



New species for the vascular flora of Republic of Macedonia and their distribution in the Balkan Peninsula

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ABSTRACT: During several botanical expeditions in the Republic of Macedonia (Mt Jablanica and Mt Baba: Pelister), a new genus *Amphoricarpus* Vis. and five new species for the flora of Macedonia were found: *Euphorbia montenegrina* (Bald.) K. Malý ex Rohlena, *Prangos ferulacea* (L.) Lindl., *Tanacetum larvatum* (Griseb. ex Pant) Hayek, *Amphoricarpus autariatus* Blečić & E. Mayer and *Allium phthioticum* Boiss. & Heldr. Most of them are mountainous Balkan (sub)endemics with less than 30 populations and with the center of distribution in southeastern Dinaric Alps. In this paper we discuss the phytogeographical importance of these five plants in the light of their new, more accurate distribution ranges in the Balkan Peninsula. In addition, new floristic records for the same species in the neighbouring Balkan countries (Albania, Montenegro and Serbia) are also presented.

KEY WORDS: vascular flora, new records, distribution ranges, Republic of Macedonia, Balkan Peninsula

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INTRODUCTION

The flora of the Republic of Macedonia is among the richest floras not only in respect to the Balkan Peninsula, but also in the context of the whole European continent. According to recent data (MATEVSKI *et al.* 2003), 210 families, 920 genera and 3700 species comprise the flora of higher plants, angiosperms being the richest group with about 3200 species. The current Macedonian flora represents a mosaic of various floral elements – Tertiary relicts, Mediterranean, Greek-Asia Minor, Caucasian, arcto-alpine, middle-European, Euroasian, holarctic and cosmopolitan (MATEVSKI 2013). Endemic taxa (Illirian, Scardo-pindic, Balcan etc.) represent a special characteristic and value of the Macedonian flora. Among

them, 114 flowering plant species are Macedonian endemics (MICEVSKI & MATEVSKI 1987; MATEVSKI *et al.* 2003; MATEVSKI 2013).

Such richness and diversity of vascular plants on a relatively small geographic area is the result of diverse geological, geomorphological and climatic factors, as well as of historic circumstances that contributed to the establishment of different floral types (Tertiary, glacial, boreal, xerothermic, endemic) in this area (MATEVSKI 2013; MELOVSKI *et al.* 2010). Beside that, the Macedonian flora has been intensively studied for more than a century and there are many data about species presence and their distribution in the area (GRISEBACH 1843; BORNMÜLLER 1925, 1926, 1928, 1937; MICEVSKI 1985-2005; MATEVSKI 2010). Floristic contributions with new species and/or

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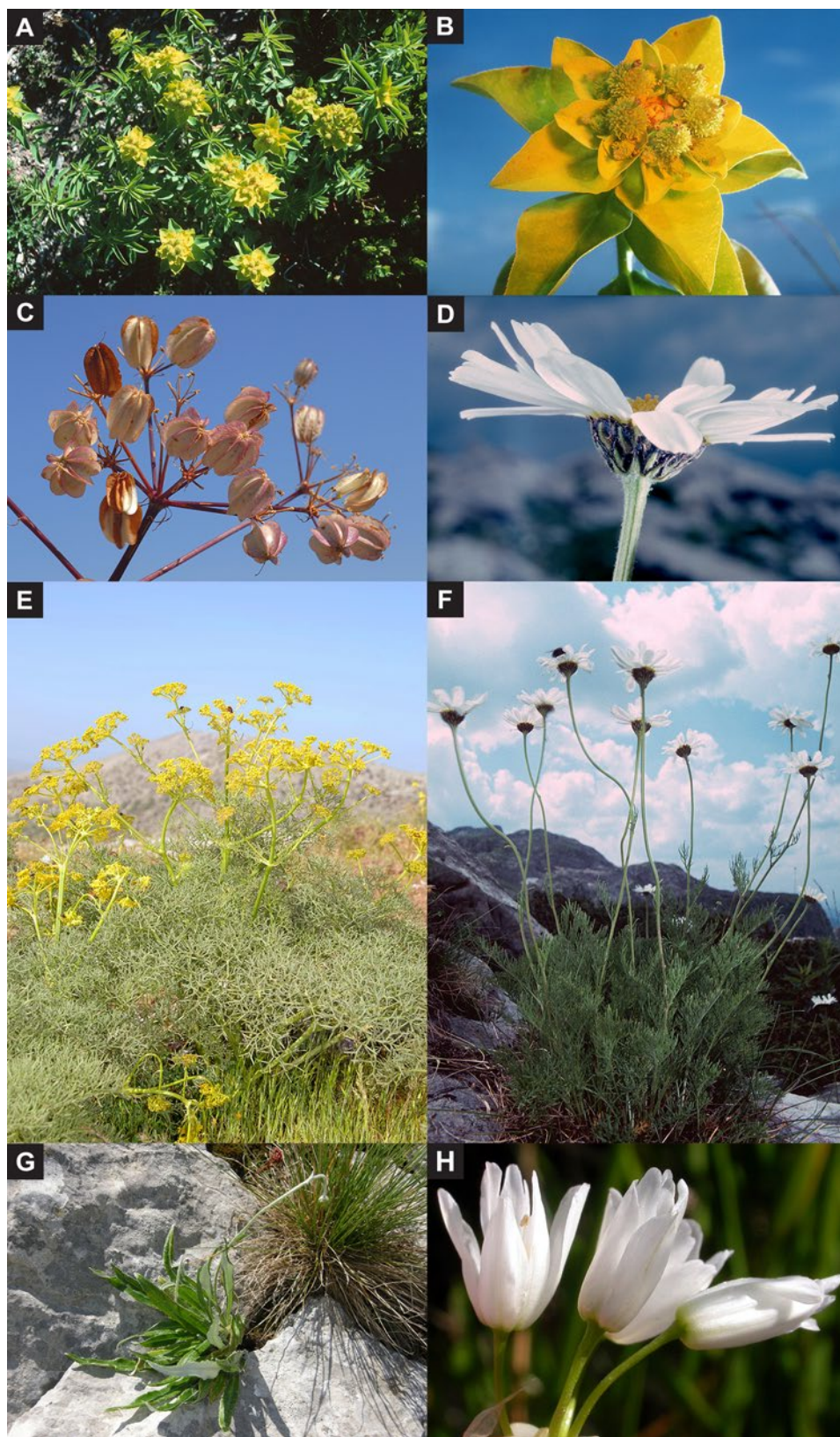


