

Taxonomy and zoogeography of intertidal Ostracoda (Crustacea) from the Cape Verde Islands (Atlantic Ocean)

by Karel WOUTERS

Abstract

Ostracoda recovered from five samples collected in the intertidal zone of St. Vincent Island (Cape Verde Islands) are studied. These comprise thirteen species, belonging to eleven genera. Two species are new, three are reported for the first time since their original description in the 19th century, and three are named in open nomenclature. Four species had already been described from elsewhere, two from the tropical realm, and two from the Mediterranean, and one species had previously been described from the Cape Verde Islands by the present author. Their taxonomy and zoogeography are briefly discussed.

Key-words: Ostracoda, taxonomy, Cape Verde Islands, zoogeography, faunistics.

Introduction

The number of publications dealing with recent marine ostracods from the Cape Verde Islands is very limited. The most important publication is "Les Fonds de la Mer", wherein BRADY (1869-1870) described ten new species from St. Vincent Island. Later, the same author (BRADY, 1880), added two more new species, also from St. Vincent Island, collected during the Challenger expedition. Three of the species described by BRADY in "Les Fonds de la Mer" were found again in the present study. Apart from some latitudinally restricted work (for an overview, see WOOD & WHATLEY, 1994), the most important paper on West African ostracods was published by WITTE (1993), who described 59 species (16 of them new) from beach sand in Senegal and the Gambia. It is surprising that only three of the species mentioned by WITTE from Senegal (only 850 km east of the Cape Verde Islands) were actually found in the Cape Verde Islands. The reasons for this are probably twofold. First, knowledge of taxonomy and distribution of West African marine ostracods is rather limited, in spite of the important contribution by WITTE, and second, the Cape Verde archipelago, because of its geographical position at the edge of the subtropical and tropical zone, and its particular hydrographic characteristics may possibly have a different faunal composition.

The aim of this paper is in the first place to inventory the ostracod fauna of the Cape Verde Islands, and where possible, to compare it with other regions, in order to draw some zoogeographical conclusions.

Material and methods

The material used in this study was collected by my colleague Thierry BACKELJAU in February 1996, on Ilha de São Vicente (= St. Vincent), of the Cape Verde Islands. This archipelago is situated in the Atlantic Ocean, about 850 km west of Senegal, at ca 16° N and 24° W. All samples were collected in the intertidal zone, in the following localities.

Ilha de São Vicente (St. Vincent Island):

- São Pedro, western part of the island, bay near airport, sediment sample in rock pool, 4 Feb. 1996 (n° 6);
- Baía das Gatas, northeastern part of the island, two bottom samples, on sand between boulders (n° 9-10), one sample in sheltered zone, with muddy sediment (n° 11), and one sediment sample in a rock pool near the fisheries centre (n° 13), 5 Feb. 1996;
- Calhau, eastern part of the island, sediment sample in rock pool, 7 Feb. 1996 (n° 19).

Only specimens with soft parts were used in the present study. The valves are stored dry in micropalaeontological slides, and the dissected appendages are preserved in glycerine preparations. All material is deposited in the Ostracod Collection (numbers O.C. 2768-2814) of the Royal Belgian Institute of Natural Sciences, Brussels.

Taxonomic account

Class Ostracoda LATREILLE, 1804
Subclass Podocopa MÜLLER, 1894
Order Platycopida SARS, 1866
Family Cytherellidae SARS, 1866
Genus *Cytherelloidea* ALEXANDER, 1929

Cytherelloidea cuneolus (BRADY, 1870)
(Pl. 1, figs 1-8; pl. 12, figs 1 a-c)

1870 *Cytherella cuneolus* (G.S. BRADY) – BRADY, in: DE FOLIN & PÉRIER, Fonds de la Mer, p. 192-193, pl. 19, figs 18-19.

SPECIFIC NAME: Latin *cuneolus* = diminutive of *cuneus*, wedge; *cuneolus* is used here as a noun standing in apposition to the generic name.

TYPE LOCALITY: Saint Vincent, Cape Verde Islands (BRADY, 1870).

MATERIAL: two males and one female (O.C. 2770-2772), from Baías das Gatas and Calhau (stations 11 and 19).

DIAGNOSIS: male carapace compressed in dorsal view, ovate-subquadrate with rounded posterior margin in lateral view. Female carapace wedge-shaped in dorsal view, with subtruncate posterior margin in lateral view. Female valves proportionally higher. Brood cavity expressed as two rather indistinct posterior swellings. Muscle scar sulcus weakly developed. Valve surface with numerous, delicate, sharply delineated polygonal fossae; fossae less developed in central area of valve. Left valves with anterior submarginal row of

larger depressions. Longitudinal ridges and dorsal and postero-dorsal oblique ridges weakly expressed. Male sixth limb with a large recurved pediform palp. Copulatory appendage long (ca 1/3 of valve length); width about 60 % of length of appendage. Wide and long, spirally coiled, distally open copulatory tube.

MEASUREMENTS: L 0.61-0.66 mm; H 0.32-0.37 mm.

COMMENTS: *C. cuneolus* is externally quite similar to the Mediterranean species *C. beckmanni* BARBEITO-GONZALEZ, 1971 (see also SISSINGH, 1972, p. 73; STAMBOLIDES, 1985, p. 184; ARANKI, 1987, p. 45). *C. beckmanni*, however, is a markedly larger species, with more prominent longitudinal ridges.

This is the first record of the species, since the original description by BRADY (1870).

Order Podocopida SARS, 1866

Suborder Bairdiocopina SARS, 1865

Superfamily Bairdioidea SARS, 1865

Family Pussellidae DANIELOPOL, 1976 (in MADDOCKS 1976)

Genus *Pussella* DANIELOPOL, 1973

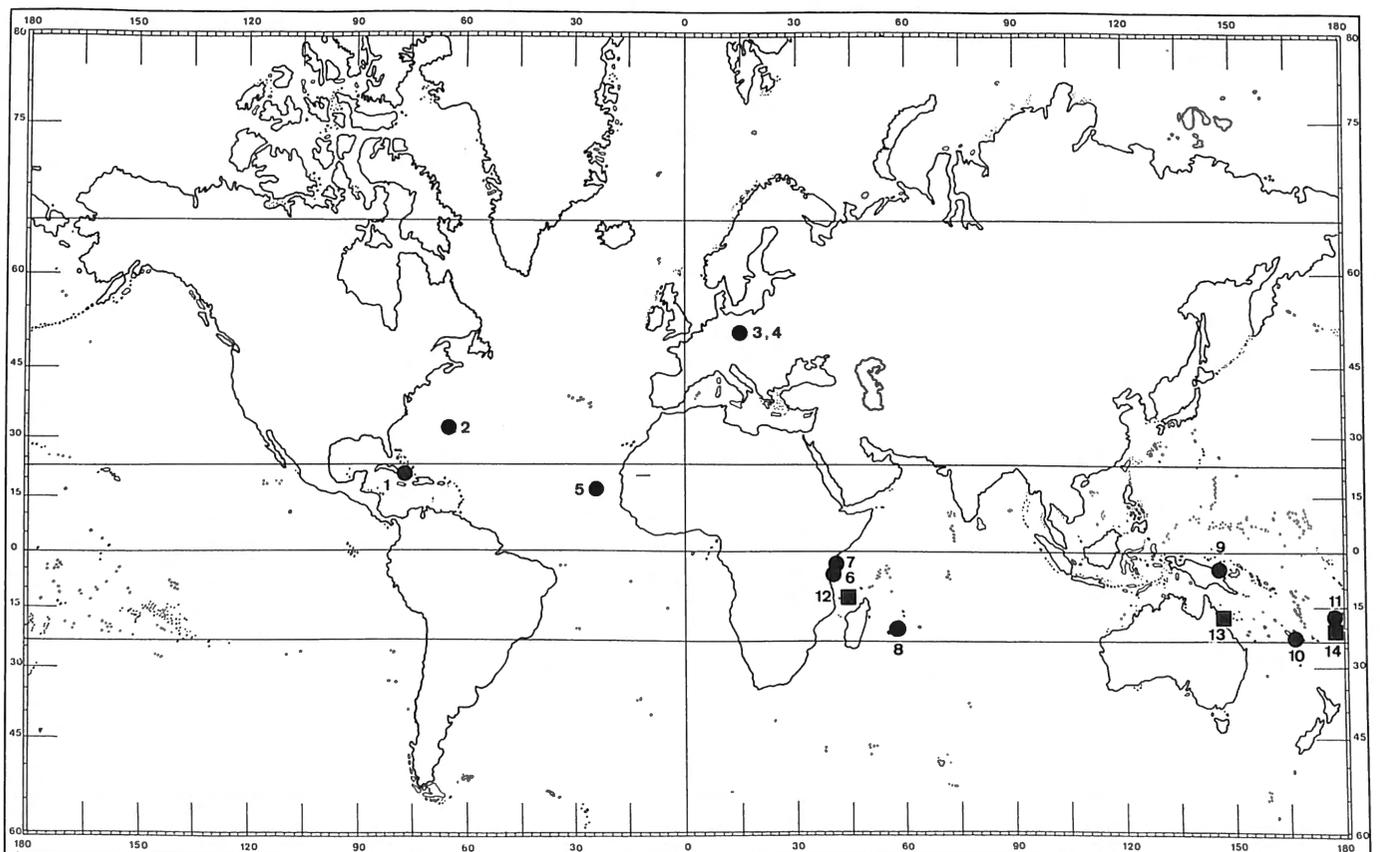


Fig. 1. Distribution of *Pussella* (circles) and *Danipussella* (squares).

1. *P. botosaneanui* DANIELOPOL, 1973.
2. *P. danielopoli* MADDOCKS, 1976.
3. *P. infraturonica* POKORNY, 1989 (Cretaceous, Turonian).
4. *Pussella* sp. POKORNY, 1989 (Cretaceous, Turonian).
5. *Pussella* sp. (this paper).
6. *Pussella* sp. JELLINEK, 1993.
7. *P. cf. danielopoli* JELLINEK, 1993.
8. *P. rhomboidea* (BRADY, 1869) (new combination).
9. *Pussella* sp. (pers. coll.).
10. *Anchistrocheles* aff. sp. CABIOCH *et al.*, 1986 (= *Pussella*).
11. *P. fijiensis* HIRUTA, 1994.
12. *D. serpentina* WOUTERS, 1988.
13. *Danipussella* sp. CORREGE, 1993.
14. *D. rhamphodes* HIRUTA, 1994.

