

REMARKS ON THE GENERA *Balssia* KEMP, 1922 AND *Acanthonyx* LATREILLE, 1828 IN THE AZORES, AND FIRST RECORD OF *Calappa tuerkayana* PASTORE, 1995 (CRUSTACEA, DECAPODA) IN THE ATLANTIC OCEAN.

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The morphology of the Azorean populations of the caridean shrimp *Balssia gasti* (Balss, 1921) is here examined. This species, which was not previously recorded from the Azores, proves to have a spectacular variability in the development of dorsal carapace processes. The variability of the Azorean majid crabs of the genus *Acanthonyx* is also studied. Comparison with Mediterranean *Acanthonyx lunulatus* (Risso, 1816) show some morphological differences but also an important overlap in characters. The Azorean *Acanthonyx* are therefore identified as *A. lunulatus*. The Azorean *Acanthonyx* also show some similarities with the poorly known species *Acanthonyx brevifrons* A. Milne-Edwards, 1869 from the Cape Verde Islands, a species of uncertain validity. *Calappa tuerkayana* Pastore, 1995, a crab recently described from the Mediterranean Sea, is recorded for the first time in the Atlantic Ocean: a unique male has been found off Pico island. This specimen is here described and illustrated.

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INTRODUCTION

The scope of the present paper is to study the morphology and the variability of the two following Crustacea Decapod from the Azores: *Balssia gasti* (Balss, 1921) (adult females only) and *Acanthonyx lunulatus* (Risso, 1816), and to give an account on *Calappa tuerkayana* Pastore, 1995, a crab recorded for the first time in the Azores and which was previously only known from the Mediterranean Sea.

MATERIAL AND METHODS

The specimens of *Balssia gasti* and *Acanthonyx lunulatus* studied in the present paper have been collected in 1999 in the Azores by the present author and Prof. Dr. Peter Wirtz. *Balssia gasti* were collected on different cnidarian hosts at

Faial Island, while SCUBA diving. *Acanthonyx lunulatus* was collected amongst algae while SCUBA diving and on lower shore at Faial and Terceira islands. The specimens were killed by freezing and fixed in 70 % ethanol. Nearly all specimens (and all illustrated specimens) have been deposited in the collections of the Institut Royal des Sciences Naturelles de Belgique / Koninklijk Belgisch Instituut voor Natuurwetenschappen, Brussels. A few specimens have been retained in author's own collection. Drawings have been carried out by the author with a camera lucida mounted on a stereomicroscope Aus Jena Technival 2. The specimen of *Calappa tuerkayana* belongs to the collection of the University of the Azores, Department of Oceanography and Fisheries (DOP). Photographs of *C. tuerkayana* have been made by Thierry Hubin at the Institut royal des Sciences Naturelles de Belgique / Koninklijk

Belgisch Instituut voor Natuurwetenschappen, Brussels; line drawings have been made by the author.

RESULTS AND DISCUSSION

Balssia gasti (Balss, 1921)

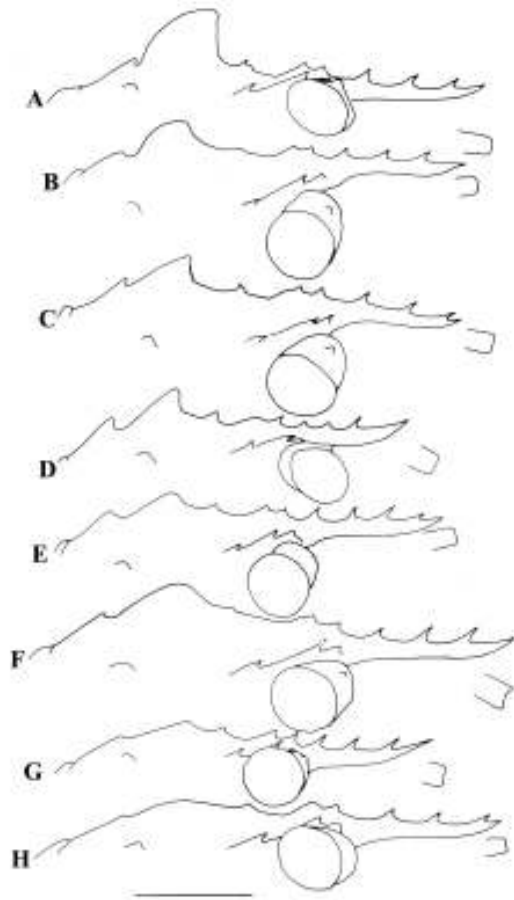


Fig. 1. *Balssia gasti* (Balss, 1921). Ovigerous females, Faial Island, Monte da Guia, on *Antipathes wollastoni*. A-H, upper part of carapace, eyestalk and tip of third segment of antennular peduncle. Scale bar = 1 mm.

