

Contribution to the vascular flora of Chelmos-Vouraikos National Park (N Peloponnese, Greece)

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Abstract. New distribution data are presented for 108 plant taxa (species and subspecies) reported from the National Park of Chelmos-Vouraikos in northern Peloponnese (Greece). Eighty-seven taxa are new records for the National Park and increase the vascular plant species richness of the area to 1252 taxa. *Lonicera alpigena* subsp. *hellenica*, a rare local endemic of the Styx ravine on Mt Chelmos, was recollected after more than 160 years since its original collection (type specimen). The presence of 20 more taxa was confirmed, including two taxa (*Sideritis raeseri* subsp. *raeseri*, *Blysmus compressus*) confirmed for the flora of Peloponnese. Comments on selected plant taxa are also provided.

Key words: endemics, floristic diversity, Greek flora, new records, vascular plants

Introduction

The Chelmos-Vouraikos National Park (CVNP) is located in northern Peloponnese and covers an area of ca. 544.4 km² (Fig. 1). Mt Chelmos is the main mountain massif of the area and one of the highest in the Peloponnese, with several peaks above 2000 m (the highest at 2355 m). The major rivers of the National Park are Aroanios, Krathis and Vouraikos in the southern, eastern and western parts, respectively, accompanied by several streams. The varied relief of the area forms numerous ravines and gorges and thus provides a high diversity of habitats which, respectively, host a high plant diversity, including a large number of rare and endemic plant taxa (Tan & Iatrou, 2001). However, a complete floristic inventory of CVNP is still lacking, and the floristic records from this area are scattered in several bibliographic

sources. More precisely, the works of Halácsy (1900–1904, 1908a, 1908b), Strid (1986), Strid & Tan (1991, 1997, 2002) include most of the published floristic records from CVNP. Bornmüller (1928) and Quezel & Katrabassa (1974) had also contributed to the floristic knowledge of Mt Chelmos, but most endemic taxa of the area are included in Tan & Iatrou (2001), while the rare and threatened taxa are referred to by Phitos & al. (1995, 2009). Also, there are floristic records of the study area derived from reports included in the online papers of *Phytologia Balcanica* (Tan & al. 2006, 2007, 2009, 2010, 2010b; Giannopoulos & al. 2011; Polymenakos & al. 2011; Zarkos & al. 2012, 2014, 2015, 2016, 2016b, 2017, 2017b, 2018, 2019; Polymenakos & Tan 2012, 2015, 2019; Authier 2014; Tan & Issigoni 2015; Kofinas & Tan 2020). Numerous plant records also come from the Natura 2000 monitoring and mapping projects (Dafis & al., 2001).

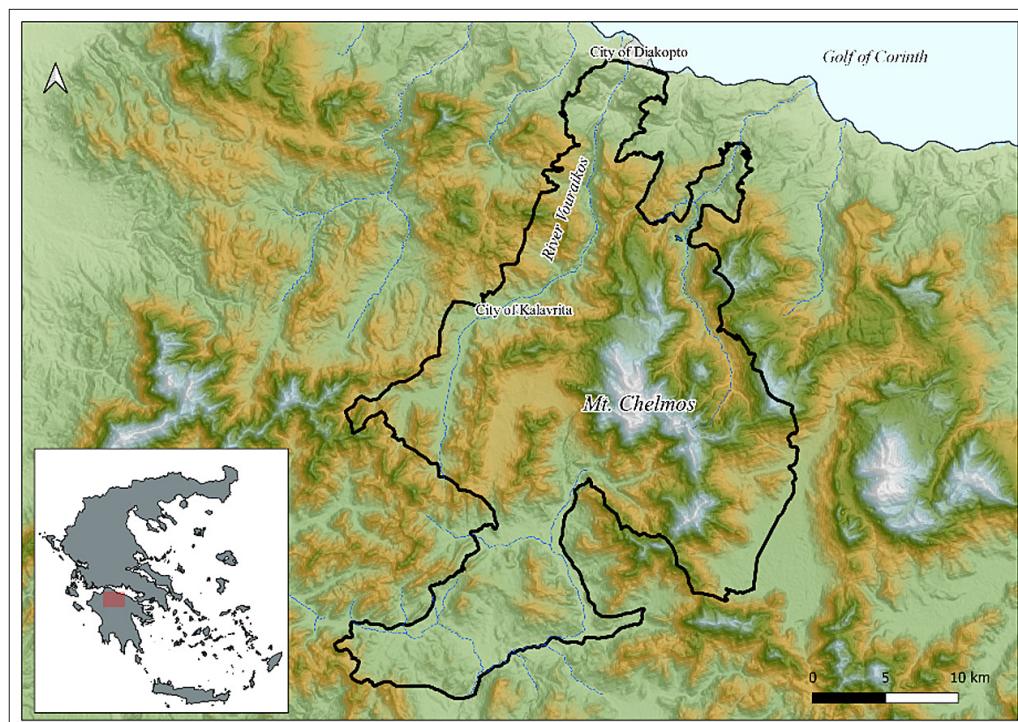


Fig. 1. Boundaries of the Chelmos – Vouraikos National Park.

Generally, based on literature reviews, 1165 vascular plant taxa have been so far reported from CVNP, most of them from Mt Chelmos and the Vouraikos river gorge.

This floristic report is part of the first author's PhD thesis currently in progress and aims at contributing to the flora of CVNP, in order to provide an integrated knowledge of its floristic diversity. It includes 108 floristic records, 87 of them new for the CVNP, including two new taxa for the flora of the Peloponnese, an important rediscovery from the CVNP, as well as 20 confirmation records, including two confirmed taxa for the flora of the Peloponnese.

Material and methods

Several collection and field observation trips were carried out by the authors across the area of CVNP from June 2012 until June 2019. Plant identification has been based mainly on collected plant specimens, with the exception of some common and/or characteristic plants that were simply observed or photographed and identified in the field. Species identification was based on the keys and species descriptions provided by Tutin & al. (1968–1980, 1993), Strid (1986), Strid & Tan (1991, 1997, 2002), Tan & Iatrou (2001), and for orchids, by Antonopoulos & Tsift-

sis (2017). Family delimitation and nomenclature and chorological categorization follow Dimopoulos & al. (2013, 2016), as presented in the Flora of Greece Web online database (<http://portal.cybertaxonomy.org/flora-greece>). The status Range Restricted refers to taxa with populations occurring along a linear distance not exceeding 500 km (Dimopoulos & al. 2013, 2016). All herbarium specimens included in this study have been deposited in the Botanical Museum of the University of Patras (UPA) and a series of duplicates in the Management Body of CVNP Herbarium in Kalavryta. Most floristic records presented in the list are new for the protected area of CVNP, unless otherwise stated.

Abbreviations: CVNP – Chelmos Vouraikos National Park, *Kok* – I. Kokkoris, *Tr* – P. Trigas, *Ts* – M. Tsakiri, *Tz* – D. Tzanoudakis, *Tz & al.* – includes collections by D. Tzanoudakis with G. Iatrou, I. Kokkoris, K. Kougioumoutzis, I. Papanikolaou, and Ag. Kalisperi.

Results

Records are distributed in 32 families and 81 genera, with 87 new records, an important rediscovery from the CVNP and 20 confirmation records. Comments on selected plant taxa are presented below.

ALLIACEAE

1. *Allium ampeloprasum* L.

Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, Vrachni village area, 1430 m, 38°02.465' N, 22°11.887' E, 07.07.2013, coll. No: Tz X989.

2. *Allium brussalisii* Tzanoud. & Kypriot.

Nomos Achaïas, Eparchia Egialias: Vouraikos gorge, along a forest road before Niamata, 264 m, 38°09.430' N, 22°10.825' E, 05.03.2013, coll. No: Tz 11554.

This is a Greek endemic species described from Mount Parnitha (Tzanoudakis & Kypriotakis 2008), also recorded in several localities in SE Peloponnese (Kalpoutzakis & al. 2019). This is its first record from N Peloponnese. An unpublished collection, as referred to in Kalpoutzakis & al. (2019), from the Vouraikos gorge (N Peloponnisis) by D. Tzanoudakis was based on this specimen.