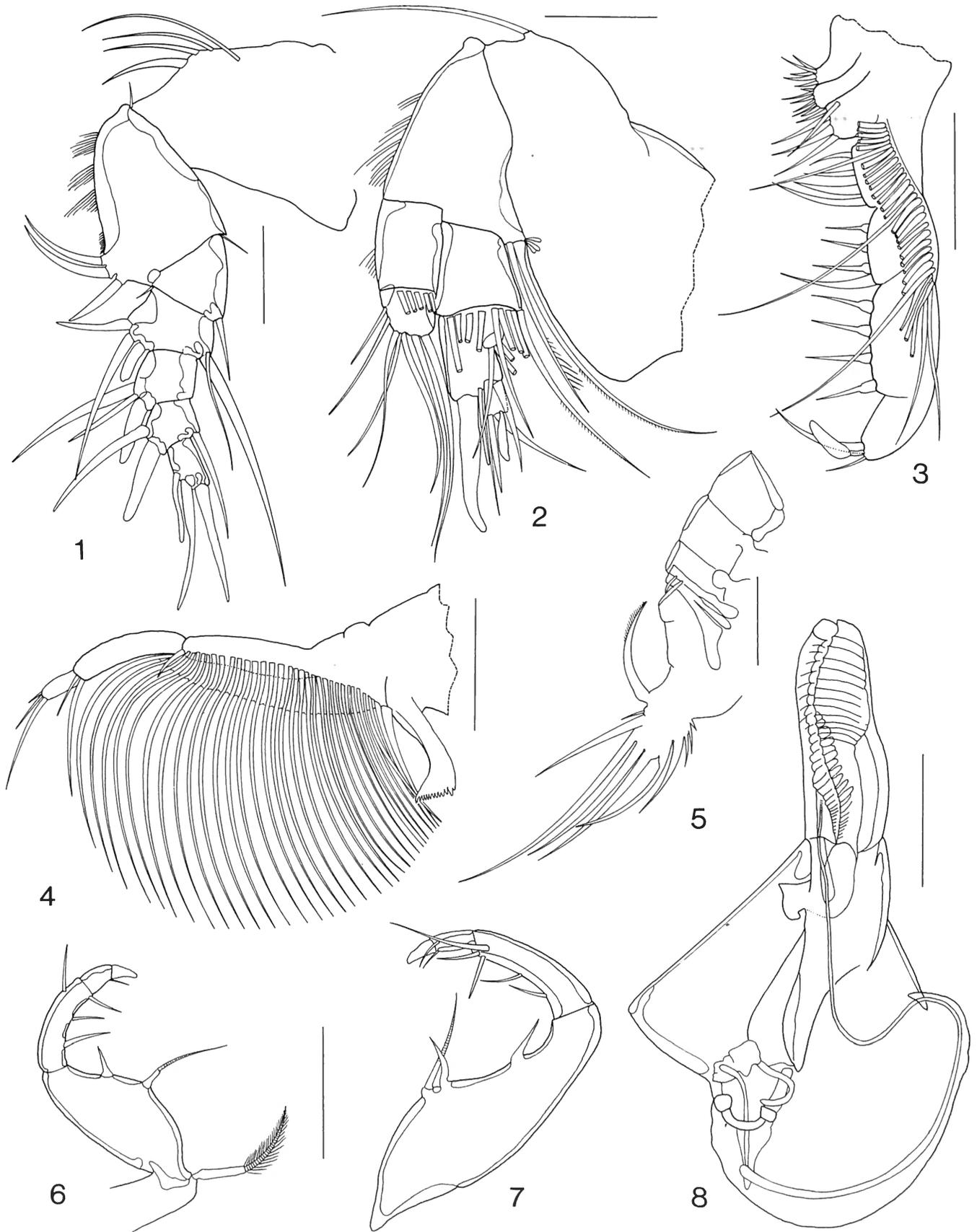


Plate 1. *Cytherelloidea cuneolus* (BRADY, 1870), male specimen (O.C. 2770). Fig. 1. Antennule. Fig. 2. Antenna. Fig. 3. Maxillule. Fig. 4. Mandible. Fig. 5. Furca and abdominal extremity. Fig. 6. Fifth limb (without respiratory plate). Fig. 7. Sixth limb (without respiratory plate). Fig. 8. Hemipenis. Scale: 50 μ m.

Pussella sp.
(Pl. 2, figs 1-8)

MATERIAL: one male specimen (O.C. 2773), from Calhau (station 9).

DESCRIPTION: small valves, with three anterior and two posterior hollow spines. Valve surface completely smooth. Appendages, see plate 2. Hemipenis large, and very complex, with two pointed hook-like processes.

MEASUREMENTS: L 0.32 mm ; H 0.13 mm.

COMMENTS: until now eleven *Pussella*-species have been recorded, some of them in open nomenclature: (1) *P. botosaneanui* DANIELOPOL, 1973, (2) *P. danielopoli* MADDOCKS, 1976, (3) *P. infraturonica* POKORNY, 1989 (Cretaceous, Turonian), (4) *Pussella* sp. POKORNY, 1989 (Cretaceous, Turonian), (5) *Pussella* sp. (this paper), (6) *Pussella* sp. JELLINEK, 1993, (7) *P. cf. danielopoli* JELLINEK, 1993, (8) *P. rhomboidea* (BRADY, 1869)(described as *Bairdia rhomboidea* by BRADY; new combination), (9) *Pussella* sp. (pers. coll.), (10) *Anchistrocheles* aff. sp. CABIOCH *et al.*, 1986 (= *Pussella*) and (11) *P. fijiensis* HIRUTA, 1994.

Pussella sp. from the Cape Verde Island is most certainly a new species. In absence of sufficient material, however, the species is not formally named and described here.

This is the first record of the genus *Pussella* in the East-Atlantic Ocean (Fig. 1).

Suborder Cytherocopina BAIRD, 1850
Superfamily Cytheroidea BAIRD, 1850
Family Hemicytheridae PURI, 1953
Genus *Auradilus* JELLINEK, 1995

Auradilus curvistriatus (BRADY, 1870)
(Pl. 3, figs 1-7; pl. 12, figs 2 a-b)

1870 *Cythere curvistriata* (G.S. BRADY) – BRADY, in: DE FOLIN & PÉRIER, Fonds de la Mer, p. 193, pl. 19, figs. 22-23.

TYPE LOCALITY: Saint Vincent, Cape Verde Islands (BRADY, 1870).

MATERIAL: one male specimen, with remnants of soft parts (O.C. 2774), from Calhau (station 19), and one left valve and two right valves (O.C. 2775) from Saint Vincent, Cape Verde Islands, collected during the Challenger Expedition, July 1872, depth 15 fm (collection Ernest VANDEN BROECK, RBINS, n° I.G. 4842, 19 May 1882).

DIAGNOSIS: valves with auriline shape and with tapering dorsal and ventral margins. Anterior margin broadly, but somewhat obliquely rounded; caudal process well-developed. Ornamentation consisting of a reticulate pattern, with, especially in the posterior half, fusion of individual fossae to

elongate, mostly longitudinally oriented depressions, surrounded by long muri. Large eye tubercle. Hinge with small "Aurila-tooth" in the LV posterior socket. About 105-108 straight and simple marginal pore canals. Very shallow antero-ventral vestibulum. Adductor scar pattern consisting of a rounded dorsal scar, two dorso-median scars, a constricted, but not divided ventro-median scar and an oval ventral scar. Appendages, see Pl. 3.

MEASUREMENTS: L 0.55-0.57 mm; H 0.31-0.34 mm.

COMMENTS: the present species is assigned to the genus *Auradilus*, using the diagnostic features, described by JELLINEK (1995). Because of the presence of a constricted, but undivided ventro-median adductor scar, however, the assignment of this species to the genus *Auradilus* is not quite certain.

This is the first record of the species, since the original description by BRADY (1870), which was also based on material from St. Vincent. It furthermore represents the second *Auradilus*-species known to occur in the East-Atlantic Ocean. The other species, *A. falcatus* (WITTE, 1993), was described from Senegal. Still another *Auradilus*-species, *A. costatus* (HU, 1979), was reported by FAUTH & COIMBRA (1998) from the West-Atlantic Ocean (Brazilian continental shelf). Both species can clearly be distinguished from *A. curvistriatus* by their different ornamentation patterns.

Genus *Orionina* PURI, 1953

Orionina caboverdensis WOUTERS, 1996
(Pl. 12, figs 3 a-b)

1996 *Orionina caboverdensis* WOUTERS sp. nov. – WOUTERS, *Stereo-Atlas of Ostracod Shells*, 23(8): 29-34.

TYPE LOCALITY: São Vicente, Baías das Gatas (WOUTERS, 1996).

MATERIAL: one male and one female specimen (O.C. 2776-2777), from Baías das Gatas (station 9-10). The type material of this species is also deposited in the collections of the RBINS, Brussels (O.C. 1779-1790).

DESCRIPTION: see WOUTERS (1996).

COMMENTS: *Orionina caboverdensis* has until now not been observed elsewhere, and is most likely endemic to the Cape Verde Islands. It is still the only *Orionina*-species occurring in the East-Atlantic Ocean. Because of its aberrant valve ornamentation it occupies a somewhat isolated position in the genus *Orionina*.

Family Loxoconchidae Sars, 1925
Genus *Loxoconcha* Sars, 1866

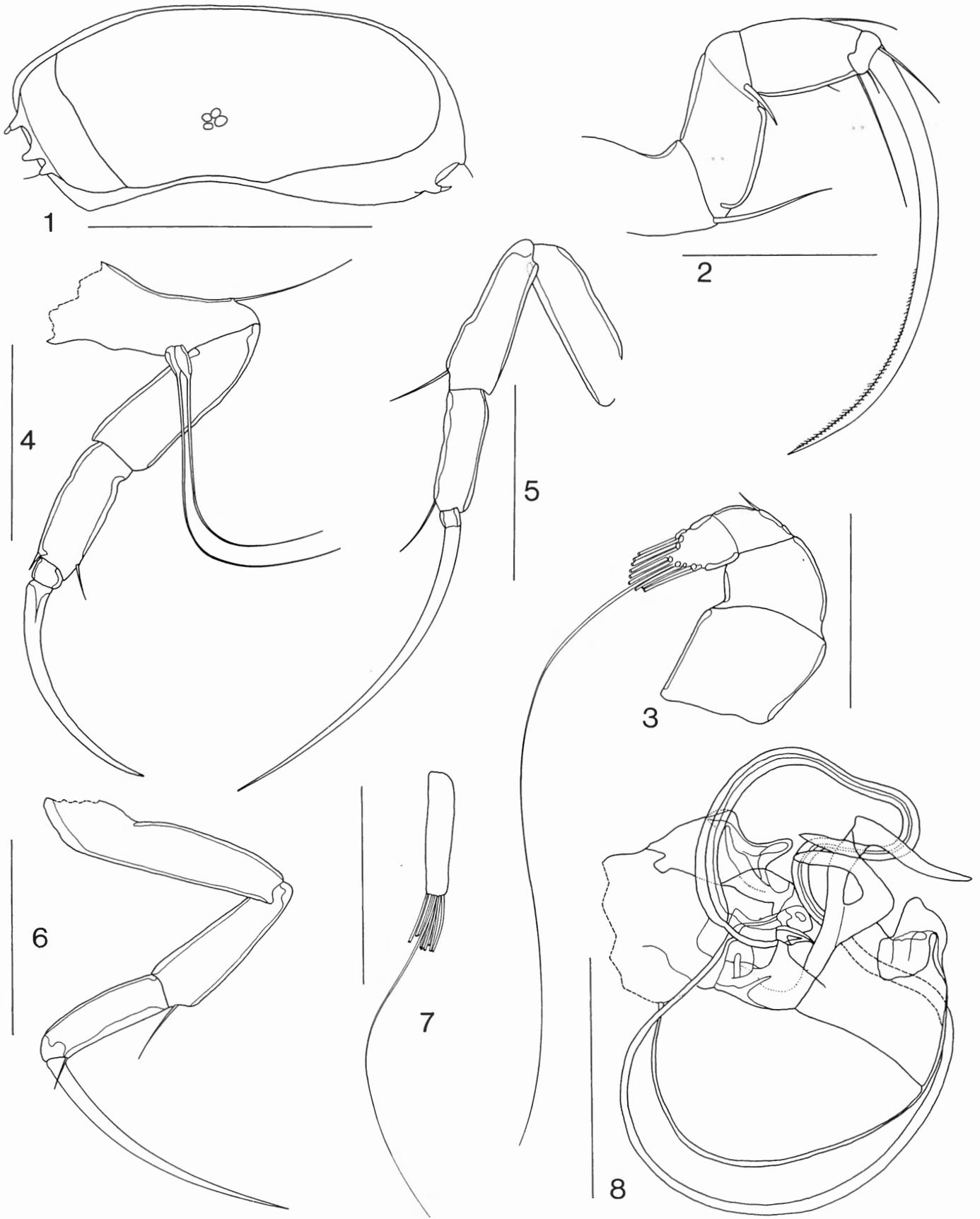


Plate 2. *Pussella* sp., male specimen (O.C. 2773). Fig. 1. Right valve, internal view. Fig. 2. Antenna. Fig. 3. Antennule. Fig. 4. First leg. Fig. 5. Third leg. Fig. 6. Second leg. Fig. 7. Brush-like organ. Fig. 8. Hemipenis. Scales: fig. 1: 200 μ m; figs 2-8: 50 μ m.

