

# BIOLOGY OF *CALLISTA CHIONE* (L., 1758) IN THERMAIKOS GULF (N AEGEAN SEA)

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## Abstract

The biology of smooth callista [*Callista chione* (Linnaeus, 1758)] was explored from two sites in Thermaikos Gulf, N Aegean Sea.  $L_{\infty}$ ,  $K$  and total mortality were found to be higher in Platamonas (81.38, 1.4, and 2.6474, respectively) compared to those from Sani (76.13, 0.66, and 1.174, respectively). No significant differences were found in the condition index (range: 43.95-51.67), both between stations and seasons.

**Keywords:** Bivalves, Growth, Mortality, Biometrics, Aegean Sea

## Introduction

Smooth callista [*Callista chione* (Linnaeus, 1758)] is commercially exploited throughout the range of its distribution in the Mediterranean. In Greece, despite its great importance, the information regarding its biology is limited (Evvoikos Gulf: [1], Thasos Island: [2]). In the present study, the biology of smooth callista was examined in Thermaikos Gulf. This research was conducted in the framework of a research project (Operational Programme for Fisheries Sector 2000-2006).

## Materials and methods

Seasonal samples (spring 2007-winter 2008) were collected from professional fishers (divers with constant air supply), from two different sites in Thermaikos Gulf, Sani (N40° 07,509' E23° 18,149') and Platamonas (N39° 56,741' E22° 42,888'). Shell length ( $L$ , in mm) and total weight ( $W$ , in 0.1 g) were measured and related using the allometric model  $W=aL^b$  [3]. The slopes of the seasonal regressions were compared using analysis of covariance (ANCOVA, [4]). For the estimation of growth parameters  $L_{\infty}$  (length infinity) and  $K$ , and total mortality, FISAT II software [5] was used. Condition index (CI) was estimated as follows [6]:

$$CI=[MW/(W-SW)]*100$$

where  $MW$ = net body weight and  $SW$ = shell weight. CI values were compared using two-way ANOVA and Fisher's least significant difference (LSD) test [4].

Tab. 1. Parameters of the von Bertalanffy equation ( $L_{\infty}$ = length infinity, in mm;  $K$ =parameter of the von Bertalanffy growth function (also known as growth coefficient; in  $yr^{-1}$ ), total mortality ( $Z$ ) and seasonal values of condition index (mean value±standard deviation) for *Callista chione*, Thermaikos Gulf, Greece.

Parameter	Platamonas	Sani
Length range (in mm)	47.31-75.28	29.53-73.02
Weight range (in g)	20.76-104.64	5.99-97.87
$L_{\infty}$ (in mm)	81.38	76.13
$K$ (in $yr^{-1}$ )	1.4	0.66
$Z$	2.6474	1.1740
Condition index		
Spring 2007		49.77±3.39
Summer 2007	43.95±7.51	
Autumn 2007	45.45±7.96	47.95±16.33
Winter 2008	51.67±2.15	49.84±3.51

## Results and Discussion

Overall, 319 individuals (140 from Platamonas and 179 from Sani) were examined. Shell length range was 47.31-75.28 mm in Platamonas, and 29.53-73.02 mm in Sani (Table 1). Seasonal length-weight relationships were all significant ( $p<0.01$ ,  $R^2>0.71$ ; Fig. 1). The values of  $b$  of the relationships ranged from 2.7431 to 3.5548 ( $3.0063\pm 0.28$ ), whereas no significant differences in their values with season and between the two sites (ANCOVA: all cases  $p>0.05$ ) were found. The von Bertalanffy growth parameters ( $L_{\infty}$  and  $K$ ), as well as total mortality (Table 1) were highest in Platamonas than in Sani.  $L_{\infty}$  values in the study area are similar to those from Evvoikos Gulf ( $L_{\infty} = 93$ mm, [1]) and higher than that from Thasos ( $L_{\infty} = 57.8$  and 62.7 mm, [2]). Additionally,  $K$  values were found to be higher than any previously reported ones from Greek waters ([1]: Evvoikos Gulf, 0.24, [2]: Thasos island, 0.24 & 0.26), indicating that the species in the study area shows very high growth rate. This could be attributed mainly to the environmental conditions prevailing in Thermaikos Gulf [7]. This species is known to have a fast growing rate in its first years of life, a rate that is progressively reduced [8]. CI ranged from 43.95 to 51.67 (Table 1). Two-way ANOVA revealed that CI values were not affected by sampling site ( $F$ -value= 0.02,  $p=0.8992$ ) and season ( $F$ -value= 1.51,  $p=0.2221$ ). In addition, Fisher's LSD showed no differences between the two sites and seasons. The fact that no spatiotemporal differences in CI values were found could be mainly attributed

to the reproduction cycle of the species. In general, spawning is prolonged from spring till the beginning of winter [1]. Given that our samples were collected during spawning season, no differences were anticipated.

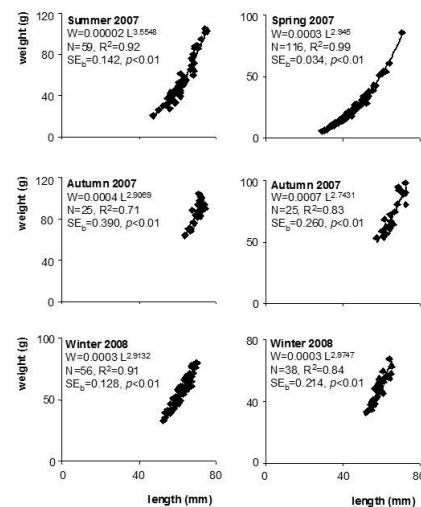


Fig. 1. Seasonal length-weight relationships for *Callista chione*, in Platamonas (left) and Sani (right), Thermaikos Gulf, Greece

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