Bangladesh J. Fish. Res., 5(1), 2001: 205-208

Short Note

Size frequency distribution and carapace length-total length relationship of *Acetes chinensis* in the Kutubdia channel of Bangladesh coast

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Abstract
The seasonal mean size distribution of *A. chinensis* were estimated às 29.229mm±4.77, 25.125mm±2.55, 25.165mm ±2.29 and 32.44mm ±3.63 for annual, monsoon, post-monsoon and pre-monsoon period, respectively. Seasonal mean carapace length distribution were estimated as 9.37mm±1.457, 8.063mm±0.63, 8.258mm±0.59 and 10.37mm±1.113 for annual, monsoon, post-monsoon and the pre-monsoon season. The carapace length and total length relationships was found to be TL= - 1.39±3.23 CL. Linear relation was found in arithmetic and as well as logarithmic scale.

Key words: *Acetes chinensis*, Size frequency, TL-CL relationship

Acetes is a minor planktonic crustacean group and represented by a few number of species in Bangladesh coastal waters. *Acetes* is assumed to play a significant role in the food web and dynamics of coastal water, lagoons, sea grass beds and mangrove swamps which extends over vast area in tropical and sub-tropical region (Omori 1975 and Achuthankuthy *et al.* 1973). They form conspicuous aggregation near the shore and are fished mainly with push net and fixed bag nets set near the shore against the flow of the tide. The fishing is generally done during day times (Omori 1974). In the Bangladesh coastal waters information on Sergestid shrimp of *Acetes* is scarce. But this shrimps are commonly distributed in estuarine and coastal waters of Bangladesh (Mahmood and Zafar 1989, Zafar 1992).

The present work shows size frequency distribution, relationship between carapace length-total length and length-weight relationship of *Acetes chinensis* in the Kutubdia channel for the first time from the Bangladesh coastal waters.

Samples of *Acetes* shrimp were collected for one year between September'95 and August'96 from the Kutubdia channel (Lat.21^0.53' 36" N and 91^0 54' 54" S). Samples were collected fortnightly from the catches of Behundi net (set bag net). Collected samples were kept into the plastic container and preserved in 5% neutralised formalin.

In the laboratory *Acetes chinensis* were identified and sorted out on the basis of morphometric characteristics such as the number of red spot in the endopod of the uropod, number of denticles in the rostrum, shape of the telson, presence or absence of procured tooth between the basis of first pair of pleopod and other characteristics mentioned by Omori (1975) and Xiao (1990). To confirm the taxonomic status of the species monthly different sizes of *Acetes chinensis* were also examined under a binocular stereoscopic microscope.

For the study of carapace length and total length relationship all specimen of the identified shrimp species were measured (Table1). The total length (from the tip of the rostrum to the tip of telson) and the carapace length (from the 1st denticle of the rostrum to starting point of the 1st abdominal segment) were measured with the help of millimetre scale. For establishing the total length and carapace length relationship the least square method was followed.

Table 1. Carapace length and total length relationship in different groups of *Acetes chinensis*

Class limit (mm)	Frequency	Mid points of CL (mm)	Log CL (X)	Observed mean TL (mm)	Log TL (Y)	Calculated LogTL= a+blogCL	Calculated TL=a+bCL
6.5-7.0	3	6.75	0.83	20	1.301	1.3077	20.411
7.0-7.5	5	7.25	0.86	22.7	1.356	1.3404	22.024
7.5-8.0	19	7.75	0.89	23.42	1.369	1.3737	23.638
8.0-8.5	28	8.25	0.92	24.63	1.391	1.4053	25.251
8.5-9.0	27	8.75	0.94	26.7	1.426	1.4264	26.864
9.0-9.5	23	9.25	0.97	28.04	1.447	1.4685	28.477
9.5-10	9	9.75	0.99	29.83	1.474	1.4896	30.091
10-10.5	10	10.25	1.01	31.85	1.503	12.5002	31.704
10.5-11	19	10.75	1.03	33.47	1.520	1.5212	33.317
11-11.5	35	11.25	1.05	37.87	1.540	1.5423	34.931
11.5-12	10	11.75	1.07	36.00	1.560	1.5634	36.544
12-12.5	7	12.25	1.09	38.29	1.580	1.5845	38.157

The sizes of *Acetes chinensis* varied seasonally. During the one year study, the highest size (39.5 mm) was recorded in the pre-monsoon period and the smallest (19.5 mm) was obtained in monsoon and mean length was recorded 29.23±4.77mm. In the monsoon months (May-Sept.) the size varied 23.5-29.5 mm and mean length was recorded 25.13 ±2.25mm. In post-monsoon period (Oct.-Dec.) the total length of this species was obtained between 20.5 mm and 29.5 mm with mean length of 25.17±2.29 mm and during the pre-monsoon period (Jan.-April) size range varied between 23.5 mm and 39.5 mm with mean size 32.44±3.63 mm

Highest carapace length (12 mm) was recorded in the pre-monsoon period and lowest carapace length (6.5 mm) was obtained in monsoon period and the mean carapace length was recorded 9.37±1.46mm. In the monsoon period, the carapace length varied between 6.5 mm and 9.5 mm, and mean was recorded 8.063±0.69 mm. In post-monsoon period, carapace length of this species was obtained between 7.0 mm and 9.5 mm with

mean length of 8.258±0.59 mm. During the pre-monsoon period size range varied between 7.0 mm to 12.0 mm with mean length 10.37±1.11 mm.

The carapace lengths were arranged in 0.5 mm interval and their average was plotted against the average total length. Scatter diagram of total length versus body weight are presented in Fig. 1. The relationship was found to be a straight line by the method of least square. The relationship of total length and CL is the carapace length was as follows: TL = - 1.39+3.23CL, where TL is the total length and CL is the carapace length.

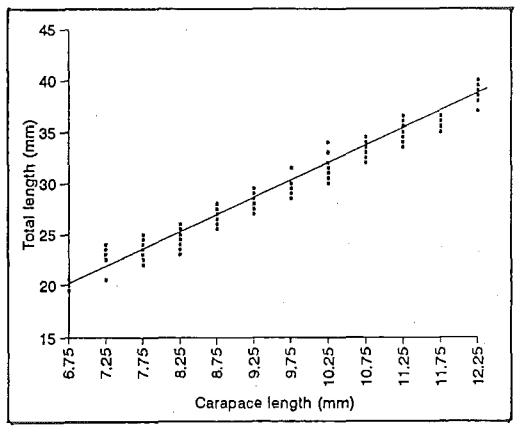

Fig. 1. Scatter diagram of carapace length and total length.

The relationship between carapace and total length of this shrimp shows a positive correlation (r = 0.9907, n = 12 groups). A linear relation was found in logarithmic scale (Fig. 1) between the total length and carapace length of *Acetes chinensis*. (Log TL = 0.44 +1.05 CL).

The relationship between carapace length and body length determined by Yasuda *et al.* (1953) for *Acetes japonicus* was CL = 2.04 + 0.18, BL for males and CL=1.13±0.18. BL for females valid for a body length range of 10-20 mm. Ikeda and Raymont (1989) determined a regression equation for *Acetes sibogae* as $\log_{10}$ (WW) = - 2.069 + 2.985. $\log_{10}$ (BL) (n=40, r=0.99) where WW is body wet weight (mg) and BL, body length (mm).

Ikematsu (1953) estimated from field samples that the life span of *A. japonicus* is 9-10 months for the winter generation and 2.5 -3.0 months for the summer generation. In the present investigation largest sizes of *A. chinensis* were found just after winter.

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(Manuscript received 6 December 1998)