

Phylogenetic Status of *Arthonia phaeophysciae* (*Arthoniaceae*, *Ascomycota*), a Species New to Japan

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Summary: The lichenicolous fungus *Arthonia phaeophysciae* Grube & Matzer (*Arthoniaceae*, *Ascomycota*), growing on *Physciella melanchra* and *Phaeophyscia* sp., is newly reported from Central Honshu in Japan. Additional localities are reported for Korea. This study demonstrates the phylogenetic position of the species in the *Bryostigma*-clade of *Arthoniaceae* and confirms the identity of this research's recent collections from Japan and Korea using Bayesian and RAXML analyses of mtSSU, nrLSU and *RPB2* sequence data. A detailed description of the species based on collections from Japan and Korea is provided.

Key words: Asia, distribution, lichen, lichenicolous fungus, mtSSU, nrLSU, phylogeny, *RPB2*, taxonomy.

Over 130 lichenicolous species are known for the heterogeneous, primarily lichenized genus *Arthonia* (Frisch et al. 2014, Frisch and Holien 2018, Frisch et al. 2018, Lawrey and Diederich 2018). About 40 to 50 of these are estimated to fall in the *Bryostigma*-clade, a distinct phylogenetic lineage within the *Arthoniaceae* that mainly includes lichenicolous taxa in addition to lichenized species with green coccal photobionts (Frisch et al. 2014, Frisch and Holien 2018). Despite its rich biota of lichenized and lichenicolous fungi (Ohmura and Kashiwadani 2018), only six lichenicolous

Arthonia are currently reported for Japan, namely *A. almquistii* Vain. (Zhurbenko et al. 2015), *A. biatoricola* Ihlen & Owe-Larss. (Frisch et al. 2014), *A. graphidicola* Coppins (Frisch et al. 2014), *A. lopingensis* Zahlbr. (Frisch et al. 2018), *A. molendoi* (Heufl. ex Frauenf.) R. Sant. (Tadome et al. 2018), and the informally described *A. lobariicola* (Frisch et al. 2014).

In this paper, an additional lichenicolous *Arthonia* species, *A. phaeophysciae* Grube & Matzer, is reported as new to Japan. Its phylogenetic position in *Arthoniaceae* is shown and a detailed description for the species based

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small subunit ribosomal DNA of lichen-forming ascomycetes. *Lichenologist* **31**: 511–516.

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日本新産の *Arthonia phaeophysciae* (ヤブレヤドリホシゴケ) (ホシゴケ科, 子囊菌門) の系統上の位置

地衣生菌の一種ホシゴケ科 *Arthonia phaeophysciae* (ヤブレヤドリホシゴケ, 新称) が, 関東地方 (茨城県, 栃木県, 東京都, 神奈川県) のケヤキ樹皮上の *Physciella melanchra* (コナロゼットチイ) およびカバノキ属樹皮上の *Phaeophyscia* sp. (クロムカデゴケ属の一種) の上から確認されたので, 日本新産種として報告する. また, 韓国から新たに採集された標本情報についても示した. *A. phaeophysciae* の子嚢果は黒色, 大きさは 0.2–0.6 mm. 子嚢層表面は褐色で K+ で深緑色. 子嚢層は厚さ 35 μm まで, インスパースせず透明から薄茶色, K+ 淡灰色, I+ 赤色, K/I+ 青色, 側糸は分枝し脈状に連絡する. 子嚢は棍棒状, 25–30 \times 13–18 μm ,

中に胞子 8 個. 子嚢胞子は透明, 2 室, 卵形, 大きさは (10.5–)11.4–13.6(–14.0) \times (3.5–)4.0–4.6(–5.0) μm であった. 日本および韓国産標本から抽出された DNA より mtSSU, nrLSU, *RPB2* 領域を増幅し, それらの塩基配列による分子系統解析を行い, 本種の単系統性およびホシゴケ科の *Bryostigma* クレードに所属することを確認した.

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