Material

Faial Island, on *Antipathes wollastoni* Gray, 1857, coll. P. Wirtz, June 1999: 4 specimens; Faial Island, Monte da Guia, on *Antipathes wollastoni*, 38 m depth, coll. P. Wirtz, 15.vi.1999: 8 specimens; Faial Island, Monte da Guia, on a

Pteria hirundo (Linnaeus, 1758) growing on *Antipathes wollastoni*, 41 m depth, coll. C. d'Udekem d'Acoz & P. Wirtz, 18.viii.1999: 1 specimen; Faial Island, Monte da Guia, on *Aglaophenia tubulifera*, 41 m depth, coll. C. d'Udekem d'Acoz & P. Wirtz, 18.viii.1999: 2 specimens; Faial Island, Monte da Guia, on *Antipathes wollastoni*, 41 m depth, coll. C. d'Udekem d'Acoz & P. Wirtz, 19.viii.1999: 10 specimens; Faial Island, Monte da Guia, host unrecorded, 41 m depth, coll. C. d'Udekem d'Acoz & P. Wirtz, 19.viii.1999: 1 specimen; Faial Island, Monte da Guia, on *Antipathes wollastoni*, 40 m depth, coll. C. d'Udekem d'Acoz & P. Wirtz, 23.viii.1999: 3 specimens; Faial Island, Monte da Guia, on *Antipathes wollastoni*, 40 m depth, coll. C. d'Udekem d'Acoz & P. Wirtz, 27.viii.1999: 1 ex. All specimens were collected while SCUBA diving.

Morphological notes on mature females

The longest rostra of the specimens examined almost reach the tip of the antennular peduncle but it is usually distinctly shorter. There are 8 (rarely 7) dorsal teeth: 3 on the carapace (median being the longest), 1 above the orbit, and 4 (rarely 3) on the rostrum. The tooth above the orbit and some rostral teeth are sometimes reduced to a blunt protuberance. The anterior tooth of the carapace is usually entire and well developed, but it may be bifid and/or obsolete. The median carapace tooth is extremely variable in development: it develops either in a huge projection, or in a well developed tooth (variable in shape), or in a low convexity (all intermediates exist between these situations). There is a lateral longitudinal faint carina on the lower part of the carapace (more distinct in its anterior half). The anterior lower part of carapace comprises a wide notch. The specimens collected on *Antipathes wollastoni* Gray, 1857 were usually dull translucent yellow or yellowish but some specimens were dull translucent purple.

Discussion

The specimens examined here constitute the first records of *Balssia gasti* in the Azores.

As a rule, the Azorean specimens agree well with the accounts of BALSS (1921) (as

Amphipalaemon gastii), ZARIQUIEY CENARRO (1935), HOLTHUIS (1951) and GARCÍA RASO (1984). HOLTHUIS (1951) was the first author who noticed that *B. gastii* is a variable species. However, he gave no illustrations, and his data did not suggest a variability as high as observed here. HOLTHUIS (1951) suspected that the variations he observed were due to development stages. Although the juveniles indeed differ markedly from adults, the material here examined definitely shows that the variations cannot be explained by growth stages only and that there is a high individual variability amongst mature (ovigerous) females.

Recently, BRUCE (1998) described a second species of *Balssia*, *B. noeli*, which differs from *B. gastii* by the dorsal ornamentation of its carapace. At first glance, it does not fall within the range of variation of *B. gastii*, although the differences between the two species are not as important as initially thought. Therefore it would be important to examine carefully the variations of every *Balssia* collected in the future.

