

Two New Hyphomycetes from India

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REFERENCES

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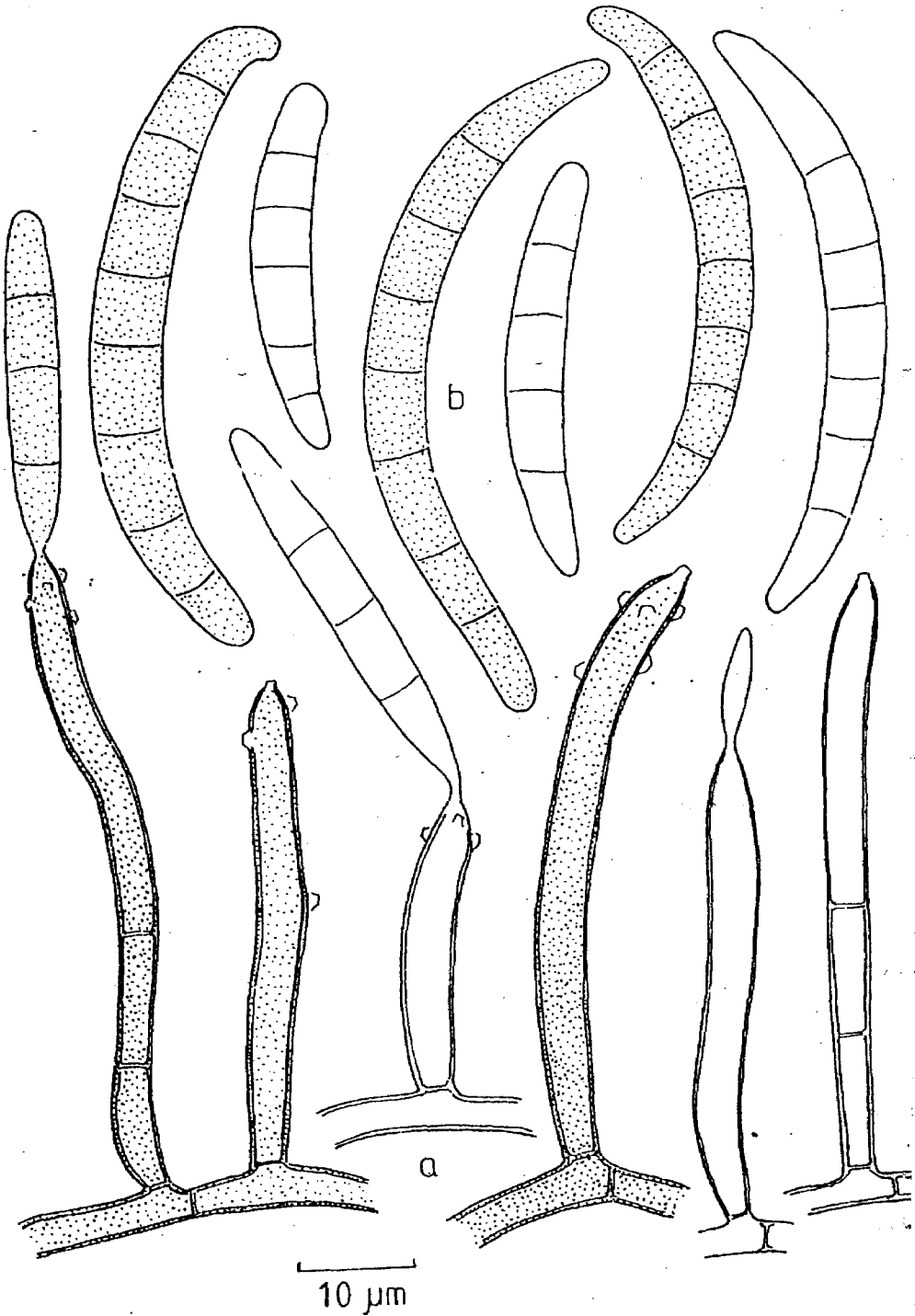
INTRODUCTION

We deem it a privilege to have been invited to submit this paper to a volume being brought out in honour of Professor Ram Dayal, Varanasi, India, who made an indelible mark in the field of mycology by his invaluable contributions to the study of zoosporic fungi in India.

