New floristic records in the Balkans: 51*

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Abstract. New chorological data are presented for 114 species and subspecies from Bosnia and Herzegovina (79), Bulgaria (39-61), Greece (8-38, 62-78, 80-114), and Turkey-in-Europe (1-7). The taxa belong to the following families: *Aceraceae* (108), *Alliaceae* (38, 106), *Apiaceae* (8, 35, 62-65, 87), *Aristolochiaceae* (1), *Asclepiadaceae* (74), *Asparagaceae* (107), *Asphodelaceae* (89), *Aspleniaceae* (40-43), *Asteraceae* (2, 3, 9, 10, 36, 66, 75, 88, 91-93, 99, 109, 110), *Athyriaceae* (44, 45), *Boraginaceae* (11, 12, 79, 94), *Brassicaceae* (4, 13, 67, 100), *Callitrichaceae* (14), *Caprifoliaceae* (15), *Caryophyllaceae* (84), *Chenopodiaceae* (16), *Colchicaceae* (90), *Convolvulaceae* (17), *Crassulaceae* (5, 95), *Cucurbitaceae* (101), *Cupressaceae* (98), *Cyperaceae* (78), *Cystopteridaceae* (46-48), *Dennstaedtiaceae* (49), *Dryopteridaceae* (50-59), *Euphorbiaceae* (102), *Fabaceae* (6, 7, 18-20, 103), *Geraniaceae* (80, 96), *Hyacinthaceae* (97), *Hypericaceae* (68), *Iridaceae* (82), *Juncaceae* (73, 83), *Lamiaceae* (21, 37, 81, 111), *Ophioglossaceae* (60), *Orobanchaceae* (39), *Paeoniaceae* (104), *Plantaginaceae* (85), *Poaceae* (28-34), *Polygonaceae* (22, 69), *Rafflesiaceae* (23, 86), *Resedaceae* (76), *Rhamnaceae* (24), *Rosaceae* (25-27, 112), *Rubiaceae* (70), *Scrophulariaceae* s.l. (71, 113, 114), *Solanaceae* (72), *Thelypteridaceae* (61), *Thymelaeaceae* (105), and *Valerianaceae* (77).

New species for science are: *Plantago charalampidis* Strid & al. (85) and *Geranium margaritae* Kit Tan & al. (96).

New taxa for the countries are: Greece – *Carex secalina* (78), *Sedum sarmentosum* (95), and *Scilla sicula* (97).

The publication includes contributions by: M. Aybeke (1-7), B. Biel & Kit Tan (8-34), C. Cattaneo & M. Grano (35-38), D. Gyurova (39), K. Lakovski & D. Ivanova (40-61), R. Marchant, Kit Tan & J. Zieliński (62-73), K. Polymenakos, Kit Tan & V. Pantavos (74-78), E. Šabanović & V. Ranđelović (79), K.B. Simoglou & Kit Tan (80-82), K. Sutorý (83), A. Strid (84-86), Kit Tan & K. Giannopoulos (87-90), Kit Tan & G. Kofinas (91-97), Kit Tan, Sister Pachomia & J. Zieliński (98-107), and G. Zarkos & Kit Tan (108-114).

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

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Reports 1–7

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

Aristolochiaceae

1. *Aristolochia clematitis* L.

Tu(E) A1(E) Edirne: Centre, Karaağaç, in a field, 11.10.2009, coll. & det. *F. Dane* (EDTU 10317).

A new taxon for A1(E) Edirne in European Turkey. According to Davis & Khan (1982), this taxon was encountered only in A1(E) Kırklareli.

Asteraceae

2. *Bidens tripartita* L.

Tu(E) A1(E) Edirne: Trakya University, Güllapoğlu Campus, along the stream, 13.09.2004, coll. & det. *F. Dane* (EDTU 8575).

A new taxon for A1(E) Edirne in European Turkey. According to Kupicha (1975), this taxon was recorded only in A2(E) Istanbul.

3. *Centaurea thirkei* Schultz Bip.

Tu(E) A1(E) Edirne: Saksağan village pasture, open ground, 10.04.2008, coll. *Ç. Meriç* & *S. Dayan*, det. *F. Dane* (EDTU 9620).

A new taxon for A1(E) Edirne in European Turkey. According to Wagenitz (1975), this taxon was reported for A1(E) Kırklareli and Tekirdağ.

Brassicaceae

4. *Alliaria petiolata* (M. Bieb.) Cavara & Grande

Tu(E) A1(E) Edirne: Karakasım, at the roadside, 13.05.2009, coll. & det. *F. Dane* (EDTU 11851).

A new taxon for A1(E) Edirne in European Turkey. According to Hedge (1965), this taxon was recorded only in A2(E) Istanbul.

Crassulaceae

5. *Umbilicus erectus* DC.

Tu(E) A1(E) Kırklareli: Demirköy, at the roadside, 10.06.2005, coll. & det. *F. Dane* (EDTU 11759).

A new taxon for European Turkey. According to Chamberlain (1972), this taxon was recorded in NW, W, S & E Anatolia.

Fabaceae

6. *Biserrula pelecinus* L.

Tu(E) A1(E) Edirne: Keşan, Mecidiye, in sandy area, at the beach, 02.06.2001, coll. *G. Dalgıç*, det. *F. Dane* (EDTU 8298)

A new taxon for European Turkey. According to Matthews (1970), this taxon was reported for W. & S. Anatolia.

7. *Cicer montbretii* Jaub. & Spach

Tu(E) A1(E) Edirne: Centrum, Güllapoğlu Campus, 15.05.2000, coll. *G. Dalgıç*, det. *F. Dane*, *Ç. Meriç*, appr. *M. Aybeke* (EDTU 7958).

A new taxon for A1(E) Edirne in European Turkey. According to Davis (1970), this taxon was reported for A1(E) Tekirdağ and A2(E) Istanbul.

Reports 8–34

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This is the tenth report of new plant-records for the island of Milos (phytogeographical region Kiklades, Nomos Kikladon, Eparchia Milou) based on annual visits in spring 2020–2023. The 27 records listed are new for the island unless otherwise stated. Six of the species were found to be new for the floristic region Kiklades (Kik) as circumscribed in *Flora Hellenica* (Strid & Tan 1997). and the total number of new records we have so far found for this floristic region are now 101. Occurrence on the other Kikladean islands is briefly summarized.

Apiaceae

8. *Anethum graveolens* L.

Gr Nomos Kikladon, Eparchia Milou: S of Pollonia, waste land and road margins, 10 m, 36°45'31"N, 24°31'38"E, 28.05.2023, *Biel* 23.232.

Recorded from several of the Kiklades.

Asteraceae

9. *Scolymus maculatus* L.

Gr Nomos Kikladon, Eparchia Milou: S margin of Zefyria, road margins, parks and olive groves, 15 m, 36°41'55"N, 24°29'24"E, 19.05.2023, *Biel* 23.165.

Only recorded from Paros in the Kiklades.

10. *Scorzonera crocifolia* Sm. (Fig. 1)

Gr Nomos Kikladon, Eparchia Milou: N of Adamas, phrygana slope with *Erica*, south of stream valley, 20 m, 36°43'54"N, 24°26'31"E, 17.03.2023, *Biel* 23.022.

New for the Kiklades. Also noted SW of Embourios and NW of Psathadika.

Fig. 1. *Scorzonera crocifolia* (photo B. Biel).

Boraginaceae

11. *Buglossoides tenuiflora* (L. f.) I. M. Johnst.

Gr Nomos Kikladon, Eparchia Milou: Pachena, waste ground, phrygana at road junction and between houses, 25 m, 36°45'09"N, 24°30'00"E, 21.03.2023, *Biel* 23.068.

Scattered in Greece, mainly Attiki.

12. *Symphytum creticum* (Willd.) Runemark ex Greuter & Rech. f.

Gr Nomos Kikladon, Eparchia Milou: NE of Psathadika, S of Chalepa, open ground with phrygana and rocky outcrops, 295 m, 36°40'36"N, 24°25'11"E, 29.05.2023, *Biel* 23.243.

In the Kiklades recorded from Amorgos, Astipalaea, Serifos, Sifnos, as well as the smaller islands of Serifopoula, Dio Adelfia, Ofidoussa and Pontikoussa.

Brassicaceae

13. *Raphanus raphanistrum* subsp. ***landra*** (DC.) Bonnier & Layens (Fig. 2)

Gr Nomos Kikladon, Eparchia Milou: E of Achivadolimni, road margins with phrygana and *Juniperus*, 15 m, 36°41'12"N, 24°26'48"E, 25.05.2023, *Biel* 23.215.

Recently reported from Astipalea in the Kiklades.

Fig. 2. *Raphanus raphanistrum* subsp. *landra* (photo B. Biel).

Callitrichaceae

14. *Callitriche stagnalis* Scop. (Fig. 3)

Gr Nomos Kikladon, Eparchia Milou: NW of Embourios, phrygana and small stream near old quarries, 140 m, 36°43'10"N, 24°21'36"E, 05.04.2022, *Biel* 22.135; N of Ag. Ioannis, rocky phrygana with small ponds near goat pen, end of track, 130 m, 36°41'00"N, 24°20'29"E, 26.05.2023, *Biel* 23.224.

New for the Kiklades.

Caprifoliaceae

15. *Lonicera japonica* Thunb.

Gr Nomos Kikladon, Eparchia Milou: SE edge of Triovasalos, road margins and cereal fields, 110 m, 36°44'36"N, 24°26'07"E, 22.05.2023, *Biel* obs. (photo).

Also noted at Adamas.

Fig. 3. *Callitriche stagnalis* (photo B. Biel).

Fig. 4. *Ononis variegata* (photo B. Biel).

Chenopodiaceae

16. *Atriplex mollis* Desf.

Gr Nomos Kikladon, Eparchia Milou: W-SW of Embourios, abandoned gravel pit surrounded by phrygana, 110 m, 36°41'47"N, 24°21'32"E, 26.05.2023, *Biel* 23.226.

New for the Kiklades. Also noted S of Pachena in 2022.

Convolvulaceae

17. *Convolvulus elegantissimus* Mill.

Gr Nomos Kikladon, Eparchia Milou: W of Psathadika, terraced phrygana on flat hill, 170 m, 36°39'57"N, 24°24'09"E, 18.03.2023, *Biel* obs. (photo).

Recorded from most of the Kiklades.

Fabaceae

18. *Melilotus elegans* Ser.

Gr Nomos Kikladon, Eparchia Milou: S-SE of Pachena, grassy slope by dirt road and waste ground at edge of large gravel pit, 50 m, 36°44'25"N, 24°30'26"E, 28.05.2023, *Biel* 23.235.

In the Kiklades, reported only from Palea Kameni (Thiras).

19. *Ononis variegata* L. (Fig. 4)

Gr Nomos Kikladon, Eparchia Milou: N-NE of Paliochori, phrygana slopes with olive trees, dirt road near stream crossing, 135 m, 36°41'47"N, 24°32'05"E, 27.05.2023, *Biel* 23.229.

Recorded from Amorgos, Iraklia and Naxos. Several other sites noted on Milos.

20. *Vicia tetrasperma* (L.) Schreb.

Gr Nomos Kikladon, Eparchia Milou: N-NE of Chodro Vouno, phrygana at edge of dirt road and fenced pine wood, 190 m, 36°41'34"N, 24°22'48"E, 21.05.2023, *Biel* 23.180.

New for the Kiklades.

Lamiaceae

21. *Sideritis lanata* L.

Gr Nomos Kikladon, Eparchia Milou: NW of Agia Kiriaki, open phrygana, gravelly pasture at Ag. Pandes, 35 m, 36°40'23"N, 24°29'40"E, 23.03.2023, *Biel* 23.073.

Recorded from Andros, Kea, Serifos, Sifnos and Thira in the Kiklades.

Polygonaceae

22. *Rumex pulcher* subsp. ***raulinii*** (Boiss.) Rech. f.

Gr Nomos Kikladon, Eparchia Milou: W of Zefiria, ruderal places at road margins and field, 15 m, 36°42'03"N, 24°29'15"E, 19.05.2023, *Biel* 23.166.

Common in Kiklades.

Rafflesiaceae

23. *Cytinus ruber* (Fourr.) Fritsch

Gr Nomos Kikladon, Eparchia Milou: Chodro Vouno, rocky phrygana slope on eastern ridge, 580 m, 36°40'51"N, 24°22'23"E, 20.03.2023, *Biel* obs. (photo).

Common in Kiklades; recorded from the adjacent islands of Poliegos and Kimolos.

Rhamnaceae

24. *Rhamnus saxatilis* subsp. ***prunifolia*** (Sm.) Aldén

Gr Nomos Kikladon, Eparchia Milou: N of Ag. Ioannis, rocky SW slope of Kalamavros with phrygana and *Juniperus*, 170 m, 36°41'07.01"N, 24°20'29.06"E, 26.05.2023, *Biel* obs. (photo).

In the Kiklades, only known from Amorgos and Naxos. Also noted SW of Pollonia.

Rosaceae

25. *Rosa canina* L.

Gr Nomos Kikladon, Eparchia Milou: NE edge of Zefiria, waste ground and fallow field, 15 m, 36°42'03"N, 24°29'31"E, 19.05.2023, *Biel* 23.167 (det. J. Zieliński).

In the Kiklades reported only from Naxos.

26. *Rosa damascena* Mill.

Gr Nomos Kikladon, Eparchia Milou: SW of Embourios, in phrygana at road margins near chapel Isodia Theotokou, 150 m, 36°41'48"N, 24°22'14"E, 26.05.2023, *Biel* obs. (photos; det. J. Zieliński).

Reported from Amorgos. An old rose, probably of hybrid origin, often cultivated as an ornamental shrub or for the perfume trade.

27. *Sanguisorba minor* subsp. ***balearica*** (Nyman) Muños Garm. & C. Navarro

Gr Nomos Kikladon, Eparchia Milou: E of Adamas, grassy road embankment, 30 m, 36°43'31"N, 24°27'52"E, 19.05.2023, *Biel* 23.156.

Recorded from most of the Kiklades.

Poaceae

28. *Aegilops comosa* Sm. subsp. ***comosa***

Gr Nomos Kikladon, Eparchia Milou: W-SW of Embourios, phrygana at fenced mining area, at dirt road, 100 m, 36°41'49"N, 24°21'33"E, 18.05.2022, *Biel* 22.344; N of Prof. Ilias, grassy slopes, pasture below dirt track to Ag. Pandeleimonas, 170 m, 36°41'39"N, 24°22'47"E, 21.05.2023, *Biel* 23.179.

Recorded mainly in N and C Kiklades. Several other sites are scattered on the island.

29. *Aegilops comosa* subsp. ***heldreichii*** (Boiss.) Eig

Gr Nomos Kikladon, Eparchia Milou: N-NE of Ag. Marina, *Erica–Calicotome*-phrygana with rocky outcrops, by concrete road, 40 m, 36°41'43"N, 24°24'23"E, 17.06.2021, *Biel* 21.181; N-NE of Prof. Ilias, rocky hillslopes with *Erica*-phrygana, edge of abandoned road, 145 m, 36°41'45"N, 24°23'21"E, 10.05.2022, *Biel* 22.249.

In the Kiklades reported with certainty only from Iraklia.

30. *Dactylis glomerata* subsp. ***rigida*** (Boiss. & Heldr.) Hayek

Gr Nomos Kikladon, Eparchia Milou: NE of Prof. Ilias, by marked path in open phrygana on steep slope, 430 m, 36°40'47"N, 24°23'25"E, 24.05.2023, *Biel* 23.204.

New for Kiklades, reported only from Crete. Also noted near Embourios, Chodro Vouno, Paliochori and Prof. Ilias. Has been regarded as an ecotype of *D. glomerata* adapted to dry conditions.

31. *Elytrigia elongata* (Host) Nevski

Gr Nomos Kikladon, Eparchia Milou: NW Milos airport, sandy beach with small dunes and ditches, road margins, W of Alikes, 2 m, 36°42'03"N, 24°28'06"E, 01.06.2023, *Biel* 23.259.

New for the Kiklades.

32. *Melica rectiflora* Boiss. & Heldr.

Gr Nomos Kikladon, Eparchia Milou: S-SW of Embourios, phrygana slopes by dirt road, 80 m, 36°42'09"N, 24°23'16"E, 23.05.2023, *Biel* 23.197; NE Prof. Ilias, by marked path in open phrygana on steep slope, 430 m, 36°40'47"N, 24°23'25"E, 24.05.2023, *Biel* 23.205.

Recorded from Amorgos in the Kiklades.

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

Gr Nomos Kikladon, Eparchia Milou: Adamas, waste ground, parks, road margins in village, 10 m, 36°43'32"N, 24°26'42"E, 28.05.2023, *Biel* 23.241.

Recorded from most of the Kiklades.

34. *Sorghum halepense* (L.) Pers.

Gr Nomos Kikladon, Eparchia Milou: S of Pollonia, margins of dirt road and field, 85 m, 36°44'17"N, 24°31'01"E, 28.05.2023, *Biel* 23.234.

Recorded from most of the Kiklades. Also noted near Adamas and Pollonia.

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

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Reports 35–38

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Apiaceae

35. *Bupleurum odontites* L.

