

## New and unusual hyphomycetes from Mahabaleshwar, India

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**Abstract** – Three conidial fungi, *Tetraploa circinata* sp. nov., *Vamsapriya mahabaleshwarensis* sp. nov. and *Gliophragma setosum*, isolated from plant litter and collected at Mahabaleshwar, Maharashtra, India, are described and illustrated.

**Key words** – biodiversity, anamorphic fungi, taxonomy, Western Ghat forests

### Introduction

During the course of our studies on microfungi of the forests of Western Ghats, two new dematiaceous hyphomycetes, *Tetraploa circinata* and *Vamsapriya mahabaleshwarensis*, were isolated from fallen litter collected from Mahabaleshwar, southern India. *Tetraploa circinata* is unique in its long, spirally coiled, verrucose appendages. *Vamsapriya mahabaleshwarensis* differs from the only previously described species in this genus by its branched conidial chains developing on polytretic conidiogenous cells. *Gliophragma setosum*, a rare conidial fungus, was also isolated during the course of this study.

### Taxonomic descriptions

*Tetraploa circinata* Pratibha & Bhat, sp. nov.

Figs. 1, 2

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*Ad fungos conidiales, hyphomycetes. Coloniae in substrato naturali effusae, atrobrunneae vel nigrae. Mycelium superficialia, ex hyphis laevibus, pallide brunneis, ramosis, septatis, 2.5–3 µm lat. compositum. Setae et hyphopodia absentia. Conidiophora micronematica, ramosa, atrobrunnea. Cellulae conidiogenae monoblasticae, incorporatae. Conidia ex corpore muriforme et appendicibus quatuor composita, solitaria, sicca, atrobrunnea, conidorum sunt 2 formae; conidia priora ex 4 columnis compositum, 13–15 × 21–26*

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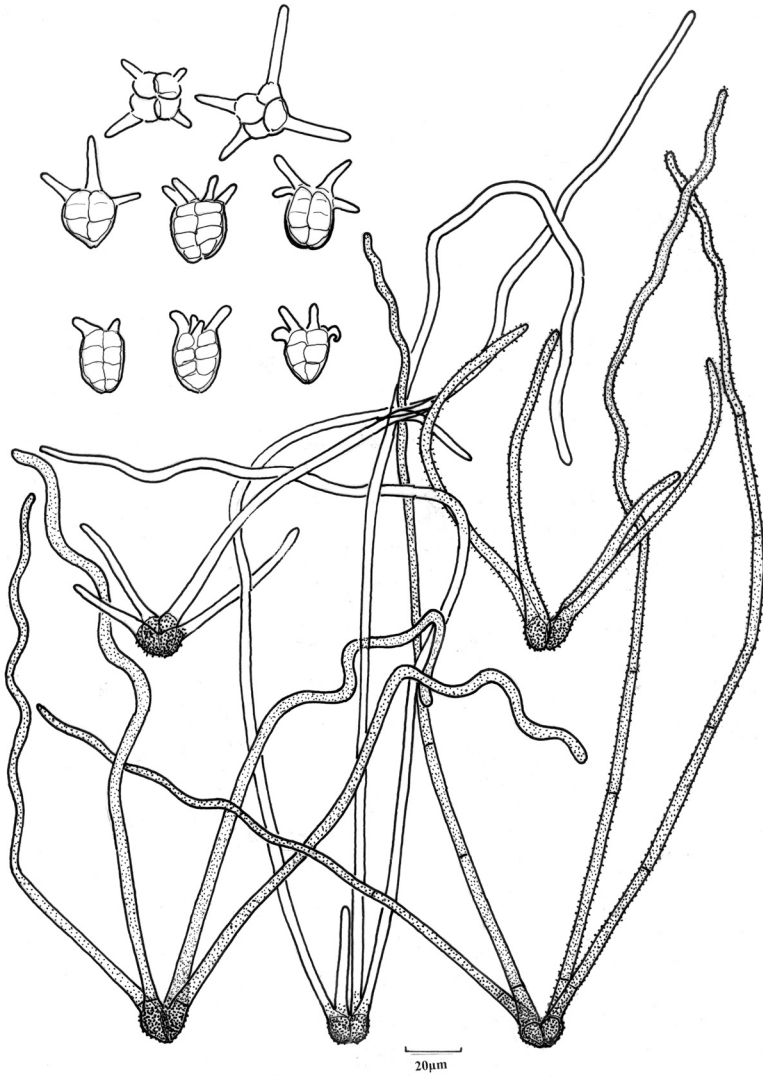


FIG. 1. *Tetraploa circinata*. Two types of conidia.

