



Black mildews on *Goniothalamus* species in Agasthyavanam National Park, Kerala, India

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Abstract : The present study indicated that *Goniothalamus rhynchantherus* and *G. wightii* were infected by three black mildew fungi, namely, *Amazonia goniothalami*, *Irenopsis goniothalami* and *Trichasterina goniothalami*. These fungi have been described and illustrated in detail.

Keywords: Fungi, Black mildew, *Goniothalamus*, Endemic, National Park

INTRODUCTION

Agasthyamala, a name after the sage Agastya, located towards the southern part of the Thiruvananthapuram district in Kerala state. The hilltop is at an altitude of 1868 m, descends steeply towards the western side. This region harbours tropical evergreen forest and is known for the endemic flora of the flowering plants. The genus *Goniothalamus* belongs to the family Annonaceae comprises about 115 species and of which 10 are in India. *Goniothalamus cardiopetalus*, *G. rhynchantherus*, *G. thwaitesii*, *G. wightii* and *G. wynaadensis* occur in the Western Ghats region of Peninsular India. Of these, *Goniothalamus rhynchantherus* and *G. wightii* are endemic to southern Western Ghats and were found infected with 'black mildews' in the present study area. 'Black mildews' are the ectophytic fungi cause dense, black velvet colonies on the surface of the leaves, and on soft and tender parts of plants. Taxonomically, these fungi include the members of Meliolaceae, Asterinaceae, Englerulaceae, Hyphomycetes, etc. However, in the present study, the black mildews on *Goniothalamus* belong to the family Asterinaceae (the genus *Trichasterina*) and Meliolaceae (the genera *Amazonia* and *Irenopsis*).

Key to the genera of black mildews on *Goniothalamus* species

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|---|-----|----------------------|
| 1. Fruiting body thyriothecia | ... | <i>Trichasterina</i> |
| 1. Fruiting body perithecia | ... | ...2 |
| 2. Fruiting body flattened-globose | ... | <i>Amazonia</i> |
| 2. Fruiting body globose with perithecial setae | ... | <i>Irenopsis</i> |

DESCRIPTION OF THE SPECIES

1. *Amazonia goniothalami* Hosagoudar, Rajkumar, Biju and Abraham (2001) (Fig. 1).

Colonies predominantly hypophyllous, subdense to dense, up to 5 mm in diameter, confluent. Hyphae straight, branching alternate to opposite at acute angles, loosely to closely reticulate, cells 9-16 x 6-8 μ m. Appressoria alternate, antrorse to closely antrorse, straight, 18-26 μ m long; stalk cells cylindrical to cuneate, 6-8 μ m long; head cells ovate, oblong to cylindrical, entire, 12-15 x 8-12 μ m. Phialides not seen. Perithecia flattened-globose with radiating cells, up to 160 μ m in diameter; ascospores oblong to ellipsoidal, 4-septate, constricted at the septa, 44-48 x 20-23 μ m.

Materials examined: On leaves of *Goniothalamus wightii* Hook. f. and Thoms. (Annonaceae), Agasthyamalai, Kerala, India, Dec. 9, 1999, G Rajkumar HCIO 43359, TBGT 257.

This is the only species of the genus *Amazonia* on the members of the family Annonaceae (Hansford, 1961; Hosagoudar, 1996; Hosagoudar *et al.*, 1997 and Mibey and Hawksworth, 1997).

This species is known only from the type collection.

2. *Irenopsis goniothalami* Hosagoudar and Abraham (1996) (Fig. 2).

Colonies hypophyllous, thin, spreading, up to 10 mm in diameter, rarely confluent. Hyphae straight to crooked, branching irregular at acute angles, loosely reticulate, cells 32-34 x 6-8 μ m. Appressoria alternate, mostly straight, rarely curved, antrorse to subantrorse, rarely recurved, 19-20 μ m long; stalk cells cylindrical to cuneate 6-10 μ m

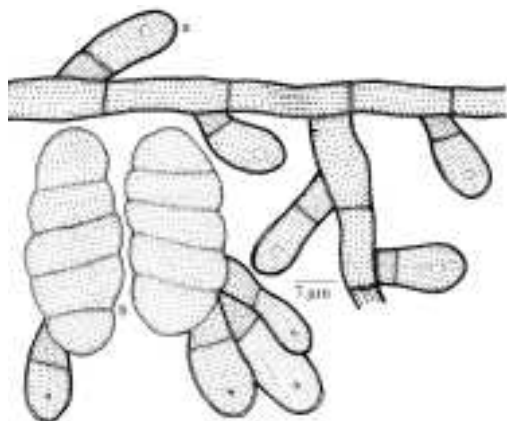


Fig. 1. *Amazonia goniothalami* Hosagoudar, Rajkumar, Biju and Abraham, a-Appressorium, b-Germinating ascospores