Gr Nomos & Eparchia Samou: island of Samos, Drosia, cultivated field with grasses, 134 m, 37°43'50"N, 26°59'53"E, 28.05.2021, *Cattaneo* 1909 (herb. Cattaneo).

New for Samos. In the East Aegean recorded from Chios, Lesvos and Rodos.

Asteraceae

36. *Scolymus maculatus* L.

Gr Nomos & Eparchia Samou: island of Samos, wasteground in Chora, 32 m, 37°41'37"N, 26°53'11"E, 30.05.2021, *Cattaneo* 1908 (herb. Cattaneo).

Confirming an old report "*in saxosis insulae Sami*" by Dumont d'Urville (1822: 103) which up to now, had never been verified.

Lamiaceae

37. *Calamintha nepeta* (L.) Savi

Gr Nomos Samou, Eparchia Ikarias: island of Ikaria, along the banks of Halaris stream, 10 m, 37°37'31"N, 26°05'12"E, 12.08.2021, *Cattaneo* & *Grano* 1672 (herb. Cattaneo).

New for Ikaria. A species common on the mainland but rare in the central Aegean. In the East Aegean, recorded from Samos and Lesvos.

Alliaceae

38. *Allium flavum* subsp. ***tauricum*** (Rchb.) K. Richt.

Gr Nomos Samou, Eparchia Ikarias: island of Ikaria: Perdiki, limestone rocks, 390 m, 37°39'54"N, 26°19'21"E, 14.08.2021 & 28.06.2022, *Cattaneo* & *Grano* 2258 (herb. Cattaneo, conf. D. Tzanoudakis, June 2023).

New for Ikaria. The plants are restricted to the high ground of the northeastern part of the island which has rocky calcareous slopes. Bulbs were collected from this site and cultivated. The living plants show some characters deviating from other populations of *A. flavum* subsp. *tauricum* from the East Aegean Islands. The Ikarian plants have small bulbs 0.3–1 × 0.2–1 cm and stems up to 13 cm long covered by leaf sheaths for 1/2–2/3 of their length. The leaves are 3–4, up to 12 cm long, and the 2-valved spathe is slightly longer than the umbel. The umbels have few flowers (max. 14), the pedicels are unequal (0.3–1.5 cm), the perianth campanulate, segments obtuse-rounded, yellowish with green veins. The filaments are ca. 4 mm, purple distally. The ovary is substipitate and globose (2 mm diam.) as in subsp. *flavum*. The small size, pale yellow inflorescence (not tawny yellow typical of most of the plants in the Dodecanese), the shorter filaments, and globose ovary typical of *A. flavum* subsp. *flavum* (not subglobose as in subsp. *tauricum*) are peculiar features that distinguish the Ikarian plants.

Report 39

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Orobanchaceae

39. *Tozzia alpina* subsp. ***carpathica*** (Woł.) Pawł. & Jasiewicz

Bu Vitosha region: Mt Vitosha, in a wet spot by a stream, grass vegetation dominated by *Rumex alpinus* and *Caltha palustris* s.l., E-NE exposure, 1700 m, 42°34'50.7"N, 23°17'56.2"E, 09.06.2023, *D. Gyurova* & *N. Doncheva* obs.; along a tributary of river Yanchovska, at the edge of a Norway Spruce forest near the lower station of the Romanski Ski Lift, 1650 m, 42.58686°N, 23.29657°E, 30.06.2023, *D. Gyurova* obs.

About 70 flowering specimens have been observed on an area of 600 m^2. The locality has been partly damaged by a wood bike trail installed in 2022 in the middle of the wet area for cyclists. In the second locality, about 130 flowering specimens have been counted on an area of *ca.* 800 m^2. These are new localities in Mt Vitosha. The species is of high conservation concern in the Bulgarian flora: it is included in the EU Habitats Directive, it is legally protected by the national

Biological Diversity Act, and is assessed as Vulnerable in the *Red List of Bulgarian vascular plants* (*cf.* Vladimirov & Assyov 2009).

Reports 40–61

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This is a report of some new plant records for Bulgaria. Chorological data on 21 fern taxa belonging to different families are presented, along with some ecological, altitudinal, phenological, or morphological notes.

Aspleniaceae

40. *Asplenium ceterach* L.

Bu Pirin Mts (*Northern*): nearby the trail from the Yavorov chalet to peak Razlozhki Suhodol, on a rock, 1774 m, 41°49'29"N, 23°22'38"E, 21.07.2023, *K. Lakovski* & *D. Ivanova* obs.

Asplenium ceterach is a widely distributed species in Bulgaria. In such taxonomic and chorological sources like *Flora of the People's Republic of Bulgaria* (Achtarov & Jordanov 1963), *Conspectus of the Bulgarian Vascular Flora* (Assyov & Petrova 2012), and *Key to the Native and Foreign Vascular Plants in Bulgaria* (Stoyanov & al. 2021), the highest altitude specified for *A. ceterach* is 1500 m. The new finding represents the highest elevation for this species in Bulgaria. Only one individual has been seen on a rock next to the tourist trail in the pine forest not far above Yavorov chalet; however, more individuals are expected in appropriate places in that forest.

41. *Asplenium ruta-muraria* L.

Bu Pirin Mts (*Northern*): Banderitsa chalet, on a rock next to the road turn in front of the chalet, 1810 m, 41°46'06"N, 23°25'34"E, 17.08.2018, *K. Lakovski* obs.; above Banderitsa chalet, on a rock next to the trail to peak Vihren, 2010 m, 41°46'22"N 23°25'19"E, 19.08.2018, *K. Lakovski* obs.; along the trail from Yavorov chalet to lake Suhodolsko, on a rock between *Pinus mugo* shrubs, 2222 m, 41°48'36"N, 23°21'58"E, 21.07.2023, *K. Lakovski* & *D. Ivanova* obs.; Kamenitishki Cirque, on a rocky slope, 2179 m, 41°48'27"N, 23°22'45"E, 21.07.2023, *K. Lakovski* & *D. Ivanova* obs.; *loc. ibid.,* on a rock above the timberline, 2076 m, 41°48'28"N, 23°22'57"E, 20.07.2023, *K. Lakovski* & *D. Ivanova* obs.; peak Orelyak, on a rocky ridge southwards of the peak, 2012 m, 41°34'01"N, 23°36'44"E, 19.07.2023, *K. Lakovski* & *D. Ivanova* obs.

Asplenium ruta-muraria is a common species in Bulgaria. In the first volume of *Flora of the People's Republic of Bulgaria*, its range has been described as: "more often in the foothills, but (it) descends to the sea level, and climbs up to 1500 m in the mountains" (Achtarov & Jordanov 1963). Assyov & Petrova (2012) and Stoyanov & al. (2021) have indicated 1500 m as the highest altitude for *A. ruta-muraria*. There are only two herbarium specimens from higher altitudes: SO 95157 (Central Pirin, on a grassy limestone slope beneath peak Baba, 1850 m, 26.09.1987, *D. Stoyanov*) and DI-99.98 (Pirin, on rocks next to the trail Banderitsa chalet – Kazanite locality, 28.08.1998, *D. Ivanova*); no exact altitude has been specified for the latter but it was surely above 1800 m. These data make the new observations in the Northern Pirin Mts the highest documented locations for *A. ruta-muraria* in Bulgaria.

42. *Asplenium trichomanes* L.

Bu Pirin Mts (*Northern*): above Banderitsa chalet, on a rock along the trail to peak Vihren, 2000 m, 41°46'22"N, 23°25'19"E, 19.08.2018, *K. Lakovski* obs.; along the trail from Yavorov chalet to lake Suhodolsko, in a pine forest, 1920 m, 41°49'01"N, 23°22'19"E, 21.07.2023, *K. Lakovski* & *D. Ivanova* obs.; Kamenitishki Cirque, on a small rock in the *Pinus peuce* forest, NE exposition, 1940 m, 41°48'50"N, 23°23'21"E, 20.07.2023, *K. Lakovski* & *D. Ivanova* obs.; *loc. ibid.,* on a rocky slope, 2295 m, 41°48'20"N, 23°22'43"E, 21.07.2023, *K. Lakovski* & *D. Ivanova* obs.; *loc. ibid.,* on a rocky slope above the timberline, NE exposition, 2055 m, 41°48'33"N, 23°22'59"E, 21.07.2023, *K. Lakovski* & *D. Ivanova* obs.

This is a widely distributed species in Bulgaria. The highest altitude of 1700 m for *A. trichomanes* has been reported by Achtarov & Jordanov (1963), Assyov & Petrova (2012) and Stoyanov & al. (2021). The only data for

the species presence at higher altitude is found on the label of the herbarium specimen DI-97.94 (Pirin Mts, under rocks next to the trail Banderitsa chalet – Kazanite locality, below the upper timberline, 16.08.1994, *D. Ivanova*). The forest does not climb higher than 1920 m in that place, hence, the observation from 1994 is limited to *ca*. 1900 m. The new observations in the Northern Pirin Mts are the highest documented locations for *A. trichomanes* in Bulgaria so far.

43. *Asplenium viride* Huds.

Bu Pirin Mts (*Northern*): peak Vihren, on a rock at the entrance to the Big Kazan Cirque, NE exposition, 2400 m, 41°46'12"N, 23°24'35"E, 23.06.2016, *K. Lakovski* obs.; *loc. cit.*, 16.08.2018, *K. Lakovski* obs. (Fig. 5); along the trail from Yavorov chalet to peak Razlozhki Suhodol, on a rocky slope, NE exposition, 2442 m, 41°48'05"N, 23°21'33"E, 21.07.2023, *K. Lakovski* & *D. Ivanova* obs.; Kamenitishki Cirque, on a rocky slope, 2403 m, 41°48'10"N, 23°22'36"E, 21.07.2023, *K. Lakovski* & *D. Ivanova* obs.; *loc. ibid.,* 2558 m, 41°47'50"N, 23°22'27"E, 21.07.2023, *K. Lakovski* & *D. Ivanova* obs.

Fig. 5. *Asplenium viride* in the Pirin Mts (photo K. Lakovski).

Fig. 6. *Athyrium distentifolium*, pinnules with mature sori, peak Midzhur (photo K. Lakovski).

In literature sources (Achtarov & Jordanov 1963; Assyov & Petrova 2012; Stoyanov & al. 2021), 2300 m was given as the highest altitude for *A. viride*. The only information for higher altitude was found on the label of the herbarium specimen SO 912 (Rila Mts, on limestone rocks beneath peak Damga, 2400 m, 29.07.1962, *M. Simeonovski*). The new observations in the Northern Pirin Mts show the highest locations documented so far for this species in Bulgaria.

Athyriaceae

44. *Athyrium distentifolium* Tausch ex Opiz

Bu Balkan Range (*Western*): peak Midzhur, on a slope with NE exposure, 1878 m, 43°25'16"N, 22°39'37"E, 08.08.2021 (Fig. 6), *K. Lakovski* obs.; *loc. ibid*., on a steep grass slope, N exposure, 1708 m, 43°23'55"N, 22°42'01"E, 19.07.2022, *K. Lakovski* (SOM 178507); *loc. cit*., 2024 m, 43°23'43"N, 22°41'17"E, 19.07.2022, *K. Lakovski* obs.

This is the first report of *A. distentifolium* for the floristic region of the Western Balkan Range. Several plants have been found in mixed populations with *A. filix-femina*. The plants grew in small groups near silicate rocks. The ferns were with well-developed sori, thus the two species could be easily distinguished on the spot.

45. *Athyrium filix-femina* (L.) Roth

Bu Forebalkan (*Western*): Vrachanski Balkan Nature Park, near Ledenika Cave, in a *Pinus nigra* forest, 846 m, 43°12'18"N, 23°29'41"E, 07.06.2022, *K. Lakovski* obs.; Vrachanski Balkan Nature Park, on the north slope of peak Peshka, in a beech forest, 988 m, 43°11'50"N, 23°29'02"E, 14.06.2022, *K. Lakovski* obs.; Vrachanski Balkan Nature Park, river Cherna, in a beech forest, NW exposure, 421 m, 43°11'08"N, 23°24'42"E, 01.07.2022, *K. Lakovski* obs.; Vrachanski Balkan Nature Park, on a slope of peak Yavorets, in a beech forest, N exposure, 1122 m, 43°07'57"N, 23°33'46"E, 21.06.2022, *K. Lakovski* obs.

Athyrium filix-femina is a widely distributed fern in the Bulgarian flora. However, there are rather few data on it from the Western Forebalkan. The only herbarium specimen of this species from the Western Forebalkan was deposited in SOM (SOM 483, above Cherepishki Monastery, 1893, *B. Davidov*). Subsequently, I. Urumov wrote in his *Fifth contribution to the Bulgarian flora* that *A. filix-femina* was growing in shady forests in the Vrachanski Balkan, but failed to mention any particular locations (Urumov 1905). In fact, in his scientific works, Urumov included in 'Vrachanski Balkan' a wider area than the present: for example, the valley of river Proboynitsa and Dupni Vrah village (the latter was renamed in 1952 and is now Druzhevo village), which are actually part of the Western Balkan Range region. Another example was found in his notes on *Nasturtium thracicum*; Urumov literally wrote: "Next to ditches and grassy places at Kalichina Bara and Dupni Vrah in the Vrachanski Balkan" (Urumov 1905). In the literature sources published before 1900, Vrachanski Balkan often included the adjacent territories. For example, Panayot Hitov mentioned in his memoirs (1880-1886; published in 1982) "Dupni Vrah village in the Vrachanski Balkan". Until 1950, Dupni Vrah (namely Druzhevo village) was part of the Vratsa Municipality and subsequently became part of the Svoge Municipality. Thus, it was not clear whether the plants mentioned in Urumov's notes for "Vrachanski Balkan" were indeed distributed in the Western Forebalkan, or rather in the Western Balkan Range. The data were over one century old and did not give sufficient information on the actual distribution of *A. filix-femina*. The new observations have shown that the species is comparatively common in the forests of Western Forebalkan and Vrachanski Balkan in particular.

Cystopteridaceae

46. *Cystopteris fragilis* (L.) Bernh.

Bu Forebalkan (*Eastern*): Chavdartsi village, Mandrata Cave, near the cave entrance, 187 m, 43°14'31"N, 24°58'03"E, 15.04.2022, *K. Lakovski* obs.;

— Pirin Mts (*Northern*): peak Razlozhki Suhodol, on a rocky slope westwards of the peak, 2553 m, 41°47'53"N 23°21'40"E, 21.07.2023, *K. Lakovski* & *D. Ivanova* obs.

The species occurs almost throughout the country but the literature sources do not give a lower limit of its vertical range. The population of *C. fragilis* at Mandrata Cave has been growing at the lowest altitude documented so far.

The upper limit of the range of *C. fragilis* was indicat-

ed at 2300 m in the Pirin Mts and 2200 m in the Rila Mts, and for *C. alpina* it was 2500 m (Achtarov & Jordanov 1963). Assyov & Petrova (2012) and Stoyanov & al. (2021) also gave 2300 m as the highest altitude for *C. fragilis*. Ivanova (2021) specified the range of the species up to 2400 m a.s.l. The new location in the Northern Pirin Mts is the highest for that species in Bulgaria.

47. *Gymnocarpium dryopteris* (L.) Newman

Bu Pirin Mts (*Northern*): Razlozhki Suhodol Cirque, above lake Suhodolsko, 2323 m, 41°48'18"N, 23°21'44"E, 21.07.2023, *K. Lakovski* & *D. Ivanova* obs.; along the trail from Betolovoto to Yavorov chalet, in the forest, 1601 m, 41°50'07"N, 23°22'49"E, 20.07.2023, *K. Lakovski* & *D. Ivanova* obs.

Location of *G. dryopteris* in the Razlozhki Suhodol Cirque is particularly interesting. That Cirque (between ridge Okadenski and ridge Stapalata (Sabitsite) in the Pirin Mts is a contact area for marble, on the one side, and for crystalline schists, granitoids and other silicate rocks, on the other. These geological characteristics of the region explain the coexistence of *G. dryopteris* and *G. robertianum* in the Northern Pirin Mts. In such places, these two generally ecologically separated species because of their different requirements for the substrate, grow only several hundred metres from each other. The shared area is one of the prerequisites for hybridisation. *Gymnocarpium* × *achriosporum*, a putative tetraploid hybrid between *G. robertianum* and *G. dryopteris*, is known only from Sweden and two localities in Quebec, Canada (Sarvela 1978, 1980). The hybrid resembles *G. robertianum* in its leaf morphology and dense glandularity but has black and malformed spores. Such hybridisation is not known for the region of the Pirin Mts yet, but is quite possible.

