

New floristic records in the Balkans: 37*

Compiled by Vladimir Vladimirov¹, Mehmet Aybeke² & Kit Tan³

¹ Department of Plant and Fungal Diversity and Resources, Institute of Biodiversity and Ecosystem Research, Bulgarian Academy of Sciences, Acad. Georgi Bonchev St., bl. 23, 1113 Sofia, Bulgaria, e-mail: vladimir_dv@abv.bg

² Department of Biology, Faculty of Science, University of Trakya, 22030 Edirne, Turkey, e-mail: mehmetaybeke@yahoo.com

³ Institute of Biology, University of Copenhagen, Øster Farimagsgade 2D, DK-1353 Copenhagen K, Denmark, e-mail: kitt@bio.ku.dk

Abstract: New chorological data are presented for 401 species and subspecies from Bulgaria (15-18, 130-148, 184-205, 390-392, 398-401), Greece (1-3, 19-129, 149-183, 206-389, 393-397), and Turkey-in-Europe (4-14). The taxa belong to the following families: *Acanthaceae* (149), *Aceraceae* (55, 242), *Aizoaceae* (150), *Alliaceae* (17, 46, 47, 120, 378, 379), *Amaranthaceae* (56, 61, 62), *Amaryllidaceae* (180), *Anacardiaceae* (243), *Apiaceae* (15, 20, 21, 63-67, 142, 151-153, 187, 206, 244-252, 393), *Apocynaceae* (253, 254), *Araceae* (48), *Aristolochiaceae* (255), *Asclepiadaceae* (68, 154), *Asparagaceae* (380), *Asphodelaceae* (381), *Asteraceae* (4-8, 22-25, 57, 69-79, 130-132, 155-158, 188, 199, 207-212, 256-277, 394), *Balsaminaceae* (133, 134, 189), *Berberidaceae* (190), *Boraginaceae* (9, 10, 26, 80, 159-161, 278), *Brassicaceae* (27, 28, 81, 82, 143, 162-164, 200, 279-282), *Buddlejaceae* (135, 191, 213), *Cactaceae* (83, 124, 197, 283), *Caesalpiniaceae* (284), *Campanulaceae* (29, 30, 285-287), *Caprifoliaceae* (84, 288, 289), *Caryophyllaceae* (1, 31, 85, 165, 166, 201, 214-216, 290-294), *Ceratophyllaceae* (217), *Chenopodiaceae* (2, 32, 86-88, 136, 167, 168, 218), *Colchicaceae* (18), *Convolvulaceae* (11, 16, 33, 34, 89, 219, 295-297), *Crassulaceae* (125, 298), *Cucurbitaceae* (35, 90, 299), *Cyperaceae* (49), *Dennstaedtiaceae* (241), *Dipsacaceae* (91, 300-303), *Dioscoreaceae* (382), *Ericaceae* (92), *Euphorbiaceae* (36, 58, 59, 93, 94, 169, 192, 193, 202, 304-306), *Fabaceae* (95, 96, 137-139, 170, 171, 194, 203, 307-323, 395), *Frankeniaceae* (97), *Gentianaceae* (37, 98, 99, 204, 324), *Geraniaceae* (325), *Hyacinthaceae* (181), *Hydrophyllaceae* (100), *Hypericaceae* (101, 326), *Iridaceae* (129, 182, 198), *Juncaceae* (50, 183, 233), *Lamiaceae* (38, 102, 144, 172, 220-223, 327-334), *Liliaceae* s.l. (51, 147), *Linaceae* (103, 104, 145, 335), *Lythraceae* (39, 105), *Malvaceae* (106, 107, 224, 225, 336), *Moraceae* (337-339), *Nyctaginaceae* (340), *Oleaceae* (341, 342), *Onagraceae* (40, 226-228), *Orchidaceae* (148, 184, 185, 390-392, 398-401), *Orobanchaceae* (41, 108, 109, 173, 174, 343, 344, 396), *Oxalidaceae* (42, 345, 346), *Papaveraceae* (110), *Phytolaccaceae* (348), *Pinaceae* (186, 196), *Platanaceae* (347), *Plumbaginaceae* (111, 126, 349), *Poaceae* (52-54, 121-123, 234-240, 383-388), *Polygalaceae* (350), *Polygonaceae* (43, 60, 140, 229, 351, 352), *Primulaceae* (353), *Pteridaceae* (19), *Rafflesiaceae* (175), *Ranunculaceae* (44, 45, 176, 177, 230, 354-356), *Resedaceae* (357), *Rosaceae* (127, 358-360), *Rubiaceae* (146, 231, 361-363, 397), *Rutaceae* (112), *Salicaceae* (364), *Sapindaceae* (141), *Saxifragaceae* (178), *Scrophulariaceae* s.l. (12-14, 113, 128, 205, 365, 366), *Smilacaceae* (389), *Solanaceae* (3, 114, 179, 367, 368), *Tiliaceae* (369), *Ulmaceae* (370), *Urticaceae* (115, 116, 371), *Valerianaceae* (372, 373), *Verbenaceae* (117, 374, 375), *Veronicaceae* (118, 232, 376, 377), *Vitaceae* (195), and *Zygophyllaceae* (119).

New species for countries are: Bulgaria – *Anacamptis coriophora* × *A. morio* (390), *Gymnadenia conopsea* s.l. × *G. rhellicani* (391), *Neotinea ×dietchiana* (184, 401), Greece – *Buddleja davidii* (213), *Euphorbia humifusa* (36).

The publication includes contributions by: E. Axiotis, M. Axiotis & Kit Tan (1-3), M. Aybeke (4-14), Zh. Barzov & A. Petrova (15-18), B. Biel & Kit Tan (19-54), C. Cattaneo & M. Grano (55-60), C. Cattaneo & M. Panitsa (61-123), K. Giannopolous, Kit Tan & G. Vold (124-129), P. Glogov, M. Georgieva & D. Pavlova (130-141), P. Glogov & D. Pavlova (142-147), I. Hristov, M. Yordanova, A. Petrova & A. Kurteva (148), R. Marchant, Kit Tan & A. Strid (149-183), A. Petrova, R. Bukova & P. Dimitrov (184), A. Petrova, R. Varbanov & A. Shishkova (185), A. Petrova, D. Venkova, I. Gerasimova & R. Vassilev (186-195), Ts. Raycheva & K. Stoyanov (196-198), S. Stoyanov, V. Goranova & Zh. Barzov (199-205), A. Strid (206-240), Kit Tan & G. Vold (241-389), V. Vladimirov, S. Bancheva & M. Delcheva (390-391), V. Vladimirov & Z. Szeląg (392), G. Zarkos, V. Christodoulou, Kit Tan & G. Vold (393-397), I. Kostadinov, S. Dalakchieva & K. Popov (398-401).

This is an ongoing report in the series dealing with the new chorological data on vascular plants in the Balkans. For details on the presentation of information, see *Phytologia Balcanica*, vol. 12(1), pp. 107-108 and vol. 12(2), p. 279.

* Reports for Bulgaria have been reviewed by V. Vladimirov, for Greece by Kit Tan, and for Turkey-in-Europe by M. Aybeke.

Reports 1–3

Evangelos Axiotis¹, Makis Axiotis² & Kit Tan³

¹ Department of Pharmacognosy and Natural Products Chemistry, Pharmacy School, National and Kapodistrian University of Athens, Greece

² Myrogianni 1, Mitilini, Lesvos island, Greece

³ Institute of Biology, University of Copenhagen, Øster Farimagsgade 2D, DK-1353 Copenhagen K, Denmark, e-mail: kitt@bio.ku.dk (author for correspondence)

Caryophyllaceae

1. *Dianthus giganteus* d'Urv. (Fig. 1)

Gr Nomos Lesvou, Eparchia Mitilinis: island of Lesvos, Malliontas, SW of Mitilini town, rocky basalt slope, 120 m, 39°08'N, 25°59'E, 03.05.2018, E. & M. Axiotis AXL039 (ATHU-herb. Skaltsounis).

New for Lesvos. Deviating in having epicalyx scales contracted into aristae longer than in typical material. Possibly representing an undescribed subspecies, more and complete material with basal leaves is required for further study.



Fig. 1. *Dianthus giganteus* (photo M. Axiotis).

Chenopodiaceae

2. *Atriplex halimus* L.

Gr Nomos Lesvou, Eparchia Mitilinis: island of Lesvos, near village of Agiasos, on schist and limestone slope, 300 m, 39°08'N, 26°36'E, 02.10.2018, E. & M. Axiotis AXL038 (ATHU-herb. Skaltsounis).

New for Lesvos, recorded from several islands in the E Aegean. A few large plants were well-established at the roadside.

Solanaceae

3. *Solanum rostratum* Dunal (Fig. 2)

Gr Nomos Lesvou, Eparchia Mitilinis: island of Lesvos, W-NW of Mitilini town, on schist and limestone slope by road, 60 m, 39°10'N, 26°53'E, 23.08.2018, E. & M. Axiotis AXL040 (ATHU-herb. Skaltsounis).

New for Lesvos and E Aegean islands, naturalized in disturbed areas. Native to United States and Mexico. Also reported from the island of Evvia (West Aegean), Sifnos (Kyklades) and along a diagonal running NE-SW across mainland Greece. The attractive yellow flowers have anthers of different size, colour and function, with pollen produced both for pollination and as a food source. Formerly the ancestral host plant of the potato beetle.



Fig. 2. *Solanum rostratum* (photo E. Axiotis).

Reports 4–14

Mehmet Aybeke

Department of Biology, Faculty of Science, University of Trakya, 22030 Edirne, Turkey, e-mail: mehmetaybeke@yahoo.com

Asteraceae

4. *Artemisia absinthium* L.

Tu(E) A1(E) Kırklareli: Demirköy, between Demirköy and Hamdibey village, 2nd km, 292 m, 41°51'38.8"N, 27°46'08.5"E, 29.07.1990, coll. C. Yarci (EDTU 5450).

New for A1(E) Kırklareli in European Turkey. According to Cullen (1975), this taxon was found in A2(E) Istanbul.

5. *Carlina graeca* Heldr. & Sartori

Tu(E) A1(E) Kırklareli: Demirköy, Armutveren

village, 303 m, 41°54'02"N, 27°32'46"E,
08.08.1990, coll. & det. C. Yarcı (EDTU 5444).

New for A1(E) Kırklareli in European Turkey. According to Meusel & Kastner (1975), this taxon was found in A1(E) Çanakkale.

6. *Erigeron acris* L. subsp. *acris*

Tu(E) A1(E) Kırklareli: Demirköy, İğneada, 0 m, 41°52'28"N, 27°59'02"E, 16.09.1990, coll. & det. C. Yarcı (EDTU 5448).

New for European Turkey. According to Grierson (1975), this taxon was found in Anatolia, in A3 Bolu, A4 Ankara. A first report for this taxon from European Turkey.

7. *Pilosella hoppeana* subsp. *pilisquama* (Nägeli & Peter) P.D. Sell & C. West

Tu(E) A1(E) Kırklareli: between Dereköy and the Bulgarian frontier, at 3rd km, in an open forest, 508 m, 41°55'48"N, 27°22'14"E, 09.05.1996, coll. & det. C. Yarcı (EDTU 6894).

New for A1(E) Kırklareli in European Turkey. According to Sell & West (1975), this taxon was recorded in A2E İstanbul.

8. *Taraxacum scaturiginosum* G. Hagl.

Tu(E) A1(E) Kırklareli: between Dereköy and Demirköy, at 7th km, 508 m, 41°55'48"N, 27°22'14"E, 12.07.1997, coll. & det. C. Yarcı (EDTU 6907).

New for A1(E) Kırklareli in European Turkey. According to Van Soest (1975), this taxon is known only from A2(E) İstanbul.

Boraginaceae

9. *Anchusa azurea* Mill. var. *azurea*

Tu(E) A1(E) Kırklareli: Demirköy, between Demirköy and İğneada, at 18th km, 30 m, 41°52'28"N, 27°59'02"E, 18.05.1991, coll. C. Yarcı, det. C. Yarcı & M. Aybeke (EDTU 5392).

New for A1(E) Kırklareli in European Turkey. According to Chamberlain (1978), this taxon was found in A1(E) Tekirdağ and A2(E) İstanbul.

10. *Onosma echioides* L.

Tu(E) A1(E) Kırklareli: Demirköy, between Demirköy and Pınarhisar, at 2nd km, 252 m, 41°49'30"N, 27°45'35"E, 26.05.1990, coll. & det. C. Yarcı (EDTU 5395).

New for A1(E) Kırklareli in European Turkey. According to Riedl (1978), this taxon was recorded in A1(E) Edirne/Çanakkale and A2(E) İstanbul.

Convolvulaceae

11. *Convolvulus elegantissimus* Mill.

Tu(E) A1(E) Kırklareli: Demirköy, between Demirköy and İğneada, at 15th km, 252 m, 41°49'30"N, 27°45'35"E, 16.06.1990, coll. & det. C. Yarcı (EDTU 4703); Kırklareli, in Çağlayık village environs, at a field side, 508 m, 42°01'59"N, 27°20'46"E, 19.06.1996, coll. & det. C. Yarcı (EDTU 6935).

New for A1(E) Kırklareli in European Turkey. According to Parris (1978), this taxon was known only from A1(E) Çanakkale.

Scrophulariaceae

12. *Kickxia spuria* subsp. *integrifolia* (Brot.) R. Fern.

Tu(E) A1(E) Kırklareli: Demirköy, Yiğitbaşı village, 301 m, 41°56'33"N, 27°39'04"E, 14.08.1990, coll. C. Yarcı, det. C. Yarcı & M. Aybeke (EDTU 5380).

New for A1(E) Kırklareli in European Turkey. According to Davis & Shepherd (1978), this taxon is known from A1(E) Tekirdağ.

13. *Linaria simplex* (Willd.) D.C.

Tu(E) A1(E) Kırklareli: Demirköy, Yeşilce village, 508 m, 41°54'12"N, 27°41'56"E, 15.08.1990, coll. & det. C. Yarcı (EDTU 5378).

New for A1(E) Kırklareli in European Turkey. According to Davis (1978), this taxon was recorded in A2 (E) İstanbul.

14. *Linaria vulgaris* Mill.

Tu(E) A1(E) Kırklareli: Demirköy, İğneada, on the edges of lake Mert, 40 m, 41°52'05.6"N 27°58'22.1"E, 01.09.1990, coll. & det. C. Yarcı (EDTU 5376).

New for A1(E) Kırklareli in European Turkey. According to Davis (1978), this taxon was known from A1(E) Edirne.

Reports 15–18

Zhivko Barzov¹ & Antoaneta Petrova²

¹ 9003 Varna, Asparuchovo Residential District, 18 Iskar Str.

² Botanical Garden, Bulgarian Academy of Sciences, P.O. Box 664, 1000 Sofia, e-mail: petrovabotgar1@abv.bg

Apiaceae

15. *Pimpinella tragium* Vill.

Bu Northeast Bulgaria: Kipra village, Ahchlayata hill southwards of the village, NH58, 43.2488°N,

27.6135°E, 06.07.2018, coll. A. Petrova & Zh. Barzov (SOM 176365).

According to Stojanov & al. (1967), the species was distributed locally in North Bulgaria, but it was not reported for the floristic regions of Northeast Bulgaria and Danubian Plain (Asenov 1982; Andreev, 1994; Delipavlov & Chesmedzhiev 2011). Assyov & Petrova (2012) reported it with a question mark for the region. This collection confirms its distribution in Northeast Bulgaria.

Convolvulaceae

16. *Convolvulus persicus* L. (Fig. 3)

Bu Black Sea Coast (*Northern*): on the sand dunes at Asparuhovo beach, Varna town, NH78, 43°10'50.32"N, 27°54'37.01"E, 28.08.2017, coll. Zh. Barzov & A. Petrova (SOM 174221).

The area of the population was about 30 m², the aboveground stems and groups of 2–3 stems numbered about 100. The habitat is 03B1 Black Sea mobile (white) dunes (Tzonev 2015), which corresponds to 2120 Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes), according to the Habitats Directive classification. The accompanying species were: *Centaurea arenaria*, *Corispermum nitidum*, *Eryngium maritimum*, *Lactuca tatarica*, *Leymus racemosus* subsp. *sabulosus*, *Medicago marina*, *Silene euxina* and *Stachys maritima*.

This species is Critically Endangered in Bulgaria (Petrova 2009). Until recently, only a single contemporary locality near Durankulak Lake has been known (Petrova 2015). Currently, Valcheva & al. (2018) reported it from the Kamchia dune system, where only a single individual was found (Valcheva, pers. comm.).



Fig. 3. *Convolvulus persicus*, 27.06.2018 (photo Zh. Barzov).

This relict Ponto-Caspian geoelement is taxonomically isolated within the genus (Wood & al. 2015). It is distributed locally on the coastal dunes and, recently, across the entire distribution range it has been found mostly inside the different categories of protected areas (Strat & Holobiuc 2018). It has received a national conservation status in all countries around the Black Sea part of its areal: Bulgaria – CR (Petrova 2009); Georgia – EW (Matchutadze & al. 2015); Romania – CR (Dihoru & Negrean 2009); Turkey – EN (Ekim & al. 2000). Strat & Holobiuc (2018) maintain that, owing to the biodiversity value of this species for the Black Sea biogeographical region, Bulgaria and Romania should suggest inclusion of *C. persicus* in Annex II of the Habitats Directive. We support the rationality of such suggestion.

Besides the so local distribution, touristic pressure is a very significant threat for this species (Petrova 2015; Strat 2016). Thus, this locality in an urban coastal area of a large town calls for urgent conservation measures. A proposal was deposited with the Ministry of Environment and Waters (MOEW) for the corresponding conservation measures and for declaring the place a protected area. In our opinion, a somewhat larger area should be protected so as to include also part of the adjacent fixed dunes, where other rare species are found: *Anchuza velenovskyi*, *Lepidotrichum uechtritizianum*, *Merendera sobolifera*, etc. Although the area has not been declared formally as protected, in 2018 (at the insistence of the first author) the regional office of MOEW put a fence around the locality and an information board (Fig. 4).



Fig. 4. *Convolvulus persicus* – information board at Asparuhovo beach, Varna (photo Zh. Barzov).

Alliaceae**17. *Allium nigrum* L.**

Bu Black Sea Coast (*Northern*): W of Bulgarevo village, in dry grasslands along the road to Kavarna town, PJ10, app. 43.4142°N, 28.3927°E, 06.07.2018, with fruits, coll. *Zh. Barzov & A. Petrova* (SOM 176351). This species in that locality was noticed by *Zh. Barzov* with flowers, 26.05.2015 (Fig. 5). Another population was identified by *Zh. Barzov* near Shabla town, at approximately 43.54948 N, 28.55914 E.

This species has a local distribution in Bulgaria, mostly in the southern part of the country. *Petrova & al.* (2013a) reported a single individual in the roadside sinanthropic vegetation, near a waste depot, SE of Kavarna town, considering it a casual distribution. A recent observation of populations with tens of individuals proved the natural distribution of the species in the area.



Fig. 5. *Allium nigrum*, 26.05.2015 (photo *Zh. Barzov*).

Colchicaceae**18. *Colchicum soboliferum* (C.A. Mey) Stef. (syn. *Merendera sobolifera* C.A. Mey)**

Bu Black Sea Coast (*Northern*): In fixed sand dunes in the park area along Asparuhovo beach, Varna town, NH78, 43°10'50.32"N, 27°54'37.01"E, *Zh. Barzov*, repeated observations since 2013. The population is a numerous one (Fig. 6).

The species has a local distribution in the country and is evaluated as Vulnerable (*Apostolova & Petrova* 2009). There are vouchers from the Varna area, from the period 1901–1911, deposited in the Herbarium of the Institute of Biodiversity and Ecosystem Research (SOM). This is the northernmost of the present-day known localities in Bulgaria.



Fig. 6. *Colchicum soboliferum* at Asparuhovo beach area, Varna, 12.03.2014 (photo *Zh. Barzov*).

Reports 19–54**Burkhard Biel¹ & Kit Tan²**

¹ Am Judengarten 3, D-97204 Höchberg, Germany

² Institute of Biology, University of Copenhagen, Øster Farimagsgade 2D, DK-1353 Copenhagen K, Denmark, e-mail: kitt@bio.ku.dk (author for correspondence)

This is the third report of new plant-records for the island of Thasos (Nomos Kavallas, Eparchia Thasou) based mainly on visits in March 2017 and June 2018. The 36 records listed are new to the island unless otherwise stated, and 11 species were found to be new for the floristic region N Aegean islands (NAe) as circumscribed in *Flora Hellenica* (*Strid & Tan* 1997). Occurrence on the other N Aegean islands is also provided. *Euphorbia humifusa* is reported as a taxon new for Greece.

Pteridiaceae**19. *Dryopteris dilatata* (Hoffm.) A. Gray**

Gr Thasos: E of Panagia, grassy slopes with shrubs near Drakotria grotto, 180 m, 40°43'52"N, 24°43'55"E, 05.03.2017, *Biel* 17.022.

Reported from Samothraki, rare in northern Greece. Previously noted S of Potamia and S of Limenas in November 2016.

Apiaceae**20. *Selinum silaifolium* (Jacq.) Beck**

Gr Thasos: S-SE of Potamia, steep pine wood slope above river and forest road, 460 m, 40°41'24"N, 24°45'08"E, 20.06.2018, *Biel* 18.079.

New for N Aegean islands, rare in northeast Greek mainland.

21. *Smyrniium perfoliatum* subsp. *rotundifolium*
(Mill.) Bonnier & Layens

Gr Thasos: SW outskirts of Theologos, waste ground between houses, 220 m, 40°39'19"N, 24°41'06"E, 10.06.2018, *Biel* obs. (photo).

Reported from Samothraki, scattered in northern Greece.

Asteraceae

22. *Arctium nemorosum* Lej.

Gr Thasos: W of Limenas (Thasos), in olive plantation behind narrow beach, 2 m, 40°46'35"N, 24°41'47"E, 17.06.2018, *Biel* obs. (photo).

New for N Aegean islands, rarely reported from Greece.

23. *Carduus tmoleus* Boiss.

Gr Thasos: E-SE of Limenaria, olive plantation on slope with open phrygana, 40 m, 40°37'29"N, 24°34'55"E, 09.06.2018, *Biel* obs. (photo); SW outskirts of Theologos, waste ground between houses, 220 m, 40°39'19"N, 24°41'06"E, 10.06.2018, *Biel* obs. (photo).

Reported from Samothraki which was previously the only occurrence for the Aegean islands.

24. *Galinsoga quadriradiata* Ruiz & Pav.

Gr Thasos: SE of Limenas (Thasos), road margins and ruderal ground, 15 m, 40°46'30"N, 24°42'43"E, 16.06.2018, *Biel* 18.063.

New for N Aegean islands.

25. *Pilosella leucopsilon* (Arv.-Touv.) Gottschl. (syn. *Hieracium leucopsilon* Arv.-Touv.)

Gr Thasos: W-SW of Potamia, at Koukla saddle, meadow with shrubs, 930 m, 40°42'35"N, 24°41'39"E, 17.06.2018, *Biel* obs. (photo).

Reported from Samothraki. Also recorded several times from the Ipsarion area.

Boraginaceae

26. *Buglossoides incrassata* (Guss.) I.M. Johnst.

Gr Thasos: E of Skala Marion, in pasture south of stream with olive trees and phrygana, 25 m, 40°38'36"N, 24°32'40"E, 09.03.2017, *Biel* 17.052.

Reported from Samothraki.

Brassicaceae

27. *Aurinia corymbosa* Griseb.

Gr Thasos: W-NW of Potamia, NE-exposed cliffs near Dio Kefale, 930 m, 40°43'47"N, 24°41'12"E, 18.06.2018, *Biel* obs. (photo, in fruit).

New for N Aegean islands. Also noted S of Potamia.

28. *Lobularia maritima* (L.) Desv.

Gr Thasos: Panagia, on old walls and road margins in village, 140 m, 40°43'50"N, 24°43'40"E, 10.06.2018, *Biel* 18.010.

Reported from Limnos. Naturalized (W Mediterranean).

Campanulaceae

29. *Campanula scutellata* Griseb. (Fig. 7)

Gr Thasos: E of Theologos, on large rock in valley with waterfall, 230 m, 40°39'40"N, 24°42'01"E, 10.06.2018, *Biel* 18.014 & 18.015.

Confirming an unpublished report by Düll in 2011.



Fig. 7. *Campanula scutellata* (photo B. Biel).

30. *Campanula sparsa* Friv.

Gr Thasos: E of Potos, ruderal margins of field road within fenced olive plantation, 40°36'38"N, 24°37'16"E, 12.06.2018, *Biel* 18.035.

Reported from Samothraki, second record for the Greek islands. Also noted E of Theologos.

Caryophyllaceae

31. *Sagina maritima* D. Don

Gr Thasos: SE of Limenaria, slope with pine wood at beach of Metallia hill, 15 m, 40°37'23"N, 24°34'58"E, 12.03.2017, *Biel* 17.068.

Reported from Samothraki, Limnos and Ag. Evstratios.

Chenopodiaceae

32. *Dysphania pumilio* (R.Br.) Mosyakin & Clemants

Gr Thasos: Limenaria, concrete river bed beneath road bridge, 5 m, 40°37'37"N, 24°34'24"E, 11.06.2018, *Biel* 18.018; S of Potos, near mouth of Dipotamos river, 2 m, 40°38'44"N, 24°31'29"E, 12.06.2018, *Biel* 18.034.

New for N Aegean islands.

Convolvulaceae**33. *Convolvulus oleifolius* Desr.**

Gr Thasos: S-SE of Potamia, steep rocky slope at eastern ridge of Fanos, 650 m, 40°41'14"N, 24°45'01"E, 20.06.2018, *Biel* 18.078.

Reported from Ag. Evstratios.

34. *Cressa cretica* L.

Gr Thasos: S of Potos, near mouth of Dipotamos river, 2 m, 40°38'44"N, 24°31'29"E, 12.06.2018, *Biel* 18.031.

Reported from Samothraki, Limnos and Ag. Evstratios.

Cucurbitaceae**35. *Citrullus lanatus* (Thunb.) Matsum. & Nakai**

Gr Thasos: N of Skala Marion, waste ground at beach, 2 m, 40°38'37"N, 24°30'54"E, 13.06.2018, *Biel* obs. (photo).

Casual introduction. Reported from Limnos.

Euphorbiaceae**36. *Euphorbia humifusa* Willd. [syn. *Chamaesyce humifusa* (Willd.) Prokh.] (Fig. 8)**

Gr Thasos: E-SE of Limenas (Thasos), open pine wood on Akropolis hill, 130 m, 40°46'42"N, 24°43'11"E, 16.06.2018, *Biel* 18.061.

New for Greece, locally naturalized. Distinguished by its stipules, opposite leaves slightly asymmetrical at base and smooth seeds less than 1.5 mm long at maturity.



Fig. 8. *Euphorbia humifusa* (photo B. Biel).

Gentianaceae**37. *Centaurium tenuiflorum* (Hoffmanns. & Link) Fritsch**

Gr Thasos: E-SE of Limenaria, olive plantation on slope with open phrygana, 40 m, 40°37'29"N, 24°34'55"E, 09.06.2018, *Biel* 18.003.

Reported from Samothraki and Ag. Evstratios. Also noted S of Potamia.

Lamiaceae**38. *Stachys atherocalyx* K. Koch (Fig. 9)**

Gr Thasos: E of Theologos, on large rock in valley with waterfall, 230 m, 40°39'40"N, 24°42'01"E, 10.06.2018, *Biel* 18.012.

New for N Aegean and first record for Greek islands; reported from the Nestos river gorge on opposite mainland.



Fig. 9. *Stachys atherocalyx* (photo B. Biel).

Lythraceae**39. *Lythrum tribracteatum* Spreng.**

Gr Thasos: S of Potos, near mouth of Dipotamos river, 2 m, 40°38'44"N, 24°31'29"E, 12.06.2018, *Biel* 18.030.

Reported from Samothraki.

Onagraceae**40. *Oenothera glazioviana* Mich.**

Gr Thasos: E-NE of Skala Marion, road margins and waste ground between gardens, 10 m, 40°38'44"N, 24°31'29"E, 13.06.2018, *Biel* 18.050.

New for N Aegean and first record from Greek islands.

Orobanchaceae**41. *Orobanche hederæ* Duby**

Gr Thasos: E of Theologos, valley with *Platanus* trees and waterfall, 230 m, 40°39'40"N, 24°42'01"E, 10.06.2018, *Biel* obs. (photo).

New for N Aegean islands. Also noted S of Potamia.

Oxalidaceae**42. *Oxalis articulata* Savigny**

Gr Thasos: E-SE of Limenaria, pine wood at N

slope of hill, near sports field, 25 m, 40°37'34"N, 24°34'58"E, 09.06.2018, *Biel* 18.005.

New for N Aegean islands.

Polygonaceae

43. *Rumex cristatus* DC.

Gr Thasos: Limenaria, concrete river bed beneath road bridge, 5 m, 40°37'37"N, 24°34'24"E, 09.06.2018, *Biel* 18.007; *loc. ibid.*, 11.06.2018, *Biel* 18.019.

Reported from Samothraki and Limnos. Confirming an unpublished report by Garnweidner based on a specimen collected in 2002.

Ranunculaceae

44. *Nigella arvensis* subsp. *glauca* (Boiss.) A. Terracc.

Gr Thasos: near Kalives Poto E of Potos, olive plantation with *Cistus phrygana*, 10 m, 40°38'44"N, 24°31'29"E, 12.06.2018, *Biel* 18.037; E-NE of Skala Marion, waste ground and scrub between gardens, 10 m, 40°38'44"N, 24°31'29"E, 14.06.2018, *Biel* 18.055.

Reported from Samothraki and Ag. Evstratios.

45. *Consolida phrygia* subsp. *thessalonica* (Soó) P.H. Davis (Fig. 10)



Fig. 10. *Consolida phrygia* subsp. *thessalonica* (photo B. Biel).

Gr Thasos: E-NE of Skala Marion, waste ground and scrub between gardens, 10 m, 40°38'44"N, 24°31'29"E, 14.06.2018, *Biel* 18.054.

Confirming an old record (4 June 1891) by Sintenis & Bornmüller.

Alliaceae

46. *Allium ampeloprasum* L.

Gr Thasos: SW outskirts of Theologos, waste ground between houses, 220 m, 40°39'19"N, 24°41'06"E, 10.06.2018, *Biel* obs. (photo).

Reported from Samothraki and Ag. Evstratios. Also noted E of Theologos.

47. *Allium paniculatum* L.

Gr Thasos: E of Theologos, terraced pasture with *Juglans* below village, 220 m, 40°39'38"N, 24°41'52"E, 10.06.2018, *Biel* 18.011.

Reported from Samothraki and Limnos. Also noted near Kalivia, Neos Prinos and Limenas.

Araceae

48. *Arum orientale* M. Bieb (Fig. 11)

Gr Thasos: W-NW of Potamia, pine wood on steep northern slope of Profitis Ilias, 1000 m, 40°42'35"N, 24°41'39"E, 18.06.2018, *Biel* 18.072.

Reported from Samothraki, scattered in northeastern Greece.

Cyperaceae

49. *Carex spicata* Huds.

Gr Thasos: W of Limenas (Thasos), in olive plantation behind narrow beach, 2 m, 40°46'35"N, 24°41'47"E, 17.06.2018, *Biel* 18.065.

New for N Aegean islands.

Juncaceae

50. *Juncus minutulus* V. Krecz. & Gontsch.

Gr Thasos: S of Potos, near mouth of Dipotamos river, 2 m, 40°38'44"N, 24°31'29"E, 12.06.2018, *Biel* 18.029.

Reported from Samothraki, Limnos and Ag. Evstratios.

Liliaceae

51. *Gagea bohémica* (Zauschn.) Schult. & Schult. f. [syn. *G. saxatilis* (Mert. & W.D.J. Koch) Schult. & Schult. f.]

Gr Thasos: E-NE of Panagia, slope by dirt road with phrygana and *Pinus*, on marble, 140 m, 40°44'06"N, 24°44'15"E, 05.03.2017, *Biel* 17.024.

Reported from Samothraki as *G. saxatilis*.

*Poaceae*52. *Bromus fasciculatus* C. Presl

Gr Thasos: S of Potos, waste ground and road margins near Dipotamos bridge, 5 m, 40°36'26"N, 24°36'40"E, 08.03.2017, *Biel* 17.043.

Reported from Samothraki, Limnos and Ag. Evstratios.

53. *Bothriochloa ischaemum* (L.) Keng

Gr Thasos: E-NE of Skala Marion, waste ground and scrub between gardens, 10 m, 40°38'44"N, 24°31'29"E, 13.06.2018, *Biel* 18.049.

Reported from Samothraki.

54. *Elytrigia obtusiflora* (DC.) Tzvelev

Gr Thasos: W-NW of Skala Prinou, near shipyard at beach with *Phragmites australis*, 2 m, 40°45'34"N, 24°34'17"E, 15.06.2018, *Biel* 18.056.

Reported from Ag. Evstratios.

Cited vouchers are provisionally kept in the private herbarium of B. Biel at Höchberg (herb. Biel).



Fig. 11. *Arum orientale* (photo B. Biel).

Reports 55–60**Cristina Cattaneo¹ & Mauro Grano²**

¹ Via Eleonora d'Arborea 12, 00162 Rome, Italy, e-mail: cristina.cattaneo76@libero.it (author for correspondence)

² Via Val Cenischia 24, 00141 Rome, Italy

The following are six new records from the East Aegean island of Ikaria (Nomos Samou, Eparchia Ikarias).

*Aceraceae*55. *Acer sempervirens* L.

Gr Ikaria: Pachia Kefali, near Ryakas waterfalls, 1010 m, 37°33'30"N, 26°04'32"E, 18.08.2018, Cattaneo & Grano 702 (herb. Cattaneo).

Pachia Kefali is a granodiorite (intrusive igneous rock) plateau with thickets of *Crataegus monogyna*. Only a single *Acer sempervirens* was observed although trees are more numerous on the E Aegean islands of Chios and Lesvos.

*Amaranthaceae*56. *Amaranthus blitoides* S. Watson

Gr Ikaria: Xilosirtis, wasteground, 199 m, 37°35'38"N, 26°14'49"E, 31.07.2018, Cattaneo & Grano obs. (photo).

Recorded for most of the E Aegean islands.

*Asteraceae*57. *Bidens bipinnatus* L.

Gr Ikaria, roadside in the village of Aghios Kirikos, 51 m, 37°36'48"N, 26°17'22"E, 01.08.2018, Cattaneo & Grano 714 (herb. Cattaneo).

