A new winter-flowering species of *Colchicum* from Greece

Nový, v zimě kvetoucí druh rodu *Colchicum* z Řecka

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A new species, *Colchicum asteranthum* Vassil. et K. Perss. (*Colchicaceae*), endemic to the Peloponnese in Greece, is described. It is a small winter-flowering plant with synanthous leaves and soboliferous corms, the latter a rare feature in the genus. The species has no obvious relations, but it shows some affinity to the S Turkish endemic *C. minutum* K. Perss.

Keywords: *Colchicum*, *Colchicaceae*, Greece, Peloponnese, soboliferous corms, synanthous

Introduction

During a February excursion to the central mountains in the Peloponnese, one of us (D.V.) came across patches of an obviously vigorously reproducing, unknown species of *Colchicum*, which turned out to have soboliferous corms. Other visits to the locality earlier in the winter revealed the species to have its peak flowering season already in late December and January.

Material and methods

The species was studied and collected in the field by the authors. For further study these plants were cultivated in the Botanical Garden, Göteborg.

All measurements and other features in the description refer to wild material. Shape and size of leaves refer to mature basal leaves, colour of anthers 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 ice-water over night, then fixed in Carnoy solution and stained in acetic orceine.

Chorological concepts are based on Meusel et al. (1965), Fischer & Fischer (1981), Davis (1971), Hedge & Wendelbo (1978), Zohary (1971, 1973) and Léonard (1989).

Taxonomy

***Colchicum asteranthum* Vassil. et K. Perss., spec. nova** (Figs. 1–4)

Descriptio: Planta parvula cormo sobolifero; species habitu cum *C. minuto* optime congruens, sed differt foliis saepissime 4 crassioribus valde canaliculatis nervo medio supra latiore pallide viridi vix impresso;

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perianthii segmentis patentibus planiusculis relative latioribus ubique pallidissime lilacinis, basi interna lamellis binis in dentem lanceolatum abeuntibus.

Type: Greece, Peloponnese, Arkadia: Mandinia: Mt Lirkio, above Moni Ag. Nikolaou (W of Sanga, NNW of Pikerni), SW- to SE-facing slopes with stony terra rossa, 950–1450 m, 9. 01. 1999 (leaves collected 2. 4. 1996 & 28. 4. 1999),Vassiliades (holo- GB).

Corm soboliferous, central part small, at the most ca. 1 cm in diam., with ± horizontal, subterete, usually shoot-bearing lobes, 3–4.5 (–5) cm long, 3–5 (–8) mm thick; tunics membranous, delicate, light yellowish-brown to reddish-brown, neck very short or missing. Cataphyll often sinuous, thin, whitish occasionally with a vinaceous tip, (4–) 6–10 cm long. Leaves 4 (occasionally 3 or 5), synanthous, narrowly linear, thick, very strongly channelled, unkeeled, subobtuse, rather deep green, midvein proportionally thick and pale somewhat yellowish green; at anthesis extending ca. 1.5–4 cm from cataphyll, at least as long as flower tubes but not overtopping flowers, suberect to erecto-patent-arcuate, tips and margins often vinaceous; at maturity 8–15 cm × 2–5 mm, patent-arcuate often ± coiled in outer parts, margins sometimes slightly wavy, very narrowly cartilaginous, glabrous or scaberulous. Flowers 1–2, rarely 3, slightly honey-scented; perianth tube entire, slender, exceeding cataphyll by 1–2.5 (–4) cm, whitish; limb infundibular but stellate in full sun, opening white but soon palest pinkish-lilac, segments flattish but slightly channelled at base, 1.8–2.8 cm × 4–8 mm, oblong-oblanceolate to oblanceolate with a subacute to subobtuse (to slightly emarginate) tip, with 7–11 veins (rather distinct in dry material); inner segments with narrow basal lamellae often terminating in narrow teeth. Outer stamens 7–11 mm, inner 9–12 mm; filaments whitish or sometimes palest pinkish-lilac, slightly thickened base yellow to golden-yellow; anthers versatile, 1.7–2.5 mm, (greyish-yellow to) dark brown or purplish-grey; pollen pale yellow to golden-yellow, grains 55–62 × 28–31 μm. Styles usually not exceeding stamens, whitish, straight or somewhat curved at apex, stigmas punctiform. Capsules ± subterranean or with tip at ground level, membranous, brown, 1–1.5 cm × 6–8 mm, ellipsoid to ellipsoid-globose, short-pointed; seeds few (usually 2–3 per locule), ellipsoid to subglobose, ca. 5–6 × 4–5 mm, reddish-brown, area arond raphe somewhat swollen, pale. Flowering from December to January.

