New floristic records in the Balkans: 46*

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Abstract: New chorological data are presented for 139 species and subspecies from Bulgaria (68-83, 87-102, 104-111, 128-139), Greece (11-67, 84-86, 103, 112-127), and Turkey-in-Europe (1-10). The taxa belong to the following families: *Aizoaceae* (12), *Amaranthaceae* (13), *Amaryllidaceae* (86, 132, 133), *Apiaceae* (14, 68, 69, 84, 87, 88, 117, 126), *Asteraceae* (1, 2, 15-25, 70-72, 89, 112, 128, 136-138), *Balsaminaceae* (104, 129), *Brassicaceae* (73, 105, 113), *Campanulaceae* (103), *Caryophyllaceae* (26, 74-76), *Chenopodiaceae* (27), *Cistaceae* (95), *Commelinaceae* (53, 134), *Crassulaceae* (28, 29, 77), *Cyperaceae* (54, 92, 111), *Equisetaceae* (11), *Elaeagnaceae* (118), *Ericaceae* (30), *Euphorbiaceae* (31, 32, 130), *Fabaceae* (3, 33, 34-38, 78, 85, 96, 119-121), *Fumariaceae* (39), *Gentianaceae* (106), *Geraniaceae* (40, 41, 79), *Globulariaceae* (80), *Hyacinthaceae* (55), *Iridaceae* (56, 125), *Juncaceae* (57, 98), *Lamiaceae* (81, 122, 123), *Liliaceae* s.l. (58, 99-101), *Linderniaceae* (90), *Meliaceae* (42), *Myrtaceae* (43), *Nyctaginaceae* (44), *Onagraceae* (45, 91, 107, 108), *Orchidaceae* (93), *Orobanchaceae* (46, 47), *Papaveraceae* (48), *Parnassiaceae* (127), *Poaceae* (4-10, 59-66, 82, 83, 94, 102, 135), *Primulaceae* (97), *Phytolaccaceae* (139), *Rosaceae* (124), *Rubiaceae* (49), *Ruppiaceae* (67), *Scrophulariaceae* s.l. (50, 109, 114, 115, 131), *Solanaceae* (51), *Urticaceae* (110), *Verbenaceae* (52), and *Violaceae* (116).

A new taxon for science is: *Onobrychis lassenii* Kit Tan & Vold (121).

A new name and status is proposed: *Campanula dimitrii* Strid (103).

A new taxon for a country is: for Greece – *Elaeagnus commutata* (118).

The publication includes contributions by: M. Aybeke (1-10); B. Biel & Kit Tan (11-67); D.S. Dimitrov (68-83); K. Giannopoulos, Kit Tan & G. Vold (84-86); G. Kunev (87-94); G. Kunev & I. Kostadinov (95-102); A. Strid (103); D. Szokala & F. Kratoš (104-111); Kit Tan & G. Kofinas (112-116); Kit Tan & G. Vold (117-125); Kit Tan, G. Zarkos & D. Mermygkas (126-127); V. Vladimirov (128-135); V. Vladimirov, V. Trifonov, A. Tashev & N. Tashev (136-139).

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

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

Reports 1–10

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This is a report of 10 new records belonging to different families from European Turkey.

Asteraceae

1. *Cirsium canum* (L.) All.

Tu(E) A1(E) Kırklareli: between Dereköy and Bulgarian frontier, 5th km, in a *Fagus* forest clearing, 508 m, 41°57'43.7"N, 27°23'45.0"E, 09.05.1996, coll. & det. *C. Yarcı* (EDTU 6892).

New for European Turkey. According to Davis & Parris (1975), this taxon was known in A3 Bolu. It has also been reported from C Europe to N Balkans, and eastwards to W Siberia, Caucasia and W Iran. A Euro-Siberian element.

2. *Sonchus asper* (L.) Hill. subsp. ***glaucescens*** (Jordan) Ball.

Tu(E) A1(E) Kırklareli: between Kula-Geçitağzı villages, Yamkalar location, in a *Quercus* forest clearing, 513 m, 41°58'44.8"N, 27°17'43.0"E, 10.07.1997, coll. & det. *C. Yarcı* (EDTU 6929).

New for A1(E) Kırklareli in European Turkey. According to Matthews (1975), this taxon was seen in A1(E) Tekirdağ and A2(E) Istanbul.

Fabaceae

3. *Trifolium constantinopolitanum* Ser.

Tu(E) A1(E) Kırklareli: between Dereköy-Demirköy, 7th km, at the roadside, 252 m, 41°55'26.0"N, 27°26'23.2"E, 09.05.1996, coll. & det. *C. Yarcı* (EDTU 6841).

New for A1(E) Kırklareli in European Turkey. According to Zohary (1970), this taxon was known only from A2(E) Istanbul.

Poaceae

4. *Aegilops markgrafii* (Greuter) Hammer

Tu(E) A1(E) Kırklareli: Ahlatlı village environs, in open forest, 577 m, 42°04'36"N, 27°13'36"E, 03.07.1996, coll. & det. *C. Yarcı* (EDTU 7012).

New for A1(E) Kırklareli in European Turkey. According to Davis (1985), this taxon was found only in A1(E) Çanakkale.

5. *Aira praecox* L.

Tu(E) A1(E) Kırklareli: between Dereköy-Demirköy, 7th km, in a mixed forest clearing, 252 m, 41°55'26.0"N, 27°26'23.2"E, 09.05.1996, coll. & det. *C. Yarcı* (EDTU 6838).

New for European Turkey. According to Doğan (1985a), this taxon was known from A2(A) Istanbul. It has also been reported from N, W & C Europe, Spain, Portugal, S France, Italy, and Crimea, and is a Euro-Siberian element.

6. *Avena fatua* L. var. ***glabrata*** Peterm

Tu(E) A1(E) Kırklareli: between Ahmetler-Karaabalar, 3rd km, at field edge, 764 m, 42°03'31.4"N, 27°13'12.7"E, 18.07.1996, coll. & det. *C. Yarcı* (EDTU 7021).

New for European Turkey. According to Doğan (1985b), this taxon was known from A2(A) Bursa. It has also been reported from Europe, the Mediterranean area, SW Asia, and eastwards to E Asia, a Euro-Siberian element.

7. *Bromus squarrosus* L.

Tu(E) A1(E) Kırklareli: between road fork to Topçular village and Ahmetler village, 5th km, in open forest, 563 m, 42°01'33.6"N, 27°12'59.5"E, 27.06.1996, coll. & det. *C. Yarcı* (EDTU 6988).

New for A1(E) Kırklareli in European Turkey. According to Smith (1985), this taxon was known only from A1(E) Çanakkale.

8. *Festuca gigantea* (L.) Vill.

Tu(E) A1(E) Kırklareli: between Topçular-Terzidere, 2nd km, 563 m, in a *Quercus* forest clearing, 42°00'59.4"N, 27°07'54.6"E, 02.07.1996, coll. & det. *C. Yarcı* (EDTU 6996).

New for A1(E) Kırklareli in European Turkey. According to Markgraf-Dannenberg (1985), this taxon was known only from A1(E) Tekirdağ and A2(E) Istanbul.

9. *Festuca jeanpertii* (St. Yves) F. Markgraf apud Hayek subsp. ***jeanpertii***

Tu(E) A1(E) Kırklareli: Ahmetler village, in a forest clearing, on rocky slope, 764 m, 42°01'56"N,

27°13'26"E, 27.06.1997, coll. & det. *C. Yarcı* (EDTU 6844).

New for European Turkey. According to Markgraf-Dannenberg (1985), this taxon was known from A2(A) Bursa. It has also been reported from C & S Greece, the Aegean (Cyclades); an Eastern Mediterranean element.

10. *Poa trivialis* L.

Tu(E) A1(E) Kırklareli: Karaabalar village environs, in mixed forest, 265 m, 42°04'09"N, 27°17'20"E, 24.09.1996, coll. & det. *C. Yarcı* (EDTU 7032).

New for A1(E) Kırklareli in European Turkey. According to Edmondson (1985), this taxon was found only in A1(E) Tekirdağ and A2(E) Istanbul.

Reports 11–67

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This is the fifth report of new plant-records for the island of Milos (phytogeographical region Kiklades, Nomos Kikladon, Eparchia Milou) based on visits in 2010, 2019 to 2021. The 57 records listed are new for the island unless otherwise stated. Seven 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 floristic region to 83. Occurrence on the other Kikladean islands is briefly summarized.

Equisetaceae

11. *Equisetum ramosissimum* Desf.

Gr Nomos Kikladon, Eparchia Milou: Adamas-Vourla, embankment north of shipyard, 2 m, 36°43'09"N, 24°27'36"E, 13.11.2021, *Biel* 21.223.

Most of the Kiklades. Already noted in 2019 near Emborios.

Aizoaceae

12. *Aptenia cordifolia* (L. f.) Schwantes (Fig. 1)

Gr Nomos Kikladon, Eparchia Milou: N of Plaka, along path in rocky phrygana at steep Kastro hill, 210 m, 36°44'43"N, 24°25'18"E, 14.11.2021, *Biel* obs. (photo).

Fig. 1. *Aptenia cordifolia* (photo B. Biel).

Confirming report by Kalheber, cited in Raus (2012). Most of the Kiklades.

Amaranthaceae

13. *Amaranthus bouchonii* Thell.

Gr Nomos Kikladon, Eparchia Milou: W of Pollonia, plant nursery and ruderal places, 3 m, 36°45'50''N, 24°31'15''E, 14.06.2021, *Biel* 21.111.

Only recorded from Serifos. There are few and scattered reports in Greece.

Apiaceae

14. *Orlaya platycarpos* W.D.J. Koch [syn. *O. daucoides* Greuter]

Gr Nomos Kikladon, Eparchia Milou: Plakes, terraces with olive trees and fallow fields at northern edge of village, 145 m, 36°44'49"N, 24°25'27"E, 22.02.2020, *Biel* obs.

N & C Kiklades, widespread in Greece.

Asteraceae

15. *Crepis fraasii* Sch. Bip.

Gr Nomos Kikladon, Eparchia Milou: NE edge of Adamas, valley with *Arundo* and open phrygana near Taxiarchis cemetery, 20 m, 36°43'40"N, 24°27'11"E, 09.05.2021, *Biel* 21.101.

N and C Kiklades, widespread in Greece except in far north. Also noted W of Adamas.

Fig. 2. *Leontodon taraxacoides* (photo B. Biel).

16. *Crepis sancta* (L.) Bornm.
Gr Nomos Kikladon, Eparchia Milou: N of Provatas, seasonally wet pasture near farm, 20 m, 36°40'37"N, 24°26'31"E, 05.05.2021, *Biel* obs.
Mainly C Kiklades, widespread in Greece.

17. *Crepis setosa* Haller f.
Gr Nomos Kikladon, Eparchia Milou: W of Achivadolimni, waste ground with phrygana at Ag. Mamas, 20 m, 36°41'17"N, 24°26'16"E, 10.03.2010, *Biel* obs. (photo).
Reported from Andros and Amorgos.

18. *Filago aegaea* subsp. ***aristata*** Wagenitz
Gr Nomos Kikladon, Eparchia Milou: W-NW of Xilokeratia, phrygana and *Juniperus* scrub on slope above dirt road, 180 m, 36°40'04"N, 24°20'19"E, 11.05.2021, *Biel* 21.118.
Most of Kiklades. An additional eight localities were noted on island.

19. *Filago cretensis* subsp. ***cycladum*** Wagenitz
Gr Nomos Kikladon, Eparchia Milou: SW of Adamas, rocky phrygana at summit ridge of Chodro Vouno, 620 m, 36°40'55"N, 24°22'18"E, 04.05.2021, *Biel* 21.053.
Most of Kiklades. Two other localities are in the southern part of island.

Fig. 3. *Scorzonera mollis* (photo B. Biel).

20. *Leontodon graecus* Boiss. & Heldr.
Gr Nomos Kikladon, Eparchia Milou: NW of Profitis Ilias, steep phrygana slope by concrete road, 610 m, 36°40'N, 24°22'E, 16.06.2021, *Biel* 21.177.
Reported from Amorgos and Naxos.

21. *Leontodon taraxacoides* (Vill.) Mérat (Fig. 2)
Gr Nomos Kikladon, Eparchia Milou: Plakes, road margins, walls, waste places between houses, 150 m, 36°44'48"N, 24°25'48"E, 23.11.2021, *Biel* 21.245; NE of Plakes, terraced phrygana slope above valley, 105 m, 36°44'55"N, 24°25'58"E, 23.11.2021, *Biel* 21.246.
According to Euro+Med PlantBase this name is synonymous with *L. saxatilis* Lam. which is reported on the Ionian islands but not in the rest of Greece. The identity of the plants from Milos thus awaits further investigation.

22. *Scorzonera mollis* M. Bieb. (Fig. 3)
Gr Nomos Kikladon, Eparchia Milou: NW of Embourios, *Erica*-phrygana by dirt track, 170 m, 36°43'18"N, 24°22'00"E, 13.05.2021, *Biel* 21.129.
Confirming literature records cited in Raus (2012). N and C Kiklades. Also noted NW of Adamas.

23. *Senecio leucanthemifolius* Poir. [*S. gallicus* auct. fl. graec., non Vill.]
Gr Nomos Kikladon, Eparchia Milou: S of Tripiti, pasture with olive trees, road margins with

phrygana near Ag. Antonios, 105 m, 36°43'53"N, 24°25'50"E, 22.02.2020, *Biel* 20.032.

Confirming literature records cited in Raus (2012) as *S. squalidus*, *S. coronopifolius* and *S. gallicus*. Mainly C Kiklades, widespread on island.

24. *Taraxacum minimum* (Guss.) N. Terracc.

Gr Nomos Kikladon, Eparchia Milou: NE edge of Adamas, valley with *Arundo* and open phrygana near Taxiarchis cemetery, 20 m, 36°43'40"N, 24°27'11"E, 13.11.2021, *Biel* 21.218.

Mainly S and C Kiklades. Widespread on island, counted in more than 60 localities.

25. *Tragopogon dubius* Scop.

