IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

ISOLATION AND CONTINUOUS CULTURE OF FRESHWATER ROTIFERS

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Abstract:

Various zooplanktons are use as a food material for fish. Rotifer is among one such group of zooplanktons which is widely use as a live feed for culture of various fishes and other aquatic organisms. In the present study the culture of rotifers like Brachionus calyaflorus, Brachionus havanaensis, Brachionus plicatilis is carried out under the laboratory conditions for which healthy samples of zooplanktons were collected from the fresh water resource and separated for isolation of rotifers with the help of fine tipped micropipette. The isolated rotifers were transfer to the culture tank at the rate of 10-20 individuals/ml and feed upon algae (*Chlorella*, *Scenedesmus)* approximately at concentration 40×10^3 cells/ ml. Growth of rotifer culture slow for initial 2 day that is 170 individuals/liter and attain its peak density at 3rd and 4th day that is1050 individuals/liter and 2440 individuals/liter respectively. From 5th day rotifer population start to decrease which was found to be 1510 individuals/liter on 5th day, 960 individuals/liter on 6th day, 750 individuals/liter on seventh day and 300 individuals/liter at 8th day The harvested rotifers then proceed for drying to get powdered form which can be use as a fish feed.

Key words: Live food, Rotifers, Rotifer culture

Introduction:

Rotifers are small wheel aquatic animals less than 1mm in size. They can be easily found in all type of water bodies. They can be found in fresh water bodies as well as marine water. The phylum Rotifera includes three classes that is Seisonidea, Bdelloidea and Monogononta. Monogononta is the largest group which represents about 1500 species, which is followed by the Bdelloidea, representing about 350 species and class Seisonidea is the smallest

class which represents only two known genera with three species. This diversity of rotifers is observed in aquatic ecosystem naturally and they serve as a best live food for the fish and fish larvae. Rotifers are good source of proteins and unsaturated fatty acids and hence they considered as a living capsules for fish. Rotifers are widely used as a primary source of food or the initial stages of fish and crustacean larvae **(Ando *et.al.*, 2004).** Fishes require protein rich live food for their better growth, efficient breeding and survival **(Mandal *et.al.*, 2009).**

Success of aquaculture depends on healthy cultured stock. A disease free healthy stock can be maintained by feeding live food to the cultured stock **(Das *et.al.*, 2012).** The enriched food sources are hard to digest and costly which increase the cost of fish production. Hence it is necessary to find out the alternate food source which is high in nutrients, easy to digest and cheap. Rotifers are valuable live food for fish culture they remain suspended in water column, having high reproductive rate and can tolerate the wide range of temperature and pH **(Arimoro 2006).** It is possible to culture rotifers under laboratory conditions. Rotifers are very useful live feed organisms in aquaculture **(Planas and Cunha, 1999).** Various researchers carry out the batch culture, continuous culture and mass culture of rotifers under laboratory condition. **Ajah 2010** culture rotifers using three different algal species. **Rufchaie *et.al.*, (2012)** culture the rotifers under laboratory conditions and studied effect on *Acipenser persicus* larvae. **Lim and Wong (1997)** use rotifer *Brachionus calyciflorus pallas* in freshwater ornamental fish larvi culture. **Park *et.al.*, (2001)** carry out high density culture of the freshwater rotifer, *Brachionus calyciflorus.* The present study was aimed to culture the rotifers under laboratory condition, which can be utilized as a food for fish larvarvae. Live food organisms contain all the nutrients such as essential proteins, lipids, carbohydrates, vitamins, minerals, amino acids and fatty acids **(New 1998)** and hence are commonly known as "living capsules of nutrition".

Materials and Methods:

Collection and Isolation of Rotifer species:

Rotifers were found in abundant amount in the fresh water bodies of Washim region. The rotifer sample was from some fresh water ponds of Washim region like Dev talav, Padma tirth, R.A. College fish farm and Ekburji dam. Different species of Rotifers like--------found in abundance in these freshwater bodies around Washim region. **Tayade and Dabhade (2011)** reported 100 species of Rotifers from Washim district. The samples were collected with the nylon net of standard mesh size 50-80 µm. The samples were immediately brought to the research laboratory of Zoology department R.A. College Washim for their isolation. In the laboratory the samples were rinsed to reduce contamination by other organisms. Isolation of the live rotifers was carried out by the fine tip micropipette under the dissecting microscope. The isolated rotifers were immediately transferred to the culture tank.

Rotifer culture:

The isolated rotifers were cultured in 30 liter capacity aquarium tank for the culture at the density of 10-20 individuals per liter. The rotifer cultures were maintained at a controlled temperature 20-28 °C in 30 Liter culture tank with proper aeration and light availability that is 12:12 light and dark cycle. The water quality was continuously monitored and 40% of water was replaced after every 5-6 days. The rotifers fed daily with a mixture of algal diets (*Chlorella*,

Scenedesmus) approximately at concentration 40×10^3 cells/ ml. All the water quality parameters were monitored before the rotifer inclusion into the culture tank.

