

**BIOCHEMICAL COMPOSITION OF *SAGITTA BEDOTI* •
AND OTHER ZOOPLANKTON ORGANISMS
FROM AN ESTUARINE AREA**

VIJAYALAKSHMI R. NAIR*, M. SARASWATHY, K. SARALADEVI
AND T. G. GOPALAKRISHNAN

Regional Centre, National Institute of Oceanography, Cochin - 18

ABSTRACT

Major biochemical constituents in *Sagitta bedoti* and other zooplankton organisms from the Cochin backwaters were estimated. The calculated values expressed as percentage of dry weight for the different components were 52 - 64 % protein, 12 - 21% lipid, 3 - 5% carbohydrates, 9 - 15% ash and 1.4 - 4% chitin.

Little is known on the biochemical composition of many marine and estuarine organisms. Such a knowledge is essential for an understanding of the metabolism of different populations for providing an estimate of their energy content and for understanding the biogeochemical circulation of elements. Data on the chemical composition of tropical zooplankton is scanty and none exists from the Cochin backwaters. In this note preliminary results on the biochemical nature of a few organisms collected from a tropical estuarine area are presented.

Weekly collections were made from the Cochin backwaters, a monsoonal estuarine lagoon during January to March 1975. The fauna of the backwaters undergoes seasonal fluctuations and copepods, chaetognaths, mysids, *Acetes* spp and decapod larvae are the main

groups encountered regularly in the samples. The purpose of this evaluation is to get some working values for the major biochemical constituents in tropical zooplankton and hence no attempt was made to segregate them into species except in the case of chaetognaths. In the live condition, organisms were sorted out into major taxonomic groups, rinsed with distilled water, drained gently over a filter paper and their wet weights were determined. Material was dried to a constant weight in an oven at 70°C. It was homogenised, dried for 3 - 4 hours and stored in a desiccator until analysed.

Estimations were made for protein, lipid, carbohydrates, ash and chitin. Although standard methods are available for the estimations of these major components (Raymont *et al.*, 1946), some modifications for analysing the various

*Present address : National Institute of Oceanography, Dona Paula, Goa 403 004

constituents in dried material become necessary. Hence the modifications suggested by Bamstedt (1974) for estimating the major biochemical fractions were adopted.

The calculated values expressed as percentage of dry weight for the different components in the samples ranged from 52-64% protein, 12-21% lipid, 3-5% carbohydrates, 9-15% ash and 1.4 - 4% chitin. Water content was found to vary from 71.6-92.9% excepting in fish larvae where a relatively low value (10.1%) was found. (Table I.)

The common chaetognath species in this estuary is *Sagitta bedoti* Beraneck. Unlike the population from higher latitudes breeding in this species is continuous in tropical waters and periods of heavy spawning are super imposed on continual spawning (Vijayalakshmi, 1973). The specimens for the present analysis were collected during the mid-February to mid-March

which represents the intensive breeding month.

The biochemical fractions as percentages of dry weight in *S. bedoti* were 64.4% protein, 16.2% lipid, 4.3% carbohydrates and 10.9% ash. Reeve *et al.* had worked out the major constituents of *Sagitta hispida* Conant, a common chaetognath in the inshore waters of Miami. The recorded values for protein are relatively higher in the present estimation. Reeve *et al.* have already noted the fluctuations in protein values in *S. hispida* and hence the difference in the protein value may be because of seasonal change. Water content was 92.3%.

We thank Dr. S. Z. Qasim and Dr. T. S. S. Rao of National Institute of Oceanography for their help. We are also indebted to Smt. C. S. Shynamma, Department of Marine Sciences, University of Cochin, for her assistance in the estimations.

TABLE I. Average values for the major biochemical constituents in tropical zooplankton

Group	Protein	Lipid	Carbo- hydrate	Ash	Chitin	Water content
	% of dry weight					%
Copepoda	52.4	18.6	3.8	15.1	1.4	91.9
Mysids	57.9	19.4	2.7	13.5	3.7	71.6
<i>Acetes</i> Spp.	59.6	16.5	4.6	9.4	4.0	81.7
Decapod larvae	58.9	12.4	5.4	15.4	—	83.2
Fish larvae	63.9	21.1	2.8	—	—	10.1
<i>Sagitta bedoti</i>	64.4	16.2	4.3	10.9	—	92.3

Vijayalakshmi R. Nair and others: Biochemical composition of sagitta bedoti

REFERENCES

- Bamstedt, U. 1974. Biochemical studies on the deepwater pelagic community of Korsfjordin, Western Norway. Methodology and sample design. *Sarsia.*, 56: 71-86.
- Raymont, J. E. G., J. Austin and E. Linford., 1964. Biochemical studies on marine zooplankton I. The Biochemical compositions of *Neomysis integer*. *J. Cons. perm. int. Explor. Mer.*, 28 : 354-363.
- Reeve, M. R., J. E. G. Raymont and J. K. B. Raymont., 1970. Seasonal biochemical composition and energy sources of *Sagitta hispida* *Mar. Biol.* 6 (4) : 357-364.
- Vijayalakshmi Nair, R. 1973. Breeding and growth of chaetognaths in the Cochin backwaters. *IOBC Handbook.* 5: 87-98.