Euro+Med-Checklist Notulae, 17

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Euro+Med-Checklist Notulae, 17

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Abstract: This is the seventeenth of a series of miscellaneous contributions, by various authors, where hitherto unpublished data relevant to both the Med-Checklist and the Euro+Med (or Sisyphus) projects are presented. This instalment deals with the families *Aizoaceae*, *Anacardiaceae*, *Asparagaceae*, *Bignoniaceae*, *Boraginaceae*, *Cannabaceae*, *Caryophyllaceae*, *Casuarinaceae*, *Chenopodiaceae*, *Compositae*, *Crassulaceae*, *Cyperaceae*, *Euphorbiaceae*, *Gentianaceae*, *Gramineae*, *Iridaceae*, *Labiatae*, *Leguminosae*, *Malvaceae*, *Myrtaceae*, *Oleaceae*, *Onagraceae*, *Orobanchaceae*, *Oxalidaceae*, *Papaveraceae*, *Portulacaceae*, *Ranunculaceae*, *Rosaceae*, *Rubiaceae*, *Sapindaceae*, *Sapotaceae*, *Solanaceae*, *Typhaceae*, *Violaceae* and *Vitaceae.* It includes new country and area records and taxonomic and distributional considerations for taxa in *Acer*, *Ampelopsis*, *Argania*, *Blackstonia*, *Buglossoides*, *Carduus*, *Carex*, *Casuarina*, *Celtis*, *Chenopodium*, *Clematis*, *Eleusine*, *Elytrigia*, *Eucalyptus*, *Euphorbia*, *Euphrasia*, *Fraxinus*, *Galium*, *Hibiscus*, *Hieracium*, *Iris*, *Koelreuteria*, *Lathyrus*, *Loeflingia*, *Ludwigia*, *Malus*, *Melampyrum*, *Mesembryanthemum*, *Muscari*, *Orobanche*, *Oxalis*, *Papaver*, *Physalis*, *Podranea*, *Portulaca*, *Pseudodictamnus*, *Pulmonaria*, *Ranunculus*, *Schinus*, *Sedum*, *Stachys*, *Typha*, *Viola* and *Vitis*, and a new combination in *Pseudodictamnus*.

Keywords: distribution, Euro+Med PlantBase, Europe, Med-Checklist, Mediterranean, new combination, new record, taxonomy, vascular plants

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Notice

A succinct description of the Euro+Med project, with a list of recognized territories and their abbreviations, and the conventions used to indicate the status and presence of taxa, can be found in the introduction to the first instalment of the Euro+Med Notulae (Greuter & Raab-Straube 2005: 223–226) and on the Euro+Med PlantBase website (Euro+Med 2006+). For the previous instalment of the Euro+Med-Checklist Notulae, see Raab-Straube & Raus (2023).

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Aizoaceae

Mesembryanthemum haeckelianum A. Berger (≡ *Aptenia haeckeliana* (A. Berger) Bittrich ex Gerbaulet ≡ *Platythyra haeckeliana* (A. Berger) N. E. Br.) – Fig. 1.

A Hs(S): Spain: Valencia, Paiporta, l'Horta, Sant Joaquim, camí de l'Hort de Colom, 39°25'8.72"N, 00°24'46.43"W, 17.5 m, nitrophilous grasslands on roadsides, 8 Dec 2020, *Fos & Laguna* (VAL 243737), det. G. F. Smith & F. Verloove. – *Mesembryanthemum haeckelianum*, which is endemic to South Africa's Eastern Cape province, is sometimes used as a groundcover in domestic horticulture and landscaping. However, as a groundcover, it is not as popular as the purple-flowered *M. cordifolium* L. f. and the red-flowered hybrid between these two species, *M.* ×*vascosilvae* (Gideon F. Sm. & al.) L. Sáez & Aymerich (see Smith & al. 2020; Sáez & Aymerich 2020), at least in the Valencian Community (Spain) and other parts of the Iberian Peninsula. Nevertheless, both species and the hybrid between them are marketed for ornamental use and plants are sold on-site in nurseries and garden centres as well as online. Note though that material of all three taxa is often confusingly sold as varieties of *M. cordifolium*. *Mesembryanthemum haeckelianum* is reported here as a new alien plant for the flora of Spain and Europe. Beyond its natural geographical distribution range, it has been reported from Belgium and Germany, but these records clearly refer to living plants cultivated in the Botanical Gardens of Meise and Darmstadt, respectively. There is also a record from Lajares, Lanzarote (Canary Islands) reported by GBIF (2022), but without access to information on the origin of this material nor any evidence such as pictures or herbarium sheets to aid its identification, it could possibly be of cultivated plants. The specimens found in Valencia (Fig. 1) cover a surface area of 3–4 m^2 with some branches scrambling to a height of about 2 m into a *Cupressus sempervirens* L. tree that grows nearby. *Mesembryanthemum haeckelianum* grows in nitrophilous plant communities on a roadside in association with *Beta vulgaris* subsp. *maritima* (L.) Thell., *Cichorium intybus* L., *Crepis vesicaria* subsp. *taraxacifolia* (Thuill.) Thell., *Diplotaxis erucoides* (L.) DC., *Emex spinosa* (L.) Campd., *Fumaria capreolata* L., *Malva parviflora* L., *Oxalis pes-caprae* L., *Euphorbia peplus* L., *E. terracina* Lag., *Piptatherum miliaceum* Coss. and *Plantago lagopus* L., among others. Because of its creeping and scrambling habit, it has not been possible to confirm the number of naturalized individuals, although the material could be derived from a single specimen. Plants flower sporadically throughout the

Fig. 1. *Mesembryanthemum haeckelianum* – A: flowering plant in nitrophilous grassland habitat; B: detail of plant with flowers; C: detail of fruits. – Spain, Valencia, Paiporta, Sant Joaquim, 1 May 2023 (A), 8 Dec 2020 (B, C), photographs by S. Fos.

year, as does *M.* ×*vascosilvae*, incidentally, although in winter the flowers are smaller and paler yellow to almost white. Fruits with well-developed seeds have also been observed. *Mesembryanthemum* L. and *Aptenia* N. E. Br. are often united by contemporary authors, as a result of molecular phylogenetic studies (Klak & al. 2007, Klak & Bruyns 2013). Online databases such as the International Plant Names Index (IPNI 2023), the World Flora Online (WFO 2023) the Catalogue of Life (Bánki & al. 2023), POWO (2023) but also the Euro+Med PlantBase (Raab-Straube 2018+a) adhere to this view. We have previously referred to this species under *Aptenia* (Smith & al. 2020).

S. Fos, E. Laguna, G. F. Smith & F. Verloove

Anacardiaceae

Schinus polygama (Cav.) Cabrera (≡ *Amyris polygama* Cav.) – Fig. 2.

A Tn: Tunisia: Jendouba, Aïn Draham, 36°46'46"N, 08°41'11"E, 720 m, roadsides beneath walls of old buildings, 17 Oct 2021, *El Mokni* (herb. Univ. Monastir). – As part of ongoing studies on updating the list of alien *Anacardiaceae* in Tunisia (El Mokni 2019), *Schinus polygama* is here reported for the first time for the adventitious Tunisian flora (Henning & Raab-Straube 2016+a; APD 2023) where it seems to have recently escaped from cultivation and therefore can be considered as a local casual alien. Admitting that known varieties of

S. polygama are connected with each other on intermediate macromorphological features, collected Tunisian material shows predominately an overflowered infructescence with dark purple fruits and is rather assigned to *S. polygama* var. *parviflora* (Marchand) F. A. Barkley (vs few-flowered inflorescence with black fruits in var. *chilensis* F. A. Barkley; cf. Barkley 1944: 176). *Schinus* L. species are distributed in Argentina, Bolivia, Chile and Peru, where they can be found in the inter-Andean valleys and Andean cloud forests as well as at low altitudes in SE to NE Argentina, extending into Uruguay, Paraguay and S Brazil; few endemic Chilean species occur in sclerophyllous forests in a Mediterranean climate (Silva Luz & al. 2019, 2022). In particular *Schinus areira* L., *S. molle* L., *S. terebinthifolia* Raddi (commonly known as pepper trees) and *S. polygama* have become invasive species outside their native range (Silva Luz & al. 2022); the latter has a native range from Chile to Mendoza in Argentina (POWO 2023). It is a dioecious shrub or tree growing to 3(–5) m tall, with simple leaves and reddish, pink to purple globose, obovoid drupes. The species was introduced to California and Tajikistan (POWO 2023) and to Brazil, Uruguay, the Iberian Peninsula, Belgium and New Zealand (GBIF 2023). In Africa, it was reported only in the Maghreb countries of Morocco and Algeria (GBIF 2023), however with "unknown status". An analytical key is proposed here for the adventitious species of the genus *Schinus* in Africa (derived from Miller & Wilken 2012; NSW Flora Online 2023).

Fig. 2. *Schinus polygama*, fruiting branches. – Tunisia, Jendouba, Aïn Draham, 17 Oct 2021, photograph by R. El Mokni.

Analytical key to species of *Schinus* introduced into Africa

1. Plants ≤5 m tall; branches ending in thorns; leaves simple . . . . . ***S. polygama***
– Plants >5 m tall; branches not ending in thorns; leaves compound **2**
2. Leaves pendent; leaflets generally > 15, lanceolate to linear, 2–10 mm wide . . . . . ***S. molle***
– Leaves not pendent; leaflets 7–13, elliptic to oblong-ovate, > 10 mm wide . . . . . ***S. terebinthifolia***

R. El Mokni

Asparagaceae

Muscari armeniacum H. J. Veitch

A Uk: Ukraine: Cherkasy Oblast, NW vicinity of Uman city, a small group (a clone and several single plants) in bushes far from urban built-up area, 28 Apr 2023, *Kostruba, Chorna & Shynder* (KWHA 103186; photo: https://www.inaturalist.org/observations/180742252); Kirovohrad Oblast, Hayvoron city, 48.332691°N, 29.861607°E, single plants on roadsides, spontaneous, reproducing by seeds and spreading beyond flower gardens, 25 Apr 2023, *Shynder & Mamchur* (photo: https://www.inaturalist.org/observations/158060830); Odesa city, 46.382489°N, 30.749556°E, steppe slope above seashore, spontaneous, 16 Apr 2016, *Kalashnik* (photo: https://www.inaturalist.org/observations/178884079); Sumy Oblast, Putivl city, one plant spontaneous on side of street, 51.335461°N, 33.873895°E, 3 May 2022, *Miskova* (photo: https://www.inaturalist.org/observations/115097911). – *Muscari*

Fig. 3. *Podranea ricasoliana* – A: flowering branch; B: habit. – Italy, Liguria, Taggia (Imperia), 15 Sep 2022, photographs by M. Lonati.

armeniacum grows wild in the Caucasus, extending to Anatolia and the Balkan Peninsula, and is widely cultivated as an ornamental plant in spring flower gardens (Mashkovska 2015; Stuart 2011). Examples of spontaneous spread of *M. armeniacum* in botanical gardens and dendrological parks were reported (Shynder & al. 2022). As an established neophyte, *M. armeniacum* has already been indicated for Austria (Fischer & al. 2008: 1076), the Czech Republic (Pyšek & al. 2012), France (Tison & Foucault 2014), Germany (Hand & al. 2023), Great Britain and Ireland (Stace 2010: 922), Italy (Conti & al. 2005), and as casual with uncertain degree of naturalization in some other European countries (Belgium, Finland, the Netherlands, see Euro+Med 2006+). In Ukraine, this plant currently has the status of a casual alien, escaped from cultivation. It is observed growing spontaneously in cities and suburbs, at various distances apart from flower gardens where it is grown. It reproduces well by seeds, so it may become naturalized in Ukraine in the near future.

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Bignoniaceae

Podranea ricasoliana (Tanfani) Sprague – Fig. 3.
A It: Italy: Liguria, Taggia (Imperia), 43.863695°N, 7.851043°E, 68 m, on a chalky SE-facing rock wall, 15 Sep 2022, *Lonati, Pittarello & Nota* (B 10 1246800). – *Podranea ricasoliana*, commonly known as Port Saint Johns creeper, is a liana species generally considered endemic to South Africa, with a very restricted range confined to the mouth of the Mzimvubu River in Port Saint Johns, Eastern Cape Province (Senar & Cardero 2019). However, many South African botanists suspect that this species may not be indigenous to S Africa but rather was introduced from E Africa (Malawi, Mozambique, Zambia) by slave traders (Malan & Notten 2002). As an ornamental species it is cultivated in all warm climate regions of the world. It is naturalized in N Africa (Algeria), in the United States (Florida, Hawaii), Central and South America, Australia and New Zealand (Hurrell & al. 2012; Senar & Cardero 2019). In the Euro+Med area, the species is considered a casual alien in the Canary Islands, and naturalized in the Azores, continental Spain and Corsica (Laguna & Mateo 2001; Tison & de Foucault 2014; Raab-Straube 2018+b; Senar & Cardero 2019). In the locality described in this note, a large individual has settled on a vertical wall facing the Monastero di S. Caterina da Siena, while two other specimens grow in the terraces above. On the basis of our observations in the field, *P. ricasoliana* is to be considered a casual alien in Italy.

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Boraginaceae

Buglossoides incrassata (Guss.) I. M. Johnst. subsp. ***incrassata*** (≡ *Lithospermum incrassatum* Guss. ≡ *B. arvensis* subsp. *incrassata* (Guss.) Kerguélen) – Fig. 4.
+ Cm: Crimea: Sevastopol region, Cape Aya Nature Reserve, Biller ridge, Demir-Capu tract, 24 Apr 2010, *Turbanov* (photo); ibid., Inzhir tract, 13 Apr 2012, *Yevseyenkov* (photo); ibid., SW slope of Biller ridge, 600 m, gravelly slope, 28 Apr 2012, *Svirin* (YALT as *B. tenuiflora*); ibid., Balaclava vicinity, Vitmer ravine, 44°30'03"N, 33°37'44"E, 175 m, open *Juniperus excelsa* M. Bieb. forest, 10 Jun 2019, *Ryff* (herb. Ryff + photo); ibid., 44°30'04"N, 33°37'33"E, 140 m, 27 Apr 2021, *Ryff* (herb. Ryff + photo); ibid., Mekenzi mountains, 44°39'15.30"N, 33°41'22.06"E, clearing in *Quercus pubescens* Willd. and *Carpinus orientalis* Mill. forest, 2 Apr 2023, *Yevseyenkov*

Fig. 4. *Buglossoides incrassata* subsp. *incrassata* – A: flowering plant; B: flower; C: fruiting plant; D: calyces of fruiting plant; E: SEM of nutlet. – A, B: Crimea, Balaclava, 27 Apr 2021; C: ibid., 10 Jun 2019; D: 27 May 2020 (collected 10 Jun 2019), photographs by L. E. Ryff; E: ibid., 31 May 2021 (collected 10 Jun 2019), photograph by T. S. Dvirna & M. Shevera.