48. *Gymnocarpium robertianum* (Hoffm.) Newman

Bu Forebalkan (*Western*): Vrachanski Balkan Nature Park, Borov Kamak locality, among *Geranium macrorrhizum* in *Fagus sylvatica/Juglans regia* forest on a limestone scree, NW exposure, 689 m, 43°09'31"N, 23°30'27"E, 17.05.2008, *K. Lakovski* (SOM 178503); *loc. cit.,* 02.08.2015, *K. Lakovski* obs.; *loc. cit.,* 19.05.2023, *K. Lakovski* obs.; *loc. ibid.,* under a big stone, about 50 m from the first location, 684 m, 43°09'33"N, 23°30'27"E, 19.10.2014, *K. Lakovski* obs.; *loc. cit.,* 02.08.2015, *K. Lakovski* obs.; *loc. cit.,* 06.05.2017, *K. Lakovski* obs. (Fig. 7); Vrachanski Balkan Nature Park, in the left-side ditch along the road from Zgorigrad village to the Mir Mine, N exposure, 623 m, 43°09'56"N, 23°29'57"E, 24.06.2022, *K. Lakovski* (SOM 178504); Vrachanski Balkan Nature Park, in a small valley at the left side of the road from Zgorigrad village to the Mir Mine, NW exposure, 746 m, 43°09'38"N, 23°29'43"E, 24.06.2022, *K. Lakovski* (SOM 178505); Vrachanski Balkan Nature Park, river Cherna, on a steep slope in a beech forest, N exposure, 684 m, 43°09'53"N, 23°26'09"E, 10.08.2014, *K. Lakovski* obs.; *loc. cit.,* 29.07.2015, *K. Lakovski* (SOM 178506); *loc. cit.,* 01.07.2022, *K. Lakovski* obs.

— Balkan Range (*Western*): northwards of Smilyova Mogila, southwestwards of Druzhevo village, in a big grassy doline (depression in the limestone terrain), 1272 m, 43°07'14"N, 23°18'25"E, 11.06.2016,

Fig. 7. *Gymnocarpium robertianum* in the forest, Vrachanski Balkan (photo K. Lakovski).

Fig. 8. *Gymnocarpium robertianum*, at rocks in a mountain pasture near Smilyova Mogila (photo K. Lakovski).

K. Lakovski obs.; *loc. cit.*, 05.08.2023, *K. Lakovski* (SOM 178514) (Fig. 8);

— Pirin Mts (*Northern*): along the trail from Yavorov chalet to lake Suhodolsko, in the forest, 1774 m, 41°49'28"N, 23°22'38"E, 21.07.2023, *K. Lakovski* & *D. Ivanova* obs.

This is a new species for the floristic region of the Western Forebalkan. Three populations of this fern have been found and all they are at the lowest elevation recorded for *G. robertianum* in Bulgaria. The three localities are situated in forest on the northern or northwestern slopes, near streams.

In some scientific literature sources, *G. robertianum* has been indicated several times for the floristic region of the Western Balkan Range but without any herbarium specimens to prove these reports: Iskar River Gorge, the surroundings of Milkova Livada (this is the area of the present Gara Lakatnik village) (Toshev 1902); Iskar River Gorge (Velenovský 1903; Stojanov & al. 1966). The newly discovered population of *G. robertianum* in the Western Balkan Range confirms the presence of that species in that floristic region.

Dennstaedtiaceae

49. *Pteridium aquilinum* (L.) Kuhn

Bu Pirin Mts (*Northern*): Kamenitishki Cirque, near the upper timberline, in a *Pinus sylvestris/P. peuce/P. heldreichii* forest, 1918 m, 41°48'54"N, 23°23'24"E, 20.07.2023, *K. Lakovski* & *D. Ivanova* obs.

The highest altitude for the widely distributed fern *P. aquilinum* given by Achtarov & Jordanov (1963), Assyov & Petrova (2012), and Stoyanov & al. (2021) was 1800 m. The new observation is now the highest location for this species in Bulgaria.

Dryopteridaceae

50. *Dryopteris borreri* (Newman) Newman ex Oberh. & Tavel

Bu Forebalkan (*Western*): Vrachanski Balkan Nature Park, river Cherna, in a beech forest, 489 m, 43°10'42"N, 23°24'58"E, 01.07.2022, *K. Lakovski* obs.; *loc. cit.*, 29.07.2015, *K. Lakovski* (SOM 178509); *loc. ibid.*, 457 m, 43°10'51"N, 23°24'39"E, 01.07.2022, *K. Lakovski* obs. (Fig. 9); Vrachanski Balkan Nature Park, peak Peshka, in a beech forest, 1039 m, 43°11'45"N, 23°29'07"E, 14.06.2022, *K. Lakovski* obs.; Vrachanski Balkan Nature Park, Barkite locality, in a beech forest, 958 m, 43°13'09"N, 23°27'31"E, 12.08.2022, *K. Lakovski* & *D. Ivanova* obs. (Fig. 10); Vrachanski Balkan Nature Park, Borov Kamak locality, in a beech forest, 1081 m, 43°09'07"N, 23°30'10"E, 11.08.2022, *K. Lakovski* & *D. Ivanova* obs.;

— Balkan Range (*Western*): Chiprovski Waterfall, in a beech forest, 1030 m, 43°21'35"N, 22°49'04"E, 19.07.2019, *K. Lakovski* obs.; peak Skrevenik, above Byalata Voda chalet (Varshets), 1100 m, 11.06.2016, *K. Lakovski* obs.; above Zanozhene (Varshets), next to the forest road, 913 m, 43°08'38"N, 23°13'29"E, 30.07.2023, *K. Lakovski* obs.;

— Vitosha region: Mt Vitosha, along the trail from Zlatnite Mostove to Vetrovala locality, 1500 m, 27.10.2017, *K. Lakovski* obs.; Ofeliite locality, under a

Fig. 9. *Dryopteris borreri* at river Cherna, 01.07.2022, part of the pinna with sori. The black spot is visible (photo K. Lakovski).

Fig. 10. *Dryopteris borreri* in Barkite, 12.08.2022, pinnae with squarely truncate pinnules (photo K. Lakovski).

Fig. 11. *Dryopteris borreri*, leaf size 165 cm (photo K. Lakovski).

Fig. 12. Fern from *Dryopteris carthusiana* group, Mt Strandzha (photos K. Lakovski).

group of trees next to a U-turn of the road, 1595 m, 42°35'42"N, 23°14'20"E, 27.10.2017, *K. Lakovski* obs.;

— Mt Belasitsa: Yavornitsa village, in the forest next to the waterfall, 700 m, 41°21'14"N, 23°02'57"E, 19.06.2016, *K. Lakovski* obs.

This is a new species for the floristic region of the Western Forebalkan. Several mature individuals have been discovered in the population at river Cherna, with leaves about 150 cm long. Even bigger plants have been observed near Varshets (Western Balkan Range), at peak Skrevenik (with leaf length 160 cm) and above Zanozhene (leaf length 165 cm), which are the biggest plants of *D. borreri* in Bulgaria (Fig. 11). The pinnules of all leaves with such length (> 140 cm) are elongated, with rounded tips in contrast to the normal-size plants in the same populations that have square-tipped (truncated) pinnules. Both populations, at river Cherna and above Varshets, are in beech forests next to water streams and show numerous individuals.

51. *Dryopteris carthusiana* (Vill.) H.P. Fuchs

Bu Forebalkan (*Western*): Vrachanski Balkan Nature Park, near Ledenika Cave, in a pine forest, 855 m, 43°12'17"N, 23°29'45"E, 29.07.2015, *K. Lakovski* obs.; *loc. cit.*, 04.08.2015, *K. Lakovski* obs.; *loc. cit.*, 07.06.2022, *K. Lakovski* (SOM 178510); Vrachanski Balkan Nature Park, Barkite locality, in a beech forest, 939 m, 43°13'14"N, 23°27'21"E, 12.08.2022, *K. Lakovski* & *D. Ivanova* obs.; Vrachanski Balkan Nature Park, Dalgata Martvina locality, in a beech forest, 1114 m, 43°08'45"N, 23°33'13"E, 31.03.2019, *K. Lakovski* obs.; *loc. cit.*, 06.09.2022, *K. Lakovski* obs.; Yagodovo village, in wet meadows, next to a small stream, 357 m, 43°13'51"N, 23°10'28"E, 13.05.2023, *K. Lakovski* (SOM 178511).

— Vitosha region: Mt Vitosha, along the trail from Zlatnite Mostove to Vetrovala locality, 1500 m, 43°13'51"N, 23°10'28"E, 27.10.2017, *K. Lakovski* obs.;

— Pirin Mts (*Northern*): near the trail from lake Ribno Banderishko to lake Dalgoto, between silicate rocks, *ca*. 2300 m, 17.08.2018, *K. Lakovski* obs.

This is the first report of *D. carthusiana* for the Western Forebalkan. The species has been discovered in several places, with single individuals. Only the population near Ledenika Cave has comprised several dozens of plants. All populations in the Western

Fig. 13. *Dryopteris dilatata*, leaf and stipe with bicolour scales. Knife length is 22 cm (photo K. Lakovski).

Forebalkan have been found below the lower altitude for this species in Bulgaria mentioned in literature sources by Achtarov & Jordanov (1963), Assyov & Petrova (2012), and Stoyanov & al. (2021). The species observed at Yagodovo village is especially interesting as it has been far beneath all other Bulgarian localities given for the three species of the *Dryopteris carthusiana* complex in general.

That is the second reporting for the Pirin Mts (first report was by Ivanova (2021), herbarium specimen DI-26.03, river Izvoro, SW from Razlog, 25.06.2003, *D. Ivanova*), and for Mt Vitosha (first record by Achtarov, herbarium specimen SOM 296, Fonfonite, 12.10.1931, *B. Achtarov*).

52. *Dryopteris carthusiana* group

Bu Mt Strandzha: the springs of river Mladezhka, in a niche at the entrance of Brezhanka Cave, 42°09'03"N, 27°21'27"E, 15.08.2017, *K. Lakovski* obs. (Fig. 12).

On 15.08.2017 several juvenile fern individuals have been found in Mt Strandzha, at the springs of river Mladezhka. The species could not be determined unquestionably but the plants certainly belonged to the *Dryopteris carthusiana* complex, which in Bulgaria includes the species *D. carthusiana*, *D. dilatata* and *D. expansa*. As only these juvenile plants have been found in the region, the species was possibly recently introduced unintentionally by spores. This is the first observation in the Strandzha region, no matter to which of the three species the plants belonged to. At the same time, their locality has been the lowest for any of the species, because in Bulgaria all three of them have been considered mountain plants. All species of the *D. carthusiana* group should be looked for in Mt Strandzha.

53. *Dryopteris dilatata* (Hoffm.) A. Gray

Bu Forebalkan (*Western*): Vrachanski Balkan Nature Park, near Ledenika Cave, in a pine forest, 842 m, 43°12'17"N, 23°29'41"E, 04.08.2015, *K. Lakovski* (SOM 178511); Vrachanski Balkan Nature Park, Gorski Dom locality, along the Fairy Tales Trail, in a pine forest, 1166 m, 43°09'41"N, 23°28'44"E, 22.05.2016, *K. Lakovski* obs.; *loc. cit.*, 05.07.2022, *K. Lakovski* (SOM 178512);

— Balkan Range (*Western*): Zanozhene (Varshets), near the river, 825 m, 43°08'47"N, 23°13'42"E, 30.07.2023, *K. Lakovski* obs.; along the trail from Bela Voda chalet (Varshets) to Gubislav village, on the western slope of peak Lisa Mogila, 1201 m, 43°08'13"N, 23°18'43"E, 05.08.2023, *K. Lakovski* obs.; *loc. ibid.*, near the river northeast of peak Skravenik, *ca*. 1100 m, 03.06.2017, *K. Lakovski* obs. (Fig. 13); Kom chalet, in the coniferous forest next to the trail, 1725 m, 43°10'51"N, 23°04'36"E, 11.07.2020, *K. Lakovski* (SOM 178512); Chuprene Reserve, along the trail to peak Replyanska Tsarkva, at the upper timberline of the coniferous forest, *ca*. 1860 m, 15.07.2021, *K. Lakovski* obs.; peak Midzur, near river Barza Reka at the upper timberline, 1547 m, 43°24'17"N, 22°41'41"E, 19.07.2022, *K. Lakovski* (SOM 178513).

— Mt Belasitsa: Yavornitsa village, in the forest next to the trail, 680 m, 41°21'15"N, 23°02'57"E, 19.06.2016, *K. Lakovski* obs.; peak Radomir, next to the trail eastwards of the peak, *ca*. 1900 m, 20.06.2016, *K. Lakovski* obs.

— Pirin Mts (*Northern*): the trail from Yavorov chalet to peak Pogledets, in the forest, 1841 m, 41°49'24"N, 23°23'19"E, 20.07.2023, *K. Lakovski* & *D. Ivanova* obs.

This is the first report of *D. dilatata* for the floristic region of Belasitsa and second report for the Western Forebalkan. So far, there has been only one herbarium specimen from the Western Forebalkan, without any precise locality though (SOM 294, Vračansky-balkan, 1903, leg. *I.K. Urumov*, det. *B. Davidov*). The new findings from Vrachanski Balkan confirm the occurrence of the species in that floristic region.

Furthermore, the new observations show the lowest elevation for *D. dilatata* in Bulgaria. Assyov & Petrova (2012) and Stoyanov & al. (2021) have indicated 1500 m as the lowest altitude for *D. dilatata*. Ivanova (2021), after a critical consideration of all data available to the moment, has revised the vertical range of the species and gave 1250 m as the lowest limit, which should be corrected now as one of the present observations near Varshets (825 m) is even lower.

The highest altitude for *D. dilatata* has been reported as 2500 m (Stoyanov & al. 2021) or 2300 m (Assyov & Petrova 2012). Ivanova (2021) has revised the range of the species at 1800 m as the upper limit. The observation at the Chuprene Reserve in the Western Balkan Range is *ca*. 1860 m, and the one at peak Radomir is *ca*. 1900 m. Furthermore, two individuals have been found in the localities near Varshets with exceptional leaf length: 110 cm (in 2017) and 115 cm (in 2023), respectively.

Like *D. filix-mas*, the leaves of *D. dilatata* are occasionally overwintering. This is especially valid for young sterile leaves developed in the summer. These leaves are still green in February and March but then rapidly turn brown and die fast. Overwintering leaves are observed mainly when the plants are growing in sheltered sites.

54. *Dryopteris expansa* (C. Presl) Fraser-Jenk. & Jermy

Bu Forebalkan (*Western*): Vrachanski Balkan Nature Park, near Ledenika Cave, in a pine forest, 855 m, 43°12'17"N, 23°29'45"E, 29.07.2015, *K. Lakovski* obs.; *loc. cit*., 04.08.2015, *K. Lakovski* obs.; *loc. cit*., 07.06.2022, *K.* Lakovski (SOM 178515);

— Balkan Range (*Western*): peak Midzur, the trail via Kozya Garbina, in a beech forest, between 1100 and 1200 m, 03.06.2018, *K. Lakovski* obs.; Kom chalet, in the coniferous forest next to the trail, 1725 m, 43°10'51"N, 23°04'36"E, 11.07.2020, *K. Lakovski* (SOM 178516); peak Obov, near a rock beneath the tourist trail, on a slope with E exposure, 1868 m, 43°25'16"N, 22°39'40"E, 08.08.2021, *K. Lakovski* obs.; *loc. cit*., 08.08.2016, *K. Lakovski* obs.; peak Trite Chuki, near the upper timberline of the coniferous forest, on a slope with E exposure, *ca*. 1650 m, 21.07.2018, *K. Lakovski* obs.; Haidushki Waterfalls (Berkovitsa), on the river bank in a beech forest, 734 m, 22.04.2023, *K. Lakovski* obs.

This is a new species for the floristic region of the Western Forebalkan. In the forest near Ledenika Cave, it forms an intermixed population with *D. carthusiana*. Hybrid individuals might occur in that place and should be looked for.

The species has not been known in Bulgaria before 1992, thus in the first volume of the *Flora of the People's Republic of Bulgaria* all plants of *D. expansa* have been included in *D. carthusiana* (Achtarov & Jordanov 1963). The vertical range given there was between 1500 m and 2500 m. The lowest altitude for *D. expansa* was also 1500 m in Assyov & Petrova (2012). However, after revision of all materials Ivanova (2021) has indicated 1250 m as the lowest altitude for the species. The newly found populations near Ledenika Cave (Western Forebalkan) and Haidushki Waterfalls (Western Balkan Range) are located much lower, thus the lowest limit of the distribution in Bulgaria should be corrected.

55. *Dryopteris filix-mas* (L.) Schott

Bu Thracian Lowland: river Luda Yana, southwards of Panagyurishte, 500 m, 42°28'25"N, 24°10'58"E, 19.07.2015, *K. Lakovski* obs.

This species is widespread in Bulgaria, though no reliable (herbarium or literature) data on its occurrence in the Thracian Lowland have been found. Therefore, it is considered new for this floristic region. Possibly, the species is common in the appropriate places there. Mention deserves the fact that the fronds of *D. filix-mas* are usually not-wintering in Bulgaria, though in warmer seasons, in sheltered locations some of them may last during the first half of the winter. Sterile leaves which unfurled in summer (from June to August) are more resistant and often remain green even until the next spring. This corresponds to the data on *D. filix-mas* phenology given by Bauer & al. (1991).

Old large leaves in late summer occasionally have a dark spot at the junction of the central veins with the rachis. However, the spots are not found on all pinnae bases (they are located in a mosaic pattern) and are never visible on the upper side of the leaf. The largest fronds can have pinnae up to 25 cm each, so the lamina width can reach up to 50 cm. The pinnae in the lower half of the lamina of the young plants are often triangular to broadly triangular, instead of the typically lanceolate or linear-lanceolate.

