

New floristic records in the Balkans: 40*

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Abstract. New chorological data are presented for 158 species and subspecies from Albania (129), Bulgaria (73, 85-86, 94-113, 130-149), Greece (6-72, 74-84, 87-93, 114-128, 150-158), and Turkey-in-Europe (1-5). The taxa belong to the following families: *Agavaceae* (38), *Aizoaceae* (6), *Alliaceae* (39, 81, 124), *Amaranthaceae* (7), *Amaryllidaceae* (82), *Araceae* (83), *Apiaceae* (47, 114), *Asteraceae* (8-11, 48-51, 74, 78, 99, 105, 106, 115, 132-138, 145), *Balsaminaceae* (107, 139), *Basellaceae* (12), *Berberidaceae* (108, 129), *Boraginaceae* (13, 52, 150), *Brassicaceae* (14, 15, 53, 94), *Cactaceae* (16-18, 100), *Caryophyllaceae* (19, 54, 87, 95, 151), *Chenopodiaceae* (2, 20, 152, 153), *Convolvulaceae* (21, 55, 116), *Cucurbitaceae* (22), *Cupressaceae* (98), *Cyperaceae* (40, 125, 126), *Dipsacaceae* (88), *Euphorbiaceae* (23-25, 75, 76, 101, 140), *Fabaceae* (56, 57, 85, 89, 109-111, 117, 118, 146), *Gentianaceae* (112), *Grossulariaceae* (147), *Haloragaceae* (154), *Hyacinthaceae* (84), *Hypericaceae* (79), *Iridaceae* (41), *Juncaceae* (127), *Lamiaceae* (58-60, 90, 102), *Lentibulariaceae* (155), *Liliaceae* (42, 77, 130), *Molluginaceae* (26, 119), *Onagraceae* (61, 120, 141), *Orchidaceae* (73, 97, 103, 104, 131, 149), *Papaveraceae* (27), *Pinaceae* (1, 70-72), *Plantaginaceae* (28), *Plumbaginaceae* (29), *Poaceae* (43-46, 128, 158), *Polygonaceae* (3, 30, 86), *Ranunculaceae* (62, 63, 142, 156), *Resedaceae* (91), *Rosaceae* (31, 32, 80, 121), *Rubiaceae* (64, 65, 92), *Salicaceae* (66), *Santalaceae* (93), *Sapindaceae* (33), *Scrophulariaceae* s.l. (4, 5, 34, 67-69, 113, 122, 123, 143, 148), *Solanaceae* (35, 96, 144), *Valerianaceae* (36), and *Verbenaceae* (37, 157).

New taxon for science is: *Epimedium alpinum* subsp. *albanicum* Kit Tan & al. (129).

New taxa for countries are: Bulgaria – *Cupressus sempervirens* (98), *Verbascum blattaria* × *V. speciosum* (148); Greece – *Opuntia rufida* (17), *Lantana achyranthifolia* (37).

The publication includes contributions by: M. Aybeke (1-5); B. Biel & Kit Tan (6-46); B. Biel & Kit Tan (47-72); P. Boycheva & D. Ivanov (73); C. Cattaneo & M. Grano (74-77); K. Giannopoulos, Kit Tan & G. Vold (78-84); T. Karakiev (85-86); G. Kofinas & Kit Tan (87-93); I. Kostadinov, A. Petrova, K. Popov & V. Koychev (94-97); A. Petrova, Zh. Barzov & V. Vladimirov (98-104); A. Petrova, I. Gerasimova & D. Venkova (105-113); K. Polymenakos & Kit Tan (114-128); L. Shuka, Kit Tan & B. Hallaçi (129); A. Tashev (130); A. Tashev & D. Kuchtev (131); V. Vladimirov (132-144); V. Vladimirov & N. Velev (145-149); G. Zarkos, V. Christodoulou, Kit Tan & G. Vold (150-158).

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 Albania and Greece by Kit Tan, and for Turkey-in-Europe by M. Aybeke.

Reports 1–5

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Pinaceae

1. *Pinus nigra* subsp. *pallasiana* (Lamb.) Holmboe

Tu(E) A1(E) Kırklareli: Demirköy, between Demirköy and Pınarhisar, 1st km, 250 m, 41°48'55.8"N, 27°44'58.8"E, 02.07.1989, coll. & det. C. Yarcı (EDTU 4184); Demirköy, between Demirköy and İğneada, 6st km, 250 m, 41°51'21.5"N, 27°48'45.6"E, 03.09.1989, coll. & det. C. Yarcı (EDTU 4229).

Confirmed for European Turkey. According to Coode & Cullen (1965), this taxon occurred in European Turkey, but was not indicated from any locality. With this new record, the taxon is reported for the first time from European Turkey.

Chenopodiaceae

2. *Atriplex halimus* L.

Tu(E) A1(E) Kırklareli: Demirköy, between Demirköy and İğneada, 11th km, 50 m, 41°51'55.2"N, 27°53'03.9"E, 20.06.1990, coll. & det. C. Yarcı (EDTU 5324).

New for European Turkey. According to Aellen (1967), this taxon was encountered in A2(A) Istanbul. With this new record, it is reported for the first time from European Turkey.

Polygonaceae

3. *Polygonum hydropiper* L.

Tu(E) A1(E) Kırklareli: Demirköy, between Demirköy and İğneada, 11th km, 50 m, 41°51'55.2"N, 27°53'03.9"E, 20.06.1990, coll. & det. C. Yarcı (EDTU 5322).

New for A1(E) Kırklareli in European Turkey. According to Coode & Cullen (1967), it was encountered only in A2(E) Istanbul.

Scrophulariaceae

4. *Veronica arvensis* L.

Tu(E) A1(E) Kırklareli: between Dereköy and Kırklareli, 5th km, in a forest clearing, 500 m, 41°53'11.7"N, 27°20'57.5"E, 12.07.1997, coll. & det. C. Yarcı (EDTU 7105).

New for A1(E) Kırklareli in European Turkey. According to Fischer (1978), it was seen in A1(E) Edirne, A2(E) Istanbul.

5. *Veronica chamaedrys* L.

Tu(E) A1(E) Kırklareli: Demirköy, between Demirköy and İğneada, 11th km, 50 m, 41°51'55.2"N, 27°53'03.9"E, 20.06.1990, coll. & det. C. Yarcı (EDTU 5391); between Terzidere and Taştepe, 1th km, 508 m, in a *Quercus* forest, 41°59'11.2"N, 27°07'32.7"E, 08.05.1996, coll. & det. C. Yarcı (EDTU 6782).

New for A1(E) Kırklareli in European Turkey. According to Fischer (1978), this taxon occurred in A1(E) Tekirdağ and A2(E) Istanbul.

Reports 6–46

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This is the first report of new plant-records for the island of Milos (phytogeographical region Kiklades, Nomos Kikladon, Eparchia Milou) based on two short visits in March 2010 and October 2019. The 40 records listed are new to the island or otherwise remarkable, and ten species were found to be new for the floristic region Kiklades (Kik) as circumscribed in *Flora Hellenica* (Strid & Tan 1997), bringing the total number of new records we have found for this area to 64. Occurrence on the other Kikladean islands is briefly summarized.

Aizoaceae

6. *Lampranthus multiradiatus* (Jacq.) N.E. Br.

Gr Milos: W of Adamas, sandy beach, 15 m, 36°43'29"N, 24°26'41"E, 06.03.2010, *Biel* obs. (photo).

Escape from adjacent park.

Amaranthaceae

7. *Amaranthus cruentus* L.

Gr Milos: SE of Milos airport, together with *A. hypochondriacus* as a weed in plant nursery, 15 m, 36°41'39"N, 24°28'41"E, 22.10.2019, *Biel* 19.019.

Asteraceae

8. *Bellis longifolia* Boiss. & Heldr.

Gr Milos: NW of Adamas, phrygana by dirt road, 70 m, 36°43'42"N, 24°26'27"E, 27.10.2019, *Biel* 19.31.

9. *Carthamus dentatus* (Forssk.) Vahl

Gr Milos: NE of Adamas, waste ground at road margin, 55 m, 36°44'00"N, 24°27'12"E, 27.10.2019, *Biel* obs. (photo).

Referable to *C. dentatus* subsp. *ruber* (Link) Hanelt.

10. *Cladanthus mixtus* (L.) Chevall.

Gr Milos: N of Provatas, *Juncus* wetland surrounded by *Arundo*, near farm, 20 m, 36°40'49"N, 24°26'34"E, 23.10.2019, *Biel* 19.25.

New for Kiklades.

11. *Erigeron canadensis* L.

Gr Milos: Adamas, road margins, waste ground in village, 15 m, 36°43'29"N, 24°26'41"E, 28.10.2019, *Biel* 19.37; Mitakas, rocky phrygana at road junction, 50 m, 36°44'26"N, 24°28'56"E, 29.10.2019, *Biel* 19.41; airport of Milos, edge of approach road, 20 m, 36°41'41"N, 24°27'38"E, 30.10.2019, *Biel* 19.42.

Basellaceae**12. *Anredera cordifolia*** (Ten.) Steenis

Gr Milos: Adamas, waste ground in village, 15 m, 36°43'29"N, 24°26'41"E, 28.10.2019, *Biel* 19.32.

Casual adventive.

Boraginaceae**13. *Heliotropium supinum*** L. (Fig. 1)

Gr Milos: N of Provatas, *Juncus* wetland surrounded by *Arundo*, near farm, 20 m, 36°40'49"N, 24°26'34"E, 23.10.2019, *Biel* 19.24.

Brassicaceae**14. *Cardamine hirsuta*** L.

Gr Milos: SW of Adamas, open phrygana with



Fig. 1. *Heliotropium supinum* (photo B. Biel).

rock outcrops at path to Profitis Ilias, 570 m, 36°40'42"N, 24°23'09"E, 10.03.2010, *Biel* obs.

15. *Erysimum hayekii* (Jáv. & Rech. f.) Polatschek

Gr Milos: N of Adamas, uncultivated field and phrygana by dirt road, 20 m, 36°43'55"N, 24°26'59"E, 27.10.2019, *Biel* 19.35.

Cactaceae**16. *Austrocylindropuntia subulata*** (Muehlenpf.)

Backeb.

Gr Milos: N of Adamas, slope of valley with olive trees and phrygana, 15 m, 36°43'52"N, 24°26'39"E, 17.10.2019, *Biel* obs. (photo), together with *Ballota acetabulosa*, *Capparis spinosa*, *Cyclamen hederifolium*, *Delphinium peregrinum*, *Hyparrhenia hirta*, *Pistacia lentiscus*, etc.

Also established on slope of Kastro above Plaka. Second report for Kiklades, the first being from Amorgos.

17. *Opuntia rufida* Engelm. (Fig. 2)

Gr Milos: S of Zefyria, phrygana with *Juniperus macrocarpa* at sandy track, 70 m, 36°40'40"N, 24°29'04"E, 22.10.2019, *Biel* obs. (photo).



Fig. 2. *Opuntia rufida* (photo B. Biel).

Established escape, three plants noted far from any habitation. First documentation for Greece.

18. *Opuntia vulgaris* Mill.

Gr Milos: N of Plaka, phrygana slopes with olive trees on road to Fyropotamos, 100 m, 36°45'06"N, 24°25'35"E, 17.10.2019, *Biel* obs. (photo).

Also on coastal slope at Fyropotamos.

Caryophyllaceae

19. *Spergula pentandra* L.

Gr Milos: SW of Adamas, Mt Profitis Ilias, rocky phrygana with shrubs near chapel at summit, 720 m, 36°40'34"N, 24°22'56"E, 10.03.2010, *Biel* obs. (photo).

Chenopodiaceae

20. *Oxybasis glauca* (L.) S. Fuentes, Uotila & Borsch

Gr Milos: W edge of Pollonia, rocky phrygana above coast, 5 m, 36°45'56"N, 24°31'19"E, 18.10.2019, *Biel* 19.010.

In Kiklades, reported from island of Kea.

Convolvulaceae

21. *Ipomoea purpurea* (L.) Roth

Gr Milos: Adamas, road margins, waste ground in village, 15 m, 36°43'29"N, 24°26'41"E, 18.10.2019, *Biel* 19.05.

Established garden escape.

Cucurbitaceae

22. *Citrullus lanatus* (Thunb.) Matsum. & Nakai

Gr Milos: NW of Adamas, fruit plantation and *Sarcopoterium*-phrygana south of sewage plant, 30 m, 36°43'52"N, 24°26'17"E, 17.10.2019, *Biel* obs. (photo); W of Adamas, sandy beach and adjacent park, 15 m, 36°43'29"N, 24°26'41"E, 18.10.2019, *Biel* obs. (photo).

Casual adventive, first report for Kiklades.

Euphorbiaceae

23. *Euphorbia chamaesyce* subsp. *massiliensis* (DC.) Thell.

Gr Milos: W edge of Pollonia, rocky phrygana above coast, 5 m, 36°45'56"N, 24°31'19"E, 18.10.2019, *Biel* 19.012.

Reported from Amorgos.

24. *Euphorbia nutans* Lag. (Fig. 3)

Gr Milos: Pollonia, road margins at southern edge of village, 10 m, 36°45'42"N, 24°31'57"E, 18.10.2019, *Biel* 19.013; Adamas, road margins, waste



Fig. 3. *Euphorbia nutans* (photo B. Biel).

ground in village, 15 m, 36°43'29"N, 24°26'41"E, 24.10.2019, *Biel* 19.27.

Second report for the Kiklades.

25. *Euphorbia serpens* Kunth (Fig. 4)

Gr Milos: W edge of Pollonia, rocky phrygana above coast, 5 m, 36°45'56"N, 24°31'19"E, 18.10.2019, *Biel* 19.011; Tripiti village, road margin, 130 m, 36°44'23"N, 24°25'32"E, 24.10.2019, *Biel* 19.030.

Reported from Naxos.



Fig. 4. *Euphorbia serpens* (photo B. Biel).

Molluginaceae

26. *Glinus lotoides* L. (Fig. 5)

Gr Milos: N of Provatas, seasonally wet field near farm, 20 m, 36°40'37"N, 24°30'37"E, 23.10.2019, *Biel* 19.022.

New for Kiklades.



Fig. 5. *Glinus lotoides* (photo B. Biel).

