ISSN 1062-3590, Biology Bulletin, 2024. © Pleiades Publishing, Inc., 2024.

BOTANY

New Lichenicolous *Phyllopsora* (Ramalinaceae) Species on *Phaeophyscia* from India

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Received October 27, 2023; revised November 28, 2023; accepted November 30, 2023

Abstract—*Phyllopsora phaeophysciae* sp. nov., having a lichenicolous habitat is growing on thallus of lichen *Phaeophyscia* and distinguished by white prothallus, globose to cylindrical isidia and thallus containing atranorin. Based on the previously published literature, *Phylloposra* species mostly reported to grow on bark, rock, soil and sometimes in association of mosses, however the new taxa is exhibit a unique lichenicolous habitat, luxuriantly growing on *Phaeophyscia hispidula* species in temperate region the country. In India, this is the first *Phyllopsora* species which is growing on Physciaceae family member.

Keywords: squamulose, taxonomy, new species, Western Himalaya

DOI: 10.1134/S1062359023605657

INTRODUCTION

The lichen genus *Phyllopsora* Müll. Arg., is characterized by a crustose to squamulose thallus, whitish to brown black prothallus, isidiate or sorediate, biatorine apothecia, 8-spored asci, hyaline, simple to fusiform ascospores. Generally, the *Phyllopsora* species found growing on bark of trees in moist tropical and temperate regions in India (Mishra et al., 2011). Swinscow and Krog (1981) revised the genus from East Africa and reported 11 species. Timdal and Krog (2001) also studied the specimens from East Africa and reported several interesting species. Kistenich et al. (2018) reported three new combinations of *Phyllopsora* which was previously reported under the genus *Krogia* from Asia. Kistenich et al. (2019) studied molecular phylogeny of *Phyllopsora* species and reported three new species from Malaysia, Thailand and Africa. Similarly, in India the genus was revised by Upreti et al. (2002) enumerated five species from India, while Mishra et al. (2011) described three new taxa viz. *P. catervisorediata* G.K. Mishra, Upreti and Nayaka, *P. himalayensis* G.K. Mishra, Upreti and Nayaka, *P. corallina* var. *subglaucella* G.K. Mishra, Upreti and Nayaka, and ten new records of the genus for the country.

During the ongoing re-examination of specimens housed at LWG herbarium, Lucknow, the authors found several interesting specimens having lichenicolous fungi on different species of genus *Phaeophyscia*. Hitherto only three lichenicolous fungi species viz. *Arthonia phaeophysciae* Grube and Matze, *Opegrapha phaeophysciae* R. Sant., Diederich, Ertz and Christnach, and *Stigmidium pumilum* (Lettau) Matzer and Hafellner, are reported on the genus *Phaeophyscia* from India (Joshi et al., 2016). The new species *Phyllopsora phaeophysciae* is recognised as lichenicolous habitat and described here in detail.

MATERIALS AND METHODS

The present study is based on *Phaeophyscia* specimens preserved at LWG herbarium, CSIR-National Botanical Research Institute, Lucknow. The specimen was examined morphologically, anatomically and chemically. The morphological examination was done under stereo zoom microscope (Leica S8APO) and anatomy was done by thin hand cut sections observed under compound microscope (Leica DM500). For chemical study, spot tests were performed using usual reagents of K, C, and P. For K test 10% KOH solution, for C test calcium hypochlorite and for P test paraphenylenediamine were used. The thin layer chromatography (TLC) was performed in solvent system A (Toluene : 1,4-dioxane : acetic acid: 180 : 60 : 8 mL), following the technique of Orange et al. (2001). For the identification of specimen was used following literatures Awasthi (2007), Timdal and Krog (2001) and Mishra et al. (2011). The identified specimen is preserved in LWG herbarium.

