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BACIDIA SPECIES IN HUNGARY

Die *Bacidia* Arten in Ungarn

by

Edit FARKAS, László LÖKÖS & Erika TÓTH

Key words: Lichens, floristics, ecology, *Bacidia*, Hungary.
Schlagwörter: Flechten, Floristik, Ökologie, *Bacidia*, Ungarn.

Summary: Twenty-one *Bacidia* species were treated from Hungary in the Hungarian Lichen Flora (VERSEGHY 1994). The considerable number of recent collections and recent taxonomic revisions of this group made a taxonomic revision of the c. 800 specimens of the above species necessary to clarify the present status of *Bacidia* species in Hungary.

Preliminary results presented here concern mainly the species *Bacidia fraxinea*, *B. rosella* and *B. rubella*. These are the most frequent *Bacidia* s. str. species in the Hungarian lichen flora. *B. fraxinea* is often found under the name *B. rubella*. These two species often occur together in the same sample. Their current geographical distribution needs further investigation - nevertheless it seems that *B. fraxinea* is the commonest of the 3 species. *B. rosella* is also a rare and endangered species in Hungary.

Permanent quadrats were selected in the Aggtelek National Park to identify the ecological niche preferences of the lichen communities dominated by *B. fraxinea* and *B. rubella*.

Zusammenfassung: Einundzwanzig Arten der Gattung *Bacidia* sind von VERSEGHY (1994) in ihrer "Flechtenflora von Ungarn" aufgenommen worden. Durch die beachtliche Zahl an aktuellen Aufsammlungen und die neuen Ergebnisse taxonomischer Studien ist eine Revision der ungefähr 800 Proben notwendig geworden, um den aktuellen Stand der Gattung in Ungarn zu klären.

Die vorläufigen Resultate betreffen überwiegend die in Ungarn am häufigsten Arten vom *Bacidia* s. str.: *Bacidia fraxinea*, *B. rosella* und *B. rubella*. *B. fraxinea* liegt oft unter dem Namen *B. rubella*. Beide Arten kommen auch zusammen vor. Ihre aktuelle geographische Verbreitung bedarf weiterer Untersuchungen. *B. fraxinea* scheint die häufigste der drei Arten zu sein. *B. rosella* ist auch in Ungarn eine seltene und gefährdete Art.

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Im Aggtelek National Park sind Dauerquadrate ausgewählt worden, um die Standortsfaktoren der von *B. fraxinea* und *B. rubella* dominierten Flechtengesellschaften festzustellen.

Introduction

VERSEGHY (1994) reported 21 *Bacidia* species from Hungary. This list is based on her former revision of the BP collection. Recent publications (COPPINS et al. 1992, EKMAN 1996, HAFELLNER 1984, PRINTZEN 1995, PURVIS et al. 1992, SANTESSON 1993, WIRTH 1995) introduce a different taxonomic status for several of these species.

EKMAN & NORDIN (1993) studying *Bacidia rubella* s. lat. in Sweden pointed out that *B. fraxinea* (which was traditionally included in *B. rubella)* is easily distinguished, distinct species differing from *B. rubella* in a number of characters (esp. thallus features: granular/areolate-cracked, squamulose; apothecium colour, pruinosity etc.). They also investigated *B. fraxinea* specimens from Hungary found under *B. rubella* in various foreign herbaria (LD, S, TUR). In Hungarian herbaria *B. fraxinea* was also kept under the name *B. rubella* – and so this species was not included in the Hungarian Lichen Flora (VERSEGHY 1994).

The considerable number of recent collections and recent taxonomic revisions of this group made a taxonomic revision of the c. 800 Hungarian *Bacidia* specimens necessary to clarify the present status of *Bacidia* species in Hungary. *B. rosella* and *B. rubella* (incl. *B. fraxinea*) altogether (263 specimens) account for about a third of the Hungarian *Bacidia* specimens, making these are the most frequent *Bacidia* s. str. species in Hungary. Consequently a preliminary study of these species was initiated in 1994.