Gr Nomos Kikladon, Eparchia Milou: NE edge of Achivadolimni, sandy waste ground with *Juniperus* scrub, 3 m, 36°41'17"N, 24°26'38"E, 12.03.2010, *Biel* obs. (photo).

Mainly C Kiklades, also noted S of Milos airport.

Caryophyllaceae

26. *Velezia quadridentata* Sm.

Gr Nomos Kikladon, Eparchia Milou: W-NW of Adamas, phrygana slope below transmitter station near Nichia, 75 m, 36°43'34"N, 24°26'22"E, 27.10.2019, *Biel* obs.

Most of the Kiklades.

Chenopodiaceae

27. *Bassia scoparia* (L.) A.J. Scott

Gr Nomos Kikladon, Eparchia Milou: Adamas, waste ground, parks, road margins at eastern part of village, 5 m, 36°43'34"N, 24°26'52"E, 16.11.2021, *Biel* 21.231.

Reported from Amorgos. Established introduction, mainly coastal in Greece.

Crassulaceae

28. *Aeonium arboreum* (L.) Webb & Berthel.

Gr Nomos Kikladon, Eparchia Milou: SW of Zefiria, road margins, uncultivated fields, 15 m, 36°41'57"N, 24°29'18"E, 03.05.2021, *Biel* obs. (photo).

Locally naturalized on a few Kikladean islands, viz., Amorgos, Anafi, Thira and Folegandros.

Fig. 4. *Arbutus andrachne* (photo B. Biel).

29. *Crassula vaillantii* (Willd.) Roth

Gr Nomos Kikladon, Eparchia Milou: NW of Achivadolimni, seasonally wet sandy flats on both sides of road, 18 m, 36°41'19"N, 24°26'22"E, 12.03.2010, *Biel* 10.024.

On Mikonos and Naxos. Six other localities were noted in the southern part of island.

Ericaceae

30. *Arbutus andrachne* L. (Fig. 4)

Gr Nomos Kikladon, Eparchia Milou: Chodro Vouno, phrygana on steep NE slope beside gravelly field, 530 m, 36°40'57"N, 24°22'27"E, 15.11.2021, *Biel* 21.227.

New for Kiklades. Unmistakeable as seven tall individuals provided welcome shade. Growing together with *A. unedo*.

Euphorbiaceae

31. *Euphorbia maculata* L. (Fig. 5)

Gr Nomos Kikladon, Eparchia Milou: E-SE of Adamas, margin of field and fallow ground by main

road to Pollonia, 20 m, 36°43'25"N, 24°27'49"E, 16.11.2021, *Biel* 21.234.

Reported from Amorgos and Naxos. Mainly in western mainland Greece.

Fig. 5. *Euphorbia maculata* (photo B. Biel).

32. *Ricinus communis* L.

Gr Nomos Kikladon, Eparchia Milou: Tripiti, rocky slope above street, 160 m, 36°44'12"N, 24°25'42"E, 02.05.2021, *Biel* obs. (photo).

Naturalized escape from cultivation. Recorded on some islands, viz., Amorgos, Andros, Naxos, Sifnos and Siros.

Fabaceae

33. *Melilotus italicus* (L.) Lam.

Gr Nomos Kikladon, Eparchia Milou: W of Adamas, hotel park behind sandy beach, 2 m, 36°43'30"N, 24°26'31"E, 30.04.2021, *Biel* obs.

Mainly S and C Kiklades.

34. *Securigera parviflora* (Desv.) Lassen

Gr Nomos Kikladon, Eparchia Milou: W-NW of Ag. Kyriaki, stream valley with phrygana and *Juniperus,* 85 m, 36°40'29"N, 24°29'10"E, 12.05.2021, *Biel* obs.

Reported from Amorgos, Andros, Ios and Tinos. Another locality noted near Fyropotamos.

35. *Trifolium boissieri* Guss.

Gr Nomos Kikladon, Eparchia Milou: NW of Adamas, olive terraces in valley, 20 m, 36°43'54"N, 24°26'08"E, 01.05.2021, *Biel* obs.

On several islands including neighbouring Kimolos. Also noted SW of Agia Marina.

36. *Trifolium hirtum* L.

Gr Nomos Kikladon, Eparchia Milou: N-NW of Fyropotamos, fallow field and wet pasture with phrygana at dirt road, 55 m, 36°45'57"N, 24°25'30"E, 02.05.2021, *Biel* obs.

On several islands in C Kiklades. Also noted W of Agia Kyriaki and S of Zefiria.

37. *Vicia tenuifolia* Roth subsp. ***tenuifolia***

Gr Nomos Kikladon, Eparchia Milou: E of Milos airport, vegetable field and waste ground east of airport, 10 m, 36°41'52"N, 24°29'02"E, 03.05.2021, *Biel* 21.039.

New for Kiklades. Also NE of Profitis Ilias and N of Skinopi.

38. *Vicia villosa* subsp. ***varia*** (Host.) Corb.

Gr Nomos Kikladon, Eparchia Milou: E of Pachena, rocky phrygana at fjord of Papafrangas, 20 m, 36°45'09"N, 24°30'05"E, 11.03.2010, *Biel* obs. (photo).

Confirming report by Kalheber and literature records cited in Raus (2012). Recorded from Andros and Naxos.

Fumariaceae

39. *Fumaria officinalis* L.

Gr Nomos Kikladon, Eparchia Milou: NE of Fyropotamos, *Sarcopoterium-Thymus* phrygana by dirt road, 75 m, 36°45'46"N, 24°25'19"E, 22.02.2020, *Biel* obs.

Widespread in Kiklades. Also noted NW of Adamas and NW of Xilokeratia.

Geraniaceae

40. *Geranium lucidum* L.

Gr Nomos Kikladon, Eparchia Milou: SW of Adamas, Mt Profitis Ilias, stony phrygana with shrubs near chapel at summit, 740 m, 36°40'33"N, 24°22'59"E, 10.03.2010, *Biel* obs.

Widespread in Kiklades. Also noted N of Adamas and NE of Chodro Vouno.

41. *Geranium pusillum* Burm. f.

Gr Nomos Kikladon, Eparchia Milou: N of Provatas, near farm, vine field and olive grove, 20 m, 36°40'49"N, 24°26'34"E, 05.05.2021, *Biel* 21.061.

New for the Kiklades. It was also noted N of Pachena.

Meliaceae

42. *Melia azedarach* L.

Gr Nomos Kikladon, Eparchia Milou: W of Adamas, hotel park behind sandy beach, 2 m, 36°43'30"N, 24°26'31"E, 30.04.2021, *Biel* obs. (photo).

Planted, not naturalized. Also on Amorgos and Naxos.

Myrtaceae

43. *Eucalyptus camaldulensis* Dehnh.

Gr Nomos Kikladon, Eparchia Milou: NW of Agia Kyriaki, open phrygana with *Phoenix* at Ag. Pandes, 35 m, 36°40'23"N, 24°29'40"E, 22.10.2019, *Biel* obs.

On Amorgos, Anafi and Folegandros. Established planting but not naturalized. Several other localities noted on island.

Nyctaginaceae

44. *Mirabilis jalapa* L.

Gr Nomos Kikladon, Eparchia Milou: Plaka, waste ground and road margins, 150 m, 36°44'29"N, 24°25'25"E, 14.11.2021, *Biel* obs. (photo).

Reported from N and C Kiklades. Noted with *Nicotiana glauca*, and fully established in several other ruderal sites.

Onagraceae

45. *Oenothera speciosa* Nutt.

Gr Nomos Kikladon, Eparchia Milou: E-SE of Adamas, edge of field and fallow ground by main road to Pollonia, 20 m, 36°43'25"N, 24°27'49"E, 16.11.2021, *Biel* obs. (photo).

New for the Kiklades. In other parts of Greece, self-sown and persisting for some time.

Orobanchaceae

46. *Orobanche alba* Stephan ex Willd.

Gr Nomos Kikladon, Eparchia Milou: SW of Adamas, rocky phrygana slope by dirt road above coast, 20 m, 36°43'24"N, 24°26'23"E, 30.04.2021, *Biel* obs. (photo).

Confirming Wiedenbein (1988) and other literature records cited in Raus (2012). On several of the larger islands in Kiklades. Also noted elsewhere on island.

47. *Orobanche minor* Sm.

Gr Nomos Kikladon, Eparchia Milou: Adamas-Neochori, coastal road and sandy beach with *Tamarix*, 1 m, 36°43'25"N, 24°27'23"E, 01.05.2021, *Biel* obs. (photo).

Most of Kiklades.

Papaveraceae

48. *Eschscholzia californica* Cham.

Gr Nomos Kikladon, Eparchia Milou: W of Pollonia, waste ground near plant nursery, 3 m, 36°45'50"N, 24°31'15"E, 10.05.2021, *Biel* obs.

New for Kiklades or at least, the first documentation. Garden escape, self-sown but unlikely to become naturalized.

Rubiaceae

49. *Galium divaricatum* Lam.

Gr Nomos Kikladon, Eparchia Milou: SW of Adamas, Mt Profitis Ilias, rocky phrygana below summit, 720 m, 36°40'33"N, 24°22'59"E, 04.05.2021, *Biel* 21.045.

Mainly N and C Kiklades.

Scrophulariaceae

50. *Kickxia spuria* (L.) Dumort.

Gr Nomos Kikladon, Eparchia Milou: W of Zefiria, road margins, 15 m, 36°42'04"N, 24°29'12"E, 15.06.2021, *Biel* 21.171.

Reported from Amorgos, Andros and Naxos. Also noted NE of Milos airport.

Solanaceae

51. *Solanum nigrum* subsp. ***schultesii*** (Opitz) Wessely

Gr Nomos Kikladon, Eparchia Milou: N of Adamas, fields, slope with olive trees and phrygana, 15 m, 36°43'52"N, 24°26'38"E, 13.11.2021, *Biel* 21.215.

Reported from Amorgos, Andros and Sifnos. Also noted NW of Adamas and W of Emborios.

Verbenaceae

52. *Lantana camara* L.

Gr Nomos Kikladon, Eparchia Milou: eastern part

of Adamas, waste ground, parks, road margins, 5 m, 36°43'34"N, 24°26'52"E, 16.11.2021, *Biel* 21.232.

Reported only from Amorgos. Naturalized in coastal areas elsewhere in Greece. Also noted near Adamas and south of Pollonia.

Commelinaceae

53. *Tradescantia fluminensis* Vell.

Gr Nomos Kikladon, Eparchia Milou: Adamas, waste ground, road margins in village, 30 m, 36°43'32"N, 24°26'42"E, 15.06.2021, *Biel* 21.172.

New for the Kiklades. Native to S America; locally established in Greece in ditches and damp, ruderal places.

Cyperaceae

54. *Cyperus rotundus* L.

Gr Nomos Kikladon, Eparchia Milou: Adamas, waste ground, road margins in village, 30 m, 36°43'32"N, 24°26'42"E, 16.11.2021, *Biel* 21.229.

Most of Kiklades. Also noted S of Pachena and near Pollonia.

Hyacinthaceae

55. *Muscari cycladicum* P.H. Davis & D.C. Stuart subsp. ***cycladicum***

Gr Nomos Kikladon, Eparchia Milou: SE of Adamas conference centre, rocky phrygana by dirt road, 20 m, 36°43'03"N, 24°27'55"E, 07.03.2010, *Biel* obs.

Mainly S Kiklades. Also noted NW of Adamas, W of Emborios and near Achivadolimni.

Iridaceae

56. *Crocus cartwrightianus* Herb. (Figs. 6 & 6a)

Gr Nomos Kikladon, Eparchia Milou: N of Xilokeratia, phrygana slope above dirt road, 225 m, 36°39'58"N, 24°21'31"E, 18.11.2021, *Biel* 21.241; N-NW of Xilokeratia, rocky phrygana slope above dirt road, 255 m, 36°39'51"N, 24°21'22"E, 18.11.2021, *Biel* 21.242.

Most of the Kiklades including the neighbouring island of Kimolos but surprisingly, not reported for Milos. Other localities are the north slope and summit of Profitis Ilias, and NW of Fyropotamos. Abundant *Crocus tournefortii* and *C. laevigatus* occurred on the island and often in the same area, sometimes together with *C. cartwrightianus* (see Fig. 6a), but they do not hybridize. Pale lilac or pink-flowered forms of *C. laevigatus* may be mistaken for *C. tournefortii* but corm tunics distinguish the taxa.

Fig. 6. *Crocus cartwrightianus* (photo B. Biel).

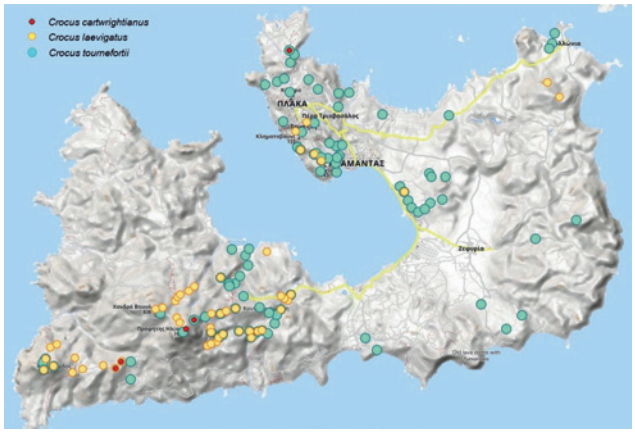

Fig. 6a. Distribution map of *Crocus* spp. on island of Milos.

Juncaceae

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

Gr Nomos Kikladon, Eparchia Milou: NW of Xilokeratia, steep phrygana slope and well by dirt road, 30 m, 36°40'33"N, 24°20'00"E, 11.05.2021, *Biel* 21.120.

Mainly N and C Kiklades. Four other localities noted on island.

Liliaceae

58. *Asphodelus fistulosus* L.

Gr Nomos Kikladon, Eparchia Milou: NE of Adamas, valley with *Arundo* and phrygana near Taxiarchis cemetery, 20 m, 36°43'40"N, 24°27'11"E, 09.05.2021, *Biel* 21.220.