Similar species

None of the soboliferous *Colchicum* species occurring in SE Europe even has a remote likeness to *C. asteranthum. C. soboliferum* (Fisch. et C. A. Mey.) Stef. has perianth segments free to the base (i.e. no flower tube), and is more similar to the non-soboliferous *C. atticum* Spruner ex Tomm. *C. psaridis* Heldr. ex Halácsy flowers somewhat earlier in the year (generally from October to the first half of December) with ± intensely rose-purple, distinctly veined flowers, and rather consistently only two, usually wider, leaves. It is closely related to *C. cupanii* Guss. in which the corms are of the "normal" rounded type. The third soboliferous Balkan species, the autumn-flowering *C. boissieri* Orph., has hysteranthous leaves generally three in number, and much larger pinkish-purple flowers with yellow anthers. As for the two remaining consistently soboliferous *Colchicum* species, viz. the Turkish endemics *C. leptanthum* K. Perss. (Persson 2001) and *C. minutum* K. Perss. (Persson 1999a), these are more reminiscent of the new species in that they are

Fig. 1. – *Colchicum asteranthum* in flower (type locality, 9. 01. 1999). Photo D. Vassiliades.

Fig. 2. – *Colchicum asteranthum* with mature leaves (type locality, 25. 03. 1999). Photo D. Vassiliades.

Fig. 3. – *Colchicum asteranthum* in leaf (type locality, 27. 03. 2001). Note soboliferous corms.

Fig. 4. – *Colchicum asteranthum*, close-up of flowers (type locality, 5. 12. 1997). Photo D. Vassiliades.

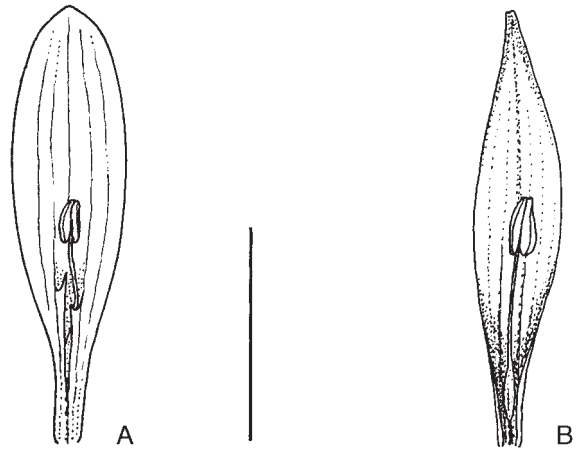

Fig. 5. – Perianth segments of *Colchicum asteranthum* (A) and *C. minutum* (B). Bar = 1 cm.

both small species with slender flowers and leaves. However, both generally have three leaves (*C. asteranthum* four) often overtopping flowers (shorter in *C. asteranthum*). Other significant differences in *C. leptanthum* are: the mature leaves are ± erect with sheaths projecting above ground (in *C. asteranthum* the leaves are patent-arcuate with subterranean sheaths), the mature flowers are white (though sometimes tinged palest purplish-pink at base), and have very narrow segments, 1–3 mm wide, lacking lamellae (*C. asteranthum* has pinkish-lilac, wider segments with distinct toothed lamellae), and stamen filaments and styles are yellowish (in *C. asteranthum* whitish or pinkish-lilac). *C. minutum*, apart from leaf number perhaps the most similar species, differs in details of leaf morphology: leaves have a thinner texture, and are somewhat paler green, less strongly channelled with a distinct keel and a narrower, more sharply defined, dark green midvein; and flower morphology: perianth limb is more consistently funnel-shaped with more channelled, proportionally narrower segments gradually long-tapering towards tip (Fig. 5), lamellae are absent or very insignificant, and anthers are larger, generally 2.5–3.5 mm. Moreover, mature flowers of *C. asteranthum* seem to be more evenly coloured and of a more violet shade.