$\mu\text{m}$ , columnae 5–7  $\mu\text{m}$  lat., divergentibus ad apicem, appendices spirales, verruculosae, atrobrunneae, 54–415  $\times$  3–3.5  $\mu\text{m}$ ; conidia cetera ex 4 columnis compositum, 15–24  $\times$  12–22  $\mu\text{m}$ , appendices laeviae, 5–22  $\mu\text{m}$  longa, 2–4  $\mu\text{m}$  lat.; columnae 8–10  $\mu\text{m}$  lat.

HOLOTYPE: On dead, decaying bamboo twig, 04/11/2006, J. Pratibha, Mahabaleshwar, Maharashtra, India, Herb. No. HCIO 48133 (Isotype: GUBH MH3)

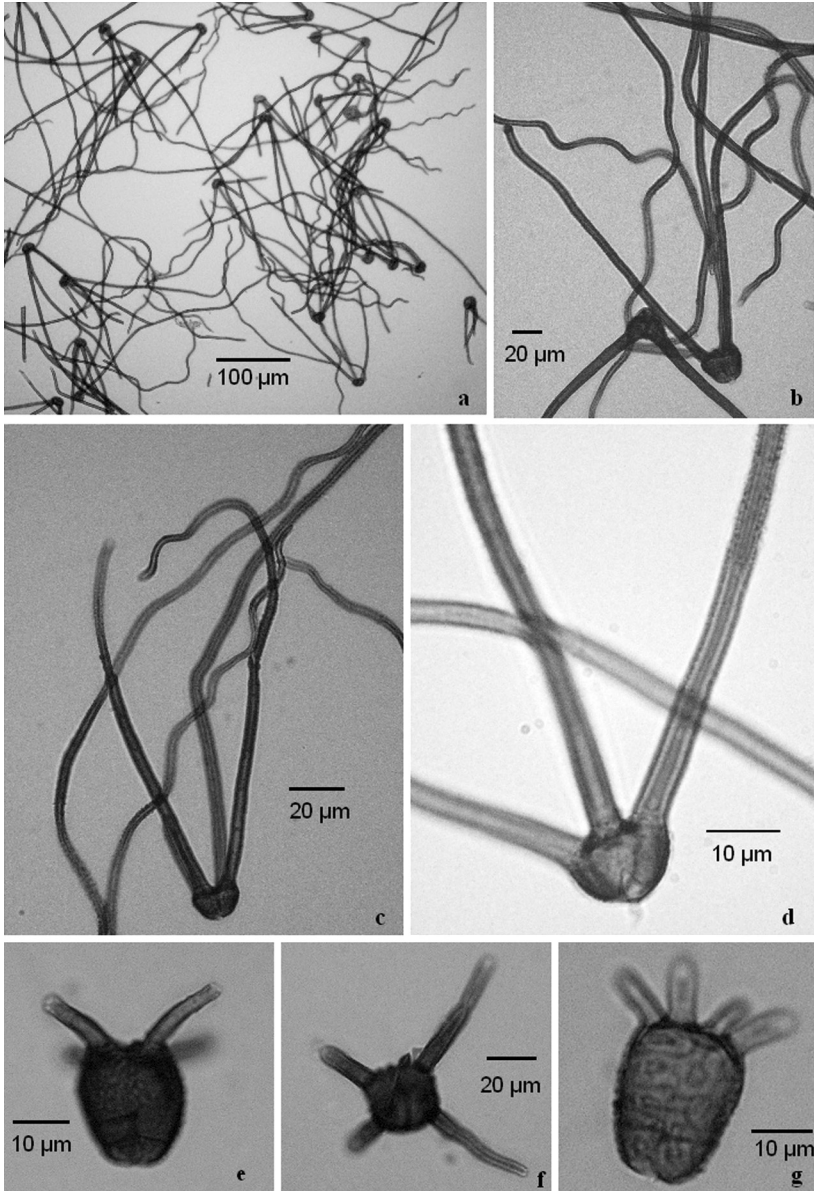


FIG. 2. *Tetraploa circinata*.

a-d. First type of conidia with long, spiral, verrucose, appendages;  
e-g. Second type of conidia with short, smooth appendages.