3. *Allium callimischon* Link subsp. *callimischon* (Fig. 2).

Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, between Planitero and Arbounas, 750 m, 37°55' N, 22°10' E, 22.09.2012, Tz obs.

4. *Allium chamaespathum* Boiss.

Nomos Achaïas, Eparchia Egialias: Mt Chelmos, lake Tsivlos, 600–700 m, 38°04.639' N, 22°13.977' E, 30.10.2013, coll. No: Tz & Kok X1131; Nomos Achaïas, Eparchia Egialias: Vouraikos gorge, at the entrance of the gorge, 10 m, 38°10.819' N, 22°11.666' E, 15.11.2013, coll. No: Tz X1148.

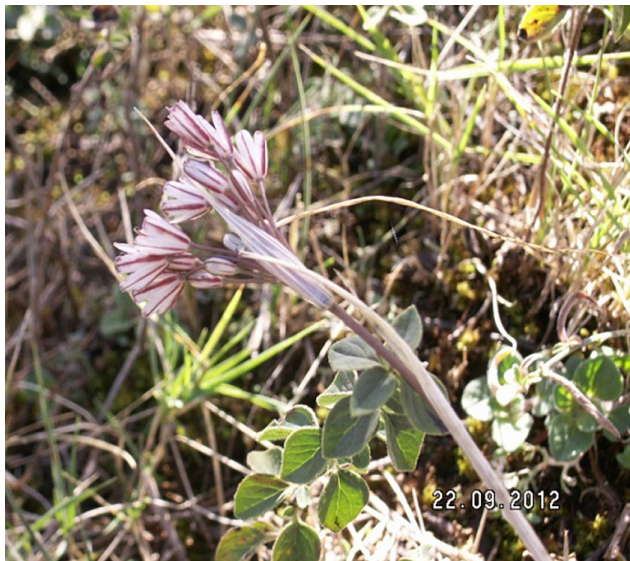


Fig. 2. *Allium callimischon* subsp. *callimischon* (photo by D. Tzanoudakis).

5. *Allium cyrilli* Ten.

Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, Vrachni village area, 1100 m, 38°02.465' N, 22°11.887' E, 07.07.2012, coll. No: Tz 13866.

6. *Allium flavum* L. subsp. *tauricum* (Rchb.) K. Richt.

Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, in mountain meadows from Xerokampos to Mesorougi, 1530 m, 38°01.660' N, 22°13.993' E, 25.06.2012, coll. No: Tz & Tr X783; Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, Gaidourorachi, 1750–1900 m, 38°01.986' N, 22°13.019' E, 26.06.2012, coll. No: Tz & Tr X784; Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, on a forest road from Souvarido to Xerokampos, Louka Plateau, 1550 m, 38°01.916' N, 22°12.265' E, 19.08.2013, coll. No: Tz X1104.

This taxon was reported from Chelmos by Bogdanovic & al. (2011), but mentioned erroneously under the name *A. achaium* Boiss. & Orph. (see Tzanoudakis & al. 2019).

7. *Allium pallens* L.

Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, Vrachni village area, 1100 m, 38°02.465' N, 22°11.887' E, 02.08.2013, coll. No: Tz X1027.

8. *Allium rhodopeum* Velen. subsp. *rhodopeum*

Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, in the area from Vrachni to Souvarido, in a fir forest, 1204 m, 38°02.554' N, 22°10.133' E, 24.07.2013, coll. No: Tz X1028; Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, at a forest road from Vrachni to the Castle of Kalavryta, 943 m, 38°02.554' N, 22°10.134' E, 25.07.2013, coll. No: Tz X1029.

This is a Balkan Range Restricted taxon. In Greece, is restricted in the East Central Greece, North Pindos, Sterea Ellas and West Aegean Islands (Dimopoulos & al., 2013, 2016). It is new for the phytogeographical region of the Peloponnese.

9. *Allium rotundum* L.

Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, Vrachni village area, 1100 m, 38°02.465' N, 22°11.887' E, 13.06.2012, coll. No: Tz X980.

10. *Allium vineale* L.

Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, in a rocky system near Pouliou Vrissi, 2020 m, 37°59' N, 22°11' E, 27.07.2015, Tz obs.

APIACEAE

11. *Ammi majus* L.

Nomos Achaïas, Eparchia Kalavriton: Lykouria Kalavriton, on rocks near Ladonas springs, 450 m,

37°50.047' N, 22°10.577' E, 09.06.2012, coll. No: Tz & al. X165.

12. *Anthriscus sylvestris* (L.) Hoffm. subsp. *nemorosus* (M. Bieb.) Koso-Pol.

Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, in a meadow on Louka Plateu, 1350 m, 38°02.428' N, 22°11.823' E, 23.05.2014, coll. No: Tz 14714.

It was reported from "Megaspileon" by Bornmüller (1928: 281).

13. *Daucus involcratus* Sm.

Nomos Achaïas, Eparchia Kalavriton: Lykouria Kalavriton, on rocks near Ladonas springs, 450 m, 37°50.047' N, 22°10.577' E. 09.06.2012, coll. No: Tz & al. X179.

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

Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, summit Velias, 1470 m, 38°00.617' N, 22°07.388' E, 23.06.2012, coll. No: Tz & al. X466; Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, along the trail from Souvarido to Xerokampos, in a fir forest, 1500 m, 38°02.184' N, 22°12.167' E, 26.06.2012, coll. No: Tz & Tr X616; Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, Gaidourorachi, along the route from Zarouchla to the Ski Center, 1750–1900 m, 38°01.986' N, 22°13.019' E, 26.06.2012, coll. No: Tz & Tr X588.

15. *Torilis elongata* (Hoffmanns. & Link) Samp.

Nomos Achaïas, Eparchia Egialias: Vouraikos gorge, at the entrance of the gorge, in a riparian area, 30–50 m, 38°10.461' N, 22°11.358' E, 18.06.2014, coll. No: Tz 14444.

16. *Torilis japonica* (Houtt.) DC.

Nomos Achaïas, Eparchia Egialias: Vouraikos gorge, at the entrance of the gorge, in a riparian area, 30–50 m, 38°10.461' N, 22°11.358' E, 18.06.2014, coll. No: Tz 14713.

17. *Torilis nodosa* (L.) Gaerttn.

Nomos Achaïas, Eparchia Kalavriton: springs of Ladonas, 432 m, 37°50.140' N, 22°10.867' E, 09.06.2012, coll. No: Tz & al. X12.

It was reported from "Kalavryta, am Kastro" and "Megaspilaeon" by Bornmüller (1928: 284).

ARACEAE

18. *Arum maculatum* L.

Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, summit Velias, 1470 m, 38°00.617' N, 22°07.388' E, 23.06.2012, coll. No: Tz & al. X378.

ASTERACEAE

19. *Carthamus lanatus* L.

Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, in the area of the Castle of Kalavryta, 988 m, 38°01.805' N, 22°07.812' E, 23.06.2012, coll. No: Tz & al. X273.

It was reported from "Kalavryta" by Bornmüller (1928: 284).

20. *Centaurea triumfettii* All. subsp. *axillaris* (Čelak.) Stef. & T. Georgiev

Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, summit Velias, 1470 m, 38°00.617' N, 22°07.388' E, 23.06.2012, coll. No: Tz & al. X388; Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, in mountain meadows from Xerokampos to Mesorougi, 1530 m, 38°01.660' N, 22°13.993' E, 25.06.2012, coll. No: Tz & Tr X471; Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, Gaidourorachi, along the route from Zarouchla to the Ski Center, 1750–1900 m, 38°01.986' N, 22°13.019' E, 26.06.2012, coll. No: Tz & Tr X605; Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, Xerokampos, along the route to Aristarchos, 1630 m, 38°00.430' N, 22°11.710' E, 18.07.2012, coll. No: Tz & al. X688; Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, in meadows, along the route from Peristera to Xerokampos, 1700 m, 38°01.581' N, 22°13.322' E, 10.05.2014, coll. No: Tz 13971.