Introduced. In Greece, so far reported only from Lesvos.

*Euphorbiaceae*58. *Euphorbia hypericifolia* L. (Fig. 12)

Gr Ikaria: roadside in the village of Aghios Kirikos,



Fig. 12. *Euphorbia hypericifolia* (photo C. Cattaneo).

71 m, 37°36'52"N, 26°17'15"E, 01.08.2018,

Cattaneo & Grano 699 (herb. Cattaneo).

Established in ruderal habitat. Reported from N Peloponnese, Kriti and Karpathos, and the E Aegean islands of Rodos, Chalki and Simi.

59. *Chrozophora tinctoria* (L.) A. Juss.

Gr Ikaria: Fanari, wasteground, 19 m, 37°40'22"N, 26°20'47"E, 04.08.2018, *Cattaneo & Grano* obs. (photo).

Recorded for most of the E Aegean islands.

Polygonaceae

60. *Polygonum arenarium* Waldst. & Kit.

Gr Ikaria: Aghios Polikarpos, field margin, sedimentary soil, 312 m, 37°36'43"N, 26°05'24"E, 07.08.2018, *Cattaneo & Grano* 728 (herb. Cattaneo).

For the E Aegean islands, reported from Lesvos, Chios, Kos, Rodos, Simi and Megisti.

Reports 61–123

Cristina Cattaneo¹ & Maria Panitsa²

¹ Via Eleonora d'Arborea 12, 00162 Rome, Italy, e-mail: cristina.cattaneo76@libero.it (author for correspondence)

² University of Patras, Department of Biology, Division of Plant Biology, GR 26504 Patras, Greece

New records for the vascular flora of Inousse (Oinousses) and Lipsi are provided. These islands belong respectively to the Inousses and Lipsi islets groups. The islets have been studied between 1989 and 1990 for Inousses (Panitsa & al. 1994) and from 1990 to 1995 for Lipsi (Panitsa & Tzanoudakis 2001). Inousses comprises six islets situated east of Chios Island (Nomos and Eparchia Chiou in floristic region East Aegean islands) and 270 taxa have been recorded for this complex: Inousse (the main island with an area of ca. 14 km²), Panaghia, Vatos, Pontikos, Vatopoula and Archontoniso. Lipsi is a group of 25 islets situated between the islands of Samos, Patmos and Leros (Nomos Dodekanisou, Eparchia Kalimnou, East Aegean islands). The largest island is Lipsi with a floristic count of 471 taxa. The first author (CC) visited Inousse between 11–18 May 2018 (48 new records belonging to 27 families) and the main island of Lipsi between 21–26 May 2018 (16 new records belonging to 12 families). The authors thank Prof. W. Greuter and Dr. M. Erben for their invaluable help.

Amaranthaceae

61. *Amaranthus blitoides* S. Watson

Gr Lipsi: wasteground close to the reservoir, 38 m, 37°17'21"N, 26°46'41"E, *Cattaneo* obs. (photo).

62. *Amaranthus viridis* L.

Gr Lipsi: roadsides in the main village, 8 m, 37°17'43"N, 26°46'11"E, 24.5.2018, *Cattaneo* obs. (photo).

Apiaceae

63. *Ammi majus* L.

Gr Lipsi: Limni bay, fallow fields, 21 m, 37°17'19"N, 26°46'33"E, 22.05.2018, *Cattaneo* 577 (herb. Cattaneo).

64. *Apium graveolens* L.

Gr Lipsi: wet field close to the main village, 3 m, 37°17'40"N, 26°46'07"E, *Cattaneo* 604 (herb. Cattaneo).

65. *Daucus carota* L.

Gr Lipsi: roadsides, 50 m, 37°12'22"N, 26°46'27"E, 26.05.2018, *Cattaneo* obs.

66. *Eryngium campestre* L.

Gr Inousse: Fokia, roadside, 12 m, 38°31'38"N, 26°12'05"E, 14.05.2018, *Cattaneo* obs. (photo).

67. *Opopanax hispidus* (Friv.) Griseb.

Gr Lipsi: Limni bay, phrygana, 12 m, 37°17'03"N, 26°46'44"E, 22.05.2018, *Cattaneo* obs. (photo).

Asclepiadaceae

68. *Cionura erecta* (L.) Griseb.

Gr Lipsi: roadsides in the main village, 5 m, 37°17'41"N, 26°46'12"E, 26.05.2018, *Cattaneo* obs.

Asteraceae

69. *Carthamus lanatus* L.

Gr Inousse: Monastiri, margin of a cultivated field, 39 m, 38°32'07"N, 26°11'45"E, 13.05.2018, *Cattaneo* obs. (photo).

70. *Cichorium intybus* L.

Gr Inousse: Mandraki, fallow field, 5 m, 38°30'53"N, 26°13'06"E, 11.05.2018, *Cattaneo* obs. (photo).

71. *Cichorium pumilum* Jacq.

Gr Inousse: Fokia, margins of a dirt road, 20 m, 38°31'30"N, 26°12'16"E, 11.05.2018, *Cattaneo* obs.

72. *Erigeron bonariensis* L.

Gr Inousse: Mandraki, roadside, 24 m, 38°30'49"N, 26°13'18"E, 11.05.2018, *Cattaneo* obs.

73. *Filago pygmaea* L.

Gr Inousse: Kastro, phrygana, 20 m, 38°31'18"N, 26°12'23"E, 14.05.2018, *Cattaneo* obs. (photo).

74. *Glebionis segetum* (L.) Fourr.

Gr Inousse: Monastiri, olive groves, 8 m, 38°32'07"N, 26°11'39"E, 13.05.2018, *Cattaneo* 597 (herb. *Cattaneo*).

75. *Lactuca serriola* L.

Gr Inousse: Mandraki, road margins, 17 m, 38°30'49"N, 26°13'12"E, 18.05.2018, *Cattaneo* obs.

76. *Notobasis syriaca* (L.) Cass.

Gr Inousse: ruderal places in the main village, 36 m, 38°30'58"N, 26°13'16"E, 15.05.2018, *Cattaneo* obs.

77. *Picris pauciflora* Willd.

Gr Inousse: Monastiri, close to the monastery, 63 m, 38°32'12"N, 26°11'49"E, 13.05.2018, *Cattaneo* 565 (herb. *Cattaneo*).

78. *Tolpis virgata* (Desf.) Bertol.

Gr Inousse: Aghios Ioannis, cultivated fields near the sea, 10 m, 38°30'55"N, 26°13'51"E, 18.05.2018, *Cattaneo* 581 (herb. *Cattaneo*).

79. *Tragopogon dubius* Scop.

Gr Inousse: near the reservoir north of the main village, 19 m, 38°31'07"N, 26°13'15"E, 15.05.2018, *Cattaneo* obs. (photo).

Boraginaceae**80. *Heliotropium curassavicum* L.**

Gr Inousse: Mandraki, coastal slopes, 19 m, 38°30'48"N, 26°13'16"E, 11.05.2018, *Cattaneo* obs. (photo).



Fig. 13. *Austrocyliodropuntia subulata* (photo C. Cattaneo).

Brassicaceae**81. *Hirschfeldia incana* (L.) Lagr.-Foss.**

Gr Inousse: roadsides in the main village, 49 m, 38°30'53"N, 26°13'21"E, 15.05.2018, *Cattaneo* obs.

82. *Matthiola incana* (L.) R.Br.

Gr Lipsi: Liedou bay, coastal slopes, 10 m, 37°17'47"N, 26°45'48"E, 25.05.2018, *Cattaneo* obs.

Cactaceae**83. *Austrocyliodropuntia subulata* (Mühlenpf.) Backeb. (Fig. 13)**

Gr Inousse: Fokia, open field, 18 m, 38°31'28"N, 26°12'13"E, 17.05.2018, *Cattaneo* obs. (photo). Reported also for Rodos and Symi (E Aegean islands).

Caprifoliaceae**84. *Lonicera implexa* Aiton**

Gr Inousse: ruderal places in the main village, 12 m, 38°30'57"N, 26°13'09"E, 12.05.2018, *Cattaneo* obs.

Caryophyllaceae**85. *Minuartia hybrida* (Vill.) Schischk.**

Gr Inousse: Fokia, phrygana, 6 m, 38°31'34"N, 26°12'06"E, 17.05.2018, *Cattaneo* 598 (herb. *Cattaneo*).

Chenopodiaceae**86. *Arthrocnemum macrostachyum* (Moric.) K. Koch.**

Gr Inousse: Aghios Ioannis, sandy beach, 8 m, 38°30'54"N, 26°13'50"E, 16.05.2018, *Cattaneo* obs. (photo).

87. *Halimione portulacoides* (L.) Aellen

Gr Inousse: Aghios Ioannis, sandy beach, 8 m, 38°30'54"N, 26°13'50"E, 16.05.2018, *Cattaneo* obs. (photo).

88. *Salsola soda* L.

Gr Inousse: Aghios Ioannis, sandy beach, 8 m, 38°30'54"N, 26°13'50"E, 16.05.2018, *Cattaneo* obs. (photo).

Convolvulaceae**89. *Convolvulus arvensis* L.**

Gr Inousse: ruderal places in the main village, 34 m, 38°30'54"N, 26°13'17"E, 15.05.2018, *Cattaneo* obs.

Cucurbitaceae**90. *Ecballium elaterium* (L.) A. Rich.**

Gr Inousse: between the main village and Aghios

Ioannis, 30 m, 38°30'54"N, 26°13'39"E,
16.05.2018, *Cattaneo* obs. (photo).

- Lipsi: ruderal places close to the main village,
5 m, 37°17'38"N, 26°46'13"E, 26.05.2018,
Cattaneo obs.

Dipsacaceae

91. *Scabiosa atropurpurea* L.

- Gr** Inousse: ruderal places in the main village, 37 m,
38°30'50"N, 26°13'36"E, 15.05.2018, *Cattaneo* obs.

Ericaceae

92. *Arbutus unedo* L. (Fig. 14)

- Gr** Lipsi: Moschato, dense macchie of *Juniperus turbinata*, 31 m, 37°19'10"N, 26°43'33"E,
24.05.2018, *Cattaneo* 608 (herb. *Cattaneo*).



Fig. 14. *Arbutus unedo* (photo C. Cattaneo).

Euphorbiaceae

93. *Chrozophora tinctoria* (L.) A. Juss.

- Gr** Lipsi: Limni bay, at edge of a cultivated field, 2 m,
37°17'05"N, 26°46'44"E, 22.05.2018, *Cattaneo* 607
(herb. *Cattaneo*).

94. *Euphorbia serpens* Kunth

- Gr** Inousse: roadsides in the main village, 21 m,
38°30'48"N, 26°13'17"E, 15.05.2018, *Cattaneo* obs.

Fabaceae

95. *Lotus angustissimus* L.

- Gr** Inousse: Chazali, in fallow field near the beach,
38°31'49"N, 26°11'55"E, 13.05.2018, *Cattaneo* 574
(herb. *Cattaneo*).

96. *Ononis spinosa* L.

- Gr** Inousse: Fokia, 12 m, 38°31'29"N, 26°12'09"E,
17.05.2018, *Cattaneo* obs. (photo).

Frankeniaceae

97. *Frankenia pulverulenta* L.

- Gr** Inousse: Fokia, on the beach, 38°31'29"N,
26°12'06"E, 17.05.2018, *Cattaneo* 755 (herb.
Cattaneo).

Gentianaceae

98. *Centaurium pulchellum* (Sw.) Druce

- Gr** Inousse: wet field near the main village, 24 m,
38°31'03"N, 26°13'16"E, 11.05.2018, *Cattaneo* 706
(herb. *Cattaneo*).

99. *Centaurium tenuiflorum* (Hoffmanns & Link) Fritsch

- Gr** Inousse: close to the reservoir near the main
village, 18 m, 38°31'07"N, 26°13'15"E, 14.05.2018,
Cattaneo 585 (herb. *Cattaneo*).

Hydrophyllaceae

100. *Phacelia tanacetifolia* Benth.

- Gr** Inousse: Chazali, in fallow field, 38°31'49"N,
26°11'55"E, 13.05.2018, *Cattaneo* 578 (herb.
Cattaneo).

Hypericaceae

101. *Hypericum triquetrifolium* Turra

- Gr** Inousse: Chazali, in fallow field, 38°31'50"N,
26°11'56"E, 13.05.2018, *Cattaneo* 582 (herb.
Cattaneo).

Lamiaceae

102. *Mentha longifolia* (L.) Huds. (Fig. 15)

- Gr** Inousse: Aghios Ioannis, in fallow field near
a water source, 15 m, 38°31'06"N, 26°13'54"E,
16.05.2018, *Cattaneo* 704 (herb. *Cattaneo*).



Fig. 15. *Mentha longifolia* (photo C. Cattaneo).

Linaceae**103. *Linum bienne* Mill.**

Gr Inousse: Aghios Ioannis, sandy coastal place, 22 m, 38°31'04"N, 26°13'47"E, 16.05.2018, *Cattaneo* 588 (herb. Cattaneo).

104. *Linum strictum* L.

Gr Inousse: Fokia, phrygana, 9 m, 38°31'30"N, 26°12'09"E, 17.05.2018, *Cattaneo* obs.

Lythraceae**105. *Lythrum thymifolia* L.**

Gr Inousse: Aghios Ioannis, wet field near the beach, 10 m, 38°30'59"N, 26°13'46"E, 18.05.2018, *Cattaneo* obs.
— Lipsi: Limni bay, cultivated field, 2 m, 37°17'04"N, 26°46'42"E, 22.05.2018, *Cattaneo* 595, (herb. Cattaneo).

Malvaceae**106. *Malva arborea* (L.) Webb & Berthel.**

Gr Inousse: coastal slopes between the main village and Aghios Ioannis, 25 m, 38°30'48"N, 26°13'19"E, 17.05.2018, *Cattaneo* obs. (photo).

107. *Malva multiflora* (Cav.) Soldano & al.

Gr Inousse: ruderal places in the main village, 49 m, 38°30'52"N, 26°13'21"E, 12.05.2018, *Cattaneo* obs.

Orobanchaceae**108. *Bellardia viscosa* (L.) Fisch. & C.A. Mey.**

Gr Inousse: close to the reservoir near the main village, 20 m, 38°31'06"N, 26°13'15"E, 15.05.2018, *Cattaneo* obs.

109. *Phelipanche mutelii* var. *nana* (Reut.) Uhlich & Rätzel

Gr Inousse: wet field near the main village, 14 m, 38°31'06"N, 26°13'13"E, 15.05.2018, *Cattaneo* obs.

Papaveraceae**110. *Glaucium flavum* Crantz**

Gr Lipsi: Liedou bay, ruderal places on sedimentary soil, 9 m, 37°17'54"N, 26°45'57"E, 25.05.2018, *Cattaneo* 614 (herb. Cattaneo).

Plumbaginaceae**111. *Limonium aucheri* (Girard) Greuter & Burdet**

Gr Lipsi: Limni bay, on sandy beach, 0 m, 37°17'01"N, 26°46'38"E, 25.05.2018, *Cattaneo* 616 (herb. Cattaneo).

Rutaceae**112. *Ruta chalepensis* L.**

Gr Lipsi: Liedou bay, coastal slopes, 10 m, 37°17'47"N, 26°45'48"E, 25.05.2018, *Cattaneo* 610 (herb. Cattaneo).

Scrophulariaceae**113. *Verbascum lasianthum* Boiss. ex Benth.**

(Fig. 16)

Gr Inousse: Aghios Ioannis, phrygana and coastal slopes, 18 m, 38°31'04"N, 26°13'44"E, 16.05.2018, *Cattaneo* 756 (herb. Cattaneo).



Fig. 16. *Verbascum lasianthum* (photo C. Cattaneo).

Solanaceae**114. *Solanum nigrum* L.**

Gr Inousse: Chazali, fallow field, 38°31'50"N, 26°11'56"E, 13.05.2018, *Cattaneo* obs. (photo).

Urticaceae**115. *Parietaria judaica* L.**

Gr Inousse: stone walls in the main village, 41 m, 38°30'52"N, 26°13'19"E, 15.05.2018, *Cattaneo* obs. (photo).

116. *Urtica pilulifera* L.

Gr Inousse: ruderal places in the main village, 67 m, 38°30'54"N, 26°13'24"E, 15.05.2018, *Cattaneo* obs. (photo).

Verbenaceae**117. *Verbena officinalis* L.**

Gr Lipsi: roadsides in the main village, 8 m, 37°17'43"N, 26°46'11"E, 24.05.2018, *Cattaneo* obs.

Veronicaceae

118. *Kickxia commutata* subsp. *graeca* (Bory & Chaub.) R. Fern.

Gr Inousse: Aghios Ioannis, fallow fields, 9 m, 38°30'58"N, 26°13'46"E, 16.05.2018, *Cattaneo* 589 (herb. Cattaneo).

Zygophyllaceae

119. *Tribulus terrestris* L.

Gr Inousse: near main village, 18 m, 36°31'08"N, 26°13'11"E, 13.05.2018, *Cattaneo* obs. (photo).
— Lipsi: orchards in the main village, 8 m, 37°17'41"N, 26°46'15"E, 24.05.2018, *Cattaneo* obs.

Alliaceae

120. *Allium ampeloprasum* L.

Gr Inousse: fallow field close to the Akropolis of the main village, 91 m, 38°30'57"N, 26°13'29"E, 15.05.2018, *Cattaneo* 580 (herb. Cattaneo).

Poaceae

121. *Aegilops biuncialis* Vis.

Gr Inousse: Aghios Ioannis, fallow fields, 10 m, 38°30'59"N, 26°13'46"E, 16.05.2018, *Cattaneo* obs.

122. *Cynodon dactylon* (L.) Pers.

Gr Inousse: Aghios Ioannis, fallow fields, 10 m, 38°30'58"N, 26°13'46"E, 16.05.2018, *Cattaneo* obs.

123. *Hordeum bulbosum* L.

Gr Inousse: Aghios Ioannis, fallow fields, 10 m, 38°30'58"N, 26°13'49"E, 16.05.2018, *Cattaneo* obs.

Reports 124–129

Konstantinos Giannopolous¹,
Kit Tan² & Gert Vold³

¹ Dabaki 15, Pyrgos, Ilias 271 00, Greece

² Institute of Biology, University of Copenhagen, Øster Farimagsgade 2D, DK-1353 Copenhagen K, Denmark, e-mail: kitt@bio.ku.dk (author for correspondence)

³ State Natural History Museum, Øster Farimagsgade 2C, DK-1353 Copenhagen K, Denmark

Cactaceae

124. *Austrocylindropuntia subulata* (Mühlenpf.) Backeb. (Fig. 17)

Gr Nomos Ilias, Eparchia Olimbias: roadside near Lake Kaiafas, 10 m, 37°31'N, 21°36'E, 06.12.2014, *Kit Tan, G. Vold & Giannopoulos* obs.; *loc. ibid.*, 19.02.2007 & 20.07.2017, *Giannopoulos* obs.



Fig. 17. *Austrocylindropuntia subulata* (photo K. Giannopoulos).

This is the first report from the Peloponnese and mainland Greece. The plants have been established for at least eleven years and are in a luxuriant state of growth. The exact year of introduction to Greece is unknown. It has been noted for Rodos, Symi and more recently, from the small islet of Inousse (Oinousses) east of Chios; all these records are from the E Aegean islands.

Crassulaceae

125. *Hylotelephium telephium* (L.) H. Ohba (syn.: *Sedum telephium* L.) (Fig. 18)

Gr Nomos & Eparchia Ilias: Mt Lambia, in forest near Lambia village, 1020 m, 37°52'N, 21°48'E, 06.10.2018, *Giannopolous* s.n. (herb. Giannopolous).

First report for the Peloponnese, probably an established escape as locality is at the outskirts of village. In Greece occurring in North Central (Falakro, Varnous, etc) and North East (Chortiatis, Nestos gorge, Vrontous, Rodopi, Beles, etc). Other species in vicinity are *Berberoa obliqua*, *Plumbago europaea* and *Sternbergia lutea*.

Plumbaginaceae

126. *Plumbago europaea* L.

Gr Nomos & Eparchia Ilias: Mt Lambia, in forest near Lambia village, 1020 m, 37°52'N, 21°48'E, 06.10.2018, *Giannopolous* s.n. (herb. Giannopolous).



Fig. 18. *Hylotelephium telephium* (photo K. Giannopoulos).

Rarely recorded from western Peloponnese, this is apparently the second report for eparchia Ilias.

Rosaceae

127. *Prunus domestica* L. cultivar ‘Mirabelle’ (referred to as *P. syriaca* Borkh.) (Fig. 19)

Gr Nomos & Eparchia Ilias: Mt Lambia, 1450 m, 37°52'N, 21°47'E, 06.10.2018, *Giannopolous* s.n. (herb. *Giannopolous*).

A naturalized cultivar; first report for Mt Lambia. Although *P. syriaca* is stated to be a wild taxon J. Zieliński considers it a cultivar selected centuries ago from *P. domestica* in Turkey. The trees on Mt Lambia are impressively large old trees in full fruit, occurring as isolated individuals or in small groups on the mountain slopes and have probably grown up from stones spat out by shepherds.

Prunus domestica s.l. is an extremely variable taxon (or rather culton), possibly of hybrid origin (*P.*



Fig. 19. *Prunus domestica* cv. ‘Mirabelle’ (photo K. Giannopoulos).

cerasifera × *spinosa*). Its great polymorphism, manifested in the shape, color and taste of fruits, is a result of centuries-long selection. Some cultivated plants naturalize in places and spread locally by root suckers, but such groups or small semi-wild “populations” usually occur not far from villages. The fruits are usually sweet and morphologically uniform indicating the trees are remnants of former cultivation.

Classification of cultivated plants in a similar way as for wild plants is groundless. Each of 5 “subspecies” of *P. domestica* recognized in Hegi’s *Illustrierte Flora of Mitteleuropa* contains numerous cultivars selected based on fruit taste and appearance regardless of where they originate. This includes also “subsp. *insititia* (L.) Bonnier & Layens” which is widespread in Greece and “subsp. *syriaca* (Borkh.) Janch. ex Mansf.” (with the cultivar “Mirabelle”). This yellow mirabelle was also noted growing wild in sheltered valleys on Mt Lykaion and here they are remnants of former cultivation [We thank Prof. J. Zieliński (Poznan) for his valuable opinion which is quoted here].

Scrophulariaceae

128. *Kickxia commutata* subsp. *graeca* (Bory & Chaub.) R. Fern. (syn.: *Antirrhinum graecum* Bory & Chaub.) (Fig. 20)

Gr Nomos & Eparchia Ilias: near Lefkianias (Kleftorema) stream, 360 m, 37°40'N, 21°45'E, 19.10.2018, *Giannopolous* s.n. (herb. *Giannopolous*).

New for nomos Ilias, this is the more common subspecies in Greece; subsp. *commutata* has not yet been recorded from the Peloponnese.



Fig. 20. *Kickxia commutata* subsp. *graeca* (photo K. Giannopoulos).

*Iridaceae***129. *Crocus cancellatus* subsp. *mazziaricus* (Herb.)**

B. Mathew (Fig. 21)

Gr Nomos & Eparchia Ilias: Mt Lambia,
1300–1500 m, 37°52'N, 21°47'E, 06.10.2018,
Giannopoulos s.n. (herb. Giannopoulos).

New for Mt Lambia where it formed pale bluish-purple carpets. Recently reported for Ilias from Mt Skiadovouni.



Fig. 21. *Crocus cancellatus* subsp. *mazziaricus* (photo K. Giannopoulos).

Reports 130–141

Plamen Glogov¹, Mira Georgieva¹ & Dolja Pavlova²

¹ Forest Research Institute, Bulgarian Academy of Sciences, 132 St. Kliment Ohridski Blvd., BG-1756 Sofia, Bulgaria, e-mail: pglogov@abv.bg

² University of Sofia, Faculty of Biology, Department of Botany, 8 Dragan Tzankov, 1164 Sofia, Bulgaria, pavlova@biofac.uni-sofia.bg

*Asteraceae***130. *Bidens frondosus* L.**

Bu Mt Sredna Gora (*Western*): Mt Lozenska, at the bank of Pasarel Dam, 42°33'7,9708"N 23°29'4,91068"E and at the bank of lake Gorno Gabrensko, 42°31'8,60038"N, 23°35'40,10773"E, 12.08.2018, coll. *P. Glogov, M. Georgieva & D. Pavlova* (SO 107 963).

The species occurs either singly or in small groups of three to eight individuals in the silt of the water-free lake bank, accompanied by *Artemisia annua*, *Persicaria hydropiper*, *Lythrum salicaria*, *Rumex conglomeratus*, *Bidens cernua*, etc. This North American plant, unintentionally introduced to Bulgaria, is included in the list of „Worst invasive alien species threatening biodiversity in Europe“ (cf. Petrova & al. 2013b). The competitive ability of the species is ensured by a high relative growth rate and very successful reproductive strategy (Ronzhina 2017). The species is distributed in Bulgaria in the following floristic regions: the Black Sea Coast (*Northern*), Northeast Bulgaria, Danubian Plain, Forebalkan, Balkan Range (*Western*), Sofia region, Valley of River Struma, Valley of River Mesta, Rhodopi Mts (*Eastern*), Thracian Lowland, Tundzha Hilly Country, and Mt Strandzha, at up to 1000 m a.s.l. (Assyov & Petrova 2012; Vladimirov & Kuzmanov 2012; Petrova & al. 2013b). Subsequently, this species was reported for the floristic regions of Rila Mts (Vladimirov 2012), Black Sea Coast (*Southern*) (Vladimirov & al. (2016) and Pirin Mts (*Southern*) (Petrova 2017). This is a new record for the species from the Sredna Gora floristic region.

131. *Helianthus tuberosus* L.

Bu Mt Sredna Gora (*Western*): Mt Lozenska, along the forest trail nearby the Villa Zone on the skirts of peak Kaleto, 42°36'39,73558" N, 23°26'50,75977"E, 10.08.2018, coll. *P. Glogov & M. Georgieva* (SO 107 964).

The only population of this species found in Mt Lozenska consists of 16 individuals. The plant has escaped from the flower gardens of the Villa Zone of Gorni Lozen village. This invasive alien species native to North America was intentionally introduced to Bulgaria as an edible and ornamental plant in the 18th century. According to Petrova & al. (2013b), it was reported as a garden escape and was established in 2003, but naturalization of the species in the coun-

try has started much earlier. The species is distributed in the following floristic regions in Bulgaria: Northeast Bulgaria, Danubian Plain, Forebalkan (*Eastern*), Sofia region, Valley of River Mesta, Rhodopi Mts (*Central, Eastern*), Thracian Lowland, and Tundzha Hilly Country, at up to 1000 m a.s.l. (Petrova & al. 2013b). A new locality for the species from the Forebalkan (*Western*) was reported by Petrova & al. (2013c). The ecological strategy of this species is based on its easy propagation by tuber and stolons, colonization of arbuscular mycorrhizal fungi and its allelopathic effect (Filep & al. 2016). This is a new record for the species from Mt Sredna Gora floristic region.

132. *Solidago gigantea* Aiton

Bu Mt Sredna Gora (*Western*): My Lozenska, the Villa Zone of Gorni Passarel village, 42°33'5,72033"N, 23°29'5,70919"E, 24.08.2018, coll. P. Glogov, M. Georgieva & D. Pavlova (SO 107 965).

This invasive alien species has got established around water basins, in communities with mosaic structure, where it formed dense groups of 40–60 individual stems/m², with stem height up to 1.2–1.6 m. It competes both with such local species as *Daucus carota*, *Artemisia vulgaris* and *Melilotus albus*, and with some other invasive and potentially invasive alien species like *Erigeron annuus* and *Lupinus polyphyllus*.

The North American species *Solidago gigantea* was intentionally introduced to Bulgaria as an ornamental plant and the exact localities for the species were published in 2003 (Vladimirov 2003), although it was reported for the country much earlier (Petrova & al. 2013b). It is distributed in the Northeast Bulgaria, Danubian Plain, Forebalkan, Balkan Range (*Western, Central*), Sofia region, Znepole region, Vitosha region, Valley of River Struma (*Southern*), Valley of River Mesta, Pirin Mts, Rhodopi Mts (*Western, Central*), and Thracian Lowland, at up to 1500 m a.s.l. (Assyov & Petrova 2012; Petrova & al. 2013b). The size and structure of *S. gigantea* populations depend highly on water availability in the habitat. Crucial for the dominance of this species is the response of its rhizome system to water availability. In humid habitats, *S. gigantea* forms single dominant clonal stocks in which no other species are present (Botta-Dukat & Dancza 2008). The species shows allelopathic activity (Petrova & al. 2013b).

Balsaminaceae

133. *Impatiens balfourii* Hook. f. (Fig. 22)

Bu Mt Sredna Gora (*Western*): Mt Lozenska, Dolni Lozen village, 42°35'56,3851"N, 23°29'45,77852"E, 10.08.2018, coll. P. Glogov & M. Georgieva (SO 107 967).

The species was found close to the village, in a semi-shady location covering approximately 50 m². The population was dense, consisting of some 300 individuals. In the grass floor, with predominant coverage were *Plantago major* L., *Lolium perenne* L., *Lactuca serriola* L., etc. Most probably, *Impatiens balfourii* has escaped from the private gardens. Although it is not included in the list of invasive plants in Bulgaria (Petrova & al. 2013b), the species is considered by most authors as invasive for the European flora (Adamowski 2009; Schmitz & Dericks 2010). This species was reported first for the flora of Bulgaria from the Valley of River Struma in 2006 (Adamowski 2009), but probably it was cultivated at least since 1985 in the country (W. Adamowski, pers. comm.) and a herbarium sheet has been kept in the Royal Botanical Garden of Edinburgh (E00099901, coll. Gardner, M.F. & Gardner, S.G.; 30 July 1985 № 3241 <http://data.rbge.org.uk/herb/E00099901>). Subsequently, it was reported for the following floristic regions in Bulgaria: Rhodopi Mts. (*Central*) (Vladimirov, 2012), Forebalkan (*Western, Eastern*), Vitosha region (Petrova & al., 2013c), and Pirin Mts (Petrova 2017). A herbarium material collected by A. Petrova from the region of Sredna Gora (Panagyurishte town, on river banks of river Maresh on 17.09.2011) was deposited in the SOM Herbarium (SOM 167685). This is the first record of the species for Mt Lozenska.



Fig. 22. *Impatiens balfourii* (photo M. Georgieva).

134. *Impatiens glandulifera* Royle

Bu Mt Sredna Gora (*Western*): Mt Lozenska, the western mountain side over the bank of river Iskar, in the Darvodeletska area locality, 42°34'1,4417"N, 23°25'48,77574"E, 02.08.2018, coll. P. Glogov, M. Georgieva & D. Pavlova (SO 107 966).

This invasive species is widely spread on the river banks of river Iskar at the foot of Mt Lozenska. Particularly, it is found on the talus above the river bank, where it forms a monodominant population of approximately 450 individuals, with an average height of 1.8 m. The ecological strategy of this species is a combination of its high reproduction rate (up to 2500 seeds per plant) and large size, which facilitates rapid colonisation. Furthermore, the ability of *I. glandulifera* to achieve substantial growth at a low irradiance level is likely to be a key factor influencing its success as a weed species in deciduous woodlands (Andrews & al. 2009). This Southeast Asian (Western Himalaya, India) species is distributed in the following floristic regions: Forebalkan, Balkan Range (*Western, Central*), Sofia region, Vitosha region, Znepole region, West Frontier Mountains, Valley of River Mesta, Rila Mts, Rhodopi Mts (*Western, Central*), and Thracian Lowland, at up to 1400 m a.s.l. (Assyov & Petrova 2012). The chorological data presented by Petrova & al. (2013b) added to the list of its distribution the floristic regions of Valley of River Struma and Mt Sredna Gora. This is a new report for Mt Lozenska.

Buddlejaceae**135. *Buddleja davidii* Franchet**

Bu Mt Sredna Gora (*Western*): Mt Lozenska, at the outskirts of Gorni Lozen village, along a forest trail to German village, 42°36'14,6227"N, 23°28'8,587"E, 10.08.2018, coll. P. Glogov & M. Georgieva (SO 107 974).

This invasive species has been cultivated in a private garden, but some of the population has spread from the garden and taken the space along the forest trail. In Bulgaria, it is distributed at the Black Sea Coast (*Northern*), Danubian Plain, Northeast Bulgaria, Sofia region, Rila Mts, and Rhodopi Mts (*Western, Central*), at up to 1100 m a.s.l. (Petrova & al. 2013b). This is the first report for the Sredna Gora floristic region.

Chenopodiaceae**136. *Chenopodium ambrosioides* L.**

Bu Mt Sredna Gora (*Western*): Mt Lozenska, German village, 42°37'9,33089"N, 23°26'11,33596"E,

10.08.2018, coll. P. Glogov & M. Georgieva (SO 107 968).

This new species for the flora of Mt Lozenska and Sredna Gora floristic region was found at the edge of a sunflower field, together with other weed species: *Chenopodium album*, *Echinochloa crus-galli*, *Digitaria sanguinalis*, *Setaria glauca*, *Cirsium arvense*, etc.

This native to South and Central America species was first established in Bulgaria in 1890, on the sands near Varna town (Petrova & al. 2013b). The following floristic regions were reported for its distribution: Black Sea Coast (*Northern*), Northeast Bulgaria, Danubian Plain, Forebalkan (*Eastern*), Sofia region, Valley of River Struma, and Thracian Lowland, at up to 700 m a.s.l. (Petrova & al. 2013b). The species was also reported for the floristic regions of Tundzha Hilly Country by Grozeva & Petkov (2013) (SOM 169145 sub *Dysphania ambrosioides*) and Forebalkan (*Western*) by Petrova & al. (2013c). This is the first record for the floristic region of Mt Sredna Gora.

Fabaceae**137. *Gleditsia triacanthos* L.**

Bu Mt Sredna Gora (*Western*): Mt Lozenska, along the forest trail near the Villa Zone at the foot of peak Kaleto, 42°36'28,84799"N, 23°27'28,70147"E, 10.08.2018, coll. P. Glogov & M. Georgieva (SO 107 969).

The North American species *G. triacanthos* was registered in Mt Lozenska with a small population, which comprised a few individuals 4–4.5 m high, along with other species like *Fraxinus ornus*, *Viburnum lantana*, *Cornus mas*, *Robinia pseudoacacia*, and *Amorpha fruticosa*. The species is distributed at the Black Sea Coast, Northeast Bulgaria, Danubian Plain, Sofia region, and Thracian Lowland, at up to 1000 m a.s.l. (Assyov & Petrova 2012; Petrova & al. 2013b). Recently, this species was reported for the floristic regions of Mt Strandza (Petrova & Dalakchieva 2017) and Valley of River Struma (Vladimirov & al. 2017). This is its first record for the floristic region of Sredna Gora.