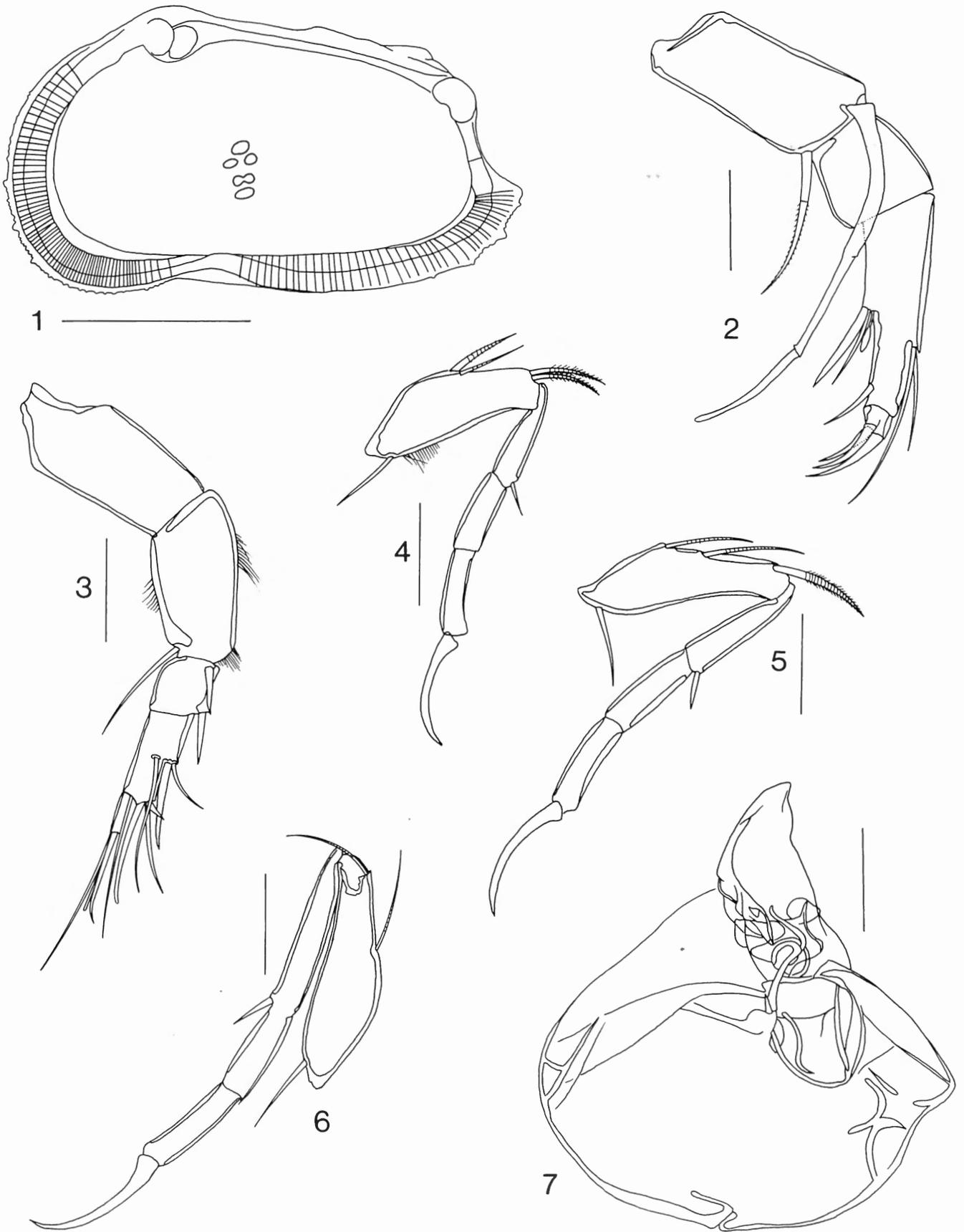


Plate 3. *Auradilus curvistriatus* (BRADY, 1870). Male specimen (O.C. 2774). Fig. 1. Right valve, internal view. Fig. 2. Antenna. Fig. 3. Antennule. Fig. 4. First leg. Fig. 5. Second leg. Fig. 6. Third leg. Fig. 7. Hemipenis. Scales: fig. 1: 200 μm ; figs 2-7: 50 μm .

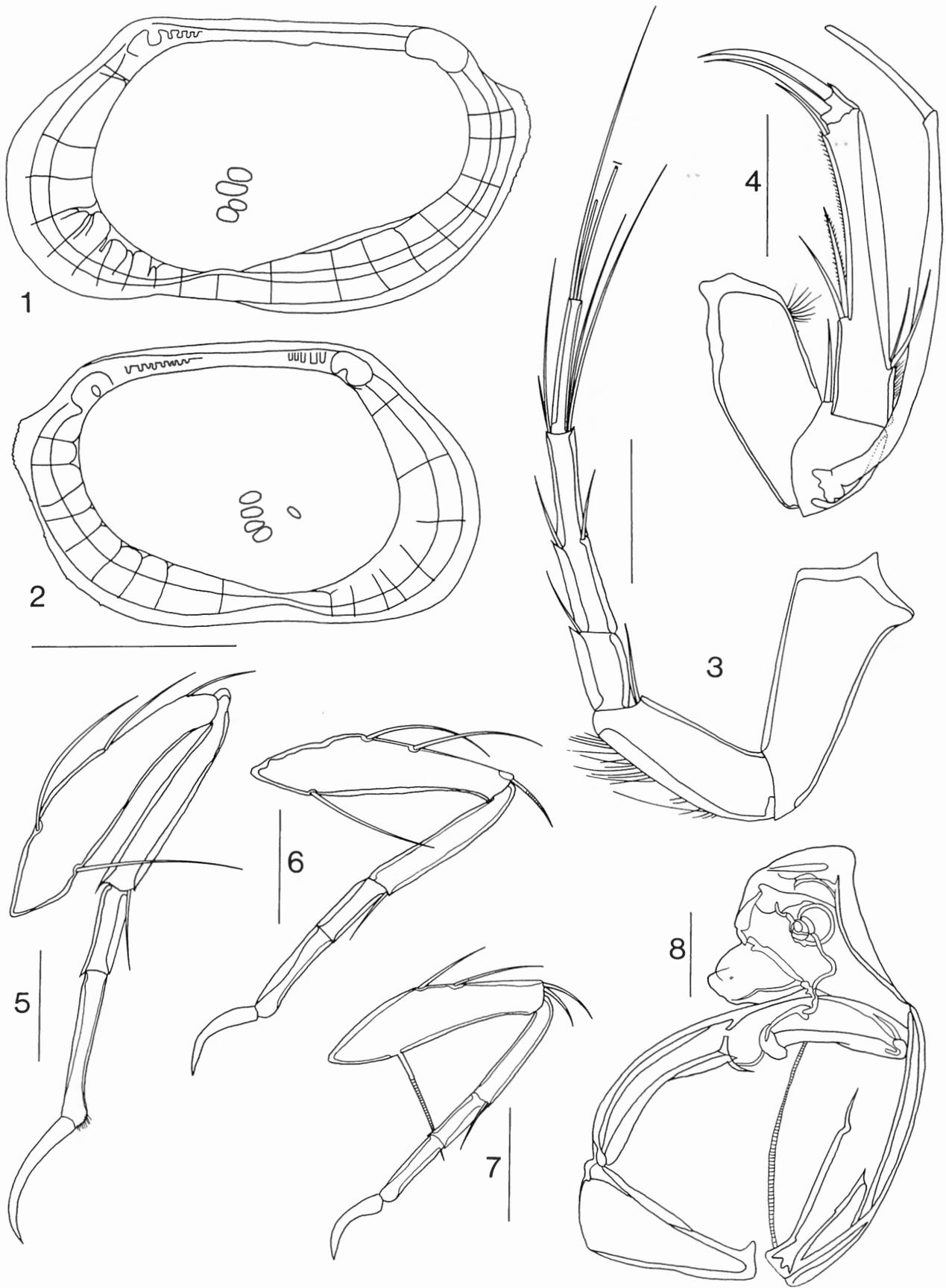


Plate 4. *Loxoconcha sculpta* BRADY, 1869. Fig. 1. Male right valve, internal view (O.C. 2778). Fig. 2. Female left valve, internal view (O.C. 2780). Appendages: male specimen (O.C. 2778). Fig. 3. Antennule. Fig. 4. Antenna. Fig. 5. Third leg. Fig. 6. Second leg. Fig. 7. First leg. Fig. 8. Hemipenis. Scales: figs 1-2: 200 μ m; figs 3-8: 50 μ m.

Loxococoncha sculpta BRADY, 1869
(Pl. 4, figs 1-8; pl. 12, figs 4 a-c)

1869 *Loxococoncha sculpta* (G.S. BRADY) – BRADY, in: DE FOLIN & PÉRIER, Fonds de la Mer, p. 140-141, pl. 18, figs 5-6.

TYPE LOCALITY: Saint Vincent, Cape Verde Islands (BRADY, 1869).

MATERIAL: three males and two females (O.C. 2778-2782), from Baias das Gatas (station 13).

DIAGNOSIS: medium-sized valves, with parallel dorsal and ventral margin; anterior margin obliquely rounded; posterior margin with short caudal process; prominent, nearly straight anterior marginal rib, diverging from the anterior margin; oblique postero-dorsal rib, connected to weakly developed postero-dorsal protuberance; straight posterior rib, and convex ventro-lateral rib, connected to the posterior but not to the anterior rib; valve surface delicately reticulated; about 18 marginal pore canals, some of them bi- or polyfurcated in the antero-ventral area; males larger than females. Appendages: see Pl. 4.

MEASUREMENTS: male valves: L 0.50-0.53 mm; H 0.28-0.31 mm; female valves L 0.46; H 0.28 mm.

COMMENTS: *L. sculpta* is externally quite similar to *Loxocorniculum visendum* WITTE, 1993, described from Bakau Beach, Gambia. The latter species, however, can clearly be distinguished by the presence of two well developed antero-median ribs. This is the first record of the species, since the original description, based on material from St. Vincent, by BRADY (1870).

Family Pectocytheridae HANAI, 1957
Genus *Keijia* TEETER, 1975

Keijia demissa (BRADY, 1868)
(Pl. 5, figs 1-7; pl. 13, figs 1 a-b)

1868 *Cythere demissa*, nov. sp. – BRADY, Marine Ostracoda from the Mauritius; p. 180, pl. 12, figs 1-2.

1993 *Keijia demissa* (BRADY, 1868) – WITTE, Taxonomy and biogeography of West African beach ostracods, p. 8-9, pl. 4, figs 10-12 (with synonymy).

TYPE LOCALITY: Mauritius, Indian Ocean (BRADY, 1868).

MATERIAL: three females (O.C. 2783-2785), from Baias das Gatas and São Pedro (stations 6, 9-10 and 11).

DESCRIPTION: see TEETER (1975) and WITTE (1993).

MEASUREMENTS: L 0.44-0.49 mm; H 0.20-0.23 mm.

COMMENT: *K. demissa* is a circumtropical species. It was recorded for the first time in the East-Atlantic Ocean (Senegal and the Gambia), on the basis of empty valves, by WITTE (1993). This is the second record: in the Cape Verde Islands

living specimens (only females) were collected in three localities.

Genus *Kotoracythere* ISHIZAKI, 1966 (synonym: *Morkhovenia* TEETER, 1975)

Kotoracythere inconspicua (BRADY, 1880)
(Pl. 6, figs 1-7; pl. 12, figs 5 a-b)

1880 *Cythere inconspicua*, n. sp. – BRADY, Report on the Ostracoda dredged by H.M.S. Challenger, p. 70-71, Pl. 13, figs 1a-d.

1991 *Kotoracythere inconspicua* (BRADY, 1880) – WITTE & VAN HARTEN, Polymorphism, biogeography and systematics of *Kotoracythere inconspicua*, p. 427-436, figs 3-5 (with synonymy).

TYPE LOCALITY: Torres Straits, N. Australia (BRADY, 1880; PURI & HULINGS, 1976).

MATERIAL: four females (O.C. 2786-2789), from Baias das Gatas (station 9-10).

DESCRIPTION: see TEETER (1975), WITTE & VAN HARTEN (1991) and WITTE (1993).

MEASUREMENTS: L 0.40-0.42 mm; H 0.21-0.23 mm.

COMMENT: This is the second record of the species in the East-Atlantic Ocean. It was already reported from Senegal and the Gambia by WITTE (1993). WITTE & VAN HARTEN (1991) propose that transport by shipping may have played a role in the arrival of the East Atlantic population of *K. inconspicua*. The most important argument in their discussion is the absence in the Atlantic of "arrowhead" morphs. The "normal" morph and "arrowhead" morph occur together in the Indo-Pacific region. They conclude that the population sample that penetrated in the Atlantic may simply not have contained the genotype responsible for arrowheads. The specimens from the Cape Verde Islands studied in the present paper are all "normal" morphs, which is, to some extent, a confirmation of the shipping hypothesis. This hypothesis, however, needs further corroboration, preferably by the study of fossil material.