Most of the Kiklades.

Poaceae

59. *Avena barbata* subsp. ***wiestii*** (Steud.) Mansf.

Gr Nomos Kikladon, Eparchia Milou: SW of Adamas, rocky phrygana on track to Mt Profitis Ilias, 250 m, 36°41'10"N, 24°23'47"E, 04.05.2021, *Biel* 21.173.

Recorded from Aspronisi (uninhabited small islet within Santorini caldera) and Naxos.

60. *Avena fatua* L.

Gr Nomos Kikladon, Eparchia Milou: E of Milos airport, vegetable field and waste ground, 10 m, 36°41'52"N, 24°29'02"E, 03.05.2021, *Biel* obs.

Mainly S Kiklades (Amorgos, Anafi and Folegandros). Also noted N of Pollonia.

61. *Cenchrus setaceus* (Forssk.) Morrone [syn. *Pennisetum setaceum* (Forssk.) Chiov.] (Fig. 7)

Gr Nomos Kikladon, Eparchia Milou: N edge of Pollonia, waste ground and rocky slopes at coastal area with hotels, 5 m, 36°46'06"N, 24°31'26"E, 17.11.2021, *Biel* 21.236.

Escape from introduction as an ornamental grass ('fountain grass'), unlikely to persist outside cultivation.

62. *Elytrigia atherica* (Link) Kerguélen

Gr Nomos Kikladon, Eparchia Milou: SW of Adamas, gravelly beach and coastal phrygana near War Memorial, 3 m, 36°43'18"N, 24°26'18"E, 12.06.2021, *Biel* 21.140; S-SE of Pachena, phrygana slopes in valley, by dirt road, 95 m, 36°43'44"N, 24°30'46"E, 15.06.2021, *Biel* 21.166.

Recorded from Amorgos, Folegandros and Serifos. Also noted NE of Pachena.

63. *Echinochloa crus-galli* (L.) P. Beauv. subsp. ***crus-galli***

Gr Nomos Kikladon, Eparchia Milou: Pachena, seasonally wet ditch at road junction, 25 m, 36°45'09"N, 24°30'00"E, 17.11.2011, *Biel* 21.239.

Fig. 7. *Cenchrus setaceus* (photo B. Biel).

N and C Kiklades. The most widespread subspecies in Greece; subsp. *hispidula* (Retz.) Honda occurs in rice fields in the north.

64. *Hainardia cylindrica* (Willd.) Greuter

Gr Nomos Kikladon, Eparchia Milou: N of Adamas, waste ground by sulphur spring, at cross-junction of dirt roads, 20 m, 36°43'52"N, 24°26'53"E, 01.05.2021, *Biel* obs.

Occurring on several islands in N and S Kiklades. Six other localities noted on island.

65. *Paspalum dilatatum* Poir.

Gr Nomos Kikladon, Eparchia Milou: Plaka centre, road margin and park area at Archaeological Museum, 165 m, 36°44'37"N, 24°25'26"E, 14.11.2021, *Biel* 21.226.

W Kiklades (Amorgos and Astipalea).

66. *Phleum subulatum* subsp. ***ciliatum*** (Boiss.) Humphries

Gr Nomos Kikladon, Eparchia Milou: S of Milos airport, open *Juniperus* scrub by dirt road, 65 m, 36°41'08"N, 24°28'01"E, 05.05.2021, *Biel* 21.063a; SE of Pollonia, phrygana on plateau of Voudia hill (with transmitting station), 110 m, 36°45'21"N, 24°31'58"E, 10.05.2021, *Biel* 21.107.

Reported only from Naxos (NW of airport) but common on E Aegean islands.

Ruppiaceae

67. *Ruppia maritima* L.

Gr Nomos Kikladon, Eparchia Milou: NE of Achivadolimni, brackish pond, 2 m, 36°41'17"N, 24°26'38"E, 12.03.2010, *Biel* 10.014; SW of Adamas, brackish swamp behind gravelly coast, 1 m, 36°43'14"N, 24°26'14"E, 25.02.2020, *Biel* 20.049; SE of Ag. Marina, artificial water-filled reservoir, 230 m, 36°40'55"N, 24°25'07"E, 07.05.2021, *Biel* obs. (photo).

On several islands in C Kiklades. Confirming 178 years later, the 1832 report of Bory & Chaubard, 'Les eaux stagnantes à Milo'. *Ruppia spiralis* Dumort. [syn. *R. cirrhosa* (Petagna) Grande] also occurs on Milos and differs by its long and coiled peduncles.

Reports 68–83

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The records below are new to the respective floristic regions or sub-regions.

Apiaceae

68. *Anthriscus nitida* (Wahlenb.) Garcke

Bu Valley of River Struma (*Northern*): on the right-side riverbank of river Rilska, FM76, 24.05.2021, coll. & det. *D. Dimitrov* (SOM 177454).

69. *Peucedanum carvifolium* Vill.

Bu Mt Sredna Gora (*Western*): in damp meadows southwards from Stargel village, GN33, 29.07.2017, coll. & det. *D. Dimitrov* (SOM 177070).

Asteraceae

70. *Cirsium heterotrichum* Pančić

Bu Sofia region: in calcareous steppe eastwards from the Seslavtsi suburb of Sofia, GN04, 26.05.2021, coll. & det. *D. Dimitrov* (SOM 177448).

71. *Hieracium caespitosum* Dumort. subsp. ***caespitosum***

Bu Sofia region: in calcareous steppe eastwards from the Seslavtsi suburb of Sofia, GN04, 26.05.2021, coll. & det. *D. Dimitrov* (SOM 177449).

72. *Leucanthemum pallens* (Gay) DC.

Bu Sofia region: in calcareous steppe eastwards from the Seslavtsi suburb of Sofia, GN04, 26.05.2021, coll. & det. *D. Dimitrov* (SOM 177447).

Brassicaceae

73. *Rapistrum rugosum* (L.) All.

Bu Balkan Range (*Western*): Mt Murgash, above Negushevo village, Gorna Malina Municipality, GN23, 05.06.2021, coll. & det. *D. Dimitrov* (SOM 177459).

Caryophyllaceae

74. *Cerastium tenoreanum* Ser.

Bu Balkan Range (*Western*): Mt Murgash, above Negushevo village, Gorna Malina Municipality, GN23, 05.06.2021, coll. & det. *D. Dimitrov* (SOM 177453).

75. *Minuartia mesogitana* (Boiss.) Hand.-Mazz.

Bu Balkan Range (*Western*): Mt Murgash, above Negushevo village, Gorna Malina Municipality, GN23, 06.06.2021, coll. & det. *D. Dimitrov* (SOM 177455).

76. *Stellaria alsine* Grimm.

Bu Valley of River Struma (*Northern*): Rila town, at the road to Stob village, FM76, 24.05.2021, coll. & det. *D. Dimitrov* (SOM 177452).

Crassulaceae

77. *Sedum sexangulare* L.

Bu Sofia region: in calcareous steppe eastwards from the Seslavtsi suburb of Sofia, GN04, 21.06.2021, coll. & det. *D. Dimitrov* (SOM 177461).

Fabaceae

78. *Onobrychis gracilis* subsp. ***bulgarica*** (Jordanov) Kožuharov

Bu Balkan Range (*Western*): Mt Murgash, above Negushevo village, Gorna Malina Municipality, GN23, 05.06.2021, coll. & det. *D. Dimitrov* (SOM 177457).

Geraniaceae

79. *Geranium phaeum* L.

Bu Valley of River Struma (*Northern*): Rila town: on the right-side riverbank of river Rilska,

FM76, 24.05.2021, coll. & det. *D. Dimitrov* (SOM 177450).

Globulariaceae

80. *Globularia aphyllanthes* Crantz

Bu Sofia region: in calcareous steppe eastwards from the Seslavtsi suburb of Sofia, GN04, 21.06.2021, coll. & det. *D. Dimitrov* (SOM 177462).

Lamiaceae

81. *Thymus thracicus* Velen.

Bu Sofia region: in calcareous steppe eastwards from the Seslavtsi suburb of Sofia, GN04, 21.06.2021, coll. & det. *D. Dimitrov* (SOM 177441).

Poaceae

82. *Koeleria simonkaii* Adam.

Bu Balkan Range (*Western*): Mt Murgash, above Negushevo village, Gorna Malina Municipality, GN23, 05.06.2021, coll. & det. *D. Dimitrov* (SOM 177460).

83. *Poa perconcinna* Edmondson

Bu Sofia region: in calcareous steppe eastwards from the Seslavtsi suburb of Sofia, GN04, 26.05.2021, coll. & det. *D. Dimitrov* (SOM 177443).

Reports 84–86

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Apiaceae

84. *Berula erecta* (Huds.) Coville (Fig. 8).

Gr Nomos & Eparchia Ilias: Kounopeli, Yrmini, freshwater ditch, 6 m, 38°05'N, 21°21'E, 16.6.2021, *Giannopoulos* s.n. (herb. Giannopoulos).

New for nomos and eparchia, scattered in Peloponnese, widespread in north temperate regions. In wet places by streams and ditches. Also occurring not so far away at Lake Lamia, SSW of Metochi (Nomos Achaias).

Fig. 8. *Berula erecta*, flowers and fruits (photo K. Giannopoulos).

Fabaceae

85. *Styphnolobium japonicum* (L.) Schott [syn.: *Sophora japonica* L.] (Figs. 9 & 10)

Gr Nomos Ilias, Eparchia Olimbias: roadside outside village of Krioneri, 765 m, 37°27'N, 21°38'E, 20.07.2018, *Kit Tan*, *G. Vold* & *Giannopoulos* obs.

New for nomos and eparchia; in the Peloponnese it has also been reported from the Mani Peninsula (Marchant 2019). Native to China where it grows on rocky mountain slopes and often planted near tem-

Fig. 9. *Styphnolobium japonicum* (photo K. Giannopoulos).

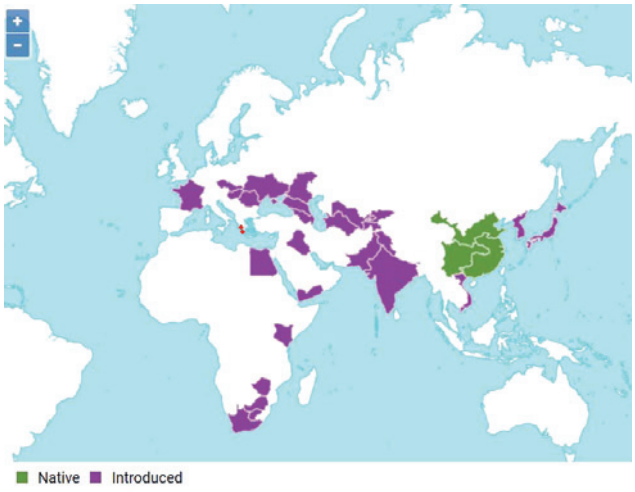

Fig. 10. Distribution of *Styphnolobium japonicum* (Plants of the World Online, presence in Greece indicated by red dots).

ples, hence the name 'Pagoda tree'. Although native to China it was originally described from trees cultivated in Japan, thus the specific epithet. It is now widely planted in the world and easily naturalized after introduction (see Fig. 10). The indehiscent fruits are very distinctive with their marked constrictions between the seeds, providing a 'beaded' effect.

Amaryllidaceae

86. *Zephyranthes rosea* Lindl. (Fig. 11)

Gr Nomos & Eparchia Ilias: at roadside outside village of Vasilaki, 220 m, 37°39'N, 21°45'E, 20.10.2021, *Giannopoulos* & *Vendras* obs.

First report from nomos and eparchia, perhaps also from the Peloponnese. Probably discarded and thrown out with garden soil. There have been other observations in Greece but no formal documentation. Native to S America, from Columbia to Peru where it is also cultivated as an ornamental.

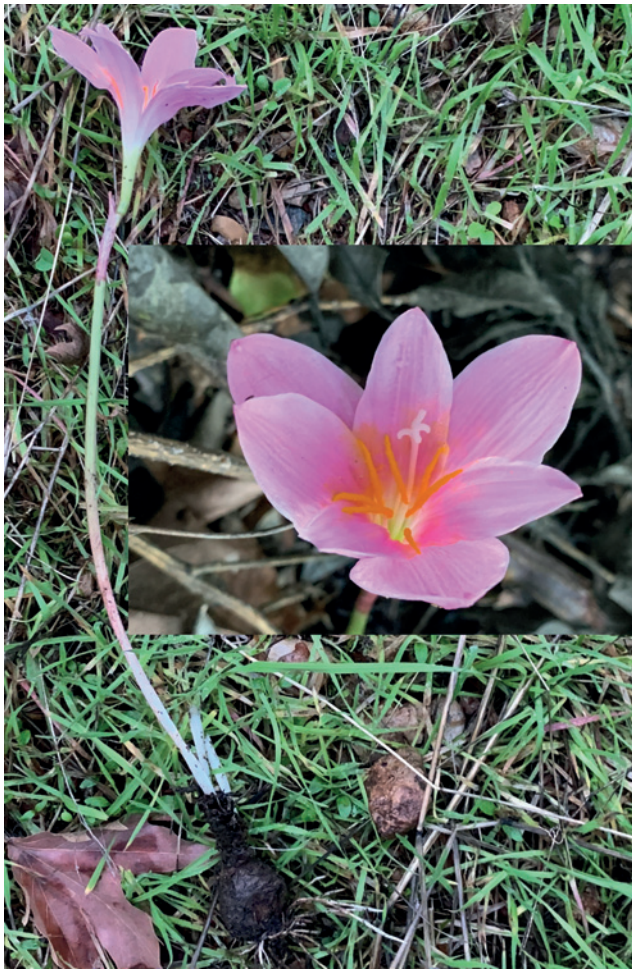

Fig. 11. *Zephyranthes rosea* (photo K. Giannopoulos).

Reports 87–94

Georgi Kunev

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Apiaceae

87. *Peucedanum officinale* L.