138. *Laburnum anagyroides* Medik.

Bu Mt Sredna Gora (*Western*): Mt Lozenska, along the forest trail at the foot of peak Kaleto, 42°36'26,45885"N, 23°27'36,55397"E, 10.08.2018, coll. P. Glogov & M. Georgieva (SO 107 970).

Few individuals of this alien invasive species, 1.4–1.6 m high, were registered near the Villa Zone of Gorni Lozen village. Most probably, they have spread from there across

this area of the mountain. Along with it, were also found *Fraxinus ornus* and *Robinia pseudoacacia*. This Central European species is one of the most commonly cultivated ornamental tree species in Bulgaria, naturalized in the following floristic regions: Northeast Bulgaria, Balkan Range (*Western*), Sofia region, Znepole region, and Tundzha Hilly Country, at up to 800–900 m (Petrova & al. 2013b). Tashev & al. (2015) added a new locality to the distribution of the species from Vitosha floristic region (above the villa zone of Simeonovo village, SOM 170632; SO 107616; SOA 060428). Subsequently, Vladimirov & al. (2016) reported a new locality southwestwards of village Rezovo (Black Sea Coast (*Southern*)). This is its first record for the floristic region of Mt Sredna Gora.

139. *Lupinus polyphyllus* Lindl. (Fig. 23)

Bu Mt Sredna Gora (*Western*): Mt Lozenska, the Villa Zone of Gorni Pasarel village, 42°33'5,72033"N, 23°29'5,70919"E, 06.09.2018, coll. P. Glogov, M. Georgieva & D. Pavlova (SO 107 971).

The population of this species occupies an area of about 300 m², with a projection cover of about 40%. Other species in the same community with high percentage of the projection cover are *Solidago gigantea* (30%) and *Erigeron annuus* (15%). This North American species is considered as one of the most aggressive plants (Vyšniauskiene & al. 2011). It is included in the European network of invasive alien species NOBANIS and in the lists of invasive alien species in many European countries, such as Sweden, Norway, Switzerland, the Czech Republic, Finland, Lithuania and the Ukraine (Fremstad & Elven 2004; Vyšniauskiene & al. 2011). So far, the species has not been included in the list of Invasive Alien Species in Bulgaria (Petrova & al. 2013b), probably due to its



Fig. 23. *Lupinus polyphyllus* (photo D. Pavlova).

limited distribution on the territory of the country. It was reported only for the Balkan Range (*Western*) floristic region (Vassilev & Pedashenko 2009; Assyov & Petrova 2012) and Vitosha region (Vladimirov 2012).

Polygonaceae

140. *Fallopia × bohémica* (Chrtek&Chrtkova) J.P.

Balley

Bu Mt Sredna Gora (*Western*): The river Iskar Gorge between the Lozenska and Plana mountains, 42°34'5,96813"N, 23°25'56,95698"E, 02.08.2018, and Mt Lozenska, along the banks of river Gabra, 42°32'13,59661", N 23°36'19,75871"E, 12.08.2018, coll. P. Glogov (SO 107 972).

This species has not been reported so far for Mt Lozenska and the floristic region of Sredna Gora. Its populations have invaded densely an area along the river bank, with a total coverage of 20–25 m². It is distributed in the Danubian Plain, Forebalkan (*Western*), Balkan Range (*Western, Central*), Sofia region, Znepole region, Vitosha region, and Rhodopi Mts (*Central*), at up to 1000 m a.s.l. (Petrova & al. 2013b). Subsequently, new localities for the species were reported from the Valley of River Struma (Vutov & Dimitrov 2016), Forebalkan (*Western*) (Dimitrov & Vutov 2017) and Black Sea Coast (*Northern*) (Vladimirov & al. 2017). Owing to its early-starting and rapidly proceeding growth, this species occupies the air space before the development of the other species by shading them off gradually with its dense stems and foliage mass, and eventually robbing them off of almost all available light. Furthermore, *Fallopia*'s rhizome system grows rampantly and the plants remove intensively the nutrients from the soil, thus taking over the ground from their competitors. Taken together, all these factors result in an almost 100% inhibition of germination and growth of co-occurring species (Balogh 2008).

Sapindaceae

141. *Koelreuteria paniculata* Laxm.

Bu Mt Sredna Gora (*Western*): Mt Lozenska, at the exit of Gorni Lozen village, in close proximity to the forest, 42°36'25,3687"N, 23°27'40,98467"E, 06.09.2018, coll. P. Glogov & M. Georgieva (SO 107 973).

In Bulgaria, the species is distributed at the Black Sea Coast, Danubian Plain, Northeast Bulgaria, Forebalkan, Thracian Lowland, and Rhodopi Mts, at up to 1000 m a.s.l. (Petrova & al. 2013b). This is its first report for the Sredna Gora floristic region.

Reports 142–147

Plamen Glogov¹ & Dolja Pavlova²

¹ Forest Research Institute, Bulgarian Academy of Sciences, 132 St. Kliment Ohridski Blvd., BG-1756 Sofia, Bulgaria, e-mail: pglogov@abv.bg

² University of Sofia, Faculty of Biology, Department of Botany, 8 Dragan Tzankov, 1164 Sofia, Bulgaria, e-mail: pavlova@biofac.uni-sofia.bg

Apiaceae

142. *Smyrniium perfoliatum* L.

Bu Mt Sredna Gora (*Western*): over the suspension bridge of Passarel, 42°32'51.26"N, 23°29'2.21"E, 30.06.2017, coll. P. Glogov (SO 107 774).

A small population of this species was found in a community of *Carpinus betulus* and *Quercus dalechampii*. *Coryllus avellana* dominates in the shrub understorey. Other sciophytes and hemisciophytes found in herbaceous undergrowth are *Galium odoratum*, *Mycelis muralis*, *Sanicula europaea*, *Lilium martagon*, *Melica uniflora*, etc. This Euro-Mediterranean species is reported for most floristic regions in Bulgaria except for Mt Sredna Gora, Northeast Bulgaria, the Tundzha Hilly Country, Mt Slavyanka and the Valley of River Mesta (Assyov & Petrova 2012).

Brassicaceae

143. *Cardamine impatiens* L.

Bu Mt Sredna Gora (*Western*): Mt Lozenska, on the shore of Pasarel Reservoir, 42°33'09.8"N, 23°29'03.88"E, 22.06.2017, coll. P. Glogov (SO 107 773).

This Euro-Asiatic species was recorded by N. Vihotzevskii in 1978 on the territory of Mt Lozenska (SOM 13981). However, this was not taken into account in the Bulgarian floristic literature (Anchev 1992; Popova 2003; Assyov & Petrova 2012). So far the species has been reported from the following floristic regions: Forebalkan, Balkan Range, Sofia region, Vitosha region, Znepole region, Mt Belasitsa, Rila Mts, Pirin Mts, Rhodopi Mts (Assyov & Petrova 2012). This is a first report for Mt Sredna Gora floristic region.

Lamiaceae

144. *Thymus comptus* Friv. (Fig. 24)

Bu Mt Sredna Gora (*Western*): Mt Lozenska, Lalina mogila peak, 42°34'57.17"N, 23°29'26.32", 10.06.2017, coll. P. Glogov (SO 107 770).

This plant was found on an open karst terrain, among



Fig. 24. *Thymus comptus* (photo P. Glogov).

species such as *Asyneuma anthericoides*, *Anthylis vulneraria*, *Stipa eriocaulis*, etc. The species is a Balkan endemic (Petrova & Vladimirov 2010). So far it has been reported for West Frontier Mts, Valley of River Struma, Mt Slavyanka, Pirin Mts, Tundzha Hilly Country (Assyov & Petrova 2012).

Linaceae

145. *Linum nervosum* Waldst. & Kit.

Bu Mt Sredna Gora (*Western*): Mt Lozenska, under peak Lalina mogila, 42°35'07.22"N, 23°28'09.56"E, 10.06.2017, coll. P. Glogov (SO 107 772).

This is a new species for the flora of Mt Sredna Gora floristic region. It was found at the edge of a shrub community of *Corylus avellana*. Accompanying species were *Trifolium alpestre* subsp. *alpestre*, *Geranium sanguineum*, *Hypericum hirsutum*, *Vicia cassubica*, *Betonica officinalis*, etc. The distribution of this sub-Mediterranean species covers the Danubian Plain, Northeast Bulgaria, Forebalkan, Balkan Range, Sofia region, Vitosha region, Znepole region, Rila Mts, Rhodopi Mts (*Central, Eastern*) (Assyov & Petrova 2012).

Rubiaceae

146. *Galium glaucum* L.

Bu Mt Sredna Gora (*Western*): Mt Lozenska, northern slope, above village of Dolni Lozen, 42°36'10.24"N, 23°28'48.54"E, 14.06.2017, coll. P. Glogov (SO 107 769).

The species was found at the edge of a shrubland community dominated by *Carpinus orientalis*. Accom-

panying herbaceous species were *Poa nemoralis*, *Melica uniflora*, *Trifolium montanum*, *Lathyrus laxiflorus*, *Vicia cassubica*, *Galium aparine*, *Viola rhinviniana* etc. This alkaline, xerothermic sub-Mediterranean geoelement is distributed in the following floristic regions: Danubian Plain, Forebalkan, Sofia region, Znepole region, West Frontier Mts, and Valley of River Struma (Assyov & Petrova 2012).

Liliaceae

147. *Ornithogalum sphaerocarpum* A. Kern.

Bu Mt Sredna Gora (Western): Mt Lozenska, above German village, 42°36'10.24"N, 23°28'48.54"E, 02.07.2017, coll. P. Glogov (SO 107779).

A population of 11 individuals was recorded in a mesophilous meadow with participation of steppe elements above the German Monastery. Accompanying species were *Agrostis capillaris*, *Phleum pratense*, *Lythrum salicaria*, *Filipendula vulgaris*, *Cirsium canum*, *Sanguisorba officinalis*, *Heracleum sibiricum*, etc. This is a first report for Mt Sredna Gora floristic region.

Report 148

Iordan Hristov¹, Michaela Yordanova², Antoaneta Petrova³ & Albena Kurteva⁴

¹ Bulgarian Society for the Protection of Birds, PO Box 50, 1111 Sofia, Bulgaria, e-mail: biomonitoring.ltd@gmail.com

² Wild Rodopi, 32 Borova Gora Str., 4701 Smolyan, Bulgaria, e-mail: michaela_yordanova@abv.bg

³ Botanical Garden, Bulgarian Academy of Sciences, P.O. Box 664, 1000 Sofia, e-mail: petrovabotgar1@abv.bg

⁴ Priroda Madzharovo, Cap. Petko Voivoda Str., bl.1, ap.1, 6480 Madzharovo, Bulgaria, e-mail: madzharovo@abv.bg

Orchidaceae

148. *Ophrys reinholdii* Spruner ex Fleischm.

Bu Rhodopi Mts (Eastern): Madzharovo town, park area in the town, 185 m, MG01, app. 41°38'04.2"N, 25°51'32.7"E, observed by I. Hristov, 20.04.2018; coll. 23.04.2018, A. Kurteva (SOM 176496), with flowers (Fig. 25).

This is a new region for this species. A population of 24 individuals was observed in the small town park. The plants grew in shade, under trees of *Fraxinus* sp. and *Picea* sp. and shrubs of *Syringa vulgaris*, and *Ligustrum vulgare* cultivated in the park. The original vegetation is influenced profoundly by the landscape design. The ground cover is also changed by cultivated grasses and *Trifolium repens*.



Fig. 25. *Ophrys reinholdii*, Madzharovo, the town's park, 05.05.2018 (photo M. Yordanova).

The Mediterranean *O. reinholdii* is known in Bulgaria with few isolated localities in Mt Strandzha (Bergman & al. 2004). It is an Endangered species in the country (Petrova 2009, 2015). The number of individuals of the new population suggests that it was not newly established, just overlooked, despite the popularity of Madzharovo town among nature explorers and the numerous floristic contributions reported from the area (see Petrova 2004 for review), where orchids are an object of special attention (Yordanova 2016, etc.). Mention deserves the fact that most individuals observed in the shady place were considerably lighter and greenish than the typical colour for that species.

Reports 149–183

Roger Marchant¹, Kit Tan² & Arne Strid³

¹ School of Biomedical Sciences, Ulster University, Coleraine, County Londonderry, BT521SA, Northern Ireland, UK, e-mail: r.marchant@ulster.ac.uk (author for correspondence)

² Institute of Biology, University of Copenhagen, Øster Farimagsgade 2D, DK-1353 Copenhagen K, Denmark

³ Bakkevej 6, DK-5853 Ørbæk, Denmark

New records for 35 species in the Mani Peninsula (Southern Peloponnese) are presented based on collection and photographing of plants in the area over a period of 15 years. The Mani Peninsula has been defined as the area bounded on the north by the road from Kalamata to Sparti and then on the east by the River Evrotas to the coast on the Lakonian Gulf. The total area included in this study is approximately 1,760 km². This region contains a range of habitats from coastal environments to the peak of the Taygetos Mountains at 2407 m and includes large areas of land given over to non-intensive olive culture. The primary identification of specimens was made by Roger Marchant with verification carried out by Kit Tan and Arne Strid based on photos.

Acanthaceae

149. *Acanthus mollis* L.

Gr Nomos Messinias, Eparchia Kalamon: in various locations in the village of Stoupa including 36.844230°N, 22.261963°E, 08.06.2012, R. Marchant obs.

A native of the western Mediterranean and probably a garden escape.

Aizoaceae

150. *Malephora purpureocrocea* (Haw.) Schwantes

Gr Nomos Messinias, Eparchia Kalamon: in the coastal village of Trachila growing on waste ground, 36.768361°N, 22.314061°E, 30.12.2012, R. Marchant obs.

Native to southern Africa, a naturalised escape.

Apiaceae

151. *Conium maculatum* L.

Gr Nomos Messinias, Eparchia Kalamon: growing in the stony verges of a rough vehicle track from the village of Aghios Nikonas to Trachila near the abandoned village of Smouga, 36.755157°N, 22.330280°E, 16.04.2014, R. Marchant obs.

Widespread in Greece but less common in the south.

152. *Coriandrum sativum* L.

Gr Nomos Messinias, Eparchia Kalamon: growing at the side of a footpath leading up from the coast to the village of Pigi, 36.813169°N, 22.310551°E, 01.01.2013, R. Marchant obs.

Widely naturalised in southern Europe, although originally brought by the Romans from Egypt.

153. *Ridolfia segetum* (Guss.) Moris

Gr Nomos Messinias, Eparchia Kalamon: along the

rough vehicle track through the King's Forest above the village of Saidona, close to Mt Taygetos, 36.890051°N, 22.312912°E, 01.07.2015, R.

Marchant obs.

Fairly rare and scattered in Greece.

Asclepiadaceae

154. *Gomphocarpus physocarpus* E. Mey.

Gr Nomos Messinias, Eparchia Kalamon: in the village of Exohori, 36.901413°N, 22.267217°E, 04.07.2015, P. Robinson obs.

This is a non-native plant, originally from tropical Africa. So far only recorded from Western Crete, Karpathos and Samos and now possibly spreading to mainland Greece.

Asteraceae

155. *Anthemis cotula* L.

Gr Nomos Messinias, Eparchia Kalamon: growing along a stony vehicle track in the village of Stoupa, 36.844141°N, 22.2611764°E, 29.04.2016, R. Marchant obs.

Widespread in Greece.

156. *Carthamus dentatus* (Forssk.) Vahl

Gr Nomos Lakonias, Eparchia Itilou: on coastal slopes near the hamlet of Stavri close to Tigani, 36.530684°N, 22.368253°E, 27.06.2015, R.

Marchant obs.

Widespread in Greece.

157. *Cirsium creticum* (Lam.) d'Urv.

Gr Nomos Messinias, Eparchia Kalamon: growing alongside the stony vehicle track in the King's Forest above the village of Saidona, 36.875755°N, 22.358530°E, 09.09.2012, R. Marchant obs.

Widespread in Greece.

158. *Hyoseris lucida* L.

Gr Nomos Lakonias, Eparchia Githiou: Cape Tenaron, along the path to the lighthouse, 36.4000737°N, 22.485324°E, 12.10.2017, R. Marchant obs.

Rare in the Peloponnese.

Boraginaceae

159. *Anchusa officinalis* L.

Gr Nomos Messinias, Eparchia Kalamon: growing alongside the stony vehicle track in the King's Forest above the village of Saidona, 36.897899°N, 22.318947°E, 16.06.2012, R. Marchant obs.

Most reports of *A. officinalis* from southern Greece refer to forms of *A. undulata*.

160. *Myosotis arvensis* (L.) Hill

Gr Nomos Lakonias, Eparchia Lakedemonos: western slopes of Mt Taygetos at Mousgha spring, 36.928702°N, 22.344223°E, 06.06.2014, R. Marchant obs.

Widespread in Greece, but less common in the south.

161. *Pulmonaria cesatiana* (Fenzl & Friedr.) Selvi & al.

Gr Nomos Messinias, Eparchia Kalamon: southern Taygetos, on a goat-track between the village of Kivelia and the abandoned hamlet of Somatiana, 36.828196°N, 22.344735°E, 14.04.2013, R. Marchant obs.

The southernmost record for this rare Peloponnesian endemic.

Brassicaceae**162. *Alyssum foliosum* Bory & Chaub.**

Gr Nomos Messinias, Eparchia Kalamon: on the Rivoli Plateau above Ano Verga, 37.011982°N, 22.192688°E, 07.04.2016, R. Marchant obs.

Scattered in the Peloponnese.

163. *Capsella grandiflora* (Fauché & Chaub.) Boiss. (Fig. 26)

Fig. 26. *Capsella grandiflora* (photo R. Marchant).

Gr Nomos Messinias, Eparchia Kalamon: on the Rivoli Plateau above Ano Verga, 37.011168°N, 22.193243°E, 06.04.2017, R. Marchant obs.

Rare in the Peloponnese.

164. *Lobularia maritima* (L.) Desv.

Gr Nomos Messinias, Eparchia Kalamon: beside the coastal road between the villages of Stoupa and Aghios Nikolaos, 36.830252°N, 22.282589°E, 05.01.2010, R. Marchant obs.

Fairly rare and scattered in Greece.

Caryophyllaceae**165. *Dianthus juniperinus* Sm. (Fig. 27)**

Gr Nomos Lakonias, Eparchia Githiou: growing on a vertical cliff face in the village of Achilio on the bay of Porto Kaigo just north of Cape Tenaron, 36.438116°N, 22.484375°E, 14.09.2018, R. Marchant obs.

This plant was believed to be endemic to Crete, but a single plant was observed growing close to plants of *D. fruticosus*. Due to the extreme inaccessibility of the plant, images were recorded with telephoto lenses and close up images taken with a drone were used to confirm the identification.

166. *Silene graeca* Boiss. & Spruner

Gr Nomos Lakonias, Eparchia Itilou: on the road between Oitylo and the village of Germa, 36.723177°N, 22.404096°E, 23.04.2014, R. Marchant obs.

Scattered in the Peloponnese.



Fig. 27. *Dianthus juniperinus* (photo R. Marchant).

Chenopodiaceae**167. *Atriplex halimus* L.**

Gr Nomos Messinias, Eparchia Kalamon: at the southern end of the coastal village of Trachila, on waste ground, 36.768744°N, 22.313940°E, 07.10.2013, R. Marchant obs.

Scattered in the Peloponnese.

168. *Salsola soda* L.

Gr Nomos Messinias, Eparchia Kalamon: growing at the side of a stony track from the village of Aghios Nikonas to the coast at Trachila, 36.762273°N, 22.322403°E, 16.04.2018, R. Marchant obs.

A plant of coastal areas in Greece.

Euphorbiaceae**169. *Euphorbia illirica* Lam. (syn.: *E. villosa* Willd.)**

Gr Nomos Messinias, Eparchia Kalamon: along the track from Aghia Sophia down into the Virou Gorge near Kardamyli, 36.901097°N, 22.250120°E, 20.04.2018, R. Marchant obs.

There are few and scattered records of this species in Greece, the southernmost is at Tripi close to Sparti.

Fabaceae**170. *Dorycnium herbaceum* Vill.**

Gr Nomos Messinias, Eparchia Kalamon: along the stony track in the King's Forest above the village of Saidona, N 36.892232, E 22.316503, 28.06.2015, R. Marchant obs.

Widespread in Greece.

171. *Trifolium patens* Schreb.

Gr Nomos Messinias, Eparchia Kalamon: along the stony track in the King's Forest above the village of Saidona, 36.892232°N, 22.316503°E, 08.06.2014, R. Marchant obs.

Scattered in Greece, mainly in the west.

Lamiaceae**172. *Salvia verticillata* L.**

Gr Nomos Messinias, Eparchia Kalamon: along the road from Saidona to Exohori, 36.890447°N, 22.275153°E and on the track down from Aghia Sophia to the Virou Gorge, 36.901097°N, 22.250120°E, 10.06.2012, R. Marchant obs.

Widely distributed in Greece.

Orobanchaceae**173. *Orobanche hederæ* Duby**

Gr Nomos Messinias, Eparchia Kalamon: at the side of the footpath from the village of Milia to the church of Panagia Giatrissa, 36.836223°N, 22.360864°E, 09.06.2014, R. Marchant obs.

Rare in the Peloponnese.

174. *Phelipanche lavandulacea* (Rchb.) Pomel (Fig. 28)

Gr Nomos Messinias, Eparchia Kalamon: along the coastal road from Aghios Dimitrios to Trachila, 36.787288°N, 22.305241°E, 08.04.2017, R. Marchant obs.

Not previously known from the Peloponnese. Large numbers of inflorescences were observed along a 100 m stretch of road verge, growing on *Bituminaria bituminosa*. Although this location has been visited every year for the last 15 years 2017 was the only year when any flowers were seen.



Fig. 28. *Phelipanche lavandulacea* (photo R. Marchant).

Rafflesiaceae**175. *Cytinus ruber* (Fourr.) Willd.**

Gr Nomos Messinias, Eparchia Kalamon: growing under bushes of *Cistus creticus* near the village of Malta, 36.921340°N, 22.193645°E, 13.04.2012, *R. Marchant* obs.

Only *C. hypocistis* s.str. has been reported so far from the Mani.

Ranunculaceae**176. *Consolida tuntasiana* (Halácsy) Soó (Fig. 29)**

Gr Nomos Lakonias, Eparchia Githiou: along the path to the lighthouse on Cape Tenaron, 36.396149°N, 22.484535°E, 25.04.2015, *R. Marchant* obs.

A rare Greek endemic.

177. *Ranunculus trichophyllus* Chaix

Gr Nomos Lakonias, Eparchia Itilou: in a small wet area created by a spring along the road from

Oitylo to Germa, 36.723177°N, 22.404096°E, 23.04.2014, *R. Marchant* obs.

Widespread in Greece.

Saxifragaceae**178. *Saxifraga hederacea* L.**

Gr Nomos Messinias, Eparchia Kalamon: on a stony footpath between the villages of Pigi and Platsa, 36.806543°N, 22.314950°E, 15.04.2013, *R. Marchant* obs.

Scattered in Greece.

Solanaceae**179. *Solanum eleagnifolium* Cav.**

Gr Nomos Messinias, Eparchia Kalamon: in an uncultivated area of olive trees in the village of Stoupa, 36.8444180°N, 22.262055°E, 16.10.2017, *R. Marchant* obs.

An invasive alien species originally from the Americas. It has only appeared in this site in Stoupa as from 2017.

Amaryllidaceae**180. *Sternbergia colchiciflora* Waldst. & Kit. (Fig. 30)**

Gr Nomos Messinias, Eparchia Kalamon: several sites above Ano Verga on the Rivoli Plateau, 37.010148°N, 22.194834°E, and further down the track back to Ano Verga, 11.09.2016, *R. Marchant* obs.

Widespread in the Greek mountains.



Fig. 29. *Consolida tuntasiana* (photo R. Marchant).



Fig. 30. *Sternbergia colchiciflora* (photo R. Marchant).

*Hyacinthaceae***181. *Scilla hyacinthoides* L.**

Gr Nomos Messinias, Eparchia Kalamon: beside a stony track in the village of Stavropigio, 36.937380°N, 22.191775°E, 14.04.2017, R. Marchant obs.

Very rare in Greece and not previously reported from the Peloponnese (possibly a garden escape).

*Iridaceae***182. *Romulea linaresii* subsp. *graeca* Bég. (Fig. 31)**

Gr Nomos Messinias, Eparchia Kalamon: in a dry stony area near the village of Pirgos, 36.837749°N, 22.307704°E, 11.03.2011, R. Marchant obs.

Scattered in the Peloponnese.

*Juncaceae***183. *Juncus inflexus* L.**

Gr Nomos Messinias, Eparchia Kalamon: along the stony track in the King's Forest above the village of Saidona, 36.890058°N, 22.312546°E, 09.10.2014, R. Marchant obs.

Reported from several localities in the Peloponnese.



Fig. 31. *Romulea linaresii* subsp. *graeca* (photo R. Marchant).

Report 184**Antoaneta Petrova¹, Rositsa Bukova² & Plamen Dimitrov³**

¹ Botanical Garden, Bulgarian Academy of Sciences, P.O. Box 664, 1000 Sofia, e-mail: petrovabotgar1@abv.bg

² Sofia, Postoyanstvo str., Geo Milev dist., e-mail: rossi_pavlova@hotmail.com

³ Sofia, 43 Hristophor Columb Bul., p_dimitroff@abv.bg

*Orchidaceae***184. *Neotinea* × *dietrichiana* (Bogenh.) H.**

Kretzschmar, Eccarius & H. Dietr. (= *N. tridentata* × *N. ustulata*) (Fig. 32)

Bu Mt Vitosha: along the trail between Fizkulturnik chalet and Yarema locality, FN91, 1360 m, app. 42.53140°N, 23.34196°E, 04.06.2014, observed by R. Bukova & 07.06.2014, observed by A. Petrova & P. Dimitrov (SOM 176498 – parents and a single flower of the hybrid specimen).

A new orchid hybrid for Bulgaria. Hybridisation is frequent in *Orchidaceae*, but according to Delforge (2006), *N. ustulata* (sub *Orchis ustulata*) stays isolated and hybridizes regularly only with *N. tridentata*. Since the first documentation of this hybrid in 1850 (as *Orchis* × *dietrichiana*), it has been found, usually with single localities, in more than 10 European countries, half of them in the Balkans (according Djordjević & al. 2012; Barina & al. 2015).

A single individual was found in the contact zone of the populations of the two parental species (Fig. 32), on a mountain slope with E-SE exposition. The mountain pastures of the area are extensively grazed nowadays. Populations of many orchid species are found there, namely: *Anacamptis coriophora*, *A. morio*, *Dactylorhiza cordigera*, *Gymnadenia conopsea*, *Platanthera chlorantha*, and *Traunsteinera globosa*. With such orchid diversity, one of the hybrid parents – *N. ustulata* is Vulnerable and the other – *Traunsteinera globosa* is Critically Endangered in Bulgaria (Petrova 2009). Both are protected under the Biodiversity Act. The place is a good example of a habitat of European significance: 6210* Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (* important orchid sites). These are solid reasons for special attention to be paid to the protection of this area in the Vitosha Nature Park. Including the area among localities deserving priority conservation measures will save the possibility of further hybridisation in this hybrid zone, as recommended by Cozzolino & al. (2006).

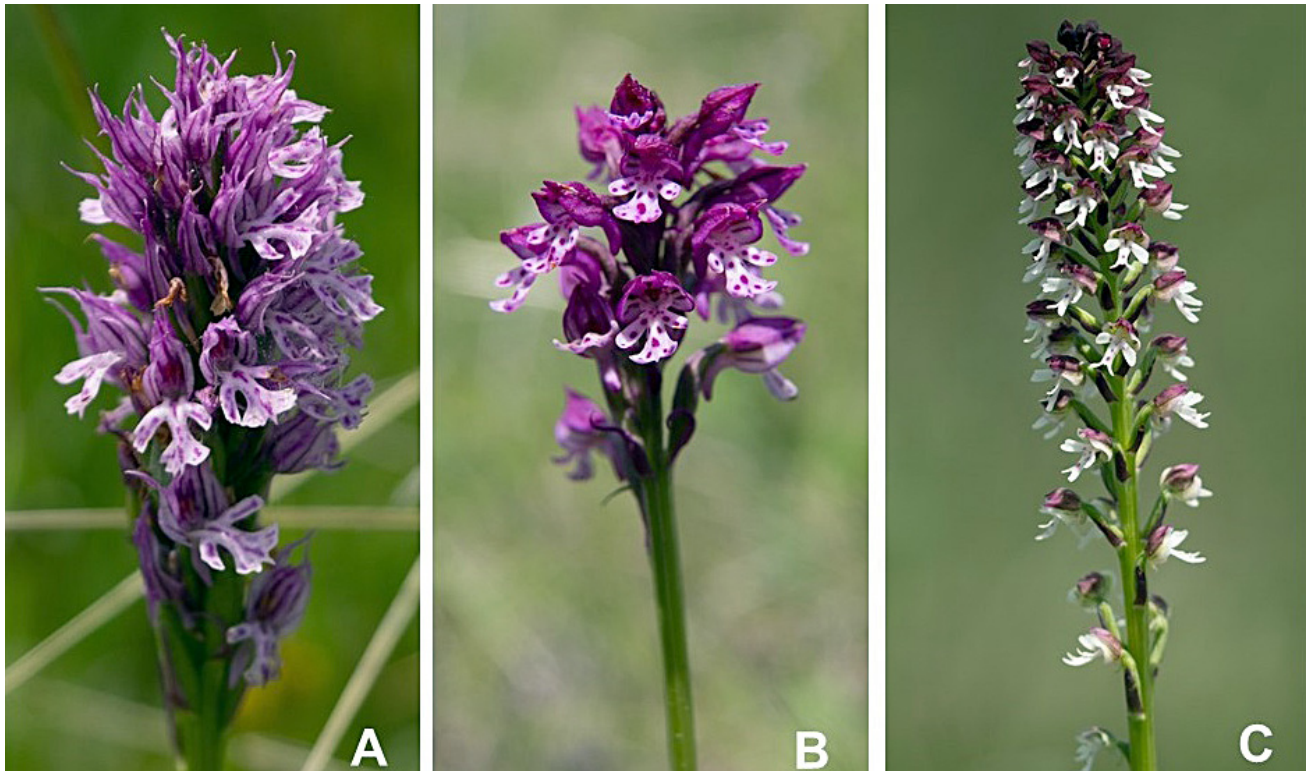


Fig. 32. A. *Neotinea tridentata*; B. *Neotinea* ×*diétrichiana*; C. *Neotinea ustulata*. Vitosha Mt., 07.06.2014 (photo P. Dimitrov).

Report 185

Antoaneta Petrova¹, Rossen Varbanov² &
Antoaneta Shishkova³

¹ Botanical Garden, Bulgarian Academy of Sciences, P.O. Box 664, 1000 Sofia, Bulgaria, e-mail: petrovabotgar1@abv.bg

² Mladost-4, bl. 425, vh. 5, ap. 35, Sofia, Bulgaria

³ Postoianstvo 67B, vh. B, 1111 Sofia, Bulgaria

Orchidaceae

185. *Traunsteinera globosa* (L.) Rchb.

Bu Rila Mts: along the tourist trail between Kobilino Branishte locality and lakes Ribni Ezera, at the Vodni Chal ridge, 2540–2490 m, GM06, 42°08'52.9"N, 23°28'16.5"E to 42°08'48"N, 23°28'32"E, 04.08.2018, with flowers and unripe seed capsules, observed by A. Shishkova & R. Varbanov (Fig. 33).

Twenty flowering individuals were identified at about 500 m lengthwise along the path, in grassy alpine vegetation. A single flowering individual was observed on 05.08.2018 along the trail between lakes Ribni Ezera to Granchar chalet.

Traunsteinera globosa is a Critically Endangered species in Bulgaria (Petrova 2009, 2015). Rila Mts is



Fig. 33. *Traunsteinera globosa*, Rila Mts, 04.08.2018 (photo R. Varbanov).

a new region for this species. The new localities move up the limit of vertical distribution of the species in Bulgaria, as the other known localities lay at an altitude between 1000–2000 m.

Acknowledgements. These finding were first published in the Facebook group *The Plants in Bulgaria* (<https://web.facebook.com/photo.php?fbid=10212721664547559&set=pcb.702490253416647&type=3&theater>). Thus, the publication could be regarded as a 'citizen science' contribution. The report is part of the continuous work on the project *Conspectus of the Bulgarian Vascular Flora*.

Reports 186–195

Antoaneta Petrova¹, Diana Venkova¹,
Irina Gerasimova² & Rossen Vassilev³

¹ Botanical Garden, Bulgarian Academy of Sciences, P.O. Box 664, 1000 Sofia, e-mail: petrovabotgar1@abv.bg

² National Museum of Natural History, Bulgarian Academy of Sciences, 1000 Sofia, 1 Blvd. Tzar Osvoboditel, Bulgaria, e-mail: lizards2007@gmail.com

³ Bulgarian Biodiversity Foundation, 6 Triaditza Str., 1202 Sofia, e-mail: rossen.vassilev@biodiversity.bg

Pinaceae

186. *Pseudotsuga menziesii* (Mirb.) Franco var. *menziesii*

Bu West Frontier Mts: Mt Osogovo, Yuchbunar locality above Bogoslov village, Kyustendil district, FM37, 42.25151°N, 22.66432°E, 07.08.2018, coll. A. Petrova & D. Venkova (SOM 176425).

This North American species has been widely planted for timber production. In the last decade, it was registered as naturalized in the forests of the Balkan Range (*Western*), Rila Mts, Mt Sredna Gora (*Western*), Rhodopi Mts, and Mt Strandzha (Assyov & Petrova 2012; Petrova & Dalakchieva 2017; Tashev & al. 2013, etc.). Mt Osogovo is a new region of its naturalization. The species was used there on quite a large scale and in many places along the trails to chalets Igljika, Osogovo and Trite Buki there is abundant self-sown recruitment.

Apiaceae

187. *Foeniculum vulgare* Mill.

Bu Northeast Bulgaria: At the eastern foothills of the Taushan Tepe hill near Nevsha village, Varna district, NH29, app. 43.2919°N, 27.3172°E, 03.06.2012, A. Petrova obs.; SE of Izgrev village, Varna district, along the road to Kalimantsi village, NH59, app. 43.29305°N, 27.70932°E, 23.09.2018, A. Petrova obs.

Distribution of this widely naturalized species in the region is apparently an oversight (Assyov & Petrova 2012).

