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A NEW TURKISH SPECIES OF *COLCHICUM* (*COLCHICACEAE*) RELATED TO *C. BOISSIERI*

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A new species, *Colchicum chlorobasis* (*Colchicaceae*), endemic to S Turkey, is described. The species is related to *C. boissieri* but differs mainly in having a larger, more rounded corm with only short lobes, browner more evanescent tunics projecting along the cataphyll, and more leaves. Both have greenish filament bases. Comparisons are also made with *C. sieheanum* and *C. baytopiorum*. A key and illustrations are provided to distinguish these four species, and their distribution is shown on a map. Chromosome numbers have been determined for *C. chlorobasis*, *C. boissieri* and *C. baytopiorum*.

Keywords. Chromosome numbers, *Colchicum*, new species, Turkey.

INTRODUCTION

Brickell (1984) in the *Flora of Turkey* vol. 8 recorded 26 certain and 5 'imperfectly known' species in the genera *Colchicum* L. and *Merendera* Ramond (considered congeneric by the present author) for Turkey and the East Aegean Islands. The genus was amended by Persson (2001a) in the second supplement of the Flora (vol. 11) with the addition of a number of taxa described or revised since 1984 (Persson, 1992, 1993, 1998, 1999a, 1999b; Brickell, 1998). Another new species was added after the publication of the supplement (Persson, 2001b). The genus *Colchicum* s.l. in Turkey and the East Aegean now comprises 41 species, including the species newly described below.

MATERIALS AND METHODS

The species was collected as corms in the wild by E. Pasche and H. Kerndorff, and then cultivated in the greenhouses of the Göteborg Botanical Garden.

As wild-collected herbarium material was scarce, measurements and other features in the description were also taken from cultivated material, characters from the latter being assessed on the basis of wide experience of both types of material in this genus. Colour of anthers refers to the condition before dehiscence; size of anthers and length of styles to the condition after anther dehiscence.

The chromosome counts were made on root-tips pretreated in iced water overnight, then fixed in Carnoy's solution and stained in acetic orcein.

Chorological concepts are based mainly on Davis (1971) and Fischer & Fischer (1981).

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Description

Colchicum chlorobasis K.Perss., **sp. nov. Figs 1, 2A–C, 3.**
In statu florenti habitu et basi filamentorum viridi cum *C. boissieri* optimo congruens, sed cormo ± ovoideo vel subgloboso uni- vel bilobo, tunicis in collum longius productis et secus cataphyllum procurrentibus; ab eo foliis usque ad 5 (nec 3) etiam differt.
Type: Turkey, Konya, SW of Sorkun (WSW of Bozkir), 1730m, on limestone with *Juniperus*, *Berberis*, *Acantholimon*, *Astragalus*, and *Cyclamen cilicium*, 1 x 1996, *Kerndorff & Pasche* 96-09 (holo. GB).

Corm irregular in shape, ± obliquely ovoid to rounded, c.2–3 × 1.5–2cm, with 1 or 2 short lobes; tunics membranous, ± evanescent, glossy light reddish-brown or light brown, projecting along cataphyll into an often rather long, ± split neck c.2–6cm long. *Cataphyll* yellow-white often purplish at mouth, c.8–11cm long. *Leaves* 4–5 (–6), developing to within a short distance of the cataphyll apex at flowering and appearing above ground as flowers fade, erecto-patent, linear, 8–13 × 0.7–1cm, shallowly channelled with distinct mid-vein, matt deep green, glabrous, ± obtuse to emarginate at apex. *Flowers* 1 or 2; perianth tube entire, yellowish-white, ± furrowed, exceeding the cataphyll (i.e. partly above ground) by 2–5(–7)cm; limb ± funnel-shaped, often opening widely in sun; segments 3.5–5 × 0.7–1(–1.3)cm, outer series often distinctly longer than inner, firm, bright rosy-lilac but mostly white at base, linear-oblong to narrowly oblanceolate, subobtuse to retuse, with rather distinct veins; median furrow glabrous, bordered by low but distinct ridges parallel to the stamen and often extending towards apex of tepal. *Stamens* generally borne in tube a few mm below fusion of segments, outer series 2–2.3cm long, inner 2.1–2.5cm, filaments white with slightly widened greenish base; anthers versatile, 5–9mm, yellow, pollen lemon-yellow to golden-yellow; grains bean-shaped, 2-foraminate. *Styles* equalling to slightly overtopping stamens, white; stigmas terminal, punctiform. *Capsules* ellipsoid, usually subterranean.