Family Paradoxostomatidae Brady & Norman, 1889
Genus *Paradoxostoma* FISCHER, 1855

Paradoxostoma sp.
(Pl. 13, fig. 2)

MATERIAL: two males (O.C. 2768-2769), from Baias de Gatas (station 13).

COMMENT: in a forthcoming paper by SCHORNIKOV & KEYSER (in press), this species will be described as a new species from the Canary Islands, and from the Cape Verde Islands.

Family Xestoleberididae Sars, 1928
Genus *Xestoleberis* Sars, 1866

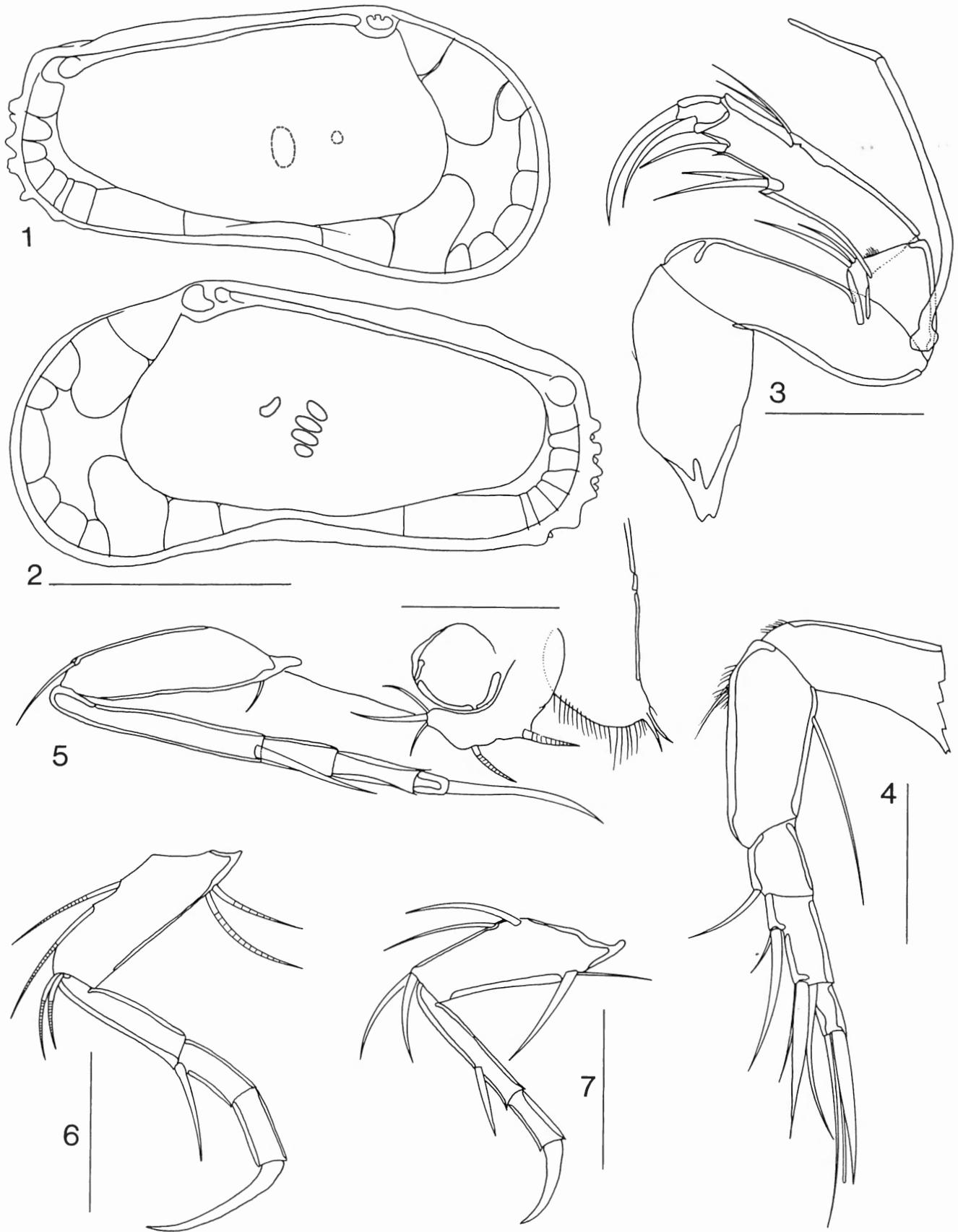


Plate 5. *Keijia demissa* (BRADY, 1868). Fig. 1. Left valve, internal view (O.C. 2784). Fig. 2. Right valve, internal view (O.C. 2783). Fig. 3. Antenna, female (O.C. 2785). Fig. 4. Antennule, female (O.C. 2785). Fig. 5. Third leg, furca and abdominal spine, female (O.C. 2783). Fig. 6. Second leg, female (O.C. 2784). Fig. 7. First leg, female (O.C. 2784). Scales: figs 1-2: 200 μ m; figs 3-7: 50 μ m.

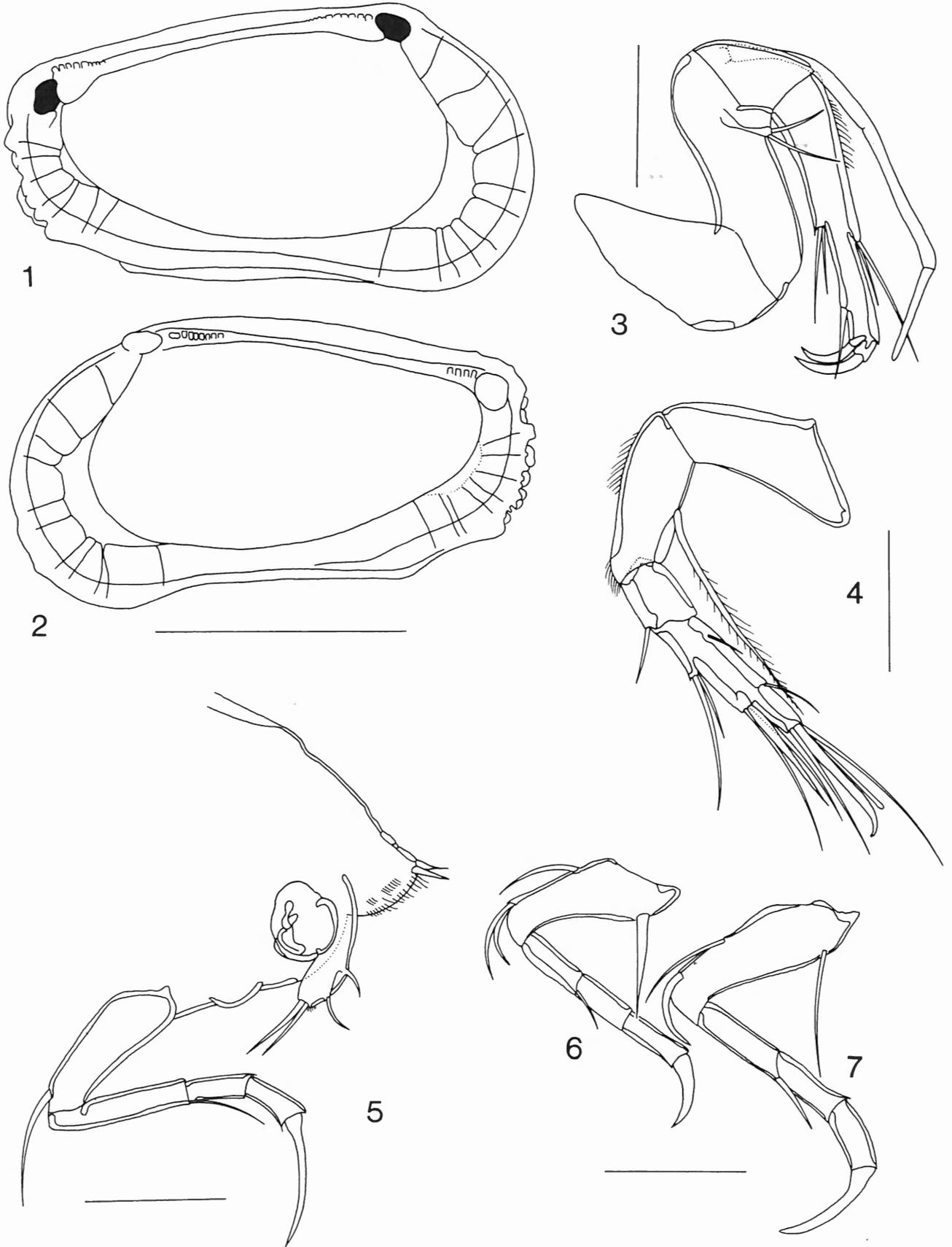


Plate 6. *Kotoracythere inconspicua* (BRADY, 1880). Fig. 1. Left valve, internal view, female (O.C. 2789). Fig. 2. Right valve, internal view, female (O.C. 2788). Fig. 3. Antenna, female (O.C. 2787). Fig. 4. Antennule, female (O.C. 2787). Fig. 5. Third leg, furca and abdominal spine, female (O.C. 2788). Fig. 6. First leg, female (O.C. 2789). Fig. 7. Second leg, female (O.C. 2789). Scales: figs 1-2: 200 μ m; figs 3-7: 50 μ m.

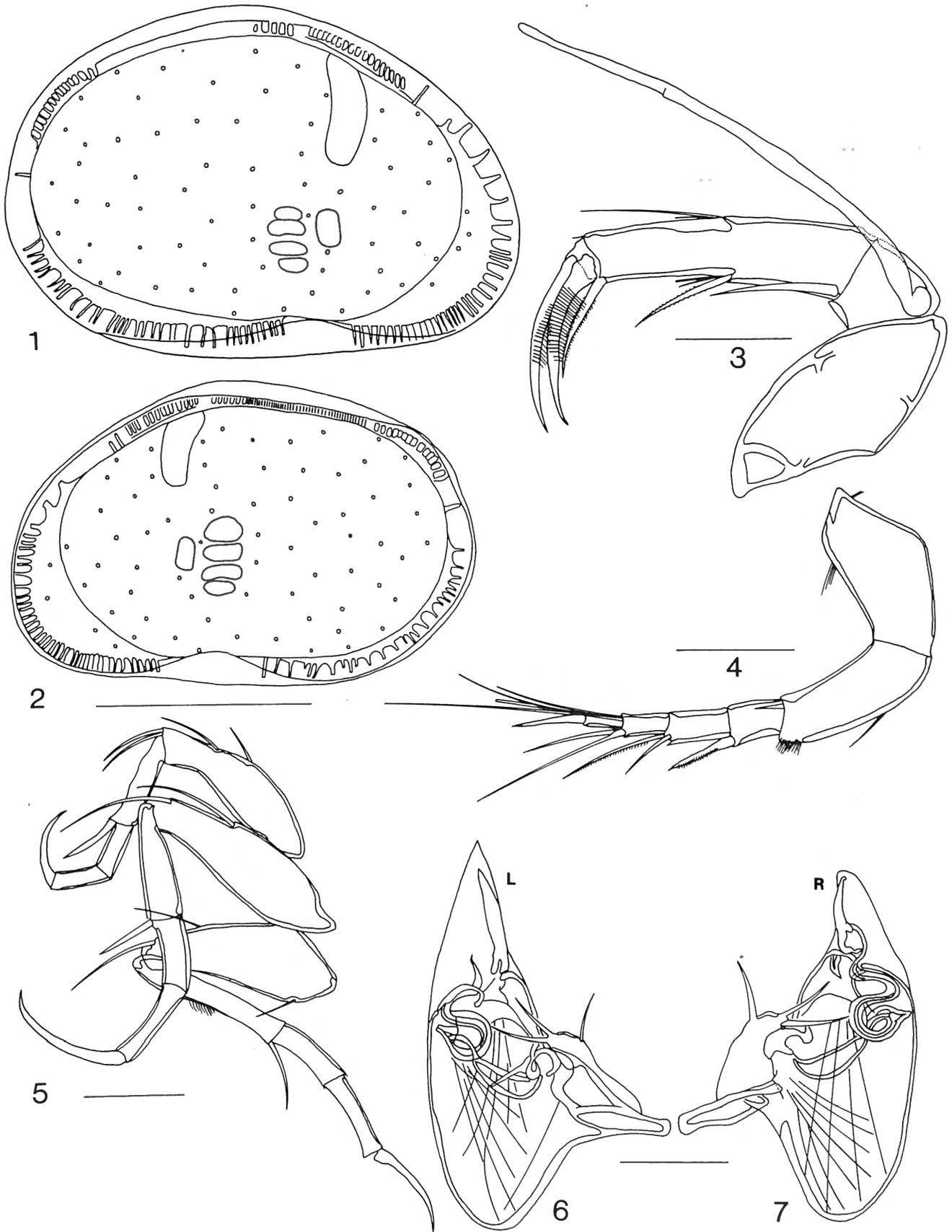


Plate 7. *Xestoleberis communis* MÜLLER, 1894. Fig. 1. Left valve, internal view, female (O.C. 2794). Fig. 2. Right valve, internal view, male (O.C. 2790). Fig. 3. Antenna, male (O.C. 2791). Fig. 4. Antennule, male (O.C. 2791). Fig. 5. First leg (top), second leg (middle), third leg (bottom), male (O.C. 2790). Fig. 6. Left hemipenis (O.C. 2790). Fig. 7. Right hemipenis (O.C. 2790). Scales: figs 1-2: 200 μ m; figs 3-7: 50 μ m.

