UPOGEBIIDAE OF THE WORLD (DECAPODA, THALASSINIDEA)

BY

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CRUSTACEANA MONOGRAPHS, 6

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PREFACE

The family Upogebiidae was established by Borradaile (1903), and revised by De Man (1927, 1928). More recently, the species of the Indo-West Pacific region have been revised by Sakai (1982), those of the western Atlantic and the eastern Pacific by Williams (1986, 1993b), and those of the eastern Atlantic and Mediterranean by Ngoc-Ho (2003). At present, the taxa of the family Upogebiidae Borradaile, 1903, itself attributed to the superfamily Thalassinoidea Dana, 1852 (cf. Sakai, 2005), consist of two subfamilies, 11 genera, and 156 species (including 4 spp. inquirendae) world-wide.

In this comprehensive revision, the family has been revised on a world-wide scale, based in part on new material. The generic structure was reassessed, with as a result that some genera have been synonymized and new genera are described herein. The existence of two subfamilies, Upogebiinae Borradaile, 1903 and Neogebiculinae Sakai, 1982, could be confirmed and keys to the genera of each subfamily are provided. Wherever desirable, keys to the species in the various genera are presented as well.

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INTRODUCTION

As mentioned in the Preface, above, the family Upogebiidae Borradaile, 1903 is currently divided into two subfamilies. These subfamilies, i.e., Upogebiinae Borradaile, 1903 and Neogebiculinae Sakai, 1982, are different in the form of the uropods: in the Neogebiculinae the uropods are slender and leaf-like, whereas in the Upogebiinae they are broadly foliaceous. The subfamily Neogebiculinae consists of two genera, *Neogebicula* Sakai, 1982 and *Paragebicula* n. gen. The subfamily Upogebiinae comprises nine genera: *Acutigebia* Sakai, 1982; *Aethogebia* Williams, 1993b; *Arabigebicula* n. gen.; *Gebicula* Alcock, 1901; *Mantisgebia* n. gen.; *Pomatogebia* Williams & Ngoc-Ho, 1990; *Tuerkayogebia* Sakai, 1982; *Upogebia* Leach, 1814; and *Wolffogebia* Sakai, 1982. Thus, one new genus, *Paragebicula* n. gen. is herein described in the subfamily Neogebiculinae, while two new genera, *Arabigebicula* n. gen. and *Mantisgebia* n. gen. are described in the Upogebiinae.

In the present review, the genera *Gebiacantha* Ngoc-Ho, 1989 and *Austinogebia* Ngoc-Ho, 2001 are synonymized with *Upogebia* Leach, 1814. The genus *Gebicula* Alcock, 1901 is now admitted as a good genus, as established by the type species, *G. exigua* Alcock, 1901 from the Andaman Sea, 485 m. A new species, *G. irawadyensis* sp. nov. from Myanmar, off Irawady Delta, and Batavia (= Jakarta) Bay, 18 m, collected by the Danish Expedition to the Kei-Islands in 1922, is separated from *G. exigua*. The series of species, *Upogebia darwinii* Miers, 1882 (from Port Darwin, Australia), *U. hexaceras* Ortmann, 1894 (from Thursday Island, Queensland), and *U. octoceras* Nobili, 1904 (from Aden, Obock, and Perim), have earlier been considered to constitute a more closely allied assemblage, possibly comprising sibling species. However, *U. hexaceras* and *U. octoceras* are to be synonymized with *U. darwinii*. *Upogebia isodactyla* Ortmann, 1891, from the Red Sea, is herein considered a synonym of *U. savignyi* (Strahl, 1862). The most abundant species in the Mediterranean, *Upogebia pusilla* (Petagna, 1792) should include *U. tipica* Nardo, 1869, which consequently is synonymized with the former species in this revision.

In June 1978, Dr. Torben Wolff of the Zoological Museum, University of Copenhagen, sent me a collection of unidentified Thalassinidea of which the axiid and callianassid components have already been reported upon (Sakai, 1982, 2005). In the present revision, the opportunity was taken to examine the upogebiid taxa within a world-wide review of the species of the family Upogebiidae, by studying also upogebiid collections from other museums, i.e., mainly

the Forschungsinstitut Senckenberg, Frankfurt am Main, and the Queensland Museum, Brisbane.

Abbreviations. — BLT, Biological Laboratory, Shikoku University, Tokushima; CBM-ZC, Natural History Museum and Institute, Chiba; MZS, Musée Zoologique de l'Université Louis Pasteur & de la Ville de Strasbourg; OIM, Oceanographic Institute, Monaco; QMB, Queensland Museum, Brisbane; RMNH, National Museum of Natural History, Leiden; SMF, Forschungsinstitut Senckenberg, Frankfurt am Main; ZMG, Zoologisches Museum Göttingen; ZMH, Zoological Museum, University of Hamburg; ZMMU, Zoological Museum, University of Moscow; ZMTU, Zoological Museum, University of Tel-Aviv; ZMUC-CRU, Zoological Museum University of Copenhagen, Crustacea collection; ZSM, Zoologische Staatssammlung, Munich.

A1, antennula; A2, antenna; Abd, abdomen; Mxp, maxilliped; P, pereiopod; Plp, pleopod; TL/CL, total length and carapace length.

FAMILY UPOGEBIIDAE BORRADAILE, 1903

Gebiadae Haworth, 1825: 184; Davie, 2002: 480.
Gebidae Dana, 1852: 12; Dana, 1852: 508.
Gebiidae; Haswell, 1881: 164 (part.); Czerniavsky, 1884: 83.
Upogebiinae Borradaile, 1903: 542.
Upogebiidae; Barnard, 1950: 497 (key), 513; Liu, 1955: 66; De Saint Laurent, 1973: 516; Le Loeuff & Intès, 1974: 48; De Saint Laurent & Le Loeuff, 1979: 35, 90; Sakai, 1982: 8; 1987: 306 (list); Holthuis, 1991: 232, fig. 24; Dworschak, 1992: 218; Sakai, 1993: 88; Williams, 1993b: 6; Poore, 1994: 104; Asakura, 1995: 339 (key), 341; Hendrickx, 1995: 388 (key), 413, figs.; Ingle & Christiansen, 2004: 99.

Diagnosis. — Rostrum of good size. Lateral ridges of gastric region present or absent. Hepatic spine present or absent. P1 chelate, subchelate, or simple; P2-5 simple. Plp1 present in females and absent in males; Plp2-5 biramous, lacking appendices internae. Uropods broadened or narrow.

Remarks. — The Upogebiidae can be divided into two subfamilies, Upogebiinae Borradaile, 1903 and Neogebiculinae Sakai, 1982, by the form of the uropods. In the Neogebiculinae, the uropods are narrow and leaf-like, whereas in the Upogebiinae they are broadly foliaceous.

Type genus. — *Upogebia* Leach, 1814.

Subfamilies included. — Upogebiinae Borradaile, 1903; Neogebiculinae Sakai, 1982.

KEY TO THE SUBFAMILIES OF THE FAMILY UPOGEBIIDAE BORRADAILE, 1903

1. Uropodal endopod and exopod narrow, leaf-like ..... Neogebiculinae Sakai, 1982
– Uropodal endopod and exopod broadened, foliaceous ..... Upogebiinae Borradaile, 1903

SUBFAMILY NEOGEBICULINAE SAKAI, 1982

Neogebiculinae Sakai, 1982: 72.

Diagnosis. — Rostrum obtuse on frontal margin, apically bearing a denticle. Hepatic spine present or absent. P1 symmetrical, simple or subchelate. P2-5 simple. Plp1 present in females, absent in males; Plp2-5 biramous, lacking appendices internae. Uropodal endopod and exopod narrow, leaf-like.

Type genus. — *Neogebicula* Sakai, 1982.

Genera included. — *Neogebicula* Sakai, 1982; *Paragebicula* n. gen.

KEY TO THE GENERA OF THE SUBFAMILY NEOGEBICULINAE SAKAI, 1982

1. Lateral ridges of gastric region widely diverging anteriorly from gastric region onward; P1 simple or subchelate; uropodal exopods slender and distally rounded ..... *Neogebicula* Sakai, 1982
– Lateral ridges of gastric region anteriorly diverging narrowly from gastric region onward; P1 subchelate; uropodal exopod distally truncate ..... *Paragebicula* n. gen.

Genus **Neogebicula** Sakai, 1982

Upogebia (*Neogebicula*) Sakai, 1982: 72; Sakai, 1987: 306 (list).
Neogebicula; Sakai, 1993: 95; Poore, 1994: 105 (key); Davie, 2002: 481.

Diagnosis. — [Revised from Sakai, 1982.] Rostrum obtuse on frontal margin, bearing marginal denticles. Lateral ridges of gastric region widely diverging anteriorly, from gastric region onward. Hepatic spine present. Mxp3 merus unarmed on mesial margin. P1 simple or subchelate, dactylus without dorsolateral plate; merus bearing subterminal spine on dorsal margin. Uropods slender and leaf-like; uropodal exopods distally rounded.