Above ground, *C. asteranthum* is also somewhat reminiscent of the non-soboliferous *C. pusillum* Sieber, but details of leaves and flowers rather suggest an affinity of this South Aegean species to the *C. cupanii*-group (also confirmed by chromosomes, Persson 1993). It seems difficult to assign the new species to this group, particularly in view of its very divergent leaves.

Corms and vegetative reproduction

The “hypopodium” lobe (cf. Troll 1937, Galil 1969, Persson 1993) including the renewal bud is long and narrow, growing ± horizontally rather than vertically (Fig. 3). Also the “reserve bud”, axillary to the second leaf, may develop contemporarily in a shorter horizontal lobe. A plantlet developed from such an “extra” lobe may produce a small, generally non-flowering shoot simultaneously with the main shoot. *C. asteranthum* in this way reproduces vegetatively rather vigourously, forming locally dense patches on the ground.

Corms with two (or more) narrow, elongated ± horizontal lobes, each with an apical, regularly developing bud, are characteristic only of five other species of the ca. 90 *Colchicum* species (Persson 2001). None appear to be really closely related, all differing from each other in various floral and foliar characters (see above under "Similar species"). It is also difficult to indicate with any certainty near relations among species with the rounded corm typical for the major part of the genus *Colchicum*. An analysis using molecular methods may perhaps shed some light on the origin and relationships of these ± soboliferous species. A handful of other species with less pronounced vegetative reproduction, but still involving intermittent development of obliquely soboliferous corm growth or tooth-like lobes, are likewise found scattered in the genus. However, among these, only the Irano-Turanian *C. munzurense* K. Perss. (from Turkey, Persson 1999a) is not obviously related to any other species.

Phenology

Winter-flowering, such as in *C. asteranthum*, is unusual in the genus outside the Saharo-Sindian zone and the Mesopotamian province of the Irano-Turanian zone. The Submediterranean *C. chimonanthum* K. Perss. (Persson 1999b), from NE Greece, and the Mediterranean *C. minutum* K. Perss. (Persson 1999a), from S Turkey, are other recorded examples. Both are lowland species. *C. hungaricum* Janka (Submediterranean) may start flowering in December in the lowermost zones of the Dalmatian coast, but is generally blooming in early spring. Several ± snow-edge species often flowering immediately after snow-melt, such as *C. triphyllum* Kunze (Submediterranean/Mediterranean), *C. trigynum* (Steven ex Adams) Stearn (mainly Irano-Turanian), *C. szovitsii* Fisch. et C. A. Mey. (do.), and *C. burttii* Meikle (Mediterranean), in some localities will come into flower occasionally already in January. None of these are strictly winter-flowering species as they inhabit zones where a period too cool for active growth above ground is rather the rule for most bulbous and tuberous plants. Furthermore, their phenological pattern of a somewhat later flowering is in large parts hereditary (see below).

In contrast, parts of the transitional Saharo-Sindian/Mediterranean zone and some provinces of the Irano-Turanian zone in SW Asia and NW Africa, e.g. in the Middle East, with a warmer, more arid climate overall, exhibit conditions during the coolest part of the year sufficiently lenient (but not too dry) in some areas for quite a number of *Colchicum* species to flower and vegetate throughout the winter season (November–February), e.g. *C. crocifolium* Boiss., *C. fasciculare* (L.) R. Br., *C. schimperi* Janka and *C. tuviae* Feinbr. (Mouterde 1966, Feinbrun-Dothan 1986, Persson 1992).

Under greenhouse conditions, the flowers of the species mentioned above will appear in more or less the same order as in nature, if not absolutely matching the exact month. Thus, *C. chimonanthum*, *C. asteranthum* and other so-called winter-flowering species will flower first, early in the winter (November), those from the Middle East sometimes already in October. Typical snow-edge and other "naturally" spring-flowering species come into bloom later on, sometimes considerably so. This type of obviously hereditary phenological behaviour is rather the rule in the genus *Colchicum*, in contrast to the onset of leaf growth which seems to be largely environmentally triggered (cf. Burtt 1970, Gutterman & Boeken 1988, Persson 1999a).