Fig. 1. a, b - *Euphorbia montenegrina* from Mts. Prokletije, Maja Sapica (photo M. Niketić); c, e - *Prangos ferulacea* from Mt Baba (Pelister), Crvena Stena (photo M. Niketić); d, f - *Tanacetum larvatum* from Mts Prokletije, Mt Maja Kolata (photo M. Niketić); g - *Amphoricarpus autariatus* from Mt Jablanica, Malo Sedlo peak (photo G. Tomović); h - *Allium phthioticum* from Mt Jablanica, Podgorečko Ezero (the lake surroundings) (photo G. Tomović)

findings for the flora of Macedonia are regularly published in addition to monographic publications (MATEVSKI 2002, 2002-2003; MATEVSKI & TEOFILOVSKI 2004, 2011; MATEVSKI *et al.* 2005, 2008, 2011; NIKETIĆ *et al.* 2007; DIMITROV 2007a, 2007b, 2011, 2012; MATEVSKI & KOSTADINOVSKI 2009; STEVANOVIĆ *et al.* 2009, 2010).

Because of these characteristics, 42 Important Plant Areas were recently identified across Macedonian territory (MELOVSKI *et al.* 2010).

This paper represents the continuation of floristic and chorological studies of the vascular flora of the Republic of Macedonia. Five new species for the flora of Macedonia, collected at different localities on southwestern mountains Jablanica and Pelister, are presented in this paper. New findings for the same species in surrounding Balkan countries (Albania, Montenegro and Serbia) are also presented.

MATERIAL AND METHODS

The study was based on fieldwork in Mt Jablanica during the years 2006 and 2013 as well as in Mt Pelister in 2012. Besides the field survey, checking and revision of herbarium material and relevant literature sources were used for supplementation of the distribution records. Distribution of the species in the Republic of Macedonia and the Balkan Peninsula was mapped on 10 × 10 sq. km using the UTM grid system (UTM Zones 33-35T). New records included findings that had not been registered in the literature for individual UTM squares so far. Imprecise records relate to wider localities which included two or more UTM 10 × 10 squares.

Collected plant material was deposited in the Herbarium of the Institute of Botany and Botanical Garden “Jevremovac”, University of Belgrade (BEOU), the Herbarium of the Natural History Museum in Belgrade (BEO) and the Herbarium of the Naturhistorisches Museum Wien, Austria (W), (THIERS 2013; <http://sweetgum.nybg.org/ih>) as well as in the Biology Students Research Society herbarium of the Faculty of Natural Sciences and Mathematics in Skopje. Nomenclature used was according to the databases Euro+Med Plantbase (<http://ww2.bgbm.org/EuroPlusMed/query.asp>) or IOPI (<http://plantnet.rbgsyd.nsw.gov.au/iopi/iopihome.htm>).

RESULTS AND DISCUSSION

Euphorbia montenegrina (Bald.) K. Malý ex Rohlena – EUPHORBIACEAE (Fig. 1a, b)

This perennial species is usually classified in *E.* sect. *Helioscopia* Dumort. (SMITH & TUTIN 1968; RIINA *et al.* 2013), although GELTMAN (2008) considers that it is reasonable to include perennial species of *E.* sect.

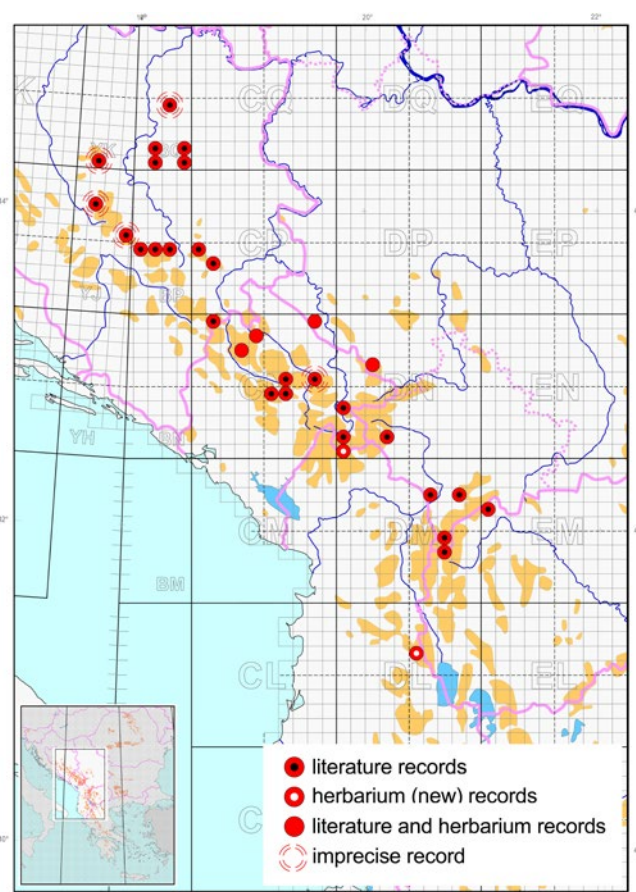


Fig. 2. Distribution of the species *Euphorbia montenegrina* (Bald.) K. Malý ex Rohlena in the Balkan Peninsula

