

## CHOROLOGY OF THE *PHYSICIA* (SCHREB.) MICHAUX (1803) GENUS IN ROMANIA

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**Abstract.** Within this paper it is presented the lichen species chorology of the *Physcia* (SCHREB.) MICHAUX (1803) genus. For each species there have been indicated, especially the counties, localities, UTM codes, and substratum. The majority of the recorded data has been published by Romanian lichenologists and a few of these has been published by foreign lichenologists. A part of the records represents author's published and unpublished contributions. The most numerous data on lichen species chorology from *Physcia* genus on Romania territory, have been recorded for *P. adscendens* (FR.) OLIV., *P. stellaris* (L.) NYL. em. HARM. and *P. tenella* (SCOP.) DC. in LAM. & DC. A lower number of data found in literature has been recorded in case of *Physcia endochrysoides* NYL., *P. tribacia* (ACH.) NYL. and *P. tribacoides* NYL. Regarding the author's own contributions, most of the recorded data refer to *P. adscendens*, *P. aipolia*, *P. stellaris* and *P. tenella* within the forests from Ilfov County.

**Keywords:** chorology, UTM code, *Physcia* genus, Romania.

**Rezumat. Corologia genului *Physcia* (SCHREB.) MICHAUX (1803) în România.** În cadrul acestei lucrări este prezentată corologia speciilor de licheni din genul *Physcia* (SCHREB.) MICHAUX (1803). Pentru fiecare specie au fost indicate, în special județele, localitățile, codurile UTM și substratul. Majoritatea datelor înregistrate au fost publicate de lichenologi români și câteva dintre acestea au fost publicate de către lichenologi din străinătate. O parte din înregistrări sunt contribuții personale publicate în reviste de specialitate și nepublicate. Cele mai multe date referitoare la răspândirea speciilor de licheni din genul *Physcia* pe teritoriul României, au fost înregistrate pentru *P. adscendens* (FR.) OLIV., *P. stellaris* (L.) NYL. em. HARM. și *P. tenella* (SCOP.) DC. in LAM. & DC. Un număr mai redus de citări în literatura de specialitate a fost înregistrat pentru *Physcia endochrysoides* NYL., *P. tribacia* (ACH.) NYL. și *P. tribacoides* NYL. În ceea ce privește contribuțiile personale, cele mai multe date au fost înregistrate pentru *P. adscendens*, *P. aipolia*, *P. stellaris* și *P. tenella* în păduri din județul Ilfov.

**Cuvinte cheie:** corologie, codul UTM, genul *Physcia*, România.

### INTRODUCTION

In Romania, the species tabulated within the *Physcia* (SCHREB.) MICHAUX (1803) genus are widely distributed in mountainous, hilly and plain areas (MORUZI & TOMA, 1971; CIURCHEA, 2004). A serious contribution on *Physcia* genus chorology in Romania was carried out by MORUZI et al. (1967) and CIURCHEA (2004).

An important role for the distribution of lichen species is attributed to the substratum characteristics. Accordingly, in Romania, the species of the *Physcia* genus have been identified, especially on corticolous substrata (MORUZI & MANTU, 1965; CRIȘAN & ARDELEAN, 2010; VICOL, 2010a; VICOL, 2011b; VICOL, 2012) but they are also reported widespread on man-made substrata (MORUZI & PETRIA, 1961; MANOLIU et al., 1998), saxicolous substrata (CIURCHEA & CRIȘAN, 1991-1992), and lignicolous substrata (VICOL, 2010a). Regarding the distribution in macrohabitats, *Physcia* genus is well represented within forests (BURLACU, 1967; BARTÓK, 1988; VICOL, 2011a).

This study is based on the knowledge of the spatial distribution of the *Physcia* genus in Romania. The main objective of this work consists in mapping of the species of *Physcia* genus on the Romania territory.

### MATERIALS AND METHODS

The researches on the chorology of the *Physcia* genus are based on the data gathered from the field, the herbarium specimens, the literature and the author's unpublished data. According to the field observations the species of the *Physcia* genus were identified on corticolous and lignicolous substrata. The original studies on *Physcia* genus chorology in the field were performed in the forest ecosystems and in the agro-ecosystems (in a *Vitis vinifera* L. crop situated at the edge of Igești village, Vaslui County) between 2009 and 2012.

The collected species from the field were determined using the bibliography as it follows: CIURCHEA (2004), MORUZI & TOMA (1971). The lichen species were investigated using a stereomicroscope (Zeiss Stereo CL 1500 ECO) and an optical microscope (Zeiss Scope A 1). The identification of each species was based on morphology, colour reaction of the upper cortex and medulla, and anatomical investigation. The collected lichen species were determined using as chemical reagent KOH (potassium hydroxide). The nomenclature is according to CIURCHEA (2004). The nomenclature for cormophytes is according to CIOCĂRLAN (2009). A part of the identified species are in the Mycology Herbarium, Lichen Collection, abbreviated as BUCM L (Bucharest Mycology Lichen) in the numbers: [BUCM L1306-1307], [BUCM L 1311], [BUCM L 1316], [BUCM L 1318], [BUCM L 1321], [BUCM L 1325], [BUCM L 1328], [BUCM L 1339-1341], [BUCM L 1343], [BUCM L 1345-1347], [BUCM L 1349], [BUCM L 1356], [BUCM L 1366] and [BUCM L 1397].

The mapping of the localities was performed using UTM code according to the work of LEHRER & LEHRER (1990). The maps of the species chorology were constructed using Corolog software (ȘTEFĂNUȚ et al., 2009).

## RESULTS AND DISCUSSIONS

In Romania, the *Physcia* genus is represented by the following species: *P. adscendens* (FR.) OLIV., *P. aipolia* (EHRH. ex HUMB.) FÜRNR., *P. caesia* (HOFFM.) HAMPE, *P. dubia* (HOFFM.) LETT., *P. endochrysoides* NYL., *P. semipinnata* (J. F. GMELIN) MOBERG, *P. stellaris* (L.) NYL. em. HARM., *P. tenella* (SCOP.) DC. in LAM. & DC., *P. tribacia* (ACH.) NYL., *P. tribacoides* NYL. (CIURCHEA, 2004).

Original data performed in the investigated macrohabitats on the species of the *Physcia* genus have revealed that these are common and widespread within anthropogenic and ruderalised areas, agro-ecosystems and forests surrounded by agricultural land. During the field work, there have been identified the following species: *P. adscendens*, *P. aipolia*, *P. dubia*, *P. semipinnata*, *P. stellaris*, *P. tenella*, and *P. tribacoides*.

The studies performed in the North-West of Hungary have indicated that in the centre of Komárom locality with a continuous build-up area and relatively high pollution (CO, Pb) caused by increased traffic, there predominate especially nitro-frequent corticolous lichen species, such as: *P. adscendens*, *P. tenella*, accompanied by *Xanthoria parietina* (L.) TH. FR. and *Phaeophyscia orbicularis* (NĚCK.) MOBERG. (FARKAS et al., 2001).

MARMOR & RANDLANE (2007) have carried out a study in Tallinn (Estonia) on the influence of the car traffic in relationship to bark pH and epiphytic lichen species. In this study, authors indicate that *P. stellaris* accompanied by *Lecanora carpinea* (L.) VAIN. and *Xanthoria parietina* have preferred small-leaved lime with a higher bark pH. Traffic did not affect the bark pH of small-lived lime because it is normally subneutral and therefore, alkaline dust does not change its value significantly. Significant correlation between bark pH of *Pinus sylvestris* L. and distance from roads were recorded. Thus, the car traffic has changed the bark pH of *P. sylvestris* from acidic to subneutral, which is favourable to nitrophilous species (*P. tenella*, *Lecanora hagenii* (ACH.) ACH., *Caloplaca holocarpa* (HOFFM. ex ACH.) WADE, and *Candelariella xanthostigma* (PERS.) LETT.

In other study regarding the effect of forest management on epiphytic lichen species in remnants forests distributed in Central Spain, species from *Physcia* genus were related to high management intensity, low shrub cover and areas with no steeper slopes (ARAGÓN et al., 2010).

An interesting study performed in apple orchards from Poland, Slovakia and Italy have pointed out that *P. adscendens*, *P. tenella*, *X. parietina*, *P. orbicularis* were found in most of the investigated orchards. The bark pH *Malus* sp. is naturally higher which favours the occurrence of nitrophilous lichen species (ZARABSKA et al., 2009).

In New Zealand, the species of the *Physcia* genus occur most commonly on coastal and inland (rarely high-alpine) rocks, on a variety of human made substrata (especially concrete), on living bark of trees and shrubs, mainly of planted and ornamental trees (especially fruit trees) in urban and agricultural areas, and more occasionally on native trees and shrubs in forest and shrub communities (GALLOWAY & MOBERG, 2005).

The chorology of lichen species tabulated within *Physcia* genus on Romania territory is presented as it follows:

*Physcia adscendens* (FR.) OLIV. (Fig. 1).

#### Alba County

Apuseni Mountains, within forests from Avram Iancu locality surroundings (FS 33), on beech and ash rhytidome (CIURCHEA & CODOREANU, 1967; CIURCHEA, 2004); Roşia Montană (FS 62/63) on *Populus tremula* L., *Salix alba* L., and *Prunus domestica* L. rhytidome (CRIŞAN & ARDELEAN, 2010); Bihorului Mountains, Răchita Peak (FS 43), altitude 1300 m, on fir, spruce and maple rhytidome (BARTÓK, 1982; CIURCHEA, 2004).

#### Botoşani County

Within Dersca, Lozna, Hilişeu, Pădureni and Şendriceni forests (MP 41), on *Quercus* sp., *Acer campestre* L., *Fraxinus excelsior* L., *Cornus* sp., *Tilia cordata* MILL., altitude 300 m (BURLACU, 1967; CIURCHEA, 2004); Vârful Cămpului Forest (MN 49), Horlăceni and Gorovei forests (MP 50) (BURLACU, 1969c; CIURCHEA, 2004).

#### Bucharest

Botanical Garden (MK 21/22/31/32), on *Abies nordmanniana* (STEVEN) SPACH, *Pinus strobus* L., *P. nigra* J. F. ARNOLD, *Gleditsia triacanthos* L., and *A. campestre* L. rhytidome (MORUZI & PETRIA, 1961; CIURCHEA, 2004); Băneasa Forest (MK 21/22/31/32), on lignicolous substrata, leg. et det. Vicol Ioana, 02.06.2010 [BUCM L 1316] (unpublished data), on lignicolous substrata, leg. et det. Vicol Ioana, 18.03.2011 (unpublished data), on corticolous substrata (VICOL, 2010b).

**Caras-Severin County:** the Danube Gorge, within forests between Cozla and Pescari (EQ 54), on *A. campestre*, *Carpinus orientalis* MILL., *Fagus sylvatica* L., *Fraxinus ornus* L., *Quercus cerris* L., and *Tilia tomentosa* MOENCH (*T. argentea* DC.) rhytidome (BURLACU et al., 1969; CIURCHEA, 2004).

#### Călăraşi County

Călăreţilor Forest (MK 62), on *Quercus robur* L. rhytidome, leg. Vicol Ioana, 04.06.2010, det. Vicol Ioana, 04.06.2010 [BUCM L 1397] (VICOL, 2012); Goştilele Forest (MK 62), on *Robinia pseudacacia* L., leg. Vicol Ioana, 03.06.2010, det. Vicol Ioana, 03.06.2010 (VICOL, 2012).