(photo). – *Buglossoides incrassata* subsp. *incrassata* is an annual, distributed from the W Mediterranean to W Iran (Zippel & Wilhalm 2003; Valdés & Raab-Straube 2011+; POWO 2023). In some sources, it is listed as a native plant also for the Canary Islands (POWO 2023), and as a casual alien for Germany (Hand & al. 2023; Valdés &

Raab-Straube 2011+) and the Czech Republic (Danihelka 2014; Randall 2017; Pyšek & al. 2022; POWO 2023). There is an opinion that this species may also grow in the Caucasus and C Asia (Popov 1953). In Crimea, plants of this taxon were recorded for the first time in 2010, on the spurs of Cape Aya in the vicinity of Sevastopol by I. S. Turbanov. But he identified them as *B. tenuiflora* (L. f.) I. M. Johnst. and showed his photos under this name on the Plantarium website (https://www.plantarium.ru/page/image/id/52917.html; https://www.plantarium.ru/page/image/id/52918.html). Similar plants were subsequently photographed and collected in the same area by S. A. Svirin and P. E. Yevseyenkov. For several years they were not correctly identified because all these finds were only represented by young, flowering specimens. The finding by one of us (LER) in 2019 of mature fruiting specimens and comparison of plants from the vicinity of Sevastopol with specimens stored in the KW and LE herbaria, as well as presented on GBIF (2023) and other internet sources, showed that, in terms of their main characteristic morphological features (bright blue corolla with oblong obtuse lobes, strongly thickened pedicel, enlarged calyx base, oblique receptacle, nutlet with rugose-scrobiculate surface, etc.) they are identical to specimens of *B. incrassata* subsp. *incrassata* from the Mediterranean, and especially from the Balkan Peninsula. We investigated the seed-surface ultrastructure of *B. incrassata* subsp. *incrassata* from Sevastopol using SEM. The nutlets are pyramidal-triangular, ovoid or subtrigonal, with subcircular areoles; the ventral side has a keel, while the dorsal side is convex; the beak is short and blunt; the shoulders are pronounced; and the surface is irregularly deeply furrowed, with protuberances with type I papillae (Fig. 4E). The features of seed morphology correspond to those given for *B. incrassata* subsp. *incrassata* (Edmondson 1978; Cecchi & al. 2014). SW Crimea is so far the only known locality of *B. incrassata* subsp. *incrassata* in E Europe. It is a native plant there and found only in natural habitats: on rocky and clayey slopes in juniper and oak woodlands.

L. E. Ryff, T. S. Dvirna & M. Shevera

Pulmonaria obscura Dumort.

+ Mk: North Macedonia: Southwest region, Mt Jablanica, forests above village of Lakaica, 21°20'24"N, 20°31'34"E, 1900 m, 17 Aug 1947, *Kitanov* (SOM 171 338), det. D. Dimitrov. – No previous published records of this taxon from North Macedonia are known (Valdes & Raab-Straube 2011+). The cited specimen corroborates a comment by Matevski (2010: 116) on the possible occurrence of "*Pulmonaria officinalis* var. *obscura*" (= *P. officinalis* subsp. *obscura* (Dumort.) Murb.) on Mt Skopska Črna Gora, however by not accepting that taxon as a member of the North Macedonian flora. It should be noted that the taxonomic opinion to regard *P. officinalis* L. and *P. obscura* as two independent species, based on Sauer (1975) and Bolliger (1982) and currently advocated by Euro+Med (2006+) and POWO (2023), has been recently disproved by phylogenetic analyses based on nuclear and plastid DNA sequences, making the resurrection of subspecies rank for the two taxa more appropriate (Kirchner 2004: 103). D. Dimitrov & Th. Raus

Cannabaceae

Celtis caucasica Willd. (≡ *C. australis* subsp. *caucasica* (Willd.) C. C. Towns.)

A Uk: Ukraine: Odesa Oblast, Odesa city, 46.444784°N, 30.764291°E, 46 m, along fence outside Botanical Garden of I. I. Mechnikov Odesa National University, several young plants, 16 Sep 2022, *Shynder & Levchuk* (KWHA 102515; photo: https://www.inaturalist.org/observations/151467932); Odesa city, 46.44079°N, 30.76807°E, Botanical Garden of I. I. Mechnikov Odesa National University, spontaneously in undergrowth in arboretum, 17 Sep 2022, *Shynder & Levchuk* (KWHA 102507; photo: https://www.inaturalist.org/observations/151643748); Zakarpattia Oblast, Uzhhorod city, 48.618504°N, 22.305502°E, in anthropogenic habitats, between Botanical Garden of Uzhhorod National University and Uzhhorod children railway, 5 Sep 2022, *Shynder* (KW s.n.; photo: https://www.inaturalist.org/observations/151284173); ibid., 16 Sep 2022, Shevera; ibid, 4 Jun 2023, *Shynder* (KWHA 103178; photo: https://www.inaturalist.org/observations/178956564); Kyiv City, M. M. Gryshko National Botanical Garden, spontaneous generative reproduction, 16 Aug 2023, *Shynder* (KWHA 103171; photo: https://www.inaturalist.org/observations/178701241). – *Celtis caucasica* is a tree native to the S Balkans, Caucasus, SW & C Asia to W Himalaya (Grudzinskaya 1979; Tutin 1993). There was information that *C. caucasica* was possibly autochthonous in Crimea, but this data has not yet been confirmed (Yena 2012). In Ukraine, *C. caucasica* is occasionally cultivated, mainly in the S region and Crimea. Currently this species has the status of a casual alien, escaped from cultivation.

O. Shynder, L. Levchuk & M. Shevera

Celtis planchoniana K. I. Chr. (= *C. glabrata* Steven ex Planch.)

A Uk: Ukraine: Odesa city, Chkalov Sanatorium Park, 46.445385°N, 30.768454°E, young tree spontaneous in underwood, 17 Sep 2022, *Shynder* (KWHA 102524; photo: https://www.inaturalist.org/observations/152606203); ibid., 46.445112°N, 30.768772°E, top of slope above sea near park, young tree 4–5 years old, 26 Sep 2022, *Shynder* (KW s.n.). – *Celtis planchoniana* is a tree with a native range in the E submediterranean region (Balkans, Caucasus, Crimea, Anatolia and SW Asia) (Grudzinskaya 1979; Tutin 1993; POWO 2023; Yena 2012). In continental Ukraine, *C. glabrata* is occasionally cultivated in the S region, for example in Odesa, where it is starting to naturalize. The young plants we discovered had a specific scattered pubescence of hooked hairs, a diagnostic character of *C. planchoniana* f. *aspera* Medw. (Grudzinskaya

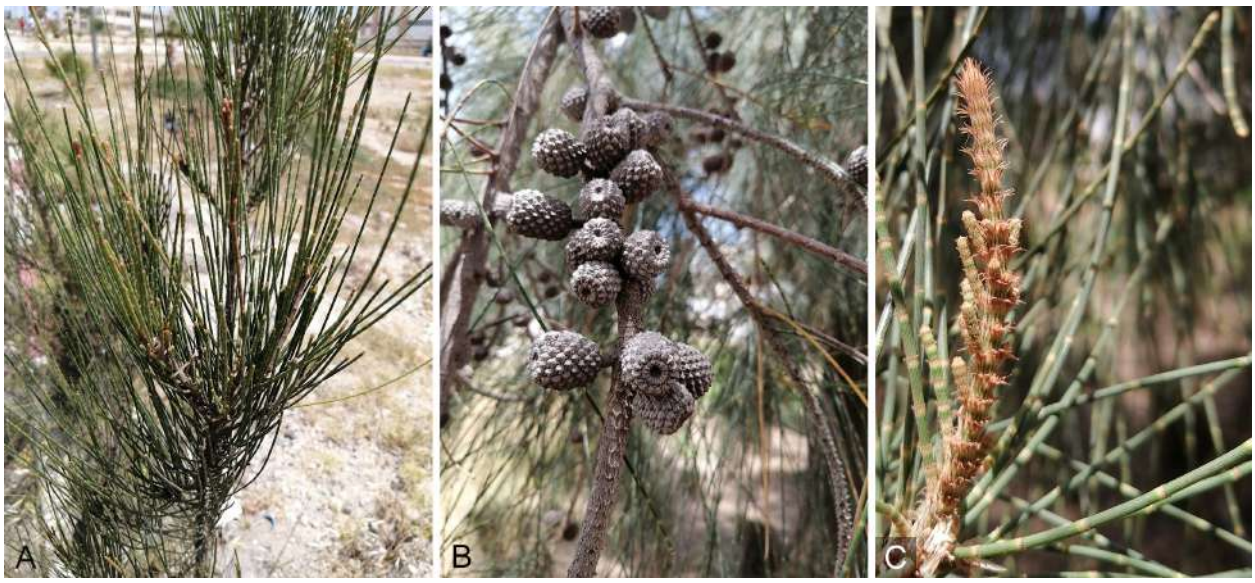

Fig. 5. Alien *Casuarina* species in Tunisia – A: *C. cunninghamiana* subsp. *cunninghamiana*, juvenile plant. – B, C: *C. glauca*; B: ferruginous cylindric cones; C: branchlet apex. – A: Tunisia, Mahdia, Rejiche, 7 Jul 2023; B, C: ibid., Monastir, Monastir city, 18 Jul 2023, photographs by R. El Mokni.

1979). The species also spreads spontaneously in the Botanical Garden of the I. I. Mechnikov Odesa National University. O. Shynder & L. Levchuk

Caryophyllaceae

Loeflingia hispanica L.
? It: Italy: Campania, "Presa nei contorni di Napoli ed alla Cava", s.d. [de facto first half of 19th century], *s.c., s.n.* (RO [herb. Borgia]). – *Loeflingia hispanica* is native to a wide area from the Canary Islands to the Mediterranean area, SW Iran and the Arabian Peninsula, according to POWO (2023); the record from Italy seems based on Heywood (1993: 153) who, however, recorded the species in Sicily. In fact, both Marhold (2011+a) and the Portale della flora d'Italia (PFI 2023) indicated *L. hispanica* in Sicily only. Nevertheless, it was already given by Cortesi (1906) for the surroundings of Naples and Cava de' Tirreni (province of Salerno), both localities in the region of Campania (SW Italy), based on the specimen cited above. This specimen consists of three flowering plants with a single label. Cesare Borgia (1776–1837) was an influential nobleman of the Papal State and a learned naturalist who intensively collected plants especially in Sicily and Campania (Cortesi 1906a, 1906b). It is to be noted that, according to Guadagno (1926), the indications from Campania might be due to a misplacing in the herbarium; however, both "*Loeflingia hispanica*" and the gathering places were handwritten by Borgia on the same label. On the other hand, *L. hispanica* is a rare and localized species of sandy meadows in Sicily (Giardina & al. 2007); this habitat is hardly compatible with the two localities of Campania, even at that time. In addition, no one else has noticed this plant in the region. This casts into doubt that the examined herbarium sheet might refer to cultivated or escaped individuals. In fact, the plant was rarely cultivated in the botanical gardens of the region, as recorded by Tenore (1809) from the erstwhile Garden of the Prince of Bisignano in Barra, from where a specimen is preserved in the herbarium of Giovanni Gussone (NAP0002244), a correspondent of Borgia himself (Cortesi 1906a). In addition, many samples of the herbarium Borgia derived from cultivated plants, frequently from the gardens of Cava de' Tirreni (including his own garden) and Catania (Sicily) (see Cortesi 1906a), normally without any note on the labels appropriate to clarify the possibly native status of the gathered plants. D. Iamonico & E. Del Guacchio

Casuarinaceae

Casuarina cunninghamiana Miq. subsp. ***cunninghamiana*** – Fig. 5A.
A Tn: Tunisia: Mahdia, Rejiche, 35°28'41"N, 11°03'02"E, 27–30 m, roadsides, 7 Jul 2023, *El Mokni* (herb. Univ. Monastir). – The casuarinas are a group of 90–96 species of trees and shrubs placed in four genera: *Allocasuarina* L. Johnson, *Casuarina* L., *Ceuthostoma* L. Johnson and *Gymnostoma* L. Johnson (Wilson & Johnson 1989). The genus *Casuarina* comprises c. 17 tree species (Boland & al. 1996), mostly endemic to Australia, but with some representatives in SE Asia and the Pacific Islands. Chiefly due to their ability of nitrogen-fixing, fast-growing and tolerance to a wide range of adverse conditions including periodic waterlogging, drought, salt spray and highly saline soils, three main species, viz. *C. cunninghamiana*, *C. equisetifolia* L. and *C. glauca* Sieber ex Spreng. have widely been planted outside their native range (National Research Council 1984). In N Africa, *C. cunninghamiana* and *C. glauca* have been reported as cultivated in Algeria (see, e.g., APD 2023; POWO 2023; Jury 2009+;

Belaid & al. 2022), the former also as cultivated in Tunisia (Greuter & Domina 2015: 31). A fourth species, *C. stricta* Aiton, was reported as introduced to Morocco and Tunisia (Dobignard & Chatelain 2011: 292). During the last few years, few juvenile specimens of *C. cunninghamiana* were discovered growing on roadsides in the region of Rejiche (Mahdia, CE Tunisia). The taxon seems to be naturalizing near some localities where it was successfully planted and can be considered currently as a casual alien; this is also its first report as a casual alien for N Africa. Tunisian collected material shows marcescent 8–10 teeth (reduced leaves), yellow at base, darker brown toward in the apex and is assigned to subsp. *cunninghamiana* (cf. Wilson & Johnson 1989: 106). R. El Mokni

Casuarina glauca Sieber ex Spreng. – Fig. 5B, C.
N Tn: Tunisia: Monastir, Monastir city, between department buildings of Faculty of Pharmacy of Monastir, 35°45'49"N, 10°49'50"E, 10 m, 27 Jun 2020, *El Mokni* (herb. Univ. Monastir), ibid, 18 Jul 2023, *El Mokni* (herb. Univ. Monastir); Bizerta, Sejnane toward Nefza, 37°03'34"N, 09°13'25"E, 140 m, roadside, 11 Jul 2023, *El Mokni* (herb. Univ. Monastir). – *Casuarina glauca* is an 8–20 m tall tree with typical long-recurved teeth (reduced leaves) on young permanent shoots (Wilson & Johnson 1989: 104 & 107–108), originating from the coast of SE Australia (Elfers 1988). The species has been successfully introduced in saline soils of Cyprus, Egypt, Florida, India, Israel, Kenya, Malawi, and South Africa (National Research Council 1984). In N Africa, *C. glauca* was introduced only to Morocco (POWO 2023) and Tunisia (pers. obs.), actually with unknown status. It is reported here for the first time as an established alien in Tunisia after the discovery of many juvenile seedlings and saplings with different stem diameters and heights since 2020 in the Monastir region (CE Tunisia) and more recently also of few juvenile specimens from seedlings in the Bizerta region (NE Tunisia). An analytical key is proposed here for the two alien species of the genus *Casuarina* occurring in Tunisia (derived from Wilson & Johnson 1989: 104; Verloove & Silva 2022: 34).