Conidial fungi, hyphomycetes. Colonies on natural substrate effuse, dark brown to black. Mycelium partly superficial, composed of septate, branched, light brown, smooth hyphae 2.5–3  $\mu\text{m}$  wide. Setae and hyphopodia absent. Conidiophores micronematous, branched, dark brown, forming an entanglement on the substrate. Conidiogenous cells monoblastic, undifferentiated from conidiophores. Conidia consisting of a dictyosporous body and four appendages, solitary, dry, dark brown, of two morphological types; first type 13–15  $\mu\text{m}$  long, 21–26  $\mu\text{m}$  wide, consisting of four columns each of 1–2 cells, columns 5–7  $\mu\text{m}$  wide, each terminating apically in a long, spiral or sinuate, verrucose, dark brown appendage, 54–415  $\times$  3–3.5  $\mu\text{m}$ ; second type of conidia 15–24  $\mu\text{m}$  long, 12–22  $\mu\text{m}$  wide, consisting of four columns each of 2–5 cells, columns 8–10  $\mu\text{m}$  wide, with short, smooth, apical appendages 5–22  $\mu\text{m}$  long and 2–4  $\mu\text{m}$  wide.

NOTES: The genus *Tetraploa* was established by Berkeley & Broome in 1850 with *T. aristata* Berk. & Broome as type species. So far 11 species and 2 varieties are accommodated in the genus: *T. abortiva*, *T. aristata* var. *aristata*, *T. aristata* var. *sacchari*, *T. biformis*, *T. curviappendiculata*, *T. divergens*, *T. ellisii*, *T. javanica*, *T. longissima*, *T. muscicola*, *T. scabra* and *T. setifera* (Revay 1993, Matsushima & Matsushima 1996, Hatakeyama et al. 2005, Anonymous 2008). The genus is characterized by conidia that are sessile, solitary, brown, verruculose, tetra-columnar, with shallow furrows between the columns; the columns diverge from one another apically and each terminates in an arm or appendage which is setiform, septate and tapering at the tip (Ellis 1949, 1971). Of the known species, *T. aristata*, with two types of conidia and long appendages, bears some similarity to *T. circinata*. In *T. aristata*, the first type of conidia are 25–39  $\times$  14–29  $\mu\text{m}$  with smooth appendages 12–80  $\times$  4.5–8  $\mu\text{m}$  while the second type of conidia, which consist of only 2 columns of cells, are 8–18  $\times$  7–12  $\mu\text{m}$  with smooth appendages 80–330  $\times$  3–6  $\mu\text{m}$ . In *T. circinata* the first type of conidia are 13–15  $\times$  21–26  $\mu\text{m}$  with long, spiral, verrucose appendages, 54–415  $\times$  3–3.5  $\mu\text{m}$  and the second type of conidia are 15–24  $\times$  12–22  $\mu\text{m}$  with short, smooth appendages, 5–22  $\times$  2–4  $\mu\text{m}$ .

***Vamsapriya mahabaleshwariensis* Pratibha & Bhat, sp. nov.**

Figs. 3, 4

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*Ad fungus conidiales, hyphomycetes. Coloniae in substrato naturali effusae, atrobrunneae vel nigrae. Mycelium substrato immersum, ex hyphis laevibus, pallide brunneis, ramosis, septatis, 2.5–3  $\mu\text{m}$  latis compositum. Setae et hyphopodia absentia. Synnematica erecta, recta vel flexuosa, atrobrunneae vel nigrae, apice divergentibus composita, 655–1150  $\mu\text{m}$  longa, 100–150  $\mu\text{m}$  lat. ad basim, 15–45  $\mu\text{m}$  lat. ad medio, 30–80  $\mu\text{m}$  lat. ad apicem. Conidiophora macronematica, synnematica, septata, ramosa, atrobrunneae, laevia. Cellulae conidiogenae polytreticae, integratae vel discretiae, terminaliae vel intercalares,*