Centaurea triumfettii was reported by Bornmüller (1928: 290) from Mt Chelmos, without any precise locality.

21. *Crepis foetida* L. subsp. *foetida*

Nomos Achaïas, Eparchia Kalavriton: Lykouria Kalavriton, on rocks near Ladonas springs, 450 m, 37°50.047' N, 22°10.577' E, 09.06.2012, coll. No: Tz & al. X194; Nomos Achaïas, Eparchia Kalavriton: springs of Ladonas, 432 m, 37°50.140' N, 22°10.867' E, 09.06.2012, coll. No: Tz & al. X92.

22. *Crepis vesicaria* L. subsp. *vesicaria*

Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, in the area of the Castle of Kalavryta, 988 m, 38°01.805' N, 22°07.812' E, 23.06.2012, coll. No: Tz & al. X302.

23. *Filago pyramidata* L.

Nomos Achaïas, Eparchia Kalavriton: springs of Ladonas, 432 m, 37°50.140' N, 22°10.867' E, 09.06.2012, coll. No: Tz & al. X36.

24. *Hedypnois rhagadiloides* (L.) F. W. Schmidt.

Nomos Achaïas, Eparchia Kalavriton: Lykouria Kalavriton, on rocks near Ladonas springs,

450 m, 37°50.047' N, 22°10.577' E, 09.06.2012, coll. No: *Tz* & *al.* X193; Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, in the area of the Castle of Kalavryta, 988 m, 38°01.805' N, 22°07.812' E, 23.06.2012, coll. No: *Tz* & *al.* X284; Nomos Achaïas, Eparchia Egialias: Vouraikos gorge, at the entrance of the gorge, in a riparian area, 30–50 m, 38°10.461' N, 22°11.358' E, 18.06.2014, coll. No: *Tz* 14443.

25. ***Leontodon saxatilis* Lam. subsp. *saxatilis***

Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, Vrachni village area, 1430 m, 38°02.465' N, 22°11.887' E, 20.10.2012, coll. No: *Tz* 14332.

This taxon occurs in agricultural and ruderal habitats; it is new for the phytogeographical region of the Peloponnese.

26. ***Onopordum tauricum* Willd.**

Nomos Achaïas, Eparchia Kalavriton: springs of Ladonas, 432 m, 37°50.140' N, 22°10.867' E, 09.06.2012, coll. No: *Tz* & *al.* X96.

27. ***Picris pauciflora* Willd.**

Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, in the area of the Castle of Kalavryta, 988 m, 38°01.805' N, 22°07.812' E, 23.06.2012, coll. No: *Tz* & *al.* X251.

28. ***Pilosella leucopsilon* (Arv.-Touv.) Gottschl. subsp. *pilisquama* (Nägeli & Peter) Gottschl.**

Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, Xerokampos, in rocky places, 1640 m, 38°00.950' N, 22°12.645' E, 24.07.2014, coll. No: *Tz* 14008.

29. ***Scorzonera mollis* M. Bieb. subsp. *mollis***

Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, near the forest road to the meadow of Xerokampos, 1540 m, 38°01.061' N, 22°11.469' E, 23.05.2014, coll. No: *Tz* 14221.

BORAGINACEAE

30. ***Alkanna tinctoria* Tausch subsp. *tinctoria***

Nomos Achaïas, Eparchia Kalavriton: Lykouria Kalavriton, on rocks near Ladonas springs, 450 m, 37°50.047' N, 22°10.577' E, 09.06.2012, coll. No: *Tz* & *al.* X209; Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, in mountain meadows from Xerokampos to Mesorougi, 1530 m, 38°01.660' N, 22°13.993' E, 25.06.2012, coll. No: *Tz* & *Tr* X446.

31. ***Buglossoides arvensis* (L.) I.M. Johnst.**

Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, along a forest road from Vrachni to Souvardo,

1270 m, 38°02.545' N, 22°10.174' E, 04.04.2017, coll. No: *Tz* 13895.

32. ***Cynoglossum columnae* Ten.**

Nomos Achaïas, Eparchia Kalavriton: near river Ladonas, in a riparian, semicultivated meadow, 479 m, 37°50.146' N, 22°11.040' E, 09.06.2012, coll. No: *Tz* & *al.* X665.

It was reported from “Kalavryta” and “Voreikos-Schluchten oberhalb Diakophto” by Bornmüller (1928: 291).

33. ***Heliotropium europaeum* L.**

Nomos Achaïas, Eparchia Kalavriton: Lykouria Kalavriton, on rocks near Ladonas springs, 450 m, 37°50.047' N, 22°10.577' E, 23.09.2012, coll. No: *Tz* & *al.* X804; Nomos Achaïas, Eparchia Egialias: Vouraikos gorge, along a forest road from the entrance of the gorge to Niamata, 10–100 m, 37°59.473' N, 22°11.987' E, 15.11.2013, coll. No: *Tz* X1146.

34. ***Onosma spruneri* Boiss.**

Nomos Achaïas, Eparchia Kalavriton: Vouraikos gorge, 587 m, 38°06.115' N, 22°09.828' E, 03.06.2017, *Kofinas* obs.

This is a Greek endemic species with restricted distribution in N Peloponnese and E Sterea Ellas (Tan & Iatrou 2001).

BRASSICACEAE

35. ***Alyssum chalcidicum* Janka**

Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, along the route from Peristera to Xerokampos, 1589 m, 38°01.679' N, 22°13.910' E, 10.05.2014, *Tz* obs.; Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, near the forest road to the meadow of Xerokampos, 1540 m, 38°01.061' N, 22°11.469' E, 23.05.2014, coll. No: *Tz* 13982.

This is a Balkan element known from a few scattered localities in the Peloponnese.

36. ***Arabis glabra* (L.) Bernh.**

Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, along the road from Kalavryta to the Ski Center, in openings of *Abies cephalonica*, 1450 m, 38°01'230" N, 22°10'778" E, 03.06.2013, coll. No: *Tr* 5539.

37. ***Calepina irregularis* (Asso) Thell.**

Nomos Achaïas, Eparchia Kalavriton: in agricultural and ruderal habitats, near the springs of Ladonas, 432 m, 37°50.140' N, 22°10.867' E, 09.06.2012, coll. No: *Tz* & *al.* X13.

38. *Draba boerhaavii* (H. C. Hall) Raus

Nomos Achaïas, Eparchia Egialias: Vouraikos gorge, near Kerpini station, 660 m, 38°03.584' N, 22°09.369' E, 05.03.2013, coll. No: Tz 14359.

39. *Erysimum pusillum* Bory & Chaub.

Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, Gaidourorachi, along the route from Zarouchla to the Ski Center, 1750–1900 m, 38°01.986' N, 22°13.019' E, 26.06.2012, coll. No: Tz & Tr X585; Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, along a forest road from Vrachni to Souvarado, 1270 m, 38°02.545' N, 22°10.174' E, 04.04.2014, coll. No: Tz 13891.

This is an endemic to the mountains of the Peloponnese (Tan & Iatrou 2001, Dimopoulos & al. 2013, 2016).

CAMPANULACEAE

40. *Campanula trachelium* L. subsp. *athoa* (Boiss. & Heldr.) Hayek

Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, on scree slopes and rocks at the roadsides near Souvarado village, 1167 m, 38°03.035' N, 22°10.723' E, 24.07.2013, coll. No: Tz X1036; Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, on rocks along the path that leads to the waterfall of the Styx ravine, 1300–1400 m, 37°59.873' N, 22°12.880' E, 22.07.2014, Tz & al. obs.

CANNABACEAE

41. *Humulus lupulus* L.

Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, eastwards of Kastria, 693 m, 37°57.003' N, 22°08.403' E, 03.06.2015, Tz & Kok obs.

CAPRIFOLIACEAE

42. *Lonicera alpigena* subsp. *hellenica* (Boiss.) Kit Tan & Ziel. (Fig. 3)

Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, on slopes just below the Styx fall, 1700 m, 37°59.111' N, 22°12.552' E, 25.06.2015, coll. No: Tr & Koug 5964.