Remarks. — This genus is closely similar to *Paragebicula* n. gen. However, *Neogebicula* differs from *Paragebicula*, because in *Neogebicula* the uropodal exopod is slender, and simply rounded distally, and the lateral ridges of the gastric region are widely diverging anteriorly, whereas in *Paragebicula* the uropodal exopod is also slender, but truncate distally, and the lateral ridges of the gastric region are only narrowly diverging anteriorly.

Three species are known, all from the Indo-West Pacific region.

Type species. — *Neogebicula alaini* Sakai, 1982, by original designation.

Species included. — *Neogebicula alaini* Sakai, 1982; *Neogebicula monochela* (Sakai, 1967); *Neogebicula wistari* Ngoc-Ho, 1995.

KEY TO THE SPECIES OF THE GENUS *NEOGEBICULA* SAKAI, 1982

1. P1 subchelate; fixed finger unarmed on distal concavity ..... *N. monochela* (Sakai, 1967)
– P1 simple 2
2. Telson trapezoid, showing straight posterior margin ..... *N. wistari* Ngoc-Ho, 1995
– Telson triangular, showing convex posterior margin ..... *N. alaini* (Sakai, 1982)

Neogebicula alaini (Sakai, 1982)

Upogebia (*Neogebicula*) *alaini* Sakai, 1982: 72, fig. 16a-f.
Neogebicula alaini; Ngoc-Ho, 1995: 79, fig. 2d-f.

Material examined. — ZMUC-CRU 9702, 2 ovig. females (TL/CL, 9.0/2.6 – 12.0/3.2 mm), 1 female (TL/CL, 7.0/2.1 mm), off Beira, Mozambique, 20°08′S 35°33′E, "Galathea" st. 208, 50 m, sand and shells, 24.ii.1951.

Type locality. — Nosy Bé, Madagascar, 13°20′S 48°10′E, 50 m depth.

Distribution. — Madagascar: Nosy Bé, Banc de Pracel, and Ile Metsio (Sakai, 1982); Nosy Bé (Ngoc-Ho, 1995).

Neogebicula monochela (Sakai, 1967)

Gebicula monochela Sakai, 1967: 322, fig. 2, pl. 11B.
Upogebia (*Neogebicula*) *monochela*; Sakai, 1982: 75; Sakai, 1987: 306 (list).
Neogebicula monochela; Itani, 2004, table 2 (list).

Remarks. — This species, *Gebicula monochela*, is transferred to the genus *Neogebicula*, because the hepatic spine is present, and the uropodal exopod is distally rounded.

Type locality. — Uze, off Tomioka, Amakusa, Kumamoto Pref., Japan, 38 m.

Distribution. — Japan: Uze, off Tomioka, Amakusa.

Neogebicula wistari Ngoc-Ho, 1995

Neogebicula wistari Ngoc-Ho, 1995: 81, figs. 1-2; Davie, 2002: 482.

Type locality. — Wistari Reef, Queensland, Australia, 23°29′S 151°53′E, in soft sand.

Distribution. — Australia: Wistari Reef, Queensland (Ngoc-Ho, 1995).

Genus **Paragebicula** n. gen.

Diagnosis. — Rostrum obtuse on frontal margin, bearing or lacking marginal denticles. Lateral ridges of gastric region narrowly diverging anteriorly, from

gastric region onward. Mxp3 merus unarmed on mesial margin. P1 subchelate, dactylus with dorsolateral plate. Uropodal endopod and exopod slender and leaf-like.

Remarks. — This new genus is separated from *Neogebicula* Sakai, 1982, because in *Neogebicula* the P1 is simple, with the dactylus lacking a dorsolateral plate, and the uropodal endopod is simply leaf-like, whereas in *Paragebicula* the P1 is subchelate, with the dactylus bearing a dorsolateral plate, and the uropodal endopod is slender, with a proximal convexity on the anterior margin.

Type species. — *Upogebia* (*Upogebia*) *fallax* De Man, 1905, by present designation.

Species included. — *Paragebicula contigua* (Božić & De Saint Laurent, 1972); *P. edentata* (Lin, Ngoc-Ho & Chan, 2001); *P. fallax* (De Man, 1905); *P. gracilis* (Ngoc-Ho, 1990); *P. leptomorpha* sp. nov.

KEY TO THE SPECIES OF THE GENUS *PARAGEBICULA* N. GEN.

1. Dorsal margin of P1 palm bearing spines 2
- Dorsal margin of P1 unarmed 3
2. Posterior margin of telson straight. Abd6 slightly longer than broad .... *P. leptomorpha* sp. nov.
- Posterior margin of telson concave. Abd6 about as long as broad .... *P. edentata* (Lin, Ngoc-Ho & Chan, 2001)
3. Telson about as long as broad ..... *P. gracilis* (Ngoc-Ho, 1990)
- Telson broader than long 4
4. Posterior margin of telson concave ..... *P. fallax* (De Man, 1905)
- Posterior margin of telson straight ..... *P. contigua* (Božić & De Saint Laurent, 1972)

Paragebicula contigua (Božić & De Saint Laurent, 1972)

Upogebia contigua Božić & De Saint Laurent, 1972: 339, figs. 1-11; Le Loeuff & Intès, 1974: 50, fig. 15a-c; De Saint Laurent & Le Loeuff, 1979: 37 (key), 44.
Upogebia sp. Buchanan, 1958: 28.

Type locality. — Nigeria, 5°15′N 5°09′E, 15 m.

Distribution. — Guinea: Conakry (De Saint Laurent & Le Loeuff, 1979); Sierra Leone (De Saint Laurent & Le Loeuff, 1979); Ivory Coast: Grand Bassam, Vridi, Jacqueville, and Sassandra (Le Loeuff & Intès, 1974); Nigeria (Božić & De Saint Laurent, 1972); Ghana, 15-50 m (De Saint Laurent & Le Loeuff, 1979).

Paragebicula edentata (Lin, Ngoc-Ho & Chan, 2001)

Upogebia edentata Lin, Ngoc-Ho & Chan, 2001: 199, figs. 1-2.

Remarks. — The Taiwanese species, *P. edentata* is similar to *P. leptomorpha* sp. nov. from the Persian-Arabian Gulf in that the P1 palm bears a row of spines. However, it differs in the form of abdominal somite 6 and the telson: in *P. leptomorpha*, abdominal somite 6 is slightly longer than broad in dorsal view and the telson is straight on the posterior margin, whereas in *P. edentata* abdominal somite 6 is about as long as broad and the telson is concave on the posterior margin.

Type locality. — Tungkung, Taiwan.

Distribution. — Tungkung, southern Taiwan.

Paragebicula fallax (De Man, 1905)

Upogebia (*Upogebia*) *fallax* De Man, 1905: 601; De Man, 1928: 22 (list), 57, pl. 2 fig. 5, pl. 3 fig. 5a-g; Sakai, 1982: 53 (part.).

Upogebia fallax; Božić & De Saint Laurent, 1972: 344; Ngoc-Ho, 1990: 973, fig. 5c-d.

Upogebia (*Upogebia*) *pugnax*; Sakai, 1982: 52 (partim); Sakai, 1984: 161 [not *U. pugnax* De Man, 1905].

Neogebicula fallax; Sakai, 1993: 95, figs. 3-5; Davie, 2002: 482.

Type locality. — Haingsisi, Semau, Indonesia, 36 m.

Distribution. — Indonesia: Haingsisi, Semau Island (De Man, 1905, 1928), off Miangas (Sakai, 1984; Ngoc-Ho, 1990); Australia: Dudley Point, Darwin, N.T. (Sakai, 1993).

Paragebicula gracilis (Ngoc-Ho, 1990)

Upogebia gracilis Ngoc-Ho, 1990: 975, fig. 6.

Material examined. — ZMUC-CRU 9703, 1 female (TL/CL, c. 12.0/3.4 mm, rostrum missing its distal part), Kei-Islands, Danish Expedition to the Kei-Islands, 1922, St. 50, 5°34′S 132°25′40″E, 233 m, 04.v.1922.

Remarks. — The specimen examined is damaged unfortunately, but it can be identified by the following characters: the carapace bears the hepatic spine; the P1 fixed finger bears four denticles proximally; the anterolateral margin of the carapace is equipped with two closely set spines; abdominal somite 6 elongate, bearing a convexity on both posterolateral margins; telson showing a concave posterior margin; uropods slenderly elongated; uropodal exopods distally rounded.

The present specimen can, due to its condidition, not be sexed by the location of the genital pores. However, it is recognizable as a female, as it bears a two-segmented Plp1.

Type locality. — Philippines, 190 m depth.

Distribution. — Philippines (Ngoc-Ho, 1990), 190 m; Kei-Islands, Indonesia, 233 m.

