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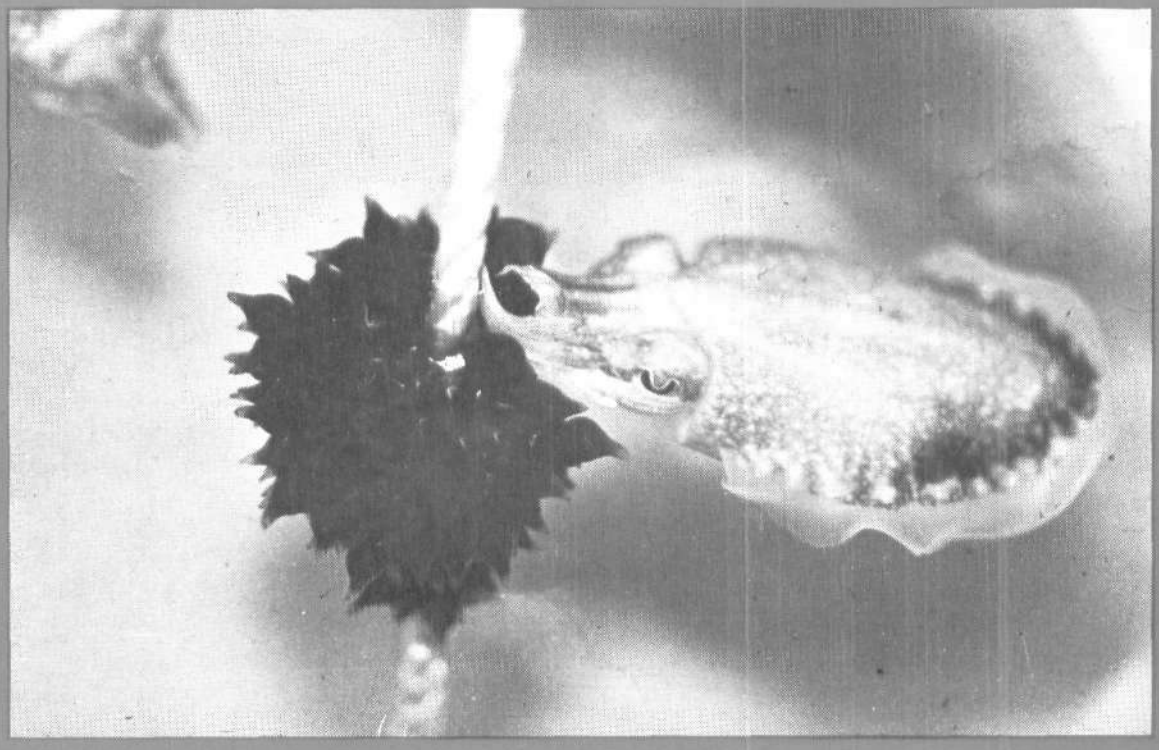

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895 ON THE MASS PRODUCTION OF ROTIFER WITH DIFFERENT COMBINATIONS OF FERTILIZERS

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Live feed organisms play a vital role in the early larval life of crustaceans and fin fishes. The success of commercial hatcheries depend to a very great extent on the availability of the required quantity of suitable live feed organisms at the right time. Among the various species of live feed organisms used in hatcheries the rotifer, *Brachionus plicatilis* is considered as an important species as it has been found to be the most suitable feed for the early zoeal stages of various species of crustaceans owing to its small size and slow swimming nature. Further, it can be cultured in high densities and can tolerate wide fluctuations in environmental conditions. Different types of feed viz. microalgae, yeast and bacteria have been successfully used in the culture of *B. plicatilis*. However, for the mass culture of the rotifer mostly microalgae have been widely used. Among the various species of microalgae, *Chlorella* sp. is preferred mainly because it is easy to culture and also less expensive. The present article reports on the mass production of *B. plicatilis* with *Chlorella* sp. as feed which was cultured using three different combinations of fertilizers. The work formed part of the programme of the crustacean hatchery work being carried out at Tuticorin Research centre of CMFRI.

Collection of rotifer and maintenance of stock culture

The rotifers for the present study were obtained from the Mandapam Regional Centre of CMFRI and maintained at Cochin. They were transported to Tuticorin in transparent plastic containers of one l capacity by bus from Cochin on 1.12.'97. After reaching Tuticorin the rotifers were stored in different plastic basins containing filtered sea water and were maintained with *Isochrysis* as feed. In order to maintain a stock culture the rotifers were transferred from the plastic basins to a cylindroconical tank containing 200 l of filtered sea water which was previously fertilized with neem oil cake (250 g/t), urea (10 g/t) and superphosphate (5 g/t) and inoculated with *Chlorella* sp. which was also cultured separately in a translucent cylindroconical FRP tank using the above mentioned fertilizers.