This is the first collection of *L. alpigena* subsp. *hellenica* since the type collection by Th. Orphanides in 1852. The subspecies was rediscovered at the type locality, a few hundred meters below the Styx fall, on the NE slope of Mt Chelmos. Only 36 individuals of this rare plant were recorded in this locality, growing in open woodland together with *Acer hyrcanum* subsp. *reginae-amaliae*, *Juniperus oxycedrus* subsp. *deltoides* and *Abies cephalonica*.

Lonicera alpigena is a widespread mountain species, quite variable on the Balkan Peninsula. *Lonicera alpigena* subsp. *hellenica* is most closely related to subsp. *formanekiana* (Halácsy) Hayek distributed in the western part of the Balkans, southwards to the mountains of Sterea Ellas in Greece, from which it mainly differs by its velutinous leaves beneath (Tan & Iatrou 2001).

CARYOPHYLLACEAE

43. *Herniaria incana* Lam.

Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, summit Velias, 1470 m, 38°00.617' N, 22°07.388' E, 23.06.2012, coll. No: Tz & al. X390.

44. *Minuartia eurytanica* (Boiss. & Heldr.)

Hand.-Mazz.

Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos,



Fig. 3. *Lonicera alpigena* subsp. *hellenica*. Flower with peduncle, bracts and ovary apex covered with a mixture of long eglandular and shorter glandular hairs (left), and twig with immature fruits showing the velutinous abaxial leaf surface and the glandular puberulent twigs, peduncles and petioles (right) (photos by P. Trigas).

forest road from Planitero to summit Nisi, 1500–1600 m, 37°56.590' N, 22°14.124' E, 06.08.2013, coll. No: Tz X1121; Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, on rocks, along a forest road from Souvarido to Xerokmpos, 1550 m, 38°01.595' N, 22°11 844' E, 19.08.2013, coll. No: Tz X1083; Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, on calcareous rocky slopes, along route from Peristera to Xerokampos, 1270 m, 38°01.552' N, 22°14.348' E, 10.05.2014, coll. No: Tz 13964; Nomos Achaïas, Eparchia Egialias: Vouraikos gorge, at the entrance of the gorge, in a riparian area, 30–50 m, 38°10.461' N, 22°11.358' E, 18.06.2014, coll. No: Tz 14124; Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, on the rocky slopes from a sheep shed to western summits, 2200–2300 m, 37°58.375' N, 22°12.070' E, 23.07.2014, coll. No: Tz 14140.

This is a Greek endemic species mainly distributed along the Pindos Mountain Range (Strid & Tan 1997). It has been recorded recently in the Peloponnese (Mt Panachaiko) by Kokkoris & al. (2014).

45. *Silene cretica* L.

Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, summit Velias, 1470 m, 38°00.617' N, 22°07.388' E, 23.06.2012, coll. No: Tz & al. X428.

46. *Silene latifolia* Poir.

Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, lake Tsivlos, on the lake banks, in the phrygana and garrigue close to the lake, 680–690 m, 38°04' 641' N, 22°13' 976' E, 05.06.2013, coll. No: Tr 5627.

This is the second record of this widespread species from the Peloponnese. Few plants were recorded with hermaphrodite flowers, a rare feature in this normally dioecious species.

CISTACEAE

47. *Helianthemum salicifolium* (L.) Mill.

Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, in calcareous rocky sites with *Quercus coccifera*, near Kastria Cave, 870 m, 37°57.610' N, 22°08.370' E, 02.05.2014, coll. No: Tz 14379.

It was reported from “Kalavryta, am Berge Kastro” and “Hagia Lavra” by Bornmüller (1928: 176).

CONVOLVULACEAE

48. *Convolvulus althaeoides* L

Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, lake Tsivlos, 720 m, 38°04.560' N, 22°14.170' E, 10.05.2014, coll. No: Tz 14410.

CYPERACEAE

49. *Blysmus compressus* (L.) Link

Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, in alpine meadows and damp sites along the path from Aristarhos Observatory to Mavrolimni, 2200 m, 37°58.721' N, 22°11.800' E, 02.07.2013, coll. No: Tr 5714.

This is also the first confirmed record of *Blysmus compressus* from the Peloponnese. The species was reported from Mt Killini by Hartvig (1991), based on an unpublished floristic catalog of J.R. Akeroyd and C.D. Preston. Its presence in the Peloponnese was never confirmed since then and it was considered absent from the Peloponnese by Dimopoulos & al. (2013, 2016).

EUPHORBIACEAE

50. *Euphorbia apios* L.

Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, along a forest road from Vrachni to Aisthiko Dasos, 970 m, 38°01.975' N, 22°08.812' E, 22.03.2013, coll. No: Tz 14350; Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, along a forest road from Vrachni to Souvarido, 1270 m, 38°02.545' N, 22°10.174' E, 04.04.2014, coll. No: Tz 13889.

FABACEAE

51. *Astragalus hellenicus* Boiss.

Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, along the road from Kalavryta to the Ski Center, ca. 500 m after the crossroad to Planitero, at the roadsides, 1300 m, 38°00' 975" N, 22°09' 179" E, 04.06.2013, coll. No: Tr 5592.

This is a Greek endemic with distribution in the Peloponnese and Sterea Ellas (Tan & Iatrou 2001).

52. *Lathyrus grandiflorus* Sm.

Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, at the route from Mesorougi to Tessera Elata, 1303 m, 37°59.965' N, 22°13.020' E, 25.06.2012, coll. No: Tz & Tr.X515; Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, along the road from Kalavryta to the Ski Center, ca. 500 m after the crossroad to Planitero, at the roadsides, 1300 m, 38°00' 975" N, 22°09' 179" E, 04.06.2013, coll. No: Tr 5595.

This species was first collected in 1862 by J.S. Mill at a “pass from Megaspelion to the valley of the Styx” (Pearce 2006).

53. *Lens ervoides* (Brign.) Grande

Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, in calcareous rocky sites with *Quercus coccifera*, near Kastria Cave, 870 m, 37°57.610' N, 22°08.370' E, 02.05.2014, coll. No: Tz 14395.

54. *Lotus angustissimus* L.

Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, in mountain meadows from Xerokampos to Mesorougi, 1530 m, 38°01.660' N, 22°13.993' E, 25.06.2012, coll. No: Tz & Tr X473.

55. *Medicago coronata* (L.) Bartal.

Nomos Achaïas, Eparchia Kalavriton: Lykouria Kalavriton, on rocks near Ladonas springs, 450 m, 37°50.047' N, 22°10.577' E, 09.06.2012, coll. No: Tz & al. X189; Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, in the area of the Castle of Kalavryta, 988 m, 38°01.805' N, 22°07.812' E, 23.06.2012, coll. No: Tz & al. X311; Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, in calcareous rocky sites with *Quercus coccifera*, near Kastria Cave, 870 m, 37°57.610' N, 22°08.370' E, 02.05.2014, coll. No: Tz 14374; Nomos Achaïas, Eparchia Egialias: Vouraikos gorge, along the route from Zachlorou to Niamata, 480–580 m, 38°07.131' N, 22°09.964' E, 11.05.2014, coll. No: Tz 14712.

This species was reported from “Megaspilaeon” and “Kalavryta” by Bornmüller (1928: 194).

56. *Medicago polymorpha* L.

Nomos Achaïas, Eparchia Kalavriton: Lykouria Kalavriton, on rocks near Ladonas springs, 450 m, 37°50.047' N, 22°10.577' E, 09.06.2012, coll. No: Tz & al. X230; Nomos Achaïas, Eparchia Kalavriton: in agricultural and ruderal habitats, near the springs of Ladonas, 432 m, 37°50.140' N, 22°10.867' E, 09.06.2012, coll. No: Tz & al. X5B; Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, in the area of the Castle of Kalavryta, 988 m, 38°01.805' N, 22°07.812' E, 23.06.2012, coll. No: Tz & al. X372.

The species was reported from “Voreikos-Schluchten” by Bornmüller (1928: 194).

57. *Melilotus segetalis* (Brot.) Ser.