Asteraceae

188. *Erigeron annuus* (L.) Pers.

Bu West Frontier Mts: Mt Osogovo, along the road to Igljika chalet, Kyustendil district, FM37, 07.08.2018, coll. A. Petrova & D. Venkova (SOM 176402).

This alien plant has a very wide distribution and is one

of the most abundant alien species in the country, but this is the first concrete report from the region.

Balsaminaceae

189. *Impatiens balfourii* Hook.f.

Bu West Frontier Mts: Mt Osogovo, along the road to Yuchbunar locality above Bogoslov village, Kyustendil district, FM37, 42.25224°N, 22.66771°E, 07.08.2018, coll. A. Petrova & D. Venkova (SOM 176408).

— Valley of River Struma (*Southern*): between Kresna town and Gorna Breznitsa village, in a *Platanus* forest along river Stara Reka, FM72, 41.738739°N, 23.136355°E, 16.09.2018, coll. R. Vassilev (SOM 176409).

A new species for the floristic region of West Frontier Mts and confirmed for the Valley of River Struma floristic region (Adamowski 2009; Vladimirov 2012; Petrova & al. 2013c).

Berberidaceae

190. *Mahonia aquifolium* (Pursh) Nutt.

Bu West Frontier Mts: Mt Osogovo, Yuchbunar locality above Bogoslov village, Kyustendil district, FM37, 42.25151°N, 22.66432°E, 07.08.2018, coll. A. Petrova & D. Venkova (SOM 176415).

New for this floristic region (Assyov & Petrova 2012, Petrova 2017, Tashev & GavriloVA 2013).

Buddlejaceae

191. *Buddleja davidii* Franch.

Bu Danubian Plain: along the road between Muselievo and Lyubenovo, Plevna district, LJ23, app. 43.628270°N, 24.850168°E, 15.07.2018, coll. A. Petrova, I. Gerasimova & R. Vassilev (SOM 176355).

A naturalized population occurring occasionally along the road and at the foothills nearby. New for this floristic region (Assyov & Petrova 2012, Vladimirov 2012).

Euphorbiaceae

192. *Euphorbia peplus* L.

Bu Tundzha Hilly Country: Kazanlak town, in the flower beds and along pavement edges in the Rosarium, LH62, 27.07.2018, coll. A. Petrova & D. Venkova (SOM 176404).

New for this floristic region (Kuzmanov 1979; Assyov & Petrova 2012).

193. *Euphorbia serpens* Kunth

Bu Black Sea Coast (*Southern*): along paths in a nursery for ornamental plants near Ravda village, NH52, 42.652270°N, 27.668177°E, 31.08.2018, coll. A. Petrova & Z. Barzov (SOM 176493).

This alien species of American origin has been reported for the country only recently (Petrova 2018) on the basis of collections in a garden center in Varna (Northern Black Sea Coast). Presumably, the source of the species' introduction in the new locality is the import of container plants from a Mediterranean country (possibly from Italy), as in the countries of West (Hoste & al. 2009) and Central Europe (Röthlisberger 2007).

Fabaceae**194. *Spartium junceum* L.**

Bu Northeast Bulgaria: On the southern slopes of Taushan Tepe hill near Nevsha village, Varna district, NH29, 43.281143°N, 27.308875°E & 43.280694°N, 27.311959°E, 03.06.2012, A. Petrova & R. Vassilev obs.; along the road between the villages Izgrev and Kalimantsi, Varna district, NH59, app. 43.284839°N, 27.712207°E, 23.09.2018, A. Petrova obs.

This is a new region for this alien species (Assyov & Petrova 2012; Petrova & Dalakchieva 2017).

Vitaceae**195. *Parthenocissus inserta* (Kerner) Fritsch**

Bu Danubian Plain: along the road between Obnova and Bulgarene villages, Pleven district, LJ41, 14.07.2018, coll. A. Petrova, I. Gerasimova & R. Vassilev (SOM 176364).

The species was also observed in some places along the main road from Pleven to Byala towns. New for this floristic region (Petrova & al. 2012; Petrova 2013; Petrova & al. 2013c).

Acknowledgements. This report is part of the continuous work on the project *Conspectus of the Bulgarian Vascular Flora*.

Reports 196–198**Tsvetanka Raycheva & Kiril Stoyanov**

Agricultural University – Plovdiv, 12 Mendeleev Blvd.,
4000 Plovdiv, Bulgaria, e-mail: raicheva@abv.bg

Pinaceae**196. *Pinus halepensis* Mill.**

Bu Mt Sredna Gora (*Western*): Mt Sredna Gora Proper, in an afforested terrain with self-sown young trees, westwards of Starosel, near the road to Krasnovo, KH90, 42.48667°N 24.55872°E, 391 m, 30.10.2018, coll. Ts. Raycheva & K. Stoyanov (SOA 062430).

Data on the distribution of this introduced species are published by Gramatikov (1992): as a cultivated species, seldom used for forestry in the Rhodopi Mts (*Eastern*) and as an ornamental tree in the warm parts of the country. In the reported locality, both old and young individuals were observed propagated by seeds. The species is widely distributed in the Mediterranean regions and Crimea, and there is data for the Balkan Peninsula from Croatia and Greece (Critchfield & Little 1966; Gausson & al. 1964).

Cactaceae**197. *Opuntia humifusa* (Raf.) Raf.**

Bu Rhodopi Mts. (*Central*): Chernatitsa Ridge, in an abandoned stone quarry on the western slope of peak Kaloyanov, near Manchova Cheshma locality, accompanied by *Pistacia terebinthus*, *Jasminum fruticans*, *Thymus* sp., *Echinops ritro*, *Orobanche alba*, and *Euphorbia myrsinites*; 607 m, LG15, 42.04186°N, 24.70703°E, 28.09.2018, coll. Ts. Raycheva & K. Stoyanov (SOA 062429).

This invasive species is reported from many parts of the country, and in our record the Rhodopi Mts are reported as a new region. The known data are for the Black Sea Coast, Forebalkan (*Eastern*), Valley of River Struma, Pirin Mts (*Southern*), Mt Sredna Gora (*Western*), Thracian Lowland, and Tundzha Hilly Country, at up to 700 m (Delipavlov & Cheshmedzhiev 2011; Assyov & Petrova 2012; Petrova & al. 2012).

Iridaceae**198. *Crocus pallasii* Goldb. (Fig. 34)**

Bu Rhodopi Mts. (*Central*): Chernatitsa Ridge, on the southern slope of peak Kaloyanov, in a rocky grassy terrain, along with *Quercus dalechampii*, *Carpinus orientalis*, *Juniperus communis*, *Stipa* sp., *Teucrium chamaedrys*, *Cyclamen hederifolia*, and *Fragaria vesca*; near Galabovo village, 611 m, LG15, 42.0305278°N, 24.7234167°E, 10.11.2018, coll. Ts. Raycheva (SOA 062431).

The species is new for the Rhodopi region. According to Velčev (1964), it is distributed “on dry grassy terrains in the eastern part of North Bulgaria, and in South Bulgaria”. The region of Rhodopi Mts is not listed in the earlier floristic works. According to Delipavlov & Cheshmedzhiev (2011) and Assyov & Petrova (2012), the species is distributed in Northeast Bulgaria, Danubian Plain, Forebalkan (*Eastern*), Sofia region, Valley of River Struma, Mt Belasitsa, Thracian Lowland, and Tundzha Hilly Country.



Fig. 34. *Crocus pallasii* (photo Ts. Raicheva).

Reports 199–205

Stoyan Stoyanov¹, Valentina Goranova¹ & Zhivko Barzov²

¹ Department of Plant and Fungal Diversity and Resources, Institute of Biodiversity and Ecosystem Research, Bulgarian Academy of Sciences, Acad. Georgi Bonchev St., bl. 23, 1113 Sofia, Bulgaria, e-mail: tjankata@abv.bg (author for correspondence), vgor@abv.bg

² 18 Iskar St., Asparuhovo neighborhood, 9003 Varna, Bulgaria, e-mail: jivko_barzov@abv.bg

Asteraceae

199. *Dittrichia graveolens* (L.) Greuter

Bu Balkan Range (*Eastern*): Rishki Pass, E of Rishki village, Smyadovo district, at the roadside embankment, 220 m, 42.97057°N, 26.95872°E, with flowers, 07.09.2018, coll. Zh. Barzov (SOM 176439, 176440).

This species has been so far reported from the Balkan Range (*Western*), Sofia region, Mt Sredna

Gora (*Western*), Rhodopi Mts (*Eastern*), Thracian Lowland, and Tundzha Hilly Country floristic regions (Assyov & Petrova 2012). Subsequently, *D. graveolens* was found in the Znepole region (Vladimirov & al. 2016).

Brassicaceae

200. *Hornungia petraea* (L.) Rchb.

Bu West Frontier Mts: Mt Vlahina, N of Logodazh village, Blagoevgrad district, on the calcareous slopes of Kozya Glava locality, 830 m, 41.99764°N, 22.93116°E, with flowers and fruits, 07.04.2017, coll. S. Stoyanov & V. Goranova (SOM 176441).

According to Ančev (2007), this species occurs at the Black Sea Coast (*Northern*), Northeast Bulgaria, Znepole region, Vitosha region, Valley of River Struma, Pirin Mts (*Southern*), Rhodopi Mts (*Central*), Thracian Lowland, and Mt Strandzha floristic regions.

Caryophyllaceae

201. *Spergula pentandra* L. (Fig. 35)

Bu Black Sea Coast (*Northern*): S of Beloslav town, Varna district, on sandy terrains, 120 m, 43.17749°N, 27.70323°E, with flowers, 06.04.2018, coll. Zh. Barzov (SOM 176442).

This species has been known so far from the Black Sea Coast (*Southern*), Forebalkan, West Frontier Mts, Valley of River Struma, Mt Slavyanka, Valley of River Mesta, Pirin Mts (*Southern*), Mt Sredna Gora, Rhodopi Mts, Thracian Lowland, Tundzha Hilly Country, and Mt Strandzha floristic regions (Assyov & Petrova 2012).



Fig. 35. *Spergula pentandra* (photo Zh. Barzov).

Euphorbiaceae**202. *Euphorbia palustris* L.**

Bu Black Sea Coast (*Northern*): NE of Novo Oryahovo village, Varna district, on the periphery of former drainage canals and along dirt roads across the farmlands, 2 m, 42.99818°N, 27.84850°E, with fruits, 03.06.2018, coll. Zh. Barzov (SOM 176443).

This species has been known so far from the Danubian Plain, Forebalkan, Sofia region, Znepole region, West Frontier Mts, Valley of River Struma, Rhodopi Mts (*Central*), Thracian Lowland, Tundzha Hilly Country, and Mt Strandzha floristic regions (Assyov & Petrova 2012).

Fabaceae**203. *Onobrychis viciifolia* Scop.**

Bu Black Sea Coast (*Northern*): NW of Asparuhovo Residential District in Varna town, in grassy places, 40 m, 43.18786°N, 27.87318°E, with flowers, 23.05.2016, coll. Zh. Barzov (SOM 176444).

This species has been known so far from the Danubian Plain, Forebalkan, Balkan Range (*Eastern*), Sofia region, Znepole region, Mt Sredna Gora (*Western*), Rhodopi Mts (*Western*), and Thracian Lowland floristic regions (Terziyski 2011). Subsequently, *O. viciifolia* was found in Northeast Bulgaria (Stoyanov & Kolev 2014).

Gentianaceae**204. *Centaureum maritimum* (L.) R.M. Fritsch (Fig. 36)**

Bu Rhodopi Mts (*Eastern*): W of Strazhets village, Krumovgrad district, near the road to Kazak village, in a forest glade



Fig. 36. *Centaureum maritimum* (photo Zh. Barzov).

dominated by *Chrysopogon gryllus* (L.) Trin., 485 m, 41.38461°N, 25.85090°E, with flowers, 05.06.2018, coll. S. Stoyanov, V. Goranova & Zh. Barzov (SOM 176445, 176446).

This rare species, included in the *Red Data Book of R. Bulgaria* as Critically Endangered, has been known so far only from the Black Sea Coast (*Southern*) floristic region (Peev & Tsoneva 2015).

Scrophulariaceae**205. *Kickxia commutata* subsp. *graeca* (Bory & Chaub.) R. Fern. (Fig. 37)**

Bu Rhodopi Mts (*Eastern*): W of Strazhets village, Krumovgrad district, along the road to Kazak village, 480 m, 41.38449°N, 25.85077°E, with flowers, 05.06.2018, coll. S. Stoyanov, V. Goranova & Zh. Barzov (SOM 176447, 176448).



Fig. 37. *Kickxia commutata* subsp. *graeca* (photo Zh. Barzov).

This species has been known so far from the Black Sea Coast (*Southern*), Mt Strandzha floristic regions (Cheshmedzhiev 2011) and from Rhodopi Mts (*Eastern*) (Pavlova & al. 2002), however, the subspecies has not been explicitly mentioned for the latter floristic region.

Reports 206–240**Arne Strid**

Bakkevej 6, DK-5853 Ørbæk, Denmark

This is a continuation of reports as published in *Phytologia Balcanica* 23: 304-308 (Strid 2017) and 24: 277-280 (Strid 2018) listing new plant records for the northeastern corner of Greece. Together with Per

Hartvig *ca.* 600 registrations were made during an excursion between 9th and 13th July 2018. Those listed in the following text represent species which are either new for the nomi of Evros and Rodopis or new for their respective eparchies. Several of them are trivial and widespread species, confirming the impression that this was (and still is) a fairly neglected corner of Greece. Together with the two earlier reports, *ca.* 90 taxa have been added to the flora of the North East.

Apiaceae

206. *Chaerophyllum bulbosum* L.

Gr Nomos Rodopis, eparchia Komotinis: meadow near the village of Smigada, 680 m, 41°16'N, 25°44'E, 10.07.2018, *Strid & al.* 59645 (UPA).

New for nomos and eparchia. Fairly rare and scattered in northern Greece.

Asteraceae

207. *Arctium lappa* L.

Gr Nomos Evrou, eparchia Didimotichou: near the village of Asimenio, 60 m, grassy hills with open deciduous scrub in agricultural area, 41°24'N, 26°33'E, 09.07.2018, *Strid & al.* 59538 (UPA).

New for eparchia, the nearest Greek locality is *ca.* 100 km WSW.

208. *Carlina vulgaris* L.

Gr Nomos Evrou, eparchia Didimotichou: N of the village of Goniko, 650 m, opening in deciduous oak forest, schist, 41°18'N, 25°58'E, 13.07.2018, *Strid & al.* 59747 (UPA).

New for nomos and eparchia. This collection is probably referable to *C. v.* subsp. *spinosa* (Velen.) Vandas, which merges into *C. v.* subsp. *vulgaris* in SE Europe. On the Greek mainland the species extends southwards to *ca.* 39°N.

209. *Cirsium candelabrum* Griseb.

Gr Nomos Rodopis, eparchia Komotinis: 1 km N of the village of Myrtiski, 500 m, dry grassland, deciduous oak woodland and wet place by a small stream, schist, 41°17'N, 25°47'E, 10.07.2018, *Strid & al.* obs.

— Nomos Evrou, eparchia Didimotichou: N of the village of Goniko, 650 m, roadside in opening of deciduous oak forest, schist, 41°18'N, 25°58'E, 13.07.2018, *Strid & al.* obs.

New for nomi. Widespread on the Greek mainland and Peloponnisos, particularly along mountain roads. The nearest localities are slightly to the south-west.

210. *Galinsoga parviflora* Cav.

Gr Nomos Rodopis, eparchia Komotinis: 1 km N of the village of Myrtiski, 500 m, dry grassland, deciduous oak woodland and wet place by a small stream, schist, 41°17'N, 25°47'E, 10.07.2018, *Strid & al.* 59637 (UPA).

New for nomos and eparchia. The nearest Greek localities are in the foothills of Eastern Rodopi *ca.* 80 km to the west as well as on the islands of Thasos and Samothraki. *Galinsoga parviflora* is an alien of South American origin, long established as a weed in Central Europe. It was first reported in Greece as late as 1971 and now appears to be spreading rapidly.

211. *Senecio viscosus* L.

Gr Nomos Rodopis, eparchia Sapon: NE of the village of Chloi, by the Bulgarian border, 1100–1200 m, schistose ridge with windmills above *Fagus* forest, 41°18'N, 25°53'E, 13.07.2018, *Strid & al.* 59800 (UPA).

New for nomos and eparchia. Scattered in mountains of the Greek mainland, southwards to *ca.* 38°40'N. The nearest Greek localities are in Eastern Rodopi *ca.* 80 km to the west.

212. *Tripleurospermum tenuifolium* (Kit.) Freyn

Gr Nomos Rodopis, eparchia Komotinis: meadow near the village of Smigada, 680 m, 41°16'N, 25°44'E, 10.07.2018, *Strid & al.* 59654 (UPA).

New for nomos and eparchia. Scattered on the Greek mainland, southwards to *ca.* 39°10'N. The nearest Greek localities are in Eastern Rodopi *ca.* 80 km to the west.

Buddlejaceae

213. *Buddleja davidii* Franch.

Gr Nomos Evrou, eparchia Didimotichou: N of the village of Goniko, 650 m, opening in deciduous oak forest, schist, 41°18'N, 25°58'E, 13.07.2018, *Strid & al.* 59751 (UPA, herb. Strid).

New for Greece. Native to China, commonly cultivated as an ornamental and sometimes naturalized in W Europe, so far reported eastwards to Bulgaria (Petrova & al. 2013b). In its only Greek locality it appeared to be well naturalized by the side of a small gravel road rather far from villages.

Caryophyllaceae

214. *Dianthus aridus* Griseb. ex Janka (Fig. 38)

Gr Nomos Evrou, eparchia Didimotichou: near the village of Asimenio, 60 m, grassy hills with open deciduous scrub in agricultural area, 41°24'N,

26°33'E, 09.07.2018, *Strid & al.* 59543 (UPA, herb. Strid).

Already reported as new for Greece based on material collected from nomos Evrou by V. Christodoulou in 2008, 2014 and 2018. It was described in 1873 from the Slivno area in E Bulgaria. Hayek (1924: 242) accepted it as a separate species and recorded it from “Bu, Thra, Ma”. Stojanov & Acharov (1935: 67), who generally adopted a broad species concept, listed it as *D. campestris* subsp. *pallidiflorus* var. *aridus* (Griseb. ex Janka) Stoj. & Achar. In *Flora Europaea* (Tutin & Walters 1993: 244) as well as Euro+Med PlantBase (<http://www.emplantbase.org/home.html>) it appeared as a synonym of *D. pallidiflorus* Ser. in DC. The original description of *D. pallidiflorus* (“... floribus solitariis ...”) as well as the locality cited (“... in herbidis ad Volgam ...”) make it unlikely that it should be conspecific with or even closely related to *D. aridus*. In the *Conspectus of the Bulgarian Vascular Flora* (Assyov & Petrova 2012: 164) the latter was again accepted as a separate species and recorded from S & SE Bulgaria. A full description of the species is here provided:

Laxly caespitose, glabrous perennial with a slender, branched woody base. Stems several, ascending



Fig. 38. *Dianthus aridus* (photo A. Strid).

to erect, usually unbranched, 30–70 cm tall, slender (*ca.* 1.2 mm diam.), terete, minutely papillose. Basal leaves ± withered at anthesis. Cauline leaves usually shorter than internodes; sheaths *ca.* twice as long as stem just below node; blade suberect, 20–40 × 1–1.5 mm, acute to acuminate, with serrulate margins and 1–3 veins on the abaxial side, without visible veins on the adaxial side. Stem usually forked once above with peduncles 1–4 cm each bearing a lax fascicle of 3–6 flowers. Bracts lanceolate. Epicalyx-scales usually 4, about half as long as calyx, elliptic-ovate, shortly acuminate, with scarious margins at least in upper half. Calyx 9–12 × *ca.* 2.5 mm, cylindrical, pale green, with *ca.* 30 closely set parallel veins; teeth *ca.* 2.5 mm, narrowly ovate, shortly acuminate, with slightly fimbriate margins. Petal claw slightly shorter than calyx, gradually expanded into limb; the latter *ca.* 4.5 × 2.5 mm, narrowly obovate, sparsely bearded, shallowly and irregularly toothed, white to cream on both sides. Anthers pale lilac. Capsule equalling or slightly shorter than calyx, cylindrical. Seeds *ca.* 1.7 × 1.4 mm, flat, ovate, apiculate, with fine radiating ridges, black.

215. *Minuartia recurva* (All.) Schinz & Thell.

Gr Nomos Rodopis, eparchia Sapon: NE of the village of Chloi, by the Bulgarian border, 1100–1200 m, schistose ridge with windmills above *Fagus* forest, 41°18'N, 25°53'E, 13.07.2018, *Strid & al.* obs.

New for nomos and eparchia. Scattered in mountains of N & C Greece; the nearest Greek locality is Mt Fengari, island of Samothraki.

216. *Silene frivaldszkyana* Hampe

Gr Nomos Evrou, eparchia Orestiadou: between the villages of Krios and Dikea, 70 m, dry grassland on road embankment, 41°41'N, 26°20'E, 11.07.2018, *Strid & al.* obs.

New for nomos and eparchia. Scattered in N Greece; the nearest locality is *ca.* 140 km W-SW.

Ceratophyllaceae

217. *Ceratophyllum demersum* L.

Gr Nomos Evrou, eparchia Didimotichou: near the village of Asimenio, 60 m, waterhole at base of grassy hills with open deciduous scrub in agricultural area, 41°24'N, 26°33'E, 09.07.2018, *Strid & al.* 59540 (UPA).

New for nomos and eparchia. Scattered throughout Greece; the easternmost record on the mainland so far is Lake Mitrikou at 25°20'E.

Chenopodiaceae**218. *Chenopodium strictum* L.**

Gr Nomos Evrou, eparchia Alexandroupoleos: Evros Delta, SW part, near a bird watching tower, 0–5 m, wet, saline and somewhat ruderalized habitats, 40°46'N, 26°03'E, 12.07.2018, *Strid & al.* 59734 (UPA).

New for eparchia. Scattered in northern Greece, probably overlooked due to its similarity to the common *C. album*.

Convolvulaceae**219. *Cuscuta epithymum* L.**

Gr Nomos Evrou/Rodopis, eparchia Didimotichou/Sapon: WNW of the village of Ourania, 850 m, opening in *Fagus* forest, parasitic on *Thymus* sp., 41°17'N, 25°55'E, 13.07.2018, *Strid & al.* 59769 (UPA).

New for eparchia. Scattered throughout Greece. The nearest localities are *ca.* 80 km W-SW.

Lamiaceae**220. *Betonica officinalis* L.**

Gr Nomos Rodopis, eparchia Komotinis: meadow near the village of Smigada, 680 m, 41°16'N, 25°44'E, 10.07.2018, *Strid & al.* 59647 (UPA).

New for nomos and eparchia. Scattered in northern Greece, with the nearest localities in Eastern Rodopi *ca.* 70 km to the west.

221. *Clinopodium dalmaticum* (Benth.) Bräuchler & Heubl

Gr Nomos Rodopis, eparchia Komotinis: 14 km from Organi along road to Chloi, 600 m, rocky serpentine slopes with open *Juniperus* scrub, 41°17'N, 25°48'E, 10.07.2018, *Strid & al.* 59611 (UPA, herb. Strid).

Micromeria dalmatica Benth. was described from Dalmatia, based on a collection by Visiani. Similar plants from S Bulgaria and NE Greece have been recognized as *M. dalmatica* subsp. *bulgarica* (Velen.) Guinea, but the combination has not been published under *Clinopodium*. These plants appear to be better placed in *Clinopodium* than in *Micromeria*, but further studies are needed to establish the status of the two disjunct population groups. The correct name for plants from S Bulgaria and NE Greece may be *Clinopodium frivaldszkyanum* (Degen) Bräuchler & Heubl.

222. *Galeopsis tetrahit* L.

Gr Nomos Rodopis, eparchia Sapon: NE of the

village of Chloi, by the Bulgarian border, 1100–1200 m, schistose ridge with windmills above *Fagus* forest, 41°18'N, 25°53'E, 13.07.2018, *Strid & al.* 59796 (UPA).

New for nomos and eparchia. Fairly rare and scattered in northern Greece, with the nearest locality *ca.* 80 km to the west.

223. *Leonurus marrubiastrum* L.

Gr Nomos Evrou, eparchia Didimotichou: by Erythropotamos river W-SW of Ellinochori, 40 m, 41°22'N, 26°26'E, 09.07.2018, *Strid & al.* 59561 (UPA, herb. Strid).

New for nomos, eparchia and floristic region North-East. Fruiting specimens. Rare and scattered in northern Greece, with the nearest locality *ca.* 250 km to the west.

Malvaceae**224. *Hibiscus trionum* L. (Fig. 39)**

Gr Nomos Evrou, eparchia Orestiadios: just E of Megali Doxipara, 50 m, dry grassland and field margins, 41°31'N, 26°18'E, 09.07.2018, *Strid & al.* 59580 (UPA, herb. Strid).

New for nomos, eparchia and floristic region North-East. A weed of traditionally managed fields and orchards, scattered in Greece.

225. *Malva thuringiaca* (L.) Vis.

Gr Nomos Evrou, eparchia Didimotichou: by Erythropotamos river W-SW of Ellinochori, 40 m, 41°22'N, 26°26'E, 09.07.2018, *Strid & al.* 59568 (UPA, herb. Strid); roadside W of the village of Mandra, 30 m, 41°18'N, 25°58'E, 13.07.2018, *Strid & al.* 59803 (UPA).

New for nomos and eparchia. Scattered in N & C Greece, with the nearest localities *ca.* 120 km W-SW. The specimens are more or less intermediate between subsp. *thuringiaca* and subsp. *ambigua* (DC.) Valdés (upper leaves with obtuse lobes but flowers rather small).

Onagraceae**226. *Epilobium obscurum* Schreb.**

Gr Nomos Evrou, eparchia Didimotichou: near the village of Asimenio, 60 m, grassy hills with open deciduous scrub in agricultural area, 41°24'N, 26°33'E, 09.07.2018, *Strid & al.* 59514 (UPA).

New for eparchia. Scattered in N & C Greece with the nearest localities in the foothills of Eastern Rodopi and on the island of Samothraki.

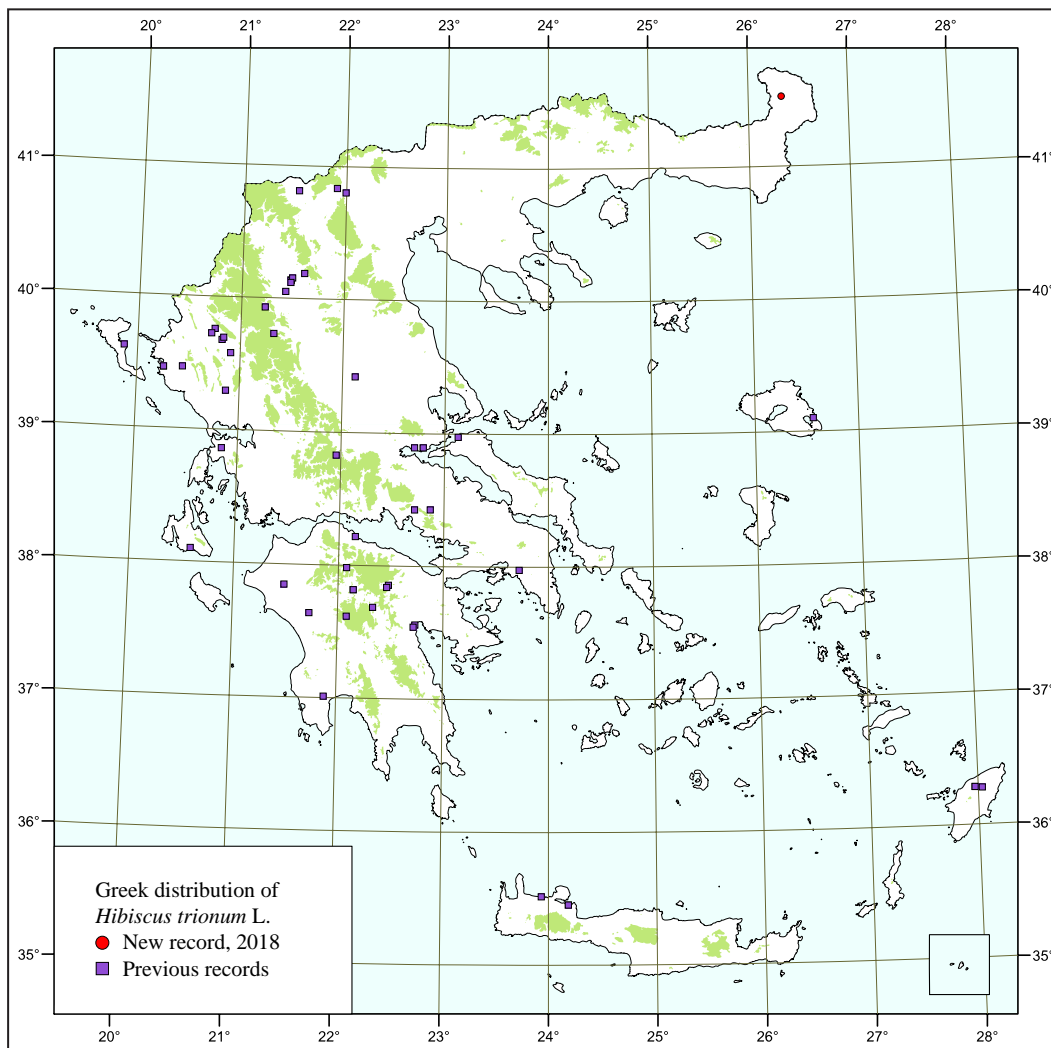


Fig. 39. Distribution map of *Hibiscus trionum* in Greece.

227. *Epilobium roseum* Schreb.

Gr Nomos Evrou, eparchia Didimotichou: N of the village of Goniko, 650 m, opening in deciduous oak forest, schist, 41°18'N, 25°58'E, 13.07.2018, *Strid & al.* 59754 (UPA).

New for eparchia. The nearest locality is *ca.* 40 km to the W-SW.

228. *Oenothera glazioviana* Micheli

Gr Nomos Evrou, eparchia Orestiadou: between the villages of Krios and Dikea, 70 m, dry grassland on road embankment, 41°41'N, 26°20'E, 11.07.2018, *Strid & al.* 59660 (UPA).

New for nomos and eparchia. Few and scattered records in N Greece; the nearest locality is in nomos Dramas *ca.* 160 km W-SW.

Polygonaceae

229. *Polygonum mesembrium* Chrtek

Gr Nomos Evrou, eparchia Alexandroupoleos: Evros

Delta, W part, 0–5 m, beach and sand dunes, 40°47'N, 26°02'E, 12.07.2018, *Strid & al.* 59746 (UPA).

New for eparchia. Scattered in sandy coastal habitats in NE Greece, with the nearest locality on Samothraki. In the Evros Delta locality it co-exists with the similar *P. maritimum* L. (*Strid & al.* 59745; UPA, herb. Strid).

Ranunculaceae

230. *Delphinium peregrinum* L.

Gr Nomos Evrou, eparchia Didimotichou: W of Didimoticho, 40 m, small limestone outcrop by Erythropotamos river, 41°21'N, 26°29'E, 09.07.2018, *Strid & al.* 59551 (UPA).

New for nomos and eparchia. Plants short, with dense inflorescence and short, subglabrous follicles; perhaps referable to var. *densum* Post. The species is widespread in Greece but rare in the interior N and NE; the nearest locality is on the island of Thasos.

Rubiaceae**231. *Galium rotundifolium* L.**

Gr Nomos Evrou/Rodopis, eparchia Didimotichou/Sapon: WNW of the village of Ourania, 850 m, opening in *Fagus* forest, partly wet, 41°17'N, 25°55'E, 13.07.2018, *Strid & al.* obs.

New for eparchia. This unmistakable species is scattered in woodland habitats almost throughout Greece; the nearest locality is on Samothraki.

Veronicaceae**232. *Misopates orontium* (L.) Raf.**

Gr Nomos Rodopis, eparchia Komotinis: 1 km N of the village of Myrtiski, 500 m, dry grassland, deciduous oak woodland and wet place by a small stream, schist, 41°17'N, 25°47'E, 10.07.2018, *Strid & al.* 59635 (UPA).

New for nomos and eparchia. Common in S Greece and in coastal areas, less so in the interior north; the nearest locality is *ca.* 80 km W-SW.

Juncaceae**233. *Juncus subulatus* Forssk.**

Gr Nomos Evrou, eparchia Alexandroupoleos: Evros Delta, *ca.* 6 km SSW of the village of Monastiraki, 0–5 m, saline habitats, 40°47'N, 26°04'E, 12.07.2018, *Strid & al.* 59724 (UPA).

New for eparchia. Scattered in coastal habitats almost throughout Greece, with the nearest locality on the island of Samothraki.

Poaceae**234. *Agrostis capillaris* L.**

Gr Nomos Evrou, eparchia Orestiadis: 7 km W of Pentalofos, near the Bulgarian border, 450–500 m, mixed deciduous woodland and patches of meadow, schist, 41°39'N, 26°06'E, 11.07.2018, *Strid & al.* 59695 (UPA, herb. Strid).

New for nomos and eparchia. Scattered in N & NW Greece, southwards to *ca.* 39°20'N.

235. *Agrostis stolonifera* L.

Gr Nomos Rodopis, eparchia Sapon: NE of the village of Chloi, by the Bulgarian border, 1100–1200 m, schistose ridge with windmills above *Fagus* forest, 41°18'N, 25°53'E, 13.07.2018, *Strid & al.* 59774 (UPA, herb. Strid).

New for eparchia. Scattered throughout Greece with the nearest localities *ca.* 80 km SW.

236. *Bothriochloa ischaemum* (L.) Keng

Gr Nomos Evrou, eparchia Didimotichou: near the village of Asimenio, 60 m, grassy hills with open deciduous scrub in agricultural area, 41°24'N, 26°33'E, 09.07.2018, *Strid & al.* 59521 (UPA).

New for eparchia. Fairly common along roads in N & C mainland Greece.

237. *Bromus benekenii* (Lange) Trimen

Gr Nomos Rodopis, eparchia Sapon: NE of the village of Chloi, by the Bulgarian border, 1100–1200 m, edge of *Fagus* forest on schistose ridge with windmills, 41°18'N, 25°53'E, 13.07.2018, *Strid & al.* 59778 (UPA, herb. Strid).

New for eparchia. Deciduous woodland throughout mainland Greece and Peloponnisos; the nearest locality is *ca.* 50 km W-SW.

238. *Polypogon viridis* (Gouan) Breistr.