Xestoleberis communis MÜLLER, 1894
(Pl. 7, figs 1-7; pl. 13, figs 3 a-c)

?1880 *Xestoleberis variegata*, n.sp. – BRADY, Report on the Ostracoda dredged by H.M.S. Challenger, p. 129, pl. 31, figs 8 a-g.

1894 *Xestoleberis communis* n. sp. – G.W. MÜLLER, Ostracoden des Golfes von Neapel, p. 338-339, pl. 25, figs 32, 33, 39; pl. 26, figs 1, 6.

?1976 *Xestoleberis variegata* BRADY – PURI & HULINGS, Lectotypes Challenger Expedition, p.302-303, pl. 20, figs 16-18.

1993 *Xestoleberis* cf. *communis* G.W. MÜLLER – WITTE, Taxonomy and biogeography of West African beach ostracods, p. 46, pl. 11, figs 13-16 (with synonymy).

TYPE LOCALITY: Gulf of Naples, Italy (MÜLLER, 1894).

MATERIAL: five males and four females (O.C. 2790-2796), from Baías das Gatas (station 13).

DESCRIPTION: see MÜLLER (1894) and ATHERSUCH (1976).

MEASUREMENTS: males L 0.42-0.44 mm; H 0.27-0.30 mm; females L 0.44-0.47 mm; H 0.29-0.32 mm.

COMMENTS: comparison of morphological features of the valves (hinge, opaque spots, marginal pore canals) and of the appendages, and more particularly of the hemipenis, as described and figured by MÜLLER (1894) and by ATHERSUCH (1976), confirms the identification of the Cape Verde material as *X. communis*, a common species in the Mediterranean. WITTE (1993) described *Xestoleberis* cf. *communis* from Senegal and the Gambia. WITTE most probably hesitated to identify his West-African material as *X. communis*, because of the difficulties in discriminating between *Xestoleberis* species on valve characteristics and because of the considerable geographical distance between West-Africa and the Mediterranean. The presence of a living population of this species in the Cape Verde Islands, however, removes this argument of doubt. Because of the strong resemblance of WITTE's material (1993, Pl. 11, figs 13-16), his *X. cf. communis* is here put in synonymy with *X. communis*.

Material collected during the Challenger expedition off St. Vincent, Cape Verde Islands (1070-1150 fathoms) yielded four ostracod species. One of them is *Xestoleberis variegata* BRADY, 1880. The figures given by BRADY (1880, pl. 31, figs 8 a-b) are very similar to *X. communis* MÜLLER. The length of the valves reported by BRADY (0.57 mm) is much larger than that of our material (0.42-0.47 mm). Whether *X. variegata* BRADY, 1880 should be considered a senior synonym of *X. communis* MÜLLER, 1894 remains doubtful. Furthermore, it is questionable whether the synonymisation of a well known, and widely distributed species, such as *X. communis*, would actually contribute to the stability of zoological nomenclature.

Xestoleberis lenae sp. nov.
(Pl. 8, figs 1-9; pl. 13, figs 4 a-c)

HOLOTYPE: a male specimen, with valves stored dry (O.C. 2797a) and soft parts preserved in a glycerine preparation (O.C. 2797b).

PARATYPES: four males and four females, with valves stored dry and soft parts preserved in glycerine preparations (O.C. 2798-2804).

TYPE LOCALITY: Cape Verde Islands, São Vicente Island, Calhau (eastern part of the island), intertidal zone, rock pool.

DERIVATION OF NAME: named after my daughter Leen.

DIAGNOSIS

Very small, smooth *Xestoleberis*, with angulated anterior margin in the right valve; hemipenis with large triangular distal shield, large antero-ventral pointed hook-like process at the base of the dorsal shield; hook-like process with posterior, slightly curved distally rounded lobe and ventro-median rounded lobe.

DESCRIPTION

Valves (Pl. 8, figs 1, 2) small, completely smooth; female valves longer than males; strongly inflated in dorsal view; dorsal margin convex, ventral margin nearly straight; posterior margin broadly rounded; anterior margin obliquely rounded, somewhat angulated antero-ventrally; greatest height in the middle (females) and in front of the middle, at ca 40 % of length (males); wide anterior and narrow posterior inner lamella; large anterior vestibulum; 16 to 20 anterior marginal pore canals; small *Xestoleberis*-spot; four large, elongate adductor scars; frontal scar large and indistinctly U-shaped.

Antennule (Pl. 8, fig. 3) slender with six segments (4 and 5 fused).

Antenna (Pl. 8, fig. 4) five-segmented (3 and 4 fused); large two-segmented exopodite; terminal claw (Gm) strongly pectinate in males but smooth in females.

First and second legs (Pl. 8, figs 5,7) with strong distally curved claws, as well in males as in females.

Third leg (Pl. 8, fig. 6) with long and weakly curved claw.

Hemipenis (Pl. 8, figs 8, 9) with large triangular distal shield, pointed in the left hemipenis and rounded in the right; long antero-ventral pointed hook-like process at the base of the dorsal shield; hook-like process with a posterior, slightly curved distally rounded lobe (= basal lobe); opposite to this lobe, a second (ventro-median) rounded lobe.

Very small eye (difficult to observe).

Measurements

Holotype (male): LV L 0.33 mm; H 0.14 mm; RV 0.33 mm; H 0.15 mm.

Paratypes: males L 0.30-0.32 mm; H 0.12-0.15 mm.

females L 0.32-0.37 mm; H 0.14-0.17 mm.

COMMENTS

X. lenae sp. nov. belongs to the *X. arcturi*-group, as defined by BONADUCE & DANIELOPOL (1988) and DANIELOPOL & BONADUCE (1990). This widely distributed group contains (at least) ten species (and subspecies) of small interstitial or sediment dwelling ostracods. On the West-African coast, there is only one other locality known with a species of the *X.*

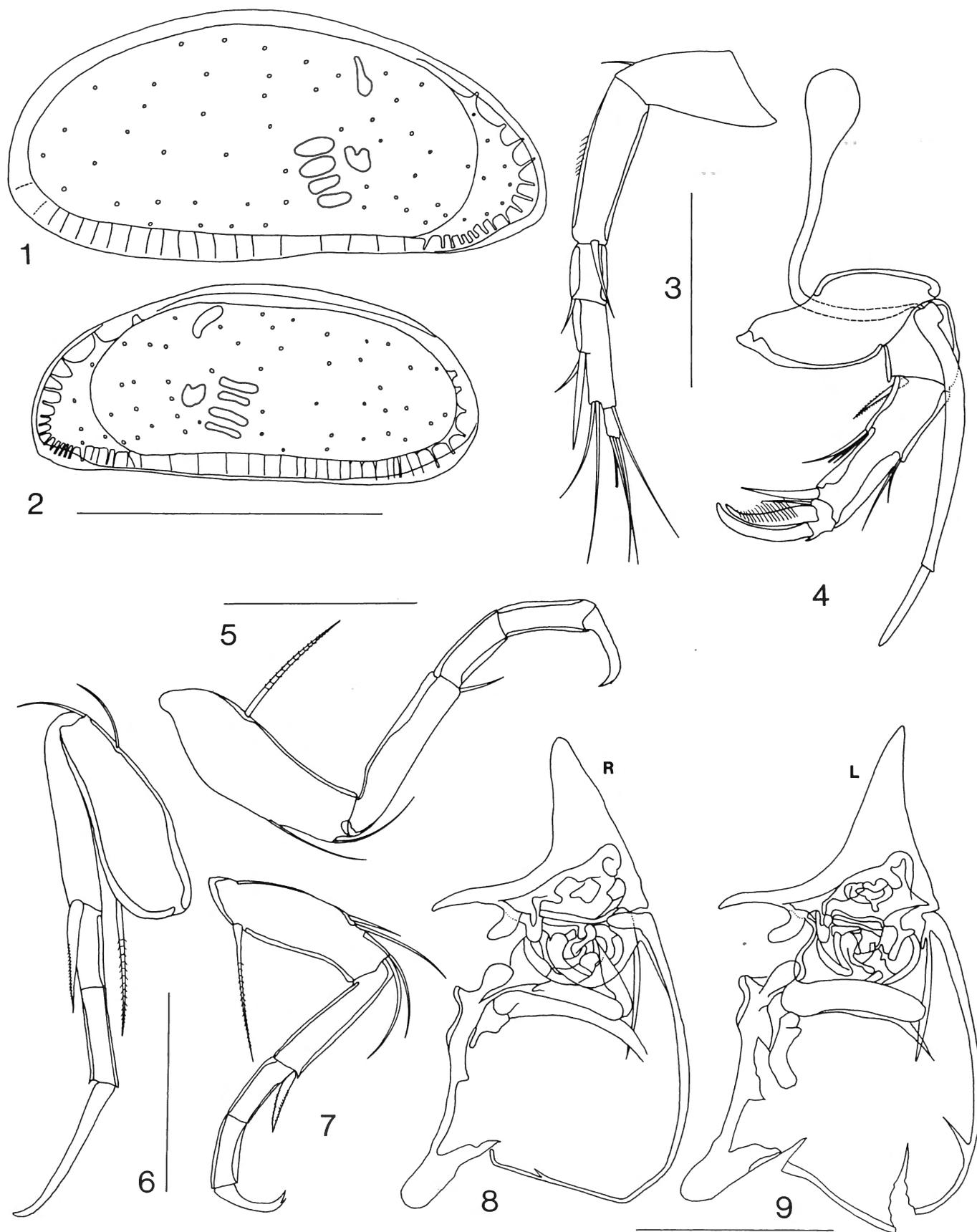


Plate 8. *Xestoleberis lenae* sp. nov. Fig. 1. Left valve, internal view, female, paratype (O.C. 2802). Fig. 2. Right valve, internal view, male, paratype (O.C. 2799). Fig. 3. Antennule, male, holotype (O.C. 2797). Fig. 4. Antenna, male, holotype. Fig. 5. Second leg, male, holotype. Fig. 6. Third leg, male, holotype. Fig. 7. First leg, male, holotype. Fig. 8. Right hemipenis, holotype. Fig. 9. Left hemipenis, holotype. Scales: figs 1-2: 200 μ m; figs 3-9: 50 μ m.

