsute annuals lacking glandular hairs (Greuter 1995). Actually its characters (annual habit, glandular and sparse eglandular hairs, globular seeds and a weak capsule lacking septa) clearly place *S. sumbuliana* in *S.* sect. *Atocion* Otth. It seems very closely related to *S. delicatula* Boiss., but differs from this species by its longer (4.5-5.5 mm) and hairy anthophore (not 2-4 mm and glabrous) and by its normally longer calyx [(8-)10-17 versus 6-10 mm)]. Studies of the new collections and of the type material make an amendment and correction of the original description necessary: the calyx is always inflated in fruiting stage, while the alar pedicel is reflexed.

The new records clearly indicate that *Silene sumbuliana* is a fairly widespread endemic of the Lycian Taurus (W Taurus); its conservation status ("Critically Endangered" (CR); see Deniz & Düşen 2004) could be more optimistically re-evaluated (IUCN 2001).

TURKEY: C2 MUĞLA: Lycian Akdağları above Gömbe, Akdağ, slopes E of Yeşilköy, 36°32'N, 29°36°E; 2000 m, rocky slope with *Juniperus excelsa,* E-facing rock with step crevices (70-90°), limestone, 28.6.1999, *Parolly & al. 6265* (B, herb. Hein, herb. Parolly). – C2/3 ANTALYA: Elmalı, Avlankuzu D., 1850-1880 m, clearings in *Cedrus libani* forest and on calcareous slopes, 21.5. 2000, *Deniz 1573* (holotype, AKDU); ibid., 9.6.2003, *Deniz 1750* (paratype, AKDU); Beydağları, Teke D. above Belen Y., 1500-1700 m, *Cedrus libani* forest, rocky slopes, limestone, 13.7.2004, *Eren 280/4 & Çinbilgel* (AKDU); Beydağları, Pozan D. above Dereköy, 1650 m, rocky slopes, limestone, 4.6.2004, *Eren 66/4 & Taylan* (AKDU). (ed.)

Hypericaceae

Hypericum saxifragum subsp. ***eglandulosum*** Parolly & Eren, **subsp. nov.**

Holotype: Turkey, C3 Antalya, W Antalya, Antalya - Saklıkent road, 300 m, vertical limestone cliffs, E-exp., 15.9.2004, *Ulrich 4/28* (herb. Parolly).

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A subspecie typica sepalis, bracteis et bracteolis eglandulosis differt.

In 1995 Robert Ulrich, Tübingen, collected a *Hypericum* specimen along the Antalya - Saklıkent road which could not be named with the help of Flora of Turkey (Robson in Davis 1967: 355-401 and Davis & al. 1988: 96-103, Dönmez in Güner & al. 2000: 71-72). Later, Norman Robson identified it as *H. saxifragum* Robson & Hub.-Mor. Apart from somewhat narrower leaves, it mainly differs by the absence of black glands along the margins of the sepals, bracteoles and bracts from the type collection and second collection *(Davis 25740)* from the same locality (Kizalçal D.). New gatherings in 2004 of glandular and eglandular plants confirmed that the latter belong to a distinct, geographically and altitudinally isolated population (subsp. *eglandulosum*) on limestone rocks of the Mediterranean foothills of the eastern Beydağları (280-750 m). In contrast, the glandular populations (subsp. *saxifragum*) adorn montane cliffs at (800) 1100-1500 further inland.

The specimens cited below also show that the species is more variable than its description in Flora of Turkey (Robson in Davis 1967: 385), based on a limited material, suggested. *Hypericum saxifragum* is a late-flowering chasmophyte, growing as a partly pulvinate shrublet with prostrate or pendent stems up to 12 cm long (to 6 cm according to Flora of Turkey), leaves up to 6 mm (3-4 mm), up to 6-8-flowered inflorescences (1-3) and petals 5-7 mm long (4-5 mm). The leaf shape ranges from narrowly oblong (type locality, Korkuteli) to very narrowly elliptic, so that little more than midrib is visible beneath (Antalya - Saklıkent population and *Ulrich 4/11* from Kremna); the leaf form is modified by the site conditions (narrower leaves at sunnier places).