An ecological study on *B. rubella* and *B. fraxinea* was initiated in the Aggtelek Karst, NE Hungary in 1995. This region is an ideal study area being covered mainly by forests dominated by deciduous trees (*Acer campestre, Fagus sylvatica, Fraxinus excelsior, Quercus petraea)* which are the most frequent phorophytes of the studied *Bacidia* species. Permanent sample plots were established to study the influence of habitat and the role of the two *Bacidia* species in different successional stages of the lichen community over time.

Materials and Methods

All Hungarian specimens of *Bacidia rosella* and *B. rubella* were investigated in the five principal lichen herbaria (BP, EGR, SZE, SZO, VBI), including recent collections of the authors. Records before and after 1975, and the literature data are indicated by different symbols.

Fourteen permanent plots, selected in the Aggtelek National Park, NE Hungary were sampled to study differences in ecological habitat preferences of

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Table 1: Current taxonomic status of *Bacidia* species in Hungary.

VERSEGHY (1994)	the latest names accepted by the cited authors
Bacidia acclinis (FLOT.) ZAHLBR.	*Arthrosporum populorum* A. MASSAL.
Bacidia arceutina (ACH.) ARNOLD	***Bacidia arceutina*** (ACH.) ARNOLD
Bacidia arnoldiana KÖRB.	*Bacidina arnoldiana* (KÖRB.) V. WIRTH & VĚZDA
Bacidia bagliettoana (A. MASSAL. & DE NOT.) JATTA	***Bacidia bagliettoana*** (A. MASSAL. & DE NOT.) JATTA
Bacidia beckhausii KÖRB.	***Bacidia beckhausii*** KÖRB.
Bacidia circumspecta (NORRL. ex NYL.) MALME	***Bacidia circumspecta*** (NYL. ex VAIN.) MALME
Bacidia friesiana (HEPP) KÖRB.	***Bacidia friesiana*** (HEPP) KÖRB.
Bacidia fusca (A. MASSAL.) DU RIETZ	*Mycobilimbia fusca* (A. MASSAL.) HAFELLNER
Bacidia hegetschweileri (HEPP) VAIN.	***Bacidia hegetschweileri*** (HEPP) VAIN.
Bacidia incompta (BORRER ex HOOK.) ANZI	***Bacidia incompta*** (BORRER ex HOOK.) ANZI
Bacidia inundata (FR.) KÖRB.	*Bacidina inundata* (FR.) VĚZDA
Bacidia laurocerasi (DELISE ex DUBY) ZAHLBR.	***Bacidia laurocerasi*** (DELISE ex DUBY) ZAHLBR.
Bacidia naegelii (HEPP) ZAHLBR.	*Lecania naegelii* (HEPP) DIEDERICH & P. BOOM
Bacidia phacodes KÖRB.	*Bacidina phacodes* (KÖRB.) VĚZDA
Bacidia polychroa (TH. FR.) KÖRB.	***Bacidia polychroa*** (TH. FR.) KÖRB.
Bacidia rosella (PERS.) DE NOT.	***Bacidia rosella*** (PERS.) DE NOT.
Bacidia rubella (HOFFM.) A. MASSAL.	***Bacidia rubella*** (HOFFM.) A. MASSAL.
Bacidia sabuletorum (SCHREB.) LETTAU	*Mycobilimbia sabuletorum* (SCHREB.) HAFELLNER
Bacidia sphaeroides (DICKS.) ZAHLBR.	*Mycobilimbia sphaeroides* (DICKS.) ined.
Bacidia subincompta (NYL.) ARNOLD	***Bacidia subincompta*** (NYL.) ARNOLD
Bacidia trachona (ACH.) LETTAU	***Bacidia trachona*** (ACH.) LETTAU

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B. fraxinea and *B. rubella*. In each plot habitat features (humidity, forest type, exposition, percentage cover of the foliage, light conditions, etc.) and substrate features (phorophyte species, size/age, bark-texture, etc.) were recorded. Transparent plastic film with quadrat-units of 10×10 cm were placed around the bark at 70–100 cm height in order to draw the map of the lichen community and the bark cracks. The sample quadrats represent a wide range of forest habitats characteristic of the territory from damp and shaded valleys to exposed, south-facing hillsides. Having analyzed the data, we hope to gain information on the habitat preferences of these species, as well as the effect of various accessory lichen and bryophyte species.