Paragebicula leptomorpha sp. nov. (fig. 1)

Material examined. — ZMUC-CRU 9714, holotype, female (TL/CL, 18.0/4.8 mm), Persian-Arabian Gulf, St. 19A, 29°07′N 49°56′E, 8 m, 11.iii.1938; ZMUC-CRU 9715, paratype, 1 male (TL/CL, 15.0/5.2 mm), Persian-Arabian Gulf, St. 122, 26°41′N 54°19′E, 8 m, leg. Løppenthin, 9.iv.1938; ZMUC-CRU 9716, paratypes, 2 males (TL/CL, 14.0/3.7 – 16.0/4.9 mm), Persian-Arabian Gulf, St. 24C, 29°07′N 49°56′E, 41 m, leg. G. Thorson, 13.iii.1937; ZMUC-CRU 9717, paratypes, 2 females (TL/CL, 17.0/4.7 mm; c. 17.0/4.5 mm, rostrum missing), Bushir, Rheden, Persian-Arabian Gulf, St. 64, 7 m, leg. Løppenthin, 23.i.1938; ZMUC-CRU 9718, paratype, 1 male (CL, 6.6 mm, missing Abd3 to tail-fan), Persian-Arabian Gulf, St. 25B, 49 m, leg. Thorson, 14.iii.1937; ZMUC-CRU 9713 (1 abdomen, 16.0 mm), Persian-Arabian Gulf, St. 25A, 49 m, leg. Thorson, 14.iii.1937; ZMUC-CRU 9719, paratype, 1 male (TL/CL, 15.0/4.6 mm), Persian-Arabian Gulf, St. 22B, 56 m, leg. Thorson, 13.iii.1937; ZMUC-CRU 9720, paratype, 1 female (TL/CL, 9.0/3.0 mm), Persian-Arabian Gulf, St. 23B, 29°04′N 49°56′E, 50 m, leg. Thorson, 13.iii.1937; ZMUC-CRU 9721, paratype, 1 male (TL/CL, 13.0/3.2 mm), Persian-Arabian Gulf, St. 32A, 7.5 m, leg. Thorson, 23.iii.1937; ZMUC-CRU 9722, paratypes, 2 males (TL/CL, 12.0/3.3 – 36.0/3.7 mm), Persian-Arabian Gulf, St. 24B, 29°07′N 49°56′E, 41 m, 13.iii.1937.

Diagnosis. — Rostrum triangular with rounded tip, setose and bearing median groove; infrarostral spine absent. Gastric region sparsely setose and devoid of spines. Lateral ridge of gastric region projecting forward, with rounded tip. Anterolateral margin of carapace with two postocular spines. P1 subchelate; palm bearing three median and one subterminal spines on dorsal margin; dactylus carinate on dorsal margin. Uropods elongate; exopods distally truncate.

Description of male holotype. — Rostrum (fig. 1A, B) triangular, 1.25 times as long as width at base; dorsal surface setose and without spines, bearing median groove; gastric region sparsely setose, spineless. Lateral ridges of gastric region projecting forward, anteriorly with rounded tip, and separated from median gastric region by distinct, longitudinal grooves; median gastric region setose and spineless, diverging posteriorly. Cervical groove unarmed. Anterolateral margin of carapace beset with two postocular spines.

Eyestalks stout, unarmed, and almost straight on dorsal and ventral margins; cornea unpigmented in alcohol specimen. A1 peduncle reaching almost to distal end of A2 peduncle. A1 terminal segment about three times as long as penultimate one, proximal segment lacking small ventrodistal spine mesially.

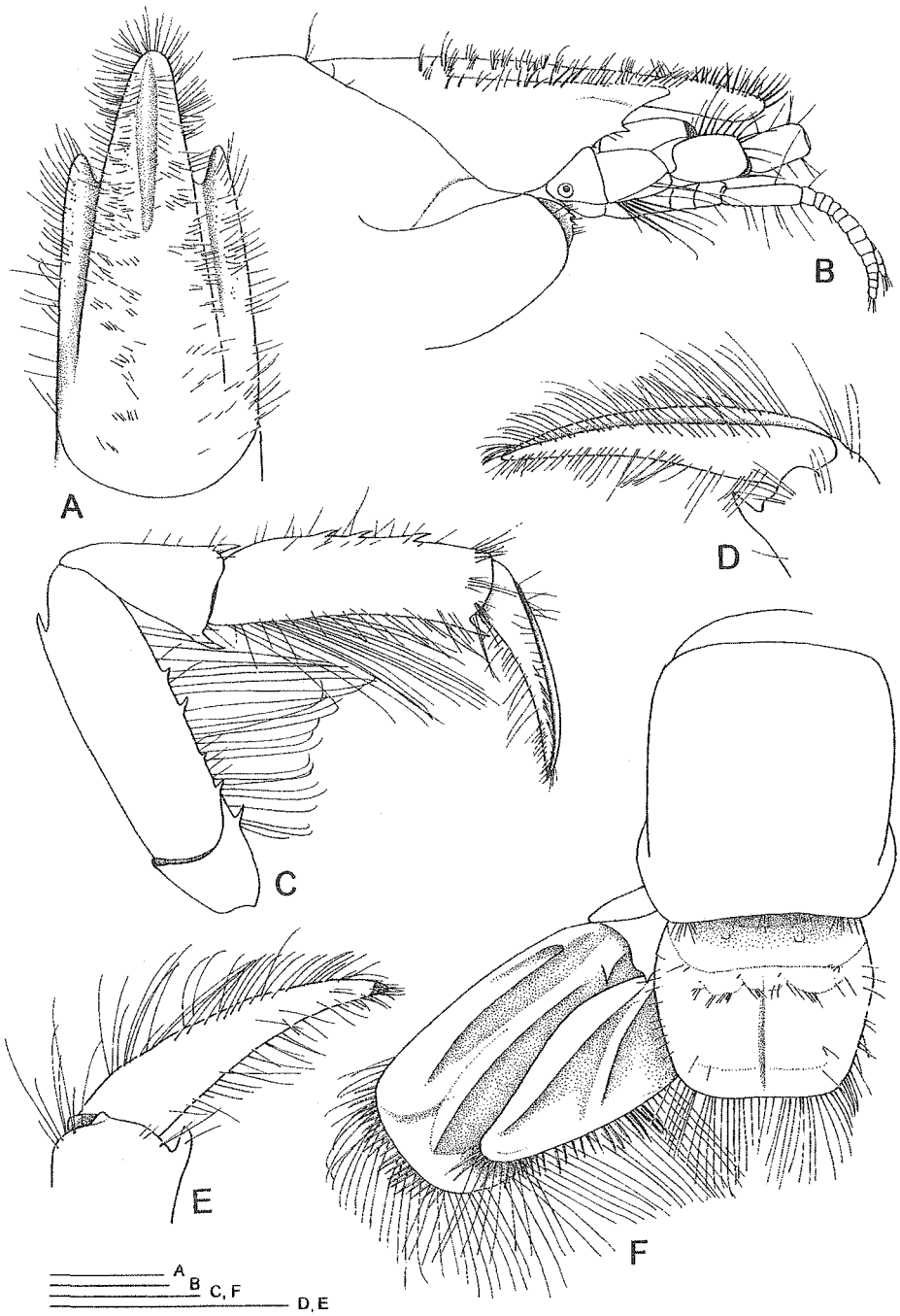


Fig. 1. *Paragebia leptomorpha* sp. nov. A, cephalic region, dorsal view; B, cephalothoracic region, lateral view; C, P1 of right side, lateral view; D, P1 dactylus, mesial view; E, P1 dactylus, lateral view; F, abdominal somite 6 and tail fan, dorsal view. A-F, ZMUC-CRU-9715, paratype, male (TL/CL, 15.0/5.2 mm), Persian-Arabian Gulf, St. 122, 26°41′N 54°19′E, 8 m.

A2 peduncle slightly extending beyond tip of rostrum, lacking spines; scaphocerite of moderate size, pointed at tip. Mxp3 exopod bearing a distal flagellum. Epistomial projection rounded in lateral view, bearing two spines on distal margin.

P1 subchelate (fig. 1C); coxa unarmed on mesiodistal margin. Ischium bearing 1 strong, subterminal spine on ventral margin. Merus with a row of four small but sharp spines on ventral margin, and with subterminal spine on dorsal margin. Carpus triangular, shallowly grooved longitudinally on dorsolateral region; strong spine present on dorsodistal and ventrodistal corners, but unarmed on distomesial margin. Palm three times as long as high, and beset with row of three spines on dorsal margin. Fixed finger (fig. 1C, D) present as a simple spine, continuous with contour of lower margin of palm, though slightly curved ventrally. Dactylus obtuse with corneous tip, bearing two thread-like protrusions distally; ventral margin arched, smooth; lateral surface carinate medially, and above that carina longitudinally grooved in dorsal half; median surface with a pair of setal rows. P2-5 missing.

Abdominal sternites unarmed. Telson (fig. 1E) broader than long, lateral margin broadest at proximal third; distal margin broadly truncate and without median spine; dorsal surface beset with proximal transverse carina, confluent with lateral margins. Uropodal protopod with stout spine; exopod 1.8 times as long as wide, bearing a sharp proximal spine, and truncate on distal margin; endopod 2.3 times as long as broad, and shorter than exopod.

