

Thraustochytrid Fungi Associated with Marine Algae

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Many of the diatoms collected from Arabian Sea were found to harbour thraustochytrid fungi on them. The fungus was identified as *Ulkenia visurgensis* and it could be grown on pine pollen in seawater. The fungus never infected healthy growing cultures of these diatoms but grew only on senescent moribund cultures. Some of the macroalgae collected from Kavarathi atoll of Lakshadweep islands also harboured thraustochytrid fungi. Contrary to other reports these thraustochytrids were found on living healthy algae.

The fungi associated with algae are largely unexplored. Especially, the Indian Ocean and the Arabian Sea have not been sufficiently explored for marine fungi in general and for algal inhabiting fungi in particular. Thraustochytrids which are obligately marine are the most dominant group of fungi in the sea¹. They have been regularly isolated from marine water column and sediment samples¹. Their association with seaweeds²⁻⁴ and phytoplankton⁵ have been reported earlier.

This communication reports thraustochytrid fungi associated with phytoplankton from central Arabian Sea and some of the macroalgae collected from Kavarathi atoll of Lakshadweep islands.

During the 3rd cruise of *R V Sagar Kanya* (30 Sept. to 25 Oct. 1983) phytoplankton were collected from Central Arabian Sea, towing a phytoplankton net of (60 μ m mesh) at 0.5 knot speed for 10 min. The samples collected were washed 3-4 times with sterile seawater, suspended in the same and incubated in sterile plastic Petri dish, near port-hole at 28 C. The cultures were examined for chytridiaceous or thraustochytrid fungi up to 30 d. Any thraustochytrid fungi observed, were isolated in pine pollen seawater medium⁶.

During the 136th cruise of *R V Gaveshani* (17-24 April 1984) to Kavarathi island (Arabian Sea), a number of intertidal algae were collected. These algae were washed thoroughly in sterile seawater and small bits (3-5 cm in size) were incubated in sterile seawater at room temperature. The algae were washed in sterile seawater everyday and put into fresh sterile seawater. To avoid any external contamination, the whole operation was done in a sterile incubation chamber on board. The algae were thoroughly examined under a microscope for the presence of epiphytic, endobiotic and parasitic fungi.

Thraustochytrids were found harboured on diatoms *Coscinodiscus* sp., *Navicula* sp., *Nitzschia* sp.,

Grammatophora sp., and *Melosira* sp.; while they were absent on *Biddulphia* sp. and *Chaetoceros* sp. Senescent cultures of species of *Nitzschia*, *Navicula* and *Grammatophora* harboured a great number of fungal thalli (Fig. 1a-f). Several isolates from various species of infected diatoms were obtained in pine pollen seawater cultures. Their life cycles were observed under a paraffin oil chamber⁷. Based on their life cycles, all the isolates were identified as *Ulkenia visurgensis* (Bahnweg & Sparrow) Gaertner⁸—a thraustochytrid fungus. Fresh cultures of these diatoms never took infection when inoculated with *U. visurgensis*. However, zoospores and sporangia of *U. visurgensis* were found attached to old moribund diatom cells.

Species of a red alga *Polysiphonia* and green alga *Cladophora frascatii* Collins and Harvey collected from Kavarathi island (Fig. 1g, h) when examined one week after collection, were found to have thraustochytrid fungus growing on them. The host algae were in healthy condition and not decaying when the thraustochytrid was found growing on them. This fungus could also be easily cultured on pine pollen seawater medium.

Thraustochytrids have not been observed on healthy diatom cells except by Gaertner⁵ who observed some sporangia on *Thalassionema* sp. The present work also shows that thraustochytrid can grow on moribund diatom cells. Diatoms are known to exude compounds inhibitory to microorganisms⁹. This might be the reason why thraustochytrids were unable to grow on diatoms in fresh cultures. Surprisingly, all the diatom species collected from one station harboured the same fungus—*U. visurgensis*. This fungus might have been a dominant one in the water column from where the diatoms were collected.