Combination of fertilizers used

The experiments were conducted using the following three different combinations of fertilizers.

Fertilizer No. 1 : Groundnut oil cake (250 g/t), urea (10 g/t) and superphosphate (5 g/t).

Fertilizer No. 2 : Neem oil cake (250 g/t), urea (10 g/t) and superphosphate (5 g/t).

Fertilizer No. 3 : Ammonium sulphate (100 g/t), area (5 g/t) and superphosphate (20 g/t).

The experiments were conducted in cylindroconical FRP tanks of 350 l capacity. The three combinations of fertilizers were introduced into three different tanks containing 200 l of filtered sea water and inoculated with *Chlorella* collected from the stock culture. The rotifers were collected from the stock using a nylobolt filter with 40M, mesh size, transferred to a bucket and the population density was recorded by counting 1 ml of the sample in a rotifer counting chamber. The rotifers were then introduced into the three experimental tanks at the rate of 1/ml. Periodical sampling was carried out in all the three tanks to assess the population density.

Production of rotifers

A total of four experiments was conducted, each experiment lasting for 9 to 12 days. The rate of production of rotifers was found to be maximum when neem oil cake was used as one of the ingredients, the average production on the last day of the experiments being 277 / ml as against 203 / ml and 65 / ml recorded for groundnut oil cake, urea and superphosphate combination and

ammonium sulphate, urea and superphosphate combination respectively (Table 1). The composition of ovigerous female/ml was also the highest when neem oil cake was used as one of the ingredients. As against an average number of 10.5/ml (5.2 %) recorded for Fertilizer No. 1 (with groundnut oil cake as the main ingredient) the composition of ovigerous females recorded for Fertilizer No. 2 (with neem oil cake as the main ingredient was 16.5/ml constituting 6.0% of the total population indicating that the rate of reproduction is faster when neem oil cake is used as one of the ingredients.

TABLE 1. *Production of rotifers in different experiments*

Expt. No.	Duration of culture Days	Total No. of rotifers/ml Fertilizer No. 1	Fertilizer No. 2	Fertilizer No. 3
1	0	1	1	1
	7	20	180	20
	12	260	580	80
2	0	1	1	1
	8	160	120	60
	10	180	520	0
3	0	1	1	1
	6	160	80	160
	9	360	1	180
4	0	1	1	1
	6	16	40	44
	9	200	180	60
	12	10	6	1
Average production on the last day of the experiment		202.5	276.7	65.2

During the course of the experiments the ambient temperature ranged from 26.0° C to 37.5°C, salinity from 29.2 to 43.6 ppt and pH from 8.3 to 9.2 (Table 2).

TABLE 2. *Hydrographical conditions in rotifer culture tanks during the period of the experiments*

Expt. No.	Temp. °C Min.	Max.	Salinity Min.	Max.	pH Min.	Max.
1	26.0	33.5	29.2	31.3	8.5	9.2
2	28.0	32.6	35.4	43.6	8.7	9.0
3	26.0	32.0	39.5	40.7	8.5	8.9
4	28.5	37.5	33.7	43.3	8.3	8.6

Since the rotifer production is directly dependent on *Chlorella* cell concentration in the culture medium, the rate of production of *Chlorella* in the tanks fertilised with the three different combinations of fertilizers was studied separately and it was observed that initially the rate of production was high in the tank fertilised with neem oil cake. Five days after inoculation, the cell concentration in the tank fertilised with ground nut oil cake was only 6.64 million/ml whereas it increased to 9.7 million/ml in the tank fertilised with neem oil cake. However, after ten days the cell concentration declined in the latter whereas in the former it showed an increase (Table 3).

TABLE 3. *Density of* Chlorella *in the culture tanks fertilized with three different combinations of fertilizers*

Days after inoculation	*Chlorella* concentration (Nos./ml) Fertilizer No. 1	Fertilizer No. 2	Fertilizer No. 3
0	360	360	360
5	66,40,000	97,00,000	16,40,000
10	1,13,00,000	88,00,000	Not counted

The maximum production of 277/ml recorded in the present investigation agrees well with the findings of the earlier workers. The relatively higher rate of production of rotifers when neem oil cake is used instead of groundnut oil cake suggests that neem oil cake is a better fertilizer for rotifer production and can effectively replace groundnut oil cake which is normally used in the mass culture of *Chlorella* and rotifer. Further,

as the neem oil cake is cheaper than groundnut oil cake the cost of production of rotifers can also be minimised. The nutritional value of the rotifers cultured with these three fertilizers may vary. However, the present investigation was aimed at finding out the rate of production of rotifers in terms of population density only and the results of the experiments clearly show that the rate of production is higher when neem oil cake is used as one of the main ingredients.

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