Bu Balkan Range (*Western*): in grasslands and on rocky slopes at the NW side of Zimevitsa Plateau, Mt Ponor, close to Dobravitsa village, Sofia district, 1100–1400 m, FN86, 43.03177°N, 23.24834°E, 20.09.2021, coll. *G. Kunev* (SO 108143).

New for this floristic subregion (Kuzmanov & Andreev 1982; Assyov & Petrova 2012). Very frequently observed in the area, but mostly solitary or in groups of up to 10 individuals in the most xeric, rocky sites; or less often in steppe meadows.

Fig. 12. *Leontodon saxatilis* (photo G. Kunev). In the left, is outer achene, typically curved and enclosed in an involucral bract, with shorter pappus. In the right is inner, beaked achene with longer, pale yellowish bristles.

88. *Pastinaca umbrosa* Steven ex DC.

Bu Sofia region: in an abandoned field, N from the Central Railway Station, 540 m, FN83, 42.71687°N, 23.31853°E, with flowers, 15.07.2021, coll. *G. Kunev* (SO 108152).

Not reported previously from Sofia region (Peev 1982; Assyov & Petrova 2012). Only a single specimen of this taxon, which originates from the Republic of Armenia, is kept in the Herbarium of Sofia University (SO 71797).

The origin of the population in Sofia is probably not autochthonous. It consists of numerous individuals which inhabit some illegally deposited piles of construction waste close to the railway. Associated species at the site are mostly such ruderals as *Silene vulgaris*, *Saponaria officinalis*, *Artemisia vulgaris*, *Crepis setosa*, *Echium vulgare*, *Sambucus ebulus*, *Melilotus albus*, and *Clematis vitalba*. Particularly abundant is also the invasive alien *Senecio inaequidens*.

Asteraceae

89. *Leontodon saxatilis* Lam. (Fig. 12)

Bu Valley of River Struma (*Northern*): on the damp shore in the tail-part of Drenov Dol Reservoir, Kyustendil district, 540 m, FM38, 42.30304°N, 22.68271°E, 11.10.2020, with fruits & 03.07.2021, with flowers, coll. *G. Kunev* (SO 108149, 108151).

New for this floristic region. Recently reported as a new species for the Bulgarian flora (Dimitrova & al. 2005) and, subsequently, new localities have been added (Vladimirov & Petrova 2010a; Bancheva & al. 2012; Vladimirov 2018). About 50 individuals were observed at the presently reported site.

Linderniaceae

90. *Lindernia dubia* (L.) Pennell

Bu Valley of River Struma (*Northern*): on the desiccating shore of the Drenov Dol Reservoir, Kyustendil district, 540 m, FM38, 42.30346°N, 22.68356°E, with flowers and fruits, 11.10.2020, coll. *G. Kunev* (SO 108060).

Not reported previously from this floristic subregion (cf. Assyov & Petrova 2012).

Onagraceae

91. *Epilobium alpestre* (Jacq.) Krock.

Bu Vitosha region: along a small stream at the source of river Bistritsa, within the outlines of Bistrishko Branishte Reserve, 1970 m, FN81, 42.55965°N, 23.29614°E, with fruits and seeds, 06.08.2021, coll. *G. Kunev* (SO 108146); on the trail from

Zlatni Mostove to Kumata chalet, damp place near a small stream, 1440 m, FN81, 42.60880°N, 23.24012°E, with flowers 12.07.2021, *G. Kunev* obs.

Second report of the species from Vitosha Mt (Vladimirov 2019). Apparently well established in the mountain, mostly restricted to damp places or streams. Also known from the Balkan Range (*Central*) and Rila Mts (Assyov & Petrova 2012). In both localities not more than 10 individuals were observed. At the first site the species grew together with *Deschampsia cespitosa*, *Geum coccineum*, *Caltha palustris*, *Carex nigra* and other less abundant species.

Cyperaceae

92. *Cyperus michelianus* (L.) Delile

Bu Valley of River Struma (*Northern*): on the desiccating shore of the Drenov Dol Reservoir, Kyustendil district, 540 m, FM38, 42.30315°N, 22.68556°E, 11.10.2020, coll. *G. Kunev* (SO 108059); Bagrentsi Reservoir, Kyustendil district, 500 m, FM48, 42.26588°N, 22.77244°E, 11.10.2020, *G. Kunev* obs.

Not reported previously from this floristic subregion (see Assyov & Petrova 2012). Recently collected from the shores of Struma River, near Kulata village (Kunev 2020a).

Orchidaceae

93. *Spiranthes spiralis* (L.) Chevall. (Fig. 13)

Bu Valley of River Struma (*Southern*): S from Ribnik village, Petrich Municipality, in open dry grasslands amongst thickets of *Quercus pubescens*, 110 m, FL89, 41.47430°N, 23.25443°E, with flowers, 11.10.2020, coll. *G. Kunev* (SO 108054).

The species was reported from many regions of the country; however, the known populations are not many and usually consist of a small number of individuals. For this reason, the species was evaluated as Vulnerable in the national *Red List* (Petrova 2009). It has been reported from the Valley of River Struma (*Southern*) floristic subregion for the first time only recently, with a single population of about 20–30 individuals (Domozetski & Petrova 2021).

The current report concerns a population of no more than 10 groups, with from several scores and up to a hundred individuals; their total number probably exceeds 800 for the entire area. It was observed at a small upland, next to the main road between Ribnik and Rupite villages, overgrown with *Quercus pubescens* at its northern, western and eastern slopes. The grassy layer was dominated by *Chrysopogon gryllus* and *Agrostis castellana*. At the same site, an ample population of *Romulea bulbocodium,* with participation of several scores of *R. linaresii* has been observed in the spring of 2020.

Fig. 13. *Spiranthes spiralis* (photo G. Kunev).

Poaceae

94. *Crypsis schoenoides* (L.) Lam.

Bu Valley of River Struma (*Northern*): on the desiccating shore of the Drenov Dol Reservoir, Kyustendil district, 540 m, FM38, 42.30315°N, 22.68556°E, 11.10.2020, coll. *G. Kunev* (SO 108055, 108056).

New for the floristic subregion of the Valley of River Struma (*Northern*) (see Assyov & Petrova 2012). Reported from the extreme south of the Bulgarian stretch of Struma River, near Topolnitsa village (Kunev 2020b).

Reports 95–102

Georgi Kunev[1] & Ivan Kostadinov[2]

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Cistaceae

95. *Fumana bonapartei* Maire & Petitm.

Bu Rhodopi Mts (*Eastern*): E from Kazak village, Haskovo district, on open stony slopes, on serpentinite rocks, in communities with *Juniperus* spp., 400 m, MF08, 41.41101°N, 25.88387°E, plants in pre-flowering stage, 04.05.2021, coll. *G. Kunev* & *I. Kostadinov* (SO 108150).

This is the second locality only of the species in Bulgaria, known so far from a single site in the Eastern Rhodopi Mts, close to Zagorichane hamlet, Kardzhali district (Kunev 2020c). It is a Balkan endemic and an obligate serpentinophyte (Stevanović & al. 2003). In this second site, the species has been observed with less than 50 individuals. However, their abundance could be underestimated since plants in pre-flowering stage could be easily overlooked. It occurs on the south-facing slope close to Kazak village, among *Juniperus communis* and *J. deltoides*. As in its first location, here it is also associates with *Convolvulus boissieri* subsp. *compactus*.

Fabaceae

96. *Hymenocarpos circinnatus* (L.) Savi (Fig. 14)

Bu Rhodopi Mts (*Eastern*): NE from Dolno Lukovo, in shrub communities dominated by *Paliurus spina-christi*, 125 m, MF28, 41.38584°N, 26.08799°E, with flowers, 04.05.2021, coll. *G. Kunev* & *I. Kostadinov* (SO 108131).

The species has been known so far from a few locations at the Black Sea Coast (*Southern*) and Mt Strandzha floristic regions and has been evaluated as Endangered at national scale (Gussev 2015). In the new locality of the species, it has been observed in a single small stand that consisted of no more than 50 individuals at an area of 0.5 m2. The surrounding vegetation was dominated by *Paliurus spina-christi* and other mostly annual taxa in the herb layer viz., *Onobrychis aequidentata*, *Medicago disciformis*, *M. minima*, *M, rigidula*, *Trifolium nigrescens*, *Rhagadiolus stellatus*, *Crepis sancta*, *Ornithopus compressus*, as well as *Anemone pavonina*, *Orchis simia*, *Anacamptis laxiflora*, *Ophrys sphegodes*, *Jasminum fruticans*, etc. The neighboring area was thoroughly investigated, yet *H. circinnatus* was not observed anywhere near the presented site. However, it is probably distributed in more locations in the Ivaylovgrad area, due to availability of adequate habitats.

Fig. 14. *Hymenocarpos circinnatus* (photo G. Kunev).

Primulaceae

97. *Asterolinon linum-stellatum* (L.) Duby (Fig. 15)

Bu Rhodopi Mts (*Eastern*): at the side of the main road between Dolno Lukovo and Mandritsa villages, Ivaylovgrad Municipality, Haskovo district, 97 m, MF28, 41.39289°N 26.09897°E, 04.05.2021, *G. Kunev* & *I. Kostadinov* obs.

The species is seldom found on the territory of the country, perhaps due to its dwarf stature and ephemeral appearance. Moreover, it has been evaluated as

Fig. 15. *Asterolinon linum-stellatum* (photo G. Kunev).

Fig. 16. *Juncus capitatus* (photo I. Kostadinov).

Endangered at national scale, according to IUCN criteria (Peev & Tsoneva 2015). The new locality is second from the Eastern Rhodopi Mts, following the one reported from Kardzhali district (see Peev & Tsoneva 2015). The species was observed on a slope with southern exposition, inclination of about 15 degrees, and xeric conditions. The slope seems to be an overgrazed pasture, moderately overgrown by *Paliurus spina-christi*. The species was noticed in less than five small groups within an area of 50 m2, each covering an area of 0.1–0.3 m2. It was found on bare ground or in association with some bryophytes and lichens such as *Pleurochaete squarrosa*, *Cladonia* spp., etc.

Juncaceae

98. *Juncus capitatus* Weigel (Fig. 16)

Bu Rhodopi Mts (*Eastern*): in a damp place at the side of the road between Dolno Lukovo and Meden Buk, 120 m, MF28, 41.37073°N, 26.05626°E, 04.05.2021, coll. *G. Kunev* & *I. Kostadinov* (SO 108108).

First finding of the species from the East Rhodopes floristic subregion (Assyov & Petrova 2012). Approximately 50 individuals were observed at the periphery of puddles, next to a road. Surrounding vegetation was composed mostly of annual grasses characteristic for the R1D31 (=E1.332) Helleno-Balkanic short grass and therophyte communities according to EUNIS habitat classification (EUNIS 2021). Most abundant were *Poa bulbosa*, *Aira caryophyllea*, *Ventenata dubia*, *Vulpia* sp., *Trifolium subterraneum*, *Trifolium nigrescens*, *Muscari neglectum*, *Moenchia mantica*, *Filago* sp., *Tuberaria guttata*, and *Psilurus incurvus*. In the damp depressions, where *Juncus capitatus* was observed, some mesophytes such as *Oenanthe pimpinelloides*, *Ranunculus* sp. and *Riccia* sp. were also noticed.

Liliaceae

99. *Gagea bohemica* (Zauschn.) Schult. & Schult.f. (Fig. 17)

Bu Balkan Range (*Eastern*): Mt Slivenska, Arabadzhiyska Hollow locality, 610 m, MH42, 42.71083°N,

26.33606°E, with flowers, 08.03.2020, coll. *I. Kostadinov* (SO 108095); Mt Slivenska, in stony grasslands, N from peak Motrun, 550 m, MH42, 42.71065°N, 26.30736°E, with flowers, 17.03.2019, coll. *I. Kostadinov* (SO 108096); Mt Slivenska, in an open grassy and trampled place near peak Kulata, 1030 m, MH42, 42.71542°N, 26.36265°E, with flowers, 14.03.2020, coll. *I. Kostadinov* (SO 108092);

— Tundzha Hilly Contry: E from Hlyabovo, Haskovo District, in grasslands next to a dirt road, 340 m, MG45, 42.06069°N, 26.28883°E, with flowers, 07.02.2021, coll. *I. Kostadinov* (SO 108094); W from Chokoba, Sliven district, in dry rocky grasslands, 220 m, MH40, 42.51697°N, 26.34164°E, 16.02.2020, coll. *I. Kostadinov* (SO 108093); S from Karnobat, on the slopes of the Hissar Hill, 285 m, MH92, 42.64117°N, 26.98908°E, 29.02.2020, coll. *I. Kostadinov* (SO 108097).

New for the Balkan Range (*Eastern*) and Tundzha Hilly Country floristic regions (see Assyov & Petrova 2012).

100. *Gagea pusilla* (F.W.Schmidt) Sweet (Fig. 18)

Bu Balkan Range (*Eastern*): Mt Slivenska, in grassy openings among *Quercus* spp. at the foot of peak Peschenik, 820 m, MH43, 42.72467°N, 26.38347°E, with flowers, 03.04.2021, coll. *I. Kostadinov* (SO 108101)

First record from the Eastern Balkan Range (see Assyov & Petrova 2012). The name *Gagea pusilla* (F. W. Schmidt) Schult. & Schult. f., used in the main floristic sources from Bulgaria (Hinkova 1964; Delipavlov & Cheshmedzhiev 2011, Assyov & Petrova 2012) should be abandoned, since it is a later isonym of *Gagea pusilla* (F.W.Schmidt) Sweet (see Bayer & González 1989).

101. *Gagea villosa* (M. Bieb.) Sweet (Fig. 19)

Bu Tundzha Hilly Country: W from Slivenski Mineralni Bani, in the turnrow area of an arable field, 195 m, MH31, 42.608147°N, 26.226070°E & 42.61336°N, 26.24189°E, with flowers 25.03.2021, coll. *I. Kostadinov* (SO 108098, 108099, 108100)

The treatment of *Gagea* Salisb. for Bulgarian flora (Hinkova 1964) is outdated. Numerous nomenclature and taxonomic novelties have been published in relevant literature ever since and on their basis the identity and chorology of the Bulgarian representatives should be reconsidered. Moreover, species of this genus are

Fig. 17. *Gagea bohemica* (photos I. Kostadinov).