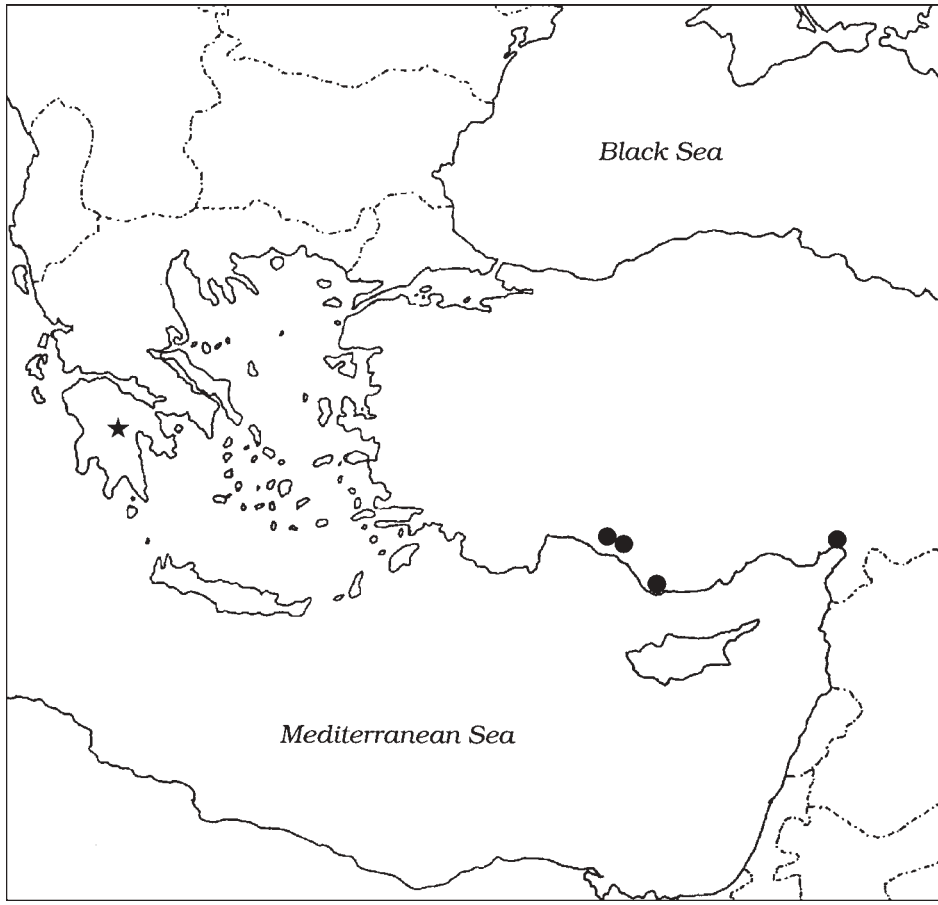

Fig. 6. – Distribution of *Colchicum asteranthum* (★) and *C. minutum* (●).

The hibernal flowering pattern is intermittantly hazardous for a successful sexual reproduction. A period of detrimental weather may have the flowers covered by snow and/or reduce the number of potential pollinating insects so that none or only very few flowers get pollinated. Therefore, in a patch of plants at a particular altitude capsules are in some years scarcely found whereas in other years most of the mature individuals have been fertilized. The occasional reduction of sexual success is however buffered by the generally very vigourous vegetative reproduction through soboliferous outgrowths from the corms.

Chromosome number

The chromosome number is 2n = 36 (K. & J. Persson 0101,Vassiliades s. n.). Only two other species (unrelated) from Greece have this number, i.e. *C. cretense* (Crete) and *C. autumnale* (N Greece) (Persson 1993, 1999b). The three Turkish endemic soboliferous

species discussed above have other numbers: *C. leptanthum* 2n = 18 (Persson 2001), *C. munzurense* 2n = 24 and *C. minutum* 2n = 44 (Persson 1999a). The most common basic number in the genus is n = 9 (Persson 1993).

