

Natarajania indica gen. et sp. nov., a dematiaceous hyphomycete from the forests of Western Ghats, India

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ABSTRACT

Natarajania, a new genus of the dematiaceous Hyphomycetes, characterised by mononematous, septate, branched conidiophores with terminal, partly verrucose, phialidic conidiogenous cells bearing a distinct collar-canal and producing slimy, dark-brown, smooth, conidia, is introduced for *N. indica* anam. sp. nov., isolated from dead leaves of *Antiaris toxicaria* (Rumph. ex Pers.) Leschen. (F: Moraceae), from the forests of Western Ghats, India.

INTRODUCTION

During the course of our efforts on documentation and taxonomic study of microfungi of the forests of Western Ghats, an interesting dematiaceous phialidic hyphomycete was recovered in culture from decaying leaves of *Antiaris toxicaria* (Rumph. ex Pers.) Leschen. by single spore isolation method of Choi *et al.* (1999). The fungus was found to produce clavate, slightly curved, dark brown, smooth, slimy conidia in cylindrical, partly verrucose, phialidic conidiogenous cells with an elongated 'collar-canal'. These unique features warranted accommodation of the fungus in a new genus, *Natarajania*, with *N. indica* as type.

MATERIALS AND METHODS

Freshly gathered leaf litter of *Antiaris toxicaria* was scanned under stereomicroscope and a sterile needle was carefully allowed to touch the tip of conidiophores, the spore-producing organs of the fungus. The spores get attached to the loop of the needle due to tenacity. A drop of sterile distilled water was taken on a clean, flame-sterilized slide and a loop load of spore mass was placed in it. The soaked spores were spread on a petri plate containing 2% malt extract agar medium

incorporated with a low concentration of a cocktail of antibiotics (Maria, 2002). On subsequent days, as and when spores germinate, a small block of agar with mycelium of individual colonies was cut and aseptically transferred onto an agar slant to obtain a pure culture of the fungus. The culture is maintained in 2% MEA.

TAXONOMY

Natarajania Pratibha et Bhat gen. nov. (Etym. After Prof. K. Natarajan, CAS in Botany, University of Madras, India).

Coloniae effusae, grisea, velutinae. *Mycelium* partim superficiale, partim in substrato immersum, ex hyphis laevibus, incoloratis vel pallide brunneis, ramosis, septatis, crassitunicatis, compositum. *Conidiophora* mononemata, macronemata, erecta, recta vel flexuosa, solitaria or fasciculata, septata, ramosa sparsa, laevia, incolorata vel pallide brunnea. *Cellulae conidiogenae* monopialidicae, terminales, integratae, cylindricae, supra verrucosae, infra laeviae, cum cylindricae, laeviae, incoloratis, collarulo prominenti collar-canal. *Conidia* mucosa, solitaria, ellipsoidea, laevia, atrobrunnea, aseptata, leniter curvata, truncata ad basim. Species typica: *N. indica* sp. nov.

Colonies effuse, greyish, velvety. *Mycelium* partly superficial, partly immersed in the substrate, composed of smooth, hyaline to pale brown, branched, septate, thick-walled hyphae. *Conidiophores* mononematous, macronematous, erect, straight to flexuous, solitary or fasciculate, septate, unbranched, smooth, hyaline to pale brown. *Conidiogenous cells* monophialidic, terminal, integrated, cylindrical, upper-half distinctly verrucose, smooth below, with a narrow, elongated, cylindrical, smooth, colourless collar-canal, terminating with a flared collarete. *Conidia* slimy, solitary, ellipsoidal, smooth, dark brown, aseptate, slightly curved, with a truncate base.