Fig. 18. *Gagea pusilla* (photos I. Kostadinov).

Fig. 19. *Gagea villosa* (photos I. Kostadinov).

seldom collected and, apparently, the herbarium materials stored at SO, SOM and SOA (Thiers 2021) do not reflect in a convincing way their range in the country.

Gagea villosa (M. Bieb.) Sweet is probably widespread but due to nomenclature reasons it has not been currently possible to estimate accurately the extent of its distribution in the country. According to Assyov & Petrova (2012), *G. villosa* (M.Bieb.) Duby has been known in Bulgaria only from the Thracian Lowland floristic region. The latter name should be abandoned because it is isonymous to *G. villosa* (M. Bieb.) Sweet (see Bayer & González 1989). On the other hand, in the earlier floristic works (see Hinkova 1964; Stoyanov et al. 1966; Delipavlov & Cheshmedzhiev 2011), the taxon *G. villosa* (M. Bieb.) Duby was treated within the frame of *G. arvensis* (Pers.) Dumort., a widely distributed taxon in the country, which at present is synonymized within *G. minima* (L.) Ker Gawl. (Rauschert 1982).

Gagea villosa has been collected by the second author from fields located closely to arable lands. These habitats represent highly ruderalized grasslands or overgrazed pastures with distinct zoo-anthropogenic impact. The following species were distinguished at the sites of *G. villosa*: *Capsella bursa-pastoris*, *Euphorbia helioscopia*, *Lamium amplexicaule*, *Sherardia arvensis*, *Calepina irregularis*, *Muscari neglectum*, *Fumaria officinalis*, *Viola* cf. *arvensis*, and *Veronica* cf. *persica*. Such a species composition corresponds well to the class of segetal vegetation *Papaveretea rhoeadis* S. Brullo et al. 2001, of which *G. villosa* is diagnostic (see Mucina & al. 2016).

Poaceae

102. *Bromus diandrus* Roth

Bu Rhodopi Mts (*Eastern*): at the side of the main road, immediately at the periphery of the city of Ivaylovgrad, 207 m, MF29, 41.52517°N, 26.11414°E, 04.05.2021, coll. *G. Kunev* & *I. Kostadinov* (SO 108105, 108106; SOM 177479, 177480)

The species was reported for the country only recently, from a single site at the Irakli locality on the Black Sea Coast (*Northern*) floristic region (Kunev 2021). In the second locality at the Ivaylovgrad region, the species occupies a gravel substrate on the road embankment. The population is composed of numerous individuals distributed in an about 15 m long and 1 m wide, densely vegetated linear strip, parallel to the road.

Report 103

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Campanulaceae

103. *Campanula dimitrii* Strid, **stat. & nom. nov**. [syn. *C. carpatha* var. *oreophila* Phitos in Oesterr. Bot. Z. 112: 475 (1965)] (Fig. 20)

Gr Nomos Dodekanisou, Eparchia Karpathou: island of Karpathos, in fissuris rupium calc. cacuminis montis Lastos, 1150 m, *Dimitrios Phitos* 816 (Holotype: M); Karpathos, in fissuris rupium calc. declivium occident. montis Kalolimni. 15.06.1935, *Rechinger* 8185 (W); Karpathos, Mt Kali Limni, summit area, 1100–1200 m, crevices and ledges of limestone cliffs in semi-shade. 12.07.2011, *Strid* 57345 (UPA).

Fig. 20. *Campanula dimitrii* (photo A. Strid).

Fig. 21. *Campanula carpatha* from Karpathos (photo A. Strid).

On 12 July 2011 I collected and photographed a small, white-flowered *Campanula* at the summit area of Mt Kali Limni, Karpathos, where it was growing together with other rare chasmophytes such as *Asyneuma giganteum* (Boiss.) Bornm., *Cephalaria squamiflora* (Sieber) Greuter, *Hypericum cuisinii* Barbey, *Origanum vetteri* Briq. & Barbey and *Seseli crithmifolium* (DC.) Boiss. It turned out to be *C. carpatha* var. *oreophila* Phitos described in Oesterr. Bot. Z. 112: 475 (1965) based on two collections from the same locality, viz., *Rechinger* 8185 (W) and *Phitos* 816 (M). Careful examination revealed several distinct differences between this and the nominate variety of *C. carpatha* Halácsy, a lowland endemic of the Karpathos island group (Karpathos, Kasos and Saria). There appear to be no intermediates so it is reasonable to re-classify the mountain plant from Kali Limni as a separate species. The epithet *oreophila* is not available at species level since there already exists *Campanula oreophila* Schur (1866). The plant from Kali Limni is thus provided with a new name. A brief description follows:

Tiny, woody-based perennial. Stems few, 2–5 cm, ascending. Basal leaves sparsely pilose; petiole 8–12 mm; blade 5–11 × 2.5–4 mm, elliptic, crenate-serrate. Cauline leaves similar but smaller. Flowers solitary. Calyx teeth *ca.* 3.2 × 2 mm, triangular; appendages *ca.* 1.8 mm, deflexed, oblong-elliptic, pilose. Corolla densely soft-puberulent, white; tube cylindrical, 12–15 × 2.5–4 mm; lobes small, ovate.

Campanula carpatha (Fig. 21) occurs in various rocky habitats on Karpathos, Kasos and Saria, at altitudes from sea-level to 680 m. It is related to the Cretan endemic *C. tubulosa* Lam. Distinguishing features from *C. dimitrii* are: Biennial or short-lived perennial, scarcely woody-based. Stems several, slender, procumbent, usually 8–20 cm. Calyx teeth *ca.* 8 × 5 mm, triangular, sharply acute. Corolla narrowly campanulate, deep lilac-blue; tube *ca.* 7 mm wide in lower part and 12 mm just below lobes, sparsely puberulent or subglabrous.

Reports 104–111

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The records below are new for the floristic subregion of the Balkan Range (Bulgaria), according to Assyov & Petrova (2012), and reflect new and refined occurrences of critically endangered plants (Petrova & Vladimirov 2009) already known from the area.

Balsaminaceae

104. *Impatiens balfourii* Hook. f.

Bu Balkan Range (*Western*): Chiprovtsi town, at an neglected road near the houses, *ca.* 450 m SW of St. Voznesenie Gospodne Church, 520 m, 43°22‘49.7“N, 22°52‘38.8“E, 25.08.2020, *D. Szokala* obs.

This is the first report for this floristic subregion. So far, this alien species has been reported from the Forebalkan, Vitosha region (Petrova & al. 2013), West Frontier Mts (Kunev 2020b), Valley of River Struma (Adamowski 2009), Pirin Mts (*Southern*) (Petrova 2017),

Rila Mts (Vladimirov 2019); Mt Sredna Gora (*Western*) (Glogov & al. 2018), and Rhodopi Mts (*Western* – Petrova & al. 2019; *Central* – Vladimirov 2012).

Brassicaceae

105. *Arabis alpina* L.

Bu Balkan Range (*Western*): Kopilovtsi village, on rock outcrops near Durshin Skok waterfall, *ca.* 2.7 km NE of peak Kopren (1965 m), 1060 m, 43°19‘40.1“N, 22°50‘56.9“E, 27.08.2021, leg. *D. Szokala* & *F. Kratoš* (herb. BRNU)

New for this floristic subregion (see Assyov & Petrova 2012).

Gentianaceae

106. *Swertia punctata* Baumg.

Bu Balkan Range (*Western*): Gorni Lom village, in a fragment of fen vegetation *ca.* 1.4 km N-NW of peak Midzhur (2169 m), 1770 m, 43°24‘26.6“N, 22°40‘15.9“E, 22.08.2020, leg. *D. Szokala* (herb. BRNU).

This species is restricted in Bulgaria to the areas near peaks Midzhur and Kopren, and by river Prodanovska above Chiprovtsi town (Pančić 1883; Tan & Vladimirov 2001). It is of high conservation concern in the Bulgarian flora, since it has been evaluated as Critically Endangered (Vladimirov 2009, 2015). *Swertia punctata* has been recently recorded only in the area of peak Midzhur, from two separate sites: one at the foothills at 1300 m a. s. l., and another one in the subalpine belt at 2000 m a. s. l. (Tan & Vladimirov 2001; Vladimirov 2014). Here a new site is added containing dozens of individuals.

Onagraceae

107. *Epilobium alpestre* (Jacq.) Krock.

Bu Balkan Range (*Western*): Gorni Lom village, in a fragment of fen vegetation *ca.* 1.4 km N-NW of peak Midzhur (2169 m), 1760 m, 43°24‘26.6“N, 22°40‘15.9“E, 22.08.2020, leg. D. Szokala (herb. BRNU); Gorni Lom village, in tall-herb vegetation near a spring, *ca.* 620 m NE of Mt Midzhur (2169 m), 1880 m, 43°23‘50.3“N, 22°41‘3.9“E, 17.07.2021, *D. Szokala* & *F. Kratoš* obs.

So far, *E. alpestre* has been documented in Bulgaria only from the mountains of Rila, Balkan Range (*Central*) (Assyov & Petrova 2012) and Vitosha region (Vladimirov 2019). Gančev (1979) also mentioned its occurrences in the Rhodope Mts. The plants in the newly-found sites grow abundantly among various vegetation types bound to wet habitats.

108. *Epilobium nutans* F. W. Schmidt

Bu Balkan Range (*Western*): Kopilovtsi village, at a subalpine spring *ca.* 1.3 km N-NW of peak Kopren (1965 m), 1780 m, 43°18‘54.6“N, 22°49‘57.1“E, 27.07.2021, leg. *D. Szokala* & *F. Kratoš* (herb. BRNU)

This record confirns the distribution of species in this floristic subregion. This plant is known in Bulgaria from the following floristic regions: Balkan Range (*Central*), West Frontier Mts, Mt Belasitsa, Rila Mts, Pirin Mts, Rhodopi Mts (*Western*), and from some uncertain records from Vitosha region and the Balkan Range (*Western*) (Gančev 1979; Assyov & Petrova 2012). The new site contains numerous individuals.

Scrophulariaceae

109. *Veronica baumgartenii* Roem. & Schult.

Bu Balkan Rannge (*Western*): Gorni Lom village, on exposed sandstone walls and screes *ca.* 220 m NE of Mt. Midzhur (2169 m), 43°23‘49.1“N, 22°40‘42.1“E, 23.08.2020, leg. *D. Szokala* (herb. BRNU)

This critically endangered plant is known in Bulgaria only from the Stara Planina Mts. A small population of the species consisting of 30 individuals was recently reported from the Western Stara Planina (Peev & Tsoneva 2015). Peev (1995) reported its occurrence at the peaks of Midzhur and Kopren, but without any details. Currently, it grows abundantly in sandstone crevices and on screes of peak Midzhur, especially at the highest altitudes.

Urticaceae

110. *Parietaria judaica* L.

Bu Balkan Range (*Western*): Chiprovtsi town, in brick crevices in the town, *ca.* 300 m S of St. Voznesenie Gospodne Church, 500 m, 43°22‘55.2“N, 22°52‘47.6“E, 25.08.2020, leg. *D. Szokala* (herb. BRNU)

Cyperaceae

111. *Carex sempervirens* Vill.

Bu Balkan Range (*Western*): Gorni Lom village, in spring vegetation in sandstone crevices, *ca.* 480 m E-NE(-E) of Midzhur Mt. (2169 m), 2020 m, 43°23‘44.7“N, 22°41‘00.4“E, 23.08.2020, leg. *D. Szokala* (herb. BRNU); Gorni Lom, on exposed stones, *ca.* 480 m NE of Mt Midzhur (2169 m), 1810 m, 43°23‘55.9“N, 022°40‘50.6“E, 17.07.2021, leg. *D. Szokala* & *F. Kratoš* (herb. BRNU).

New species for this floristic subregion (see Assyov & Petrova 2012).

Reports 112–116

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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).

Asteraceae

112. *Matricaria discoidea* DC. [syn. *Chamomilla suaveolens* (Pursh) Rydb.] (Fig. 22)

Gr Nomos & Eparchia Florinis: Mt Vitsi, gravelly ground near parking site at Vigla Pisoderi Ski Centre, 1555 m, 40°46'N, 21°16'E, 21.08.2019, *Kofinas* obs. (photos).

Confirming report in area by Willing (250503, B) based on a collection in October 2014 within the village of Pisoderi, 5 km from the Ski Centre. Growing together with *Diplotaxis muralis* (see following entry). It also occurs higher up at Anthovouni (1979 m) and interestingly, in Greece, was first noted around the chalets and ski centres of Mts Vrondous, Falakro, Voras and Vitsi in northern Greece. It is native to N America and Greenland but has spread rapidly eastwards.

Brassicaceae

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

Gr Nomos & Eparchia Florinis: Mt Vitsi, dirt road to Anthovouni and Mt Varnous, caravan parking site at Vigla Pisoderi Ski Centre a few metres from asphalted main road, 1552 m, 40°46'N, 21°16'E, 21.08.2019 & 01.08.2021, *Kofinas* obs. (photos).

Fig. 22. *Matricaria discoidea* (photo G. Kofinas).

New for Mt Vitsi, at least 15 plants observed. Atypical in having hairy sepals and tending to *D. tenuifolia* in having carpophore slightly longer than 0.5 mm and being subperennial. Together with the white-flowered *Anchusa officinalis* subsp. *leucantha* (Selvi & Bigazzi) Kit Tan which is also abundant at the Pisoderi Pass, by the Vigla military outpost. *Diplotaxis muralis* has been considered an allotetraploid derived from *D. tenuifolia* and *D. viminea*. At 700–1600 m, it flowers from May to mid-July but at Anthovouni or even higher, August is the norm.

Scrophulariaceae

114. *Veronica orsiniana* subsp. ***teucrioides*** (Boiss. & Heldr.) M.A. Fischer [syn. *V. teucrioides* Boiss. & Heldr.; *V prostrata* auct. fl. graec. non L.] (Figs. 23 & 24a)

Gr Nomos Kozanis, Eparchia Eordeas: Mt Siniatsiko, meadow with rocky limestone outcrops, 1715 m,

Fig. 23. Procumbent habit of *Veronica orsiniana* subsp. *teucrioides* from Mt Siniatsiko (photo G. Kofinas).