Analytical key to alien species of *Casuarina* occurring in Tunisia

1. Root suckers frequent; leaf teeth (reduced leaves) 12–20; samara (winged achene) to 5 mm long . . . . . ***C. glauca***
– Root suckers absent; leaf teeth 8–10; samara 3–4 mm long . . ***C. cunninghamiana*** subsp. ***cunninghamiana***

R. El Mokni

Chenopodiaceae

Chenopodium pratericola Rydb.
A Cm: Crimea: Simferopol, food market Privoz, roadside, 27 Dec 2022, *Yena* (CSAU); Simferopolsky Rayon, Perovo Village, vicinity of Yuzhnaya poultry farm, 29 Sep 2022, *Oleshko* (CSAU). – This species is native to North America but as an alien plant spread to Europe, Asia, and South America (GBIF 2023). In the European area, *C. pratericola* is known from N, C and E Europe (Uotila 2011+a) reaching S as far as Bulgaria (Grozeva 2012) and the Ukraine (Mosyakin & al. 1994). For Crimea, *C. pratericola* is given here for the first time. The whole plant has a narrowly conic or fusiform habit. From the 17 species of *Chenopodium* s.l. that occur in the Crimean Peninsula (Yena 2012), *C. pratericola* is well distinguished by its markedly small (up to 17 mm long), lanceolate (length : width ratio (3–)4 : 1), toothless leaves, pointed at the tip and wedge-shaped at the base, tapering into a petiole. One of the most distinctive features of this species is its venation pattern: the leaf is 3-veined from the base, lateral veins are arcuate and twice as short as the midrib (on very small leaves the lateral veins may be faint or sometimes absent). The upper leaf surface is smooth, the lower surface as well as the calyx and petioles are moderately to densely white mealy. The pericarp peels off easily, the flattened, round and nearly keeled, shiny black seeds reach 1–1.3 mm in diam. In general, all morphological characters correspond well to those given in the literature (Mosyakin 1996; Clemants & Mosyakin 2003; Sukhorukov 2014). It seems no coincidence that the pioneering findings of *C. pratericola* in Crimea were made in areas where active transportation of food and feed occurs. The further fate of this ephemerophyte will be traced in the area. A. V. Yena

Compositae (*Asteraceae*)

Carduus acicularis Bertol. (≡ *C. pycnocephalus* var. *acicularis* (Bertol.) Weiss) – Fig. 6.
A Cm: Crimea: Yalta region, vicinity of Goluboy Zaliv (Blue Bay) settlement, Limeny valley, territory of Yalta Nature Reserve, 44°24'19"N, 33°58'52"E, 140 m, *Pinus* plantation, side of fire-fighting country road, 9 Jun 2023, *Ryff* (YALT + photo); ibid., recreational complex near sea coast, 44°24'07"N, 33°59'17"E, 15 m, roadside, 28 Jun 2023, *Ryff* (photo). – This species is native to the Mediterranean and Bulgaria. In Switzerland, it is probably alien (Greuter 2006+; POWO 2023). Compared to the closely related *Carduus pycnocephalus* L. s.l., *C. acicularis* is more slender, has longer (11–15 cm) and narrower (c. 1 mm in diam.) peduncles, narrower involucral bracts (not more than 0.5 mm wide in the middle part) and rugulose achenes (Amaral Franco & Rocha Afonso 1976; Devesa & al. 2009). *Carduus acicularis* was probably accidentally introduced into Crimea in recent decades with building materials or seedlings of ornamental plants from the Mediterranean. Only two micropopulations in one area with a total number of c. 30 individuals have been found so far. However, it is possible that this species is more widely distributed, but it is easily confused with *C. pycnocephalus*, which often occurs on the S coast of Crimea in anthropo-

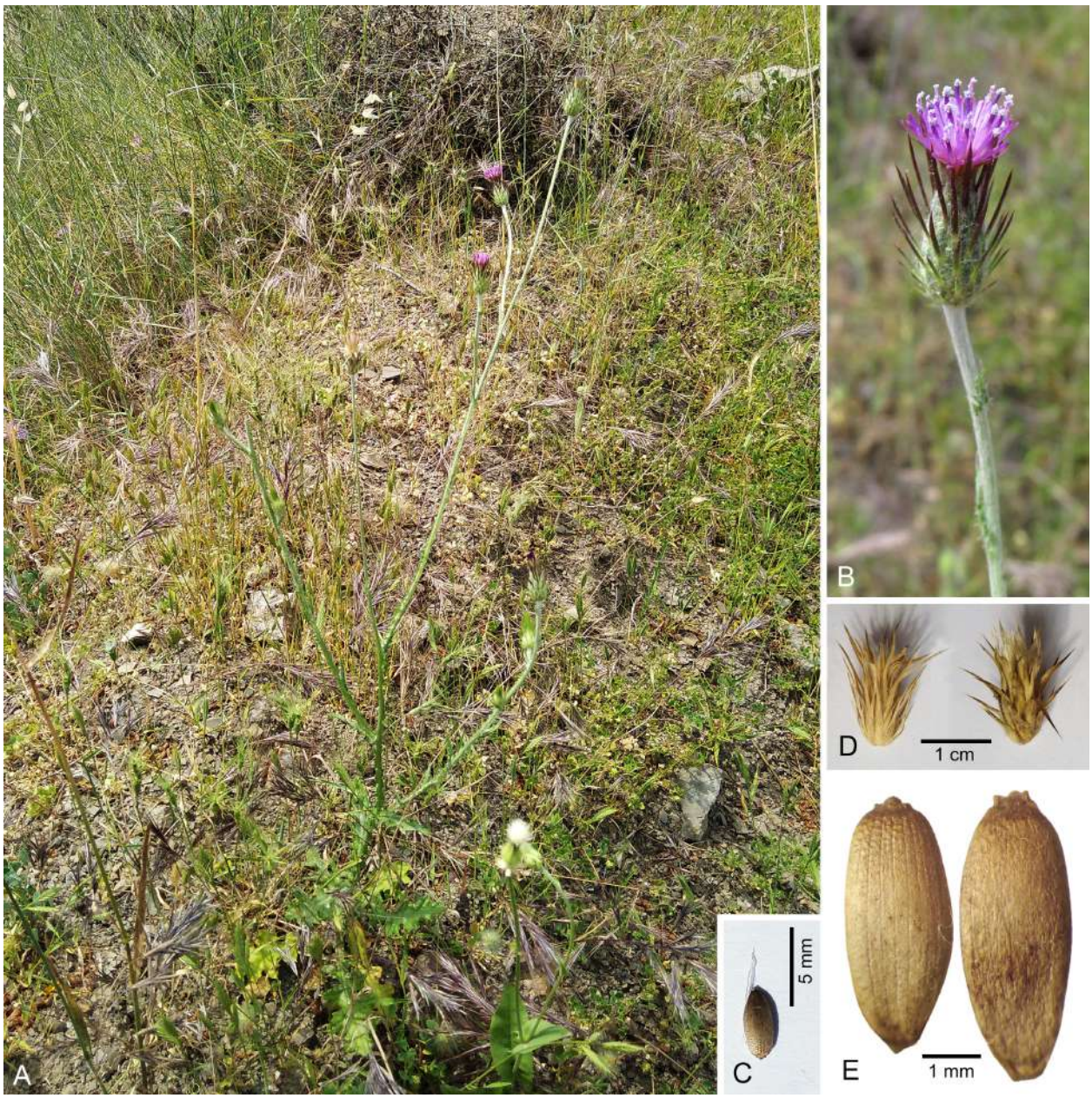

Fig. 6. *Carduus acicularis* – A: flowering plant; B: capitulum; C: achene. – D: *C. acicularis* (left), *C. pycnocephalus* subsp. *pycnocephalus* (right), mature capitula. – E: *C. acicularis* (left), *Carduus pycnocephalus* subsp. *pycnocephalus* (right), achenes. – A–C: Crimea, Goluboy Zaliv, Jun 2023; D, E: ibid., 30 Jun 2023 (collected 28 Jun 2023), photographs by L. E. Ryff.

genic and seminatural habitats. In the coastal ruderal habitats of Goluboy Zaliv, *C. acicularis* grows together with *C. pycnocephalus* subsp. *pycnocephalus*. *Carduus acicularis* is also similar in habit to and can be confused with *Tyrimnus leucographus* (L.) Cass., which was recently found in SW Crimea (Seregin & al. 2015). L. E. Ryff

Hieracium umbrosum subsp. ***abietinum*** (Boiss. & Heldr.) Greuter (≡ *H. vulgatum* var. *abietinum* Boiss. & Heldr. ≡ *H. vulgatum* subsp. *abietinum* (Boiss. & Heldr.) Fr. ≡ *H. abietinum* (Boiss. & Heldr.) Boiss. ≡ *H. umbrosum* [subsp. *umbrosum*] var. *abietinum* (Boiss. & Heldr.) Zahn) **+ Rm:** Romania: Banat, Băile Herculane [Herkulesbad], "Im Buchenwald um Suskului", 24 Jun 1905, *Schröter* (ZT-00275378). – As shown in the synonymy, the taxonomic position of this Greek taxon has often changed. The rank adopted by Zahn is obviously undervalued for this remarkable taxon with its nearly circular basal leaves. Besides in Greece, it was recently detected in S Italy (Gottschlich & al. 2017) and is thereby an interesting case for an amphi-Adriatic range. G. Gottschlich

Crassulaceae

Sedum sediforme (≡ *Petrosedum sediforme* (Jacq.) Grulich) **A Uk:** Ukraine: Odesa Oblast, Odesa Raion, upper reach-

Fig. 7. *Euphorbia serrata*, inflorescence. – Greece, Argolis, Limnes to Angelokastro, 19 May 2023, photograph by Ute Bergmeier.

es of Khadzhybey estuary, 46.690551°N, 30.392068°E, limestone slopes, spontaneous colony with an area of c. 0.03 ha, 1 Oct 2022, *Kalashnik* (photo: https://www.inaturalist.org/observations/178887319); ibid, 18 Jun 2023, *Kalashnik* (photo: https://www.inaturalist.org/observations/178888664). – New for the continental part of Ukraine as a casual alien, of Mediterranean origin, escaped from cultivation. Spontaneous seed dispersal was also noted in the Odesa Botanical Garden, 18 Sep 2017, *Shynder* (obs.). The species is already listed as naturalized in Crimea (Yena 2012). It is cultivated very rarely in Ukraine. K. Kalashnik & O. Shynder

Cyperaceae

Carex umbrosa Host subsp. ***umbrosa***
+ Mk: North Macedonia: Pelagonia region, Nidže Planina, Dobro Pole peak, 41.05056°N, 21.88349°E, 1100 m, 14 Jun 1916, *Mrkvicka* (SOM 10 401, 10 411), det. B. Davidov. – Not previously recorded from North Macedonia, according to Jiménez-Mejías & Luceño (2011+). The species is not mentioned in the published *Reliquiae mrkvičkanae* of Velenovský (1922: 22). The collector, Jan Mrkvicka, an officer in the Bulgarian army, was killed in World War I on 17 Aug 1916 near the Grazhden peak which is situated SW of the North Macedonian Dobro Pole peak. Mrkvicka was buried in the village of Gradeshnitsa eventually. He could certainly not have crossed enemy lines to collect this plant on Greek territory. However, *C. umbrosa* subsp. *umbrosa* is also known to occur directly S of the Greek-North Macedonian border, in a shallow depression known under the similar toponym of Dobro Polje (Kali Pediada), where it grows in swampy open meadows over micaceous schist, partly with *Sphagnum* mosses and stagnant water (Strid 2006: 727). D. Dimitrov

Carex viridula Michx. (= *C. serotina* Mérat)
+ Mk: North Macedonia: Southwest region, Mt Jablanica, E slope of Sliva peak, 1200 m, swamp near spring, 14 Jul 1948, *Kitanov* (SOM 171731), det. D. Dimitrov. – Jiménez-Mejías & Luceño (2011+) did not report this species for North Macedonia. Bornmüller (1928), who collected intensively in what is today North Macedonia, did not observe this taxon which is, however, known to occur in adjacent Albania (Barina & al. 2018: 143, as *C. serotina*), N Greece (Dimopoulos & al. 2013: 89) and Bulgaria (Assyov & al. 2012: 121, as *C. serotina*).
D. Dimitrov

Euphorbiaceae

Euphorbia serrata L. – Fig. 7.
+ Gr: Greece: Peloponnisos, Argolis, Municipality of Mykines, between Limnes and Angelokastro, 37°44.307'N 22°56.860'E, 770 m, arable field, 19 May 2023, *Bergmeier*

23-252 (herb. Bergmeier). – Only two plants of the species were found in the surveyed field, which was traditionally cultivated with barley and oats. The weed vegetation was very species-rich, the most abundant wild plants being *Bifora testiculata* (L.) Spreng., *Dasypyrum villosum* (L.) P. Candargy, *Neslia apiculata* C. A. Mey., *Papaver rhoeas* L., *Ranunculus arvensis* L., *Rhagadiolus stellatus* (L.) Gaertn., *Valerianella echinata* (L.) DC., *Veronica glauca* subsp. *peloponnesiaca* (Boiss. & Orph.) Maire & Petitm. and *Vicia striata* M. Bieb., among many others. *Euphorbia serrata* is widely distributed in the W and C Mediterranean, where it occurs in species-rich cereal fields on base-rich soils (see, e.g., Nezadal 1989). The occurrence in S Greece should be considered native, because there was no incidence of recent casual introductions in the field and its surroundings, and the seeds of the cereals are domestic. E. Bergmeier

Fig. 8. *Blackstonia acuminata* – A: flower; B: inflorescence. – A: Algeria, Skikda, cité Zeramna, 15 May 2021; B: ibid., 2 Jun 2021, photographs by A. Saci.

Gentianaceae

Blackstonia acuminata (W. D. J. Koch & Ziz) Domin (≡ *Chlora acuminata* W. D. J. Koch & Ziz = *B. perfoliata* subsp. *serotina* (Rchb.) Vollm.) – Fig. 8.

+ Ag: Algeria: Skikda, Skikda city, cité Zeramna, 36°51'23"N, 06°55'13"E, 90 m, clayey and rocky N-facing slope in suburban environment, 15 May & 2 Jun 2021; 27 May, 11 Jun & 6 Jul 2022, *Saci* (photos [Fig. 8]), det. E. Véla. – This is the first confirmed record of *Blackstonia acuminata* in Algeria, more precisely in the former province of Constantine; see following entry. E. Véla & A. Saci

Blackstonia perfoliata (L.) Huds. (≡ *Chlora perfoliata* L.)

– Ag: The first surveys of the genus *Blackstonia* Huds. (≡ *Chlora* Adans.) in N Africa during the 18th century (Poiret 1789: 158; Desfontaines 1798: 327) only refer to *B. perfoliata* sensu lato (as *C. perfoliata*). After the description of *B. grandiflora* (Viv.) Pau by Viviani (1830: 4, as *C. grandiflora*), the Algerian floras only considered that taxon (Munby 1847: 40; 1859: 21; 1866: 23). At the end of the 19th century, Battandier (1890: 590, as *C. perfoliata*) reintroduced the name *B. perfoliata* for Algeria, however with doubt, saying "des échantillons de la province de Constantine m'ont paru s'y rapporter". Nevertheless Julien (1894: 186) accepted *B. perfoliata* (as *C. perfoliata*) for Algeria in addition to the common *B. grandiflora*. Battandier (1890: 590) claimed the occurrence of *B. perfoliata* also for Tunisia, but Bonnet & Barratte (1896: 288, as *C. imperfoliata* L. f.) argued that the latter record concerned *B. imperfoliata* (L. f.) Samp. Accordingly, Battandier & Trabut (1905: 228) then accepted *B. imperfoliata* as the second species for Tunisia, but not for Algeria where they considered only the occurrence of *B. grandiflora*. Battandier (1910: 63) also confirmed *B. imperfoliata* for Tunisia, but considered *B. perfoliata* to be deleted from the flora of Algeria. On the contrary, Quézel & Santa (1963: 741) reconsidered, additionally to the common *B. grandiflora* (as *B. perfoliata* subsp. *grandiflora* (Viv.) Maire), the presence of *B. perfoliata* in Algeria (as *B. perfoliata* subsp. "*eu-perfoliata*" Maire). Pottier-Alapetite (1981: 699) forgot to mention the historical presence of *B. imperfoliata* but added *B. perfoliata* (subsp. "*eu-perfoliata*" Maire) to the flora of Tunisia, based on three collections (two from herself and one from Cuénod). Finally, Le Floc'h & al. (2010: 209) reconsidered the historical presence of *B. imperfoliata* (as *B. perfoliata* subsp. *imperfoliata*) in Tunisia, but did not consider the possibility of any misidentification concerning *B. perfoliata* subsp. *perfoliata*. As a consequence, they accepted three *Blackstonia* taxa for Tunisia (followed by Marhold 2011+c). Flowering plants illustrated on the sharing network iNaturalist by one of us (AS) allowed the other (EV) to identify them as *B. acuminata* (W. D. J. Koch & Ziz) Domin (see preceding entry). None of the main, independent backbone databases on the N African flora gives this species for Algeria (nor Tunisia). We carried out a digital search

Fig. 9. *Eleusine indica* – A: flowering plants; B: inflorescence. – A, B: Crimea, Yalta, 8 Jul 2023, photographs by L. E. Ryff.

on specimens of the genus *Blackstonia* from "Afrique du Nord" stored in the herbarium P, which gave 217 results (https://science.mnhn.fr/institution/mnhn/collection/p/item/list?specificEpithet=imperfoliata&secteur=AFN&genus=Blackstonia, accessed 3 Jan 2023). Among them, 11 sheets from the Canaries, Morocco and Tunisia (but none from Algeria) are correctly sorted under *B. imperfoliata*, 133 sheets from all three N African countries are correctly sorted under *B. grandiflora* and 72 sheets are sorted under "*B. perfoliata*"; only seven of them, all from Morocco, effectively concern *B. perfoliata* s.str., a further three from Morocco fall within the variability of *B. acuminata*, whereas the majority shows specimens of *B. grandiflora* from all three countries (mostly labelled "subsp./var. *grandiflora*"). As a consequence, we cannot confirm any specimen of *B. perfoliata* s.str. from Algeria, and this taxon should therefore be retracted from the national checklist. E. Véla & A. Saci

Gramineae (*Poaceae*)

Eleusine indica (L.) Gaertn. (≡ *Cynosurus indicus* L.) – Fig. 9.