Helioscopia into the separate section, *E.* sect. *Chamaebuxus* Lázaro. There is a widespread opinion that *E. montenegrina* belongs to the *E. epithymoides* group, which includes five closely related species and subspecies centered in the Balkan peninsula (SMITH & TUTIN 1968). This opinion was not supported by molecular analysis (RIINA *et al.* 2013) which indicated that *E. montenegrina* is in a separate clade from *E. epithymoides* L., together with *E. verrucosa* L. and *E. flavicomma* DC.

E. montenegrina is a Balkan endemic species distributed in the Dinaric Alps, mountains of Bosnia and Herzegovina (LUBARDA 2013), Montenegro (ROHLENA 1942) and Serbia (TOMOVIĆ 2007) as well as in Mts. Šar Planina in Serbia (LAZAREVIĆ *et al.* 2013). It was also recorded in the low-altitude serpentine area of northern Bosnia and Herzegovina, together with closely related *E. gregersenii* K. Malý ex G. Beck (AQUARO *et al.* 2007). It occurs on different geological substrata usually on stony sites in the zone of *Pinetum sylvestris-nigrae*, *Picea abies*, *Pinus peuce* or *Pinus mugo* communities. Its chromosome number ($2n = 22$) was counted by AQUARO *et al.* (2007).

First record in the Republic of Macedonia: Mt Jablanica: Podgorečko Ezero (the lake surroundings), rocks,

2000 m, conglomerate (limestone + silicate), DL56, coll./det. M. Niketić, 18-Jul-2006 (BEOU 21602; BEO 20060710).

New record in Montenegro: Mts. Prokletije: Maja Sapica (Kunj Kadis), rocky pastures, 2000 m, silicate, DN00, coll./det. M. Niketić, 07-Jul-1995 (BEO 19950705).

This species was not quoted in the Flora of the Republic of Macedonia (MICEVSKI 1998). The newly-discovered locality of *E. montenegrina* represents the southernmost distributional border for the species. Only recently, new localities of this plant from Montenegro (PETROVIĆ 2008) and southwestern Serbia (LAZAREVIĆ *et al.* 2013: 281-282) were also reported. The nearest locality from Mt Jablanica is situated c. 85 km northwards on Mts. Šar Planina (Šutman) in Serbia (AMIDŽIĆ *et al.* 1999: 65) (Fig. 2). The population on Mt Jablanica is limited to the rocks around the lake and has fewer than 100 individuals.

***Prangos ferulacea* (L.) Lindl. – APIACEAE (Fig. 1c, e)**
≡ *Cachrys ferulacea* (L.) Calest.

The genus *Prangos* Lindl. includes xerophyllous species mostly distributed in East Mediterranean, southeastern and central Asia, with a diversity centre in Irano-Turanian phytogeographical region (DUMAN 2000, DURAN *et al.* 2005). The number of species of the genus varies in

different literature sources. According to DURAN *et al.* (2005) the genus has “almost 28 species”. In The Plant List (<http://www.theplantlist.org>) there are ca. 18 accepted names, but a dozen of unresolved names from the Eastern Mediterranean are accepted in Euro+Med (2006–). *P. ferulacea* is the type species of the genus and it has a widespread range across the C and E Mediterranean, Near and Middle East: central part of the Apennine Peninsula, Sicily, Balkan Peninsula (Croatia, Montenegro, Albania, Serbia, Bulgaria, Greece), Romania, Anatolia, Transcaucasus, southwest Asia (to Israel to the south) and Middle East (Iran, Turkmenistan). In the global IUCN Red List of Threatened Plants (WALTER & GILLET 1998: 587) it has vulnerable (V) status.

This aromatic plant has a scattered distribution in the Balkan Peninsula. It grows mostly in mountainous areas between 1000 and 2000 m s.m. (southeastern Dinaric Alps, Scardo-Pindic mountain range and northern Peloponnese) but in the far west (Croatia) and east (Bulgaria) it is only known at lower altitudes. The species inhabits rocky and sunny places, prefers limestone substrate, but it was also recorded on serpentinite in Albania (MARKGRAF 1931). Its chromosome number ($2n = 66$) is known from Anatolia (MARHOLD & BREITWIESER 2010).