#### Cluj County

Botanical Garden from Cluj (FS 97), on *Hippophaë rhamnoides* L. rhytidome (CODOREANU et al., 1960; CIURCHEA, 2004); Transilvaniei Plain, Băile Sărate, Turda (GS 15), on *Fraxinus excelsior* L. rhytidome (TODOR, 1947; CIURCHEA, 2004).

**Giurgiu County**

Crețești Forest (MK 30), on lignicolous substrata, leg. et det. Vicol Ioana, 24.08.2010 (unpublished data); Crevedia Forest (MK 02), on lignicolous substrata, leg. et det. Vicol Ioana, 17.03.2011 (unpublished data); Bolintin-Deal Forest (MK 02), on *Quercus pedunculiflora* K. KOCH (VICOL, 2011c).

**Constanța County**

Constanța, Trofeul Traiani, Adamclisi (PJ 28/29/38/39), altitude 150 m, 44°06'07.00"N, 27°57'20.80"E, 16.05.2007, on *Juglans* sp., *Tilia* sp. (YAVUZ & ÇOBANOĞLU, 2008).

**Harghita County**

Căpâlnița Village (LM 83), on fruit trees (BARTH, 1905; CIURCHEA, 2004).

**Iași County**

Dealul Mare-Hârlău Forest (MN 78), on *Fagus sylvatica* L. rhytidome; Iași, Ciric Park Forest, on *Robinia pseudoacacia* L. (BURLACU, 1969a; CIURCHEA, 2004).

**Ifov County**

Mogoșoaia Forest (MK 13), on *A. campestre* L. rhytidome (MORUZI & MANTU, 1965; CIURCHEA, 2004); Snagov Forest (MK 34), on corticolous substrata (MANTU, 1965; CIURCHEA, 2004); Brănești Forest (MK 42), on *Tilia* sp., *Ulmus minor* MILL., *Prunus cerasifera* EHRH., *Acer tataricum* L., *Fraxinus ornus* L., *Crataegus monogyna* JACQ. rhytidome (MORUZI & KLOHS, 1970; CIURCHEA, 2004); Andronache Forest (MK 32), on *F. excelsior* L. rhytidome, leg. Vicol Ioan, 18.06.2009, det. Vicol Ioana 03.07.2009 [BUCM L 1341], on *Prunus cerasifera* Ehrh. rhytidome, leg. Vicol Ioan, 24.03.2009, det. Vicol Ioana 30.06.2009 [BUCM L 1345], on *Quercus robur* L. rhytidome, leg. Vicol Ioan, 18.06.2009, det. Vicol Ioana, 06.07.2009 [BUCM L 1346], on *Q. cerris* L., *C. monogyna* JACQ., *Sophora japonica* L., *Q. robur* L., *A. campestre* L. (VICOL, 2010a); Cernica Forest (MK 41), on *Q. cerris* L. rhytidome, leg. Vicol Ioan, 26.03.2009, det. Vicol Ioana, 30.06.2009 [BUCM L 1325] (unpublished data); Pustnicul Forest (MK 42), on *Q. cerris* L. rhytidome, leg. Vicol Ioan, 30.04.2009, det. Vicol Ioana 25.06.2009 [BUCM L 1318], VICOL (2010a); Vlădiceasca Forest, on lignicolous substrata, leg. Vicol Ioana, 26.04.2010, det. Vicol Ioana 06.06.2010 (unpublished data); Biglaru Forest (MK 34), on lignicolous substrata, leg. Vicol Ioana, 27.04.2010, det. Vicol Ioana, 17.05.2010 [BUCM L 1347] (VICOL, 2011b); Snagov Forest (MK 34/35), on lignicolous substrata, leg. et det. Vicol Ioana, 08.06.2010 [BUCM L 1343], leg. Vicol Ioana, 26.04.2010, det. Vicol Ioana 07.05.2010 [BUCM L 1349] (unpublished data); Pustnicul Forest (MK 42), on *Fraxinus* sp. and *Quercus* sp. rhytidome (VICOL, 2012).

**Mehedinți County**

The Danube Gorge at Cazanele Mici (FQ 04), Cernei Valley (FQ 17), Ieșelniței Valley (FQ 05) on oak, hornbeam, and ash rhytidome; Forest Reserve Ogradena (FQ 04) on stones (MORUZI & TOMA, 1972; CIURCHEA, 2004).

**Neamț County**

Cheile Bicazului, Cheile Mici and Cheile Mari (MM 18), on beech and willow, respectively rhytidome (BURLACU, 1969b; CIURCHEA, 2004); Ceahlău Mountain (MN 20), on *Acer* sp. at Piciorul Maicilor, *Alnus incana* (L.) MOENCH. at Piciorul Muntelui, *Populus* sp. on Horștei Peak, *Ribes aureum* PURSH at Bâta Durăului, on the boards of the fences near the tourist complex Durău (MANOLIU et al., 1998).

**Sibiu County**

Agnita (LL 19), on oak rhytidome, altitude 560 m (MORUZI & TOMA, 1967; CIURCHEA, 2004); Cindrel (Cibinului) Mountains (GR 15), on *Quercus* sp., *Q. cerris* L. altitude 450-500 m, *Robinia pseudoacacia* L., altitude 500-550 m, *Crataegus* sp., altitude 600 m, *Tilia* sp., altitude 450- 650 m, *Fraxinus* sp., altitude 900 m, *Acer* sp., *Fagus* sp., altitude 1200 m (MORUZI & TOMA, 1970; CIURCHEA, 2004); Tâlmăciu Forest (KL85/86), on lignicolous substrata, leg. et det. Vicol Ioana, 28.03.2011 (unpublished data).

**Tulcea County**

Tulcea, Horia (PL 40), altitude 175 m, 45°00'45.2"N, 28°26'53.1"E, 13.04.2008, on *Juglans* sp.; Valea Teilor, near Nicolîțel, altitude 270 m, 45°10'3.1"N, 28°29'20.5"E, 13.04.2008, on *Juglans* sp., *Platanus* sp. (YAVUZ & ÇOBANOĞLU, 2008).

**Vaslui County**

Mălușteni Nature Reserve (NM 71), on *Populus nigra* L. (VICOL, 2011a); Igești Village (NM 71), at the edge of this locality, on *Vitis vinifera* L. rhytidome, leg. Vicol Ioana, 04.10.2011, det. Vicol Ioana, 20.10.2011 (unpublished data); Forestry Nature Reserve Bălteni Forest (NM 46), on lignicolous substrata, leg. Vicol Ioana, 17.08.2012 det. Vicol Ioana, 14.09.2012 (unpublished data).

**Vâlcea County**

Cozia National Park (KL 92), on beech (ÇOBANOĞLU et al., 2009).

**Vrancea County**

Cârligata Forest (ML 79), on *Fagus sylvatica* L. rhytidome (BURLACU, 1969a; CIURCHEA, 2004).

*Physcia aipolia* (EHRH. ex HUMB.) FÜRNR. (Fig. 2).

**Alba County**

Sebeș (FR 99), on the alder branches (BORZA, 1959; CIURCHEA, 2004); Bihorului Mountains, Răchita Peak, altitude 1300 m, on *Acer* sp. rhytidome (BARTÓK, 1982; CIURCHEA, 2004).

**Botoșani County**

Within Pădureni Forest on *Quercus* sp., Dersca and Șendriceni forests (MP 41), on *A. campestre* L. (BURLACU, 1967; CIURCHEA, 2004); in Horlăceni Forest, on *A. campestre* and *Populus* sp., Gorovei Forest, on *Quercus* sp., and Văculești Forest, on *Populus* sp. (MP 50), Vârful Câmpului Forest (MN 49), on *Populus* sp. rhytidome (BURLACU, 1969c; CIURCHEA, 2004).

**București**

Băneasa Forest (MK 21/22/31/32), on lignicolous substrata (VICOL, 2011b).

**Caraș-Severin County**

The Danube Gorge, within forests between Cozla and Pescari (EQ 54), on *Fraxinus ornus* L., *F. sylvatica* L., and *Morus* sp. (BURLACU et al., 1969; CIURCHEA, 2004).

**Călărași County**

Goștilele Forest (MK 62), on *Quercus robur* L. rhytidome (VICOL, 2012) and lignicolous substrata (unpublished data).

**Cluj County**

Bocului Mountain, Boc hamlet (FS 86), on ash rhytidome (TOTHĂZAN & CRIȘAN, 2008)

**Ilfov County**

Mogoșoaia Forest (MK 13), on *Quercus cerris* L., *Q. robur* L., *A. campestre* L., *F. excelsior* L., and *Tilia tomentosa* MOENCH. (MORUZI & MANTU, 1965; CIURCHEA, 2004); Snagov Forest (MK 34/35), on *Quercus* sp., *Tilia* sp., *Fagus* sp., and *Carpinus* sp. rhytidome (MANTU, 1965; CIURCHEA, 2004); Brănești Forest (MK 42), on *Q. robur* L., *Q. pedunculiflora* K. KOCH., *F. ornus* L., *A. campestre* L., and *Ulmus procera* SALISB. (MORUZI & KLOHS, 1970; CIURCHEA, 2004); Vlădiceasca Forest (MK 24), on lignicolous substrata, leg. Vicol Ioana, 26.04.2010, det. Vicol Ioana, 11.05.2010 [BUCM L 1339] (unpublished data); Snagov Forest (MK 34/35), on *Pinus nigra* L. trunk, leg. Vicol Ioan, 08.06.2010, det. Vicol Ioana [BUCM L 1340] (VICOL, 2011c); Biglaru Forest (MK 34), on lignicolous substrata, leg. Vicol Ioana, 27.04.2010, det. Vicol Ioana, 14.05.2010 (VICOL, 2011b); Cernica Forest (MK 41), on lignicolous substrata, leg. Vicol Ioan, 25.04.2009, det. Vicol Ioana, 28.04.2010 [BUCM L 1321] (VICOL, 2010a).

**Mehedinți County**

Along of Ieșelnița-Ogradena and Orșova-Ogradena (FQ 05) roads, on mulberry and walnut, respectively rhytidome; the former Ada-Kaleh island (FQ 24), on the poplar rhytidome (MORUZI & TOMA, 1972; CIURCHEA, 2004).

**Neamț County**

Ceahlău Mountain, at Bâta Durăului (MN 20), on *F. sylvatica* L., *Ribes aureum* PURS., and *Rosa* sp. (MANOLIU et al., 1998).

**Sibiu County**

Cindrel (Cibin) Mountains, Crinț Pasture (GR 16), on beech rhytidome, altitude 1150 m; along the Săliștei road (GR 27), on lime and pear rhytidome, altitude 1200 m; Agnita (LL 19), on oak rhytidome, altitude 560 m (MORUZI & TOMA, 1967; CIURCHEA, 2004).

**Vaslui County**

Igești Village (NM 71), at the edge of this locality, on *Vitis vinifera* L. rhytidome, leg. Vicol Ioana, 04.10.2011, det. Vicol Ioana, 20.10.2011 (unpublished data).

**Vâlcea County**

Cozia National Park (KL 92), on ash rhytidome (ÇOBANOĞLU et al., 2009).

*Physcia caesia* (HOFFM.) HAMPE (Fig. 3).

**Alba County**

Apuseni Mountains, Râmețului Gorges (FS 93), on saxicolous substrata (CODOREANU et al., 1968; CIURCHEA, 2004).

