Diversity of Albanian Cladoniaceae

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Abstract. As a result of collections made during the years 2009-2017, the number of Cladoniaceae species is enlarged to 27 species, providing fifteen new records to Albanian Cladonia. The distribution of many of the previously mentioned taxa is extended and the chemical variability for many of the species is discussed. Cladonia borealis, C. caespiticia, C. cervicornis, C. coccifera, C. conista, C. cryptochlorophaea, C. cyathomorpha, C. humilis, C. merochlorophaea, C. parasitica, C. peziziformis, C. polycarpoides, C. ramulosa, C. rei and C. subulata are new for Albania.

Key words. Cladonia; Albania; phytogeography.

Introduction

Albania is a Mediterranean country located in SE Europe and surrounded by the Adriatic Sea and Montenegro in the NW, by the Ionian Sea and Greece in the SW and North Macedonia in the East. Despite its small extension, 28,748 km², it is topographically very diverse. Although Albania lies within the temperate zone the topographic heterogeneity and the combination of Mediterranean and continental influences confer a great climatic and vegetation diversity (Reed et al. 2004).

The main mountain ranges in the country, the Dinaric Alps, run parallel to the coast and they present the highest peak at 2753 m (Mt. Korab). The coastal region has a Mediterranean climate, and further east the mountains act as a barrier to the penetration of temperate air masses. The climate of the mountainous regions is alpine, with strong changes in precipitation and temperature depending on height and exposure. The temperature differences between the coast and the interior regions are more marked in winter, while the precipitations are more intense in summer (Tatli & Türkeş 2014).

The karstic soils (limestones) are predominant, although there are locations with serpentine substrates containing a certain amount of silicates, yielding slightly acid soils (Bego et al. 2018).

Most of the Albanian territory is included in the Illyrian province of the Circumboreal
Region with predominant deciduous forest of *Quercus* ssp. (*Q. pubescens*, *Q. frainetto* and *Q. cerris*) and with an important presence of *Carpinus orientalis* (Polunin & Walters 1989). In the higher altitudinal zones the grasslands and beech forests are dominant. The Mediterranean vegetation belongs to the Adriatic province and is usually well developed. It occupies a small coastal strip and has sub-Mediterranean and Mediterranean species of evergreen and maquis shrubs (Sadorni et al. 2015).

The lichenological studies in Albania are quite scarce as confirmed by Hafellner & Kashtta (2003) and Hafellner (2007). Later Svoboda et al. (2012) increased the number of species found up to 333 taxa of lichenized fungi and 11 of them represent *Cladonia*. The aim of this contribution is to summarize results from new collections in the framework of a project on the family Cladoniaceae in the Mediterranean area of Eurasia.

**Materials and Methods**

After several recollections in the Albanian territory at different periods during 2009-2017, we studied and analysed 335 *Cladonia* specimens, which are listed in Annex 1. The new collections were deposited in Madrid (MACB), Helsinki (H) or Budapest (BP). Most of the specimens were analysed by means of thin-layer chromatography (TLC, HPTLC) to identify the major lichen substances according to standardized methods (Orange et al. 2001, 2010; Arup et al. 1993). The main secondary metabolites of Albanian *Cladonia* are listed in Table 1. Comments on world distribution of species are from Ahti & Stenroos (2013). The distribution maps are presented according to the administrative divisions in counties of Albania (Figure 1). The ITS rDNA region was sequenced in some specimens to confirm the identifications and the GeneBank numbers are provided (Annex 1). The primers and protocols used are described in Pino-Bodas et al. (2015).

![Figure 1. A- Map of Albania (http://www.lahistoriaconmapas.com/atlas/albania-map/tirana-albania-map.htm). B- Albanian counties (https://www.revolvy.com/page/Counties-of-Albania-Albania_Counties_Gray.svg: Joshbaumgartner). C- Districts of Albania: 1 Berat, 2 Bulqizë, 3 Delvinë, 4 Devoll, 5 Dibër, 6 Durrës, 7 Elbasan, 8 Fier, 9 Gjirokastër, 10 Gramsh, 11 Has, 12 Kavajë, 13 Kolonjë, 14 Korçë, 15 Krujë, 16 Kuçovë, 17 Kukës, 18 Kurbin, 19 Lezhë, 20 Librazhd, 21 Lushnijë, 22 Malësi e Madhe, 23 Mallakastër, 24 Mat, 25 Mirditë, 26 Peqin, 27 Përmet, 28 Pogradec, 29 Pukë, 30 Sarandë, 31 Shkodër, 32 Skrapar, 33 Tepelenë, 34 Tirana, 35 Tropojë and 36 Vlorë (https://en.wikipedia.org/wiki/Districts_of_Albania).](image-url)
Results and discussion

*Cladonia* is the only genus of Cladoniaceae represented in Albania. Of the 27 analysed species the following 15 are newly reported to the former lichen checklist of Albania (*): *Cladonia borealis*, *C. caespiticia*, *C. cervicornis*, *C. coccifera*, *C. conista*, *C. cryptochlorophaea*, *C. cyathomorpha*, *C. humilis*, *C. merochlorophaea*, *C. parasitica*, *C. peziziformis*, *C. polycarpoides*, *C. ramulosa*, *C. rei* and *C. subulata*. The species studied occur between the sea level and 1800 m of altitude based on our records and the information published by other authors (Figure 2).

The commonest species are: *C. cariosa*, *C. fimbriata*, *C. foliacea*, *C. furcata*, *C. pyxidata* and *C. rangiformis*, while *C. caespiticia*, *C. coccifera*, *C. digitata*, *C. macilenta*, *C. peziziformis*, *C. polycarpoides* and *C. ramulosa* are restricted to northern Albania, and *C. borealis*, *C. cryptochlorophaea*, *C. humilis*, *C. merochlorophaea* and *C. parasitica* have a southern or a south-eastern distribution (Figure 3).

![Figure 2. Species altitudinal rank in Albania (except for C. carneola in the lack of data).](image)
Cladonia borealis

Cladonia cariosa

Cladonia chlorophaea

Cladonia coccifera

Cladonia coniocraea

Cladonia conista

Cladonia cryptochlorophaea

Cladonia cyathomorpha
Nine species are chemically variable (Table 1) *C. cariosa, C. foliacea, C. furcata, C. polycarpoides, C. pyxidata, C. rangiformis, C. rei* and *C. symphycarpa*. *Cladonia cariosa* specimens contain three chemotypes: atranorin; atranorin and norstictic acid; atranorin and rangiformic acid, and additional zeorin. Most of the specimens of *C. foliacea* contain fumarprotocetraric and usnic acids, additionally physodalic acid; but a few contain fumarprotocetraric, psoromic and usnic acids. In *C. furcata* most of the specimens contain fumarprotocetraric acid, occasionally with physodalic acid; specimens with atranorin and fumarprotocetraric acid or atranorin and bourgeanic acid were also found. Two chemotypes were detected in the specimens of *C. polycarpoides* atranorin and norstictic acid, and one specimen containing only norstictic acid. *Cladonia pyxidata* contains fumarprotocetraric acid and additionally physodalic acid, and also some specimens have fumarprotocetraric and psoromic acids. The commonest chemotype in *C. rangiformis* contains atranorin, fumarprotocetraric and rangiformic acids sometimes with additional physodalic acid, the other chemotype with atranorin and rangiformic acid is very rare in the Albanian specimens. The specimens of *C. rei* contain fumarprotocetraric and homosekikaic acids and other with only homosekikaic acid. Specimens of *C. symphycarpa* have atranorin and norstictic acid; and other also atranorin, norstictic and fumarprotocetraric acids.
Table 1. Main secondary metabolites of the *Cladonia* species chemically analysed from Albania. ATR: atranorin, BAR: barbatic acid, BOU: bourgeanic acid, CRY: cryptochlorophaeic acid, FUM: fumarprotocetraric acid, HSEK: homosekikaic acid, MER: merochlorophaeic acid, NST: norstictic acid, PHY: physodalic acid, PSO: psoromic acid, RAN: rangiformic acid, THAM: thammolic acid, USN: usnic acid, ZEO: zeorin.

| Species                  | ATR | BAR | BOU | CRY | FUM | HSEK | MER | NST | PHY | PSO | RAN | THAM | USN | ZEO |
|--------------------------|-----|-----|-----|-----|-----|------|-----|-----|-----|-----|-----|------|-----|-----|
| C. borealis              |     |     |     |     |     |      |     |     |     |     |     |      |     |     |
| C. caespiticia           |     |     |     |     |     |      |     |     |     |     |     |      |     |     |
| C. cariosa 1             |     |     |     |     |     |      |     |     |     |     |     |      |     |     |
| C. cariosa 2             |     |     |     |     |     |      |     |     |     |     |     |      |     |     |
| C. cariosa 3             |     |     |     |     |     |      |     |     |     |     |     |      |     |     |
| C. cariosa 4             |     |     |     |     |     |      |     |     |     |     |     |      |     |     |
| C. cervicornis           |     |     |     |     |     |      |     |     |     |     |     |      |     |     |
| C. chlorophaea           |     |     |     |     |     |      |     |     |     |     |     |      |     |     |
| C. coccifera             |     |     |     |     |     |      |     |     |     |     |     |      |     |     |
| C. coniocraea            |     |     |     |     |     |      |     |     |     |     |     |      |     |     |
| C. conista               |     |     |     |     |     |      |     |     |     |     |     |      |     |     |
| C. cryptochlorophaea     |     |     |     |     |     |      |     |     |     |     |     |      |     |     |
| C. cyathomorpha          |     |     |     |     |     |      |     |     |     |     |     |      |     |     |
| C. fimbriata             |     |     |     |     |     |      |     |     |     |     |     |      |     |     |
| C. foliacea 1            |     |     |     |     |     |      |     |     |     |     |     |      |     |     |
| C. foliacea 2            |     |     |     |     |     |      |     |     |     |     |     |      |     |     |
| C. foliacea 3            |     |     |     |     |     |      |     |     |     |     |     |      |     |     |
| C. furcata 1             |     |     |     |     |     |      |     |     |     |     |     |      |     |     |
| C. furcata 2             |     |     |     |     |     |      |     |     |     |     |     |      |     |     |
| C. furcata 3             |     |     |     |     |     |      |     |     |     |     |     |      |     |     |
| C. furcata 4             |     |     |     |     |     |      |     |     |     |     |     |      |     |     |
| C. furcata 5             |     |     |     |     |     |      |     |     |     |     |     |      |     |     |
| C. humilis               |     |     |     |     |     |      |     |     |     |     |     |      |     |     |
| C. macilenta             |     |     |     |     |     |      |     |     |     |     |     |      |     |     |
| C. merochlorophaea       |     |     |     |     |     |      |     |     |     |     |     |      |     |     |
| C. parasitica            |     |     |     |     |     |      |     |     |     |     |     |      |     |     |
| C. peziziformis          |     |     |     |     |     |      |     |     |     |     |     |      |     |     |
| C. polycarpoides 1       |     |     |     |     |     |      |     |     |     |     |     |      |     |     |
| C. polycarpoides 2       |     |     |     |     |     |      |     |     |     |     |     |      |     |     |
| C. pyxidata 1            |     |     |     |     |     |      |     |     |     |     |     |      |     |     |
| C. pyxidata 2            |     |     |     |     |     |      |     |     |     |     |     |      |     |     |
| C. pyxidata 3            |     |     |     |     |     |      |     |     |     |     |     |      |     |     |
| C. ramulosa              |     |     |     |     |     |      |     |     |     |     |     |      |     |     |
| C. rangiformis 1         |     |     |     |     |     |      |     |     |     |     |     |      |     |     |
| C. rangiformis 2         |     |     |     |     |     |      |     |     |     |     |     |      |     |     |
| C. rangiformis 3         |     |     |     |     |     |      |     |     |     |     |     |      |     |     |
| C. rei 1                 |     |     |     |     |     |      |     |     |     |     |     |      |     |     |
| C. rei 2                 |     |     |     |     |     |      |     |     |     |     |     |      |     |     |
| C. subulata              |     |     |     |     |     |      |     |     |     |     |     |      |     |     |
| C. symphycarpa 1         |     |     |     |     |     |      |     |     |     |     |     |      |     |     |
| C. symphycarpa 2         |     |     |     |     |     |      |     |     |     |     |     |      |     |     |
| C. symphycarpa 3         |     |     |     |     |     |      |     |     |     |     |     |      |     |     |
List of species

*1. **Cladonia borealis** S. Stenroos, Ann. Bot. Fenn. 26: 160 (1989)
   This terricolous species was only found in Korçë County growing on sandstone in slopes of beech forest at 1550 m altitude. It is distributed in arctic/antarctic-temperate and circumboreal regions (Ahti & Stenroos 2013).

*2. **Cladonia caespiticia** (Pers.) Flörke, Clad. Comm.: 8 (1828)
   It is a very rare species only found in Lezhë County on limestone in slopes of *Carpinus orientalis* formations at 40 m altitude. This is mainly a temperate species with oceanic tendencies, not continuously circumpolar (Ahti & Stenroos 2013).

