



RESEARCH COMMUNICATION

First record of *Meliola rhamnicola* Stev. & Tehon (Meliolaceae) in India: A species originally described from British Guiana

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Abstract

During a survey of foliar mycobionts in the Little Andaman Islands, the authors observed *Colubrina asiatica* (L.) Brongn. (Rhamnaceae) infected with black mildew. Detailed microscopic examination of the fungal specimen revealed it to be a notable species of *Meliola*, identified as *Meliola rhamnicola* F. Stevens & Tehon. This species was originally described 99 years ago from British Guiana (present-day Guyana) and, until now, was known only from its type locality. This finding represents the first record of *M. rhamnicola* from India with a new host association with *C. asiatica*. Comprehensive taxonomic observations, along with illustrations and microphotographs, are provided to facilitate accurate identification of the species.

Keywords: Andaman Islands; black mildews; fungal biodiversity; meliolaceous fungi; rediscovery; sordariomycetes

Introduction

Meliolaceous fungi are predominantly ectophytic, obligate, black colony-forming parasitic fungi usually infect the leaves, petioles and stems of vascular plants (1–5). These fungi are highly host-specific with a narrow host range (5–7). Therefore, accurate identification of the host, at least to the species level, is essential for the proper and correct identification of these groups. This is quite a large and highly diverse group. The family Meliolaceae of Meliolales are perithecial fungi, accommodated under Sordariomycetes (4, 8, 9). The genus *Meliola* was introduced by Fries and is the largest genus in the family Meliolaceae, containing over 1703 species (5, 10). The first report of the genus *Meliola* from India was by Cooke also reported *Meliola densa* Cooke (11). Genus *Meliola* presently represented by 3064 epithets listed in Index Fungorum. *Meliola* species are biotrophic and recorded on a wide range of host plants in tropical and sub-tropical regions (5). The genus is characterised by brown mycelium with mainly two-celled appressoria, phialides, presence of mycelial setae; generally globose, dark perithecia and four septate ascospores (1–3, 12).

During a mycotaxonomic survey from the Little Andaman Islands, the authors encountered an interesting collection of the genus *Meliola*. The survey region is ecologically sensitive, with species often threatened by habitat loss due to logging, agricultural practices and wildfire. The fungal specimen was found on the leaves of *Colubrina asiatica* (L.) Brongn. (Rhamnaceae), a plant harvested from the wild for local use as medicine and as a soap substitute. *Colubrina asiatica* also serves as an excellent ground cover and soil stabiliser (13). Detailed morphological studies confirmed the specimen as *Meliola rhamnicola* Stev. and Tehon, a species originally described from British Guiana (now

Guyana) and previously known only from its type locality. This represents the first record of *M. rhamnicola* from India, thereby contributing a new entry to the country's fungal biodiversity. Before this study, 32 species of the genus *Meliola* were documented from the Andaman and Nicobar Islands, underscoring the region's rich fungal diversity (14). The host family Rhamnaceae itself supports a wide range of meliolaceous fungi, particularly across tropical and subtropical regions, with 16 species of *Meliola* recorded on members of this family from various geographic locations (1, 15–28). This study provides a detailed standard taxonomic description, supported by illustrations and microphotographs, thereby enriching the knowledge of fungal diversity in India.

Materials and Methods

Infected leaves and twigs were collected in polythene bags along with flowering/fruitlet twigs of the host plant species to confirm the identity. The field information on infection pattern, collection locality, altitude, date of collection and other special information regarding the host plant, etc. was recorded in the field book during plant collection. The identity of the host plants was confirmed by referring to regional floras (29–31) and also in consultation with experts in the field. Plant parts were pressed neatly and dried between blotting papers. After ensuring their dryness, they were used for a microscopic study. To examine the structural and morphological features of the fungi, permanent slides were prepared using the nail polish technique (32). The nail polish technique provides a simple and effective way to create permanent slides that preserve the surface structures of fungi for long-term microscopic examination. These permanent slides were then used for further studies. Microscopic preparations are

made under a Leica DM2000 compound microscope. The fungal specimens were identified and their distributional records verified using standard taxonomic literature (1–3, 33–41). Camera lucida line drawings were also prepared to support the final confirmation of fungi. Identified specimens were deposited in the fungal herbarium of Jawaharlal Nehru Tropical Botanic Garden and Research Institute, Thiruvananthapuram (TBGT), India.