Hypericum saxifragum tolerates a wide range of limestone rock habitats, including shady, humid overhanging rocks and sunny cliffs. At shady places round Kremna (subsp. *saxifragum*) the following few associated species were noted: *Adiantum capillus-veneris* L., *Asplenium lepidum* subsp. *haussknechtii* (God. & Reut.) Brownsey, *Campanula cymbalaria* Sm. and *Stachys pinardii* Boiss. Along the Antalya - Saklıkent road (subsp. *eglandulosum*) only *Adiantum capillus-veneris* was found. On sun-drenched rocks, *H. saxifragum* tends to form dense, often monospecific stands or it grows together with the xerophytic *Stachys aleurites* Boiss. & Heldr. at the sites of subsp. *eglandulosum*.

Subspecific rank seems appropriate for the eglandular population of *Hypericum saxifragum;* those individuals also have the typical coumarin smell of the species, a feature also apparent on old herbarium specimens. The collections from Kremna slightly extend the range of the species, which was hitherto only known from the Antalya vilayet.

Paratypes. – TURKEY: C3 ANTALYA: Richtung Saklıkent (W Antalya), 280 m, senkrechte Kalkfelsen, E-exp., 30.8.1995, *Ulrich* (BM); ibid., 750 m, SW-exp., 15.9.2004, *Ulrich 4/28a* (B).

Specimens of subsp. saxifragum seen. – TURKEY: C3 ANTALYA: Korkuteli - Elmalı arası, kalkerlik yamaç, 800-1300 m, 7.7.1968, *Quézel & Pamukçuoğlu* (HUB); Korkuteli, Korkuteli - Elmalı yolu 16 km, *Juniperus excelsa* ormanı, kaya üzeri, 1400-1500 m, 24.8.1993, *Duman & al. 5311* (GAZI); etwa 3 km S Korkuteli in Richtung Elmalı, 1190 m, Kalkfelsen, E-exp., 26.4.2004, *Ulrich 4/10* (sterile, herb. Parolly). – C3 BURDUR: E Bucak, nahe Kremna, 1100 m, steile Kalkfelsen, N-exp., 25.4.2004, *Ulrich 4/11* (sterile, herb. Parolly); ibid., 1190 m, 14.9.2004, *Ulrich 4/27* (herb. Parolly). (ed.)

Scrophulariaceae

Verbascum rupicola (Hayek & Siehe) Hub.-Mor.

Verbascum rupicola was hitherto only known from the type gathering of June 1912 and considered to be a very local endemic of the Konya vilayet (Huber-Morath in Davis 1978: 486). All recent attempts to recollect this little known species at its type locality failed over three years (F. Karavelioğulları, Ankara, pers. comm.), contributing to the view that the type locality near Koraș (the label on the type at E has "Cilic. Taurus beim Übergange nach Korash", Ian Hedge in litt. to the first editor) was wrongly or imprecisely indicated in the protologue. During field studies around İzmir, *V. rupicola* was surprisingly collected from Gümüldür where it grows in a small population comprising 30-40 individuals, on siliceous rocks at an altitude of 180-200 m (2000 m

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for the type!). This record extends the distribution range of the taxon considerably to the west. The IUCN threat category suggested by Ekim & al. (2000) now can be changed from "DD" to "CR" according to the IUCN threat category (2001). At the new locality, *V. rupicola* flowers from February to June. The plants vary in size from 15-40 cm more than indicated by Huber-Morath (in Davis 1978: 486, see here for a general description of the plant); mature capsules were measured at 3-4 × 3-3.5 mm.

TURKEY: B1 IZMIR: Gümüldür, Tahtalı barajı yakını, 180-200 m, silisli kayalar, 20.5.2003, *Şenol 3025* (AYDN, EGE, GAZI). S. G. Şenol

Valerianaceae

Valeriana oligantha Boiss. & Bal.

The local populations of *Valeriana oligantha* on Çamdağı in the Barladağı massif can provide problems in identification (see the key by Richardson in Davis 1972: 552, lead 10). They display fairly stout plants with (3-)5-7-lobed basal leaves *(Eren & Parolly 7714),* not (1-)3(-5)-lobed as indicated by Richardson (l.c.: 553-554). Typical individuals can be observed on the neighbouring Pisidian mountains, where *V. oligantha* is endemic. In all other respects, the plants of on Çamdağı perfectly match those of the type locality.