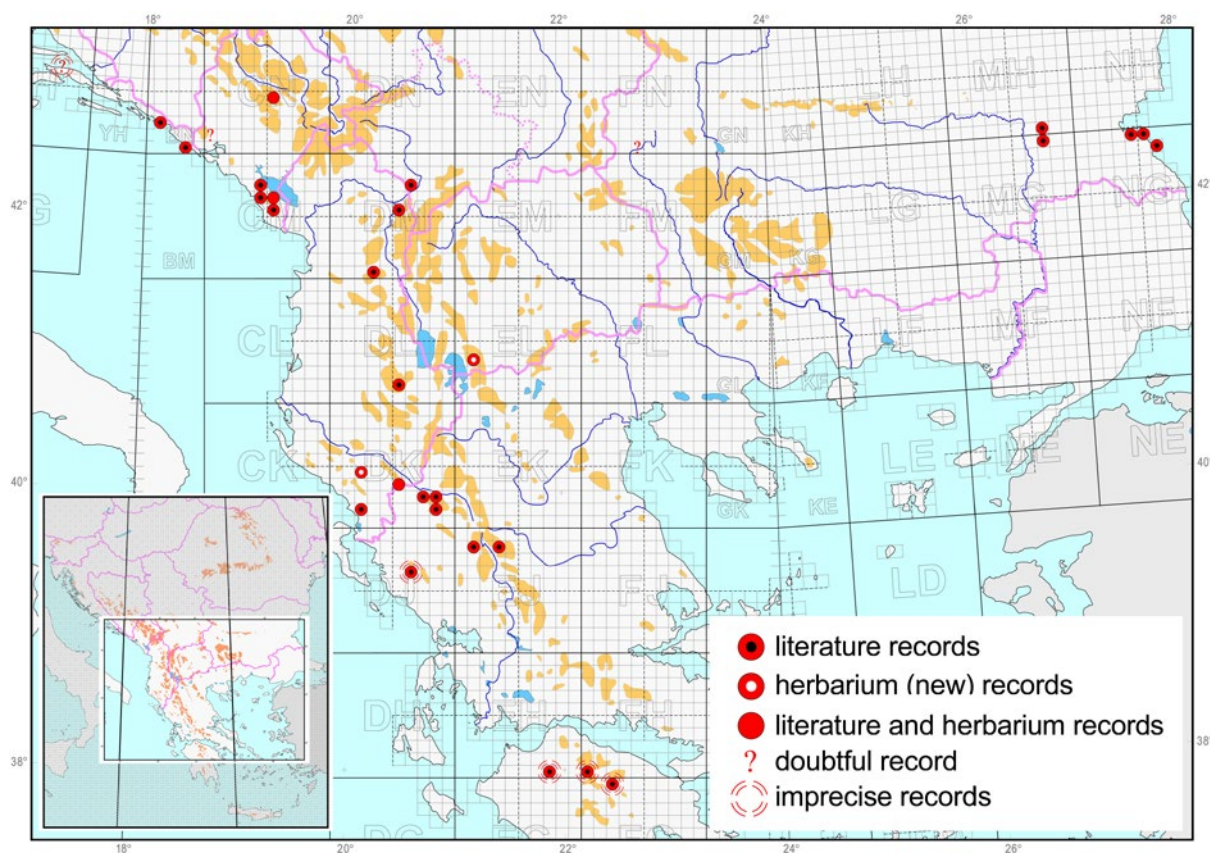


Fig. 3. Distribution of the species *Prangos ferulacea* (L.) Lindl. in the Balkan Peninsula

First record in the Republic of Macedonia: Mt Baba: Pelister (Crvena Stena), rocky ground beside *Pinus peuce* forest, 1740 m, silicate, EL13, coll./det. M. Niketić, 19-Jul-2012 (BEO 20120715), 30-Aug-2012 (BEO 20120809).

New record in Albania: Mt Mal i Lunxërisë: Qafa Çajup, rocky ground, c. 1400 m, limestone, DK24, coll./det. M. Niketić, 17-May-2013 (BEO 20130517).

New record in Montenegro: Mts. Prokletije: Mt Žijevo, near the peak, 2000 m, limestone, CN71, coll./det. M. Niketić, 25-Aug-2011 (BEO 20110813).

In the Flora of the R. of Macedonia this species was not mentioned, while the single representative of the genus *Prangos* which grows in Macedonia is *Prangos trifida* (Mill.) Herrnst. & Heyn (published under the name *Cachrys alpina* M. Bieb. in MATEVSKI 2005: 1589-1590). The nearest population of *P. ferulacea* is c. 60 km westward from Mt Baba on serpentinite massif Mt Mal i Alamanit (MARKGRAF 1931) (Fig. 3). Notably, the newly-discovered population in Macedonia inhabits siliceous geological substrate which has not been known as a species habitat so far for the Balkan Peninsula. However, in other regions, the species often occurs on siliceous substrata, as in Sicily (MANISCALCO & RAIMONDO 2009, BRULLO *et al.* 2012). The population on Mt Baba is estimated to consist of fewer than 50 individuals, but presumably this species could also be found on unexplored rocky slopes which are numerous in the area.

Tanacetum larvatum (Griseb. ex Pant.) Hayek – ASTERACEAE (Fig. 1d, f)

≡ *Chrysanthemum larvatum* Griseb. ex Pant.

This is a neglected Balkan endemic species which was not mentioned in Flora Europaea (HEYWOOD & ALAVI 1976) even as a synonym. Due to its pinnatifid, glandular-punctate leaves and solitary capitula it resembles a parapatric oromediterranean subadriatic endemic *T. cinerariifolium* (Trevir.) Sch. Bip. from the section *T. sect. Cinerariifolia* (Heywood) Alavi at first glance. However, the results of recent phytochemical studies of this aromatic plant showed significant similarity to *T. parthenium* (L.) Sch. Bip. from the section *T. sect. Pyrethrum* (Zinn.) Rchb. f. (PETROVIĆ *et al.* 2003; BULATOVIĆ *et al.* 2006, ALJANČIĆ *et al.* 2010; TADIĆ *et al.* 2010).