**București**

Botanical Garden (MK 21/22/31/32), on limestone substrata (MORUZI & PETRIA, 1961; CIURCHEA, 2004).

**Caraș-Severin County**

The Danube Gorge, at Cozla, between Cozla and Pescari: Mare Valley, Stâncă Mare, Stâncă Popa, Stâncă Toza (EQ 54/84), on saxicolous substrata (CIURCHEA et al., 1968; CIURCHEA, 2004); Pescari (EQ 54), on saxicolous substrata (CODOREANU & CIURCHEA, 1970; CIURCHEA, 2004).

**Cluj County**

Pietrele Albe Mountain (FS 39), situated in south-west part of Vlădeasa Peak, altitude 1514 m, on saxicolous substrata (CODOREANU & CIURCHEA, 1966; CIURCHEA, 2004); Vlădeasa Mountains (FS 39), on western side of this mountain, on saxicolous substrata (BARTÓK & CODOREANU, 1979; CIURCHEA, 2004); Someșului Cald Valley, between Fântânele dam (Beliș locality) and Tarnița dam (FS 56), on saxicolous substrata (CIURCHEA & CRIȘAN, 1991-1992; CIURCHEA, 2004).

**Harghita County**

Căpâlnița locality (LM 83), on a tile (BARTH, 1905; CIURCHEA, 2004).

**Ilfov County**

Mogoșoaia Forest (MK 13), on *Quercus pedunculiflora* K. KOCH and *Acer campestre* L. rhytidome (MORUZI & MANTU, 1965; CIURCHEA, 2004); Snagov Forest (MK 34), corticolous (MANTU, 1965; CIURCHEA, 2004).

**Mehedinți County**

The former Ada-Kaleh island (FQ 24), on siliceous rocks (MORUZI & TOMA, 1973; CIURCHEA, 2004).

**Mureș County**

Gănești Village (KM 93), on old boards (CRETZOIU, 1939; CIURCHEA, 2004); Călimani Mountains, at Neagră Valley, within Defileul Deda-Toplița Landscape Reserve (LN 50), on *Populus* sp. (CRIȘAN & BANC, 2007).

**Neamț County**

Ceahlău Mountain, Ocolașul Mic (MN 20), on saxicolous and corticolous substrata (MANOLIU et al., 1998).

**Sibiu County**

Cindrel (Cibin) Mountains, Căldarea Iezerului Mare, altitude 2050 m and Cindrel Peak (GR 26), altitude 2230 m, on saxicolous substrata (MORUZI & TOMA, 1967; CIURCHEA, 2004).

**Vâlcea County**

Cozia Mountain, on crystalline schists (CODOREANU & CIURCHEA, 1965; CIURCHEA, 2004); Olt Valley, at Călinești (KL 82), on saxicolous substrata (CIURCHEA, 1969; CIURCHEA, 2004); Lotrului Mountains, Călinești Valley (KL 82), on saxicolous substrata (CIURCHEA, 1970; CIURCHEA, 2004).

*Physcia dubia* (HOFFM.) LETT. (Fig. 4).

**Alba County**

Apuseni Mountains, Râmețului Gorges (FS 93), on saxicolous substrata (CODOREANU et al., 1968; CIURCHEA, 2004).

**București**

Botanical Garden (MK 21/22/31/32), on stones (MORUZI & PETRIA, 1961; CIURCHEA, 2004).

**Caraș-Severin County**

Between Liubcova and Coronini localities (EQ 74), on saxicolous substrata, the Danube Gorge at Cozla, Stâncă Popa, Stâncă Mare, and Stâncă Toza (EQ 84), on saxicolous substrata (CIURCHEA et al., 1968; CIURCHEA, 2004).

**Călărași County**

Călăreților Forest (MK 62), on *Quercus robur* L. rhytidome, leg. Vicol Ioana, 24.08.2011, det. Vicol Ioana, 29.08.2011 (unpublished data).

**Cluj County**

Someșului Cald Valley, between Fântânele dam (Beliș locality) and Tarnița dam (FS 56), on saxicolous substrata (CIURCHEA & CRIȘAN, 1991-1992; CIURCHEA, 2004).

**Ifov County**

Râioasa Forest (MK 12) on *Fraxinus* sp. rhytidome (VICOL, 2011c).

**Giurgiu County**

Căscioarelor Forest (LK 92), corticolous, leg. Vicol Ioana, 17.03.2011, det. Vicol Ioana, 16.05.2011 (unpublished data); Bolintin-Deal Forest (MK 02), on *Quercus* sp. (VICOL, 2011c).

**Neamț County**

Ceahlău Mountain, at Bâtca Fântânile (MN 20), on saxicolous substrata (MANOLIU et al., 1998).

**Vâlcea County**

Lotrului Mountains, Călinești Valley (KL 82), on saxicolous substrata (CIURCHEA, 1970; CIURCHEA, 2004); Cozia National Park (KL 92), on calcareous rock, 45°17'49.51"N, 24°18'25.63"E, 10.07.2007, altitude 661 m; 45°22'15.83"N, 24°18'26.11"E, 27.07.2007, altitude 382 m (ÇOBANOĞLU et al., 2010).

*Physcia endochrysoides* NYL. (Fig. 5).

**Hunedoara County**

Retezat Mountains, Râul Mare Valley (FQ 69), on saxicolous substrata (CRETZOIU, 1940; CIURCHEA, 2004).

**Gorj County**

Vâlcanului Mountains, near Gureni (FR 32), on saxicolous substrata (CRETZOIU, 1940; CIURCHEA, 2004).

*Physcia semipinnata* (J. F. GMELIN) MOBERG. (Fig. 6).

**Botoșani County**

Within Pădureni Forest, on *Quercus* sp. and *Fraxinus excelsior* L., Șendriceni and Dersca forests, on *A. campestre* L. (MP 41); within Gorovei Forest, on *A. campestre* L. and *Quercus* sp., Horlăceni Forest, on *A. campestre* L. and *Populus* sp., Vârful Câmpului Forest, on *Populus* sp., Văculești Forest (MP 50) BURLACU (1969c); CIURCHEA, 2004).

**București**

Botanical Garden, on corticolous substrata (MORUZI & PETRIA, 1961; CIURCHEA, 2004).

**Caraș-Severin County**

The Danube Gorge, within the forests between Cozla and Pescari (EQ 54), on *Tilia cordata* MILL., *Cynops orientalis* DAVID, *Fagus sylvatica* L., *F. ornus* L., *Quercus cerris* L., and *T. tomentosa* MOENCH (BURLACU et al., 1969; CIURCHEA, 2004).

**Ifov County**

Mogoșoaia Forest (MK 13), on *T. tomentosa* MOENCH, *A. campestre* L., and *F. excelsior* L. rhytidome (MORUZI & MANTU, 1965; CIURCHEA, 2004); Snagov Forest (MK 34), on *Quercus* sp., *Alnus* sp., and *Carpinus* sp.

(MANTU, 1965; CIURCHEA, 2004); Snagov Forest (MK 34), on lignicolous substrata, leg. Vicol Ioana, 26.04.2010, det. Vicol Ioana, 14.05.2010 (unpublished data).

#### **Mehedinți County**

The Danube Gorge, at Cazanele Mici (FQ 04), on hornbeam and walnut rhytidome; on the side of the road Orșova (FQ 05/15)-Ogradena (EQ 93/FQ 04), on mulberry rhytidome (MORUZI & TOMA, 1972; CIURCHEA, 2004).

#### **Neamț County**

Ceahlău Mountains, Bâta Durăului (MN 20), on *Acer* sp., *Malus sylvestris* (L.) MILL., *Populus* sp., *Ribes aureum* PURS. (MANOLIU et al., 1998).

#### **Sibiu County**

Cindrel (Cibinului) Mountains (KL 76), on *Crataegus* sp., altitude 600 m (MORUZI & TOMA, 1970; CIURCHEA, 2004); Plaiul Tiliștei (GR 27), on beech rhytidome, altitude 1270 m (MORUZI & TOMA, 1967; CIURCHEA, 2004).

#### **Vaslui County**

Igești Village (NM 71), at the edge of this locality, on *Vitis vinifera* L. rhytidome, leg. Vicol Ioana, 04.10.2011, det. Vicol Ioana, 20.10.2011 (unpublished data).

#### **Vâlcea County**

Cozia National Park (KL 92), on ash and beech rhytidome (ÇOBANOĞLU et al., 2009).

*Physcia stellaris* (L.) NYL. em. HARM. (Fig. 7).

#### **Alba County**

Apuseni Mountains, within the forests from the surroundings of Avram Iancu locality (FS 33), on corticolous substrata (CIURCHEA & CODOREANU, 1967; CIURCHEA, 2004); Roșia Montană (FS 62/63), on *Salix alba* L. and *Prunus domestica* L. (CRIȘAN & ARDELEAN, 2010).

#### **Bistrița-Năsăud County**

Rodnei Mountains, Rodna, Vinului Valley (LN 36), on oak rhytidome (ZSCHACKE, 1911; CIURCHEA, 2004); Șieului Valley, Arcalia Village, Arcalia Scientific Stationary Park, on corticolous substrata (CIURCHEA & SZABÓ, 1966; CIURCHEA, 2004).

#### **Botoșani County**

Within Dersca, Lozna, Hilișeu, and Pădureni forests (MP 41), on *Quercus* sp., *F. sylvatica* L., and *A. campestre* L. rhytidome (BURLACU, 1967; CIURCHEA, 2004); within Gorovei Forest, on *A. campestre* L. and *F. excelsior* L., Vârful Câmpului Forest, on *Populus* sp., Horlăceni and Văculești forest, on *Quercus* sp., *Betula* sp., and *Acer* sp. (MP 50) BURLACU (1969c); CIURCHEA, 2004).

#### **Brașov County**

Brașov (LL 85/95), on walls (ZSCHACKE, 1911; CIURCHEA, 2004).

#### **București**

Botanical Garden (MK 21/22/31/32), on *Pinus strobus* L., *Populus alba* L., *Abies numidica* COSS, and *Rhus hirta* (L.) SUDW. (MORUZI & PETRIA, 1961; CIURCHEA, 2004).

#### **Cluj County**

Hoiia Hill (FS 97/98/GS 08), altitude 400 m, on corticolous substrata (BORZA, 1938; CIURCHEA, 2004); on the western side of Vlădeasa Mountain (FS 39), on *Juniperus communis* L. (BARTÓK & CODOREANU, 1979; CIURCHEA, 2004); Vlădeasa Mountain, Răcad Valley (FS 38), altitude 1200-1300 m, on conifers rhytidome (BARTÓK, 1988; CIURCHEA, 2004); Botanical Garden from Cluj (FS 97), on corticolous substrata (CODOREANU et al., 1960; CIURCHEA, 2004) Bocului Mountain, at Roșala (FS 86) (TOHĂZAN & CRIȘAN, 2008).

#### **Constanța County**

Constanța, Trofeul Traiani, Adamclisi (PJ 28/29/38/39), altitude 150 m, 44°06'07.00"N, 27°57'20.80"E, 16.05.2007, on *Elaeagnus* sp., *Tilia* sp. (YAVUZ & ÇOBANOĞLU, 2008).

#### **Dâmbovița County**

Leaota Mountain, Romanescu Peak, Poiana Marginea Domnească Valley, altitude 850 m, on *A. alba* trunk (BURLACU & DIACONESCU, 1969; CIURCHEA, 2004).

#### **Harghita County**

Harghitei Mountains (LM 62/MM 00), on fruit trees (BARTH, 1905; CIURCHEA, 2004).