A Cm: Crimea: Yalta, Ignatenko Street, cracks between paving slabs, asphalt cracks, sidewalks, bases of walls of buildings, 44°29'49"N, 34°10'18"E, 10 m, 1 Jul 2023, *Ryff* (YALT); ibid., 8 Jul 2023, *Ryff* (YALT + photo); ibid., Radina square, 44°29'47"N, 34°10'21"E, 11 m, 21 Aug 2023, *Ryff* (YALT); ibid., Komsomol'skaya square, 44°29'51"N, 34°10'22"E, 15 m, 21 Aug 2023, *Ryff* (YALT + photo); ibid., Moskovskaya Street, 44°29'53"N, 34°10'13"E, 10 m, 21 Aug 2023, *Ryff* (photo). – This species is widespread in tropical and warm-temperate zones of the world. It is native to S, SE and SW Asia and Africa (except N Africa). Information about its status, whether native or alien, in the E Mediterranean and Caucasus is conflicting. In the rest of its range, including Europe, *Eleusine indica* is an alien species. In the Euro+Med PlantBase (Valdés & Scholz 2009+) it is given for Ukraine, taken from the *Vascular plants of Ukraine* (Mosyakin & Fedoronchuk 1999). However, this publication clearly states that *E. indica* was collected once in Kyiv in 1991, but subsequently its population disappeared (Mosyakin & Shevera 1993; Mosyakin & Fedoronchuk 1999). There are no more recent records of this species in Ukraine (Shevera, pers. comm.). *Eleusine indica* has not been previously reported for the flora of Crimea (Yena 2012). It was accidentally introduced to Yalta, apparently several years ago, most likely from the Caucasus, either by road transport or with building materials when laying new paving slabs. Now *E. indica* is actively spreading in various anthropogenic habitats in the area of its initial introduction in the centre of the city. The population includes c. 1000 individuals and occupies an area of c. 0.25 km^2, its density is up to 10–20 plants per m^2. *Eleusine indica* forms monodominant groups or grows in a weed community with *Amaranthus deflexus* L., *A. retroflexus* L., *Chenopodiastrum murale* (L.) S. Fuentes & al., *Digitaria sanguinalis* (L.) Scop., *Eragrostis minor* Host, *Erigeron canadensis* L., *E. sumatrensis* Retz., *Poa annua* L., *Polygonum aviculare* L., *Portulaca oleracea* L. s.l., *Setaria viridis* (L.) P. Beauv., *Symphyotrichum squamatum* (Spreng.) G. L. Nesom and other ruderal plants. Currently, *E. indica* is only locally distributed in Crimea and can be considered as a casual alien. But this species is considered one of the most problematic weeds worldwide (Holm & al. 1991) due to its invasive behaviour and rapid spread. Therefore, we can expect its further expansion in Crimea. L. E. Ryff

Elytrigia atherica (Link) Kerguélen (≡ *Elymus athericus* (Link) Kerguélen = *Elymus pycnanthus* (Godr.) Melderis) – Fig. 10.

+ Cm: Crimea: Sevastopol, Kruglaya Bay (Omega Bay), 44°35'43"N, 33°26'54"E, 1 m, sea shore, 2 Aug 2014, *Yevseyenkov* (photos: https://www.plantarium.ru/page/image/id/400093.html [Fig. 10A], https://www.plantarium.ru/page/image/id/400094.html [Fig. 10C], https://www.plantarium.ru/page/image/id/400095.html); ibid., 13 Jun 2018, *Yevseyenkov* (photo: https://www.plantarium.ru/page/image/id/594550.html); ibid., Kamyshovaya Bay, 44°34'23.34"N, 33°25'34.82"E, seashore, 26 Mar 2020, *Yevseyenkov* (photo: https://www.plantarium.ru/page/image/id/649618.html); ibid., Kruglaya Bay, 44°35'43"N, 33°26'54"E, 1–2 m, sea shore, 19 Jul 2020, *Ryff* (photo); ibid., 19 Jul 2020, *Ryff*, *Yevseyenkov* & *Kudrinskaya* (YALT); ibid., Kamyshovaya Bay, 44°34'23"N, 33°25'39"E, 1 m, sea shore, 19 Jul 2020, *Ryff*, *Yevseyenkov* & *Kudrinskaya* (YALT); ibid., Kazachya Bay, 44°34'08"N, 33°24'49"E, 1 m, sea shore, 19 Jul 2020, *Ryff*, *Yevseyenkov* & *Kudrinskaya* (YALT); ibid., Streletskaya Bay, 44°35'39"N, 33°28'06"E, 2–3 m, sea coast, 19 Jul 2020, *Ryff*, *Yevseyenkov* & *Kudrinskaya* (YALT). – This is a characteristic plant of sea shores. The taxonomy of the group of couch grass, united by the common English name sea couch (*Elymus pungens* (Pers.) Melderis, *Elymus pycnanthus* (Godr.) Melderis, *Elytrigia atherica* and *Thinopyrum acutum* (DC.) Banfi), is very confusing and requires further study. In the present note we adhere to the concept adopted in the Euro+Med PlantBase (Valdés & Scholz 2009+) and consider the plants we found under the name *Elytrigia atherica*. This species is native to the Mediterranean, W and C Europe, and the Black Sea coast of Turkey, Bulgaria and Romania (Ciocârlan 1994, 2011; Valdés & Scholz 2009+; Doroftei & al. 2011; Assyov & al. 2012; POWO 2023). In the Black Sea region it is rare and therefore it is included (as *Elymus pycnanthus* (Godr.) Melderis) in the Red List of Bulgarian vascular plants and the Red Book of the Black Sea (Dumont 1999; Petrova & Vladimirov 2009). For E Europe, sea couch is indicated as an alien species based on a single herbarium specimen from 1859 from an unknown collector from Kotlin island (city of Kronstadt) in the Gulf of Finland near Saint Petersburg. This find was cited in different sources under different names: *Elytrigia pungens* (Pers.) Tutin (Tzvelev 1964), *Elymus pycnanthus* (Melderis 1985) or *Elytrigia atherica* (Tzvelev 2006). For the Baltic region, hybrids with the formula *E. pycnanthus* × *Elytrigia repens* (L.) Nevski are mentioned (Tzvelev 1964; Melderis 1980). To date, such plants have disappeared from the vicinity of Kronstadt (Tzvelev & Probatova 2019), and there is no current information from the Baltic countries. In S Ukraine, sea couch was found in 1868 near the coast of the Tiligul estuary, and there is a relevant herbarium specimen in BRNU, identified as *Triticum pungens* Pers. (GBIF 2023). However, in *Vascular plants of Ukraine* (Mosyakin & Fedoronchuk 1999) this species is not indicated for the territory of the country. In Crimea, sea couch was first found by one of us (PY) in 2014 in the Kruglaya Bay of the Black Sea in the city of Sevastopol. Subsequently, the same plants were identified by PEY and AYK along the shores of other bays of Sevastopol – Kamyshovaya, Kazachya and Streletskaya. Their photos were shown in Plantarium (2007–2023), but the identification

Fig. 10. *Elytrigia atherica* – A: flowering plants; B: spike in flower; C: spike in fruit. – A, C: Crimea, Sevastopol, 2 Aug 2014; B: ibid., 16 Jul 2020, photographs by P. E. Yevseyenkov.

of the plant caused difficulties. It was assumed that this was ×*Agrotrigia hajastanica* (Tzvelev) Tzvelev – a rare intergeneric hybrid of *Agropyron cristatum* (L.) Gaertn. s.l. × *Elytrigia repens* (Seregin & al. 2015). However, a more careful study convinced us that the plants from Sevastopol are identical with *Elytrigia atherica* from the Mediterranean. As in other areas of its range, in Sevastopol this species grows exclusively along the seashore. It forms a pure sward or communities of the class *Juncetea maritimi* Br.-Bl. in Br.-Bl. & al. 1952 together with *Elytrigia elongata* (Host) Nevski, *E. repens*, *Phragmites australis* (Cav.) Steud. and some other species. Without doubt, this is a species native to the flora of Crimea and, accordingly, E Europe.

L. E. Ryff, P. E. Yevseyenkov & A. Y. Kudrinskaya

Iridaceae

Iris foetidissima L.

N Cm: Crimea: Urban District Yalta, Nizhnyaya Oreanda, 44.46412°N, 34.146639°E, forest, 5 Sep 2003, *Levon* (photo: https://www.inaturalist.org/observations/67905405); ibid., Foros, Forossky Park, mature individuals with seedlings, 30 Dec 2012, *Gayvoronskaya* (photo: https://www.plantarium.ru/lang/en/page/image/id/170042.html; Gayvoronskaya 2013); Miskhor, Miskhorsky park, near stream, escaped, 7 Nov 2020, *Zorina* (photo: https://www.plantarium.ru/lang/en/page/image/id/760954.html; Plantarium 2023); ibid., surroundings of Nikita, 44°30'56"N, 34°14'03"E, 230 m, disturbed ash-oak forest, 7 Jun 2023, *Sadogurskiy* (photo); ibid., 11 Jul 2023, *Ryff* (YALT); ibid., Magarach, 44°30'31"N, 34°13'06"E, 125 m, disturbed ash-oak forest, 25 Jul 2023, *Ryff* (YALT). – This species is native to W Europe and the W Mediterranean (Euro+Med 2006+). *Iris foetidissima* is widely cultivated as an ornamental plant and sometimes escapes from cultivation. Now it is naturalized in many regions of the world, especially in North America and Australia (Randall 2017; GBIF 2023; POWO 2023). It has been grown for a long time in the Nikitsky Botanical Garden and in other parks as well as in private gardens along the S coast of Crimea. For the first time in the region, escaped plants of *I. foetidissima* (erroneously determined as *I. musulmanica* Fomin; see following entry) were revealed by the first author in the eastern, abandoned edge of the Massandrovsky Park in Yalta in the second half of the 1980s. Numerous plants of *I. foetidissima*, together with another adventive species, *Daphne laureola* L., grow there in a dense shibljak of *Carpinus orientalis* Mill. and *Quercus pubescens* Willd, in a ground vegetation layer of *Hedera helix* L. In 2022, a spontaneously sprouted plant of this species was found near the settlement of Nikita, approximately 500 m apart from the cultivated population in the Verkhniy Park of the Nikitsky Botanical Garden. In 2023, a population of *I. foetidissima* in the vicinity of Magarach was examined in detail. Evidently, the population has been growing spontaneously in this place for several decades. To date, it occupies an area of about 200 m^2 and has more than 20 individual clones of different age, of which at least three are generative; they bloom and bear fruit and reproduce by seeds and vegetatively. The largest clones reach 2 m in diam. and consist of 10–15 elementary individuals. Flowering time is in the middle of June. The population grows not far from a stream, in the lowland and on adjacent slopes in a disturbed *Quercus-Fraxinus* forest. It forms a plant community with *Brachypodium sylvaticum* (Huds.) P. Beauv., *Clematis vitalba* L., *Hedera helix* L., *Rubus caesius* L., *Ruscus aculeatus* L., *Solanum dulcamara* L. and other mesophytic species. *Iris foetidissima* is known from a few localities in S Crimea and its populations are small. It persists in the natural flora for a long period, at least more than 30 years, successfully reproducing and spreading by seeds, slowly expanding its range. The species is therefore considered to have become naturalized in Crimea. A. V. Yena & L. E. Ryff

Iris spuria subsp. ***musulmanica*** (Fomin) Takht. (≡ *I. musulmanica* Fomin)

– N Cm: This name has been erroneously applied to two different taxa of *Iris* L. that occur in Crimea. Firstly, it concerns alien *Iris* plants naturalized in Yalta, on the S coast of Crimea, and originally given for the Crimean flora at the very end of the 20th century (Didukh & Yena 1999). Later the same name was included in the annotated checklist of the regional spontaneous flora (Yena 2012) and mentioned with reference to that monograph in the Euro+Med-Checklist Notulae, 16 (Svirin & Kashirina 2023). According to the taxonomic re-examination of those plants, *I. spuria* subsp. *musulmanica* is to be excluded from the Crimean flora and all records for this region mentioned here refer to *I. foetidissima* L. (see preceding entry). Secondly, the name *I. spuria* subsp. *musulmanica* was also misapplied to a herbarium specimen in MW collected in the Sevastopol area on 30 May 2012 (Seregin 2023), which turned out to belong to the autochthonous *I. halophila* Pall. (Svirin & Kashirina 2023). This error is also mirrored in the occurrence data for *I. spuria* subsp. *musulmanica* provided by GBIF (2023); the locality on the Gerakleysky Peninsula in Crimea shown there refers in fact to *I. halophila*. A. V. Yena

Labiatae (*Lamiaceae*)

Pseudodictamnus mediterraneus subsp. ***lycius*** (Hub.-Mor.) Raus, **comb. nov.** ≡ *Ballota pseudodictamnus* subsp. *lycia* Hub.-Mor. in Bauhinia 2: 203. 1963. – From a phylogenetic analysis based on nuclear and plastid DNA sequences representing all genera of the tribe *Marrubieae*, Siadati & al. (2018) revealed the necessity of splitting the genus *Ballota* L., in its traditional concept, into two well-supported clades matching well with the genera *Ballota* s.str. (2 or 3 species, with calyx limb regularly dentate, 5-toothed) and *Pseudodictamnus* Fabr.