Gr Nomos Evrou, eparchia Didimotichou: near the village of Asimenio, 60 m, grassy hills with open deciduous scrub in agricultural area, 41°24'N, 26°33'E, 09.07.2018, *Strid & al.* 59518 (UPA, herb. Strid).

New for eparchia. Scattered throughout Greece with the nearest locality on Samothraki.

239. *Setaria verticillata* (L.) P. Beauv.

Gr Nomos Evrou, eparchia Didimotichou: by Erythropotamos river WSW of Ellinochori, 40 m, 41°22'N, 26°26'E, 09.07.2018, *Strid & al.* 59572 (UPA, herb. Strid).

New for eparchia. Scattered throughout Greece; the nearest confirmed locality is on Samothraki.

240. *Stipa capillata* L.

Gr Nomos Evrou, eparchia Orestiadis: 7 km W of Pentalofos, near the Bulgarian border, 450–500 m, mixed deciduous woodland and patches of meadow, schist, 41°39'N, 26°06'E, 11.07.2018, *Strid & al.* 59710 (UPA, herb. Strid).

New for nomos and eparchia. Scattered on mainland and Peloponnisos. The easternmost localities so far are in nomos Dramas.

Acknowledgements. Georgios Korakis, Emilia Lempesi and Eleni Makrygianni are thanked for their assistance with field work arrangements. Travel was supported by a grant from the Velux Foundation, Denmark.

Reports 241–389

Kit Tan¹ & Gert Vold²

¹ Institute of Biology, University of Copenhagen, Øster Farimagsgade 2D, DK-1353 Copenhagen K, Denmark, e-mail: kitt@bio.ku.dk (author for correspondence)

² State Natural History Museum, Øster Farimagsgade 2C, DK-1353 Copenhagen K, Denmark

A new gas-fired Power Plant in addition to four old radioactive lignite-burning Power Plants has been established in the Megalopolis area, central Peloponnese (Nomos Arkadias, Eparchia Megalopoleos). Air pollution and the dispersion of pollutants over vegetation and geographical terrain attract the concern and attention of environmental analysts. Very few floristic records have been compiled for this area. An inventory of vascular plant taxa was thus carried out. Floristic records new for Eparchia Megalopoleos are listed in the following text. More than 1380 records are currently registered from the area, representing nearly 700 plant taxa. The flora in the surrounding meadows and oak woodland is rich and diverse and does not seem to be adversely affected by pollution.

Dennstaedtiaceae

241. *Pteridium aquilinum* (L.) Kuhn

Gr Nomos Arkadias, Eparchia Megalopoleos: Perivolia, damp meadows, roadsides and clearings in *Quercus* woodland, 420 m, 37°23'N, 22°09'E, 31.05.2018, *Kit Tan* & *G. Vold* obs.; Paliochouni to Malliota and Makrysi, 691 m, 37°41'N, 22°16'E, 01.06.2018, *Kit Tan* & *G. Vold* obs.; 1 km from Kalivia on Leontari – Potamia road, roadside slopes, 489 m, 37°46'N, 22°04'E, 02.06.2018, *Kit Tan* & *G. Vold* obs.

Also noted at Routsis, Athinaio and Tourkolekas.

Aceraceae

242. *Acer negundo* L.

Gr Nomos Arkadias, Eparchia Megalopoleos: Perivolia, damp meadows, roadsides and clearings in *Quercus* woodland, 420 m, 37°23'N, 22°09'E, 31.05.2018, *Kit Tan* & *G. Vold* obs.; Grekos, 30 km S-SE of Megalopolis, roadsides and *Quercus* woodland, 560 m, 37°14'N, 22°17'E, 01.06.2018, *Kit Tan* & *G. Vold* obs.; near village of Papis, 12 km SE of Megalopolis, roadsides and scrub, 670 m, 37°21'N, 22°15'E, 01.06.2018, *Kit Tan* & *G. Vold* obs.

Also noted at Athinaio.

Anacardiaceae

243. *Cotinus coggygria* Scop.

Gr Nomos Arkadias, Eparchia Megalopoleos: Perivolia, damp meadows, roadsides and clearings in *Quercus* woodland, 420 m, 37°23'N, 22°09'E, 31.05.2018, *Kit Tan* & *G. Vold* obs.; 1 km from Kalivia on Leontari – Potamia road, roadside slopes, 489 m, 37°46'N, 22°04'E, 02.06.2018, *Kit Tan* & *G. Vold* obs.; beginning of dirt road to Frankish/Byzantine Castle of Oria (Gardiki), limestone rocks and openings in *Quercus* woodland, 525–550 m, 37°16'N, 22°03'E, 02.06.2018, *Kit Tan* & *G. Vold* obs.

Also noted at Routsis, Voutsaras and Leontari.

Apiaceae

244. *Bubon arachnoideum* (Boiss. & Orph.) Hand

Gr Nomos Arkadias, Eparchia Megalopoleos: beginning of dirt road to Frankish/Byzantine Castle of Oria (Gardiki), limestone rocks and openings in *Quercus* woodland, 525–550 m, 37°16'N, 22°03'E, 02.06.2018, *Kit Tan* & *G. Vold* 32934 (leaf rosettes).

245. *Bupleurum fruticosum* L.

Gr Nomos Arkadias, Eparchia Megalopoleos: Voutsaras, ca. 10 km SE of Megalopolis, fields and clearings in *Quercus* woodland, 550 m, 37°19'N, 22°12'E, 01.06.2018, *Kit Tan* & *G. Vold* obs.; Potamia to Tourkolekas, roadside slopes, 440–455 m, 37°17'N, 22°08'E, 02.06.2018, *Kit Tan* & *G. Vold* obs.; beginning of dirt road to Frankish/Byzantine Castle of Oria (Gardiki), limestone rocks and openings in *Quercus* woodland, 525–550 m, 37°16'N, 22°03'E, 02.06.2018, *Kit Tan* & *G. Vold* 32979.

Also noted at Tourkolekas.

246. *Daucus carota* L.

Gr Nomos Arkadias, Eparchia Megalopoleos: Grekos, 30 km SSE of Megalopolis, roadsides and *Quercus* woodland, 560 m, 37°14'N, 22°17'E, 01.06.2018, *Kit Tan* & *G. Vold* obs.; Skortsinos, 15 km SE of Megalopolis, roadsides, 537 m, 37°19'N, 22°14'E, 01.06.2018, *Kit Tan* & *G. Vold* obs.; near village of Papis, 12 km SE of Megalopolis, roadsides and scrub, 670 m, 37°21'N, 22°15'E, 01.06.2018, *Kit Tan* & *G. Vold* obs.

Also noted at Routsis, Voutsaras, Athinaio and Leontari.

247. *Eryngium campestre* L.

Gr Nomos Arkadias, Eparchia Megalopoleos: Perivolia, damp meadows, roadsides and clearings in *Quercus* woodland, 420 m, 37°23'N, 22°09'E, 31.05.2018, *Kit Tan & G. Vold* obs.; Voutsaras, ca. 10 km SE of Megalopolis, fields and clearings in *Quercus* woodland, 550 m, 37°19'N, 22°12'E, 01.06.2018, *Kit Tan & G. Vold* obs.; near village of Paporis, 12 km SE of Megalopolis, roadsides and scrub, 670 m, 37°21'N, 22°15'E, 01.06.2018, *Kit Tan & G. Vold* obs.

Also noted at Routsis and Skortsinos.

248. *Ferula communis* L.

Gr Nomos Arkadias, Eparchia Megalopoleos: Voutsaras, ca. 10 km SE of Megalopolis, fields and clearings in *Quercus* woodland, 550 m, 37°19'N, 22°12'E, 01.06.2018, *Kit Tan & G. Vold* obs.

249. *Foeniculum vulgare* Mill.

Gr Nomos Arkadias, Eparchia Megalopoleos: Perivolia, damp meadows, roadsides and clearings in *Quercus* woodland, 420 m, 37°23'N, 22°09'E, 31.05.2018, *Kit Tan & G. Vold* obs.; Grekos, 30 km S-SE of Megalopolis, roadsides and *Quercus* woodland, 560 m, 37°14'N, 22°17'E, 01.06.2018, *Kit Tan & G. Vold* obs.; Skortsinos, 15 km SE of Megalopolis, roadsides, 537 m, 37°19'N, 22°14'E, 01.06.2018, *Kit Tan & G. Vold* obs.

Also noted at Routsis, Voutsaras, Paporis, Athinaio and Leontari.

250. *Lagoecia cuminoides* L.

Gr Nomos Arkadias, Eparchia Megalopoleos: beginning of dirt road to Frankish/Byzantine Castle of Oria (Gardiki), limestone rocks and openings in *Quercus* woodland, 525–550 m, 37°16'N, 22°03'E, 02.06.2018, *Kit Tan & G. Vold* 32983.

251. *Malabaila aurea* (Sm.) Boiss.

Gr Nomos Arkadias, Eparchia Megalopoleos: Perivolia, damp meadows, roadsides and clearings in *Quercus* woodland, 420 m, 37°23'N, 22°09'E, 31.05.2018, *Kit Tan & G. Vold* obs.

252. *Tordylium apulum* L.

Gr Nomos Arkadias, Eparchia Megalopoleos: Perivolia, damp meadows, roadsides and clearings in *Quercus* woodland, 420 m, 37°23'N, 22°09'E, 31.05.2018, *Kit Tan & G. Vold* obs.

Apocynaceae**253. *Nerium oleander* L.**

Gr Nomos Arkadias, Eparchia Megalopoleos: near

village of Routsis, 8 km SE of Megalopolis, 450 m, 37°21'N, 22°11'E, 01.06.2018, *Kit Tan & G. Vold* obs.; Voutsaras, ca. 10 km SE of Megalopolis, fields and clearings in *Quercus* woodland, 550 m, 37°19'N, 22°12'E, 01.06.2018, *Kit Tan & G. Vold* obs.; Skortsinos, 15 km SE of Megalopolis, roadsides, 537 m, 37°19'N, 22°14'E, 01.06.2018, *Kit Tan & G. Vold* obs.

Also noted at Grekos.

254. *Vinca major* L.

Gr Nomos Arkadias, Eparchia Megalopoleos: near village of Routsis, 8 km SE of Megalopolis, 450 m, 37°21'N, 22°11'E, 01.06.2018, *Kit Tan & G. Vold* obs.; Athinaio, 10 km E of Megalopolis on way to Paliochouni, 700 m, 37°24'N, 22°15'E, 01.06.2018, *Kit Tan & G. Vold* 32912.

Aristolochiaceae**255. *Aristolochia sempervirens* L.**

Gr Nomos Arkadias, Eparchia Megalopoleos: Leontari, 9 km S of Megalopolis, roadsides and waste ground, 548 m, 37°19'N, 22°09'E, 02.06.2018, *Kit Tan & G. Vold* obs.

Asteraceae**256. *Carlina corymbosa* subsp. *graeca* (Heldr. & Sartori) Nyman**

Gr Nomos Arkadias, Eparchia Megalopoleos: Voutsaras, ca. 10 km SE of Megalopolis, fields and clearings in *Quercus* woodland, 550 m, 37°19'N, 22°12'E, 01.06.2018, *Kit Tan & G. Vold* obs.; beginning of dirt road to Frankish/Byzantine Castle of Oria (Gardiki), limestone rocks and openings in *Quercus* woodland, 525–550 m, 37°16'N, 22°03'E, 02.06.2018, *Kit Tan & G. Vold* obs.

257. *Centaurea iberica* subsp. *holzmanniana* (Boiss.) Dostál

Gr Nomos Arkadias, Eparchia Megalopoleos: beginning of dirt road to Frankish/Byzantine Castle of Oria (Gardiki), limestone rocks and openings in *Quercus* woodland, 525–550 m, 37°16'N, 22°03'E, 02.06.2018, *Kit Tan & G. Vold* obs.

Also new for Nomos Arkadias.

258. *Centaurea solstitialis* L.

Gr Nomos Arkadias, Eparchia Megalopoleos: beginning of dirt road to Frankish/Byzantine Castle of Oria (Gardiki), limestone rocks and openings in *Quercus* woodland, 525–550 m, 37°16'N, 22°03'E, 02.06.2018, *Kit Tan & G. Vold* obs.

- 259. *Cirsium arvense* (L.) Scop.**
Gr Nomos Arkadias, Eparchia Megalopoleos: Perivolia, damp meadows, roadsides and clearings in *Quercus* woodland, 420 m, 37°23'N, 22°09'E, 31.05.2018, *Kit Tan* & *G. Vold* obs.
- 260. *Cirsium vulgare* (Savi) Ten.**
Gr Nomos Arkadias, Eparchia Megalopoleos: near village of Paparis, 12 km SE of Megalopolis, roadsides and scrub, 670 m, 37°21'N, 22°15'E, 01.06.2018, *Kit Tan* & *G. Vold* obs.
- 261. *Crupina crupinastrum* (Moris) Vis.**
Gr Nomos Arkadias, Eparchia Megalopoleos: Athinaio, 10 km E of Megalopolis on way to Paliochouni, 700 m, 37°24'N, 22°15'E, 01.06.2018, *Kit Tan* & *G. Vold* obs.
- 262. *Cynara cardunculus* L.**
Gr Nomos Arkadias, Eparchia Megalopoleos: near village of Routsis, 8 km SE of Megalopolis, 450 m, 37°21'N, 22°11'E, 01.06.2018, *Kit Tan* & *G. Vold* obs.
- 263. *Echinops sphaerocephalus* L.**
Gr Nomos Arkadias, Eparchia Megalopoleos: Voutsaras, ca. 10 km SE of Megalopolis, fields and clearings in *Quercus* woodland, 550 m, 37°19'N, 22°12'E, 01.06.2018, *Kit Tan* & *G. Vold* obs.; beginning of dirt road to Frankish/Byzantine Castle of Oria (Gardiki), limestone rocks and openings in *Quercus* woodland, 525–550 m, 37°16'N, 22°03'E, 02.06.2018, *Kit Tan* & *G. Vold* obs.
- 264. *Erigeron bonariensis* L.**
Gr Nomos Arkadias, Eparchia Megalopoleos: 1 km from Kalivia on Leontari – Potamia road, roadside slopes, 490 m, 37°46'N, 22°04'E, 02.06.2018, *Kit Tan* & *G. Vold* obs.
- 265. *Geropogon hybridus* (L.) Sch. Bip.**
Gr Nomos Arkadias, Eparchia Megalopoleos: Perivolia, damp meadows, roadsides and clearings in *Quercus* woodland, 420 m, 37°23'N, 22°09'E, 31.05.2018, *Kit Tan* & *G. Vold* obs.
- 266. *Inula graveolens* (L.) Desf.**
Gr Nomos Arkadias, Eparchia Megalopoleos: Paliochouni to Malliota and Makrysi, 691 m, 37°41'N, 22°16'E, 01.06.2018, *Kit Tan* & *G. Vold* obs.; beginning of dirt road to Frankish/Byzantine Castle of Oria (Gardiki), limestone rocks and openings in *Quercus* woodland, 525–550 m, 37°16'N, 22°03'E, 02.06.2018, *Kit Tan* & *G. Vold* obs.
- 267. *Inula viscosa* (L.) Aiton**
Gr Nomos Arkadias, Eparchia Megalopoleos: Perivolia, damp meadows, roadsides and clearings in *Quercus* woodland, 420 m, 37°23'N, 22°09'E, 31.05.2018, *Kit Tan* & *G. Vold* obs.; Paliochouni to Malliota and Makrysi, 691 m, 37°41'N, 22°16'E, 01.06.2018, *Kit Tan* & *G. Vold* obs.; Leontari, 9 km S of Megalopolis, roadsides and waste ground, 548 m, 37°19'N, 22°09'E, 02.06.2018, *Kit Tan* & *G. Vold* obs.
- 268. *Lactuca saligna* L.**
Gr Nomos Arkadias, Eparchia Megalopoleos: Leontari, 9 km S of Megalopolis, roadsides and waste ground, 548 m, 37°19'N, 22°09'E, 02.06.2018, *Kit Tan* & *G. Vold* obs.
- 269. *Onopordum illyricum* L.**
Gr Nomos Arkadias, Eparchia Megalopoleos: Perivolia, damp meadows, roadsides and clearings in *Quercus* woodland, 420 m, 37°23'N, 22°09'E, 31.05.2018, *Kit Tan* & *G. Vold* obs.; near village of Routsis, 8 km SE of Megalopolis, 450 m, 37°21'N, 22°11'E, 01.06.2018, *Kit Tan* & *G. Vold* obs.
- 270. *Pallenis spinosa* (L.) Cass.**
Gr Nomos Arkadias, Eparchia Megalopoleos: Perivolia, damp meadows, roadsides and clearings in *Quercus* woodland, 420 m, 37°23'N, 22°09'E, 31.05.2018, *Kit Tan* & *G. Vold* obs.; near village of Routsis, 8 km SE of Megalopolis, 450 m, 37°21'N, 22°11'E, 01.06.2018, *Kit Tan* & *G. Vold* obs.; Athinaio, 10 km E of Megalopolis on way to Paliochouni, 700 m, 37°24'N, 22°15'E, 01.06.2018, *Kit Tan* & *G. Vold* obs.
- 271. *Phagnalon rupestre* subsp. *graecum* (Boiss. & Heldr.) Batt.**
Gr Nomos Arkadias, Eparchia Megalopoleos: beginning of dirt road to Frankish/Byzantine Castle of Oria (Gardiki), limestone rocks and openings in *Quercus* woodland, 525–550 m, 37°16'N, 22°03'E, 02.06.2018, *Kit Tan* & *G. Vold* 32963.
- 272. *Ptilostemon afer* (Jacq.) Greuter**
Gr Nomos Arkadias, Eparchia Megalopoleos: Paliochouni to Malliota and Makrysi, 691 m, 37°41'N, 22°16'E, 01.06.2018, *Kit Tan* & *G. Vold* obs.

273. *Ptilostemon chamaepeuce* (L.) Less.

Gr Nomos Arkadias, Eparchia Megalopoleos: beginning of dirt road to Frankish/Byzantine Castle of Oria (Gardiki), limestone rocks and openings in *Quercus* woodland, 525–550 m, 37°16'N, 22°03'E, 02.06.2018, *Kit Tan & G. Vold* obs.

274. *Pulicaria dysenterica* (L.) Bernh.

Gr Nomos Arkadias, Eparchia Megalopoleos: near village of Paporis, 12 km SE of Megalopolis, roadsides and scrub, 670 m, 37°21'N, 22°15'E, 01.06.2018, *Kit Tan & G. Vold* obs.

275. *Scolymus hispanicus* L.

Gr Nomos Arkadias, Eparchia Megalopoleos: Perivolia, damp meadows, roadsides and clearings in *Quercus* woodland, 420 m, 37°23'N, 22°09'E, 31.05.2018, *Kit Tan & G. Vold* obs.; Grekos, 30 km S-SE of Megalopolis, roadsides and *Quercus* woodland, 560 m, 37°14'N, 22°17'E, 01.06.2018, *Kit Tan & G. Vold* obs.

276. *Sonchus oleraceus* L.

Gr Nomos Arkadias, Eparchia Megalopoleos: Grekos, 30 km S-SE of Megalopolis, roadsides and *Quercus* woodland, 560 m, 37°14'N, 22°17'E, 01.06.2018, *Kit Tan & G. Vold* obs.; Athinaio, 10 km E of Megalopolis on way to Paliochouni, 700 m, 37°24'N, 22°15'E, 01.06.2018, *Kit Tan & G. Vold* obs.

277. *Tragopogon longifolius* Heldr. & Sartori ex Boiss.

Gr Nomos Arkadias, Eparchia Megalopoleos: Perivolia, damp meadows, roadsides and clearings in *Quercus* woodland, 420 m, 37°23'N, 22°09'E, 31.05.2018, *Kit Tan & G. Vold* obs.

Boraginaceae**278. *Heliotropium hirsutissimum* Grauer**

Gr Nomos Arkadias, Eparchia Megalopoleos: Leontari, 9 km S of Megalopolis, roadsides and waste ground, 548 m, 37°19'N, 22°09'E, 02.06.2018, *Kit Tan & G. Vold* obs.

Brassicaceae**279. *Alyssum simplex* Rudolphi [syn. *A. minus* (L.) Rothm.]**

Gr Nomos Arkadias, Eparchia Megalopoleos: near village of Paporis, 12 km SE of Megalopolis, roadsides and scrub, 670 m, 37°21'N, 22°15'E, 01.06.2018, *Kit Tan & G. Vold* obs.

280. *Arabis verna* (L.) R. Br.

Gr Nomos Arkadias, Eparchia Megalopoleos: beginning of dirt road to Frankish/Byzantine Castle of Oria (Gardiki), limestone rocks and openings in *Quercus* woodland, 525–550 m, 37°16'N, 22°03'E, 02.06.2018, *Kit Tan & G. Vold* obs.

281. *Cardaria draba* (L.) Desv.

Gr Nomos Arkadias, Eparchia Megalopoleos: near village of Paporis, 12 km SE of Megalopolis, roadsides and scrub, 670 m, 37°21'N, 22°15'E, 01.06.2018, *Kit Tan & G. Vold* obs.

282. *Raphanus raphanistrum* L.

Gr Nomos Arkadias, Eparchia Megalopoleos: Perivolia, damp meadows, roadsides and clearings in *Quercus* woodland, 420 m, 37°23'N, 22°09'E, 31.05.2018, *Kit Tan & G. Vold* obs.

Cactaceae**283. *Opuntia ficus-indica* (L.) Mill.**

Gr Nomos Arkadias, Eparchia Megalopoleos: beginning of dirt road to Frankish/Byzantine Castle of Oria (Gardiki), limestone rocks and openings in *Quercus* woodland, 525–550 m, 37°16'N, 22°03'E, 02.06.2018, *Kit Tan & G. Vold* obs.

Caesalpiniaceae**284. *Cercis siliquastrum* L.**

Gr Nomos Arkadias, Eparchia Megalopoleos: Voutsaras, ca. 10 km SE of Megalopolis, fields and clearings in *Quercus* woodland, 550 m, 37°19'N, 22°12'E, 01.06.2018, *Kit Tan & G. Vold* obs.; 1 km from Kalivia on Leontari – Potamia road, roadside slopes, 489 m, 37°46'N, 22°04'E, 02.06.2018, *Kit Tan & G. Vold* obs.; Leontari, 9 km S of Megalopolis, roadsides and waste ground, 548 m, 37°19'N, 22°09'E, 02.06.2018, *Kit Tan & G. Vold* obs.

Also noted at Perivolia, Routsis, Paporis, Athinaio, Skortsinos and Tourkolekas.

Campanulaceae**285. *Campanula drabifolia* Sm.**

Gr Nomos Arkadias, Eparchia Megalopoleos: beginning of dirt road to Frankish/Byzantine Castle of Oria (Gardiki), limestone rocks and openings in *Quercus* woodland, 525–550 m, 37°16'N, 22°03'E, 02.06.2018, *Kit Tan & G. Vold* 32959.

286. *Campanula sparsa* Friv.

Gr Nomos Arkadias, Eparchia Megalopoleos: Leontari, 9 km S of Megalopolis, roadsides and waste ground, 548 m, 37°19'N, 22°09'E, 02.06.2018, *Kit Tan & G. Vold* obs.

287. *Legousia speculum-veneris* (L.) Chaix

Gr Nomos Arkadias, Eparchia Megalopoleos: Perivolia, damp meadows, roadsides and clearings in *Quercus* woodland, 420 m, 37°23'N, 22°09'E, 31.05.2018, *Kit Tan & G. Vold* obs.; Athinaio, 10 km E of Megalopolis on way to Paliochouni, 700 m, 37°24'N, 22°15'E, 01.06.2018, *Kit Tan & G. Vold* 32911.

Caprifoliaceae**288. *Lonicera implexa* Aiton**

Gr Nomos Arkadias, Eparchia Megalopoleos: Perivolia, damp meadows, roadsides and clearings in *Quercus* woodland, 420 m, 37°23'N, 22°09'E, 31.05.2018, *Kit Tan & G. Vold* obs.: beginning of dirt road to Frankish/Byzantine Castle of Oria (Gardiki), limestone rocks and openings in *Quercus* woodland, 525–550 m, 37°16'N, 22°03'E, 02.06.2018, *Kit Tan & G. Vold* obs.; Potamia to Tourkolekas, roadside slopes, 440–455 m, 37°17'N, 22°08'E, 02.06.2018, *Kit Tan & G. Vold* obs.

289. *Sambucus nigra* L.

Gr Nomos Arkadias, Eparchia Megalopoleos: Perivolia, damp meadows, roadsides and clearings in *Quercus* woodland, 420 m, 37°23'N, 22°09'E, 31.05.2018, *Kit Tan & G. Vold* obs.

Caryophyllaceae**290. *Arenaria serpyllifolia* L.**

Gr Nomos Arkadias, Eparchia Megalopoleos: Leontari, 9 km S of Megalopolis, roadsides and waste ground, 548 m, 37°19'N, 22°09'E, 02.06.2018, *Kit Tan & G. Vold* obs.

291. *Dianthus viscidus* Bory & Chaub.

Gr Nomos Arkadias, Eparchia Megalopoleos: Perivolia, damp meadows, roadsides and clearings in *Quercus* woodland, 420 m, 37°23'N, 22°09'E, 31.05.2018, *Kit Tan & G. Vold* obs.

292. *Petrorhagia dubia* (Raf.) G. López & Romo

Gr Nomos Arkadias, Eparchia Megalopoleos: Grekos, 30 km SSE of Megalopolis, roadsides and *Quercus* woodland, 560 m, 37°14'N, 22°17'E,

01.06.2018, *Kit Tan & G. Vold* obs.; Voutsaras, ca. 10 km SE of Megalopolis, fields and clearings in *Quercus* woodland, 550 m, 37°19'N, 22°12'E, 01.06.2018, *Kit Tan & G. Vold* obs.; Skortsinos, 15 km SE of Megalopolis, roadsides, 537 m, 37°19'N, 22°14'E, 01.06.2018, *Kit Tan & G. Vold* obs.

Also noted at Perivolia and Routsis.

293. *Scleranthus annuus* L.

Gr Nomos Arkadias, Eparchia Megalopoleos: Paliochouni to Malliota and Makrysi, 691 m, 37°41'N, 22°16'E, 01.06.2018, *Kit Tan & G. Vold* obs.

294. *Scleranthus verticillatus* Tausch

Gr Nomos Arkadias, Eparchia Megalopoleos: Leontari, 9 km S of Megalopolis, roadsides and waste ground, 548 m, 37°19'N, 22°09'E, 02.06.2018, *Kit Tan & G. Vold* obs.

Convolvulaceae**295. *Convolvulus arvensis* L.**

Gr Nomos Arkadias, Eparchia Megalopoleos: Perivolia, damp meadows, roadsides and clearings in *Quercus* woodland, 420 m, 37°23'N, 22°09'E, 31.05.2018, *Kit Tan & G. Vold* obs.; Voutsaras, ca. 10 km SE of Megalopolis, fields and clearings in *Quercus* woodland, 550 m, 37°19'N, 22°12'E, 01.06.2018, *Kit Tan & G. Vold* obs.; Skortsinos, 15 km SE of Megalopolis, roadsides, 537 m, 37°19'N, 22°14'E, 01.06.2018, *Kit Tan & G. Vold* obs.

Also noted at Routsis, Grekos, Athinaio and Paphis.

296. *Convolvulus elegantissimus* Mill.

Gr Nomos Arkadias, Eparchia Megalopoleos: Voutsaras, ca. 10 km SE of Megalopolis, fields and clearings in *Quercus* woodland, 550 m, 37°19'N, 22°12'E, 01.06.2018, *Kit Tan & G. Vold* obs.; beginning of dirt road to Frankish/Byzantine Castle of Oria (Gardiki), limestone rocks and openings in *Quercus* woodland, 525–550 m, 37°16'N, 22°03'E, 02.06.2018, *Kit Tan & G. Vold* obs.

297. *Convolvulus oleifolius* Desr.

Gr Nomos Arkadias, Eparchia Megalopoleos: Voutsaras, ca. 10 km SE of Megalopolis, fields and clearings in *Quercus* woodland, 550 m, 37°19'N, 22°12'E, 01.06.2018, *Kit Tan & G. Vold* obs.; Skortsinos, 15 km SE of Megalopolis, roadsides,

537 m, 37°19'N, 22°14'E, 01.06.2018, *Kit Tan* & *G. Vold* obs.; beginning of dirt road to Frankish/ Byzantine Castle of Oria (Gardiki), limestone rocks and openings in *Quercus* woodland, 525–550 m, 37°16'N, 22°03'E, 02.06.2018, *Kit Tan* & *G. Vold* obs.

Also noted at Tourkolekas.

Crassulaceae

298. *Sedum magellense* Ten.

Gr Nomos Arkadias, Eparchia Megalopoleos: Perivolia, damp meadows, roadsides and clearings in *Quercus* woodland, 420 m, 37°23'N, 22°09'E, 31.05.2018, *Kit Tan* & *G. Vold* obs.

Cucurbitaceae

299. *Ecballium elaterium* (L.) A. Rich.

Gr Nomos Arkadias, Eparchia Megalopoleos: Grekos, 30 km S-SE of Megalopolis, roadsides and *Quercus* woodland, 560 m, 37°14'N, 22°17'E,

01.06.2018, *Kit Tan* & *G. Vold* obs.; Leontari, 9 km S of Megalopolis, roadsides and waste ground, 548 m, 37°19'N, 22°09'E, 02.06.2018, *Kit Tan* & *G. Vold* obs.

Dipsacaceae

300. *Cephalaria ambrosioides* (Sm.) Roem. & Schult. (Fig. 40)

Gr Nomos Arkadias, Eparchia Megalopoleos: Skortsinos, 15 km SE of Megalopolis, roadsides, 537 m, 37°19'N, 22°14'E, 01.06.2018, *Kit Tan* & *G. Vold* 32900.

301. *Dipsacus fullonum* L. (Fig. 41)

Gr Nomos Arkadias, Eparchia Megalopoleos: Skortsinos, 15 km SE of Megalopolis, roadsides, 537 m, 37°19'N, 22°14'E, 01.06.2018, *Kit Tan* & *G. Vold* obs.; near village of Paparis, 12 km SE of Megalopolis, roadsides and scrub, 670 m, 37°21'N, 22°15'E, 01.06.2018, *Kit Tan* & *G. Vold*

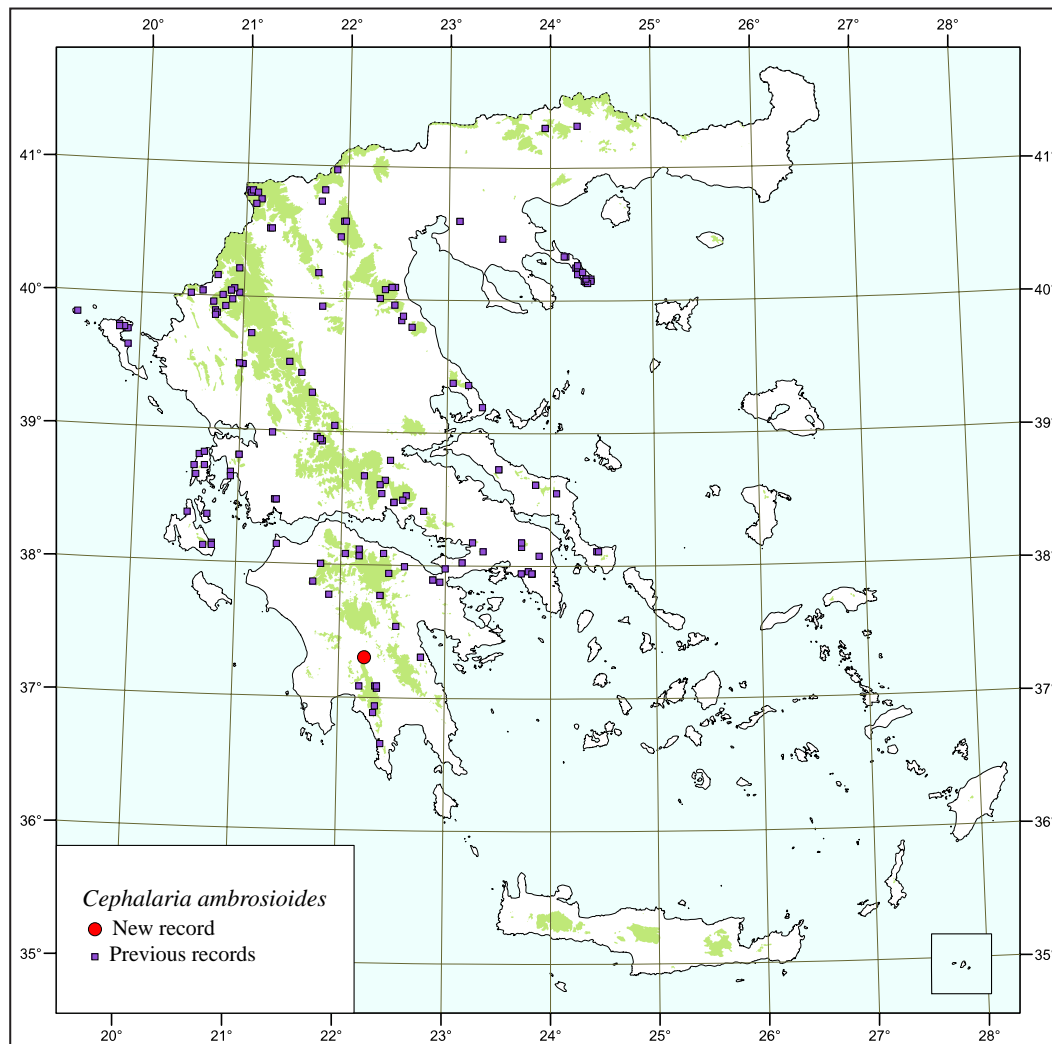


Fig. 40. Distribution of *Cephalaria ambrosioides* in Greece.