In the *B. gastii* here studied, the rostrum does not reach the tip of the third segment of the antennular peduncle, while in the illustrations of Mediterranean females by BALSS (1921) and GARCÍA RASO (1984), it distinctly overlaps the third segment. The Mediterranean male illustrated by ZARIQUIEY CENARRO (1935) agrees better with our material, since its rostrum extends nearly to the tip of the third segment.

Careful examination showed that *Balssia gastii* presents a lateral longitudinal carina on each side of carapace, just like in the genera *Coutierea*, *Pseudocoutierea* and *Veleroniopsis*. This carina has been overlooked by previous authors, probably because it is poorly developed and difficult to detect. This observation raises the question whether this carina has also been overlooked in other related genera.

The morphology of the anterior lower part of the carapace is also interesting. The notch observed in that area is probably homologous to the pterygostomian sinus observed in the genera *Coutierea*, *Miopontonia*, *Pseudocoutierea*, *Pseudopontonides* and *Veleroniopsis*. Actually, I suspect that such a notch could be present amongst other related genera.

The present observations indicate that specimens from the same host have not always the same colour. *Balssia gastii* (Balss, 1921) has not been found previously in association with antipatharians (*Antipathes wollastoni* Gray, 1857) and with hydroids (*Aglaophenia tubulifera* Hincks, 1861). MANCONI & MORI (1990) recorded *Balssia gastii* on the red coral *Corallium rubrum* (Linnaeus, 1758), on various gorgonians, on *Alcyonium* sp. and on sponges.

Acanthonyx lunulatus (Risso, 1816)

Material

Faial Island, Feteiras, rocky shore, between algae at low tide, coll. C. d'Udekem d'Acoz & P. Wirtz, 24.viii.1999: 7 specimens; Faial Island, Monte da Guia, rocks with algae, 10 m depth, SCUBA diving, coll. C. d'Udekem d'Acoz & P. Wirtz, 18.viii.1999: 1 male; Terceira Island, Cabo da Praia, outer wall of harbour, rocks with algae, 10 to 23 m depth, SCUBA diving, coll. C. d'Udekem d'Acoz & P. Wirtz, 28.viii.1999: 8 specimens.

Morphological notes

All Azorean *Acanthonyx* have fairly long rostral horns (as in Mediterranean specimens). A pair of tufts of setae is usually present on the gastric area, but it is lacking on the juvenile illustrated on Fig. 2F. There are usually no tufts of setae behind the gastric pair, although there are 2 successive unpaired tufts of setae in median position behind the gastric pair on the specimen illustrated on Fig. 2G. The development of the hepatic protuberance is variable; it usually bears a tuft of setae, although it is not the case in the juvenile illustrated on Fig. 2F. The branchial lobe always bears a tuft of setae. The lateral lobe (i.e. the lobe between the hepatic and the branchial lobe) may be absent, indistinct or fairly well developed. There is often (but not always) one large seta on the lateral lobe, or at the place where the lateral lobe should be present. In addition to the large lateral seta, there is sometimes a few additional very short lateral setae. Part of the Azorean *Acanthonyx* examined are adults (they include ovigerous females) but none of them is large. The

largest specimen is a male from Feteiras with a carapace length of 11.4 mm.