Chromosome number. $2n = 54$ (holotype).

Distribution and habitat. Endemic to Turkey (Fig. 5). In open scrub with junipers and various thorny cushion plants, on limestone; c.1000–1750m. East-Mediterranean element (Taurus district).

Flowering time. September–October, without leaves.

Other specimen seen. Turkey. Near Bozkir (Beyşehir–Karaman road), 1050m, stony ground, clearings in juniper scrub, 3 x 1960, *Guichard* T175/60 (K).

Similar species

When found, this species was first thought to be *Colchicum sieheanum* Hausskn. ex Stef. (Figs 2D, 4) on account of its partially soboliferous corm with tooth-like

FIG. 1. Holotype of *Colchicum chlorobasis* K.Perss. (*Kerndorff & Pasche* 96-09, GB).

FIG. 2. A–C: *Colchicum chlorobasis* K.Perss.: A & B, flowering plant; C, detail of flower, note green filament bases (all *Kerndorff & Pasche* 96-09). D: *Colchicum sieheanum* Hausskn. ex Stef. from type locality (*T. Baytop* ISTE 52543). (Photographs: A & B, *E. Pasche*; C, *J. Persson*; D, *T. Baytop*.)

projections. However, above ground, *C. chlorobasis* is most reminiscent of the distinctly soboliferous *C. boissieri* Orph. Both have green filament bases, and similar flower colour and leaf shape. Also, they have the same chromosome number, $2n = 54$ (the count for *C. boissieri* was made on numerous collections from Greece and Turkey; see list of specimens examined). Apart from having corms with long, narrow horizontal soboles at flowering time (note that newly developed corms in early leaf are short and $\pm$ rounded!), *C. boissieri* differs in regularly having only three leaves, appearing some time (often shortly) after flowering; the tunics are more persistent, more yellow-brown, and hardly project along the cataphyll, and the flower segments have filament channels bordered by distinct lamellae, which are short and broad on

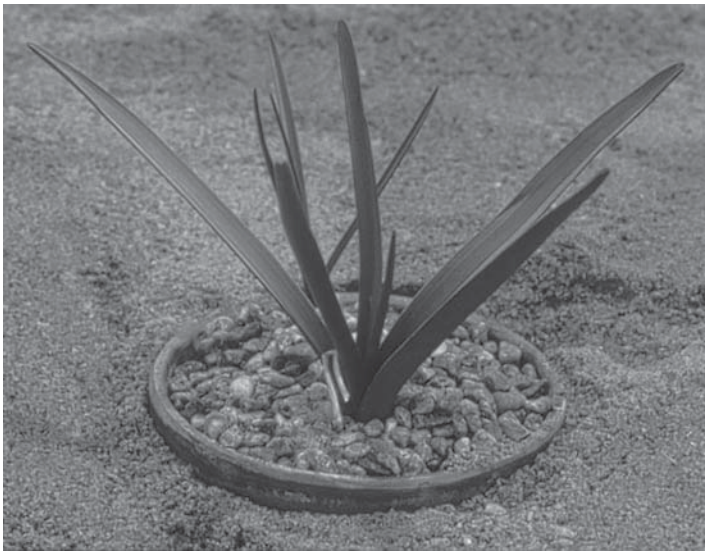

FIG. 3. *Colchicum chlorobasis* K.Perss. Leaves, in cultivation (*Kerndorff & Pasche* 96-09).

outer segments, long, narrow and frequently toothed on inner ones. *Colchicum boissieri* is common in Greece (southern mainland northwards to S Pindos, and Evvia, Chios and Samos), and also occurs in W and SW Anatolia in an area well separated from that of *C. chlorobasis* (Fig. 5).