(13 species, with calyx limb undulate or crenate or irregularly dentate with 10 to many teeth). In this context, 13 new names and combinations in *Pseudodictamnus* at specific rank were proposed, among them *P. mediterraneus* Salmaki & Siadati (Siadati & al. 2018: 779), known as *Ballota pseudodictamnus* (L.) Benth. in previous floristic literature. This is an E Mediterranean geoelement with its nominate subspecies *P. mediterraneus* subsp. *mediterraneus* (≡ *B. pseudodictamnus* subsp. *pseudodictamnus*) distributed in the S Aegean area (Crete and Andikithira, see Strid 2016: 537, map 2116), extending to opposite N Africa (Cyrenaica, Patzak 1959: 52; POWO 2023), and a second subspecies occurring in SW Asia (Stapf 1885: 41; Davis & Doroszenko 1982: 157–158), originally described as *B. pseudodictamnus* subsp. *lycia* Hub.-Mor., which differs mainly by its larger calyx limb with more prominently mucronate teeth (Huber-Morath 1963: 203). For the latter, a still lacking name under *Pseudodictamnus* is proposed here. Th. Raus

Stachys obliqua Waldst. & Kit.
+ Mk: North Macedonia: Southwest region, Mt Jablanica, E slope of Vokari peak, 1400 m, limestone, 24 Jul 1948, *Kitanov* (SOM 177 242), det. D. Dimitrov. – New to North Macedonia. The species is not mentioned or keyed out in the *Labiatae* treatment of the most recent flora of the country (Matevski 2021). D. Dimitrov

Leguminosae (*Fabaceae*)

Lathyrus cassius Boiss. – Fig. 11A, B.
+ Bu: Bulgaria: Thracian lowland, Haskovo district, 1.5 km NE of Simeonovgrad town, 19 Jun 2021, *Mátis & Miholcsa* (obs.); ibid., 42.04326°N, 25.84557°E, 90 m, dry grasslands among sparse *Paliurus spina-christi* Mill. scrub, 15 Jun 2023, *Stoyanov & Marinov* (SOM 178626); ibid., 42.04386°N, 25.84665°E, 15 Jun 2023, *Stoyanov & Marinov* (SOM 178627, SOM 178628). – This is the first record of *Lathyrus cassius* from Bulgaria. Up to now, *Lathyrus* L. was represented by 30 species in the Bulgarian flora (Kožuharov 1976; Tosheva 2005). *Lathyrus cassius*, an E Mediterranean element, was known only from SW Asia (Anatolia and the Levant) until a few years ago (Davis 1970). It was recently reported for the first time for the European flora, from Edirne Province in European Turkey (Güneş & Çırpıcı 2015). The Bulgarian locality of *L. cassius* is about 160 km N of the one from near Edirne and therefore now represents the northernmost outpost of the range of the species. Among the Bulgarian members of the genus, *L. cassius* is closely related to *L. annuus* L. The latter is a circum-mediterranean species, growing sympatrically with the former but in more humid, more or less scrubby habitats. Morphologically, the two species are well distinguished. *Lathyrus cassius* has pale pink flowers and its peduncles, calyx teeth and legumes are covered with more or less dense, sessile glands, whereas *L. annuus* shows yellow to orange-yellow flowers, without or with only a few, sparse glands (Fig. 11C, D). Furthermore, the legumes of *L. cassius* are 28–35 mm long, whereas those of *L. annuus* are 40–80 mm long (Davis 1970). The two species also differ significantly in phenology: *L. annuus* blooms in the second half of May, whereas *L. cassius* a month later. The population of *L. cassius* occupies the S slope of a small hill NE of Simeonovgrad town and consists of about 100 individuals. The species grows in dry grasslands dominated by *Aegilops speltoides* Tausch and *Hordeum bulbosum* L., alongside other typical Mediterranean or submediterranean species such as *Bituminaria bituminosa* (L.) C. H. Stirt., *Bupleurum odontites* L., *Convolvulus betonicifolius* Mill., *Cota tinctoria* (L.) J. Gay, *Cruciata pedemontana* (Bellardi) Ehrend., *Crupina vulgaris* Cass., *Echinops microcephalus* Sm., *Linum trigynum* L., *Pimpinella peregrina* L., *Polygala monspeliaca* L., *Rumex tuberosus* L., *Rapistrum rugosum* (L.) All., *Stachys obliqua* Waldst. & Kit., *Teucrium capitatum* L., *Ziziphora capitata* L. Due to extensive grazing, ruderal plants such as *Bromus arvensis* L., *Cephalaria transsylvanica* (L.) Roem. & Schult., *Ononis spinosa* L., *Eryngium campestre* L., *Phleum paniculatum* Huds. and *Xeranthemum cylindraceum* Sm. were also abundant in the grasslands.
A. Mátis, Z. Miholcsa, Y. Marinov & S. Stoyanov

Malvaceae

Hibiscus syriacus L.
A Uk: Ukraine: Cherkasy Oblast, Cherkasy city, 49.425286°N, 32.054533°E, spontaneous seedlings near flower beds, 21 Aug 2022, *Chorna & Shynder* (photo: https://www.inaturalist.org/observations/148261389); Uman city, 48.750379°N, 30.223615°E, young plants along edges of sidewalks in several places, 1 Jul 2023, *Chorna* (obs.); Chernivtsi city, 48.287608°N, 25.936161°E, Cathedral of the Holy Spirit, several self-sowing plants along sidewalk, 2–3 years old, 5 Jan 2023, *Shynder* (photo: https://www.inaturalist.org/observations/155428815); Kyiv City, 50.41437°N, 30.561165°E, M. M. Gryshko National Botanical Garden, plants of various ages (including flowering ones) in cracks of paths and foundations of buildings, spontaneous, 12 Apr 2020, *Shynder* (photo: https://www.inaturalist.org/observations/143890294); ibid, 29 Sep 2020, *Shynder* (KWHA 102587); Kyiv Oblast, Bila Tserkva city, square near railway station, several young plants (2–3 years old) in cracks along edge of sidewalk, 49.811361°N, 30.108871°E, 12 Aug 2023, *Doiko* (BCK s.n.); Odesa city, 46.404526°N, 30.751991°E, self-sown in flower beds and on sides of sidewalks and roads, 26 Sep 2022, *Shynder* (photo: https://www.inaturalist.org/observations/155382645); Ternopil Oblast, Ternopil city, 49.562659°N, 25.594468°E, along edges of sidewalks in several places, 23 Jul 2023, *Shynder* (obs.); Chortkiv city, plants spreading beyond flower gardens, 1–15 Jul 2023, *Sobolenko* (obs.); Zakarpattia Oblast, Mukachevo Raion, Svalyava city, 48.549765°N, 22.982052°E, a gen-

Fig. 11. A, B: *Lathyrus cassius*; A: flowers; B: young legume. – C, D: *L. annuus*; C: flowers; D: young legume. – A: Bulgaria, Simeonovgrad, 19 Jun 2021, photograph by A. Mátis; B: ibid., 15 Jun 2023; C, D: ibid., 22 May 2023, photographs by S. Stoyanov.

erative plant in crack in sidewalk along central street, 30 Aug 2022, *Shynder* (photo: https://www.inaturalist.org/observations/155429219); ibid., Berehove city, territory of B. Linner Berehove District Hospital, near central entrance, near place of culture, several self-sown plants, 28 Aug 2022, *Shevera & Shynder* (photo: https://www.inaturalist.org/observations/152538461); Berehove city, 48.204664°N, 22.633318°E, several 2–3 year old plants along walls and edges of sidewalks, 28 Aug 2022, *Shevera & Shynder* (photo: https://www.inaturalist.org/observations/152384970); Berehove city, 48.217651°N, 22.645113°E, spontaneous group of mature plants on roadside, 1 Sep 2022, *Shynder & Shevera* (photo: https://www.inaturalist.org/observations/152491353); ibid., Uzhhorod city, spontaneous in undergrowth of Botanical Garden of Uzhhorod National University, 15 Jul 2022, *Shevera* (obs.); ibid, flower embankment between Botanical Garden of Uzhhorod National University (where species is cultivated) and Uzhhorod children railway, escaped, 16 Sep 2022, *Shevera* (obs.). – A shrubby species of E Asian origin. Nowadays, it is often used for decorative gardening almost throughout Ukraine, but 20–30 years ago it was almost never grown in the N regions due to its low winter hardiness. New for the continental part of Ukraine as a casual alien, escaped from cultivation.

M. Shevera, O. Shynder, H. Chorna & N. Doiko

Fig. 12. Alien *Eucalyptus* species in Tunisia – A, B: *E. botryoides*; A: flaky-fibrous grey bark; B: cylindric fruits. – C–E: *E. cylindrocarpa*; C: basal part of planted individual with flaky bark and two juvenile individuals of different age; D: cylindric buds with conic operculum; E: flowers and ovoid fruits. – F, G: *E. gomphocephala*; F: subfibrous fissured bark; G: cylindric to ovoid fruits. – A, B: Tunisia, Jendouba, Aïn Draham, Babouch to Tabarka, 15 Oct 2022; C–E: ibid., Monastir, Jemmal to Touza, 20 Sep 2022; F, G: ibid., Bizerta, Sidi Salem to Nadhour, 1 Oct 2022, photographs by R. El Mokni.

Myrtaceae

Eucalyptus botryoides Sm. – Fig. 12A, B.
A Tn: Tunisia: Jendouba, Aïn Draham, road from Babouch toward Tabarka, 36°48'46"N, 08°40'43"E, 485 m, escaped on roadsides, 15 Oct 2022, *El Mokni* (herb. Univ. Monastir). – Aiming at updating the list of alien *Myrtaceae* in Tunisia (see, e.g., El Mokni 2021), *Eucalyptus botryoides* is reported here from the Kroumirian mixed oak forest in NW Tunisia as a casual alien species new for the adventitious flora of Tunisia and Africa (see APD 2023). The species is native to SE Australia (Victoria, New South Wales); in the Mediterranean region, it is reported as a casual alien only in Italy, Sardinia, Sicily and Malta, and as cultivated in Portugal (Raab-Straube 2022+). R. El Mokni

Eucalyptus cylindrocarpa Blakely – Fig. 12C–E.
A Tn: Tunisia: Monastir, road from Jemmal toward Touza, 35°37'46"N, 10°48'29"E, 1–2 m, escaped on roadsides, 20 Sep 2022, *El Mokni* (herb. Univ. Monastir). – A casual alien species new for the adventitious flora of Tunisia, Africa and the Mediterranean area. *Eucalyptus cylindrocarpa* (Austin 1960: 102, sheet 40) is restricted to W Australia (POWO 2023) and has not been recorded beyond its native range before, except in the Americas (Raab-Straube (2022+; APD 2023; GBIF 2023). In the Euro+Med region, the species is known to occur only in Tunisia, where it was successfully introduced and escaped into the Touza region. For identification and more details, see Chippendale (1988: 310).
R. El Mokni

Eucalyptus gomphocephala DC. – Fig. 12F, G.
A Tn: Tunisia: Bizerta, road from Sidi Salem toward Nadhour, 37°17'13"N, 09°52'20"E, 7–10 m, escaped on roadsides, 1 Oct 2022, *El Mokni* (herb. Univ. Monastir); Jendouba, Ghar Dimaou, El Ghorra, Aïn gampho, 36°35'16"N, 08°23'30"E, 1000 m, 6 Jul 2022, *El Mokni* (herb. Univ. Monastir); Monastir (Monastir city), 35°45'50"N, 10°49'38"E, 12–15 m, roadsides and under walls of buildings, 29 Oct 2020, *El Mokni* (herb. Univ. Monastir). – A casual alien species new for the adventitious flora of Tunisia and Africa. *Eucalyptus gomphocephala* is an evergreen tree up to 40 m tall native to W Australia. As many species of the genus, it has been widely introduced around the world and can be found in cultivation used for wood production, windbreakers, stabilization of sands near the sea shore and afforestation and also as an important tree for honey production. In the Mediterranean the taxon is reported as a casual alien in Sardinia and Sicily (Galasso & al. 2018) and introduced in Spain, whereas only as cultivated for Morocco, Italy and Cyprus (Raab-Straube 2022+). For Africa, the taxon is cited with "unknown status" only from Morocco, Tunisia and Libya (see, e.g., Greuter & Domina 2015: 45; APD 2023). The actual status of *E. gomphocephala* in Tunisia and N Africa is defined here as casual alien. Three distant sporadic subpopulations of few juvenile individuals of different ages have been observed growing not far apart from successful introductions in the regions of Bizerta, Jendouba and Monastir.
R. El Mokni

Oleaceae

Fraxinus angustifolia subsp. ***oxycarpa*** (Willd.) Franco & Rocha Afonso (≡ *F. oxycarpa* Willd.)
A Uk: Ukraine: Kirovohrad Oblast, Kropyvnytskyi city, near Kovalivsky Park, 48.517684°N, 32.261230°E, young plants in cracks of pavement, 22 Jul 2023, *Shynder* (photo: https://www.inaturalist.org/observations/181019035); Kyiv City, 50.40998°N, 30.56021°E, M. M. Gryshko National Botanical Garden, Caucasus and Crimea plots, in plantations and spontaneously, 19 Sep 2022, *Shynder* (photo: https://www.inaturalist.org/observations/135759608); Mykolaiv Oblast, Voznesensk Raion, 47.565823°N, 31.85712°E, sporadically on side of highway, spontaneous offspring in roadside plantings, 9 Oct 2022, *Shynder* (obs.); Odesa Oblast, Bilhorod-Dnistrovskyi Raion, W vicinity of Mayaky village, 46.4185°N, 30.175°E, along highway, a spontaneously established young tree, 20 Jun 2019, *Shynder* (KWHA 102712); ibid., 46.437651°N, 30.191667°E, young self-sown tree, 23 Sep 2022, *Shynder* (KW s.n.); ibid., 46.418578°N, 30.175048°E, 24 Sep 2022, *Shynder* (KWHA 102489); ibid., 46.411699°N, 30.166699°E, group of trees along edge of reed swamp, 24 Sep 2022, *Shynder* (KWHA 102490); Odesa city, near Sport Palace, 46.446450°N, 30.758812°E, young tree weedy among *Juniperus sabina* L. plantation, 16 Sep 2022, *Shynder* (obs.); Odesa city, 46.445978°N, 30.763767°E, Botanical Garden of I. I. Mechnykov Odesa National University, new territory, mature tree in plantations with spontaneous offspring, 16 Sep 2022, *Shynder & Levchuk* (KW s.n.; photo: https://www.inaturalist.org/observations/150573368, https://www.inaturalist.org/observations/150573365); Odesa city, 46.384336°N, 30.749836°E, on slope above seashore, mature planted trees with scattered young spontaneous offspring, 24 Sep 2022, *Shynder* (KW s.n.; photo: https://www.inaturalist.org/observations/181061258); Vinnytsia Oblast, Bershad city, 48.360249°N, 29.523069°E, between slabs along embankment near park, dense self-sown seedlings, 14 Aug 2023, *Shynder* (KWHA 103173); Zakarpattia Oblast, Berehove city, spontaneous growth in old cemetery, 29 Aug 2022, *Shynder & Shevera* (KW s.n.); ibid., Berehove, 48.211269°N, 22.657157°E, spontaneous growth on side of road near old estate, 29 Aug 2022, *Shynder & Shevera* (KW s.n.). – The native range of this tree is submediterranean, including S Crimea. However, this taxon is listed as indigenous also for the continental part of Ukraine (Raab-Straube 2022+), based on Prokudin (1987), where exact original data are

missing. Therefore, we checked the existing information and found no original data on the natural occurrence of *Fraxinus angustifolia* subsp. *oxycarpa* in the continental part of Ukraine – this taxon is either not mentioned at all, or indicated only as a cultivated plant, or general statements are given that cannot be verified. Our indications are the first specifying the status of this subspecies as a casual alien in the continental part of Ukraine, where is has escaped from cultivation in several places given above.

O. Shynder, M. Levchuk & M. Shevera

Onagraceae

Ludwigia brevipes (Britton & al.) Eames (≡ *Ludwigiantha brevipes* Britton & al.) – Fig. 13.
A Cm: Crimea: Sevastopol, coast of Streletskaya Bay, 44°35'37"N, 33°28'11"E, 1 m, wasteland on ruins of ancient manor, 1 Sep 2022, *Yevseyenkov* (photo: https://www.plantarium.ru/page/image/id/741947.html); ibid., 4 Sep 2022, *Yevseyenkov* (photo: https://www.plantarium.ru/page/image/id/742251.html); ibid., 20 Sep 2022, *Yevseyenkov* (photo: https://www.plantarium.ru/page/image/id/744223.html); ibid., 20 Sep 2022, *Svirin* (photos: https://www.inaturalist.org/observations/153577017 as *L. repens* J. R. Forst.); ibid., 28 Sep 2023, *Yevseyenkov* (YALT; photo: https://www.plantarium.ru/page/image/id/781950.html). – The native range of *Ludwigia brevipes* is SE North America (POWO 2023). Its natural habitats are shores of seasonal ponds and shallow waterbodies, marshes, moist dune hollows and edges of impoundments and ditches. The species is widespread as an ornamental aquatic plant, especially in aquarium keeping. It is listed as an alien invasive species for Great Britain (CABI 2023). There is no information about records of *L. brevipes* in other European countries. In Crimea, *Ludwigia* was first found in 2021 by one of the authors (SAS), and in 2022 it was independently rediscovered in the same habitat by the second author (PEY). The species was originally identified as *L. repens*. A more thorough study showed that the plants were morphologically closer to *L. brevipes*, which differs from *L. repens* in its narrower leaf blades, larger flower parts, sepals 2–3 times longer than wide (vs approximately equally long and wide) and significantly longer fruiting pedicels. Both species belong to the same hybridogenic complex, are hexaploids and have the same genome composition (Liu & al. 2020). The plants we found have morphological and morphometric characters intermediate between typical *L. brevipes* and *L. repens*. The length : width ratio of the sepals of 2 : 1. Clearly visible and persistent petals and the presence of relatively long fruiting pedicels allow us to consider the Crimean plants as *L. brevipes*, although it is possible that they belong to the hybrid *L. brevipes* × *L. repens*. The only known locality of this taxon in the city of Sevastopol is the territory of the archeological monument, rural estate No. 101A, of the khôra of the ancient Tauric Chersonese. The plants grow in two soil-filled pithos holes cut into the limestone rock. Currently, the population includes about 100 individuals forming dense mats and covering an area of 1–1.5 m^2. *Ludwigia* L. is a new genus for the flora of Crimea; only one species of this genus, *L. palustris* (L.) Elliott, is native to Europe (Raab-Straube 2018+c). The same species was considered the only representative of *Ludwigia* in the flora of E Europe, where it is reliably known only from Ukrainian Transcarpathia (Prokudin 1987; Skvortsov 1996). Therefore, *L. brevipes* is the second species of this genus in E Europe, and to our knowledge the first report of this species for mainland Europe as a whole.

