Agonimia borysthenica, a new lichen species (*Verrucariales*) from Ukraine

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Abstract: The lichen *Agonimia borysthenica* is described as new. It is known only from the Dnieper river basin in Ukraine where it was found growing on bark of *Quercus robur* and *Fraxinus excelsior*.

Zusammenfassung: Die Flechte *Agonimia borysthenica* wird neu beschrieben. Sie ist bislang nur aus dem Tal des Flusses Dnieper in der Ukraine bekannt, wo sie auf Borke von *Quercus robur* und *Fraxinus excelsior* gefunden wurde.

Agonimia ZAHLBR. is a Verrucariacean genus similar to *Polyblastia* A. MASSAL. and differs from the latter by the 2- or 3-layered exciple, the lack of an involucrellum and consistently colourless ascospores. The thallus consists of aggregations of goniocysts or small squamules, the cortical cells of which are papillate in most species (ORANGE & PURVIS 2009). *Psoroglaena* MÜLL. ARG. is similar to *Agonimia* in having 3-layered perithecial walls and a papillate cortex but differs in having pale perithecia and less elaborated thalli. Both genera form two clades in gene sequence analyses (MUGGIA & al. 2010).

Ten species are currently assigned to *Agonimia*, including *Agonimiella* H. HARADA, but excluding *Flakea* O. E. ERIKSS. (MUGGIA & al. 2009).

During the study of the lichen flora of Dnieper river basin by the first author a new species was discovered which is described here:

***Agonimia borysthenica* L. V. DYMYTROVA, O. BREUSS & S. Y. KONDR., spec. nova** (Fig. 1)
MycoBank MB 563434

Agonimia allobata affinis sed granulis thalli cinerescentibus, discretis, subglobosis ad leviter elongatis et ascosporis majoribus differt.

Typus: Ukraine, Kyiv region, ca. 15 km S of Kyiv-city, 'Golosiivskyi' national nature park, 'Lisnyky' botanical reserve, Dnieper river basin, broad leaved forest with maple, oak and ash trees, over mosses and on bark of old *Quercus robur* L., 50° 17.483' N, 30° 33.246' E, 91 m s. m., plot no. 074, 11. 4. 2010, leg. L. V. DYMYTROVA (KW – holotype, W – isotype).

Additional material examined: Ukraine, Kyiv region, ca. 15 km S of Kyiv-city, 'Golosiivskyi' national nature park, 'Lisnyky' botanical reserve, Dnieper river basin, broad leaved forest with maple, oak and ash trees, on bark of *Fraxinus excelsior* L., 50° 17′ 33.9′′ N 30° 33′ 18.7′′ E, 102 m s. m., plot no. A5, 07. 10. 2010, leg. L. V. DYMYTROVA & S. Y. KONDRATYUK (KW).

Characters:

Thallus rather thick, granular, greenish grey to dark grey. Thalline goniocysts convex, rounded to vertically elongate, swollen, distinctly discrete or partly confluent in a granular crust, (55-)60-75(-90) µm in diam. Cortical cells of goniocysts 5-10 µm, often with a small papilla. Photobiont chlorococcoid.

Perithecia very small, 0.17-0.22(-0.25) mm in diam., black, matt, smooth throughout, ovoid or pyriform, with a short smooth neck and a pale top, sessile to 1/3 immersed. Perithecial wall distinctly 2-layered, the outer layer dark brown, 11-30 µm thick, the inner pale to colourless, 12-60 µm thick. Filaments in perithecia (empty asci?) K/I + distinctly blue. Hymenial gel I + blue. Asci (?4-)8-spored[1], 130-140 × 40-60 µm, with minutely granular matrix. Ascospores muriform, colourless, ellipsoid, (33-)40-55(-75) × (15-)18-24 µm.

Ecology: The new species has been found growing on mosses and mossy bark of old trees, especially *Quercus* and *Fraxinus*, in sheltered habitats in old woodlands, together with *Verrucaria viridigrana* BREUSS, *Dimerella pineti* (SCHRAD. ex ACH.) VĚZDA, *Bacidia rubella* (HOFFM.) A. MASSAL., *B. subincompta* (NYL.) ARNOLD, and *Bactrospora dryina* (ACH.) A. MASSAL. It should be mentioned that the locality cited is rather abundant of 'montane' species (term after OXNER 1974 and MAKAREVICH & al. 1982), e. g. *Dimerella pineti* and *Verrucaria viridigrana* as well as montane aerophytic algae *Trentepohlia* (VOITSEKHOVYCH, pers. comm.).

Etymology: The epithet refers to the old Greek name Borysthenes (Βορυσθένης) of the river Dnieper.

Distribution: So far known only from type locality, situated in the plain part of Ukraine, Eastern Europe, where it is rather abundant.

