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A new species of *Chrysothrix* (*Arthoniales*: *Arthoniaceae*) from India

T. A. M. JAGADEESH RAM, G. P. SINHA, Robert LÜCKING, and H. Thorsten LUMBSCH

Abstract: A new species, *Chrysothrix septemseptata*, is described from India. It is characterized by 7-septate ascospores, which is unique within the genus. It is currently known only from the Sundarbans Biosphere Reserve, where it grows in mangrove plantations.

Key words: *Arthoniales*, India, Sundarbans, taxonomy

Introduction

The genus *Chrysothrix* includes mostly leprose lichens with a yellowish thallus or apothecia owing to the presence of pulvinic acid derivatives. The genus was originally regarded as monospecific, with the single species *C. noli-tangere*, a common lichen in fog deserts of the Pacific coast of South America, where it grows on spines of cacti. Laundon (1981) enlarged the generic concept and included all taxa with pulvinic acid derivatives that were formerly placed in *Crocynia* and *Lepraria* and combined three additional species into *Chrysothrix*. With the description of further new species and acceptance of other taxa (Thor 1988; Tønsberg 1994; Kalb 2001), about ten species are currently known in the genus.

The first author is working on an inventory of lichens growing in the Sundarbans Biosphere Reserve (West Bengal, India). The biosphere reserve is situated in the delta of the Ganges and Brahmaputra rivers and covers an area of 9630 sq km. It lies between 21°31′N and 22°41′N latitude and 88°10′E and 89°51′E longitude in the north and south 24-Parganas districts. Among collections from this area, a *Chrysothrix* species was found that differs from all currently known species in having 7-septate ascospores, while the other species usually have 3-septate (rarely only 1–2 septate) ascospores. The new species is described below.

T. A. M. Jaagadeesh Ram and G. P. Sinha: Botanical Survey of India, Central Circle, Allahabad – 211002, India.
R. Lücking and H. T Lumbsch: Department of Botany, The Field Museum, 1400 S. Lake Shore Drive, Chicago, IL 60605, USA.

Materials and Methods

Specimens are deposited in the herbaria ASSAM and F. Hand-cut sections of thalli and apothecia were examined in water. The chemical constituents were identified using thin layer chromatography (TLC) (Lumbsch 2002).

The Species

Chrysothrix septemseptata Jagadeesh Ram, Lumbsch, Lücking et Sinha sp. nov.

Thallus crustaceus, leprosus, flavus. Apothecia sessilia, orbicularia, flave pruinosa. Excipulum et hypothecium debiliter evolutum. Hymenium hyalinum, 50–60 µm altum. Epithecium 10–15 µm altum, granulosum. Asci late clavati, 30–40 × 10–12 µm, octospori. Ascosporae anguste obovoidae vel ellipsoidae, hyalinae, (5–)7-septatae, (16–)18–22(–23) × (3–)3·5–5·0(–5·5) µm. Pycnidia ignota. Acidum vulpinicum et calycinum continens.

Typus: India, West Bengal, Sundarbans Biosphere Reserve, Bakkhali, *c.* 150 km south of Kolkata, near

