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CULTURE OF *MOINA MICRURA* ON VARIOUS ORGANIC WASTE PRODUCTS

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ABSTRACT

Moina micrura, a cladoceran species, is considered to be one of the best live food organisms for rearing the young larval stages of fish and prawn. Considering the importance of this species in hatchery operations the present study was undertaken to record the fecundity and life span of *Moina micrura* and to culture it using different locally available organic waste products. Experiments revealed that each individual of *Moina micrura* produces an average of 5.97 offsprings per day and a total of 27 offsprings in its average life span of 4.72 days when fed with Backer's dry yeast at the rate of 300 ppm/day. Mass culture experiments conducted in two series of 10 containers each, were treated separately, with, groundnut oilcake, coconut oilcake, maize oilcake, cotton seed oilcake, gram cake, mustard oilcake, "til" oilcake, "alsi" oilcake, gram + maize cake (1:1) and raw cattledung. In indoor culture, a maximum production of 2600 ind/l and a minimum of 1050 ind/l were obtained when treated with gram + maize oilcake (1 : 1) and "til" oilcake respectively. In outdoor culture, a highest production of 6000 ind/1 was achieved with "Alsi" and "Till" cakes and a lowest density of 1050 ind/1 with coconut oilcake and raw cattle dung was obtained with an inoculation rate of 5 ind/1.

INTRODUCTION

Zooplankton form a high class nutritive food for better survival and growth of all life stages of fish and prawn. The natural live food organisms make available minerals and micro-nutrients and thus compensate when formulated feeds are used, resulting in healthy growth and vigour of fish and prawn larvae.

The success of live feed production depends on the suitable culture medium. In Japan the zooplankton species have been cultured using diatoms and yeast as food (Theilacker, and Mc Master, 1971; Kinne, 1977; Gatesoupe and Robin, 1981). In India, the zooplankters like *Artemia sp* , *Brachionus sp* and *Moina sp* etc. have been cultured successfully by the application of organic manures and inorganic fertilizers in different combinations and doses (Shirgur, 1971; Dwivedi *et al*, 1980, Dwivedi *et al*, 1985) which is simple and less expensive. In the present study, different locally available organic waste products were tested to determine their suitability for the mass culture of *Moina micrura*.

MATERIALS AND METHODS

For fecundity and life span study of an individual *Moina micrura* eleven cylindrical glass tubes of 20 ml capacity were used. Each tube was filled with 10 ml filtered tubewell water. Offsprings of *Moina micrura* of known age were inoculated @ one in each test tube. They were fed with dry yeast @ 300 ppm. After 24 hours, original *Moina micrura* was seperated from offsprings of second generation and kept in a seperate test tube. This process was continued till the original *Moina* died.

Ten 2.5 litre capacity and ten cylindrical glass jars of 2.5 litre capacity were used for indoor mass culture. Each jar was filled with 2 litres of filtered tube well water. Each jars was treated with different organic manures, viz., groundnut oilcake, coconut oilcake, maize oilcake, cotton seed oil cake, gram cake, gram + maize cake, raw cattledung, mustard oilcake, til oilcake and alsi oilcake @ 200 ppm. A day after the application of manuring, *Moina* was inoculated in the culture medium @ 5 individuals/litre. The same dose of manure was repeated on the second day also. Since, the water in the jars was turbid, no other dose of manure was applied after the second day.

For outdoor mass culture 10 circular cement cisterns of 300 litre capacity, filled with 250 litres of filtered tubewell water were used. Tanks were treated separately with the same organic manures as applied in indoor culture. On the 4th day of application of the organic manure, *Moina micrura* was inoculated in each cistern @ 5 ind/1. The population densities of each cistern were recorded daily.

RESULTS AND DISCUSSION

The results of the fecundity and life span experiments revealed that each *Moina micrura* produces 1 to 14 offsprings per day and an average of 5.97. It produces a total of 27 off springs in its average life span of 4.72 days. On an average, the maximum offsprings of 6.9 were produced on the 2nd day of its life and gradually reduced day by day.