56. *Polystichum aculeatum* (L.) Roth

Bu Forebalkan (*Western*): Vrachanski Balkan Nature Park, Dalgata Martvina locality, in a beech forest, 1097 m, 43°08'57"N, 23°33'14"E, 31.03.2019, *K. Lakovski* obs.; *loc. cit*., 24.10.2020, *K. Lakovski* obs.; *loc. cit*., 06.09.2022, *K. Lakovski* obs.; Vrachanski Balkan Nature Park, Haidushka Propast Cave, in a beech forest, 718 m, 43°14'24"N 23°27'51"E, 09.10.2022, *K. Lakovski* obs.;

— Forebalkan (*Eastern*): at Parnitsite Cave, near Bezhanovo village, 218 m, 43°12'05"N, 24°24'58"E, 21.03.2023, *K. Lakovski* obs.

The area of distribution of *P. aculeatum* given by Stojanov & al. (1966) included the entire country, while the specified vertical range was from 1000 to 2000 m. Achtarov & Jordanov (1963) revised the distribution of *P. lobatum* (syn. *P. aculeatum*) and did not include the Forebalkan region in its distribution area, while the reported altitude was between 300 and 2250 m. Assyov & Petrova (2012) indicated the upper altitude at 2000 m, and the Eastern Forbalkan was marked as a questionable region of distribution. The distribution area in Stoyanov & al. (2021) included the entire Forebalkan, but as uncertain region, and the altitude

Fig. 14. *Polystichum* × *illyricum* (photo K. Lakovski).

was limited to 2300 m. Actually, there were no reliable data about the distribution of *P. aculeatum* in the Eastern Forebalkan. Also, there were no herbarium specimens from the floristic region of the Forebalkan. Urumov (1905) wrote in his *Fifth contribution to the Bulgarian flora* that *Aspidium aculeatum* (syn. *P. aculeatum*) was a rare plant in the forests along the valley of river Proboynitsa in Vrachanski Balkan. But as it was already mentioned above, the valley of river Proboynitsa is part of the Western Balkan Range.

The new observations confirm the putative distribution of *P. aculeatum* in both Western and Eastern Forebalkan. *Polystichum aculeatum* is a widespread species in the Vrachanski Balkan. This fern grows mainly in the forests on the northern and northwestern slopes and the ridge of the mountain, between 700 and 1200 m. *Polystichum aculeatum* and *P. setiferum* often grow together in the region and this is a prerequisite for hybridisation.

57. *Polystichum* × *illyricum* (Borbás) Hahne

Fig. 15. *Polystichum lonchitis* in Vrachanski Balkan (photo K. Lakovski).

Bu Pirin Mts (*Northern*): Banderitsa chalet, in a small glade in the forest next to the road, 1800 m, 41°45'59"N, 23°25'35"E, 15.08.2018, *K. Lakovski* obs. (Fig. 14).

The place is interesting with the presence of several hybrid individuals growing together with the parental species *P. aculeatum* and *P. lonchitis* on an area of several square metres.

58. *Polystichum lonchitis* (L.) Roth

Bu Forebalkan (*Western*): Vrachanski Balkan Nature Park, along the road from Parshevitsa to Borov Kamak locality, in the left ditch, in a beech forest, 1273 m, 43°08'54"N, 23°29'49"E, 18.06.2022, *K. Lakovski* (SOM 178517); *loc. cit.*, 24.06.2023, *K. Lakovski* obs. (Fig. 15).

— Pirin Mts (*Northern*): along the trail from Yavorov chalet to peak Pogledets, in the forest, 1707 m, 41°49'27"N, 23°22'51"E, 20.07.2023, *K. Lakovski* & *D. Ivanova* obs.

So far, the first and only information about the presence of *P. lonchitis* in the Western Forebalkan has been found in Urumov's (1905) *Fifth contribution to the Bulgarian flora*. He had not given any particular localities in that contribution. It is not clear if the plants mentioned by him for Vrachanski Balkan were present in the Western Forebalkan indeed, or rather in the Western Balkan Range (see the notes about *Athyrium filix-femina*). Thus, the new observation in Vrachanski Balkan Nature Park is the only one for the species in that region in the last 100 years and most probably the first fully reliable one.

In Bulgaria, *P. lonchitis* prefers silicate substrates in the Rila Mts, Western Balkan Range, Mt Belasitsa, Mt Vitosha, a great part of the Central Balkan Range, and in Northern Pirin Mts. However, it is not exceptional for *P. lonchitis* to grow also on lime containing substrates, such as in the Western Forebalkan, Western and Central Phodopes, Mt Slavyanka, part of the Central Balkan Range, and Northern Pirin Mts. However, most of these localities are on metamorphic rocks (marble, crystalline schists, sandstones, conglomerate and breccia) and seldom on classical karst (limestone and dolomite).

The individuals in the Northern Pirin Mts observed in 2023 possess the largest leaves of *P. lonchitis* found so far in Bulgaria, reaching up to 70 cm in length.

59. *Polystichum setiferum* (Forssk.) Woyn.

Bu Forebalkan (*Eastern*): along the trail from Glozhene village to Glozhene Monastery, in a beech forest, 471 m, 42°58'33"N, 24°10'53"E, 15.04.2022, *K. Lakovski* obs.; in a beech forest near Glozhene Monastery, 798 m, 42°58'27"N, 24°10'02"E, 15.04.2022, *K. Lakovski* obs.; near Saeva Dupka Cave, in a *Carpinus orientalis* forest, 543 m, 43°02'47"N, 24°11'06"E, 14.04.2022, *K. Lakovski* obs.; near Devetashka Cave, 120 m, 43°14'01"N, 24°53'07"E, 22.03.2023, *K. Lakovski* obs.

In the literature sources (e.g., Achtarov & Jordanov 1963; Stojanov & al. 1966; Assyov & Petrova 2012), there have been no data about the distribution of *P. setiferum* in the Eastern Forebalkan. In 2013, *P. setiferum* has been reported for the first time from the Eastern Forebalkan, so this is a second record for the floristic region after the report of Dimitrov (2013). Single plants have been seen near Saeva Dupka and Devetashka caves, but the population near Glozhene Monastery is numerous.

The leaves of *P. setiferum* often endure the first frosts and survive until midwinter. Most of the leaves are still green in the snow in December and January. In sheltered places and during mild winters, the old leaves die as late as in March, just before unfurling of the new ones.

Ophioglossaceae

60. *Botrychium lunaria* (L.) Sw.

Bu Pirin Mts (*Northern*): Kamenitishki Cirque, on a grassy slope, E exposition, 2625 m, 41°47'52"N, 23°22'20"E, 21.07.2023, *K. Lakovski* & *D. Ivanova* (SOM 178502) (Fig. 16).

Fig. 16. *Botrychium lunaria* (photo K. Lakovski).

In Achtarov & Jordanov (1963), Assyov & Petrova (2012) and Stoyanov & al. (2021), the highest altitude for *B. lunaria* was given at 2500 m (*cf.* also the herbarium specimen SO 35, Pirin, "valle Kamenitza", *ca.* 2500 m.s.m., 11.08.1939, *N. Stojanoff*). The new locality in the Northern Pirin Mts is the highest one documented so far for this species in Bulgaria. Four individuals have been observed (plant height of 4-8 cm) in the grasses, several metres off the tourist trail. There certainly must be more plants in the vicinity.

Thelypteridaceae

61. *Phegopteris connectilis* (Michx.) Watt

Bu Balkan Range (*Western*): peak Obov, beneath a big stone next to the tourist trail, on a slope with E exposure, between *Vaccinium myrtillus* and *Juniperus sibirica*, 1880 m, 43°25'16"N, 22°39'37"E, 08.08.2021, *K. Lakovski* (SOM 178508); *loc. cit.*, 08.08.2016, *K. Lakovski* obs.

Stojanov & al. (1966) have included the Western Balkan Range in the area of distribution of *Phegopteris vulgaris* (synonym of *Ph. connectilis*) but without further precision. However, that region has not been included within the range of species distribution in the other taxonomic or chorological sources (e.g., Achtarov & Jordanov 1963; Assyov & Petrova 2012; Stoyanov & al. 2021). A new population of *P. connectilis* has been discovered in the Western Balkan Range, which confirms the presence of the species in that floristic region.

Reports 62–73

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Eleven new records for species in the Mani Peninsula (Southern Peloponnese) are presented based on collection and photographing of plants in the last four years. The Mani Peninsula has been defined as the area bounded on the north by the old road from Kalamata to Sparti and then on the east by the River Evrotas to the coast on the Lakonian Gulf. The total area included in this study is approximately 1,760 km^2. This region contains a range of habitats from coastal environments to the peak of the Taygetos Mountains at 2407 m and includes large areas of land given over to non-intensive olive culture much of it with little or no cultivation of the ground between the trees and little use of chemical herbicides. The preliminary identification of specimens was made by Roger Marchant with verification carried out by Kit Tan and Jerzy Zieliński based on photos.

Fig. 17. *Ammi majus* (photo R. Marchant).

Apiaceae

62. *Ammi majus* L. (Fig. 17)

Gr Nomos Lakonias, Eparchia Itilou: near the village of Mina, 200 m, 36.544698°N, 22.412496°E, 17.04.2023, *Marchant* obs. (photos).

New for eparchia. *Ammi majus* is widely distributed in east central mainland Greece and scattered in the Peloponnese.

63. *Ammi visnaga* (L.) Lam.

Gr Nomos Messinias, Eparchia Kalamon: near the village of Milea along the roadside, 500 m, 36.837574°N, 22.348155°E, 16.04.2023, *Marchant* obs. (photos).

New for nomos and eparchia.

64. *Ferulago sylvatica* (Besser) Reichb.

Gr Nomos Messinias, Eparchia Kalamon: Pedino, Kentro, 480 m, 36.913842°N, 22.261376°E, 17.06.2023, *Marchant* obs. (photos).

New for nomos and eparchia but not new for the Mani Peninsula, having previously been reported in Lakonias, between Githion and Areopolis.

65. *Pastinaca sativa* L.

Gr Nomos Messinias, Eparchia Kalamon: near the village of Milea along the roadside, 500 m, 36.837574°N, 22.348155°E, 15.04.2023, *Marchant* obs. (photos).

New for nomos and eparchia, reported from N Peloponnese.

Asteraceae

66. *Cotula coronopifolia* L.

Gr Nomos Lakonias, Eparchia Githiou: dunes behind Glyfada beach, sea level, 36.790220°N, 22.380992°E, 20.04.2023, *Marchant* obs. (photo).

New for south Peloponnese. Introduced and naturalized in Greece, native range is from Angola to S Africa.

Brassicaceae

67. *Myagrum perfoliatum* L.

Gr Nomos Messinias, Eparchia Kalamon: near the village of Milea at roadside, 500 m, 36.837574°N, 22.348155°E, 16.04.2023, *Marchant* obs. (photos).

New for nomos and eparchia.

Hypericaceae

68. *Hypericum aegypticum* L.

Gr Nomos Lakonias, Eparchia Itilou: Koukouri Bay, 60 m, 36.575333°N, 22.390941°E, 10.10.2022, *Marchant* obs. (photos).

New for nomos and eparchia. In Greece recorded from the Ionian Islands, Crete and SW Peloponnese (Messinian Peninsula).

Polygonaceae

69. *Fallopia convolvulus* (L.) Á.Löve

Gr Nomos Lakonias, Eparchia Githiou: car park at Glyfada beach, sea level, 36.789206°N, 22.581862°E, 13.06.2023, *Marchant* obs. (photos).

New for nomos and eparchia. Widespread in Greece.

Fig. 18. *Galium hellenicum* (photo R. Marchant).

Rubiaceae

70. *Galium hellenicum* Krendl (Fig. 18)

Gr Nomos Messinias, Eparchia Kalamon: south of the village of Langkada, at the roadside foot of a cliff, 460 m, 36.773677°N, 22.350832°E, 08.06.2023, *Marchant* obs. (photos).

New for the Peloponnese.

Scrophulariaceae

71. *Verbascum phlomoides* L. (Fig. 19)

Gr Nomos Lakonias, Eparchia Itilou: near the village of Pirgos, 340 m, 36.838030°N, 22.302122°E, 15.04.2019, *Marchant* obs. (photos).

As with other material of *V. phlomoides* collected in the Peloponnese this could represent a cryptic new species since it morphologically resembles some northern populations of *V. phlomoides* but is genetically distinct and more related to *V. samniticum* Ten. Further studies are needed and the species is currently under phylogenetic investigation (A. Zografidis, pers. comm., 13.07.2023).

An unusual white-flowered form was observed in the usual yellow-flowered population on the road to Manganiari Springs (nomos Lakonias, eparchia Lakedemonos). It has not been noted elsewhere in the Mani or Peloponnese.

Solanaceae

72. *Solanum pseudocapsicum* L.

Gr Nomos Messinias, Eparchia Kalamon: roadside in the village of Kastania, 580, 36.862069°N, 22.310062°E, 16.10.2022, *Marchant* obs. (photos).

New for nomos and eparchia. Naturalized escape, native range is from Bolivia to Brazil and southern S America.

Juncaceae

73. *Juncus conglomeratus* L. (Fig. 20)

Gr Nomos Lakonias, Eparchia Githiou: dunes behind Glyfada beach, sea level, 36.790220°N, 22.380992°E, 20.04.2023, *Marchant* obs. (photos).

New for the Peloponnese.

Fig. 19. *Verbascum phlomoides*, white-flowered form (photo R. Marchant).

Fig. 20. *Juncus conglomeratus* (photo R. Marchant).

Reports 74–78

Kostas Polymenakos[1], Kit Tan[2] & Vasilis Pantavos[3]

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Asclepiadaceae

74. *Vincetoxicum fuscatum* (Hornem.) Rchb. subsp. ***fuscatum*** (Fig. 21)

Gr Nomos & Eparchia Attikis: Mt Parnitha, 1.9 km W-SW of Fili, near the Municipal Stadium, stony limestone slope with sparse *Quercus coccifera* scrub, 400 m, 38°05'N, 23°38'E, 16.04.2023, *Pantavos* obs. (photos).

New for Mt Parnitha and eparchia; in Attiki reported from Mt Pateras (Eparchia Megaridos). A small population was noted in the southeastern corner of the National Park.

Asteraceae

75. *Lactuca aurea* (Vis. & Pančić) Stebbins [syn.: *Mulgedium aureum* Vis. & Pančić, *M. sonchifolium* Vis. & Pančić] (Fig. 22)

Gr Nomos Fokidos, Eparchia Parnassidos: Mt Parnassos, 4 km NW of Eptalofos, roadsides and shady places in *Abies* forest, 1300 m, 38°36'N, 22°27'E, 27.06.2023, *Polymenakos* & *Pantavos* 1202 (ATH).

New for Mt Parnassos. In North Central, N and S Pindos; in Sterea Ellas reported only from Mt Timfristos (Nomos & Eparchia Evritanias).

Fig. 21. *Vincetoxicum fuscatum* subsp. *fuscatum* (photo V. Pantavos).

Fig. 22. *Lactuca aurea* (photo V. Pantavos).

Resedaceae

76. *Reseda minoica* Martín-Bravo & Jim Mejías (Fig. 23)

Gr Nomos Attikis, Eparchia Megaridos: W-SW of Loutropyrgos, along main road to Nea Peramos, at roadside, limestone, 1 m, 38°01'N, 23°27'E, 15.04.2023, *Polymenakos* & *Pantavos* 1187 (ATH).

Confirming records more than a hundred years old from Attiki – Salamis, *Heldreich* 24 April 1859 and Skaramanga, *Heldreich* 20 May 1880 (sub nom. *R. phyteuma* L. in Halácsy 1900: 125). Known from Kriti, Gavdos and the Kikladean island of Anafi, also Cyprus and S Anatolia. Two small populations were found, one at the roadside and the other on the sea shore. Both comprised less than 50 individuals which grew together with *Reseda alba* L.

Valerianaceae

77. *Valerianella pumila* (L.) DC.

Gr Nomos Viotias, Eparchia Levadias: 1.6 km W of village Loutsi, edge of *Quercus coccifera* scrub near cereal fields, on serpentine, 240 m, 38°33'N, 23°03'E, 20.05.2023, *Polymenakos* & *Pantavos* obs. (ripe fruits collected).

New for Sterea Ellas. Found together with *Valerianella discoidea*, *V. vesicaria* and *V. coronata*.

Cyperaceae

78. *Carex secalina* Willd. ex Wahlenb. (1803) non Lapeyr. (1813) (Fig. 24)

Gr Nomos Evvias, Eparchia Chalkidos: stony west shore of Lake Paralimni, with *Convolvulus mairei*, *Medicago* and *Trifolium* spp., on limestone, 45 m, 38°26'N, 23°18'E, 20.05.2023, *Polymenakos & Pantavos* 1197 (ATH, det. Jacob Koopman).

New for Greece; native range from Central and East Europe to Central Asia, probably overlooked in the

Fig. 23. *Reseda minoica* (photo K. Polymenakos & V. Pantavos).

Fig. 24. *Carex secalina* (photo K. Polymenakos & V. Pantavos).

Balkans. A small population with 15–20 individuals was noted in wetland submerged for most of the year; it has possibly been introduced by visiting birds. *Carex secalina* is rare and critically endangered in its native habitats in Europe but it seems to survive and even become invasive in man-made habitats elsewhere, e.g., cultivated fields. *Carex secalina* Lapeyr. (1813) is a synonym of *Carex riparia* Curtis (1783).