Colchicum sieheanum was collected by Siehe in the province of Içel, near Fındıkpınar, named by Haussknecht *in sched.* (nomen nudum) and later validated by Stefanov (1926). Two original collections exist: *Siehe* Fl. Orientalis 92 (see Fig. 4) and *Siehe* s.n., x–xi 1900. Dissection of the flowering specimens revealed three leaves developed within the cataphyll, reaching up to 16mm below its mouth. The species was collected again and photographed by Baytop (1987) above Fındıkpınar at 1400m (ISTE 52543). Baytop's photographs, three of which have been seen, including Fig. 2D (see also Mathew & Baytop, 1984, pl. 77), confirm his determination. Plants were then cultivated in Istanbul, and Baytop (1987) reported it to have 3 or 4 narrow leaves 2–6mm wide. Living material was also sent to Kew, pressed and incorporated in their herbarium. The Kew specimen has three leaves projecting just above the spathe. The species had, however, been in cultivation long before (Irving, 1903), and had also then been observed to have $\pm$ subsynanthous leaves: 'Under the name of *C. sieheanum* corms were received this year from Mr. W. Siehe of Mersina . . . produces flowers and leaves at the same time, it began to flower at the end of November' (Irving, op. cit.). As leaves in *Colchicum* often appear earlier in cultivation than in nature, especially in late-flowering species, *C. sieheanum*, as judged from herbarium material and photographs, is perhaps best characterized as having subhysteranthous leaves. Stefanov (1926) describes it as hysteranthous.

FIG. 4. *Colchicum sieheanum* Hausskn. ex Stef. (*Siehe* 92, iso. JE).

Both Irving (1903) and Hayek (1914) compared *C. sieheanum* to *C. arenarium* Waldst. & Kit., a Central European species of slender habit, and flowers of a rich rose-purplish hue, the latter claiming that he could hardly see any differences between the two species. The comparison is rather far-fetched but probably derives from certain similarities in flower shape and colour. Later, Brickell (1983) considered *C. boissieri* as the nearest relative on account of 'great similarities in the characters of stigmas, anthers, perianth segments and corm tunics'. I have seen no living material, but my impressions of the species as seen in the herbarium and in photographs, taken together with Irving's description (1903) and Hayek's note (1914), lead me to recognize *C. sieheanum* as a distinct species, perhaps more similar to *C. baytopiorum* C.D.Brickell than to *C. boissieri* and *C. chlorobasis*. The cultivated specimen of *C. sieheanum* at Kew is reminiscent of a young plant of *C. baytopiorum*. *Colchicum sieheanum* and *C. baytopiorum* are characterized by only a slight tendency to soboliferous corm growths, as in *C. chlorobasis*, but compared with both *C. chlorobasis* and *C. boissieri* they have more slender flower tubes, and more narrowly funnel-shaped perianth limbs of a thinner texture and more intense colour (deeper, it seems, in *C. sieheanum* than in *C. baytopiorum*). In both *C. sieheanum* and *C. baytopiorum* the anthers are thinner, and the filament bases are yellow, not green; *C. sieheanum* also has darker tunics than either of the other species. The mature lanceolate, $\pm$ recurved leaves of *C. baytopiorum* are of course very different from *C. boissieri*, *C. chlorobasis* and seemingly *C. sieheanum* (Table 1). Whereas *C. sieheanum* is so far

