Opegrapha trilocularis Müll. Arg. (lichenized Ascomycota), a lichen species new to India
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ABSTRACT

Opegrapha trilocularis Müll. Arg. (Roccellaceae) is reported as a new record for Indian lichen flora from Uttarakhand, Western Himalaya of India. The species is characterized by its black, sessile lirellate ascomata and transversely 2-septate ascospores. A detailed taxonomic description with illustrations is provided to facilitate its easy identification of the species.

KEYWORDS
Opegrapha trilocularis, Roccellaceae, New record, Garhwal Himalaya

Introduction

Opegrapha Ach., a genus of family Roccellaceae (Lumbsch & Huhndorf, 2010), and large cosmopolitan genus comprises c. 300 species with both lichenized and lichenicolous species (Kirk et al. 2008) world-wide. In India, the genus is represented by 35 species includes two lichenicolous species (Joseph & Sinha, 2015). The genus is characterized by its a crustose, ecorticate thalli, elongate to rounded lirellate ascomata, laterally to completely carbonized exciple, branched and anastomosing paraphysoids, 8-spored asci and transversely septate to muriform, non amyloid ascospores (Ertz, 2009). During intensive fieldwork in the Garhwal Himalaya by the author within the “Flora of India project”, an interesting species Opegrapha from Garhwal Himalaya of Uttarakhand, India was collected. After thorough consultation of literature, protologue and on critical studies, it has been confirmed as Opegrapha trilocularis Müll. Arg. It is an interesting addition to the lichen flora of India and detailed taxonomic description with illustrations and its general distribution are provided herewith for easy identification of the taxon.

Material and Methods

Specimens were collected in March 2015 from Garhwal Himalaya of Uttarakhand, deposited in Botanical Survey of India, Allahabad herbarium of the Lichen (BSA). Morphological characters of thallus, reproductive structures, colour, size and shapes were examined under stereomicroscope (Nikon SMZ 1500). Thin hand-cut sections of thalli and ascomata were mounted in water and 5% KOH and examined. All anatomical measurements were made in water mounts and examined under a compound microscope (Nikon Eclipse 50i). Ascospores were stained with Lugol’s solution to check the amyloid reaction and measured in water. Secondary metabolites were identified by thin-layer chromatography (TLC) following standard procedures (Orange et al. 2001)

Taxonomic description

Opegrapha trilocularis Müll. Arg., Bull. Herb. Boissier 1: 132. 1893. (Fig. 1 A-C).

Thallus crustose, corticolous, 5-10 cm across, thin to inconspicuous or endophloedal, 20-30 µm thick, greyish-green, turning brown in herbarium; photobiont trentepohlioid; prothallus indistinct.

Ascomata lirellate, numerous, short, scattered, sessile, mostly simple or bifurcate, scattered evenly over the thallus, 0.3–0.6 (–0.8) mm long, 0.1–0.3 (–0.4) mm broad; disc generally slit-like at first and mostly gaping to broadly exposed later black, epurinose; excipulum carbonized, continuous below the subhymenium and raised above disc, 25–50 µm laterally, 25-45 µm at base; subhymenium brown, 8-10 µm thick; hymenium hyaline, not inspersed, 46–60 µm, I+ red, KI+ blue; paraphysoids branched and anastomosing, c. 1.5 µm thick; subhymenium hyaline, 8–12 µm high, I+ pale red, KI+ blue; asci of Opegrapha-type, clavate with an apical K+/+ blue-ring, 8-spored, 37–41 × 10.5–14 µm; ascospores hyaline, oblong, transversely 2-septate, septation starts with submedian septum, (12–) 15–25 µm x (3.5–) 4–5.0 µm, I–. Pycnidia not observed.

Chemistry: Thallus K–, C–, KC–, Pd–, UV–. TLC: no lichen substances detected.

Remarks: This species is characterized by its thin to endophloedal thallus; short, sessile lirellae; non inspersed hymenium; 8-spored asci; transversely 2-septate (12–) 15–18 µm long ascospores and absence of lichen substances. It closely resembles O. confertula Nyl., in transversely 2-septate ascospores but later species differs by its punctiform to lirelliform or stellate ascomata and slightly smaller ascospores (13-15 µm long, fide Ertz 2009).

Ecology: The locality is characterized by subtropical rainforest with high humidity, at an elevation of 1900-2000 m. The species has been collected from the bark of Cedrus

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Figure 1. Opegrapha trilocularis. A. Habit, B. Asci with eight ascospores, C. Ascospores. Scales A= 1 mm and B & C= 10 µm.
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Figure 2. Distribution of Opegrapha trilocularis (red circles) in the world.

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dara trees in old-growth coniferous forests. The crown structure of the trees provided a relatively shady, stable, protected microhabitat.

Distribution: Previously, it was reported from Brazil, Gabon, Indonesia, Papua New Guinea, the Philippines, New Caledonia, Rwanda, Zambia (Fig. 2).

Specimens examined: India, Uttarakhand, Garhwal Himalaya, Pauri district, Nagdev forest, alt. 1900 m, 30° 8’ 30” N, 78° 46’ 25” E; on bark of Cedrus deodara, 11.03.2015, Pushpi Singh 9840, 9841, 9842, 9843, 9844, 9849 (BSA).

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References


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