

5. Losada, M., Paneque, A., Ramirez, J. M. and Del Campo, F. F., *Biochem. Biophys. Res. Commun.*, 1963, **10**, 298.
6. Ramirez, J. M., Del Campo, F. F., Paneque, A. and Losada, M., *Biochim. Biophys. Acta*, 1966, **118**, 58.
7. Ritenour, G. L., Joy, K. W., Bunning, J. and Hageman, R. H., *Plant Physiol.*, 1967, **42**, 233.
8. Goodman, R. N., Kiraly, Z. and Zaitlin, M., *The biochemistry and physiology of infectious plant diseases*. D. van Nostrand, Princeton, New Jersey, 1967, p. 209.
9. Clinch, P., *Sci. Proc. R. Dublin Soc.*, 1932, **20**, 143.
10. Abbott, E. V. and Sass, J. E., *J. Agric. Res.*, 1945, **70**, 201.
11. Esau, K., *Am. J. Bot.*, 1956, **43**, 739.

### *HETEROPATELLA INDICA* MUTHUMARY SP. NOV. FROM INDIA

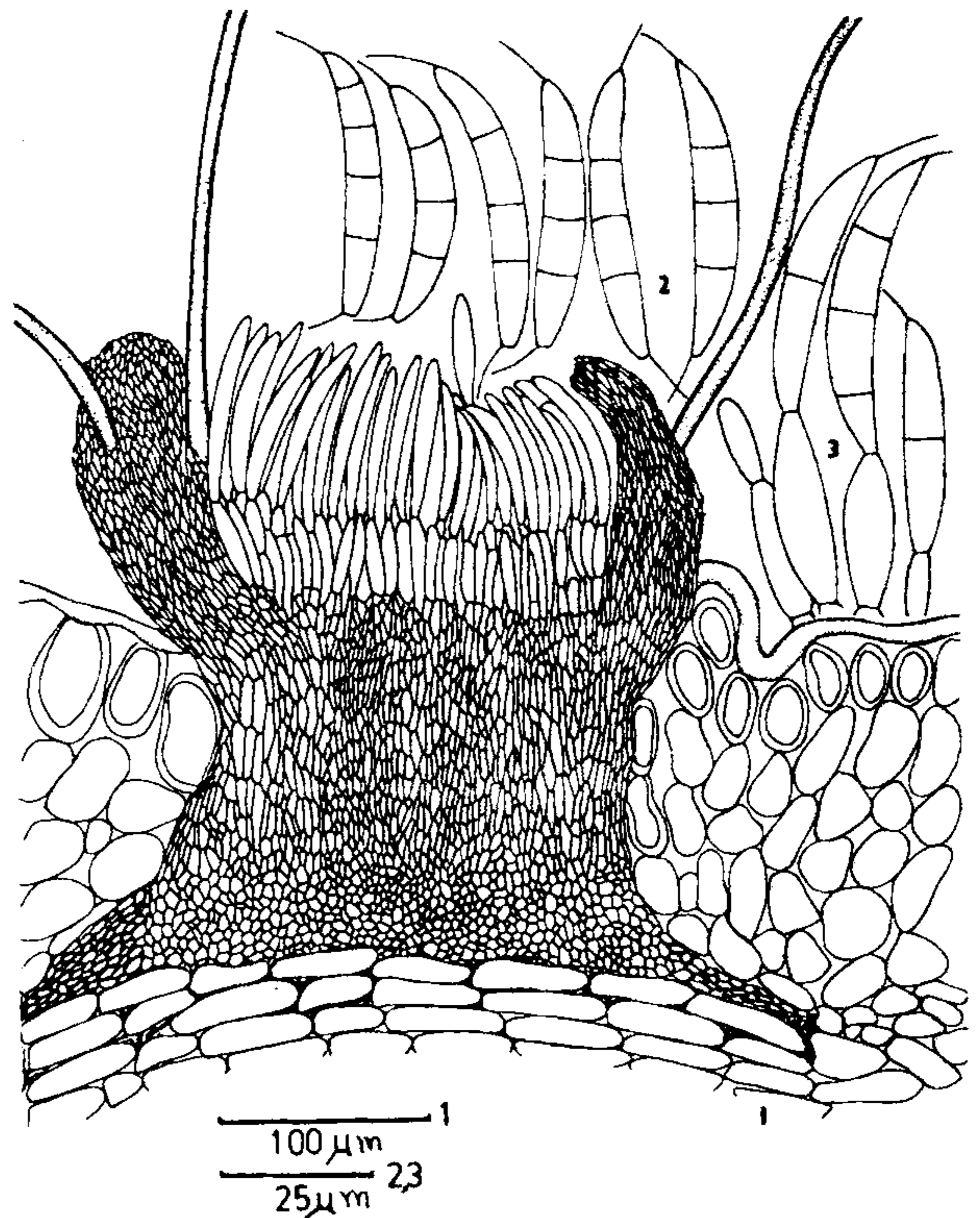
J. MUTHUMARY

Centre of Advanced Study in Botany,  
University of Madras, Madras 600 025, India.

DURING a study of Coelomycetes from South India, an undescribed species of *Heteropatella* was collected on fallen twigs of *Eugenia jambolana* inside the Madras Christian College campus, Tambaram, Madras. A description of the fungus is given below.

The fungus forms black, cupulate conidiomata on dead twigs. The conidiomata are solitary, at first closed, later opening to become cupulate, 250–400  $\mu\text{m}$  in diam. In vertical section, the conidioma is peridermal; the basal part is immersed in the peridermal tissue and the cupulate part is erumpent. The wall of the conidioma is multilayered, consisting of thin-walled, hyaline to pale brown, textura angularis at the base, at the sides of similar darker tissue which develops into textura porrecta at the periphery (figure 1). Setae are present on the outer wall of the conidioma. They are brown, rigid, septate, smooth, tapering, paler towards the subacute apex, 150–200  $\times$  3.75–4.0  $\mu\text{m}$ , confined to the sides of the conidioma.

The conidiogenous cells line the cavity of the conidioma; arranged in a palisade, blastic, hyaline, smooth, cylindrical, 25–30  $\times$  3.5–4.0  $\mu\text{m}$  (figure 3). The conidia are fusiform, 3-septate, very rarely 4-septate, hyaline but pale brown in mass, thin-walled, smooth, straight to slightly curved, often guttulate, apex obtuse, base truncate, 45–50 ( $\bar{X}$  = 46.0)  $\times$  5.0–5.5 ( $\bar{X}$



