

Indian Anisochytrids *)

John S. Karling.

Purdue University, Lafayette, Indiana, USA.

(With 6 figures).

In connection with the author's (1964 a) studies on the chytrid flora of India several anisochytrids were trapped on various substrata such as bleached corn leaves, bits of hemp seed and fibrin film from soil in numerous parts of the country. These fungi are strikingly similar in structure and development to many of the true chytrids, but are distinguishable from them by the presence of an anterior tinsel-type flagellum on their zoospores. Comparatively few species are known so far, and these have been classified (Karling, 1943) into three families, *Anisopidiaceae*, *Rhizidiomycetaceae*, and *Hyphochytriaceae*, on the basis of thallus structure and organization. In this respect the three families correspond with and are fairly similar, respectively, to the families *Olpidiaceae*, *Rhizidiaceae* and *Cladochytriaceae* of the true chytrids.

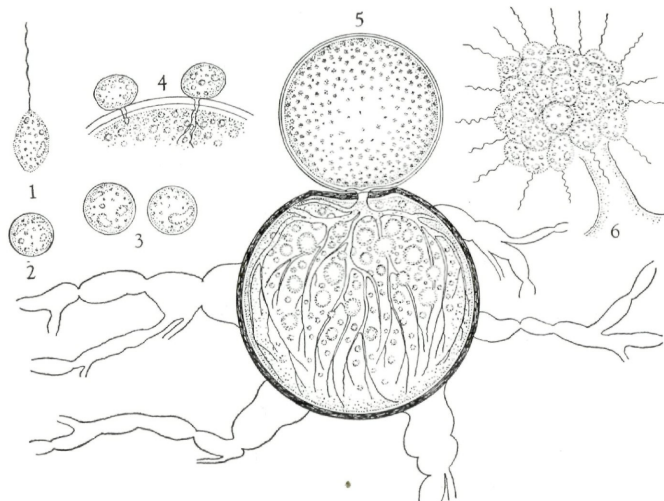
Among the anisochytrids isolated in the manner noted above occurred a species of *Rhizidiomyces* which parasitized virulently the thick-walled sporangia of *Rhizophlyctis* sp., a true chytrid. The only other species of this genus reported to be parasitic is *R. apophysatus* which occurs on the oogonia of *Achlya* and *Saprolegnia*. Apparently, it is a facultative parasite which can be cultured readily on synthetic media (Couch, 1939) and also occurs on pollen grains when they are used to bait soil samples (Gaertner, 1954). The present species, on the other hand, appears to be a virulent parasite with a limited host range. So far all attempts to infect the sporangia of *Karlingia rosea*, *Phlyctorhiza variabilis*, *Allomyces arbuscula*, *Catenaria anguillulae*, *Nowakowskiella elegans* and *N. ramosa* as well as the oogonia of *Achlya* and *Saprolegnia* have been unsuccessful. Also, attempts to grow it on nutrient agar have failed. Furthermore, it is non-apophysate, has slightly larger zoospores, and lacks the short spines which are frequently present on the sporangia of *R. apophys-*

*) This study has been supported by the U. S. Program in Biology, International Indian Ocean Expedition and conducted at the Central Marine Fisheries Research Institute, Mandapman Camp, Madras State. I am very grateful to Dr. S. Jones, Director of the Institute, for research facilities and assistance.

satus. For these reasons the author believes it is distinct from *R. apophysatus* and the other species of this genus. Accordingly, it is diagnosed here as a new species for which the name *R. parasiticus* is proposed.

***Rhizidiomyces parasiticus* sp. nov.**

Fungus parasiticus. Sporangiis extramatrix, non-apophysatis, levibus, hyalinis, sphaericis, 20—40 μ diam. ovalibus, 12—21 \times 30



Figs. 1—6. *Rhizidiomyces parasiticus*. Fig. 1. Anteriorly uniflagellate zoospore. Fig. 2. Zoospore after coming to rest. Fig. 3. Encysted and enlarged zoospores 24 hours after coming to rest. Fig. 4. Infection stages. Fig. 5. Mature thallus on and in sporangium of (?). *Rhizophlyctis* sp. Fig. 6. Completion of cleavage of sporeplasm outside of sporangium.

—42 μ diam. Zoosporis ovalibus aut oblongatis 3.5—4.2 \times 5.7—7 μ ; flagello 14—16 μ longo. Sporidis perdurantibus non notis.

Sporangia non-apophysate, smooth, hyaline, with a wall 2—3 μ thick, spherical, 20—40 μ diam., or ovoid. 12—21 \times 30—42 μ diam.; content emerging slowly through an exit tube, 12 μ broad by 18—25 μ long, and usually undergoing cleavage outside of sporangium; vesicular membrane around sporeplasm lacking. Zoospores ovoid to oblong, 3.5—4.2 \times 5.7—7 μ diam. with coarsely granular refractive content; flagellum 14—16 μ long. Resting spores unknown.

* Parasitic on the sporangia of *Rhizophlyctis* sp., isolated from brackish soil at Mandapam Camp, and non-brackish soil at Madurai, Madas State. Type slide no. 120 PU.