Papaveraceae

27. *Hypecoum torulosum* Å.E. Dahl

Gr Milos: N edge of Pollonia, rocky coastal area with holiday houses, 5 m, 36°46'06"N, 24°31'25"E, 08.03.2010, *Biel* obs. (photo); S of Adamas, Chivadolimni, sandy beach with *Juniperus* scrub at northern margin of lake, 3 m, 36°41'17"N, 24°26'38"E, 12.03.2010, *Biel* obs. (photo).

Plantaginaceae

28. *Plantago lanceolata* L.

Gr Milos: NW of Adamas, fruit plantation and *Sarcopoterium*-phrygana south of sewage plant, 30 m, 36°43'52"N, 24°26'17"E, 17.10.2019, *Biel* 19.03.

Noted in 2010 at Chivadolimni.

Plumbaginaceae

29. *Limoniastrum monopetalum* (L.) Boiss.

Gr Milos: SE of Adamas, sandy beach with roadside *Tamarix*, 3 m, 36°43'12"N, 24°27'35.02"E, 07.03.2010, *Biel* obs. (photo).

In various localities, established escapes or planted. Recorded from Kithnos.

Polygonaceae

30. *Polygonum bellardii* All. (Fig. 6)

Gr Milos: N of Provatas, seasonally wet field near farm, 20 m, 36°40'37"N, 36°40'37"N, 23.10.2019, *Biel* 19.023.

New for Kiklades.



Fig. 6. *Polygonum bellardii* (photo B. Biel).

Rosaceae

31. *Prunus domestica* subsp. *insititia* (L.) Bonnier & Layens

Gr Milos: S of Tripiti, steep slope with olive trees and shrubs on road to Klima, 40 m, 36°44'08"N, 24°25'36"E, 24.10.2019, *Biel* 19.29.

New for Kiklades.

32. *Rubus sanctus* Schreb.

Gr Milos: N of Adamas, fenced ruderal site by road, 80 m, 36°44'22"N, 24°26'33"E, 28.10.2019, *Biel* obs. (photo).

Sapindaceae

33. *Cardiospermum halicacabum* L.

Gr Milos: Adamas, road margins, waste ground in village, 15 m, 36°43'29"N, 24°26'41"E, 18.10.2019, *Biel* 19.04.

Scrophulariaceae

34. *Cymbalaria muralis* G. Gaertn., B. Mey. & Scherb.

Gr Milos: Adamas, road margins, waste ground in village, 15 m, 36°43'29"N, 24°26'41"E, 28.10.2019, *Biel* 19.36.

Solanaceae

35. *Lycium barbarum* L. (Fig. 7)

Gr Milos: N edge of Adamas, valley with *Arundo* and open phrygana near Taxiarchis cemetery, 20 m, 36°43'40"N, 24°27'11"E, 27.10.2019, *Biel* 19.33.



Fig. 7. *Lycium barbarum* (photo B. Biel).

New for Kiklades. *Lycium europaeum* was also noted.

Valerianaceae

36. *Centranthus ruber* (L.) DC.

Gr Milos: Tripiti village, road margin, 130 m, 36°44'23"N, 24°25'32"E, 24.10.2019, Biel obs. (photo).

Verbenaceae

37. *Lantana achyranthifolia* Desf. (Fig. 8)

Gr Milos: N edge of Adamas, open phrygana near Taxiarchis cemetery, 20 m, 36°43'40"N, 24°27'11"E, 27.10.2019, Biel 19.34, together with, *Anchusa undulata*, *Glebionis segetum*, *Malva sylvestris*, *Medicago arborea*, *Piptatherum miliaceum*, *Salsola kali*, *Thymus* sp., *Verbascum sinuatum*, etc.

First report of this casual adventive in Greece, several plants noted.

Agavaceae

38. *Agave americana* L.

Gr Milos: E-SE of Adamas, phrygana with *Juniperus macrocarpa* by dirt road, 20 m, 36°43'15"N, 24°28'08"E, 19.10.2019, Biel obs. (photo).

Naturalized in several other places on the island.

Alliaceae

39. *Allium cupanii* Raf.

Gr Milos: SW of Adamas, coastal phrygana near War Memorial, 3 m, 36°43'18"N, 24°26'18"E, 16.10.2019, Biel 19.02.

Cyperaceae

40. *Carex illegitima* Ces.

Gr Milos: SW of Adamas, rocky phrygana on



Fig. 8. *Lantana achyranthifolia* (photo B. Biel).

track to Mt Profitis Ilias, 230 m, 36°41'10"N, 24°23'47"E, 10.03.2010, Biel 10.06.

See Koopman (2011: 641) for photos.

Iridaceae

41. *Freesia leichtlinii* subsp. *alba* (G.L. Mey) J.C. Manning & Goldblatt

Gr Milos: NW of Adamas, phrygana and waste ground by dirt road, 30 m, 36°43'41"N, 24°26'38"E, 07.03.2010, Biel obs. (photo).

Also noted on road to Sarakiniko.

Liliaceae

42. *Ornithogalum naxense* (Landström) Strid

Gr Milos: S of Adamas, Chivadolimni, *Juncus* wetland with *Populus alba* at the western margin of lake, 6 m, 36°41'17"N, 24°26'38"E, 12.03.2010, Biel obs. (photo).

Reported from Amorgos and Naxos.

Poaceae

43. *Digitaria sanguinalis* (L.) Scop.

Gr Milos: W of Adamas, sandy beach and adjacent park, 15 m, 36°43'29"N, 24°26'41"E, 18.10.2019, Biel 19.01.

44. *Micropyrum tenellum* (L.) Link

Gr Milos: S of Adamas, Chivadolimni, rocky phrygana at northern edge of lake, 8 m, 36°41'17"N, 24°26'32"E, 12.03.2010, *Biel* obs. (photo).

Recorded from Amorgos.

45. *Setaria verticilliformis* Dumort. (Fig. 9)

Gr Milos: SE of Milos airport, plant nursery, 15 m, 36°41'39"N, 24°28'41"E, 22.10.2019, *Biel* 19.018.

New for Kiklades. In Greece reported in ruderal places near Patras (NW Peloponnese) and Lesvos (E Aegean islands), together with *S. viridis* (L.) P. Beauv.



Fig. 9. *Setaria verticilliformis* (photo B. Biel).

46. *Setaria viridis* (L.) P. Beauv.

Gr Milos: Adamas, road margins, waste ground in village, 15 m, 36°43'29"N, 24°26'41"E, 24.10.2019, *Biel* 19.26.

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

Reports 47–72

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This is the fourth report of new plant-records for the island of Thasos (Nomos Kavallas, Eparchia Thasou) based on a visit in May–June 2019. The 24 records listed are new to the island unless otherwise stated, and 5 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.

Apiaceae**47. *Bupleurum semicompositum* L.**

Gr Thasos: NE of Limenaria, sandy stream bed and phrygana by dirt road, 50 m, 40°38'18"N, 24°35'38"E, 02.06.2019, *Biel* 19.074.

Recorded from Samothraki.

Asteraceae**48. *Achillea pannonica* Scheele**

Gr Thasos: E of Theologos, terraced pasture with water channel above stream, 230 m, 40°39'40"N, 24°42'01"E, 31.05.2019, *Biel* 19.060.

Confirming report by Chilton (2009: 439) which regards the taxon as an isolated, short-lived naturalization.

49. *Andryala integrifolia* L. (Fig. 10)

Gr Thasos: S margin of Skala Marion, phrygana, abandoned quarry and waste ground by road, 15 m, 40°38'19"N, 24°31'04"E, 29.05.2019, *Biel* 19.050.

Recorded from Samothraki.

50. *Reichardia intermedia* (Sch. Bip.) Samp.

Gr Thasos: NE of Limenas (Thasos), rocky coastal slope with *Vitex* shrubs near chapel Dio Apostoli, 10 m, 40°47'05"N, 24°42'57"E, 22.05.2019, *Biel* 19.003.

New for the N Aegean islands.



Fig. 10. *Andryala integrifolia* (photo B. Biel).

51. *Senecio lividus* L.

Gr Thasos: E-NE of Limenas (Thasos), slope with open pine wood and shrubs by dirt road, 50 m, 40°47'00"N, 24°43'03"E, 24.05.2019, *Biel* 19.026.
New for N Aegean islands.

Boraginaceae**52. *Buglossoides arvensis* subsp. *subthorpiana* (Griseb.) R. Fern.**

Gr Thasos: E-NE of Skala Marion, stream banks with *Quercus* scrub, by dirt track, 20 m, 40°38'41"N, 24°32'16"E, 29.05.2019, *Biel* 19.053.
Recorded from Samothraki. *Buglossoides arvensis* subsp. *arvensis* also occurs on the island.

Brassicaceae**53. *Eruca vesicaria* (L.) Cav.**

Gr Thasos: Limenaria, hill slopes with *Pinus* E of village, 40 m, 40°37'29"N, 24°34'55"E, 01.06.2019, *Biel* obs. (photo).
Recorded from Samothraki and Limnos.

Caryophyllaceae**54. *Velezia quadridentata* Sm.**

Gr Thasos: NE of Limenaria, slag heap of a mineral quarry with shrubs, 150 m, 40°37'59"N, 24°35'44"E, 02.06.2019, *Biel* 19.070.
Recorded from Samothraki.

Convolvulaceae**55. *Ipomoea purpurea* (L.) Roth**

Gr Thasos: Limenaria, waste ground, road margins in village, 10 m, 40°37'39"N, 24°34'27"E, 01.06.2019, *Biel* 19.065.
Naturalized on waste ground and at roadsides on Samothraki and Limnos.

Fabaceae**56. *Medicago sativa* subsp. *falcata* (L.) Arcang. × *sativa* L. subsp. *sativa***

Gr Thasos: NE of Limenas (Thasos), rocky coastal slope with *Vitex* shrubs near chapel Dio Apostoli, 10 m, 40°47'05"N, 24°42'57"E, 22.05.2019, *Biel* 19.005.
Recorded from Samothraki and Ag. Evstratios.

57. *Ononis viscosa* L. (Fig. 11)

Gr Thasos: S part of Limenaria, waste ground, road margins, parks near the new harbour, 5 m, 40°37'33"N, 24°34'36"E, 28.05.2019, *Biel* 19.048.
New for the N Aegean islands.

Lamiaceae**58. *Micromeria nervosa* (Desf.) Benth.**

Gr Thasos: W border of Limenaria, olive plantations and waste ground between houses, 15 m, 40°37'43"N, 24°34'03"E, 29.05.2019, *Biel* 19.046.
Recorded from Samothraki, Limnos and Ag. Evstratios.

59. *Salvia virgata* Jacq.

Gr Thasos: W border of Limenaria, olive plantations and waste ground between houses, 15 m, 40°37'43"N, 24°34'03"E, 02.06.2019, *Biel* 19.068.
Recorded from Samothraki, Limnos and Ag. Evstratios. Already noted in 2017 near Potamia.

60. *Ziziphora capitata* L.

Gr Thasos: SW of Theologos, path in alluvial forest lined with *Platanus* and *Pinus*, 80 m, 40°37'57"N, 24°40'16"E, 30.05.2019, *Biel* 19.059; Astris, 40°36'N, 24°39'E, 07.06.2004, *Niketić & Tomović* 23767 (BEOU, unpubl. record).
Recorded from Samothraki.

Onagraceae**61. *Oenothera speciosa* Nutt.**

Gr Thasos: Potamia, road margin, waste ground in village, 120 m, 40°42'52"N, 24°45'23"E, 05.06.2019, *Biel* obs. (photo).
New for the N Aegean islands. Self sown, spontaneous.



Fig. 11. *Ononis viscosa* (photo B. Biel).

Ranunculaceae**62. *Consolida ajacis* (L.) Schur**

Gr Thasos: S of Skala Rachinou, road margin and olive plantation with phrygana, 20 m, 40°45'51"N, 24°36'39"E, 23.05.2019, *Biel* 19.023.

Recorded from Samothraki. Noted in 2018 at Theologos.

63. *Nigella damascena* L.

Gr Thasos: Skala Potamias, waste ground between houses behind beach, 3 m, 40°42'52"N, 24°45'23"E, 24.05.2019, *Biel* 19.025.

Recorded from Samothraki.

Rubiaceae**64. *Galium capitatum* Bory & Chaub.**

Gr Thasos: E-NE of Skala Marion, stream banks with *Quercus* scrub, by dirt track, 20 m, 40°38'41"N, 24°32'16"E, 29.05.2019, *Biel* 19.052.

Recorded from Samothraki.

65. *Galium samothracicum* Rech. f. (Fig. 12)

Gr Thasos: W of Potamia, rocky slope with *Pinus*, *Platanus* and *Quercus*, by dirt road, 370 m, 40°42'55"N, 24°42'24"E, 25.05.2019, *Biel* 19.030.

Recorded from Samothraki. All previous reports of *G. insulare* Krendl from Thasos refer to *G. samothracicum*.

Salicaceae**66. *Salix ×sepalucralis* Simonk.**

Gr Thasos: S border of Limenas (Thasos), waste ground with shrubs between houses, near stream, 15 m, 40°46'23"N, 24°42'21"E, 22.05.2019, *Biel* 19.005.

This was reported from Samothraki as *S. ×pendulina* Wender. Probably a hybrid between *S. alba* L. and *S. babylonica* L.



Fig. 12. *Galium samothracicum* (photo B. Biel).

Scrophulariaceae**67. *Kickxia spuria* (L.) Dumort.**

Gr Thasos: S-SW of Glifada, wood margin and slope with olive trees in valley, by dirt road, 15 m, 40°46'30"N, 24°40'49"E, 23.05.2019, *Biel* 19.015.

Recorded from Samothraki and Limnos.

68. *Verbascum orientale* (L.) All.

Gr Thasos: E-SE of Limenas (Thasos) slope with open pine wood and shrubs near Acropolis ruins, 120 m, 40°46'N, 24°43'E, 24.05.2019, *Biel* 19.027.

A collection by Sintenis and Bornmüller on 19 May 1891 was previously the first and only record for the island.

69. *Veronica chamaedrys* subsp. *chamaedryoides* (Bory & Chaub.) M.A. Fisch.

Gr Thasos: S-SW of Glifada, wood margin and slope with olive trees in valley, by dirt road, 15 m, 40°46'30"N, 24°40'49"E, 23.05.2019, *Biel* 19.017.

Recorded from Samothraki. Several specimens from Thasos have not been determined at subspecies rank.

Poaceae**70. *Aegilops markgrafii* (Greuter) K. Hammer**

Gr Thasos: W border of Limenaria, olive plantations and waste ground between houses, 15 m, 40°37'43"N, 24°34'03"E, 29.05.2019, *Biel* 19.045.

