

# Mycological Society of America

---

A New Species of *Trinacrium* from Submerged Leaves from India

Author(s): M. Soosamma, G. Lekha, K. N. Sreekala and D. J. Bhat

Source: *Mycologia*, Vol. 93, No. 6 (Nov. - Dec., 2001), pp. 1200-1202

Published by: Mycological Society of America

Stable URL: <http://www.jstor.org/stable/3761680>

Accessed: 01-06-2015 04:47 UTC

## REFERENCES

Linked references are available on JSTOR for this article:

[http://www.jstor.org/stable/3761680?seq=1&cid=pdf-reference#references\\_tab\\_contents](http://www.jstor.org/stable/3761680?seq=1&cid=pdf-reference#references_tab_contents)

You may need to log in to JSTOR to access the linked references.

---

Your use of the JSTOR archive indicates your acceptance of the Terms & Conditions of Use, available at <http://www.jstor.org/page/info/about/policies/terms.jsp>

JSTOR is a not-for-profit service that helps scholars, researchers, and students discover, use, and build upon a wide range of content in a trusted digital archive. We use information technology and tools to increase productivity and facilitate new forms of scholarship. For more information about JSTOR, please contact support@jstor.org.



*Mycological Society of America* is collaborating with JSTOR to digitize, preserve and extend access to *Mycologia*.

<http://www.jstor.org>

## A new species of *Trinacrium* from submerged leaves from India

M. Soosamma  
G. Lekha

*Department of Botany, Mount Carmel College,  
Bangalore-560 052, India*

K. N. Sreekala  
D. J. Bhat<sup>1</sup>

*Department of Botany, Goa University, Goa-403 206,  
India*

**Abstract:** *Trinacrium indica* sp. nov., isolated from submerged coffee leaves from India, is described and illustrated. The new taxon is compared with previously described species of *Trinacrium*.

**Key Words:** Aquatic hyphomycetes, biodiversity, India, foam, submerged coffee leaves, taxonomy, triradiate conidia

Freshwater hyphomycetes (Ingoldian Hyphomycetes) constitute an ecologically specialized group of microfungi which grow on fallen and decomposing plant litter submerged in stream and river waters. The conidia of these fungi are distinctly shaped in that they are tri- or tetra-radiate, branched, sigmoid, curved or appendaged (Ingold 1975). In the last two decades, mountain streams and rivers traversing the Western and Eastern Ghats in southern India and the central and eastern Himalayas in the northern India have been surveyed, and efforts made to document the distribution of these fungi (Subramanian and Bhat 1981, Bhat and Chien 1990, Sridhar et al 1992, Sati and Tiwari 1997). Nearly one third of the total 318 species of freshwater hyphomycetes recorded from all over the world are documented from India (Sati and Tiwari 1997).

During a survey of freshwater hyphomycetes of Western Ghat forests, triradiate conidia with a recurved arm of an aquatic fungus were gathered in foam and submerged coffee leaves from a stream in a coffee plantation in Somwarpet, Kodagu District, Karnataka State, India. The fungus is undescribed. We describe it here as a new taxon of *Trinacrium*.

Single conidia of the fungus were transferred to 2% malt extract agar medium supplemented with an-

tibiotic (Streptomycin sulfate 0.04 g and Penicillin G 0.04 g dissolved in 10 mL of sterile distilled water and added to 1 L of cooling sterile medium). The fungus grew slowly on the culture medium but submerging 14-d-old culture strips in sterile distilled water yielded abundant conidia and conidiogenous structures at various stages of development within 3–4 d. Leaf litter of *Coffea arabica* L., gathered from the same locality and incubated in sterile distilled water in a vertical glass jar with agitator by a continuous flow of air from a fish-aerator also yielded abundant conidia after 2 d. The fungus sporulated in malt extract agar medium only after 6 wk of incubation.

*Trinacrium indica* Soosamma, Lekha, Sreekala and Bhat, sp. nov. FIG. 1

*Coloniae* tardae crescentes in ME agar, cum marginis circinatis, albidae ad ochraceae, aequusae, 1.2–1.5 cm diam in 10 ad 12 d inter 25 C. *Mycelium* immersum ramosum, septatum, hyalina hyphae 1–3  $\mu\text{m}$  latum. *Conidiophora* micronematosa, mononematosa, formo lateralia on hyphae, simplicia, hyalina, laevis, 1.5–2.5  $\times$  1.5–2.5  $\mu\text{m}$ . *Cellulae conidiogena*e monoblasticae, laeviae, determinatae ad sympodiales, hyalinae, apicalae truncatae. *Conidia* solitaria, triradiata, Y-formia, bifurcatus asymmetricalae, septata, hyalina, laevia, ad leniter constricta ac septata a punctatis bifurcata, pallude brunnea in massa, originata in massa 1–10 ab loci, principalis axis cylindrica, recta vel flexuosa, 1–3-septata, 28–56  $\times$  1.2–2.5  $\mu\text{m}$ , cum 2 cylindricale ac divergenta brachium originata synchronous ad apicem principalis axis; brachia parvus recta vel flexuosa, rotundata in finibus, 1–2-septata, 23–35  $\times$  1.2–2.5  $\mu\text{m}$ ; brachia longa 1–3-septata, recurvata distincta in medius inter, 46–65  $\times$  1.2–2.5  $\mu\text{m}$ .