Growth performance:

To check the growth performance of rotifers, 20 adult rotifers/ liter were transferred into the 10 liter separate container and feed with the algal diet. Total numbers of rotifer were counted after 5-7 days to check their growth performance.

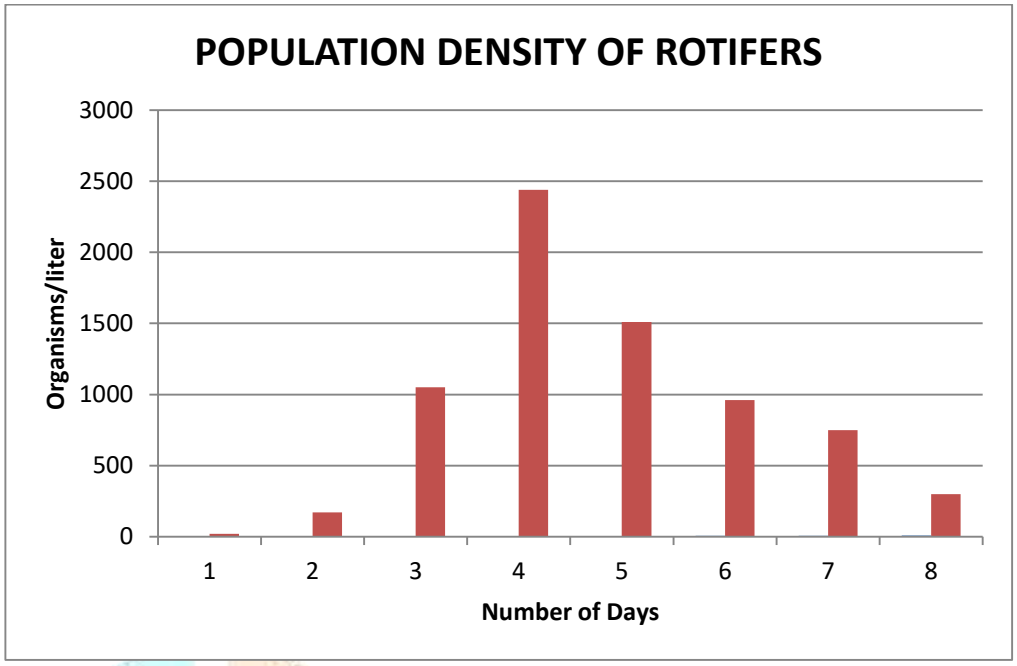
Harvesting of Rotifers:

The rotifer population reached at its peak density after 5-7 days of the culture. The high density rotifers were harvested from the culture tank in a bulk and sun dried or freeze dried to obtained the powdered form.

Result and Discussion:

Growth performance of rotifers were monitored on regular basis initially growth of rotifer culture was slow that is 170 individuals/liter and culture attained its peak density at 3rd and 4th day that is1050 individuals/liter and 2440 individual/liter respectively. From 5th day rotifer population start to decrease which was found to be 1510 individuals/liter, 960 individuals/liter on 6th day, 750 individuals/liter on seventh day and 300 individuals/liter at 8th day (**Graph plate I).** Thus to get maximum yield it was important to harvest the rotifers on 3rd or 4th day of the culture. Rotifers were isolated from the culture tanks and fresh rotifers were again inoculated to get the second culture. After harvesting 20-30% water was replaced by fresh water to get continuous healthy culture of rotifers. The harvested rotifers then proceed for drying to get powdered form which can be use as a fish feed.

Rotifer production depends on temperature and algal species used as feed, **Kraul (1989)** culture marine rotifers using algal diet and conclude that algal enrichment is the safest method **Dhert *et.al.*, (2001)** carried out a rotifer culture using microalgae and bakers yeast as a food source and produces over 300 to 1000 individuals/ml in 3-7 days. **Ekelemu and Nwabueze (2011),** culture rotifers using different organic mannure like cow dung, poultry dropping and pig dung, the rotifer culture showed modrate poputaion density in the culture of cow dung and pig dung that is 14 individuals/ml and 12 individuals/ml while rotifer density increases tremandously 20-30 individuals/ml in poultry manure tank hence their research reveals poultry dropping as a better source of organic mannure for rotifer culture as compare to cow dung or pig dung. **Rahman *et.al.*, (2018)** researched on the effects of microalgae as live food fot *Brachionus plicatilis* (Rotifer) in intensive culture system, the culture yield 0.7 x 10^6 individuals/ml. A general method for establishing cultures of planktonic rotifers from natural waters was described by **Stemberger (1981),** durimg the culture experiment four species of rotifers *Asplanchana priodonta, A.herricki, Polyarthra major and Synchaeta pectinata* were culture using algal diet. All the species shows good response to the algal diet and shows maximum growth under laboratory conditions.



Conclusion:

Rotifers play very important and diverse roles in freshwater aquaculture and serve as good source of food for small fish. Rotifers are easy to culture and can be maintained at high density and can be use directly as a live fish feed or can be converted into the dry powdered form for the future use.

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