

## ***Ramoacrodictys*, a new hyphomycete genus for one species previously accommodated in *Acrodictys***

by

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A new genus, *Ramoacrodictys*, is erected to accommodate one species, *R. malabarica*, formerly placed in *Acrodictys*, on the basis of examination of literature and a specimen collected on *Bambusa* sp. in China. *Ramoacrodictys* is mainly characterized by erect, macronematous, multi-branched conidiophores, monoblastic conidigenous cells and production of gangliar conidia. *R. malabarica* is compared with closely related species.

Keywords: anamorphic, bambusicolous, and dictyosporous fungi, taxonomy

*Acrodictys* M.B. Ellis was originally erected by Ellis (1961) with *A. bambusicola* as the type species, and was mainly characterized by percurrently proliferating conidiophores and muriform conidia. Subsequently, more than 30 species have been referred to the genus. Baker *et al.* (2002ab) and Baker & Morgan-Jones (2003) refined the generic concept of *Acrodictys* in a stricter sense as ‘conidiophore commonly indeterminate and proliferating percurrently, successive terminal proliferations lageniform to doliiform, conidia muriform, usually with vertical-longitudinal septa in the middle cells and several parallel – transversal septa’. Three other genera were established, i.e., *Rhexoacrodictys*, *Junewangia*, and *Pseudoacrodictys*, to accommodate *Acrodictys* species. As a result, three species were retained in the refined *Acrodictys sensu stricto*; another five species were placed in *Junewangia* as characterized by successive percurrent proliferating conidiophores, narrowly cuneate conidigenous cells and seceding schizolytically conidia; four taxa were assigned to *Rhexoacrodictys*, characterized by rhexolytically disarticulated detachment conidia, and seven species were transferred to *Pseudoacrodictys* with large, somewhat irregularly shaped, many-celled conidia. Several questionable *Acrodictys sensu lato* species, including *A. malabarica* Subram. & Bhat (1987),

remained out of the four *Acrodictys*-related genera. *A. malabarica* is atypical by the presence of fertile branches and gangliar conidia, and is previously known only on *Bambusa* sp. from India, the type locality. Baker & Morgan-Jones (2003) pointed out that it might be better re-classified into another genus.

During a continuing investigation of dictyosporous fungi on fallen leaves, decaying branches, stems and dead wood from China (Zhao & Zhang 2003, 2004ab, 2005ab, Zhao *et al.* 2006), a collection with multi-branched conidiophores and muriform conidia was assigned to *Acrodictys malabarica*. A new genus, *Ramoacrodictys*, with the monotypic species, *R. malabrica* (Subram. & Bhat) G. Z. Zhao, is established on the basis of examination of literature and the Chinese specimen. The specimen examined is deposited at HMAS (Herbarium of Mycology, Chinese Academy of Sciences).

### Materials and Methods

Field samples were separately placed into plastic or paper bags, taken to the laboratory, and stored in a refrigerator at 4 °C before microscopic study, or incubated in moist containers (plastic bags or boxes) at room temperature to induce sporulation. Humidity was maintained by adding moistened paper towels. The incubated samples were examined under stereo-microscopes for the presence of microfungi after 4–5 days and periodically for up to one month. A piece of mycelia with sporulating structures of fungi on natural substrates or agar cultures were picked up and transferred to a slide. Water mounts were used for all observations, measurements, line-drawings and photographs under a Nikon 80i microscope with DIC. Semi-permanent slides were prepared by mounting in lactophenol-cotton blue and sealing with clear fingernail polish or neutral balsam.

### Taxonomy

***Ramoacrodictys* G. Z. Zhao, gen. nov.**

Mycobank no.: MB 515350

Coloniae effusae, pilosae, brunneae vel fuscae. Mycelium partim superficiale, partim in substrato immersum, ex hyphis septatis, ramosis, laevibus, subhyalinis vel pallide brunneis compositum. Conidiophora macronemata, simplicia vel multiramosa, recta vel leviter flexuosa, septata, cylindrica, laevia, brunnea vel atro-brunnea. Cellulae conidiogenae monoblasticae, integratae, terminales, cylindricae, determinatae. Conidia holoblastica, solitaria, acrogena, sicca, ellipsoidea, late ellipsoidea, subglobosa, obovoidea vel pyriformia, olivaceo-brunnea ad atro-brunnea, muriformia, laevia vel verruculosa.

