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# A New Marine Ascomycete from Australia

## **Abstract**

Most marine pyrenomycetes are lignicolous, but some are epiphytic on marine phanerogams and algae. Meyers (1957) listed 30 species of algae known to be attacked by these fungi. A number of reports dealing with marine ascomycetes on algal hosts appeared before 1900, the most noteworthy being those of Winter (1887), and Jones (1898). Cotton (1908) described a pyrenomycete on *Ascophyllum nodosum* (L.) Le Jol. and summarized previous reports of ascomycetes found on algae. Reed (1902) collected two species, and Sutherland, in a series of papers (1914-1916), reported several alga-infesting pyrenomycetes. More recently, a number of ascomycetes occurring on algae have been noted (Feldmann, 1957, 1958; Cribb & Herbert, 1954; Cribb & Cribb, 1955, 1960a, b; Wilson & Knoyle, 1961; Kohlmeyer, 1963). This report describes a heretofore unreported pyrenomycete collected from the marine alga, *Ballia callitricha* Ag. The material was obtained from Warrnambool, Victoria, in waters off southern Australia.

## **Keywords**

ascomycete

## **Disciplines**

Biology | Marine Biology

# A NEW MARINE ASCOMYCETE FROM AUSTRALIA<sup>1</sup>

A. R. CAVALIERE AND T. W. JOHNSON, JR.

(WITH 8 FIGURES)

Most marine pyrenomycetes are lignicolous, but some are epiphytic on marine phanerogams and algae. Meyers (1957) listed 30 species of algae known to be attacked by these fungi.

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This report describes a heretofore unreported pyrenomycete collected from the marine alga, *Ballia callitricha* Ag. The material was obtained from Warrnambool, Victoria, in waters off southern Australia.

## **SPATHULOSPORA** Cavaliere & Johnson, gen. nov.

Peritheciis erumpentibus vel superficialibus, globosis vel subsphaericis, carbonaceis vel subcarbonaceis, bruneis vel nigris, villosis; ostiolatis. Sine paraphysibus. Ascis octosporis, unitunicatis, deliquescentibus. Ascosporis inseptis; apicibus spatulatis; appendice gelatinosa laterali ad utrumque apicem appressa.

Perithecia erumpent or superficial, globose or subspherical, carbonaceous or subcarbonaceous, brown or black, villous; ostiolate. Aparaphysate. Asci 8-spored, unitunicate, deliquescent. Ascospores non-septate; ends spatulate and provided with a gelatinous, lateral, appressed appendage.

## **Spathulospora phycophila** Cavaliere & Johnson, sp. nov.

Peritheciis 170–300  $\mu$  diam, globosis vel subsphaericis, erumpentibus vel superficialibus, carbonaceis vel subcarbonaceis, fuscis vel nigris; villos, longos, nigros,

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septos, crispus ferentibus; peritheciis in subicula lato pseudoparenchymatico interdum fundatis; rostro conico vel papilliformi. Sine paraphysibus. Ascis 80–125  $\times$  30–40  $\mu$  pariete tenui, cylindricis, lanceolatis vel claviformibus, octosporis, deliquescentibus. Ascosporis elongatis, 80–110  $\times$  10–13  $\mu$ , rectis vel curvatis, inseptis sed divacualibus membranulo cytoplasmatico separatis; apicibus spatulatis; appendice gelatinosa laterali ad utrumque apicem appressa.

HAB.: In *Ballia callitricha* Ag.

TYPE: Legit R. E. Norris, 3892, April, 1959. Holotype deposited in the National Fungus Collection, Washington, D. C. Isotypes deposited in the Mycological Collections, Dept. of Botany, Duke University, Durham, North Carolina.

