

***Biazrovia*, a new genus of lichenicolous ascomycetes from Asia**

Mikhail P. Zhurbenko ^{1*} & Javier Etayo ²

¹Laboratory of the Systematics and Geography of Fungi, Komarov Botanical Institute, Russian Academy of Sciences, Professor Popov 2, St.-Petersburg, 197376, Russia

²Navarro Villoslada, 16-3 dcha., E-31003 Pamplona, Spain

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Abstract. The genus *Biazrovia* is described from Siberia for the single new species *B. stereocaulicola* growing on *Stereocaulon* species. It is characterized by a lichenicolous habit; finally urceolate orange-brown apothecia; a cupulate non-hairy exciple; a hyaline, I–, K/I– hymenium; filiform, apically swollen paraphyses; 8-spored, I–, K/I– asci with an apically thickened wall without a distinct ocular chamber; and hyaline, trans-septate, smooth-walled, non-halonate ascospores. The new genus is provisionally included in the *Ostropales*.

Key words: lichen-inhabiting fungi, *Ostropales*, Russia, *Stereocaulon*

Introduction

In a recent treatment of lichenicolous fungi growing on species of *Stereocaulon* in the Holarctic, a “pyrenomycete 2” found in Siberia was mentioned (Zhurbenko 2010). Further studies of relevant material suggested that it represents an undescribed species of a previously unknown genus of discomycetes, which is formally described below as *Biazrovia*. The diversity of lichenicolous fungi known to grow on *Stereocaulon* thus is enlarged to 32 species representing 26 genera (Etayo 2002, 2010; Berger & Priemetzhofer 2008; Zhurbenko 2010; Kukwa et al. 2012; Zhurbenko & Braun 2012), two of the latter (*Cecidiomyces* U. Braun & Zhurb. and the newly described *Biazrovia*) being exclusively known from this host genus.

*Corresponding author: e-mail: zhurb58@gmail.com

Materials and methods

The material was examined and photographed using Zeiss microscopes Stemi 2000–CS and Axio Imager A1 equipped with Nomarski differential interference contrast optics. Microscopic examination was carried out on material mounted in water, 10% KOH (K), or Lugol's iodine, directly (I) or after a KOH pre-treatment (K/I). Measurements were taken from water mounts. Dimensions of ascospores were rounded to the nearest 0.5 μm . Their length, breadth and length/breadth ratio (l/b) are given as: (min–){X – SD}–{X + SD}(–max), where min and max are the extreme values, X the arithmetic mean, and SD the corresponding standard deviation. The *Ascomycota* classification follows Lumbsch & Huhndorf (2007), except for the placement of *Spirographa* Zahlbr. in *Ostropales* (Diederich 2004). The material examined is housed in the herbarium of the V.L. Komarov Botanical Institute in St. Petersburg, Russia (LE).

Taxonomy

Biazrovia Zhurb. & Etayo, gen. nov.

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Lichenicolous ascomycetes. **Ascomata** apothecia, semi-immersed to sessile, initially subglobose and almost closed, later deeply urceolate, with circular non-dentate opening, fleshy, shades of orange-brown. **Exciple** cupulate, without hairs, shades of yellowish brown, in surface view resembling *textura angularis* or *textura intricata*, K–. **Periphysoids** absent. **Epihymenium** and **subhymenium** hyaline, indistinct. **Hymenium** hyaline, all parts I–, K/I–. **Paraphyses** filiform, scarcely septate, occasionally branched, with markedly swollen apices. **Asci** subcylindrical, wall apically thickened, without distinct ocular chamber when mature, I–, K/I–, 8-spored. **Ascospores** hyaline, narrowly ellipsoid, trans-septate, smooth-walled, non-halonate, guttulate, overlapping uni- or biseriate in the ascus. **Conidiomata** not observed.

Etymology. Dedicated to the outstanding Russian lichenologist Lev Biazrov, who made significant contribution to the knowledge of the lichen flora of Central Asia.

Type species: *Biazrovia stereocaulicola* Zhurb. & Etayo

Biazrovia stereocaulicola Zhurb. & Etayo, sp. nov.

Fig. 1

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Similar to *Paschelkiella pini* (Romell) Sherwood, but differs in the ecology, capitate paraphyses, I– asci, and narrowly ellipsoid, 3-septate ascospores.

Type: **RUSSIA:** Siberia, Irkutsk Region, 2 km SE of Anchuk, Bol'shaya Bystraya River, 51°44' N, 103°29' E, alt. 700 m, taiga forest, pebble among shrubs by the river bank, on *Stereocaulon glareosum* (mostly stems, occasionally phyllocladia), 9 Jun 2005, M. Zhurbenko 0554 (LE 233 719 – **holotype**).