Recorded from Samothraki.

71. *Phalaris canariensis* L.

Gr Thasos: Limenaria, waste ground, road margins in village, 10 m, 40°37'39"N, 24°34'27"E, 01.06.2019, *Biel* 19.066.

Recorded from Samothraki.

72. *Parapholis filiformis* (Roth) C.E. Hubb.

Gr Thasos: SW of Glifada, slope with pine trees, by dirt road, 170 m, 40°46'21"N, 24°40'11"E, 23.05.2019, *Biel* 19.014.

New for the N Aegean islands. This is normally a coastal saline plant and has been noted near Rachoni in 2016. The present record is for a locality where plants or seeds may have arrived via traffic/transport on the nearby dirt road on the way up from the coast to the marble quarries.

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

Report 73

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Orchidaceae

73. *Himantoglossum jankae* Somlyay, Kreutz & Ovari.

Bu Northeast Bulgaria: on the territory of the European NATURA 2000 network site Suha Reka (BG0000107), close to arable lands and a dirt road, Krumovo village, Varna region, 43.414451°N, 27.784819°E, 15.06.2019, coll. P. Boycheva (SOM 176799).

Himantoglossum jankae is native to Southeast Europe and is included in the Annex II of the Council Directive 92/43 EEC (the Habitats Directive). The species is already known from this floristic region but our data report it for the first time in SCI BG0000107 Suha Reka (MOEW 2019, <http://natura2000.moew.government.bg/>). The accompanying plants were: *Teucrium chamaedrys*, *Lotus corniculatus*, *Bromus racemosus*, *Poa angustifolia*, *Eringium campeste*, *Euphorbia cyparissias*.

Reports 74–77

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Asteraceae

74. *Helichrysum* × *rhodium* Rech. f. [*Helichrysum orientale* (L.) Vaill. × *Helichrysum stoechas* subsp. *barrelieri* (Ten.) Nyman]

Gr Nomos & Eparchia Samou: Samos, at foot of the eastern slopes of Mt Kerkis near Pythagoras cave, 250 m., 37°43'31"N, 26°39'52"E, 18.05.2019, Cattaneo 1084 (herb. Cattaneo).

Two specimens of *H. xrhodium* on limestone rock in open scrub were observed. Both parental species were in the vicinity. The hybrid specimens were intermediate in character between the parental species — stems suberect, 20 cm tall, white-lanate; basal leaves oblanceolate, 40 × 3 mm, longer and broader than those of *H. stoechas* subsp. *barrelieri*, revolute, densely tomentose; synflorescence densely corymbose, larger than that of *H. stoechas* subsp. *barrelieri* and smaller than that of *H. orientale*; capit-

ula hemispheroidal, 6 × 8 mm; phyllaries lemon-yellow, scarious, shining; florets deep yellow as in *H. orientale*. The specimens observed on Samos are comparable to the hybrid specimens observed at several sites in the East Mediterranean. Several records of this hybrid have been reported on Crete, Rhodes, Folegandros and in Turkey (Rechinger 1944, Davis & Kupicha 1975, Galbany-Casals & al. 2012, Kleinstaub & al. 2016).

In 1936 Rechinger collected at Cape Ag. Georgios (Monolithos, Rhodes) a specimen of this hybrid which he named *H. rhodium* (Rechinger 1944). Davis & Kupicha (1975) later stated that Rechinger's specimen represented low-growing, small-leaved specimens of *H. orientale*. However, Rechinger's taxon was recognized by Galbany-Casals & al. (2012). *Helichrysum stoechas* subsp. *barrelieri* and *Helichrysum orientale* are well differentiated taxa as the former belongs to sect. *Stoechadina* (DC.) Gren. & Godr. while the latter belongs to sect. *Helichrysum* (Galbany-Casals & al. 2006, 2012). *Helichrysum stoechas* subsp. *barrelieri* is widespread in the whole Mediterranean, and grows in open habitats on various substrates, whereas *H. orientale* is endemic to the East Mediterranean and is found on limestone rock or in crevices of limestone cliffs, or on sandy, serpentine or clay soils (Galbany-Casals & al. 2012). Galbany-Casals & al. (2012) carried out a study on spontaneous hybridization occurring between *H. stoechas* subsp. *barrelieri* and *H. orientale* at several sites on the islands of Crete and Rhodes. The hybrids were always observed growing together with the parental taxa and are intermediate in character.

Euphorbiaceae

75. *Euphorbia prostrata* Aiton

Gr Nomos Dodekanisou, Eparchia Karpathou: Karpathos, Pigadia village, in garden near the beach, 6 m, 35°30'N, 27°12'E, 31.07.2019, Cattaneo & Grano 1105 (herb. Cattaneo).
New for Karpathos.

76. *Euphorbia serpens* Kunth

Gr Nomos Dodekanisou, Eparchia Karpathou: Karpathos, Pigadia village, in garden together with *Euphorbia prostrata*, 6 m, 35°30'N, 27°12'E, 01.08.2019, coll. Cattaneo & Grano 1106 (herb. Cattaneo); Kasos island, Aghia Marina village, at roadside, 104 m, 35°24'N, 26°54'E, Cattaneo & Grano 1132 (herb. Cattaneo).

New for Karpathos and Kasos. Reported from Rodos, Kriti, Naxos, Skiros and Lemnos.

Liliaceae**77. *Lilium candidum* L.** (Fig. 13)

Gr Nomos & Eparchia Samou: near Aghia Kiriaki village, 156 m, 37°42'N, 26°36'E, 19.05.2019, *Cattaneo* obs. (photos); near Ormos Marathokampou village, 76 m, 37°42'N, 26°41'E, 22.05.2019, *Cattaneo* obs. (photo).

New for Samos. Several plants were noted in uncultivated fields with dry stone walls.

Reports 78–84**Konstantinos Giannopoulos¹,
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The following taxa were recorded for the first time from the southern lower slopes of Mt Skiadovouni, a long low mountain at the border of prefectures (nomi) Iliia and Achaia in NW Peloponnisos. This report is based on an autumnal visit, previous journeys were carried out in early spring and summer. A record from Mt Lambda (nomos Ilias) is included.

Asteraceae**78. *Centaurea affinis* Friv.**

Gr Nomos & Eparchia Ilias: Mt Skiadovouni, Lipsouta summit, 1420 m, 37°53'N, 21°43'E, 28.09.2019, *Giannopoulos* obs.



Fig. 13. *Lilium candidum* (photo C. Cattaneo).

Hypericaceae**79. *Hypericum tetrapterum* Fr.** (Fig. 14)

Gr Nomos & Eparchia Ilias: Mt Lambda, Astras plateau, wet places, 1400 m, 37°53'N, 21°48'E, 24.07.2019, *Giannopoulos* obs.

New for nomos and eparchia, first record from West Peloponnese. Distinct by its angular, winged stem.

Rosaceae**80. *Prunus domestica* L.**

Gr Nomos & Eparchia Ilias: lower slopes of Mt Skiadovouni, 1040 m, 37°54'N, 21°45'E, 28.09.2019, *Giannopoulos* obs.

Naturalized.

Alliaceae**81. *Allium callimischon* Link** (Fig. 15)

Gr Nomos & Eparchia Ilias: lower slopes of Mt Skiadovouni, 1020 m, 37°54'N, 21°44'E, 28.09.2019, *Giannopoulos* obs.

Autumn-flowering.



Fig. 14. *Hypericum tetrapterum* (photo K. Giannopoulos).



Fig. 15. *Allium callimischon* (photo K. Giannopoulos).

Amaryllidaceae

82. *Sternbergia lutea* (L.) Ker Gawl. ex Spreng.

Gr Nomos & Eparchia Ilias: Mt Skiadovouni, 1080 m, 37°54'N, 21°44'E, 28.09.2019, *Giannopoulos* obs.; *loc. ibid.*, 1266 m, 37°53'N, 21°44'E & at Lipsouta summit, 1452 m, 37°53'N, 21°43'E, 28.09.2019, *Giannopoulos* obs.

Araceae

83. *Biarum tenuifolium* (L.) Schott (Fig. 16)

Gr Nomos & Eparchia Ilias: Mt Skiadovouni, 1330 m, 37°53'N, 21°43'E, 28.09.2019, *Giannopoulos* obs.

Hyacinthaceae

84. *Scilla autumnalis* L.

Gr Nomos & Eparchia Ilias: Mt Skiadovouni, 1080 m, 37°54'N, 21°44'E & at Lipsouta summit, 1440 m, 37°53'N, 21°43'E, 28.09.2019, *Giannopoulos* obs.



Fig. 16. *Biarum tenuifolium* (photo K. Giannopoulos).

Reports 85–86**Todor Karakiev**

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Fabaceae

85. *Lathyrus grandiflorus* Sm. (Fig. 17)

Bu Pirin Mts (*Southern*): S of the road between Katuntsi village and Popovi Livadi village zone, at about 800 m a.s.l., 41°30'30"N, 23°34'31"E, 08.06.2019, *T. Karakiev* obs. (photo).

This species has been known from the floristic regions of Znepole, West Frontier Mts, Mt Belasitsa, Mt Slavjanka, and Rila Mts (*Assyov & Petrova* 2012).

Polygonaceae

86. *Fallopia baldschuanica* (Regel) Holub

Bu Rhodopi Mts (*Eastern*): near the road Kardzhali – Haskovo, almost in Kardzhali city, at 488 m a.s.l., 41°39'14"N, 25°22'01"E, 28.08.2019, *T. Karakiev* obs.



Fig. 17. *Lathyrus grandiflorus* (photo T. Karakiev).

This species has been known from the floristic regions of the Black Sea Coast (*Northern*) (Assyov & Petrova 2012), Danubian Plain (Vladimirov & al. 2017), Forebalkan (*Western*), Balkan Range (*Western*), Sofia region, Vitosha region, Rhodopi Mts (*Western, Central*), and Thracian Lowland (Karakiev 2019).

Reports 87–93

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Continuing a series of new plant records based on further floristic investigations in Greece. The floristic regions adopted follow those circumscribed in *Flora Hellenica* (Strid & Tan 1997).

Caryophyllaceae

87. *Silene conglomeratica* Melzh. (Fig. 18)

Gr Nomos Achaias, Eparchia Kalavriton: Mt Chelmos, calcareous rock, 953 m, 38°05'N, 22°10'E, 03.06.2017, *Kofinas* obs.

New for Chelmos. The type was based on a Halácsy collection from the rocky conglomerate slopes at the monastery of Mega Spileo.

Dipsacaceae

88. *Cephalaria leucantha* (L.) Roem. & Schult. (Fig. 19)

Gr Nomos & Eparchia Evritanias: Mt Timfristos, limestone rock, 1748 m, 38°55'N, 21°48'E, 10.08.2019, *Kofinas* s.n. (herb. Kit).

New for Mt Timfristos. A report of *C. tenuiloba* Strid from Timfristos (Dimitrellos & Christodoulakis 1996: 28) may refer to *C. leucantha*.



Fig. 18. *Silene conglomeratica* (photo G. Kofinas).



Fig. 19. *Cephalaria leucantha* (photo G. Kofinas).

Fabaceae

89. *Onobrychis viciifolia* Scop. (Fig. 20)

Gr Nomos Arkadias, Eparchia Megalopoleos: at roadside of Korinthos to Kalamata motorway,



Fig. 20. *Onobrychis viciifolia* (photo G. Kofinas).

405 m, 37°21'N, 22°09'E, 18.05.2019 & 27.07.2019, *Kofinas* obs.; *loc. ibid.*, 31.05.2018, *Kit Tan* & *G. Vold* obs.

- Nomos & Eparchia Grevenon: 2 km from Grevena to Siatista, along new motorway, 540 m, 40°05'N, 21°25'E, 13.05.2017, *Kit Tan* & *G. Vold* 32280.

New for nomi, eparchies and both phytogeographical regions Peloponnese and North Central. This plant is more widely distributed in Greece than presently documented, and has spread rapidly along newly opened motorways especially in the north, e.g., stretches of the Egnatia Odos from Thessaloniki to Igoumenitsa.

Lamiaceae

90. *Calamintha menthifolia* subsp. *hirta* (Jord.) Raus

Gr Nomos Chalkidikis, Eparchia Athou: Mt Athos, 1143 m, 40°08'N, 24°18'E, 04.08.2019, *Kofinas* s.n. (herb. Kit).

New for Mt Athos, nomos and eparchia and phytogeographical region NE. Only three plants were found in the same site.

Resedaceae

91. *Reseda tymphaea* Hausskn. subsp. *tymphaea* (Figs. 21 & 22)

Gr Nomos Achaïas, Eparchia Egialias: in shaded places on cliffs at sides of Vouraikos gorge, 112 m, 38°10'N, 22°10'E, 03.06.2017, *Kofinas* obs. Confirming Heldreich's 8 June 1899 collection (in faucibus Diakophto) which was the first and only record for the Peloponnese (see Fig. 22). The photograph



Fig. 21. *Reseda tymphaea* subsp. *tymphaea* (photo G. Kofinas).

with the bee was taken on 26 April 2019 at Nafpaktos across the Gulf of Corinth.

Rubiaceae

92. *Cruciata taurica* subsp. *euboea* (Ehrend.) Ehrend. (Fig. 23)

Gr Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, 1489 m, 38°01'N, 22°14'E, 09.05.2015 & 04.06.2017, *Kofinas* obs. (photos).

— Nomos Argolidos, Eparchia Argous: Mt Oligirtos, 1189 m, 37°47'N, 22°24'E, 09.06.2019, *Kofinas* obs. (photos).

New for Mt Oligirtos. Independently noted on Chelmos by Shaw on 7 June 2015 (photos sent to Kit Tan).

Santalaceae

93. *Thesium macedonicum* Hendrych

Gr Nomos & Eparchia Dramas: Mt Falakro, at roadside, 1253 m, 41°17'N, 24°08'E 17.08.2019, *Kofinas* s.n. (fragment herb. *Kofinas*).

New for Mt Falakro. Recorded from North Macedonia and northern Greece (NC, NE); described from Mt Kajmakčalan on the Greek border area and distinct by the whole plant, including flowers and fruits, be-



Fig. 23. *Cruciata taurica* subsp. *euboea* (photo G. Kofinas).



