

Trimmatostroma commonii, a new lichenicolous hyphomycete inhabiting Graphidaceae hosts

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Abstract: The new lichenicolous hyphomycete *Trimmatostroma commonii* is described from Réunion, the USA (Florida) and Vietnam. It strongly resembles the generic type *T. salicis*, from which it is distinguished by much looser conidiomatal tufts, less septate conidia and the lichenicolous habitat, growing over species of Graphidaceae in the tropics.

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INTRODUCTION

The genus *Trimmatostroma* Corda includes hyphomycetes with simple, little differentiated conidiophores and conidigenous cells, and polymorphous conidia formed in basipetal chains; it includes c. 30 mostly bark-inhabiting, but also aquatic saprobic species, and additionally a number of lichen-inhabiting taxa. The type species *T. salicis* Corda, a bark-inhabiting saprobic microfungus, has pulvinate, sometimes confluent sporodochia, and conidiophores originating from a basal stroma (Ellis, 1971); it was included in a phylogenetic analysis and found to belong to the Mollisiaceae in the Helotiales (Hernández-Restrepo et al., 2017). Diederich et al. (2010) described four new *Trimmatostroma* species growing on lichens and presented a key to identify them, Zhurbenko & Brackel (2013) added one species, and Heuchert & Braun (2014) described two more, together with an updated key to seven lichenicolous species. Two additional species were eventually described by Brackel (2015) and Schiefelbein et al. (2017), resulting in eight obligately and one facultatively lichenicolous *Trimmatostroma* species accepted by Diederich et al. (2018). These nine taxa represent a heterogeneous assemblage of morphologically similar species of which at least some are almost surely not related to the generic type. Here we describe a further lichenicolous species

in *Trimmatostroma* that strongly resembles the generic type and might therefore be phylogenetically related to it. Unfortunately, no molecular data have ever been obtained from any of these lichenicolous species.

MATERIAL AND METHODS

The specimens examined are deposited in BR and LE, and in the private herbaria of P. Diederich and P. van den Boom. Dry herbarium specimens were examined and measured under a binocular microscope Leica MZ 7.5 (magnification up to $\times 50$), and photographed using a Canon 40D camera with a Nikon BD Plan 10 microscope objective, StackShot (Cognisys) and Helicon Focus (HeliconSoft) for increasing the depth of field. Small fragments or sections of conidiomata were studied in water, without or after a slight pressure on the cover glass, and in 5% KOH. The material from Vietnam was studied using a Stemi 2000-CS stereo microscope and a Zeiss Axio Imager A1 compound microscope equipped with Nomarski differential interference contrast optics.

Microscopic photographs were prepared using a Leica DMLB microscope, a Leica EC3 camera and Helicon Focus. Conidial measurements are

indicated as (min.–)X– σ_x –X+ σ_x (–max.), followed by the number of measurements (n). Chemical reactions were tested using 5% KOH (K).

RESULTS

TRIMMATOSTROMA COMMONII Diederich, Zhurb. & van den Boom sp. nov. (Fig. 1)

Mycobank number: MB835494

Diagnosis. Similar to *Trimmatostroma salicis*, but differs by the much looser conidiomatal tufts, the less septate conidia and the lichenicolous lifestyle.

Type. Réunion, W of Plaine des Palmistes, along the road to Forêt de Bébour, 21°08.50'S, 55°35.20'E, elev. 1220 m, *Cryptomeria japonica* forest, on *Phaeographis* (apothecia, thallus) and occasionally on adjacent bark, 26 May 2008, P. & B. van den Boom 39750 (BR – holotype, herb. Diederich, herb. van den Boom – isotypes).