Ascomata apothecia, macroscopically reminiscent of *Taxus baccata* fruits, semi-immersed to sessile, 100–250 μm diam, initially subglobose, almost closed, and resembling perithecia, later deeply urceolate, with wide, circular, non-dentate opening up to 125 μm diam., glabrous, fleshy, vinaceous, cinnamon or orange-brown. **Exciple** cupulate, 20–35

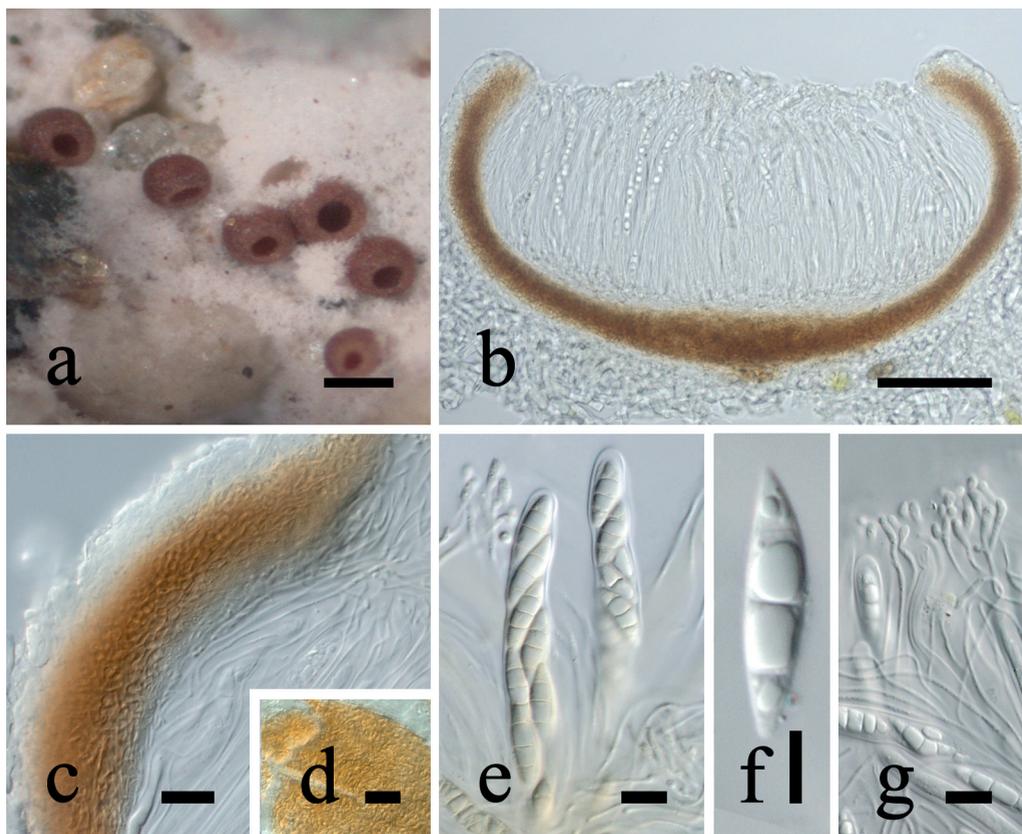


Fig. 1. *Biazrovia stereocaulicola* (holotype): **a** – ascomata habitus; **b** – ascoma in cross section (in water); **c** – wall of ascoma in cross section (in water); **d** – squashed wall of ascoma in surface view (in water); **e** – asci with spores (in I); **f** – ascospore (in K); **g** – paraphyses (in water). Bars: a = 200 μm ; b = 50 μm ; c, e, g = 10 μm ; d, f = 5 μm

μm thick, without hairs, yellowish brown to cinnamon throughout except outer hyaline layer 5–10 μm thick in exposed parts, in cross section of angular-elongated cells, in surface view resembling *textura angularis* or *textura intricata*, of cells 3–7 μm across, K–. **Periphysoids** absent. **Epiphymenium** hyaline, indistinct. **Hymenium** hyaline, ca. 100 μm tall, I–, K/I–. **Subhymenium** hyaline, ca. 10 μm tall. **Paraphyses** numerous, persistent, filiform, scarcely septate, occasionally branched above into two unequal arms, ca. 1 μm diam., with non-pigmented, markedly swollen, sometimes slightly strangled apices 2.5–4 μm diam. **Asci** subcylindrical, lateral wall ca. 1 μm thick, apical dome 3–10 μm tall, distinct ocular chamber absent, but in young asci occurs small apical indentation, 75–91(–100) \times (7–)8–10(–12) μm ($n = 17$), 8-spored, easily separating in K, I–, K/I–. **Ascospores** hyaline, ellipsoid, symmetric or occasionally slightly attenuated below, with subacute apices, 3-septate when mature, not constricted at the septa, (12–)15–20(–28) \times