T. larvatum is a subalpine endemic species which grows between 1500 and 2400 m s.m. The main part of the species range comprises limestone grounds of the southeastern Dinaric Alps (Albania, Montenegro and Kosovo in Serbia). A disjunct part of the species range is located to the south, in the northern part of the Scardo-Pindic massif, on serpentinite grounds of Mt Mal i Alamanit and Mt Guri Topit in eastern Albania (MARKGRAF 1931). The species inhabits limestone rocks in the zones of subalpine beech forest (*Fagetum subalpinum*) or dwarf mountain pine

(*Pinetum mugii*), rarely Macedonian pine (*Pinetum peucis* in Mts. Prokletije). It often forms particular communities (from the endemic order *Amphoricarpetalia*) on the rocky blocks and crevices, usually on north-facing slopes.

First records in the Republic of Macedonia: Mt Jablanica: Crn Kamen peak, high-mountain pastures and rocky ground, 1600-1800 m, conglomerate (limestone + serpentinite), 18-Jul-2006, DL66, coll./det. M. Niketić, G. Tomović (BEOU 21525; BEO 20060710); Strižek peak, high-mountain pastures and rocky ground, 1800-2200 m, limestone, DL67, coll./det. M. Niketić, G. Tomović, 19-Jul-2006 (BEOU 21647; BEO 20060711).

New records in Serbia: Mts. Prokletije: Mt Hajla, 2200m, limestone, DN23, DN33, coll./det. M. Niketić, 03-Sep-1997 (BEO 19970902); Mt Marijaš, 2000 m, limestone, DN21, coll./det. M. Niketić, 28-Aug-1997 (BEO 19970813); Mt Nedžinat (Nedžinat lake), 1900 m, limestone, DN22, coll./det. M. Niketić, 02-Sep-1997 (BEO 19970901).

New record in Montenegro: Mts. Prokletije: Mt Maja Kolata, rocky places, 2300 m, limestone, DN10, coll. V. Stevanović, D. Lakušić, M. Niketić, Z. Bulić, S. Hadžiahlović 05-Jul-1995 (BEOU 718/95; BEO 19950703).

So far there are no data about the presence of this species in the R. of Macedonia (BORNMÜLLER 1926). The occurrence of *T. larvatum* in the southwestern part of R. of Macedonia represents the easternmost locality of the species distribution range, spatially closest to the localities on serpentinite massifs of Mt Mal i Alamanit and Mt Guri Topit in eastern Albania (Fig. 4). At a single locality on Mt Jablanica this species grows both on serpentinite and limestone bedrock. A large number of individuals were found at both localities (more than 1000) on Mt Jablanica.

Amphoricarpus autariatus Blečić & E. Mayer – ASTERACEAE (Fig. 1g)

= *A. neumayerianus* subsp. *murbeckii* Bošnjak

Amphoricarpus Vis. is a small genus of the tribe *Cardueae* with five mountainous locally-restricted species. Recent morphological (PETIT 1997; GARNATJE & MARTIN 2007) and molecular (ANDERBERG *et al.* 2007; WANG *et al.* 2007; BARRES *et al.* 2012) studies have clearly shown that the genus belongs to the *Xeranthemum* group together with *Xeranthemum* L., *Siebera* J. Gay and *Chardinia* Desf. The relict status of the genus was also confirmed by cytogenetic records. *Amphoricarpus* has a lower DNA content compared with other genera of the group; thus it “appears as the ancestral genus in the group, according to the molecular analyses (unpublished results) and also according to the life form (it is a perennial genus)” (GARNATJE *et al.* 2004a, 2004b). The distribution range of the genus is discontinuous, being found on the mountains

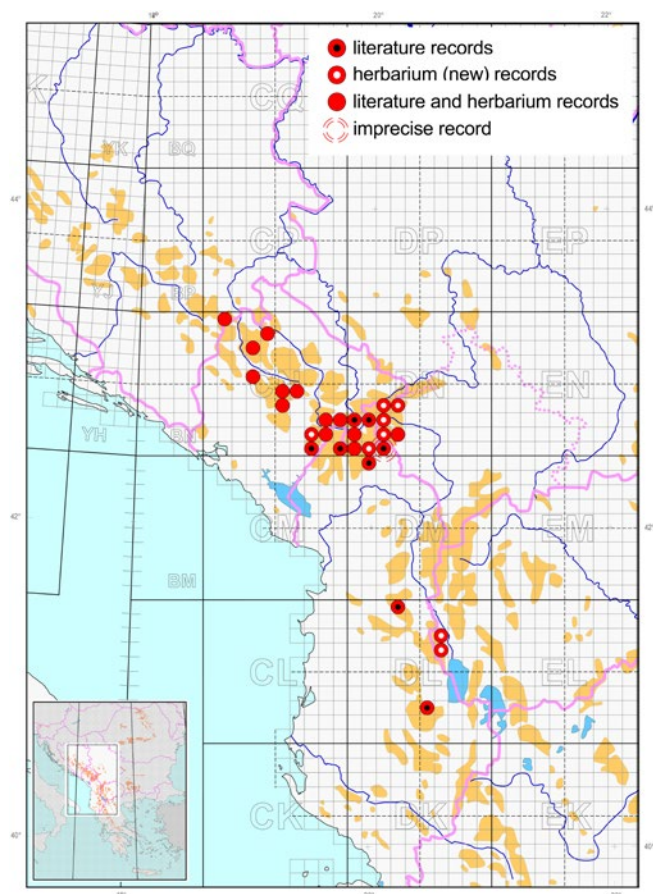


Fig. 4. Distribution of the species *Tanacetum larvatum* (Griseb. ex Pant.) Hayek in the Balkan Peninsula

of the Balkans, Asia Minor and the Caucasus. *A. autariatus* Blečić & Mayer and *A. neumayerianus* (Vis.) Greuter are distributed in the western Balkans (Dinaric Alps and Scardo-Pindic mountain chain); the other two species, *A. exsul* O. Schwarz and *A. praedictus* Ayasligil & Grierson, are known from Mts. Taurus chain in southwestern Anatolia, while the remaining species *A. elegans* Albov is endemic for the western Caucasus in Georgia.