3. **Cladonia cariosa** (Ach.) Spreng., Syst. Veg., Edn 16, 4(1): 272 (1827)
   A very common species found in Elbasan, Korçë, Kukës, Shkodër and Tiranë counties. It was reported by Svoboda et al. (2012) from Dibër County on calcareous soil. This is a terricolous species growing on bare soils of limestone, sandstone, serpentine and slate substrates in a wide variability of formations at 120-1550 m altitude. It is a Holarctic species with an outlier in southern South America (Ahti & Stenroos 2013). It is very common and frequent with several chemotypes.

4. **Cladonia carneola** (Fr.) Fr., Lichenogr. Eur. Reform.: 233 (1831)
   This species has only been reported from Shkodër County by Zahlbruckner (1889: 7) (Hafellner 2007). Species with bipolar distribution (Ahti & Stenroos 2013).

5. **Cladonia cervicornis** (Ach.) Flot., Jahresber., Schles. Ges. Vaterl. Cult. 27: 105 (1849)
   This species is not frequent, only encountered in Durrës, Shkodër and Vlorë counties. It grows from sea level to 865 m altitude on limestone and sandy and acid soils. It has a Holarctic distribution with uncertain records in South America (Ahti & Stenroos 2013).

6. **Cladonia chlorophaea** (Flörke ex Sommerf.) Spreng., Syst. Veg., Edn 16, 4(1): 273 (1827)
   A rare species collected in Gjirokastër and Vlorë counties. But it was early reported from Kukës and Shkodër districts (Hafellner & Kashta 2003); from Dibër and Tiranë districts by Markgraf (1931, 1932) (Hafellner 2007). It is a cosmopolitan species (Ahti & Stenroos 2013).

*7. **Cladonia coccifera** (L.) Willd., Fl. Berol. Prodr.: 361 (1787)
   This is a very rare species only collected in Shkodër County at 735 m altitude on serpentine substrate. It has a cosmopolitan distribution (Ahti & Stenroos 2013).

8. **Cladonia coniocraea** (Flörke) Spreng., Syst. Veg., Edn 16, 4(1): 272 (1827) syn. **C. ochrochlora** Flörke
   It was collected from Durrës, Lezhë and Vlorë counties from sea level until 828 m altitude, on limestone and sandy substrates or stumps of *Castanea sativa*. It was reported of Dibër and Shkodër districts by Svoboda et al. (2012) and Hafellner & Kashta (2003). All of the Albanian specimens belong to *C. coniocraea* s.str. the more oceanic morphotype often recognized as *C. ochrochlora*, which is not distinguishable in DNA analyses (Pino-Bodas et al. 2011) is not present here.

*9. **Cladonia conista** (Nyl.) Robbins, in Allen, Rhodora 32: 92 (1930)
   A common species collected in Durrës, Elbasan, Fier, Gjirokaster, Korçë, Lezhë, Shkodër, Tirana and Vlorë counties. It grows on slopes and bare soils of *Carpinus orientalis* formations and also *Quercus coccifera*, on sandstone and limestones substrates, from 40-1000 m altitude. Traditionally considered a chemotype of *C. humilis* with fumarprotocetraric and bourgeanic acids nevertheless, should be considered a different species in base of the results of Pino-Bodas et al. (2012).

10. **Cladonia cryptochlorophaea** Asahina, J. Jap. Bot. 16: 711 (1940)
    This is a very rare species only collected in Vlorë County at 186 m altitude growing on limestones with *Erica arborea* and deciduous *Quercus*. Is a terricolous species with arctic/antarctic to northern temperate distribution (Ahti & Stenroos 2013).

11. **Cladonia cyathomorpha** Stirt. ex Walt. Watson, J. Bot. 73: 156 (1935)
    It was collected from Elbasan, Kukës, Shkodër and Tiranë counties growing at 120-540 m altitude on limestone and serpentine substrates with *Carpinus orientalis*, deciduous *Quercus*
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12. Cladonia digitata (L.) Hoffm., Deutschl. Fl., Zweiter Theil (Erlangen): 124 (1796)

This species was only reported by Svoboda et al. (2012) from Dibër district growing on rotten wood at 1700-1730 m altitude. It is mainly a Holarctic species with some outposts in East Africa (Ahti & Stenroos 2013).

13. Cladonia fimbriata (L.) Fr., Lich. Eur. Reform. (Lund): 222 (1831)
syn. C. major (K. G. Hagen) Sandst., C. minor (K. G. Hagen) Szat.

A very common species encountered in Dibër, Durrës, Elbasan, Gjirokastër, Korçë, Kukës, Lezhe, Shkodër, Tiranë and Vlorë counties. It grows from sea level to 1750 m altitude on rotten wood, tree bases and humose soil over limestone, sandstone and sandy soil. The species was reported by Hafellner & Kashta (2003) and Svoboda et al. (2012) from Dibër, Has, Kukës and Shkodër districts. It is a cosmopolitan species (Ahti & Stenroos 2013).

14. Cladonia foliacea (Huds.) Willd., Fl. Berol. Prodr.: 363 (1787)
incl. C. convoluta (Lam.) Anders

This is a very common species found in Berat, Dibër, Durrës, Elbasan, Gjirokastër, Korçë, Kukës, Lezhe, Shkodër, Tiranë and Vlorë counties. It grows from sea level to 1750 m altitude on rotten wood, tree bases and humose soil over limestone, sandstone and sandy soil. The species was reported by Hafellner & Kashta (2003) and Svoboda et al. (2012) from Dibër, Has, Kukës and Shkodër districts. It is a cosmopolitan species (Ahti & Stenroos 2013).

15. Cladonia furcata (Huds.) Schrad., Spicil. Fl. Germ. 1: 107 (1794)
incl. C. subrangiformis Sandst.

This common species was collected in Durrës, Elbasan, Gjirokastër, Korçë and Vlorë counties from sea level to 1700 m altitude. Most of the samples contain fumarprotocetraric acid and occasionally physodalic acid. The morphotype with atranorin and fumarprotocetraric acid or atranorin and bourgeanic acid, traditionally identified as C. subrangiformis, was collected from Korçë, Shkodër and Vlorë counties. This taxon is considered to fall into the chemical variability of C. furcata supported by the DNA studies of Pino-Bodas et al. (2015).

C. furcata was reported from Dibër, Përmet, Shkodër and Tiranë districts by Markgraf (1931, 1932), Hafellner & Kashta (2003) and Svoboda et al. (2012) without chemical indications. It grows on humose, shaded or open soil over limestone, serpentine, and conglomerate substrates in a wide variety of forests. It has a subcosmopolitan distribution in boreal to tropical areas (Ahti & Stenroos 2013).

16. Cladonia humilis (With.) J.R. Laundon, Lichenologist 16: 220 (1984)

A rare species only collected in Elbasan and Vlorë counties from 50 to 540 m altitude. It grows on limestone substrate with Carpinus orientalis, Quercus spp. and Buxus sempervirens. The samples analysed contain atranorin and fumarprotocetraric acid. It has a Holarctic distribution, with several outposts in the Southern Hemisphere, occurring from boreal to arctic areas (Ahti & Stenroos 2013), although its distribution is not well known.

17. Cladonia macilenta Hoffm., Deutschl. Fl., Zweiter Theil (Erlangen): 126 (1796)

This is a rare species only collected in Lezhë County growing on bark of Pinus nigra. It was reported from Vlorë district (Hafellner & Kashta 2003). This species has a subcosmopolitan distribution (Ahti & Stenroos 2013).

18. Cladonia merochlorophaea Asahina, J. Jap. Bot. 6: 713 (1940)

A very rare species only collected in Korçë County, on calcareous soil, at 1625 m altitude. This is a subcosmopolitan species but its taxonomic status is not fully clear (Ahti & Stenroos 2013).
*19. *Cladonia parasitica* (Hoffm.) Hoffm., Deutschl. Fl. 2: 127 (1796)

This is a very rare species only collected in Vlorë County at 828 m altitude growing on *Castanea sativa* stumps. This is a Holarctic species with continental tendencies (Ahti & Stenroos 2013).

*20. *Cladonia peziziformis* (With.) J.R. Landon., Lichenologist 16: 223 (1984)

A very rare species only collected in Shkodër County, on serpentine soil at 120 m altitude. This is a subcosmopolitan species easily overlooked due to its small size (Ahti & Stenroos 2013).

*21. *Cladonia polycarpoides* Nyl. in Zwackh, Lich. Exs. Nos. 626, 626bis (1892) syn. *C. subcariosa* auct.

It is a rare species collected in Kukës and Shkodër counties growing on serpentine soil from sea level to 600 m altitude. It is a subcosmopolitan species especially abundant under suboceanic to oceanic conditions (Ahti & Stenroos 2013).

*22. *Cladonia pyxidata* (L.) Hoffm., Deutschl. Fl., Zweiter Theil (Erlangen): 121 (1796) incl. *C. pocillum* (Ach.) Grognot; *C. monomorpha* Aptroot, Sipman & van Herk

A common species collected in Dibër, Durrës, Elbasan, Fier, Gjirokastër, Korçë, Shkodër, Tiranë and Vlorë counties growing on bare soils, grasslands and rarely on wood. Most of the samples analysed contain fumarprotocetraric acid and often additional physodalic acid. A chemotype with fumarprotocetraric and psoromic acids was collected at 540 m altitude from Elbasan County. *Cladonia pyxidata* was early reported from Kukës, Lezhë, Shkodër and Vlorë districts (Zahlbruckner 1889, Markgraf 1927, 1932 and Svoboda et al. 2012), but without indication of their chemistry.

*23. *Cladonia ramulosa* (With.) J.R. Landon, Lichenologist 16: 225 (1984)

It was collected in Durrës and Lezhë counties on sandy soil and limestone from sea level to 40 m altitude. This is a subcosmopolitan species (Ahti & Stenroos 2013).

*24. *Cladonia rangiformis* Hoffm., Deutschl. Fl., Zweiter Theil (Erlangen): 114 (1796)

A very common species collected in Berat, Dibër, Durrës, Elbasan, Fier, Gjirokastër, Korçë, Kukës, Lezhë, Shkodër, Tiranë and Vlorë counties. It grows on grasslands and open soil of sandy substrate, serpentines, limestones and slates from sea level to 1770 m altitude. Its distribution is mainly restricted to western Eurasia and North Africa with one outpost in eastern Canada (Ahti & Stenroos 2013). The commonest chemotype contains atranorin, fumarprotocetraric and rangiformic acids sometimes with additional physodalic acid, but the chemotype with atranorin and rangiformic acid (common elsewhere) is very rare. One specimen of a sorediate morph (‘var. sorediophora’) was found in Shkodër.

It was reported from Dibër, Gjirokastër, Kukës, Shkodër, Tiranë and Vlorë counties by Szatala & Timkó (1926), Markgraf (1927, 1932) and Svoboda et al. (2012), but without indication of their chemistry.

*25. *Cladonia rei* Schaer. Lich. Helv. Spicil. 1(1): 34 (1823)

It is an uncommon species collected in Durrës, Kukës and Vlorë counties. It grows on limestone and sandstone substrates at 90-330 m altitude on limestone and sandstones substrates. It has a Holarctic distribution with continental preferences (Ahti & Stenroos 2013). One sample analysed contains homosekikaic acid only, but other specimens contain homosekikaic and fumarprotocetraric acids. Some time ago *C. rei* was considered a homosekikaic chemotype of *C. subulata* (Spier & Aptroot 2007) but molecular studies maintained them as different species (Pino-Bodas et al. 2010b).

*26. *Cladonia subulata* (L.) F.H. Wigg., Prim. Fl. Holsat.: 90 (1780)

This is a rare species only collected in Kukës and Lezhë counties on limestone substrate at 40-330 m altitude. It is a subcosmopolitan species (Ahti & Stenroos 2013).

*27. *Cladonia symphycarpa* (Flörke) Fr., Sched. Crit. Lich. Suec. 8-9. 20 (1826) incl. *C. dahliana* Kristinsson

A very common species collected in Elbasan, Korçë and Shkodër counties growing on limestone substrate at 400 to 1800 m altitude. It has been reported only from Shkodër County by Svoboda et al. (2012). The most frequent chemotype
has atranorin and norstictic acid, additionally fatty acid, the other chemotype with atranorin, norstictic and fumarprotocetraric acids is very rare. It has a Holarctic distribution with some outliers in South America (Ahti & Stenroos 2013).

**Cladonia sp.**

Some specimens collected in Shkodër and Vlorë were difficult to identify when the podetia are not well developed and do not bear split proliferations in the margin of the scyphi. These specimens belong to the *Cladonia humilis* group (Pino-Bodas et al. 2013) but molecular studies are necessary to clarify the identity of these specimens.

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Annex 1. Selected specimens examined

**Cladonia borealis** S. Stenroos

**Barbatic acid:** KORÇË: District of Koroçë, Dardhë, SH90 Boboshticë-Dardhë, 40°31'26"N 20°48'06"E, *Fagus sylvatica*, *Juniperus communis*, *Abies* sp., sandstone, 1550 m, 23-IV-2017, A.R. Burgaz (MACB 111457).