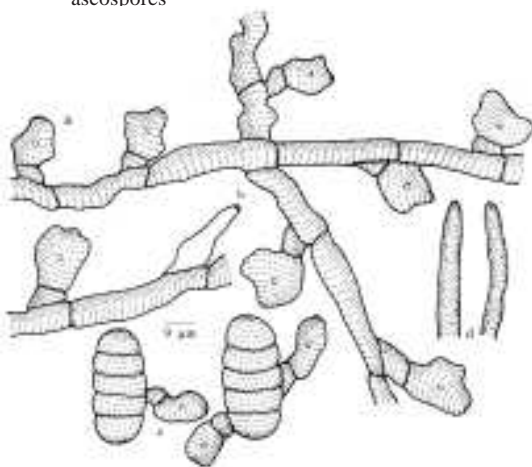


Fig. 2. *Irenopsis goniothalami* Hosagoudar and Abraham, a-Appressorium, b- Phialide, c-Germinating ascospores, d- Apical portion of the perithecial setae

long; head cells ovate, globose, entire, angular to lobate, 11-15 x 11-16 μm . Phialides mixed with appressoria, alternate to unilateral, ampulliform, 17-20 x 4-7 μm . Perithecia scattered, mostly immature, up to 160 μm in diameter. Perithecial setae 0-6, simple, straight to curved, mostly prostrate, erect, 2-6-septate, rarely nodulose in the middle, bulbous at the base, rarely obtuse to broadly rounded at the apex, up to 150 μm long, ascospores obovoidal, 4-septate, constricted at the septa, 32-35 x 14-16 μm .

Materials examined: On leaves of *Goniothalamus rhynchantherus* Dunn. (Annonaceae), in the evergreen forest of Chemunji, Bonaccaud, Thiruvananthapuram, Kerala, India, March 11, 1997, V.B. Hosagoudar TBGT 200, ILLS (Illinois).

This is the first report of the genus *Irenopsis* on the

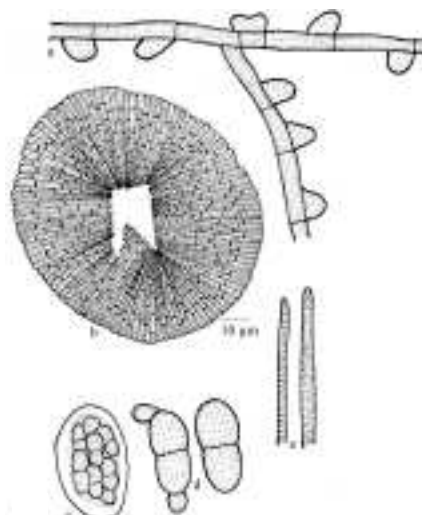


Fig. 3. *Trichasterina goniothalami* Hosagoudar and Goos
a- Appressoriolate mycelium, b- Thyriothecium,
c- Ascus, d- Ascospores, e- Setae

members of the family Annonaceae (Hansford, 1961 and Hosagoudar *et al.*, 1997).

This species is known only from the type collection.

3. *Trichasterina goniothalami* Hosagoudar and Goos (1996) (Fig.3).

Colonies amphigenous, dense, velvety, up to 10 mm in diameter, rarely confluent. Hyphae straight to substraight, branching irregular at acute angles, loosely to closely reticulate, cells 18-31 x 5-7 μm . Appressoria unilateral, alternate and about 5% opposite, seated on a broad base, unicellular, ovate, cylindrical, mammiform, rarely truncate, 6-13 x 6-10 μm . Mycelial and thyriotheacial setae numerous, simple, straight, erect, obtuse at the tip, up to 110 μm long. Thyriotheacia scattered, orbicular, carbonaceous black and opaque, up to 110 μm in diameter; margin crenate, dehiscence stellately at the centre; asci many, globose to slightly ovate, eight spored, 31-40 x 27-31 μm ; ascospores brown, conglobate, 1-septate, deeply constricted at the septum, 31-34 x 12-16 μm , wall smooth.

Materials examined: On leaves of *Goniothalamus wightii* Hook.f. & Thoms. (Annonaceae), Chemunji, March 11, 1997, V.B. Hosagoudar HCIO 44076, TBGT 510; April 12, 1999, G. Rajkumar HCIO 43368, TBGT 258; Feb. 8, 1998, G. Rajkumar HCIO 43367, TBGT 259; April 23, 1998, G. Rajkumar HCIO 43365, TBGT 260; July 16, 1998, G. Rajkumar HCIO 43366, TBGT 261.

This species differs from *Trichasterina polyalthiae* Hansf. in having alternate appressoria, smaller setae and larger ascospores (Hansford, 1955).

This species is known only from the present locality.

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