The type species of the genus is oromediterranean *A. neumayerianus* (Vis.) Greuter, which has a range restricted to the eastern Adriatic coastal mountains (Mt Orjen, Mt Lovćen) (BLEČIĆ & MAYER 1967). These authors also distinguished a vicarious sibling species, *A. autariatus*, which inhabits subalpine rocky slopes and surrounding canyons and gorges of the southeastern Dinaric Alps with several enclaves in the Scardo-Pindic mountain range in Albania and Epirus in northwestern Greece. Two subspecies were recognized: *A. a.* subsp. *autariatus* in the northwest (Bosnia and Herzegovina and northwestern Montenegro) and *A. a.* subsp. *bertisceus* Blečić & Mayer in the southeast (Montenegro, Kosovo in Serbia, Albania and northwestern Greece). However,

current morphological evidence suggests that there is not much reason for separation of these taxa. Furthermore, it seems that identification of the species *A. neumayerianus* and *A. autariatus* can sometimes be difficult, and their ranges occasionally overlap (JANAČKOVIĆ *et al.* 2011). Therefore, some authors treat *A. autariatus* as a subspecies - *A. neumayerianus* subsp. *murbeckii* Bošnjak (WEBB 1976; TAN 1991; JANAČKOVIĆ *et al.* 2011), though according to GREUTER & RAAB-STRAUBE (2008) both species and both subspecies are accepted.

A. autariatus usually grows on southern exposed limestone or dolomite rocky crevices in the subalpine (-alpine) belt (1500-2200 m s.m.) or in canyons (600-1500 m s.m.). It is a characteristic species of the western Balkan chasmophytic vegetation of the order *Amphoricarpetalia*. Its communities are commonly found in the area of endemorelict Bosnian pine (*Pinus heldreichii*), as well as in the zone of beech forest, *Pinus nigra*, *Picea abies* etc. The species has the same chromosome number ($2n = 24$) as *A. neumayerianus* (GARNATJE *et al.* 2004a, 2004b; counted from Mt Prenj in Herzegovina as "*Amphoricarpos neumayeri*"). Recently, several studies have been reported to identify the chemical composition and pharmacological activity of the plant (ĐORĐEVIĆ *et al.* 2004; GAVRILOVIĆ *et al.* 2013; JADRANIN *et al.* 2013).

First record in the Republic of Macedonia: Mt Jablanica: Malo Sedlo peak, rock crevices, c. 1980 m, limestone, 20.530393° E, 41.211742° N, DL66, coll. M. Niketić, G. Tomović, S. Đurović, U. Buzurović, det. G. Tomović, M. Niketić, 24-Jul-2013 (BEOU, 37150; BEO, 20130716).

New record in Serbia: Priboj, canyon of the river Ljutina (Sutjeska), 650 m, limestone, DN21, coll./det. V. Stevanović, D. Lakušić, M. Niketić, 04-Oct-1991 (BEOU 2855/91, BEO 19911004).

This genus was not cited for the Flora of Macedonia (BORNMÜLLER 1926). The population in Mt Jablanica is situated between the northern (Mt Mal i Gjalicës, Mt Koritnik) and southern (Mal i Tomorit, Mt Gramos) parts of the species distribution range in the Scardo-Pindic mountain chain (Fig. 5). Despite the detailed field survey on Mt Jablanica, only a single individual was found. Most likely it came from a more numerous subpopulation which inhabits nearby unexplored limestone slopes on the Albanian side of the mountain. The collected specimen was not in blossom yet. Therefore it was not identified to the subspecific level (*sensu* BLEČIĆ & MAYER 1967), although phytogeographically it probably belongs to *A. autariatus* subsp. *bertisceus*.

The new record for *A. autariatus* for Serbia in the vicinity of Priboj (canyon of the river Ljutina) is the first for the flora of 'Serbia proper' (the part of Serbia excluding the provinces of Vojvodina and Kosovo).