Fig. 22. *Reseda tymphaea* subsp. *tymphaea*: specimen from Vouraikos gorge collected on 8 June 1899 by Heldreich (P-herb. Cosson).

ing densely hispid-pubescent. *Thesium alpinum* L. and *T. divaricatum* Mert. & W.D.J. Koch both occur at the summit of Falakro.

Reports 94–97

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Brassicaceae

94. *Diplotaxis muralis* (L.) DC.

Bu Balkan Range (*Eastern*): Sliven town, 240 m, MH42, 42°40'33.44"N, 26°20'38.39"E, 04.04.2019 & 27.10.2019, coll. I. Kostadinov (SOM 176968, 176967); Sotirya village, Sliven Municipality, 300 m, MH52, 42°40'39.03"N, 26°25'10.00"E, 04.05.2019, I. Kostadinov obs.

A new record for this species (*cf.* Assyov & Petrova 2012).

Caryophyllaceae

95. *Silene gallinyi* Rchb.

Bu Balkan Range (*Central*): N of Tazha village, Pavel Banya Municipality, 650 m, LH42, 42°39'59.54"N, 25°04'43.48"E, 28.07.2019, I. Kostadinov & V. Koychev (Fig. 24).

A new region for this species (Assyov & Petrova 2012).

Solanaceae

96. *Datura innoxia* Mill.

Bu Balkan Range (*Eastern*): Sliven town, 290 m, MH42, 42.688288°N, 26.335785°E, 27.10.2019, coll. I. Kostadinov (SOM 176958).

A new region for this species (Assyov & Petrova 2012). The naturalized population consists of small groups and dispersed individuals in ruderal places and pavement crevices among blocks of flats and a local school, at an area less than 0.1 ha.

Orchidaceae

97. *Dactylorhiza kalopissii* E. Nelson

Bu Pinin (*Northern*): Krushe locality SW of Razlog town, wet forest glade in an *Alnus glutinosa*

forest, 1150 m, FM93, 41°51'2.40"N, 23°22'30.8"E, 16.06.2019, I. Kostadinov & K. Popov obs.

(Fig. 25).

The species is a globally Endangered (Bilz & al. 2011), included in Annex IIb of the Council Directive 92/43 EEC. It is evaluated as 'Critically Endangered' in Bulgaria (Petrova 2009, 2015). It has already been reported for this floristic region (Griehl 2007; Kunev 2018). The report of Griehl is for a locality in the meadows near Razlog town without more details. Considering the position of the observed by us locality which is quite remote and not easily accessible, we believe that it is a new record. It is located in NATURA 2000 SAC BG0000626 Krushe. The population is small – only six flowering individuals were observed. Other rare species found in the glades and abandoned meadows nearby are two more species that are included in Annex IIb of the Council Directive 92/43: *Gladiolus palustris* Gaudin and *Ligularia sibirica* (L.) Cass.



Fig. 24. *Silene gallinyi*, N of Tazha village, 28.07.2019 (photo I. Kostadinov).



Fig. 25. *Dactylorhiza kalopissii*, Pinin Mts, 16.06.2019 (photo I. Kostadinov).

Reports 98–104

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Cupressaceae

98. *Cupressus sempervirens* L.

Bu Black Sea Coast (*Northern*): coastal limestone cliffs at Bolata locality near Balgarevo village, Dobrich district, a self-sown specimen, PJ10, 43°22'51.11"N 28°28'10.54"E, 20.10.2019, coll. Zh. Barzov (SOM).

The Mediterranean cypress is among the commonest ornamental trees of the world, especially in the countries with a Mediterranean type of climate. It has been used for making forest plantations during the last decades (e.g. Caudullo & de Rigo 2016). It naturalized in many countries, and in some of them (Cuba, Chile) it is considered as an invasive alien (Rojas-Sandoval 2016).

Cupressus sempervirens is one of the first alien ornamental trees in Bulgaria (Stojanov 1963). Although it is a quite common ornamental in the country, especially along the Black Sea Coast, this is the first published report for a self-recruitment. A single young tree is found on the steep rocky slope (Fig. 26). The nearest planted trees which produce strobils are about 180 m apart, on the plateau.



Fig. 26. *Cupressus sempervirens*, Bolata bay (photo Zh. Barzov).

Asteraceae

99. *Sonchus palustris* L.

Bu Black Sea Coast (*Northern*): near Beloslavsko lake E of Beloslav town and W of Yatata Protected Site, ca. 2–3 m, NH58, 43.19152°N, 27.72719°E, 27.08.2018, coll. V. Vladimirov, A. Petrova & Zh. Barzov (SOM) (Fig. 27).

— Danubian Plain: marshland dominated by *Typha latifolia*, *Epilobium hirsutum* and *Lythrum salicaria* in Branishteto locality S of Knezha town, ca. 120 m, KJ61, 16.08.2004, leg. M. Anchev (SOM 161690).

Providing new records and data for this rare species in the Bulgarian flora. A few hundred specimens in a flowering and fruiting phase have been recorded in the first locality. The species is of high conservation concern in the country, since it has been evaluated as 'Endangered' at national level (Dimitrova 2009) and is

legally protected by the Bulgarian Biological Diversity Law (Darzhaven vestnik 77/ 10.07.2002). It has been known from localities mainly by River Danube and along the Black Sea coast in the following floristic regions: Black Sea Coast, Northeast Bulgaria, Danubian Plain (Assyov & Petrova 2012; Dimitrova 2015). Recently, it has been reported from the Thracian Lowland (Gussev & al. 2018).



Fig. 27. *Sonchus palustris* (photo V. Vladimirov).

Cactaceae

100. *Opuntia engelmannii* Engelm.

Bu Black Sea Coast (*Southern*): on cliffs with southern or southeastern exposition, *ca.* 1.0–1.5 km S of Sinemorets village, 5–10 m, NG85, 42.05066°N, 27.99014°E, 26.04.2015, V. Vladimirov obs. (photo, Fig. 28); *loc. ibid.*, NG85, 42.051137°N, 27.989898°E, 14.10.2018, Zh. Barzov obs. (photo); *loc. ibid.*, NG85, 42.049107°N, 27.990867°E, 14.10.2018, Zh. Barzov obs. (photo, Fig. 29).

New for this floristic region. The species has been very recently reported as a new alien species to the Bulgarian flora from Mt Lozenska in Mt Sredna Gora (*Western*) floristic region (Naydenova & al. 2019).



Fig. 28. *Opuntia engelmannii* (photo V. Vladimirov).



Fig. 29. *Opuntia engelmannii* (photo Zh. Barzov).

There is evidence that some *Opuntia* species were deliberately planted in 1930-s on Sveti Toma Island (St. Thomas Island, Zmiyskiya Ostrov) (Jordanov 1970). It is likely that *O. engelmannii* was also planted on the island from where it escaped and invaded some areas along the coast. The island is about 35–40 km to the north of the presently reported localities.

Euphorbiaceae

101. *Euphorbia nicaeensis* subsp. *dobrogensis*

(Prodán) Kuzmanov

Bu Northeast Bulgaria: Dry grasslands NE of Bezhanovo village, PJ14, 14.05.2012, coll. A. Petrova (SOM 176753).

Euphorbia nicaeensis is a variable species; *E. n.* subsp. *dobrogensis* is an endemic for Dobrogea (Bulgaria and Romania) and is typical for *Pimpinello-Thymion zygoides* communities (Sârbu & al. 2013, sub *E. do-*

brogensis Prodan). According to Kuzmanov (1979) in Bulgaria it is found only in the Black Sea Coast region. In fact, it is distributed in most of the territories covered with Ponto-Sarmatic steppes in North-Eastern Bulgaria.

Lamiaceae

102. *Lavandula angustifolia* L.

Bu Northeast Bulgaria: Dry grasslands NE of Yagnilo village, near the road to Dobroplodno village, NJ20, 20.03.2019, coll. A. Petrova & Zh. Barzov (SOM 176720).

A new record for this alien species which often escapes from cultivation. So far it has been reported for: Balkan Range, Sofia region, Znepole region, West Frontier Mts (Assyov & Petrova 2012), Forebalkan (Petrova & al. 2013a; Vladimirov 2014) and Rhodopi Mts (*Western*) (Kunev 2018). During the past decade is has been planted on a large scale in Bulgaria as an essential oil plant. Therefore, an enlargement of the invaded area can be expected.

Orchidaceae

103. *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.]

Bu Rhodopi Mts (*Western*): Mt Dabrash, meadows on the right side of the road from Satovcha village to Dospat town in the area of hotel Dabrash (NE of Osina village), ca. 1260 m, KG51, 41.64293°N, 24.08295°E, 21.06.2019, V. Vladimirov obs. (photo, Fig. 30).

Already reported recently from this locality (Vladimirov & al. 2018). Other two hybrid specimens noted. Apparently, hybridization between the two parent species in this particular locality is not unusual event and does occur from time to time. Otherwise, according to Delforge (2006), hybrids between *A. coriophora* and *A. morio* are extremely rare. In the above reported locality, specimens of *A. coryophora* are much more abundant whereas these of *A. morio* are much rarer and grow mixed with the former species. Although *A. morio* flowers earlier in general, some overlap in the flowering period of both species in the locality occurs which provides opportunity for hybridization events. Accompanying species were *Festuca* spp., *Filipendula vulgaris*, *Holcus lanatus*, *Moenchia mantica*, *Nardus stricta*, *Plantago lanceolata*,



Fig. 30. *Anacamptis coriophora* × *A. morio*, two flowering specimens (photo V. Vladimirov).

Ranunculus polyanthemus, *Rumex acetosa*, *Trifolium alpestre*, etc.

104. *Himantoglossum jankae* Somlyay, Kreutz & Óvári

Bu Northeast Bulgaria: NATURA 2000 SAC BG0000107 Suha Reka, dry grasslands and scrubland N of Zornitsa village, NH69, 43.338847°N, 27.730561°E, 18.11.2016, A. Petrova & S. Nikolov obs.; NATURA 2000 SAC BG0000635 Devnenski Halmove, dry grasslands on the foothills of Sivri Tepe Hill, NE of Devnya town, NH48, 43.248742°N, 27.600514°E, 18.03.2018, A. Petrova & Zh. Barzov obs. (Fig. 31) & 02.06. 2019, A. Petrova obs.

Himantoglossum jankae, native to South-East Europe, is included in Annex II of the Council Directive 92/43/EEC (the Habitats Directive), and thus, it is of high conservation concern. Such species are registered and monitored in the special areas of conservation of the European NATURA 2000 network. These are the first reports for the presence of the species in the above mentioned SACs (MOEW 2019).

About 50 specimens, mostly in a reproductive age, were counted in the population near Zornitsa village. Some 40 plants were counted on Sivri Tepe hill, also mostly with large rosettes (Fig. 31).



Fig. 31. *Himantoglossum jankae*, Sivri Tepe, overwintering rosette (photo A. Petrova).

03.08.2019, with flowers & 16.10. 2019, with seeds, coll. A. Petrova (SOM 176721).

The species is included in the *Red List of the Bulgarian Vascular Plants* as Endangered (Vladimirov 2009). In Bulgaria, it occurs along Danube River and in two formerly extensive inland wetlands: Palakaria–Samokov Plain and Batak Marsh. Both inland areas underwent severe habitat changes during the second half of the past century. Large parts were flooded by dams (Iskar and Batak reservoirs, respectively); drained and converted to agricultural lands (Samokov Plain); different type of infrastructure was built (roads, factories, etc. in the Samokov Plain and roads and the Tsigov Chark Resort Center around Batak Reservoir). This entailed significant changes in the plant life and populations of many rare plants and some species have decreased or disappeared. The existing herbarium data from the Batak Marsh area are dated back to 1887 (S. Georgiev, SO 76630) and 1929 (D. Yordanov, SO 76629). Vladimirov (2015) considered the species extinct in the area of the former Batak Marsh and Palakaria–Samokov Plain.

The observed population grows in patches in meadows, along roadside ditches or brook banks. It is small, of seven individuals only (with 1–7 stems respectively) found along the roadside area in the central part of Tsigov Chark Resort. A flowering plant was also observed along the road, near the dam, at approximately 42.00528°N, 24.18452°E.

This report confirms that the species has survived in the area. However, the size and position of the observed population suggest high vulnerability. Conservation measures are needed to improve the

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Asteraceae

105. *Carduus personata* (L.) Jacq.

Bu Balkan Range (*Eastern*): Mt Slivenska, along the forest road to Aglikina Polyana locality, MH34, ca. 42.82012°N, 26.15835°E, 04.07.2019, coll. A. Petrova & I. Gerasimova (SOM 176734).

New for the floristic subregion (Assyov & Petrova 2012).

106. *Jacobaea paludosa* (L.) G.Gaertn., B.Mey. & Scherb.

Bu Rhodopi Mts (*Western*): In wet spots in the Tsigov Chark Resort area along the Batak dam, 1050 m, KG64, 41.95380°N, 24.149634°E,

state of the population. More field studies in the area in the flowering period are desirable too.

Balsamonaceae

107. *Impatiens balfourii* Hook. f.

Bu Rhodopi Mts (*Western*): Tsigov Chark Resort area, south of Batak dam, near Uyut villas, KG64, 41.94357°N, 24.151928°E, 03.08.2019, coll. A. Petrova (SOM 176723).

An ornamental alien species, which used to escape from cultivation. New for the floristic region (Vladimirov 2012; Petrova & al. 2013a, 2018; Petrova 2017). The observed population started from discarded plants from the adjacent holiday bungalows.

Berberidaceae

108. *Mahonia aquifolium* (Pursh) Nutt.

Bu Znepole region: Mt Greben, near Vrabcha village, Pernik District, FN34, ca. 42.83730°N, 42.83730°E, 02.04.2019, coll. A. Petrova & I. Gerasimova (SOM 176717).

— Struma Valley (*Southern*): Sandanski town, Sveti Vrach Park area, seedlings and young plants, FM90, ca. 41.57019°N, 23.28320°E & 41.57012°N, 23.281250°E, etc., 13.03.2019, coll. A. Petrova (SOM 176716).

An alien species easily established in new places by seed dispersion and vegetative spread. New for the floristic regions (Assyov & Petrova 2012; Petrova & al. 2012, 2018; Tashev & Gavriloova 2013; Dimitrov & Vutov 2015; Petrova 2017).

Fabaceae

109. *Albizzia julibrissin* Durazz

Bu Tracian Lowland: along Trakia Motorway, near a petrol station, LG06, 42.26394°N, 24.30931°E, 04.07.2019, coll. A. Petrova (SOM 176736).