**Cladonia caespiticia** (Pers.) Flörke

**Fumarprotocetraric acid:** LEZHË: District of Kukës, Kolsh, SH5 close Drin river, 42°04'18"N 20°20'32"E, deciduous *Quercus*, *Juniperus oxycedrus*, *Buxus sempervirens*, limestone, 710 m, 22-IV-2017, A.R. Burgaz (MACB 111452). KUKËS: District of Kukës, Kolsh, SH5 close Drin river, 42°04'24"N 20°36'18"E, *Quercus cerris*, deciduous *Quercus*, limestone, 330 m, 21-IV-2017, A.R. Burgaz (MACB 111433).

**Cladonia cariosa** (Ach.) Spreng.

**Atranorin and rangiformic acid chemotype:** ELBASAN: Prejenjas, Urakë, SH9 Qafë Thanë, 41°04'24"N 20°36'18"E, *Quercus nigra*, *Juniperus oxycedrus*, limestone, 865 m, 20-IV-2017, A.R. Burgaz (MACB 111298). Atranorin and rangiformic acid chemotype: ELBASAN: Prejenjas, Urakë, SH9 Qafë Thanë, 41°04'24"N 20°36'18"E, *Quercus nigra*, *Juniperus oxycedrus*, limestone, 865 m, 20-IV-2017, A.R. Burgaz (MACB 111298). **Atranorin and rangiformic acid chemotype:** ELBASAN: Prejenjas, Urakë, SH9 Qafë Thanë, 41°04'24"N 20°36'18"E, *Quercus nigra*, *Juniperus oxycedrus*, limestone, 865 m, 20-IV-2017, A.R. Burgaz (MACB 111298). **Atranorin and rangiformic acid chemotype:** ELBASAN: Prejenjas, Urakë, SH9 Qafë Thanë, 41°04'24"N 20°36'18"E, *Quercus nigra*, *Juniperus oxycedrus*, limestone, 865 m, 20-IV-2017, A.R. Burgaz (MACB 111298). **Atranorin and rangiformic acid chemotype:** ELBASAN: Prejenjas, Urakë, SH9 Qafë Thanë, 41°04'24"N 20°36'18"E, *Quercus nigra*, *Juniperus oxycedrus*, limestone, 865 m, 20-IV-2017, A.R. Burgaz (MACB 111298). Atranorin and rangiformic acid chemotype: ELBASAN: Prejenjas, Urakë, SH9 Qafë Thanë, 41°04'24"N 20°36'18"E, *Quercus nigra*, *Juniperus oxycedrus*, limestone, 865 m, 20-IV-2017, A.R. Burgaz (MACB 111298). Atranorin and rangiformic acid chemotype: ELBASAN: Prejenjas, Urakë, SH9 Qafë Thanë, 41°04'24"N 20°36'18"E, *Quercus nigra*, *Juniperus oxycedrus*, limestone, 865 m, 20-IV-2017, A.R. Burgaz (MACB 111298). **Atranorin and rangiformic acid chemotype:** ELBASAN: Prejenjas, Urakë, SH9 Qafë Thanë, 41°04'24"N 20°36'18"E, *Quercus nigra*, *Juniperus oxycedrus*, limestone, 865 m, 20-IV-2017, A.R. Burgaz (MACB 111298). Atranorin and rangiformic acid chemotype: ELBASAN: Prejenjas, Urakë, SH9 Qafë Thanë, 41°04'24"N 20°36'18"E, *Quercus nigra*, *Juniperus oxycedrus*, limestone, 865 m, 20-IV-2017, A.R. Burgaz (MACB 111298). Atranorin and rangiformic acid chemotype: ELBASAN: Prejenjas, Urakë, SH9 Qafë Thanë, 41°04'24"N 20°36'18"E, *Quercus nigra*, *Juniperus oxycedrus*, limestone, 865 m, 20-IV-2017, A.R. Burgaz (MACB 111298). Atranorin and rangiformic acid chemotype: ELBASAN: Prejenjas, Urakë, SH9 Qafë Thanë, 41°04'24"N 20°36'18"E, *Quercus nigra*, *Juniperus oxycedrus*, limestone, 865 m, 20-IV-2017, A.R. Burgaz (MACB 111298). Atranorin and rangiformic acid chemotype: ELBASAN: Prejenjas, Urakë, SH9 Qafë Thanë, 41°04'24"N 20°36'18"E, *Quercus nigra*, *Juniperus oxycedrus*, limestone, 865 m, 20-IV-2017, A.R. Burgaz (MACB 111298).
chemistry: SHKODËR: Vau i Dejës, SH25 Vau i Dejës-Koman, 42°03'01"N 19°39'45"E, Pinus pinea, sandy soil, 1 m, 20-IV-2017, A.R. Burgaz (MACB 111425). Vau i Dejës, Karmë, SH25 Vau i Dejës-Koman, 42°04'02"N 19°40'59"E, Quercus macrolepis, Q. pubescens, Juniperus oxycedrus, Erica arborea, Slates, 130 m, 20-IV-2017, A.R. Burgaz (MACB 111428).

*Cladonia cervicornis* (Ach.) Flot.

**Fumarprotocetraric acid:** DURRËS: District of Durrës, Fushë-Draçi, San Pietro beach track, 41°31'01"N 19°31'12"E, Pinus pinea, sandy soil, 1 m, 19-IV-2017, A.R. Burgaz (MACB 111225). SHKODËR: District of Malësi e Madhe, Poica, SH21 Koplik-Bogë, 42°15'53"N 19°29'47"E, Cupressus sempervirens, boulders, 320 m, 20-IV-2017, A.R. Burgaz (MACB 111292). District of Malësi e Madhe, Dedaj, SH21 Koplik-Bogë, 42°18'04"N 19°32'32"E, Carpinus betulus, Juniperus oxycedrus, limestone rocks, 495 m, 20-IV-2017, A.R. Burgaz (MACB 111299). District of Malësi e Madhe, Bogë, SH21 Koplik-Bogë, 42°21'46"N 19°37'56"E, Pinus nigra, Juniperus oxycedrus, limestone, 865 m, 20-IV-2017, A.R. Burgaz (MACB 111303).

Pukë District (Rrëthi i Pukës), Mount Rras' e Qerrett above village Qerret, 42°49'53.45"E, in serpentine rocky area, on acid soil in pine woodland, 735 m, 6-V-2015, L. Lökös (BP 96621).

**Cladonia coccifera** (L.) Wild.

**Usnic acid and zeorin:** SHKODËR: Pukë District (Rrëthi i Pukës), Mount Rras’ e Qerrett above village Qerret, 42°03'36.98"N 19°49'53.45"E, in serpentine rocky area, on acid soil in pine woodland, 735 m, 6-V-2015, L. Lökös (BP 96621).

**Cladonia coniocraea** (Flörke) Spreng.

**Fumarprotocetraric acid:** DURRËS: District of Durrës, Fushë-Draçi, San Pietro beach track, 41°31'01"N 19°31'12"E, Pinus pinea, sandy soil, 1 m, 19-IV-2017, A.R. Burgaz (MACB 111224). LEZHË: District of Shkodër (Rrëthi i Shkodër), Mali i Gjerë, on the southern slope of 1331 m high mount above Delvinë, 39°57'42.12"N 20°07'59.66"E, in chestnut woodland, on bark (Castanea sativa), 828 m, 1-V-2009, Z. Barina & D. Piškó (BP 96542).

**Cladonia chlorophaea** (Flörke ex Sommerf.) Spreng.

**Fumarprotocetraric and physodalic acids:** GJIROKASTër: District of Tepelenë, Këkçyrë, Këkçyrë gorge, left side Vjosa river, 40°17'52"N 20°10'05"E, Carpinus betulus, Pinus halepensis, sandstone, 180 m, 18-IV-2017, A.R. Burgaz, (MACB 111411). LEZHË: District of Mirditë (Rrëthi i Mirditës), in the valley of stream Fani i Vogël above village Thirërë, in serpentine rocky area, on bark (Pinus nigra), 42°02'20.98"N 20°14'33.25"E, 905 m, 6-V-2015, L. Lökös (BP 96627). VLORE: Finiq, Bistrice, Muzine, 39°55'08"N 20°08'48"E, Quercus coccifera, Carpinus betulus, Pinus halepensis, Cercis siliquastrum, limestone slopes, 125 m, 17-IV-2017, A.R. Burgaz (MACB 111193).

**Cladonia coniocraea** (Flörke) Spreng.

**Fumarprotocetraric acid:** DURRËS: District of Durrës, Fushë-Draçi, San Pietro beach track, 41°31'01"N 19°31'12"E, Pinus pinea, sandy soil, 1 m, 19-IV-2017, A.R. Burgaz (MACB 111224). LEZHË: District of Shkodër (Rrëthi i Shkodër), Mali i Gjerë, on the southern slope of 1331 m high mount above Delvinë, 39°57'42.12"N 20°07'59.66"E, in chestnut woodland, on bark (Castanea sativa), 828 m, 1-V-2009, Z. Barina & D. Piškó (BP 96542).

**Cladonia conica** (Nyl.) Robbins

**Fumarprotocetraric and bourgeanie acid:** DURRës: District of Durrës, Fushë-Draçi, road cape of Rodon, 41°32'50"N 19°31'08"E, Carpinus betulus, Arbutus unedo, Pistacia lentiscus, Cistus salviifolius, sandstone, 90 m, 19-IV-2017, A.R. Burgaz (MACB 111412). District of Durrës (Rrëthi i Durrësit), west of village Shënje, at the southern foot of hill M. e Multit (159.9 m), near the coast of the Adriatic Sea, 41°32'41.00"N 19°29'16.00"E, on soil in grasslands, 0 m, 26-IV-2009, L. Lökös (BP 96756). VLORE: Finiq, Muzine, Muzine, 39°54'48"N 20°11'20"E, deciduous Quercus, Erica arborea, limestone, 186 m, 17-IV-2017, A.R. Burgaz (MACB 111199).
rocky serpentine area, 510 m, 16-V-2016, L. Lökös (BP 96660). FIER: Fier County, Pylli i Levanit, above village Levan, 40°40’48.99"N 19°30’11.70"E, on calcareous soil in oak woodland, 95 m, 5-V-2017, L. Lökös (BP 96678).

GIROKASTËR: Gjirokastër District (Rrethi i Gjirokastërës), Mali i Nikollaqit above village Sofratikë, 39°59’41.22"N 20°12’40.05"E, on calcareous soil in rocky grasslands, 260 m, 8-V-2015, L. Lökös (BP 96631). District of Gjirokastër (Rrethi i Gjirokastërës), Kursevelo i Sipërmi uplands above village Pтар, 40°11’0.39"N 20°02’31.51"E, on calcareous soil in rocky grasslands, 750 m, 29-III-2015, L. Lökös (BP 96600). District of Përmet (Rrethi i Përmitit); left part of river Vjosë, between town Këlcyrë and village Mbrezhdan, 40°19’11.24"N 20°38’22.95"E, on acid soil in dry rocky grasslands, 1105 m, 18-X-2015, L. Lőkös, Z. Barina, L. Lőkös & D. Pifkó (BP 96637).

KUKËS: District of Kukës, Kukës, Rruga Tepelenë (Rrrethi i Tepelenës), c. 510 m, 16-V-2016, L. Lőkös (BP 96637). District of Kukës (Rrethi i Kukësës), above the water reservoir c 2.5 km WSW of village Prrenjas, 41°04’24"N 20º30’15"E, Carpinus orientalis, deciduous Quercus, Buxus sempervirens, limestone slopes, 540 m, 22-IV-2017, A.R. Burgaz (MACB 111443).

SHKODËR: Vau i Dejës, SH9 Qafë Thanë, 41º04’24"N 20º30’15"E, deciduous Quercus, Quercus macrolepis, deciduous Quercus, Buxus sempervirens, limestone slopes, 186 m, 21-IV-2017, A.R. Burgaz (MACB 111438).

VLORË: Finiq, on sandy soil in sand dune area, 10 m, 27-IV-2009, L. Lőkös (BP 96549). DURRËS: District of Durrës, Fushë-Krujë, Krujë, SH38 to Qafë-Shtamë, 41º04’24"N 20º30’15"E, Carpinus orientalis, deciduous Quercus, Buxus sempervirens, limestone slopes, 540 m, 22-IV-2017, A.R. Burgaz (MACB 111445).

Theodor, 40°08’07.8"N 19°40’26.4"E, on soil in olive plantation, 211 m, 29-IV-2009, L. Lökös (BP 96557).

**Cladonia cryptochlorophphae** Ashahina

**Cryptochlorophaeic acid:** VLORE: Finiq, Muzinë, Muzinë, 39°54’48"N 20º11’20"E, deciduous Quercus, Erica arborea, limestone, 186 m, 17-IV-2017, A.R. Burgaz (MACB 111410).

**Cladonia cyathomorpha** Stirt. ex Walt. Watson

**Fumarprotocetraric acid:** ELBASAN: Prrenjas, SH3 Qukës-Prrenjas, 41°04’24"N 20º30’15"E, Carpinus orientalis, Quercus macrolepis, deciduous Quercus, Buxus sempervirens, limestone slopes, 540 m, 22-IV-2017, A.R. Burgaz (MACB 111443).