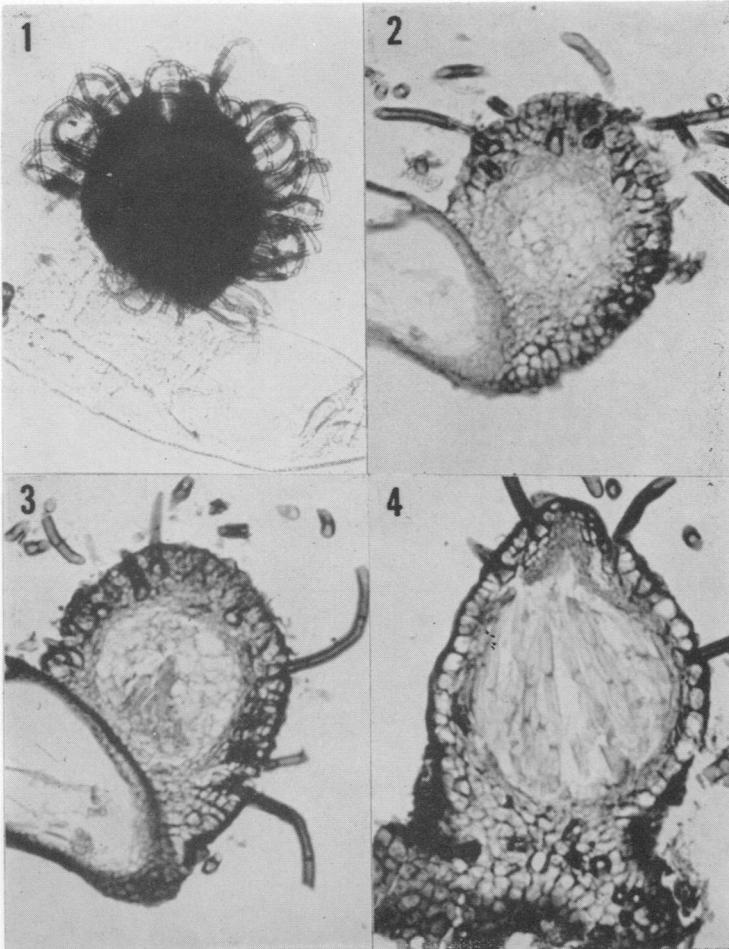
Perithecia 170–300  $\mu$  in diam, globose or subglobose, erumpent or superficial, carbonaceous or subcarbonaceous, dark brown or black; covered with long, dark, septate, curved or curled hairs; occasionally seated on a broad, pseudoparenchymatous subiculum; neck conoid or papilliform. Aparaphysate. Ascii 80–125  $\times$  30–40  $\mu$ , thin-walled, cylindrical, lanceolate or clavate, 8-spored, deliquescent. Ascospores elongate, 80–110  $\times$  10–13  $\mu$ , straight or curved, nonseptate; with an equatorial, cytoplasmic band; ends spatulate and provided with a gelatinous, lateral, appressed appendage.

Characterization of the gross perithecial features and centrum morphology of this newly discovered fungus has been made from paraffin-sectioned material, stained in Delafield's hematoxylin.

The profusely villous perithecia were either superficial on the algal filaments (FIG. 1), or seated on a subiculum (FIG. 4), 100–165  $\times$  100–225  $\mu$ .

The ascocarp wall is composed of a double stratum. Thick-walled pyramidal or subspherical cells having large lumina comprise 1–3 layers of the outer stratum. These outer layers merge rather abruptly with an inner stratum of 3–8 thinner walled ellipsoidal cells. The width of the ascocarp wall, composed of 4–12 layers of cells (FIG. 5), is 12–40  $\mu$ . The ascocarp hairs, covering the entire surface of the perithecium usually originate deeply within the outer stratum of the wall (FIGS. 4, 5). The ostiole is produced on a conoid rostrum or a papillus, and the neck canal appears to be formed lysigenously (FIG. 4).

