ZOOPLANKTON AS FEED FOR FISH: FOR BETTER QUALITY AND PROFIT

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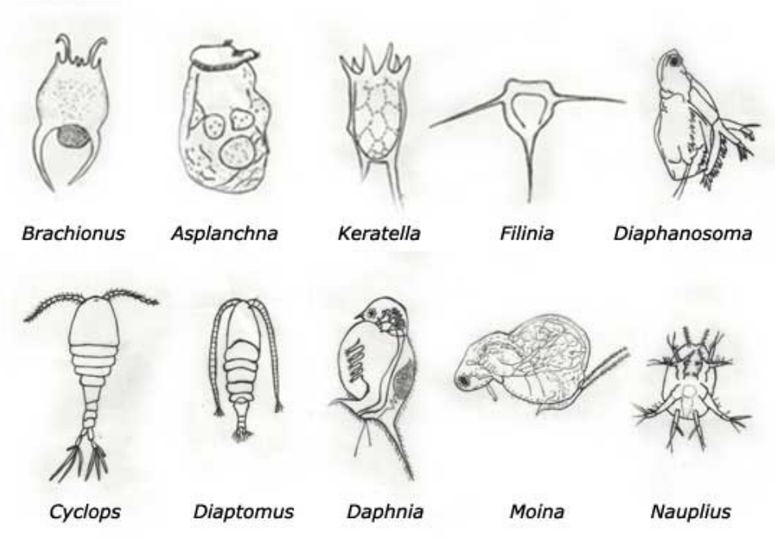
INTRODUCTION

Zooplankton comprises a vast group of animals ranging in body size from microscopic single-celled protozoa to jellyfishes; inhabiting almost all the surface water bodies of the world and even the subterranean aquifers. Most of the organisms in this group lead a planktonic life (being minimally motile and drifting) throughout life; the initial developmental stages of many larger invertebrates and vertebrates also lead a planktonic life and are known by the respective taxon names (e.g., Ichthyoplankton). Being heterotrophs (getting nourished with algae and other smaller zooplanktons); act as one of the fundamental chains in the global food web facilitating energy transfer to the next trophic level.

In nature, zooplankton act as the basic food or prey for the initial stages of adult lifeforms of most the aquatic organisms including the commercially important forms like crustaceans, molluscs and fishes. The close connection of these organisms existing in the form of a 'prey-predator relationship' is widely been made used in developing farming practices and economic aquatic faunal varieties in diverse types of farming and husbandry practices. In nature, much of the nutritional requirements of the fish species for enhancing their growth and reproduction are derived from consuming the zooplanktons. Also, as the fish species are incapable of synthesising essential amino acids (EAAs), has to be obtained from exterior sources rich in those aspects such as zooplankton. As the zooplankton are feeding on microalgae able to synthesise the EAAs (e.g Eicosapentaenoic acid (EPA) and the Docosahexaenoic acid (DHA)); fish assimilates those biomolecules through the consumption of zooplankton. Hence, on a global scale, this technique of microalgal based zooplankton culture for nourishing the fish larvae is widely been used in the hatchery practices of saline and freshwater fish species.

Among freshwater zooplankton, cladocerans, rotifers and copepods are the widely employed groups for live feed aquaculture, as these can be easily cultivated at low cost. Because of the high reproduction rate, wide tolerance to the fluctuating environment and the ability to feed other organic matter other than microalgae make these organisms, candidate groups to the farmers. Gathering preliminary knowledge regarding the biology and ecology of each zooplankton group such as feeding, reproduction, life cycle and essential water quality parameters is a prerequisite for the farmer before venturing into the aqua business



CULTURE METHODS

Three methods have been widely used by the small and medium scale aquaprenuers for the mass scale production of live feed for catering for the dietary requirement of fish larvae: 1. In yeast media - Culture in small to medium containers using 'Baker's yeast' by providing additional aeration and with minimal water exchange on alternate days for regulating the stock and culture environment 2. Organic manure media- Culture in freshwater fertilised with organic manure (chicken manure, cow dung, groundnut oil cake etc.) in covered small to medium containers with gentle aeration 3. In green water – Pure microalgal culture in freshwater fertilised with organic or inorganic manures with a single component or with a combination of Single Super Phosphate, Urea and Ammonium Sulphate provided with pure algal inoculation, gentle aeration and water exchange on alternate days to maintain an optimal environment to ensure high plankton density.

COMMON ZOOPLANKTON IN INDIAN FRESHWATERS

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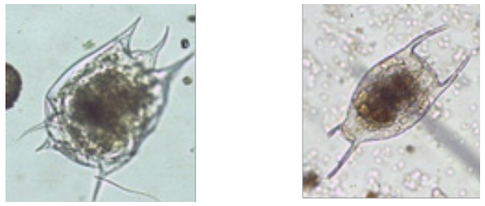

Fig. 1: Rotifers (Wheel animalcules)

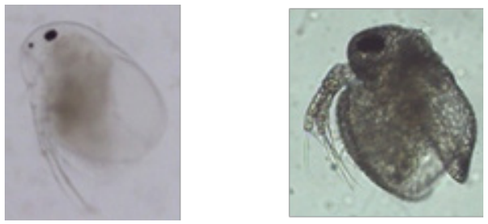

Fig.2: Cladocerans (Water fleas)

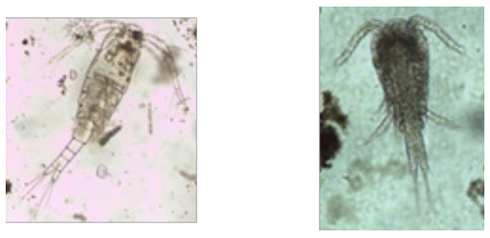

Fig.3: Copepods

CONCLUSION

As the cost of the life feeds available at markets such as cysts of brine shrimp are quite expensive; a good alternative venture is to cultivate the desired zooplankton at a low-cost venture. Other than the nutritional and economic gains, this technique will ensure the economic loss due to the wastage of unconsumed feed and associated water quality issues; the ability of plankton to purify the environment will be an added advantage for the farmer.