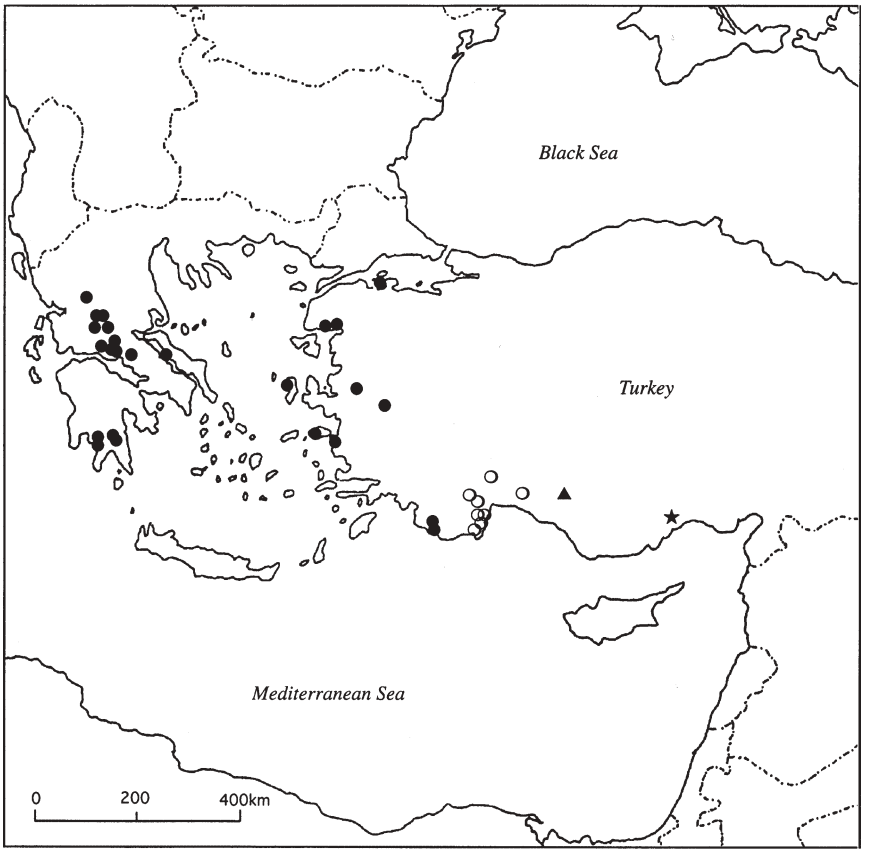

FIG. 5. Distribution of *Colchicum chlorobasis* K.Perss. (▲), *C. boissieri* Orph. (●), *C. sieheanum* Hausskn. ex Stef. (★) and *C. baytopiorum* C.D.Brickell (○).

known only from a small area in Cilicia, *C. baytopiorum* has its main distribution in the province of Antalya (Fig. 5). Thus, all of the four species discussed above occur in ± widely separate areas.

The chromosome number of *C. sieheanum* is still unknown, whereas *C. baytopiorum* has been found to have $2n = 50$ (pers. obs.; see specimen list below). The report of $2n = 46$ for *C. baytopiorum* (Küçüker & Çelebioğlu, 1986) is probably erroneous; *Colchicum* is a notoriously difficult subject for cytological studies.

All four species discussed grow on ± stony ground, mostly on limestone. *Colchicum chlorobasis* is found in open low scrub; *C. boissieri* occurs on turfy mountain slopes or in open coniferous or sometimes deciduous forests; *C. baytopiorum* is a plant of deep rich terra rossa mainly in rather shady habitats such as macchie, light woodland and rocky ravines, and *C. sieheanum* likewise grows in deep red loam but in open pine forest, presumably a habitat somewhat similar to that of many *C. boissieri* localities.

TABLE 1. Morphological characters compared in *C. chlorobasis*, *C. boissieri*, *C. sieheanum* and *C. baytopiorum*

Character	*C. chlorobasis*	*C. boissieri*	*C. sieheanum*	*C. baytopiorum*
Corm	Ovoid to rounded; 1–2 short wide lobes	Soboliferous; long horizontal soboles	Ovoid to rounded; 1–2 tooth-like lobes	Ovoid to rounded; 1–2 short wide lobes
Tunic	Thin and evanescent, glossy light reddish-brown to light brown	Thin but persistent, yellow-brown	Thin and ± evanescent, mid-brown	Thin and evanescent, light reddish-brown to light brown
Tunic neck	2–6cm long	None	1.5–5cm long	None
Leaf number	4–5(–6)	3	3–4	3
Leaf shape and attitude	Linear (0.7–1cm wide), erecto-patent	Linear (0.4–1.2cm wide), erecto-patent	Linear (0.2–0.6cm wide?)	Lanceolate (1.5–4.5cm wide), recurving
Leaf development	Subhysteranthous	Hysteranthous but early	Subhysteranthous	Subsynanthous or synanthous
Perianth tube	Stout, firm, mostly yellow-white	Stout, firm, mostly yellow-white	Slender, ± purplish	Slender, often ± purplish
Perianth limb	Funnel-shaped	Funnel-shaped to narrowly campanulate	Narrowly funnel-shaped	Narrowly funnel-shaped
Limb colour	Bright rosy-lilac, base mostly white	Bright rosy-lilac, base often white	Rich violet-purple, concolorous or with small pale or white base	Pinkish-purple, concolorous or with small pale or white base
Limb segments	Firm, linear-oblong to narrowly oblanceolate	Firm, mostly ± oblanceolate	Thin, linear-oblong to narrowly oblong-oblanceolate	Thin, linear-oblong to narrowly oblong-oblanceolate
Filaments	Stout, firm	Stout, firm	Filiform	Filiform
Filament base	Green	Green	Yellow	Yellow
Anthers	Yellow; thecae narrowly oblong	Yellow; thecae narrowly oblong	Yellow; thecae filiform to narrowly oblong	Mostly lemon yellow; thecae filiform with a wide connective
Capsules	Mostly ± subterranean	Mostly ± subterranean	Unknown	Above ground

Key to the species discussed

1a. Corm soboliferous with long, narrow, ± horizontal soboles _____ **C. boissieri**
1b. Corm ovoid to rounded with 1–2 short tooth-like or cone-shaped lobes _____ 2