Species typica: *Ramoacrodictys malabrica* (Subram. & Bhat) G. Z. Zhao.

Colonies effuse, hairy, olivaceous brown to dark blackish-brown; mycelium partly superficial and partly immersed, composed

of branched, septate, smooth, subhyaline to pale brown hyphae. Conidiophores macronematous, simple to multi-branched, single and scattered or gregarious and loosely caespitose, erect or ascending, straight or slightly flexuous, dark brown, paler towards the apex, thick-walled, smooth, septate, usually with a number of small branches; branches single or in group of 2–4 oppositely arranged in verticils or whorls along the main axis of the conidiophore, short, pale brown, thin-walled, smooth, truncate at the apex. Conidiogenous cells monoblastic, cylindrical, light brown, integrated, terminal on stipe and branches, determinate. Conidia holoblastic, solitary, dry, acrogenous, ellipsoidal, gangliar, broadly ellipsoidal, subspherical, obovoid or pyriform, brown or dark blackish-brown, smooth or verruculose, formed at the apex of the main conidiophores or branches, with transverse and usually also longitudinal or oblique septa, sometimes crucially septate.

**Etymology.** – lat.: *ramo*, referring to the branched conidiophores.

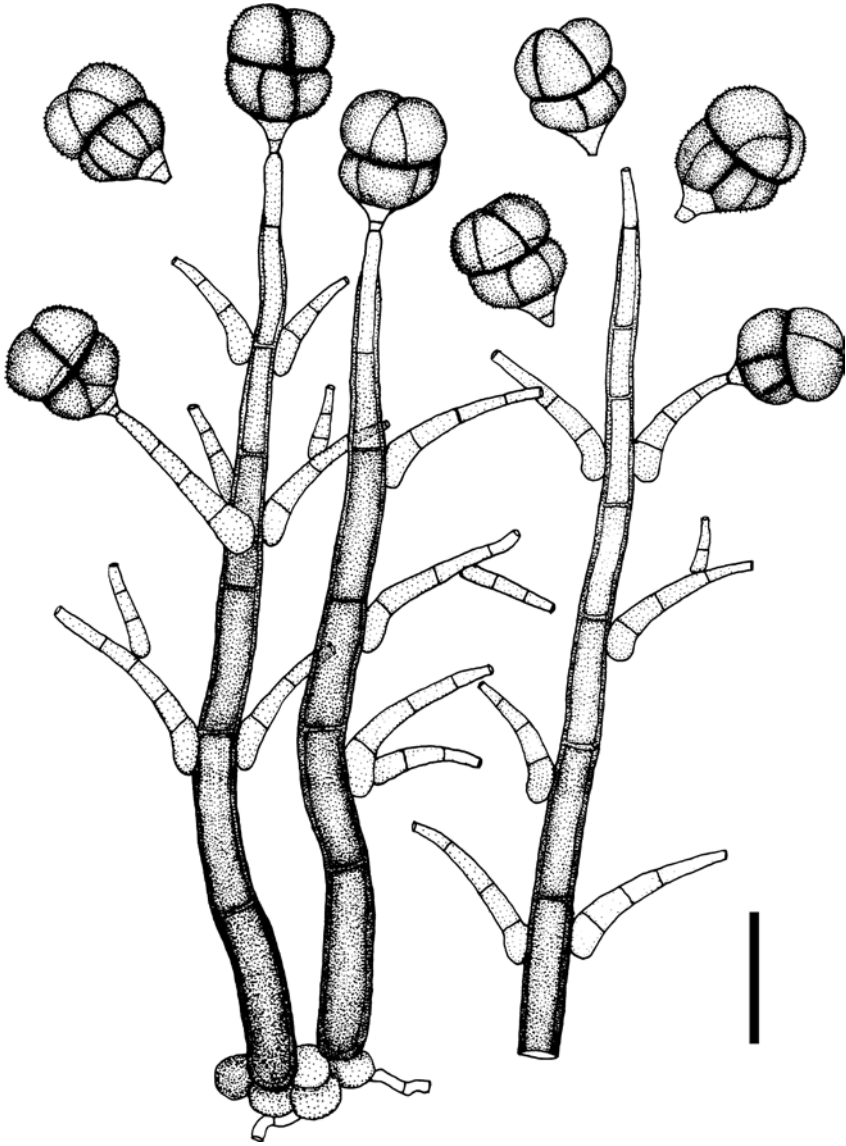
***Ramoacrodictys malabarica*** (Subram. & Bhat) G. Z. Zhao, **comb. nov.** – Figs.1, 2.