**Fumarprotocetraric acid:** DIBËR: District of Mat (Rrethi i Matit), Mali i Skënderbeut, on the northern forehills of Mt. “maja e Levaqit”, near village Shkopet, 41º41’54"N 19º45’10"E, on soil in rocky serpentine area, 510 m, 16-V-2016, L. Lőkös (BP 96653). District of Vlorë (Rrethi i Vlorës), between village Ilias and manastir Shën Theodor, 40°08’07.8″N 19°40’26.4″E, on soil in olive plantation, 211 m, 29-IV-2009, L. Lökös (BP 96557).
20°36′18″E, Quercus macrolepis, deciduous Quercus, Juniperus oxycedrus, limestone, 1000 m, 22-IV-2017, A.R. Burgaz (MACB 111448).

**GJIROKASTËR:** Gjirokastër County, Bredhë, of Kukës, Kukës, Rruga Tirana, 42°04′46″N 20°24′21″E, on calcareous soil in open serpentine bushland, on calcareous soil, 490 m, 25-V-2004, Z. Barina & Cs. Németh (BP 96540). District of Skrapar (Rreti i Skraparit), above the gorge of river Osum next to village Dhorës, 40°28′27.79″N 20°15′16.11″E, in open bushland, on calcareous soil, 420 m, 13-X-2010, L. Lőkös (BP 96575). DIBËR: Dibër county, on the mount between villages Fushë Studë and Zabzun, 41°19′54.43″N 20°24′38.25″E, on calcareous soil in rocky grasslands, 1295 m, 18-V-2016, L. Lőkös (BP 96668). DURRËS: District of Durrës, Fushë-Draçi, San Pietro beach track, 41°31′01″N 19°31′12″E, Pinus pinea, sandy soil, 1 m, 19-IV-2017, A.R. Burgaz (MACB 111288). Prenjas, Ura e Murrashit, between Mirakë and Librazhd, 20°07′59.66″E, in chestnut woodland, on bark (Castanea sativa), 828 m, 1-V-2009, Z. Barina & D. Pifkó (BP 96544).

**Cladonia foliacea** (Huds.) Willd.

**Fumarprotocetraric and usnic acids chemotype:** BERAT: District of Berat (Rreti i Beratit), Tomor Mountains (Mali i Tomorrít), c. 700 m north of village Karkanjoz, 40°41′55.61″N 20°03′28.69″E, in Mediterranean scrubland, on calcareous soil in rocky grassland, 490 m, 25-V-2004, Z. Barina & Cs. Németh (BP 96540). District of Skrapar (Rreti i Skraparit), above the gorge of river Osum next to village Dhorës, 40°28′27.79″N 20°15′16.11″E, in open bushland, on calcareous soil, 420 m, 13-X-2010, L. Lőkös (BP 96575). DIBËR: Dibër county, on the mount between villages Fushë Studë and Zabzun, 41°19′54.43″N 20°24′38.25″E, on calcareous soil in rocky grasslands, 1295 m, 18-V-2016, L. Lőkös (BP 96668). DURRËS: District of Durrës, Fushë-Draçi, San Pietro beach track, 41°31′01″N 19°31′12″E, Pinus pinea, sandy soil, 1 m, 19-IV-2017, A.R. Burgaz (MACB 111288). Prenjas, Ura e Murrashit, between Mirakë and Librazhd, 20°07′59.66″E, in chestnut woodland, on bark (Castanea sativa), 828 m, 1-V-2009, Z. Barina & D. Pifkó (BP 96544).
41°11’1.64”N 20°16’33.36”E, on acid soil in serpentine scrublands, 290 m, 3-IV-2016, L. Lökös (BP 96657). Elbasan county, in village Floq, 41°16’1.19”N 20°14’19.17”E, on soil by the roadside, 650 m, 17-V-2016, L. Lökös (BP 96664). GJIROKASTËR: Dropull, Grashp, SH78, 39°56’50”N 20°14’31”E, deciduous Quercus, limestone slope rocks, 440 m, 17-IV-2017, A.R. Burgaz (MACB 111285). Dropull, Goranxi, to Kishaë Raveñes, 40°00’56”N 20°11’15”E, limestone rocks, 268 m, 17-IV-2017, A.R. Burgaz (MACB 111286). District of Gjirokastër (Rrethi i Gjirokastrës), Kurvelesh in Sipërmi uplands above village Picar, 40°10’21.66”N 20°02’40.64”E, on calcareous soil in rocky grasslands, 390 m, 29-III-2015, L. Lökös (BP 96602). District of Përmet (Rrethi i Përmetit), c. 1.3 km SE of village Kosinë, along river Vjosë, 40°15’40.11”N 20°19’08.84”E, on calcareous conglomerate rocks, 220 m, 5-V-2015, L. Lőkös (BP 96618). District of Shkodër (Rrethi i Shkodrës), above the water reservoir c 2.5 km WSW of village Ujëbdarë, 40°31’17.31”N 20°39’50.62”E, on acid soil in dry rocky grasslands, 1105 m, 18-X-2011, L. Lökös (BP 96587). District of Devoll (Rrethi i Devollit), on the mountains above village Ponçarë, 40°31’17.63”N 20°57’54.23”E, in dry grasslands, on flysh soil, 1035 m, 11-V-2015, Z. Barina, L. Lökös & D. Pifkó (BP 96646). District of Korçë, Dardhë, SH90 Boboshticë-Dardhë, 40°31’26”N 20°48’06”E, Fagus sylvestra, Juniperus communis, Abies sp., sandstone, 550 m, 23-IV-2017, A.R. Burgaz (MACB 111319). District of Korçë (Rrethi i Korçës), on the ridge of Mts Mali i Moravës above village Dardhë, near peak Buzeja e Boboshticës (1701 m), 40°32’23.97”N 20°49’14.20”E, on acid soil in beech forest on gravel conglomerate, 1550 m, 10-VIII-2010, L. Lökös (BP 96561). Korçë, Boboshticë, SH90 Boboshticë-Dardhë, 40°32’37”N 20°47’11”E, Juniperus oxycedrus, pastureland, sandstone, 1200 m, 23-IV-2017, A.R. Burgaz (MACB 111317). District of Korçë (Rrethi i Korçës), Mali i Strugarit above village Belorëta, 40°39’56.56”N 20°50’9.79”E, open grasslands on conglomerate rocks, 1010 m, 11-V-2015, Z. Barina, L. Lökös, D. Pifkó (BP 96643). District of Devoll (Rrethi i Devollit), on the mount between village Tren and lake Liqeni i Prespës së Vogël, 40°40’10.55”N 20°59’12.62”E, on calcareous soil in rocky grasslands, 910 m, 12-V-2015, Z. Barina, L. Lökös & D. Pifkó (BP 96648). Korçë County, Mali i Lenies at village Gopensh, 40°43’37.56”N 20°23’56.77”E, on calcareous soil in rocky pastures, 1005 m, 3-V-2017, L. Lökös (BP 96676). Korçë County, Mt “Golines” at village Rakickë, 40°43’8.88”N 20°59’0.97”E, on calcareous soil in rocky grasslands, 1105 m, 1-V-2017, L. Lökös (BP 96672). District of Pogradec, Udënisht, SH3 Piskutat-Pogradec, shore Ohiro lake, 40°58’55”N 20°38’21”E, Pinus halepensis, Juniperus oxycedrus, Buxus sempervirens, sandstone, 710 m, 22-IV-2017, A.R. Burgaz (MACB 111316). KUKËS: District of KukËs, Kolsh, SH5 close Drin river, 42°04’18”N 20°20’32”E, deciduous Quercus, Juniperus oxycedrus, Buxus sempervirens, serpentine soil, 510 m, 21-IV-2017, A.R. Burgaz (MACB 111308). LEZHË: District of Lezhë (Rrethi i Lezhës), near the pass between Mt. “Sheshi i Velës” (1049.2 m) and Mt. “Velës” (1170.1 m), above village Kallmet, 41°50’28.1”N 19°42’54.5”E, on soil in rocky forest, 961 m, 23-IV-2009, L. Lökös (BP 96548). SHKODËR: Shkodër District (Rrethi i Shkodrës), c. 1.5 km NE of village Gomsiqe e Epërme, near road SH5, 41°59’31.61”N 19°48’12.99”E, on acid soil in dry serpentine grasslands, 533 m, 6-5-2015, L. Lökös (BP 96618). District of Shkodër (Rrethi i Shkodrës), Qafasë Çelës above village Mirdicë, 42°01’11.98”N 19°43’33.16”E, on soil in roadside dry rocky grassland, 470 m, 12-X-2011, L. Lökös (BP 96578). Pukë District (Rrethi i Pukës), at village Rakickë, 40°50’28.1”N 19°42’54.5”E, on soil in rocky forest, 961 m, 23-IV-2009, L. Lökös (BP 96548). SHKODËR: Shkodër District (Rrethi i Shkodrës), c. 1.5 km NE of village Gomsiqe e Epërme, near road SH5, 41°59’31.61”N 19°48’12.99”E, on acid soil in dry serpentine grasslands, 533 m, 6-5-2015, L. Lökös (BP 96618). District of Shkodër (Rrethi i Shkodrës), Qafasë Çelës above village Mirdicë, 42°01’11.98”N 19°43’33.16”E, on soil in roadside dry rocky grassland, 470 m, 12-X-2011, L. Lökös (BP 96578). Pukë District (Rrethi i Pukës), Mount Rras’ e Qerretit above village Qerret, 42°02’36.98”N 19°49’53.45”E, in serpentine rocky area, on acid soil in pine woodland, 735 m, 6-V-2015, L. Lökös (BP 96623). Shkodër District (Rrethi i Shkodrës), in the valley of stream Përroi i Çibunit E of village Prekal, 42°10’44.69”N 19°43’18.46”E, on calcareous soil in scrubland, 220 m, 5-V-2015, L. Lökös (BP 96617). Shkodër
District (Rrethi i Shkodrës), between villages Linaj-Eëg-Lepurosh and Kurjtaj, 42°11'10.22"N 19°33'19.74"E, on calcareous soil in dry scrubland, 260 m, 4-V-2015, Z. Barina, L. Lõkös & D. Pifkó (BP 96613). District of Shkodër (Rrethi i Shkodrës), in the valley of river Përrroi i Tha të at village Lashaj, along the road nr. E 762, 42°14'19.70"N 19°25'24.82"E, on calcareous soil in open dry rocky grasslands, 78 m, 30-III-2015, L. Lõkös (BP 96603). District of Malësi e Madhe, Poica, SH21 Koplik-Bogë, 42°15'53"N 19°29'47"E, Juniperus oxycedrus, Cupressus sempervirens, boulders, 320 m, 20-IV-2017, A.R. Burgaz (MACB 111293). District of Malësi e Madhe, Dedaj, SH21 Koplik-Bogë, 42°18'04"N 19°32'32"E, Carpinus betulus, Juniperus oxycedrus, limestone rocks, 495 m, 20-IV-2017, A.R. Burgaz (MACB 111294). District of Malësi e Madhe, Bogë, SH21 Koplik-Bogë, 42°21'46"N 19°37'56"E, Pinus nigra, Juniperus oxycedrus, limestone, 865 m, 20-IV-2017, A.R. Burgaz (MACB 111302). Malësi e Madhe, Bogë, SH21 Koplik-Bogë, 42°21'46"N 19°37'56"E, Pinus nigra, Juniperus oxycedrus, limestone, 865 m, 20-IV-2017, A.R. Burgaz (MACB 111302). Malësi e Madhe District (Rrethi i Malësisë së Madhe), on Mount Bukovik above village Rrapshë-Starë, 42°23'6.12"N 19°25'24.82"E, on calcareous soil in open dry rocky grasslands, 78 m, 30-III-2015, L. Lõkös (BP 96554). VLORË: District of Vlorë (Rrethi i Vlorës), on the E ridge of Mt maja e Thanasit (1352.1 m) above Llogora pass, 41°06'36.2"N 19°32'07.0"E, on soil in poplar woodland, 107 m, 28-IV-2009, L. Lõkös (BP 96554). VLORË: Himarë, Ilias, Himarë, 40°08'29"N 19°40'11"E, Quercus coccifera, Cupressus sempervirens, Cistaceae shrubs, limestone, 300 m, 16-IV-2017, A.R. Burgaz (MACB 111283). District of Vlorë (Rrethi i Vlorës), on the E ridge of Mt maja e Thanasit (1352.1 m) above Llogora pass, 40°11'51.54"N 19°35'27.82"E, on calcareous soil in mixed forest, 1075 m, 12-VIII-2010, L. Lõkös (BP 96568). District of Vlorë, Dukat i Ri, SH3 Orikum-Dhërmë, Llogora N. P., 40°12'00"N 19°35'26"E, Pinus nigra, Juniperus oxycedrus, Buxus sempervirens, limestone, 1030 m, 16-IV-2017, A.R. Burgaz (MACB 111282). District of Vlorë, Dukat i Ri, SH3 Orikum-Dhërmë, Llogora N. P., 40°15'11"N 19°32'14"E, Quercus coccifera, Pinus halepensis, limestone, 320 m, 16-IV-2017, A.R. Burgaz (MACB 111280). Fumarprotocetraric, usnic and physodalic acids chemotype: VORË: District of Vlorë (Rrethi i Vlorës), between village Ilias and monastir Shën Theodor, 40°08'07.8"N 19°40'26.4"E, on soil in olive plantation, 211 m, 29-IV-2009, L. Lõkös (BP 96558).