Two self-recruited saplings close to the base of a prop wall on the road, one of them with flowers, at about 50 m distance from the parent plants. *Albizzia julibrissin* is a popular ornamental tree. It is naturalized in many countries and is considered invasive in some states in Southeast USA (Swearingen & Bargerion 2016; Global Invasive Species Database 2017; CABI 2017). In Bulgaria, it is used as ornamental in regions with mild climate. Only recently, Sokolov & al. (2016) & Petrova (2018) reported its self-reproduction in Plovdiv city (Thracian Lowland floristic region) and Golden Sands Resort near Varna town (Black Sea Coast (*Northern*) floristic region).

110. *Laburnum anagyroides* Medik.

Bu Balkan Range (*Eastern*): Mt. Slivenska, along the road between Sliven town and Byala village, MH33, 42.705619°N, 26.216694°E, 04.07.2019, A. Petrova, I. Gerasimova & D. Venkova obs.

Widely used as ornamental plant in Bulgaria, recently reported as naturalized in some regions: Black Sea Coast (Vladimirov & al. 2016; Petrova 2018), Northeast Bulgaria, Balkan Range (*Western*), Sofia region, Znepole region, Tundzha Hilly Country (Petrova & al. 2012), Vitosha region (Tashev & al. 2015), Mt Sredna Gora (Glogov & al. 2018).

111. *Spartium junceum* L.

Bu Balkan Range (*Eastern*): Mt. Slivenska, along the road between Sliven town and Byala village, MH33, 42.705619°N, 26.216694°E, 04.07.2019, coll. A. Petrova, I. Gerasimova & D. Venkova (SOM 176704).

This is a new region for this alien species (Assyov & Petrova 2012; Petrova & Dalakchieva 2017; Petrova & al. 2018).

Gentianaceae

112. *Gentianella germanica* (Willd.) Börner

Bu Rila Mts: In the wet meadows between Beli Iskar village and Borovetz Resort, 1200 m, GM18, 42.26496°N, 23.55116°E, 22.06.2019, coll. A. Petrova & I. Gerasimova (SOM 176724).

The species is distributed locally in the mountainous regions of Bulgaria. There has been some uncertainty about the distribution of this species in the Rila Mts floristic region. Petrova (1992), Delipavlov (2011) and Assyov & Petrova (2012) did not report it for the Rila Mts floristic region. Kožuharov & Petrova (1982) also failed to list Rila Mts among the regions, where the species was found. They maintained that in the Tsarevi Kladentsi locality in the Rila Mts there are autumn-flowering populations that represented introgression with *Gentianella lutescens* (Velen.) Holub. Our checks in the herbaria SO, SOM and SOA have shown that there are samples collected by Davidov from the river Iskar watershed (in the area of Samokov town) between 1917–1919 and revised by Petrova & Kožuharov as *Gentianella* ×*germanica*. Those are: SOM 57977 (Davidov, 10.11. 1917); SOM 57917 (Davidov, 02.12. 1917); SOM 58264 (Davidov, 20.12. 1918); SOM 58052 (Davidov, 01.12. 1919). All those samples were collected by Davidov very late in the autumn. They share common characters such as

low (pigmy) height and variable but usually paler (? yellow) color of flowers.

The population observed by us flowers in summer; plants are predominantly 10–15 cm high and the color of the flowers is bluish-purple (Fig. 32). Our record confirms the distribution of *G. germanica* in the Rila Mts. There have been many changes in the wet meadows in the area but the check of the old localities cited by Davidov with the intriguing and unusually late flowering populations seem worth it. Mention deserves the fact that in the locality near Beli Iskar village were observed some rare for Bulgaria wet-loving plants: *Drosera rotundifolia*, *Epipactis palustris*, *Dactylorhiza incarnata*, etc.

Scrophulariaceae

113. *Budleya davidii* Franch.

Bu Struma Valley (Southern): Sandanski town, Sveti Vrach Park area, FM90, self-sown plants in many places, 02.04.2019, coll. A. Petrova (SOM 176735). New for the floristic region (Assyov & Petrova 2012; Petrova & al. 2012, 2018; Vladimirov 2012; Tashev & Gavrilova 2013; Glogov & al. 2018).



Fig. 32. *Gentianella germanica* (photo A. Petrova).

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Continuing a series of new plant records based on further floristic investigations in Greece. The floristic regions adopted follow those circumscribed in *Flora Hellenica* (Strid & Tan 1997).

Apiaceae

114. *Geocaryum capillifolium* (Guss.) Coss.

Gr Nomos Viotias, Eparchia Levadias: Mt Parnassos, Eptastomos, 7 km NW of Kalivia Arachovas, in *Abies* forest, limestone, 1250 m, 38°33'N, 22°29'E, 14.07.2019, Polymenakos & Kofinas 888 (ATH).

New for Parnassos, nomos and eparchia. Four other species of *Geocaryum* occur in eparchia Levadias which is a fairly high concentration of taxa.

Asteraceae

115. *Gnaphalium uliginosum* L. (Fig. 33)

Gr Nomos & Eparchia Korinthias: wet, seasonally flooded ground at southern edge of Lake



Fig. 33. *Gnaphalium uliginosum* (photo K. Polymenakos).

Stymfalia, limestone, 610 m, 37°50'N, 22°27'E,
13.10.2019, *Polymenakos* 944 (ATH).

New for the Peloponnese. A widespread Euro-Siberian species, mainly in north and central Greece; the nearest locality is on Mt Iti (Sterea Ellas).

Convolvulaceae

116. *Convolvulus mairei* Halácsy (Fig. 34)

Gr Nomos Viotias, Eparchia Levadias: seasonally flooded flats south of Corycian Cave, 1100 m, 38°30'N, 22°31'E, 08.08.2010, *Polymenakos* obs.

Rediscovered at *locus classicus* and locally common in the muddy fields around Kalivia Arachovas.

Fabaceae

117. *Genista januensis* subsp. *lydia* (Boiss.) Kit Tan & Ziel. (Fig. 35)

Gr Nomos Viotias, Eparchia Levadias: Mt Parnassos, 0.5 km W of village Zambios, roadsides, on schist, 1250 m, 38°34'N, 22°29'E, 12.08.2019, *Polymenakos* & *Zografidis* 907 (ATH).

New for Parnassos.

118. *Trifolium patulum* Tausch

Gr Nomos Achaias, Eparchia Kalavriton: Mt Chelmos, near Krathis river, along small stream 2.6 km SW of village Solos, limestone, 1140 m, 37°59'N, 22°13'E, 14.08.2019, *Polymenakos* 920 (ATH).

New for Chelmos; in Peloponnese reported from nomi Achaias (Kalavrita area) and Arkadias (Parnonas).



Fig. 35. *Genista januensis* subsp. *lydia* (photo K. Polymenakos).



Fig. 34. *Convolvulus mairei* (photo K. Polymenakos).

Molluginaceae

119. *Glinus lotoides* L. (Fig. 36)

Gr Nomos Kikladon, Eparchia Sirou: island of Mikonos, muddy patches on west shore of artificial lake of Marathi, 30 m, 37°27'N, 25°21'E, 26.08.2019, *Polymenakos* 927 (ATH).

New for the Kiklades. Growing together with *Heliotropium supinum*, *Juncus* spp.

Onagraceae

120. *Epilobium lamyi* F.W. Schultz

Gr Nomos Kikladon, Eparchia Sirou: island of Mikonos, 2.1 km NE of Ano Mera, along stream, near the artificial lake of Fokos, 35 m, 37°27'N, 25°24'E, 26.08.2019, *Polymenakos* 924 (ATH).

New for the Kiklades. Together with *Solanum dulcamara* and *Epilobium hirsutum*.



Fig. 36. *Glinus lotoides* (photo K. Polymenakos).

Rosaceae**121. *Potentilla supina* L.**

Gr Nomos Kikladon, Eparchia Sirou: island of Mikonos, muddy patches on west shore of artificial lake of Marathi, 30 m, 37°27'N, 25°21'E, 26.08.2019, *Polymenakos* 926 (ATH).

New for the Kiklades. Growing together with *Glinus lotoides*.

Scrophulariaceae**122. *Kickxia commutata* subsp. *graeca* (Bory & Chaub.) R. Fern.**

Gr Nomos Kikladon, Eparchia Sirou: island of Mikonos, 0.8 km north of the bay of Elia, seasonally flooded flats with *Juncus capitatus* and *Lotus subbiflorus*, 70 m, 37°25'N, 25°23'E, 21.08.2019, *Polymenakos* 923 (ATH).

Within the Kiklades, recorded from Andros and Siros.

123. *Linaria genistifolia* (L.) Mill. subsp. *genistifolia*

Gr Nomos Evvias, Eparchia Chalkidos: Mt Dirfis, 2 km NE of Steni, roadsides and edge of *Castanea* woodland, limestone, 670 m, 38°35'N, 23°51'E, 29.06.2019, *Polymenakos* & *Pantavos* 867 (ATH).

New for Evvia and phytogeographical region W Aegean. Less robust in habit and with smaller capsules than *L. dalmatica* (L.) Mill. The latter had also been considered a subspecies of *L. genistifolia*. Both taxa occur on the opposite mainland but not on Evvia itself.

Alliaceae**124. *Allium dentiferum* Webb & Berthel.**

Gr Nomos & Eparchia Korinthias: S of Mougosto forest, in vineyard near the main road from Kiato to Stymfalia, 870 m, 37°58'N, 22°36'E, 19.07.2019, *Polymenakos* & *Kofinas* 897 (ATH).

New for nomos and eparchia.

Cyperaceae**125. *Carex remota* L.**

Gr Nomos Viotias, Eparchia Livadias: Mt Parnassos, Eptastomos, 7 km NW of Kalivia Arachovas, in *Abies* forest, limestone, 1250 m, 38°33'N, 22°29'E, 14.07.2019, *Polymenakos* & *Kofinas* 887 (ATH).

New for Parnassos.

126. *Cyperus fuscus* L.

Gr Nomos Achaias, Eparchia Kalavriton: Mt Chelmos, W of village Solos, along road to Mesorougi, muddy roadsides, limestone, 1055 m, 38°01'N, 22°14'E, 14.08.2019, *Polymenakos* 918 (ATH).

New for Chelmos; abundant in wet meadows south of Kalavrita.

Juncaceae**127. *Juncus alpinoarticulatus* Chaix (Fig. 37)**

Gr Nomos Fokidos, Eparchia Doridos: Mt Vardousia, near refuge, 0.7 km SW of peak Portes, damp places in alpine meadow near stream, limestone, 1975 m, 38°41'N, 22°07'E, 13.08.2019, *Polymenakos* & *Zografidis* 911 (ATH).

New for Vardousia; in Sterea Ellas reported only from Mts Giona and Iti. Referable to *J. a.* subsp. *alpinoarticulatus*. Found together with *Carex echinata*, *Pinguicula balcanica* and *Crepis aurea*.



Fig. 37. *Juncus alpinoarticulatus* (photo K. Polymenakos).

Poaceae

128. *Narduroides salzmannii* (Boiss.) Rouy (Fig. 38)

Gr Nomos Viotias, Eparchia Thivon: W of village Alikei, south-facing stony serpentine slope with *Consolida hellespontica* and *Matthiola longipetala*, 45 m, 38°12'N, 23°02'E, 19.05.2019, Polymenakos & Koutsogiannopoulos 822 (ATH).

New for nomos and eparchia. The nearest serpentine localities are on Mts Kallidromo and Gerania.



Fig. 38. *Narduroides salzmannii* (photo K. Polymenakos).

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Two species of *Epimedium* (*Berberidaceae*) are recognized in the Balkan Peninsula, *E. alpinum* L. and *E. pubigerum* (DC.) C. Morr. & Decne. *Epimedium alpinum* subsp. *albanicum* is described as a new subspecies endemic to NE and E Albania. It is compared with *E. alpinum* subsp. *alpinum* which occurs in southern Europe from the Balkans and C Italy, northwards to Austria. An identification key to the three Balkan taxa is presented and the distribution in the Balkan Peninsula mapped, excluding occurrence in the northern part of Croatia. The dots of *E. alpinum* published in Barina (2017) have not previously been assigned by Barina to infraspecific level.

Berberidaceae

129. *Epimedium alpinum* subsp. *albanicum* Kit Tan, Shuka & Hallaçi, **subsp. nov.** (Figs. 39–41)

Al Type: NE Albania: Kukësi district, Livadhet e Laskit, ca. 1.3 km above Kalimashi tunnel, 1300 m, serpentine substrate, 14.05.2010, Hallaçi & Shuka *s.n.* (holotype TIR).

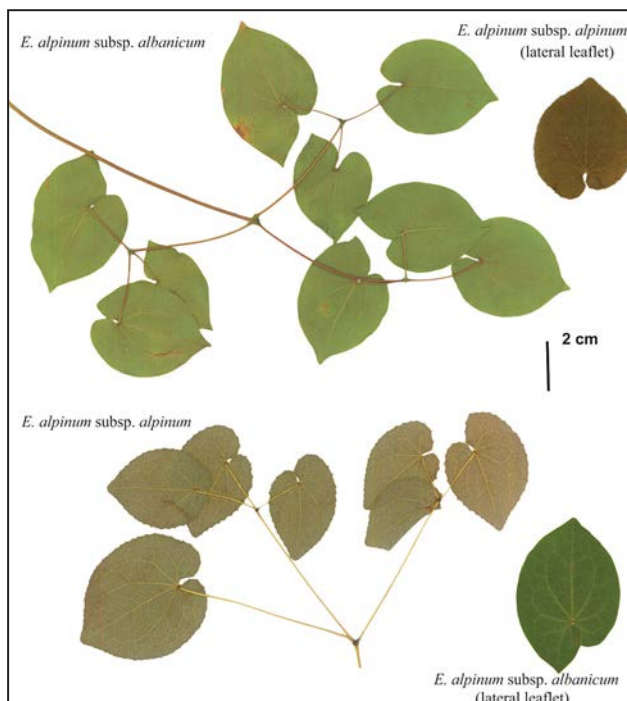


Fig. 39. *Epimedium alpinum* leaves.

