OBSERVATIONS ON THE BIOLOGY OF *LEPTOMYSIS GRACILIS* G. O. SARS, 1864 (CRUSTACEA: MYSIDACEA) FROM THE CENTRAL ADRIATIC SEA

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Introduction

Knowledge of mysids present along the Italian coasts is still scarce. They are considered an important component of the suprabenthic (hyperbenthic) communities, constituted by the association of small size animals with swimming capacity, living in the water layer close to the sea bed (Mees & Jones, 1997).
Abundant catches of *Leptomysis gracilis* G. O. Sars, 1864 (CRUSTACEA; MYSIDACEA) were obtained in March 2003 in the central Adriatic Sea, from experimental surveys carried out in the framework of the EU Project "Response of Benthic Communities and Sediment to Different Regimens of Fishing Disturbance in European Coastal Waters" (Demestre *et al.*, 2004).
Preliminary information on the structure of the population caught, as well as on some biological parameters, are provided.

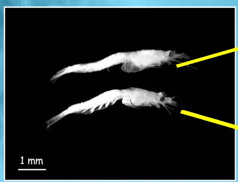

Fig. 3 – Two specimens of *Leptomysis gracilis* G. O. Sars, 1864, observed under a dissection microscope (6.4x).

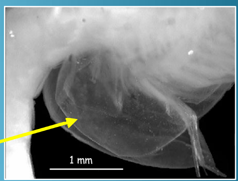

Fig. 5 – The *marsupium* consists of three pairs of incubatory *lamellae* (40x).

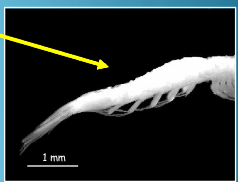

Fig. 4 – The pleopods of male are well developed and biramous (16x).

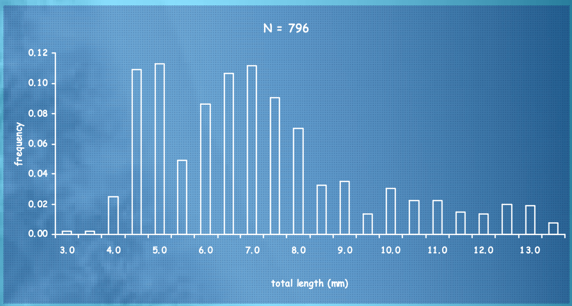

Fig. 8 – Length-frequency distribution of *L. gracilis* in the central Adriatic Sea.

Materials and Methods

The study area (Fig. 1) was located 15 miles off Fano (central Adriatic Sea), on a sandy bottom from 50 to 55 m depth. Three experimental hauls were performed using a suprabenthic sledge (Fig. 2) designed *ad hoc* and provided with a net of 0.5 mm mesh size. The sledge was towed at a speed of 1 knot and each haul lasted 10 minutes; a flowmeter was connected to the sledge.
Small size organisms living from 10 to 50 cm from the sea bottom were caught. The material collected was preserved in 4 % buffered formalin; in the laboratory, the fauna was sorted, identified to the lowest practical taxonomic level, counted and preserved in 70 % ethanol.

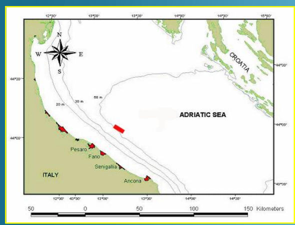

Fig. 1 – Study area (red frame).

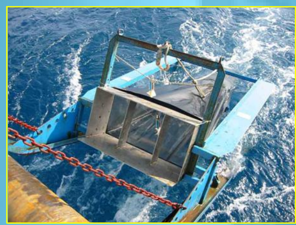

Fig. 2 – The suprabenthic sledge used for the experimental hauls.