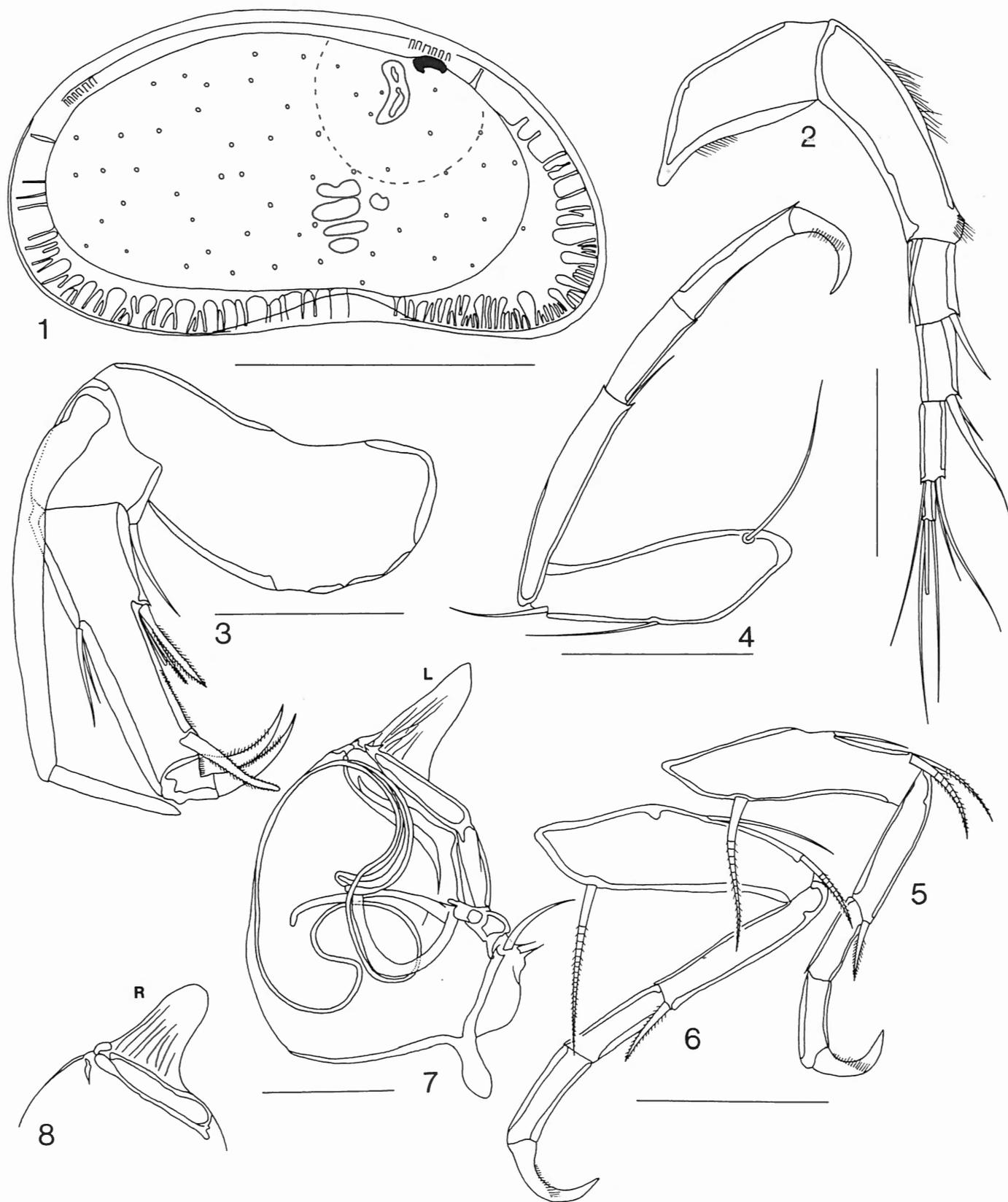


Plate 9. *Xestoleberis toni* sp. nov. Fig. 1. Left valve, internal view, male, holotype (O.C. 2806). Fig. 2. Antennule, holotype. Fig. 3. Antenna, holotype. Fig. 4. Third leg, holotype. Fig. 5. First leg, holotype. Fig. 6. Second leg, holotype. Fig. 7. Left hemipenis, holotype. Fig. 8. Right hemipenis, distal shield, holotype. Scales: fig. 1: 200 μ m; figs 2-8: 50 μ m.

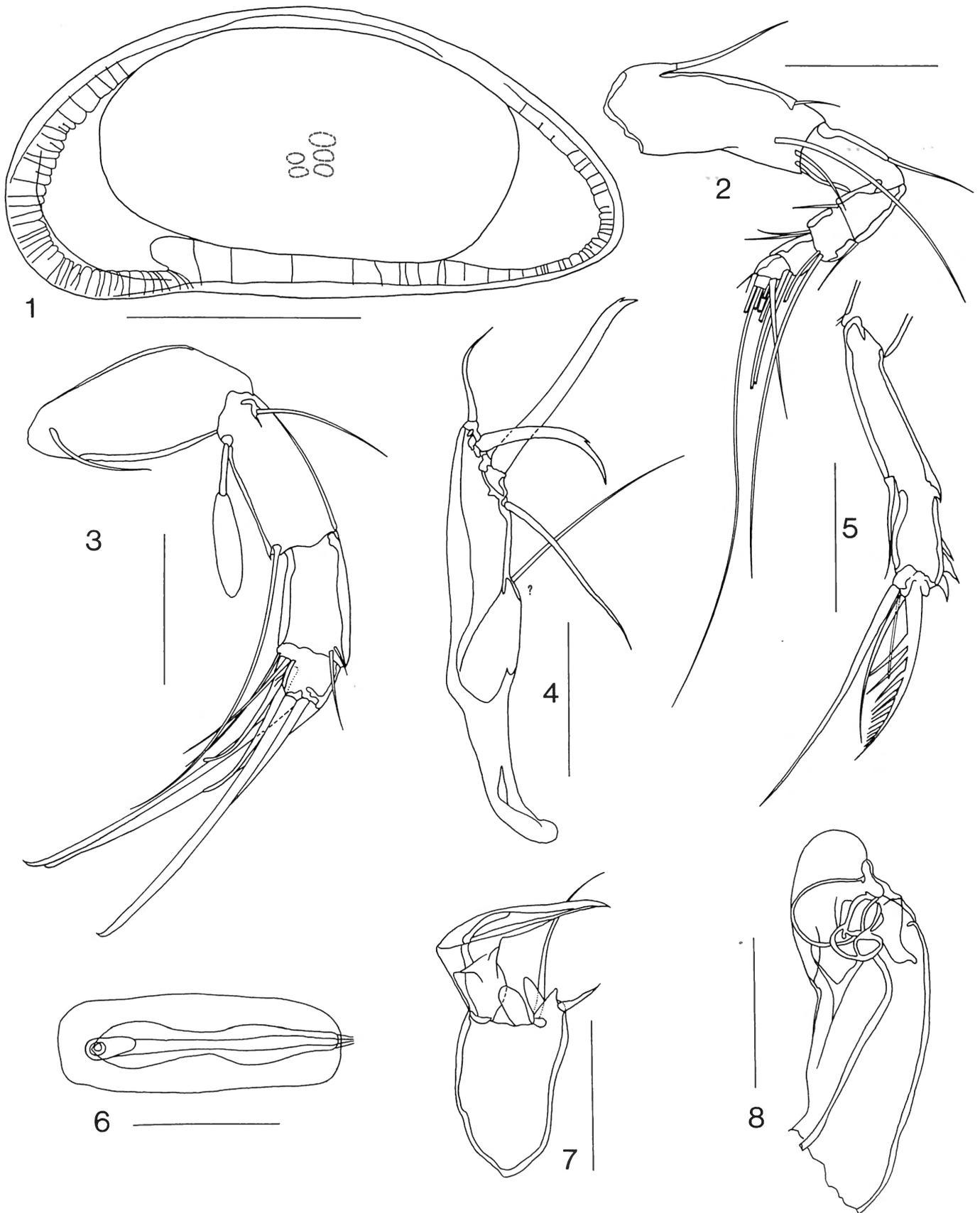


Plate 10. *Schedopontocypris* sp., male specimen (O.C. 2813). Fig. 1. Right valve, internal view. Fig. 2. Antennule. Fig. 3. Antenna. Fig. 4. Furca. Fig. 5. Distal segments of cleaning limb. Fig. 6. Zenker's organ. Fig. 7. Clasping apparatus. Fig. 8. Hemipenis. Scales: fig. 1: 200 μ m; figs 2-8: 50 μ m.

arcturi-group, namely *X. humilis* KLIE, 1940, described from the algal zone of Lüderitz Bay in Namibia. *X. humilis* is a markedly larger species (L 0.56 mm, female valves vs. 0.32-0.37 mm in *X. lenae*), with a larger eye, and with a much shorter and dorsally curved right dorsal shield; left dorsal shield is longer and narrower. *X. arcturi* TRIEBEL, 1956 (type-locality Galapagos Islands) has less elongated valves, with strongly curved dorsal margin. The posterior margin of the dorsal shield is less convex and the anterior margin is weakly convex (left) or concave (right), and the dorsal adductor scar is not oval as in *X. lenae*, but three-lobed. *X. rubrimaris* HARTMANN, 1964 (type locality Ghardaqa, Red Sea) has less elongated valves, a bifid basal lobe and a three-lobed dorsal adductor scar. *X. delamarei* HARTMANN, 1954 (type locality Banyuls, S. France) can easily be distinguished by its much higher valves, with strongly convex dorsal margin. *X. galapagosensis* GOTTWALD, 1983 (type locality Galapagos Islands) has long and nearly straight claws on the first and second male legs and a three-lobed dorsal adductor scar. *X. chilensis* HARTMANN, 1962 (type locality near Concepcion, Chile) and *X. chilensis austrocontinentalis* HARTMANN, 1978 (type locality W. Australia) have much shorter right distal shields, and longer and narrower left distal shields. *X. setouchensis* OKUBO, 1979 (type locality Inland Sea, Japan) has a short hook-like process at the base of the distal shield, a long basal lobe and a three-lobed dorsal adductor scar.

Xestoleberis toni sp. nov.

(Pl. 9, figs 1-8; pl. 13, figs 5 a-c)

HOLOTYPE: a male specimen, with valves stored dry (O.C. 2806a) and soft parts preserved in a glycerine preparation (O.C. 2806b).

PARATYPES: six females, with valves stored dry and soft parts preserved in glycerine preparations (O.C. 2807-2812).

TYPE LOCALITY: Cape Verde Islands, São Vicente Island, São Pedro (western part of the island), intertidal zone, rock pool.

DERIVATION OF NAME: named after my son Toon.

DIAGNOSIS

Medium-sized, smooth and shiny white elongate valves; concave ventral margin; numerous bi- or polyfurcated marginal pore canals; valves opaque, with semicircular anterodorsal lucid zone; legs 1-3 stout, with strongly curved terminal claws; left hemipenis with relatively small triangular, pointed distal shield; right hemipenis with short, distally rounded distal shield; L and R shields longitudinally striped.

DESCRIPTION

Valves (Pl. 9, fig. 1; Pl. 13, figs 5a-c) medium-sized, elongate, smooth and shiny white, with black eye-spot; males

smaller than females; dorsal margin convex, anterior margin obliquely rounded, posterior margin evenly rounded, ventral margin distinctly concave at ca 40 % of the length. Anterior inner lamella wide, ventral and posterior inner lamella narrow, with wide anterior and narrow ventral and postero-ventral vestibulum; numerous marginal pore canals, some of them simple, but most of them bi- or polyfurcated. Muscle scar pattern consisting of four elongate adductor scar; dorsal scar dorsally incised; small frontal scar. Large *Xestoleberis*-spot, and large eye. Valves opaque, with large semi-circular translucent zone around the *Xestoleberis*-spot and the eye (stippled on fig. 1 of pl. 9).

Antennule (Pl. 9, fig. 2) slender, with short setae and spines. Antenna (Pl. 9, fig. 3) strong, with two-segmented exopodite; terminal claws weakly pectinate, in males and females. Male (Pl. 9, figs 4, 5, 6) and female legs 1-3 slender, with stout and strongly curved, weakly pectinate, terminal claws. Left hemipenis (Pl. 9, fig. 7) with relatively small triangular, pointed distal shield; right hemipenis (Pl. 9, Fig. 8) with shorter, and distally rounded distal shield. L and R shields longitudinally striped.

Measurements

Holotype (male): LV L 0.40 mm; H 0.21 mm; RV 0.40 mm; H 0.20 mm.

Paratypes (females): L 0.42-0.46 mm; H 0.22-0.25 mm.

COMMENTS

X. toni sp. nov. shows some resemblance to *X. sexmaculata* ATHERSUCH, 1976 (= *X. margaritea* BRADY, *sensu* MÜLLER, 1894, *non* BRADY, 1866). Both species have elongated valves, but *X. sexmaculata* is higher, with a more convex dorsal margin. The left distal shield of *X. sexmaculata* is longer, narrower and more pointed, and the right shield is blunt and curved. It is interesting to note that according to ATHERSUCH (1976, p. 294) this is the only species of *Xestoleberis* which occurs both in the Atlantic (Madeira) and the Mediterranean. *X. communis*, described in the present paper, then is the second Mediterranean *Xestoleberis*-species occurring in the Atlantic.