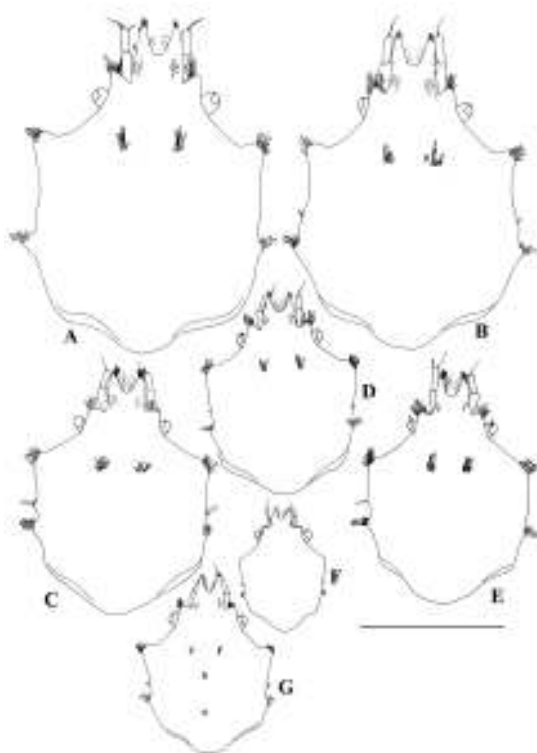


Fig. 2. *Acanthonyx lunulatus* (Risso, 1816). A, male, Faial Island, Feteiras; B, idem; C, female, Faial Island, Feteiras; D, female, Terceira Island, Cabo da Praia; E, female, Faial Island, Feteiras; F, male, Terceira Island, Cabo da Praia; G, male, Monte da Guia. Scale bar = 5 mm.

Discussion

According to MONOD (1956), *Acanthonyx brevifrons* A. Milne-Edwards, 1869 is a probable synonym of *A. lunulatus*. However, on the basis of the study of a juvenile and a mature female 8.8 mm long from the Cape Verde Islands, MANNING & HOLTHUIS (1981) concluded that *A. brevifrons* is distinct from *A. lunulatus*. They observed that *A. brevifrons* is a smaller and smoother species than *A. lunulatus*, and that it further differs in having shorter rostral horns, a less prominent hepatic lobe on each carapace side, and in the complete absence of a lateral lobe between the hepatic and branchial lobes. More recently, PAULA et al. (1992), when studying *Acanthonyx*

from the Azores said: "Two forms of *Acanthonyx* were found, corresponding to the species *A. lunulatus* and *A. brevifrons*. (...) The specimens collected that were assigned to *A. lunulatus* show intermediate features between the two species, especially concerning the characters that are used to separate them, as the form and armature of the carapace. This fact raises again the question of the validity of the species *A. brevifrons*."

Since PAULA et al. (1992) gave neither further details nor illustrations, I thought it was appropriate to give further details on Azorean *Acanthonyx*, and give figures of some specimens (see Fig. 2), and to compare them directly with Mediterranean (i.e. topotypical) *A. lunulatus* (Fig. 3) and with the published account on *A. brevifrons* by MANNING & HOLTHUIS (1981).

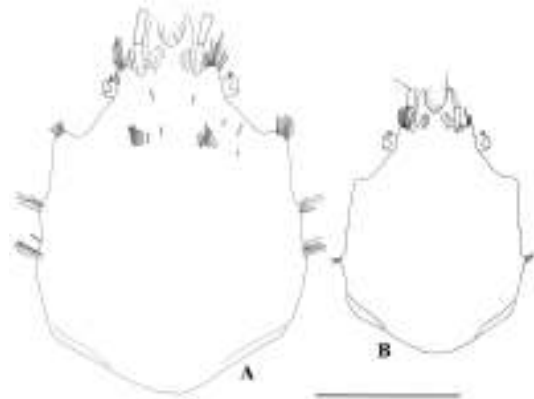


Fig. 3. *Acanthonyx lunulatus* (Risso, 1816). A, B, females, Aegean Sea, Samos Island, Potami, shore, 03.vii.1984. Scale bar = 5 mm.

All Azorean *Acanthonyx* examined by me have longer and narrower rostral horns than the Cape Verde Islands *A. brevifrons* of MANNING & HOLTHUIS (1981), and are in this respect very similar to the Mediterranean *A. lunulatus*. Some have the lateral sides of the carapace morphologically close to the Cape Verde Islands *A. brevifrons* of MANNING & HOLTHUIS (1981): without lateral lobe and without seta at the position where there should be a lateral lobe. However, there is usually one seta and often a more or less developed lateral lobe. The specimens with one or both of these features are closer to the Mediterranean *A. lunulatus* which always have a more or less distinct lateral lobe

and quite often setae on it (usually more than one large seta). With the exception of one juvenile, the Azorean *Acanthonyx* have a pair of tufts of setae on the gastric area, which is lacking in the Cape Verde Islands *A. brevifrons* of MANNING & HOLTHUIS (1981). This pair of setae is also often present in Mediterranean *A. lunulatus*.

Although the Azorean *Acanthonyx* examined by me are fairly variable, they obviously consists of only one species. For the time being they should be referred to *A. lunulatus*.