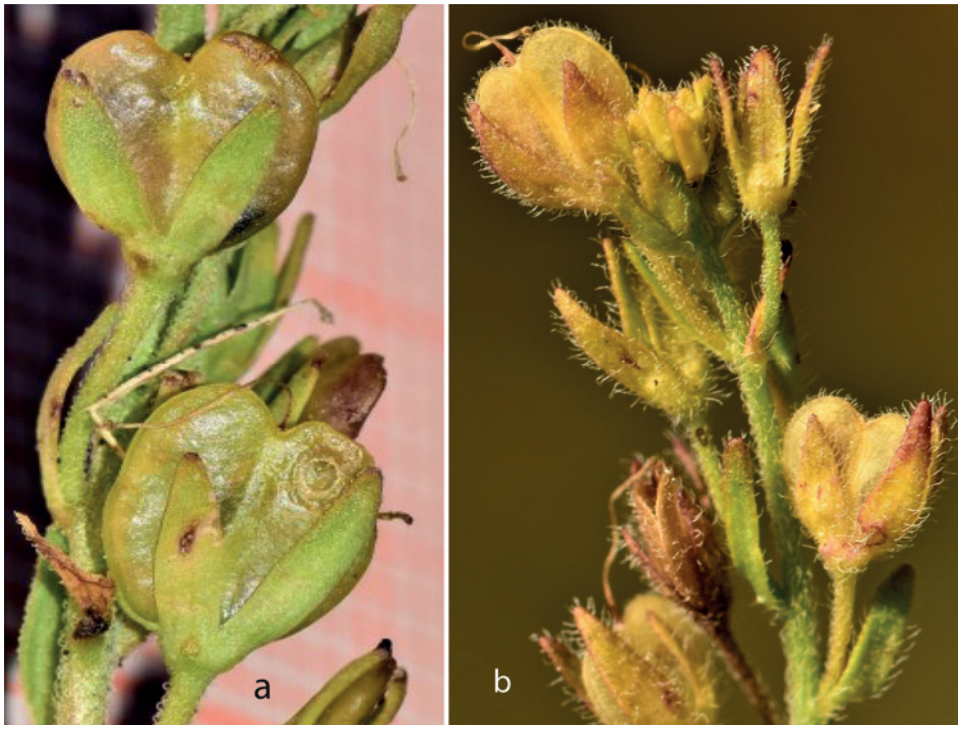

Fig. 24. Glabrous capsules (a) of *Veronica orsiniana* subsp. *teucrioides* from Mt Siniatsiko and hairy capsules (b) of plant from Mt Kajmakčalan (photo G. Kofinas).

40°23'N, 21°34'E, 31.07.2021, *Kofinas* obs. (photo); *loc. ibid*., at summit, 2065 m, 40°24'N, 21°33'E, 31.07.2021, *Kofinas* obs. (photos).

Confirming record from Mt Siniatsiko, possibly in the same area (6 km S-SE of Vlasti, 28.06.1979, *Gustavsson* & *Franzén* 8018, C). Distinguished from *V. orsiniana* subsp. *orsiniana* by its procumbent habit and glabrous or subglabrous leaf blades. The capsules are glabrous in plants from Mt Siniatsiko (Fig. 24a) as also in plants from Mt Vourinos.

115. *Veronica orsiniana* Ten. (Fig. 24b)

Gr Nomos Pellis, Eparchia Almopias: Mt Kajmakčalan, meadow with rocky limestone outcrops, 1842 m, 40°53'N, 21°49'E, 02.08.2021, *Kofinas* obs. (photo).

Resembling *V. orsiniana* subsp. *teucrioides* but whole plant hairy, including calyx and capsules. This is possibly the taxon referred to as *Veronica prostrata* var. *kajmakcalanica* Adamović but further studies, including cytological and ecological, are needed. *Veronica orsiniana* in S Europe is very variable. According to M.A. Fischer (Vienna), plants from Mt Olimbos have been mis-identified as *V. prostrata* L. which is a pontic-pannonic steppe species absent from Greece.

Violaceae

116. *Viola poetica* Boiss. & Spruner (Fig. 25)

Gr Nomos Achaias, Eparchia Kalavriton: Mt Chelmos, rocky slopes, 2039 m, 37°58'N, 22°12'E, 12.06.2010, *Kofinas* obs. (photo).

New for Peloponnese, previously only known as restricted to the high mountains of Sterea Ellas. The holotype of *V. poetica* (in G-BOIS) is a collection by Spruner from Mt Parnassos. The species has also been recorded from Mts Vardousia, Giona and Iti. On Mt Chelmos, only a few plants (seven individuals) were noted, in shaded crevices and ledges of rocky limestone cliffs, together with *Omphalodes luciliae* subsp. *scopulorum, Campanula aizoides* and *Hieracium scapigerum* subsp. *scapigerum*.

Fig. 25. *Viola poetica* from Mt Chelmos (photo G. Kofinas).

Reports 117–125

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Apiaceae

117. *Elaeoselinum asclepium* (L.) Bertol. subsp. ***asclepium***

Gr Nomos Achaias, Eparchia Egialias: near village of Ambelokipi, stony limestone slopes at roadside, 959 m, 38°06'N, 22°18'E, 06.06.2021, *Kit Tan* & *G. Vold* 33201.

New for eparchia. *Elaeoselinum asclep*. subsp. *meiodes* (Desf.) Fiori occurs in the W Mediterranean and is sometimes treated at species level.

Elaeagnaceae

118. *Elaeagnus commutata* Bernh. ex Rydb.

Gr Nomos Achaias, Eparchia Egialias: 4 km from Valimi to Akrata, thickets forming hedge by abandoned field, 845 m, 38°07'N, 22°17'E, 28.05.2021, *Kit Tan* & *G. Vold* 33190 (ATH, C, UPA).

New for Greece, native to N America. The trees had been planted long ago but have remained local. *Elaeagnus commutata* is an elegant, silvery-leaved tree differing from *E. angustifolia* L. which is widely naturalized in southern Europe, by its brown twigs not covered with silvery scales, and fruits which are dry and powdery (mealy), not succulent.

Fabaceae

119. *Onobrychis arenaria* subsp. ***lasiostachya*** (Boiss.) Hayek

Gr Nomos Achaias, Eparchia Egialias: 1.3 km N of Valimi on road to Chrysanthio, edge of cultivated field of *Avena*, 845 m, 38°06'N, 22°17'E, 28.05.2021, *Kit Tan* & *G. Vold* 33184 (fruits collected).

New for eparchia. Common in north and central mainland Greece and eastern part of Peloponnese.

DESIGNATION OF NEOTYPE

120. *Onobrychis citrina* Kit Tan, Stevanović & G. Vold in Phytol. Balcan. 22(2): 282 (2016)

Gr Nomos Kozanis, Eparchia Voiou: deforested southern side of Mt Siniatsiko, rocky limestone

slopes and road embankments between Siatista and Galatini, 1100–1150 m, 40°17'N, 21°33'E, 17.06.2016, *Kit Tan & G. Vold* 32118 (holotype C; isotypes ATH, BEOU, LD).

This voucher from Mt Siniatsiko which represents *Onobrychis alba* (Waldst. & Kit.) Desv. was erroneously selected to represent the type of *O. citrina* (Tan & Vold 2016). Kit Tan and G. Vold first collected *O. citrina* in Nomos Serron in May 2000, on the way from Siderokastro to Achladohori near the Greek-Bulgarian border. Material was used by the late Bent Johnsen, the well-known Copenhagen botanical artist, to prepare an illustration. Material was also sent to Vladimir Stevanović (Beograd) for a comparison with *O. degenii* Dörfl., and to prepare a sketch of the leaves and fruits.

The holotype of *O. citrina* is the voucher from Siderokastro sent to Johnsen to prepare an illustration, and not the specimen from Siniatsiko as cited in the protologue (Tan & Vold 2016).The original material from Siderokastro could not be traced and is presumed no longer extant. The illustration made by Johnsen belonged to the original material and could be considered an iconotype as it was indirectly cited in the protologue. However, according to Art. 40.4 (*ICN*: McNeill & al., 2012), after 1 January 2007, the type must be represented by a specimen.

Art. 9.2 of the Code states "If a designation of holotype made in the protologue of the name of a taxon is later found to contain errors (e.g. in locality, date, collector, collecting number, herbarium code, specimen identifier, or citation of an illustration), these errors are to be corrected provided that the intent of the original author(s) is not changed".

The error was corrected and the name lectotypified by a specimen from Siderokastro (Tan & Kofinas 2020): Greece, Nomos Serron, Eparchia Sintikis: 3 km N-NE of Siderokastro, rocky limestone outcrops, 200–250 m, 41°16'N, 23°25'E, 03.06.2001, *Strid* & *al*. 52775 (lectotype G, isolectotype LD).

However, the lectotypification is not valid as this gathering was not designated from original material mentioned in the protologue. This necessitates the designation of a neotype (according to Art. 9:13) to serve as the nomenclatural type since the original material is missing. The same specimen from Siderokastro which was used for the erroneous lectotypification is therefore selected.

Neotype (designated here by Kit Tan): Greece, Nomos Serron, Eparchia Sintikis: 3 km N-NE of Siderokastro, rocky limestone outcrops, 200–250 m, 41°16'N, 23°25'E, 03.06.2001, *Strid* & *al*. 52775 (neotype G, isoneotype LD).

Acknowledgement. Thanks are due to Dieter Reich (Vienna) for his helpful advice.

121. *Onobrychis lassenii* Kit Tan & Vold, **sp. nov**. (Figs. 26 & 27).

Gr Nomos Kozanis, Eparchia Voiou: Mt Siniatsiko, southern slopes between Siatista and Galatini, 1100–1150m, 40°17'N, 21°33'E, 31 May 2001, *Strid* & *al.* 52481 [collected by Per Lassen, Arne Strid, Kit Tan & Gert Vold] (holotype G; isotypes ATH, LD).

Suffrutescent, tap-rooted perennial with moderately woody, thickened stock 0.5–1.0 cm diam. Flowering stems several, erect-ascending, 30–45 cm long, densely patent villous-hirsute to villous-tomentose. Stipules ovate-lanceolate, 4–6 mm long. Leaves 3–7 cm long, with 6–8 pairs of leaflets. Leaflets 5–10 × 3–5 mm, broadly elliptic-oblong, obtuse-rounded, mucronulate, densely grey-sericeous-villous on both surfaces, more so beneath. Racemes moderately dense, short at anthesis, 3–4 cm, elongating in fruit to 6–10 cm. Peduncles 10–15 cm long, more than three times the length of subtending leaf, patently pilose to pubescent. Calyx tube 2.5–3 mm long; teeth filiform, 5–6 mm, adpressed white-villous, tipped reddish-brown. Standard 10–11 mm long, equalling or slightly shorter than keel, glabrous, creamy yellow. Legume densely villous-tomentose, obliquely obovoid, *ca*. 5 mm long, 4–4.5 mm at broadest part excluding the 4 outer, 1 mm long marginal spines and the spines on lateral ridges.

Flowering late May to June, occurring on deforested rocky slopes at *ca.* 1100 m. Probably endemic to Greece, known at present only from Mt Siniatsiko in North Central. The recently described *O. citrina* Kit Tan, Stevanović & Vold, neotypified by a specimen from Siderokastro (Nomos Serron) in north-eastern Greece (see preceding entry) differs in having leaves with 8–16 pairs of elliptic-linear leaflets 7–10 × 1.5–2.5 mm.

The plants from Mt Siniatsiko had previously been identified as the yellow-flowered *O. degenii* Dörfl. The type specimen of the latter (*Dörfler* 149, B) was described from the vicinity of Allchar

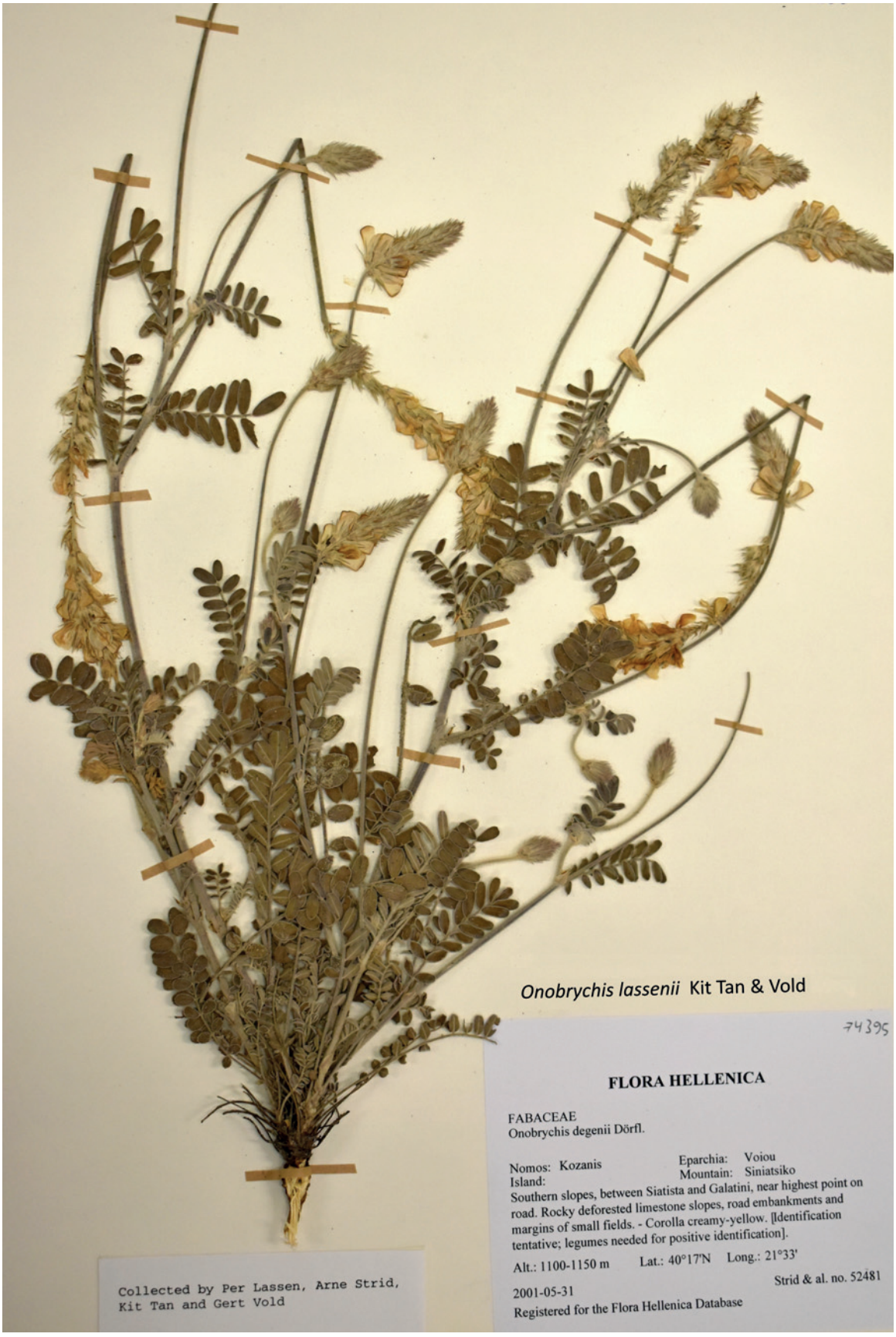

Fig. 26. Isotype of *Onobrychis lassenii* (ATH, image provided by D. Mermygkas).

