

VARIATION OF SOME DIAGNOSTIC CHARACTERS IN *SPELAEOMYSIS*
BOTTAZZII CAROLI (MYSIDACEA)

BY

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Spelaeomysis bottazzii is a hypogean, phreatic mysid, endemic for the Apulia country where it represents one of the most exceptional and ancient phreatobites. At present it is known from the brackish underground waters of three caves near Castro Marina, Otranto (Caroli, 1924, 1937), from four man-made wells near Gallipoli (Pesce, 1975) and also from some not clearly identifiable wells around Bari (Caroli, 1937; Ruffo, 1955). Moreover, it is a euryhaline and eurythermal species which lives both in darkness and in full or dim light. In this last regard, we successfully kept alive some specimens for more than four months in our laboratory, in fresh and saltish water, under temperatures from 10° C to 18° C, and in full light or in darkness.

Recently, during researches on phreatic fauna in southern Italy, we collected about 300 specimens of this supposedly uncommon and interesting mysid from four localities in the Salentine Peninsula (namely: "Zinzulusa", "L'Abisso", "Buco dei Diavoli" caves, and wells near Gallipoli) and we had the opportunity to analyse statistically some of them and to determine their variability.

We wanted particularly to single out the more stable characters for the species and to look for possible subspecific or populational differences among the above mentioned samples.

MATERIALS AND METHODS *)

Our materials for study were from the following collections:

"Zinzulusa" Cave (40°00'39"N 05°58'33"W):

3 ♂♂, 11 ♀♀, 2 May 1975, Pesce and Fusacchia coll.; 2 ♂♂, 2 ♀♀, 1 juv., 31 May 1975, Pesce and Cicolani coll.; 6 ♂♂, 25 ♀♀, 1 juv., 4 July 1975, Pesce, Silverii and Cicolani coll.

"Buco dei Diavoli" Cave (40°04'47"N 06°01'56"W):

2 ♂♂, 36 ♀♀, 1 June 1975, Pesce and Cicolani coll.; 2 ♂♂, 11 ♀♀, 6 July 1975, Pesce, Silverii and Cicolani coll.

*) The material was collected by a modified "Cvetkov" net (Vigna Taglianti, Cottarelli & Argano, 1969) and a usual plankton net. Specimens (in alcohol 80%) and slides from their partial dissection (in polyvinyl-lactophenol) are deposited in the "Museo Civico di Storia Naturale di Verona", Verona, Italy.

“L’Abisso” Cave (40°00’01”N 05°58’04”W):

4 ♂♂, 7 ♀♀, 20 juv., 31 May 1975, Pesce and Cicolani coll.; 3 ♀♀, 16 juv., 6 July 1975, Pesce, Silverii and Cicolani coll.

Gallipoli Wells (40°02’29”N 05°33’58”W):

2 ♂♂, 17 ♀♀, 10 October 1974, Pesce and Fusacchia coll.; 11 ♀♀, 9 juv., 22 November 1974, Pesce and Fusacchia coll.; 10 ♂♂, 14 ♀♀, 31 juv., 3 May 1975, Pesce and Fusacchia coll.; 4 ♂♂, 11 ♀♀, 8 juv., 1 June 1975, Pesce, Silverii and Cicolani coll.

First we analysed random samples of 30 mature ♀♀ for each collecting station, except for “L’Abisso” cave (sample of 10 mature ♀♀), paying attention to such main diagnostic characters of the species as the morphology of the telson, uropod, second pleopod and antennal scale (Bacescu & Orghidan, 1971; Bowman, 1973; Williams et al., 1974).

Measurements and counts used in assessing variation were: the body length from eye plates to distal margin of uropods; the number of spines on the exopod of the uropod; the length of the endopod and the exopod of the uropod; the number of differentiated spines on the medial lobe of the protopod of the uropod; the length and width of the antennal scale in ventral view; the length and the smallest, median and greatest widths of the telson; the number of lateral spines and differentiated apical spines on the telson.

However, almost all the analysed characters and relationships yielded statistically significant correlations, but no constant differences were noted among the above said samples. Therefore, as we did not find clearcut differences, we resolved to examine the samples as a whole, i.e. 180 random specimens, namely 30 ♂♂ (16.7%), 90 ♀♀ (50%) and 60 juveniles (33.3%).

RESULTS AND DISCUSSION

The features analysed, together with the statistical relationships we obtained, yielded the following results:

Uropod. — The number of spines on the exopod is a function of the body length, depending on the stage of development and the size of the individuals; in this connection the regression analysis ($y = 1.49 + 1.97x$; $b \pm t_{0.05, sb} = 1.97 \pm 0.09$; $r = 0.842$; $z = 1.228$) clearly shows that the distribution is rather broad and the relationship is nonlinear (fig. 1).