**Cladonia furcata** (Huds.) Schrad.

**Fumarprotocetraric acid chemotype:** DIBËR: Dibër county, on the mount between villages Fushë Stëdë and Zabzun, 41°19'54.43"N 20°24'38.25"E, on calcareous soil in rocky grasslands, 1295 m, 18-V-2016, L. Lõkös (BP 96669). DURRËS: District of Durrës, Fushë-Draçi, road cape of Rodon, 41°32'50"N 19°31'08"E, Carpinus betulus, Arbutus unedo, Pistacia lentiscus, Cistus salviifolius, sandstone, 90 m, 19-IV-2017, A.R. Burgaz (MACB 111220). ELBASAN: District of Librazhd (Rrethi i Librazhdit): Polis Mts, between villages Gurrëshpat and Vilan, 41°05'38.45"N 20°16'15.72"E, on acid soil among serpentine rocks, 1270 m, 12-X-2010, L. Lõkös (BP 96574). District of Elbasan, Bradashesh, SH3 Bradashesh-Graze, 41°06'33"N 19°59'49"E, Carpinus betulus Juniperus oxycedrus, limestone karst, 530 m, 15-IV-2017, A.R. Burgaz (MACB 111403). District of Librazhd (Rrethi i Librazhdit): Polis Mts; above village Gurrëshpat and Vilan, 41°05'38.45"N 20°16'15.72"E, on acid soil among serpentine rocks, 1270 m, 12-X-2010, L. Lõkös (BP 96572). Elbasan County (Qarku i Elbasanit), on the mount above bridge Ura e Murashit, between Mirakë and Librazhd, 41°11'1.64"N 20°15'08.79"E, on conglomeratic flysch sediments, 555 m, 12-X-2010, L. Lõkös (BP 96572). Elbasan County, in village Floq, 41°16'1.9"N 20°14'19.17"E, on soil by the roadside, 650 m, 17-V-2016, L. Lõkös (BP 96665). GJIROKASTËR: District of Gjirokastër (Rrethi i Gjirokastrôs), between settlements Picar and Andon Poçi in the valley of river Vjošë near road SH4, 40°10'41.12"N 20°04'45.55"E, in grazed grassland, on flysh soil, 170 m, 28-III-2015, L.
Lökös (BP 96598). District of Tepelenë, Këlcyrë, Këlcyrë gorge, left side Vjosa river, 40°17'52"N 20°10'05"E, Carpinus betulus, Pinus halepensis, sandstone, 180 m, 18-IV-2017, A.R. Burgaz (MACB 111215). KORÇÉ: Kolonjë District (Rrethi i Kolonjës), between town Leskovik and village Vrëpçikë, 40°10'30.62"N 20°38'22.95"E, on acid soil in rocky serpentine grasslands, 1030 m, 10-V-2015, Z. Barina, L. Lökös & D. Piňko (BP 96639). District of Kolonjë (Rrethi i Kolonjës), c. 1.9 km W of village Pepellash, 40°28'56.18"N 20°40'21.27"E, on acid soil in moist road slope, 549 m, 18-X-2011, Z. Barina, L. Lökös & D. Piňko (BP 96582). District of Korçë (Rrethi i Korçës), on the ridge of Mt Mali i Moravës above village Dardhë, 40°31'52.6"N 20°48'36.1"E, on acid soil in beech forest on gravel conglomerate, 1625 m, 10-VIII-2010, L. Lökös (BP 96565). District of Korçë, Dardhë, SH90 Boboshticë-Dardhë, 40°31'18"N 20°49'22"E, Fagus sylvatica, Pinus nigra, Juniperus communis, Betula pendula, Abies sp., limestone, 1390 m, 23-IV-2017, A.R. Burgaz (MACB 111344). District of Devoll (Rrethi i Devollit), on the mount between village Tren and lake Liqeni i Përc herës, 40°40'10.55"N 20°11'15"E, limestone rocks, 268 m, 17-IV-2017, A.R. Burgaz (MACB 111197). District of Tepelenë, Këlcyrë gorge, left side Vjosa river, 40°17'52"N 20°17'07"E, Juniperus oxycedrus, Paliurus spinachristi, Arbutus unedo, Pistacia terebinthus, sandstone, 230 m, 18-IV-2017, A.R. Burgaz (MACB 111218). District of Tepelenë, close to Vjosa river, 40°17'52"N 20°10'05"E, Carpinus betulus, Pinus halepensis, sandstone, 180 m, 18-IV-2017, A.R. Burgaz (MACB 111314). KORÇÉ: Dropull, Goranxi, to Kishae Ravanës, 40°00'56"N 20°11'15"E, limestone rocks, 268 m, 17-IV-2017, A.R. Burgaz (MACB 111206). KORÇÉ: District of Përmet, Piskovë, left side Lumica river, K75 to Frashër, 40°16'44"N 20°17'07"E, Juniperus oxycedrus, Pinus nigra, Quercus macrolepis, deciduous Quercus, Juniperus oxycedrus, limestone, 1000 m, 22-IV-2017, A.R. Burgaz (MACB 111315). KORÇÉ: District of Tepelenë, Këlcyrë, Këlcyrë gorge, left side Vjosa river, 40°17'52"N 20°10'05"E, Carpinus betulus, Pinus halepensis, sandstone, 180 m, 18-IV-2017, A.R. Burgaz (MACB 111213). District of Tepelenë, south of village Lenies, K76 Tepelenë-Sinanaj, 40°18'45"N 19°57'46"E, Quercus coccifera, limestone, 280 m, 18-IV-2017, A.R. Burgaz (MACB 111221). KORÇÉ: District of Korçë, Dardhë, SH90 Boboshticë-Dardhë, 40°31'18"N 20°49'22"E, Fagus sylvatica, Pinus nigra, Juniperus communis, Betula pendula, Abies sp., limestone, 1390 m, 23-IV-2017, A.R. Burgaz (MACB 111213). District of Tepelenë, Këlcyrë gorge, left side Vjosa river, 40°17'52"N 20°10'05"E, Carpinus betulus, Pinus halepensis, sandstone, 180 m, 18-IV-2017, A.R. Burgaz (MACB 111315). KUKËS: District of Kukës, Kukës, Rruga Tirana, 42°04'46"N 20°20'32"E, deciduous Quercus, Juniperus oxycedrus, deciduous Quercus, Pinus halepensis, limestone, 270 m, 18-IV-2017, A.R. Burgaz (MACB 111321). District of Pogradec, Udënisht, near peak Rugova e Kolaç, 40°58'55"N 20°38'21"E, Pinus halepensis, Juniperus oxycedrus, Buxus sempervirens, sandstone, 710 m, 22-IV-2017, A.R. Burgaz (MACB 111315). KUKËS: District of Kukës, Kolsh, SH5 close Drin river, 42°04'18"N 20°20'32"E, deciduous Quercus, Juniperus oxycedrus, Buxus sempervirens, serpentine soil, 510 m, 21-IV-2017, A.R. Burgaz (MACB 111307). District of Kukës, Kükës, Rruga Tirana, 42°04'46"N 20°24'45"E, Quercus cerris, deciduous Quercus, limestone, 330 m, 21-IV-2017, A.R. Burgaz (MACB 111309). LEZHË: District of Durrës, Fushë-Durrës, near peak Maja e Pandelejmonit, 40°09'32.2"N 19°38'49.4"E, in dry rocky grassland, on calcareous soil, 260 m, 29-IV-2009, L. Lökös (BP 96555). Fumaprotoectaric and physodalic acids chemotype: DURRËS: District of Durrës, Fushë-Draçia, San Pietro beach track, 41°31'01"N 19°31'12"E, Pinus pinea, sandy soil, 1 m, 19-IV-2017, A.R. Burgaz (MACB 111228). ELBASAN: Prrenjas, Dardhë, SH9 Qafë Thanë, 41°04'24"N 20°36'18"E, Quercus macrolepis, deciduous Quercus, Juniperus oxycedrus, limestone, 1000 m, 22-IV-2017, A.R. Burgaz (MACB 111214). GIROKASTÈR: Dropull, Goranxi, to Kishae Ravanës, 40°00'56"N 20°11'15"E, limestone rocks, 268 m, 17-IV-2017, A.R. Burgaz (MACB 111206). GIROKASTÈR: District of Përmet, Piskovë, left side Lumica river, K75 to Frashër, 40°16'44"N 20°17'07"E, Juniperus oxycedrus, Paliurus spinachristi, Arbutus unedo, Pistacia terebinthus, sandstone, 230 m, 18-IV-2017, A.R. Burgaz (MACB 111213). District of Tepelenë, south of village Lenies, K76 Tepelenë-Sinanaj, 40°18'45"N 19°57'46"E, Quercus coccifera, limestone, 280 m, 18-IV-2017, A.R. Burgaz (MACB 111221). KORÇÉ: District of Korçë, Dardhë, SH90 Boboshticë-Dardhë, 40°31'18"N 20°49'22"E, Fagus sylvatica, Pinus nigra, Juniperus communis, Betula pendula, Abies sp., limestone, 1390 m, 23-IV-2017, A.R. Burgaz (MACB 111213). District of Tepelenë, Këlcyrë gorge, left side Vjosa river, 40°17'52"N 20°10'05"E, Carpinus betulus, Pinus halepensis, sandstone, 180 m, 18-IV-2017, A.R. Burgaz (MACB 111315). KUKËS: District of Kukës, Kolsh, SH5 close Drin river, 42°04'18"N 20°20'32"E, deciduous Quercus, Juniperus oxycedrus, Buxus sempervirens, serpentine soil, 510 m, 21-IV-2017, A.R. Burgaz (MACB 111307). District of Kukës, Kükës, Rruga Tirana, 42°04'46"N 20°24'45"E, Quercus cerris, deciduous Quercus, limestone, 330 m, 21-IV-2017, A.R. Burgaz (MACB 111309). LEZHË: District of Durrës, Fushë-Durrës, near peak Maja e Pandelejmonit, 40°09'32.2"N 19°38'49.4"E, in dry rocky grassland, on calcareous soil, 260 m, 29-IV-2009, L. Lökös (BP 96555).
Malësi e Madhe, Poça, SH21 Koplik-Bogë, 42°15'53"N 19°29'47"E, Juniperus oxycedrus, Cupressus sempervirens, boulders, 320 m, 20-IV-2017, A.R. Burgaz (MACB 111291). District of Malësi e Madhe, Dedaj, SH21 Koplik-Bogë, 42°18'04"N 19°32'32"E, Carpinus betulus, Juniperus oxycedrus, limestone rocks, 495 m, 20-IV-2017, A.R. Burgaz (MACB 111297). District of Malësi e Madhe, Bogë, SH21 Koplik-Bogë, 42°21'46"N 19°37'56"E, Pinus nigra, Juniperus oxycedrus, limestone, 865 m, 20-IV-2017, A.R. Burgaz (MACB 111301). VLORE: Finiq, Muzinë, 39°54'48"N 20°11'20"E, deciduous Quercus, Erica arborea, limestone, 186 m, 17-IV-2017, A.R. Burgaz (MACB 111200). Finiq, Bistrice, 39°55'08"N 20°08'48"E, Pinus nigra, Platanus orientalis, deciduous Quercus, Erica arborea, limestone, 186 m, 17-IV-2017, A.R. Burgaz (MACB 111201). District of Malësi e Madhe, Dedaj, SH21 Koplik-Bogë, 42°18'04"N 19°32'32"E, Carpinus betulus, Juniperus oxycedrus, limestone rocks, 495 m, 20-IV-2017, A.R. Burgaz (MACB 111200). Finiq, Muzinë, Quercus, Erica arborea, limestone, 186 m, 17-IV-2017, A.R. Burgaz (MACB 111201). District of Malësi e Madhe, Poça, SH21 Koplik-Bogë, 42°15'53"N 19°29'47"E, Juniperus oxycedrus, Cupressus sempervirens, boulders, 320 m, 20-IV-2017, A.R. Burgaz (MACB 111291). District of Malësi e Madhe, Dedaj, SH21 Koplik-Bogë, 42°18'04"N 19°32'32"E, Carpinus betulus, Juniperus oxycedrus, limestone rocks, 495 m, 20-IV-2017, A.R. Burgaz (MACB 111297). District of Malësi e Madhe, Bogë, SH21 Koplik-Bogë, 42°21'46"N 19°37'56"E, Pinus nigra, Juniperus oxycedrus, limestone, 865 m, 20-IV-2017, A.R. Burgaz (MACB 111301). VLORE: Finiq, Muzinë, 39°54'48"N 20°11'20"E, deciduous Quercus, Erica arborea, limestone, 186 m, 17-IV-2017, A.R. Burgaz (MACB 111200). Finiq, Bistrice, 39°55'08"N 20°08'48"E, Pinus nigra, Platanus orientalis, deciduous Quercus, Erica arborea, limestone, 186 m, 17-IV-2017, A.R. Burgaz (MACB 111201).