*Colonies* on malt extract agar slow growing, with circular margin, white to gray, flat, 1.2–1.5 cm diam in 10–12 d at 25 C. *Mycelium* mostly immersed, composed of branched, septate, hyaline hyphae 1–3  $\mu\text{m}$  wide. *Conidiophores* micronematous, mononematous, formed laterally on vegetative hyphae, simple, hyaline, smooth, 1.5–2.5  $\times$  1.5–2.5  $\mu\text{m}$ . *Conidiogenous cells* monoblastic, simple, determinate to sympodial, hyaline, truncate at the apex after conidial secession. *Conidia* solitary, triradiate, asymmetrically Y-shaped, septate, hyaline, smooth, thin-walled, slightly constricted and septate at bifurcation point, pale brown in mass, developing in groups of 1–10 from one locus, with main axis cylindrical, erect or flexuous, 1–3-septate, 28–56  $\times$  1.2–2.5  $\mu\text{m}$ , with two cylindrical,

Accepted for publication April 28, 2001.

<sup>1</sup> Corresponding author, Email: djbhat@unigoa.ernet.in

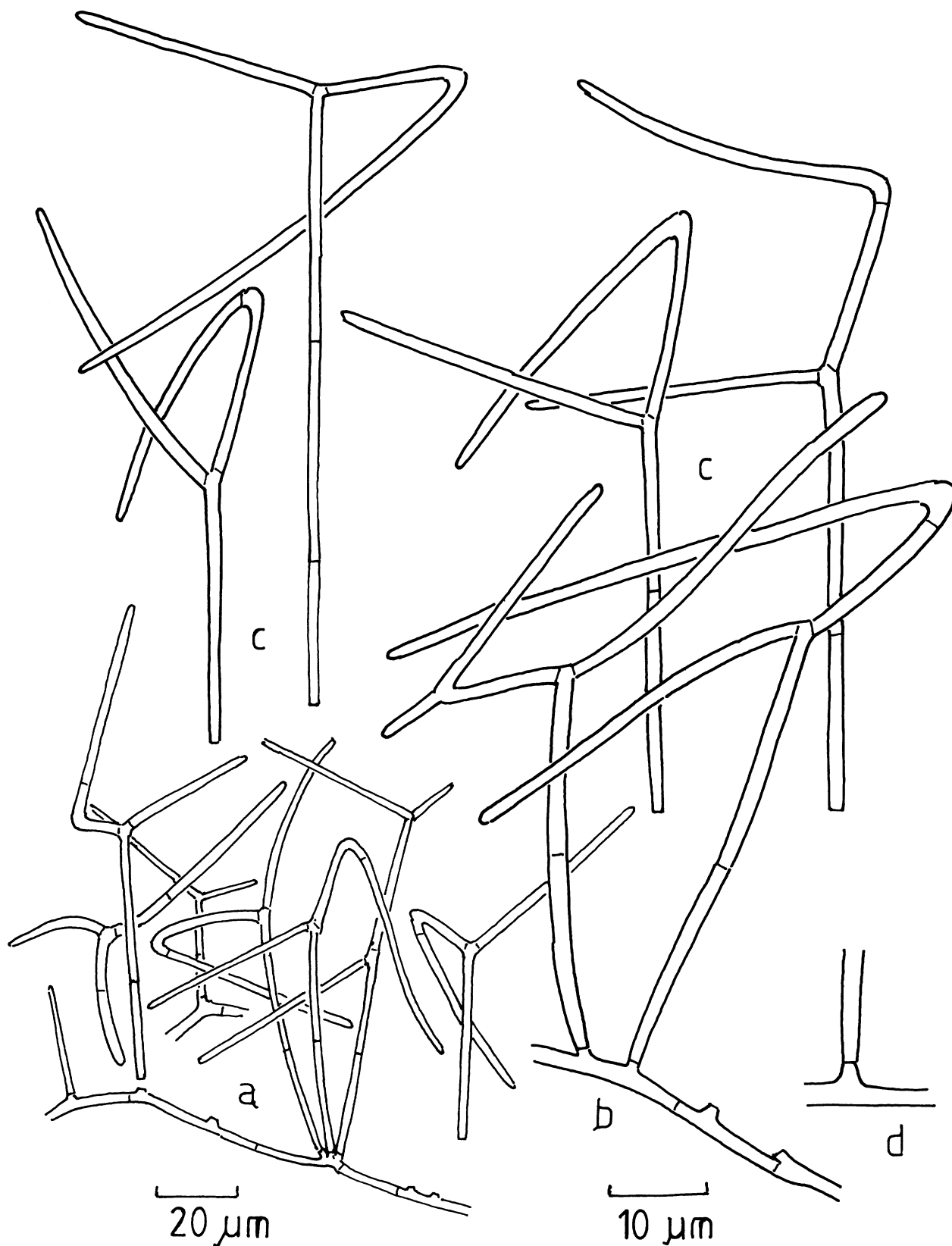


FIG. 1. *Trinacrium indica*. a. Conidiogenesis (in lower magnification); b. Conidiogenesis (in higher magnification); c. Conidia; d. Conidiogenous locus (note the holoblastic conidiogenesis).