Results and discussion

In line with recent revisionary studies of the genus *Bacidia* (COPPINS et al. 1992, EKMAN 1996, HAFELLNER 1984, PRINTZEN 1995, PURVIS et al. 1992, SANTESSON 1993, WIRTH 1995), out of the previously recognized 21 species in Hungary (VERSEGHY 1994) only 13 are here retained in the genus *Bacidia* s. str. (boldface) (Table 1).

A preliminary revision of the specimens shows that some of the 21 species *(B. circumspecta, B. friesiana, B. hegetschweileri* and *B. laurocerasi)* are probably very rare or their occurrence is doubtful. A detailed study is in progress. The status of several specimens under the dubious name *Bacidia effusa* in Hungarian herbaria requires clarification. Furthermore the occurrence of two additional species *(B. fraxinea, B. herbarum)* were identified amongst our recent collections, and more are to be expected.

A discussion of the results of our ecological assessment of *Bacidia rosella, B. fraxinea* and *B. rubella* follows:

Bacidia rosella (PERS.) DE NOT.

B. rosella is characterised by a thin, continuous to areolate thallus with pale pinkish apothecia and has been well illustrated (WULFEN in JACQUIN 1789, DIETRICH 1846, GALLOE 1929). Thirty-one specimens were collected between 1871 and 1996 from 8 phorophyte species. It occurs in the central mountain range area (Fig. 1). Specimens collected before 1975 were found mainly on *Fagus* bark, the four recent samples on *Acer* and *Quercus* bark (Table 2) in a shaded, humid habitat. *B. rosella* is considered a rare, endangered species in Hungary.

Bacidia fraxinea LÖNNR.

Following EKMAN & NORDIN's (1993) treatment of *B. fraxinea* (with thin, smooth-verrucose-squamulose areolate thallus, and frequently pruinose apothecial margins), we were able to readily identify this species not reported by VERSEGHY (1994) as new to Hungary. *Bacidia fraxinea* is often found under the

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name *B. rubella* also in the Hungarian herbaria. In several cases (11%) the two species occur together part of the same herbarium specimen. The 195 specimens were collected between 1868 and 1996 on 20 (!) different phorophytes (*Acer* spp., *Aesculus, Alnus, Carpinus, Euonymus, Fagus, Fraxinus, Juglans, Lonicera, Pinus, Populus, Pyrus, Quercus, Robinia, Salix, Sambucus, Tilia, Ulmus)* (Table 2). It is by far the most frequent species of *Bacidia* in Hungary occurring throughout Hungary including in anthropogenic environments (Fig. 2).

Bacidia rubella (HOFFM.) A. MASSAL.

B. rubella has a finely granular thallus differing from both of the above species. Apothecia reddish-brown to orange, usually somewhat paler, than those of *B. fraxinea*, only very rarely pruinose. The 63 specimens, growing mainly on *Acer* and *Quercus* bark, were collected on 12 phorophyte species (Table 2) in the central mountain range area (Fig. 3). In shaded, humid forests it often occurs together with *B. fraxinea*, but in open, dry habitats it normally grows alone.