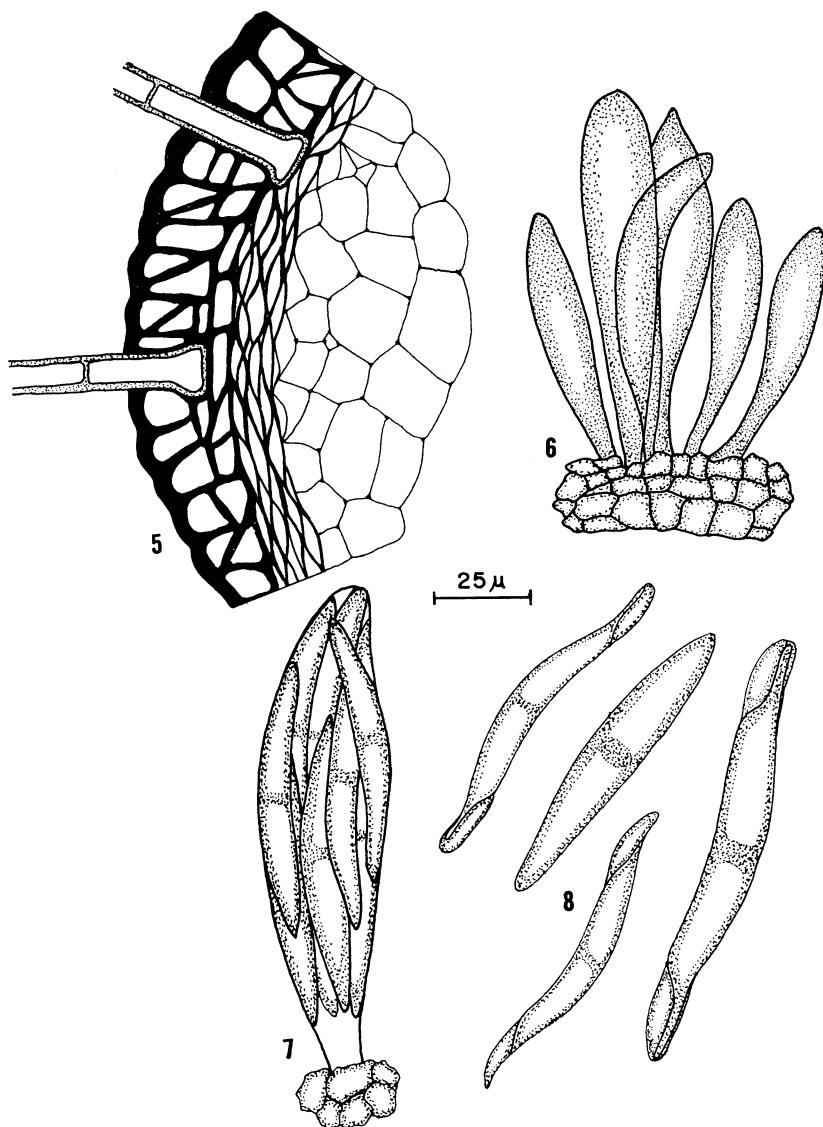
In the youngest ascocarps examined, development had proceeded to the point where the wall was clearly delimited from the thin-walled, pseudoparenchymatous tissue of the centrum (FIG. 2). In slightly older fructifications, asci had begun to form at the base of the ascocarp and subsequent centrum dissolution was noted (FIG. 3). The young, thin-walled asci, 50–80  $\times$  10–20  $\mu$ , were densely granular (FIG. 6). Ascus deliquescence occurs before or during spore maturation. In some specimens, young ascospores were observed within asci (FIG. 7),



FIGS. 1-4. Photomicrographs of *Spathulospora phycophila*. 1. Ascocarp on algal filament.  $\times 100$ . 2. Young perithecium showing ascocarp wall and early centrum structure.  $\times 200$ . 3. Young ascocarp during early ascus formation.  $\times 200$ . 4. Mature ascocarp with spores.  $\times 200$ .

but ascocarps containing mature spores commonly were without detectable ascus remnants (FIG. 4).

A number of aspects of the spores are quite characteristic. An equatorial cytoplasmic band, first observable during spore formation (FIG. 7), remains distinct during subsequent spore maturation. A bluntly tapered spore apex, 20-26  $\mu$  long, is clearly visible. The spore



FIGS. 5-8. Essential features of *Spathulospora phycophila*. 5. Cell configuration of the perithecial wall and position of the hairs. 6. Young asci. 7. Young ascospores showing equatorial cytoplasmic band. 8. Mature ascospores.

appendage is a laterally appressed process (FIG. 8), and in some specimens a thin, barely detectable sheath envelops the entire spore.

The fungus cannot be placed in a recognized genus. *Spathulospora* superficially resembles a number of genera, among which are *Haloguignardia* Cribb & Cribb (1956), *Lophotrichus* Benjamin (1949) and *Chaetosphaeria* Tulasne (Ellis & Everhart, 1892). Our organism differs from *Haloguignardia* in two respects. The ascocarps of the species in *Haloguignardia* are glabrous and the spores have terminal "peg-like" structures. On the other hand, the ascocarps of *Spathulospora* are villous and the spores, twice the length of those of *Haloguignardia*, are terminated by blunt, spatulate tips, each having a lateral gelatinous appendage. Moreover, although gross perithecial characters of *Spathulospora* resemble *Lophotrichus* and *Chaetosphaeria*, the spores of our organism possess definite dissimilarities. Spores of *Lophotrichus* are small and lemon-shaped, and those of *Chaetosphaeria* are 2-many septate; both are without detectable appendages.

#### SUMMARY

A new marine ascomycete, *Spathulospora phycophila*, from Victoria, Australia, occurring on the alga, *Ballia callitricha*, is described and discussed briefly. This pyrenomycete is characterized by the profusely villous ascocarps and nonseptate spores provided with bluntly tapered apices, each of which has a lateral, appressed, gelatinous appendage.

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