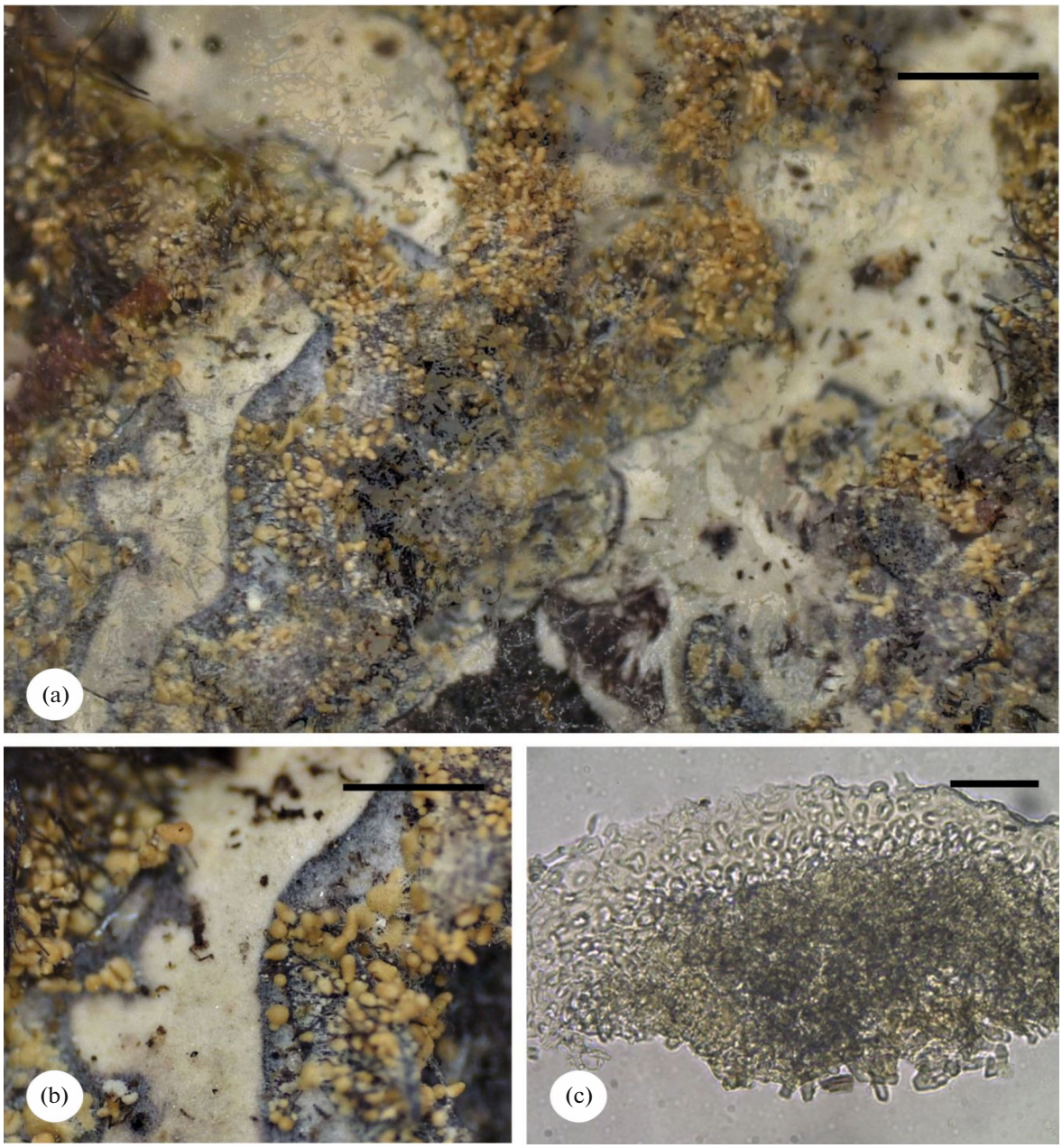

Fig. 1. *Phyllopsora phaeophysciae*: (a) habitat of lichenicolous lichen, (b) isidia and white prothallus, (c) cross section of the thallus. Scale: (a–b) = 2 mm and (c) = 20 μm.

RESULTS

Taxonomy

***Phyllopsora phaeophysciae* P. Maurya, G.K. Mishra & D.K. Upreti sp. nov. (Figs. 1a–c)**

Mycobank: 850673.

Diagnosis: The new species differs from *P. corallina* var. *subglaucella* G.K. Mishra, Upreti and Nayaka by its lichenicolous habitat, growing on *Phaeophyscia hispidula* (Ach.) Essl., with white prothallus and globose to cylindrical isidia.

Type: INDIA: Uttarakhand, Pithoragarh district, Gori–Ganga Catchment, Thakala forest, alt. 1800 m, on *P. hispidula*, September 29, 2002, Vikas Pant 02–000666 (Holotype; LWG).

Description. Thallus: lichenicolous, squamulose, closely adnate on host lobes, rounded somewhat slightly elongate, 0.2–0.6 mm wide. **Prothallus:** white. **Upper surface:** glabrous, pale greenish to yellow, plane to convex, pruina lacking and isidate. **Isidia:** globose to cylindrical, thick. **Photobiont:** green alga. **Cortex:** type 1–2. **Medulla:** with crystals

that dissolving in K. **Apothecia** and **pycnidia** not seen in Indian material.

Chemistry: Thallus K+ yellow, C–, P–; atranorin present in TLC.

Etymology: The name of the species is based on the host *Phaeophyscia* on which it grows.

Distribution and ecology: The new species have a lichenicolous habitat growing on *Phaeophyscia hispidula* at altitude of 1800 m in Indian Western Himalaya region. The host lichen species of the new taxon grows luxuriantly in Indian temperate region of Himalayas.

Remarks: The new species is characterized by a lichenicolous habit growing on lichen species *Phaeophyscia hispidula*, with white prothallus, globose to cylindrical isidia and presence of atranorin in thallus. *P. phaeophysciae* showed close resemble with *P. corallina* var. *subglaucella*, in having 1–2 type cortex and thallus containing atranorin but the latter species differs in corticolous (on bark) habitat, presence of apothecia and pycnidia (Mishra et al., 2011). The new species also showed close resemblance with *P. furfuraceaea* (Pers.) Zahlbr., in having similar isidia and white prothallus but *P. phaeophysciae* differ in 1–2 type cortex and having atranorin in thallus. While, *P. isidiotyla* (Vain.) Riddle is similar to *P. phaeophysciae* in having greenish yellow upper side and thallus containing atranorin but new taxa differs in white prothallus and unbranched isidia (Timdal and Krog, 2001).

ACKNOWLEDGMENTS

The authors are thankful to the Director of the CSIR-National Botanical Research Institute, Lucknow for providing laboratory facilities under in house project OLP0114. The authors are also thankful to V. Pant for submitting his samples in LWG Herbarium of CSIR—National Botanical Research Institute, Lucknow. We are thankful to ethical committee, CSIR-NBRI, for evaluating the manuscript and providing number is CSIR-NBRI-MS/2023/11/10.

FUNDING

Author GKM is thankful to SERB, New Delhi for financial support under the fellowship SIR/2022/00161. First author (PM) thanks University Grant Commission, New Delhi for providing financial assistance in the form of Senior Research Fellowship (SRF).

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

This work does not contain any studies involving human and animal subjects.

CONFLICT OF INTEREST

The authors of this work declare that they have no conflicts of interest.

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