Nomos Achaïas, Eparchia Kalavriton: in agricultural and ruderal habitats, near the springs of Ladonas, 432 m, 37°50.140' N, 22°10.867' E, 09.06.2012, coll. No: Tz & al. X58; Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, in the area of the Castle of Kalavryta, 988 m, 38°01.805' N, 22°07.812' E, 23.06.2012, coll. No: Tz & al. X293.

58. *Onobrychis alba* subsp. *calcareo* (Vandas) B.W. Ball

Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, summit Velias, 1470 m, 38°00.617' N, 22°07.388' E, 23.06.2012, coll. No: Tz & al. X425.

59. *Trifolium fragiferum* L.

Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, lake Tsivlos, 720 m, 38°04.160' N, 22°14.170' E, 10.05.2014, coll. No: Tz 14416.

The species was reported by Goulimis (1948: 23) from “Mt Chelmos”, without any precise locality.

60. *Vicia grandiflora* Scop.

Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, along a forest road from Vrachni to Aisthithiko Dasos, 1085 m, 38°02.578' N, 22°09.438' E, 02.05.2014, coll. No: Tz 13915.

61. *Vicia hirsuta* (L.) Gray

Nomos Achaïas, Eparchia Egialias: Vouraikos gorge, along the route from Zachlorou to Niamata, 480–580 m, 38°07.131' N, 22°09.964' E, 11.05.2014, coll. No: Tz 14715.

62. *Vicia sativa* L. subsp. *sativa*

Nomos Achaïas, Eparchia Kalavriton: at the springs of Ladonas, 432 m, 37°50.140' N, 22°10.867' E, 09.06.2012, coll. No: Tz 14394.

63. *Vicia villosa* Roth subsp. *eriocarpa* (Hausskn.) P.W. Ball

Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, in mountain meadows from Xerokampos to Mesorougi, 1530 m, 38°01.660' N, 22°13.993' E, 25.06.2012, coll. No: Tz & Tr X454.

GERANIACEAE

64. *Erodium ciconium* (L.) L' Her.

Nomos Achaïas, Eparchia Kalavriton: at the springs of Ladonas, 432 m, 37°50.140' N, 22°10.867' E, coll. No: Tz & al. X754; Nomos Achaïas, Eparchia Kalavriton: Lykouria Kalavriton, on rocks near Ladonas springs, 450 m, 37°50.047' N, 22°10.577' E, 09.06.2012, coll. No: Tz & al. X205; Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, summit Velias, 1470 m, 38°00.617' N, 22°07.388' E, 23.06.2012, coll. No: Tz & al. X400.

HYACINTHACEAE

65. *Bellevalia dubia* (Guss.) Rchb.

Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, in calcareous rocky sites with *Quercus coccifera*, near Kastria Cave, 870 m, 37°57.610' N, 22°08.370' E, 02.05.2014, coll. No: Tz 14375.

66. *Ornithogalum sibthorpii* Greuter

Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, along a forest road from Vrachni to Aisthithiko Dasos, 970 m, 38°01.975' N, 22°08.812' E, 22.03.2013, Tz obs.; Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, along a forest road from Vrachni to Souvarado, 1400 m, 38°03.418' N, 22°11.858' E, 04.04.2014, coll. No: Tz 13890; Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, along a forest road from Souvarado to the Louka Plateau, 1400 m, 38°03.061' N, 22°11.858' E, 04.04.2014, coll. No: Tz 13995; Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, along the road to the Ski Center, 1400 m, 38°12.190' N, 22°25.133' E, 14.04.2015, Tz obs.

Despite a controversy about synonymy of *O. sibthorpii* and *O. nanum*, we refer *O. sibthorpii* following Strid & Tan (1991) and Dimopoulos & al. (2013, 2016).

IRIDACEAE

67. *Crocus olivieri* J. Gay subsp. *olivieri*

Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, along the road to the Ski Center, 1500 m, 38°00.968' N, 22°10.308' E, 22.03.2013, coll. No: Tz 14213; Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, along a forest road from Vrachni to Aisthithiko Dasos, 1050 m, 38°00.464' N, 22°09.080' E, 22.03.2013, coll. No: Tz 14339; Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, along a forest road from Souvarado to the Louka Plateau, 1400 m, 38°03.061' N, 22°11.858' E, 04.04.2014, coll. No: Tz 13994; Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, along a forest road from Souvarado to lake Tsivlos, 1440 m, 38°03.003' N, 22°11.980' E, 04.04.2014, coll. No: Tz 13905; Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, along a forest road from the Louka Plateau to Xerokampos, 1630 m, 38°01.664' N, 22°11.917' E, 04.04.2014, coll. No: Tz 13910; Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, Xerokampos, on the slopes with eastern exposure, along the road from Xerokampos to Zarouchla, 1571 m, 38°00.569' N, 22°12.125' E, 14.04.2015, coll. No: Tz obs.

68. *Romulea bulbocodium* (L.) Sebast. & Mauri

Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, along a forest road from Vrachni to Aisthithiko Dasos, 930 m, 37°50.140' N, 22°10.867' E, 22.03.2013, coll. No: Tz 14340.

JUNCACEAE

69. *Juncus articulatus* L.

Nomos Achaïas, Eparchia Kalavriton: at the springs of Ladonas, 432 m, 37°50.140' N, 22°10.867' E, 09.06.2012, coll. No: Tz & al. X44.

LAMIACEAE

70. *Sideritis purpurea* Benth.

Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, lake Tsivlos, on the lake banks, in the phrygana and garrigue close to the lake, 680–690 m, 38°04' 641' N, 22°13' 976' E, 05.06.2013, coll. No: Tr 5647. The species was reported from “Kalavryta” by Bornmüller (1928: 308).

71. *Sideritis raeseri* Boiss. & Heldr. subsp. *raeseri*

(Fig. 4)

Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, valley of the Styx ravine, 1410 m, 38°01.975' N, 22°08.812' E. coll. No: Tz 14087; Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, on the rocky slopes of Gaidourorachi, 818m, 38°01.391' N, 22°13.499' E, 17.07.2018, Ts obs.; Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, on the rocky slopes, at Tris Gynaïkes location, SW of Kertezi, 1474 m, 37°57.226' N, 21°57.669' E, 18.07.2018, Ts obs.; Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, on rocks along the path that leads to the waterfall of the Styx ravine, 2013 m, 37°58.887' N, 22°12.229' E, 20.07.2018, Ts obs.; Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, on the rocky slopes near EOS refuge, 2085 m, 37°59.163' N, 22°11.342' E, 23.07.2018, Ts obs.; Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, on the rocky



Fig. 4. *Sideritis raeseri* subsp. *raeseri* (photo by M. Tsakiri).

slopes of Gaidourorachi, 1780 m, 38°02.102' N, 22°13.097' E, 01.08.2018, *Ts* obs.; Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, on the rocky slopes near EOS refuge, 2108 m, 37°59.193' N, 22°11.310' E, 01.08.2019, *Ts* obs.; Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, on the rocky slopes near summit Avgo, 1979 m, 37°59.870' N, 22°11.019' E, 01.08.2019, *Ts* obs.

Mention deserves the fact that *Sideritis raeseri* was reported from Peloponnese (Mt Chelmos) only by Bornmüller (1928) (coll. No. 1282, collected in 1926).

The main diagnostic characteristics among *S. raeseri* subsp. *raeseri* and *S. clandestina* subsp. *peloponnesiaca*, viz. shape of basal leaves, middle and upper leaves, bracts, distance between verticillasters, and presence of corolla stripes, are not always clearly visible. Moreover, these characteristics show remarkable intrapopulation variability among the individuals. The basic characteristic to distinguish *S. raeseri* subsp. *raeseri* from *S. clandestina* subsp. *peloponnesiaca* is the glandular middle bracts. To identify *S. raeseri* subsp. *raeseri*, we have also compared our specimens with specimens of *S. raeseri* and *S. clandestina* subsp. *peloponnesiaca* deposited in the botanical museums of University of Patras and Lund.