2a. Leaves lanceolate (1.5–4.5cm wide), subsynanthous or synanthous _____ **C. baytopiorum**
2b. Leaves linear (to 1.2cm wide), hysteranthous or subhysteranthous _____ 3

3a. Flower tube stout, usually yellow-white; limb funnel-shaped, segments bright rosy-lilac with conspicuous white base; filament bases green _____ **C. chlorobasis**
3b. Flower tube slender, ± purplish; limb narrowly funnel-shaped, segments deep violet-purple, concolorous or with small pale base; filament bases yellow _____ **C. sieheanum**

Colchicum boissieri Orph., Atti Congr. Bot. Firenze 1874: 29 (nomen), 30–31 (descr.) (1836).
Type: Greece, Peloponnisos, Messinia: Kalamata: Taygetus Peloponnesi, 1871, *Orphanides* 4016 p.p. (G-Boiss, lectotype, selected here). Note: Only the flowering material on 4016 is designated as lectotype; the leaves belong to *C. psaridis* Heldr. (4016 *bis* has material of *C. psaridis* in flower).
Syn.: *C. procurrens* Baker, Gard. Chron. ser. 3, 7: 192 (1890).
C. pinatziorum Rech.f., Bot. Jahrb. Syst. 80: 433 (1961).

Chromosome number. $2n = 54$ (for collections counted, see list of specimens below).

Distribution and habitat. S and C Greece, W Anatolia. Stony places and turf on mountain slopes, *Quercus* and *Juniperus* scrub, *Abies*, *Cedrus* and *Pinus* forest; on limestone; 400–1800m.

Colchicum sieheanum Hausskn. ex Stef., Sborn. Balg. Akad. Nauk. Sofiya 22: 47 (1926).
Type: Turkey, Içel: Bei Fundukbunar, obere Waldregion, 1400m, *Siehe* Fl. Orientalis 92 (holo. B; iso. JE, LE, W).

Chromosome number. Unknown.

Distribution and habitat. S Anatolia (Cilicia). Pine forest in terra rossa; on limestone; 1000–1400m.

Colchicum baytopiorum C.D.Brickell, Notes Roy. Bot. Gard. Edinburgh 41: 49 (1983).
Type: Turkey, Antalya: Termessos, macchie, 550m, 7 xi 1976, *T. Baytop* ISTE 36255 (holo. ISTE).

Chromosome number. $2n = 50$ (for collections counted, see list of specimens below).

Distribution and habitat. SW Anatolia. Moist and shady places on stony or rocky ground in macchie, light woodland under *Pinus* or *Quercus*, steep N-exposed rocksides in deep soil; on limestone; 50–1500m.

Selection of other specimens seen

Chromosome numbers were determined on cultivated material from collections marked by an asterisk.

C. boissieri Orph.

Greece. Peloponnisos. Messinia: Kalamata: Taygetos, regio super., 5000 ped., ix–x 1870 et 1871, *Orphanides* 585 (G-Boiss); In regione mediam. Taygeti, probabiliter in declivibus occidentalis prope pagum Gaïza, 3500–4000 ped., ix–x 1871, *Psarides* in *Heldreich* Herb. Graec. Norm. 981 (B, BM, E, FI, G, JE, K, LD, M, MPU, P, S, UPS, W). Lakonia: Lakedemona: Messini to Pilia, Langada, 55km from Kalamata to Sparti, 1100m, 26–28 x 1950, *Goulimis* 14941 (ATH); Kallithea to Polidroso, 3km N of the road to Agriani, grazed meadows, 1100m, *K. Persson* 416* (GB). Arkadia: Kinouria: Mt. Parnon, Gaïdanorrachi, gravelly slope, 1600m, 17 ix 1974, *K. Persson* 249* (GB). – Sterea Ellada. Fokida: Parnassida: Mt. Parnassos, 1700m, 29 x 1977, *Sønderhousen* 521* (GB); Mt. Giona, mountain road leading to Karoute, grassy slopes, 1200m, 27 ix 1974, *K. Persson* 261* (LD); ibid., 8km NW of Amfissa, mountain plateau, on bare earth among grass tufts and *Daphne oleoides*, 1750m, 27 ix 1974, *K. Persson* 260* (C, GB); Mt. Vardousia, on the road from Pentagious to Artotina, 1100m, 25 x 1952, *Goulimis* 604 (K). Fthiotida: Fthiotida: Mt. Iti, above Kastanea, grassy slopes, 1400m, 28 ix 1974, *K. Persson* 263* (GB); Loutra Smokovou to Makrakomi, 7km before Tsouka, deciduous oak forest, gravelly ground, 800–850m, 7 xi 1987, *K. Persson* 457* (GB). Evritania: Evritania: Evvia: Chalkida: Près du sommet du mont Candyli, dans la forêt de *Abies cephalonica*, 1000m, 23 xi 1958, *Pinatzi* (W, holotype of *C. pinatziorum* Rech.f.). – Thessalia. Karditsa: Karditsa: Karava range, Mouzaki–Arta, W of Oxia NNE of the highest top, rocky ridge with grass, 1600m, 13 iii 1998, *J. & K. Persson* 9833 (GB). – Samos. Samos: Mt. Karvouni, 1km S of Profitis Ilias, limestone outcrop in burnt *Pinus nigra* woodland, 1050m, 5 vi 2003, *Strid* 54703 (GB). – Chios. Chios: N-slope of Mt. Pelineon above Vikion, mixed forest of mainly deciduous trees, 850–950m, *S. & B. Snogerup* 11044 (LD).