The indoor mass culture experiment showed that the maximum production of *Moina micrura* was obtained by feeding gram + maize cakes (1:1), i.e, 2600 ind./l., followed by maize cake (2100 ind/1), mustard oilcake (1800 ind/l), gram cake (1550 ind /l), coconut cake (1350 ind./l), cotton seed oilcake (1200 ind/L), groundnut oilcake (1080 ind/l) alsi oilcake (1060 ind/l), till oilcake (1050 ind/l) and raw cattledung (1050 ind/l) on the 3rd, 2nd, 5th, 2nd, 7th, 9th, 4th, 7th, 8th and 4th & 8th day (two peaks for cattledung) and the peak remained for 2,3,1,1,3,2,2,2,2 and 2 & 1 days respectively. The fluctuations of the population density treated with various organic manures during the culture period is shown in Fig.1.

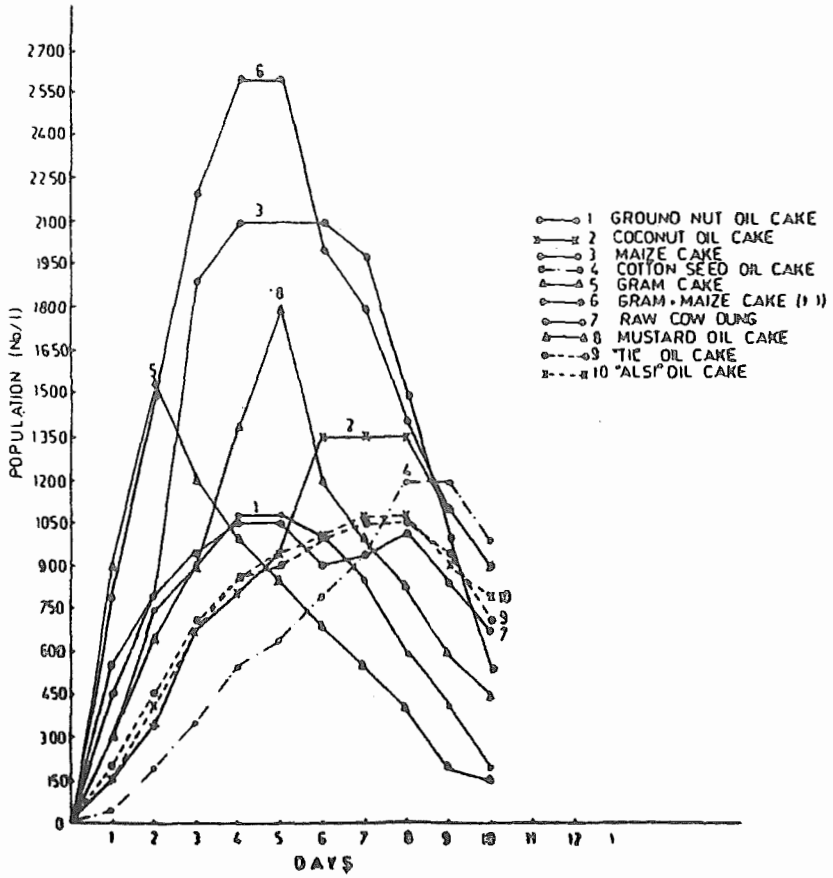

Fig.1. Population density in various organic manures

This study shows that an average production of 1584 individuals can be obtained with an initial inoculum of 5 ind/1 while Hameed Ali (1981) reported 8365 individuals/litre against the initial inoculation of 100 individuals/litre. Shirgur (1971) achieved a maximum production of 700 and 500 individuals/litre when *Moina* was fed with oilcake (200 ppm) and buffalodung (300 ppm) respectively. Thus the production of *Moina* in the present experiments is comparatively higher than that observed by Shirgur(1971).

The outdoor mass culture gave a maximum production of 6000 ind/1 with til and alsi oilcakes on the 10th and 9th day respectively, followed by gram + maize cake (1800. ind/l), maize cake (1600 ind/l), mustard oilcake (600 ind/1) and raw cattledung (600 ind/l). Fluctuation of population density under different feeds during the 14 days of experimental period is shown in Fig.2.