During our studies on the taxonomy and diversity of microfungi occurring in association with the plant species of Western Ghat forests in southern India, two new hyphomycetous fungi were recovered in culture when litter samples of *Caryota urens* Linn., and *Flacourtia montana* (Burm.f.) Merrill. were subjected to 'particle-plating isolation technique' (Bills and Polishook, 1974). The new taxa are described and illustrated below.

Materials and Methods

Freshly gathered decaying leaves of *Caryota urens* and *Flacourtia montana* were washed separately in tap water followed by sterile distilled water and broken into fine particles in a blender. The particles were filtered through pre-imposed metal sieves with mesh size of 250 and 100µm. The particles retained in the lower sieve, those between 100 and 250µm size, were thoroughly washed in sterile distilled water and plated in malt extract agar



10 μm
Fig. 1 : *Aquaphila ramdayalea*
(a) Conidiophore and conidiogenous cells

(MEA) medium incorporated with a cocktail of antibiotics (bacitracin 0.02g, neomycin 0.02g, penicillin G 0.02g, polymixin 0.02g, streptomycin 0.02g and terramycin 0.04g dissolved in 10ml of distilled water and added to 1 l of MEA medium). The colonies originated from each particle were aseptically transferred into fresh MEA slants.

Results

Several interesting and rare fungi were recovered in culture from the leaf particles and of these two new conidial fungi described below belonged to anamorph genera *Aquaphila* Goh, Hyde et Ho (Goh *et al.*, 1998) and *Kumbhamaya* Miriam et Bhat (2000).

Aquaphila ramdayalea Maria et Bhat anam.-sp. nov. (Fig. 1)

(Etym. specific epithet-in honour of Professor Ram Dayal).

Coloniae is agar maltoso effusae, floccosae, atrobunneae. *Mycelium* partim immersum partim superficiale, rhizoidae, densae, ex hyphis pallide brunneis, septatis, ramosis, 2.5–4 μm lat. compositum. *Conidiophora* mononematosa, laterales, erecta, recta, vel flexuosa, 1-4-septata, nonramosa, basim pallide vel atrobrunnea, 30-110 x 2.5-5 μm . *Cellulae conidiogenae* monoblasticae vel polyblasticae, terminales, integratae, cylindricae, medium brunnae, 30-60 x 4-6 μm , 1-10 denticulatae usque ad 1.5 μm longa. *Conidia* solitaria, sicca, fusoida vel falcata, utrinque rotundata, 5-10-euseptata, crassitunicata, laevia, brunnea, 35-80 x 3-5 μm .

Holotypus : Cultura in MEA, extractis in putridinis foliis *Caryota urens* Linn. (Arecaceae), Cotigao Wildlife Sanctuary, Goa, India; Maria D'Souza, 11 April 1999; Herb. No. GUFCC-162.

Terrestrial litter hyphomycete. *Colonies* on malt extract agar effuse, slow growing with circular margin, attaining a diam. of 10 mm in 7 days, adpressed first and later becoming floccose, dark brown. *Mycelium* partly immersed, partly superficial, composed of septate, rhizoidal to densely branched, pale medium brown hyphae 2.5-4 μm wide. *Conidiophores* mononematous, erect, striaght or flexuous, 1-4-septate, unbranched, slightly narrower at base, smooth, medium to dark brown at the base, slightly paler towards apex, 30-110 x 2.5-5 μm . *Conidiogenous cells* monoblastic to polyblastic, terminal, integrated, cylindrical, medium brown, 30-60 x 4-6 μm , with up to 10 long 1-10 denticles distributed in the upper half. *Conidia* solitary, fusoid to falcate, rounded at both ends, 5-10-euseptate, thick-walked, dense cytoplasm, smooth, brown, 35-80 x 3-5 μm .