(4–)4.5–5.5(–6.5) μm , l/b = (2.4–)2.9–3.9(–4.7) ($n = 114$), smooth-walled, non-halonate, guttulate, overlapping uni- or biseriate in the ascus. **Conidiomata** not observed.

Distribution and hosts. Found in two localities in northern and southern Siberia within arctic tundra and southern taiga forest biomes. The species grows on healthy-looking tomentose stems or occasionally on phyllocladia of *Stereocaulon glareosum* and *S. rivulorum*. Pathogenicity not observed.

Additional specimen examined: **RUSSIA:** Siberia, Taimyr Pen., Dikson Island, 73°30' N, 80°20' E, alt. 30 m, stony tundra, on *Stereocaulon rivulorum* (stems), 7 Jul 1990, M. Zhurbenko 90903a (LE 233 719a).

Discussion

With respect to genera containing lichenicolous species, *Biazrovia* is comparable to the ostropalean genera *Odontotrema* Nyl., *Paraethariicola* Calat., Etayo & Diederich, and *Spirographa*, and the helotialean genera *Llimoniella* Hafellner & Nav.-Ros., *Rhymbocarpus* Zopf, *Skyttea* Sherwood, D. Hawksw. & Coppins, and *Unguiculariopsis* Rehm (Sherwood-Pike 1987; Zhuang 1988; Holien & Triebel 1996; Diederich & Etayo 2000; Calatayud et al. 2001; Diederich et al. 2002, 2010; Diederich 2004; Flakus & Kukwa 2012). The genus *Odontotrema* differs from *Biazrovia* by its often radially fissured ascomata of cleistohymenial nature, usually present well-developed periphysoids, a I+ finally red hymenium, and asci with a distinct ocular chamber. *Paraethariicola* shares the above mentioned features with *Odontotrema* and additionally differs from the new genus by the presence of excipular hairs and curved ascospores. *Spirographa* is distinguished from *Biazrovia* by its black or dark brown ascomata of cleistohymenial nature, a dark yellow granulose layer covering the hymenium, polyspored asci with an apically only slightly thickened wall, and acicular, usually curved ascospores. It is noteworthy that many species currently placed in *Odontotremataceae* have periphysoids, which are absent in *Biazrovia*, but according to Diederich (2004) this character is non-diagnostic for the family. The genus *Llimoniella* is distinguished from *Biazrovia* by its dark brown to blackish, non-urceolate apothecia, apically indistinctly swollen paraphyses, and usually hardly thickened apical ascal wall. *Rhymbocarpus* differs from the new genus in its black ascomata, the presence of excipular hairs in some species, a greenish, K+ olivaceous epihymenium, apically slightly swollen paraphyses, and apically not or slightly thickened ascal wall. *Skyttea* has dark-coloured ascomata, permanent excipular hairs, apically not or poorly swollen paraphyses, and asci with a small, but distinct ocular chamber. Most species of *Unguiculariopsis* are characterized by an exciple covered by hook-shaped hairs with a swollen base. However, some lichenicolous species of the genus do not have such hairs, and some of them, for instance *U. acrocordiae* (Diederich) Diederich & Etayo (Diederich & Etayo 2000), have apically thickened asci similar to those observed in *Biazrovia stereocaulicola*. Amongst the non-lichenicolous genera, *Biazrovia stereocaulicola* seems to be most similar morphologically to the monotypic genus *Paschelkiella* Sherwood currently placed in *Odontotremataceae* (Sherwood-Pike 1987). *Paschelkiella pini* is a saprotroph on decorticated wood and differs from the new species in its ecology, inclusion of host tissue in the exciple, diffusely I+ blue asci, non-capitate paraphyses, and cylindrical 1-septate

ascospores. It is notable that ascomata of *Paschelkiella* are not typical for *Odontotremataceae*, where they are mostly black, with at least partly carbonized exciple and radially striate/dentate opening. Until the new species is subjected to molecular phylogenetic analysis we suggest that it should be placed in the *Ostropales*.

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