ability of the fungus, controlled infection tests were conducted at room temperature (25–28°C) as suggested by Scott and O'Warren[5]. Infection appeared in about 90% of the eggs and 70–80% of fingerlings within 24 hr of inoculation. Only 5% of the eggs hatched but the hatchlings too, in most cases, developed fungal infection soon. The fungus growing on these artificially infected eggs and fingerlings was isolated and compared with the original culture and was found to be identical. To maintain a control for the experiments, eggs and fingerlings (100 each) were kept under the same conditions but not exposed to the fungal inoculum.

Scott and O'Bier[6] have reported *A. anomalous* for the first time as a fish pathogen, but they failed to prove its pathogenicity. Sati[7] has reported *A. arbuscula* Butler parasitizing the eggs of *Cyprinus carpio* var *communis* and has also proved its pathogenicity. Scott and O'Bier[6] expressed the view that negative results in pathogenicity experiments do not prove the fungus to be strictly saprophytic and positive results simply demonstrate that the fungus is capable of growing on the experimental fish species under a given set of conditions. As *A. arbuscula* is primarily a saprophyte, the pathogenicity tests during the present investigation confirm the contention that the saprophytic fungal forms may become parasitic under certain conditions and exhibit facultative parasitism.

The present investigation also extends the host range of *A. arbuscula* to the eggs of *C. punctatus* and it is being reported for the first time as a naturally occurring parasite of the fingerlings.

14 November 1984; Revised 15 April 1985

1. Raper, J. R., *Science*, 1937, **85**, 342.
2. Tiffney, W. N., *J. Elisha Mitchell Sci. Soc.*, 1939, **55**, 134.
3. Johnson, T. W., Jr., *The Genus Achlya: Morphology and Taxonomy*, Univ. of Michigan Press, Ann. Arbor, Michigan, 1956.
4. Sparrow, F. K., *Aquatic Phycomycetes, Ibid*, 1960.
5. Scott, W. W. and O'Warren, C., *Tech. Bull. Virg. Polytech. Inst., Virginia*, 1964, **171**, 1.
6. Scott, W. W. and O'Bier, A. H., *Prog. Fish-cult.*, 1962, **24**, 3.
7. Sati, S. C., *Sci. Cult.*, 1983, **49**, 396.