Distribution

The new species has been so far only known from one mountain on the Peloponnese, i.e. Mt Lirkio, which constitutes the southern outskirt of the Killini–Oligirtos–Trachi chain (Fig. 6), overlooking the Arcadian plateau. Here it grows in a few patches at moderate altitudes (950–1450 m) on ± south-exposed slopes not usually liable to be covered other than very temporarily by snow, in stony terra rossa typical of the Greek limestone mountains. The slopes may dry out and the leaves wither already in March if precipitation in late winter/early spring has been less than average (this was the case in early 2001). The most similar species, the Turkish endemic *C. minutum*, ± winter- to early spring-flowering, is found in flatter, more humid habitats with a deeper terra rossa layer, such as dolines or other smaller depressions, and also abandoned fields.

The possible affinity of the new species to Turkish rather than to European members of the genus is not entirely surprising. The phytogeographical link to Anatolia of at least the northern part (Mt Killini) of the mentioned mountain chain has been established before, in the form of either similar or closely related taxa occurring on this mountain and in Anatolia (Dimopoulos & Georgiadis 1992). Moreover, the presence of the rare disjunct *Biebersteinia orphanidis* Boiss. in the chain just north of Mt Lirkio as well as in the Taurus range in southern Turkey (Davis 1967, Vassiliades & Yannitsaros 2000) appears to mirror the combined distributions of *C. asteranthum* and *C. minutum* (Fig. 6, Persson 1999a).

Like a number of other Mediterranean and SW Asian *Colchicum* species, *C. asteranthum* is very restricted in distribution. However, the locality where it has been found is rather secluded, and in view of the inconspicuous appearance of the plant in leaf and the very late flowering, it does not seem to be particularly vulnerable to any threat, provided that the mountain slopes are not subjected to overgrazing. Still, in view of its scarcity it should perhaps be included in the "Vulnerable" category of the World Conservation Union (IUCN).

Specimens other than type: Greece, Peloponnese, Arkadia: Mandinia: Mt Lirkio, above Moni Ag. Nikolaou (4 km W of Sanga, 2.5 km NNW of Pikerni), SW- to SE-facing slopes with stony terra rossa, 950 m, 12. 1. 2001,Vassiliades (GB); ibid., 960 m, 27. 3. 2001, K. & J. Persson 0101 (GB).

Acknowledgements

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Souhrn

Článek přináší popis nového druhu *Colchicum asteranthum* Vassil. et K. Perss. Ten byl objeven na kamenitých, jižně exponovaných svazích hory Lirkio na řeckém poloostrově Peloponés, kde roste ve středních nadmořských výškách. K neobvyklým vlastnostem nového druhu patří výběžkaté hlízy a hlavní doba kvetení od prosince do ledna. Mezi diagnostické znaky *C. asteranthum* dále patří: rostliny obvykle se 4 listy, okvětní lístky bělavé, na bázi srostlé v trubku, a prašníky tmavohnědé až nachově šedé. Na Balkáně rostou ještě tři další druhy s výběžkatými hlízami: *C. soboliferum* (Fisch. et C. A. Mey.) Stef. má však okvětní lístky až k bázi volné, *C. psaridis* Heldr.

ex Halácsy se liší dobou kvetení od října do prosince, květy sytě růžově nachovými a výrazně žilnatými, a dvěma širšími listy, a na podzim kvetoucí *C. boissieri* Orph., který má zpravidla tři listy a mnohem větší, růžově purpurové květy se žlutými prašníky.

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Kolbek J. a kol.

Květena Chráněné krajinné oblasti a Biosférické rezervace Křivoklátsko 2. Rozbor a syntéza

Botanický ústav AV ČR, Průhonice, ve spolupráci se Správou chráněných krajinných oblastí ČR, Praha 2001, 132 str., 47 foto, ISBN 80-86188-09-4.