Herbaceous perennial. Stems 20–35 cm, one to several, arising from creeping, cylindrical rhizome 2–5 mm in diameter. Basal leaves 1–2, compound, bi- or tri-ternate with 9–11 leaflets. Leaflets with petiolules 1–3 cm long, 4–8 × 2–8 cm, entire, rarely with weak apical spine, coriaceous in fruit, green and glabrous above, greyish-green and puberulent beneath; central leaflet broadly cordate-ovate with ± equal basal lobes; one lateral leaflet with asymmetrical overlapping base, outer lobe larger, deltoid-acute. Inflorescence terminal, 10–20 cm, shorter than cauline or basal leaf, laxly paniculate with 10–20 (30) pendent flowers. Bracts ovate, *ca.* 5 mm. Pedicels 1–2 cm long, rufous glan-



Fig. 40. *Epimedium alpinum* subsp. *albanicum*, fruits and entire leaf margin (photo L. Shuka).

dular-hairy. Flowers 10–12 mm across. Outer 4 sepals obovate, unequally-paired, 3–4 × 2–3 mm, greyish to purplish-pink, caducous; inner 4 sepals oblong-ovate, longer than outer, 5–6 × 4–4.5 mm, dark carmine-magenta. Honey leaves (petals) 4–4.5–5 × 2–3 mm, equal, obtuse, flattened proximally and tubular distally (slipper-shaped), bright yellow, lying in the concavity of the inner sepals. Stamens 4; filaments 3–4 mm long, concave in upper 2/3; anthers basifixed, 1–1.5 mm long, dehiscing by apically-hinged 1 mm long flaps; pollen yellow. Capsule dry, unilocular, 7–12 × 2 mm (excl. beak), falcately curved, glabrous, dehiscing into 2 unequal valves. Seeds 3–8, 4–5 × 1.5 mm.

Distinguished from *E. alpinum* subsp. *alpinum* by its broader coriaceous leaflets entire at the margin, inflorescence shorter than the cauline leaf, fewer and larger flowers. From the third Balkan taxon, *E. pubigerum*, it differs by its dark magenta-coloured (not white or pale pink) inner sepals and less hairy pedicels.

Distribution, habitat and ecology: Endemic to NE and E Albania. Large populations were found at Livadhet e Laskit (Meadows of Laski) at an altitude of 1150–1350 m above sea level. This area is to the left of the Drin valley, *ca.* 25 km southwest of the city of Kukës, between Kepi i Molles (Apple Rock) and Kroi i Pulave (Chicken Spring). As recent as twenty years ago, the area was densely forested with *Fagus sylvatica* and *Pinus nigra* but now trees are absent due to unau-

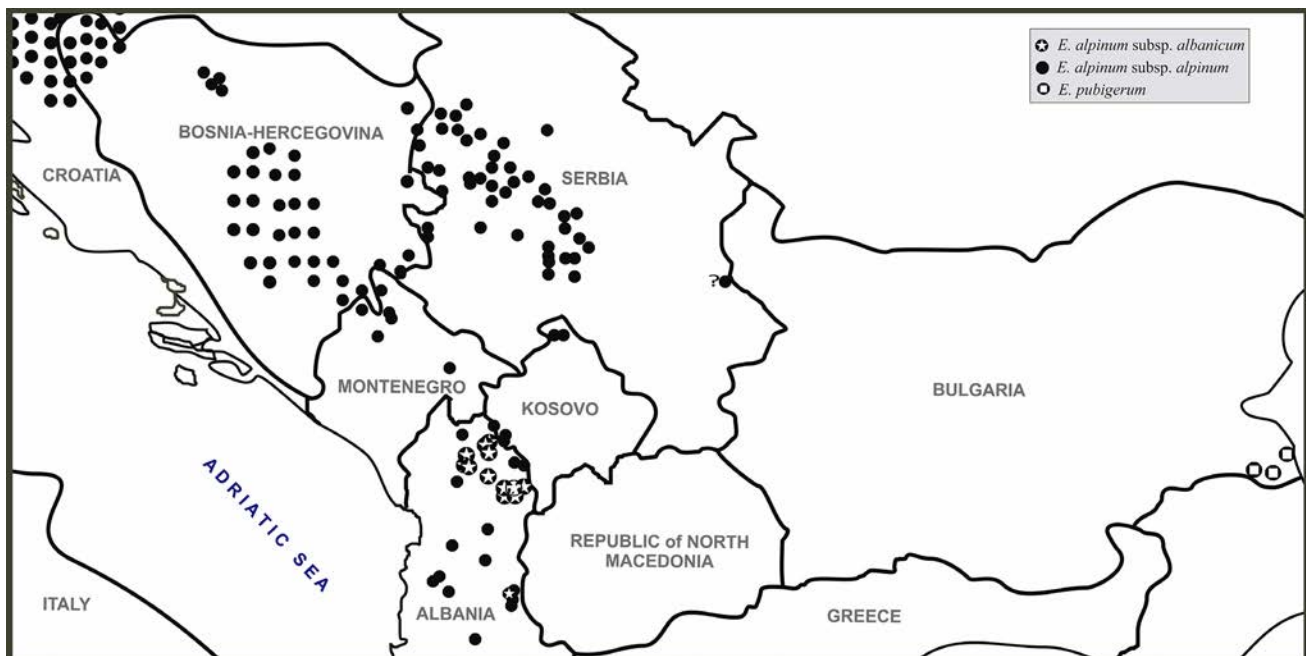


Fig. 41. Distribution map of *Epimedium* in the Balkan Peninsula (northern part of Croatia excluded).

thorized logging and forest fire. The ground substrate is serpentine derived from ultrabasic rocks from the Jurassic and the soil is coloured a rich brown due to a high content of Magnesium salts. The meadow is surrounded by smooth-topped hills and gentle valleys.

We explored an area of ca. one square km in the type locality. There is a shrub cover of *Vaccinium myrtillus*, *Juniperus oxycedrus*, *Rubus sanctus*, *R. idaeus*, *Prunus spinosa* and *Crataegus monogyna*. *Acer platanoides*, *Fraxinus ornus* and *Forsythia europaea* were still abundant below 1000 m. The herbaceous flora included *Agrimonia eupatoria*, *Alkanna scardica*, *Aquilegia vulgaris*, *Centaurea triumfetti*, *Doronicum orientale*, *Genista sagittalis*, *Gentiana lutea*, *Helleborus odoratus*, *Iberis sempervirens*, *Lilium albanicum*, *Primula veris*, *Polygala doerfleri*, *P. nicaeensis*, *Potentilla micrantha*, *Veratrum album*, *Veronica andrasovszkyi* and the rare *Viola raunsiensis*. In May ca. half the *Epimedium* populations were in full flower. The fruits ripen in late June and early July, dehiscing in the latter half of July with the seeds falling directly on the ground.

On Mt Shebeniku in E Albania, both subspecies occur and intermediate forms were noted with the lateral leaflets more similar to the central leaflet, i.e., with equal basal lobes. Such intermediate forms have also been observed from Tregtani village to Kruma in NE Albania.

Additional specimens examined: NE Albania – Kukësi district: northern slopes of Kulla e Lumës, on flysch, 250–300 m, 17.05. 1960, *Demiri s.n.* (TIR); Trulli village, on serpentine, 1100 m, 20.07.2010, *Shuka & Hallaçi 4411* (TIR); below Meadows of Laski (Livadhet e Laskit), along road to Qafa e Kumbullës (Prunus Pass), ca. 500 m above Kalimashi tunnel, on serpentine substrate, in open or degraded beech or pine woods, 1250–1350 m, 42°00'N, 20°17'E, 25.06.2011, *Kit Tan, G. Vold & Shuka 30962* (C); Përroi i ëndrrave (Stream of dreams) near Surroj village, in open deciduous woodland dominated by *Quercus* spp., on serpentine, 550 m, 6.06.2012, *Shuka 6315* (TIR); **Hasi district:** Mali i Oplasit, in open woodland dominated by *Quercus* spp., on serpentine, 800 m, 18.05.2019, *D. Shuka s.n.* (TIR); Mali i Sukës, in open woodland dominated by *Quercus* spp., on serpentine, 750 m, 26.05.2019, *D. Shuka s.n.* (TIR); **Puka district:** above Flet village, on the road from Qafa e Malit to Dardha village, on serpentine, 900–1000 m, 8.06.2006, *Shuka 172* (TIR); on the path from Thirra village to Runa Mt, on serpentine, 740–1100 m, 9.03.2011, *Shuka 5027*

(TIR); **Tropoja district:** Kam (Bajram Curri), on serpentine, 600–700 m, 13.05.1960, *Demiri s.n.* (TIR); Kolgecaj, an der strabe zwischen Kam und Kolgecaj, serpentin, ca. 400 m, 13.05.1960, *F. K. Meyer 5624* (JE); above the spring on road from Qafa e Luzhës to Rragami village, open deciduous woodland dominated by *Quercus* spp., on serpentine, 700 m, 21.06.2019, *D. Shuka & Hallaçi s.n.* (TIR); **E Albania – Librazhdi district:** Mt Shebeniku, near Qarrishta village, on serpentine, 1200 m, 22.07.2013, *Gjeta obs.* (photo).

Identification key to taxa

1. Leaflet margin entire, ± smooth (NE & E Albania) *E. alpinum* subsp. *albanicum*
- 1*. Leaflet margin conspicuously spinose-ciliate, appearing dentate-serrate 2
2. Inner sepals white or pale pink; inflorescence overtopping cauline leaf; rhachis densely glandular and eglandular-hairy (SE Bulgaria) *E. pubigerum*
- 2*. Inner sepals dark carmine-magenta; inflorescence not overtopping cauline or basal leaf; rhachis glabrous or sparsely puberulent *E. alpinum* subsp. *alpinum*

Acknowledgements. We thank Ana Petrova (Bulgarian Academy of Sciences, Sofia) for kindly providing the data for the herbarium material of *E. pubigerum* kept at SO and SOM, Ermelinda Gjeta (Elbasan, Albania) for sending photographs of *E. alpinum* subsp. *albanicum* from Mt Shebeniku, and Donald Shuka for information on additional localities from Hasi and Tropoja districts. Alfred Mullaj (Tirana) and Gert Vold (Copenhagen) are thanked for their help and companionship during fieldwork.

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Liliaceae

130. *Lilium rhodopeum* Delip. (Fig. 42)

Bu Rhodopi Mts (*Central*): In the land of Gorno Dimovo village, Dimova Bara locality, siliceous bedrock, on a glade in a hundred-year-old *Pinus sylvestris* forest, at mid-slope with eastern exposition and inclination of 20°, 1409 m, 41°32'23.3"N, 24°36'36.2"E, 04.08.2019, with fruits, coll. A. *Tashev* (SOM).



Fig. 42. *Lilium rhodopeum* with fruits in Dimova Bara locality (photo A. Tashev).

An eco-trail crosses the locality, starting at Dolno Dimovo village, crossing Gorno Dimovo village and leading to peak Kartolski Kamak. The location lies in a glade among a hundred-year-old *Pinus sylvestris* forest, with single participation in the plant community of *Picea abies* and *Abies alba*. This well preserved natural habitat belongs to 35G3 Scots pine forests (*Pinus sylvestris*) (EUNIS: G3.4C Southeast European [*Pinus sylvestris*] forests; PAL. CLASS.: 42.5C Southeast European Scots pine forests; HD 92/43: 91CA Rhodopide and Balkan Range Scots pine forests; Bondev (1991): 18 *Pineta sylvestris* forests, 19 Mixed *Pinus sylvestris* and Common Beech (*Fagus sylvatica*) forests, 20 Mixed forests of Scots Pine (*Pinus sylvestris*) and *Quercus dalechampii*, 21 Mixed forests of *Pinus sylvestris* and *Pinus nigra*, protected by the Bulgarian Biodiversity Act, Habitats Directive and Bern Convention.

Forty individuals of *Lilium rhodopeum* were found distributed unevenly on an area of about 200 m². Of these, there were 16 flowering and 24 non-flowering (only vegetative stems) plants. This testifies to the good age structure of the studied pop-

ulation of this species and to the fact that it regenerates successfully. Several square meters of the glade are occupied by a rock outcrop, bare of plants. In the glade, along with *L. rhodopeum*, there are young specimens of *Pinus sylvestris*, *Picea abies*, *Abies alba*, *Fagus sylvatica*, *Prunus avium*, *Acer tataricum*, and *Sorbus aria*. The periphery of the glade is occupied by *Juniperus communis*, with projection cover up to 30%, and *Genista rumelica*, which covers up to 20% of the glade area. Of the shrubs, still occur *Cornus mas*, *Rosa canina*, *Chamaecytisus absinthioides*, *Corylus avellana*, and *Teucrium chamaedrys*. Of the grassy species, were recorded *Luzula luzuloides*, *Sieglingia decumbens*, *Acinos rotundifolius*, *Allium flavum*, *Asperula aristata*, *Centaurea phrygia*, *Hieracium wernerii*, *H. hoppeanum*, *H. sp.*, *Hypochoeris maculata*, *Nepeta nuda*, *Linum capitatum*, *Prunella laciniata*, *Plantago carinata*, *Pimpinella saxifraga*, *Cuscuta epithimum*, *Trifolium velenovskyi*, *T. alpestre*, *Stachis alpina*, *Sedum annuum*, *Anthemis arvensis*, *Dianthus cruentus*, *Ranunculus montanus*, *Polygala major*, *Scabiosa triniifolia*, etc.

The prognosis for future development of the above-described very rare for Bulgaria and Europe plant community is that the succession in the glade would completely overgrow all open parts and the location of *L. rhodopeum* would gradually disappear. This means that, similarly to the maintenance regimes in the managed reserves, the location in the future should be object to a set of measures that would prevent the closure of the forest canopy and shrub species that would stifle the location. The area of Yundola in Western Rhodopes has already witnessed such a phenomenon, where the location of the local endemic *Ranunculius stojanovii* situated in a forest glade among a coniferous forest has disappeared after the glade was overgrown by the trees, which closed down their canopy.

This is a new location in the Rhodopi Mts (*Central*) of this endemic and Critically Endangered species, protected by the Bulgarian Biodiversity Act and Bern Convention. It has been included in the 1997 IUCN *Red List of Threatened Plants* (Walter & Gillett 1998) in the category 'Rare'. So far it has been mentioned for the Rhodopi Mts (*Central*), in the villages of Sivino, Progled, Stoykite, Gerzovitsa locality near Smolyan town, and Kechikaya (Kozi Kamak) locality near Rudozem town, as well as on peak Tsigansko Gradishte (Ivanova 2015: 271).