**Basionym.** – *Acrodictys malabarica* Subram. & Bhat, Kavaka 15(1–2): 41. 1987. MycoBank no.: MB 515351

**Colonies** on natural substrate effuse, hairy, scattered, olivaceous brown to blackish brown. – **Mycelium** partly superficial and partly immersed, composed of branched, septate, subhyaline to pale brown, smooth, 1–3  $\mu\text{m}$  wide hyphae. – **Conidiophores** macronematous, simple to multi-branched, singly or in group of two or three, erect or ascending, straight or flexuous, smooth, thick-walled, septate, up to 210  $\mu\text{m}$  long, dark brown at the base, 7.5  $\mu\text{m}$  wide, becoming taper and paler towards the apex, 2–3.5  $\mu\text{m}$  wide; branches fertile, pale brown, 20–50  $\mu\text{m}$  long, 4  $\mu\text{m}$  in the broadest part, tapered to a 1–2  $\mu\text{m}$  wide truncate apex. – **Conidiogenous cells** monoblastic, cylindrical, light brown, integrated, terminal, determinate. – **Conidia** holoblastic, acrogenous, dry, solitary, arising from the attenuated tips of the conidiophores or branches, olivaceous-brown to dark blackish-brown, smooth or slightly verruculose, gangliar, ellipsoidal, broadly ellipsoidal or obovoid, pyriform, muriform, usually with 1–3-transverse septa and a few longitudinal and oblique septa, constricted at the septa, 17–22  $\times$  12.5–15.5  $\mu\text{m}$ , sometimes crucially septate; basal 1–2 cells persistent, protuberant, subhyaline to pale yellow, conical or cuneiform, truncate at base, 4–6.5  $\times$  4–5  $\mu\text{m}$ .

On bamboo twigs, India, FFSI No. 3646 (typus).

**Material examined.** – CHINA, Diaoluoshan national forest park, Hainan province, on decaying culms of bamboo; 12 Dec 2003, leg. G. Z. Zhao, HMAS 90364 (= ZGZII<sub>03</sub>183-2).