Turkey. Balıkesir: Kazdağı complex, Baba Dağ, S slopes above Altınoluk, mountain pine forest at tree line, limestone, 1500m, 21 ix 1966, *Watson et al.* 2352* (GB, K). Manisa: Manisa Da., under *Quercus* and *Juniperus*, 1300m, 9 x 1973, *T. Baytop* ISTE 26752 (ISTE). Izmir: Mountains in the neighbourhood of Smyrna, Fl. *Whittall*, Fol. Cult. in hort Kew. 1889 (K, holotype of *C. procurrens* Baker); Boz Dağ, shaley slopes along ridge of summit area, 1700m, 24 iv 1991, *K. Persson* 523* (GB). Aydın: Samsundağ, 400m, 13 x 1973, *T. Baytop* ISTE 26795 (ISTE). Antalya: Kaş to Elmalı, Sinekcibelı pass, pine forest, 1450m, 4 xi 1988, *K. Persson** (GB); 28km from Kasaba to Elmalı, moist grassy slopes in open *Pinus–Cedrus* forest, 1400m, 22 iv 1987, *K. Persson* 437* (GB).

C. sieheanum Hausskn. ex Stef.

Turkey. Fundukpunar, Region d. *P. Laricii*, in rothem Lehm zw. Kalkgestein, 1000m, Oct.–Anf. Nov. 1900, *Siehe* Fl. Orientalis Prov. Cilicia trachea (JE); De Fındıkpınar à Arslanköy, 1400m, 3 xi 1983, *T. Baytop* ISTE 52543 (ISTE, K).

C. baytopiorum C.D.Brickell

TURKEY. Burdur: 70km S of Isparta, 250m, 18 xi 1995, *Kerndorff & Pasche* 95-52* (GB). Antalya: 10km S of Korkuteli, 800m, 24 iv 1972, *Runemark & Wendelbo* cult. no. 44B* (GB); 10km E of Korkuteli, N-exposed limestone cliffs, 960m, 24 iv 1972, *Runemark & Wendelbo* 256* (GB); E of Korkuteli towards Antalya, among macchie of *Quercus*, *Arbutus* etc., 800m, 27 iv 1985, *J. & J. Archibald* 6009* (GB); Termessos, macchie, 900m, 26 x 1973, *Pasche* 73-04* (GB), 800–1000m, 11 x 1978, *Leep* 78/T40a* (GB), 900–1000m, 22 iv 1976, *Brickell* 1380* (GB, K); Çakırlar to Çınarı, 29km from Antalya–Burdur road, steep rocksides (limestone) in pockets and crevices, 1100m, 18 iv 1991, *K. Persson* 508* (GB); SW of Antalya, Belbidi, 25 iv 1972, *Runemark & Wendelbo* cult. no. 52C* (GB); W of Kemer in the Kesmeboğazı ravine, in macchie under *Pinus*, 175m, 1981, *Sønderhousen* 793* (GB); Antalya to Altınyaka, 25km off Antalya–Kemer road, below cliffs in deep soil under pines, 1000m, 3 xi 1988, *K. Persson* 470* (GB); Manavgat to Beşkonak, E of Altınkaya, 800m, 22 xi 1971, *Ayaşlıgil* ISTE 47970* (GB, ISTE).

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