

***Sirothecium triseriale*, a new chirosporous anamorphic species from China**

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Abstract – A new *Sirothecium* species on decaying bamboo culms was collected from China. This fungus is distinct from other *Sirothecium* species in conidial size and septum number. A synoptic table of *Sirothecium* species is provided.

Bambusicolous fungi / lignicolous fungi / taxonomy

INTRODUCTION

Sirothecium Karst. was first established by Karsten (1887) for *Sirothecium saepiarium*. The genus was originally described as producing catenate brown conidia, which, however, was not accepted by Petrak & Sydow (1925). The type species *S. saepiarium* Karst. was later re-described and fully illustrated by Morgan-Jones *et al.* (1972). Sutton (1978) added another species of *Sirothecium minor* and emphasized that the cheiroid conidia and pycnidoid conidiomata are of importance for *Sirothecium*. *Chelisporium* and *Cheiroconium* were later synonymized with *Sirothecium* and only three species i.e. *S. saepiarium* Karst., *S. tinctum* (Peck) Hughes, and *S. minor* Sutton were accepted (Sutton, 1985).

We are studying the lignicolous freshwater fungi in Asia (Cai *et al.*, 2003, 2005; Fryar *et al.*, 2005; Luo *et al.*, 2004; Tsui *et al.*, 2006; Vijaykrishna & Hyde, 2006a), and in this paper report a previously undescribed species of *Sirothecium*. This fungus is distinct from other *Sirothecium* species in conidial size and septum number. It is therefore described herein as a new species.

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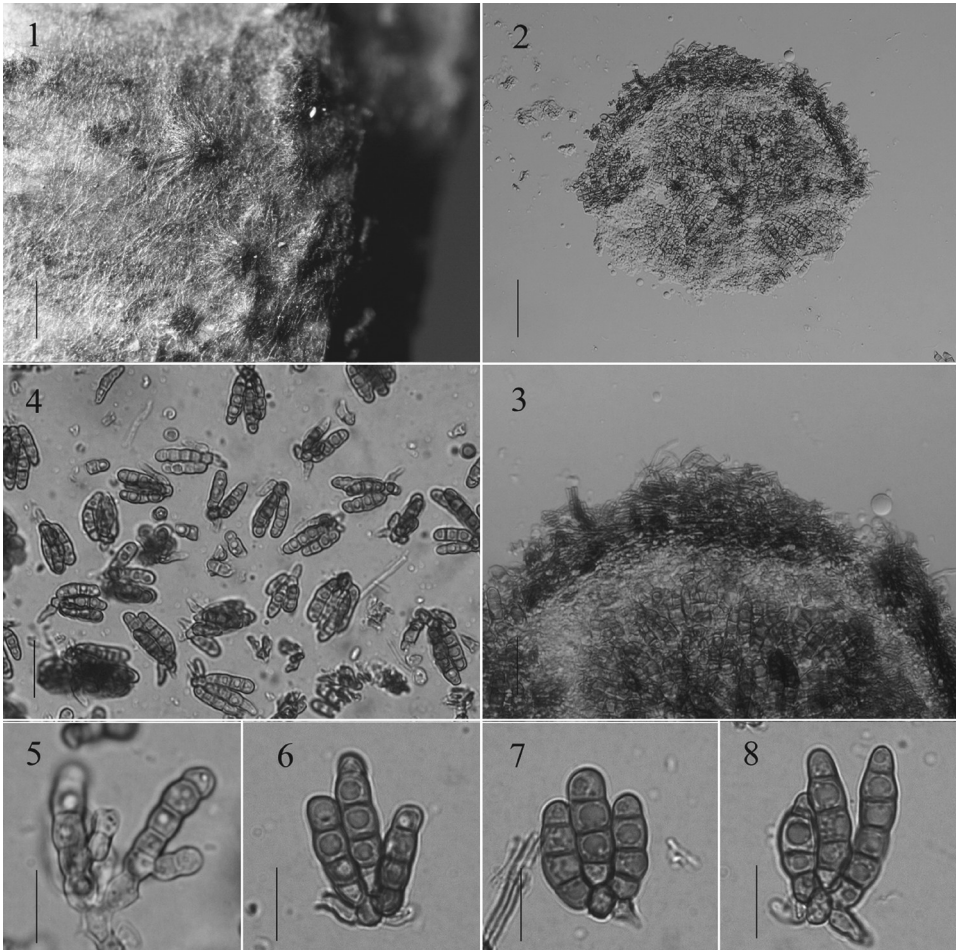
TAXONOMY