On the other hand, the validity of *A. brevifrons* becomes again questionable. However, if valid, this species is probably restricted to the tropical Eastern Atlantic. The variability of topotypical (Cape Verde Island) *A. brevifrons* should be carefully examined when additional specimens will be available, particularly as concerns the morphology of the rostral horns.

***Calappa tuerkayana* Pastore, 1995**

Material

Cais do Pico, set 9, trap 2, 38°20'20"N 28°15'05"W, 50 m depth, F/V PATRÃO PEDRO coll. Olavo Amaral, 09/II/1988: 1 male, carapace length = 33.4 mm, carapace width = 40.6 mm, cephalothorax height = 22.5 mm, Collection University of the Azores, Department of Oceanography and Fisheries (DOP), registration number DOP-CR-217 (specimen previously identified as *Calappa granulata* by R. Ferreira in February 1988).

Description

Carapace strongly convex, 1.2 times as wide as long, with fairly deep longitudinal grooves separating gastrocardial from branchial regions, and a shallow longitudinal groove in the middle of each branchial region. Surface prominently tuberculate; largest tubercles on middle line of carapace and on both sides of the shallow mediobranchial grooves (no large tubercles on posterior 0.2 of carapace). Large tubercles conical (not blunt). Intestinal region with small granulations; isolated granules are the highest in number; there are however many groups of two

granules and there are a few groups of three and one group of four granules. Front projecting, with two blunt triangular teeth separated by a deep sulcus. Anterolateral + lateral carapace margins carinated, with no distinct teeth on anterior half and with 6 (left side) or 7 (right side) small but quite distinct teeth in posterior half. Posterolateral + posterior part of carapace with 7 well developed teeth on each side; they are triangular except those of the median (posteriormost) pair which are quite blunt; the 3rd, 4th, 5th and 6th teeth have a median carina on which a row of granules is spread out. Outer projection of basal antennal article with large blunt granulations and with anterior margin entire and slightly convex; peduncle emerging from distal inner angle, no distinct tubercle at base of peduncle. Endostomial septum visible with first maxillipeds closed, with convex anterior margin. Distal margin of first maxilliped with endopodial lacinia obliquely rounded and with marginal granulations, antero-internal angle being with a strong tooth. Third maxilliped as illustrated. Cheliped merus with 4 sharp triangular outer teeth and an anterior blunt tubercle (condyle). Cheliped carpus with 4 dorsal faint flattened tubercles. Cheliped propodus with a sharp triangular basal outer tooth. Outer cheliped surface minutely granulate and with about 15 flattened tubercles forming oblique rows. Upper crest of chelipeds with 4 (left side) or 5 (right side) sharp triangular teeth followed by 2 blunt teeth (the distal blunt tooth is bicuspid). Telson much longer than wide. Almost no trace of colouration after 12 years in ethanol (only two tubercles of each outer cheliped surface are still reddish).

Discussion

Calappa tuerkayana Pastore, 1995 has been briefly described by PASTORE (1995) from Mediterranean specimens (Ionian coasts of Italy). *C. tuerkayana* appears to be very close to the well known species *Calappa granulata* (LINNAEUS, 1758) but it is much smaller, has stronger tubercles on the carapace, a much longer telson, and has the carapace and cheliped tubercles much less pigmented.



Fig. 4. *Calappa tuerkayana* Pastore, 1995. Male, Pico island, 33.4 x 40.6 mm, dorsal view.



Fig. 6. *Calappa tuerkayana* Pastore, 1995. Male, Pico island, 33.4 x 40.6 mm, dorso-facial view.



Fig. 5. *Calappa tuerkayana* Pastore, 1995. Male, Pico island, 33.4 x 40.6 mm, ventral view.

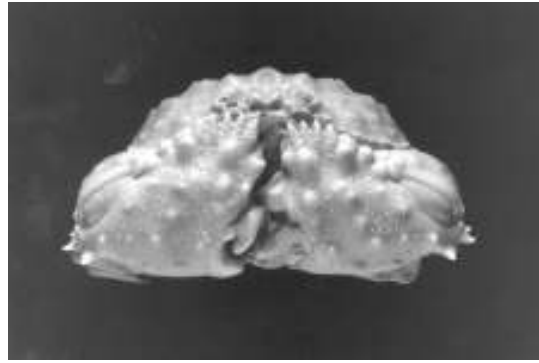


Fig. 7. *Calappa tuerkayana* Pastore, 1995. Male, Pico island, 33.4 x 40.6 mm, facial view.