S. A. Svirin, P. E. Yevseyenkov, L. E. Ryff

Orobanchaceae

Euphrasia liburnica Wettst.
+ Mk: North Macedonia: Southwest region, Mt Jablanica, slope of Beličko Bardo, 1400 m, *Kitanov* (SOM 171 806), det. D. Dimitrov. – Widespread in the mountains of the Balkan Peninsula but not previously reported from North Macedonia (Marhold 2011+b). Several populations of this species that occur close to the borders of North Macedonia are known from Albania (Barina 2017: 330) and Greece (Mts Varnous, Kajmakčalan, Vitek 1991: 239; Mt Tzena, Chasapis & al. 2020).

D. Dimitrov

Melampyrum scardicum Wettst. – Fig. 14.
+ Gr: Greece: E Macedonia, Nomos of Drama, Mt Falakron, c. 3 km SE of Ochiro village, 41°17'N, 23°52'E, 640 m, edges of old dirt road, with *Carpinus orientalis* Mill., *Ostrya carpinifolia* Scop., *Syringa vulgaris* L., 24 Jun 2022, *Vidakis* (obs.); ibid., 14 Jun 2023, *Vidakis & Tsiftsis* (IHUF). – *Melampyrum scardicum* is known from Albania, Bulgaria, North Macedonia and Serbia (Petrova & Vladimirov 2010). It was not reported for Greece in the previously published *Vascular plants of Greece* (Dimopoulos & al. 2013, 2016). In the various Balkan countries, the species presents considerable differences in its distribution. In Bulgaria the species is widespread and occurs from sea level to 2000 m (Petrova & Vladimirov 2010; Assyov & Petrova 2012), whereas in Albania it is rather rare, confined to high-elevation areas of 1900–2200 m (Barina 2017). In Greece, *M. scardicum* has so far been found only in a very small area, which is threatened by extensive marble quarrying.

S. Tsiftsis & K. Vidakis

Orobanche litorea Guss.
+ Ma: Morocco: not far from Bouznika, 33.840538°N, 07.108651°W, sandy areas covered with vegetation behind dunes, 8 Apr 2010, *Pils* (obs., photo; see also Pils 2022: 407, as *O. artemisiae-campestris* Gaudin). – After El Mokni & al. (2015: 8) and particularly Rätzel

Fig. 13. *Ludwigia brevipes* – A: flowering branches; B: flower; C: fruiting branch. – A: Crimea, Sevastopol, 1 Sep 2022; B: ibid., 20 Sep 2022, photographs by P. E. Yevseyenkov; C: ibid., 20 Sep 2022, photograph by S. A. Svirin.

& al. (2018: 207 ff.) clarified the status of this species, which is presumably related to *O. minor* Sm. or *O. artemisiae-campestris*, *O. litorea* is better recognized as an independent species (see also El Mokni & Domina 2019) and has been reported or photographed more often, even if sometimes under a false name. This species was previously not known to occur in Morocco. The finding extends the range of *O. litorea* Guss. along the N African coast far to the west.

H. Uhlich, S. Rätzel & G. Pils

Orobanche teucrii Holandre

+ Gr: Greece: W Macedonia, Kozani, S Velventos, 557 m, deciduous forest, 1 May 2019, *Willing & Willing 295688* (B 10 1089280, as *O. caryophyllacea* Sm.). – Already in 1989, Uhlich (in Uhlich & al. 1995: 42 fig. 29, 97) found *Orobanche teucrii* in Bulgaria (C Pirin, descent from Premkata pass to Banderiza refuge, here f. *aurea* Teyber), about 45 km distant from the border with Greece. It was only a matter of time that the species would be detected for the first time also in Greece.

H. Uhlich & S. Rätzel

Orobanche variegata Wallr.

? Al: *Orobanche variegata* was reported for Albania by Shuka & Tan (2019) from various locations. However,

Fig. 14. *Melampyrum scardicum* – A: flowering plant; B: inflorescence. – Greece, Mt Vrondous, 24 Jun 2022, photographs by K. Vidakis.

the plant depicted in the published photograph is to be identified rather as *O. gracilis* Sm. *Orobanche variegata* is always a larger plant, often producing more than one stem, while its corolla is almost always uniformly dark red in the upper 3/4–4/5 without any yellow colour in its upper part. Moreover, the lower corolla lobe is usually larger and the thorat margins are less denticulate to subentire. Frequent misidentification of *O. gracilis* as *O. variegata* in the past lead to an alleged excessively broad distribution range of the latter taxon. Indeed, rare individuals of *O. gracilis* that are both robust and display an almost entirely red corolla may pose some uncertainty of identification. The same is true for single individuals with all-yellow corollas. Notwithstanding, *O. variegata* is a species belonging to the SW Mediterranean chorotype occurring from Morocco to Tunisia in NW Africa and having its easternmost populations in Sicily and northernmost ones in Sardinia (Sánchez Pedraja & al. 2016). In this light, it seems unlikely that *O. variegata* could be found also in the Balkans. The record published by Shuka & Tan (2019) could have been premature, because, according to what was written in their note, it is possible that Rätzel and Uhlich identified only one photograph, and the authors then seem to have extended this one provision to all their material. V. Lazzeri

Oxalidaceae

Oxalis articulata Savigny (≡ *Acetosella articulata* (Savigny) Kuntze; = *O. rubra* A. St.-Hil. ≡ *O. articulata* subsp. *rubra* (A. St.-Hil.) Lourteig) – Fig. 15.

A Cm: Crimea: Vicinity of Yalta, Nikita village, 44°30'56"N, 34°14'14"E, 250 m, ruderal habitat on roadside, 7 Jun 2023, *Ryff* (YALT + photo). – *Oxalis articulata* is a tuberous geophyte. Its native range is SE South America. This species is widely in cultivation as an ornamental, food and medicine plant in all continents and often escapes (Randall 2017). *Oxalis articulata* is listed as an alien species for many European countries (Henning & Raab-Straube 2016+b; POWO 2023). There are no indications in the scientific literature for E Europe, but a single find is known in N Ukraine (GBIF 2023). The species was recently reported as alien in Bulgaria (Petrova & Vladimirov 2019), a neighbouring region with a similar climate to the Crimean Peninsula. In recent years *O. articulata* has been widely cultivated in the Nikitsky Botanical Garden and other parks, in urban landscaping and private gardens of S Crimea, where it is suggested to have escaped from cultivation (Ryff 2021). In 2023, a small population of c. 30 individuals was found in the settlement of Nikita in a ruderal habitat, associated with

Hordeum murinum subsp. *leporinum* (Link) Arcang., *Humulus lupulus* L., *Lepidium draba* L. and *Sonchus oleraceus* L. *Oxalis articulata* has been recorded as a casual alien only in this single locality so far and does not yet show a tendency to spread, in contrast to the recently identified invasive bulb-bearing *Oxalis latifolia* Kunth (Ryff 2021), which is actually expanding its range in Crimea.

L. E. Ryff

Fig. 15. *Oxalis articulata*, flowering plants. – Crimea, Nikita, 7 Jun 2023, photograph by L. E. Ryff.

Papaveraceae

Papaver atlanticum (Ball) Coss.
A Uk: Ukraine: Zhytomyr Oblast, Berdychiv Raion, N vicinity of Ruzhyn town, 49.742867°N, 29.187592°E, edge of wheat field, 26 Jun 2023, *Orlov* (KW s.n., KWHA 103182). – An ephemerophyte new for Ukraine. The spontaneous spread of the species beyond the borders of the flower gardens in the M. M. Gryshko National Botanical Garden of Kyiv City was also noted on 21 May 2022, *Shynder & Kostruba* (photo: https://www.inaturalist.org/observations/118053714).

O. Shynder, O. Orlov & T. Kostruba

Portulacaceae

Portulaca oleracea L. is a common weed in Romania (Grințescu 1952; Anghel & al. 1972; Ciocârlan & al. 2004; Ciocârlan 2009 etc.). It has been reported in this country since the 18th century (Baumgarten 1816; Schur 1866; Edel 1835–1853 & Guebhard 1842–1848 cited in Brândză 1879–1883; Uechtritz & Sintenis 1876 cited in Kanitz 1879–1881; Herbich 1859; Grecescu 1898; Brândză 1898 etc.). *Portulaca oleracea* subsp. *sativa* (Haw.) Čelak. was mentioned as a garden vegetable by Schur (1866) and Porcius (1885) from Transylvania (as *P. sativa* Haw.) and by Grecescu (1898) from the extra-Carpathian regions (as *P. oleracea* var. *sativa* (Haw.) DC.) (Sîrbu & Oprea 2011).

In the botanical works from the last century as well as in recent times, the following species of *Portulaca* have been reported from Romania: *P. oleracea* L. (Prodan 1939; Borza 1947; Grințescu 1952; Beldie 1977; Oprea 2005; Ciocârlan 2009; Sîrbu & Oprea 2011; Sârbu & al. 2013), *P. grandiflora* Hook. as casual alien (Morariu 1937; see other references in Sîrbu & Oprea 2011) and *P. pilosa* L. as naturalized alien (Nagodă & al. 2013).

Special research on the *Portulaca oleracea* aggregate based on micromorphological peculiarities of the seed surface was triggered by the investigations of Avinoam Danin in different countries of the world (Danin 2011a, 2011b; Danin & al. 2008, 2012, 2016). In this context, two morphotypes new for Romania were found, viz. *P. granulatostellulata* (Poelln.) Ricceri & Arrigoni (Danin 2011a) and *P. trituberculata* Danin & al. (2011b).

Our special investigation of the *Portulaca oleracea* complex in Romania was started in 2022 by C. Sîrbu and A. Oprea with material from different regions of the country (34 specimens). Some morphotypes new for the Romanian flora were identified: *P. cypria* Danin, *P. daninii* Galasso & al., *P. macrantha* (Maire) Ricceri & Arrigoni, *P. nitida* (Danin & H. G. Baker) Ricceri & Arrigoni, *P. oleracea* L. s.str., *P. rausii* Danin, *P. sardoa* Danin & al. and *P. socotrana* Domina & Raimondo, and *P. granulatostellulata* and *P. trituberculata* were confirmed (11 morphotypes in total).

See Supplemental content online for Fig. S1–S3.

E. Bulakh, C. Sîrbu, A. Oprea, O. Volutsa & M. Shevera

Portulaca cypria Danin – Fig. S1A, B.
A Rm: Romania: Buzău, Râmnicu Sărat, 45.38231°N, 27.03869°E, 2022, *Sîrbu & Oprea* (IASI). – New area record for this taxon, identified by SEM study of the seeds. Its native range is the Mediterranean basin. It is also found in many other European countries (POWO 2023).

E. Bulakh, C. Sîrbu, A. Oprea, O. Volutsa & M. Shevera

Portulaca daninii Galasso & al. (≡ *P. oleracea* subsp. *tuberculata* Danin & H. G. Baker) – Fig. S1C, D.
N Rm: Romania: Iași, M. Sadoveanu Alley, 47.20946°N, 27.53154°E, roadside, 2022, *Sîrbu* (IASI); ibid., Iași, Miroslava, Ion Vodă cel Viteaz Street, 47.4082°N, 27.54360°E, roadside, 2022, *Sîrbu* (IASI); ibid., Iași, Șorogari, 47.20260°N, 27.58781°E, roadside, 1963, *Zanoschi* (IASI); ibid., Iași, Mircea cel Bătrân residential area, 47.15605°N, 27.56213°E, disturbed ground, 2022, *Sîrbu* (IASI); ibid.,

Vrancea, Focșani, 45.67287°N, 27.17918°E, disturbed ground, 2022, *Sîrbu & Oprea* (IASI); ibid., Buzău, Râmnicu Sărat, 45.39353°N, 27.04560°E, roadside, 2022, *Sîrbu & Oprea* (IASI); ibid., Buzău, ring road, 45.13493°N, 26.78704°E, roadside, 2022, *Sîrbu & Oprea* (IASI); ibid., Ilfov, Urziceni, 44.71385°N, 26.62536°E, 2022, roadside, *Sîrbu & Oprea* (IASI); ibid., Ilfov, Urziceni, 44.71955°N, 26.62721°E, roadside ground, 2022, *Sîrbu & Oprea* (IASI); ibid., Ilfov, Urziceni, 44.71624°N, 26.62611°E, disturbed ground, 2022, *Sîrbu & Oprea* (IASI); ibid., Buzău, Râmnicu Sărat, 45.39778°N, 27.04790°E, roadside ground, 2022, *Sîrbu & Oprea* (IASI); ibid., București, Splaiul Independenței Street, 44.43768°N, 26.06922°E, roadside, 2022, *Sîrbu & Oprea* (IASI); ibid., București, Biological Research Institute, 44.44694°N, 26.04603°E, garden, 2022, *Sîrbu & A. Oprea*, (IASI); ibid., București, right bank of river Dâmbovița, 44.44734°N, 26.04030°E, disturbed ground, 2022, *Sîrbu & Oprea*, (IASI). – New area record for this taxon, identified by SEM study of the seeds. Its native range is Tropical America. It has recently been noted from Ukraine (Bulakh & al. 2020) and Poland (Bulakh & al. 2022).

E. Bulakh, C. Sîrbu, A. Oprea, O. Volutsa & M. Shevera

Portulaca macrantha Ricceri & Arrigoni (≡ *P. oleracea* subsp. *macrantha* Maire, nom. illeg.) – Fig. S1E, F.

A Rm: Romania: Iași, Țuțora, 47.13540°N, 27.79433°E, roadside, 2022, *Sîrbu* (IASI); ibid., Iași, Mircea cel Bătrân residential area, 47.15605°N, 27.56213°E, disturbed ground, 2022, *Sîrbu* (IASI); ibid., Ilfov, Urziceni, 44.71385°N, 26.62536°E, roadside, 2022, *Sîrbu & Oprea* (IASI); ibid., Ilfov, Urziceni, 44.71955°N, 26.62721°E, roadside ground, 2022, *Sîrbu & Oprea* (IASI); ibid., Ilfov, Urziceni, 44.71624°N, 26.62611°E, disturbed ground, 2022, *Sîrbu & Oprea* (IASI); ibid., București, Cotroceni Street, 44.43705°N, 26.06689°E, roadside, 2022, *Sîrbu & Oprea* (IASI). – New area record for this taxon, identified by SEM study of the seeds. It is native to the Canary Islands and Morocco (Dobignard & Chatelain 2013), and introduced in Tunisia (Domina & al. 2010), Poland (Bulakh & al. 2022) and Ukraine (Bulakh & al. 2023).