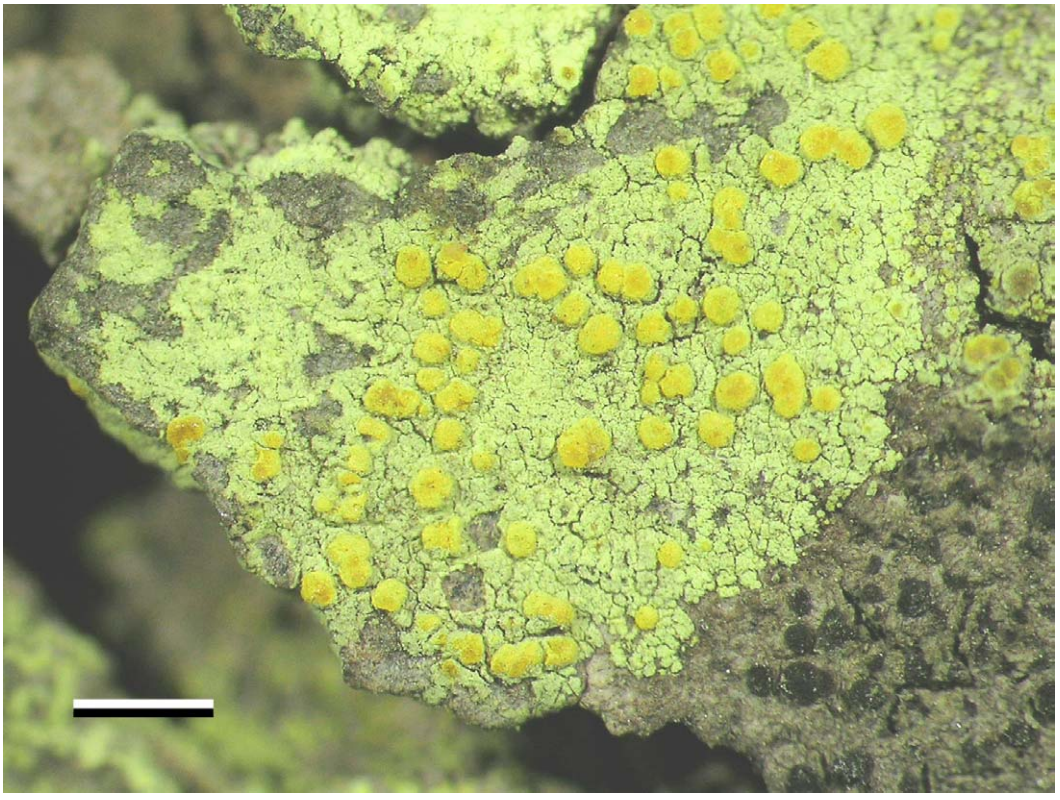

FIG. 1. *Chrysothrix septemseptata*, habit (holotype). Scale bar: 1 mm.

forest range office and Bay of Bengal, 0 m, on *Tamarix gallica*, 23 December 2001, *G. P. Sinha & T. A. M. Jagadeesh Ram* 11479 (ASSAM—holotypus, F—isotypus).

(Fig. 1)

Thallus 0·5–2·5 cm diam., patches partly confluent, crustose, leprose, tightly attached to the substratum, thin, lemon yellow, epruinose, margin indistinct, cortex absent; granules round, covering the thallus surface; walls of mycobiont hyphae encrusted with crystals; photobiont a unicellular green alga, cells sometimes aggregated, *c*. 10–20 µm diam.; prothallus not visible.

Apothecia sessile, solitary, round, yellowish pruinose, 0·2–0·8 mm diam.; discs orange-brown to yellowish brown, plane to convex; margins thin, poorly developed and evanescent, concolorous with thallus. *Excipulum* poorly developed, of anastomosing hyphae, interspersed with crystals, hyaline. *Hypothecium* hyaline to yellowish, poorly developed. *Hymenium* hyaline, clear, 50–60 µm high, I+ and KI+ red; epithecium hyaline, forming a distinct zone of anastomosing paraphysoidal apices, granular, 10–15 µm thick, granules adhering to the paraphysoidal tips. *Paraphysoids* richly branched and anastomosing, *c*. 1 µm diam., septate, hyaline. *Asci* bitunicate, broadly clavate, with KI+ apical ring structure, 30–40 × 10–12 µm, 8-spored. *Ascospores* narrowly obovoid to ellipsoid, straight or slightly curved, hyaline, (5–)7-septate, often slightly constricted at the middle septum, (16–)18–22(–23) × (3–)3·5–5·0(–5·5) µm.

Pycnidia not seen.

Chemistry. Thallus and apothecia K − , C − , KC − , PD − , containing vulpinic acid (major) and calycin (minor).

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Etymology. The specific epithet refers to the characteristic 7-septate ascospores.

Notes. *Chrysothrix septemseptata* is characterized by a yellow leprose thallus, abundant apothecia and 7-septate ascospores. If fertile, it cannot be confused with any other *Chrysothrix* species, which all have only up to three septa. *Chrysothrix septemseptata* may be mistaken for a *Caloplaca* or *Candelariella* species, but is readily distinguished by the broadly clavate, bitunicate asci and richly branched and anastomosing paraphysoids. In the sterile state, however, the species may have been overlooked, and based on thalline characters alone it is very difficult to distinguish from other *Chrysothrix* species.

At present the new species is known only from Sundarbans Biosphere Reserve, where it grows on the bark of mangrove trees such as *Brugruiera gymnorhiza*, *Heritiera fomes*, *Sonneratia apetala*, *Tamarix gallica* and the non-mangrove tree *Casuarina equisetifolia* in mangrove plantations at Bakkhali, Bhagabatpur and Jhilla villages. These villages are near the mangrove reserve and interestingly the new species was not found in natural reserve forests of the biosphere reserve. Associated species include *Anisomeridium* sp., *Arthonia* spp., *Buellia* sp., *Graphis* sp. and *Lecanora leprosa* Fée.

Additional specimens examined. **India:** *West Bengal*: Sundarbans Biosphere Reserve, alt. sea level, Bhagabatpur, near Crocodile Breeding Centre, on *Tamarix gallica*, 2002, *Jagadeesh* 12237 (ASSAM); Jhilla, near forest beat office, 2003, on *Casuarina equisetifolia*, *Jagadeesh* 13670 (ASSAM); *ibid.*, on *Sonneratia apetala*, *Jagadeesh* 13673 (ASSAM); *ibid.*, Bakkhali, on *Tamarix gallica*, 2003, *Jagadeesh* 13846 (ASSAM).

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