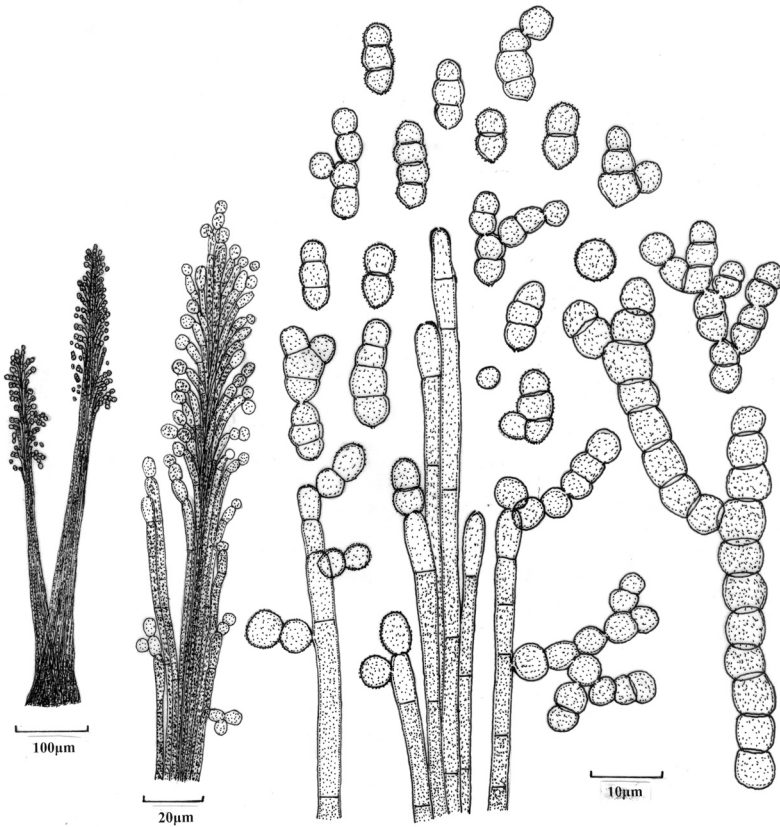


FIG. 3. *Vamsapriya mahabaleshwarensis*. Synnemata, conidiogenous cells and conidia.

*nunquam cicatricem, pallide brunneae, 6–23 × 3–5 µm. Conidia sicca, catenulata, laevia vel verruculosa, 0–4-septata, ad septa constricta, ovoidea, ellipsoidea vel oblonga, utrinque rotundata, 5–25 × 4–9 µm.*

HOLOTYPE: On unidentified dead twig, 04/11/2006, J. Pratibha, Mahabaleshwar, Maharashtra, India, Herb. No. HCIO 48134. (Isotype: GUBH MH4)

Conidial fungi, hyphomycetes. Colonies on natural substrate effuse, dark brown to black. Mycelium immersed in the substrate, composed of septate, branched, light brown, smooth, 2.5–3 µm wide hyphae. Setae and hyphopodia absent. Synnemata erect, straight to flexuous, dark brown to black, diverging at the apex, 655–1150 µm long, 100–150 µm wide at the base, 15–45 µm wide in the middle, 30–80 µm wide at the apex. Conidiophores macronematous,