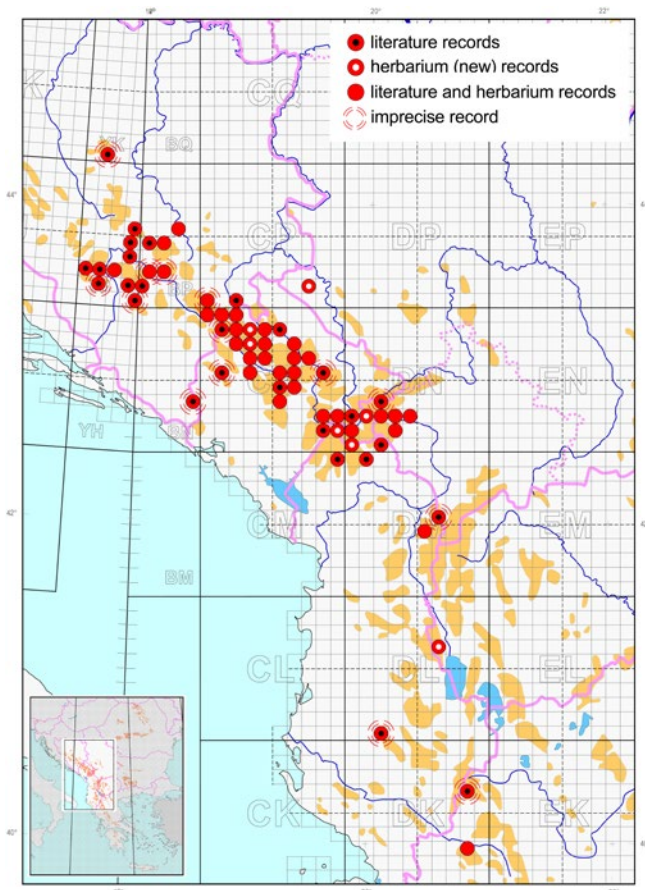


Fig. 5. Distribution of the taxon *Amphoricarpos autariatus* Blečić & E. Mayer Blečić & E. Mayer in the Balkan Peninsula

Allium phthioticum Boiss. & Heldr. – AMARYLLIDACEAE (Fig. 1h)

= *A. breviradium* (Halácsy) Stearn

A. phthioticum belongs to section *A. sect. Molium* G. Don ex Koch which includes 13 taxa in Europe (STEARNS 1980). It was described from Mt Iti (Sterea Ellas) in Greece (BOISSIER 1882), while HALÁCSY (1904) described the closely related taxon *A. neapolitanum* Cyr. var. *breviradium* Halácsy also from Greece. The latter was treated by STEARN (1980) as a separate species - *A. breviradium* (Halácsy) Stearn. According to him the main differences between these two taxa are in the length of flower stems, shape and size of the perigon and presence or absence of bulbs in the raceme. However, Anderson (1991) made the most recent nomenclature amendments and included *A. breviradium* in the synonymy of *A. phthioticum*. *A. phthioticum* is distributed in Greece (BOISSIER 1882; ANDERSSON 1991), Albania (STEARNS 1980; ANDERSSON 1991), Montenegro and Bosnia and Herzegovina (PULEVIĆ 1981), and central Italy (CONTI 1995). Only recently, it was also recorded as a new species for the flora of Bulgaria (CHESHMEDZHIEV

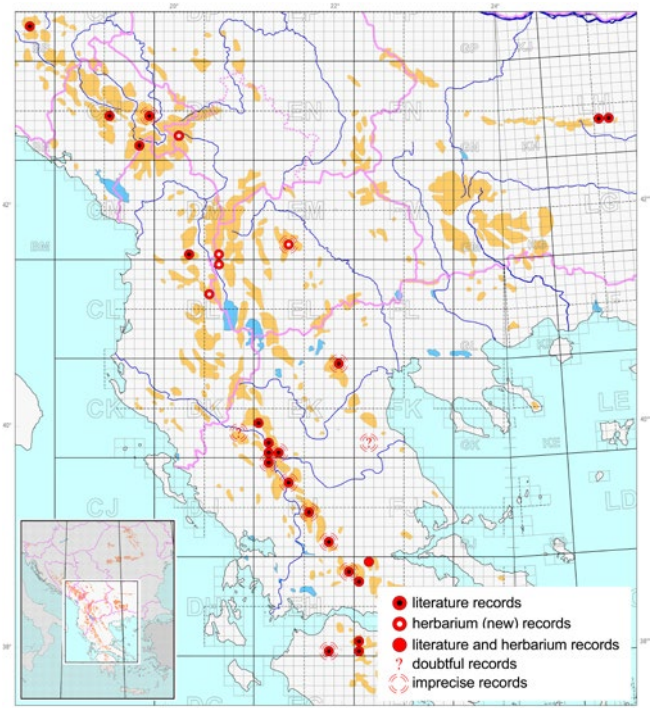


Fig. 6. Distribution of the species *Allium phthioticum* Boiss. & Heldr. in the Balkan Peninsula

& MARINOV 2009). It is included in the European Red List under the category Rare (ECONOMIC COMMISSION FOR EUROPE 1991).

This hygrophilous mountainous species grows in open fens, damp meadows and wet rocky slopes, between (700) 1200 and 2300 m s.m, on different geological substrata. Diploid ($2n = 16$) and triploid ($2n = 24$) cytotypes occur, even in the same populations (TZANOUDAKIS 1986, CHESHMEDZHIEV & MARINOV 2009).

First records in the Republic of Macedonia: Mt Dautica, EM31, coll./det. Th. Soška, 27-Jul-1926 sub *A. ex aff. zebdanense/A. phthioticum*, rev. G. Anačkov 28-Nov-2008 (BEO); Mt Bistra: sub. cacum. Trebiška Čuka, 2100 m, DM60, coll./det. O. Grebenščikov, 10-Jul-1936 sub *A. narcissiflorum/A. neapolitanum* var. *breviradium* Hal.?!/*A. phthioticum* B. et H., rev. G. Anačkov 28-Nov-2008 (BEO); Mt Stogovo: ob von Kočišta, c. 1500-2000 m, Blockhalden, Weidematten, DL69, coll. F. Krendl, 12-Jul-1976 sub *A. breviradium* (Halácsy) Stearn (W 1989-03724); Mt Jablanica: Podgorečko Ezero (the lake surroundings), fens, 1800 m, calcareous bedrock, DL56, coll. M. Niketić, G. Tomović, 18-Jul-2006, G., det. M. Niketić sub *A. breviradium* (BEOU 21573; BEO 20060710).