#### **Giurgiu County**

Crevedia Forest (MK 02), on lignicolous substrata, leg. Vicol Ioana, 17.03.2011, det. Vicol Ioana, 08.04.2011; Crețești Forest (MK 30), on lignicolous substrata, leg. Vicol Ioana, 24.08.2010, det. Vicol Ioana, 09.2010 (unpublished data).

#### **Iași County**

Dealul Mare-Hârlău Forest (MN 95), on *Quercus* sp. rhytidome, Ciric Park Forest from Iași (NN 41), on *R. pseudoacacia* rhytidome, Sadoveni Forest (NP 01/11), on *Quercus* sp. rhytidome (BURLACU, 1969a; CIURCHEA, 2004).

#### **Ifov County**

Mogoșoaia Forest (MK 13), on lignicolous substrata, on *A. campestre* L. and *Q. cerris* L. rhytidome (MORUZI & MANTU, 1965; CIURCHEA, 2004); Snagov Forest (MK 34/35), on corticolous and saxicolous substrata (MANTU, 1965; CIURCHEA, 2004); Brănești Forest (MK 42), on *Q. robur* rhytidome (MORUZI & KLOHS, 1970; CIURCHEA, 2004); Pustnicul Forest (MK 42), on lignicolous substrata (VICOL, 2010a); Snagov Forest (MK 34/35), on lignicolous

substrata, leg. Vicol Ioana, 08.06.2010, det. Vicol Ioana, 07.2010; Vlădiceasca Forest (MK 24), on lignicolous substrata, leg. Vicol Ioana, 06.04.2010, det. Vicol Ioana, 11.05.2010 [BUCM L 1366] (unpublished data); Biglaru Forest (MK 34), on lignicolous substrata (VICOL, 2011b); Pustnicul Forest (MK 42), on lignicolous substrata, leg. Vicol Ioana, 26.08.2011, det. Vicol Ioana, 02.09.2011 (unpublished data).

#### **Mehedinți County**

Porțile de Fier I, at Cazanele Mici (FQ 04) and Ieșelniței Valley (FQ 05), on walnut, hornbeam, and hawthorn (MORUZI & TOMA, 1972; CIURCHEA, 2004).

#### **Mureș County**

Gănești (KM 93), on old boards (CRETZOIU, 1939; CIURCHEA, 2004); Călimani Mountains, Neagră Valley, Defileul Deda-Toplița Reserve (LN 50), on oak rhytidome (CRIȘAN & BANC, 2007).

#### **Neamț County**

Bicazului Gorges, Mici Gorges (MM 18), on beech rhytidome (BURLACU, 1969a, b, c; CIURCHEA, 2004); Ceahlău Mountain, Bâta Durăului and Horștei Peak (MN 20), on *Acer* sp., *Malus sylvestris* MILL., *Sorbus aucuparia* L., and *Populus* sp., respectively (MANOLIU et al., 1998).

#### **Sibiu County**

Sibiu (KL 77/87) (CRETZOIU, 1940; CIURCHEA, 2004); Sibiu (KL 77/87), on *R. pseudacacia* L. rhytidome (MORUZI & TOMA, 1970; CIURCHEA, 2004); Cindrel (Cibin) Mountains, Pășunea Crinț (GR 16), altitude 1190 m, on beech rhytidome, Gușteriței Hill (KL 87), altitude 460 m, on plum rhytidome, Agnita (LL 19), altitude 750 m, on oak rhytidome (MORUZI & TOMA, 1967; CIURCHEA, 2004); Rășinari (KL 76), on *R. pseudacacia* L. rhytidome (MORUZI & TOMA, 1970; CIURCHEA, 2004); Tălmăciu Forest (KL 85), on lignicolous substrata, leg. Vicol Ioana, 28.03.2011, det. Vicol Ioana, 05.04.2011, on *R. pseudacacia* rhytidome, leg. Vicol Ioana, 28.03.2011, det. Vicol Ioana, 05.04.2011 (unpublished data); Nature Reserve Lacul Tătarilor, on *Prunus spinosa* L., leg. Vicol Ioana, 29.03.2011, det. Vicol Ioana, 05.04.2011 (unpublished data).

#### **Tulcea County**

Tulcea, Horia (PL 40), altitude 175 m, 45°00'45.2"N, 28°26'53.1"E, 13.04.2008, on *Juglans* sp. (YAVUZ & ÇOBANOĞLU, 2008).

#### **Vaslui County**

Mălușteni Nature Reserve (NM 71), on *Populus* sp. rhytidome (VICOL, 2011a).

#### **Vâlcea County**

Cozia National Park (KL 92), on beech rhytidome (ÇOBANOĞLU et al., 2009).

*Physcia tenella* (SCOP.) DC. in LAM. & DC. (Fig. 8).

#### **Alba County**

Apuseni Mountains, Râmețului Gorges, Uzmezău (FS 93), on saxicolous substrata (CODOREANU et al., 1968; CIURCHEA, 2004); Bihorulului Mountain, Răchita Peak (FS 43), altitude 1300 m, on *Abies alba* L. and *Picea abies* (L.) H. KARST. (BARTÓK, 1982; CIURCHEA, 2004).

#### **Botoșani County**

Within Dersca and Pădureni forests, on *Quercus* sp., *A. campestre*, Lozna Forest, on *Quercus* sp., Hilișeu Forest (MP 41), on *A. campestre* and *Carpinus betulus* L. (BURLACU, 1967; CIURCHEA, 2004); within Vârful Câmpului Forest, on *Quercus* sp., Văculești Forest, on *Populus* sp., and Horlăceni Forest (MP 50), on *Acer* sp. and *Quercus* sp. (BURLACU, 1969c; CIURCHEA, 2004).

#### **București**

Botanical Garden (MK 21/22/31/32), on corticolous substrata (MORUZI & PETRIA, 1961; CIURCHEA, 2004); Băneasa Forest (MK 21/22/31/32), on *A. campestre* rhytidome, leg. Vicol Ioana, 26.03.2009, det. Vicol Ioana, 15.06.2009 [BUCM L 1307] (VICOL, 2010b).

#### **Caras-Severin County**

Pescari (EQ 54), on saxicolous substrata (CODOREANU & CIURCHEA, 1970; CIURCHEA, 2004).

#### **Cluj County**

Someșului Cald Valley, between Fântânele dam (Beliș locality) and Tarnița dam (FS 56), on saxicolous substrata (CIURCHEA & CRIȘAN, 1991-1992; CIURCHEA, 2004).

#### **Ifov County**

Mogoșoaia Forest (MK 13), on *Ulmus minor* MILL., *Prunus spinosa* L., and *T. tomentosa* L. rhytidome (MORUZI & MANTU, 1965; CIURCHEA, 2004); Snagov Forest (MK 34), on corticolous substrata (MANTU, 1965; CIURCHEA, 2004); Brănești Forest (MK 42), on *Q. robur* L., *Q. pedunculiflora* K. KOCH, *Prunus cerasifera* L., *F. ornus* L., and *F. excelsior* L. (MORUZI & KLOHS, 1970; CIURCHEA, 2004); Andronache Forest (MK 32), on *F. excelsior* and *P. cerasifera* leg. Vicol Ioan, 18.06.2009, det. Vicol Ioana, 07.07.2009 [BUCM L 1306] (VICOL, 2010a); Snagov Forest (MK 34), on lignicolous substrata, leg. Vicol Ioana, 22.04.2010, det. Vicol Ioana, 05.2010 [BUCM L 1311] (unpublished data); Cernica Forest (MK 41), on *Q. cerris* rhytidome (VICOL, 2010a); Pustnicul Forest (MK 42), on lignicolous substrata, leg. Vicol Ioana, 19.06.2009, det. Vicol Ioana, 07.07.2009 [BUCM L 1328] (unpublished data).

**Mehedinți County**

Within the forests between Cozla and Pescari (EQ 54), on *A. campestre* L., *C. orientalis* DAVID, *F. sylvatica* L., *F. ornus* L., and *Q. cerris* L. (BURLACU et al., 1969; CIURCHEA, 2004); Cazanele Mici and Ogradena Forest Reserve (FQ 04), Ieșelniței Valley (FQ 05), Cernei Valley (FQ 37), on hornbeam, ash, poplar and hawthorn rhytidome (MORUZI & TOMA, 1972; CIURCHEA, 2004).

**Prahova County**

Sinaia (LL 81/82), on corticolous substrata (ZSCHACKE, 1911; CIURCHEA, 2004).

**Sibiu County**

Sibiului Depression, at Tâlmăciu (KL 85/86) ZSCHACKE (1911), CIURCHEA (2004); Cindrel (Cibin) Mountains, along the Săliștei Road (GR 27), on linden rhytidome, at Agnita (LL 19), on saxicolous substrata (MORUZI & TOMA, 1967; CIURCHEA, 2004); at Rășinari (KL 76), on *Quercus* sp., *Crataegus* sp., *Tilia* sp., *Fraxinus* sp., *Acer* sp., and *R. pseudacacia* L., altitude 500-1200 m (MORUZI & TOMA, 1970; CIURCHEA, 2004).

**Vâlcea County**

Oltului Valley, between Proeni and Călinești (KL 82), on saxicolous substrata (CIURCHEA, 1969; CIURCHEA, 2004).

*Physcia tribacia* (ACH.) NYL. (Fig. 9).

**Sibiu County**

Micăsasa, Radac Forest (KM 70), on beech (CRETZOIU, 1939; CIURCHEA, 2004); Cindrel (Cibin) Mountains, Rășinari (KL 76), on *Quercus* sp., *Crataegus* sp., *Tilia* sp., *Fraxinus* sp., *Acer* sp., *R. pseudacacia* rhytidome (MORUZI & TOMA, 1970; CIURCHEA, 2004).

*Physcia tribacoides* NYL. (Fig. 10).

**Botoșani County**

Lozna Forest (MP 41), on *Quercus* sp. rhytidome (BURLACU, 1967; CIURCHEA, 2004).

**Ifov County**

Cernica Forest (MK 41), on lignicolous substrata, leg. Vicol Ioan, 25.03.2009, det. Vicol Ioana, 26.06.2009 [BUCM L 1356] (VICOL, 2010a).

**Tulcea County**

Tulcea, Horia (PL 40), altitude 175 m, 45°00'45.2"N, 28°26'53.1"E, 13.04.2008, on *Juglans* sp. (YAVUZ & ÇOBANOĞLU, 2008).