In its mononematous conidiophores, monoblastic to polyblastic and multiseptate conidiogenous cells and fusoid to falcate and multiseptate conidia

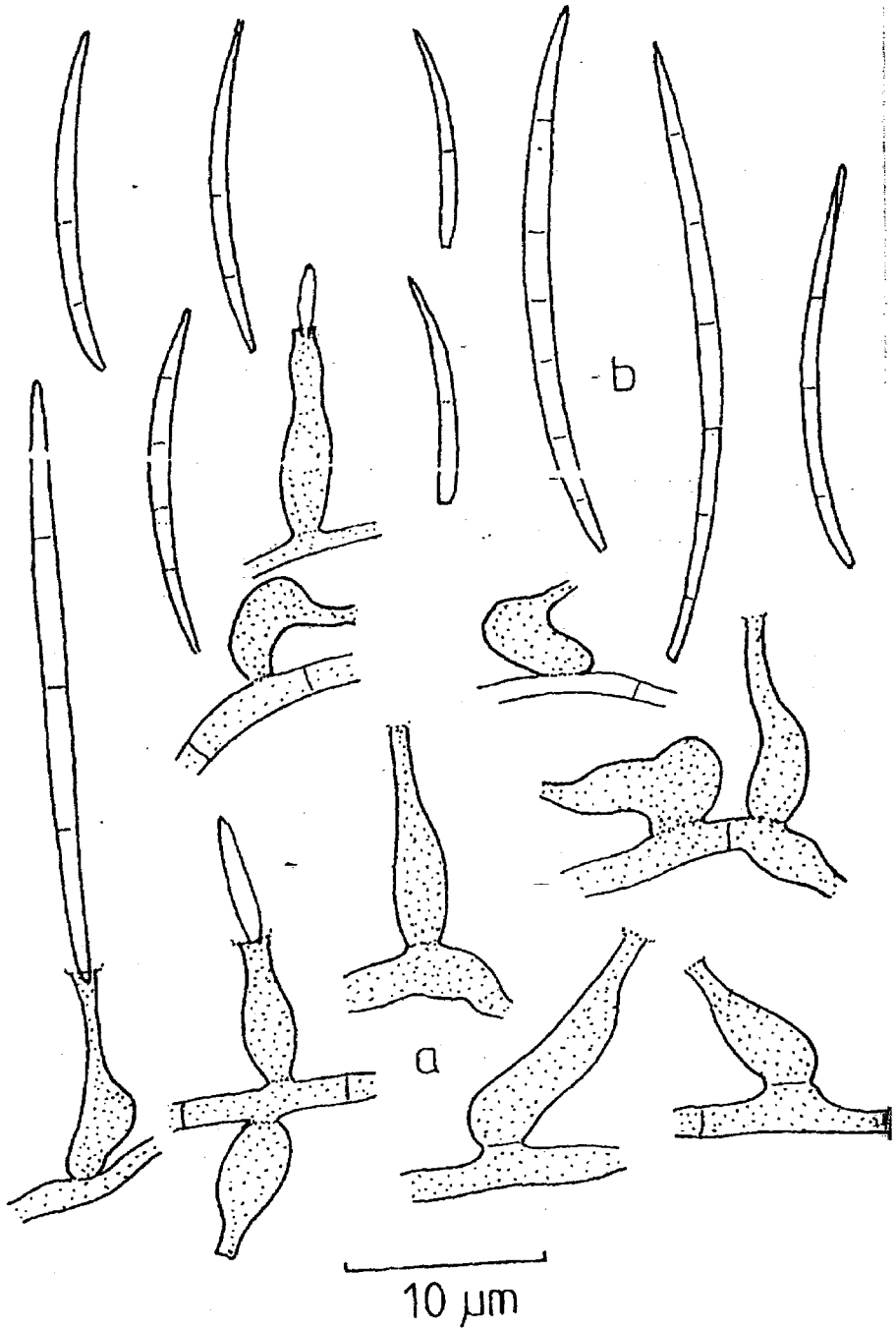


Fig. 2 : *Kumbhamaya goanensis*

(a) Conidiophore and conidiogenous cells

(b) Conidia

A. ramdayalea clearly belongs to the monotypic genus *Aquaphila* Goh, Hyde & Ho, typified by *A. albicans* Goh, Hyde & Ho (Goh *et al.*, 1998). It differs from the type species by its dematiaceous nature and affinity to terrestrial habitat. The conidiophores, conidiogenous cells and conidia are medium to moderately dark brown in *A. ramdayalea* whereas these in *A. albicans* are moniliaceous. Further, *A. albicans* is a representative of freshwater habitat. The conidia of *A. ramdayalea*, similar to *A. albicans*, superficially resemble those of *Fusarium* Link in shape, but they differ markedly in conidiogenesis. In *Fusarium*, the conidia are phialidic (Minter *et al.*, 1983) whereas in *Aquaphila* they are mono- to polyblastic.