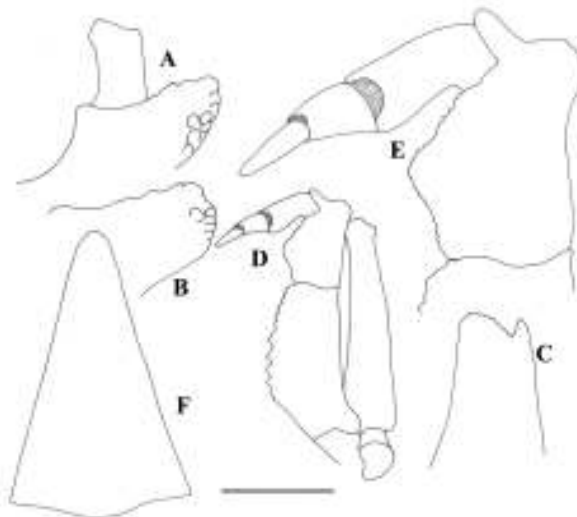


Fig. 8. *Calappa tuerkayana* Pastore, 1995. Male, Pico island. A, left antennal basal segment, upper view; B, idem, oblique view of outer process; C, tip of endopodial lacinia of left first maxilliped; D, left third maxilliped; E, last four segments of left third maxilliped; F, telson. Scale bar: A, B, C, 1 mm; D, 5 mm; E, 2 mm; F, 3.3 mm.

When examining the decapod collection of DOP, I found large typical *Calappa granulata* (with crimson flattened tubercles) and one small *Calappa* with almost no pigmentation and with much stronger tubercles. The morphology of this specimen agrees quite well with the original description of *C. tuerkayana* by PASTORE (1995). Indeed, it has conical unpigmented tubercles on carapace, while the *C. granulata* available to me have flattened crimson tubercles (in Mediterranean *C. granulata* conserved for 14 years in ethanol, the pigmentation of tubercles is still perfectly preserved). Furthermore it has a very long and narrow telson, much narrower than in *C. granulata*.

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REFERENCES

- BALSS, H. 1921. Über eine neue Pontiiden aus dem Golf von Neapel. *Mitteilungen aus der Zoologischen Station zu Neapel* 22 (15): 523-526.
- BRUCE, A.J. 1998. A second species of the genus *Balssia* KEMP, 1922 (Crustacea: Decapoda: Pontiinae). *Zoosystema* 20 (4): 603-601.
- GARCÍA RASO, J.E. 1984. Carideos (Crustacea, Decapoda, Caridea) nuevos o interesantes en aguas ibéricas. *Investigación Pesquera* 48(1): 45-50.
- HOLTHUIS, L.B. 1951. The Caridean Crustacea of Tropical West Africa. *Atlantide Report* 2: 7-187.
- MANCONI, R. & M. MORI 1999. New records of *Balssia gasti* (BALSS, 1921) (Decapoda, Palaemonidae) in the western Mediterranean Sea. *Crustaceana* 59 (1): 96-101.
- MANNING, R.B. & L.B. HOLTHUIS 1981. West African Brachyuran Crabs (Crustacea: Decapoda). *Smithsonian Contribution to Zoology* 306: i-xii + 1-379.
- MONOD, Th. 1956. Hippidea et Brachyura ouest-africains. *Mémoires de l'Institut Français d'Afrique Noire* 45: 1-674.
- PASTORE, M. 1995. The genus *Calappa* in the Ionian Sea. *Oebalia* 21: 187-196.
- PAULA, J., A. CARTAXANA & H. QUEIROGA 1992. Decapod crustaceans collected by the "Expedition Azores 1989". *Arquipélago. Life and Earth Sciences* 10: 67-74.
- ZARIQUIEY CENARRO, R. 1935. *Balssia gasti* (BALSS), en la costa Catalana (España-Mediterráneo). *Eos* 11: 101-107.

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