Remarks. — The present new species from the Persian-Arabian Gulf is closely similar to *Upogebia anacanthus* Ngoc-Ho, 1994a from N.E. of Townsville and Pandora Reef, Queensland, Australia, 12-34 m, because the rostrum is rounded apically, it is longer than broad at its base, convergent distally, and unarmed on the lateral margins; the dorsal surface bears a median longitudinal groove; anterolateral margin of the carapace with two spines; and the P1 palm armed with a row of dorsal spines. In *U. anacanthus*, however, the A2 peduncle bears 1-2, 2, and 3 ventral spines, respectively, on each segment, counted from the first to the second, and the penultimate, whereas in the present new species the peduncle is unarmed, lacking any ventral spines.

Type locality. — Persian-Arabian Gulf, St. 19A, 29°07′N 49°56′E, 8 m.

Distribution. — Persian-Arabian Gulf, 29°07′N 49°56′E – 26°41′N 54°19′E, 8-52 m.

Etymology. — The species name "*leptomorpha*" is derived from Greek, "leptos", meaning small or slender, and "morphe", meaning form or shape, because the rostrum of this new species is simple-shaped.

SUBFAMILY UPOGEBIINAE BORRADAILE, 1903

Upogebiinae Borradaile, 1903: 542; Borradaile, 1907: 468, 476 (key); Balss, 1925: 211; Hale, 1927a: 85; Makarov, 1938: 50; Bouvier, 1940: 105; Balss, 1957: 1582; Davie, 2002: 480.

Diagnosis. — Rostrum of good size. Hepatic spine usually absent, but occasionally present in exceptional species. P1 chelate or subchelate; P2-5 simple. Plp1 absent in males, present in females; Plp2-5 biramous, lacking appendices internae. Uropod broadened.

Remarks. — The validity of the genera *Gebiacantha* Ngoc-Ho, 1989 and *Austinogebia* Ngoc-Ho, 2001, is strongly doubted. The genus *Gebiacantha* was established in 1989 (Ngoc-Ho, 1989) and revised by that author in 2001 (Ngoc-Ho, 2001). This genus was defined with as most important characters: "1. Presence of infrarostral spines. 2. Rostrum approximately ovoid, bordered with teeth or spines. 3. Mxp1 without epipod. 4. Ventral margin of P1 palm with 1-2 large spines (often 1 large and 1 small) posterior to fixed finger. 5. Posterior border of telson medially concave". It included 16 species: *G. bermudensis* (Williams, 1993b) and *G. talismani* (Bouvier, 1915) from the eastern Atlantic Ocean; and *G. acanthochela* (Sakai, 1967), *G. acutispina* (De Saint Laurent & Ngoc-Ho, 1979) (syn.: *U. niugini* Poore, 1982), *G. arabica* Ngoc-Ho, 1989a, *G. ceratophora* (De Man, 1905), *G. lagonensis* Ngoc-Ho, 1989a, *G. laurentae* Ngoc-Ho, 1989a, *G. lifuensis* Ngoc-Ho, 1994b, *G. monoceros* (De Man, 1905), *G. multispinosa* Ngoc-Ho, 1994b, *G. plantae* (Sakai, 1982), *G. poorei* Ngoc-Ho, 1994a, *G. priochela* (Sakai, 1993), *G. reunionensis* Ngoc-Ho, 1989a, and *G. richeri* Ngoc-Ho, 1989a from the Indo-West Pacific region. The species, *Upogebia affinis* (Say, 1818) and *U. poensis* De Saint Laurent & Ngoc-Ho, 1979 were, however, excluded from *Gebiacantha*, because they are inconsistent with the generic characters as defined, except for the presence of the infrarostral spines.

The genus *Austinogebia* Ngoc-Ho, 2001 was defined by the following characters: "1. The armature of the infrarostral spines; 2. the lateral ridges of the gastric region projecting forward with lower distal spines; 3. the morphology of the P3; and 4. the knob on the proximal shoulder of the uropod endopod". It included five species, *Austinogebia edulis* (Ngoc-Ho & Chan, 1992), *A. narutensis* (Sakai, 1986), *A. spinifrons* (Haswell, 1881) (= *A. nobilii* (Sakai, 1995)), *A. takaoensis* (Sakai & Türkay, 1995), and *A. wuhsienweni* (Yü, 1931). However, most of the defining characters overlap with those of the previous genus, *Gebiacantha*.

Sakai & Türkay (1995: 198) subsequently placed *U. plantae* Sakai, 1982, *U. spinifrons* (Haswell, 1881) (= *U. nobilii* Sakai, 1995), and *U. takaoensis* Sakai, 1982 in the genus *Upogebia*, because Ngoc-Ho (1989, 2001) was confused in the definitions of the genera *Gebiacantha* and *Austinogebia*. Ngoc-Ho (1989: 118) placed *U. plantae* in the genus *Gebiacantha* in 1989, but she (Ngoc-Ho, 1994b: 198) placed *U. spinifrons* in the genus *Upogebia*, regardless of the fact that *U. spinifrons* is not different from *U. plantae* with respect to the defining characters of the genus *Gebiacantha*. Later, she (Ngoc-Ho, 2001) placed both *U. spinifrons* and *U. takaoensis* as new combinations in the genus *Austinogebia*, and *U. plantae* remained in the genus *Gebiacantha*. As a result, it is concluded that "*Gebiacantha*" should be treated as a synonym of *Upogebia* (cf. Sakai & Türkay, 1995). In the present revision, I have examined all the species of the genus *Upogebia*, with as a result that I conclude that the genera *Gebiacantha* and *Austinogebia* can not be admitted as good, unambiguously characterized genera, for the reasons stated below:

1. Infrarostral spines are absent in most of the species of the genus *Upogebia*, so that it would seem that the presence of infrarostral spines is characteristic for the genera, *Gebiacantha* and *Austinogebia*. In fact, the genera *Gebiacantha* and *Austinogebia* were established based on those species in the genus *Upogebia* that bear infrarostral spines. However, the infrarostral spines show variation in number from 0 to 7, and also in position, i.e., either ventrally, subdistally, or distally. A single infrarostral spine is present in *Gebiacantha arabica*, *G. ceratophora*, *G. monoceros* (spine located subdistally), *G. reunionensis*, and *Upogebia snelliusi* (spine located distally) from the Indo-West Pacific region, and in *U. felderi* (but there can be 1-4 spines in that species) from the West Atlantic region. This spine is located ventrally in most of those species, but located distally in *U. snelliusi* and subdistally in *Gebiacantha monoceros*.

The infrarostral spines usually number 2-4 in *Austinogebia edulis* (4 ventrally), *A. narutensis* (4-5 ventrally), *A. spinifrons* (3-4 subdistally), *A. takaoensis* (3 ventrally), *A. wuhsienweni* (4 subdistally), *Gebiacantha acanthochela* (2 distally), *G. acutispina* (3 distally), *G. arabica* (2 subdistally), *G. exigua* (3 ventrally), *G. lagonensis* (2 distally), *G. laurentae* (3 distally), *G. lifuensis* (4 ventrally), *G. multispinosa* (3 distally), *G. poorei* (2 subdistally), *G. priochela* (3 subdistally), *G. richeri* (3 distally), *Upogebia imperfecta* (small distal and subdistal spines), and *U. plantae* (4 ventrally), all from the Indo-West Pacific region; *Gebiacantha bermudensis* (3 subdistally) and *G. talismani* (4 ventrally) from the East Atlantic region; *Upogebia paraffinis* (3 distally), *U. poensis* (2 subdistally), and *U. spinistipula* (2 ventrally) from the West Atlantic region. These spines are usually located on the ventral rostral surface,

but located on the distal margin in *Upogebia acanthochela*, *U. acutispina*, *U. lagonensis*, *U. laurentae*, *U. multispinosa*, and *U. richeri* from the Indo-West Pacific region.

The infrarostral spines number more than 4 in *U. affinis* (2-7) and *U. pillsbury* (5 ventrally) from the West Atlantic region. As a result, it is possible to state that the presence of infrarostral spines is not available as a generic character, so that neither *Gebiacantha* nor *Austinogebia* are to be separated from *Upogebia*.

