

**PRELIMINARY OBSERVATIONS ON EFFECT OF THREE DIFFERENT TYPES OF FOOD  
ON THE POPULATION DENSITY OF THE FRESH WATER ROTIFER,  
*LECANE INOPINATA*.**

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**Keywords:** Rotifer, *Lecane inopinata*, population density, food

**Abstract:**

*Effect of three different types of food i.e. Chlorella, bacteria in supernatant liquid of DOGC dipped in distilled water and bacteria in supernatant liquid of rice bran dipped in distilled water was studied on Lecane inopinata. Preliminary observations on population density of L. inopinata were recorded. Maximum population density was observed in the set of experiments where bacteria in the supernatant liquid of rice bran dipped in distilled water were used as the food and minimum population density was observed in the set of experiments where Chlorella was used as food. Thus preliminary investigations showed that Lecane inopinata prefers bacteria as food than microalgae, Chlorella spp.*

**Introduction:**

Rotifers are the smallest metazoan zooplankton in freshwater pelagium and very common in Indian waters. Significance of rotifer population as the quantitative dominant class in zooplankton population has been recorded in many Indian lakes (Nene (1985); Salaskar (1996); Hosmani (2002); Manzer *et al.* (2005) and hence they can be easily available as food for aquatic organisms.

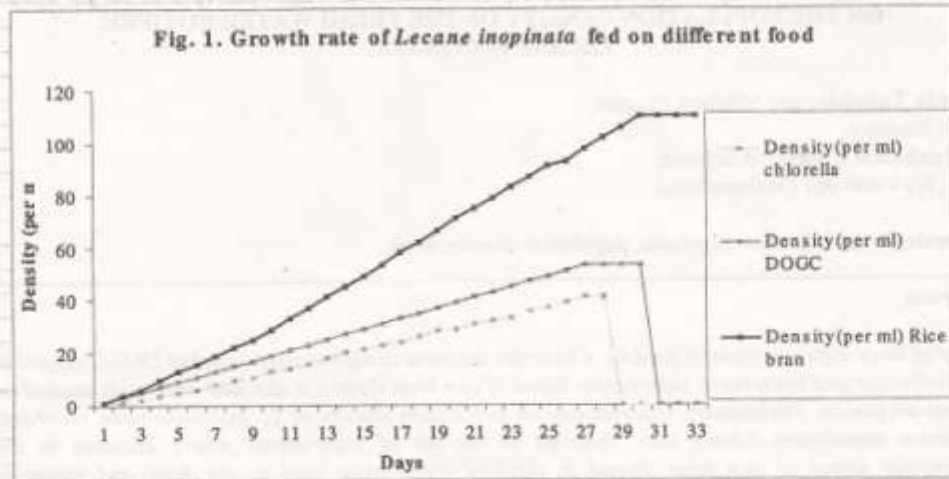
As rotifer constitute large portion of diet of larval fish (Polgar and Souza, 1981), they can be used as live feed for larvae of fishes as well as prawns and other cultivable aquatic animals. Live feeds are highly nutritive and easily digestible food for many cultivable aquatic species and hence simple low cost live feed production technology is the need of present era for the success of aquaculture in India. Thus to explore the possibility of culture of rotifers all over India, study of suitability of food for rotifers has an importance. To explore this possibility certain experiments were carried out in laboratory.

Rotifers exhibit wide range of feeding behaviour, which differ in response to the changes in nutritional environment, and availability of prey. Many rotifer species are described as herbivores (Koste, 1978; Battish, 1992) but there are the evidences from laboratories and field studies that rotifers are capable to feed on small prey such as bacteria (Arndt, 1993) as well as large prey such as ciliates. (Sanders and Wickham, 1993).

The type of food on which the organisms feed can affect their growth rate as well as reproductive rate, which might be true for rotifers. Hence to study this effect, rotifers were fed on different diets.

**Materials and Methods:**

For the present study, zooplankton were originally collected from fresh water ponds with the help of nylon net (mesh 25, diameter of pore 60 $\mu$ ). From collected plankton, rotifers *L. inopinata* were identified and classified. Identification was done by using key given by Battish (1992). Isolated specimens were propagated under laboratory conditions.



**Table 1. Population density of rotifers in different media (food) .**

Day	No. of Organisms		
	Chlorella	DOGC	Rice bran
0	5	5	5
1	7	15	20
2	12	24	30
3	20	35	50
4	25	44	65
5	32	55	80
6	40	65	94
7	48	77	109
8	56	85	125
9	64	93	143
10	72	105	165
11	81	115	185
12	90	125	207
13	98	134	225
14	106	145	245
15	113	156	267
16	122	165	290
17	130	175	312
18	139	185	332
19	145	197	355
20	153	207	375
21	160	217	395
22	168	225	415
23	178	235	435
24	186	247	455
25	195	256	468
26	203	268	488
27	203	268	508
28	All dead	268	528
29	-	268	528
30	-	All dead	528
31	-	-	528
32	-	-	All dead

To study the effect of different types of food on *L. inopinata*, three food items were selected, namely chlorella, Bacteria in supernatant liquid of de oiled groundnut cake (DOGC) dipped in distilled water and bacteria in supernatant liquid of rice bran dipped in distilled water. Among these food items, chlorella was brought from live feed culture laboratory, CIFE, Mumbai while bacteria were cultured in our own laboratory.

To study the effect of these food items on *L. inopinata*, experiments were arranged in three sets. Each set consisted of three 10ml sterile glass beakers. For three sets of experiments three different food items were used. Food used in each set is as follows:

**1<sup>st</sup> set: Chlorella**

**2<sup>nd</sup> set: Bacteria in supernatant liquid of DOGC dipped in distilled water**

**3<sup>rd</sup> set: Bacteria in supernatant liquid of rice-bran dipped in distilled water**

To start the experiment, 5ml distilled water was taken in each beaker. *L. inopinata* was inoculated as one organism per ml i.e. total 5

organisms in the beginning. Quantity of food fed to organisms in each set of experiments was constant i.e. 0.1 ml per beaker. Each set was repeated thrice. Each set was observed at the interval of 6 hrs and total no. of organisms were recorded for 32 days. At the end of experiments average readings were calculated and are represented in Table 1.

#### Result and Discussion:

During the present study, the maxima of population density were obtained in different days in different sets of experiments. A maximum of population density of 1st set was observed at the end of 26 days. In second set it was observed at the end of 27 days while in third set it was observed at the end of 28 days.

Among these experiment sets, maximum population density i.e. 110 organisms/ml was observed in the third set with Bacteria in supernatant liquid of rice bran dipped in distilled water as food while minimum population density i.e. 41 organisms was observed in first set with *Chlorella* as food. In second set intermediate population density i.e. 51 organisms/ml was observed where bacteria in supernatant liquid of DOGC dipped in distilled water were used as food.

A gradual increase in population density of the rotifer species was observed in the first few days (Fig. 1). Subsequently, the population remained in steady state in the last 2 to 4 days to be followed by sudden death of all organisms in all the sets of experiment.

These observations point out to the correlation between population density and food availability; as in the beginning when abundant food was available there was a steady increase of *L. inopinata*. The growth phase was followed by sudden crash of population which can be attributed to any one or all the factors listed below :

1. Unavailability of food
2. Accumulation of metabolic waste
3. Unavailability of sufficient amount of water

#### 4. Over-crowding

#### Conclusion:

Results during the present study showed that *L. inopinata* prefers bacteria than microalgae i.e. *Chlorella* sp. as the food. The present investigation also reveals that the sustainability of rotifer culture is dependent on the type of food and per capita availability of water.

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