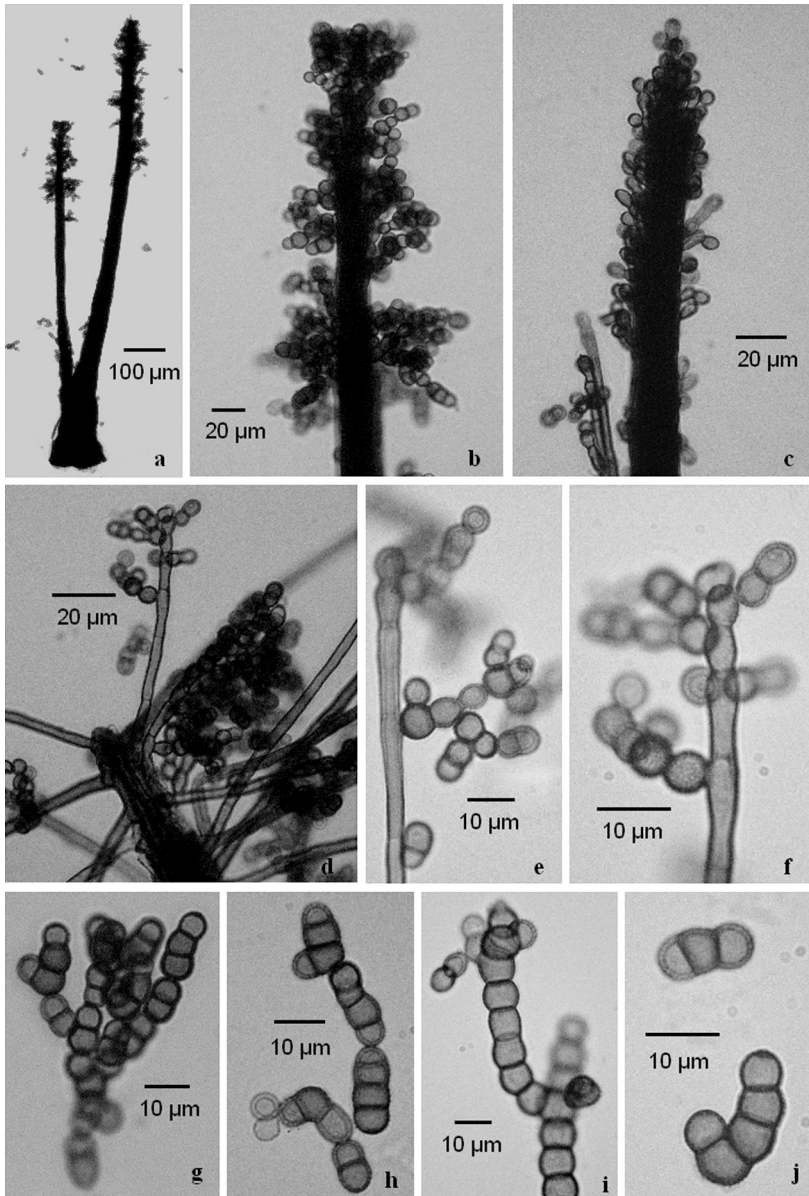


FIG. 4. *Vamsapriya mahabaleshwarensis*.  
a. Synnemata; b–c. Fertile apical region;  
d–f. Conidiophores with polytretic conidiogenous cells and conidia;  
g–j. Catenate conidia with branched chains.

synnematos, septate, branched, dark brown, smooth. Conidiogenous cells polytretic, integrated or discrete, terminal or intercalary, non-cicatrizated, light brown,  $6\text{--}23 \times 3\text{--}5 \mu\text{m}$ . Conidia dry, catenate, smooth to minutely verruculose, 0–4-septate, constricted at the septa, ovoid, ellipsoidal or oblong, rounded at both ends,  $5\text{--}25 \times 4\text{--}9 \mu\text{m}$ , developing in branched chains which secede easily.

NOTES: The monotypic genus *Vamsapriya* was established by Gawas & Bhat, with *V. indica* as type, to accommodate conidial fungi with catenate, phragmosporous conidia on synnematos conidiophores with non-cicatrizated, monotretic, conidiogenous cells (Gawas & Bhat 2005). *Vamsapriya mahabaleshwarensis* differs from the type species by formation of polytretic conidiogenous cells and branched conidial chains. Conidia in *V. indica* are smooth, 2–12-septate,  $10\text{--}80 \times 4\text{--}6 \mu\text{m}$ , whereas in *V. mahabaleshwarensis* they are smooth to minutely verruculose, mostly 0–4-septate, rarely up to 10-septate,  $5\text{--}25 \times 4\text{--}9 \mu\text{m}$ .

*Gliophragma setosum* Subram. & Lodha, Can. J. Bot. 42: 1060. 1964. Fig. 5

Conidial fungi, hyphomycetes. Colonies on natural substrate effuse, cottony, grayish, velvety. Mycelium partly superficial on the substrate, composed of septate, branched, hyaline, smooth hyphae  $2\text{--}2.5 \mu\text{m}$  wide. Synnemata erect, straight to flexuous, brown,  $105\text{--}150 \times 12\text{--}25 \mu\text{m}$ , enclosing the lower part of setae. Setae branched, septate, smooth, light brown,  $230\text{--}270 \times 2.5\text{--}4 \mu\text{m}$ ; middle seta unbranched, dark brown, thick-walled,  $260\text{--}300 \times 3\text{--}6.5 \mu\text{m}$ . Conidiophores macronematous, synnematos, septate, branched, light brown, smooth,  $170\text{--}250 \times 3\text{--}5 \mu\text{m}$ , developing together with setae. Conidiogenous cells polyblastic, integrated. Conidia aggregated in slimy, light brown masses; individual conidium hyaline, smooth, consisting of 5–7 cells separated by narrow isthmi,  $40\text{--}48.5 \mu\text{m}$  long,  $3\text{--}4.5 \mu\text{m}$  wide.