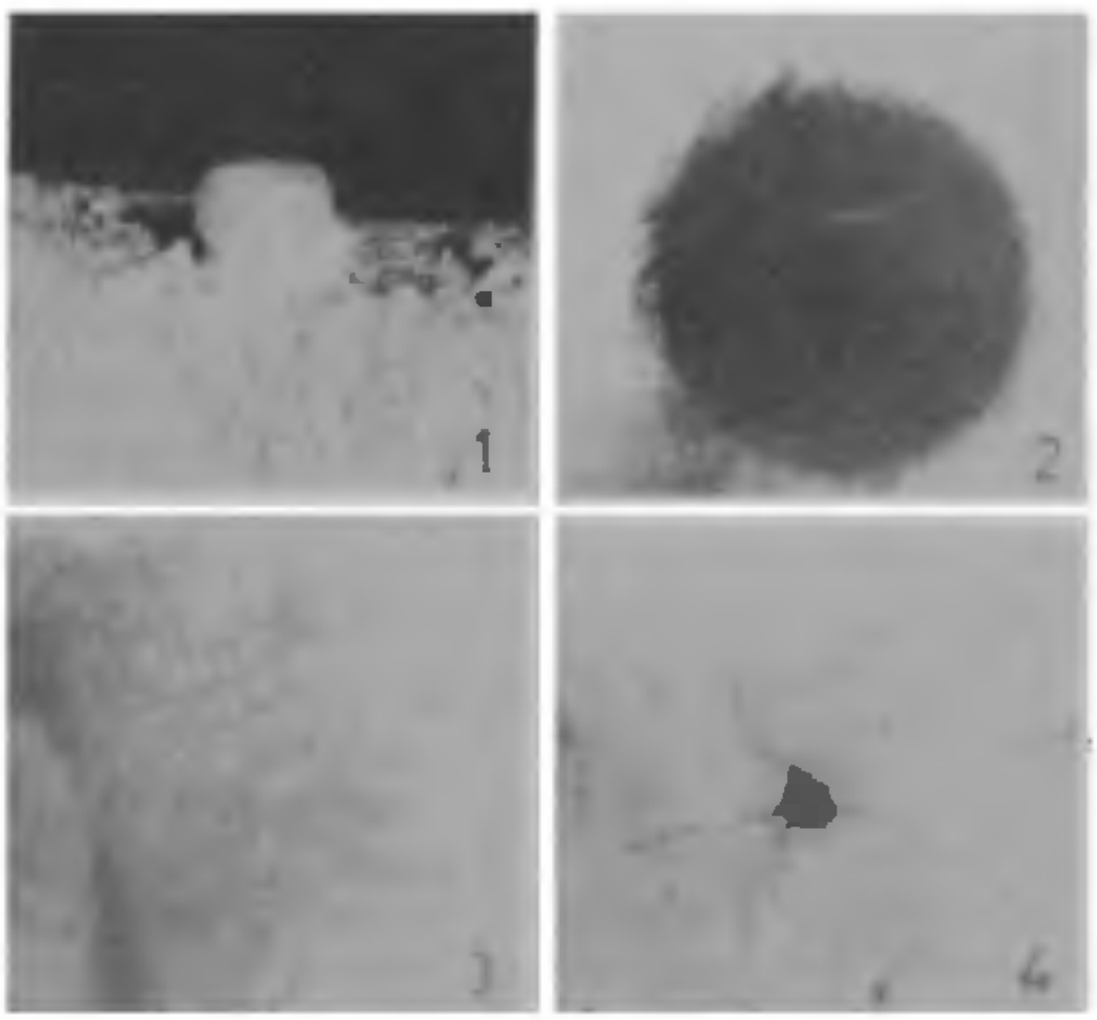
MARINE FUNGI FROM INDIA-II

B. D. BORSE*
Department of Botany, University of Poona, Pune 411 007, India
* *Present address: Department of Botany, Arts, Commerce and Science College, Erandol 425 109, India.*

DURING the survey of marine fungi, the author collected a Basidiomycetous fungus *Nia vibrissa* Moore and Meyers, which is a new record for India. The specimen has been deposited in the herbarium, at the University Campus. (M. F. M. no. 43).

Representatives of Basidiomycetes are rarely found in the marine environment. Only four filamentous marine Basidiomycetes are known[1]. Originally *Nia* was described as a member of Deuteromycetes[2], but Doguet[3] demonstrated its affinity with Gastromycetes. A brief description of the fungus is given below:-

Basidiocarps 1–3 mm in diameter, subglobose, superficial, anchored in the substrate with an inconspicuous, cylindrical pediccel, whitish, yellowish, pinkish and finally orange-coloured soft, thin-walled, villose or smooth, opening by irregular rupture of the peridium, solitary or gregarious. Peridium 10–15 μm thick, bearing on the outside long hairs upto 275 μm in length, 4–7 μm in diameter, thick-walled, straight or curved, somewhat slightly curved apically and un-



Figures 1–4, 1. Habit × 20. **2.** Basidiocarp × 150. **3.** Peridium external hairs × 670. **4.** Basidiospore × 1900.

cinate. Gleba and basidia not observed. Basidiospores 9–15 μm long 6–11 μm in diameter, ovoid or ellipsoidal, one-celled, hyaline, appendaged; at the apex provided with a single, slender, flexible, attenuate, hyaline appendage, 20–47 μm long, less than 1 μm in diameter, four (rarely 3 to 5) similar subterminal radiating appendages around the base, 20–32 μm long; at the point of attachment to the basidium with a short cylindrical projection.

Collection examined: M. F. M. no 43, on dead and decaying intertidal wood, Malvan, Maharashtra, October 12, 1981-Leg B. D. Borse.

