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Record of a new host of the wood-rotting fungus *Hexagonia tenuis*

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Abstract

Basidiocarps of *Hexagonia tenuis* were found on a living plant of *Nerium odorum* in Burdwan, West Bengal, India. *Nerium odorum* (family Apocynaceae) is reported as a new host of *H. tenuis*. It is evident that basidiocarp development of *H. tenuis* is not affected by diameter of the wood of host plants.

Key words – *Hexagonia tenuis* – host – India – *Nerium odorum* – West Bengal

Introduction

During a survey of wood-rotting fungi, conducted in West Bengal, India during 2012–2017, basidiocarps of a species of *Hexagonia* Fr., causing white rot, were observed on wood of a living plant of *Nerium odorum* Sol. (= *Nerium indicum* Mill.) of family Apocynaceae. May (2017) suggested that minor variations in morphology between collections from different locations are sufficient to erect new species. So, these basidiocarps were studied morphologically to confirm the identification of the species.

Materials & Methods

Each basidiocarp was collected and placed in separate polythene bags. Thin sections from various parts of each basidiocarp were cut using sharp blades and put in 5% KOH solution. The sections were stained with cotton blue, teased apart with sharp needles and mounted in lactophenol. Microscopic observations were made using both 40× and 100× magnifications. A piece of each basidiocarp was attached onto the underside of a Petri dish lid and then the lid was inverted over the dish. The pores were situated over malt agar medium and after one or two hours spores were discharged onto the medium and germinated to form cultures. Oxidase tests were carried out with the cultures on media containing 1.5% Difco malt extract agar and 0.5% gallic acid and tannic acid, respectively, as described by Davidson et al. (1938). Basidiocarps were deposited in the Department of Microbiology, The University of Burdwan, West Bengal, India.

Results

The morphological and anatomical features of the fungus observed indicate that it is *Hexagonia tenuis* (Hook.) Fr. (Fig.1).

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Morphological characters of basidiocarps

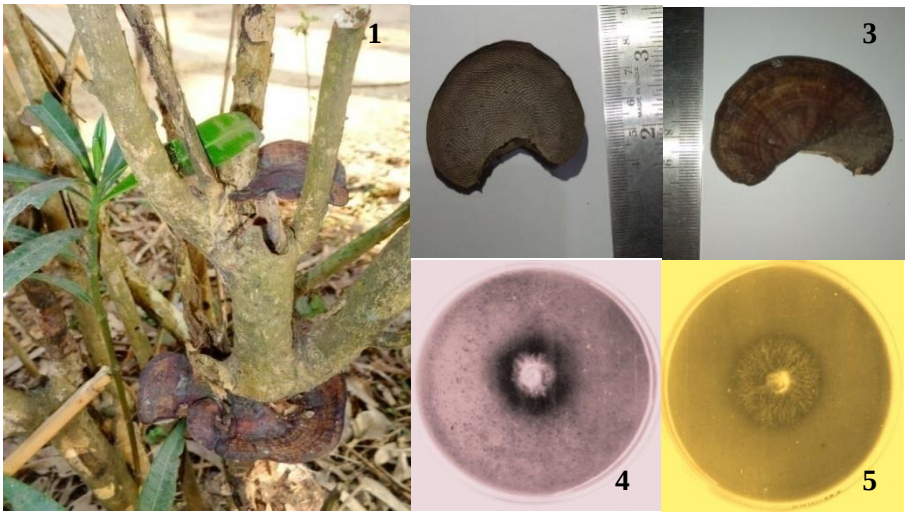
Basidiocarps solitary, sessile, dimidiate with narrow base, applanate to flabelliform, slightly concave, 4.0–12.0 × 3.0–8.0 × 0.2–0.3 cm, corky-coriaceous; upper surface (Fig. 3) pale brown to dark brown, some with greyish black colour at the centre, uneven, concentrically striate to zonate; margin entire and thin; hymenial surface (Fig. 2) greyish, pores hexagonal, 10–12 per cm.

Microscopic characters of basidiocarps

Hyphal system trimitic. Generative hyphae (Fig. 6a) hyaline, thin-walled, branched, clamped, 1.5–3.0 µm wide. Skeletal hyphae (Fig. 6b) subhyaline to yellowish brown, straight or flexuous, thick-walled to solid, occasionally with septa towards the apex, 3.0–6.0 µm wide. Binding hyphae hyaline to subhyaline, thick-walled to solid, much branched, branches mostly short and coralloid (Fig. 6c), a few freely branched but short (Fig. 6d) and flexuous, 1.5–3.2 µm wide, reddish brown, thin-walled to slightly thick-walled cuticular cells (Fig. 6e) with irregular projections in the crustose area at the base of the pileus surface. Basidia (Fig. 6f) narrow clavate, 4-sterigmate, 15.0–22.0 × 8.0–10.0 µm. Subhyaline to pale brown cystidioid hyphae formed at apical ends of skeletal hyphae, present more commonly in sterile pore mouths. Basidiospores (Fig. 6g) hyaline, thin-walled, cylindrical, 10.0–15.0 × 4.0–6.0 µm.

Oxidase reactions – Positive on both gallic acid agar (GAA) (Fig. 4) and tannic acid agar (TAA) (Fig. 5), which is indicated by black zone around the colonies.