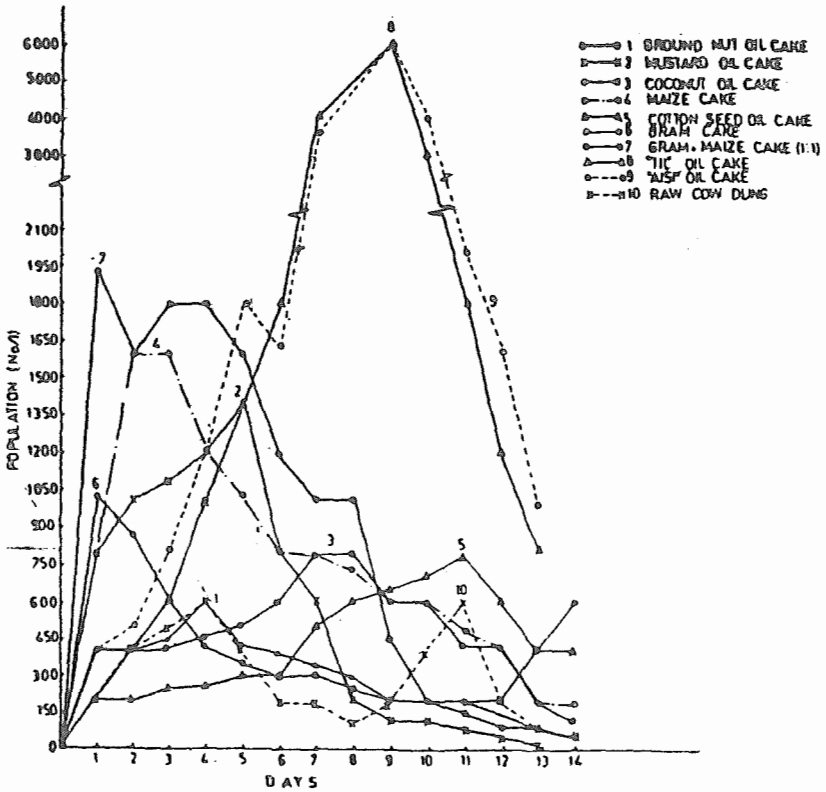

Fig.2. Population density for different feeds.

It is further observed that the peaks were obtained very fast in the outdoor culture in the tanks treated with gram + maize cake (1800 ind /l), maize cake (1600 ind/l). and gram cake (1000 ind/l) on the 2nd 3rd and 2nd day respectively. Therefore, treatment with one of those manures will be helpful in getting fast production of *Moina micrura* in the batch cultures at a shorter period for fish and prawn hatcheries.

The indoor and outdoor mass culture experiments were conducted in different types of environments and in different sizes of containers. In indoor culture, higher production was observed except in two tanks treated with til and alsi oilcakes. Higher production in smaller containers has been also reported by Bhimachar (1971), George (1973), Nandi *et al* (1977), Yung(1975) and Hameed Ali (1981). On the contrary in the outdoor culture, the two tanks treated with til and alsi oilcakes gave higher production (6000 ind/1) in comparision with the indoor culture but in this case, the peak density was delayed and was observed on the 9th and 10kth day in the tanks treated with alsi and til oilcake respectively. In these two tanks due to the presence of sunlight phytoplankton blooms were abundant on the 6th day and it was followed by *Moina micrura*. The results of these two tanks (outdoor) revealed that the yield of zooplankton depends on the intensity of phytoplankton and food in the culture system, as also observed by Theilacken and McMaster (1971) and Dwivedi *et al.*, (1980).

Therefore, it is concluded from the present experiments that for commercial prawn and fish hatcheries, which require a regular supply of live feed the present culture technique of *Moina micrura* with the use of organic manures can be a dependable source of live feed, This technique is very simple and gives high production in short duration of time.

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