In this report, we have confirmed the occurrence of *S. raeseri* subsp. *raeseri* in various sites on Mt Chelmos. Also, mention deserves the fact that plants considered as *S. clandestina* subsp. *peloponnesiaca*, which have been collected by cultivators from sites of Erymanthos and Killini for mountain tea cultivation, have been finally identified as *S. raeseri* subsp. *raeseri* by G. Iatrou.

LILIACEAE

72. *Gagea amblyopetala* Boiss. & Heldr.

Nomos Achaïas, Eparchia Egialias: Vouraikos gorge, 80 m, 38°09.932' N, 22°10.825' E, 05.03.2013, coll. No: *Tz* 14358; Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, along the forest road from Vrachni to Aisthitiko Dasos. 970 m, 38°01.975' N, 22°08.812' E, 22.03.2013, coll. No: *Tz* 14349.

73. *Gagea fragifera* Eher. Bayer & Lopez

Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, in a rocky area, along the route from Peristera to Xerokampos, antenas???, 1800 m, 38°01.220' N, 22°13.230' E, 10.05.2014, coll. No: *Tz* 13978.

74. *Gagea pratensis* (Pers.) Dumort

Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, near the forest road to the meadow of Xerokampos, 1540 m, 38°01.061' N, 22°11.469' E, 23.05.2014, coll. No: *Tz* 14225.

MALVACEAE

75. *Malva neglecta* Wallr.

Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, Gaidourorachi, along the route from Zarouchla to the Ski Center, 1750–1900 m, 38°01.896' N, 22°13.019' E, 26.06.2012, coll. No: *Tz* & *Tr* X608.

ORCHIDACEAE

76. *Anacamptis boryi* (Rchb. f.) R.M. Bateman & al.

Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, along a forest road from Vrachni to Aisthitiko Dasos, 995 m, 38°01.51' N, 22°09.15' E, 02.05.2014, coll. No: *Tz* 13944.

77. *Cephalanthera rubra* (L.) Rich.

Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, along the route from Mesorougi to Tessera Elata, 1303 m, 37°59.965' N, 22°13.020' E, 25.06.2012, coll. No: *Tz* & *Tr* obs.; Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, along the route from Peristera to Xerokampos, 1365 m, 37°59.969' N, 22°12.859' E, 29.06.2017, *Ts* obs.

It was reported by J.S. Mill at the “pass from Megaspelion to the valley of the Styx” in 1862 (Pearce 2006: 163).

78. *Dactylorhiza saccifera* (Brongn.) Soo subsp. *saccifera*

Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, along the route from Mesorougi to Tessera Elata, 1303 m, 37°59.965' N, 22°13.020' E, 25.06.2012, coll. No: *Tz* & *Tr* X511.

79. *Ophrys reinholdii* H. Fleischm. subsp. *reinholdii*

Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, along the road from Kalavryta to Agia Lavra, 950 m, 38°01.121' N, 22°04.513' E, 01.05.2015, *Tz* obs.

80. *Epipactis halacsyi* Robatsch

Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, along the route from Aristarchos to the Styx ravine, 1500 m, 23.07.2014, *Tz* obs.; Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, along the route from Peristera to Xerokampos, 1365 m, 37°59.969' N, 22°12.859' E, 29.06.2017, *Ts* obs.

This is a Peloponnesian endemic known from the Killini, Menalo, Parnon and Taigetos Mts (Tsiftsis & Antonopoulos 2017).

81. *Orchis mascula* (L.) L. subsp. *mascula*
Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, on calcareous rocky slopes, along the route from Peristera to Xerokampos, 1270 m, 38°01.552' N, 22°14.348' E. 10.05.2014, coll. No: Tz 13954.
82. *Orchis pauciflora* Ten.
Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, along the road from Kalavryta to the Ski Center, ca. 500 m after the crossroad to Planitero, at the roadsides, 1300 m, 38°00' 975" N, 22°09' 179" E, 04.06.2013, Tz obs.
83. *Spiranthes spiralis* (L.) Chevall.
Nomos Achaïas, Eparchia Kalavriton: Vouraikos gorge, along a forest road from the entrance of the gorge to Niamata, 10–100 m, 38°10.473' N, 22°11.93' E, 15.11.2013, coll. No: Tz X1139.
84. *Himantoglossum jankae* Somlyay, Kreutz & Óvári
Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, in openings in an oak forest, 1005 m, 37°55.635' N, 22°04.721' E, 25.05.2017, Ts obs.

OROBANCHACEAE

85. *Orobanche amethystea* Thuil. subsp. *amethystea*
Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, Xerokampos, in rocky places, 1640 m, 37°59.944' N, 22°12.885' E, 24.07.2014, coll. No: Tz & Kok 13994.
86. *Orobanche baumanniorum* Greuter
Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, along the route from Mesorougi to Tessera Elata, 1330 m, 38°00.170' N, 22°13.380' E, 25.06.2012, coll. No: Tz & Tr X518.

POACEAE

87. *Aegilops biuncialis* Vis. subsp. *biuncialis*
Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, summit Velias, 1470 m, 38°01.805' N, 22°07.812' E, 23.06.2012, coll. No: Tz & al. X394;
Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, in the area of the Castle of Kalavryta, 988 m, 38°01.805' N, 22°07.812' E, 23.06.2012, coll. No: Tz & al. X250.
It was reported “in den Tannenwäldern der Vorberge von Chelmos” by Bornmüller (1928: 332) (Slageren 1994: 156).
88. *Aegilops triuncialis* L. subsp. *triuncialis*
Nomos Achaïas, Eparchia Kalavriton: at the springs of Ladonas, 432 m, 37°50.140' N, 22°10.867' E, 09.06.2012, coll. No: Tz & al. X82.

It was reported by Bornmüller (coll. No. 1707, collected in 1926) “prope pagum Kalavryta” (Slageren 1994: 364).

89. *Brachypodium distachyon* (L.) P. Beauv.
Nomos Achaïas, Eparchia Kalavriton: Lykouria Kalavriton, on rocks near Ladonas springs, 450 m, 37°50.047' N, 22°10.577' E, 09.06.2012, coll. No: Tz & al. X147.
It was reported from “Kalavryta, steile Hänge” by Bornmüller (1928: 331)
90. *Bromus fasciculatus* C. Presl
Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, along the route from Planitero to Arbounas, 770 m, 37°55.631' N, 22°10.273' E, 09.06.2012, coll. No: Tz & al. X142.
91. *Bromus diandrus* Roth
Nomos Achaïas, Eparchia Kalavriton: at the springs of Ladonas, 432 m, 37°50.140' N, 22°10.867' E, 09.06.2012, coll. No: Tz & al. X47; Nomos Achaïas, Eparchia Kalavriton: at the springs of Ladonas, 450 m, 37°50.047' N, 22°10.577' E, 09.06.2012, coll. No: Tz & al. X55; Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, Aisthitiko Dasos, 1 km off Kalavryta to Agia Lavra, 900 m, 38°01.270' N, 22°05.320' E, 21.04.2013, Tz obs.
It was reported from “Kalavryta” by Bornmüller (1928: 330).
92. *Bromus japonicus* Thunb.
Nomos Achaïas, Eparchia Kalavriton: at the springs of Ladonas, 432 m, 37°50.140' N, 22°10.867' E, 09.06.2012, coll. No: Tz & al. X48.
93. *Bromus riparius* Rehmman
Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, in mountain meadows from Xerokampos to Mesorougi, 1830 m, 38°01.660' N, 22°13.993' E, 25.06.2012, coll. No: Tz & Tr X559; Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, in mountain meadows from Xerokampos to Mesorougi, 1530 m, 38°00.950' N, 22°12.645' E, 25.06.2012, coll. No: Tz & Tr X10.
94. *Festuca arundinacea* Scherb.
Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, on rocks along the path that leads to the waterfall of the Styx ravine, 1300–1400 m, 38°01.457' N, 22°13.411' E, 22.07.2014, Tr, Kok & Koug obs.
It was reported from Mt Chelmos by Bornmüller (1928: 330)

95. *Hordeum bulbosum* L.

Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, in mountain meadows from Xerokampos to Mesorougi, 1530 m, 38°01.200'N, 22°13.490'E, 25.06.2012, coll. No: Tz & Tr X452.

96. *Lolium rigidum* Gaudin

Nomos Achaïas, Eparchia Kalavriton: at the springs of Ladonas, 432 m, 37°50.140'N, 22°10.867'E, 09.06.2012, coll. No: Tz & al. X71.

97. *Phleum subulatum* (Savi) Asch. & Graebn.

Nomos Achaïas, Eparchia Kalavriton: at the springs of Ladonas, 432 m, 37°50.140'N, 22°10.867'E, 09.06.2012, coll. No: Tz & al. X49; Nomos Achaïas, Eparchia Kalavriton: Lykouria Kalavriton, on rocks near Ladonas springs, 450 m, 37°50.140'N, 22°10.867'E, 09.06.2012, coll. No: Tz & al. X220.

98. *Poa trivialis* L.

Nomos Achaïas, Eparchia Kalavriton: at the springs of Ladonas, 432 m, 37°50.140'N, 22°10.867'E, 09.06.2012, coll. No: Tz & al. X43.

99. *Rostraria cristata* (L.) Tzvelev

Nomos Achaïas, Eparchia Kalavriton: at the springs of Ladonas, 432 m, 37°50.140'N, 22°10.867'E, 09.06.2012, coll. No: Tz & al. X68.

100. *Vulpia ciliata* Dumort. subsp. *ciliata*

Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, Aisthitiko Dasos, 1 km off Kalavryta to Agia Lavra, 900 m, 38°01.270'N, 22°05.320'E, 28.04.2013, coll. No: Tz X941.

101. *Holcus lanatus* L. subsp. *lanatus*

Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, lake Tsivlos, close to the bridge, on banks of river Krathis, 700 m, 38°04.456'N, 22°14.215'E, 05.06.2013, coll. No: Tr 5602.

It was reported from "Kalavryta" by Bornmüller (1928:327).

POLYGALACEAE102. *Polygala comosa* Schkuhr

Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, along the route from Planitero to Arbounas, 770 m, 37°55.631'N, 22°10.273'E, 09.06.2012, coll. No: Tz & al. X131.

POLYGONACEAE103. *Rumex pulcher* subsp. *raulinii* (Boiss.) Rech. f.

Nomos Achaïas, Eparchia Kalavriton: at the springs of Ladonas, 432 m, 37°50.140'N, 22°10.867'E, 09.06.2012, Tz & al. X36.; Nomos Achaïas, Eparchia

Kalavriton: Mt Chelmos, in the area of the Castle of Kalavryta, 988 m, 38°01.805'N, 22°07.812'E, E, 23.06.2012, Tz & al. X286.

ROSACEAE104. *Agrimonia eupatoria* L. subsp. *eupatoria*

Nomos Achaïas, Eparchia Egialias: Vouraikos gorge, along a forest road from the entrance of the gorge to Niamata, 10–100 m, 38°10.220'N, 22°11.230'E, 15.11.2013, coll. No: Tz X1145.

SELAGINELLACEAE105. *Selaginella denticulata* (L.) Spring

Nomos Achaïas, Eparchia Egialias: Vouraikos gorge, along a forest road before the river, 80 m, 38°10.220'N, 22°11.230'E, 05.03.2013, coll. No: Tz 14364.

VALERIANACEAE106. *Valerianella coronata* (L.) DC.

Nomos Achaïas, Eparchia Kalavriton: Lykouria Kalavriton, on rocks near Ladonas springs, 450 m, 37°50.047'N, 22°10.577'E, 09.06.2012, coll. No: Tz & al. X232; Nomos Achaïas, Eparchia Kalavriton: Mt Chelmos, Gaidourorachi, along the route from Zarouchla to the Ski Center, 1750–1900 m, 38°01.896'N, 22°13.019'E, 26.06.2012, coll. No: Tz & Tr X641; Nomos Achaïas, Eparchia Kalavriton: Lykouria Kalavriton, on rocks near Ladonas springs, 450 m, 38°04' 641"N, 22°13' 976" E, 03.06.2013, coll. No: Tr 5541.

VERONICACEAE107. *Veronica polita* Fr.

Nomos Achaïas, Eparchia Egialias: Vouraikos gorge, along a forest road before the river, 80 m, 38°10.220'N, 22°11.230'E, 05.03.2013, coll. No: Tz 14368.

ZYGOPHYLLACEAE108. *Tribulus terrestris* L.

Nomos Achaïas, Eparchia Kalavriton: Lykouria Kalavriton, on rocks near Ladonas springs, 450 m, 37°50.130'N, 22°10.550'E, 23.09.2012, Tz obs.