Report 79

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Boraginaceae

79. *Pontechium maculatum* (L.) Böhle & Hilger (Fig. 25)

BH Mt Mahnjača, Matinski Vis locality, on a peridotite-serpentine complex, 925 m, YK32 (10×10 km UTM grid cell), 44°28'07"N, 17°58'13"E, 14.05.2022, coll. *E. Šabanović* (no. 05/14/22).

That is the central-eastern limit of the species distribution in BiH. Populations are very small and include only a few plants, with preferable habitats in grassland. *Pontechium maculatum* is Natura 2000 Pontic species distrubuted in: Serbia & Kosovo, Croatia, Bosnia & Herzegovina, Albania, North Macedonia, Bulgaria, Crimea, Austria, Czech Republic, Slovakia, Hungary, Poland, Romania, Germany, C-European Russia, E-European Russia, Ukraine, Northern Caucasus, Armenia, Georgia [Caucasus], ?Azerbaijan, Turkey (E Anatolia, NE Anatolia, WN Anatolia), Egypt (Great Southwestern Desert, NE Egypt, NW Coastal Egypt), Lebanon (Coastal W Lebanon), Sinai Peninsula (C Sinai, N Sinai, S Sinai), Syria (Coastal W Syria) (Hassler, 2023). Most Natura 2000 sites designated for *P. maculatum* are in Hungary (45), Slovakia (14), Bulgaria (12), Czech Republic (12) and Poland (3) (https://eunis.eea.europa.eu/species/162097#protected). This species occurs mainly in the central and eastern part of the Balkan Peninsula. Its localities in Bosnia and Herzegovina are restricted to serpentines, while in Serbia it inhabits both sepentines and limestones (Stupar & al. 2009).

The first botanical records of that species in Bosnia and Herzegovina was confirmed by Ritter-Studnička (1953-1963). So far, it has been known only from several localities: Mt. Varda near Rudo and Vardište near Višegrad (Drešković & al. 2011) as a continuation of the species range from the serpentine areas in W Serbia, then Mt Borja, Miljkovača Creek locality and SW from Bosansko

Fig. 25. *Pontechium maculatum* in Matinski Vis locality (photo E. Šabanović).

Petrovo Selo, Maglajska Kosa locality, both in C Bosnia (Stupar & al. 2009). *Pontechium maculatum* is listed in Annex II of the EC Habitats Directive (Council Directive 92/43/EEC) as a Species of Community Interest. According to IUCN Red List Categories and Criteria Version 3.1 (IUCN 2001), it is an Endangered species (EN) in Bosnia and Herzegovina (Šilić 1996; Đug & al. 2013).

Reports 80–82

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Falakro (Boz Dagh of Drama) is a large limestone mountain lying *ca*. 10 km NW of Drama in northeastern Greece. Its highest peak Profitis Ilias reaches 2232 m. It is well-known as a locality for a number of species of alpine or arctic-alpine affinity, e.g., *Dryas octopetala* L. Although the upper slopes and sum-

mit area are considered floristically well-known the lower slopes with deciduous woodland at altitudes of 1000–1400 m still repay investigation.

Geraniaceae

80. *Geranium reflexum* L. (Fig. 26)

Gr Nomos & Eparchia Dramas: Mt Falakro, 26 km NW of Drama, limestone, 1030 m, 41°16'N, 23°54'E, 05.06.2021, *K.B. Simoglou* obs. (photos).

Confirming the first and only record from north-eastern Greece, previously reported by Akeroyd & Preston (1981:287). Only a single plant was found in dense *Fagus sylvatica* forest on a north-facing slope overlying limestone. The altitude and geographical co-ordinates of the two collections indicate they are in slightly different localities but are not far distant. The species is endemic to Italy and the southern part of the Balkan Peninsula. In Greece it occurs in N & E Central, N & S Pindos and Sterea Ellas (Mts Timfristos and Giona).

Lamiaceae

81. *Nepeta cataria* L.

Gr Nomos & Eparchia Dramas: Mt Falakro, 26 km NW of Drama, limestone, 1313 m, 41°16'N, 23°53'E, 19.07.2014, *K.B. Simoglou* obs. (photos).

New for Mt Falakro. In open *Fagus* forest, on a north-facing slope near the site of *Iris variegata*.

Iridaceae

82. *Iris variegata* L. (Fig. 27)

Gr Nomos & Eparchia Dramas: Mt Falakro, 26 km NW of Drama, limestone, 1270 m, 41°16'N, 23°53'E, 23.06.2012, *K.B. Simoglou* obs. (photos); *loc. ibid*., 19.07.2015, 12.07.2020 & 08.07.2023, *K.B. Simoglou* obs.

New for Mt Falakro, nomos, eparchia and phytogeographical region North East. This is the second record for Greece, first reported as new for Greece from Mt Tzena in North Central (based on *Chasapis* 2243, TAUF). The plants were found in a clearing in dense *Fagus* forest, on a north-facing slope overlying limestone, not far from the locality of *Geranium reflexum*. Since the summer of 2012 its presence has remained stable with a locally restricted population of *ca*. 50 plants in this particular clearing of dense *Fagus* forest. Plant species recorded within the 2–3 ha area include *Asphodeline lutea* (L.) Rchb., *Centaurea salonitana* Vis., *Delphinium fissum* Waldst. & Kit., *Dianthus cruentus* Griseb., *Digitalis lanata* Ehrh., *Digitalis viridiflora* Lindl., *Filipendula vulgaris* Moench, *Inula conyzae* (Griess.) DC., *Jurinea mollis* (L.) Rchb., *Lactuca muralis* (L.) Gaertn., *Rhinanthus rumelicus* Velen., *Rosa spinosissima* L., *Securigera varia* (L.) Lassen, *Sempervivum marmoreum* Griseb., *Senecio macedonicus* Griseb., *Silene coronaria* (L.) Clairv., *Stachys germanica* L., *Tanacetum corymbosum* (L.) Sch. Bip., *Tanacetum vulgare* L., *Thalictrum aquilegii-*

Fig. 26. *Geranium reflexum* (photo K.B. Simoglou).

Fig. 27. *Iris variegata* (photo K.B. Simoglou)

folium L., *Trifolium alpestre* L., *Valeriana officinalis* L. and *Verbascum* sp.

The distribution range of *Iris variegata* is from Central to Southeast Europe.

Report 83

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Juncaceae

83. *Juncus effusus* L.

Gr Nomos Chalkidikis, Eparchia Athou: Athos Peninsula, mountain ridge *ca.* 4 km N-NW of Great Lavra monastery, on forest road, 770 m, 40°10'16"N, 24°20'00"E, 15.06.2019, *K. Sutorý* BRNM 816430; on the forest road crossing small valley on northern slopes, *ca*. 2.7 km W of the Great Lavra monastery, 760 m, 40°10'17"N, 24°20'57"E, 27.6.2023, *K. Sutorý* BRNM 843471.

New for Athos Peninsula. Not indicated in Strid 2016: 528, map 2080.

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Reports 84–86

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Caryophyllaceae

84. *Sagina stridii* Kit Tan, Zarkos & Christodoulou (Fig. 28)

Gr Nomos & Eparchia Florinis: Mt Varnous, near the windmills above the pass of Pisoderi, 1800 m, at upper edge of *Fagus* forest, wet place by a track. 40°49'N, 21°15'E. 06.06.2023, *Strid* 61169 (B, UPA, herb. Strid); Vigla pass, near the ski resort, 1450 m, wet short-grass meadow in opening of *Fagus* forest, 40°47'N, 21°16'E, 06.06.2023, *Strid* 61170 (LD, herb. Strid).

This species was described in 2012 from Mts Chelmos and Killini in N Peloponnisos and later reported from Mt Vardousia in Sterea Ellas. The new localities are *ca.* 260 km N-NW.

Plantaginaceae

85. *Plantago charalampidis* Strid, Dimop. & Raus, **sp. nov.** (Fig. 29)

Gr Nomos Chalkidikis, Athos: Athos peninsula, Kaliagra N-NW of Iviron, *ca*. 10 m. Rocky, schistose coastal habitats. 40°15'N, 24°17'E, 11.06.2023, *Strid* & *al.* 61288 (holotype UPA; isotypes B, G, LD, herb. Strid).

Additional records: Same locality, 2023-04-28, Strid & al. 61162 (UPA; plants in bud). – At Milopotamos *ca.* 3 km SE of the type locality, similar habitat. Lat. 40°15'N, long. 24°18'E. 2023-04-28, Strid & al. 61121 (B, UPA; plants in bud). – Same as type locality, 2023-08-30, Strid & al. 61608 (ATH, B, UPA, Herb. Strid). – By Arsanas Filotheou *ca.* 3.5 km SE of the type locality, similar habitat. Lat. 40°15'N, long. 24°18'E. 2023-09-01, Strid photo.

This species is named after Stylianos Charalampidis, biology teacher at the island of Imbros and a distinguished specialist on Athos. Our joint field trips in the area are fondly remembered.

Perennial with laxly branched woody stock 4–12 mm in diameter, producing several leaf rosettes. Leaves numerous, linear to narrowly linear-oblanceolate, 5–15 cm long and 2–4 mm wide, soft but rather thick and somewhat coriaceous, entire or rarely with a few short teeth, with indistinct veins, glabrous or sparsely short-pubescent on the margins. Scapes few from each leaf rosette, exceeding the leaves, usually 10–22 cm long and c. 1.5 mm in diameter, terete, appressed-pubescent. Spike 30–70 × *ca.* 5 mm, dense, cylindrical. Bracts shorter than flowers, ovate, acute to acuminate. Flowers 4-merous, protogynous. Adaxial sepals boat-shaped, with a narrow, denticulate dorsal wing. Corolla membranous, straw-coloured, persistent; tube conical-cylindrical, *ca.* 1.5 × 1 mm, puberulent; lobes *ca.* 1.5 × 1 mm, ovate, acute, spreading to deflexed. Filaments long and slender; anthers versatile, *ca.* 1.5 mm, broadly oblong, apiculate, yellow. Ovary *ca.* 1 mm, ovoid, 2-locular, glabrous; style filiform. Fruit a circumscissile capsule with usually only a single seed developing; the latter narrowly ovoid,

somewhat compressed, *ca.* 2 × 0.8 mm, chestnut brown, smooth, with a small aril at the narrow end.

A member of the *P. coronopus* group as defined in Flora Europaea 4: 40 (1976). The nearest relative is probably *P. crassifolia* Forssk. (*P. maritima* subsp. *crassifolia* (Forssk.) Holmboe) which is a species of coastal salt marshes (not rocky habitats). The latter lacks the branched woody stock and has usually solitary rosettes of long, fleshy leaves; the adaxial sepals are broadly winged; the seeds are 2–4 and smaller. There is also some similarity to *P. holosteum* Scop., but this is a mountain plant with many small rosettes forming mats. Tocl & Rohlena (in Sitzungsber. Königl. Böhm. Ges. Wiss. Prag, Math.-Naturwiss. Cl. 1902(49): 6 1902) had seen a single plant from "Ivir [probably Iviron], in saxis" which they tentatively listed as "*Plantago carinata* Schr. forma ad *P. crassifoliam* Forsk. vergens". It probably represents the taxon here described as a new species.

Plantago charalampidis is probably restricted to a small area on the NE side of the Athos peninsula, growing in rocky, schistose coastal habitats (but off the littoral zone), together with two other Athos endemics, *Armeria sancta* and *Centaurea rutifolia*. Other accompanying species are *Andryala integrifolia*, *Anthemis auriculata*, *Anthyllis hermanniae*, *Catapodium marinum*, *Cheilanthes acrostica*, *Crithmum maritimum*, *Dianthus corymbosus*, *Filago gallica*, *Hypericum montbretii*, *Ornithopus compressus*, *Phleum subulatum*, *Ptilostemon chamaepeuce*, *Sedum grisebachii*, *Silene fabaria* subsp. *fabaria*, *Stachys cretica* subsp. *cassia*, *Trifolium arvense* and *Trifolium uniflorum*.

Rafflesiaceae

86. *Cytinus ruber* (Fourr.) Fritsch (Fig. 30)

Gr Nomos & Eparchia Grevenon: Valia Kalda National Park, 500 m on forest road after turnoff from main road Krania-Milea, 1050 m, *Pinus nigra* woodland. Parasitic on roots of *Cistus sintenisii*. 39°53'N, 21°15'E. 08.06.2023, *Strid* obs. (photo).

This new locality represents a considerable extension of the range for *Cytinus ruber* which is otherwise widespread in Greece (and elsewhere in the Mediterranean area) and usually parasitic on *Cistus creticus*. The new host plant, *Cistus sintenisii*, is restricted to a small area in NW Greece and adjacent parts of Albania, growing in woodland habitats at 1000–1600 m.

Fig. 28. *Sagina stridii* (photo A. Strid).

Other interesting species at the locality in Valia Kalda National Park are *Erica carnea* and *Teucrium siculum*.

Reports 87–90

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Apiaceae

87. *Ammi visnaga* (L.) Lam. (Fig. 31)

Gr Nomos & Eparchia Ilias: Pinia, near village Simopoulo, 170 m, 37°51'N, 21°33'E, 06.08.2023, flowering, *Giannopoulos* s.n. (herb. Giannopoulos); *loc. ibid*., 18.08.2023, *Giannopoulos* obs.; near village Kakotari at the foothills of Skiadovouni,

Fig. 29. *Plantago charalampidis*. Below: together with *Armeria sancta* and *Centaurea rutifolia* (photos A. Strid).

Fig. 30. *Cytinus ruber* (photo A. Strid).

600 m, 37°50'N, 21°41'E, 06.08.2023, *Giannopoulos* s.n. (herb. Giannopoulos).

Confirming a single earlier report from another locality in Ilia (*Böhling* 12124, herb. Böhling). Large populations noted in an area of winter-wet ground drying out in the summer, within 10 km radius of Simopoulo.

Asteraceae

88. *Cirsium italicum* DC. [syn.: *Epitrachys italica* (DC.) Bureš & al.] (Fig. 32)

Gr Nomos & Eparchia Ilias: Pinia, near village Simopoulo, 170 m, 37°51'N, 21°33'E, 06.08.2023, *Giannopoulos* s.n. (herb. Giannopoulos).

New for nomos and eparchia. Occurring together with *Ammi visnaga* on seasonally wet drained ground. Native to Europe and Turkey.

Asphodelaceae

89. *Asphodeline liburnica* (Scop.) Rchb.

Gr Nomos & Eparchia Ilias: Mt Lampia, on almost vertical limestone slopes with *Spartium* and *Phlomis*, 1050 m, 37°54'N, 21°49'E, 01.07.2023, flowering, *Giannopoulos* s.n. (herb. Giannopoulos); *loc. ibid.*, 11.08.2023, fruiting, *Giannopoulos* obs. (photo).

New for nomos and eparchia. Occurring in S Italy, Balkan Peninsula, Lebanon and Syria.

Colchicaceae

90. *Colchicum confusum* K.M. Perss. (Figs. 33 & 34)

Gr Nomos Ilias, Eparchia Olimbias: Skliava, open grassy slope at edge of cultivated olive grove, limestone, 80–100 m, 37°36'N, 21°38'E, 02.10.2011, flowering, *Kit Tan*, *G. Vold* & *Giannopoulos* 31165 (herb. Giannopoulos); *loc. ibid.*, 28.09.2016 & 06.10.2021, *Giannopoulos* s.n. (herb. Giannopoulos); *loc. ibid.*, 18.03.2023, fruiting, *Kit Tan* & *G. Vold* 33226 (C).

Corm ovoid to globose, 2.5–5 × 1.5–4 cm; tunics reddish- to dark brown, subcoriaceous, produced into a neck. Leaves 4–6, absent at flowering, lanceolate, 3.5–5 (–7) cm wide, erect-spreading, ± procumbent in fruit, long-attenuate, acute to subobtuse, sometimes twisted, glabrous, cartilaginous at margin. Flowers 2–6. Perianth tube white; segments elliptic-oblong, pale to dark pinkish-purple, not or very faintly tessellated. Anthers and pollen orange to yellow. Styles recurved at apex; stigmas decurrent for 2–3 mm. Capsules near ground level, ovoid-ellipsoid (length/width ratio c. 2), 4–6 × 2–3.2 cm, broadly acuminate. Seeds numerous, globose to depressed-globose, 2–3 mm in diam., pale to reddish-brown at maturity; raphe region swollen to a very large yellowish-white appendage. — $2n = 40$ (Persson 1999, material from Kerkira).

Central part of Ilia. Grassy slopes, on *terra rossa* overlying limestone, 80–100 m. Flowering (without leaves) September to October, leaves and fruits March to June.

New for the Peloponnese. Reported from Ionian islands, North Central, North & South Pindos and Sterea Ellas. Possibly endemic to Greece.

This plant was first noted fifteen years ago (on 11 October 2008) by K. Giannopoulos but its identity was unknown since leaves were not seen until the spring of 2021. And it was not until May 2023 that seeds were finally obtained. The very large swollen

Fig. 31. *Ammi visnaga* (photo K. Giannopoulos).

caruncles (Fig. 33e) confirm its identity as *C. confusum*. Although we record the species as new for the Peloponnese it is possibly more widely distributed in southern Greece. In Ilia, the olive groves are usually sprayed and cleared of ground vegetation by late spring, thus the leaves of many hysteranthous species are not visible.