Natarajania indica Pratibha et Bhat gen. et sp. nov. (Fig. 1 & 2a-f)

Coloniae in cultura MEA circulares, incolorata cum atrobrunneae spore massis, planae, effusae, pallide brunneae, 4.2 cm diam. in 10 d. *Mycelium* partim in substrato immersum, ex hyphis laevibus, incoloratis vel pallide brunneis, ramosis, septatis, crassitunicatis, 2-3 μm lat. compositum. *Conidiophora* mononemata, macronemata, erecta, recta vel flexuosa, solitariae or fasciculatae, 1-3 septata, ramosa sparsa, laevia, incolorata vel pallide brunnea, 50-120 μm alt., 2-4.5 μm lat. *Cellulae conidiogenae* monophialidicae, terminales, integrae, cylindricae, supra verrucosae, infra laeviae, 30-45 \times 2-4 μm , cum cylindricae, laeviae, incoloratis, collarulo prominenti, 4-7 μm collar-canal. *Conidia* mucosa, solitaria, ellipsoidea, laevia, atrobrunnea, non-septata, leniter curvata, truncata ad basim, 5-7.5 \times 3-5 μm . Conidial secession rhexolytic.

Holotypus: In foliis emortuis e *Antiaris toxicaria* (Rumph. ex Pers.) Leschen. (Moraceae), leg. J. Pratibha, 11 June 2006, Netravali, Canacona, Goa, India, Herb. No. GUBH MP27; Cultura No. GURCC 5240.

Colonies on MEA circular, colourless with dark brown mass of spores, flat, mycelial, effuse, colourless to pale brown, wet, moderately growing, attaining a diam. of 4.2 cm in 10 days. *Mycelium* partly superficial, partly immersed in the substrate, composed of smooth, hyaline to pale brown, branched, septate, thick-walled, 2-3 μm wide hyphae. *Conidiophores* mononematous, macronematous, erect, straight to flexuous, solitary or fasciculate, 1-3-septate, unbranched, smooth, hyaline to pale brown, 50-120 \times 2-4.5 μm , arising from hyaline prostrate hyphae. *Conidiogenous cells* monophialidic, terminal, integrated, cylindrical, upper-half distinctly verrucose, smooth below, 30-45 \times 2-4 μm , with a narrow, elongated, cylindrical, smooth, colourless, 4-7 μm long collar-canal, terminating with a flared collarete. *Conidia* slimy, solitary, ellipsoidal, smooth, dark brown, aseptate, slightly curved, truncate at the base, 5-7.5 \times 3-5 μm . Conidial secession rhexolytic.

DISCUSSION

Genera of phialidic Hyphomycetes such as *Bahusutrabeeja* Subram. & Bhat (Subramanian and Bhat, 1977), *Catenularia* Grove (Hughes, 1965), *Craspedodidymum* Holubova-Jechova (Holubova-Jechova, 1972), *Dictyochaeta* Spegazzini (Kuthubutheen and Nawawi, 1991), *Phialocephala* Kendrick (Kendrick, 1961), *Virgatospora* Finley (Finley, 1967) and several others (Carmichael *et al.*, 1980; Ellis, 1971, 1976; Matshushima, 1971, 1975; Subramanian and Bhat, 1987; Bhat and Kendrick, 1993) produce flared collarete at the tip of the conidiogenous cells. In all these, the collarete is perched directly at the tip or on the sides of the conidiogenous cell whereas *Chalara* (Corda) Rabenhorst, *Fusichalara* Hughes & Nag Raj, *Sporoschisma* Berk. & Br. and *Sporoschismopsis* Holubova-Jechova & Hennebert do exhibit an elongated collarete