Host – *Nerium odorum* Sol. (=*Nerium indicum* Mill.)



Figs 1–**5** – *Hexagonia tenuis* 1, Basidiocarps on *Nerium odorum*. 2, Lower surface of basidiocarp. 3, Upper surface of basidiocarp. 4, Oxidase positive on gallic acid agar. 5, Oxidase positive on tannic acid agar.

Discussion

Hexagonia tenuis causes white rot of its host (Roy & De 1979, Leite 1994). Production of a dark zone around the colony in the oxidase test shows that it is a white rot fungus, which confirms that the basidiocarps collected from *Nerium odorum* is *H. tenuis.* Hosts of *Hexagonia tenuis* are listed in Table 1.

The present study provides the first record of *H. tenuis* on *Nerium odorum. Carissa* sp. is the only other plant of Apocynaceae which has been recorded as a host for *H. tenuis* (Ranadive et al. 2013).

Table 1 Hosts of *Hexagonia tenuis* along with respective references.

Host	Family	Reference
Mangifera indica L.	Anacardiaceae	Roy & De 1979, Pandit 2016
Hevea brasiliensis (HB. & K.) Muell-Arg.	Euphorbiaceae	Seephueak 2012
Dimocarpus longan Lour.	Sapindaceae	Anonymous 2015
Delonix regia Raf.	Leguminosae	
Ficus microcarpa L. f.	Moraceae	
Grevillea robusta A. Cunn.	Proteaceae	Spaulding 1961
Anacardium occidentale L.	Anacardiaceae	Leelavathy & Ganesh 2000
Calycopteris floribunda (Rox.) Poir.	Combretaceae	
Moringa oleifera Lam.	Moringaceae	
Dysoxylum gaudichaudianum (A. Juss.) Miq.	Meliaceae	Tadiosa et al. 2011
Tectona grandis L. f.	Verbenaceae	Tiwari & Harsh 2005
Pterocarpus angolensis DC.	Leguminosae	Mehl 2010
Caesalpinia spinosa (Mol.) Kuntze	Leguminosae	Arenas et al. 2015
Acacia catechu Willd.	Leguminosae	Bakshi 1971
Albizzia stipulata Bovin	Leguminosae	
Casuarina montana Leschin ex Miq.	Casuarinaceae	
Eriobotrya japonica Lindt.	Rosaceae	
Mallotus philippinensis Muell-Arg.	Euphorbiaceae	
Psidium guyava L.	Myrtaceae	
Shorea robusta Gaertn. f.	Dipterocarpaceae	
Carissa sp.	Apocynaceae	Ranadive et al. 2013

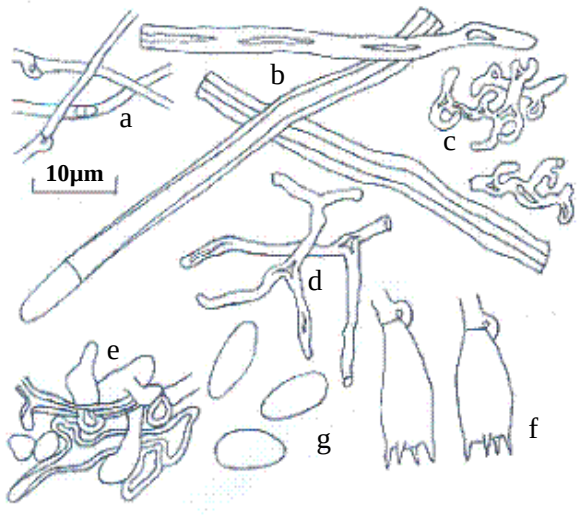


Fig. 6 – Microscopic characters of basidiocarps of *Hexagonia tenuis*. a, generative hyphae. b, skeletal hyphae. c, coralloid binding hyphae. d, binding hyphae with short free branches. e, cuticular cells along with thick-walled hyphae occurring in the crustose area. f, basidia. g, basidiospores.

In the present study *H. tenuis* was found to produce basidiocarps on stems of *Nerium odorum* of diameter less than 3 cm. However, *H. tenuis* has also been reported to grow on logs and branches of wider diameter of various trees such as *Hevea brasiliensis* (Seephueak 2012) and *Dimocarpus longan* (Anonymous 2015). Thus, the present observation supports the view of Adarsh et al. (2015) who suggested that some polypores growing on wood of small diameter can usually grow on large logs as well. Hattori & Lee (2003) found that in Malaysia *Coriolopsis retropicta, Microporus xanthopus* and *Trametes mimetes* are mostly restricted to twigs or small trunks (<10 cm in diameter), whereas *Ganoderma australe*, *Phellinus lamaensis* and *Rigidoporus microporus* occur on larger substrates. Similarly, in a study in an Andean alder wood in Argentina, Urcelay & Robledo (2004) observed a preference for large diameter logs (25–30 cm) to support fruiting by *Trametes cubensis* and *Phellinus gilvus* while *Bjerkandera adusta* and *Lenzites betulina* were characterised by having the highest frequency on logs of intermediate diameter (10–15 cm). *Datronia mollis*, *Hexagonia papyracea, Polyporus tricholoma* formed a group that was always found on branches with small diameter (<10 cm).

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