GROWTH PARAMETERS OF THE MOST ABUNDANT PANDALID SHRIMPS (DECAPODA: CARIDEA) FROM THE NORTHERN AEGEAN SEA

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Abstract

Length-weight relationships and von Bertalanffy growth parameters were estimated for the five most abundant deep-water pandalid shrimps (*Chlorotocus crassicornis* A. Costa, 1871; *Plesionika antigai* Zariquiey-Alvarez, 1955; *P. giglioli* Senna, 1903; *P. heterocarpus* A. Costa, 1871 and *P. martia* A. Milne-Edwards, 1883) caught in the northern Aegean Sea.

Keywords: Pandalidae; length-weight relationship; growth; Aegean Sea

Introduction

Several pandalid shrimps are distributed along the Mediterranean continental shelf and slope. Although their biology has been thoroughly studied in western Mediterranean, little is known on their growth in the eastern Mediterranean. The present study provides preliminary information on the length-weight relationships and growth parameters of the five most-abundant pandalids of the northern Aegean Sea.

Materials and methods

Samples were collected during a 4-year MEDITS survey, preserved in 10% formaldehyde solution and carapace length (CL, to the nearest 0.01 mm) and total weight (TW, to the nearest 0.01 g) were measured. Sex was identified by the presence or absence of the male appendage on the second pair of pleopods. Appropriate parametric and non-parametric statistical tests were used to compare mean CLs between sexes. Length-weight relationships were determined using linear regressions and $\log_{10}$-transformed data, and analysis of covariance (ANCOVA) was used to identify differences in slope values between sexes. *t*-tests (H_0=3) with a confidence level of ±95% (a=0.05) were also performed to determine the allometry of the relationships. Standard von Bertalanffy growth curves were fitted to the length-frequency data for both sexes using ELEFAN I.

Results and discussion

Length frequency distributions are presented in Figure 1. A comparison of the mean CLs between sexes showed that females of *P. giglioli*, *P. heterocarpus* and *P. martia* reached a significantly (P<0.05) larger size than males, whereas no significant (P>0.05) difference existed in *C. crassicornis* and *P. antigai*. Length-weight relationships (Table 1) showed isometric growth and negative allometries in males and females respectively of *P. antigai* and *P. martia*. In *P. heterocarpus and C. crassicornis*, weight increased relatively slower than length in both sexes. Weight increased isometrically to length in *P. giglioli*. Length-weight relationships are instrumental in prescribing life habits of deepwater decapod crustaceans [1, 2]. Our results generally agree with those from the western Mediterranean [2] and are characteristic of nectobenthic species of moderate locomotory ability. The von Bertalanffy growth parameters (Table 1) showed distinct growth patterns between sexes in all species, as female generally reached larger L_{inf}s and had higher K. This is apparent for *P. martia* and *P. heterocarpus* from the northwestern [2] and central [3] Mediterranean, although growth parameters notably differ between different geographical regions. Results of the present study should be interpreted under the limitations regarding sampling of nectobenthic species using bottom trawling.

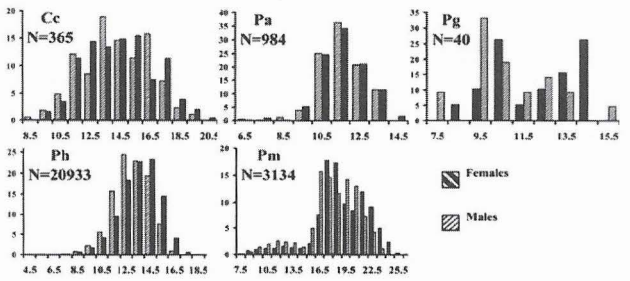

Fig. 1. Length-frequency distributions for the five most-abundant pandalids from the northern Aegean Sea. Abbreviations: Cc= *C. crassicornis*, Pa= *P. antigai*, Pg= *P. giglioli*, Ph= *P. heterocarpus*, Pm= *P. martia*.

Table 1. Descriptive statistics of carapace length (mm), length-weight relationships and von Bertalanffy growth parameters for the five most-abundant pandalids from the northern Aegean Sea (abbreviations of species names as in Fig. 1, += significant difference between intercepts (*a*) in the length-weight relationship, *= significant difference between slopes (*b*) and ns= no significant difference between sexes, P<0.001 for all regressions).

	Sex	N	Min-Max	Mean	Allometric equation	r^2	L_{inf} mm	K y^{-1}	t_o y
Cc+	F+M	365	9.0-20.2	14.4			17.3	0.48	-0.31
	F	201	9.6-20.2	14.4	$TW=3.3*CL^{2.8}$	0.90	19.0	0.40	-0.30
	M	164	9.0-19.4	14.3	$TW=5.9*CL^{2.8}$	0.90	17.4	0.48	-0.27
Pa*	F+M	944	6.5-15.2	11.6			12.7	0.73	-0.11
	F	560	6.9-15.2	11.6	$TW=4.8*CL^{3.0}$	0.81	13.9	0.98	-0.79
	M	384	6.5-13.9	11.5	$TW=11.0*CL^{2.8}$	0.82	12.7	0.68	-0.27
Pg ns	F+M	40	7.7-15.3	11.4	$TW=17.0*CL^{2.8}$	0.93	-	-	-
Ph*	F+M	20933	6.1-18.2	13.4			15.6	1.09	-0.31
	F	9468	6.3-18.2	13.6	$TW=12.6*CL^{2.9}$	0.91	17.8	1.45	-0.17
	M	11465	6.1-17.6	13.0	$TW=41.7*CL^{2.6}$	0.90	16.1	1.17	-0.28
Pm*	F+M	3134	7.5-26.2	18.5			24.0	0.73	-0.79
	F	1643	7.5-26.2	19.0	$TW=4.7*CL^{3.0}$	0.96	23.7	0.71	-0.74
	M	1491	7.8-26.1	17.9	$TW=6.8*CL^{2.8}$	0.97	23.0	0.58	-0.19

References

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