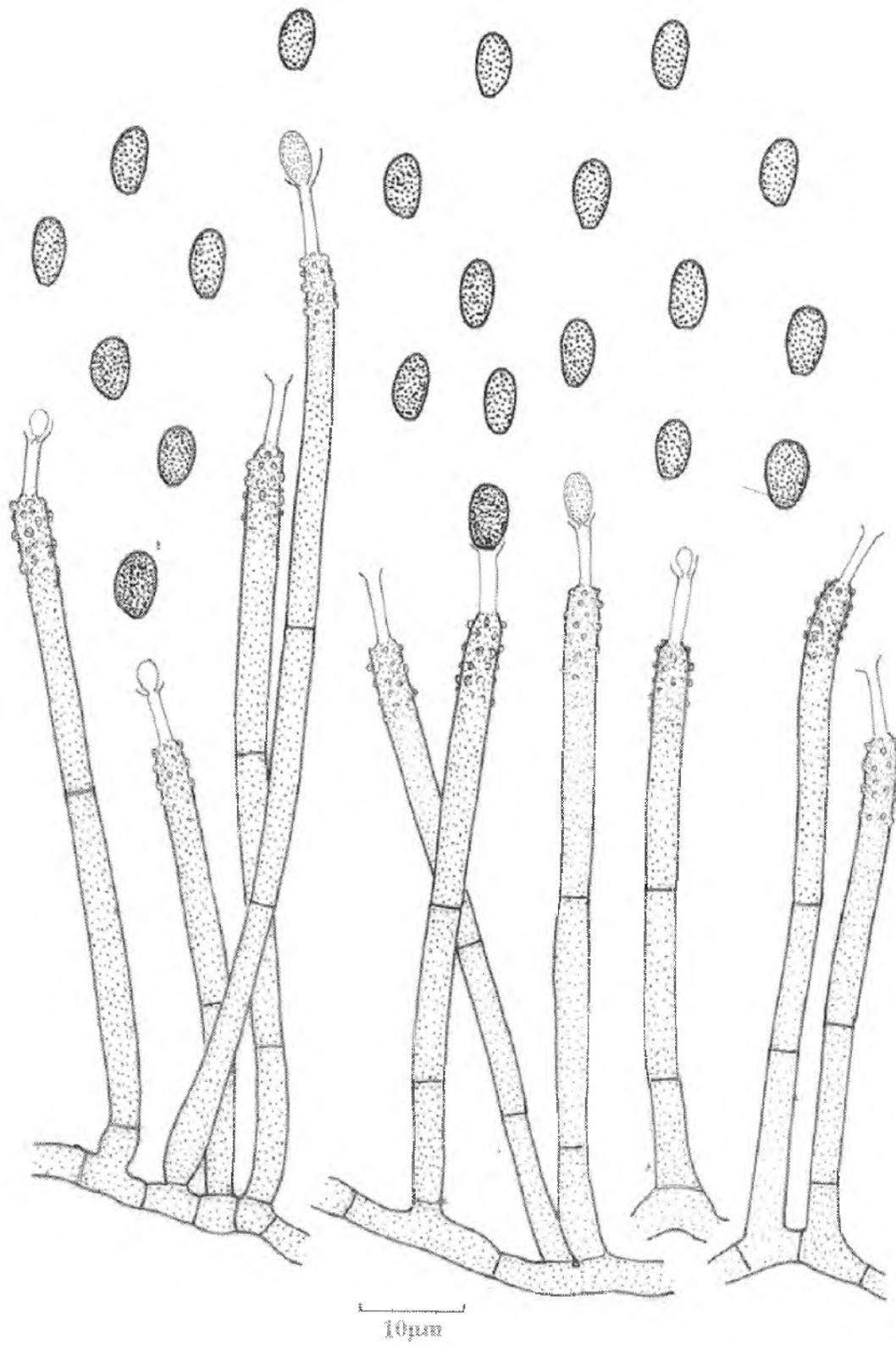


Fig 1: *Natarajania indica*

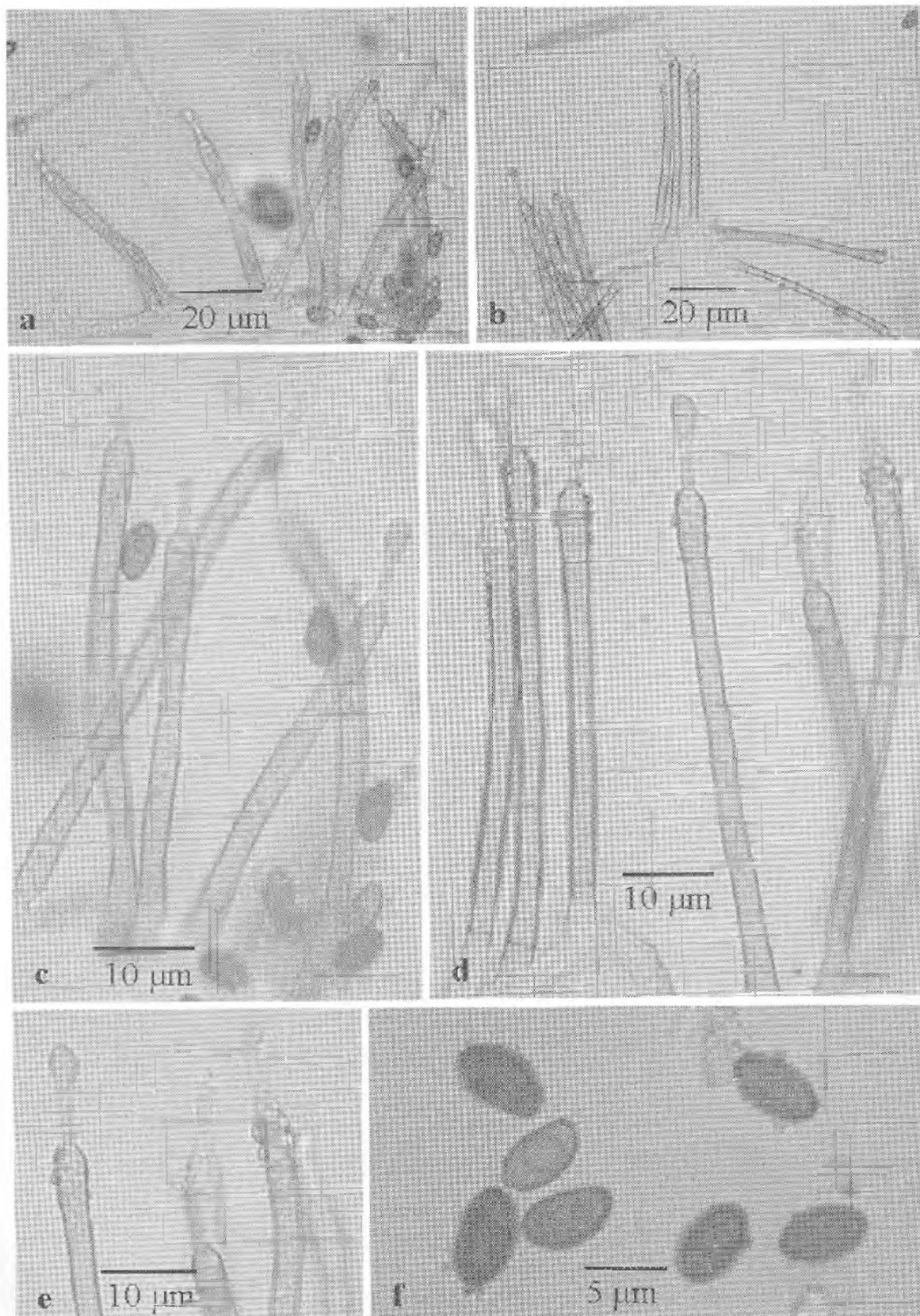


Fig 2: *Natarajania indica* a-d: Conidiophores; e: Conidiogenous cells with conidium; f: conidia

above a basal venter but these are unlike the collar-canal referred in this paper. None of the hitherto described fungi exhibits distinguishable collar-canal between the collarete and conidiogenous cells, except *Dictyochoeta ciliata* (Onofri & Rambelli) Bhat & Kendrick (Bhat and Kendrick, 1993) in which the collarete and conidiogenous cell are distanced by a brief channel of 2-3 μm long. However, the hyaline, setulate, aseptate conidia in the latter favoured disposition of the fungus in the genus *Dictyochoeta*.

Natarajania is very distinct with following characters: mononematous, solitary or sparsely fasciculate, conidiophores; monophialidic, terminal, cylindrical, conidiogenous cells with distinctly verrucose upper-half and a narrow, elongated, cylindrical, smooth, colourless collar-canal, terminating into a flared collarete. None of the hitherto described phialidic genera of fungi show such unique characters.

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