New record in Montenegro: Mts. Prokletije: valley of the Bjeluha, meadows, DN22, coll. V. Nikolić, N. Diklić, M. Bogdanović 15-Jul-1973, det. M. Niketić, G. Tomović (BEO s.n.).

A. phthioticum was not mentioned in the Flora of Macedonia (BORNMÜLLER 1926). The new record makes it currently the only representative of the section *Molium* in this country. Four new records in the Republic of Macedonia make connection with other parts of the species distribution area in the Balkan Peninsula: on the south – Greece (several localities), on the east – Bulgaria (the Central Balkan Range: Shipka Divide and Uzana) and on the west – Albania (Mt Mal e Alamanit), Montenegro (Mts. Prokletije: valley of the Bjeluha; Mt Vila near Rikavac lake; Mt Mala Lukavica: Trebiješ) and Bosnia and Herzegovina (Mt Bjelašnica: Obalj) (Fig. 6). The population on Mt Jablanica is limited to the ungrazed fens at the mouth of the stream that feeds the glacial lake and has fewer than 100 individuals. The species population status at three other localities could not be assessed as the records were only from herbarium collections.

CONCLUSIONS

The following species were reported from the Republic of Macedonia for the first time: *Euphorbia montenegrina*, *Prangos ferulacea*, *Tanacetum larvatum*, *Amphoricarpos autariatus* and *Allium phthioticum*. The total distribution range of these taxa in the Balkans was mapped using numerous herbarium and literature data.

The locality of the newly-discovered species *E. montenegrina* in Macedonia represents its southernmost distributional border in the Balkan Peninsula. The population on Mt Jablanica is limited to rocks around the lake and amounts to fewer than 100 individuals. A new locality for the species in Montenegro (Mt Prokletije, Maja Sapica peak) was also reported.

The species *P. ferulacea* was found on Mt Baba (Pelister); the nearest known population is about 60 km away from this locality and is situated on the serpentinite massif of Mt Mal i Alamanit in Albania. It is noteworthy that the newly discovered population in Macedonia grows on siliceous geological substrate which has not been known so far for the Balkan Peninsula. It was estimated that the population on Mt Baba consists of fewer than 50 individuals, but it could be larger as presumably this species also grows on unexplored rocky slopes which are numerous in the area.

The occurrence of *T. larvatum* in the southwestern part of the Republic of Macedonia represents a connection to two southernmost points of the species distribution range – serpentinite massifs of Mt Mal i Alamanit and Mt Guri Topit in eastern Albania. The record from Mt Jablanica represents the eastern limit of the species distribution in the Balkan Peninsula. There are three new localities from Serbia and one new locality from Montenegro.

Amphoricarpos represents a new genus for the flora of R. of Macedonia. The new locality of the species *A. autariatus* in the high-mountainous region of Mt Jablanica

fits into the known range of this species in the Balkans and represents a connection towards the distant sites to the north (Mt Mal i Gjalicës in Albania and Mt Koritnik in Kosovo province of Serbia) and to the south (Mt Tomorit in Albania and Mt Gramos in Greece). Our field observations showed that this plant is extremely rare in its natural habitats in the Republic of Macedonia, as only a single specimen was found. Most likely it came from a more numerous subpopulation on the Albanian side of the mountain. An additional chorological location is given for the flora within Serbia proper (canyon of the river Ljutina).

A. phthioticum is the only representative of the section *Molium* in the Republic of Macedonia. This species was found in four new localities (Mt Dautica, Mt Bistra, Mt Stogovo and Mt Jablanica), which makes a connection with other parts of the species distribution area in the Balkan Peninsula. The population in Mt Jablanica was limited to ungrazed fens at the mouth of a stream that feeds the lake and had fewer than 100 individuals. A new locality for the species in Montenegro (Mts. Prokletije, valley of the Bjeluha) was also reported.

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REZIME

Nove vrste za vaskularnu floru Republike Makedonije i njihovo rasprostranjenje na području Balkanskog poluostrva

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Tokom nekoliko botaničkih ekskurzija obavljenih na teritoriji Republike Makedonije na planinama Jablanica i Baba (Pelister), otkriven je jedan novi rod *Amphoricarpos* Vis. i pet novih vrsta za floru Makedonije. To su: *Euphorbia montenegrina* (Bald.) K. Malý ex Rohlena, *Prangos ferulacea* (L.) Lindl., *Tanacetum larvatum* (Griseb. ex Pant) Hayek, *Amphoricarpos autariatus* Blečić & E. Mayer and *Allium phthioticum* Boiss. & Heldr. Većina novootkrivenih biljaka predstavlja balkanske (sub)endemične planinske vrste koje su na Balkanskom poluostrvu predstavljene sa manje od 30 populacija i čije se težište areala nalazi na području jugoistočnih Dinarida. U radu je istaknut fitogeografski značaj novoutvrđenih granica areala svake pojedinačne vrste. Takođe su predstavljeni i novi lokaliteti pojedinih vrsta u susjednim balkanskim zemljama (Albaniji, Crnoj Gori i Srbiji).

Ključne reči: vaskularna flora, novi nalazi, distribucija, Republika Makedonija, Balkansko poluostrvo