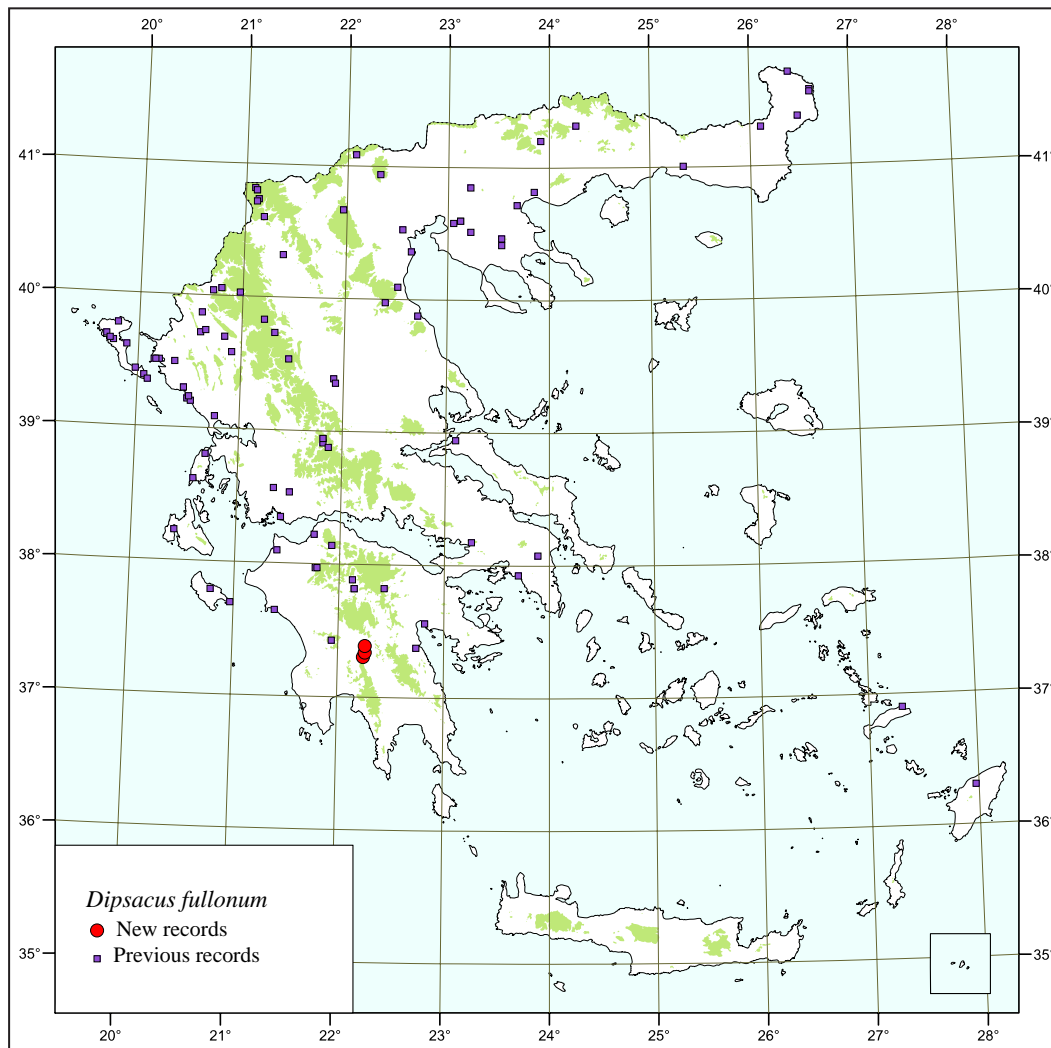


Fig. 41. Distribution of *Dipsacus fullonum* in Greece.

obs.; Athinaio, 10 km E of Megalopolis on way to Paliochouni, 700 m, 37°24'N, 22°15'E, 01.06.2018, *Kit Tan & G. Vold* obs.

Also noted at Malliota and Makrysi.

302. *Knautia integrifolia* (L.) Bertol.

Gr Nomos Arkadias, Eparchia Megalopoleos: Grekos, 30 km S-SE of Megalopolis, roadsides and *Quercus* woodland, 560 m, 37°14'N, 22°17'E, 01.06.2018, *Kit Tan & G. Vold* obs.; Skortsinos, 15 km SE of Megalopolis, roadsides, 537 m, 37°19'N, 22°14'E, 01.06.2018, *Kit Tan & G. Vold* obs.; beginning of dirt road to Frankish/Byzantine Castle of Oria (Gardiki), limestone rocks and openings in *Quercus* woodland, 525–550 m, 37°16'N, 22°03'E, 02.06.2018, *Kit Tan & G. Vold* obs.

Also noted at Routsis and Athinaio.

303. *Scabiosa columbaria* L.

Gr Nomos Arkadias, Eparchia Megalopoleos:

Paliochouni to Malliota and Makrysi, 691 m, 37°41'N, 22°16'E, 01.06.2018, *Kit Tan & G. Vold* 32915; near Tourkolekas on way to Castle of Oria (Gardiki), 752 m, 37°15'N, 22°07'E, 02.06.2018, *Kit Tan & G. Vold* obs.; beginning of dirt road to Frankish/Byzantine Castle of Oria (Gardiki), limestone rocks and openings in *Quercus* woodland, 525–550 m, 37°16'N, 22°03'E, 02.06.2018, *Kit Tan & G. Vold* obs.

Also noted at Athinaio.

Euphorbiaceae

304. *Euphorbia characias* subsp. *wulfenii* (W.D.J. Koch) Radcl.-Sm.

Gr Nomos Arkadias, Eparchia Megalopoleos: near village of Papolis, 12 km SE of Megalopolis, roadsides and scrub, 670 m, 37°21'N, 22°15'E, 01.06.2018, *Kit Tan & G. Vold* obs.; Potamia to Tourkolekas, roadside slopes, 440–455 m,

37°17'N, 22°08'E, 02.06.2018, *Kit Tan & G. Vold* obs.; 1 km from Kalivia on Leontari – Potamia road, roadside slopes, 489 m, 37°46'N, 22°04'E, 02.06.2018, *Kit Tan & G. Vold* obs.

305. *Euphorbia myrsinites* L.

Gr Nomos Arkadias, Eparchia Megalopoleos: near Tourkolekas on way to Castle of Oria (Gardiki), 752 m, 37°15'N, 22°07'E, 02.06.2018, *Kit Tan & G. Vold* obs.

306. *Mercurialis annua* L.

Gr Nomos Arkadias, Eparchia Megalopoleos: Perivolia, damp meadows, roadsides and clearings in *Quercus* woodland, 420 m, 37°23'N, 22°09'E, 31.05.2018, *Kit Tan & G. Vold* obs.; beginning of dirt road to Frankish/Byzantine Castle of Oria (Gardiki), limestone rocks and openings in *Quercus* woodland, 525–550 m, 37°16'N, 22°03'E, 02.06.2018, *Kit Tan & G. Vold* obs.

Fabaceae

307. *Anagyris foetida* L.

Gr Nomos Arkadias, Eparchia Megalopoleos: Voutsaras, ca. 10 km SE of Megalopolis, fields and clearings in *Quercus* woodland, 550 m, 37°19'N, 22°12'E, 01.06.2018, *Kit Tan & G. Vold* obs.

308. *Bituminaria bituminosa* (L.) C.H. Stirt.

Gr Nomos Arkadias, Eparchia Megalopoleos: Perivolia, damp meadows, roadsides and clearings in *Quercus* woodland, 420 m, 37°23'N, 22°09'E, 31.05.2018, *Kit Tan & G. Vold* obs.

309. *Colutea arborescens* L.

Gr Nomos Arkadias, Eparchia Megalopoleos: near village of Papis, 12 km SE of Megalopolis, roadsides and scrub, 670 m, 37°21'N, 22°15'E, 01.06.2018, *Kit Tan & G. Vold* obs.; 1 km from Kalivia on Leontari – Potamia road, roadside slopes, 489 m, 37°46'N, 22°04'E, 02.06.2018, *Kit Tan & G. Vold* obs.; beginning of dirt road to Frankish/Byzantine Castle of Oria (Gardiki), limestone rocks and openings in *Quercus* woodland, 525–550 m, 37°16'N, 22°03'E, 02.06.2018, *Kit Tan & G. Vold* obs.

Also noted at Athinaio on way to Paliochouni.

310. *Hymenocarpos circinnatus* (L.) Savi

Gr Nomos Arkadias, Eparchia Megalopoleos: beginning of dirt road to Frankish/Byzantine Castle of Oria (Gardiki), limestone rocks and openings in

Quercus woodland, 525–550 m, 37°16'N, 22°03'E, 02.06.2018, *Kit Tan & G. Vold* 32960.

311. *Lathyrus aphaca* L.

Gr Nomos Arkadias, Eparchia Megalopoleos: near village of Papis, 12 km SE of Megalopolis, roadsides and scrub, 670 m, 37°21'N, 22°15'E, 01.06.2018, *Kit Tan & G. Vold* obs.

312. *Lathyrus cicera* L.

Gr Nomos Arkadias, Eparchia Megalopoleos: Perivolia, damp meadows, roadsides and clearings in *Quercus* woodland, 420 m, 37°23'N, 22°09'E, 31.05.2018, *Kit Tan & G. Vold* obs.

313. *Lathyrus grandifloras* Sm. (Fig. 42)

Gr Nomos Arkadias, Eparchia Megalopoleos: near village of Papis, 12 km SE of Megalopolis, roadsides and scrub, 670 m, 37°21'N, 22°15'E, 01.06.2018, *Kit Tan & G. Vold* obs.

314. *Lotus corniculatus* L.

Gr Nomos Arkadias, Eparchia Megalopoleos: Perivolia, damp meadows, roadsides and clearings in *Quercus* woodland, 420 m, 37°23'N, 22°09'E, 31.05.2018, *Kit Tan & G. Vold* obs.; Skortsinos, 15 km SE of Megalopolis, roadsides, 537 m, 37°19'N, 22°14'E, 01.06.2018, *Kit Tan & G. Vold* obs.; near village of Papis, 12 km SE of Megalopolis, roadsides and scrub, 670 m, 37°21'N, 22°15'E, 01.06.2018, *Kit Tan & G. Vold* obs.

Also noted at Routsis, Grekos, Voutsaras and Athinaio.

315. *Medicago polymorpha* L.

Gr Nomos Arkadias, Eparchia Megalopoleos: Perivolia, damp meadows, roadsides and clearings in *Quercus* woodland, 420 m, 37°23'N, 22°09'E, 31.05.2018, *Kit Tan & G. Vold* obs.

316. *Onobrychis aequidentata* (Sm.) d'Urv.

Gr Nomos Arkadias, Eparchia Megalopoleos: Perivolia, damp meadows, roadsides and clearings in *Quercus* woodland, 420 m, 37°23'N, 22°09'E, 31.05.2018, *Kit Tan & G. Vold* obs.

317. *Robinia pseudoacacia* L.

Gr Nomos Arkadias, Eparchia Megalopoleos: Grekos, 30 km S-SE of Megalopolis, roadsides and *Quercus* woodland, 560 m, 37°14'N, 22°17'E, 01.06.2018, *Kit Tan & G. Vold* obs.; Skortsinos, 15 km SE of Megalopolis, roadsides, 537 m, 37°19'N, 22°14'E, 01.06.2018, *Kit Tan & G. Vold* obs.; Paliochouni to Malliota and Makrysi, 691 m, 37°41'N, 22°16'E, 01.06.2018, *Kit Tan & G. Vold* obs.

Also noted at Perivolia, Routsi, Potamia and Tourkolakas.

318. *Trifolium campestre* Schreb.

Gr Nomos Arkadias, Eparchia Megalopoleos: Athinaio, 10 km E of Megalopolis on way to Paliouchouni, 700 m, 37°24'N, 22°15'E, 01.06.2018, *Kit Tan & G. Vold* obs.

319. *Trifolium lappaceum* L.

Gr Nomos Arkadias, Eparchia Megalopoleos: Athinaio, 10 km E of Megalopolis on way to Paliouchouni, 700 m, 37°24'N, 22°15'E, 01.06.2018, *Kit Tan & G. Vold* obs.

320. *Trifolium pretense* L.

Gr Nomos Arkadias, Eparchia Megalopoleos: Perivolia, damp meadows, roadsides and clearings in *Quercus* woodland, 420 m, 37°23'N, 22°09'E, 31.05.2018, *Kit Tan & G. Vold* obs.

321. *Trifolium xanthinum* Freyn

Gr Nomos Arkadias, Eparchia Megalopoleos: Perivolia, damp meadows, roadsides and clearings in *Quercus* woodland, 420 m, 37°23'N, 22°09'E, 31.05.2018, *Kit Tan & G. Vold* obs.

322. *Tripodion tetraphyllum* (L.) Fourr.

Gr Nomos Arkadias, Eparchia Megalopoleos: beginning of dirt road to Frankish/Byzantine Castle of Oria (Gardiki), limestone rocks and openings in *Quercus* woodland, 525–550 m, 37°16'N, 22°03'E, 02.06.2018, *Kit Tan & G. Vold* obs.

323. *Vicia cracca* L.

Gr Nomos Arkadias, Eparchia Megalopoleos: Perivolia, damp meadows, roadsides and clearings in *Quercus* woodland, 420 m, 37°23'N, 22°09'E, 31.05.2018, *Kit Tan & G. Vold* obs.

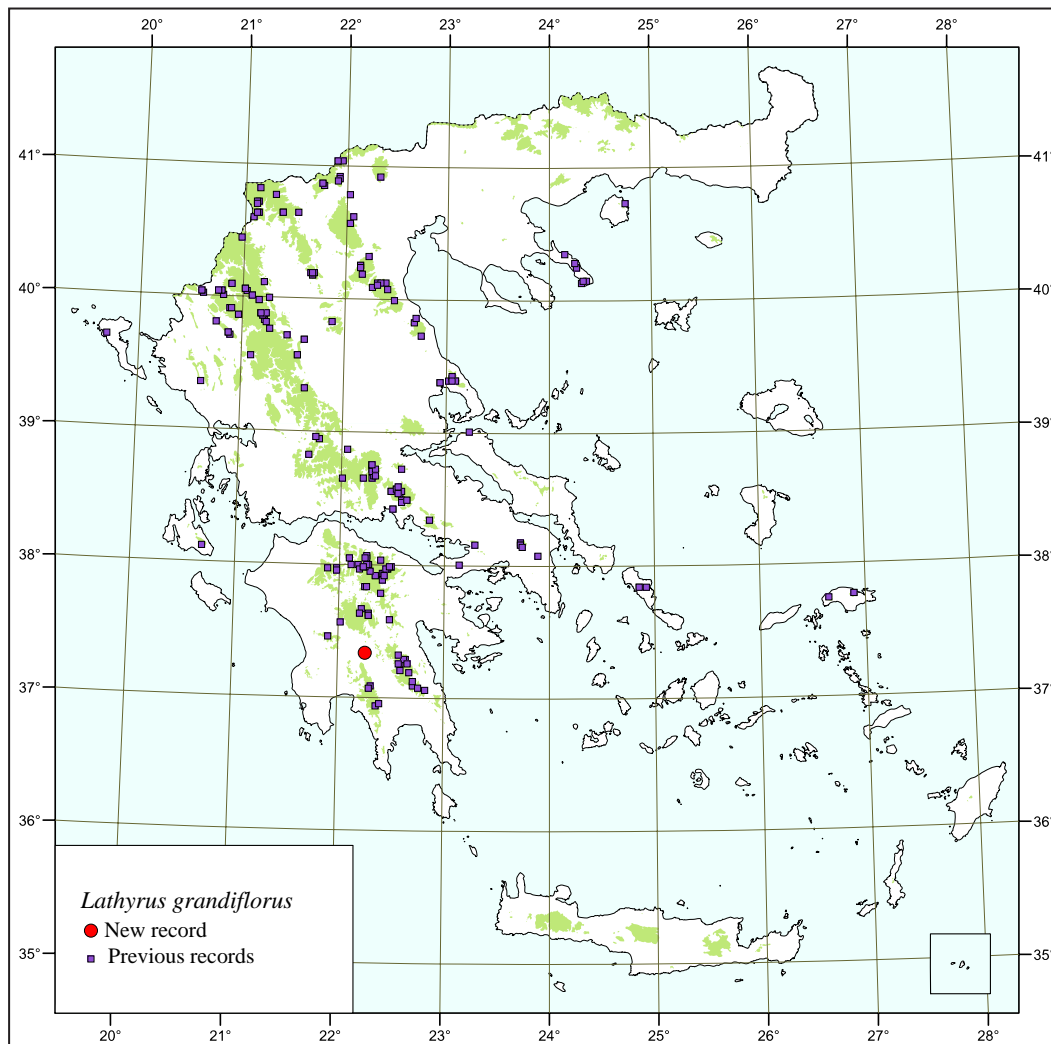


Fig. 42. Distribution of *Lathyrus grandiflorus* in Greece.

Gentianaceae**324. *Centaureum erythraea* Rafn**

Gr Nomos Arkadias, Eparchia Megalopoleos: Perivolia, damp meadows, roadsides and clearings in *Quercus* woodland, 420 m, 37°23'N, 22°09'E, 31.05.2018, *Kit Tan* & *G. Vold* obs.; beginning of dirt road to Frankish/Byzantine Castle of Oria (Gardiki), limestone rocks and openings in *Quercus* woodland, 525–550 m, 37°16'N, 22°03'E, 02.06.2018, *Kit Tan* & *G. Vold* obs.

Geraniaceae**325. *Geranium dissectum* L.**

Gr Nomos Arkadias, Eparchia Megalopoleos: near village of Papis, 12 km SE of Megalopolis, roadsides and scrub, 670 m, 37°21'N, 22°15'E, 01.06.2018, *Kit Tan* & *G. Vold* obs.

Hypericaceae**326. *Hypericum tetrapterum* Fr.**

Gr Nomos Arkadias, Eparchia Megalopoleos: Perivolia, damp meadows, roadsides and clearings in *Quercus* woodland, 420 m, 37°23'N, 22°09'E, 31.05.2018, *Kit Tan* & *G. Vold* obs.; Skortsinos, 15 km SE of Megalopolis, roadsides, 537 m, 37°19'N, 22°14'E, 01.06.2018, *Kit Tan* & *G. Vold* obs.; Leontari, 9 km S of Megalopolis, roadsides and waste ground, 548 m, 37°19'N, 22°09'E, 02.06.2018, *Kit Tan* & *G. Vold* obs.

Also noted at Grekos, Papis and Athinaio.

Lamiaceae**327. *Ballota nigra* L.**

Gr Nomos Arkadias, Eparchia Megalopoleos: near village of Papis, 12 km SE of Megalopolis, roadsides and scrub, 670 m, 37°21'N, 22°15'E, 01.06.2018, *Kit Tan* & *G. Vold* 32906; Paliochouni to Malliota and Makrysi, 691 m, 37°41'N, 22°16'E, 01.06.2018, *Kit Tan* & *G. Vold* obs.; beginning of dirt road to Frankish/Byzantine Castle of Oria (Gardiki), limestone rocks and openings in *Quercus* woodland, 525–550 m, 37°16'N, 22°03'E, 02.06.2018, *Kit Tan* & *G. Vold* obs.

Also noted at Leontari.

328. *Mentha spicata* L.

Gr Nomos Arkadias, Eparchia Megalopoleos: Paliochouni to Malliota and Makrysi, 691 m, 37°41'N, 22°16'E, 01.06.2018, *Kit Tan* & *G. Vold* obs.

329. *Phlomis herba-venti* subsp. *pungens* (Willd.) Maire ex DeFilipps

Gr Nomos Arkadias, Eparchia Megalopoleos: beginning of dirt road to Frankish/Byzantine Castle of Oria (Gardiki), limestone rocks and openings in *Quercus* woodland, 525–550 m, 37°16'N, 22°03'E, 02.06.2018, *Kit Tan* & *G. Vold* obs.

330. *Salvia fruticosa* Mill.

Gr Nomos Arkadias, Eparchia Megalopoleos: beginning of dirt road to Frankish/Byzantine Castle of Oria (Gardiki), limestone rocks and openings in *Quercus* woodland, 525–550 m, 37°16'N, 22°03'E, 02.06.2018, *Kit Tan* & *G. Vold* obs.

331. *Sideritis curvidens* Stapf

Gr Nomos Arkadias, Eparchia Megalopoleos: beginning of dirt road to Frankish/Byzantine Castle of Oria (Gardiki), limestone rocks and openings in *Quercus* woodland, 525–550 m, 37°16'N, 22°03'E, 02.06.2018, *Kit Tan* & *G. Vold* 32944.

332. *Stachys chrysantha* Boiss. & Heldr. (Fig. 43)

Gr Nomos Arkadias, Eparchia Megalopoleos: beginning of dirt road to Frankish/Byzantine Castle of Oria (Gardiki), limestone rocks and openings in *Quercus* woodland, 525–550 m, 37°16'N, 22°03'E, 02.06.2018, *Kit Tan* & *G. Vold* 32942.

333. *Stachys germanica* L.

Gr Nomos Arkadias, Eparchia Megalopoleos: Voutsaras, ca. 10 km SE of Megalopolis, fields and clearings in *Quercus* woodland, 550 m, 37°19'N, 22°12'E, 01.06.2018, *Kit Tan* & *G. Vold* obs.

334. *Teucrium polium* L.

Gr Nomos Arkadias, Eparchia Megalopoleos: Perivolia, damp meadows, roadsides and clearings in *Quercus* woodland, 420 m, 37°23'N, 22°09'E, 31.05.2018, *Kit Tan* & *G. Vold* obs.; Voutsaras, ca. 10 km SE of Megalopolis, fields and clearings in *Quercus* woodland, 550 m, 37°19'N, 22°12'E, 01.06.2018, *Kit Tan* & *G. Vold* obs.; Paliochouni to Malliota and Makrysi, 691 m, 37°41'N, 22°16'E, 01.06.2018, *Kit Tan* & *G. Vold* obs.

Widespread, noted at Routsis, Grekos, Skortsinos and Castle of Oria.



Fig. 43. Distribution of *Stachys chrysantha* in Greece.

Linaceae

335. *Linum strictum* subsp. *spicatum* (Pers.) Nyman

Gr Nomos Arkadias, Eparchia Megalopoleos: near village of Routsis, 8 km SE of Megalopolis, 450 m, 37°21'N, 22°11'E, 01.06.2018, *Kit Tan & G. Vold* obs.; Voutsaras, ca. 10 km SE of Megalopolis, fields and clearings in *Quercus* woodland, 550 m, 37°19'N, 22°12'E, 01.06.2018, *Kit Tan & G. Vold* obs.

Malvaceae

336. *Alcea biennis* Winterl subsp. *biennis*

Gr Nomos Arkadias, Eparchia Megalopoleos: Voutsaras, ca. 10 km SE of Megalopolis, fields and clearings in *Quercus* woodland, 550 m, 37°19'N, 22°12'E, 01.06.2018, *Kit Tan & G. Vold* obs.; Grekos, 30 km S-SE of Megalopolis, roadsides and *Quercus* woodland, 560 m, 37°14'N, 22°17'E, 01.06.2018, *Kit Tan & G. Vold* obs.

Moraceae

337. *Ficus carica* L.

Gr Nomos Arkadias, Eparchia Megalopoleos: Perivolia, damp meadows, roadsides and clearings in *Quercus* woodland, growing wild, 420 m, 37°23'N, 22°09'E, 31.05.2018, *Kit Tan & G. Vold* obs.; Voutsaras, ca. 10 km SE of Megalopolis, fields and clearings in *Quercus* woodland, 550 m, 37°19'N, 22°12'E, 01.06.2018, *Kit Tan & G. Vold* obs.; beginning of dirt road to Frankish/ Byzantine Castle of Oria (Gardiki), limestone rocks and openings in *Quercus* woodland, 525–550 m, 37°16'N, 22°03'E, 02.06.2018, *Kit Tan & G. Vold* obs.

Widespread, seeds dispersed by birds, noted growing wild in several localities including Routsis, Grekos and Skortsinos.

338. *Morus alba* L.

Gr Nomos Arkadias, Eparchia Megalopoleos: near village of Papis, 12 km SE of Megalopolis, roadsides and scrub, 670 m, 37°21'N, 22°15'E, 01.06.2018, *Kit Tan & G. Vold* obs.; Leontari, 9 km S of Megalopolis, roadsides and waste ground, 548 m, 37°19'N, 22°09'E, 02.06.2018, *Kit Tan & G. Vold* obs.; Athinaio, 10 km E of Megalopolis on way to Paliochouni, 700 m, 37°24'N, 22°15'E, 01.06.2018, *Kit Tan & G. Vold* obs.

Abandoned cultivation, established escape or planted.

339. *Morus nigra* L.

Gr Nomos Arkadias, Eparchia Megalopoleos: Voutsaras, ca. 10 km SE of Megalopolis, fields and clearings in *Quercus* woodland, 550 m, 37°19'N, 22°12'E, 01.06.2018, *Kit Tan & G. Vold* obs.; near village of Papis, 12 km SE of Megalopolis, roadsides and scrub, 670 m,

37°21'N, 22°15'E, 01.06.2018, *Kit Tan & G. Vold* obs.; Athinaio, 10 km E of Megalopolis on way to Paliochouni, 700 m, 37°24'N, 22°15'E, 01.06.2018, *Kit Tan & G. Vold* obs.

Widespread and formerly grown in large plantations in the area, with black-fruited and white-fruited cultivars.

Nyctaginaceae**340. *Mirabilis jalapa* L.**

Gr Nomos Arkadias, Eparchia Megalopoleos: Leontari, 9 km S of Megalopolis, roadsides and waste ground, 548 m, 37°19'N, 22°09'E, 02.06.2018, *Kit Tan & G. Vold* obs.

Oleaceae**341. *Ligustrum vulgare* L. (Fig. 44)**

Gr Nomos Arkadias, Eparchia Megalopoleos: Perivolia, damp meadows, roadsides and clearings

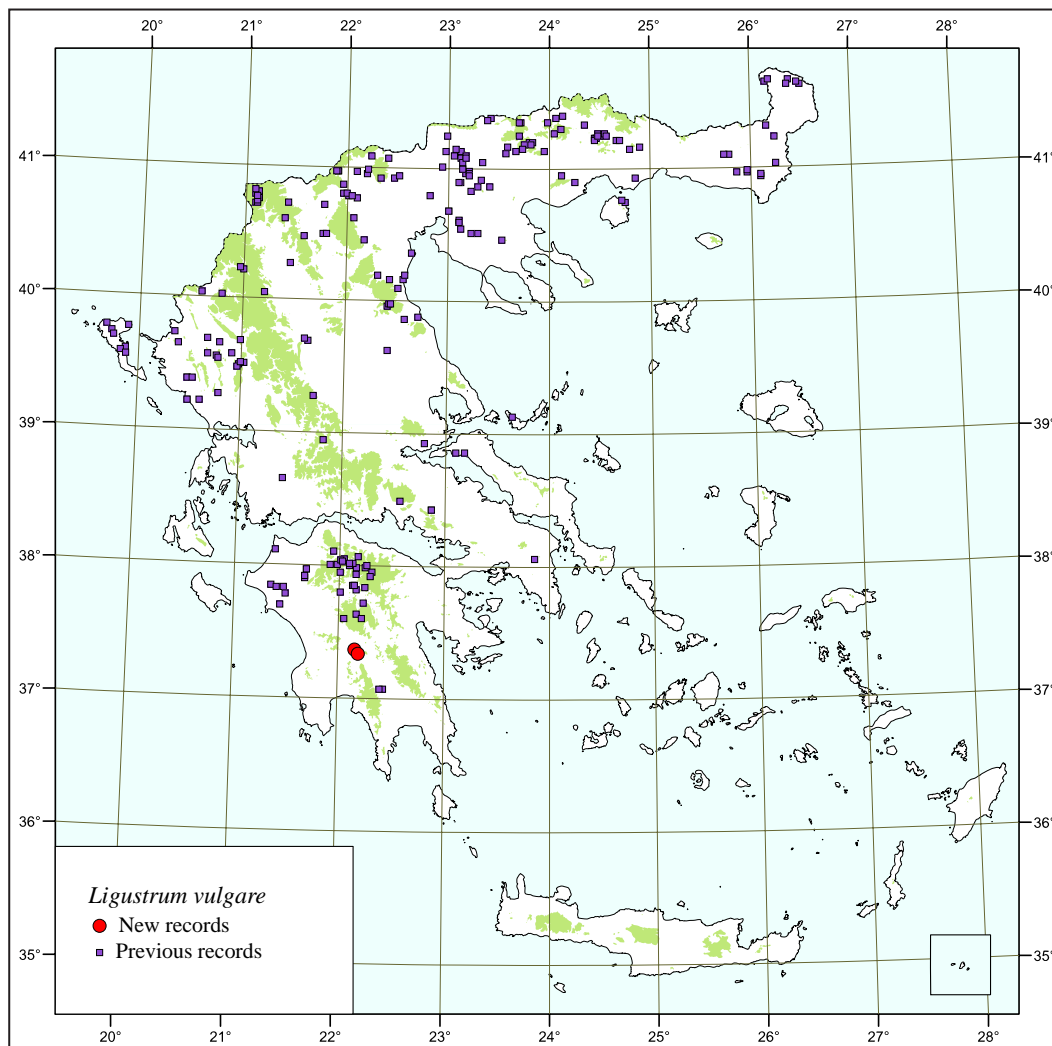


Fig. 44. Distribution of *Ligustrum vulgare* in Greece.

in *Quercus* woodland, 420 m, 37°23'N, 22°09'E, 31.05.2018, *Kit Tan* & *G. Vold* obs.; near village of Routsis, 8 km SE of Megalopolis, 450 m, 37°21'N, 22°11'E, 01.06.2018, *Kit Tan* & *G. Vold* obs.

342. *Olea europaea* L.

Gr Nomos Arkadias, Eparchia Megalopoleos: Perivolia, damp meadows, roadsides and clearings in *Quercus* woodland, growing wild, 420 m, 37°23'N, 22°09'E, 31.05.2018, *Kit Tan* & *G. Vold* obs.; beginning of dirt road to Frankish/Byzantine Castle of Oria (Gardiki), limestone rocks and openings in *Quercus* woodland, 525–550 m, 37°16'N, 22°03'E, 02.06.2018, *Kit Tan* & *G. Vold* obs.

Orobanchaceae

343. *Bellardia trixago* (L.) All.

Gr Nomos Arkadias, Eparchia Megalopoleos: Perivolia, damp meadows, roadsides and clearings in *Quercus* woodland, 420 m, 37°23'N, 22°09'E,

31.05.2018, *Kit Tan* & *G. Vold* obs.; near village of Routsis, 8 km SE of Megalopolis, 450 m, 37°21'N, 22°11'E, 01.06.2018, *Kit Tan* & *G. Vold* obs.; Voutsaras, ca. 10 km SE of Megalopolis, fields and clearings in *Quercus* woodland, 550 m, 37°19'N, 22°12'E, 01.06.2018, *Kit Tan* & *G. Vold* obs.

344. *Odontites linkii* Heldr. & Sartori ex Boiss. (Fig. 45)

Gr Nomos Arkadias, Eparchia Megalopoleos: near village of Routsis, 8 km SE of Megalopolis, 450 m, 37°21'N, 22°11'E, 01.06.2018, *Kit Tan* & *G. Vold* obs.; near Tourkolekas on way to Castle of Oria (Gardiki), 752 m, 37°15'N, 22°07'E, 02.06.2018, *Kit Tan* & *G. Vold* obs.; beginning of dirt road to Frankish/Byzantine Castle of Oria (Gardiki), limestone rocks and openings in *Quercus* woodland, 525–550 m, 37°16'N, 22°03'E, 02.06.2018, *Kit Tan* & *G. Vold* obs.

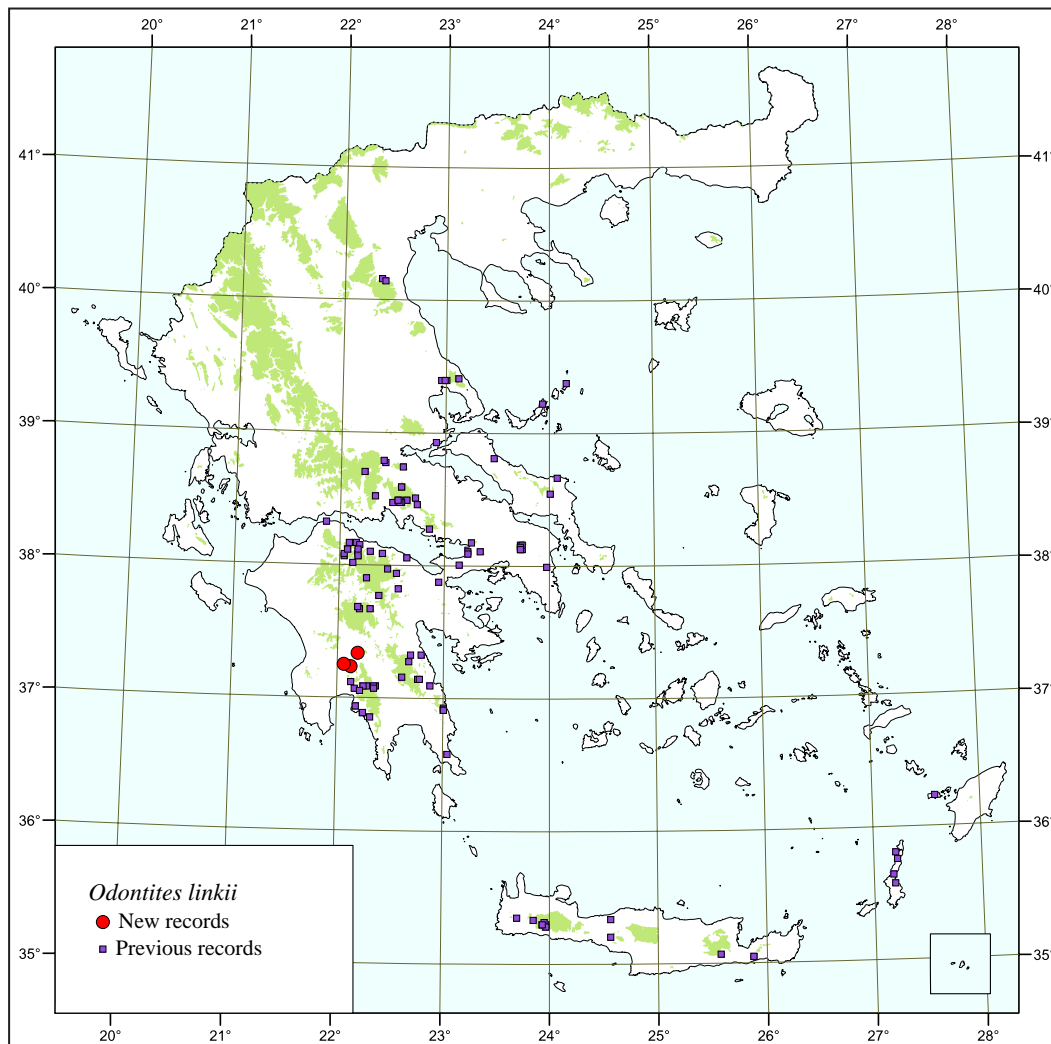


Fig. 45. Distribution of *Odontites linkii* in Greece.