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Orchidaceae

131. *Cypripedium calceolus* L. (Fig. 43)

Bu Rhodopi Mts (*Central*): Dobrostan Mts, in the land of Dobrostan village, forest section 146d, ca. 50 m off the boundary of Chervenata Stena reserve, *Pinus nigra* subsp. *pallasiana* forest, limestone, upper part of a slope with eastern exposition and inclination of 40°, 1340 m, 41°55'N, 24°53'E, with flowers, 02.06.2019, A. Tashev & D. Kuchtev obs.

On the territory of Kluviyata – Diva Voda protected site (Order No ПД-780 of 16.10.2007, No 29/2008 of the *State Gazette*), Dobrostan Mts, in the land of Dobroistan village, forest section 146d. Fifty meters off the boundary with the Chervenata Stena Reserve, below a trail going down from the Chervenata Stena locality. In a natural habitat 36G3 9530 *Pinus nigra* subsp. *pallasiana* forests (EUNIS: G3.5618 Rhodopide Pallas' pine forests, G3.5619 Balkan Range Pallas' pine forests, G3.561A Moeso-Macedonian Pallas' pine forests; PAL. CLASS.: 42.6618 Rhodopide Pallas' pine forests, 42.6619 Balkan Range Pallas' pine forests, 42.661A Moeso-Macedonian Pallas' pine forests; HD 92/43: 9530 *(Sub-) Mediterranean pine forests with endemic black pines; Bondev (1991): 46



Fig. 43. *Cypripedium calceolus* (photo A. Tashev).

Mixed forests of *Fagus sylvatica* subsp. *Moesiaca* and *Pinus nigra*, 65 *Pineta nigrae* forests, 66 *Pinus nigra* and *Quercus dalechampii* forests, 67 *Pinus nigra* and *Ostrya carpinifolia* forests). This habitat is of a high conservation concern. It is protected by the Bulgarian Biodiversity Act, Bern Convention and Habitats Directive.

In a small glade of about 5 m² three individuals were found, of which, two were with generative flowering stems and one was with a vegetative shoot at about 5 m away from the group.

The forest plant coenosis consists of three layers. The first one is presented by 120-year-old tree stand, with 90% participation of *Pinus nigra*, 10% of *Abies alba* and single specimens of *Fagus sylvatica*. The second layer consists of undergrowth of *Pinus nigra*, *Abies alba* and *Fagus sylvatica*, and underbrush of *Tilia platyphyllos*, *Acer hyrcanum*, *Fraxinus ornus*, *Sorbus torminalis*, *Cornus mas*, *Lonicera coerulea*, *Daphne mezereum*, *Rubus saxatilis*, and *Clematis vitalba*. The grassy floor is dominated by *Calamagrostis arundinaceae*, with participation of *Pteridium aquilinum*, *Lilium martagon*, *Cephalanthera longifolia*, *Corallorhiza trifida*, *Polygonatum odoratum*, *Aremonia agrimonoides*, *Cardamine bulbifera*, *Clinopodium vulgare*, *Euphorbia amygdaloides*, *Fragaria vesca*, *Potentilla regis-borissii*, *Mycelis muralis*, *Helleborus odoratus*, *Primula veris*, *Hieracium murorum*, *Pyrola chlorantha*, *Salvia glutinosa*, *Sanicula europaea*, *Viola odorata*, etc. Among those species, there are seedlings of *Fagus sylvatica*, *Acer hyrcanum* and patches of green mosses.

This is a new location of this Tertiary relict, which has an extremely high conservation status both in the flora of Bulgaria and in Europe. The species is regarded as Critically Endangered in the *Red Data Book of the Republic of Bulgaria* (Petrova 2015) and is protected by the Biodiversity Act (Darzhaven vestnik 77/ 10.07.2002). It is listed in the CITES Convention (1973), Bern Convention (1979) and Habitats Directive (1993). It is also included in the *List of Rare, Threatened and Endemic Plants in Europe*, 1982 (Council of Europe 1983), in the category 'Vulnerable'. So far only two locations of the species have been recorded for Bulgaria: in the Central Rhodopes – Chervenata Stena Biosphere Park and in the region of Teshel (Petrova 2015: 229).

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Asteraceae

132. *Achillea ×vandasii* Velen. [*Achillea clypeolata* ×
A. crithmifolia]

Bu Znepole region: Mt Golo Bardo, limestone hill
ca. 3 km (straight line) W of Bosnek village,
ca. 935 m, FN70, 42.492775°N, 23.140164°E,
19.06.2016 (Fig. 44) & 17.06.2019, V. Vladimirov
obs.

— Rhodopi Mts (*Central*): small limestone hill by
Arkan Han hotel south of Trigrad village, small
site with disturbed soil and vegetation cover,
ca. 1220 m, KG80, 41.583520°N, 24.394113°E,
29.06.2019, coll. V. Vladimirov (SOM) (Fig. 45).

In both localities the hybrid species grows together with its presumable parent species – *A. clypeolata* and *A. crithmifolia*. Several hybrid specimens have

been recorded in each locality. Due to the perennial biological type and the branching rhizome groups of 5–20 flowering stems are formed for each individual. Although the species has been already recorded in these floristic regions, it is very rarely collected and reported, and therefore, it is worth publishing these new localities. Nedelcheva (1998) reported the nothospecies for Byala Cherkva and Bachkovo village [Rhodopi Mts (*Central*) floristic region], and Pazardzhik town (Thracian Lowland), and Kuzmanov & Ančev (2012: 340) – for Znepole region (from Mt Chepan above Dragoman town, where is the *locus classicus*) and Rhodopi Mts (*Western* – Byala Cherkva). However, the mentioned locality of Bela Cherkva for Western Rhodopi is, in fact, in Central Rhodopi Mts.

133. *Ambrosia artemisiifolia* L.

Bu Znepole region: Pernik town, railway station
'Razpredelitelna' (shunting yard), 705 m, FN61,
42.604661°N, 23.062541°E, 08.11.2019, coll. V.
Vladimirov (SOM).

Providing a new locality of this alien to Bulgaria species for this floristic region (*cf.* Petrova & al. 2013b). So far the species has been reported from locali-



Fig. 44. *Achillea ×vandasii*, Mt Golo Bardo (photo V. Vladimirov).



Fig. 45. *Achillea ×vandasii*, Rhodopi Mts (*Central*) (photo V. Vladimirov).

ties along the road from Sofia city to Kalotina village (the road to Serbia). The present locality is far away from the previously known locations and lies along a transport route directed westwards to the Republic of North Macedonia.

134. *Bidens bipinnatus* L.

Bu Forebalkan (*Eastern*): Railway station in Gorna Oryahovitsa town, *ca.* 100 m, LH97, 43.14020°N, 25.67553°E, 31.08.2019, coll. V. Vladimirov (SOM).

New for this floristic region. Several dozens of specimens recorded along the railways. So far this alien species has been reported from the Black Sea Coast (*Northern*) (Petrova & Vladimirov 2009) and Northeast Bulgaria (Vladimirov & al. 2016).

135. *Eclipta prostrata* (L.) L.

Bu Sofia region: Sofia city, in the center, on a bridge near the National Pallas of Culture, *ca.* 560 m, FN92, 42.682050°N, 23.320380°E, 15.11.2019, coll. V. Vladimirov (SOM).

New for this floristic region. It is very likely that the species has been brought here with contaminated ornamental plant material used for landscaping of the alleys and parks in the city center. So far this alien species has been reported from the Black Sea Coast (Stoyanov 2010; Petrova & Venkova 2017), Northeast Bulgaria (Tzonev 2007), and Danubian Plain (Vladimirov & Petrova 2009; Petrova & al. 2013b).

136. *Helianthus tuberosus* L.

Bu Rhodopi Mts (*Western*): south of Borino village near a sawmill, margins of arable land in the valley of Borinska river, *ca.* 1120 m, KG71, 41.67901°N, 24.29976°E, 13.07.2019, V. Vladimirov obs.

New for this floristic subregion. An alien species in the Bulgarian flora, so far reported from the following floristic regions: Black Sea Coast, Northeast Bulgaria, Danubian Plain, Forebalkan, Sofia region, Valley of River Struma, Valley of River Mesta, Mt Sredna Gora (*Western*); Rhodopi Mts (*Central, Eastern*), Thracian Lowland, and Tundzha Hilly Country (Assyov & Petrova 2012; Petrova & al. 2013a, b; Vladimirov & al. 2016, 2017; Glogov & al. 2018; Dimitrov & Vutov 2019; Karakiev 2019).

137. *Petasites kablikianus* Bercht.

Bu Rhodopi Mts (*Central*): above the asphalt-road from Chudnite Mostove (Wonderful Bridges) locality to Chepelare town, *ca.* 1100 m, KG93,

41.80739°N, 24.60706°E, 28.06.2019, coll. V. Vladimirov (SOM); Trigrad gorge, damp to wet screes above the road near the fork to Chairski lakes, *ca.* 1020 m, KG80, 41.624913°N, 24.389609°E, 22.06.2019, V. Vladimirov obs.; Buynovsko gorge, damp screes by the road to Yagodina village, *ca.* 980 m, KG71, 41.65791°N, 24.34363°E, 12.07.2019, V. Vladimirov obs.

Providing new localities of the species in this floristic region since it has not been documented with herbarium specimens from there. *Petasites kablikianus* is a relatively rare plant in the Bulgarian flora evaluated as 'Near Threatened' at national level (Vladimirov 2009) and legally protected by the national Biological Diversity Law (Darzhaven vestnik 77/ 10.07.2002). It was first reported for the country by Hermann & Stefanoff (1929) from Pirin Mt., above Banderitsa hut. Consequently, it was reported from the Rhodopi Mts (*Central*) by Vălev (1968, along a river above the village of Mougla, Smolyan district) and by Petrova (2010, W of Smolyan town, along the road to Mugla village, in wet places in the river Cherna valley).

138. *Pilosella pseudopilosella* (Ten.) Soják

Bu Vitosha region: Mt Vitosha, subalpine grassland in the area of the springs of River Struma, 2150–2160 m, FN81, *ca.* 42.55114°N, 23.28880°E, 18.07.2019, coll. V. Vladimirov (SOM).

New for this floristic region. Only a few dozens of specimens have been seen in the locality. So far this subalpine and alpine species has been reported from the Balkan Range (*Western, Central*), Pirin Mts, Rila Mts, and Rhodopi Mts (*Western, Central*) (Assyov & Petrova 2012: 227, sub *Hieracium pseudopilosella*), however, the localities in the Balkan Range and Rhodopi Mts are doubtful since neither herbarium specimens nor live plants in the field have been seen in these regions.

Balsaminaceae

139. *Impatiens balfourii* Hook. f.

Bu Rila Mts: by the asphalt-road to Rila Monastery, on a slope in *Fagus sylvatica* forest, *ca.* 1170 m, FM96, 42.13253°N, 23.33855°E, 20.10.2019, coll. V. Vladimirov (SOM).

New for this floristic region. An emerging alien invader in the Bulgarian flora. So far the species has been reported from: Forebalkan, Vitosha region (Petrova & al. 2013a); Valley of River Struma (Adamowski 2009), Pirin Mts (*Southern*) (Petrova 2017), Mt Sredna Gora

(*Western*) (Glogov & al. 2018), and Rhodopi Mts (*Central*) (Vladimirov 2012).

Euphorbiaceae

140. *Euphorbia prostrata* Aiton

Bu Znepole region: Pernik town, railway station 'Raspredelitelna' (shunting yard), 705 m, FN61, 42.604661°N, 23.062541°E, 08.11.2019, coll. V. Vladimirov (SOM).

— Rila Mts: Rila Monastery, on the pavement in the yard of the monastery, ca. 1190 m, FM96, 42.13389°N, 23.34013°E, 03.07.2019 & 20.10.2019, coll. V. Vladimirov (SOM).

New for these floristic regions. So far this alien species has been reported from the Black Sea Coast (*Northern*), Northeast Bulgaria, Danubian Plain, Forebalkan (*Eastern*), Sofia region, Valley of River Struma (Vladimirov & al. 2014, 2017).

Onagraceae

141. *Epilobium alpestre* (Jacq.) Krock. (Fig. 46)

Bu Vitosha region: Mt Vitosha, along the trail from Aleko hut to Mecha Polyana locality, ca. 1800 m, FN81, 42.57985°N, 23.29862°E, 04.07.2019, coll. V. Vladimirov (SOM)

New for this floristic region. So far reported from the



Fig. 46. *Epilobium alpestre* (photo V. Vladimirov).

Balkan Range (*Central*) and Rila Mts (Gančev 1979; Assyov & Petrova 2012).

Ranunculaceae

142. *Pulsatilla halleri* subsp. *rhodopaea* (Stoj. & Stef.) K. Krause (Fig. 47)

Bu Valley of River Mesta: sparse scrubland in Kozen locality W-SW of Slashten village, Satovcha Municipality, ca. 650 m, KF59, 41.48865°N, 23.97506°E, 09.03.2019, coll. V. Vladimirov (SOM).

New for this floristic region. The species grows in openings of low *Quercus pubescens* forest with *Ostrya carpinifolia*, *Syringa vulgaris*, *Juniperus oxycedus*. So far the subspecies has been reported from the Balkan Range (*Eastern*) and Rhodopi Mts (*Central*) (Popova 2011; Assyov & Petrova 2012).

Scrophulariaceae

143. *Cymbalaria muralis* P. Gaertn., B. Mey. & Scherb.

Bu Pirin Mts (*Southern*): Teshovo village, Hadzhidimovo Municipality, stone walls near Algesa hotel, 970 m, GL29, 41.46707°N, 23.69333°E, 30.06.2019, V. Vladimirov obs.

— Rila Mts: Rila Monastery, stone walls in the yard of the monastery, ca. 1190 m, FM96, 42.13389°N, 23.34013°E, 20.10.2019, coll. V. Vladimirov (SOM)



Fig. 47. *Pulsatilla halleri* subsp. *rhodopaea* (photo V. Vladimirov).

— Rhodopi Mts (*Central*): stone walls in the village of Kosovo, near Hadzhiyska house, Asenovgrad Municipality, ca. 860 m, LG04, 41.91172°N, 24.70009°E, 27.06.2019, coll. V. Vladimirov (SOM). New for Pirin and Rila Mts and confirming the distribution in Rhodopi Mts (*Central*). An alien species in the Bulgarian flora, so far reported from the Black Sea Coast, Northeast Bulgaria, Danubian Plain, Forebalkan, Balkan Range (*Western, Central*), Sofia region, West Frontier Mts, Valley of River Struma (*Northern*), Rhodopi Mts (*Eastern*), Thracian Lowland and Tundzha Hilly Country (Cheshmedzhiev 2011; Assyov & Petrova 2012). Markova (1995) reported the species for Rhodopi Mts (*Central*) but this was not adopted in the later sources on the entire Bulgarian flora, e.g. in Cheshmedzhiev (2011) and Assyov & Petrova (2012).