**Fig. 1.** – *Ramoacrodictys malabarica*: Conidiophores and conidia on natural substrate. Bar = 20  $\mu$ m.

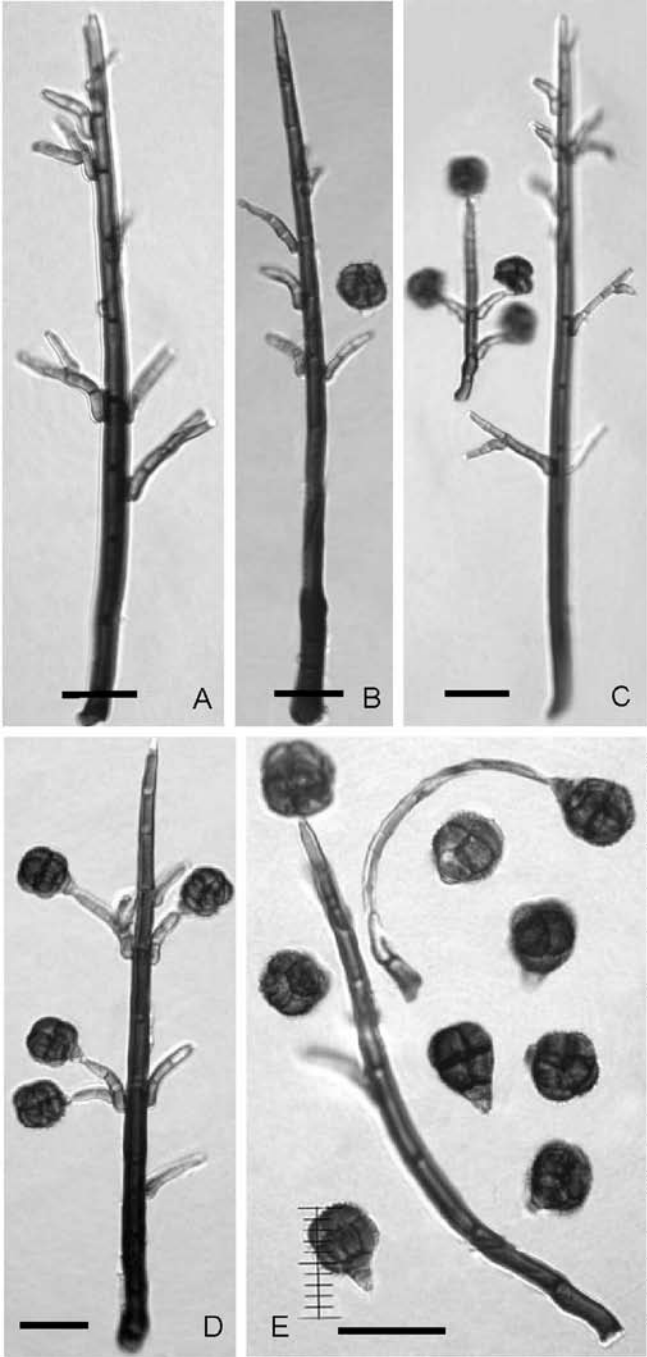


Fig.2. – *Ramoacrodictys malabarica*: A-E. Conidiophores and conidia on natural substrate. Bar = 20  $\mu$ m.

## Discussion

*Ramoacrodictys malabarica* superficially resembles *Acrodictys bambusicola* M.B. Ellis, *A. atroapicula* C.J.K. Wang & B. Sutton and *A. elaeidicola* M.B. Ellis (Baker *et al.* 2002a) in producing erect, macrone-matous conidiophores and holoblastic, muriform conidia. Those *Acrodictys* species can be distinguished from *R. malabarica* by the presence of unbranched conidiophores. *Ramoacrodictys malabarica* is also similar to *Mystrosporiella litseae* Munjal & Kulshrestha (Ellis 1971) by the presence of branched conidiophores and muriform conidia, but the latter has conidiophores that branch near the apex forming a stipe and a head, and the conidiogenous cells are polyblastic and sympodial.

*Ramoacrodictys malabarica* shares a similar conidial morphology with the members of *Ulocladium* Preuss (Ellis 1971, 1976). They both produced pyriform or obovoid, smooth or verruculose, muriform conidia. They can be differentiated on the basis of conidiophore morphology and ontogeny. Conidia in *R. malabarica* are typically holoblastic, monoblastic and conidiophores are erect, macrone-matous, proliferating percurrently, with branches in verticils, while in *U. botrytis* Preuss (Ellis 1971), type species of *Ulocladium*, conidia are produced on enteroblastic, polytretic, cicatrized, terminal or intercalary conidiogenous cells, which originate from sympodially extended conidiophores.

The Chinese collection slightly differs from the description of Subramanian & Bhat (1987). The Indian specimen has distinctly verruculose conidia and 2–4 lateral single fertile branches in the upper half of conidiophores, while the Chinese collection produces smooth or slightly verruculose conidia and a verticillate arrangement of the fertile branches on the conidiophores. The presence of single branches in the description of Subramanian & Bhat (1987) could be considered an observation of incompletely developed conidiophores or a morphological variation due to specific ecological conditions.

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