More interesting is the occurrence of thraustochytrid fungi on living algae—*Polysiphonia* sp. and

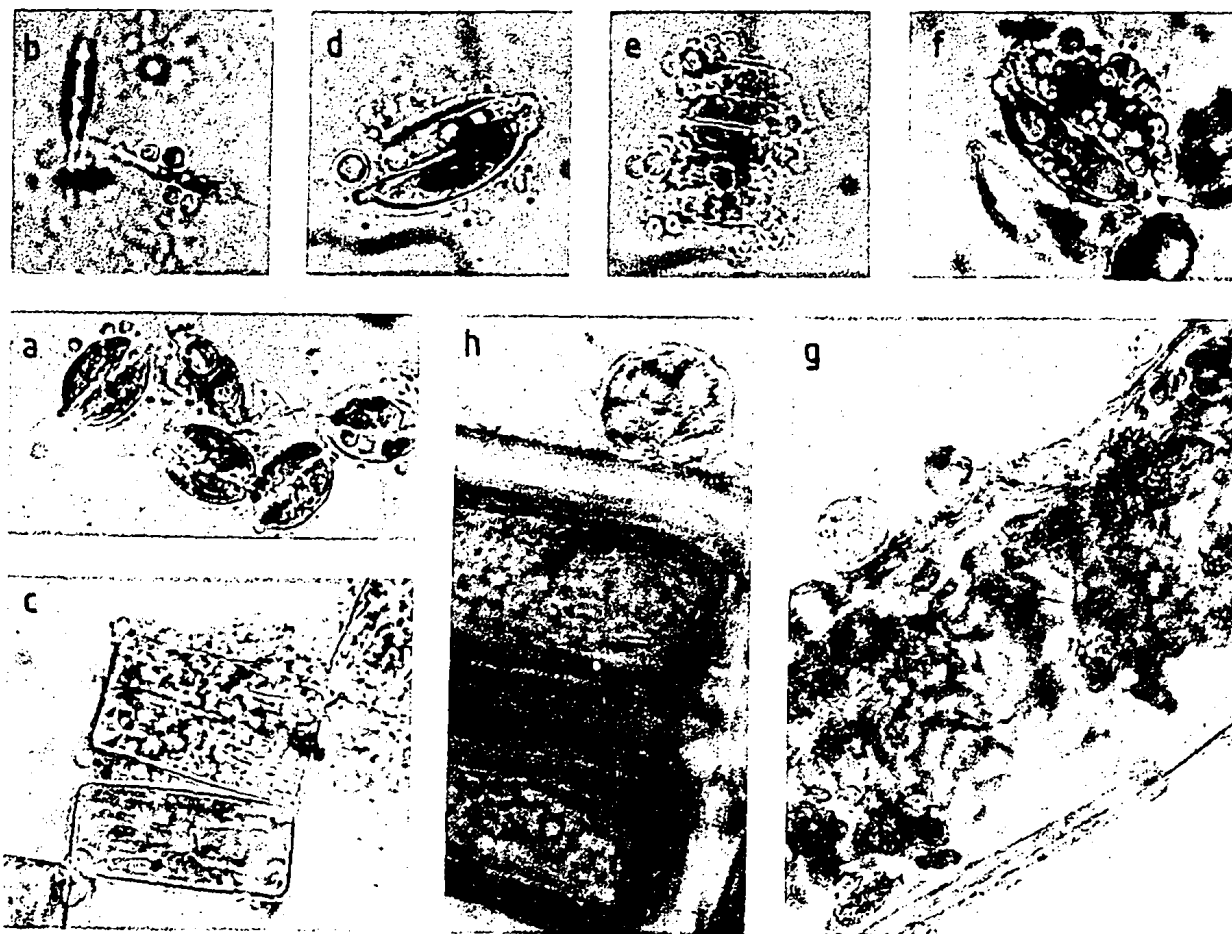


Fig. 1—(a) Thraustochytrid thalli on *Navicula* sp. $\times 200$. (b) Thraustochytrid thalli on *Nitzschia* sp. $\times 200$. (c) Thraustochytrid thalli on *Grammatophora* sp. $\times 700$. (d) On *Navicula* sp. $\times 700$. (e) Thraustochytrid thalli on an unidentified diatom $\times 700$. (f) On *Navicula* sp. $\times 700$. (g) On the green alga *Cladophora* $\times 700$. (h) On the red alga *Polysiphonia* $\times 700$.

Cladophora frascatii. Goldstein² and Miller and Jones⁴ reported that thraustochytrids did not attach and grow on living algae. But the present study shows that they do attach themselves and grow on some living algae as epiphytes although not on diatoms.

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