2. The lateral ridges of the gastric region are usually protruding forward in most of the species of *Upogebia*, but they are only scarcely protruded in some species. This character was adopted by Ngoc-Ho (1989, 2001) for *Austinogebia* as one of the complex of generic characters, but not for *Gebiacantha*. This character is, however, observed in *Gebiacantha acanthochela*, *G. acutispina*, *G. arabica*, *G. bermudensis*, *G. ceratophora*, *G. exigua*, *G. lagonensis*, *G. laurentae*, *G. lifuensis*, *G. monoceros*, *G. multispinosa*, *G. plantae*, *G. poorei*, *G. priochela*, *G. reunionensis*, *G. richeri*, and *G. talismani*, and also in some species of *Upogebia*, like *U. mediterranea*, *U. nitida*, and *U. senegalensis* from the Mediterranean and East Atlantic; and in *Upogebia ancylodactyla*, *U. barbata*, *U. baweana*, *U. dromana*, *U. holthuisi*, *U. kempi*, *U. pugnax*, and *U. sakaii* from the Indo-West Pacific Ocean. However, some species of *Austinogebia* are equipped with those forward-protruding lateral ridges of the gastric region, as seen in *Austinogebia edulis*, *A. narutensis*, *A. plantae*, *A. spinifrons*, and *A. wuhsienweni*, just like in some species of *Upogebia*, i.e., *U. affinis*, *U. imperfecta*, *U. paraffinis*, *U. pillsbury*, *U. poensis*, *U. snelliusi*, and *U. spinistipula*. This fact proves that the lateral ridges of the gastric region constitute an ambiguous feature in the characterization of *Gebiacantha* and *Austinogebia*, so it is also difficult to separate those two genera from *Upogebia* based on this character.

3. *Gebiacantha* is characterized by the ventral margin of the P1 palm bearing a large spine, often accompanied proximally by a small one posterior to the fixed finger, or armed with a series of spines, or unarmed. Indeed, the species of *Gebiacantha*, *G. acanthochela* (with a small spine), *G. acutispina* (with small spine), *G. arabica* (with a small one), *G. exigua* (no small one), *G. lifuensis* (no small spine), *G. monoceros* (no small one), *G. plantae* (no small one), *G. poorei* (no small one), *G. priochela* (no small one), and *G. talismani* (with small one) all bear a large spine, often accompanied by a smaller spine proximally. However, one species of *Upogebia*, *U. snelliusi*, has 2 reduced spines. Moreover, some species of *Upogebia*, *Gebiacantha*, and *Austinogebia*, are not armed with a large spine: *Austinogebia narutensis* (type species of the

genus), *Gebiacantha ceratophora*, *G. multispinosa*, *G. reunionensis*, *Upogebia affinis* (small spines), *U. imperfecta* (small spines), *U. paraffinis*, *U. poensis*, and *U. spinistipula*. The other species of *Gebiacantha*, *G. bermudensis*, *G. lagonensis*, *G. laurentae*, and *G. richeri* bear only a series of reduced spines. This fact causes confusion in the complexes of characters defining the two genera, *Gebiacantha* and *Austinogebia*.

4. *Austinogebia* is also characterized by the uropodal endopod bearing a proximal knob on its lateral margin. That can be distinct, as in *A. edulis* (triangle), *A. narutensis* (triangle), *A. spinifrons* (triangle), *A. takaoensis* (triangle), and *A. wuhsienweni* (triangle). However, in *Gebiacantha multispinosa*, the proximal knob is also distinct, as in the species of *Austinogebia*. Yet, the uropodal endopod also bears a knob in some other species of *Gebiacantha*, albeit reduced in size: *G. acutispina* (syn.: *U. niugini*) (low triangle), *G. exigua* (triangularly protruded), *G. lagonensis* (triangle), *G. lifuensis* (triangle), *G. monoceros* (low triangle), and *G. richeri* (low triangle). In contrast, the uropodal endopod lacks a proximal knob on its lateral margin in some species of *Austinogebia*, *Gebiacantha*, and *Upogebia*, such as *Austinogebia plantae*, *Gebiacantha bermudensis*, *G. ceratophora*, *G. laurentae*, *G. reunionensis*, *G. talismani*, *Upogebia affinis*, *U. imperfecta*, *U. paraffinis*, *U. pillsbury*, *U. poensis*, *U. snelliusi*, and *U. spinistipula*. This fact clearly indicates that the knob on the uropodal endopod is not always a good character for either *Gebiacantha*, or *Austinogebia*.

5. The genus *Gebiacantha* is also characterized by the posterior margin of the telson, that is usually concave, as in *Gebiacantha acanthochela* (shallow), *G. acutispina* (distinct), *G. arabica* (shallow), *G. bermudensis* (shallow), *G. ceratophora* (distinct), *G. lagonensis* (distinct), *G. laurentae* (distinct), *G. monoceros* (shallow), *G. multispinosa* (weakly), *G. plantae* (shallow), *G. poorei* (shallow), *G. priochela* (shallow), *G. reunionensis* (distinct), *G. richeri* (distinct), and *G. talismani* (distinct; type species of *Gebiacantha*). But this is also found in the genus *Upogebia*, in the species *U. imperfecta*. However, the telson shows the convex posterior margin, as characteristic of *Austinogebia*, in *A. narutensis* (type species of *Austinogebia*), *A. edulis*, *A. spinifrons*, *A. takaoensis*, and *A. wuhsienweni*, but the same condition is observed in some species of *Upogebia*: *U. affinis*, *U. paraffinis*, *U. pillsbury*, *U. poensis*, *U. snelliusi*, and *U. spinistipula*.

As a summary result, it is possible to say that such characters as the number of infrarostral spines, the feature of the lateral ridges of the gastric region, the armature on the ventral margin of the P1 palm posterior to the fixed finger, the proximal knob on the uropodal endopod, and the state of the posterior margin of

the telson in the genera *Gebiacantha* Ngoc-Ho, 1989 and *Austinogebia* Ngoc-Ho, 2001 are complicated and ambiguous, and hence liable to give much ambiguity and inconsistency in the allocation of species: simply because many species will take positions intermediate between the genera based on those criteria.

The male specimen of *Gebicula exigua* from off Irawady Delta, Myanmar, c. 37 m, leg. R/V "Investigator", St. 60 (ZSI 2355/7) was kindly sent to me by K. K. Tiwari in 1982 as conspecific material of *Gebicula exigua* Alcock, 1901 (in litt.: K. K. Tiwari). However, this male is clearly different from the specimen described by Alcock, because the male specimen described by me shows three infrarostral spines, whereas the holotype of *Gebicula exigua* is devoid of infrarostral spines (Alcock, 1901, pl. 2 fig. 4). As a result, the present author treated it as *Wolffogebia exigua* in 1982 (cf. Sakai, 1982).

In the present study, however, I had an opportunity to examine a male specimen from Batavia (= Jakarta) Bay, 18 m, Danish Expedition to the Kei-Islands (ZMUC-CRU 9710) and identified it as conspecific with the specimen of *Wolffogebia exigua* Sakai, 1982. This is because the rostrum is broadly triangular in dorsal view, bearing distinct infrarostral spines, the lateral ridges of the gastric region are not protruding forward, the cervical groove lacks a row of spinules but it bears a row of spines on the anterolateral margin of the carapace as well as a line of tiny spinules on the anterolateral margin of the branchial region, and the A2 segments 3 and 4 are provided with one spine each. Through the present examination of the specimen from Batavia Bay, I reconfirmed that this specimen is clearly different from Alcock's species, *Gebicula exigua*, in such points as that in *G. exigua* the infrarostral spine is absent, the cervical groove bears a row of spines, and the A2 segments 1, 3, and 4 are provided with one spine each (Alcock, 1901, pl. 2 fig. 4). As a result, both specimens, that from Irawadi, Myanmar, and that from Batavia Bay, Indonesia, should be treated as a species of the genus *Gebicula*, by taking into account the characters of that genus, such as dense setae on the rostrum and the medio-gastric regions, the lateral ridge of the gastric region not projecting forward, the hepatic spine present, and the P1 subchelate: even though an infrarostral spine is present. So, *Wolffogebia exigua* Sakai, 1982 (not Alcock, 1901) is to be renamed and described as *Gebicula irawadyensis* sp. nov.

Poore (1994: 105) indicated that *Gebicula* Alcock, 1901 is a senior subjective synonym of *Wolffogebia* Sakai, 1982, but without any further references. However, it is clear that the genera *Gebicula* Alcock, 1901 and *Wolffogebia* Sakai, 1982 are fundamentally different from each other. *Gebicula exigua* Alcock, 1901, the type species of *Gebicula*, is characterized by the anterolateral margin

of the carapace being armed with a row of spines; the A2 peduncle is armed with ventrodistal spines; and the uropod is narrow. In contrast, in *Wolffogebia phuketensis* Sakai, 1982, type species of *Wolffogebia*, an infrarostral spine is absent; the distinct lateral ridges of the gastric region are projecting forward; the A2 peduncle is spineless; and the uropods are broadened. As a result, it can safely be said that *Wolffogebia* is not synonymous with *Gebicula*.

Ngoc-Ho (2001b: 47) once transferred *Gebicula* to *Gebiacantha*, and later established the genus *Austinogebia* Ngoc-Ho, 2001 based on some species from *Gebiacantha* Ngoc-Ho, 1989. However, *Austinogebia* has the lateral ridges of the gastric region of the same structure as in the genera *Upogebia* and *Acutigebia*, so *Gebicula* is not to be included in *Austinogebia*.