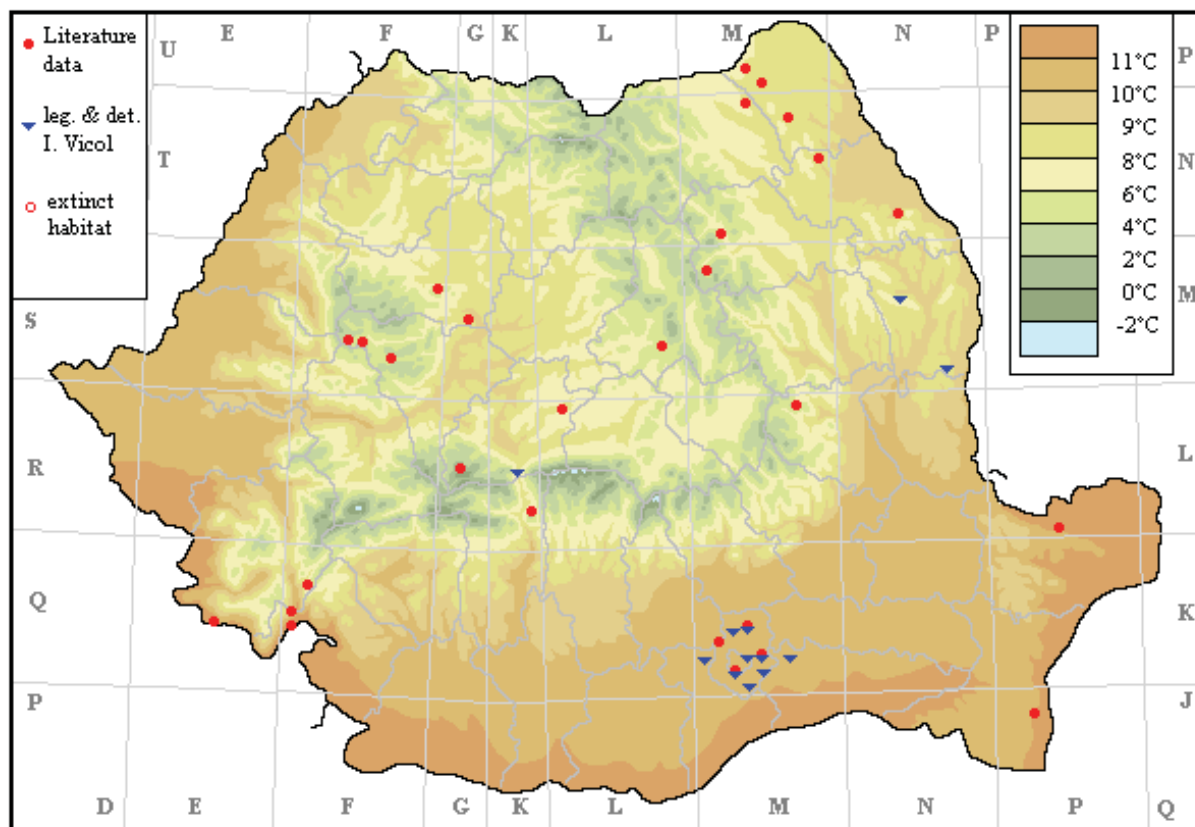


Figure 1. Chorology of the *Physcia adscendens* (FR.) OLIV. in Romania.



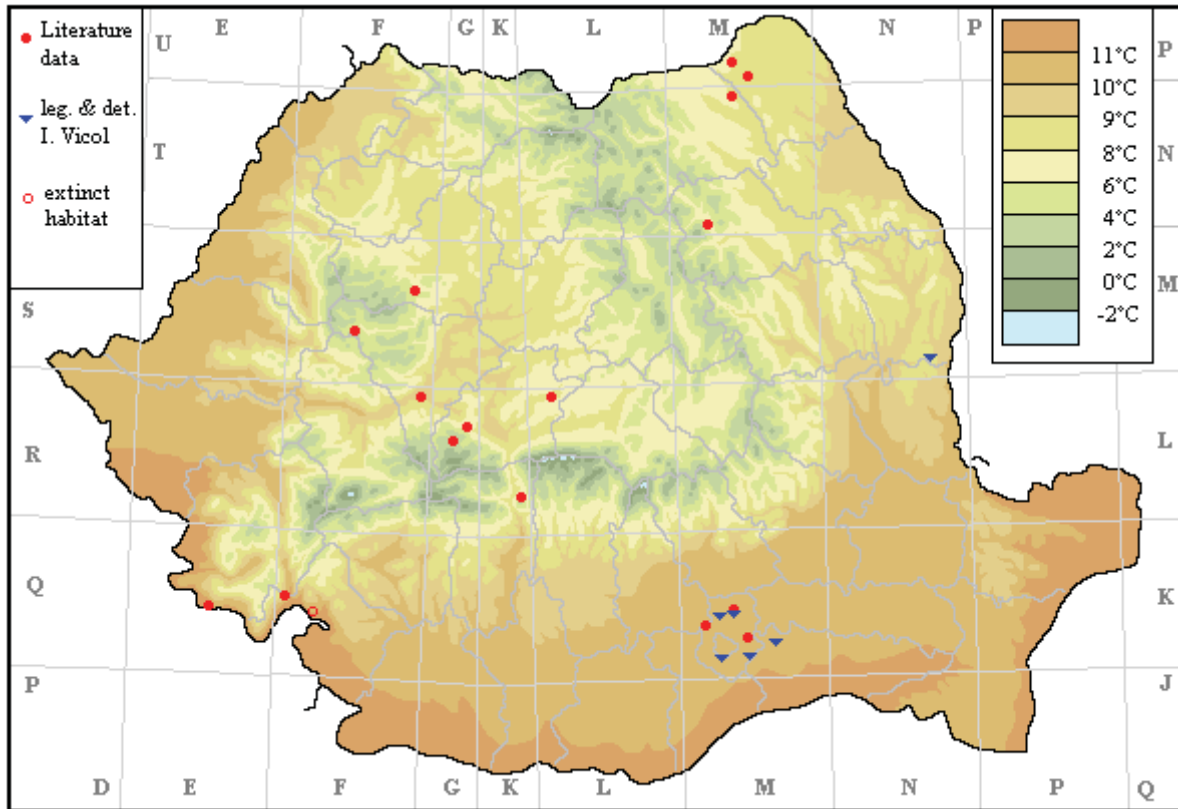


Figure 2. Chorology of the *Physcia aipolia* (EHRH. ex HUMB.) FÜRNR. in Romania.

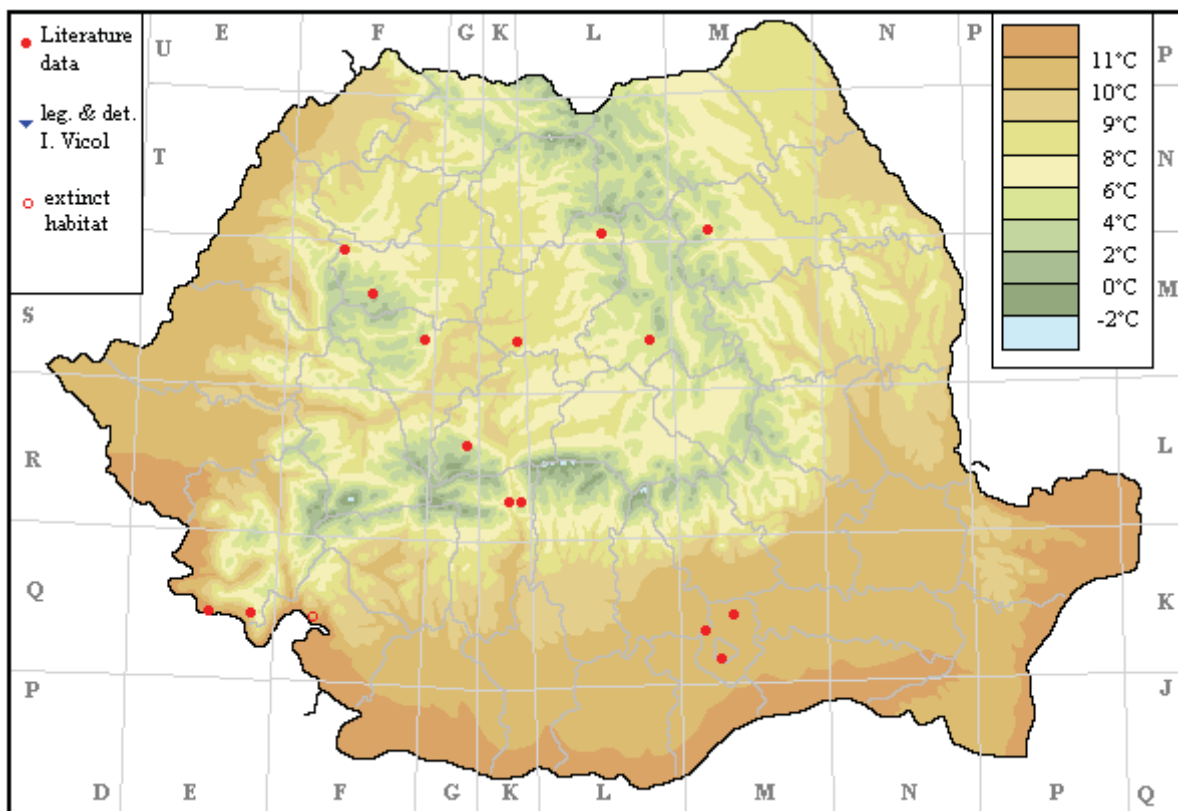


Figure 3. Chorology of the *Physcia caesia* (HOFFM.) HAMPE in Romania.

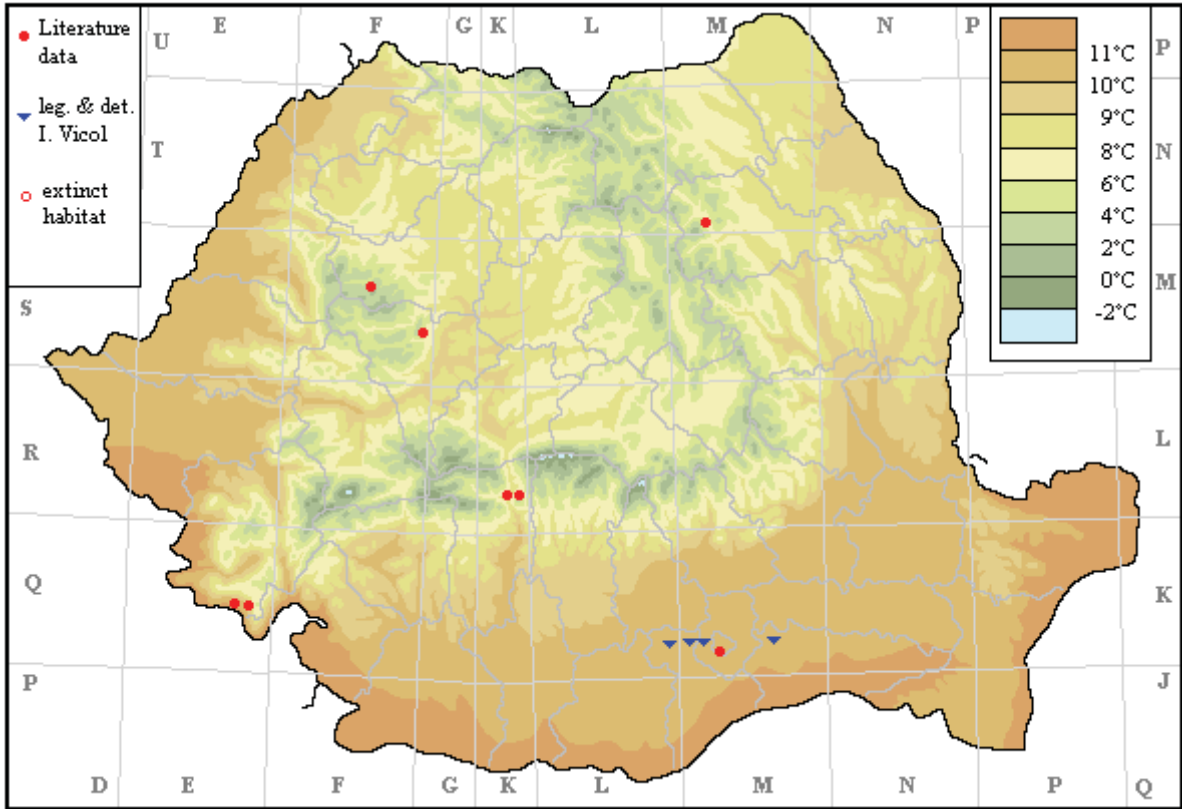


Figure 4. Chorology of the *Physcia dubia* (HOFFM.) LETT. in Romania.