This feature, therefore, does not represent an effective diagnostic character for the examined species and also, we suppose, for the other species of the genus *Spelaeomysis*.

The analysis of the uropod also revealed that there is a connection between the length of the endopod and of the exopod; in this regard, in fact, all the specimens showed by a sufficiently constant length ratio (♂♂: 82.07 ± 1.97 ; ♀♀: 81.12 ± 1.15 ; juveniles: 86.95 ± 1.74), that the former is about 0.80 of the length of the latter.

Moreover, we remarked that the medial lobe of the protopod can be armed,

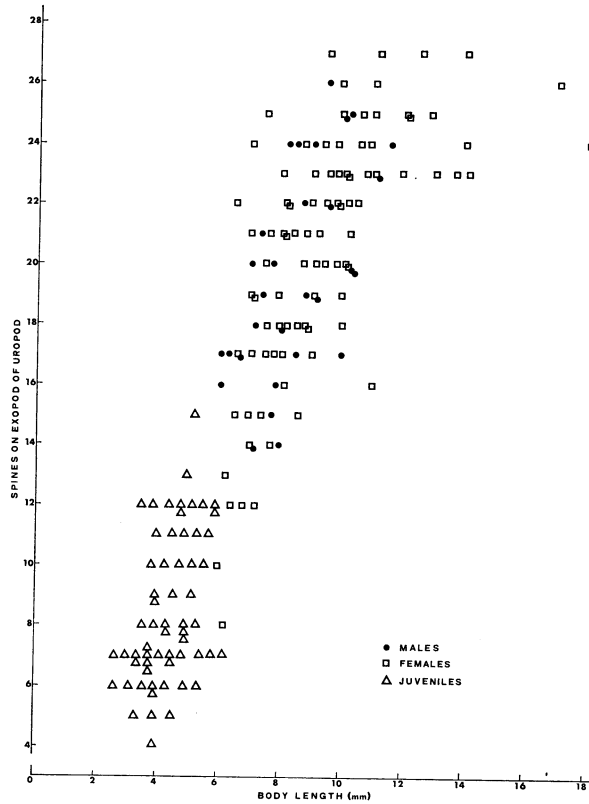


Fig. 1. *Spelaemysis bottazzii* Caroli. Relation between number of spines on exopod of uropod and length of body, from eye-plates to distal margin of uropods.

besides with one (94.44%), also with two (2.78%), three (0.56%) or none (2.22%) differentiated longer spines.

Telson. — As well as for the uropods also for the telson we found out that the number of lateral marginal spines is a clear function of the body length; the regression analysis showed that there is a correlation between the spines and the body length, but it is not a linear one; this feature, also, is not to be considered as a valuable diagnostic character for the species.

On the contrary some diagnostic value has been shown by the morphology of the telson and particularly by the correlations between the greatest width and the length ($\delta\delta$: 0.73; ♀♀ : 0.72; juveniles: 0.71); between the smallest width and the length ($\delta\delta$: 0.33; ♀♀ : 0.31; juveniles: 0.28) and between the median width and the length ($\delta\delta$: 0.62; ♀♀ : 0.61; juveniles: 0.54).

The regression analysis regarding length and proximal width of the telson in mature females ($y = 0.112 + 0.62x$; $b \pm t_{0.05, sb} = 0.62 \pm 0.03$; $r = 0.895$; $z = 1.449$) is illustrated in fig. 2.

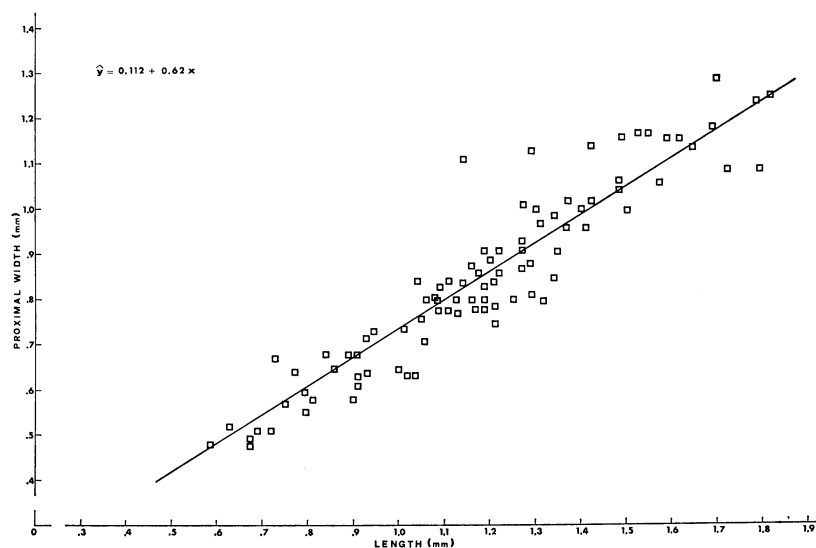


Fig. 2. *Spelaeomysis bottazzii* Caroli. Relation between length of body and proximal width of telson in mature females.