E. Bulakh, C. Sîrbu, A. Oprea, O. Volutsa & M. Shevera

Portulaca nitida (Danin & H. G. Baker) Ricceri & Arrigoni (≡ *P. oleracea* subsp. *nitida* Danin & H. G. Baker) – Fig. S2A, B.

A Rm: Romania: Vrancea, Slobozia Bradului, 45.49367°N, 27.06135°E, vineyard, 1996, *Sîrbu* (IASI); ibid., Vaslui, Bădeana, 46.16738°N, 27.60062°E, roadside, 2022, *Sîrbu & Oprea* (IASI); ibid., Vrancea, Focșani, 45.69015°N, 27.20203°E, roadside, 2022, *Sîrbu & Oprea* (IASI); ibid., București, right bank of river Dâmbovița, 44.46040°N, 26.04160°E, disturbed ground, 2022, *Sîrbu & Oprea* (IASI). – New area record for this taxon, identified by SEM study of the seeds. The area of distribution is Europe to C Asia and N Africa (POWO 2023).

E. Bulakh, C. Sîrbu, A. Oprea, O. Volutsa & M. Shevera

Portulaca oleracea L. s.str. – Fig. S2C, D.

N Rm: Romania: Vaslui, Bădeana, 46.16738°N, 27.60062°E, roadside, 2022, *Sîrbu & Oprea* (IASI); ibid., Buzău, ring road, 45.13493°N, 26.78704°E, roadside, 2022, *Sîrbu & Oprea* (IASI); ibid., București, right bank of river Dâmbovița, 44.46040°N, 26.04160°E, disturbed ground, 2022, *Sîrbu & Oprea* (IASI). – New area record for this taxon, identified by SEM study of the seeds.

E. Bulakh, C. Sîrbu, A. Oprea, O. Volutsa & M. Shevera

Portulaca papillatostellulata (Danin & H. G. Baker) Danin (≡ *P. oleracea* subsp. *papillatostellulata* Danin & H. G. Baker) – Fig. S2E, F.

N Rm: Romania: Iași, M. Sadoveanu Alley, 47.20946°N, 27.53154°E, roadside, 2022, *Sîrbu* (IASI); ibid., Iași, Miroslava, Voinești Street, 47.14633°N, 27.55206°E, roadside, 2022, *Sîrbu* (IASI); ibid., Iași, Alexandru cel Bun residential area, 47.16030°N, 27.57270°E, railway embankment, 2022, *Sîrbu* (IASI); ibid., Iași, train station, 47.16619°N, 27.56796°E, railway embankment, 2022, *Sîrbu* (IASI); ibid., Galați, Târgu Bujor, 45.86607°N, 27.90437°E, vineyard, 1996, *Sîrbu* (IASI); ibid., Iași, Mircea cel Bătrân residential area, 47.15605°N, 27.56213°E, disturbed ground, 2022, *Sîrbu* (IASI); ibid., Vaslui, Bădeana, 46.16738°N, 27.60062°E, roadside, 2022, *Sîrbu & Oprea* (IASI); ibid., Galați, Tecuci, 45.85010°N, 27.38700°E, roadside, 2022, *Sîrbu & Oprea* (IASI); ibid., Vrancea, Focșani, 45.67287°N, 27.17918°E, disturbed ground, 2022, *Sîrbu & Oprea* (IASI); ibid., Vrancea, Focșani, 45.68437°N, 27.19392°E, roadside, 2022, *Sîrbu & Oprea* (IASI); ibid., Buzău, Râmnicu Sărat, 45.39353°N, 27.04560°E, roadside, 2022, *Sîrbu & Oprea* (IASI); ibid., Buzău, 45.13453°N, 26.78952°E, railway embankment, 2022, *Sîrbu & Oprea* (IASI); ibid., Ilfov, Urziceni, 44.71385°N, 26.62536°E, roadside, 2022, *Sîrbu & Oprea* (IASI); ibid., Buzău, Râmnicu Sărat, 45.39778°N, 27.04790°E, roadside ground, 2022, *Sîrbu & Oprea* (IASI); ibid., București, E81 street, 44.43453°N, 26.08174°E, roadside, 2022, *Sîrbu & Oprea* (IASI); ibid., București, Biological Research Institute, 44.44694°N, 26.04603°E, garden, 2022, *Sîrbu & A. Oprea*, (IASI); ibid., București, right bank of river Dâmbovița, 44.44734°N, 26.04030°E, disturbed ground, 2022, *Sîrbu & Oprea* (IASI). – New area record for this taxon, identified by SEM study of the seeds. The native range is the Mediterranean; it is also given as native for some countries of Europe (POWO 2023).

E. Bulakh, C. Sîrbu, A. Oprea, O. Volutsa & M. Shevera

Portulaca rausii Danin (≡ *P. oleracea* subsp. *rausii* (Danin) Greuter) – Fig. S3A, B.

A Rm: Romania: Iași, Sărărie Street, 47.18018°N, 27.57376°E, disturbed ground, 2022, *Sîrbu* (IASI); ibid., Iași, Păcurari Street, 47.17283°N, 27.53111°E, roadside, 2022, *Sîrbu* (IASI); ibid., Iași, Miroslava, Ion Vodă cel Viteaz Street, 47.14082°N, 27.54360°E, roadside, 2022, *Sîrbu* (IASI); ibid., Buzău, Râmnicu Sărat,

45.39353°N, 27.04560°E, roadside, 2022, *Sîrbu & Oprea* (IASI); ibid., Buzău, Râmnicu Sărat, 45.38231°N, 27.03869°E, 2022, *Sîrbu & Oprea* (IASI); ibid., Buzău, ring road, 45.13493°N, 26.78704°E, roadside, 2022, *Sîrbu & Oprea* (IASI); ibid., București, Cotroceni Street, 44.43705°N, 26.06689°E, roadside, 2022, *Sîrbu & Oprea* (IASI); ibid., București, right bank of river Dâmbovița, 44.44734°N, 26.04030°E, disturbed ground, 2022, *Sîrbu & Oprea* (IASI). – New area record for this taxon, identified by SEM study of the seeds. Its native range is the Mediterranean (POWO 2023).

E. Bulakh, C. Sîrbu, A. Oprea, O. Volutsa & M. Shevera

Portulaca sardoa Danin & al. – Fig. S3C, D.
A Rm: Romania: Iași, Sărărie Street, 47.18018°N, 27.57376°E, disturbed ground, 2022, *Sîrbu* (IASI); ibid., Iași, Țuțora, 47.13540°N, 27.79433°E, roadside, 2022, *Sîrbu* (IASI); ibid., Galați, Cosmești, 45.86197°N, 27.30917°E, roadside, 2022, *Sîrbu & Oprea* (IASI); ibid., Buzău, Râmnicu Sărat, 45.38231°N, 27.03869°E, 2022, *Sîrbu & Oprea* (IASI); ibid., Buzău, 45.13453°N, 26.78952°E, railway embankment, 2022, *Sîrbu & Oprea* (IASI); ibid., București, Cotroceni Street, 44.43705°N, 26.06689°E, roadside, 2022, *Sîrbu & Oprea* (IASI). – New area record for this taxon, identified by SEM study of the seeds. This taxon is given only for Sardinia, Corsica (Danin & al. 2012, 2016; POWO 2023) and recently for Ukraine (Bulakh & al. 2023).

E. Bulakh, C. Sîrbu, A. Oprea, O. Volutsa & M. Shevera

Portulaca socotrana Domina & Raimondo – Fig. S3E, F.
A Rm: Romania: București, E81 street, 44.43453°N, 26.08174°E, roadside, 2022, *Sîrbu & Oprea* (IASI). – New area record for this taxon. Preliminarily determined as *P.* cf. *socotrana*, identified by SEM study of the seeds, and requiring additional research. The taxon was described from the island of Socotra (Domina & Raimondo 2009), now noted from Iran (Amini Rad & al. 2017) and Ukraine (Crimea) (Bulakh & al. 2023).

E. Bulakh, C. Sîrbu, A. Oprea, O. Volutsa & M. Shevera

Ranunculaceae

Clematis serratifolia Rehder – Fig. 16.
A Uk: Ukraine: Chernihiv Oblast, Pryluky Raion, Trostyanets village, surroundings of Trostianets State Dendrological Park, 50.78810819°N, 32.8046822°E, where an invasive colony is registered outside the park boundary, escaped from the park, 1 Oct 2022, *Tarabun & Shynder* (KW s.n., KWHA 102526; photo: https://www.inaturalist.org/observations/181019984 [Fig. 16]); ibid, Trostianets State Dendrological Park, 50.788390°N, 32.805177°E, several invasive colonies in the arboretum, 1 Oct 2022, *Tarabun & Shynder* (KWHA 102528). – *Clematis serratifolia* is a woody liana, native to the Russian Far East and Korea. In the territory of Ukraine, it is occasionally cultivated in some botanical gardens and dendrological parks. It is new for Ukraine as a casual alien, escaped from cultivation.

O. Shynder, M. Tarabun & O. Bilyk

Ranunculus cornutus DC.
+ AE(G): Greece: East Aegean Islands, Nomos of Dodekanisos, Eparchia of Rhodos, Rhodos island, c. 1 km N of Laerma, outskirts of town, 36°10'N, 27°56'E, 250 m, ruderal in wet ditch by forest road to Moni Artamiti, 3 Apr 1996, *Kalheber 96-151* (FR); ibid., Nomos of Lesvos, Eparchia of Mitilini, Lesvos island, hills above Kato Tritos W of Kolpos Geras, c. 500 m SW of chapel of Ag. Michail, 36°04'30"N, 27°25'45"E, 150–230 m, 9 Apr 2000, *Kalheber 00-031* (FR). – This chiefly SW Asian species, extending E to Kazakhstan and W to coastal NE Africa (POWO 2023), is given as absent from Greece in recent floras and checklists (Dimopoulos & al. 2013, 2020; Strid & Tan 2002). The occurrence of *Ranunculus cornutus* in Europe was first reported by Hayek (1924: 343) for "Thra" (Thrace) under its synonym *R. lomatocarpus* Fisch. & C. A. Mey. This record, however, was queried by Tutin & Akeroyd (1993: 277) but is in fact corroborated by collections from Turkey-in-Europe kept in B (Istanbul-Čatalca, 16 Apr 1876, *Dingler*; Edirne, 1904, *Dingler*, det. H. Demiriz, confirm. Th. Raus). Strid (2002: 48) therefore conjectured the possible occurrence of *R. cornutus* also in continental NE Greece. According to Pampanini (1923), the Italian agronomist N. Mazzocchi-Alemanni surveyed Rhodos economically in 1922 when it was under Italian rule (Mazzocchi-Alemanni 1924). During his fieldwork he collected *R. cornutus* on the island, later published as *R. lomatocarpus* by Ciferri (1944: 39), but without giving a precise locality. The record was accepted by Rechinger in his influential *Flora aegaea* (Rechinger 1944: 193) but finally rejected by Carlström (1987: 48) as "probably erroneous". As a consequence, both *Med-Checklist* (Greuter & al. 1989: 429) and *Flora hellenica* (Strid & Tan 2002: 48) discarded *R. cornutus* from the flora of the E Aegean Islands which, however, is disproved now. It should be noted that for the time being *R. cornutus* is not determinable with European floras and can be keyed out only in the Floras of Turkey, Cyprus and SW Asia.

H. Kalheber & Th. Raus

Rosaceae

Malus niedzwetzkyana Dieck (= *M. pumila* Mill. s.l. = *M. domestica* Borkh. s.l.)
A Uk: Ukraine: Zhytomyr Oblast, E vicinity of Berdychiv city, 49.89703°N, 28.6577°E, edge of Trykutnyk forest, near highway, 5–6 year old self-sown tree, probably spontaneously escaped by zoochory from plantation 1.8 km away, 21 Jun 2021, *Shynder & Orlov* (KW s.n.; photo: https://www.inaturalist.org/observations/102732945). – A tree species of C Asian origin. It is occasionally cultivated in many regions of Ukraine, but its occurrence outside cultivation has not been noted before. New for

Fig. 16. *Clematis serratifolia* – A: habitat (invasive in conifer plantation) and habit; B: flowering branch; C: fruiting branch. – Ukraine, Chernihiv Oblast, 1 Oct 2022, photographs by O. Shynder.

Ukraine as a casual alien, escaped from cultivation.
O. Shynder & O. Orlov

Malus toringo (Siebold) de Vriese (≡ *M. sieboldii* Rehder) **A Uk:** Ukraine: Kirovohrad Oblast, Holovanivsk Raion, Novoselytsia village, 48.303917°N, 30.326258°E, several mature trees planted in local arboretum, from there abundant self-sown seedlings and saplings outside arboretum, more than 35 individuals at more than 230 m from mature trees, 29 Jun 2021, *Shynder* (KW s.n., KWHA 102155; photo: https://www.inaturalist.org/observations/112017489, https://www.inaturalist.org/observations/93347016); ibid., Kyiv City, M. M. Gryshko National Botanical Garden, edge of path in Syringaria plot, 50.417317°N, 30.563095°E, 3 year old sapling spontaneously spread (probably offspring from mature tree 110 m away), 30 Jun 2022, *Levon* (photo: https://www.inaturalist.org/observations/124858344). – A tree species of SE Asian origin, new for Ukraine as a casual alien, escaped from cultivation. O. Shynder

Rubiaceae

Galium debile Desv.
+ Hu: Hungary: between cities of Szentendre and Pomáz N of Budapest, 47°39'36.64"N, 19°02'38.44"E, wet and

somewhat saline meadow characterized by *Galatella sedifolia* (L.) Greuter and *Iris spuria* L., in flowering stage, 28 May 2023, *Somlyay* (BP); ibid, 47°39'35.38"N, 19°02'37.58"E, with ripe fruits, 5 Jul 2023, *Somlyay* (BP). – Only a single record of this species has so far been published from the territory of present-day Hungary (Menyhárth 1877). This record was considered erroneous by Degen (1908) and dubious by Jávorka (1924–1925). Indeed, Menyhárth's only known voucher from the vicinity of Kalocsa city (S Hungary) labelled as "*G. debile*" represents *G. palustre* L. (rev. L. Somlyay). Later, Hungarian determination keys (e.g. Soó & Kárpáti 1968; Simon 1992; Vidéki 2009) did not include *G. debile*, and Hungary is not covered by the distribution range of the species in the Euro+Med PlantBase (Marhold 2011+d) and POWO (2023) websites. My recent revision in the Herbarium Carpato-Pannonicum (BP), however, revealed that several *Galium* specimens collected in Hungary, and identified under different names by their collectors, actually belong to *G. debile*. They are as follows: Transdanubia (Dunántúl): Sopron, meadow at Városliget, 2 Jul 1933, *Kárpáti* (as *G. palustre*); Pannonian plains (Alföld): Dorog, 20 Jun 1903, *Jávorka* (as *G. palustre* × ? and (duplicate) *G. austriacum* L.); Makó, wet meadow, 9 Jun 1902, *Thaisz* (as *G. palustre*); Pákozd, margin of reed stand at Lake Velence, 21 Jun 1980, *Felföldy* (as *G. uliginosum* f. *glabratum*, revised by Bauer as *G. pumilum* Murray); Pákozd, wet meadow Kerek-tói-lapos at Lake Velence, 2 Jun 2015, *Bauer* (as *G. palustre* subsp. *elongatum*); Szolnok, near Tisza river, 15 Jul 1944, *Timár* (as *G. uliginosum*). Furthermore, several old (and quite unripe) specimens from the vicinity of Buda (Budapest) may also represent *G. debile*. The species is assessed here as native to Hungary considering the records of *G. debile* scattered all over the region and covering a long period of collecting. Being very similar to *G. palustre*, *G. debile* can easily be overlooked. Moreover, sufficiently ripe fruits (a feature diagnostic for *G. debile*, see, e.g., Kliphuis & al. 1986) are seldom observable, due to early mowing on wet meadows in the region. L. Somlyay