Figures 1–3. 1. Vertical section of conidioma. 2. Mature conidia. 3. Conidiogenous cells with young conidia.

= 4.5)  $\mu\text{m}$  apical appendage terminal, unbranched, 11.5–14.0  $\mu\text{m}$  long, basal appendage excentric, filiform, unbranched, shorter than the apical appendage, 7–8  $\mu\text{m}$  (figure 2).

About 17 species have been described in *Heteropatella*. No species was described on *Eugenia jambolana*. The present fungus has been assigned to the genus *Heteropatella* because of the presence of the cupulate conidioma, the simple blastic conidiogenous cells and the appendaged, hyaline phragmospore. However, the present fungus is distinct from known species of *Heteropatella* in that conidiomata are peculiarly cupulate in which the basal portion is immersed in the host tissue and the cup-like upper portion is erumpent and provided with setae; the conidia are also different from those of *Heteropatella* species so far known. Hence the fungus is described as a new species.

*Heteropatella indica* sp. nov. Muthumary

Conidiomata nigra, solitaria, primo clausa, postea aperientia, inde cupulata, 250–400  $\mu\text{m}$  diametro. In

sectione verticali conidioma peridermale, pars basalis immersa in textura peridermali, pars cupulata erumpens. Peridium multiseriatum consistens ad basim e textura angulari hyalina vel pallide brunnea cum pariete crasso, lateraliter e textura simili, fusciori, quae transit in texturam porrectam ad peripheriam. Setae presentes in pariete externo conidiomatis, brunneae, rigidae, septatae, levae, praeacutae, pallidiores ad apicem, subacutum,  $150-200 \times 3.75-4.0 \mu\text{m}$ . Cellulae conidiogenosae limitantes cavum conidiomatis, dispositae sicut valli, blasticae, hyalinae, leves, cylindratae,  $25-30 \times 3.5-4.0 \mu\text{m}$ . Conidia fusiformia, 3-septata, rarissime 4-septata, hyalina, pallide brunnea in massa, cum pariete tenui, levia, recta vel vix curva, saepe guttulata, apex obtusus, basis truncata,  $45-48 (45.8) \times 5.0-5.5 (4.8) \mu\text{m}$ , appendix apicalis, terminalis, filiformis, non-ramosa,  $11.5-14.0 \mu\text{m}$  longa, appendix basalis excentrica, filiformis, non-ramosa, brevior quam appendix apicalis,  $7-8 \mu\text{m}$  longa.