None of the five *Xestoleberis*-species described by KLIE (1940) from Namibia, or of the five species described by HARTMANN (1974) from Angola, correspond to the here described new species. These species can be easily distinguished from *X. toni* on the basis of the shape of the valves or the morphology of the hemipenis. *X. nigromaculata* BRADY, 1911, described from Madeira, is an elongate species, but with higher valves, and with distinctive large opaque spots. *X. latissima* BRADY, 1911 (also from Madeira), has elongate valves with straight ventral margin, and is also a much larger species (L 0.75 mm vs L 0.40-0.46 in *X. toni*).

Suborder Cypridocypina JONES, 1901

Superfamily Pontocypridoidea MÜLLER, 1894

Family Pontocypridae MÜLLER, 1894

Genus *Schedopontocypris* MADDOCKS, 1969

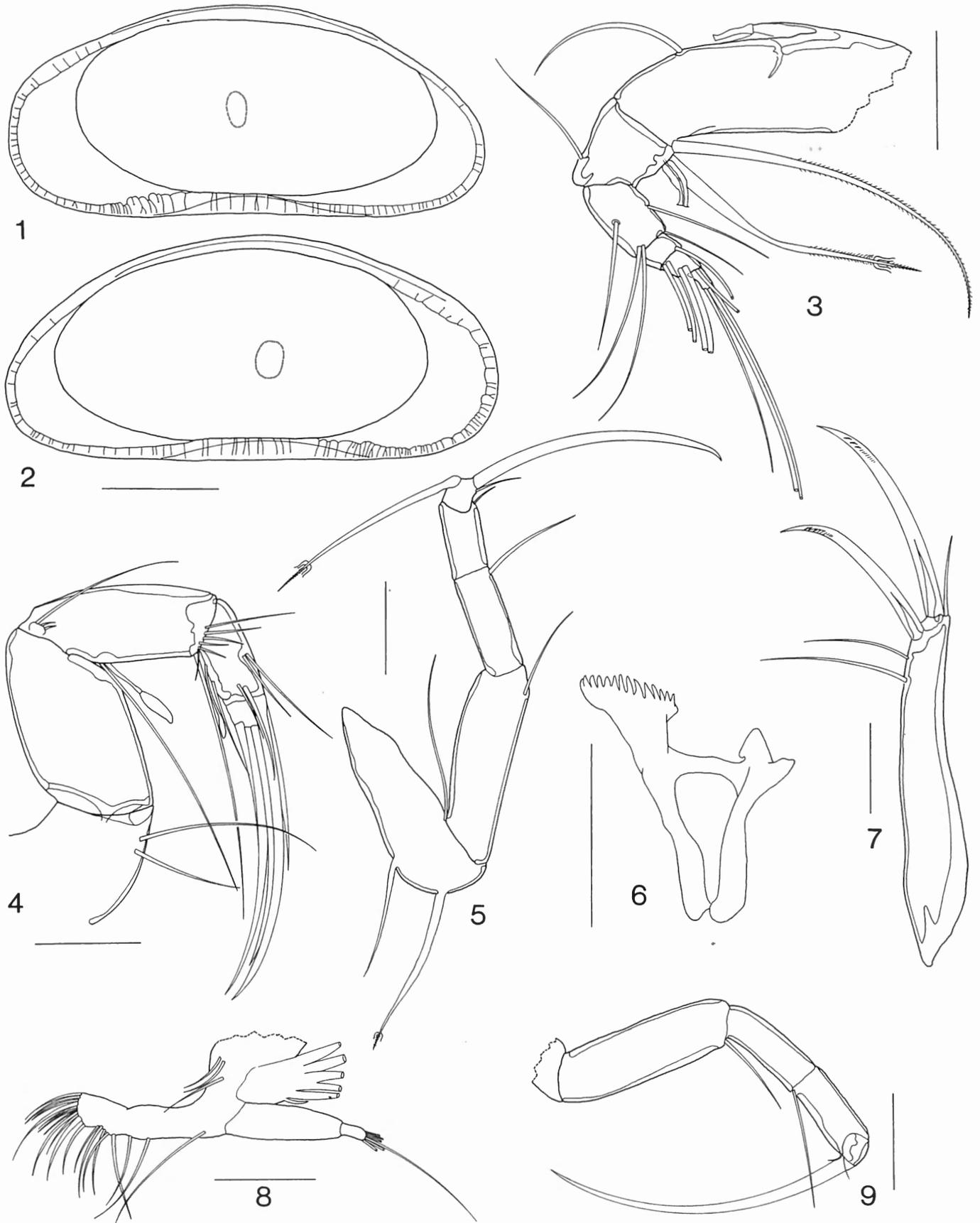


Plate 11. "*Aglaia*" *rara* MÜLLER, 1894, female specimen (O.C. 2814). Fig. 1. Right valve, internal view. Fig. 2. Left valve, internal view. Fig. 3. Antennule. Fig. 4. Antenna. Fig. 5. Third leg (cleaning limb). Fig. 6. Rake-like organ. Fig. 7. Furca. Fig. 8. First leg. Fig. 9. Second leg. Scales: figs 1-2: 200 μ m; figs 3-9: 50 μ m.

Schedopontocypris sp.
(Pl. 10, figs 1-8; pl. 13, fig. 7)

? 1894 *Pontocypris succinea* n.sp. – MÜLLER, Ostracoden des Golfes von Neapel, p. 249, pl. 6, figs 6,7,46-50.

MATERIAL: one male specimen (O.C. 2813), Calhau, rock pool.

DESCRIPTION: medium-sized, smooth, light brownish valves with rounded anterior and posterior margins; dorsal margin arched, without distinct angle at highest point; ventral margin straight. Anterior and posterior inner lamella wide, with large anterior and posterior vestibula; anterior vestibulum constricted antero-ventrally; posterior marginal pore canals short; anterior marginal pore canals long, and antero-ventrally curved. Appendages, see Plate 10.

MEASUREMENTS: L 0.52 mm; H 0.24 mm.

COMMENTS: *Schedopontocypris* sp. is very similar to, if not identical with, *S. succinea* (MÜLLER, 1894), a rare and poorly understood Mediterranean species. The valves figured by MÜLLER (1894, Pl. 9, Figs 7-8) are higher than in the Cape Verde specimen. The morphology of the hemipenis and the Zenker's organ are nearly identical. There is some difference in the structure of the hook of the male clasping apparatus, which is very angular in the specimen from Cape Verde, and rounded in *S. succinea*. Both species have a constricted anterior vestibulum. There are other *Schedopontocypris*-species with this type of vestibulum, such as *S. subfusca* (MÜLLER, 1894) and *Schedopontocypris* sp. cf. *S. subfusca* sensu WOUTERS, 1997. As well *S. succinea* as *S. subfusca* have been assigned to the genus *Schedopontocypris* by MADDOCKS (1969, 1991). Not all *Schedopontocypris*-species, however, appear to have a constricted vestibulum. Some of the historically important pontocyprid species described by MÜLLER (1894) from the Gulf of Naples are in urgent need of revision and redescription. The single, not perfectly preserved, male specimen from the Cape Verde Islands, does not allow more conclusions toward the real identity or genus assignment of the species.

Superfamily Cypridoidea BAIRD, 1845

Family Candonidae KAUFMANN, 1900

Subfamily Paracypridinae SARS, 1923

Genus *Aglaiia* BRADY, 1868 (new name *Aglaiocypris* SYLVESTER-BRADLEY, 1947), non *Aglaiia* RENIER, 1804 (Mollusca), non *Aglaiia* SWANSON, 1827 (Aves).

"Aglaiia" rara (MÜLLER, 1894)
(Pl. 11, figs 1-9; pl. 13, fig. 6)

1894 *Aglaiia rara* sp. nov. - MÜLLER, Ostracoden des Golfes von Neapel, p. 244, Pl. 12, figs 7, 41, 44, 45, 47, 49, 50, pl. 13, figs 1-7.

1912 *Paracypris rara* (G.W. MÜLLER) - MÜLLER, Ostracoda, Das Tierreich, p. 125.

1961 *Aglaiocypris rara* (G.W. MÜLLER) - REYS, Ostracodes région Marseille, p. 63.

1971 *Aglaiocypris rara* (G.W. MÜLLER) - BARBEITO-GONZALEZ,

Ostracoden von Naxos, p. 271-272, pl. 8, figs 1d, 2d, 3d, 4d, 5d, pl. 44, figs 9, 10.

1992 *Hansacypris rara* (MÜLLER) - MADDOCKS, Anchialine Cyprididae Galapagos, p. 6.

2000 *Hansacypris rara* (MÜLLER) - MADDOCKS, Antennule chaetotaxy, p. 34.

TYPE LOCALITY: Gulf of Naples, Italy (MÜLLER, 1894).

MATERIAL: one female specimen (O.C. 2814), Baia das Gatas, rock pool (station 9-10).

DESCRIPTION: large, smooth, translucent valves, with gently arched dorsal margin, rounded anterior and posterior margins; ventral margin straight; transitions between margins without angulations; greatest height in the middle; fused zone narrow; large vestibula; numerous marginal pore canals, short and simple in the posterior area, and longer and bifurcated in the anterior and especially in the antero-ventral area. Antennule with eight podomeres, 1 and 2, and 4 and 5 fused. First segment with large dorsal "new organ" (WOUTERS, 1999); large Rome-organ between second and third segment. Antenna with short swimming setae. Cleaning limb, with long recurved setae and long claw. Furca with two long, distally inserted, posterior setae. V-process of lower lip pointed.

MEASUREMENTS: L 0.52 mm; H 0.24 mm.

COMMENTS: the specimen from the Cape Verde Islands is, as far as can be judged from a single female specimen, identical with *Aglaiia rara* (MÜLLER, 1894), a very rare, and almost mysterious Mediterranean species. The genus *Aglaiia* was described by BRADY (1868) on material from Messina (Sicily). The genus name appeared to be preoccupied by *Aglaiia* RENIER, 1804 (Mollusca) and *Aglaiia* SWANSON, 1827 (Aves), and SYLVESTER-BRADLEY (1947) introduced the new name *Aglaiocypris*, with *Aglaiocypris pulchella* (BRADY, 1868) as type species. Unfortunately, the species figured and described later in the Treatise on Invertebrate Paleontology (Moore, 1961, p. 245-246, fig. 181, 3 c-e on p. 249) is *Aglaiocypris complanata*, a species that is not congeneric with *A. pulchella*. *A. complanata* is now in the genus *Gerdocypris* MCKENZIE, 1983, together with some other species as *G. muelleri* MCKENZIE, 1983, *G. eulitoralis* (HARTMANN, 1974) and *G. croneisi* (TEETER, 1975) (new combination). "*Aglaiia*" *rara* does not belong to the genus *Gerdocypris*. The type species of the original "*Aglaiia*", is *A. pulchella*. The present author studied the type material of this species, which is preserved in the Hancock Museum (Newcastle upon Tyne), and from this study it appeared that *Aglaiocypris pulchella* is congeneric with the much later described species *Ghardaglaia triebeli* HARTMANN, 1964. MÜLLER (1894) originally placed the species *rara* in the genus *Aglaiia*. Later (1912) he moved it to the genus *Paracypris*. After the introduction of the new name *Aglaiocypris*, subsequent authors placed the species in that genus, such as REYS (1961) and BARBEITO-GONZALEZ (1971). MADDOCKS (1992, 2000) assigned the species *rara* to the genus *Hansacypris* WOUTERS, 1984. The species *rara*,