Sapindaceae

Acer monspessulanum L.
A Uk: Ukraine: Kirovohrad Oblast, Dolyna Community, N vicinity of Ivanivka village, 48.20802°N, 32.85166°E, young self-sown tree by roadside, 7 Oct 2022, *Pidtykana, Shynder & Kolomiychuk* (KWHA 102577); Mykolaiv Oblast, vicinity of Trykraty village, Trikraty forest, young plants spontaneously spread, 3 May 2020, *Borovyk* (photo: https://www.inaturalist.org/observations/100952984); Odesa city, 46.384287°N, 30.74988°E, lower part of slope above sea, self-sown trees (c. 10 years old) on both sides of road, 46.384357°N, 30.749866°E, 26 Sep 2022, *Shynder* (KW s.n.; photo: https://www.inaturalist.org/observations/181061257). – *Acer monspessulanum* is a tree of Mediterranean origin. In Ukraine, it is grown in the steppe zone and is occasionally found in botanical gardens and arboretums, where it sometimes produces self-sown offspring. New for Ukraine as a casual alien, escaped from cultivation.
O. Shynder, D. Borovyk, V. Kolomiychuk & H. Pidtykana

Koelreuteria paniculata Laxm.
A Uk: Ukraine: Khmelnytskyi Oblast, Kamianets-Podilskyi city, 48.667925°N, 26.582607°E, several plants along Lesia Ukrainka street, outside fence of Botanical Garden of Kamianets-Podilskyi University, 30 Oct 2022, *Lyubinska, Shynder & Kolomiychuk* (photo: https://www.inaturalist.org/observations/155434377); Odesa Oblast, Odesa city, near Sport Palace, 46.445583°N, 30.759605°E, self-sown offspring near mature trees along street, 17 Sep 2022, *Shynder* (KW s.n.); Zakarpattia Oblast, Uzhhorod city, between Botanical Garden of Uzhhorod National University (where it is cultivated) and Uzhhorod children railway, 48.619911°N, 22.302777°E, small colony of young generative plants escaped from Botanical Garden, 5 Sep 2022, *Shynder* (KW s.n.; photo: https://www.inaturalist.org/observations/151286876); ibid., 16 Aug 2022, *Shevera* (obs.). – A tree species of E Asian origin (POWO 2023). *Koelreuteria paniculata* is often cultivated in the S and Crimean regions of Ukraine, and in the N and W regions it is grown mainly in plant introduction centres. In places of cultivation in Ukraine it forms vegetative colonies, e.g.: Odesa city, Botanical Garden of I. I. Mecnykov Odesa National University, 16 Sep 2022, *Levchuk & Shynder* (KWHA 102522); Dnipro city, Botanical Garden of Oles Honchar Dnipro National University, 17 Oct 2022, *Kabar & Shynder* (photo: https://www.inaturalist.org/observations/171521198); Dnipropetrovsk Oblast, Kryvyi Rih Botanical Garden, 8 Oct 2022, *Shol* (KRW s.n.); Zakarpattia Oblast, J. Szikura Botanical Garden of Ferenc Rákóczi II Transcarpathian Hungarian College of Higher Education, 3 Jun 2023, *Shevera & Shynder* (UU s.n.); Kyiv City, O. V. Fomin Botanical Garden of Taras Shechenko National University of Kyiv (Mosyakin & Yavorska 2001; Shynder & al. 2022); Kyiv City, Syretskyi Dendrological Park, 13 Jun 2022, *Glukhova & Shynder* (KWHA s.n.). Noted for Crimea (Protopopova & Shevera 2014) as a plant escaped from cultivation. New for the continental part of Ukraine as a casual alien, escaped from cultivation.
O. Shynder, M. Shevera, V. Kolomiychuk, L. Lyubinska, L. Levchuk, A. Kabar, H. Shol & S. Glukhova

Sapotaceae

Argania spinosa (L.) Skeels (≡ *Sideroxylon spinosum* L.) – Fig. 17.
A Tn: Tunisia: Nabeul, Korbous, 36°50'04"N, 10°35'34"E, *Quercus coccifera* L. forest of Korbous (where the species was successfully introduced), 227–230 m, 12 Apr 2019, *El Mokni* (herb. Univ. Monastir);

Fig. 17. *Argania spinosa* – A: flowering branch; B: fruits. – Tunisia, Nabeul, Korbous, 30 May 2022, photographs by R. El Mokni.

ibid., 30 May 2022, *El Mokni* (herb. Univ. Monastir). – *Argania spinosa* is a shrub or tree with a native range from S Morocco and W Algeria to N Western Sahara and N Mauritania. The plant was introduced to scattered areas around the world including the Canary Islands and, in Europe, the Netherlands, Belgium and Spain (e.g. Rivera & Ruiz 1978; Martínez-Gómez & al. 2020; Labarca-Rojas & al. 2022; GBIF 2023), as well as to Mexico and Argentina in the W hemisphere (Falasca & al. 2018). In Tunisia, introduction of the plant started in 1963, but no published report of its naturalization in the country is known by now (Raab-Straube 2020+; APD 2023; POWO 2023; GBIF 2023). During the monitoring of the floristic diversity of the Korbous forest, many juvenile individuals of *A. spinosa* were discovered resulting from seeds of the local mature planted trees. This is therefore the first record of *A. spinosa* as a possibly establishing xenophyte in Tunisia. It should be noted that, on recent molecular results, the genus *Argania* Roem. & Schult. is embedded in the genus *Sideroxylon* L. and should therefore better be sunk in the synonymy of the latter (Stride & al. 2014).

R. El Mokni

Solanaceae

Physalis peruviana L.

A Uk: Ukraine: Cherkasy Oblast, vicinity of Uman city, near random dump on edge of forest, a few flowering plants, 21 Oct 2018, *Shynder, Chorna & Kostruba* (KWHA 104076; photo: https://www.inaturalist.org/observations/150587239); Kyiv Oblast, Vasylkiv city, abandoned railway track, a few plants, 20 Oct 2020, *Shynder* (https://www.inaturalist.org/observations/112016901). – The species is occasionally cultivated as an ornamental vegetable crop. In many European countries (as well as in other continents) it is an alien plant at various stages of naturalization (POWO 2023; Valdés 2012+). In Ukraine it currently has the status of a casual alien (ephemerophyte).

O. Shynder, H. Chorna & T. Kostruba

Typhaceae

Typha shuttleworthii W. D. J. Koch & Sond. (≡ *T. latifolia* subsp. *shuttleworthii* (W. D. J. Koch & Sond.) Stoj. & Stef.; = *T. latifolia* var. *bethulona* (Costa) Kronf.)

+ Cg: Montenegro: Northern region, Boljanići, Sađe, Jakupov grob, swamp, 8 Aug 2022, *Kuzmanović & Stevanoski* (BEOU 45965); ibid., Boljanići, Čardak, in *Typhetum shuttleworthii*, 8 Aug 2022, *Kuzmanović & Stevanoski* (BEOU 45966). – According to Cook (1980), *Typha shuttleworthii* is distributed in SC and SE Europe, except Hungary where its occurrence is doubtful. However, according to Király (2007) and POWO (2023), it is considered extinct for this country. In former Yugoslavia it is known from Slovenia (Martinčić & al. 1999), Croatia (Nikolić 2015+), Bosnia and Herzegovina (Hayek & Markgraf 1933) and Serbia (Jovanović 1986; Niketić & Tomović 2018; Tomović & al. 2020; Jenačković-Gocić & al. 2020; Sabovljević & al. 2021). A record for Montenegro in the surroundings of Spuž and Danilovgrad (Rohlena 1942: 499, as *T. latifolia* var. *bethulona* (Costa) Kronf.), was in fact overlooked by Uotila (2011+b), but Rohlena reported the species even earlier from a swamp near Danilovgrad (Rohlena 1904: 86, as *T. latifolia* var. *bethulona*) noting that he could not be sure whether the plants he collected were *T. shuttleworthii* because the material was not in fruit. The populations found near Pljevlja (Boljanići) cover an area of about 5 m^2 each and corroborate the occurrence of that species in the N part of the country. At the first site near Jakupov grob it was found in a swamp together with *Deschampsia cespitosa* (L.) P. Beauv., *Equisetum arvense* L., *Juncus inflexus* L., *Mentha longifolia* (L.) L. and *Valeriana officinalis* L., neighboured by *Filipendula ulmaria* (L.) Maxim. tall herb vegetation. The second site at Čardak is a small shallow pond where the association *Typhetum shuttleworthii* was recorded. The species is known from similar habitats in Serbia.

N. Kuzmanović & I. Stevanoski

Fig. 18. *Viola hissarica* – A: synanthropic habitat; B: flowering plant. – Ukraine, Dnipro city, 25 Mar 2020, photographs by L. Karmyzova.

Violaceae

Viola hissarica Juz. – Fig. 18.

A Uk: Ukraine: Dnipro city, 48.4525°N, 35.0626°E, campus of Oles Honchar Dnipro National University, Gagarina Avenue, plentiful on lawn, 24 Apr 2012, *Baranovsky* (DSU); ibid, Olesya Honchara Street, 48.4513°N, 35.0560°E, small colony near residential building; ibid., 48.4510°N, 35.0558°E, ornamental garden area, 9 Apr 2017, *Karmyzova* (DSU s.n.); ibid, Kniahyni Olhy Street, 48.4755°N, 35.0252°E, small colony near residential building, 25 Mar 2020; Odesa city, Prymorska Street, 46.4864°N, 30.7430°E, small colony from ornamental garden area, spontaneously spreading, 15 Oct 2021, *Kamyzova* (obs.); Odesa city, Hoholya Street, spontaneous near flower bed, along cracks in sidewalk, plentiful, 16 Sep 2022, *Shynder* (photo: https://www.inaturalist.org/observations/149924369); ibid., 21 Apr 2023, *Kalashnik* (photo: https://www.inaturalist.org/observations/178880099); Odesa city, Panteleimonovska Street, around parking lot, cracks in road surface, scattered, several tens of plants, 21 Apr 2023, *Kalashnik* (photo: https://www.inaturalist.org/observations/178879343); Zaporizhzhya city, Zaporizhzhya City Children Botanical Garden, plentifully along cracks of paths near administrative building and greenhouses, spontaneous, 1 Jul 2023, *Shynder* (photo: https://www.inaturalist.org/observations/180431803); Kyiv City, Arboretum of M. M. Gryshko National Botanical Garden, in shade (planted c. 10 years ago, origin of plants could not be established, now dense carpet of new-generation plants has developed), 16 Apr 2023 (KWHA 103184; photo: https://www.inaturalist.org/observations/178718229); ibid., 21 Jun 2023 (photo: https://www.inaturalist.org/observations/170976692); Odesa city, Botanical Garden of I. I. Mechnykov Odesa National University, self-sown in flower bed, 16 Sep 2022, *Shynder* (photo: https://www.inaturalist.org/observations/151494601). – *Viola hissarica* is a narrow endemic of C Asia (Shishkin & Bobrov 1949), known only from one locality (Hisar Valley in Tajikistan). It was considered endangered (Takhtajan 1981), listed in the Red Book of the USSR (Borodin 1984) and in the Red Book of Tajikistan (Rahimi & al. 2017). Currently, the state of the population in its native habitat is unknown (Rahimi & al. 2017). In Ukraine, this species was indicated in Soviet times in the O. V. Fomin

Botanical Garden of National Taras Schevchenko University of Kyiv (Lapin 1983), although it is currently not mentioned in the catalogues and publications of this institution (Solomakha 2007). The species is not mentioned in modern catalogues of other botanical gardens in Ukraine, although it is represented in some of them. In 1999, *V. hissarica* was found by V. V. Tarasov on the territory of the Botanical Garden of the Dnipro National University (DNU) (Tarasov 2005; Karmyzova & Baranovsky 2020). This species may have been spontaneously introduced together with other plants from C Asia. It was then found by B. Baranovsky near the Botanical Garden on the DNU campus in 2012, from where it began to spread actively into suitable urban habitats of Dnipro city. Now populations of up to 80 specimens per 1 m² are common in the territory of Dnipro city. In 2021, the species was found by L. Karmyzova and in 2022 by O. Shynder in Odesa, and in 2023 by O. Shynder in the botanical gardens of Kyiv and Zaporizhzhya. Now *V. hissarica* is at the initial stage of expansion in the continental part of Ukraine and should still be considered as a casual alien species. Additional findings of *V. hissarica* cannot be excluded. It is primarily characterized by its lanceolate-triangular leaves (with a length : width ratio of 1 : 2–3.5), winged petioles and whitish-violet bicolored flowers.

L. Karmyzova, B. Baranovsky & O. Shynder

Vitaceae

Ampelopsis aconitifolia Bunge

A Uk: Ukraine: Zakarpattia Oblast, Uzhhorod city, 48.618607°N, 22.305243°E, ruderal habitats between Botanical Garden and Uzhhorod children railway, a small colony of several young individuals, escaped from Botanical Garden, 5 Sep 2022, *Shynder* (KWHA 102504; photo: https://www.inaturalist.org/observations/151284174); ibid., 16 Sep 2022, *Shevera* (obs.). – Woody liana of SE Asian origin. New for Ukraine as a casual alien, escaped from cultivation. In addition, there have been recorded cases of spontaneous reproduction of *Ampelopsis aconitifolia* in botanical gardens and dendrological parks in Ukraine, e.g.: Odesa city, Botanical Garden of I. I. Mechnykov Odesa National University, 16 Sep 2022, *Levchuk & Shynder* (KW); Zakarpattia Oblast, Botanical Garden of Uzhhorod National University, 5 Sep 2022, *Shynder & Shevera* (UU s. n.); Donetsk city Donetsk Botanical Garden, (Burda & Koniakin 2019); Dnipropetrovsk Oblast, Kryvyi Rih Botanical Garden, 8 Oct 2022, *Shol* (obs.); Kyiv City, M. M. Grysko Botanical Garden, 2016–2023, *Shynder* (KWHA s.n.); Cherkasy Oblast, Sofiyivka National Dendrological Park (Chorna & al. 2021); Chernihiv Oblast, Trostianets State Dendrological Park (Iljenko & Medvedev 2012).

O. Shynder, M. Shevera, H. Chorna, H. Shol, L. Levchuk & M. Tarabun

Vitis ×instabilis Ardenghi & al. (= *V. riparia* Michx. × *V. rupestris* Scheele)

A Uk: Ukraine: Mykolaiv Oblast, Mykolaiv Raion, 47.380441°N, 31.628250°E, Natural Reserve Elanetskyi Step, Mykhaylivske division, Kemlych ravine, carbonate shrub-steppe slope, 1 young generative and 2 young vegetative plants, 9 Oct 2022, *Shynder, Drabyniuk & Kolomiychuk* (KWHA 1024944; photo: https://www.inaturalist.org/observations/181068932, https://www.inaturalist.org/observations/181068933); Odesa Oblast, Bilhorod-Dnistrovskyi Raion, N vicinity of Kozatske village, 46.371549°N, 30.084136°E, bank of canal, 1 mature plant, 23 Sep 2022, *Shynder* (photo: https://www.inaturalist.org/observations/176392550). – *Vitis ×instabilis* is a shrub with long, somewhat twisted shoots, a nothospecies of anthropogenic hybrid origin (Ardenghi & al. 2014). It is widely cultivated as a *Phylloxera*-resistant rootstock in areas of industrial viticulture (Goldammer 2018) and is characterized by an upright habit (not a classic liana) and leaf bases broadly U- or V-shaped to truncate and cuneate (Ardenghi & al. 2014). New for Ukraine as a casual alien.

O. Shynder, H. Drabyniuk & V. Kolomiychuk

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Fig. S1, S2 and S3. *Portulaca oleracea* aggregate, ultrastructural study of seed surfaces by SEM.

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