Type genus. — *Upogebia* Leach, 1814.

Genera included. — *Acutigebia* Sakai, 1982, *Aethogebia* Williams, 1993b, *Arabigebicula* n. gen., *Gebicula* Alcock, 1901, *Mantisgebia* n. gen., *Pomatogebia* Williams & Ngoc-Ho, 1990, *Tuerkayogebia* Sakai, 1982, *Upogebia* Leach, 1814, and *Wolffogebia* Sakai, 1982.

KEY TO THE GENERA OF THE SUBFAMILY UPOGEBIINAE BORRADAILE, 1903

1. Eyestalks broader than rostrum. Dorsal surface of gastric region nearly parallel-sided, bearing few dorsal tubercles; anterior tip of rostrum with a pair of subdistal dorsal spines ..... *Aethogebia* Williams, 1993
- Eyestalks narrower than rostrum 2
2. Dorsal surface of gastric region armed with stout, yellow-translucent tubercles with rounded tip; anterior tip of rostrum with two apical tubercles ..... *Tuerkayogebia* Sakai, 1982
- Dorsal surface of gastric region with conical tubercles 3
3. Dorsal surface of rostrum and gastric region setose, bearing a low median carina in gastric region 4
- Dorsal surface of rostrum and gastric region beset with tubercles, lacking a median carina 5
4. Rostrum elongate, infrarostral spine present; lateral ridges of gastric region not projecting forward ..... *Gebicula* Alcock, 1901
- Rostrum not elongate, infrarostral spine absent; lateral ridges of gastric region projecting forward ..... *Wolffogebia* Sakai, 1982
5. Telson bearing radiating longitudinal ribs 6
- Telson lacking radiating longitudinal ribs 7
6. Telson converging backwards in breadth, anterolateral margin of carapace without ocular spine ..... *Pomatogebia* Williams & Ngoc-Ho, 1990
- Telson rectangular, anterolateral margin of carapace bearing spines ..... *Arabigebicula* n. gen.
7. Rostrum elongate; telson concave on posterior margin, in V-shape ... *Mantisgebia* n. gen.
- Rostrum broadened in dorsal view 8
8. Rostrum triangular, converging forwards, with an apical spine ..... *Acutigebia* Sakai, 1982
- Rostrum obtuse on frontal margin ..... *Upogebia* Leach, 1814

Genus **Acutigebia** Sakai, 1982

Acutigebia s. str. Sakai, 1982: 69; Sakai, 1987: 306 (list).
Acutigebia; Sakai, 1993: 105; Poore, 1994: 105 (key); Davie, 2002: 480.

Diagnosis. — [Revised after Sakai, 1982.] Rostrum tapering anteriorly, provided with an apical denticle. Mxp3 merus ornamented with denticles on mesial margin. P1 subchelate; dactylus bearing dorsolateral plate. Telson subquadrate, proximal half of equal width, distal half narrowing to some degree. Uropodal endopod and exopod slender and leaf-like; endopod with single longitudinal ridge, lateral margin straight, distal margin elongate, and weakly convex; exopod with double ridge, longer than endopod.

Type species. — *Gebia danai* Miers, 1876a, by original designation [by Sakai, 1982, as *Upogebia* (*Acutigebia*) *danae* (Miers, 1876)].

Species included. — *Acutigebia danai* (Miers, 1876a); *A. kyphosoma* Sakai, 1993; *A. simsoni* (Thomson, 1893); *A. trypeta* (Sakai, 1970); *A.* sp. α (De Man, 1928).

Key to the Species of the Genus *Acutigebia* Sakai, 1982

1. P1 palm unarmed on ventral margin 2
– P1 palm armed with spinules on ventral margin 3
2. Telson square ..... *A. kyphosoma* Sakai, 1993
– Telson subsaquare, broader than long ..... *A. trypeta* (Sakai, 1970)
3. Both lateral margins of rostrum convex; telson conspicuously broader than long .... *A. simsoni* (Thomson, 1893)
– Both lateral margins of rostrum straight; telson square 4
4. Lateral ridges of gastric region denticulate ..... *A. danai* (Miers, 1876)
– Lateral ridges of gastric region unarmed ..... *A.* sp. α (De Man, 1928)

Acutigebia danai (Miers, 1876)

Gebia hirtifrons Dana, 1852b: 511; Dana, 1855, pl. 32 fig. 2a-f; Kirk, 1879: 401. [Not *Gebia hirtifrons* White, 1847b; Filhol, 1886: 428].
Gebia Danai Miers, 1876a: 223.
Gebia danai; Miers, 1876b: 70 (identical with Miers, 1876a).
Upogebia danai; Chilton, 1907: 459; Chilton, 1911: 552.
Upogebia (*Upogebia*) *Danai*; Borradaile, 1903: 543; De Man, 1927: 22, pl. 3 fig. 9-9d; De Man, 1928: 22 (list), 35, 38, 39, 52, 54, 57.
Upogebia (*Acutigebia*) *danai*; Sakai, 1982: 69, fig. 14b, pl. G 5.

Material examined. — ZMUC-CRU 9731, 1 male (TL/CL, 45.0/14.4 mm), North Cape, New Zealand, shore collecting, leg. Th. Mortensen, 3.i.1915; ZMUC-CRU 9732, 2 males (TL/CL, 33.0/10.6 – 35.0/11.6 mm), Kaipara, New Zealand, shore collecting, leg. Th. Mortensen, 8.i.1915; ZMUC-CRU 9733, 4 males (TL/CL, 21.0/7.3 – 43.0/14.9 mm), Plimmataw, Kystev, New Zealand, leg. Th. Mortensen's Pacific Expedition 1914-16, 15.i.1915.

Type locality. — Bay of Islands, New Zealand.

Distribution. — New Zealand: Bay of Islands (Dana, 1852b), Stewart Island (Chilton, 1907), Kaikoura Peninsula, Cook Strait, and Hauraki Gulf (Sakai, 1992), Opoulu, Kaifara Harbour (De Man, 1927); Kermadec Islands: Sunday Island (Chilton, 1911).

Acutigebia kyphosoma Sakai, 1993

Acutigebia kyphosoma Sakai, 1993: 105, figs. 10-11; Davie, 2002: 480.

Type locality. — North West Shelf, Western Australia, 19°55.0′S 117°54.5′E.

Distribution. — Western Australia: North West Shelf (Sakai, 1993).

Acutigebia simsoni (Thomson, 1893)

Gebia simsoni Thomson, 1893: 49, pl. 1 figs. 3-5.
Upogebia simsoni; Fulton & Grant, 1902: 61, pl. 5 figs. 5-6; McNeill, 1926: 305; Hale, 1927a: 85; Hale, 1927b: 309; McNeill & Ward, 1930: 362; Dworschak, 1992: 225.
Upogebia (*Upogebia*) *Simsoni*; Borradaile, 1903: 543; De Man, 1927: 24; De Man, 1928: 28 (list), 38, 40, 52.
Upogebia (*Upogebia*) *simsoni*; Poore & Griffin, 1979: 301, fig. 52.
Upogebia (*Acutigebia*) *simsoni*; Sakai, 1982: 71, fig. 14c-e.
Acutigebia simsoni; Davie, 2002: 480.

Type locality. — East coast of Tasmania.

Distribution. — Australia: east coast of Tasmania (Thomson, 1893), Flinders, Western Port (Fulton & Grant, 1902), North-west Islet, Capricorn Group (McNeill, 1926), Emu Bay, Beare's Point, and Vivonne Bay, South Australia (Hale, 1927a), Botany Bay and Port Jackson (McNeill & Ward, 1930), Port Darwin, Northwest Island, Collaroy, Port Jackson, Botany Bay, Shellharbour, Flinders, and Fishers Island and Margate, Tasmania (Poore & Griffin, 1979), Port Phillip Bay and Western Port (Sakai, 1982); New Zealand (Dworschak, 1992); intertidal to high subtidal.

Acutigebia trypeta (Sakai, 1970)

Upogebia trypeta Sakai, 1970: 49, figs. 1, 2A, B.
Upogebia (*Acutigebia*) *trypeta*; Sakai, 1982: 72; Sakai, 1984: 104, figs. 6-7; Sakai, 1987: 306 (list).
Acutigebia trypeta; Davie, 2002: 480; Itani, 2004, table 2 (list).

Type locality. — Maya, Amami-Oshima, Japan.

Distribution. — Japan: Amami-Oshima, Japan (Sakai, 1970, 1982); Australia: Heron Island, Queensland (Sakai, 1984).

Acutigebia sp. α (De Man, 1928)

Upogebia (*Upogebia*) sp. α De Man, 1928: 24 (list), 52, pl. 1 fig. 4, pl. 2 fig. 4a-f.
Upogebia (*Acutigebia*) sp. α, Sakai, 1982: 72, fig. 14f.

Distribution. — Siboga Exped. St. 149, "Fau-anchorage and lagune", west coast of Gebé Island, Indonesia, 31 m.