Specimens were sexed and measured from the anterior end of the carapace to the apex of the *telson*, to the 0.1 mm below (total length). Males were distinguished from females by the presence of well developed and biramous pleopods (Tattersal & Tattersal, 1951) (Figs. 3-4). Females with *marsupium* (Fig. 5) were identified. Differences in length-frequency distribution between sexes were tested by means of the Kolmogorov-Smirnov non parametric test.
Individual weight was recorded on a sub-sample, with an accuracy of 0.0001 g; the length-weight relationship was described by means of the power equation $w = a \cdot l^b$. Parameters *a* and *b* were estimated using ordinary least-square regression after trasforming data into natural logarithms (Ricker, 1973). The Student's t-test was applied to evaluate isometry of the relationship; the ANCOVA was used to compare the length-weight relationship between sexes.

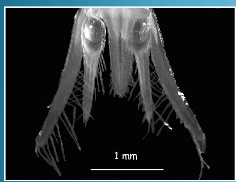

Fig. 6 – *Telson* and uropods of *L. gracilis* (40x).

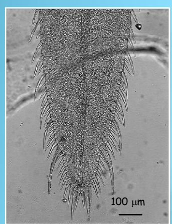

Fig. 7 – Apex of the *telson* of *L. gracilis* observed under a compound green light-polarising microscope, connected to an image analysis software (Optimas 6.2) through a video camera (200x).

Tab. 1 – Length-weight relationship in *L. gracilis*. N = number of specimens; R^2 = determination coefficient; *a* = intercept; *b* = slope; SE = standard error; *s* = significance level of *b* *vs* 3; * = $p < 0.05$.

	N	length range (mm)	R^2	*a*	*b*	SE (*b*)	*s*
Total	90	3.0 - 13.3	0.935	0.029	3.165	0.832	*
Males	37	4.2 - 12.6	0.944	0.012	3.547	0.866	*
Females	53	3.0 - 13.3	0.943	0.045	2.968	0.727	ns

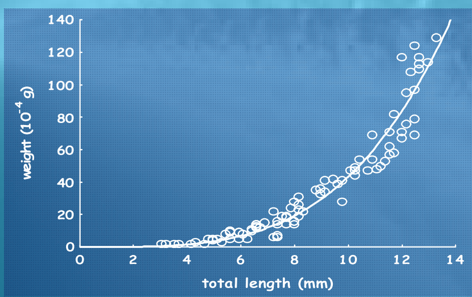

Fig. 9 – Overall length-weight relationship of *L. gracilis*.

Results

A total of 911 specimens of *L. gracilis* was collected, with a mean abundance (± SD) of 3.5 ± 1.9 ind m^{-3}. 796 specimens were measured and sexed (418 females, 378 males), ranging from 3.0 to 13.8 mm total length. Fig. 8 shows the length-frequency distribution of *L. gracilis*. The Kolmogorov-Smirnov non parametric test did not show statistically significant differences in size composition between males and females ($\chi^2 = 1.597$; $p > 0.05$).
A total of 59 females with *marsupium* was identified, representing 14.1 % of the female population and showing lengths ranging from 8.8 to 13.8 mm total length.
The overall length-weight relationship (Fig. 9) resulted significantly isometric, as showed in Tab. 1. Significant differences were evidenced between males and females ($F_{1, 87} = 10.81$; $p < 0.05$), existing a positive allometric relationship in males and isometric in the second.

Conclusions

L. gracilis resulted one of the most abundant hyperbenthic species in the investigated area. The presence of this species in the Adriatic Sea has already been mentioned by Hoenigman (1968).
The present results are still preliminary, being the laboratory analyses of the samples caught during subsequent surveys in progress. This study has been performed in the framework of an EU Project which aims to analyse the response of the physical and biological compartments of the benthic ecosystem due to fishing activities (Demestre, 2004). The characterisation of some ecological aspects of the hyperbenthos are one of the targets of this study. As a matter of fact, the hyperbenthos represents a basic component in the diet both of adult and juvenile specimens of many demersal species (Mees & Jones, 1997; Cartes & Sorbe, 1999; Cartes *et al.*, 2002). In particular, the estimation of secondary production should represent an important tool to evaluate the effects of different fishing activity regimes on the hyperbenthic communities. In this context, the collection of biological data and parameters (body mass, biomass, growth, mortality) of *L. gracilis* is included .

Bibliographic References

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