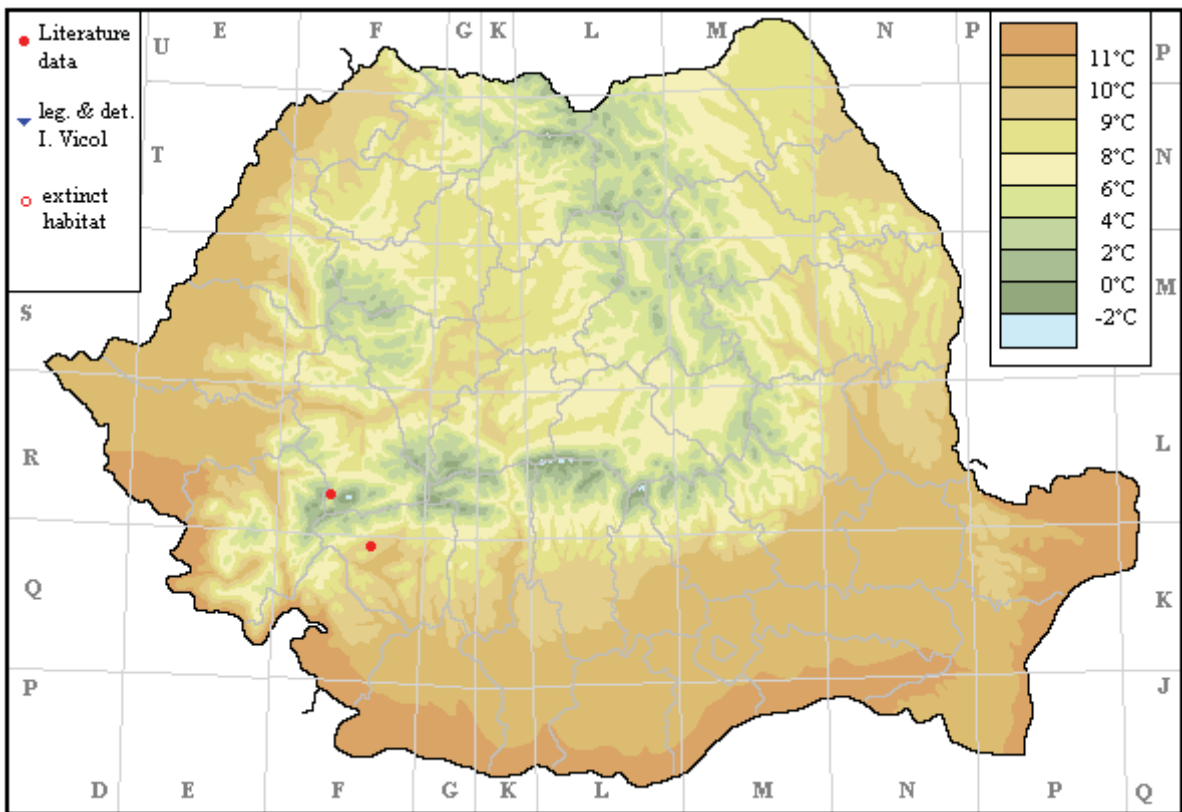


Figure 5. Chorology of the *Physcia endochrysoides* NYL. in Romania.

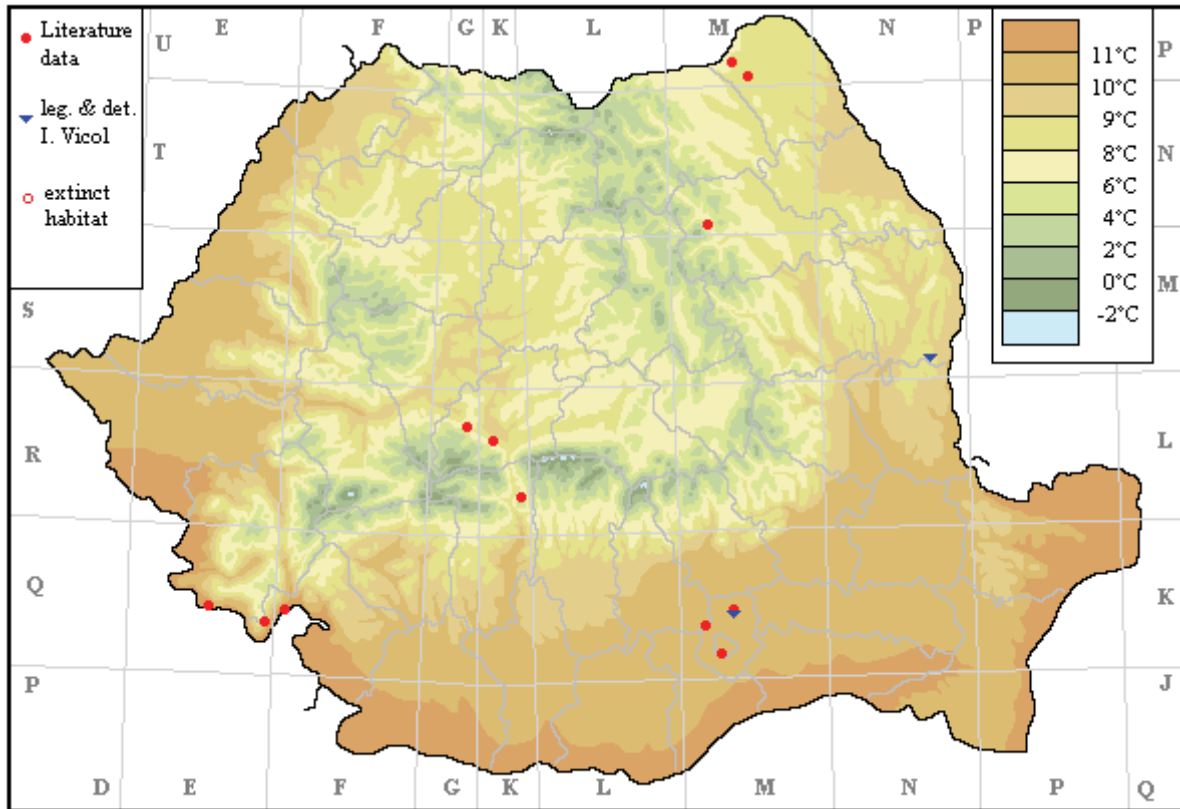


Figure 6. Chorology of the *Physcia semipinnata* (J. F. GMELIN) MOBERG. in Romania.

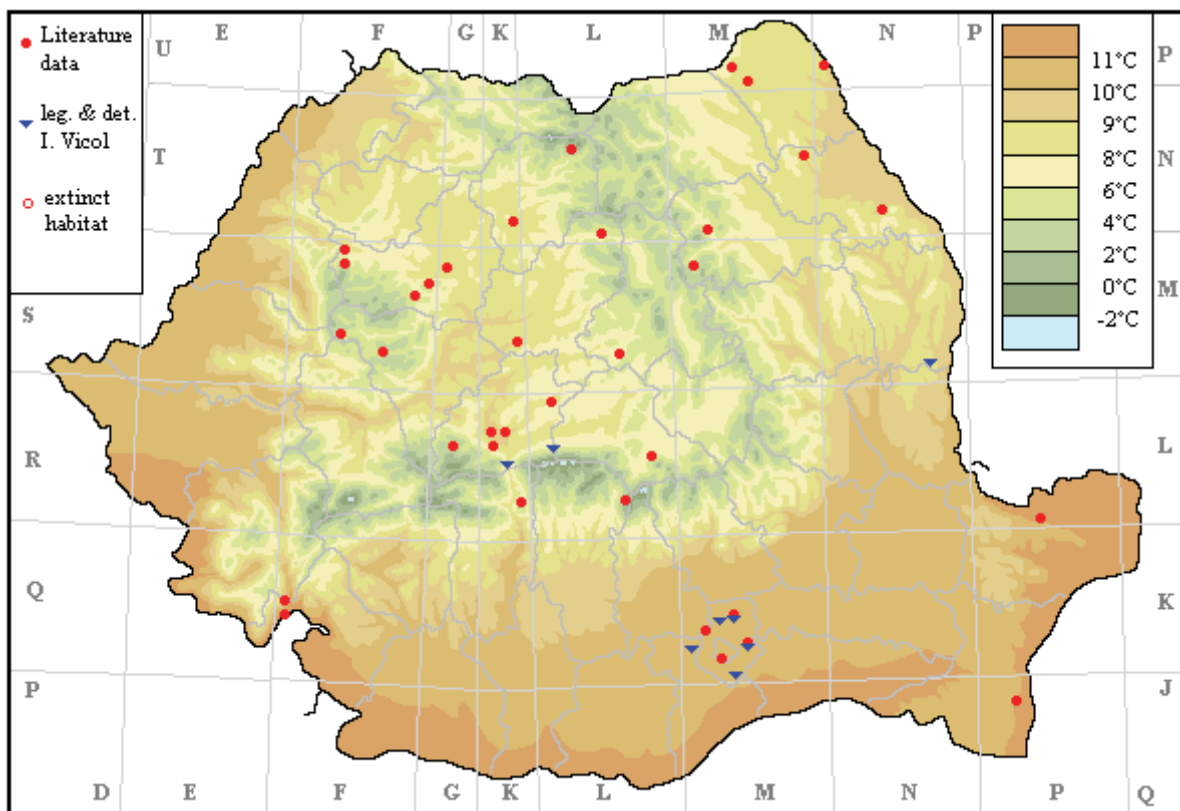


Figure 7. Chorology of the *Physcia stellaris* (L.) NYL. em. HARM. in Romania.