Results

Taxonomy

***Meliola rhamnocola* F. Stevens & Tehon** (42) (Fig. 1, 2)

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Colonies are hypophyllous, thin, scattered up to 2 mm in diameter and confluent. Hyphae substraight to flexuous, branching opposite at acute to wide angles, loosely reticulate, cells 25–45 × 5–7 μm. Appressoria alternate to 3 % opposite, straight, spreading, antrorse, 10–20 μm long; stalk cells cylindrical to cuneate, 2–7 μm long; head cells oblong, ovate, entire, 7–12 × 7–10 μm. Phialides mixed with appressoria, opposite, ampulliform, 12–25 × 5–7 μm. Mycelial setae scattered, simple, straight, acute, obtuse to variously dentate at the tip, up to 550 μm long. Perithecia scattered, orbicular, verrucose, up to 170 μm in diameter; ascospores ellipsoidal to oblong, 4-septate, constricted at the septa, 32–48 × 12–15 μm.

Materials examined: On leaves of *Colubrina asiatica* (L.) Brongn. (Rhamnaceae), Farm Tikrey, Little Andaman Islands, India, February 14, 2014, Biju H & al 7140 (TBGT!).

Known distribution: British Guiana.

Discussion

The species *M. rhamnocola* was originally reported by Stevens and Tehon from British Guiana (now Guyana) on *Gouania* sp. (42). The present collection corresponds closely with the type specimen, showing hypophyllous colonies, predominantly alternate appressoria with up to 3 % opposite forms, ovate, entire head cells and phialides intermixed with appressoria. The ascospores are oblong, with measurements consistent with those originally described. In addition, the dimensions of the hyphal cells, the length of the appressoria and the diameter of the perithecia all align with those recorded for the type, confirming full concordance with the reference description. In this collection, the mycelial setae are simple, straight and range from obtuse to dentate, but differ only in being shorter than those of the type. On this basis, the present collection is identified as conspecific with *M. rhamnocola*.

The occurrence of *M. rhamnocola* in the Little Andaman Islands represents a remarkable disjunct distribution, extending its known range from Guyana to India after nearly a century of being restricted to its type locality. This finding suggests that the species may have a broader pantropical distribution facilitated by its host plant, *C. asiatica* and highlights the role of island ecosystems as reservoirs of overlooked fungal diversity. Such discoveries underscore the importance of tropical surveys in uncovering hidden biogeographical links and challenge the notion of strict endemism in foliicolous fungi.

Conclusion

This study documents *M. rhamnocola* for the first time in India, marking a noteworthy addition to the country's fungal flora. *Colubrina asiatica* is identified as a new host, thereby extending