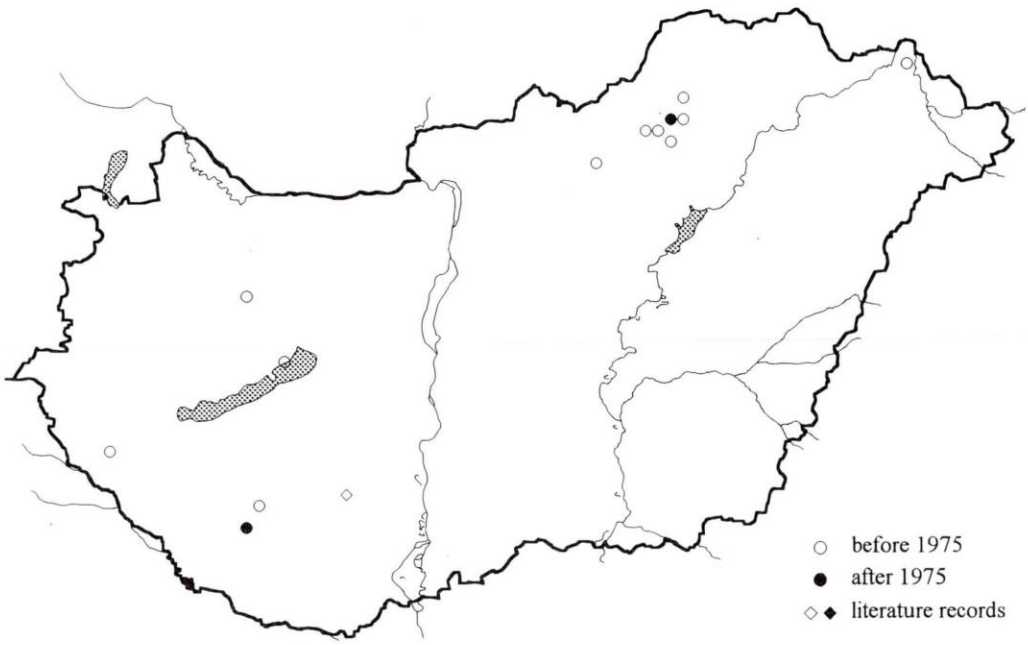


Fig. 1: Distribution of *Bacidia rosella* in Hungary, based on herbarium and literature (SÁNTHA 1924) records. (Grid system with 5×6 km units).

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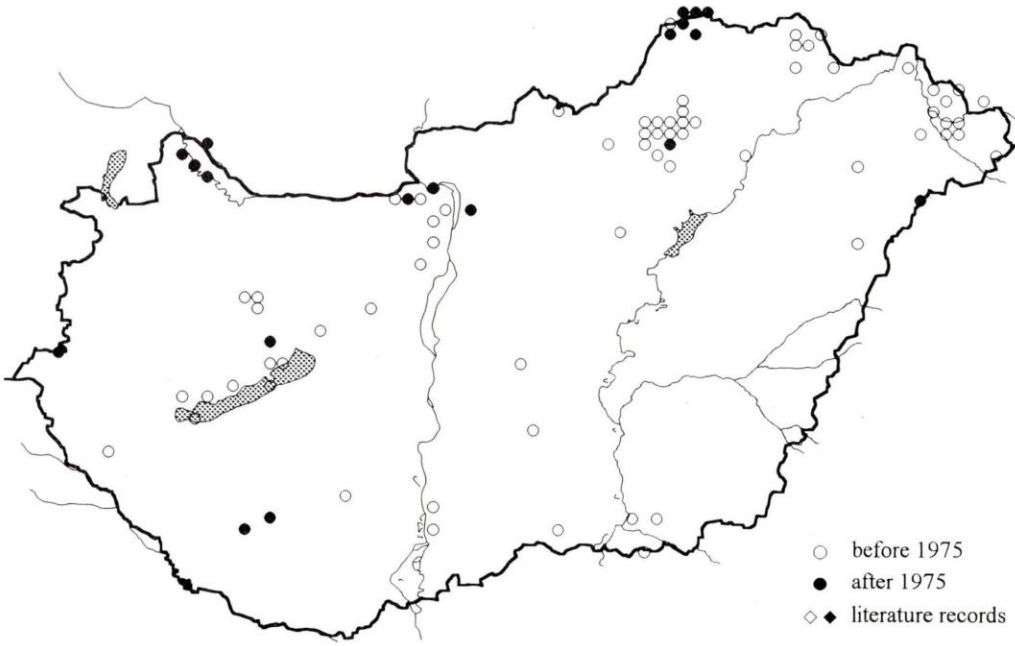