In summing up the above facts it appears clear that the morphology of the telson could be considered as a real and valuable diagnostic character for the species. Moreover, we observed that the length of the telson is well correlated with the body length and we pointed out that the apical margin of the telson can be provided, besides with one (92.78%), also with two (1.11%), three (2.22%), four (0.56%) or none (3.33%) longer spines.

Antennal scale. — The length of the antennal scale is well correlated with its width ($\delta\delta$: $y = -0.003 + 0.40x$; $b \pm t_{0.05.sb} = 0.40 \pm 0.04$; $r = 0.907$; $z = 1.514$; ♀♀ : $y = 0.03 + 0.40x$; $b \pm t_{0.05.sb} = 0.40 \pm 0.01$; $r = 0.990$; $z = 1.729$; juveniles: $y = -0.023 + 0.47x$; $b \pm t_{0.05.sb} = 0.47 \pm 0.04$; $r = 0.875$; $z = 1.354$) and also with the body length ($y = -0.023 + 0.07x$; $b \pm t_{0.05.sb} = 0.07 \pm 0.01$; $r = 0.869$; $z = 1.328$) (figs. 3-6).

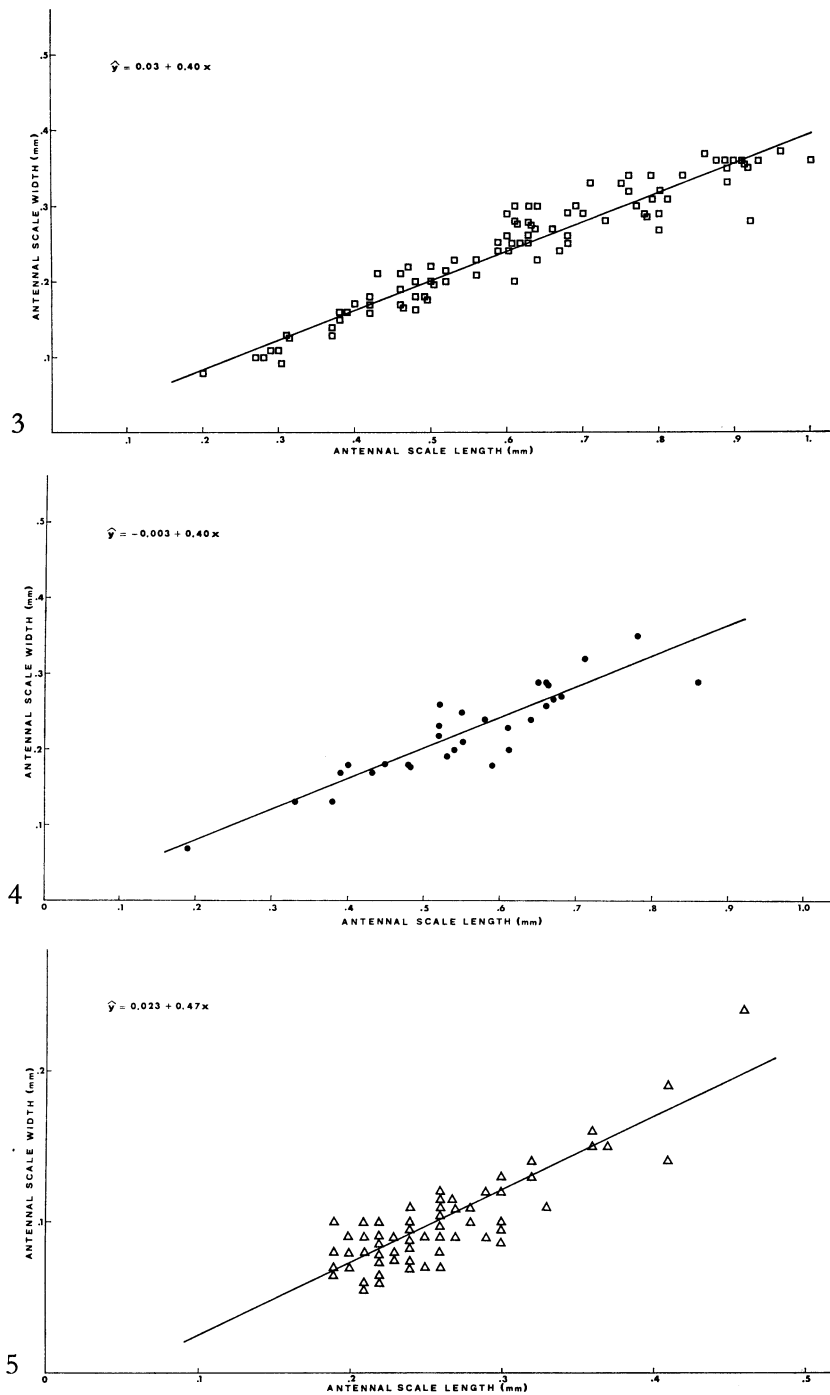
Moreover, the ratio width/length is nearly constant (0.40) in males, females and juveniles ($\delta\delta$: 0.40; ♀♀ : 0.40; juveniles: 0.38).