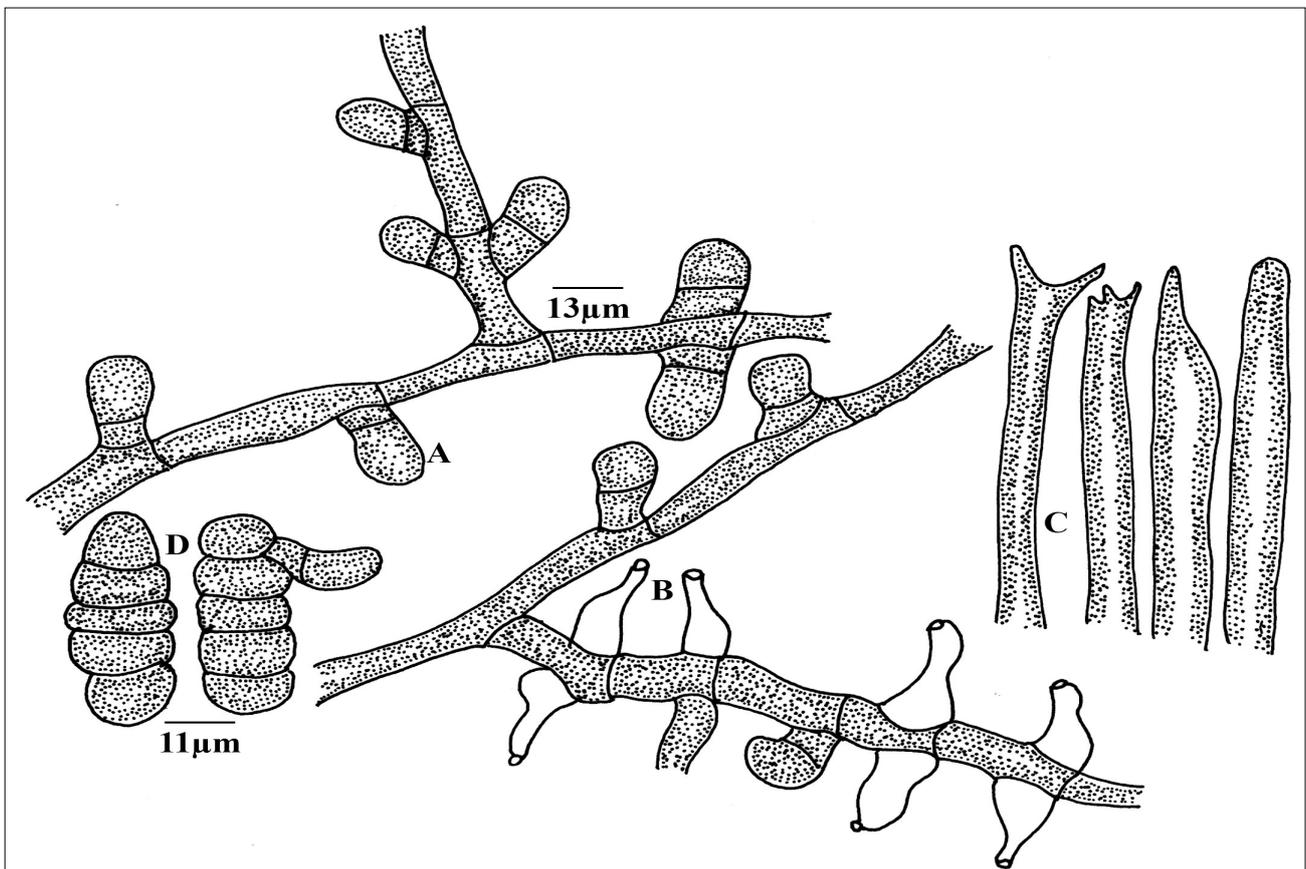


Fig. 1. A: Appressorium; B: Phialide; C: Apical portion of the mycelial setae; D: Ascospores.