Fig. 2: Distribution of *Bacidia fraxinea* in Hungary, based on herbarium specimens. (Grid system with 5×6 km units).

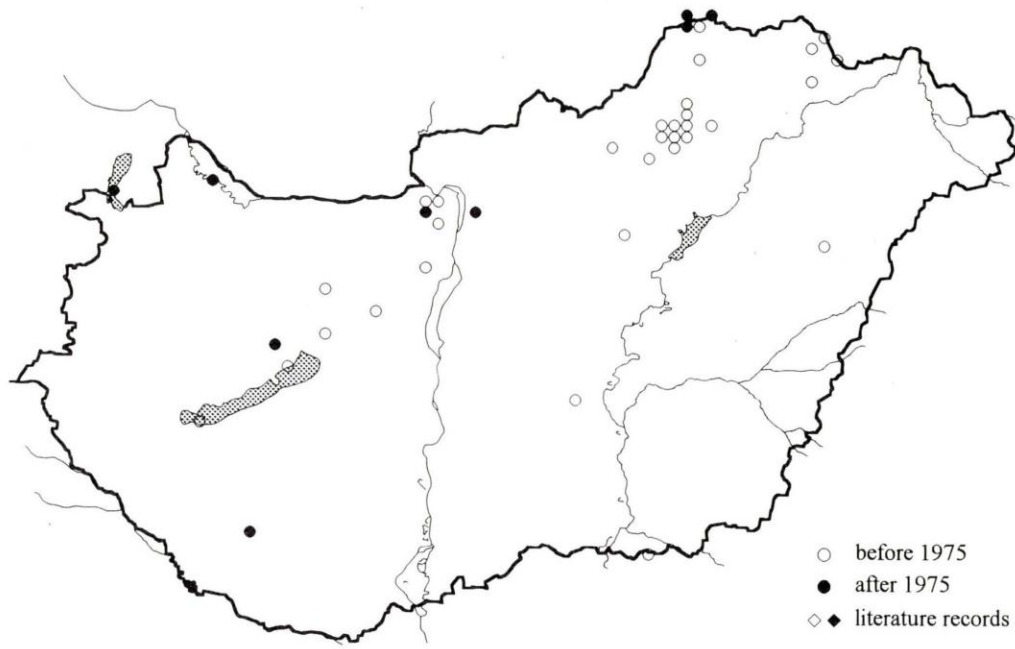


Fig. 3: Distribution of *Bacidia rubella* in Hungary, based on herbarium records. (Grid system with 5×6 km units).

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Table 2: Distribution (in percent) of these species on some of the phorophytes is presented below.

Phorophyte	*B. rosella*	*B. fraxinea*	*B. rubella*
Acer	32.2%	29.2%	33.3%
Fagus	29.0%	2.5%	3.1%
Fraxinus	9.7%	19.5%	4.7%
Quercus	3.2%	6.6%	19.0%
Ulmus	9.7%	10.2%	12.7%