Kumbhamaya goanesis Maria et Bhat anam.-sp. nov.

(Etym. specific epithet-from Goa)

Coloniae in agar maltoso effusae, rhizoideae, floccosae, reverso atrobrunneo. *Mycelium* partim immersum, partim superficiale, ex hyphis densum, ramosis, crassiseptatis, medio-brunneis vel atrobrunneis, 2.5-3.5 μm lat. compositum. *Conidiophora* mononematosa, indistincta, septata, nonramosa, medio-brunneis, 2-8 x 2.5-4.5 μm . *Cellulae conidiogae* monophialidicae, in conidiophoris incorporatae, terminales vel laterales, pyriformes ad vermiformes, flexuatae, ad basim oblongatae, rectae vel curvatae, laeves, medio-brunneae, 8-12 μm longae et ad basim 2.5-6.5 μm latae, in medio 2-4 μm latae, collari prominente 1.5-2 μm . *Conidia* mucoidea, solitaria, fusiformia vel falcata, utrinque-acuta, hyalina, crassitunicata, laevia, 2.5-septata, 7-30 x 1.5-2.5 μm , in massis mucosis aggregata.

Holotypus : Cultura in MEA, extractis in putridinis foliis *Flacourtia montana* (Burm.f.) Merrill. (Flacourtiaceae), Cotigao Wildlife Sanctuary, Goa, India; Maria D'Souza, 11 April 1999; Herb. No. GUFCC No. 214.

Terrestrial litter hyphomycete. *Colonies* on MEA slow growing, attaining a diam. of 1 cm in 7 days, adpressed at first, later becoming floccose, dome shaped at the centre, rhizoidal towards the periphery, with circular margin, grayish black. *Mycelium* partly immersed, partly superficial, composed of densely branched, smooth, septate, pale to medium brown hyphae 2.5-3.5 μm wide. *Conidiophores* mononematous, indistinct, septate, unbranched, medium brown, 2-8 x 2.5-4.5 μm . *Conidiogenous cells* monophialidic, aggregated, terminal or lateral, vase-like, vermiform, flexuous, erect to curved, apiculate-oblong at the base, with a collarette, smooth, medium brown, 8-12 μm long, 2.5-6.5 μm wide at the base, 2-4 μm wide in the middle, 1.5-2.5 μm wide at the collarette region. *Conidia* slimy, solitary, fusoid to falcate, pointed at the ends, 2.5-septate, thin-walled, with dense cytoplasm, hyaline, smooth,

The monotypic genus *Kumbhamaya* M. Jacob et D.J. Bhat, typified by *K. indica* M. Jacob et D.J. Bhat (Jacob and Bhat, 2000), is characterised by kettle or pitcher-shaped monophialidic conidiogenous cells bearing flared collarettes and producing slimy, fusiform, curved, septate and hyaline conidia which are pointed at both ends. *K. goanensis*, differs from the type species by its smaller conidiogenous cells and conidia. The conidiogenous cells and conidia in *K. indica* are $12-50 \times 2.5-8.5 \mu\text{m}$ and $25-40 \times 3.5-5.5 \mu\text{m}$, respectively whereas in *K. goanensis* these are $8-11.5 \times 2.5-6.5 \mu\text{m}$ and $7-25 \times 1.5-2.5 \mu\text{m}$. The conidia in *K. indica* are mostly 3-septate whereas in *K. goanensis* the conidia are up to 5-septate.

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REFERENCES

- Bills, G.F. and Polishook, J.D. (1994). Abundance and diversity of microfungi in leaf litter of lowland rain forest in Costa Rica. *Mycologia*, **86** : 187-198.
- M. Goh, T.K., Hyde, K.D. and Ho, W.H. (1998). *Aquaphila albicans* gen. et sp. nov., a hyphomycete from submerged wood in the tropics. *Mycol. Res.* **102** : 587-592.
- Jacob, M. and Bhat, D.J. (2000). Two new endophytic conidial fungi from India. *Cryptogam. Mycol.* **21** : 81-88.
- Minter, D.W., Sutton, B.C. and Brady, B.L. (1983). What are phialides anyway? *Trans. Brit mycol. Soc.* **81** : 109-120.