These facts confirm that the antennal scale is a stable and valuable diagnostic character of the examined species and, presumably, it is a differential one also for the other species of the genus.

Other features investigated, but not discussed in detail here, were the ratio between the length of the proximal segment and the length of the distal segment of the exopod of the uropod; the ratio between the last two segments of the exopod of male and female pleopod II, and the body length.

However, in this last regard no significant differences were noted compared to the up-to-date diagnosis of *S. bottazzii*.

The present research and the above results both complete and partially amend



Figs. 3-5. *Spelaeomysis bottazzii* Caroli. Relation between length and width of antennal scale in juveniles (fig. 3), males (fig. 4) and females (fig. 5). (Symbols as in fig. 6.)

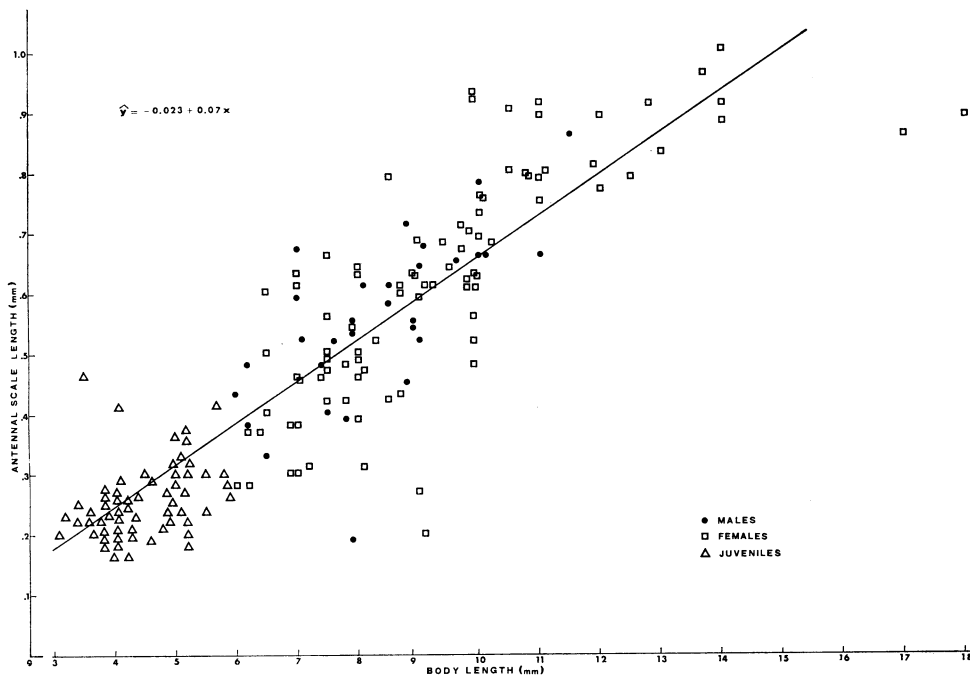


Fig. 6. *Spelaeomysis bottazzii* Caroli. Relation between length of antennal scale and length of body.

the previous recent redescription of *S. bottazzii* by Pesce (1975) and particularly in regard to the number of apical spines on the telson, the number of differentiated spines on the medial lobe of the protopod of the uropods, and the number of marginal spines on the telson and on the uropod.

Moreover, to recapitulate, the wide variability we pointed out in our specimens questions the validity of some diagnostic features among the species of the genus *Spelaeomysis*. In this last respect we are working on a revision of this genus and we hope to find out a better definition of variability regarding the main differential characters in the other species of *Spelaeomysis*.

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The drawings were made by P. Tetè.

RÉSUMÉ

Résultats d'une analyse statistique concernant la variabilité de certains caractères diagnostiques dans quatre populations du mysidacé des eaux souterraines, *Spelaeomysis bottazzii* Caroli.

Les auteurs ont mis en évidence la morphologie du telson et de l'écaille antennulaire en tant que caractères stables et constants de l'espèce; ils ont d'autre part, exclu l'existence de différences morphologiques en ce qui concerne les caractères examinés chez divers spécimens.

De nombreuses illustrations, relatives à l'analyse de la régression de quelques caractères examinés, y sont incluses.

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