Křivoklátsko je oblast, která svojí bohatostí a v oblasti středních Čech i výjimečnou zachovalostí přirozené vegetace patří k nesmírně cenným územím České republiky. V posledních desetiletích se zaslouženě stala předmětem cíleného a soustavného zájmu pracovní skupiny J. Kolbeka, kterému se v poměrně krátkém časovém rozmezí podařilo publikovat výsledky intenzivního výzkumu této oblasti. V současnosti již vyšly dvě základní studie o vegetaci Křivoklátska: Mapa potencionální přirozené vegetace Biosférické rezervace Křivoklátsko (1995), Potenciální přirozená vegetace Biosférické rezervace Křivoklátsko (1997) a Vegetace Chráněné krajinné oblasti a Biosférické rezervace Křivoklátsko (1999). V roce 1999 pak vyšel první díl plánovaného třídílného kompendia věnovanému Květeně Křivoklátska, a to Květena Chráněné krajinné oblasti a Biosférické rezervace Křivoklátsko 1. Mapy rozšíření cévnatých rostlin. V roce 2001 pak Jiří Kolbek s kolektivem spolupracovníků publikovali druhou část Květeny Křivoklátska, která je předmětem této recenze. Tato publikace se soustřeďuje především na rozbor vybraných prvků květeny tohoto cenného území, a to ať již s ohledem na jejich ohroženost v dané oblasti či naopak jejich až potencionálně nebezpečné šíření v regionu. Na tomto díle se více či méně podílela řada spolupracovníků, často specialistů ať již na metodiku, určitý typ vegetace nebo na konkrétní taxonomickou skupinu. To bezesporu významně přispívá k vysoké odborné úrovni publikace, i když největší zásluhu na ní má samozřejmě hlavní autorský kolektiv – J. Kolbek spolu se Z. Hroudovou, T. Kučerou, M. Vítkovou a E. Brabcem.

Kniha čítající 132 stran obsahuje vedle textové části též 40 fytokartogramů. Kromě úvodní a závěrečné kapitoly se recenzovaná práce skládá ze sedmi kapitol: první tři jsou věnované z hlediska ochranářského významným lokalitám a druhům, další dvě kapitoly pak výskytu jak invazivních taxonů, tak expanzivních domácích druhů. Studii uzavírají fytokartogramy zachycující výskyt určitých druhových skupin, které byly vytvořeny podle nejrůznějších kritérií (ať již vegetačních či fytogeografických.)

Velmi cenný je abecední seznam maloplošných chráněných oblastí, který je přehledně zpracován v první kapitole. Pro 24 chráněných maloplošných území, které se vyskytují na území Křivoklátska je vždy uvedena stručná charakteristika jejich geomorfologie a geologie, hlavní pozornost je však věnována vegetačním a floristickým poměrům. V závěru kapitoly jsou pomocí statistických metod univariační a multivariační analýzy vyhodnocena autorům dostupná data pro sledovaná MCHÚ.

Výsledkem velmi pečlivé a podrobné floristické práce v regionu jsou komentáře k výskytu více než 100 chráněných druhů v území a Červený seznam květeny Křivoklátska. Z hlediska ochrany přirozené vegetace oblasti je velmi důležité sledovat nejen ubývající a mizející druhy, ale také šíření nepůvodních či expandujících taxonů v daném regionu. To je předmětem kapitol „Invazivní druhy oblasti“ a „Expandující domácí druhy“. Autoři v území zachytili šíření 14 cizích taxonů s relativně vysokou agresivitou i rychlostí šíření.

Snad jediné, co v této publikaci postrádám, je informace, zda alespoň kritické taxony a z hlediska fytogeografického překvapivé nálezy jsou dokladovány v nějaké veřejně přístupné herbářové sbírce.

V závěru knihy čtenář najde 48 barevných fotografií atraktivních druhů Křivoklátska, esměs velmi dobré úrovně.

Publikace je velmi zdařilým zhodnocením časově nesmírně náročné floristické práce řady pracovníků. Významně obohacuje regionální flory České republiky a jistě již dnes plně slouží nejen botanikům základního výzkumu, ale i nejrůznějším ochranářským institucím jako velmi solidní podklad pro jejich aktivity ve studovaném území. Lze se jen těšit na avizované další dva díly Květeny, kde budou konkrétní charakteristiky (fytogeografické, cenologické, stupeň ohrožení) a kritické taxonomické poznámky k jednotlivým taxonům.

Jitka Štěpánková