Atranorin and fumarprotocetraric acid: KORÇË: District of Korçë (Retri i Korçës), on the ridge of Mt Mali i Moravës above village Dardhë, near peak Buzeja e Boboshticës (1701 m), 40°32'23.97"E, 20°49'14.20"E, on acid soil in beech forest on gravel conglomerate, 1550 m, 10-VIII-2010, L. Lőkös (BP 96626).

Atranorin, fumarprotocetraric and physodalic acids chemotype: KORÇË: District of Korçë, Dardhë, SH90 Boboshticë-Dardhë, 40°31'26"N 20°48'06"E, Fagus sylvatica, Juniperus communis, Abies sp., sandstone, 1550 m, 23-IV-2017, A.R. Burgaz (MACB 111318). SHKODËR: District of Malësi e Madhe, Poça, SH21 Koplik-Bogë, 42°15'53"N 19°29'47"E, Juniperus oxycedrus, Cupressus sempervirens, boulders, 320 m, 20-IV-2017, A.R. Burgaz (MACB 111291). District of Malësi e Madhe, Dedaj, SH21 Koplik-Bogë, 42°18'04"N 19°32'32"E, Carpinus betulus, Juniperus oxycedrus, limestone rocks, 495 m, 20-IV-2017, A.R. Burgaz (MACB 111297). Malësi e Madhe, Dedaj, SH21 Koplik-Bogë, 42°18'04"N 19°32'32"E, Carpinus betulus, Juniperus oxycedrus, limestone rocks, 495 m, 20-IV-2017, A.R. Burgaz (MACB 111297). Malësi e Madhe, Bogë, SH21 Koplik-Bogë, 42°21'46"N 19°37'56"E, Pinus nigra, Juniperus oxycedrus, limestone, 865 m, 20-IV-2017, A.R. Burgaz (MACB 111300). VLORE: Finiq, Muzinë, 39°54'48"N 20°11'20"E, deciduous Quercus, Erica arborea, limestone, 186 m, 17-IV-2017, A.R. Burgaz (MACB 111284). District of Vlorë, Dukat i Ri, SH3 Orikum-Dhëmni, Llogora N. P., 40°15'11"N 19°32'14"E, Quercus coccifera, Pinus halepensis, limestone, 320 m, 16-IV-2017, A.R. Burgaz (MACB 111281). Atranorin, bourgeanic and fumarprotocetraric acids: KORÇË: Korçë County, Mt Golines at village Rakickë, 40°43'42.80"N 20°59'28.06"E, on calcareous soil in open, rocky scrublands, 1295 m, 1-V-2017, L. Lőkös (BP 96674).

Cladonia humilis (With.) J.R. Laundon

Atranorin and fumarprotocetraric acid: ELBASAN: Prrenjas, Prrenjas, SH3 Qukses-Prrenjas, 41°04'24"N 20°30'15"E, Carpinus orientalis, Quercus macrolepis, deciduous Quercus, Buxus sempervirens, limestone slopes, 540 m, 22-IV-2017, A.R. Burgaz (MACB 111444). VLORE: District of Sarandë, Pasqirave, Butrint N. P., SH81, Shengjerj monastery, 39°48'42"N 20°00'43"E, Quercus coccifera, limestone slopes, 50 m, 17-IV-2017, A.R. Burgaz (MACB 111407).

Cladonia macilenta Hoffm.

Barbatic and thamnolic acids: LEZHË: District of Mirditë (Rrethi i Mirditës); in the valley of stream Fani i Vogël above village Thirrë; in serpentine rocky area, on bark (Pinus nigra). 42°0° 20.98"N 20°14'33.25"E, 905 m, 6-V-2015, L. Lőkös (BP 96626).

Cladonia merochlorophaea Asahina

Fumarprotocetraric and merochlorophaeic acids: KORÇË: District of Korçë (Retri i Korçës), on the ridge of Mt Mali i Moravës above village Dardhë, near peak Buzeja e Boboshticës, on calcareous soil, 40°31'52.6"N 20°48'36.1"E, 1625 m, 10-VIII-2010, L. Lőkös (BP 96666).

Cladonia parasitica (Hoffm.) Hoffm.

Barbatic and thamnolic acids: VLORE: District of Delvinë (Rrethi i Delvinës), Mali i Gjerë, on the southern slope of 1331 m high mount above Delvinë; in chestnut woodland, on bark (Castanea sativa), 39°57'42.12"N 20°07'59.66"E, 828 m, 1-V-2009, Z. Barina & D. Pifikő (BP 96545).

Cladonia peziziformis (With.) J.R. Laundon

Fumarprotocetraric acid: SHKODËR: Vau i Dejës, SH25 Vau i Dejës-Koman, 42°00'55"N 20°39'37"E, 828 m, 1-V-2009, Z. Barina & D. Pifikő (BP 96545).

Cladonia polycarpoides Nyl. (= C. subcariosa auct.)

Norstictic acid chemotype: SHKODËR: Vau i Dejës, SH25 Vau i Dejës-Koman, 42°00'55"N 20°39'37"E, 828 m, 1-V-2009, Z. Barina & D. Pifikő (BP 96545).
serpentine soil, 130 m, 20-IV-2017, A.R. Burgaz (MACB 111427). **Atranorin and norstictic acid chemotype:** KUKÊS: District of Kukës, Kolsh, SH5 close Drin river, 42°04′18″N 20°20′32″E, deciduous *Quercus, Juniperus oxycedrus, Buxus sempervirens*, serpentine soil, 510 m, 21-IV-2017, A.R. Burgaz (MACB 111432).