The author is indebted to Dr. S. D. Patil for guidance and to UGC for the financial assistance.

30 May 1984; Revised 14 May 1985

1. Kohlmeyer, J. and Kohlmeyer, E., *Marine Mycol.*, Academic Press, New York, 1979.
2. Moore, R. T. and Meyers, S. P., *Mycologia*, 1959, **15**, 874.
3. Doguet, G., Hebd, C. R. *Seances Acad, Sci.*, 1967, **D265**, 1980.

EMBRYOLOGY OF STEGNOSPERMATACEAE

P. SATYANARAYANA and L. L. NARAYANA
Department of Botany, Kakatiya University, Vidyaranyapuri, Warangal 506 009, India.

THE taxonomic placement of *Stegnosperma* is controversial. It was included in Phytolaccaceae by Bentham and Hooker[1] (as anomalous genus). Others[2–5] segregated it into a monogeneric family. Stegnospermataceae and placed it in the order Pittosporales in association with Pittosporaceae, Byblidaceae, Tremandraceae and Vivianiaceae. Dahlgren[6] also accorded it the status of an independent family but under the order Caryophyllales. Thorne[7], though initially treated it as a sub-family, Stegnospermatoideae under Phytolaccaceae, later[8] raised it to the status of an independent family. Embryologically, the genus *Stegnosperma* is unknown[9] and the present study is the first attempt in this regard on two species, namely *S. halimifolium* Benth and *S. watsonii* Rogers.

The differentiated anther shows an epidermis, hypodermis which develops into the fibrous endothecium, two middle layers which become pressed during the development of the anther, and secretory tapetum (figure 1). The tapetal cells become multinucleate by the time the pollen mother cells enter meiosis (figure 1) and become absorbed by the time the pollen grains are formed in the anthers. Cytokinesis of pollen mother cells takes place by furrowing method (figure 2). Pollen tetrads show tetrahedral arrangement. Ripe pollen are three-celled (figure 3).

The ovary is pentacarpellary syncarpous and pentalocular with one ovule in each loculus. The ovule is bitegmic and the integuments are free. The outer integument is four-cell thick and the inner two-cell thick on the antiraphe side (figure 5). However, in the apical region the outer and inner integuments are 7- and 3-cell thick respectively. Starch grains are present in the cells of the outer integument (figure 5). Dark granular bodies of unknown nature accumulate in the cells of the inner epidermis of the inner integument (figure 5). The microphyle is formed by the inner integument alone (figure 4). The archesporium in the ovule is hypodermal and single-celled (figure 7). It cuts off primary parietal cell before it functions as the megaspore mother cell (figure 8). The former undergoes periclinal and anticlinal divisions giving rise to three-to-five layered parietal tissue (figure 9). The embryo sac develops according to the Polygonum type. The egg apparatus consists of two hooked synergids, which show filiform apparatus and an egg. The polar nuclei fuse before fertilization. The antipodals show signs of early degeneration (figure 11).

As the embryo sac develops, a narrow 5–7 cell wide strand differentiates along the median line of the curved nucellus, the upper end terminating at the base of the embryo sac and the other at the chalazal end. The cells of this strand show deep staining vacuolate cytoplasm and are packed with starch grains (figures 4, 6) which are obviously concerned with the nutrition of the embryo sac. The lower end of the embryo sac elongates and grows into a caecum-like haustorium crushing the cells of the central strand and reaches the chalazal end of the ovule.

Fertilization is porogamous. Endosperm is of the nuclear type. The embryogeny conforms to the Caryophyllad type (figures 12–19) of Johansen. The seed is arillate. The seed coat is formed by the outer and the inner epidermal layers of the outer and inner integuments respectively and the cells are filled with deeply stained material (figure 20).

In embryological features such as glandular tapetum, multinucleate condition of tapetal cells, simultaneous cytokinesis of pollen mother cells, three-celled pollen, bitegmic crassinucellate ovules, endostome,