Oxalidaceae**345. *Oxalis corniculata* L.**

Gr Nomos Arkadias, Eparchia Megalopoleos: near village of Routsis, 8 km SE of Megalopolis, 450 m, 37°21'N, 22°11'E, 01.06.2018, *Kit Tan & G. Vold* obs.; Voutsaras, ca. 10 km SE of Megalopolis, fields and clearings in *Quercus* woodland, 550 m, 37°19'N, 22°12'E, 01.06.2018, *Kit Tan & G. Vold* obs.

346. *Oxalis corymbosa* DC.

Gr Nomos Arkadias, Eparchia Megalopoleos: Voutsaras, ca. 10 km SE of Megalopolis, fields and clearings in *Quercus* woodland, 550 m, 37°19'N, 22°12'E, 01.06.2018, *Kit Tan & G. Vold* obs.

Naturalized escape.

Platanaceae**347. *Platanus orientalis* L.**

Gr Nomos Arkadias, Eparchia Megalopoleos: near village of Paparis, 12 km SE of Megalopolis, roadsides and scrub, 670 m, 37°21'N, 22°15'E, 01.06.2018, *Kit Tan & G. Vold* obs.; Leontari, 9 km S of Megalopolis, roadsides and waste ground, planted, 548 m, 37°19'N, 22°09'E, 02.06.2018, *Kit Tan & G. Vold* obs.; beginning of dirt road to Frankish/Byzantine Castle of Oria (Gardiki), limestone rocks and openings in *Quercus* woodland, 525–550 m, 37°16'N, 22°03'E, 02.06.2018, *Kit Tan & G. Vold* obs.

Phytolaccaceae**348. *Phytolacca americana* L.**

Gr Nomos Arkadias, Eparchia Megalopoleos: Leontari, 9 km S of Megalopolis, roadsides and waste ground, 548 m, 37°19'N, 22°09'E, 02.06.2018, *Kit Tan & G. Vold* obs.

Plumbaginaceae**349. *Plumbago europaea* L.**

Gr Nomos Arkadias, Eparchia Megalopoleos: 1 km from Kalivia on Leontari – Potamia road, roadside slopes, 489 m, 37°46'N, 22°04'E, 02.06.2018, *Kit Tan & G. Vold* obs.

Polygalaceae**350. *Polygala crista-galli* Chodat**

Gr Nomos Arkadias, Eparchia Megalopoleos: 1 km from Kalivia on Leontari – Potamia road,

crevices of rocky limestone slopes, 489 m, 37°46'N, 22°04'E, 02.06.2018, *Kit Tan & G. Vold* 32921.

Rare, few plants observed.

Polygonaceae**351. *Polygonum arenastrum* Boreau**

Gr Nomos Arkadias, Eparchia Megalopoleos: Perivolia, damp meadows, roadsides and clearings in *Quercus* woodland, 420 m, 37°23'N, 22°09'E, 31.05.2018, *Kit Tan & G. Vold* obs.

352. *Rumex pulcher* L.

Gr Nomos Arkadias, Eparchia Megalopoleos: Perivolia, damp meadows, roadsides and clearings in *Quercus* woodland, 420 m, 37°23'N, 22°09'E, 31.05.2018, *Kit Tan & G. Vold* obs.

Primulaceae**353. *Cyclamen hederifolium* Sol. ex Aiton**

Gr Nomos Arkadias, Eparchia Megalopoleos: beginning of dirt road to Frankish/Byzantine Castle of Oria (Gardiki), limestone rocks and openings in *Quercus* woodland, 525–550 m, 37°16'N, 22°03'E, 02.06.2018, *Kit Tan & G. Vold* obs.

Ranunculaceae**354. *Clematis flammula* L.**

Gr Nomos Arkadias, Eparchia Megalopoleos: Voutsaras, ca. 10 km SE of Megalopolis, fields and clearings in *Quercus* woodland, 550 m, 37°19'N, 22°12'E, 01.06.2018, *Kit Tan & G. Vold* obs.; Leontari, 9 km S of Megalopolis, roadsides and waste ground, 548 m, 37°19'N, 22°09'E, 02.06.2018, *Kit Tan & G. Vold* obs.; beginning of dirt road to Frankish/Byzantine Castle of Oria (Gardiki), limestone rocks and openings in *Quercus* woodland, 525–550 m, 37°16'N, 22°03'E, 02.06.2018, *Kit Tan & G. Vold* obs.

Widespread, including at Routsis.

355. *Delphinium hellenicum* Pawł. (Fig. 46)

Gr Nomos Arkadias, Eparchia Megalopoleos: near village of Paparis, 12 km SE of Megalopolis, roadsides and scrub, 670 m, 37°21'N, 22°15'E, 01.06.2018, *Kit Tan & G. Vold* obs.; beginning of dirt road to Frankish/Byzantine Castle of Oria (Gardiki), limestone rocks and openings in *Quercus* woodland, 525–550 m, 37°16'N, 22°03'E, 02.06.2018, *Kit Tan & G. Vold* 32946.

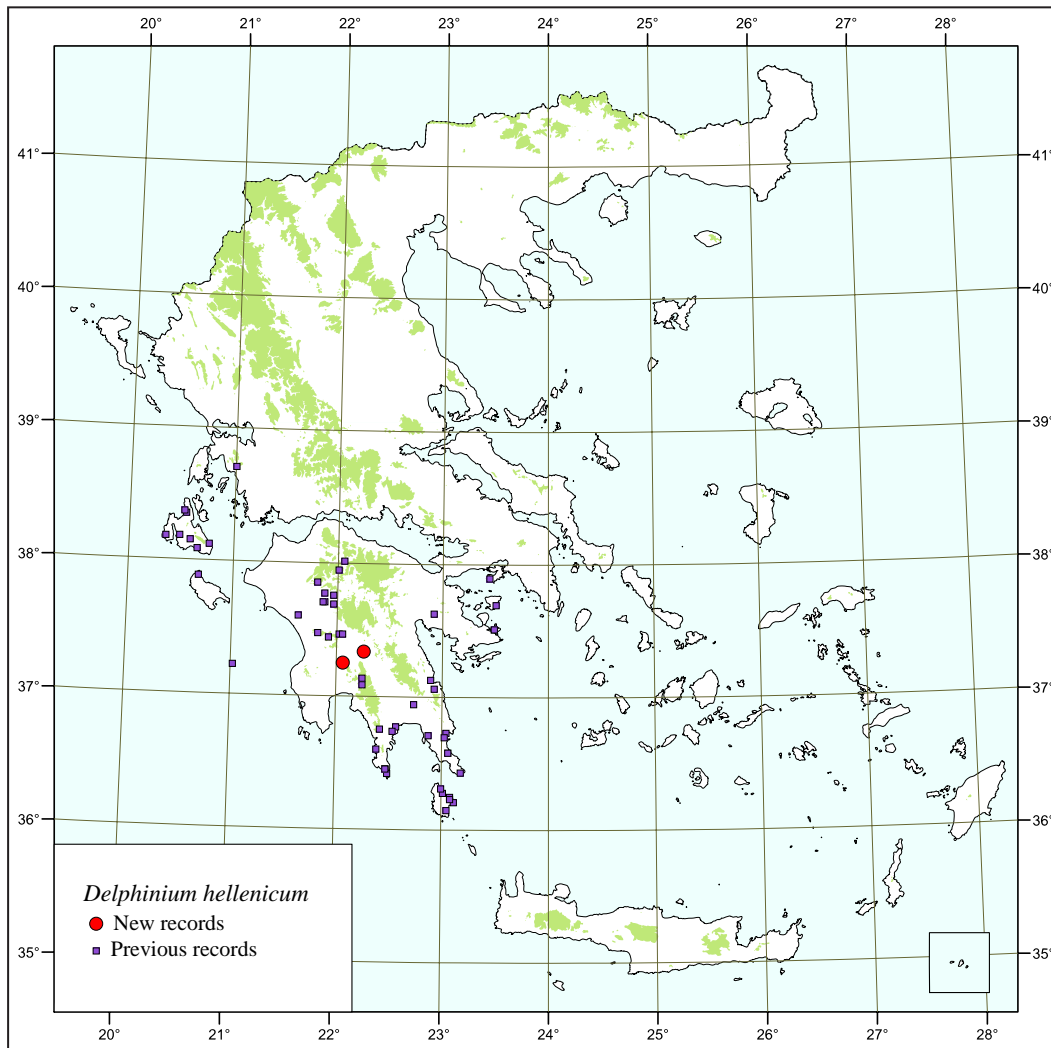


Fig. 46. Distribution of *Delphinium hellenicum* in Greece.

356. *Thalictrum orientale* Boiss.

Gr Nomos Arkadias, Eparchia Megalopoleos: beginning of dirt road to Frankish/Byzantine Castle of Oria (Gardiki), limestone rocks and openings in *Quercus* woodland, 525–550 m, 37°16'N, 22°03'E, 02.06.2018, *Kit Tan & G. Vold* 32967.

Resedaceae

357. *Reseda lutea* L.

Gr Nomos Arkadias, Eparchia Megalopoleos: near village of Papis, 12 km SE of Megalopolis, roadsides and scrub, 670 m, 37°21'N, 22°15'E, 01.06.2018, *Kit Tan & G. Vold* obs.

Rosaceae

358. *Crataegus monogyna* Jacq.

Gr Nomos Arkadias, Eparchia Megalopoleos: near village of Routsis, 8 km SE of Megalopolis, 450 m,

37°21'N, 22°11'E, 01.06.2018, *Kit Tan & G. Vold* obs.; Voutsaras, ca. 10 km SE of Megalopolis, fields and clearings in *Quercus* woodland, 550 m, 37°19'N, 22°12'E, 01.06.2018, *Kit Tan & G. Vold* obs.; Paliochouni to Malliota and Makrysi, 691 m, 37°41'N, 22°16'E, 01.06.2018, *Kit Tan & G. Vold* obs.

Also noted at Athinaio.

359. *Prunus cocomilia* Ten.

Gr Nomos Arkadias, Eparchia Megalopoleos: near village of Routsis, 8 km SE of Megalopolis, 450 m, 37°21'N, 22°11'E, 01.06.2018, *Kit Tan & G. Vold* obs.; Voutsaras, ca. 10 km SE of Megalopolis, fields and clearings in *Quercus* woodland, 550 m, 37°19'N, 22°12'E, 01.06.2018, *Kit Tan & G. Vold* obs.; Leontari, 9 km S of Megalopolis, roadsides and waste ground, 548 m, 37°19'N, 22°09'E, 02.06.2018, *Kit Tan & G. Vold* obs.

360. *Sarcopoterium spinosum* (L.) Spach

Gr Nomos Arkadias, Eparchia Megalopoleos: Perivolia, damp meadows, roadsides and clearings in *Quercus* woodland, 420 m, 37°23'N, 22°09'E, 31.05.2018, *Kit Tan & G. Vold* obs.; Voutsaras, ca. 10 km SE of Megalopolis, fields and clearings in *Quercus* woodland, 550 m, 37°19'N, 22°12'E, 01.06.2018, *Kit Tan & G. Vold* obs.; Leontari, 9 km S of Megalopolis, roadsides and waste ground, 548 m, 37°19'N, 22°09'E, 02.06.2018, *Kit Tan & G. Vold* obs.

Widespread.

Rubiaceae**361. *Asperula boryana* (Walp.) Ehrend.**

Gr Nomos Arkadias, Eparchia Megalopoleos: beginning of dirt road to Frankish/Byzantine Castle of Oria (Gardiki), limestone rocks and openings in *Quercus* woodland, 525–550 m, 37°16'N, 22°03'E, 02.06.2018, *Kit Tan & G. Vold* obs.

362. *Galium murale* (L.) All.

Gr Nomos Arkadias, Eparchia Megalopoleos: beginning of dirt road to Frankish/Byzantine Castle of Oria (Gardiki), limestone rocks and openings in *Quercus* woodland, 525–550 m, 37°16'N, 22°03'E, 02.06.2018, *Kit Tan & G. Vold* obs.

363. *Galium verum* L.

Gr Nomos Arkadias, Eparchia Megalopoleos: Perivolia, damp meadows, roadsides and clearings in *Quercus* woodland, 420 m, 37°23'N, 22°09'E, 31.05.2018, *Kit Tan & G. Vold* obs.; Voutsaras, ca. 10 km SE of Megalopolis, fields and clearings in *Quercus* woodland, 550 m, 37°19'N, 22°12'E, 01.06.2018, *Kit Tan & G. Vold* obs.; near village of Paparis, 12 km SE of Megalopolis, roadsides and scrub, 670 m, 37°21'N, 22°15'E, 01.06.2018, *Kit Tan & G. Vold* obs.;

Widespread, including at Routsis, Athinaio, Leontari and Tourkolekas.

Salicaceae**364. *Populus nigra* L.**

Gr Nomos Arkadias, Eparchia Megalopoleos: Perivolia, damp meadows, roadsides and clearings in *Quercus* woodland, 420 m, 37°23'N, 22°09'E, 31.05.2018, *Kit Tan & G. Vold* obs.

Scrophulariaceae**365. *Scrophularia heterophylla* Willd.**

Gr Nomos Arkadias, Eparchia Megalopoleos: beginning of dirt road to Frankish/Byzantine Castle of Oria (Gardiki), limestone rocks and openings in *Quercus* woodland, 525–550 m, 37°16'N, 22°03'E, 02.06.2018, *Kit Tan & G. Vold* obs.

366. *Verbascum blattaria* L.

Gr Nomos Arkadias, Eparchia Megalopoleos: Perivolia, damp meadows, roadsides and clearings in *Quercus* woodland, 420 m, 37°23'N, 22°09'E, 31.05.2018, *Kit Tan & G. Vold* obs.

Solanaceae**367. *Atropa belladonna* L.**

Gr Nomos Arkadias, Eparchia Megalopoleos: Paliochouni to Malliota and Makrysi, 691 m, 37°41'N, 22°16'E, 01.06.2018, *Kit Tan & G. Vold* obs.

368. *Lycium europaeum* L. (Fig. 47)

Gr Nomos Arkadias, Eparchia Megalopoleos: Leontari, 9 km S of Megalopolis, roadsides and waste ground, 548 m, 37°19'N, 22°09'E, 02.06.2018, *Kit Tan & G. Vold* 32918.

Tiliaceae**369. *Tilia tomentosa* Moench**

Gr Nomos Arkadias, Eparchia Megalopoleos: Athinaio, 10 km E of Megalopolis on way to Paliochouni, planted, 700 m, 37°24'N, 22°15'E, 01.06.2018, *Kit Tan & G. Vold* obs.

Ulmaceae**370. *Celtis australis* L.**

Gr Nomos Arkadias, Eparchia Megalopoleos: near village of Routsis, 8 km SE of Megalopolis, 450 m, 37°21'N, 22°11'E, 01.06.2018, *Kit Tan & G. Vold* obs.

Urticaceae**371. *Urtica dioica* L.**

Gr Nomos Arkadias, Eparchia Megalopoleos: near village of Paparis, 12 km SE of Megalopolis, roadsides and scrub, 670 m, 37°21'N, 22°15'E, 01.06.2018, *Kit Tan & G. Vold* obs.

Valerianaceae

372. *Centranthus ruber* subsp. *sibthorpii* (Boiss.) Hayek

Gr Nomos Arkadias, Eparchia Megalopoleos: Voutsaras, ca. 10 km SE of Megalopolis, fields and clearings in *Quercus* woodland, 550 m, 37°19'N, 22°12'E, 01.06.2018, *Kit Tan & G. Vold* obs.; Leontari, 9 km S of Megalopolis, roadsides and waste ground, 548 m, 37°19'N, 22°09'E, 02.06.2018, *Kit Tan & G. Vold* obs.; beginning of dirt road to Frankish/Byzantine Castle of Oria (Gardiki), limestone rocks and openings in *Quercus* woodland, 525–550 m, 37°16'N, 22°03'E, 02.06.2018, *Kit Tan & G. Vold* obs.

373. *Valeriana italica* Lam.

Gr Nomos Arkadias, Eparchia Megalopoleos: Leontari, 9 km S of Megalopolis, roadsides and waste ground, 548 m, 37°19'N, 22°09'E, 02.06.2018, *Kit Tan & G. Vold* obs.

Verbenaceae

374. *Verbena officinalis* L.

Gr Nomos Arkadias, Eparchia Megalopoleos: Perivolia, damp meadows, roadsides and clearings in *Quercus* woodland, 420 m, 37°23'N, 22°09'E, 31.05.2018, *Kit Tan & G. Vold* obs.

375. *Vitex agnus-castus* L.

Gr Nomos Arkadias, Eparchia Megalopoleos: Grekos, 30 km S-SE of Megalopolis, roadsides and *Quercus* woodland, 560 m, 37°14'N, 22°17'E, 01.06.2018, *Kit Tan & G. Vold* obs.

Veronicaceae

376. *Kickxia elatine* (L.) Dumort.

Gr Nomos Arkadias, Eparchia Megalopoleos: Perivolia, damp meadows, roadsides and clearings in *Quercus* woodland, 420 m, 37°23'N, 22°09'E, 31.05.2018, *Kit Tan & G. Vold* obs.

377. *Kickxia spuria* (L.) Dumort.

Gr Nomos Arkadias, Eparchia Megalopoleos: Perivolia, damp meadows, roadsides and

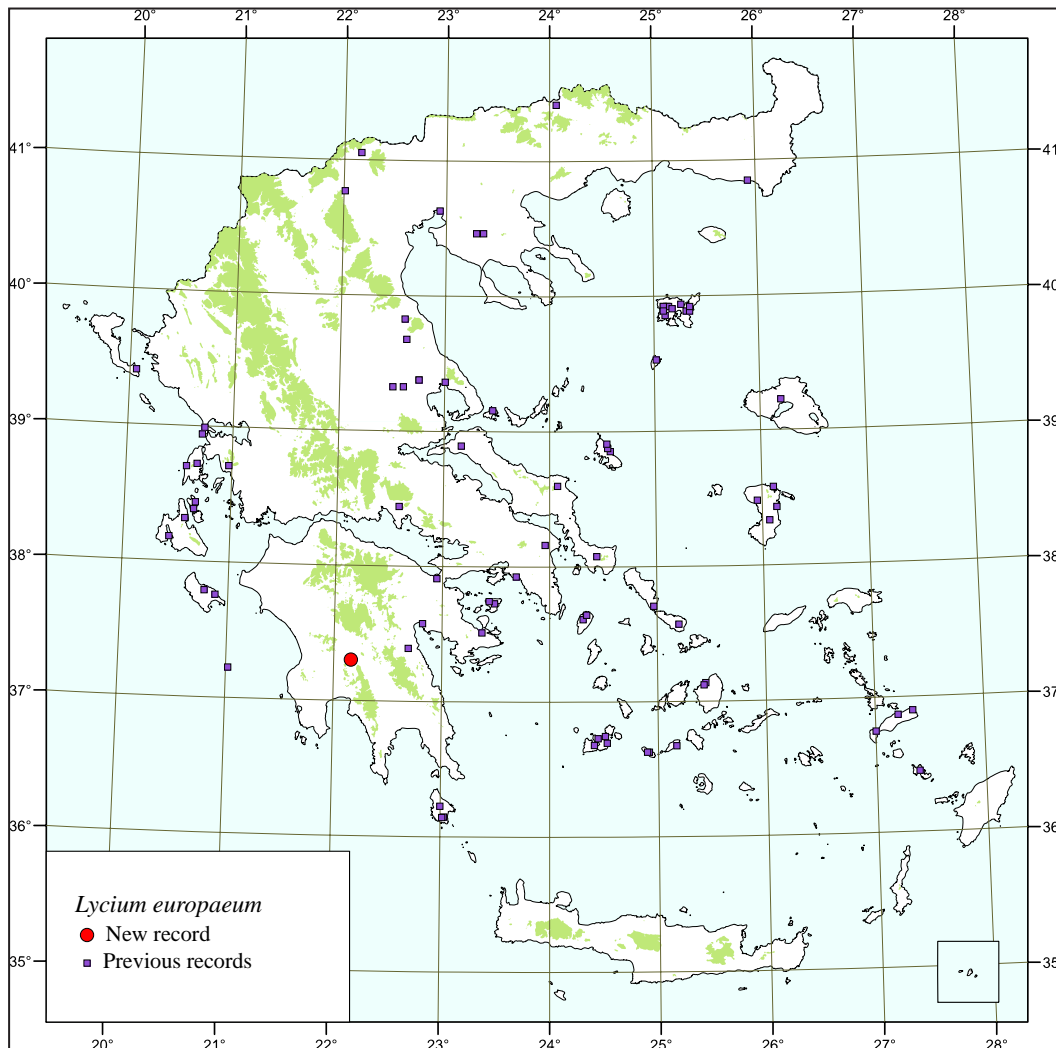


Fig. 47. Distribution of *Lycium europaeum* in Greece.

clearings in *Quercus* woodland, 420 m, 37°23'N, 22°09'E, 31.05.2018, *Kit Tan & G. Vold* obs.

Quercus woodland, 525–550 m, 37°16'N, 22°03'E, 02.06.2018, *Kit Tan & G. Vold* obs.

Alliaceae

378. *Allium ampeloprasum* L.

Gr Nomos Arkadias, Eparchia Megalopoleos: Perivolia, damp meadows, roadsides and clearings in *Quercus* woodland, 420 m, 37°23'N, 22°09'E, 31.05.2018, *Kit Tan & G. Vold* obs.

379. *Allium sphaerocephalon* L.

Gr Nomos Arkadias, Eparchia Megalopoleos: Perivolia, damp meadows, roadsides and clearings in *Quercus* woodland, 420 m, 37°23'N, 22°09'E, 31.05.2018, *Kit Tan & G. Vold* obs.

Asparagaceae

380. *Asparagus acutifolius* L.

Gr Nomos Arkadias, Eparchia Megalopoleos: Perivolia, damp meadows, roadsides and clearings in *Quercus* woodland, 420 m, 37°23'N, 22°09'E, 31.05.2018, *Kit Tan & G. Vold* obs.; Voutsaras, ca. 10 km SE of Megalopolis, fields and clearings in *Quercus* woodland, 550 m, 37°19'N, 22°12'E, 01.06.2018, *Kit Tan & G. Vold* obs.; near village of Paparis, 12 km SE of Megalopolis, roadsides and scrub, 670 m, 37°21'N, 22°15'E, 01.06.2018, *Kit Tan & G. Vold* obs.

Also noted at Grekos and Skortsinos.

Asphodelaceae

381. *Asphodelus ramosus* L.

Gr Nomos Arkadias, Eparchia Megalopoleos: Perivolia, damp meadows, roadsides and clearings in *Quercus* woodland, 420 m, 37°23'N, 22°09'E, 31.05.2018, *Kit Tan & G. Vold* obs.; Skortsinos, 15 km SE of Megalopolis, roadsides, 537 m, 37°19'N, 22°14'E, 01.06.2018, *Kit Tan & G. Vold* obs.; near village of Paparis, 12 km SE of Megalopolis, roadsides and scrub, 670 m, 37°21'N, 22°15'E, 01.06.2018, *Kit Tan & G. Vold* obs.

Widespread, noted in several localities including at Routsis, Grekos, Voutsaras, Athinaio, Paliouchouni, Malliota and Leontari.

Dioscoreaceae

382. *Tamus communis* L.

Gr Nomos Arkadias, Eparchia Megalopoleos: beginning of dirt road to Frankish/Byzantine Castle of Oria (Gardiki), limestone rocks and openings in

Poaceae

383. *Andropogon distachyos* L.

Gr Nomos Arkadias, Eparchia Megalopoleos: Voutsaras, ca. 10 km SE of Megalopolis, fields and clearings in *Quercus* woodland, 550 m, 37°19'N, 22°12'E, 01.06.2018, *Kit Tan & G. Vold* obs.

384. *Briza humilis* M. Bieb.

Gr Nomos Arkadias, Eparchia Megalopoleos: Perivolia, damp meadows, roadsides and clearings in *Quercus* woodland, 420 m, 37°23'N, 22°09'E, 31.05.2018, *Kit Tan & G. Vold* obs.

385. *Briza minor* L.

Gr Nomos Arkadias, Eparchia Megalopoleos: Perivolia, damp meadows, roadsides and clearings in *Quercus* woodland, 420 m, 37°23'N, 22°09'E, 31.05.2018, *Kit Tan & G. Vold* obs.

386. *Bromus squarrosus* L.

Gr Nomos Arkadias, Eparchia Megalopoleos: Perivolia, damp meadows, roadsides and clearings in *Quercus* woodland, 420 m, 37°23'N, 22°09'E, 31.05.2018, *Kit Tan & G. Vold* obs.

387. *Hordeum bulbosum* L.

Gr Nomos Arkadias, Eparchia Megalopoleos: Perivolia, damp meadows, roadsides and clearings in *Quercus* woodland, 420 m, 37°23'N, 22°09'E, 31.05.2018, *Kit Tan & G. Vold* obs.

388. *Piptatherum miliaceum* (L.) Cosson

Gr Nomos Arkadias, Eparchia Megalopoleos: Perivolia, damp meadows, roadsides and clearings in *Quercus* woodland, 420 m, 37°23'N, 22°09'E, 31.05.2018, *Kit Tan & G. Vold* obs.; beginning of dirt road to Frankish/Byzantine Castle of Oria (Gardiki), limestone rocks and openings in *Quercus* woodland, 525–550 m, 37°16'N, 22°03'E, 02.06.2018, *Kit Tan & G. Vold* obs.

Smilacaceae

389. *Smilax aspera* L.

Gr Nomos Arkadias, Eparchia Megalopoleos: beginning of dirt road to Frankish/Byzantine Castle of Oria (Gardiki), limestone rocks and openings in *Quercus* woodland, 525–550 m, 37°16'N, 22°03'E, 02.06.2018, *Kit Tan & G. Vold* obs.

Acknowledgements. We are grateful to the Velux Foundation, Denmark for supporting our fieldwork.

Reports 390–391

Vladimir Vladimirov^{1, 2}, Svetlana Bancheva¹ & Malina Delcheva¹

¹ Institute of Biodiversity and Ecosystem Research, Bulgarian Academy of Sciences, Acad. Georgi Bonchev St., bl. 23, 1113 Sofia, Bulgaria, e-mail: vladimir_dv@abv.bg (author for correspondence)

² Faculty of Forestry, University of Forestry, 10 Kliment Ohridski Blvd., 1797 Sofia, Bulgaria

Orchidaceae

390. *Anacamptis coriophora* (L.) R.M. Bateman, Pridgeon & M.W. Chase × *A. morio* (L.) R.M. Bateman, Pridgeon & M.W. Chase [syn. *Orchis coriophora* L. × *O. morio* L.] (Fig. 48)

Bu Rhodopi Mts (Western): Mt Dabrash, in montane meadows on the right side of the road from Satovcha village to Dospat town, near hotel Dabrash (NE of Osina village), 1260 m,



Fig. 48. *Anacamptis coriophora* × *A. morio*, Western Rhodopi Mts, Bulgaria (photo V. Vladimirov).

ca. 41.642955°N, 24.082915°E, 03.07.2015, V. Vladimirov obs.

This is a first report of this hybrid for the Bulgarian flora. The species is also known under the name *Anacamptis ×olida* (Bréb.) H. Kretzschmar, Eccarius & H. Dietr. [syn. *Orchis ×olida* Bréb.] (e.g. Perko 1994; Kretzschmar & al. 2007). Only a single hybrid plant was noticed at the locality. Both parental species are rather common in the Bulgarian flora. *Anacamptis morio* usually flowers a bit earlier than *A. coriophora*. However, higher in the mountains and in years with unusual whether or climatic anomalies, overlapping of the flowering time of both species occurs and then hybridization is possible. In this particular year, at the date of the visit of the locality, the hybrid plant was in full bloom, so were the specimens of *A. coriophora*, whereas the flowers of *A. morio* had already gone. According to Delforge (2006), hybrids between *A. coriophora* and *A. morio* are extremely rare.

391. *Gymnadenia conopsea* s.l. × *G. rhellicani* (Teppner & E. Klein) Teppner & E. Klein (Fig. 49)

Bu Mt Slavyanka: in subalpine grassland N-NE of peak Gotsev (2212 m), 2100–2150 m, ca. 41.378432°N, 23.621131°E, 13.07.2016, V. Vladimirov, S. Bancheva & M. Delcheva obs.

This is a first report of this hybrid for the Bulgarian flora. At least five plants were noted, growing together with both parental species. *Gymnadenia conopsea* s.l. was represented by an abundant population comprising a few thousand flowering plants. The plants were relatively big in size and with dense inflorescences and probably belonged to *G. densiflora* (Wahlenb.) A. Dietr. (Fig. 50), which is considered by some authors a separate species (e.g. Stark & al. 2011), whereas other consider it an infraspecific taxon of *G. conopsea* (e.g. Delforge 2006).

The population of *G. rhellicani* (Fig. 51) was smaller, of about one thousand individuals. Both parental species and the hybrids were in full bloom. The flowers of the hybrid plants had strong and very pleasant odor (somewhat reminding of vanilla), and intermediate colour – dark magenta – between the two parental species (pink in *G. conopsea* and blackish-purple in *G. rhellicani*). According to Delforge (2006), this is one of the most common hybrid combinations within *Gymnadenia*. In most cases, the plants of *G. conopsea* s.l. serve as the mother plant, whereas those of *G. rhellicani* donate the pollen. However, a combination vice-versa has been reported too (Hedrén & al. 2018).



Fig. 49. *Gymnadenia conopsea* s.l. × *G. rhellicani*, three different specimens in Mt Slavyanka, Bulgaria (photo V. Vladimirov).



Fig. 50. *Gymnadenia conopsea* s.l., Mt Slavyanka, Bulgaria (photo V. Vladimirov).



Fig. 51. *Gymnadenia rhellicani*, Mt Slavyanka, Bulgaria (photo V. Vladimirov).

Acknowledgements. Special thanks are due to Dr. Antoaneta Petrova (Botanical Garden of the Bulgarian Academy of Sciences, So-

fia) for confirming the determination of the hybrids and for providing information about the known hybrid orchids in the Bulgarian flora.

Report 392

Vladimir Vladimirov^{1, 2} & Zbigniew Szelaĝ³

¹ Institute of Biodiversity and Ecosystem Research, Bulgarian Academy of Sciences, Acad. Georgi Bonchev St., bl. 23, 1113 Sofia, Bulgaria, e-mail: vladimir_dv@abv.bg (author for correspondence)

² Faculty of Forestry, University of Forestry, 10 Kliment Ohridski Blvd., 1797 Sofia, Bulgaria

³ Institute of Biology, Pedagogical University of Cracow, Podchorążych 2, 30-084 Kraków, Poland

Orchidaceae

392. *Gymnadenia conopsea* (L.) R. Br. × *G. rhellicani* (Teppner & E. Klein) Teppner & E. Klein (Fig. 52)

Gr Nomos & Eparchia Dramas: Mt Falakro, subalpine pasture below the uppermost station of the ski lift, ca. 2050–2100 m, limestone, ca. 41.29933°N, 24.07975°E, 20.07.2016, V. Vladimirov (photo) & Z. Szelaĝ obs.

A first report of this hybrid for the mountain. At least three plants were noted, growing together with both parental species. *Gymnadenia conopsea* was represented



Fig. 52. *Gymnadenia conopsea* × *G. rhellicani* (magenta-flowered), growing together with the parental species *G. conopsea* (pink-flowered).

by an abundant population comprising a few thousand flowering plants, whereas *G. rhellicani* was represented by a few hundred individuals. Both parental species were in full bloom, as were the two hybrid specimens. The hybrids are easily distinguished even from a distance by their dark magenta flowers, unlike the pale pink or blackish-purple ones of the two parents. According to Delforge (2006) this is one of the most frequent hybrid-combinations within the genus *Gymnadenia*.

Reports 393–397

George Zarkos¹, Vasilis Christodoulou², Kit Tan³ & Gert Vold⁴

¹ Kolokotroni 37A, Kiato, 202 00, Korinthias, Greece

² Apellou sidestreet, Kiato, 202 00, Korinthias, Greece

³ Institute of Biology, University of Copenhagen, Øster Farimagsgade 2D, DK-1353 Copenhagen K, Denmark, e-mail: kitt@bio.ku.dk (author for correspondence)

⁴ State Natural History Museum, Øster Farimagsgade 2C, DK-1353 Copenhagen K, Denmark

The following are new plant records based on floristic investigations in the prefectures of Korinthias and Arkadias in north and central Peloponnese. A diagonal running from the NE to the SW of the peninsula still represents an under-explored area.

Apiaceae

393. *Seseli aroanicum* Hartvig (Fig. 53)

Gr Nomos & Eparchia Korinthias: west side of Mt Killini (Ziria), in crevices of vertical limestone



Fig. 53. *Seseli aroanicum* (photo G. Zarkos).

cliffs, 1216 m, 37°58'N, 22°21'E, 21.07.2014, *Zarkos* obs.; *loc. ibid.*, 1616 m, 37°53'N, 22°21'E & 1402 m, 37°54'N, 22°21'E, 30.08.2015, *Zarkos* obs.; 1374 m, 37°54'N, 22°21'E, 16.09.2015, *Zarkos* obs.; Farmakila, 1817 m, 37°55'N, 22°23'E, 22.05.2017, *Zarkos* & *Christodoulou* obs.; east side of Mt Killini, Zastano, 1671 m, 37°53'N, 22°25'E, 22.05.2017, *Zarkos* & *Christodoulou* obs.; *loc. ibid.*, 1191 m, 37°53'N, 22°26'E, 16.08.2017, *Zarkos* obs.

— Summit of Stavraetos, near Psari village east of Lake Stymfalia, vertical limestone cliffs, 1056 m, 37°51'N, 22°30'E, 09.11.2017, *Zarkos* obs.; *loc. ibid.*, 03.06.2018, *Zarkos* & *Christodoulou* obs. (sterile leaf rosettes only).

Endemic to the Peloponnese, recorded from Mts Erimanthos, Kallifoni, Chelmos and Killini, the latter a first report for Korinthias. Only two flowering plants were noted in August 2015; since then, several new localities with numerous plants have been discovered which are duly reported here.

Asteraceae

394. *Galinsoga quadriradiata* Ruiz & Pav. (Fig. 54)

Gr Nomos Arkadias, Eparchia Kinourias: Mt Parnon, Sitena to Platanos, roadside slopes, 500–580 m, 37°19'N, 22°39'E, 13.04.2005, *Kit Tan* & *G. Vold* obs.; along the road from Kastanitsa to Sitena, 880 m, 37°15'N, 22°38'E, 27.10.2018, *Zarkos* & *Christodoulou* obs.