Genus **Aethogebia** Williams, 1993

Aethogebia Williams, 1993b: 7.

Diagnosis. — Lateral ridges of gastric region not developed. Dorsal surface of gastric region nearly parallel-sided, bearing few dorsal tubercles in anterior region; anterior tip of rostrum with a pair of subdistal dorsal spines. Uropodal endopod and exopod broadly foliaceous; exopod convex on distal margin.

Type species. — *Aethogebia gorei* Williams, 1993, by original designation.

Species included. — *Aethogebia gorei* Williams, 1993b.

Aethogebia gorei Williams, 1993

Aethogebia gorei Williams, 1993b: 7, fig. 4.

Type locality. — Pickles Reef, off Key Largo, Florida, 3 m.

Distribution. — Florida: Pickles Reef (Williams, 1993b).

Genus **Arabigebicula** n. gen.

Diagnosis. — Rostrum triangular with rounded tip, setose on dorsal surface; infrarostral spine absent. Gastric region setose, beset with some tubercles on dorsal surface; lateral ridge of gastric region projecting forward, setose dorsally; anterolateral margin of carapace with four strong spines. Telson square, bearing transverse carina in middle part, and longitudinal convexity and radiating longitudinal ribs in posterior half.

Remarks. — This new genus is established by an incomplete single specimen from the Persian Gulf. However its morphology is very distinct from that of the other species of the family Upogebiidae. The gastric region, with a hepatic spine, is similar to that of *Gebicula* Alcock, 1901, and the presence of radiating longitudinal ribs on the tail-fan is similar to the genus *Pomatogebia* Williams & Ngoc-Ho, 1990.

Type species. — *Arabigebicula rhynchos* sp. nov.

Species included. — The type species only.

Arabigebicula rhynchos sp. nov. (figs. 2, 3)

Material examined. — ZMUC-CRU 9712, holotype, male (TL/CL, 15.0/4.1 mm; with deformations in the distal part of the rostrum, that is now bent downwards, and in the uropodal endopod; also lacking P3-4 on the right side and P3-5 on the left side), Persian-Arabian Gulf, 29°07′N 49°59′E, St. 24A, 13.iii.1937, 41 m.

Diagnosis. — Rostrum setose and dorsally spineless, tapering towards its rounded tip, though most probably artificially bent downward in distal half (fig. 2A-C); ventral surface spineless. Gastric region setose, flanked laterally by denticles along longitudinal lateral furrow (fig. 2A), median dorsal regions with some dispersed tubercles, and bearing shallow median furrow in anterior part. Lateral longitudinal ridges setose and spineless. Four strong postocular spines present. Abdominal sternites unarmed. Carpus of cheliped with two strong spines on anteromesial margin. P2 merus with row of 8 spines on ventral margin, and 1 subdistal dorsal spine.

Description. — Rostrum setose, and spineless dorsally, tapering towards its rounded tip, though probably artificially bent downward in distal half (fig. 2A, B); ventral surface spineless. Gastric region setose, flanked laterally by denticles (fig. 2A), median regions with some dispersed tubercles, and bearing shallow median furrow in its anterior part. Lateral longitudinal ridges setose and spineless. Four strong postocular spines present. Gastric region damaged and deformed.

Eyestalk stout; cornea prominent in rounded terminal margin, reaching short of anterior end of lateral longitudinal ridge of gastric region. A1 peduncle overreaching A2 peduncle by proximal part of penultimate segment; A1 flagella short, about as long as peduncle. A2 peduncle with segment 1 with strong ventral spine, segment 2 with two strong ventral spines, and penultimate segment with three ventral spines; antennal flagellum long, extending posteriorly to posterior margin of abdominal somite 1. Epistome bearing two strong spines distally.

Mxp3 (fig. 3A) bearing simple exopod.

Chelipeds with coxa bearing stout spine on mesial margin. Basis unarmed; ischium (fig. 3B) usually bearing row of 3-4 strong spines on ventral margin. Merus with two subterminal spines on dorsal margin and row of 8-6 strong spines on ventral margin. Carpus triangular, shallow longitudinal groove laterally, row of five spines on dorsomesial margin, and below distal one of dorsal spines another strong spine on distomesial margin, as well as one strong middle spine, and another one at ventrodistal corner; mesial surface setose (fig. 3C). Palm narrow, about 4.0 times as long as broad, dorsal margin with row of 6 sharp spines including distal one, and ventral margin distally extending to fixed finger just

below proximal dactylar condyle; mesial palm surface bearing well-developed setae. Fixed finger short. Dactylus 0.7 times as long as palm, tip corneous, prehensile edge not armed with tooth, lateral surface smooth on dorsal half, but setose on ventral half; mesial surface setose over its full extent.

P2 (fig. 3D) longer than P1. Merus with row of 8 spines on ventral margin,

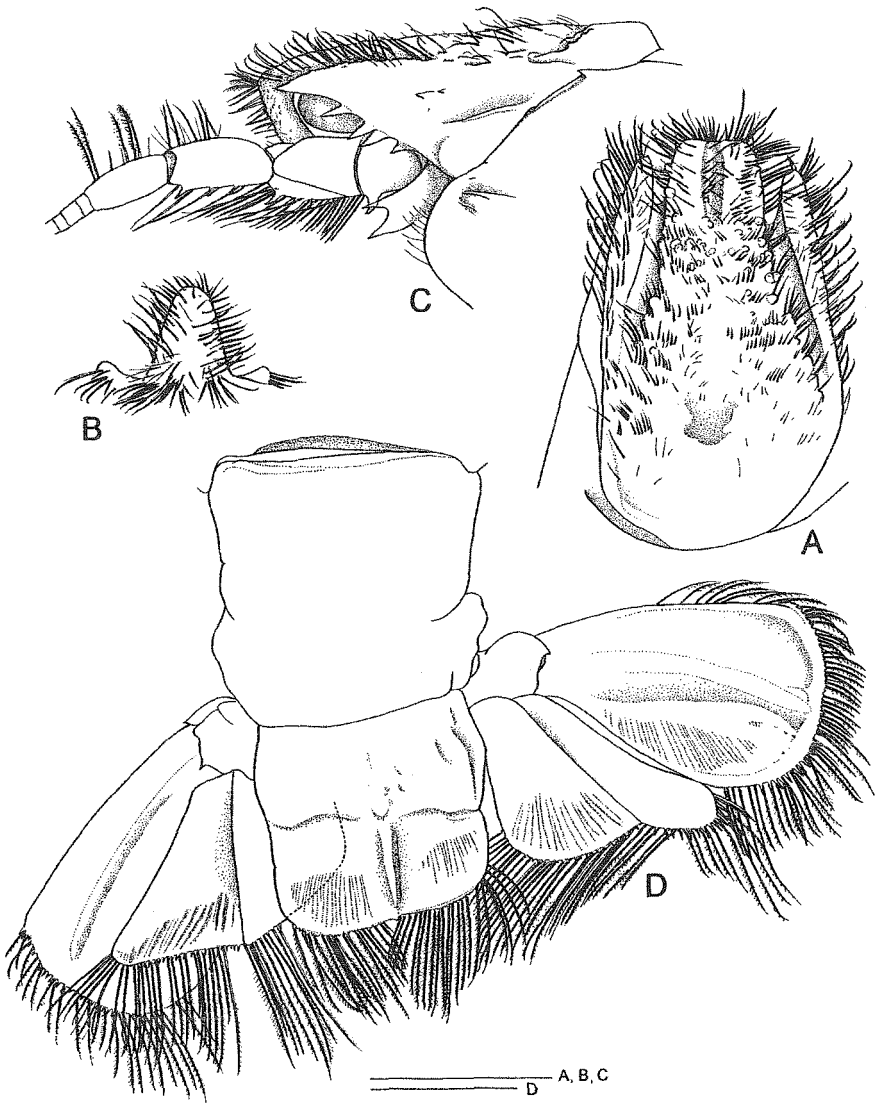


Fig. 2. *Arabigebicula rhynchos* sp. nov. A, cephalic region, dorsal view; B, rostrum bent downward, dorsal view; C, cephalic region, lateral view; D, abdominal somite 6 and tail fan, dorsal view. A-D, ZMUC-CRU 9712, holotype, male (TL/CL, 15.0/4.1 mm), Persian-Arabian Gulf, 29°07′N 49°59′E, St. 24A, 13.iii.1937, 41 m.

proximal spine proximally branched, thus effectively forming two spines on a common basis; dorsal margin with subterminal spine. Carpus and propodus unarmed. Dactylus with medial longitudinal furrow on lateral surface.