Growing together with *C. bivonae* Guss. which can be recognized in the flowering state by the strongly tessellated perianth segments (Fig. 34). The chromosome number of *C. bivonae* is $2n = 48$ (Persson 2009, based on material from Andritsena), that of *C. confusum*, $2n = 40$. *Colchicum autumnale* L. which is some-

Fig. 32. *Cirsium italicum* (photo K. Giannopoulos).

Fig. 33. *Colchicum confusum* (photo K. Giannopoulos).

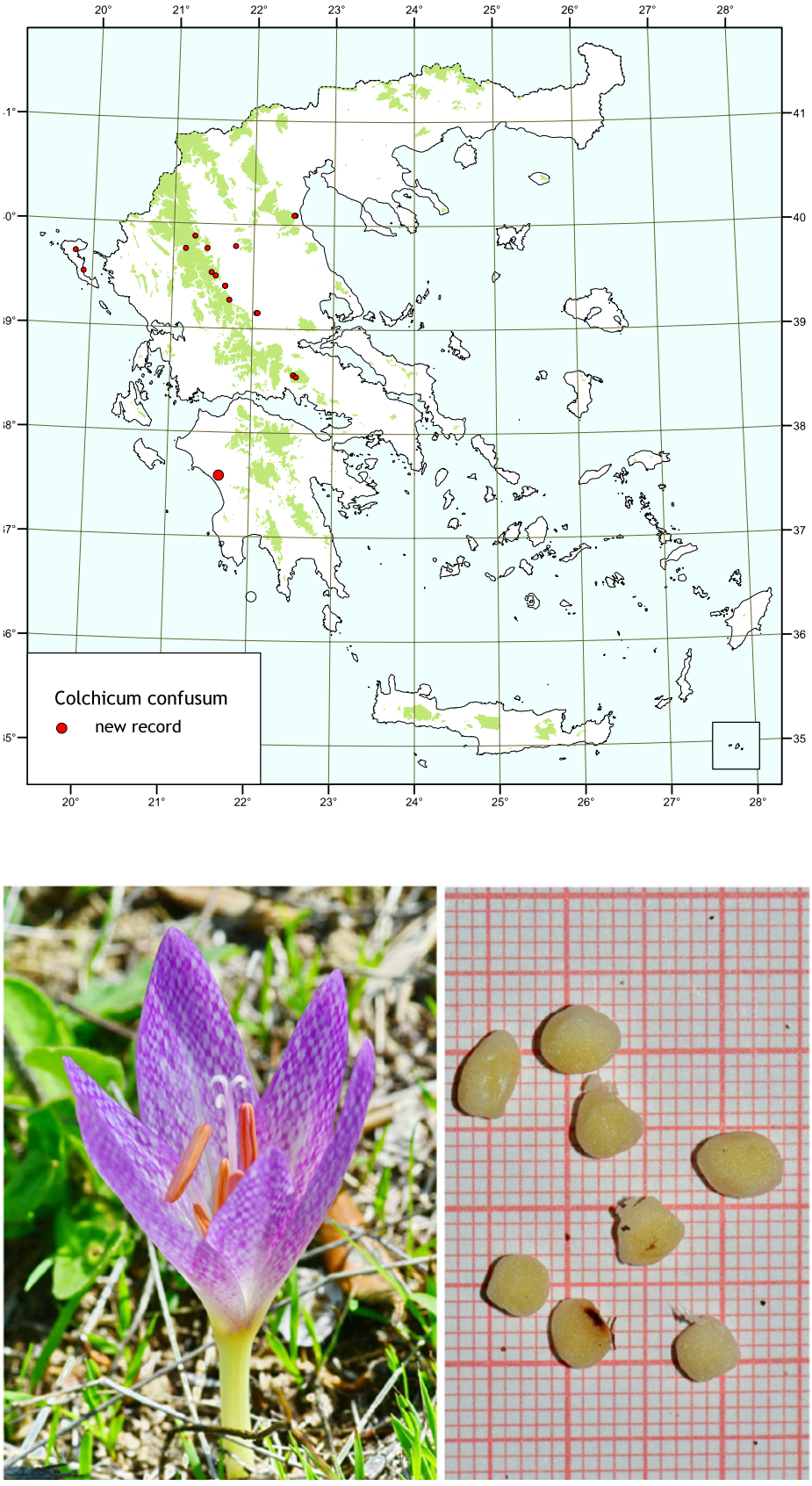

Fig. 34. Distribution of *Colchicum confusum* in Greece; flower and seeds of *C. bivonae*.

what similar has leaves broadest at the middle, and is restricted to northern mainland Greece. *Colchicum confusum* has long-attenuate leaves (Fig. 34c).

White-flowered forms of *C. confusum* (Fig. 33b) occur in the pale to unusually dark pink-flowered population at Skliava, as found elsewhere in the species' range. The type of *C. confusum* was described from S Pindos – Greece: Trikala, 2 km from Pertouli to Elati, 1150 m, moist meadows, in grass, deep soil, 20.09.1989, *K. Persson* 486 (holotype GB; isotypes B, K, UPA).

Reports 91–97

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Asteraceae

91. *Centaurea triamularia* Aldén (Fig. 35)

Gr Nomos & Eparchia Trikalon: above Armatolikon, limestone rock outcrops in grassland, 1860 m, 39°29'N, 21°16'E, 11.08.2023, *Kofinas* obs. (photos).

A new locality for this rare endemic, more than 1 km SW of the *locus classicus* on Mt Pachtouri (nomos Trikalon).

92. *Erigeron epiroticus* (Vierh.) Halácsy (Figs. 36 & 36a)

Gr Nomos Lakonias, Eparchia Lakedemonos: Mt Taigetos, 2270 m, 36°57'N, 22°21'E, 29.07.2017, *Kofinas* obs. (photos); *loc. ibid*., 15.07.2018, *Kofinas* s.n. (UPA, herb. Kit); *loc. ibid*., June 2020, *Samaras* obs. (photos); *loc. ibid*., 30.6.2023, *Shaw* obs. (photos).

New for the Peloponnese. The Taigetos plants have more densely hairy leaves but are otherwise similar to plants from Mt Olimbos. In the same locality was *Astragalus glycyphyllos* subsp. *glycyphylloides* (DC.) Maire & Petitm. This is known at altitudes of 400–1300 m in the Peloponnese. It was noted by Shaw as occurring at 2270 m on Mt Taigetos; this is the highest altitude reported for Greece, exceeding even the altitude of 2052 m on Mt Vermio in North Central.

93. *Matricaria discoidea* DC. (Fig. 37)

Gr Nomos Trikalon, Eparchia Kalambakas/Trikalon: Mt Koziakas, Pertouli Ski Resort, 2162 m, 39°33'N, 21°30'E, 19.08.2023, *Kofinas* obs. (photos).

New for S Pindos. Locally abundant on gravelly ground. This is the southernmost distribution in Greece, the other reports are at ski centres in northern Greece – on Mts Vrondous, Voras, Falakro, Vitsi (Vigla Pisoderi). The populations at these centres are all naturalized. Native to N America and Greenland, spreading eastwards.

Boraginaceae

94. *Echium vulgare* L. subsp. ***vulgare*** (Figs. 38 & 38a)

Gr Nomos & Eparchia Lasithiou: Mt Dikti, Katharo plateau, 1150 m, 35°08'N, 25°30'E, 17.06.2023, *M. Gogolos* obs. (photos, conf. Ralf Jahn and Stavros Apostolou); in nearby fields, 22.06.2023 & 24.06.2023, *M. Gogolos* obs. (photos).

New for Kriti, only once recorded from the Peloponnese. Several plants were found, some nearly 1 m tall. Native to most of Europe, C Asia and W Siberia, introduced elsewhere. *Echium vulgare* subsp. *pustulatum* (Sm.) Em. Schmid & Gams occurs in N Pindos, East Central, North East and the N Aegean islands; it is supposedly distinguished by its sparse rigid setae arising from white tubercles but *E. vulgare* is a very variable species.

We thank Marinos Gogolos (Anopolis, Crete) for sharing this information first reported in his Facebook account.

Crassulaceae

95. *Sedum sarmentosum* Bunge

Gr Nomos & Eparchia Karditsis: on house wall in village of Messenicolas, 700 m, 39°21'N, 21°46'E, 10.08.2023, *Kofinas* obs. (photos); small village of Morfovouni near Messenicolas, 807 m, 39°21'N, 21°45'E, 10.08.2023, *Kofinas* obs. (photos).

— Nomos & Eparchia Kastorias: on wall of a tavern in village of Aetomilitsa, 1430 m, 40°18'N, 20°51'E, 14.08.2023, end of flowering, *Kofinas* obs. (photos); also noted cultivated in village of Chrysi, 1050 m, 40°15'N, 20°58'E, 15.08.2023, *Kofinas* obs. (photos).

Established escape from cultivation, apparently first documentation for Greece (POWO 2023). Native to E Asia, distributed from Thailand to Japan; introduced

Fig. 35. *Centaurea triamularia* (photo G. Kofinas).

in Europe and East N America. Messenicolas is well known for its excellent dry red wines partly produced from the "Black Messenikolas" grape, a unique variety cultivated only in the area.

Geraniaceae

96. *Geranium margaritae* Kit Tan, Vold & Kofinas, **sp. nov.** (Figs. 39–41).

Gr Nomos Attikis/Viotias, Eparchia Megaridos/Thivon: Mt Kitheronas, summit area, open rocky limestone slopes and flats, 1350–1400 m, 38°10'N, 23°16'E, 30.05.2023, *Kit Tan* & *G. Vold* 33240 (holotype C; isotype ATH); *loc. ibid*., 18.06.2023, *Kit Tan* & *G. Vold* 33245 (paratypes ATH, C).

Perennial with stout, vertical, shortly branched rhizome sheathed in old stipules. Stems short, 5–10 cm, procumbent to ascending, long and short patent-hairy. Basal leaves long-petiolate, appressed-hairy on both surfaces, 1.4–3 cm wide, palmatifid to 4/5, green to greyish-green above; segments obovate-cuneate or obdeltoid, apically 3-fid; lobes obtuse or apiculate. Peduncles arising from basal rosettes, ultimate peduncles 5–15 cm long, with 1–2 flowers, green or reddish-purple. Peduncles and pedicels patent-hairy, all eglandular. Bracts small, lanceolate, scarious. Sepals 5, 7–12 mm long, appressed-pubescent, patent-pilose at base, hyaline at margins; awn 0.5–1 mm. Petals 5, broadly obovate, slightly emarginate, with very short or inconspicuous claw, 10–15 mm long, white or white to pale pink with darker veins. Stamens in two whorls of 5, all fertile; filaments creamy-white; anthers oblong, *ca.* 3 mm long, yellow or blackish-purple; pollen yellow. Styles united; stigmas 5, free, linear-filiform, 2–3 mm long, creamy-white (rarely yellow or reddish-brown) at anthesis. Mericarps 1-seeded, 8–10 mm long, pilose; beak 3–4 cm, curved at dehiscence; seeds elliptic-oblong, *ca.* 3.5 mm long, smooth, glabrous, olivaceous-brown.

On rocky limestone slopes and flats, 1340–1400 m. Flowering from late April to early June, fruiting till

Fig. 36. *Erigeron epiroticus* from Taigetos and Olimbos (photo G. Kofinas).

Fig. 36a. Distribution of *Erigeron epiroticus* in Greece.

Fig. 37. Distribution of *Matricaria discoidea* in Greece.

July. Endemic to Greece.

This species has been collected on Mt Kitheronas by several botanists including Heldreich in May 1880, Tuntas in June 1911, Strid in June 2015, etc., and photographed by many others in recent years. The plants were considered as *Geranium subcaulescens* L'Hér. ex DC., a mountain species described from Mt Parnassos in Sterea Ellas, Greece. Plants have also been cultivated by Allan and Marian Robinson in South Lincolnshire, England, material then dried and pressed in 2009 and sent to Knud Ib Christensen† (Copenhagen Botanical Garden) who determined them also as *G. subcaulescens*. The material was later referred by Kit Tan to *G. subacutum* (Boiss.) Aedo (syn.: *G. subcaulescens* var. *subacutum* Boiss.; *G. subcaulescens* var *leucophaeum* Hausskn. ex Bornm.), a species with a wide distribution range from SW, C and NE Anatolia to the Caucasus. It superficially resembles *G. subcaulescens* (see Robinson & Tan 2018). However, the stem and pedicels of type material of *G. subacutum* were found to be retrorsely adpressed-pubescent, not patent-hirsute or patent-pilose as in the Kitheronas plants. It was then decided to examine the latter in their natural habitat more carefully.

The Kitheronas plants differ from typical *G. subcaulescens* by a combination of pale-coloured filaments and stigmas at *anthesis* and white or pale pink petals without a blackish-purple basal blotch (Figs. 40a–d). In one population on Mt Kitheronas the stigmas are dark coloured after anthesis but the filaments are always white. The petals of *G. subcaulescens* are usually dark purplish-pink, deep reddish-purple or vivid magenta, and often with a dark blackish-purple patch at the base (Fig. 40e). They may also be a paler pink but the genitalia (filaments and stigmas) are always dark purplish-maroon. The leaves of the Kitheronas plant turn brown and soon wither after seed production and the plant goes summer-dormant. This is one reason it has not been widely noticed in late summer on Mt Kitheronas. In contrast, *G. subcaulescens* remains green for a long time, even flowering at the end of August.

The populations at the summit of Mt Kitheronas are morphologically differentiated and geographically isolated, with a well-defined distribution range (Fig. 41). They merit recognition as a stable morphotype with a unique combination of characters more obvious in *vivo*. Since the diagnostic characters allow ease of recognition in the field it was decided to treat it as a separate species, with the description based on living plants, field observations and photographs in habitat of both *G. margaritae* and *G. subcaulescens*. *Geranium thessalum* Franzén (endemic to North Central Greece) also has pale coloured genitalia like *G. margaritae*, and these three taxa are the only Greek repre-

Fig. 38. *Echium vulgare* subsp. *vulgare* (photo M. Gogolos).

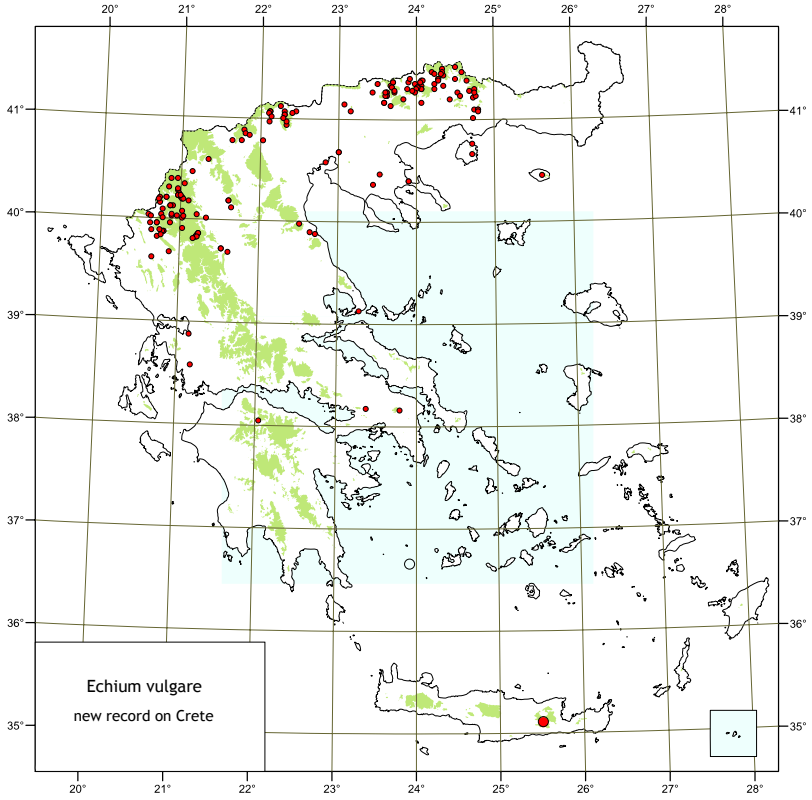

Fig. 38a. Distribution of *Echium vulgare* subsp. *vulgare* in Greece.

sentatives of *Geranium* sect. *Subacaulia* Boiss., which is considered an old Mediterranean mountain group occurring from Italy eastwards to the Caucasus.

Geranium subcaulescens does not occur on Mt Kitheronas, thus *G. margaritae* does not co-exist with it. The latter is found as pale pink to almost white populations, numbering several thousand plants at the summit area, on open rocky limestone slopes and flats (Fig. 40a). Other plants in the surroundings are *Acinos suaveolens*, *Armeria canescens*, *Asphodeline lutea*, *Astragalus hellenicus*, *Aubrieta deltoidea*, *Alyssum montanum*, *Centaurea pseudocadmea*, *Centaurea raphanina* subsp. *mixta*, *Cerastium candidissimum*, *Marrubium peregrinum*, *Minuartia hamata*, *Nepeta argolica*, *Paronychia macedonica*, *Prunus prostrata*, *Sedum amplexicaule* subsp *tenuifolium*, *Silene radicosa*, etc.

