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Biochemical composition of selected Meiobenthic fauna, cultured copepod *Mesocyclops leuckarti* (Claus, 1857) from Mombatta Lake

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Abstract
The present study was carried out from the laboratory culture; *Mesocyclops leuckarti* collected from Mombatta Lake at Daulatabad was sieved through 42 µm plankton net. 100 mg of cultured *Mesocyclops leuckarti* was taken for the biochemical estimation. The biochemical composition of *Mesocyclops leuckarti* shown the protein content was 58.33 ± 0.55% dry weight, lipid was 10.16 ± 0.10% dry weight, carbohydrates was 18.10 ± 0.24% dry weight and the water content was 93.25 ± 0.77%.

Keywords: Biochemical composition, copepod, *Mesocyclops leuckarti,* Mombatta Lake

1. Introduction
Sleep The production of planktonic organisms is good nutritional condition to feed fish larvae and fingerlings is a basic requirement in fish culture. Although this procedure ensures a quick response in terms of algal biomass increase, both zooplankton composition and nutritional condition change abruptly, causing low survival rates of fish fingerlings due to bad quality of food (Santeiro and Pinto-Coelho, 2000) [18]. An adequate plankton biochemical composition ensures the nutritional requirements for fish fingerlings especially during their initial development stages. Rajkumar and Vasagam (2006) [14] reported that many copepods are identified as potential live feed organisms and active investigations are carried out.
A wide variety of live organism has been utilized in larvae culture, mainly because of their nutritional value, which is higher than that of prepared diets. Copepods are a well-known natural food source from fish larvae and fingerlings, and the larvae of certain fishes prefer nauplii and copepodids over rotifers (Meeren, 1991; Schipp *et al.;* 1999) [11, 21]. Copepods constitute an important component of the food chain in aquatic ecosystem and accepted to be highly satisfactory for larvae of prawn and fin-fish species. Biochemical studies have shown that copepods are rich in protein, lipids, essential amino acid (EAAs), and essential fatty acids (EFAs) which can provide enhanced reproduction of brood stock, augmented growth, immune stimulation, and colour enhancement in prawns and fishes (Altaff and Chandran 1989; Safiullah, 2001) [1, 17].
Many authors have reported the utilization of copepods from wild and cultured sources from higher yields of prawn in ponds (Goswami *et al.,* 2000; Ashok *et al.,* 2005; Ashok and Rajkumar, 2007; Rajkumar *et al.,* 2008) [7, 2, 3, 15]. Studies on the biochemical estimation of different copepods and their utilization as food for the freshwater post larvae of prawn and fish are limited. Therefore, present study is focused on the biochemical composition viz. protein, lipid, carbohydrate and water content of laboratory cultured copepod *Mesocyclops leuckarti.*

2. Material and methods
The laboratory culture, *Mesocyclops leuckarti* collected from Mombatta Lake at Daulatabad was sieved through 42 µm plankton net. Collected *Mesocyclops leuckarti* was first washed with clean water to remove detritus. It was filtered through filter paper and was dried a blotting sheet. From this blot dried material, 100 mg of cultured *Mesocyclops leuckarti* was taken for the biochemical estimation by adopting Biuret method of Lowry *et al.,* (1951) [9] for protein, Dezwaan and Zandee, (1972) [6] using the anthrone reagent for carbohydrates and the total lipid estimated by the Vanillin reagent method by Barnes *et al.,* (1973) [4]. The water content of *Mesocyclops leuckarti* was determined according to Clegg (1974) [5]. Statistical analysis was performed by Mungikar (2003) [12].

3. Results

The biochemical composition of *Mesocyclops leuckarti* shown in table 1. The protein content was 58.33 ± 0.55% dry weight, lipid was 10.16 ± 0.10% dry weight, carbohydrates was 18.10 ± 0.24% dry weight and the water content was 93.25 ± 0.77%.

Table 1: Showing the biochemical composition of culture copepod, *Mesocyclops leuckarti.*

Parameters	Biochemical composition (%), Dry weight
Protein	58.33 ± 0.55
Lipid	10.16 ± 0.10
Carbohydrates	18.10 ± 0.24
Moisture	93.25 ± 0.77

Mean ± S.D. of 3 observations

4. Discussion

Perumal *et al.,* (2009) [10] reported the protein content of wild copepods varied from 59.53 to 69.61% in *Oithoma similis* and 67.33 to 75.45% in *Acartia spinicauda* from Parangipatti coast. Sipauba Tavares 2001 [22] reported 64% protein content in cultured *Argyrodiaptomus furcatus.* Hossain *et al.,* (2002) [8] while working on diet of mahsser fingerlings reported that feed containing 40% protein exhibited the best growth response while diet containing 20% protein resulted is the poorest growth. The present study show that protein 58.33% is the major chemical constituent of cultured *Mesocyclops leuckarti.*

Santeiro *et al.,* (2006) [19] reported 9.14% lipid content in copepod *Thermocyclops sp.* Rao and Krupanidhi (2001) [16] showed that variation in the lipid content can be attributed to its storage and utilization during period when it serves as an effective energy reserve. The present study 10.16% lipid content are present in cultured *Mesocyclops leuckarti* the lipid content of tropical zooplankton when compared to temperate zooplankton is significantly low which may be due to the hydrological condition and the type of availability of food organisms in environment (Ashok *et al.,* 2005) [2].

The carbohydrates content in cultured copepod *Mesocyclops leuckarti* showed 18.10%. According to Perumal *et al.,* (2009) [13] low carbohydrate content may be attributed to the fact that glycogen is the usual storage carbohydrate in many zooplankton like *Oithona similis* 7.98% and 6.59% in *Acartia spinicauda.* Comparatively *Mesocyclops leuckarti* show that the carbohydrates content a much higher 18.10% than reported.

In the present study, *Mesocyclops leuckarti* the water content was found to be 93.25%. Vengadeshperumal *et al.,* (2010) [18] has reported 82.94 ± 0.60% water content in another cultured copepod *Acartia centrura.* In cultured copepods *Oithona similis* varied from 79.22 to 83.87% and in *Acartia spinicauda* 82.06 to 85.80% reported by Perumal *et al.,* (2009) [13]. According to Madhupratap *et al.,* (1997) [10] different copepod species have a different protein, lipid and carbohydrates contents.

5. Conclusion

It is important to note that a species of choice could be used to obtain best result in fish culture.

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