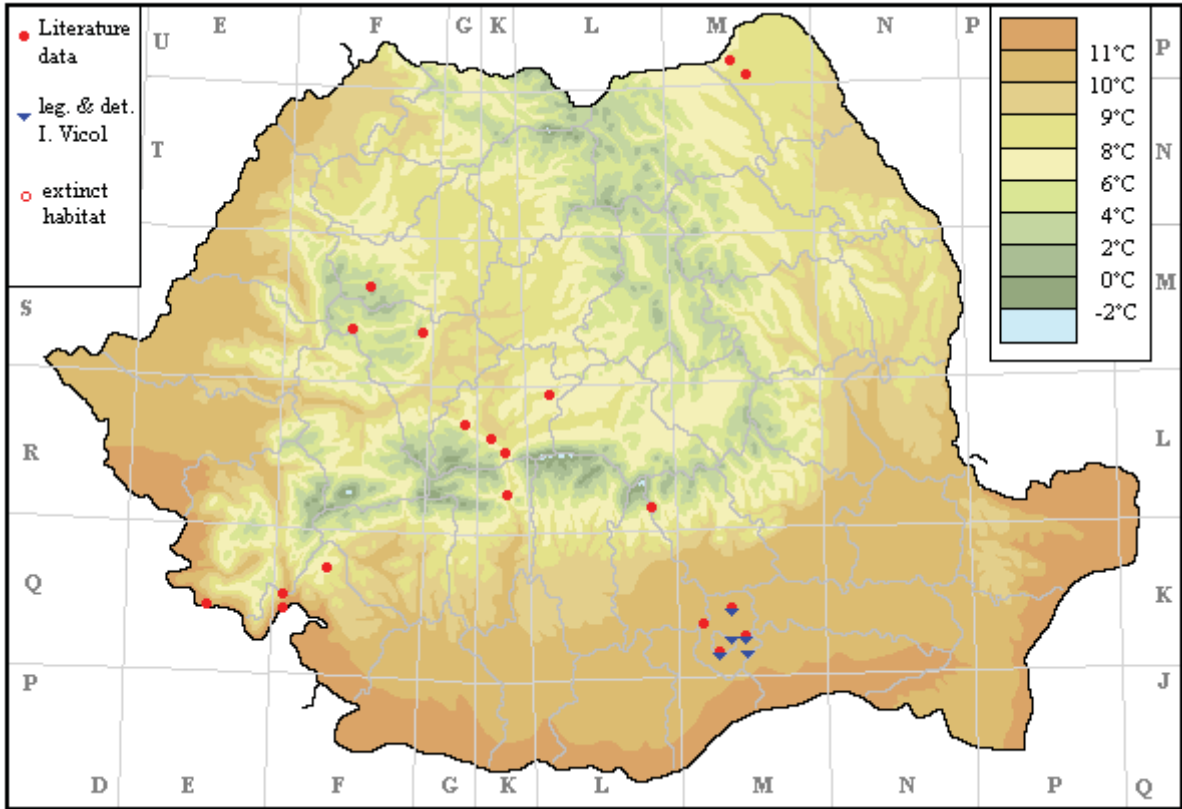


Figure 8. Chorology of the *Physcia tenella* (SCOP.) DC. in LAM. & DC. in Romania.

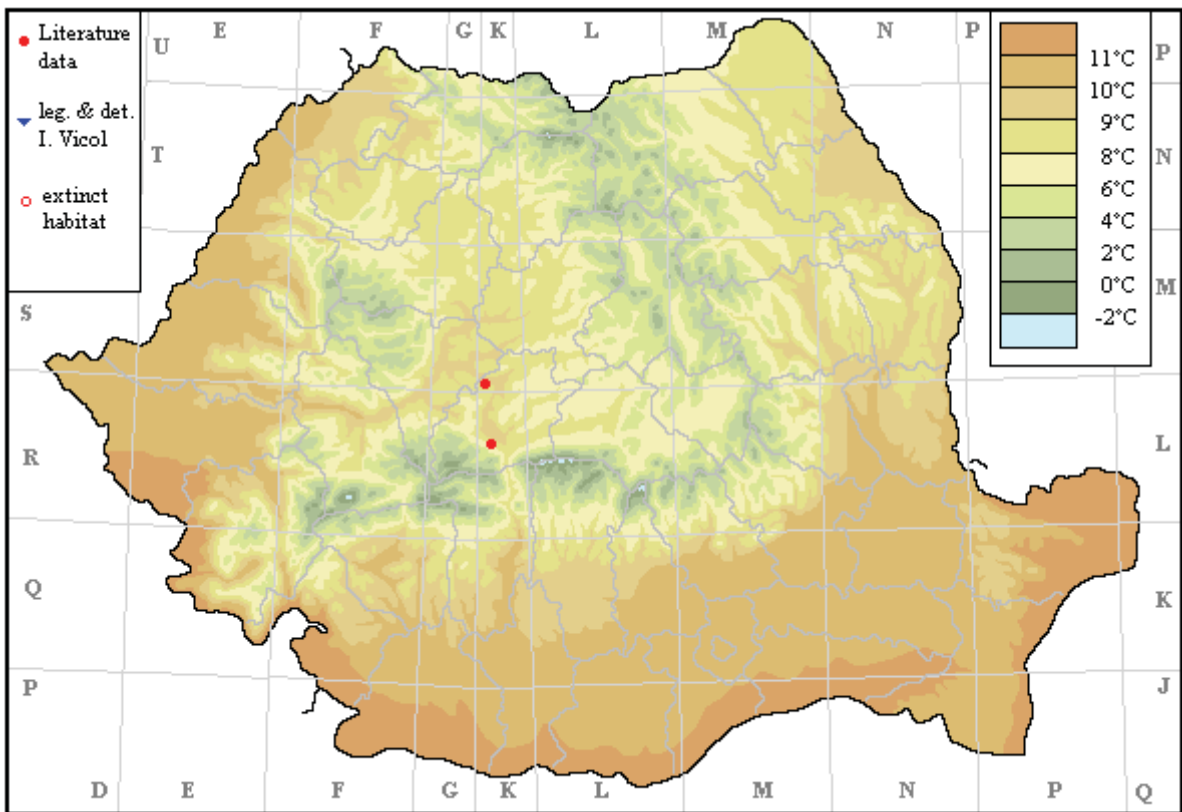


Figure 9. Chorology of the *Physcia tribacia* (ACH.) NYL. in Romania.

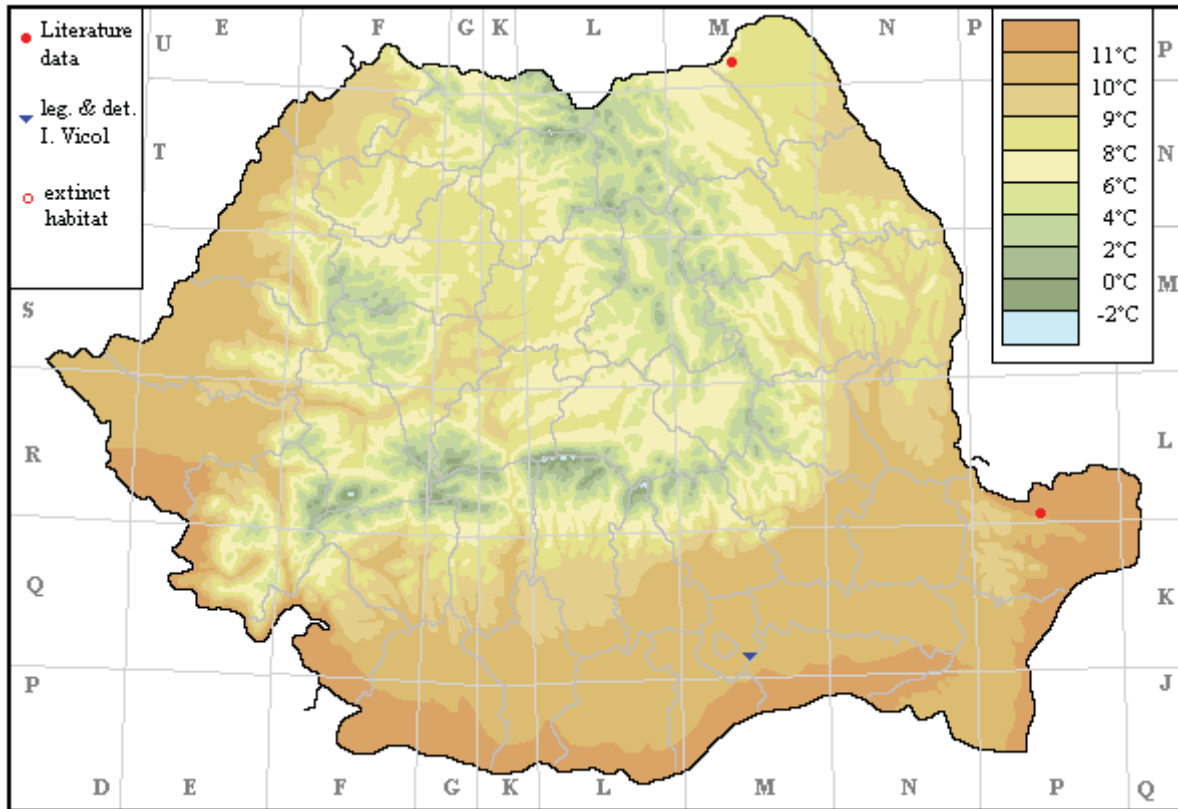


Figure 10. Chorology of the *Physcia tribacoides* NYL. in Romania.

### CONCLUSIONS

The most widespread lichen species from *Physcia* genus in Romania are *P. adscendens*, *P. stellaris*, *P. tenella*. Compared with the above mentioned species, *P. aipolia*, *P. dubia*, *P. caesia*, *P. semipinnata* were distributed in a lower number of localities. A few data on the spatial distribution were recorded in case of *P. endochrysooides*, *P. tribacia* and *P. tribacoides*. Within own fieldwork, more widespread species of *Physcia* genus were attributed to *P. adscendens*, *P. aipolia*, *P. stellaris* and *P. tenella* found especially on outer bark of trees in the forest ecosystems from Ilfov County. A few original data were recorded from Bucharest and Călărași, Giurgiu, Sibiu, and Vaslui counties.

### ACKNOWLEDGEMENTS

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### REFERENCES

- ARAGÓN G., MARTÍNEZ I., IZQUIERDO P., BELINCHÓN R., ESCUDERO A. 2010. *Effects of forest management on epiphytic lichen diversity in Mediterranean forests*. Applied vegetation science. Proceedings of the Royal Society of London. **13**: 183-194.
- BARTH J. 1905. *A Harghita hegység s szomszédságának Flórája*. Magyar Botanikai Lapok. Budapest. **4**: 8-12.
- BARTÓK K. 1982. *Flora și vegetația lichenologică a pădurilor de amestec din Munții Bihorului*. Studii și Cercetări de Biologie. Seria Biologie Vegetală. București. **34**: 101-106.
- BARTÓK K. 1988. *Recherches lichenologiques dans quelques forêts de mélange (hêtres et résineuses) de la Transylvania (Roumanie)*. Contribuții Botanice. Herbarium of the University of Cluj-Napoca: 189-196.
- BARTÓK K. & CODOREANU V. 1979. *Contribuții la studiul florei și vegetației lichenologice din Munții Vlădeasa (rama vestică)*. Contribuții Botanice. Herbarium of the University of Cluj-Napoca: 37-44.
- BORZA A. 1938. *Schedae ad "Floram Romaniae Exsiccatum" a Museo Botanico Universitatis Clusiensis Editam. Centuria XVII-XVIII*. Buletinul Grădinii Botanice și al Muzeului Botanic de la Universitatea din Cluj. Cluj-Napoca. **18**: 20-64.
- BORZA A. 1959. *Flora și vegetația Văii Sebeșului*. Edit. Academiei Republicii Populare Române. București. 65 pp.