TURKEY: C3 ISPARTA/KONYA: Dedegöl Da., Dipoyraz (Dedegöl) D. (ascent from Yenişarbademli), area above the large cirque below the main summit, 37°42'N, 31°19'E, 2550-2650 m, limestone and dolomite, shady cliffs and screes close to snow-fields, 16.7.1999, *Parolly & al.* (B, herb. Parolly); Davras Da., Büyük Davras D. [ascent from the Kır Y.], N-facing cirque and summit region above the yayla, i.e. the main ridge between Oğlaktaşı T. and Ulparçukur T. [= main summit, 2635 m], 37°45''77''N, 30°44'64''E; 2450-2550 m, limestone and dolomite, shady rock crevices and cliffs (Silenetalia odontopetalae), 28.6.2000, *Eren & Parolly 7652* (B, herb. Parolly); Barla D., Boyalı to Çamdağı, 1800-2000 m, shady rocks in a ravine, mountain forests *(Cedrus libani*, *Pinus nigra* var. *caramanica, Juniperus excelsa),* dolomite, 30.6.2000, *Eren & Parolly 7714* (herb. Parolly). (ed.)

Violaceae

Viola dirimliensis Blaxland

Two annual violets of *Viola* sect. *Melanium* DC. were recorded from more or less the same narrow serpentine range in SW Anatolia and published within a short period in 2004: *V. rauliniana* Erben as new for Turkey (Eren & al. 2004b) and *V. dirimliensis* Blaxland as new for science (Blaxland 2004). Their conspecifity became obvious by cross-checking *Eren & Şirin 4738* with the protologue of the new species, which surprisingly did not compare the new plant with *V. rauliniana,* but with *V. mercurii* Orph. ex Hal., *V. modesta* Fenzl and *V. parvula* Tin.

Although we noted some differences between the Anatolian plant and *Viola rauliniana* known only from Crete and Cyprus, we hesitated to describe a new taxon based on our scrappy material and without knowing its chromosome number, which is considered as essential in annual violets. The strikingly golden colour of the flowers was attributed to the impact of the substrate (Eren & al. 2004b), as was the purplish colour of the leaves. Even after having brought the plant into cultivation on garden mould, the tiny violet is, especially in vegetative respects, a good match for *V. rauliniana,* but deviates, among other characters, in the shape and size of the lower petal. The colouring of the plants is partly due to the substrate; the leaves of the cultivated plants exhibit an only weak purplish hue, while the flowers show all shades of yellow. Nevertheless, bright golden yellow flowering individuals prevail. The indumentum, too, approaches that of *V. rauliniana,* although less than 15 % of all specimens (B; Crete and Cyprus) seen do have such a long and dense indumentum as *V. dirimliensis*.

However, our chromosome count of $2n = 8$ (Fig. 4) in root-tips of plants raised from *Eren & Şirin 4738* (cytological standard techniques follow the protocol by Vogt & Oberprieler 1993) places both plants widely apart and confirms the independent status of *Viola dirimliensis* (Fig. 3,

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Fig. 3. *Viola dirimliensis* – cultivated plants raised from *Eren & Şirin 4738* (herb. Parolly).

for colour photographs see the electronic supplement). This number is also new for the genus and fills the single gap in the descending aneuploid series from x = 11 to x = 2 in *V.* sect. *Melanium* (Erben 1996). *V. rauliniana* has 2*n* = 36 (Erben 1985), and thus must be deleted from the flora of Turkey. The Turkish plant can neither be seen as a putative subspecies of *V. rauliniana,* as was our hypothesis for some time, nor is it close to *V. mercurii,* endemic to the eastern Peloponnisos, which is clearly distinct from *V. dirimliensis* in many morphological characters and 2*n* = 10, as has *V. parvula*.

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Judging from chromosome numbers and biogeography, at the moment only two convincing putative, substrate-vicarious allies remain: The first is the Irano-Anatolian *Viola modesta* s.l. with westernmost stands around İçel (Coode & Cullen in Davis 1965: 530), for which Erben (1996) counted $2n = 4$. The second is the Anatolian *V. heldreichiana* with $2n = 16$, which partly occurs sympatrically with *V. dirimliensis* (Cretan and Cypriot occurrences of *V. heldreichiana* were rightly split off under the name *V. rauliniana,* thus making *V. heldreichiana* endemic to Turkey). *V. dirimliensis* seems to be rather frequent in the ophiolite areas of the W Taurus (see records and observations below). It flowers very early in the year and is therefore easily overlooked.



Fig. 4. *Viola dirimliensis,* metaphases of root-tip mitoses, $2n = 8$ (from *Eren & Şirin 473*). – Scale bar = 10 µm.