Fig. 27. Leaves of *Onobrychis lassenii* (ATH, image provided by D. Mermygkas).

Fig. 28. Isotype of *Onobrychis degenii* (B, *Dörfler* 149, image provided by Mus. Bot. Berol.).

(Alšar), SE of Prilep in North Macedonia (Fig. 28). The two species are quite different in their leaflet shape and fruit size. The leaflets in *O. degenii* are 18–20 × *ca.* 4 mm and the fruits larger, 8–10 mm, with marginal spines *ca.* 2 mm. The calyx teeth are filiform-setose, 7–10 mm and densely fulvous hairy. The standard is larger, 14–15 mm long, equalling the keel.

Named after Per Lassen, former curator of the Botanical Museum in Lund (LD), who has been an excellent and cheerful companion, accompanying us on several expeditions in northern Greece.

Acknowledgements. Thanks are due to Dionysios Mermygkas and Kiki Dimas (Goulandris Natural History Museum, Kifisia) for kindly facilitating the loan of specimens. The former is also thanked for providing the images used in Figs. 26 & 27.

Lamiaceae

122. *Ajuga chamaepitys* subsp. ***chia*** (Schreb.) Arcang.

Gr Nomos Achaias, Eparchia Egialias: 1.3 km N of Valimi on road to Chrysanthio, edge of cultivated field of *Avena*, 845 m, 38°06'N, 22°17'E, 28.05.2021, *Kit Tan* & *G. Vold* 33181.

New for eparchia. This is the most common and widespread subspecies in Greece, two other subspecies occur – *A. ch.* subsp. *chamaepitys* mainly in the north, and *A. ch.* subsp. *palaestina* (Boiss.) Bornm. from the East Aegean islands of Lesvos, Samos and Ikaria.

123. *Salvia ringens* Sm.

Gr Nomos Achaias, Eparchia Egialias: 1.3 km N of Valimi on road to Chrysanthio, edge of cultivated field of *Avena*, 845 m, 38°06'N, 22°17'E, 28.05.2021, *Kit Tan* & *G. Vold* 33186.

New for eparchia. Balkan Peninsula and S Romania. In the Peloponnese, occurring mainly in the north-central. The *locus classicus* is at Megaspileo in eparchia Kalavriton.

Rosaceae

124. *Rubus canescens* DC.

Gr Nomos Achaias, Eparchia Egialias: 4 km from Valimi to Akrata, thickets surrounding abandoned field, 845 m, 38°07'N, 22°17'E, 28.05.2021, *Kit Tan* & *G. Vold* 33191.

New for eparchia, widespread on mainland Greece.

Iridaceae

125. *Gladiolus illyricus* W.D.J. Koch

Gr Nomos Achaias, Eparchia Egialias: 1.3 km N of Valimi on road to Chrysanthio, edge of cultivated field of *Avena*, 845 m, 38°06'N, 22°17'E, 28.05.2021, *Kit Tan & G. Vold* 33189.

New for eparchia, there seem to be few reports from north Peloponnese. Distinct by its winged seeds and anthers shorter than filaments.

Report 126–127

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Apiaceae

126. *Geocaryum divaricatum* (Boiss. & Orph.) Engstrand [syn. *Freyera divaricata* Boiss. & Orph.; *Biasolettia divaricata* (Boiss. & Orph.) Nyman] (Fig. 29)

Gr Nomos & Eparchia Korinthias: In m. Kyllene Achaiae, prope Trikala, alt. 3000', 17.06.1852, [37°56'N, 22°24'E], *T.G. Orphanides* s.n. (isolectotype WU 0070467).

Geocaryum divaricatum was described in Boissier, Diagn. pl. orient. sér. 2, 2: 102–103 (1856) as *Freyera divaricata* Boiss. & Orph. According to Pimenov & Jacquemoud (2020: 28) the lectotype is in G-BOIS. Since its discovery in June 1852, nearly 170 years ago, this rare plant had never been re-collected. Thus it was listed as an extinct species in the Threatened Plant Database of the World Conservation Monitoring Centre, Cambridge, U.K. In a recent publication with an intriguing title, *Global dataset shows geography and life form predict modern plant extinction and rediscovery* (Humphreys & al. 2019) this dataset lists *Geocaryum divaricatum* as a species from Greece which had been re-discovered, so no longer extinct. The supporting evidence for its rediscovery was cited as a herbarium specimen in The Goulandris Natural History Museum which has the herbarium acronym ATH. A voucher was stated in the dataset: Greece, S.

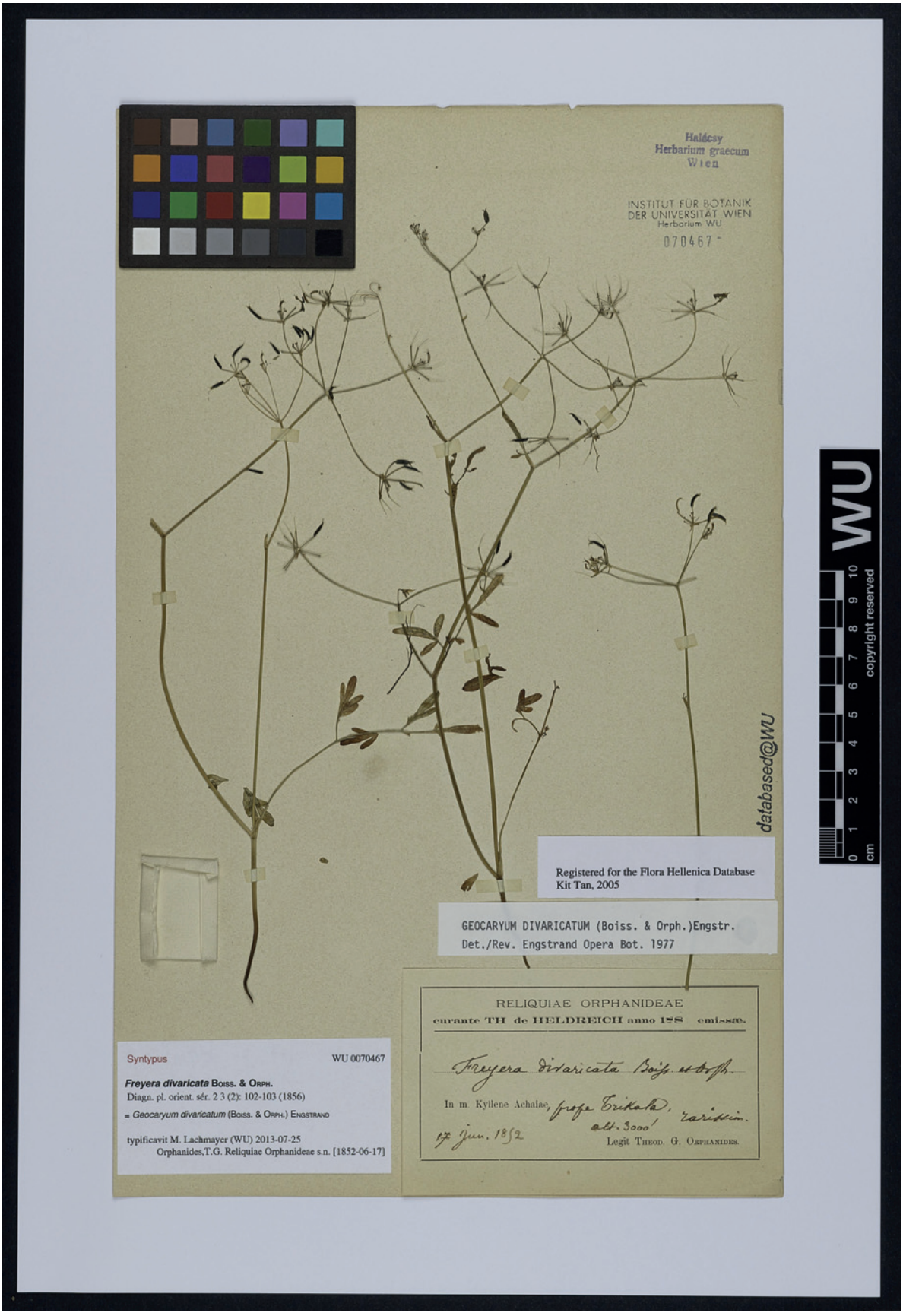

Fig. 29. *Geocaryum divaricatum* (isolectotype in WU-Hal, WU0070467).

Fig. 30. *Geocaryum peloponesiacum* sub nom. *Freyera divaricata* Boiss. & Orph. (ATH, image provided by D. Mermygkas).

of Trikala, Killiní, 1300 m, 2 June 1996, *R. Govaerts* 961304002 (K).

On examining the specimen in ATH which had been collected by the lawyer, diplomat and amateur botanist Constantine Goulimis (1886–1963), indeed the specimen is labelled under the synonyms of *G. divaricatum*, viz., *Freyera divaricata* and sub *Biasolettia* (Fig. 30). The accompanying label states, 'Kyllini (Ziria), 17–23 July 1949, area of the highest peak Kyllini, bare mountain, 2100 m' [as translated from Greek], bare mountain referring to a treeless area near the summit. There was no mention of Trikala, the *locus classicus*, or an altitude of 1300 m. This specimen in the Goulandris Museum does not represent *Geocaryum divaricatum* but *G. peloponesiacum* Engstrand. The characters of fruit size (*ca.* 5 mm), style divergence and high altitude (2000 m) confirm it. The misidentification, if it had been made by Goulimis, is understandable as *G. peloponesiacum* was not formally described until 1977 (Engstrand 1977), the plant being previously confused with *G. parnassicum* (Boiss. & Heldr.) Engstrand, another species occurring on Mt Killini but usually at lower altitude and with smaller fruits (less than 4 mm). Both species are more easily distinguished *in vivo* by the colour of the anthers, dark red in *G. peloponesiacum* (Fig. 31) as compared to the greenish-yellow or cream-coloured ones of *G. parnassicum* (Fig. 32).

Fig. 33 is an image of *Geocaryum divaricatum* as depicted in RBG Kew, Plants of the World Online. This is the voucher in the Kew dataset cited as evidence for the rediscovery of *G. divaricatum* [Greece, S of Trikala, Killini, 1300 m, 2 June 1996, *R. Govaerts* 961304002 (K)].When compared with the type specimen of *Geocaryum divaricatum* it is obvious the Kew specimen cannot represent the same species. In *G. divaricatum*, bracts are absent, the umbels are rather few-rayed, and the rays divaricate to almost horizontal (see Fig. 29, isolectotype WU 0070467). In the absence of basal parts and fruit, one cannot even be certain that the Kew specimen is a *Geocaryum*.

Thus *G. divaricatum* is still only known from the single historical collection of Extraordinary Professor of Botany at the National and Kapodistrian University of Athens, Theodoros Orphanides (1817–1886). The sole locality is on Mt Killini, Greece, probably in open woodland at *ca.* 1000 m, flowering in the month of June. It is very likely a forest species, very unlikely to inhabit open rocky calcareous slopes or scree at sub-

Fig. 31. *Geocaryum peloponesiacum* from Mt Killini (photo. G. Zarkos).

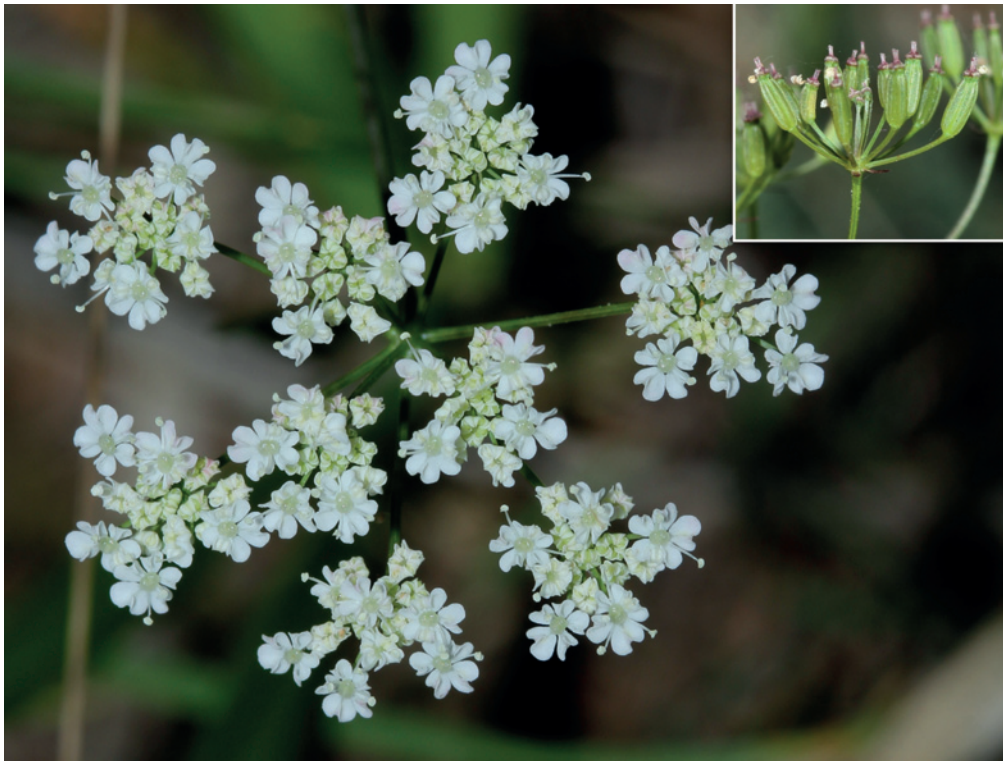

Fig. 32. *Geocaryum parnassicum* from Mt Killini (photo. G. Zarkos).