**Habitat:** in ramulis decisis mortuis *Eugenia jambolana*. collectis in Tambaram, in campo Madras Christian College, 13.3.84 a J. Muthumary, Herb. MUBL. 2873; the specimen has also been deposited in HCIO, IARI, New Delhi.

The author is grateful to Rev. Fr. V. Dierckx, St. Albert's College, Ranchi for kindly translating the diagnosis of the new species into Latin. Grateful thanks are due to Professor C. V. Subramanian, former Director, Centre of Advanced Study in Botany, University of Madras for his encouragement.

3 October 1985; Revised 5 December 1985

## STUDIES ON *STOECHOSPERMUM MARGINATUM* (C. AG.) KÜTZ. (DICTYOTALES, PHAEOPHYTA)

R. RENGASAMY,

Centre of Advanced Study in Botany, University of Madras,  
Madras 600 025, India.

THE brown alga *Stoechospermum marginatum* (C. Ag.) Kütz occurs on the Indian coast<sup>1</sup>. Preliminary studies on this species drew attention to the involute apical portion as in *Padina* and the occurrence of paraphyses along with the reproductive bodies as in *Zonaria*<sup>3</sup>. In the present report certain interesting observations are made on the occurrence of indusium in female gamet-

ophyte and the *in situ* germination of the spores.

Specimens of *S. marginatum* (both sporophyte and female gametophyte) were collected from Mandapam, South India, during April 1984 at a depth of 0.1–1.0 m at low spring tide and preserved in Navashin fixative for microtomy<sup>4</sup>. Serial microtome sections (L.S.) were stained with hematoxylin and erythrosin.

**Morphology:** Plants (sporophyte and female gametophyte) are yellowish brown in the apical portion and dark-brown in the older portion. The height of the sporophyte and female gametophyte was 15–20 cm and 10–15 cm; the width of the divided parts of the thallus was 1.0–1.5 cm and 0.5–1.0 cm respectively (figure 1,2). The thallus is sharply differentiated by irregular dichotomy, marginal patches of reproductive organs always found mingled with paraphyses, hairs represented in bundles and scattered throughout and the apical involute portion<sup>1,3</sup>.

Observations on the anatomical features of the serial microtome sections of the thallus revealed certain interesting points.

**Oogonia:** The oogonial sori occur in the form of elongated patches along the upper (dorsal) and lower (ventral) surface of the thallus. The superficial cells of the thallus function as oogonial initials. Each initial divides transversely into the lower stalk cell and the upper oogonial cell. Each oogonium ( $50-75 \mu\text{m}$  long and  $35-50 \mu\text{m}$  broad) produces a single egg. Both the paraphyses and oogonia are covered by a common sheath, the indusium. This indusium is generally derived from the outer wall layers of the oogonia as well as paraphyses<sup>5</sup>. Illustrations of the thallus of *S. marginatum* from India<sup>1</sup> have shown the oogonia without indusium. In *S. marginatum* tetrasporangia are the ones without indusium and the oogonia certainly possess indusium. The mature eggs are usually released by the rupture of the oogonial wall and the indusium on the upper side (figure 3).

**In situ germination:** In *S. marginatum* large and small spores (tetraspores) are liberated and the stages of early germination and the development have been reported<sup>6</sup>. In the present investigation large spores showed *in situ* germination. Contents of each mature spore undergo both vertical and transverse divisions forming a 'quadrant' stage (figure 4) and latter by irregular divisions attain the 'central nodule' stage. Any cell on the upper side of the 'central nodule' protrudes and cuts off the apical cell. This cell divides in three planes (transverse, vertical and anticlinal) resulting in a