# ROLE OF REPRODUCTIVE BODIES OF ALGAE AS ULTRA MICROSCOPIC FOOD OF LARVAL AND PLANKTONIC ANIMALS: A NEW FINDING IN ENVIRONMENTAL SCIENCE

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Scientists believe that the bivalve larvae feed on diatoms, detritus etc. When large scale spawning of these animals happens in the sea releasing million of larvae into the environment, no noticeable change is observed in the environment to show a boost of the feed material and it is also out of question that these millions of larvae are feeding on the diatoms of the sea which are larger in size than the larval forms. Continued observations in the spawning locality of mussels has shown that the period of reproduction of algae like *Ulva* spp., *Chaetomorpha* spp., *Cladophora* spp. etc. coincides with the breeding of the bivalve forms and it has been found that the reproductive cycle of algae has direct linkage with the large scale spawning and larval cycle in the sea.

Experimentally it has been shown that the larvae of mussels kept in filtered sea water avoiding all the food items in the medium, fed on reproductive bodies of algae and metamorphosed into settlement stage in the laboratory. (Plate 1). These gametes could be highly nutritious because these larvae could metamorphose with this diet. Their micro size below 6 to 8μ and similarity to the size and shape of laboratory cultured micro feeds like *Isochrysis, Pavola* etc. make the larvae (from Trochophore to the settlement

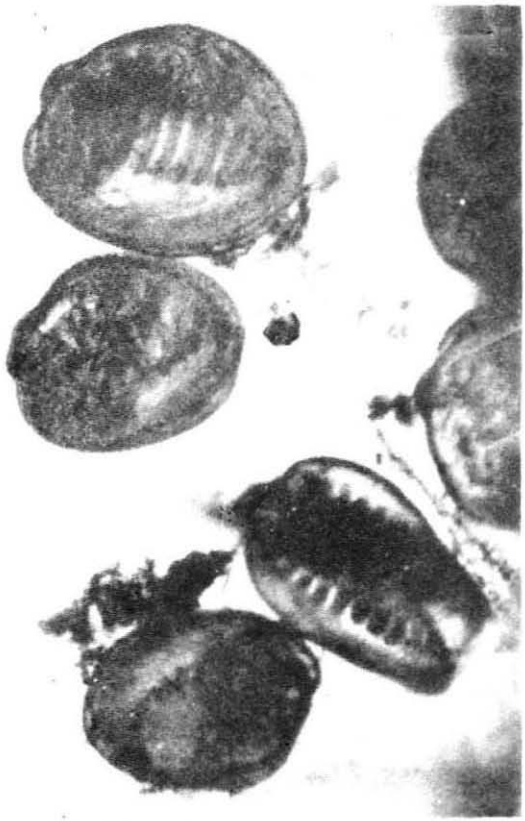

Plate 1. Mussel larvae feeding on the gamete diet in the medium

stage) to feed on these gametes. It was also noticed in the natural environment that there was no other feed available other than similar to these micro algal bodies when bulk quantities of larvae occur in the sea, by the spawning process during the spawning season. The details of the findings are given elaborately elsewhere.

## MAJOR FINDINGS AND CONCLUSIONS

1) The study shows that there is a microlevel food chain in the aquatic medium which is constituted by the reproductive cells, both sexual as well as asexual released by algae. One of the reason for the high productivity of the coastal zone can be assigned to this.

2) The larvae of mussels feed on microgametes of algae like *Ulva, cladophora, chaetomorpha* and it is found that the coincidence of the reproduction of algae and the mussels in the southwest coast of India has direct relationship. The gametes of the algae liberated in bulk during the breeding season add the biomass in suspension and form the food for the larvae of other invertebrates and fishes feeding on them.

3) The coagulated unconsumed products formed by the gametes liberated by these algae which could not successfully settle at the substratum to form new colonies of algae can improve the dietary value of the detritus feeders also and can directly influence the productivity of the bottom communities.

4) The study also points out that the exploitation of different species of algae for commercial purposes indiscriminately may effect the gamete based food chain in the environment which support the invertebrate larvae, their adults as well as fish larvae feeding on them.

5) The addition to the commercial exploitation of the algae the man made changes in the environment also might affect the algal population and therefore conservation measures are to be adopted to balance the ecosystem.

6) Further studies are to be initiated to assess the standing crop of sexual and asexual products like 'gametes', 'zoospores', 'aplanospores', stato spores', propagules etc and their correlation with the fishery and benthic biomass on a global basis by various laboratories in different parts of the world. This will give certain important results as far as the production of commercial fish, bivalves, gastropod molluscs and other invertebrate groups are concerned and would help to evolve procedures for artificial enrichment of the environment to increase production.

## IMPACT AND FUTURE POTENTIAL

1) The role of reproductive bodies of algae as food of larval forms in the marine, brackish water and fresh water system was unknown to science, and it opens new

fields of studies in the environmental science giving new dimensions in the concepts of food chain in the aquatic ecosystems and therefore has unlimited potentialities.

2) The impact of these bodies (algal reproductive bodies) in the food chain was not accounted in the productivity study of water bodies earlier and as a consequence, the food chain studies conducted throughout the world in aquatic medium wherever algal beds are dominant in the ecosystem are to be revised and a re-approach is to be made for the food cycle studies.

3) The study also gives information for improving biological productivity of an area by regulations of algal exploitation for commercial purposes during their breeding and multiplication periods in different parts of the world.

4) It has also the potentialities of protecting the larval and planktonic food production in a localised area by increasing biological productivity in a localised area by increasing biological productivity in the natural environment, while it enhances the production of algae which are used as human food as well as for production of essential and costly chemicals throughout the world.

5) As the role of algal reproductive bodies as food of larval forms was unknown to science, the reasons for concentration of certain marine animals in shallow algal beds for spawning and release of their young ones could not be investigated from this angle. Already there is a report by Soviet scientists that the giant "Kamchatka crabs" migrate in large groups from the deep sea area to shallow seas where the vegetation is particularly thick for spawning and releasing their larvae. The larvae feed on plankton and spend about two months in the shallow areas dominated by algae and sea grasses. The reason for this shoreward migration is yet to be investigated and perhaps this seasonal spawning migration might be due to the high availability of feed like the sexual and asexual products released by the algae for the young stages of these giant crabs.

6) In short, this finding opens new lines of investigations, in the field of aquatic sciences for conservation and enhancement of natural resources, rational utilisation of depletable algal resources, environmental planning and management, environment impact assessment and also for creating awareness of new environmental issues connected with aquatic resources of the world.