SPECIMEN EXAMINED: On leaf litter, 04/11/2006, J. Pratibha, Mahabaleshwar, Maharashtra, India, Herb. No. HClO 48135; GUBH MH12.

NOTES: *Gliophragma setosum* originally isolated from horse dung from Massoorie, Uttar Pradesh, India, is the type and only species of the genus *Gliophragma* Subram. & Lodha (Subramanian & Lodha 1964). We isolated the fungus from plant litter collected at Mahabaleshwar, India, and this is only the second known collection.

### Acknowledgments

We thank the University Grants Commission, Council of Scientific and Industrial Research and Ministry of Environment & Forests, Government of India, New Delhi, for financial support in the form of research grants during the tenure of which this work was carried out. The authors thank Prof. Bryce Kendrick, Canada, and Dr. Eric McKenzie, New Zealand, for reviewing the manuscript.

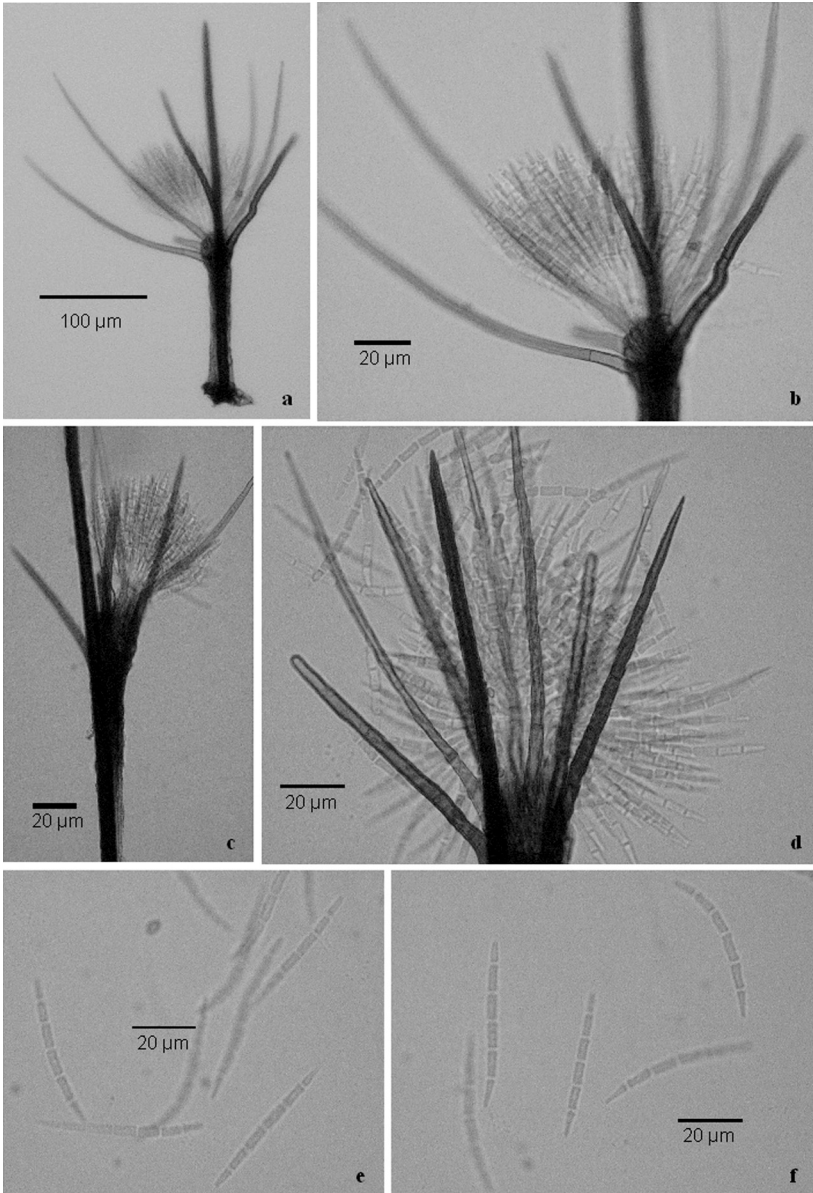


FIG. 5. *Gliophragma setosum*.

a. Setose synnema; b–d. Conidiogenous cells with conidia;  
e–f. Conidia with isthmi.



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