Solanaceae

144. *Lycium barbarum* L.

Bu Znepole region: Pernik town, railway station 'Raspredelitelna' (shunting yard), 705 m, FN61, 42.604661°N, 23.062541°E, 08.11.2019, coll. V. Vladimirov (SOM).

New for this floristic region. So far this alien for the Bulgarian flora species has been reported from the Black Sea Coast, Northeast Bulgaria, Danubian Plain, Forebalkan, Balkan Range, Sofia region, Mt Belasitsa, Mt Sredna Gora, Rhodopi Mts (*Eastern*), Thracian Lowland, Tundzha Hilly Country (Assyov & Petrova 2012; Petrova & al. 2013b).

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Asteraceae

145. *Bidens frondosus* L.

Bu Znepole region: Choklyovo Blato near Baykalsko

village, Radomir Municipality, ca. 860 m, FM59, 42.397035°N, 22.831827°E, 15.09.2019, coll. V. Vladimirov (SOM).

New for this floristic region. A few dozens of specimens noted growing together with the more abundant *B. trpartitus*. So far this alien for the Bulgarian flora species has been reported from the following floristic regions: Black Sea Coast, Northeast Bulgaria, Danubian Plain, Forebalkan, Balkan Range (*Western*), Sofia region, Valley of River Struma, Valley of River Mesta, Pirin Mts (*Southern*), Rila Mts, Mt Sredna Gora (*Western*), Rhodopi Mts (*Western, Eastern*), Thracian Lowland, Tundzha Hilly Country, and Mt Strandzha (Vladimirov 2012; Vladimirov & Kuzmanov 2012; Petrova 2013, 2017; Vladimirov & al. 2016; Glogov & al. 2018).

Fabaceae

146. *Medicago sativa* nothosubsp. *varia* (Martyn) Arcang.

Bu Znepole region: by a dirt road near Baykalsko village, Radomir Municipality, ca. 880, FM49, 42.404132°N, 22.821267°E, 12.07.2019, V. Vladimirov & N. Velev obs.

New record for this hybrid taxon. Both presumable parent taxa – *M. falcata* and *M. sativa* subsp. *sativa* grow in close proximity. Kožuharov (1976) mentioned that hybrids between *M. falcata* and *M. sativa* subsp. *sativa* were recorded in Western and Southeastern Bulgaria, however, neither exact localities nor floristic regions were mentioned.

Grossulariaceae

147. *Ribes nigrum* L.

Bu Znepole region: sparse forest-patches of *Salix* spp. around Choklyovo Blato near Baykalsko village, Radomir Municipality, ca. 860 m, FM59, 42.39868°N, 22.83183°E; 42.39907°N, 22.83117°E & ca. 42.40541°, 22.82392°E, 12.07.2019, coll. V. Vladimirov & N. Velev (SOM).

New for this floristic region. The species is of high conservation concern in the country, since it has been evaluated as 'Critically Endangered' (Vitkova 2009) at national level and is legally protected by the Bulgarian Biological Diversity Law (Darzhaven vestnik 77/10.07.2002). So far it has been reported from the Rhodopi Mts (*Western, Central*) (Assyov & Petrova 2012; Vitkova 2015). It is doubtful whether *R. nigrum* is native in the presently reported localities. The area is particularly rich in birds and it is very likely that some

bird species feed on the fruits of the species which is cultivated in the private gardens in the village nearby and thus distributed it in suitable habitats around the swamp. This hypothesis is supported by the fact that most of *Ribes*-specimens have been observed under trees where birds may stay and digest their food.

Scrophulariaceae

148. *Verbascum blattaria* L. × *V. speciosum* Schrad.

Bu Znepole region: near Choklyovo Blato, in a meadow, ca. 860 m, FM59, 42.39611°N, 22.83410°E, 11.07.2019, coll. V. Vladimirov & N. Velev (SOM).

Perhaps, first report of this hybrid combination for the Bulgarian flora. Such hybrids have not been reported by Anchev (1984) or Stefanova-Gateva (1995).

Only a single hybrid specimen recorded (Fig. 48). The presumable parent species – *V. blattaria* and *V. speciosum* grew in close proximity. The recorded single specimen had more or less intermediate morphological characters: Stem ca. 1 m high, erect, sparsely branched in the upper part, with sparse to moderately dense stellate hairs below and moderately dense



Fig. 48. *Verbascum blattaria* × *V. speciosum*: A. whole plant; B. cauline leaves; C. flowers (photo V. Vladimirov).

stellate and short glandular hairs above. Leaves numerous, dense, gradually decreasing in size upwards, oblong-ob lanceolate, subentire, sessile, somewhat undulate and auriculate at base, on both sides with sparse to moderately dense stellate hairs. Main axis of inflorescence and branches with moderately dense stellate and short glandular hairs. Flowers in groups of 2–5; sepals 3.5–5 mm long, with moderately dense stellate and short glandular hairs; petals yellow, sparsely stellate hairy on the outer face and glabrous inside. Filament-hairs purple. Moreover, when leaves of the reported specimen were crushed, they had a specific odor, very similar to that of *V. blattaria* (*V. speciosum* has no specific odor, at all) which also supported the hybrid origin of the specimen. The hybrid differs from *V. speciosum* mainly by the sparse indumentum of the whole plant, sparsely branched stem, and the purple filament-hairs, and from *V. blattaria* by the presence of sparse to moderately dense stellate hairs on the entire plant, distinctly longer cauline leaves, more branched inflorescence, flowers in groups of 2–5, and the ovoid-oblong capsule.

Orchidaceae

149. *Himantoglossum jankae* Somlyay, Kreutz & Óvári (Fig. 49)

Bu Znepole Region: by a dirt road near Baykalsko village, ca. 880 m, FM49, 42.401956°N, 22.816237°E, 12.07.2019, V. Vladimirov & N. Velev obs. (photo).

Providing a new record for the species, which is of high conservation concern since it is listed in the EU Habitats Directive (Council Directive 92/43/EEC of 21 May 1992, https://ec.europa.eu/environment/nature/legislation/habitatsdirective/index_en.htm) and is legally protected by the Bulgarian Biological Diversity Law (Darzhaven vestnik 77/ 10.07.2002). Three flowering specimens noted. The reported locality is in very close proximity to the borders of the NATURA 2000 site 'BG0000134 Choklyovo Blato', however, it has not been recorded within the boundaries of the site (cf. SDF for the site, <http://natura2000.moew.government.bg/Home/ProtectedSite?code=BG0000134&siteType=HabitatDirective>).

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Reports 150–158

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The following are new plant records based on floristic investigations in the prefecture of Korinthias in north Peloponnese.

Boraginaceae

150. *Heliotropium supinum* L.

Gr Nomos & Eparchia Korinthias: dried-up, seasonally flooded ground west of Lake Stymfalia, 610 m, 37°51'N, 22°26'E, 26.10.2019, Kit Tan, Vold, Zarkos & Kouni 33116 (herb. Kit); *loc. ibid.*, 29.08.2019, Zarkos obs.

New for nomos and eparchia. In the Peloponnese the species has been noted only at coastal Strofilia in NW Peloponnese (Georgiadis & al. 1990: 29) and on the island of Poros (Zaganiaris 1940: 248).



Fig. 49. *Himantoglossum jankae* (photo N. Velev).

*Caryophyllaceae***151. *Bolanthus chelmicus*** Phitos subsp. *chelmicus*

Gr Nomos Achaïas/Korinthias, Eparchia Kalavriton/Korinthias: summit of Ntourntouvana (Dourdouvana), limestone scree, 2051 m, 37°54'N, 22°15'E, 24.07.2015, Zarkos obs.

— Nomos & Eparchia Korinthias: Mt Killini, on limestone rocks below summit Simeo, 2000 m, 37°55'N, 22°24'E, 17.07.2018, Kit Tan, Vold, Zarkos & Christodoulou 33016 (herb. Kit); *loc. ibid.*, 19.07.2017, Christodoulou obs.

New for Mts Killini and Dourdouvana, nomos and eparchia Korinthias. *Bolanthus chelmicus* was described from Mt Chelmos and previously referred to as *Gypsophila polygonoides* (Willd.) Halácsy. We had originally considered the Dourdouvana plant to be *B. graecus* (Schreber) Barkoudah on account of the faint transverse purple stripe on some petals. After examining a wide range of material for different species of *Bolanthus* in Greece, we realized that this is not a consistent or diagnostic character and plants in the same population (and even on the same plant) can have pure white or white striped-purple petals varying in degree and intensity of the marking. The number of collections of *B. chelmicus* subsp. *chelmicus* available for study is a limiting factor even now (only three records known, all from

the same area in or near the Styx ravine). Our present collections from Mt Killini however, reinforce our view that the Killini and Dourdouvana plants are very similar and represent *B. chelmicus*. We have an ongoing survey of *Bolanthus* in the Peloponnese at the moment.

*Chenopodiaceae***152. *Camphorosma monspeliaca*** L. (Fig. 50)

Gr Nomos & Eparchia Korinthias: above Xylokaastro on road to Trikala, white sandy hill slopes, 314 m, 38°00'N, 22°30'E, 26.10.2019, Kit Tan, Vold, Zarkos & Kouni 33112 (ATH, UPA); *loc. ibid.*, 07.08.2019, Zarkos s.n. (herb. Kit).

Confirming report based on the 2 July 1848 collection by Heldreich more than 170 years ago. In the Peloponnese, it is otherwise known from the archaeological site of Sikyon (collected on 17 August 1871, also by Heldreich). Other records, few in number, are from NE Greece and the E Aegean islands.

153. *Noaea mucronata* (Forssk.) Asch. & Schweinf. (Fig. 51)

Gr Nomos & Eparchia Korinthias: above Xylokaastro on road to Trikala, at roadside, 157 m, 38°03'N, 22°36'E, 26.10.2019, Kit Tan, Vold, Zarkos & Kouni 33110; *loc. ibid.*, 24.07.2019, Zarkos s.n. (herb. Kit); above Xylokaastro on road to Trikala,



Fig. 50. *Camphorosma monspeliaca* (photo G. Zarkos).



Fig. 51. *Noaea mucronata* (photo G. Zarkos).

white sandy hill slopes, 314 m, 38°00'N, 22°30'E, 26.10.2019, *Kit Tan, Vold, Zarkos & Kouni* 33111 (ATH, UPA); *loc. ibid.*, 07.08.2019, *Zarkos s.n.* (herb. Kit).

Greyish-glaucous, semi-prostrate perennial with long, soft, linear leaves in lower part of stem. Spiny branches absent. Perianth wings well-developed. Matching descriptions and specimens from Iran labelled as *N. mucronata* subsp. *tournefortii* (Spach) Aellen.

Regardless of whether treated as *Noaea mucronata* subsp. *mucronata* or subsp. *tournefortii* the discovery of this predominantly Irano-Turanian species in Korinthias is new for nomos and eparchia as well as the first report for the Peloponnese. If treated as subsp. *tournefortii* it would also be new for Europe. Plants are late-flowering and fruiting, and thus under-collected in Greece. They have been overlooked in the area by botanists as they are well camouflaged by greyish-yellow shrubs of *Atriplex halimus* which occur in great abundance. On mainland Greece the species has been reported from stony and sandy places at Sounion, district Lavrio in S Attiki. There it is typical *Noaea mucronata* with robust, hard and clearly spiny branches, such as present on plants occurring in Turkey, Iran, Iraq and Syria. As the species is morphologically very variable we decided to name our non-spiny plant *N. mucronata* without infraspecific ranking.

Haloragaceae

154. *Myriophyllum verticillatum* L. (Fig. 52)

Gr Nomos & Eparchia Korinthias: in shallow water at northern edge of Lake Stymfalia, 610 m, 37°51'N, 22°27'E, 09.09.2019, *Christodoulou* obs. Confirming the first and only report for the Peloponnese (Koumpli-Sovantzi & al. 1997: 456).

Lentibulariaceae

155. *Utricularia australis* R.Br. (Fig. 53)

Gr Nomos & Eparchia Korinthias: abundant in shallow water at southern edge of Lake Stymfalia, 604 m, 37°50'N, 22°27'E, 26.08.2019, *Zarkos* obs. In this particular year, a 'million' flowers formed a beautiful yellow carpet on the lake surface, quite wonderful to behold! This confirms the first and only report for the Peloponnese (Koumpli-Sovantzi & al. 1997: 456).

Ranunculaceae

156. *Ranunculus baudotii* Godr. (Fig. 54)

Gr Nomos & Eparchia Korinthias: in shallow receding water at the northern edge of Lake Stymfalia, 609 m, 37°51'N, 22°26'E, 24.09.2019, *Zarkos* obs.

Second record for nomos and eparchia. Only a few plants were observed. In the Peloponnese it has been collected in brackish water at Kalogria beach (Nomos Achaïas) and in the drained area of Lake Mouria (Nomos Ilias, Karagianni & al. 2010: 78).



Verbenaceae

157. *Verbena supina* L.

Gr Nomos & Eparchia Korinthias: dried-up, seasonally flooded ground west of Lake Stymfalia, 609 m, 37°51'N, 22°26'E, 26.10.2019, Kit Tan, Vold, Zarkos & Kouni 33118 (herb. Kit); *loc. ibid.*, 29.08.2019, Zarkos obs.

This complements the only collection known from the Peloponnese, made in August 1974 from the same area (Stamatiadou 18078, ATH).

Poaceae

158. *Crypsis alopecuroides* (Piller & Mitterp.) Schrad.

Gr Nomos & Eparchia Korinthias: dried-up, seasonally flooded ground west of Lake Stymfalia, 610 m, 37°51'N, 22°26'E, 26.10.2019, Kit Tan, Vold, Zarkos & Kouni 33114 (herb. Kit).

New for nomos and eparchia. Second record for the Peloponnese, the first being from Nomos Arkadias (Baliouis 2016: 57).

Fig. 52. *Myriophyllum verticillatum* (photo V. Christodoulou).



Fig. 53. *Utricularia australis* (photo G. Zarkos).



Fig. 54. *Ranunculus baudotii*
(photo G. Zarkos).

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