Fig. 33. Digital image as representing *Geocaryum divaricatum* (from Kew Science Photographs, Board of Trustees, RBG Kew).

Fig. 34. *Parnassia palustris* (photo, G. Zarkos).

alpine or alpine level, a habitat favoured by *G. peloponesiacum*. This habitat is well-indicated on the label of the Goulimis specimen at ATH.

Parnassiaceae

127. *Parnassia palustris* L. (Fig. 34)

Gr Nomos & Eparchia Korinthias: Mavro Oros, south of the village Gelini, wet places shaded by vertical limestone rock, 1167 m, 38°02'N, 22°26'E, 05.05.2021, *Zarkos* & *Kounis* obs.

Confirming observations by Rätzel and Raabe in May 2010 from the same mountain, although not in the same area. *Pinguicula crystallina* subsp. *hirtiflora* was found in damp to wet crevices on semi-shaded rock faces in the vicinity, as well as *Achillea grandifolia* subsp. *hellenica*. *Parnassia palustris* is rare in the Peloponnese; it was recorded from the Styx waterfall on Mt Chelmos (Nomos Achaias) by Orphanides as early as July 1851, and confirmed by later collections. A report from Profitis Ilias, the summit of Mt Taigetos (Chilton 1993) has not been verified although very likely. *Parnassia* has sometimes been placed in the family *Celastraceae*.

Acknowledgements. We thank Kiki Dimas (Goulandris Natural History Museum) for kindly locating the *Geocaryum* specimen collected by C. Goulimis and making it available for our study.

Reports 128–135

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Asteraceae

128. *Bidens vulgatus* Greene

Bu Forebalkan (*Eastern*): along river Ovcharka in Zhaltesh village, *ca.* 480 m, LH64, 42.85824°N, 25.38223°E, 31.08.2021, *V. Vladimirov* obs.

This is a second report of the species for this floristic subregion; however, the earlier records have been from the banks of river Osam in Lovech town and near Devetashka Cave (Vladimirov 2012).

Balsaminaceae

129. *Impatiens glandulifera* Royle

Bu Forebalkan (*Eastern*): along river Ovcharka in Zhaltesh village, *ca.* 480 m, LH64, 42.85824°N, 25.38223°E, 31.08.2021, *V. Vladimirov* (SOM).

The species is already known from this floristic subregion (see Vladimirov & Georgiev 2019). However, since the species is included in the list of invasive alien species of EU concern (CIR 2017), it seems worth publishing some new chorological data following the recommendation by Vladimirov & Georgiev (2019). So far, this species has not been reported from the region of Gabrovo Municipality and from the UTM quadrant LH64 (see Petrova & al. 2013; Vladimirov & Georgiev 2019). Scattered solitary individuals have been observed at several localities along the river in the village.

Euphorbiaceae

130. *Euphorbia prostrata* Aiton

Bu Northeast Bulgaria: southwards of Veliki Preslav town, on the pavement in the Medieval Palace Complex, *ca.* 150 m, 43.14616°N, 26.81382°E, 26.08.2021, with flowers and unripe fruits, coll. *V. Vladimirov* (SOM).

Hundreds of plants have been observed to grow together with *E. maculata* L., which is even more widespread there. The species is already reported from this floristic region, although from localities close to the Danube River and the Black Sea Coast which are in the northern and eastern parts of the region (Vladimirov & al. 2014). The present locality is situated in the SW parts of Northest Bulgaria floristic region.

Scrophulariaceae

131. *Buddleja davidii* Franch. (Fig. 35)

Bu Northeast Bulgaria: south of Veliki Preslav town, on the walls next to the South Gate of the medieval Palace complex, *ca.* 150 m, 43.14616°N, 26.81382°E, 26.08.2021, with flowers and fruits, coll. *V. Vladimirov* (SOM).

A second report of the species for this floristic region (see Petrova & al. 2013). However, the species has been previously reported from the easternmost parts of the region, close to the Black Sea Coast. The present locality is situated in the SW parts of the region. A dozen of flowering and fruiting specimens have been observed scattered on the walls of the medieval fortress.

Fig. 35. *Buddleja davidii* on a wall of a historical monument (photo V. Vladimirov).

Amaryllidaceae

132. *Galanthus aff. elwesii* Hook. f. (Fig. 36)

Bu Valley of River Struma (*Southern*): slope in a deciduous forest right of the road from Yanovo to Katuntsi villages, *ca.* 380 m, 41.43644°N, 23.47371°E & *ca.* 390 m, 41.43649°N, 23.47625°E, 02.02.2021, *V. Vladimirov* obs.

The observed plants represent most likely a local cultivar that is widely grown in the neighbouring villages and thrown here with garden waste. The reason for this assumption is that the observed plants were adjacent to a small dumpsite, where construction and garden waste from the neighbouring village is regularly dumped. In addition, the plants apparently multiplied exclusively by vegetative means – several groups were observed, each of which consisted of 50–100 clonally propagated bulbs, respectively plants. Such a pattern is common in cultivated snowdrops and has not been observed in any of the Bulgarian wild populations of *Galanthus elwesii*, where single individuals (result of seed propagation) or small clonal groups of up to 5–10 individuals predominate. Although *Galanthus elwesii* is found as a wild species in the same floristic region (e.g. see Assyov & Petrova 2012), no natural population was observed in the immediate vicinity. The big size of the plants, and especially of the flowers, as well as the occurrence of the alien *Sternbergia lutea* in the immediate vicinity (see the report below), also support the hypothesis for non-native origin of this *Galanthus* locality. Disposal of cultivated snowdrops in natural habitats is an undesirable practice that should be discontinued. It can lead to possible hybridization with the wild populations and may affect their genetic structure. *Galanthus elwesii* is a species of conservation concern in Bulgaria – it is assessed as 'Endangered' (Evstatieva 2009) and is protected by the national Biodiversity Act (Evstatieva 2015).

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

Bu Black Sea Coast (*Northern*): pasture N of Kamen Bryag village, *ca.* 50 m, 43.48423°N, 28.57619°E, 01.05.2021, *V. Vladimirov* obs. (Fig. 37a);

— Valley of River Struma (*Southern*): road verge right of the road from Yanovo to Katuntsi villages,

Fig. 36. *Galanthus* aff. *elwesii* Hook. f., a garden escape (photo V. Vladimirov).

Fig. 37a. *Sternbergia lutea*, a garden escape near Kamen Bryag village (photo V. Vladimirov).

Fig. 37b. *Sternbergia lutea*, a garden escape near Yanovo village (photo V. Vladimirov).

ca. 390 m, 41.43649°N, 23.47625°E, 02.02.2021, *V. Vladimirov* obs. (Fig. 37b).

First report for the Black Sea Coast floristic region. Bulbs must have been thrown there with garden waste long ago, since a rather dense stand covering an area of *ca.* 30 m² was observed, comprising a few thousands of bulbs propagated by vegetative means. The species has already been reported from the Valley of River Struma, however, from distant localities close to River Struma. The presently reported locality comprised several clonal groups, each of *ca.* 50–100 bulbs close to the road and to a dumpsite. Naturalised snowdrop plants have also been observed in the same place (see previous report). So far the species has been reported for the following floristic regions: Valley of River Struma (*Southern*) (Vladimirov & al. 2016), Rhodopi Mts (*Central*), Tundzha Hilly Country (Tashev & Tashev 2020).

Commelinaceae

134. *Commelina communis* L. (Fig. 38)

Bu Northeast Bulgaria: south of Veliki Preslav town by a small ditch under a fountain next to the Archaeological Museum 'Veliki Preslav', *ca.* 160 m, 43.15291°N, 26.81480°E, 26.08.2021, with flowers and fruits, *V. Vladimirov* (SOM).

New for this floristic region. It densely covers a strip along the ditch of 2–3 m². Perhaps a casual species, although it may survive there for many years if not intentionally removed by people. So far the species has been reported from the Forebalkan (*Eastern*), Sofia region, Valley of River Struma, and Thracian Lowland (Assyov & Petrova 2012). Consequently, it has been published for the Black Sea Coast (*Southern*) (Vladimirov & al. 2016; Vladimirov 2020), Pirin Mts (*Southern*) (Petrova 2017).

Fig. 38. *Commelina communis* (photo V. Vladimirov).

Poaceae

135. *Phalaris arundinacea* var. ***picta*** L.

Bu Forebalkan (*Eastern*): by Ovcharka river in Zhaltesh village, *ca.* 480 m, LH64, 42.85824°N, 25.38223°E, 31.08.2021, *V. Vladimirov* (SOM).

A new report for this floristic region. Several groups of the species observed. So far escaped occurrences of this ornamental plant have been reported from the Balkan Range (*Western*, *Central*), Sofia region and Rhodopi Mts (*Western*, *Central*) floristic regions (Petrova & Vladimirov 2019).

Acknowledgements. Part of the study was carried out in the framework of the National Science Program 'Environmental Protection and Reduction of Risks of Adverse Events and Natural Disasters', approved by the Resolution of the Council of Ministers № 577/17.08.2018 and supported by the Ministry of Education and Science (MES) of Bulgaria (Agreement № Д01-363/17.12.2020).

Reports 136–139

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Asteraceae

136. *Erigeron sumatrensis* Retz.

Bu Rhodopi (*Eastern*): Chakalarovo village, along 'Deveti Septemvri' St. near the building of the 'State Forestry – Kirkovo', *ca.* 400 m, 41.297832°N, 25.304767°E, 06.10.2021, *V. Vladimirov* & *V. Trifonov* obs.

This is the first record of this alien species in this floristic subregion. Single individuals or small groups of plants have been observed at several places along the streets and in the private gardens in the village. So far the taxon has been reported from the following floristic regions: Black Sea Coast, Northeast Bulgaria, Forebalkan (*Western*), Sofia region, West Frontier Mts, Valley of River Struma, Mt Belasitsa, Valley or River Mesta, Pirin Mts (*Northern*), Rila Mts, Thracian Lowland, Tundzha Hilly Country (Vladimirov & Kuzmanov 2012), Pirin Mts (*Southern*) (Petrova 2017), Rhodopi Mts (*Central*) (Vladimirov & Tashev 2017), Mt Strandzha (Vladimirov & al. 2016).

137. *Senecio inaequidens* DC. (Fig. 39)

Bu Rhodopi Mts (*Eastern*): sandy verge by the road from Kardzhali to Haskovo towns, *ca.* 530 m, 41.69596°N, 25.36331°E, 06.10.2021, *V. Vladimirov* & *V. Trifonov* obs.

A single plant spotted and eradicated to prevent establishment. However, many ripe seeds have already been dispersed in the area by the wind. So far this alien species has been reported from the Forebalkan (*Western*) (Vladimirov & Tashev 2017), Sofia Region (Vladimirov & Petrova 2009), Vitosha region (Vladimirov & al. 2016), Mt Sredna Gora (*Western*) (Vladimirov & al. 2017), and Thracian Lowland (Petrova & al. 2015).

138. *Silphium perfoliatum* L. (Fig. 40)

Bu Rhodopi Mts (*Western*): S-SW of Borino village, meadows, *ca.* 1120 m, 41.67511°N, 24.30170°E, 18.07.2021, coll. *V. Vladimirov*, *A. Tashev* & *N. Tashev* (SOM).

Three neighbouring groups of plants recorded covering a total area of *ca.* 6 m². So far *S. perfoliatum* has been reported as a casual species from the Northeast Bulgaria floristic region (Vladimirov & Petrova 2010b). Very recently an established population has been recorded in the Forebalkan (*Eastern*) (Vladimirov 2021).

Phytolaccaceae

139. *Phytolacca americana* L.

Bu Rhodopi (*Eastern*): Chakalarovo village, along 'Deveti Septemvri' St. near the building of the 'State Forestry – Kirkovo', *ca.* 400 m, 41.297832°N, 25.304767°E, 06.10.2021, *V. Vladimirov* & *V. Trifonov* obs.

A new record of the species for this floristic subregion. So far this North-American taxon has been reported from Black Sea Coast, Northeast Bulgaria, Danubian Plain, Forebalkan, Balkan Range, Sofia region, Valley of River Struma, Mt Belasitsa, Rila Mts, Mt Sredna Gora, Rhodopi Mts (*Western*, *Central*), Thracian Lowland, Tundzha Hilly Country (Assyov & Petrova 2012; Petrova & al. 2013).

Fig. 39. *Senecio inaequidens* (photo V. Vladimirov).

Fig. 40. *Silphium perfoliatum* (photo V. Vladimirov).

Acknowledgements. Work of V. Vladimirov was carried out in the framework of the National Science Program 'Environmental Protection and Reduction of Risks of Adverse Events and Natural Disasters', approved by the Resolution of the Council of Ministers № 577/17.08.2018 and supported by the Ministry of Education and Science (MES) of Bulgaria (Agreement № Д01-363/17.12.2020).

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