The distinguishing structural features of this species are shown in figures 1 to 6. Its development, the dehiscence of the sporangia, and the cleavage of the sporeplasm after emergence are so similar to those of other species described by the author (1944, 1945) and Fuller (1962) that it is not necessary to describe them again. Careful observations and plasmolytic experiments have been made on the emerged sporeplasm of this species, and these have confirmed the previous observations of the author that it is not enveloped by a distinct wall or membrane. Nabel (1939) and Fuller (1962) reported the presence of a membrane around the sporeplasm of the species which they studied, but the author is confident that it does not exist.

Occasionally, a portion of the sporeplasm may remain in the sporangium, as reported by the author, (1939, 1944) in *Hyphochytrium catenoides*, *Rhizidiomyces bivellatus* and *R. hansonii*, and undergoes cleavage to produce zoospores which then swim out. Also, on rare occasions the development of the exit tube may be arrested, with the result that the sporeplasm does not emerge but cleaves into zoospores within the spoangium as in *R. hansonii* (Karling, 1944, fig. 60).

So far the only anisochytrid reported previously from India is *R. apophysatus* which Chaudhuri and Kochar (1935) found on the oogonia of *Achlya klebsiana*. However, as noted above, the author isolated several other species, as is indicated below.

Rhizidiomyces hirsutus Karling, 1945. Bull. Torrey Bot. Club 72: 47, 19 figs.

Saprophytic on and around bits of hemp seed, from brackish soil at Mandapam Camp, Rhamnad District, Madras State.

Rhizidiomyces bivellatus Nabel, 1939. Ark. Mikrobiol. 10: 515—541.

Saprophytic on wings of mosquito, from non-brackish soil 10 km. south of Madurai along the Rhamnad Road, Madras State, and Calcutta, Bengal State.

Rhizidiomyces hansonii Karling, 1944. Amer. J. Bot. 31: 396, figs. 35—64.

Saprophytic on bleached corn leaves from soil 2 km. north of Rhamnad, Madras State.

Rhizidiomyces apophysatus Zopf, 1884. Nova Acta Acad. Leop. Carol. 47: 188, pl. 20, figs. 1—7.

Parasitic on the oogonia of *Achlya* sp., from soil in a cotton paddy at Bodinakayanur, Madras Staate.

Hyphochytrium catenoides Karling, 1939. Amer. J. Bot. 26: 513, 19 figs.

Saprophytic in bleached corn leaves from soil in the Thalayar Tea Estate, near Munnar, Kerala State.

Literature Cited.

- Chaudhuri, H., and P. L. Kochhar. 1935. Indian water moulds. I. Proc. Indian Acad. Sci. Sect. B, 2: 137—154, pls. 5—12.
- Couch, J. N. 1939. Technic for collection, isolation, and culture of chytrids. J. Elisha Mitchell Sci. Soc. 55: 208—214.
- Fuller, M. S. 1962. Growth and development of the water mold *Rhizidiomyces* in pure culture. Amer. J. Bot. 49: 64—71, 24 figs.
- Gaertner, A. 1954. Über das Vorkommen niederer Erdphycomyceten in Afrika, Schweden, und einigen mitteleuropäischen Standorten. Arch. f. Mikrobiol. 21: 4—56, 7 figs.
- Karling, J. S. 1939. A new fungus with anteriorly uniloculate zoospores: *Hyphochytrium catenoides*. Amer. J. Bot. 26: 512—519, 18 figs.
- Karling, J. S. 1943. The life history of *Anisopodium ectocarpii* gen. nov. et sp. nov., and a synopsis and classification of other fungi with anteriorly unilagellate zoospores. Amer. J. Bot. 30: 637—648, 21 figs.
- Karling, J. S. 1944. Brazilian anisochytrids. Amer. J. Bot. 31: 391—397, 64 figs.
- Karling, J. S. 1945. *Rhizidiomyces hirsutus* sp. nov., a hairy anisochytrid from Brazil. Bull. Torrey Bot. Club 72: 47—51, 19 figs.
- Karling, J. S. 1964 a. Indian chytrids. I. *Olpodium indianum* sp. nov. Trans. Brit. Mycol. Soc. 47 (In press).
- Nabel, K. 1939. Über die Membran niederer Pilze, besonders von *Rhizidiomyces bivellatus* nov. spez. Arch. f. Mikrobiol. 10: 515—541, 7 figs.
- Zopf, W. 1884. Zur Kenntnis der Phycomyceten. I. Zur Morphologie und Biologie der Ancylisteen und Chytridiaceen. Nova Acta Acad. Leop.-Carol. 47: 143—236, pls. 12—21.

ZOBODAT - www.zobodat.at

Zoologisch-Botanische Datenbank/Zoological-Botanical Database

Digitale Literatur/Digital Literature

Zeitschrift/Journal: [Sydowia](#)

Jahr/Year: 1964

Band/Volume: [17](#)

Autor(en)/Author(s): Karling John S.

Artikel/Article: [Indian Anisochytrids. 193-196](#)