Etymology: *Geranium margaritae* is named for Dr Margarita Issigoni (Athens) who has an interest in the flora of Greece and has found several new plant records on the Saronic island of Aegina although this small island had already been well-investigated botanically.

Hyacinthaceae

97. *Scilla sicula* Tineo ex Guss. [syn.: *Oncostema sicula* (Tineo ex Guss.) Speta] (Fig. 42)

Gr Nomos & Eparchia Attikis: Filopappou hill near Acropolis, open ground near paved path, 121 m, 37°58'N, 23°43'E, 02.05.2023, *Kofinas* obs. (photos).

Established introduction, existing for at least five years in a single locality on Filopappou hill in the centre of Athens. An unusual occurrence in Greece, first reported by Stavros Apostolou in 2018 (Facebook post) as *Scilla dimartinoi* Brullo & Pavone. On 11 May 2022, G. Kofinas visited the site and found *S. sicula* in good condition. This was confirmed by several later visits. In May 2023 the inflorescence was partly damaged probably by a passing dog. As a result seed was not available in the summer of 2023.

Leaves prostrate-spreading, undulate, white-ciliate, 2–4 cm broad. Peduncles glabrous. Pedicels elongating to 5 cm, glabrous. Perianth 10–11 mm long. Anthers yellow to smoky-blue. Style 3–3.5 mm. Capsule glabrous.

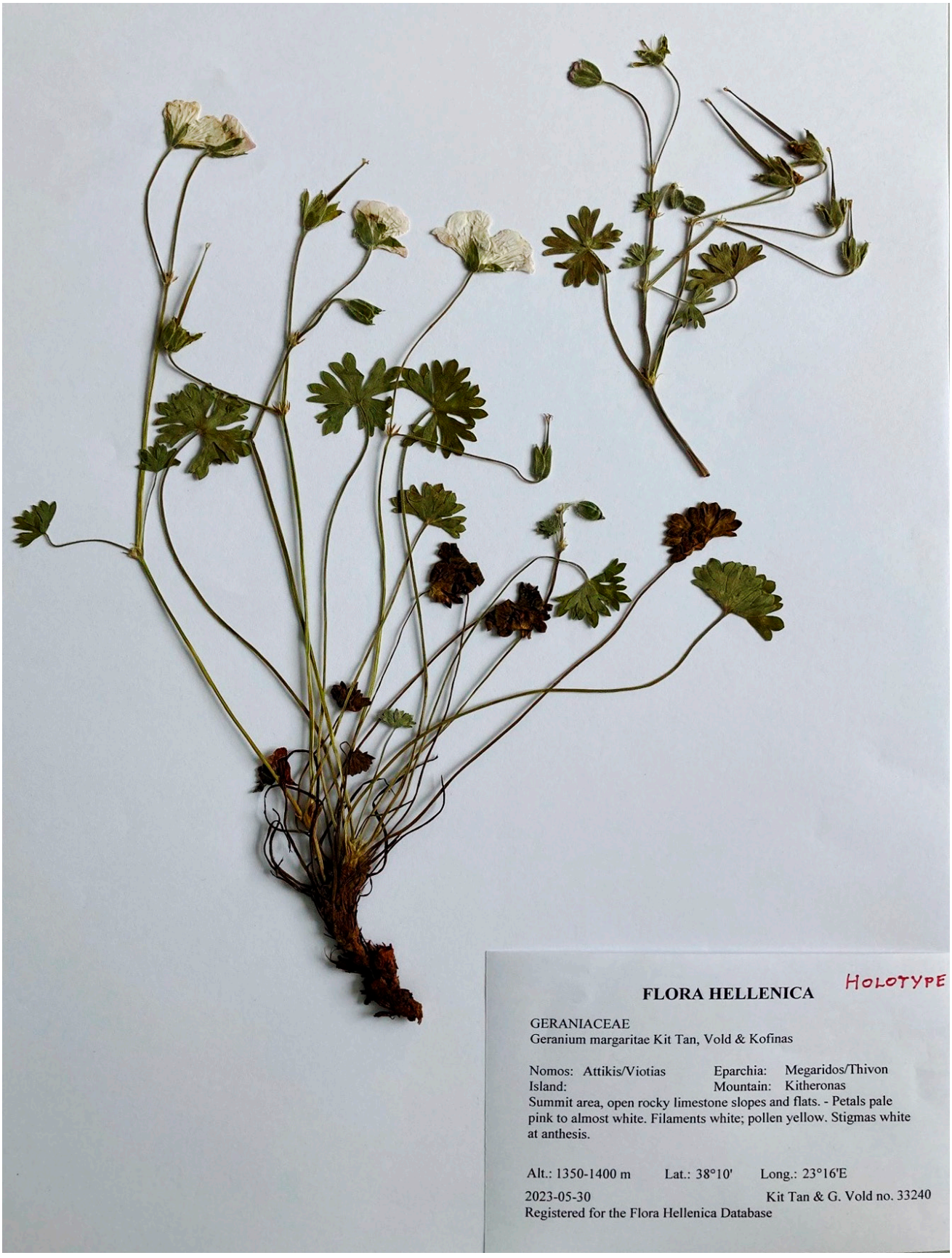

Fig. 39. *Geranium margaritae*: holotype (*Kit Tan & G. Vold* 33240).

Fig. 40. *Geranium margaritae*: a, habit (photo K. Polymenakos); b–d, flowers with petals white or pale pink but filaments always white (photos G. Kofinas). *Geranium subcaulescens*: e, flower with petals purplish-pink and dark basal blotch, filaments and stigmas dark coloured (photo A. Strid).

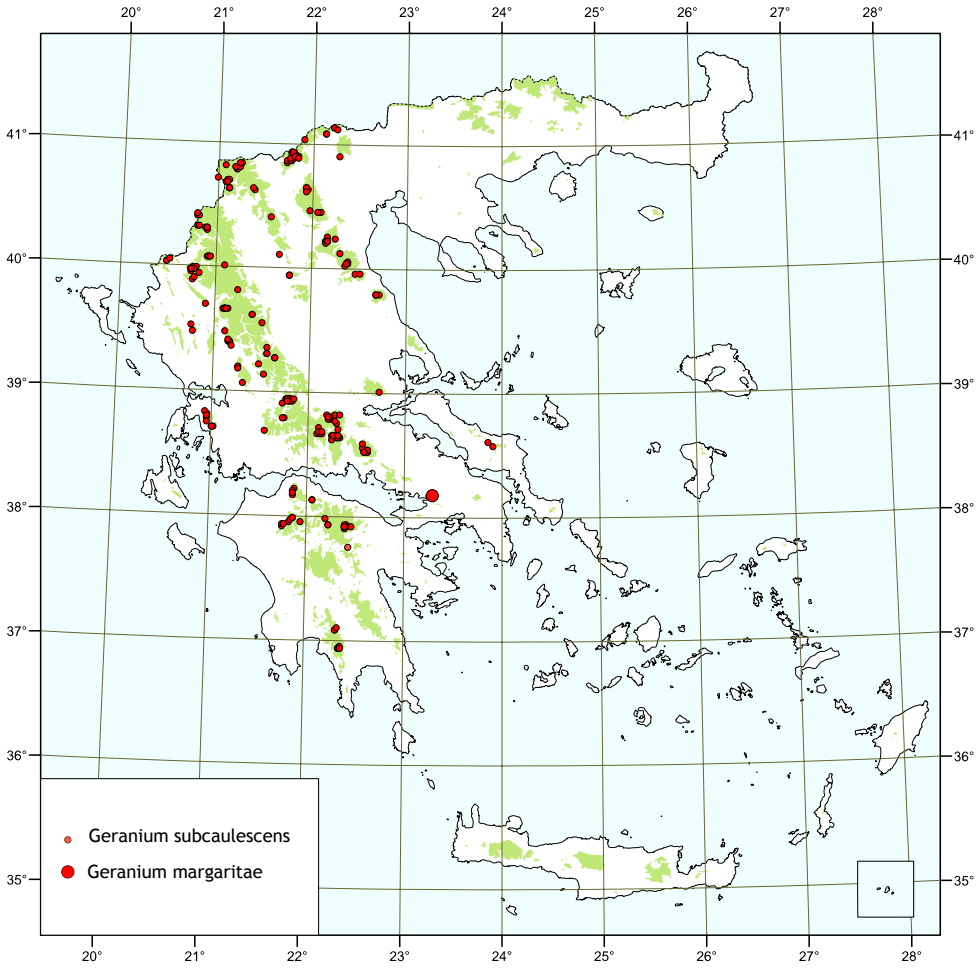

Fig. 41. Distribution of *Geranium margaritae* and *G. subcaulescens* in Greece.

Fig. 42. *Scilla sicula* on Filopappou hill, Athens (photo G. Kofinas).

Native distribution: S Italy, Sicily and Malta.

The plant had also been found by Gregory and Lambros Tsounis during their exploration of the hills around the Acropolis. They suggest some reasons for the plant's existence.

1. It is possible that seeds have been brought by birds during their autumn migration from western and central Mediterranean, passing through S Italy, Sicily and Malta on their way to eastern Mediterranean or Africa. Birds such as *Turdus philomelos* (Song Thrush) come in winter to Greece from S Italy and Malta. Filopappos hill is an important bird migration site in Athens, both in spring and autumn.
2. Seeds could have been transported in a backpack, by a traveller coming from Sicily or Malta. The single location of the plant is just beside the path of Pikionis.
3. It is a hoax to deceive the general public or botanist who would be intrigued by the occurrence and distribution of this plant thought to be endemic to S Italy, Sicily and Malta. Some person may have deliberately planted it or sown seeds obtained from a seed catalogue. Unfortunately, there are such strange people! In Athens there was a person who dug up plants of *Micromeria acropolitana* from the Acropolis (a protected site) in broad daylight and planted them in various parts of Attica, even documenting this brazen action in a Facebook post.
4. It is unlikely that *S. sicula* is cultivated in a botanical garden in Athens or elsewhere in Greece and has escaped into the wild. There is a report it has been observed in Karystias in southern Evvia. Apostolou noted that it was different to *S. peruviana* L. which he had found in coastal fields at the seaside resort of Mati, near the port of Rafina in eastern Attica. The latter plant is probably an escape from cultivation and has not been seen recently, apparently eradicated after the disastrous fire of 23 July 2018 although its underground bulb could have survived. Should the plant in southern Evvia represent *S. peruviana* instead, it would be a logical explanation of its occurrence on Evvia, as there are good ferry connections from Rafina to Karystos.

Acknowledgements: We thank Kostas Polymenakos (Athens) for Fig. 40a which shows a white-flowered population of *G. margaritae* on Mt Kitheronas, and Arne Strid (Ørbæk, Denmark) for Fig. 40e representing a flower of typical *G. subcaulescens*. Also, we thank Gregory and Lambros Tsounis (Athens) for sharing their independent discovery of *Scilla sicula* on Filopappou hill.

Reports 98–107

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Cupressaceae

98. *Juniperus sabina* L. (Fig. 43)

Gr Nomos Serron, Eparchia Sintikis: Mt Agkistro, limestone scree and rocky slopes, 1045 m, 41°20'N, 23°28'E, 03.06.2022, *Sister Pachomia* s.n. (herb. Monastery of Timios Prodromos, Serres).

New for nomos and eparchia. In Greece it occurs in phytogeographical regions North Central (Mt Tzena) and North East (Rodopi Mts, Lekanis Ori, Falakro, in the latter locally abundant). A collection (*Gustavsson* 4367, LD, *n.v.*) from Mt Parnassos in Sterea Ellas may possibly refer to *J. foetidissima* Willd. which is common on Parnassos. Greek plants are tetraploid ($2n$ = 44) and belong to var. *balkanensis* R.P. Adams & Tashev (described from Mt Tzena); var. *sabina* is diploid ($2n$ = 22) and is widespread. The distribution range of the species is from C and S Europe to Caucasus, Central and East Asia, also in Algeria.

Asteraceae

99. *Centaurea stenolepis* A. Kern. [syn. *C. phrygia* subsp. *stenolepis* (A. Kern.) Gugler] (Fig. 44)

Gr Nomos Serron, Eparchia Sintikis: Mt Beles, above Neo Petritis, *ca.* 800 m, 41°27'N, 23°29'E, 11.07.2020, *Sister Pachomia* obs. (photos).

— Nomos & Eparchia Serron: Mt Menikio, forest clearings, 839 m, 41°15'N, 23°48'E, 21.07.2022, *Sister Pachomia* s.n. (herb. Monastery of Timios Prodromos, Serres).

Fig. 43. *Juniperus sabina* (photo Sister Pachomia).

Fig. 44. *Centaurea stenolepis* (photo Sister Pachomia).

Fig. 45. *Hesperis sylvestris* subsp. *sylvestris* (photo Sister Pachomia).

New for Mts Beles and Menikio, easily recognized by its fimbriate phyllary appendages. Common in shady places in deciduous woodland, forest clearings and at roadsides in North Central and North East Greece.

Brassicaceae

100. *Hesperis sylvestris* Crantz subsp. ***sylvestris*** (Fig. 45)

Gr Nomos Serron, Eparchia Sintikis: Mandraki to Beles, stony ground in shaded places, 1158 m,

41°18'N, 23°09'E, 11.07.2023, *Sister Pachomia* s.n. (herb. Monastery of Timios Prodromos, Serres).

New for nomos and eparchia. Rare in Greece, only three collections known from nomi Dramas (Nestos alluvial flood-plain), Pellis (Mt Voras) and Kilkis (Mt Beles).

Cucurbitaceae

101. *Bryonia alba* L.

Gr Nomos & Eparchia Serron: road from Ano Vrontou to Ag. Eleftherios, 1134 m, 41°14'N, 23°39'E, 20.06.2023, *Sister Pachomia* s.n. (herb. Monastery of Timios Prodromos, Serres).

New for nomos and eparchia, scattered in Greece. A tuberous geophyte climbing in roadside scrub.

Euphorbiaceae

102. *Mercurialis ovata* Sternb. & Hoppe

Gr Nomos Serron, Eparchia Fillidos: Mt Kerdylion, between Monastery of Timios Prodromos and Nea Kerdylia, open deciduous oak forest, 732 m, 40°47'N, 23°41'E, 14.05.2020, *Sisters Pachomia* & *Paisia* s.n. (herb. Monastery of Timios Prodromos, Serres).

New for eparchia, scattered in northern Greece. In nomos Serron reported only from Mt Pangeo.

Fabaceae

103. *Genista sessilifolia* DC. (Figs. 46 & 46a)

Gr Nomos Serron, Eparchia Sintikis: Mt Agkistro, stony limestone slopes, 379 m, 41°18'N, 23°30'E, 17.06.2022, *Sister Pachomia* s.n. (herb. Monastery of Timios Prodromos, Serres).

New for the North East, only known with certainty from North Central. Records from Sterea Ellas (Nomos Fokidos, *Willing* 47280, B) and the Peloponnese (Nomos Achaias, *Willing* 198888, B and Nomos Korinthias, *Willing* 195697, B) need investigation as the species has not been confirmed in the latter localities.

Paeoniaceae

104. *Paeonia mascula* subsp. ***hellenica*** Tzanoud. (Figs. 47 & 47a)

Gr Nomos Serron, Eparchia Fillidos: Mt Kerdylion, between Monastery of Timios Prodromos and Nea Kerdylia, open *Quercus frainetto* forest, 732 m, 40°47'N, 23°41'E, 14.05.2020, flowering, *Sisters Pachomia* & *Paisia* s.n. (herb. Monastery of Timios Prodromos, Serres), *loc. ibid*., 04.08.2023, fruiting, *Sisters Pachomia* & *Paisia* s.n. (herb. Monastery of Timios Prodromos, Serres).

New for the North East. Only two species of *Paeonia* have been reported from northeastern Greece, viz., the bright red-flowered *P. peregrina* Mill. that is widespread but scattered in the north, and the pink-flowered *P. daurica* Andrews subsp. *daurica* that occurs only on Mt Menikio (Nomos & Eparchia Dramas). *Paeonia saueri* D.Y. Hong & al. described from Mt Pangeo (Nomos Kavalas, Eparchia Pangeou) is a synonym of *P. peregrina*. The discovery of white-flowered *P. mascula* subsp. *hellenica* in open deciduous oak forest on Mt Kerdylion is interesting and indicates that the total distribution of this taxon, especially in northern Greece is still not fully known (D. Tzanoudakis, pers. comm., August 2023). The locality in Serres is the northernmost locality in Greece (at 40°48'N), which is quite distant from known reports on Mt Parnassos (38°35'N) and Evvia (38°52'N). There were more than 100 plants in the large population which was in full flower during May. Seed production was excellent (see figure). Other plants in the ground cover are *Polygonatum hirtum* (dominant), *Mercurialis ovata* and *Smyrnium perfoliatum* subsp. *perfoliatum*. On Mt Parnassos, a few plants of *Paeonia mascula* subsp. *hellenica* had been found growing together with *P. parnassica* Tzanoud.

Thymelaeaceae

105. *Thymelaea passerina* (L.) Coss. & Germ.