Description. Colonies lichenicolous, over the thallus of corticolous Graphidaceae, black, caespitose or in erect tufts, mostly 100–400 μm diam., conidiophores rather dense, visible at a very high magnification ($\times 50$). Mycelium internal, hyphae branched, 2.5–5 μm wide, pale brown, septate, thin-walled, smooth, superficial hyphae not formed. Stromata rather reduced, composed of swollen hyphal cells, subglobose or slightly elongate, 4–8 μm diam., pale to medium brown, smooth, wall 0.5–1 μm thick. Conidiophores immersed to erumpent, micronematous or semi-macronematous, erect, ca. 20–40 \times 6–8 μm , hyphal filaments suddenly developing into fertile threads by becoming wider and darker, with a distinctly thicker wall, smooth or slightly rough, reduced to conidiogenous cells, or conidiogenous cells integrated, terminal, little differentiated, conidiogenous loci undifferentiated, subtruncate. Conidia in simple or rarely branched, irregular, easily disarticulating basipetal chains, straight or slightly curved, oblong, basally truncate, apically rounded or truncate, hila unthickened and not darkened, transversely (0–)1–pluriseptate, with septa occasionally oblique, (4.5–)5.1–6.7(–7.8) μm wide (n=114), 1-septate conidia (6.6–)7.5–10.3(–12) μm long (n=20), 2-septate (9.6–)10.5–12.7(–13.7) μm (n=20), 3-septate (11–)13.2–17.1(–21.3) μm (n=24), 4-septate (13.7–)15.1–19.0(–20.7) μm (n=20), 5-septate (10.5–)15.5–21.9(–23.2) μm

(n=20), 6-septate (19.7–)20.7–25.5(–27.7) μm (n=10), medium to dark brown, becoming dark violet brown to blackish in KOH, ends more or less rounded, wall 0.5–1 μm thick, smooth or slightly rough, septa 1–1.5 μm thick; some conidia apparently meristematic, producing secondary conidia at their ends, superficially resembling acropetal chains; conidia often enteroblastically proliferating (rejuvenation) with obvious sheath-like wall remnants visible as an irregular fringe.

Etymology. *Trimmatostroma commonii* is named after Ralph Common, an enthusiastic American lichenologist and a remarkable collector of lichenicolous fungi, who kindly sent us his recent Florida specimen of the new species and allowed us to describe it.

Distribution and hosts. The new species is currently known from Réunion (Mascarene Islands, Indian Ocean), Vietnam and the USA (Florida). It grows on corticolous Graphidaceae, including *Graphis* and *Phaeographis* species, not visibly damaging the hosts. The species has been observed growing on the thallus and apothecia of the hosts, on hypothallus lines, and on minuscule bark outgrowths within lichen thalli, sometimes not distinctly lichenicolous. We consider it as a poorly host-specific species that may also grow on the bark very close to infected thalli.

Notes. Microscopically, the new species strongly resembles the generic type, *Trimmatostroma salicis*; that species differs by much more compact and well delimited sporodochia, up to 13-septate conidia and by being non-lichenicolous, known exclusively from *Salix* twigs and branches (Ellis 1971, Crous et al. 2007). With the description of a new species, the genus *Trimmatostroma* now includes 10 lichenicolous species, of which nine are considered as obligately lichenicolous, and one as facultatively lichenicolous. Keys to lichenicolous species were given by Diederich et al. (2010) and Heuchert & Braun (2014). Most other lichenicolous species are distinguished by conidiophores not forming tufts, by ornamented conidia, or by a different reaction of the conidial pigment with KOH. *Trimmatostroma hierrense* Diederich & Ertz is distinguished by an unevenly thickened conidial wall. All these species also inhabit other host lichens belonging to the Arthoniales, Lecanorales, Pertusariales and Umbilicariales.