Sirothecium triseriale D.M. Hu, H. Zhu, K.Q. Zhang, L. Cai
et K.D. Hyde, **sp. nov.**

(Figs 1-8)

Etymology: Referring to the 3-armed conidia of this species.

Mycelium immersum, septatum, hyalinum vel pallide brunneum. Fructificationes semi-immersae vel superficiales, complanatae, sparsa or gregarious, usque, 240 μm diametro \times 150 μm crassae; Conidiphora micronemata, hyalina, septata, ramosa; *Cellulae conidiogena*e monoblasticae, integratae, terminales, determinatae, hyalinae vel pallide brunneae; Conidia holoblastica, cheiroidea, pallidissime brunnea, laevia, parietibus tenuibus, 14.5-24.5 μm \times 14.5-20 μm , e cellula basali sistencia e qua rami 2-4 breves 3-4(-5)-euseptati apicibus obtusis, exorti.



Figs 1-8. *Sirothecium triseriale* (from holotype). 1. Sporodochia on substratum. 2-3. Vertical section of sporodochia. 4. Mass of conidia. 5-8. Conidia. Scale bars: 1 = 200 μm , 2 = 40 μm , 3-4 = 20 μm , 5-8 = 10 μm .

Holotype. – China, Yunnan, Xiaobailong Forest Reserve, on submerged bamboo culms, 4 Sep. 2004, H. Zhu, YMF6.00017.

Mycelium immersed, septate, hyaline to pale brown. Conidiomata stromatic, pycnidoid, semi-immersed to superficial, scattered or gregarious, flattened, black, unilocular, ca. 240 μm in diam and 150 μm high. Conidiophores micronematous, hyaline, branched, septate, formed from the inner cells of the conidiomatal wall. Conidiogenous cells monoblastic, integrated, terminal, lateral or comprising the conidiophore, hyaline to pale brown, smooth, determinate, not proliferating. Conidia holoblastic, 17.5–24.5 μm \times 14.5–20 μm (\bar{x} = 17.8 \times 15.2 μm , n = 25), pale to medium brown, smooth, chiroid, 3–4(–5) euseptate, with 2–4 arms vertically inserted in different planes on a basal cell; arms discrete, unbranched, appressed or divergent.

Teleomorph. – Unknown.

Habitat. – Saprobic on submerged bamboo culms.

Known distribution. – China.

DISCUSSION

Sirothecium triseriale produces euseptate chiroid conidia in pycnidoid conidiomata and the conidial arms are slightly laterally appressed. These features agree well with the generic concept of *Sirothecium* Karst. (Sutton, 1978; Morgan-Jones *et al.*, 1972). Ho *et al.* (2000) reviewed anamorphic genera that produce chiroid conidia, and *Sirothecium* is unique in producing pycnidoid conidiomata. SSU, ITS and LSU sequence data indicated that *Dictyosporium* and allied genera (i.e with chiroid conidia) occurred in the Pleosporales (Tsui *et al.*, 2006). Although *Sirothecium* was not included in this study it is also likely to belong in this order with is one of the five marine lineages of freshwater ascomycetes (Vijaykrishna *et al.*, 2006).

The number of arms and the septate of *Sirothecium triseriale* are similar to that of *S. saepiarium*, but the later produces larger conidia than *S. triseriale* (Table 1). *Sirothecium triseriale* can be differentiated from *S. minor* and *S. tinctum* in producing larger conidia with more septa (Table 1).

Table 1. Comparison of species of *Sirothecium*.