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References

- Antonopoulos, Z. & Tsiftsis, S.** 2017. Atlas of the Greek Orchids. Vol. II. Mediterraneo Editions, Rethymno.
- Authier, P.** 2014. Reports 1–24. – In: **Vladimirov, V. & al.** (comps), New floristic records in the Balkans: 24. – *Phytol. Balcan.*, **20**(1): 99–137.
- Bogdanović, S., Brullo, C., Brullo, S., Giusso del Galdo, G., Musarella, C., M., & Salmeri, C.** 2011. *Allium achaium* Boiss. (Alliaceae), a critical species of the Greek flora. – *Candollea*, **66**: 57–64.
- Bornmüller, J.** 1928. Ergebnis einer botanischen Reise nach Griechenland im Jahre 1926 (Zante, Cephalonia, Achaia, Phokis, Aetolien). – *Repert. Spec. Nov. Regni Veg.*, **25**: 161–203, 270–350.
- Dafis, S., Papastergiadou, E., Lazaridou, E., Tsiadouli, M.** 2001. Technical Guide for Identification, Description and Mapping of Habitat Types of Greece (in Greek). Thessaloniki: Greek Biotope/Wetland Centre.
- Dimopoulos, P., Raus, T., Bergmeier, E., Constantinidis, T., Iatrou, G., Kokkini, S., Strid, A., Tzanoudakis, D.** 2013. Vascular plants of Greece: An annotated checklist. – *Englera*, **31**: 1–372.
- Dimopoulos, P., Raus, T., Bergmeier, E., Constantinidis, T., Iatrou, G., Kokkini, S., Strid, A., Tzanoudakis, D.** 2016. Vascular plants of Greece. An annotated checklist. Supplement. – *Willdenowia*, **46**(3): 301–347.
- Flora of Greece – An annotated checklist.** – <http://portal.cybertaxonomy.org/flora-greece>.
- Giannopoulos, K., Tan, K., Vold, G.** 2011. Reports 25–69. – In: **Vladimirov, V. & al.** (comps), New floristic records in the Balkans: 17. – *Phytol. Balcan.*, **17**(3): 361–384.
- Greuter, W., Burdet, H. M., & Long, G.** (eds) 1984–1989. Med-Checklist, Vols 1,3 and 4. Genève: Conservatoire et Jardin Botanique de la Ville du Genève; Med-Checklist Trust of OPTIMA.
- Greuter, W. & Raab-Straube, V.** 2008. Med-Checklist. Vol. 2. Palermo, Geneve, Berlin: Optima Secretariat, Med-Checklist Trust of OPTIMA.
- Halácsy, E.v.** 1900–1904. *Conspectus Flora Graecae*. Vol. 1,2,3. Lipsiae: Sumptibus Guilelmi Engelmann.
- Halácsy, E.v.** 1908. *Supplementum secundum Conspectus Florae Graecae*. Lipsiae: Sumptibus Guilelmi Engelmann.
- Hartvig P.** 1991. *Blysmus* Panzer. – In: **Strid A. & Tan K.** (eds) *Mountain Flora of Greece*, vol. 2, pp. 833–834. Univ. Press, Edinburgh.
- Kalpoutzakis, E., Constantinidis, T., Trigas, P.** 2019. Chorological additions for some noteworthy taxa of the Greek flora. – *Bot. Chron. (Patras)*, **22**: 233–249.
- Kofinas, G., & Tan, K.** 2020. Reports 43–48. – In: **Vladimirov V. & al.** (comps), New floristic records in the Balkans: 41. – *Phytol. Balcan.*, **26**(1): 163–179.
- Kokkoris, I., Dimitrellos, G., Kougioumoutzis, K., Laliotis, I., Georgiadis, T., Tiniakou, A.** 2014. The native flora of Mountain Panachaikon (Peloponnese, Greece): new records and diversity. – *J. Biol. Res. (Thessalon)*, **21**(9).
- Pearce, N.R.** 2006. Joahn Stuart Mill's botanical collections from Greece (a private passion). – *Phytol. Balcan.*, **12**(2): 149–164.
- Pearce, N. R.** 2006. John Stuart Mill's botanical collections from Greece (a private passion). – *Phytol. Balcan.*, **12**(2): 149–164.
- Phitos, D., Konstantinidis, T., & Kamari, G.** 2009. The Red Data Book of Rare and Threatened Plants of Greece. Vol.1 (A–D) & Vol.2 (E–Z), (in Greek). Hellenic Botanical Society, Patras.
- Phitos, D., Strid, A., Snogerup, S., & Greuter, W.** 1995. The Red Data Book of Rare and Threatened Plants of Greece. WWF Greece.
- Polymenakos, K. & Tan, K.** 2012. Reports 106–113. – In: **Vladimirov, V. & al.** (comps), New floristic records in the Balkans: 18. – *Phytol. Balcan.*, **18**(1): 69–92.
- Polymenakos, K. & Tan, K.** 2015. Reports 217–234. – In: **Vladimirov V. & al.** (comps), New floristic records in the Balkans: 26. – *Phytol. Balcan.*, **21**(1): 53–91.
- Polymenakos, K. & Tan, K.** 2019. Reports 114–128. – In: **Vladimirov V. & al.** (comps), New floristic records in the Balkans: 40. – *Phytol. Balcan.*, **25**(3): 295–335.
- Polymenakos, K., Bonetti, A., Fakas, G., Tan, K.** 2011. Reports 74–83. – In: **Vladimirov, V. & al.** (comps), New floristic records in the Balkans: 17. – *Phytol. Balcan.*, **17**(1): 129–156.
- Quézel, P. & Katrabassa, M.** 1974. Premier aperçu sur la végétation du Chelmos (Peloponèse). – *Biol. Écol. Médit.* **1**(1): 11–25.
- Slageren, M.W. van** 1994. Wild wheats: A monograph of *Aegilops* L. and *Amblyopyrum* (Jaub. & Spach) Eig (*Poaceae*). – Wageningen Agric. Univ. Pap. **94-7**: xiv + 512 pp.
- Strid, A.** 1986. *Mountain Flora of Greece*. Vol. 1. Cambridge: Cambridge University Press.
- Strid, A. & Tan, K.** 1991. *Mountain Flora of Greece*. Vol. 2. Edinburgh University Press, Edinburgh.
- Strid, A. & Tan, K.** 1997. *Flora Hellenica 1*. Koeltz Scientific Books, Königstein.
- Strid, A. & Tan, K.** 2002. *Flora Hellenica 2*. Koeltz Scientific Books, Königstein.
- Tan, K. & Iatrou, G.** 2001. *Endemic Plants of Greece. The Peloponnese*. Gads Forlag, Copenhagen.
- Tan, K. & Issigoni, M.** 2015. Reports 82–84. – In: **Vladimirov V. & al.** (comps), New floristic records in the Balkans: 27. – *Phytol. Balcan.*, **21**(2): 189–219.

- Tan, K., Bonetti, A., Lafranchis, T. 2010. Reports 74-82. – In: Vladimirov V. & al. (comps), New floristic records in the Balkans: 13. – Phytol. Balcan., 16(1): 143-165.
- Tan, K., Lafranchis, T., Vold, G. 2010b. Reports 162-164. – In: Vladimirov V. & al. (comps), New floristic records in the Balkans: 14. – Phytol. Balcan., 16(3): 415-445.
- Tan, K., Sfikas, G., Vold, G., Lafranchis, T. 2009. Reports 75-89. – In: Vladimirov, V. & al.(comps), New floristic records in the Balkans: 10. – Phytol. Balcan., 15(1): 15-139.
- Tan, K., Vold, G., Sfikas, G. 2007. Report 64-75. – In: Vladimirov, V. & al.(comps), New floristic records in the Balkans: 5. – Phytol. Balcan., 13 (2): 261-276.
- Tan, K., Vold, G., Iatrou, G., Sfikas, G. 2006. Reports 47-68. – In: Vladimirov, V. & al.(comps), New floristic records in the Balkans: 1.– Phytol. Balcan., 12 (1): 107-128.
- Tsiftsis, S. & Antonopoulos, Z. 2017. Atlas of the Greek Orchids. Vol. I. Mediterraneo Editions, Rethymno.
- Tutin, T. G., Burges, N. A., Chater, A. O., Edmondson, J. R., Heywood, V. H., Moore, D. M., Valentine, D. H., Walters, S. M. & Webb, D. A. (ed.) 1993: Flora Europaea, 1. *Psilotaceae* to *Platanaceae*. Ed. 2. University Press, Cambridge.
- Tutin, T. G., Heywood, V. H., Burges, N. A., Moore, D. M., Valentine, D. H., Walters, S. M. & Webb, D. A. (ed.). 1964-1980: Flora Europaea. 1 (1964), 2 (1968), 3 (1972), 4 (1976), 5 (1980). Cambridge Univ. Press.
- Tzanoudakis, D. & Kypriotakis, Z. 2008. *Allium brussalisii* (Alliaceae), a new species from Greece. – Bot. J. Linn. Soc., 158: 140-146.
- Tzanoudakis, D., Tsakiri, M., Rhaus, T. 2019. What is *Allium achaium* Boiss. & Orph.? Disentangling the taxonomy of a Greek mountain species. – Willdenowia, 49: 231-239.
- Zarkos, G., Christodoulou, V., Tan, K. 2012. Reports 130-136. – In: Vladimirov, V. & al. (comps), New floristic records in the Balkans: 19. – Phytol. Balcan., 18(2): 205-230.
- Zarkos, G., Christodoulou, V., Tan, K., Vold, G. 2014. Reports 244-265. – In: Vladimirov V. & al. (comps), New floristic records in the Balkans: 25. – Phytol. Balcan., 20(2-3): 267 – 310.
- Zarkos, G., Christodoulou, V., Tan, K., Vold, G. 2015. Reports 137-238. – In: Vladimirov V. & al. (comps), New floristic records in the Balkans: 28. – Phytol. Balcan., 21(3): 367-399.
- Zarkos, G., Christodoulou, V., Tan, K., Vold, G. 2016. Reports 119-123. – In: Vladimirov V. & al. (comps), New floristic records in the Balkans: 29. – Phytol. Balcan., 22(1): 93-123.
- Zarkos, G., Christodoulou, V., Tan, K., Vold, G. 2016b. Reports 163-185. – In: Vladimirov V. & al. (comps), New floristic records in the Balkans: 30. – Phytol. Balcan., 22(2): 259-292.
- Zarkos, G., Christodoulou, V., Tan, K., Vold, G. 2017. Reports 89-114. – In: Vladimirov V. & al. (comps), New floristic records in the Balkans: 32. – Phytol. Balcan., 23(1): 119-146.
- Zarkos, G., Christodoulou, V., Tan, K., Vold, G. 2017b. Reports 213-235. – In: Vladimirov V. & al. (comps), New floristic records in the Balkans: 33. – Phytol. Balcan., 23(2): 281-329.
- Zarkos, G., Christodoulou, V., Tan, K., Vold, G. 2018. Reports 156-180. – In: Vladimirov V. & al. (comps), New floristic records in the Balkans: 36. – Phytol. Balcan., 24(2): 263-392.
- Zarkos, G., Christodoulou, V., Tan, K., Vold, G. 2019. Reports 109-117. – In: Vladimirov V. & al. (comps), New floristic records in the Balkans: 39. – Phytol. Balcan., 25(2): 203-238.
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