New for Parnonas, nomos and eparchia. In the Peloponnese, *G. quadriradiata* has only been reported from Nomos Messinias, eparchia Kalamon.

Fabaceae

395. *Lathyrus nissolia* L. (Fig. 55)

Gr Nomos & Eparchia Korinthias: Boutsis, Mt Killini, in abandoned fields at the edge of forest, 1192 m, 37°59'N, 22°24'E, 17.05.2018, *Zarkos* obs.

New for Mt Killini, nomos and eparchia Korinthias, easily recognized by its long slender peduncles shorter than leaves. In the Peloponnese reported from vicinity of Erimanthos, Chelmos and Parnonas.

Orobanchaceae

396. *Odontites vulgaris* Moench (Fig. 56)

Gr Nomos Arkadias, Eparchia Kinourias: Mt Parnon, along the road from Astros to Kastanitsa, near village of Kastanitsa, 790 m, 37°16'N, 22°39'E, 27.10.2018, flowering and fruiting, *Zarkos* & *Christodoulou* obs.

New for eparchia and first report for mountain range Parnonas. It is common in the Taigetos range.

Rubiaceae

397. *Galium laconicum* Boiss. & Heldr. (Fig. 57)

Gr Nomos Arkadias, Eparchia Kinourias: Mt Parnon, along the road from Kastanitsa to



Fig. 54. *Galinsoga quadriradiata* (A, photo V. Christodoulou; B & C, photo G. Zarkos).



Fig. 55. *Lathyrus nissolia* (photo G. Zarkos).



Fig. 56. *Odontites vulgaris* (photo V. Christodoulou).

Sitena, near village of Kastanitsa, 880 m, 37°15'N, 22°38'E, 27.10.2018, flowering, Zarkos & Christodoulou obs.

Orphanidis collected this species on Parnonas in July 1870, “in m. Malevo Laconiae in castanetis prope Kastanitzza” and the type was based on a gathering by Heldreich also from the same area. Our plants are surprisingly late-flowering (end of October, see photo). Although the species was described from the vicinity of Kastanitsa in the Peloponnese, there is only one other report from this floristic region, viz., from Mt Killini (Halácsy 1901: 708) which locality was confirmed by Kit Tan, G. Vold and G. Zarkos in June 2016. There are however, numerous reports of *G. laconicum* from mainland Greece, further to the north.



Fig. 57. *Galium laconicum* (A, photo G. Zarkos; B & C, photo V. Christodoulou).

Reports 398–401

Ivan Kostadinov¹, Svetla Dalakchieva^{2, 3} & Konstantin Popov³

¹ 14, Stoyan Papazov Str., 8800 Sliven, Bulgaria, e-mail: vankich1@abv.bg

² University “Prof. d-r Asen Zlatarov” – Burgas, 1, Prof. Dr. Yakimov Blvd., 8010, Burgas, Bulgaria, e-mail: s.dalakchieva@gmail.com

³ One nature NGO, K-s Lazur, bl. 114, Burgas, Bulgaria

Orchidaceae

398. *Dactylorhiza incarnata* (L.) Soó

Bu Balkan Range (*Eastern*): wet meadows on both sides of the road Sliven – Elena, between Maisko village and Konstantin village, 400 m, MH25, 42°56'25.5"N, 26°06'51.2"E, 42°56'08.8"N, 026°07'58.0"E & 42°56'49"N, 26°05'04"E, 17.05.2018, S. Dalakchieva & K. Popov obs. (Fig. 58).

— Mt Strandzha: a lowland wet meadow around a marshy area near Bliznak village, NG26, 42°11.938N, 27°17.700E, 13.05.2017 & 28.05.2017, S. Dalakchieva & K. Popov obs.

An Endangered species in Bulgaria (Petrova 2009), distributed mainly in the western and central part of the country (Petrova 2015). New species for Mt Strandzha

floristic region (Uzunova & Uzunov 2005; Assyov & Petrova 2012). The locality near Konstantin village is the second documented for the Eastern Balkan Range subregion.

The population between Maisko and Konstantin villages, in the Balkan Range, numbers more than 1000 individuals. It is divided in two numerous subpopulations of several hundreds and three smaller subpopulations of several dozens of specimens.

The population near Bliznak village in Mt Strandzha numbers about 400 specimens. The plants in this isolated population are with quite pale flowers (Fig. 59). The meadow is not managed nowadays and this is a potential threat to the habitat and the population. The population was visited again in July 2017 when a good fruit set was observed.

399. *Epipactis exilis* P. Delforge

Bu Balkan Range (*Central*): North of Karlovo, Stara reka reserve, near Balkan Roses hut, LH23, 42°42'22.20"N, 24°50'6.60"E, 1290 m, 10.08.2017, I. Kostadinov, K. Popov, S. Dalakchieva obs. (Fig. 60).

Epipactis exilis is a rare species with sporadic distribution, evaluated as Endangered for Bulgaria (Petrova 2009). This is the second reported locality in the



Fig. 58. *Dactylorhiza incarnata*, Balkan Range (*Eastern*), near Konstantin village, 17.05.2018. a. the habitat, b. inflorescence (photo K. Popov).



Fig. 59. *Dactylorhiza incarnata*, Mt Strandzha, near Bliznak village, 13.05.2017 (photo K. Popov).

region (Petrova & Venkova 2008). A population of 8 individuals was observed in a beech (*Fagus sylvatica*) forest on south facing slope with inclination of 10° to 45°. The same number of plants was observed on the 15.07.2018.

400. *Epipactis purpurata* Sm.

Bu Balkan Range (*Eastern*): Sinite kamani Nature Park, Sliven district, in a forest of *Fagus sylvatica* facing southwards, 1065 m, 42°44'58.80"N, 26°20'32.15"E, 30.07.2017, I. Kostadinov, K. Popov, S. Dalakchieva obs. (Fig. 61).

A new region for this species (Assyov & Petrova 2012; Petrova & al. 2012), which has a local distribution and is evaluated as Endangered in Bulgaria (Petrova 2009, 2015). On an area of 0.5 ha, 16 plants were scattered. The population was observed again in 2018, the number of individuals remains the same.



Fig. 60. *Epipactis exilis*, Balkan Range (*Central*), 15.07.2018 (photo I. Kostadinov).

401. *Neotinea × dietrichiana* (Bogenh.) H.

Kretzschmar, Eccarius & H. Dietr. (= *N. tridentata* × *N. ustulata*)

Bu Rhodopi Mts (*Central*): south of Trigrad village, Smolyan district, KG80, 27.05.2018, K. Popov & I. Kostadinov obs. (Fig. 62).

A new orchid hybrid for Bulgaria. Djordjević & al. (2012) summarize that this hybrid is reported from

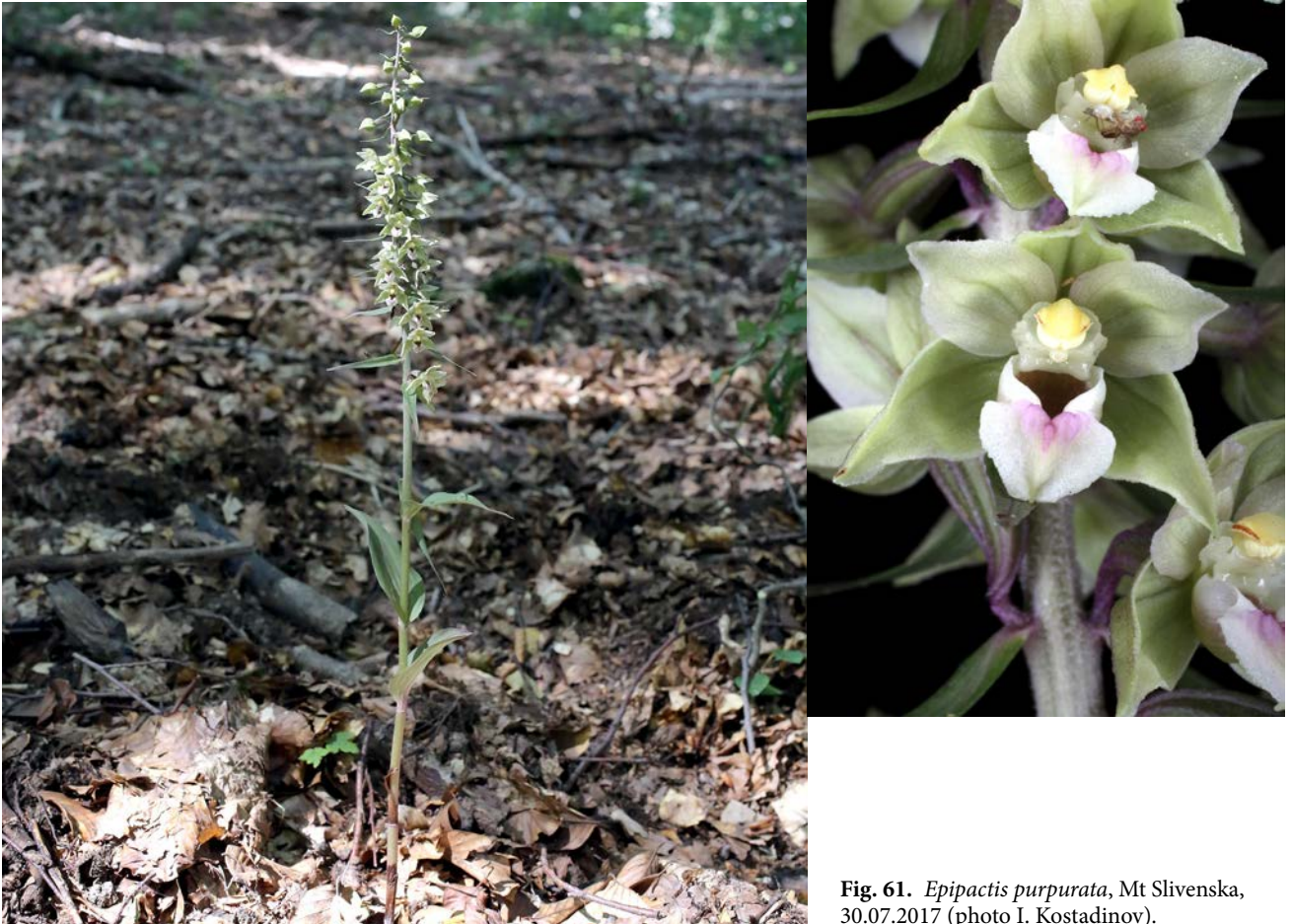


Fig. 61. *Epipactis purpurata*, Mt Slivenska, 30.07.2017 (photo I. Kostadinov).



Fig. 62. *Neotinea tridentata* (1), *N. x dietrichiana* (2), *N. ustulata* (3), south of Trigrad village, Rhodopi Mts, 27.05.2018 (photo I. Kostadinov).

more than 10 countries in Europe, among them Bosnia-Herzegovina, Croatia, Greece, Serbia in the Balkan Peninsula.

About 10 hybrid individuals were observed in a mountain meadow with a SE exposition. Accompanying species were *Festuca* sp., *Trifolium* sp., *Primula veris*, *Linum capitatum*, *Geum coccineum*, *Globularia aphyllanthes*, *Veronica austriaca*, *Polygala major*, *Euphorbia cyparissias*, *Plantago media*, *Ribes uva-crispa*, *Rosa* sp. Other orchid species found there were *Anacamptis coriophora* and *Neottia nidus-avis* at the margins of the meadow. Considering the abundance of the parental species, *N. tridentata* is more abundant than *N. ustulata*.

Acknowledgements. We are grateful to Dr. Antoaneta Petrova for the regular consultations for orchids and for the inspiration to publish our observations. The data for *D. incarnata* were collected during the work on the project BG-TR-CBC/025, CB005.1.12.025 "ORCHIS – orchids researches, conservation and habitats in Strandzha".

References

- Adamowski, W.** 2009. *Impatiens balfourii* as an emerging invader in Europe. – In: **Pyšek, P. & Pergl, J.** (eds), Biological invasions: towards a synthesis. – *NeoBiota*, **8**: 183-194.
- Ančev, M.** 2007. Catalogue of the family *Brassicaceae* (*Cruciferae*) in the flora of Bulgaria. – *Phytol. Balcan.*, **13**(2): 153-178.
- Anchev, M.** 1992. *Brassicaceae*. – In: **Kozuharov, S.** (ed.), Field Guide to the Vascular Plants in Bulgaria, pp. 245-278. Nauka & Izkustvo, Sofia (in Bulgarian).
- Andreev, N.** 1994. *Pimpinella*. – In: **Kozuharov, S.** (ed.), Field Guide to the Vascular Plants in Bulgaria, p. 121. Nauka & Izkustvo, Sofia (in Bulgarian).
- Andrews, M., Maule, H.G., Hodge, S. Cherrill, A. & Raven J.** 2009. Seed dormancy, nitrogen nutrition and shade acclimation of *Impatiens glandulifera*: implications for successful invasion of deciduous woodland. – *Pl. Ecol. Divers.*, **2**: 145-153.
- Apostolova, I. & Petrova, A.** 2009. *Merendera sobolifera*. – In: **Petrova, A. & Vladimirov, V.** (eds), Red List of Bulgarian vascular plants. – *Phytol. Balcan.*, **15**(1): 85.
- Asenov, I.** 1982. *Pimpinella*. – In: **Velčev, V.** (ed.), Fl. Reipubl. Popularis Bulgariae. Vol. **8**, pp. 148-157. In Aedibus Acad. Sci. Bulgariae, Serdicae (in Bulgarian).
- Assyov, B. & Petrova, A.** (eds). 2012. Conspectus of the Bulgarian Vascular Flora. Distribution Maps and Floristic Elements. Ed. 4. Bulgarian Biodiversity Foundation, Sofia.
- Balogh, L.** 2008. Japanese, giant and Bohemian knotweed (*Fallopia japonica*, *Fallopia sachalinensis* and *Fallopia ×bohemica*). – In: **Botta-Dukat, Z. & Balogh, L.** (eds), The Most Important Invasive Plants in Hungary, pp. 13-33. Institute of Ecology and Botany, Hungarian Academy of Sciences.
- Barina, Z., Pifkó, D. & Rakaj, M.** 2015. Contributions to the flora of Albania, 5. – *Studia Bot. Hung.*, **46**(2): 119-140.
- Bergman, B., Draleva, S. & Uzunov, S.** 2004. *Ophrys reinholdii* (*Orchidaceae*), a new species for the flora of Bulgaria. – *Phytol. Balcan.*, **10**(2-3): 175-177.
- Botta-Dukat, Z. & Dancza, I.** 2008. Giant and Canadian goldenrod (*Solidago gigantea* Ait., *S. canadensis* L.). – In: **Botta-Dukat, Z. & Balogh, L.** (eds), The Most Important Invasive Plants in Hungary, pp. 167-177. Institute of Ecology and Botany, Hungarian Academy of Sciences.
- Chamberlain, D.F.** 1978. *Anchusa*. – In: **Davis, P.H.** (ed.), Flora of Turkey and the East Aegean Islands. Vol. **6**, pp. 393-394. Univ. Press, Edinburgh.
- Cheshmedzhiev, I.** 2011. *Scrophulariaceae*. – In: **Delipavlov, D. & Cheshmedzhiev, I.** (eds), Key to the Plants of Bulgaria. Pp. 343-363. Agrarian Univ. Acad. Press, Plovdiv (in Bulgarian).
- Cozzolino, S., Nardella, A.M., Impagliazzo, S., Widmer, A. & Lexer, C.** 2006. Hybridization and conservation of Mediterranean orchids: Should we protect the orchid hybrids or the orchid hybrid zones? – *Biol. Conservation*, **129**(1): 14-23.
- Critchfield, W.B. & Little, E.L.Jr.** 1966. Geographic Distribution of the Pines of the World. USDA, Miscellaneous Publication 991, Washington.
- Cullen, J.** 1975. *Artemisia*. – In: **Davis, P.H.** (ed.), Flora of Turkey and the East Aegean Islands. Vol. **5**, p. 318. Univ. Press, Edinburgh.
- Davis, P.H. & Shepherd, G.J.** 1978. *Kickxia*. – **Davis, P.H.** (ed.), Flora of Turkey and the East Aegean Islands. Vol. **6**, p. 677. Univ. Press, Edinburgh.
- Davis, P.H.** 1978. *Linaria*. – In: **Davis, P.H.** (ed.), Flora of Turkey and the East Aegean Islands. Vol. **6**, pp. 669-672. Univ. Press, Edinburgh.
- Delforge, P.** 2006. Orchids of Europe, North Africa and the Middle East. A. & C. Black Publ., London.
- Delipavlov, D. & Cheshmedzhiev, I.** (eds). 2011. Key to the Plants in Bulgaria. Agrarian Univ. Acad. Press, Plovdiv (in Bulgarian).
- Dihoru, G. & Negrean, G.** 2009. The Red Book of Vascular Plants in Romania [Cartea roșie a plantelor vasculare din România]. Editura Academiei Române, București (in Rumanian).
- Dimitrov, D. & Vutov, V.** 2017. Reports 72-93. – In: **Vladimirov, V. & al.** (comp.), New floristic records in the Balkans: 31. – *Phytol. Balcan.* **23**(3): 419-421.
- Djordjević, V., Tsiftsis, S., Jakovljević, K., Šinžar-Sekulić, J. & Vukojičić, S.** 2012. First record of a natural hybrid *Neotinea × dietrichiana* (*Orchidaceae*) in Serbia. – *Phytol. Balcan.*, **18**(2): 163-171.
- Ekim, T., Koyuncu, M., Vural, M., Duman, H., Aytaç, Z. & Adigüzel, N.** (eds). 2000. Red Data Book of Turkish Plants (*Peridophyta* and *Spermatophyta*), p. 162. Türkiye Tabiatı Koruma Derneği & Van Yüzüncü Yıl Uni. Pres, Ankara.
- Filep, R., Pál, R.W., Balázs, V.L., Mayer, M., Nagy, D.U., Cook, B.J., Farkas, Á.** 2016. Can seasonal dynamics of allelochemicals play a role in plant invasions? A case study with *Helianthus tuberosus* L. – *Pl. Ecol.*, **217**(12): 1489-1501.
- Fremstad, E. & Elven, R.** 2004. Perennial lupins in Fennoscandia. – In: **van Santen, E. & Hill, G.D.** (eds), Wild and Cultivated Lupins

- from the Tropics to the Poles. Proceedings of the 10th International Lupin Conference, Laugarvatn, Iceland, 19–24 June 2002. Pp. 178–183. International Lupin Association, Canterbury, New Zealand.
- Gausсен, H., Heywood, V.H. & Chater, A.O.** 1964. *Pinus*. – In: **Tutin, T.G. & al.** (eds), *Flora Europaea*. Vol. 1, pp. 32–36. Cambridge Univ. Press, Cambridge.
- Gramatikov, D.** 1992. Key to the Trees and Shrubs in Bulgaria. IntelSis, Plovdiv (in Bulgarian).
- Grierson, A.J.C.** 1975. *Erigeron*. – In: **Davis, P.H.** (ed.), *Flora of Turkey and the East Aegean Islands*. Vol. 5, pp. 127–128. Univ. Press, Edinburgh.
- Grozeva N. & Petkov B.** 2013. Reports 98–102. – In: **Vladimirov, V. & al.** (comp.), *New floristic records in the Balkans*: 21. – *Phytol. Balcan.*, **19**(1): 142–143.
- Halácsy, E.v.** 1901. *Conspectus Florae Graecae*. Vol. 1. Leipzig: Engelmann.
- Hayek, A.v.** 1924. *Prodromus Florae Peninsulae Balcanicae*. Vol. 1 (first part). – *Repert. Spec. Nov. Regni Veg.*, **30**: i–ix + 1–352.
- Hedrén, M., Lorenz, R. & Ståhlberg, D.** 2018. Evidence for bidirectional hybridization between *Gymnadenia* and *Nigritella*. – *J. Eur. Orch.*, **50**(1): 43–60.
- Hoste, I., Verloove, F., Nagels, C., Andriessen, L. & Lambinon, J.** 2009. Alien plant species associated with the importation of Mediterranean container plants to Belgium [De adventievenflora van in België ingevoerde mediterrane containerplanten]. – *Dumortiera*, **97**: 1–16. [http://www.br.fgov.be/DUMORTIERA/DUM_97/].
- Kuzmanov, B.** 1979. *Euphorbiaceae*. – In: **Jordanov, D.** (ed.), *Fl. Reipubl. Popularis Bulgaricae*. Vol. 7, pp. 110–177. In Aedibus Acad. Sci. Bulgaricae, Serdicae (in Bulgarian).
- Kretzschmar, H., Eccarius, W. & Dietrich, H.** 2007. The Orchid Genera *Anacamptis*, *Orchis* and *Neotinea*. Phylogeny, Taxonomy, Morphology, Biology, Distribution, Ecology and Hybridisation. EchinoMedia.
- Matchutadze, I., Bakuradze, T., Tcheishvil, T. & Bolkvadze, B.** 2015. Vegetation of Colchis Mires. – *Earth Sciences*, **4**(5–1): 73–78.
- Meusel, H. & Kastner, A.** 1975. *Carlina*. – In: **Davis, P.H.** (ed.), *Flora of Turkey and the East Aegean Islands*. Vol. 5, p. 599. Univ. Press, Edinburgh.
- Panitsa, M. & Tzanoudakis, D.** 2001. Contribution to the study of the Greek flora: Flora and phytogeography of Lipsi and Arki islet groups (East Aegean area, Greece). – *Folia Geobot.*, **36**: 265–279.
- Panitsa, M., Dimopoulos, P., Iatrou, G. & Tzanoudakis, D.** 1994. Contribution to the study of the Greek flora: Flora and vegetation of the Enousses (Oinousses) islands (E. Aegean area). – *Flora*, **189**: 367–374.
- Parris, B.S.** 1978. *Convolvulus*. – In: **Davis, P.H.** (ed.), *Flora of Turkey and the East Aegean Islands*. Vol. 6, pp. 214–215. Univ. Press, Edinburgh.
- Pavlova, D., Kožuharova, E. & Dimitrov, D.** 2002. New chorological data for the flora of the Eastern Rhodopes Mountains. – *God. Sofiisk. Univ. "Kliment Ohridski" Biol. Fak.*, **90**(2): 79–90.
- Peev, D. & Tsoneva, S.** 2015. *Centaureum maritimum*. – In: **Peev, D. & al.** (eds), *Red Data Book of the Republic of Bulgaria*. Vol. 1. Plants and Fungi, p. 212. BAS & MOEW, Sofia.
- Perko, M.** 1994. *Orchis xolida* Breb. (*Orchis coriophora* L. × *Orchis morio* L.) (*Orchidaceae*) – neu für Kärnten. – *Naturwissenschaftlicher Verein für Kärnten, Austria*, **184/104**: 21–217.
- Petrova, A.** 2004. Flora of the Eastern Rhodopes (Bulgaria) and its Conservation Significance – In: **Beron P. & Popov A.** (eds). *Biodiversity of Bulgaria*. 2. Biodiversity of Eastern Rhodopes (Bulgaria and Greece). Pp. 53–118. Pensoft & Nat. Mus. Natur. Hist., Sofia.
- Petrova, A.** 2009. *Convolvulus persicus* (p. 67), *Dactylorhiza incarnata* (75), *Epipactis exilis* (76), *Ophrys reinholdii* (78), *Traunsteinera globosa* (71). – In: **Petrova, A. & Vladimirov, V.** (eds), *Red List of Bulgarian vascular plants*. – *Phytol. Balcan.*, **15**(1).
- Petrova, A.** 2013. Reports 43–53. – In: **Vladimirov, V. & al.** (comps), *New floristic records in the Balkans*: 23. – *Phytol. Balcan.*, **19**(3): 373–399.
- Petrova, A.** 2015. *Convolvulus persicus* (p. 222), *Dactylorhiza incarnata* (464), *Epipactis exilis* (485), *Ophrys reinholdii* (562), *Traunsteinera globosa* (333). – In: **Peev, D. & al.** (eds), *Red Data Book of the Republic of Bulgaria*. Vol. 1, Plants and Fungi. BAS & MoEW, Sofia.
- Petrova, A.** 2017. Reports 103–113. – In: **Vladimirov, V. & al.** (comp.), *New floristic records in the Balkans*: 34. – *Phytol. Balcan.*, **23**(3): 423–427.
- Petrova, A.** 2018. *Amaranthus viridis* and *Euphorbia serpens*, new alien species records for the flora of Bulgaria. – *Compt. Rend. Acad. Sci. Bulg.*, **71**(1): 46–52.
- Petrova, A. & Dalakchieva, S.** 2017. Reports 114–124. – In: **Vladimirov, V. & al.** (comp.), *New floristic records in the Balkans*: 34. – *Phytol. Balcan.* **23**(3): 127–128.
- Petrova, A., Vassilev, R., Venkova, D. & Gerasimova, I.** 2013a. Reports 54–64. – In: **Vladimirov, V. & al.** (comp.), *New floristic records in the Balkans*: 23. – *Phytol. Balcan.*, **19**(3): 384–385.
- Petrova, A., Vassilev, R., Gerasimova, I., & Venkova, D.** 2013c. Reports 87–99. – In: **Vladimirov, V. & al.** (comp.), *New floristic records in the Balkans*: 22. – *Phytol. Balcan.*, **19**(2): 267–303.
- Petrova, A. & Venkova, D.** 2008. *Epipactis exilis* and *E. greuteri* (*Orchidaceae*) in the Bulgarian flora. – *Phytol. Balcan.*, **14**(1): 69–73.
- Petrova, A., Venkova, D., Getova, N., Georgieva, M. & Dohchev, D.** 2012. Orchids in Sinite Kamani Nature Park. – In: **Petrova, A.** (ed.), *Proc. VII Natl. Conf. Bot.*, 29–30.09.2011, Sofia, pp. 181–190. Bulg. Bot. Soc., Sofia (in Bulgarian).
- Petrova, A. & Vladimirov, V.** 2010. Balkan endemics in the Bulgarian flora. – *Phytol. Balcan.*, **16**(2): 293–311.
- Petrova, A., Vladimirov, V. & Georgiev, V.** 2012. Invasive Alien Species of Vascular Plants in Bulgaria. IBER-BAS, Sofia (in Bulgarian).
- Petrova, A., Vladimirov, V. & Georgiev, V.** 2013b. Invasive Alien Species of Vascular Plants in Bulgaria. IBER-BAS, Sofia.
- Popova, M.** 2003. *Brassicaceae*. – In: **Delipavlov, D. & Cheshmedzhiev, I.** (eds), *Key to the Plants of Bulgaria*. Pp. 116–141. Agrarian Univ. Acad. Press, Plovdiv (in Bulgarian).
- Riedl, H.** 1978. *Onosma*. – In: **Davis, P.H.** (ed.), *Flora of Turkey and the East Aegean Islands*. Vol. 6, p. 372. Univ. Press, Edinburgh.

- Ronzhina, D.** 2017. Distribution, competitive ability, and seed production of *Bidens frondosus* L. in the Middle Urals. – Russ. Journ. Biol. Invasions, **8**(4): 351-359.
- Röthlisberger, J.** 2007. Aktuelle Verbreitung der Gattung *Chamaesyce* (*Euphorbiaceae*) in der Schweiz. – *Bauhinia*, **20**: 19-33.
- Schmitz, U. & Dericks, G.** 2010. Spread of alien invasive *Impatiens balfourii* in Europe and its temperature, light and soil moisture demands. – *Flora*, **205**(11): 772-776.
- Sell, P.D. & West, C.** 1975. *Pilosella*. – In: **Davis, P.H.** (ed.), *Flora of Turkey and the East Aegean Islands*. Vol. 5, pp. 748-749. Univ. Press, Edinburgh.
- Stark, Ch., Michalski, S.G., Babik, W., Winterfeld, G. & Durka, W.** 2011. Strong genetic differentiation between *Gymnadenia conopsea* and *G. densiflora* despite morphological similarity. – *Pl. Syst. Evol.*, **293**: 213-226.
- Stojanov, N. & Achtarov, B.** 1935. Kritische Studien über die Nelken Bulgariens. – *Sborn. Bălg. Akad. Nauk., Klon. Prir.-Mat.*, **29**: 1-101.
- Stojanov, N., Stefanov, B. & Kitanov, B.** 1967. *Flora Bulgarica*. Ed. 4, Vol. 2. Nauka & Izkustvo, Sofia (in Bulgarian).
- Stoyanov, S. & Kolev, I.** 2014. Reports 113-121. – In: **Vladimirov, V. & Tan, Kit** (comp.), *New floristic records in the Balkans*: 24. – *Phytol. Balcan.*, **20**(1): 119-120.
- Strat, D. & Holobiuc, I.** 2018. The occurrence and conservation status of *Convolvulus persicus* L. (*Solanales: Convolvulaceae*) on the western Black Sea coast – Romania. – *Acta Zool. Bulg., Suppl.* **11**: 125-132.
- Strat, D.** 2016. Floristic composition and functional zones pattern of the beach-dune system along the Danube Delta coast – Romania. – *Forum geografic. Studii și cercetări de geografie și protecția mediului* [Forum Geographical. Geographical Studies and Environment Protection Research], **15**(1): 65-79.
- Strid, A. & Tan, Kit** (eds). 1997. *Flora Hellenica*. Vol. 1. Koeltz Scientific Books, Königstein.
- Strid, A.** 2017. Reports 158-188. – In: **Vladimirov, V. & al.** (comp.), *New floristic records in the Balkans*: 33. – *Phytol. Balcan.*, **23**(2): 304-308.
- Strid, A.** 2018. Reports 124-148. – In: **Vladimirov, V. & al.** (comp.), *New floristic records in the Balkans*: 36. – *Phytol. Balcan.*, **24**(2): 277-280.
- Tashev, A., & Gavrilova, A.** 2013. Reports 81-82. – In: **Vladimirov, V. & al.** (comp.), *New floristic records in the Balkans*: 23. – *Phytol. Balcan.*, **19**(3): 388-389.
- Tashev, A., Koev, K. & Tashev, N.** 2013. Reports 83-85. – In: **Vladimirov, V. & al.** (comp.), *New floristic records in the Balkans*: 23. – *Phytol. Balcan.*, **19**(3): 389-390.
- Tashev, A., Koev, K. & Tashev, N.** 2015. Reports 242-244. – In: **Vladimirov, V. & al.** (comp.), *New floristic records in the Balkans*: 26. – *Phytol. Balcan.*, **21**(1): 84-85.
- Terziyski, D.** 2011. *Fabaceae*. – In: **Delipavlov, D. & Cheshmedzhiev, I.** (eds), *Key to the Plants of Bulgaria*. Pp. 199-237. Agrarian Univ. Acad. Press, Plovdiv (in Bulgarian).
- Tutin, T.G. & Walters, S.M.** 1993. *Dianthus*. – In: **Tutin, T.G. & al.** (eds), *Flora Europaea*. Vol. 1: *Psilotaceae to Platanaceae*, 2nd ed., pp. 227-246. Cambridge Univ. Press, Cambridge.
- Tzonev, R.** 2015. 03B1 Black Sea mobile (white) dunes. – In: **Biserkov, V. & al.** (eds), *Red Data Book of the Republic of Bulgaria*. Vol. 3. Natural habitats, pp. 67-68. BAS & MOEW, Sofia.
- Uzunova, S. & Uzunov, S.** 2005. Notes on the distribution of the species of *Orchidaceae* family in the Strandzha Natural Park. – In: **Drazheva, Ts.** (ed.), *The natural history museums – centers for implementation of contemporary interdisciplinary methods for research, preservation and exhibition of the natural species*. Proceedings National theoretic conference, Burgas, 2005, pp. 85-90. Regional Museum, Burgas.
- Valcheva, M., Sopotlieva, D., Meshinev, T. & Apostolova, I.** 2018. Is penetration of non-psammophytes an underestimated threat to sand dunes? – a case study from western Pontic coast. – *J. Coast. Conserv.* <https://doi.org/10.1007/s11852-018-0656-3>.
- Van Soest, J.L.** 1975. *Taraxacum*. – In: **Davis, P.H.** (ed.), *Flora of Turkey and the East Aegean Islands*. Vol. 5, p. 804. Univ. Press, Edinburgh.
- Vassilev K. & Pedashenko, H.** 2009. Reports 111-117. – In: **Vladimirov, V. & al.** (comp.), *New floristic records in the Balkans*: 10. – *Phytol. Balcan.*, **15**(1): 137-138.
- Velčev, V.** 1964. *Crocus*. – In: **Jordanov, D.** (ed.), *Flora Reipublicae Popularis Bulgaricae*. Vol. 2, pp. 328-338. In *Aedibus Acad. Sci. Bulgaricae, Serdicae* (in Bulgarian).
- Vladimirov, V.** 2003. On the distribution of four alien Compositae species. – *Phytol. Balcan.*, **9**(3): 513-516.
- Vladimirov, V.** 2012. Reports 176-188. – In: **Vladimirov, V. & al.** (comp.), *New floristic records in the Balkans*: 20. – *Phytol. Balcan.*, **18**(3): 363-365.
- Vladimirov, V., Delcheva, M., Tashev, A. & Bancheva, S.** 2017. Reports 78-87. – In: **Vladimirov, V. & al.** (comp.), *New floristic records in the Balkans*: 32. – *Phytol. Balcan.*, **23**(1): 139-140.
- Vladimirov, V. & Kuzmanov, B.** 2012. *Bidens* (pp. 266-272), *Erigeron* (196-208). – In: **Peev, D.** (ed.), *Fl. Reipubl. Bulgaricae*. Vol. 11. *Aedibus Acad. Prof. Marin Drinov, Serdicae* (in Bulgarian).
- Vladimirov, V., Tashev, A. & Delcheva, M.** 2016. Reports 178-189. – In: **Vladimirov, V. & Tan, Kit** (comp.), *New floristic records in the Balkans*: 31. – *Phytol. Balcan.*, **22**(3): 459-460.
- Vutov, V. & Dimitrov, D.** 2016. Reports 190-213. – In: **Vladimirov, V. & al.** (comp.), *New floristic records in the Balkans*: 31. – *Phytol. Balcan.*, **22**(3): 460-462.
- Vyšniauskiene, R., Ranceliene, R., Zvingila, D., Patamsytė, J.** 2011. Genetic diversity of invasive alien species *Lupinus polyphyllus* populations in Lithuania. – *Zemdirbyste*, **98**(4): 383-390.
- Wood, J.R., Williams, B., Mitchell, T.C., Carine, M.A., Harris, D.J. & Scotland, R.W.** 2015. A foundation monograph of *Convolvulus* L. (*Convolvulaceae*). – *PhytoKeys*, **51**: 1-282.
- Yordanova, M.** 2016. Orchids of the Rodopi Mountains. Wild Rodopi, Sofia.