**Cladonia pyxidata** (L.) Hoffm.

**Fumarprotocetraric acid chemotype:** DIBÊR: Dibër county, Gjolborde, in the dry valley Gropa Gjugarica above village Sebisht, 41°23′34.22″N 20°25′16.33″E, on calcareous soil in rocky grasslands, 1015 m, 19-V-2016, L. Lökös (BP 96670). Dibër county, Mt Serakoli above vallae Ploshtan, 41°50′44.99″N 20°26′43.85″E, on calcareous soil in rocky pastures, 1200 m, 21-V-2016, L. Lökös (BP 96671). DURRÊS: District of Krujê, Krujê, SH38 to Qafë-Shtamë N., 41°31′03″N 19°47′27″E, *Carpinus betulus*, pasturelands, limestone, 720 m, 19-IV-2017, A.R. Burgaz (MACB 111229). ELBASAN: Elbasan county, in open boxwood scrubland above village Kutërm, 41°13′40.99″N 20°14′14.04″E, on acid soil in rocky serpentine area, 510 m, 16-V-2016, L. Lökös (BP 96661). FIER: Fier District (Rrethi i Fierit), Mali i Kalivaçit, S of village Kalivaç, above river Vjosë, 40°24′14.86″N 19°48′4.08″E, on calcareous soil in *Quercus cocccifera* scrubland, 100 m, 8-V-2015, L. Lökös (BP 96629). GJIROKASTËR: Gjirokastër County, Bredhi i Sotirës above village Sotirë, 39°48′53.21″N 20°21′41.98″E, on mossy rocks in dry scrublands, 550 m, 6-V-2017, L. Lökös (BP 96681). Gjirokastër County, at village Derviçian, 40°01′24.45″N 20°10′39.21″E, on calcareous soil in rocky grasslands, 260 m, 7-V-2017, L. Lökös (BP 96684). District of Përmet (Rrethi i Përmetit), c. 1.3 km SE of village Kosinë, along river Vjosë, 40°15′40.11″N 20°19′8.84″E, on calcareous conglomerate rocks, 215 m, 17-X-2011, Z. Barina, L. Lökös, D. Pifkó (BP 96581). District of Përmet (Rrethi i Përmetit), left part of river Vjosë, between town Këlëyrrë and village Mbroezhdan, 40°18′17.42″N 20°12′17.52″E, in scrubland, on flysh soil, 205 m, 9-V-2015, L. Lökös (BP 96686). Tepelenë District (Rrethi i Tepelenës), in village Mezhgoran, 40°19′11.24″N 20°05′43.54″E, on calcareous soil, 660 m, 9-V-2015, Z. Barina, L. Lökös, D. Pifkó (BP 96634). **KORÇË:** District of Pogradec, Udënisht, SH3 Piskutat-Pogradec, shore Ohrid lake, 40°58′55″N 20°38′21″E, *Pinus halepensis, Juniperus oxycedrus, Buxus sempervirens*, sandstone, 710 m, 22-IV-2017, A.R. Burgaz (MACB 111341). District of Korçë (Rrethi i Korçës); Mali i Strugarat above village Belorta, 40°39′56.56″N 20°50′9.79″E, open grasslands on conglomerate rocks, 1010 m, 11-V-2015, Z. Barina, L. Lökös, D. Pifkó (BP 96644). District of Devoll (Rrethi i Devollit), on the mount between village Tren and lake Liqeni i Prespës së Vogël, 40°40′10.55″N 20°59′12.62″E, on calcareous soil in rocky grasslands, 910 m, 12-V-2015, Z. Barina, L. Lökös, D. Pifkó (BP 96650). Korçë County, Mt Golines at village Rakikë, 40°43′8.88″N 20°59′0.97″E, on calcareous soil in rocky grasslands, 1105 m, 1-V-2017, L. Lökös (BP 96673). District of Korçë (Rrethi i Korçës), Thatë Mountains (Mali i Thatë), c. 3.0 km north of village Zvezdë, c. 1.85 km south-southeast of the peak of Mount “maja e Shëngjergjit” (1921 m), 40°44′37.16″N 20°52′35.53″E, on calcareous soil in rocky grasslands, 1165 m, 18-X-2011, L. Lökös (BP 96589). SHKODËR: Vau i Dejës, SH25 Vau i Dejës-Koman, 42°03′01″N 19°39′45″E, *Pinus pinaster, Juniperus oxycedrus, Quercus cerris, Erica arborea, Cotinus coggyria*, serpentine soil, 130 m, 20-IV-2017, A.R. Burgaz (MACB 111423). Shkodër District (Rrethi i Shkodrës), in the valley of stream Përroi i Çibunit E of village Prekal, 42°10′50.54″N 19°43′42.57″E, on calcareous soil in scrubland, 250 m, 5-V-2015, L. Lökös (BP 96615). District of Malësi e Madhe, Dedaj, SH21 Koplik-Bogë, 42°18′04″N 19°32′32″E, *Carpinus betulus, Juniperus oxycedrus*, limestone rocks, 495 m, 20-IV-2017, A.R. Burgaz (MACB 111326). District of Malësi e Madhe, Bogë, SH21 Koplik-Bogë, 42°21′46″N 19°37′56″E, *Pinus nigra, Juniperus oxycedrus*, limestone, 865 m, 20-IV-2017, A.R. Burgaz (MACB 111327). Malësi e Madhe District (Rrethi i Malësës së Madhe), on Mount Bukovik above village Rrapshë-Starë, 42°23′6.12″N 19°29′25.56″E, on calcareous soil in rocky grasslands, 715 m, 3-V-2015, L. Lökös (BP 96609). TIRANË: District of Tirëna (Rrethi i Tiranës); Mali i Strugarat above village Bajrakisht, 41°12′38″N 19°59′07″E, *Arbutus unedo, Erica arborea, Platanus orientalis*, boulders, 480 m, 22-IV-2017, A.R. Burgaz (MACB 111337). Tirana County (Qarku i Tirënas), between village Pëllumbas and cave Shpella e Pëllumbasisit, 41°15′4.10″N 19°57′25.56″E, on calcareous soil in *Carpinus orientalis* woodland, 445 m, 3-IV-2016, L. Lökös (BP 96654). Tirana County (Qarku i Tirënas), near cave Shpella e Pëllumbasit above village Pëllumbas, 41°15′21.11″N 19°57′50.31″E, on calcareous soil in *Carpinus orientalis* woodland, 450 m, 3-IV-2016, L. Lökös (BP 96656). VLORE: District of Sarandë (Rrethi i Sarandës),...
on the eastern slope of Mt Maja e Milletit, about village Sopik, 39°46’12.49”N 20°06’20.58”E, on calcareous soil in rocky grasslands, 160 m, 13-X-2012, L. Lőkös (BP 96594). District of Sarandë (Rrrethi i Sarandës), on a hill between villages Kulluricë and Kadër, 39°48’43.85”N 20°06’34.02”E, in dry grassland, on flysh soil, 55 m, 13-X-2012, L. Lőkös (BP 96592). Ilsia, Himarë, 40°08’29”N 19°40’11”E, Quercus cocifera, Cupressus sempervirens, Cistaceae shrubs, limestone, 300 m, 16-IV-2017, A.R. Burgaz (MACB 110961). District of Vlorë (Rrrethi i Vlorës); on the E ridge of Maja e Thanasit (Rrrethi i Sarandës), on a hill between villages Kulluricë and Kodër, 39°48’43.85”N 20°06’20.58”E, on calcareous soil in rocky grasslands, 160 m, 13-X-2012, L. Lőkös (BP 96594). District of Sarandë (Rrrethi i Sarandës), on a hill between villages Kulluricë and Kodër, 39°48’43.85”N 20°06’20.58”E, on calcareous soil in mixed forest, 1075 m, 12-VIII-2010, L. Lőkös (BP 96569). **Fumarprotocetraric and phosydolic acids chemotype:** GJIROKASTÉR: Dropull, Grapsh, SH78, 39°56’50”N 20°14’31”E, deciduous Quercus, limestone slope rocks, 440 m, 17-IV-2017, A.R. Burgaz (MACB 111210, 111203). Dropull, Goranxi, to Kishae Ravenes, 40°00’56”N 20°11’15”E, limestone rocks, 268 m, 17-IV-2017, A.R. Burgaz (MACB 111205). District of Tepelenë, Kodër, left Vjosa river bank, 40°17’20”N 20°04’25”E, Paliurus spina-christi, Spartium junceum, Phlomis shrubs, limestone slopes, 160 m, 18-IV-2017, A.R. Burgaz (MACB 111208, 111209). District of Tepelenë, Këlcyrë, Këlcyrë gorge, left side Vjosa river, 40°17’52”N 20°10’05”E, Carpinus betulus, Pinus halepensis, sandstone, 180 m, 18-IV-2017, A.R. Burgaz (MACB 111212, 111214). VLORE: Finiq, Districë, Muzinë, 39°55’08”N 20°11’15”E, Quercus cocifera, Cupressus sempervirens, Pinus halepensis, Cercis siliquastrum, limestone slopes, 125 m, 17-IV-2017, A.R. Burgaz (MACB 111192). District of Vlorë, Đukat i Ri, SH3 Orikut-Dhërmi, Llogora N. P., 40°12’00”N 19°35’26”E, Pinus nigra, Juniperus oxycedrus, Buxus sempervirens, limestone, 1030 m, 16-IV-2017, A.R. Burgaz (MACB 110957, 110958). District of Vlorë, Đukat i Ri, SH3 Orikut-Dhërmi, Llogora N. P., 40°15’11”N 19°32’14”E, Quercus cocifera, Pinus halepensis, limestone, 320 m, 16-IV-2017, A.R. Burgaz (MACB 110954, 110955). **Fumarprotocetraric and psoronic acids chemotype:** BERAT: District of Berat (Rrrethi i Beratit), Tomor Mountains (Mali i Tomorrit), c. 700 m north of village Karkanjoz, 40°41’55.61”N 20°03’28.69”E, in Mediterranean scrubland, on calcareous soil in rocky grassland, 490 m, 25-V-2004, Z. Barina, Cs. Németh & D. Pifkó (BP 96539). ELBASAN: Elbasan county, in open boxwood scrubland above village Kutërman, 41°13’40.99”N 20°14’41.04”E, on acid soil in rocky serpentine area, 510 m, 16-V-2016, L. Lőkös (BP 96662). GJIROKASTÉR: District of Përmet (Rrrethi i Përmetit), left part of river Vjosë, between town Këlcyrë and village Mbrezhdan, 40°18’17.42”N 20°12’17.52”E, in scrubland, on flysh soil, 205 m, 9-V-2015, L. Lőkös (BP 96636). KORÇË: Kolonjë District (Rrrethi i Kolonjës); between town Leskovik and village Vrëpëckë, 40°10’30.62”N 20°38’22.95”E, on acid soil in rocky serpentine grasslands, 1030 m, 10-V-2015, Z. Barina, L. Lőkös & D. Pifkó (BP 96640). District of Devoll (Rrrethi i Devollit), on the hills above village Ponçarë, 40°31’17.63”N 20°57’54.23”E, in dry grasslands, on flysh soil, 1035 m, 11-V-2015, Z. Barina, L. Lőkös & D. Pifkó (BP 96647). KORÇË County, Mal Moravë above village Hoçisht, 40°31’30.57”N 20°53’33.39”E, on calcareous soil in oak woodland, 1030 m, 2-V-2017, L. Lőkös (BP 96675). District of Korçë (Rrrethi i Korçës), Mali i Strugariit above village Belorta, 40°39’56.56”N 20°50’9.79”E, open grasslands on conglomerate rocks, 1010 m, 11-V-2015, Z. Barina, L. Lőkös & D. Pifkó (BP 96645). District of Devoll (Rrrethi i Devollit), on the mount between village Tren and lake Liqeni i Prespës së Vogël, 40°40’10.55”N 20°59’12.62”E, on calcareous soil in rocky grasslands, 910 m, 12-V-2015, Z. Barina, L. Lőkös & D. Pifkó (BP 96651). District of Pogradec,
UDENISHT, SH3 Piskutat-Pogradec, shore Ohrid lake, 40°58′55″N 20°38′21″E, Pinus halepensis, Juniperus oxycedrus, Buxus sempervirens, sandstone, 710 m, 22-IV-2017, A.R. Burgaz (MACB 111342). KUKËS: District of Kukës, Kolsh, SH5 close Drin river, 42°04′18″N 20°20′32″E, deciduous Quercus, Juniperus oxycedrus, Buxus sempervirens, serpentinite soil, 510 m, 21-IV-2017, A.R. Burgaz (MACB 111334). LEZHË: District of Lezhë (Rrethi i Lezhës), on the slope of Mt Guri i Kuq above village Fregën, 41°51′41.58″N 19°44′11.22″E, on acid soil in open serpentinite grasslands, 575 m, 30-III-2015, L. Lökös (BP 96607). SHKODÈR: Shkodër District (Rrethi i Shkodërës), c. 1.5 km NE of village Gomsiqe e Epërme, near road SH5, 41°59′31.61″N 19°48′12.99″E, on acid soil in dry serpentine grasslands, 533 m, 6-V-2015, L. Lökös (BP 96619). PUKË: District (Rrethi i Pukës); Mount Ras’ e Qerretit above village Qerret, 42°03′36.98″N 19°49′53.45″E, in serpentinite rocky area, on acid soil in pine woodland, 735 m, 12-X-2017, L. Lökös (BP 96650). District of Shkodër (Rrethi i Shkodërës), in the valley of river Përroi i Thatë at village Lashaq, along the road nr. E 762, 42°14′19.70″N 19°25′24.82″E, on calcareous soil in open dry rocky grasslands, 78 m, 30-III-2015, L. Lökös (BP 96605). VLORÈ: District of Vlorë (Rrethi i Vlorës), at seashore Rugët e Bardha west of village Palasë, 40°10′30.46″N 19°36′9.32″E, on calcareous soil in dry roadside scrubland, 225 m, 12-X-2012, L. Lökös (BP 96590). ATRANORIN, Fumarprotocetraric and rangiformic acids chemotype: BERAT: District of Skrapar (Rrethi i Skraparit), above the gorge of river Osum next to village Dhorës, 40°28′27.79″N 20°14′20.54″E, in open bushland, on calcareous soil, 420 m, 13-X-2010, L. Lökös (BP 96576). DIBÊR: District of Mat (Rrethi i MËtës), Mali i Kolsh, on the northern forehills of Mt. “maja e MëÎletzë”, near village Shkopet, 41°41′28.5″N 19°49′14.8″E, on soil, 222 m, 24-IV-2009, L. Lökös (BP 96550). ELBASAN: Prenjas, SH3 Qukës-Prenjas, 41°04′24″N 20°30′15″E, Carpinus orientalis, Quercus macrolepis, deciduous Quercus, Buxus sempervirens, limestone slopes, 540 m, 22-IV-2017, A.R. Burgaz (MACB 111339). Prenjas, Urakë, SH9 Qafë Thanë, 41°04′24″N 20°36′18″E, Quercus macrolepis, deciduous Quercus, Juniperus oxycedrus, limestone, 1000 m, 22-IV-2017, A.R. Burgaz (MACB 111340). District of Elbasan, Bradashe, SH3 Bradashe-Graze, 41°06′05″N 20°00′26″E, Olea europea, limestone karst, 390 m, 15-IV-2017, A.R. Burgaz (MACB 111401). District of Elbasan, Bradashe, SH3 Bradashesh-Graze, 41°06′33″N 19°59′49″E, Carpinus betulus, Juniperus oxycedrus, limestone karst, 530 m, 15-IV-2017, A.R. Burgaz (MACB 111404). District of Librazhd (Rrethi i Librazhdit): Polis Mts, above village Polis, on the ridge between the valley of brook “Sut Kukit” and river Shkumbin, 41°09′16.50″N 20°15′08.79″E, in bushland, on conglomeratic flysh sediments, 555 m, 12-X-2010, L. Lökös (BP 96573). Elbasan County (Qarku i Elbasanit), on the mount above bridge Ura e Murrashit, between Mirakë and Librazhd, 41°11′1.64″N 20°16′33.36″E, on acid soil in serpentinite scrublands, 290 m, 3-IV-2016, L. Lökös (BP 96659). Elbasan county, in village Fiq, 41°16′1.19″N 20°14′19.17″E, on soil by the roadside, 650 m, 17-V-2016, L. Lökös (BP 96666). FIER: District of Fier (Rrethi i Fierit), Pishë-Poro Nature Reserve, between village Pishë and the Adriatic Sea, 40°40′3.67″N 19°22′17.76″E, on soil in stone pine forest, 5 m, 12-VIII-2010, L. Lökös (BP 96567). Lushnjë District (Rrethi i Lushnjës), Goldë e Kullarit W of village Kular, ca 4 km NW of Divjakë, 41°01′6.54″N 19°29′24.54″E, in pine woodland on sandy seacoast area, 5 m, 7-V-2015, L. Lökös (BP 96628). Fier District (Rrethi i Fierit), Mali i Kalivaçit, S of village Kalivaç, above river Vjosë, 40°24′14.86″N 19°48′4.08″E, on calcareous soil in Quercus cocifera scrubland, 100 m, 8-V-2015, L. Lökös (BP 96630). Fier County, Pylli i Levanit, above village Levan, 40°40′48.99″N 19°30′11.70″E, on calcareous soil in oak woodland, 95 m, 5-V-2017, L. Lökös (BP 96679). GJIROKASTÈR: Gjirokastër County, Bredhi i Sotirës above village Sotirë, 39°48′53.21″N 20°21′41.98″E, on mossy rocks in dry scrublands, 550 m, 6-V-2017, L. Lökös (BP 96682). Gjirokastër County, N of village Koshovice, in Plantanus woodland, 39°50′11.52″N 20°23′51.90″E, on soil in rocky grasslands, 430 m, 6-V-2017, L. Lökös (BP 96683). Dropull, Grapsh, SH78, 39°56′50″N 20°14′31″E, deciduous Quercus, limestone slope rocks, 440 m, 17-IV-2017, A.R. Burgaz (MACB 111204). Dropull, Goranxi, to Kishë Ravënes, 40°00′56″N 20°11′15″E, limestone rocks, 268 m, 17-IV-2017, A.R. Burgaz (MACB 111207). Gjirokastër District (Rrethi i Gjirokastrës), Mount Maja e Lalucit above village Saraqinishtë, 40°06′57.10″N 20°14′20.54″E, on calcareous soil in rocky grasslands, 1055 m, 9-V-2015, L. Lökös (BP 96632). District of Gjirokastër (Rrethi i Gjirokastrës), between settlements Picar and Andon Poçi in the valley of river Vjosë near road SH4, 40°10′41.12″N 20°04′45.55″E, in grazed grassland, on flysh soil, 170 m, 28-III-2015, L. Lökös (BP 96690).
Lökös (BP 96599). District of Gjirokastër (Rrethi i Gjirokastrisë); Kurvelesh i Sipërëm uplands above village Picar, 40°11’0.39”N 20°02’31.51”E, on calcareous soil in rocky grasslands, 750 m, 29-III-2015, L. Lökös (BP 96601). District of Tepelenë, Kodër, left Vjosë river bank, 40°17’20”N 20°04’25”E, *Paliurus spinosa-christi*, *Spartium junceum*, *Phlomis* shrubs, limestone slopes, 160 m, 18-IV-2017, A.R. Burgaz (MACB 111210). Tepelenë District (Rrethi i Tepelenës); village Mezhgoran, 40°19’11.24”N 20°05’43.54”E, on calcareous soil, 660 m, 9-V-2015, Z. Barina, L. Lökös, D. Pifkó (BP 96635). District of Tepelenë (Rrrethi i Tepelenës), c. 1.4 km S of village Vojar, 40°21’27.84”N 19°55’57.13”E, on acid soil in exposed rocky grasslands, 155 m, 14-X-2012, L. Lökös (BP 96597). KORČË: Kolonjë District (Rrethi i Kolonjës); between town Leskovik and village Vrëpckë, 40°10’30.62”N 20°20’32”E, on acid soil in dry rocky grassland, 1105 m, 18-X-2011, Z. Barina, L. Lökös, D. Pifkó (BP 96583). District of Devoll (Rrethi i Devollit), 1.9 km W of village Papëllash, 40°28’56.18”E 20°40’21.27”N, on acid soil in moist road slope, 549 m, 18-X-2011, Z. Barina, L. Lökös, D. Pifkó (BP 96588). District of Tepelenë, Boboshticë, SH90 Boboshticë-Dardhë, 40°32’37”N 20°47’11”E, *Juniperus oxycedrus* pastureland, sandstone, 1200 m, 23-IV-2017, A.R. Burgaz (MACB 111343). District of Kavajë (Rrethi i Kavajës); Mt Mali i Moravës, near the peak of Mt Maja e Dhema, between villages Linaj-Egç-Lepurosh and Kurtaj, 42°11’10.22”N 19°33’19.74”E, on calcareous soil in dry scrubland, 260 m, 4-V-2015, Z. Barina, L. Lökös, D. Pifkó (BP 96614). Malësi e Madhe District (Rrethi i Malësisë së Madhe), on Mount Bukovik above village Rrapshë-Starë, 42°23’6.12”N 19°29’25.56”E, on calcareous soil in rocky grasslands, 715 m, 3-V-2015, L. Lökös (BP 96610). TIRANË: District of Kavajë (Rrethi i Kavajës), by the coast of the Adriatic Sea between villages Spille and Rreth (Rreth-Greth), 41°05’07.6”N 20°27’31.5”E, on sandy soil in sand dune area, 10 m, 27-IV-2009, L. Lökös (BP 96553). Tirana County (Qarku i Tiranës), at the foot of Mt Kalaja e Dorëzit, between villages Pezë and Dorëz, 41°13’30.08”N 19°45’53.26”E, in open oak woodland, on limestone together with bryophytes, 255 m, 22-IV-2009, L. Lökös (BP 96547). SHKODËR: Shkodër District (Rrethi i Shkodrës), between villages Linaj-Egç-Lepurosh and Kurtaj, 42°11’10.22”N 19°33’19.74”E, on calcareous soil in dry scrubland, 260 m, 4-V-2015, Z. Barina, L. Lökös, D. Pifkó (BP 96614). Malësi e Madhe District (Rrethi i Malësisë së Madhe), on Mount Bukovik above village Rrapshë-Starë, 42°23’6.12”N 19°29’25.56”E, on calcareous soil in rocky grasslands, 715 m, 3-V-2015, L. Lökös (BP 96610). TIRANË: District of Kavajë (Rrethi i Kavajës), by the coast of the Adriatic Sea between villages Spille and Rreth (Rreth-Greth), 41°05’07.6”N 20°27’31.5”E, on sandy soil in sand dune area, 10 m, 27-IV-2009, L. Lökös (BP 96553). Tirana County (Qarku i Tiranës), at the foot of Mt Kalaja e Dorëzit, between villages Pezë and Dorëz, 41°13’30.08”N 19°45’53.26”E, in grasslands, on flysh soil, 180 m, 2-IV-2016, L. Lökös (BP 96653). Tirana County (Qarku i Tiranës), between village Pëllumbas and cave Shpella e Pëllumbasit, 41°15’4.10”N 19°57’34.16”E, on calcareous soil in *Carpinus orientalis* woodland, 445 m, 3-IV-2016, L. Lökös (BP 96655). VLORE: Sarandë, Pásqirave, Butrint N. P., SH81, Shengjergj monastery, 39°44’51”N 19°44’28.2”E, on calcareous soil in rocky grassland, 130 m, 20-IV-2017, A.R. Burgaz (MACB 111329). Vau i Dejës, Karmë, SH25 Vau i Dejës-Koman, 42°04’02”N 19°40’59”E, *Quercus macroilepis*, *Q. pubescens*, *Juniperus oxycedrus*, *Erica arborea*, slates, 130 m, 20-IV-2017, A.R. Burgaz (MACB 111331). District of Shkodër (Rrethi i Shkodrës), in the valley of river Përrëoi i Thatë at village Lashaj, along the road nr. E 762, 42°14’19.70”N 19°25’24.82”E, on calcareous soil in open dry rocky grasslands, 78 m, 30-III-2015, L. Lökös (BP 96605). LEZHË: District of Lezhë (Rrethi i Lezhës), Mali i Rrencit, near the peak of Mt Burga (262 m), above village Shëngjin, 41°49’28.2”N 19°35’03.9”E, in open oak woodland, on limestone together with bryophytes, 255 m, 22-IV-2009, L. Lökös (BP 96547).
Kodër, 39°48′43.85″N 20°06′34.02″E, in dry grassland, on flysh soil, 55 m, 13-X-2012, L. Lőkös (BP96593). District of Sarandë (Rrethi i Sarandës), north of village Gjashtë, towards Delvinë, 39°53′34.58″N 20°01′58.26″E, in open rocky grassland, on limestone together with bryophytes, 45 m, 1-V-2009, Z. Barina, L. Lőkös & D. Piškò (BP 96546). Finiq, Muzinë, Muzinë, 39°54′48″N 20°11′20″E, deciduous Quercus, Erica arborea, limestone, 186 m, 17-IV-2017, A.R. Burgaz (MACB 111020). Finiq, Bistrëcë, Muzinë, 39°55′08″N 20°08′48″E, Quercus coccifera, Carpinus betulus, Pinus halepensis, Cercis siliquastrum, limestone slopes, 125 m, 17-IV-2017, A.R. Burgaz (MACB 111194). Himarë, Ilías, Himarë, 40°08′29″N 19°40′11″E, Quercus coccifera, Cupressus sempervirens, Cistaceae shrubs, limestone, 300 m, 16-IV-2017, A.R. Burgaz (MACB 111046). District of Vlorë (Rrethi i Vlorës), Mts. Mali i Çikës, in the valley below Mt. “Maja e Pandelejmonit” (805.8 m), north of village Dhërmi, 40°09′32.2″N 19°38′49.4″E, in dry rocky grassland, on calcareous soil, 260 m, 29-IV-2009, L. Lőkös (BP 96556). District of Vlorë (Rrrethi i Vlorës), on the E ridge of Mt maja e Pandelejmonit and Thanasit (1352.1 m) above Llogora pass, 40°11′51.54″N 19°35′27.82″E, on calcareous soil in mixed forest, 1075 m, 12-VIII-2010, L. Lőkös (BP 96570). Atranorin, fumarprotocetraric, rangiformic and physodalic acids chemotype:

DURRS: District of Durrës, Fushë-Draç, San Pietro beach track, 41°31′01″N 19°31′12″E, Pinus pinea, sandy soil, 1 m, 19-IV-2017, A.R. Burgaz (MACB 111227). Krujë, Krujë, SH38 to Qafë-Shtamë N. P., 41°31′03″N 19°49′27″E, Carpinus betulus, forestpalearounds, limestone, 720 m, 19-IV-2017, A.R. Burgaz (MACB 111289). District of Durrës, Fushë-Draç, road cape of Rodon, 41°32′50″N 19°31′08″E, Carpinus betulus, Arbutus unedo, Pistacia lentiscus, Cistus salviifolius, sandstone, 90 m, 19-IV-2017, A.R. Burgaz (MACB 111200). ELBASAN: District of Elbasan, Bradashe, SH3 Bradashe-Graze, 41°06′05″N 20°00′26″E, Olea europaea, limestone karst, 390 m, 15-IV-2017, A.R. Burgaz (MACB 110952). District of Elbasan, Bradashe, SH3 Bradashe-Graze, 41°06′33″N 19°59′49″E, Carpinus betulus Juniperus oxycedrus, limestone karst, 530 m, 15-IV-2017, A.R. Burgaz (MACB 110953). GJIROKASTÉR: District of Tepelenë, Kodër, left Vjosa river bank, 40°17′20″N 20°04′25″E, Palmarus spina-christi, Spartium junceum, Phlomis shrubs, limestone slopes, 160 m, 18-IV-2017, A.R. Burgaz (MACB 111211). District of Tepelenë, Këlcyrë, Këlcyrë gorge, left side Vjosa river, 40°17′52″N 20°10′05″E, Carpinus betulus, Pinus halepensis, sandy soil, 180 m, 18-IV-2017, A.R. Burgaz (MACB 111216). District of Tepelenë, Dukaj, SH76 Tepelenë-Sinanaj, 40°18′45″N 19°57′46″E, Quercus coccifera, limestone, 280 m, 18-IV-2017, A.R. Burgaz (MACB 111219). District of Përmet, Piskovë, left side Lumica river, K75 to Frashër, 40°16′44″N 20°17′07″E, Juniperus oxycedrus, Palmarus spina-christi, Arbutus unedo, Pistacia terebinthus, sandstone, 230 m, 18-IV-2017, A.R. Burgaz (MACB 111217). SHKODËR: Vau i Dejës, SH25 Vau i Dejës-Koman, 42°00′55″N 19°39′37″E, Pinus pinaster, Carpinus orientalis, serpentine soil, 120 m, 20-IV-2017, A.R. Burgaz (MACB 111304). Karmë, SH21 Koplik-Bogë, 42°15′53″N 19°29′47″E, Juniperus oxycedrus, Cupressus sempervirens, boulders, 320 m, 20-IV-2017, A.R. Burgaz (MACB 111324). District of Malësi e Madhe, Poica, SH21 Koplik-Bogë, 42°18′04″N 19°32′32″E, Carpinus betulus, Juniperus oxycedrus, limestone rocks, 495 m, 20-IV-2017, A.R. Burgaz (MACB 111325). District of Malësi e Madhe, Dedaj, SH21 Koplik-Bogë, 42°18′04″N 19°32′32″E, Carpinus betulus, Juniperus oxycedrus, limestone, 865 m, 20-IV-2017, A.R. Burgaz (MACB 111328). TIRANË: Rrogozhinë, Grethi i Mesem, 41°05′00″N 19°27′35″E, Pinus pinaster, Juniperus oxycedrus, sandy soil, 1 m, 15-IV-2017, A.R. Burgaz (MACB 110951). VLORE: District of Sarandë, Pasqirave, Butrint N. P., SH81, Shengjergj monastery, 39°44′51″N 20°00′24″E, Quercus coccifera, limestone, 60 m, 17-IV-2017, A.R. Burgaz (MACB 110964). District of Sarandë, Pasqirave, Butrint N. P., SH81, Shengjergj monastery, 39°44′51″N 20°00′24″E, Quercus coccifera, Olea europaea, Phlomis sp., limestone, 60 m, 17-IV-2017, A.R. Burgaz (MACB 110964). District of Sarandë, Pasqirave, Butrint N. P., SH81, Shengjergj monastery, 39°44′51″N 20°00′24″E, Quercus coccifera, Olea europaea, Phlomis sp., limestone, 60 m, 17-IV-2017, A.R. Burgaz (MACB 110964). District of Sarandë, Pasqirave, Butrint N. P., SH81, Shengjergj monastery, 39°44′51″N 20°00′24″E, Quercus coccifera, Olea europaea, Phlomis sp., limestone, 60 m, 17-IV-2017, A.R. Burgaz (MACB 110964). District of Sarandë, Pasqirave, Butrint N. P., SH81, Shengjergj monastery, 39°44′51″N 20°00′24″E, Quercus coccifera, Olea europaea, Phlomis sp., limestone, 60 m, 17-IV-2017, A.R. Burgaz (MACB 110964). District of Sarandë, Pasqirave, Butrint N. P., SH81, Shengjergj monastery, 39°44′51″N 20°00′24″E, Quercus coccifera, Olea europaea, Phlomis sp., limestone, 60 m, 17-IV-2017, A.R. Burgaz (MACB 110964). District of Sarandë, Pasqirave, Butrint N. P., SH81, Shengjergj monastery, 39°44′51″N 20°00′24″E, Quercus coccifera, Olea europaea, Phlomis sp., limestone, 60 m, 17-IV-2017, A.R. Bur...
Dhërmí, Llogora N. P., 40°15′11″N 19°32′14″E, Quercus coccifera, Pinus halepensis, limestone, 320 m, 16-IV-2017, A.R. Burgaz (MACB 110956).

**Cladonia rei** Schaer.

**Homosekikaic acid chemotype:** VLORE: Finiq, Muzinë, Muzinë, 39°54′48″N 20°08′48″E, deciduous Quercus, Pinus nigra, deciduous Quercus, limestone, 30 m, 21-IV-2017, A.R. Burgaz (MACB 111439).

**Cladonia subulata** (L.) F.H. Wigg.

**Fumarprotocetraric acid chemotype:** KUKËS: District of Kukës, Ryuga Tirana, 42°04′26″N 20°24′18″E, Quercus cerris, deciduous Quercus, limestone, 30 m, 21-IV-2017, A.R. Burgaz (MACB 111461).

**Cladonia symphycarpa** (Flörke) Fr.

**Atranorin and norstictic acid chemotype:** KORÇË: District of Kolonjë (Rrethi i Kolonjës), c. 1.9 km W of village Pepellash, 42°28′56.18″N 20°40′21.27″E, on calcareous soil in moist road slope, 549 m, 18-X-2011, Z. Barina, L. Lükös, D. Pifkó (BP 96584). District of Korçë, Dardhë, SH90 Boboshicë-Dardhë, 40°31′18″N 20°49′22″E, Fagus sylvatica, Pinus nigra, Juniperus communis, Betula pendula, Abies sp., limestone, 1390 m, 23-IV-2017, A.R. Burgaz (MACB 111450).

**Cladonia sp.**

**Fumarprotocetraric acid chemotype:** SHKODER: Vau i Dejës, SH25 Vau i Dejës-Koman, 42°00′55″N 19°39′37″E, Pinus pinaster, Carpinus orientalis, serpentine soil, 120 m, 20-IV-2017, A.R. Burgaz. VLORE: Finiq, Bistrice, Muzinë, 39°55′08″N 20°04′48″E, Quercus coccifera, Pinus pinaster, Carpinus orientalis, Pinus halepensis, Cercis silicaustrum, limestone slopes, 125 m, 17-IV-2017, A.R. Burgaz.