C2 Antalya: Between Korkuteli and Fethiye, Kayabaşı, ascent from Kayabaşı village to summit of Ziyaret T., 1520 m, barren serpentine rock, 22.4.2002, *Eren & Şirin 4738* (AKDU, B, herb. Parolly); ibid., 9.1.2005, cult. material of *Eren & Şirin 4738* (herb. Parolly); ibid., 1500 m, 12.5.2003, *Eren 57/03 & Şirin* (fruiting, AKDU); between Söğüt and Bekçiler, barren serpentine rock, 1270 m, 8.5.2004, *Eren 22/04 & Şirin* (AKDU); between Söğüt and Acıpayam, barren serpentine rock, c. 1250 m, 30.4.2005, *Eren* (photograph). G. Parolly, Ö. Eren, B. Nordt, E. von Raab-Straube & Th. Raus

Monocotyledoneae

Alliaceae

Allium cyrilli Ten.

= *Allium elmaliense* I. G. Deniz & Sümbül in Ann. Bot. Fenn. 41: 147. 2004, **syn. nov.**

Allium elmaliense was described as a local endemic from the *Cedrus* Research Forest near Elmalı in the W Taurus (Deniz & Sümbül 2004) and said to be related to *A. cyrilli, A. orientale* Boiss. and *A. asclepiadeum* Bornm. Detailed studies on type specimens, new gatherings, as well as the specimens of *A. cyrilli* kept at B revealed that *A. elmaliense* is conspecific with the widespread *A. cyrilli* due to the complete overlap of the diagnostic characters. The quantitative characters and the field observations of the first author suggest *A. elmaliense* to be a mere habitat modification, representing an extreme, depauperate form that develops on stony ground with reduced nutrient supply. Moreover, all qualitative characters (seeds rugose in *A. elmaliense* versus smooth in *A. cyrilli;* outer bulb tunics papery and brownish-black versus membranous and black; leaf margin undulate versus plane) break down, when considering a wider range of material. It became evident that a black versus green ovary at flowering time is much too variable to serve as a reliable character. As in *A. orientale,* both character states can occur within the same population of *A. cyrilli* (pers. obs. Özkan Eren; see also *Sintenis 4442,* which in addition includes individuals with undulate leaves). In sum, *A. cyrilli* is variable in all its diagnostic characters and connected to the taxon cited in synonymy by intermediate forms *(Eren 100/4, Sintenis 4442)*.

Turkey: A4 Kastamonu: Tossia, Giaurdagh (Gavur D.), 10.6.1892, *Sintenis 4242* (B). – A7 Gümüşhane: Sanschak Gümüschhane, in montos. prob. pag. Monastir, 5.6.1894, *Sintenis 5821* (B). – C2/3 Antalya: Elmalı, entering road of *Cedrus* Research Forest, openings in *Juniperus excelsa* and *Quercus coccifera* forests, 1150 m, 30.4.2001, *Deniz 1254* (holotype of *A. elma-*

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liense, AKDU); ibid., 16.5.2003, *Deniz 2309* (paratype of *A. elmaliense,* AKDU); Pozan D., ascending to Pozan D. from Dereköy, damp place with fine soil, 1875 m, 6.6.2004, *Eren 100/4* (AKDU); Korkuteli, between Korkuteli and Antalya, field margin, c. 900 m, 3.6.2005, *Eren 127/05* (AKDU). Ö. Eren, G. Parolly & Th. Raus

Poaceae

Alopecurus aucheri Boiss.

The new gatherings of this Irano-Anatolian element of hygrophytic vegetation, previously known from Caucasia, Transcaspia, Iran and E Turkey (Doğan in Davis & al. 1985: 380-381), represent the westernmost, isolated station of its occurrence. Such a range extension into the Mediterranean territories seems surprising, but reflects how poorly explored the grass flora of Turkey really is. All records come from bottoms of dolines in the eastern Beydağları, W Taurus, where *Alopecurus aucheri* is associated to a Trifolio-Polygonetalia community developed over limestone. The sites indicated in Flora of Turkey (Doğan, l.c.) outlined a wide range of different geological substrates, including igneous and siliceous rocks.