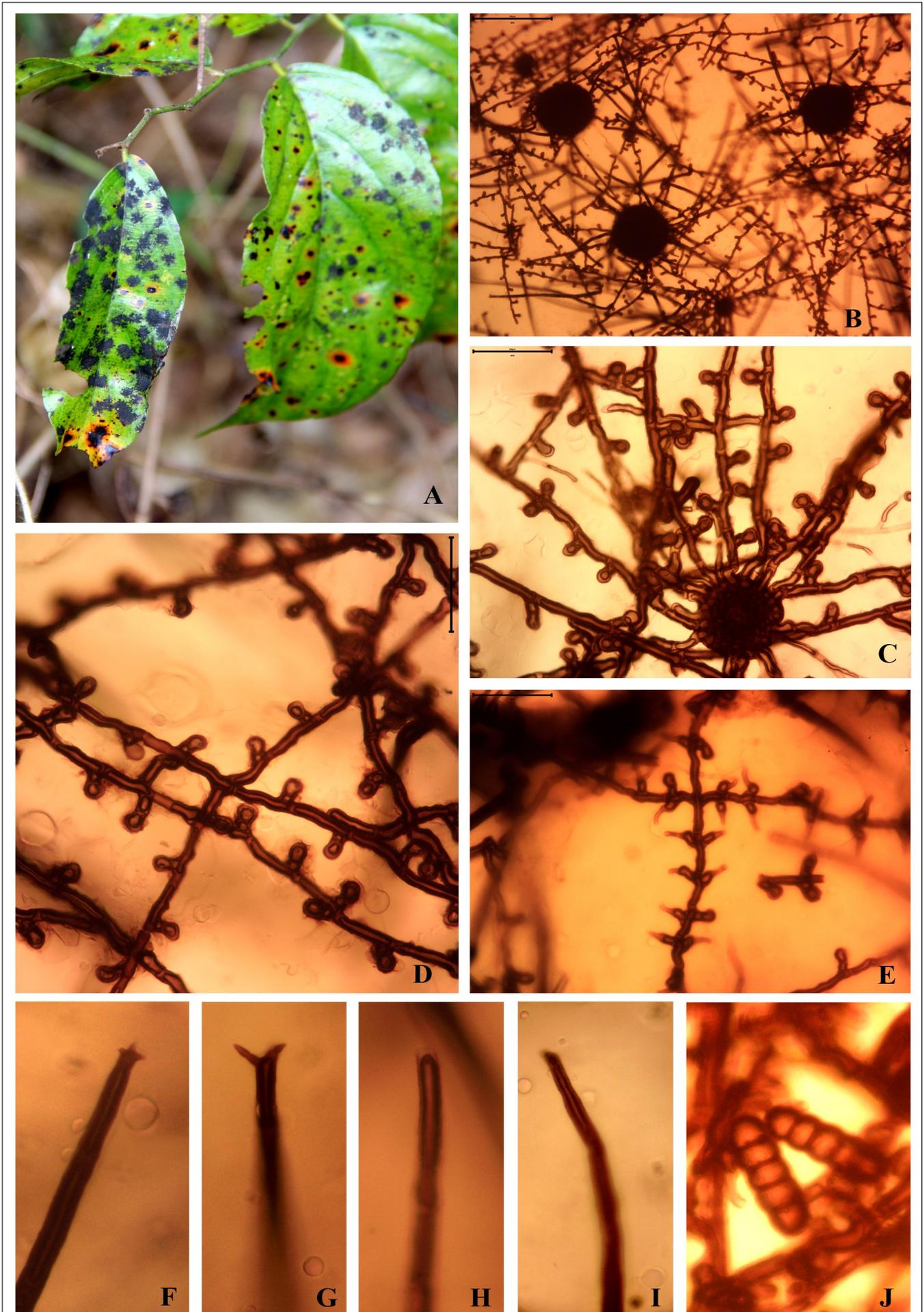


Fig. 2. A: Infected leaves of *Colubrina asiatica* (L.) Brongn.; B: Colony with Perithecia; C, D: Appressariate mycelium; E: Hyphae showing phialides mixed with Appressoria; F–I: Apical portion of the mycelial setae; J: Ascospores.

the known distribution of *M. rhamnocola* beyond its type locality in British Guiana. This record enriches the diversity of *Meliola* species associated with Rhamnaceae, which in mainland India includes *M. gouaniicola*, *M. gouaniae* var. *keralica* and *M. ziziphi*. Reports from the Andaman Islands remain scarce, making this finding particularly significant as it broadens the geographic range of host associations in the region.

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Authors' contributions

SA was responsible for the taxonomic identification of the fungal specimens using compound microscopy, verified the distributional records by consulting standard taxonomic literature and prepared detailed illustrations using a camera lucida (mirror type) and also contributed significantly to the drafting and initial preparation of the manuscript, including literature review. BH conducted the fieldwork in the Little Andaman Islands, where the fungal specimens were collected, documented the habitat and morphological features through field photography, prepared the photo plates for publication and contributed to the final editing and formatting of the manuscript. All the authors read and approved the final manuscript.

Compliance with ethical standards

Conflict of interest: Authors do not have any conflict of interest to declare.

Ethical issues: None

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