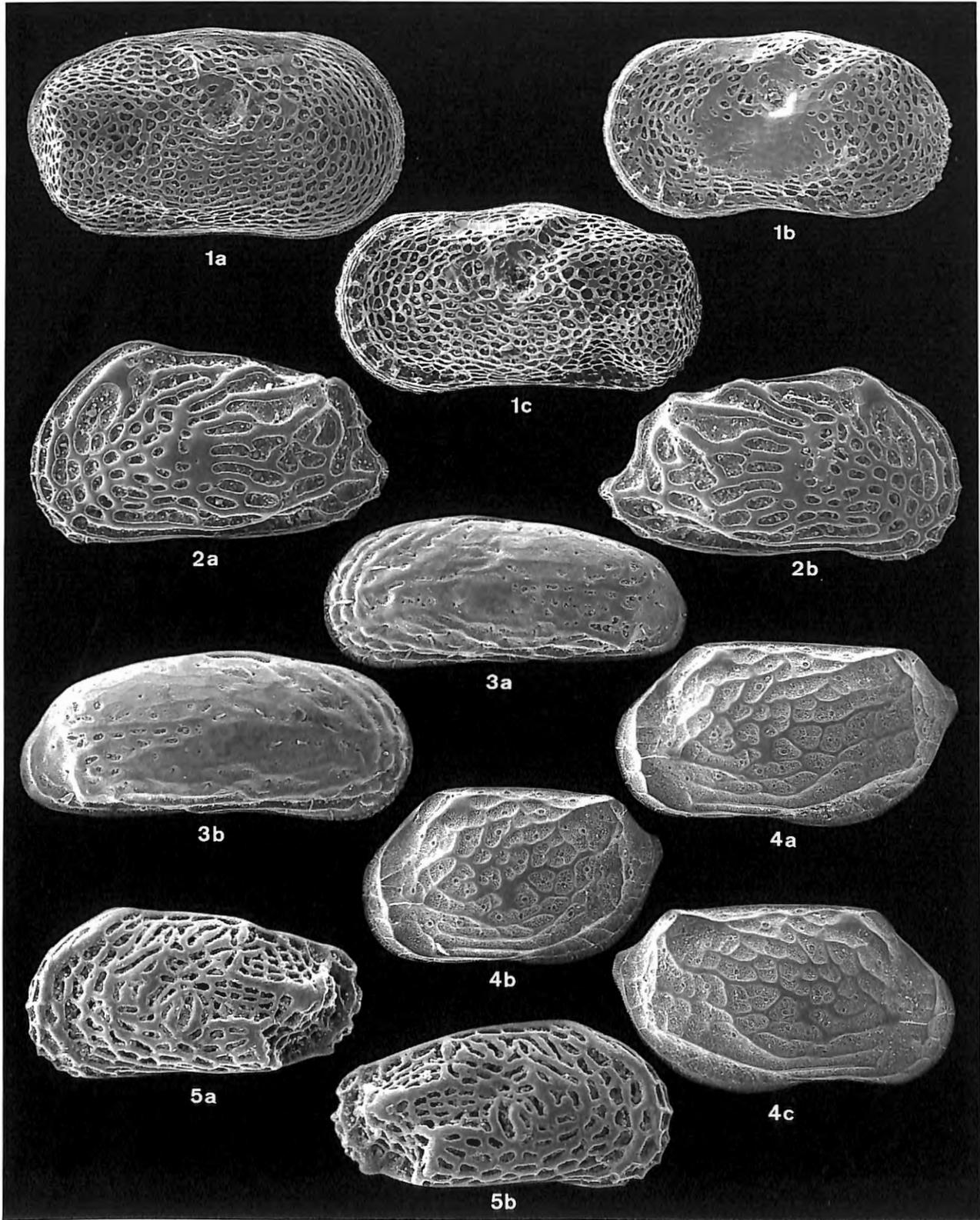


Plate 12. Fig. 1. *Cytherelloidea cuneolus* (BRADY, 1870). 1a. Right valve, female (O.C. 2772), X 105. 1b. Left valve, male (O.C. 2770), X 105. 1c. Left valve, female (O.C. 2772), X 105. Fig. 2. *Auradilus curvistriatus* (BRADY, 1870). 2a. Left valve, male (O.C. 2774), X 120. 2b. Right valve, male (O.C. 2774), X 120. Fig. 3. *Orionina caboverdensis* WOUTERS, 1996. 3a. Left valve, male (O.C. 2776), X 135. 3b. Right valve, female (O.C. 2777), X 135. Fig. 4. *Loxoconcha sculpta* BRADY, 1869. 4a. Left valve, male (O.C. 2779), X 140. 4b. Left valve, female (O.C. 2780), X 140. 4c. Right valve, male (O.C. 2779), X 140. Fig. 5. *Kotoracythere inconspicua* (BRADY, 1880). 5a. Left valve, female (O.C. 2786), X 160. 5b. Right valve, female (O.C. 2786), X 160.

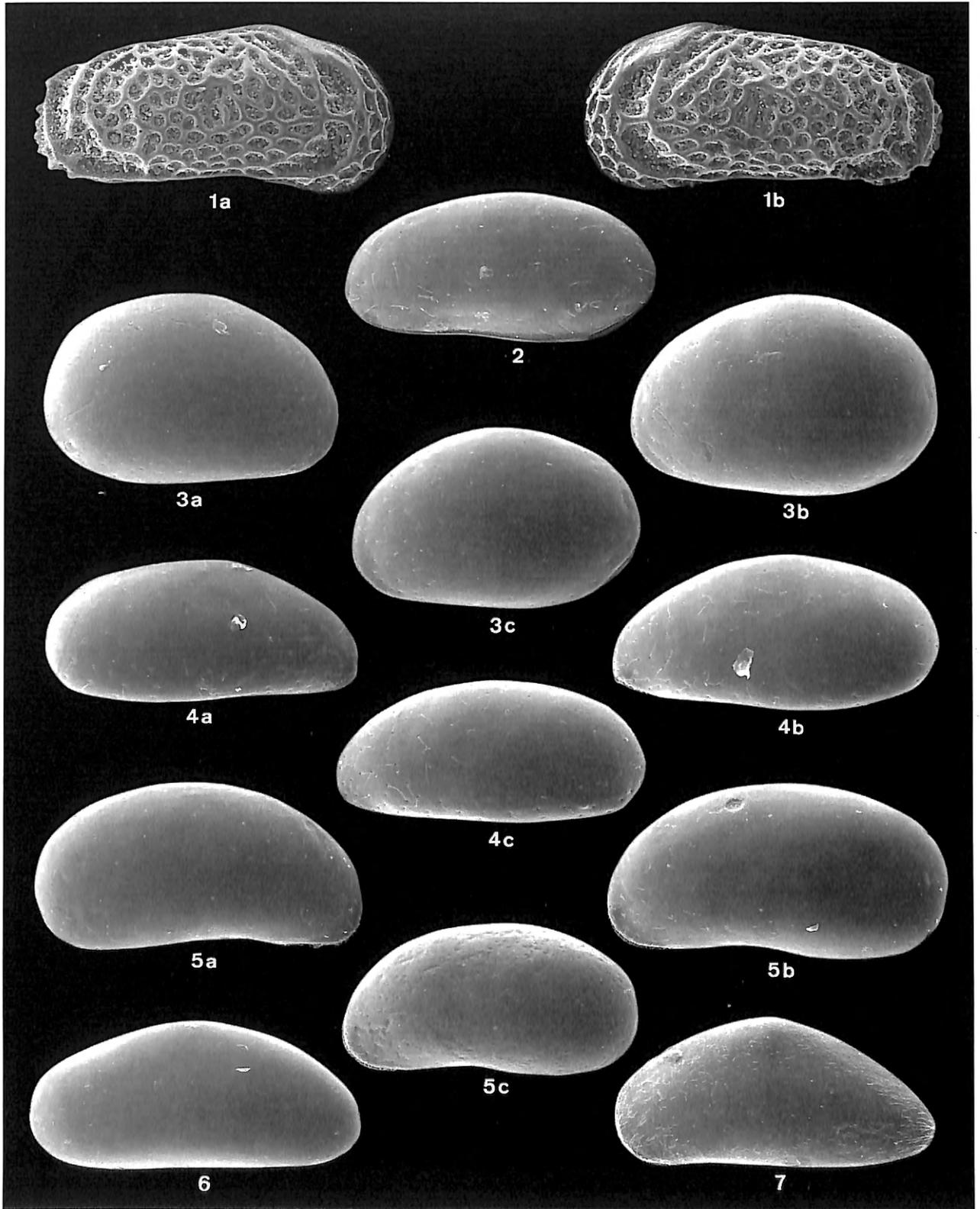


Plate 13. Fig. 1. *Keijia demissa* (BRADY, 1868). 1a. Right valve, female (O.C. 2783), X 130. 1b. Left valve, female (O.C. 2783), X 130. Fig. 2. *Paradoxostoma* sp., left valve, male (O.C. 2768), 120. Fig. 3. *Xestoleberis communis* MÜLLER, 1894. 3a. Right valve, female (O.C. 2794), X 125. 3b. Left valve, female (O.C. 2794), X 125. 3c. Left valve, male (O.C. 2790), X 125. Fig. 4. *Xestoleberis lenae* sp. nov. 4a. Right valve, female, paratype (O.C. 2803), X 175. 4b. Left valve, female, paratype (O.C. 2803), X 175. 4c. Left valve, male, holotype (O.C. 2797), X 175. Fig. 5. *Xestoleberis toni* sp. nov. 5a. Right valve, female, paratype (O.C. 2810), X 140. 5b. Left valve, female, paratype (O.C. 2806), X 140. 5c. Left valve, male, holotype (O.C. 2806), X 140. Fig. 6. «*Aglaia*» *rara* MÜLLER, 1894, left valve, female (O.C. 2814), X 77. Fig. 7. *Schedopontocypris* sp., left valve, male (O.C. 2813), X 115.

however, does not belong there, because of the absence of the characteristic hook-like process on the third and fourth segment of the cleaning limb, and because of the absence of the antero-ventral inner list with tooth (LV) and socket (RV), present in *Renaudocypris*- and *Hansacypris*-species (WOUTERS, 2001). Because of all this, the species *rara* remains "homeless". The description of a new genus is probably needed here, but it is obvious that this cannot be done on the basis of a single female specimen. The taxonomy of marine and brackish cypridoideans remains difficult and confused, partly because of the insufficiently detailed descriptions of the type species and partly because of the presence of homeomorphies, as already emphasized by MCKENZIE (1982) and MADDOCKS (1988).

Zoogeography

The thirteen ostracod species from the Cape Verde Islands listed in the present paper fall into several zoogeographical categories.

(1) Seven species are only known from the Cape Verde Islands: *Cytherella cuneolus*, *Auradilus curvistriatus*, *Orioina caboverdensis*, *Loxoconcha sculpta*, *Xestoleberis lenae*, *Xestoleberis toni* and *Pussella* sp. None of this seven species was reported by WITTE (1993) from the West African coast. This does not necessarily mean that they are endemic to the islands, because of the limited information available on the distribution of West African Ostracoda. On the other hand, the Cape Verde Islands have a relatively large number of endemics. According to TÜRKAY (1982), 6.8 percent of the decapod crustaceans is endemic to the Cape Verde Islands. It is therefore not to be excluded that some of the mentioned ostracod species are endemic to the islands.

(2) Two species have a wide distribution in the tropical zone, and are also known from West Africa (WITTE, 1993): *Keijia demissa*, *Kotoracythere inconspicua*.

(3) One species is known from the Cape Verde Islands and the Canary Islands: *Paradoxostoma* sp. (SCHORNIKOV & KEYSER, in press). According to TÜRKAY (1982), 10.3 % of the decapod crustaceans are insular species, i.e. occurring on the east Atlantic Islands, from the Azores in the north to the islands in the Gulf of Guinea in the south.

(4) Two species (probably three) occur also in the Mediterranean: *Xestoleberis communis*, "*Aglaia*" *rara*, and probably *Schedopontocypris* sp. *X. communis* is also known from the West African coast (WITTE, 1993). Because of the important influence of the NW Canary current, it is not surprising to observe northern faunal elements, including Mediterranean species, in the Cape Verde fauna. Of the 146 decapod crustaceans listed by TÜRKAY (1982) from the Cape Verde Islands, 50 (i.e. 34 percent) are known to occur also in the Mediterranean.

On the basis of the limited amount of material available for this study, it is not possible to draw further conclusions on the zoogeography of Cape Verde ostracods, but even with this

limited material it is clear that the ostracod fauna of Cape Verde is composed of species belonging to different zoogeographical categories. More collecting and more faunistic studies are certainly needed to determine the actual distribution ranges of ostracod species, not only in the Cape Verde Islands, but along the whole West African coast.

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