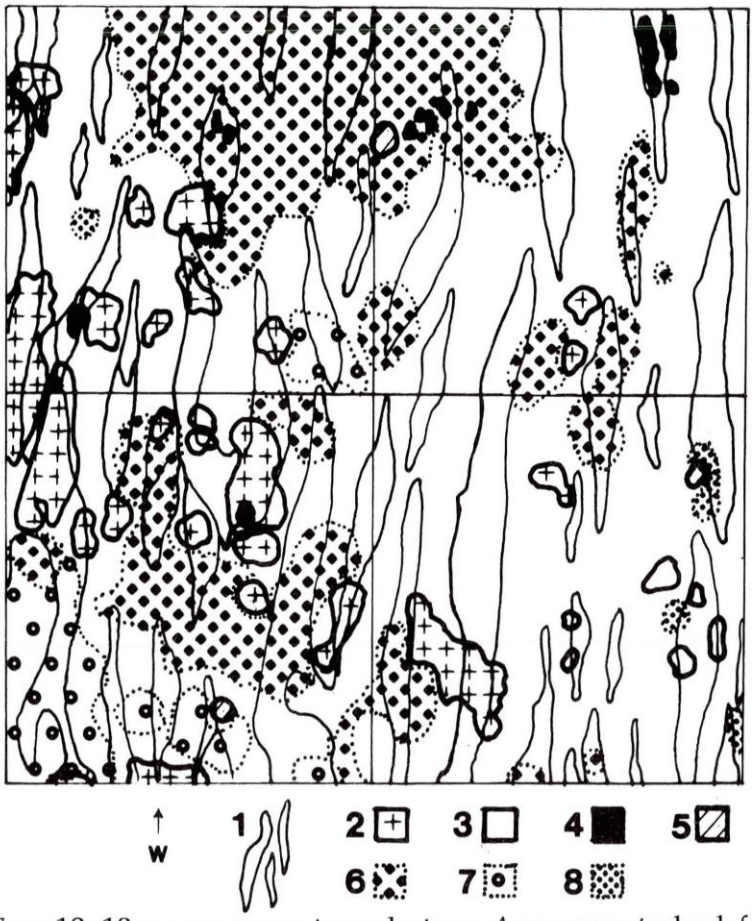


Fig. 4: Four 10×10 cm permanent quadrats on *Acer campestre* bark facing west (see arrow).
(1) bark cracks – thin outline; lichens – thick outline: (2) *Bacidia rubella*, (3) *Bacidia fraxinea*, (4) *Lepraria incana*, (5) *Physconia enteroxantha*; (6, 7, 8) bryophytes.

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Permanent plot investigations

Most of the quadrats (90%) contained *B. rubella* (10–40% cover). *B. fraxinea* (50% of the quadrats) was less frequent (2–30% cover). Other species present in the quadrats are: *Amandinea punctata* (HOFFM.) COPPINS & SCHEID., *Candelariella xanthostigma* (ACH.) LETTAU, *Melanelia glabratula* (LAMY) ESSL., *Scoliciosporum chlorococcum* (GRAEWE ex STENHAM.) VĚZDA, *Lepraria incana* (L.) ACH., *Physconia enteroxantha* (NYL.) POELT and bryophytes.

Having compared the percentage cover in different habitat types the results support the field observation that the open, dry habitats are preferred by *B. rubella*. In the transitional zone between the warm, sunny hillsides to the wet and dark valleys *B. fraxinea* and *B. rubella* occur together and the percentage cover of *B. rubella* decreases towards the valley-bottoms. In the darkest places only some small thalli can be found with few or without any apothecia. In the open, sunny habitats *Bacidia* species are gradually replaced by several other species.

Although the thalli often grow inside and near the bark cracks, the number of samples is insufficient to explain if the growth of these *Bacidia* species is independent on the microrelief of the bark.

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Addresses:

Edit FARKAS
Institute of Ecology and Botany, Hungarian Academy of Sciences
H-2163 Vácrátót
Hungary
E-Mail: efarkas@botanika.botanika.hu

László LÖKÖS
Department of Botany, Hungarian Natural History Museum
H-1476 Budapest, Pf. 222
Hungary
E-Mail: lokos@bot.nhmus.hu

Erika TÓTH
Aggtelek National Park
H-3758 Jósvafö, Pf. 6, Tengerszem oldal
Hungary

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