	<i>Conidial size</i>	<i>Number of arms</i>	<i>Number of septa</i>
<i>S. saepiarium</i>	30–33 \times 12–19 μm	3–5	3–5
<i>S. minor</i>	12–17 \times 10–13 μm	3–7	2–3
<i>S. tinctum</i>	10.5–13 \times 6–9 μm	2–4	0–2
<i>S. triseriale</i>	17–24.5 \times 14.5–20 μm	2–4	3–4(–5)

KEY TO SPECIES OF *SIROTHECIUM*

1. Conidia longer than 30 μm *S. saepiarium*
 1. Conidia shorter than 20 μm 2
2. Conidia 10.5-13 \times 6-9 μm , with 2-4 arms *S. tinctum*
 2. Conidia 12-17 \times 10-13 μm , with 3-7 arms *S. minor*
 2. Conidia 17-24.5 \times 14.5-20 μm , with 2-4 arms *S. triseriale*

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LITERATURE CITED

- CABANELA M.V., JEEWON R. & HYDE K.D., 2007 — Morphotaxonomy and phylogeny of *Paoayensis lignicola* gen. et sp. nov. (ascomycetes) from submerged wood in Paoay Lake, Ilocos Norte, the Philippines. *Cryptogamie Mycologie* (In press).
- CAI L., ZHANG K.Q., MCKENZIE E.H.C. & HYDE K.D., 2003a — Freshwater fungi from bamboo and wood submerged in the Liput River in the Philippines. *Fungal Diversity* 13: 1-12.
- CAI L., ZHANG K.Q. & HYDE K.D., 2005 — *Ascoyunnania chameleonina* gen. et sp. nov. a freshwater fungus collected from China and its microcyclic conidiation. *Fungal Diversity* 18: 1-8.
- FRYAR S.C., BOOTH W., DAVIES J., HODGKISS I.J. & HYDE K.D., 2005 — Evidence of *in situ* competition between fungi in freshwater. *Fungal Diversity* 18: 59-71.
- HO W.H., HODGKISS I.J. & HYDE K.D., 2000 — *Cheiromyces lignicola*, a new chirosporous anamorphic species from Hong Kong. *Mycologia* 92: 582-588.
- KARSTEN P.A., 1887 — Symbolae ad Mycologiam fennicam XIX. *Meddelanden af Societas pro Fauna et Flora Fennica. Helsinki* 14: 85-94.
- LUO J., YIN J.F., CAI L., ZHANG K.Q. & HYDE K.D., 2004 — Freshwater fungi in Lake Dianchi, a heavily polluted lake in Yunnan, China. *Fungal Diversity* 16: 93-112.
- MORGAN-JONES G., NAG RAJ T.R. & KENDRICK W.B., 1972 — Icones Generum Coelomycetum V. *University of Waterloo Biology Series* 7: 1-52.
- PETRAK F. & SYDOW H., 1925 — Kritisch-systematische Originaluntersuchungen über Pyrenomyzeten, Sphaeropsideen und Melanconieen. *Annales Mycologici* 23: 209-294.
- SUTTON B.C., 1978 — Two undescribed deuteromycete microfungi from the Azores. *Kew Bulletin* 33: 343-346.
- SUTTON B.C., 1985 — Notes on some deuteromycete genera with cheiroid or digitate brown conidia. *Proceedings of the Indian Academy of Sciences. Plant Sciences* 94: 229-244.
- TSUI C.K.M., BERBEE M.L., JEEWON R. & HYDE K.D., 2006 — Molecular phylogeny of *Dictyosporium* and allied genera inferred from ribosomal DNA. *Fungal Diversity* 21: 157-166.
- VIJAYKRISHNA D. & HYDE K.D., 2006 — Inter and intra stream variation of lignicolous freshwater fungi in tropical Australia. *Fungal Diversity* 21: 203-224.
- VIJAYKRISHNA D., JEEWON R. & HYDE K.D., 2006 — Molecular taxonomy, origins and evolution of freshwater ascomycetes. *Fungal Diversity* 23: 367-406.