Taxonomical notes: Eight-spored asci are characteristic of *A. allobata* (STIZENB.) P. JAMES, *A. octospora* COPPINS & P. JAMES, and *A. repleta* CZARNOTA & COPPINS. *Agonimia allobata* is distinguished from *A. borysthenica* by narrower and smaller ascospores (30-35 × 10-15 µm vs. 40-55 × 18-24 µm in *A. borysthenica*) and a continuous, roughened to granular thallus. *Agonimia octospora* differs in having larger perithecia (0.46-0.80 mm in diam. vs. 0.17-0.25 mm diam. in *A. borysthenica*) and a squamulose thallus composed of terete or slightly flattened, mostly scattered squamules. *Agonimia repleta* is characterized by perithecia with a well-defined, roughened,

[1] Only asci with young ascospores (25-30 × 10-12 µm) were observed, while groups of discharged spores in different numbers were usually observed.

vertically furrowed neck and an absence of pale ostiolar region, and it has also much smaller ascospores (20-45 × 12-20 µm vs. 40-75 × 18-24 µm in *A. borysthenica*).

Further two species with eight-spored asci, *A. gelatinosa* (ACH.) M. BRAND & DIEDERICH and *A. globulifera* M. BRAND & DIEDERICH, are ecologically different in that they grow over mosses on soil or rocks in calcareous habitats. Furthermore, *A. globulifera* is distinguished from *A. borysthenica* by the presence of black, glossy, sterile globules and finger-like thallus lobes. *Agonimia gelatinosa* differs in having rounded goniocysts without papillae and smaller ascospores (31-41 × 15-20 µm vs. 40-55 × 15-24 µm in *A. borysthenica*).

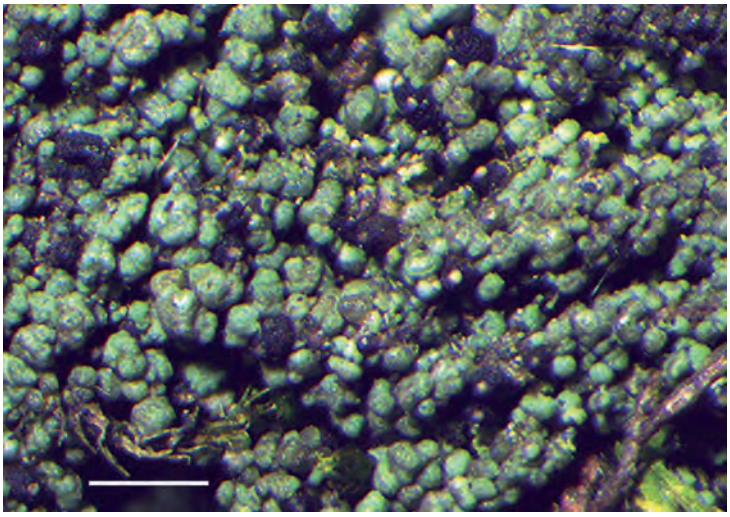

Fig. 1. *Agonimia borysthenica,* thallus with perithecia. Part of holotype specimen. Bar: 1 mm. – Phot. Y. SMILIANETS.

Morphologically, *Agonimia borysthenica* is very similar to *A. vouauxii* (DE LESD.) M. BRAND & DIEDERICH, which differs in having 2-spored asci and a granulose to squamulose, greenish to brownish thallus with much larger squamules (60-200 µm vs. 55-90 µm in diam. in *A. borysthenica*). Furthermore, *A. vouauxii* is a mainly terricolous lichen which grows in open habitats on soil, lichens or mosses.

Corticolous, sterile samples of *Agonimia tristicula* (NYL.) ZAHLBR., which usually grows on calcareous soil or on lichens and mosses on calcareous rocks, differ in having distinctly flattened squamules. Fertile specimens are readily separated by their plicate-rugose perithecia, 2-spored asci and much larger ascospores (57-120 µm vs. 40-55 µm length in *A. borysthenica*).

Specimens examined: ***Agonimia repleta*****: Ukraine:** Zakarpatska (Transkarpathian) oblast, Tiachiv district, vicinity of village Shyrokyi Luh; Carpathian biosphere reserve, Shyrokoluhanskyi massif, beech forest, on mossy bark of *Fagus sylvatica* L., 48° 21′ 12.1′′ N 23° 46′ 01.3′′ E, 1207 m s. m., plot no. 64, 11. 08. 2010, leg. O. NADYEINA & O. ORDYNETS, det. L. V. DYMYTROVA (KW); -, on mossy bark of *Fagus sylvatica* L., 48° 20′ 25.4′′ N 23° 46′ 20.3′′ E, 905 m s. m., plot no. 98, 16. 08. 2010, leg. O. NADYEINA & O. ORDYNETS, det. L. V. DYMYTROVA (KW).

Agonimia allobata**: Ukraine:** Ivano-Frankivsk oblast, Kosiv district, 'Hutzulshchyna' national nature park, beech forest, 1040 m s. m., on bark of *Fagus sylvatica*, plot no. 20814, 2008, leg. S. Y. KONDRATYUK & L. M. DERZHYPILSKY (KW).

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