Gr Nomos & Eparchia Serron: Mt Menikio, open stony slopes, 458 m, 41°11'N, 23°48'E, 21.07.2022, *Sister Pachomia* s.n. (herb. Monastery of Timios Prodromos, Serres).

New for Mt Menikio; in the North East reported from foothills of Mts Orvilos, Pangeo and Chortiatis as well as at lower altitudes of 150–400 m.

Alliaceae

106. *Allium flavum* subsp. ***tauricum*** (Rchb.) K. Richt.

Gr Nomos Serron, Eparchia Sintikis: Mt Beles, dry grassland on side of Ano Poroia village, 1528 m, 41°19'N, 23°02'E, 27.07.2023, *Sister Pachomia* s.n. (herb. Monastery of Timios Prodromos, Serres; det. D. Tzanoudakis, July 2023).

Fig. 46. *Genista sessilifolia* (photo Sister Pachomia).

Fig. 46a. Distribution of *Genista sessilifolia* in Greece.

Fig. 47. *Paeonia mascula* subsp. *hellenica* showing habit, flower, fruit and seeds (photo Sister Pachomia).

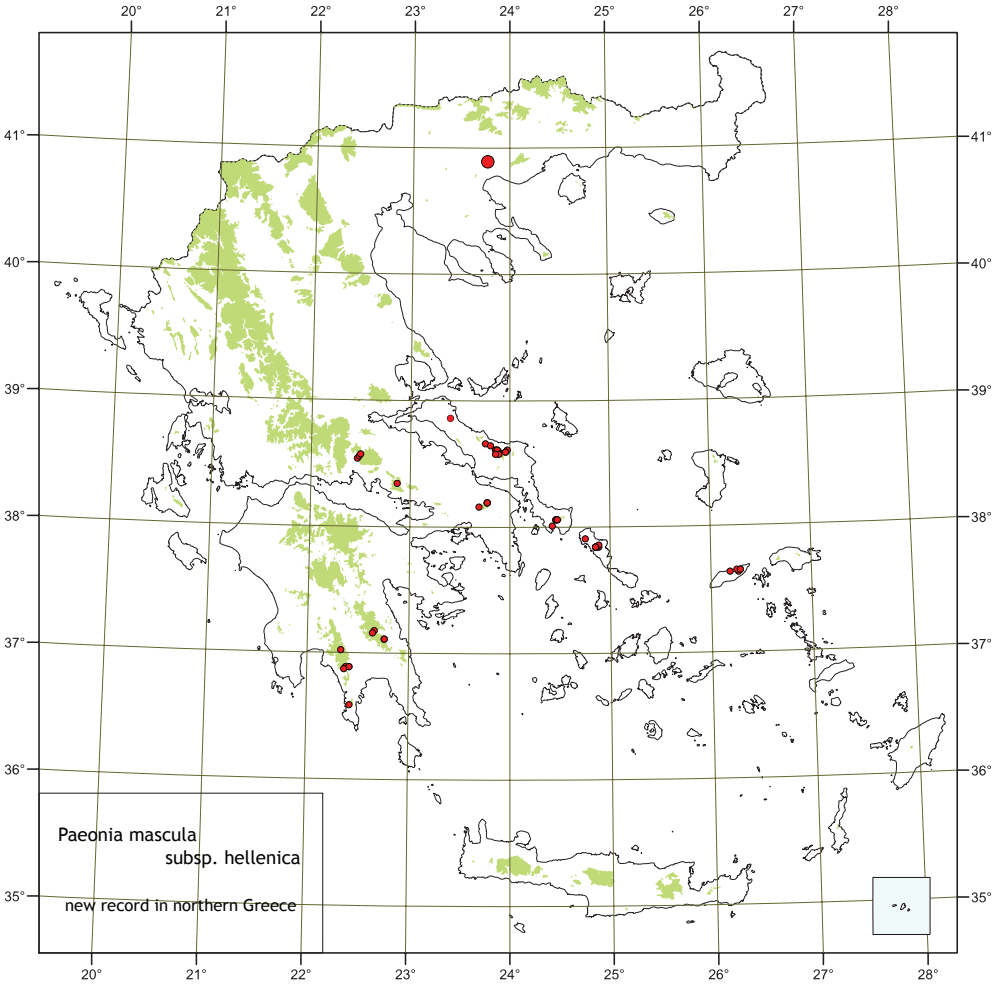

Fig. 47a. Distribution of *Paeonia mascula* subsp. *hellenica* in Greece.

Fig. 48. *Asparagus tenuifolius* (photo Sister Pachomia).

New for eparchia and Mt Beles (Kerkini). Only two species of *Allium* have so far been reported from Mt Beles, viz., *A. stamineum* Boiss. and *A. ursinum* L. The report of *A. stamineum* may possibly be a misidentification for *A. flavum* subsp. *tauricum* which looks rather similar.

Asparagaceae

107. *Asparagus tenuifolius* Lam. (Fig. 48)

Gr Nomos & Eparchia Serron: Mt Menikio, 4–5 km from Kato Vrontou, shady places in woodland, 648 m, 41°15'N, 23°46'E, 18.07.2023, *Sister Pachomia* s.n. (herb. Monastery of Timios Prodromos, Serres).

New for nomos and eparchia. In the North East recorded only from Mt Stratoniko (Nomos Chalkidikis) and Nestos river gorge (Nomos Dramas). Native from S Europe to Ukraine and Turkey.

Reports 108–114

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

Aceraceae

108. *Acer pseudoplatanus* L. (Fig. 49)

Gr Nomos & Eparchia Korinthias: NE of the village of Saradapicho, *Abies cephalonica* forest, 1400 m, 38°01'N, 22°23'E, 15.05.2023, *Zarkos* obs. (photos).

New for nomos and eparchia, certainly not planted. Rare in the Peloponnese, reported from nomi Achaias (Zarouchla, Kertezi), Arkadias (Alonistena, Vytina) and Lakonias (Langada gorge).

Asteraceae

109. *Centaurea heldreichii* Halácsy (Fig. 50)

Gr Nomos & Eparchia Korinthias: Kiato, at concrete base of house wall, 45 m, 38°07'N, 22°44'E, 21.05.2023 & 07.06.2023, *Zarkos* obs. (photos); 18.06.2023, *Kit Tan* & *G. Vold* obs.

"New" for the Peloponnese. An excellent example of a weed, defined as "a plant growing in a place where it should not be". This beautiful Greek endemic originates from the limestone rocks by the sea at Mt Varasova (Mt Chalkis) near Kryoneri in the prefecture of Etolias-Akarnanias in western Sterea Ellas. It has flowered well in Kiato the last two years, sown from accidentally scattered seed at the concrete base of a house wall. The achenes found their way into cracks simulating the native habitat of rock crevices in limestone cliffs. Endemic

Fig. 50. *Centaurea heldreichii* (photo G. Zarkos).

Fig. 49. *Acer pseudoplatanus* (photo G. Zarkos).

Fig. 51. *Tephroseris papposa* (photo G. Zarkos)

to Greece, known from only two localities across the Gulf of Corinth on mainland Greece.

110. *Tephroseris papposa* (Rchb.) Schur [syn.: *Cineraria papposa* Rchb., *T. integrifolia* (L.) Holub] (Fig. 51)

Gr Nomos & Eparchia Korinthias: Mikri Ziria, Tsouma peak, rocky and stony meadows, 1990 m, 37°55'N, 22°26'E, 11.07.2023, *Zarkos* & *Kounis* obs. (photos).

New for nomos, eparchia and Mt Killini (Mikri Ziria). Within the Peloponnese reported only from Mts Chelmos, Kallifoni and Taigetos. Plants were previously referred to the wide-ranging *Tephroseris integrifolia*, in particular to subsp. *aucheri* (DC.) B. Nord. which has subglabrous achenes. *Tephroseris integrifolia* (L.) Holub subsp. *integrifolia* has pubescent achenes and occurs in northern Greece. Kadereit & al. (2021) treats all Greek material as *T. papposa*.

Lamiaceae

111. *Acinos arvensis* (Lam.) Dandy

Gr Nomos & Eparchia Korinthias: Mt Killini, dry meadow, 1514 m, 37°57'N, 22°24'E, 17.06.2011, *Zarkos* obs. (photos); *loc. ibid*., 24.06.2023, *Zarkos* & *Kounis* s.n. (herb. Kit).

New for nomos, eparchia and Mt Killini. In the Peloponnese, only reported from nomi Achaias (Mt Chelmos) and Arkadias (Vytina, Sangas).

Rosaceae

112. *Potentilla argentea* L. (Figs. 52 & 52a)

Gr Nomos & Eparchia Korinthias: Mt Killini, Dasiou lake, 1490 m, 37°58'N, 22°25'E, 29.06.2008, *Zarkos* & *Christodoulou* obs.; E of the village of Saradapicho, openings in *Abies* forest, 1400 m, 38°01'N, 22°23'E, 18.05.2023, flowering, *Zarkos* obs. (photos); *loc. ibid*., 31.07.2023, fruiting, *Zarkos* obs. (photos).

New for the Peloponnese, widely distributed on the mainland. A very variable species distinguished from members of the *Potentilla recta* group by its leaflets with dense white indumentum of crispate hairs beneath.

Scrophulariaceae

113. *Cymbalaria microcalyx* subsp. ***minor*** (Cuf.) Greuter [syn.: *Cymbalaria minor* (Cuf.) Speta subsp. *minor*] (Figs. 53 & 54)

Gr Nomos & Eparchia Korinthias: Mt Vesiza, SW of Kryoneri village, *Abies* forest, 1120 m, 37°55'N, 22°35'E, 08.05.2023, *Zarkos* obs. (photos); *loc. ibid*., 29.05.2023 & 27.06.2023, *Zarkos* obs. (photos).

New for nomos and eparchia. Among other characters Carnicero & al. (2021) diagnosed their newly described species *C. spetae* Carnicero & al. as having 17–24 seeds per capsule. *Cymbalaria microcalyx* (Boiss.) Wettst. subsp. *microcalyx* and *C. microcalyx* subsp. *minor* are stated to have less than 14 seeds per capsule. We cut open a capsule from Mt Vesiza and out poured at least 23 seeds (Fig. 54). Thus the number of seeds should not be used as a distinguishing character of *C. microcalyx* from *C. spetae*.

114. *Verbascum hypoleucum* Boiss. & Heldr.

Gr Nomos & Eparchia Korinthias: Mt Vesiza, SW

Fig. 52. *Potentilla argentea* (photo G. Zarkos).

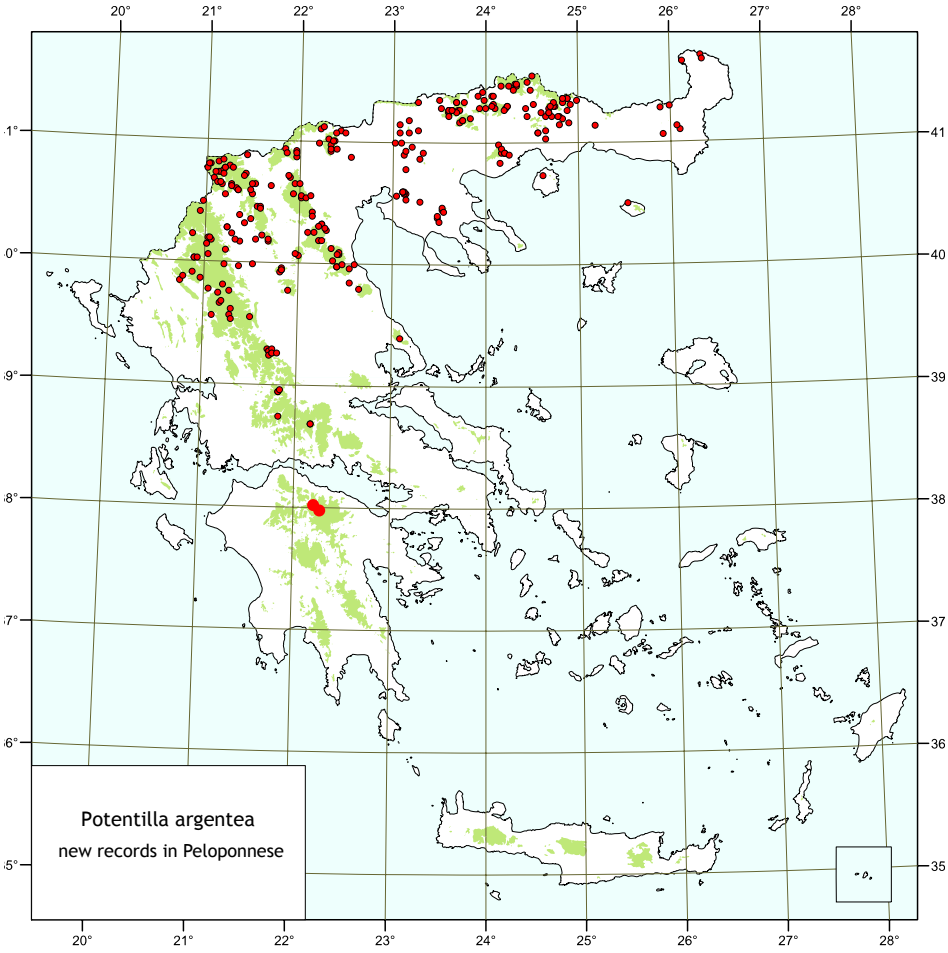

Fig. 52a. Distribution of *Potentilla argentea* in Greece.

Fig. 53. *Cymbalaria microcalyx* subsp. *minor* (photo G. Zarkos).

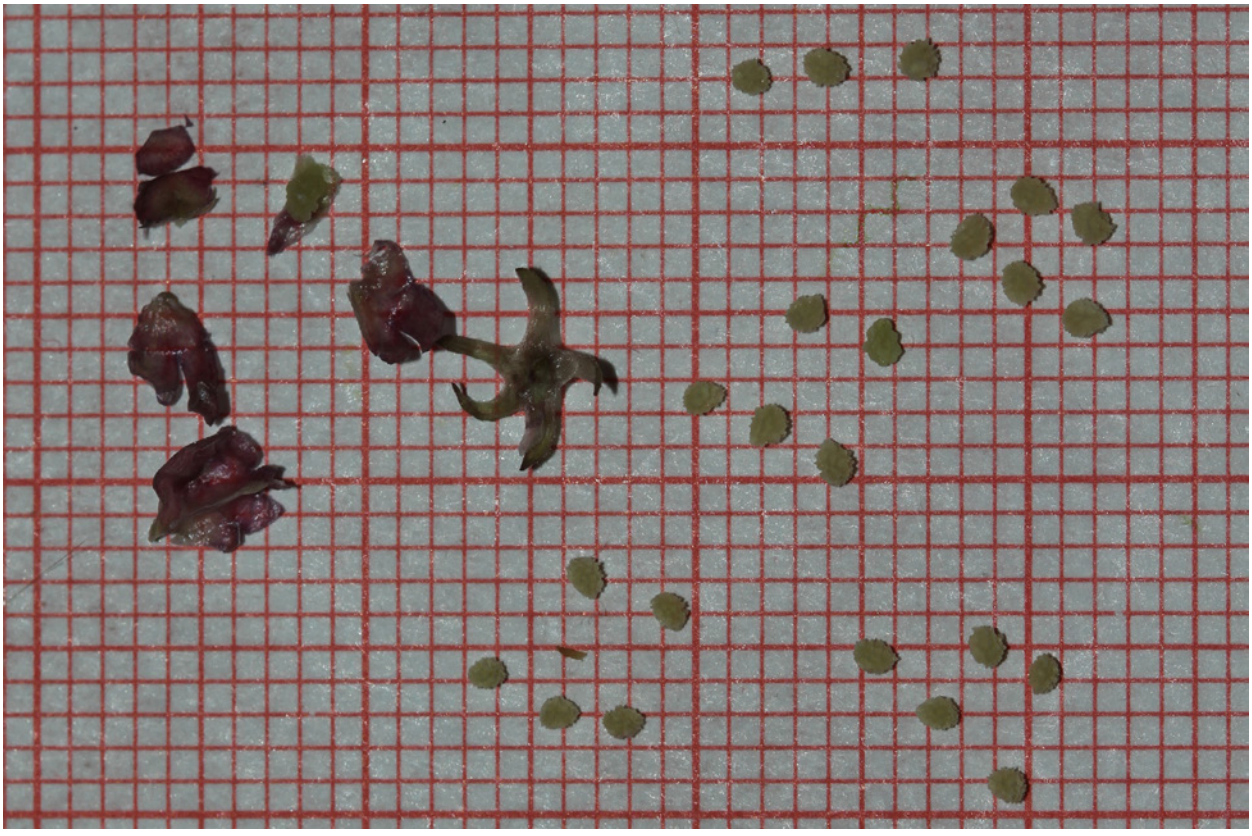

Fig. 54. *Cymbalaria microcalyx* subsp. *minor*: seeds from single capsule (photo G. Zarkos).

of Kryoneri village, *Abies* forest, 1120 m, 37°55'N, 22°35'E, 08.05.2023 & 27.06.2023, *Zarkos* obs. (photos).

An additional locality for this rare species first collected from Mt Killini by Heldreich in July 1848. Apparently restricted to Korinthias in N Peloponnese. Some of the plants on Mt Vesiza reached more than 2.3 m in height.

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