TURKEY: C3 ANTALYA: Beydağları, Tahtalı D., 2000 m, damp place in doline (Trifolio-Polygonetalia), 10.6.2001, *Eren 4425 & Şirin* (AKDU); ibid., 2200 m, 21.6.2001, *Eren 4861 & Şirin (*AKDU); Çalbalı D., damp place, 1850 m, 10.7.2003, *Eren 5379 & Şirin* (AKDU).
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Alopecurus davisii Bor

This is an obvious Aegean element with only one substantiated locality in mainland Anatolia (İzmir, Nif D. above Kemalpaşa, see Doğan in Davis & al. 1985: 381). The new record, below, indicates its radiation into the Lycian Taurus.

TURKEY: C3 ANTALYA: Beydağları, Çalbalı D., c. 2300 m, rocky place with Drabo-Androsacetalia vegetation, 5.7.2003, *Eren 5377* (AKDU). Ö. Eren, G. Parolly & H. Scholz

Alopecurus gerardii var. ***cassius*** (Boiss.) M. Doğan

So far believed to be an endemic taxon of the Amanos Da. in C5/C6 Hatay (Doğan in Davis & al. 1985: 380), a record from Kartal D., forming the north-western summit range of the Beydağları, extends its range far to the west.

TURKEY: C3 ANTALYA: Beydağları, Kartal D., 1800-2000 m, rocky slopes, limestone, thorn-cushion and dwarf shrub communities (Astragalo-Brometalia), 3.7.2004, *Eren 169/4 & Taylan* (AKDU). Ö. Eren, G. Parolly & H. Scholz

Elytrigia erosiglumis (Melderis) Valdés & H. Scholz
≡ *Elymus erosiglumis* Melderis

Hitherto known as endemic to E Anatolia (Melderis in Davis & al. 1985: 217), the new record widens the known range of the species considerably to the west. In the western Taurus it occurs sporadically in an open thorn-cushion community of the Astragalo-Brometalia in the oreal / lower subalpine belt of Tahtalı D.

TURKEY: C3 ANTALYA: Beydağları, Tahtalı D. above Çukuryayla, 1800-1950 m, rocky slopes, limestone, thorn-cushion and dwarf shrub communities, 30.7.2004, *Eren 361/4 & Taylan* (AKDU). Ö. Eren, G. Parolly & H. Scholz

Poa pseudobulbosa Bor.

This species was considered to be a local endemic of the Geyik Da. in the Isaurian part of the Central Taurus and only known from a few collections (Edmondson in Davis & al. 1985: 484). The gathering below is from the W Taurus.

TURKEY: C3 ANTALYA: Özdemir D., 1820 m, rocky place, 5.7.2004, *Eren & Taylan* (AKDU).
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Secale leptorhachis H. Scholz & Parolly

This recently described species had a single locality (Bakırlı D.) in the eastern Beydağları in the western Taurus, were it was recorded only once at an elevation of 1800 m in a open, secondary thorn-cushion community (Parolly & Scholz 2004). The gatherings, below, add further three localities, all in the Beydağları, and show that this taxon is much more there abundant than assumed. The habitat preferences of *Secale leptorhachis* given in the protologue are confirmed.

TURKEY: C3 ANTALYA: Beydağları, Özdemir D., 1780 m, limestone, thorn-cushion community, 26.6.2003, *Eren 5107 & Şirin* (AKDU); Teke D. above Belen Y., 1800-1900 m, limestone, thorn-cushion community, 30.7.2004, *Eren 344a/4 & Taylan* (AKDU); Pozan D., 1970 m, limestone, thorn-cushion community, 15.7.2005, *Eren 173/5 & Çinbilgel* (AKDU).

Ö. Eren, G. Parolly & H. Scholz

Zingeria trichopoda (Boiss.) P. Smirn.

≡ *Z. biebersteiniana* (Claus) P. Smirn. subsp. *trichopoda* (Boiss.) R. R. Mill

Known to occur mainly in Inner and E Anatolia, rarely in the Central Taurus (Doğan & Mill in Davis & al. 1985: 364-365), the following gatherings are the first records for the W Taurus.

TURKEY: C2 ANTALYA: Elmalı, Elmalı Sedir Araştırma Ormanı, Çamkuyu, 1660 m, doline, 4.7.2004, *Eren 172a/4 & Taylan* (AKDU). – C3 ANTALYA: Beydağları, Pozan D., 1700 m, doline, 3.7.2004, *Eren 147/4 & Taylan* (AKDU). Ö. Eren, G. Parolly & H. Scholz

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