- BURLACU LUCIA. 1967. *Contribuții la cunoașterea florei și vegetației lichenologice a pădurilor din Raionul Dorohoi (Reg. Suceava)*. Analele Științifice ale Universității "Al. I. Cuza" din Iași. **13**: 167-172.
- BURLACU LUCIA. 1969a. *Contribuții la cunoașterea florei lichenologice din Moldova*. Comunicări de Botanică. Edit. Ceres București. **8**: 79-83.
- BURLACU LUCIA. 1969b. *Contribuții la cunoașterea florei lichenologice din Cheile Bicazului (Jud. Bacău)*. Comunicări de Botanică. Edit. Ceres București. **9**: 207-215.
- BURLACU LUCIA. 1969c. *Contribuții la cunoașterea florei și vegetației lichenologice arboricole din pădurile Horlăceni, Gorovei, Văculești și Vârful Câmpului (Jud. Botoșani)*. Analele Științifice ale Universității "Al. I. Cuza" din Iași. Secțiunea 2 Biologie. Iași. **15**: 369-379.
- BURLACU LUCIA, CIURCHEA MARIA, CODOREANU V. 1969. *Contribuții la cunoașterea florei și vegetației lichenologice arboricole din pădurile dintre Cozla și Pescari (Jud. Caraș-Severin)*. Analele Științifice ale Universității "Al. I. Cuza" din Iași. Secțiunea 2 Biologie. Iași. **15**: 357-367.
- BURLACU LUCIA & DIACONESCU FLORICA. 1969. *Contribuții la cunoașterea florei lichenologice din Masivul Leoata*. Analele Științifice ale Universității "Al. I. Cuza" din Iași. Secțiunea 2 Biologie. Iași. **15**: 203-209.
- CIOCĂRLAN V. 2009. *Flora ilustrată a României. Pteridophyta et Spermatophyta*. Edit. Ceres. București. 1141 pp.
- CIURCHEA MARIA. 1969. *Flora și vegetația lichenologică saxicolă de pe Valea Oltului între Proeni și Călinești (Jud. Vâlcea)*. Contribuții Botanice. Herbarium of the University of Cluj-Napoca: 117-126.
- CIURCHEA MARIA. 1970. *Vegetația stâncăriilor de pe Valea Călinești (Jud. Vâlcea)*. Contribuții Botanice. Herbarium of the University of Cluj-Napoca. 145-165.
- CIURCHEA MARIA. 2004. *Determinatorul lichenilor din România*. Edit. Bit. București. 488 pp.
- CIURCHEA MARIA & CODOREANU V. 1967. *Aspecte din flora și vegetația lichenologică a împrejurimilor comunelor Vidra și Avram Iancu din Munții Apuseni*. Studia Universitatis Babeș-Bolyai. Series Biologia. Cluj Napoca. **1**: 39-53.
- CIURCHEA MARIA, CODOREANU V., BURLACU LUCIA. 1968. *Flora și vegetația lichenologică saxicolă dintre Cozla și Pescari (Jud. Caraș-Severin)*. Contribuții Botanice. Herbarium of the University of Cluj-Napoca: 129-148.
- CIURCHEA MARIA & CRIȘAN F. 1991-1992. *Caracterizarea vegetației lichenologice saxicole de pe Valea Someșului Cald, între Fântânele și Târnița*. Contribuții Botanice. Cluj-Napoca: 123-134.
- CIURCHEA MARIA & SZABÓ A. T. 1966. *Licheni corticoli din Parcul Arcalia (R. Bistrița)*. Studia Universitatis Babeș-Bolyai. Series Biologia. Cluj-Napoca. **1**: 13-23.
- CODOREANU V. & CIURCHEA MARIA. 1965. *Contribuții la cunoașterea florei lichenologice de pe șisturi cristaline*. Studii și Cercetări de Biologie. Seria Botanică. București. **17**: 145-151.
- CODOREANU V. & CIURCHEA MARIA. 1966. *Licheni calcicoli de pe Pietrele Albe (Masivul Vlădeasa)*. Studia Universitatis Babeș-Bolyai. Series Biologia. Cluj-Napoca. **1**: 7-12.
- CODOREANU V. & CIURCHEA MARIA. 1970. *Flora și vegetația lichenologică saxicolă de la Pescari și Divici (Jud. Caraș-Severin)*. Contribuții Botanice. Herbarium of the University of Cluj-Napoca: 57-65.
- CODOREANU V., CIURCHEA MARIA, ȘUTEU Ș. 1968. *Flora și vegetația lichenologică saxicolă din Cheile Râmețului (Munții Apuseni)*. Contribuții Botanice. Herbarium of the University of Cluj-Napoca: 119-128.
- CODOREANU V., ȚIU-ROVENȚA E., MICLE F. 1960. *Licheni corticoli din Grădina Botanică din Cluj*. Contribuții Botanice. Herbarium of the University of Cluj-Napoca: 97-108.
- ÇOBANOĞLU GÜLŞAH, YAVUZ M., COSTACHE I., RADU IRINA, AÇIKGÖZ B., BALONIU L. 2009. *Epiphytic and terricolous lichens diversity in Cozia National Park (Romania)*. Oltenia. Studii și Comunicări. Științele Naturii. Muzeul Olteniei Craiova. **25**: 17-22.
- ÇOBANOĞLU GÜLŞAH, YAVUZ M., COSTACHE I., RADU IRINA. 2010. *Additional and new lichen records from Cozia National Park, Romania*. Mycotaxon. Academia Edu. București. **114**: 193-196.
- CRETZOIU P. 1939. *Lichenii din Herbarul Al. Borza, colectați de J. Barth*. Buletinul Grădinii Botanice și al Muzeului Botanic de la Universitatea din Cluj. Cluj-Napoca. **19**: 122-125.
- CRETZOIU P. 1940. *Contribuții lichenologice din Herbarul Muzeului Botanic al Universității din Cluj*. Buletinul Grădinii Botanice și al Muzeului Botanic de la Universitatea din Cluj. Cluj-Napoca. **20**: 97-116.
- CRIȘAN F. & ARDELEAN IOANA. 2010. *The analysis of ecological behaviour of the macrolichens from Roșia Montană (Romania)*. Studia Universitatis "Vasile Goldiș". Seria Științele Vieții. Arad. **20**: 53-56.
- CRIȘAN F. & BANC A. 2007. *Data upon foliose and fruticose lichens from Valea Neagră (Landscape Reserve "Defileul Deda-Toplița")*. Contribuții Botanice. Herbarium of the University of Cluj-Napoca. **42**: 35-40.
- FARKAS E., LÖKÖS L., MOLNÁR K. 2001. *Lichen mapping in Komárom, NW Hungary*. Acta Botanica Hungarica. Budapest. **43**(1-2): 147-162.
- GALLOWAY D. J. & MOBERG R. 2005. *The lichen genus Physcia (SCHREB.) MICHX (Physciaceae: Ascomycota) in New Zealand*. Tuhinga. Museum of New Zealand. **16**: 59-91.
- LEHRER A. Z. & LEHRER M. MARIA. 1990. *Cartografierea faunei și florei României (coordonate arealografice)*. Edit. Ceres. București. 290 pp.
- MANOLIU A., NEGREAN G., MONAH FELICIA, ZANOSCHI V. COROI M. 1998. *Plante inferioare din Masivul Ceahlău*. Edit. Cermei. Iași: 313-314.
- MANTU ELENA. 1965. *Lichens de la Forêt de Snagov*. Travaux du Muséum d' Histoire Naturelle «Grigore Antipa». București. **5**: 465-472.

- MARMOR LIIS & RANDLANE TIINA. 2009. *Effects of road traffic on bark pH and epiphytic lichens in Tallinn*. Folia cryptogamica Estonica. University of Tartu. **43**: 23-37.
- MORUZI CONSTANȚA & KLOHS DALIA. 1970. *Contribuții la flora lichenologică a Pădurii Brănești*. Analele Universității din București. București. **19**: 9-11.
- MORUZI CONSTANȚA & MANTU ELENA. 1965. *Lichenii corticoli gymnocarpi din Pădurea Mogoșoia*. Comunicări de Botanică. Edit. Agroprint. București. **3**: 195-205.
- MORUZI CONSTANȚA & PETRIA ELENA. 1961. *Lichenii corticoli și saxicoli din Grădina Botanică din București*. Acta Botanica Horti Bucurestiensis. București: 261-271.
- MORUZI CONSTANȚA & TOMA N. 1967. *Noi contribuții la cunoașterea lichenilor din Munții Cibinului (II)*. Acta Botanica Horti Bucurestiensis. București: 295-303.
- MORUZI CONSTANȚA & TOMA N. 1970. *Contribuții la studiul vegetației lichenologicea Munților Cibin*. Acta Botanica Horti Bucurestiensis. București: 165-192.
- MORUZI CONSTANȚA & TOMA N. 1971. *Lichenii. Determinator de plante inferioare*. Edit. Didactică și Pedagogică. București. 221 pp., 45 Pl.
- MORUZI CONSTANȚA & TOMA N. 1972. *Contribuție la cunoașterea florei lichenologice corticole, tericole și muscicole din zona Porților de Fier (I)*. Acta Botanica Horti Bucurestiensis. București: 433-447.
- MORUZI CONSTANȚA & TOMA N. 1973. *Flora și vegetația lichenologică saxicolă de pe Insula Ada-Kaleh*. Analele Universității din București. Biologie vegetală. București. **22**: 101-116.
- ȘTEFĂNUȚ S., SANDA V., ÖLLERER KINGA, VICOL IOANA, ION ROXANA. 2009. *Atlas Florae Romaniae VI. Fabaceae: Medicago, Melilotus, Ononis, and Trigonella*. Edit. Ars Docendi. București. 179 pp.
- TODOR I. 1947. *Flora și vegetația de la Băile Sărute Turda*. Partea I. Buletinul Grădinii Botanice și al Muzeului Botanic de la Universitatea din Cluj. Cluj-Napoca. **27**: 40-41.
- TOTHĂZAN MED-GLORIA & CRIȘAN F. 2008. *Data upon the macrolichens in Bocului Mountain, Cluj County*. Contribuții Botanice. Herbarium of the University of Cluj-Napoca. **43**: 79-84.
- VICOL IOANA. 2010a. *Preliminary study on epiphytic lichens as an indicator of environmental quality in forests from around Bucharest Municipality (Romania)*. Analele Universității din Oradea-Fascicula Biologie. Oradea. **17**: 200-207.
- VICOL IOANA. 2010b. *Preliminary studies regarding the epiphytic lichens diversity from Băneasa Forest (Bucharest Municipality, Romania)*. Muzeul Olteniei Craiova. *Oltenia. Studii și Comunicări. Științele Naturii*. Craiova. **26**: 257-262.
- VICOL IOANA. 2011a. *Preliminary study using lichen species diversity as an indicator of local environmental quality within two nature reserves from Romania*. Analele Universității din Oradea-Fascicula Biologie. Oradea. **18**: 53-58.
- VICOL IOANA. 2011b. *A study regarding the impact of forestry management on lichen flora within forests from Bucharest surroundings (Romania)*. Muzeul Olteniei Craiova. *Oltenia. Studii și comunicări. Științele Naturii*. Craiova. **27**: 165-170.
- VICOL IOANA. 2011c. *Lichenii epifitici, indicatori ai calității mediului în ecosisteme forestiere din aria metropolitană a Municipiului București*. International Symposium "The Environment and Industry". București. Edit. Est Falia. **2**: 303-309.
- VICOL IOANA. 2012. *The sinstructure of epiphytic lichens within forests from eastern part of Bucharest municipality (Romania)*. Botanica Serbica. Publication Ethics. Belgrade. **36**: 131-137.
- YAVUZ M. & ÇOBANOĞLU GÜLŞAH. 2008. *Lichen records from Dobrogea, Romania*. *Oltenia. Studii și comunicări. Științele Naturii*. Muzeul Olteniei Craiova. **24**: 17-21.
- ZARABSKA DARIA, GUTTOVA ANNA, CRISTOFOLINI FABIANA, GIORDANI P., LACKOVIČOVÁ. 2009. *Epiphytic lichens of apple orchards in Poland, Slovakia, and Italy*. Acta mycologica. Polish Botanical Society. **44**(2): 151-163.
- ZSCHACKE H. 1911. *Beiträge zur flechtenflora Siebenbürgens*. Magyar Botanikai Lapok. Budapest. **10**: 362-380.

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