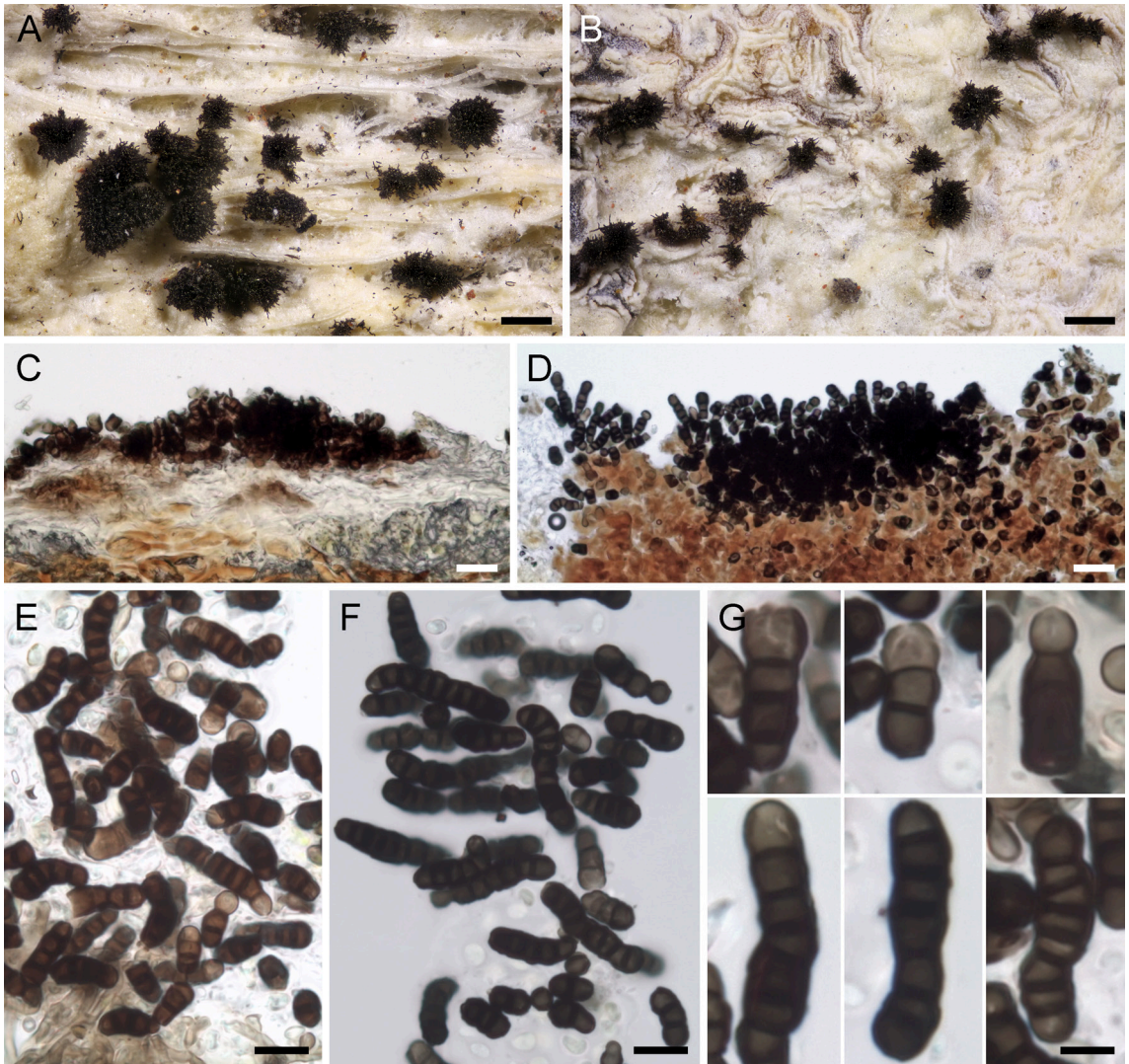


Fig. 1. *Trimmatostroma commonii* (all BR – holotype, except C: Common 10118B). A, B – colonies over thallus and apothecia of *Phaeographis*; C – section through young conidioma, in water; D – section through conidioma, in KOH; E – conidia, in water; F, G – conidia in KOH (scale bars: A, B = 200 μ m, C, D = 20 μ m, E, F = 10 μ m, G = 5 μ m).

Additional specimens examined. Vietnam: Northeast Region, Cao Bằng Province, Nguyễn Bình District, Phia Oắc-Phia Đén National Park, 4.8 km SW of Tinh Tuc village, 22°36'28"N, 105°51'59"E, elev. 1700 m, montane evergreen broad-leaved forest near road, on corticolous *Graphis* (thallus), 7.06.2019, L. V. Gagarina (LE 310090). USA: Florida, Hillsborough Co., near Morris Bridge Road, 28.115°N, 82.301°W, on *Phaeographis* (thallus) and occasionally on adjacent bark, 2016, R. Common 10118B (herb. Diederich).

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