synchronously developing and divergent arms at the apex of the main axis; short arm straight or slightly flexuous, rounded at the tip, 1–2-septate,  $23\text{--}35 \times 1.2\text{--}2.5 \mu\text{m}$ ; long-arm 1–3-septate, distinctly recurved at midpoint,  $46\text{--}65 \times 1.2\text{--}2.5 \mu\text{m}$ .

*Specimen examined.* INDIA, KARNATAKA: Kodagu, Somwarpet. On decaying and submerged leaves of *Coffea arabica*, Nov 1998, IMI 385464 (HOLOTYPE). Soosamma Mathews, GUFCC 168 (ISOTYPE). Dried MEA culture mat established from single conidium isolated from decaying and submerged leaves of *Coffea arabica*, 18 Nov 1998, Sreekala Nair, GUFCC 169 (PARATYPE).

The genus *Trinacrium* Riess, typified by *T. subtile* Riess, is characterized by production of triradiate conidia, consisting of a main axis bearing two divergent radiate arms (Saccardo 1886). The conidia in general are hyaline, smooth-walled, septate and Y-shaped. Depending upon the species, the main axis and arms of the conidia may be thin and delicate, clavate or further branched. Based on conidiophore and conidogenous cell morphology and conidium morphology and ontogeny, seven species of *Trinacrium* have been described. These include *T. angamosense* Matsushima (1995), *T. gracile* Matsushima (1975), *T. inaequiramiferum* Matsushima (1989), *T. parvisporum* Matsushima (1987), *T. robustum* Tzean & Chen (1989), *T. subtile* Riess (Saccardo 1886, Matsushima 1975) and *T. torulosum* Sacc. & Malbr. (Saccardo 1886). Species of *Trinacrium* generally inhabit decaying leaf litter (Matsushima 1975, 1987, 1989, 1995) but are also reported as parasitizing oospores of *Pythium* (Drechsler 1938). Ando (1992) noted that *T. subtile* has an affinity for aquatic environments. Tzean and Chen (1989) compared the species of *Trinacrium* and concluded that these can be distinguished by length and width of main axis and arms, or the shape of the conidia. The conidium of *T. indica* shows some similarity to *T. subtile* and *T. gracile* in its overall dimensions but differs markedly by its distinctly recurved long arm.

## ACKNOWLEDGMENT

Two of us (S.M. and L.G.) sincerely thank Dr. (Sr) M. Genevieve, Principal, Mt Carmel College, Bangalore, for constant encouragement. This work is supported by a research grant to D.J. Bhat from the Department of Science & Technology, Government of India, New Delhi.

## LITERATURE CITED

- Ando K. 1992. Differentiation patterns of stauroconidia based on unusual conidia produced by *Trinacrium subtile*. *Trans Mycol Soc Japan* 33:223–229.
- Bhat DJ, Chien CY. 1990. Water-borne hyphomycetes found in Ethiopia. *Trans mycol Soc Japan* 31:147–157.
- Drechsler C. 1938. Two hyphomycetes parasitic on oospores of root-rotting Oomycetes. *Phytopathology* 28:81.
- Ingold CT. 1975. An illustrated guide to aquatic and water-borne hyphomycetes (Fungi Imperfecti) with notes on their biology. Freshwater Biological Association. Scientific Association Scientific Publication No. 30.
- Matsushima T. 1975. *Icones Microfungorum a Matsushima Lectorum*. Kobe, Japan: Publ. by the author. 209 p, 415 pl.
- . 1987. *Matsushima Mycological Memoirs No.5*. Kobe, Japan: Publ. by the author. 100 p.
- . 1989. *Matsushima Mycological Memoirs No.6*. Kobe, Japan: Publ. by the author. 44 p.
- . 1995. *Matsushima Mycological Memoirs No.8*. Kobe, Japan: Publ. by the author. 60 p.
- Saccardo PA. 1886. *Sylloge Fungorum* 4:1–807.
- Sati SC, Tiwari N. 1997. Glimpses of conidial aquatic fungi in Kumaun Himalay. *Recent Researches in Ecology, Environment and Pollution* 10:17–33.
- Sridhar KR, Chandrashekar KR, Kaveriappa KM. 1992. Research on the Indian Subcontinent. In: Barlocher F, ed. *The Ecology of Aquatic Hyphomycetes*. Berlin: Springer-Verlag. p 182–211.
- Subramanian CV, Bhat DJ. 1981. Conidia from freshwater foam samples from the Western Ghats, southern India. *Kavaka* 9:45–62.
- Tzean SS, Chen JL. 1989. A new species of *Trinacrium* from Taiwan. *Mycol Res.* 93:391–393.