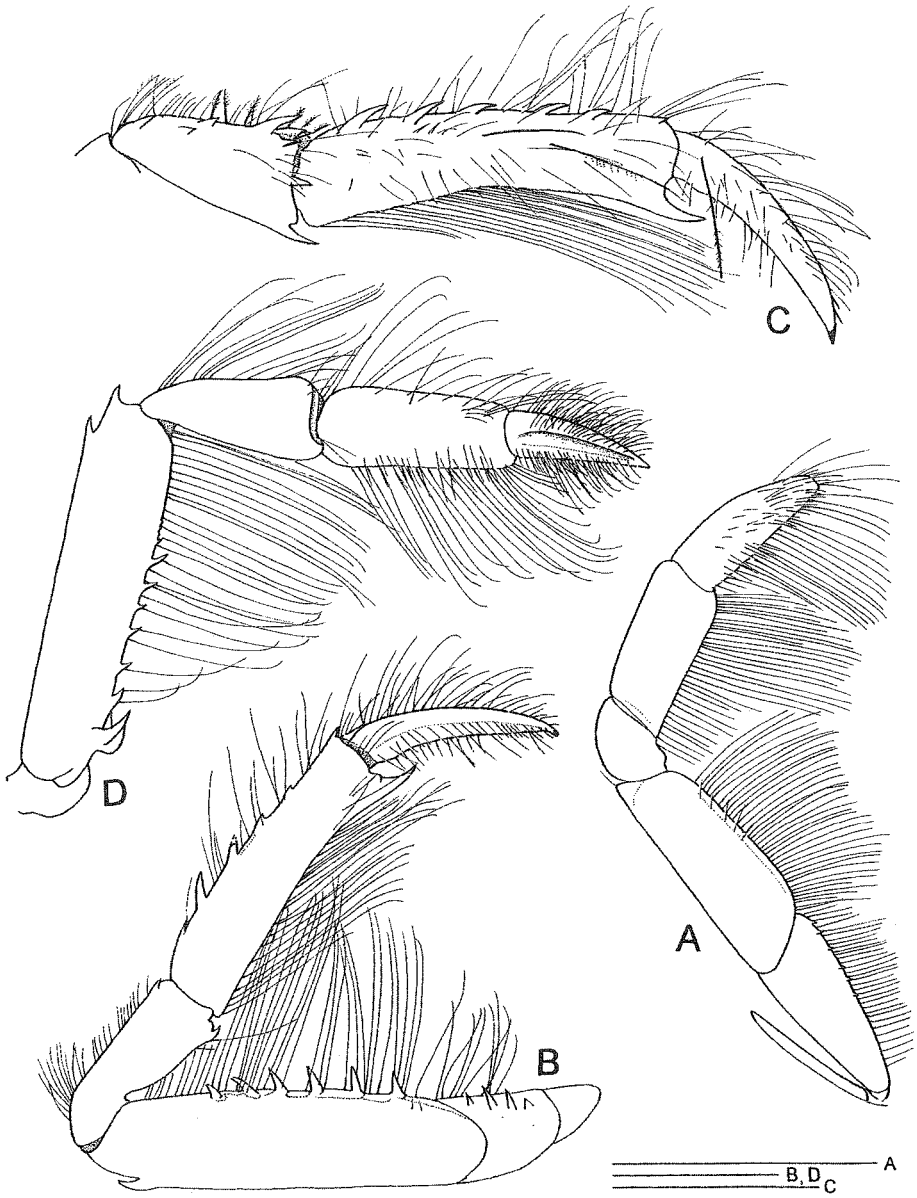


Fig. 3. *Arabigebicula rhynchos* sp. nov. A, Mxp3 of right side, lateral view; B, P1 of right side, lateral view; C, same, mesial view; D, P2 of right side, lateral view. A-D, ZMUC-CRU 9712, holotype, male (TL/CL, 15.0/4.1 mm), Persian-Arabian Gulf, 29°07′N 49°59′E, St. 24A, 13.iii.1937, 41 m.

P3-4 missing. P5 subchelate.

Abdominal sternites unarmed. Male Plp1 absent.

Telson deformed in the type specimen, but fundamentally squarish, with distal margin almost straight and an obsolescent median spine; lateral margins slightly convex in proximal third; dorsal surface bearing a median carina in posterior half, a series of radiating longitudinal ribs on both sides of posterior half; and a transverse median ridge is present.

Uropodal endopod (fig. 2D) deformed asymmetrically on right side. Protopod with small spine on protopod; endopodal surface longitudinally divided in two by median carina; medial surface broadened, and extended with convex distomedian angle; lateral surface in normal appendage on left side broadened laterally, with protruding distolateral angle, that in deformed right side extended posteriorly, with a narrow protrusion.

Remarks. — In the present new species, *Arabigebicula rhynchos*, the rostrum, the uropodal endopod, and the telson bearing a median posterior spine, are similar to those structures in *Wolffogebia inermis* Sakai, 1982 except for the strongly deformed rostrum and the right uropodal endopod. However, the present species differs from *W. inermis* as follows: the anterolateral margin of the carapace is unarmed, and the epistome is simply spinose in *W. inermis*, whereas the anterolateral margin of the carapace bears a series of four distinct spines, and the epistome is bispinose distally in the present new species.

Type locality. — Arabian Sea, 29°07′N 49°59′E, 41 m.

Distribution. — So far only known from the type locality.

Etymology. — The species name *rhynchos* is derived from the Greek, a snout [as like the beak of a salmon, *Oncorhynchus*]. It is a noun in apposition to the generic name.

Genus **Gebicula** Alcock, 1901

Gebicula Alcock, 1901: 201; Borradaile, 1903: 543; Balss, 1916: 35; Poore, 1994: 105.

Diagnosis. — Rostrum broadly triangular on frontal margin, bearing or lacking ventral spines. Rostrum and medio-gastric region densely covered with setae dorsally, but without dorsomedial rows of tubercles; bearing a slight, non-setose median convexity. Lateral ridges of gastric region not projecting forward. Anterolateral margin of carapace unarmed. Hepatic spine present. P1 subchelate. Telson subquadrate and medially concave on posterior margin. Uropodal endopod bearing a low proximal knob on lateral margin.

Remarks. — The genus *Gebicula* Alcock, 1901 is very similar to *Wolffogebia* Sakai, 1982. However in *Gebicula* the hepatic spine is present, whereas in *Wolffogebia* that spine is absent.

Type species. — *Gebicula exigua* Alcock, 1901.

Species included. — *Gebicula exigua* Alcock, 1901; *G. irawadyensis* sp. nov.

Gebicula exigua Alcock, 1901

Gebicula exigua Alcock, 1901: 202, pl. 2 fig. 4; Alcock & McArdle, 1903, pl. 57 fig. 4; Borradaile, 1903: 543; De Man, 1928: 25 (list), 60, 66, 68.
Wolffogebia exigua; Sakai, 1982: 82 (partim; other part is *Gebicula irawadyensis* n. sp.).

Remarks. — This species, *Gebicula exigua* Alcock, 1901 from the Andaman Sea, 485 m deep, was once considered identical to *Wolffogebia exigua* (Sakai, 1982) from Burma, 37 m deep. However, it is different, because in *Gebicula exigua* from the Andaman Sea the infrarostral spine is absent, the hepatic spine is present, and the cervical groove bears tiny spinules (Alcock, 1901; Sakai, 1982: 84), whereas in *Wolffogebia exigua* from Burma, there are three infrarostral spines, and, though the hepatic spine is also present, the cervical groove is not armed with tiny spinules.

Type locality. — Andaman Sea, 485 m.

Distribution. — Andaman Sea.

Gebicula irawadyensis sp. nov. (figs. 4, 5)

Wolffogebia exigua; Sakai, 1982 [not *Gebicula exigua* Alcock, 1901]: 82 (partim), figs. 17f, 17a-b, 20c-d.

Material examined. — ZMUC-CRU 9710, holotype, male (TL/CL, 17.0/5.5 mm, missing P1 on both sides, P2 on right side, P3 on right side, detached left P3 present, missing P4 on right side, and P5 on right side), paratype, male (TL/CL, 13.0/4.0 mm, missing P1 on right side, P2-4 on both sides), Batavia (= Jakarta) Bay, 18 m, Danish Expedition to the Kei-Islands, 1922, 20.vii.1922.

Diagnosis. — Rostrum (fig. 4A, B) elongately triangular in shape, with rounded anteriormost margin, surpassing eyestalks by proximal one-third of its length; dorsal surface setose, bearing 5-7 unequally distributed spines on each lateral margin. Gastric regions also densely setose except in median region, bearing row of spines along each lateral area. Lateral ridges of gastric region scarcely protruding forward. Strong hepatic spine and two postocular spines present. Epistome distally beset with one strong spine.

Eyestalks stout, with prominent terminal cornea. A1 peduncle overreaching distal margin of penultimate segment of A2 peduncle. A2 peduncle overreaching tip of rostrum by terminal segment; segment 2 beset with ventral subterminal spine, penultimate segment also with ventral spine at proximal third; scaphognathite bispinose distally.

Mxp3 exopod present, proximal segment of exopod reaching to distal part of ischium, and flagellum reaching to distal part of merus.

P1 coxa (fig. 5A, B) beset with a sharp ventrodistal spine. Basis unarmed. Ischium usually beset with one distal spine on ventral margin. Merus with

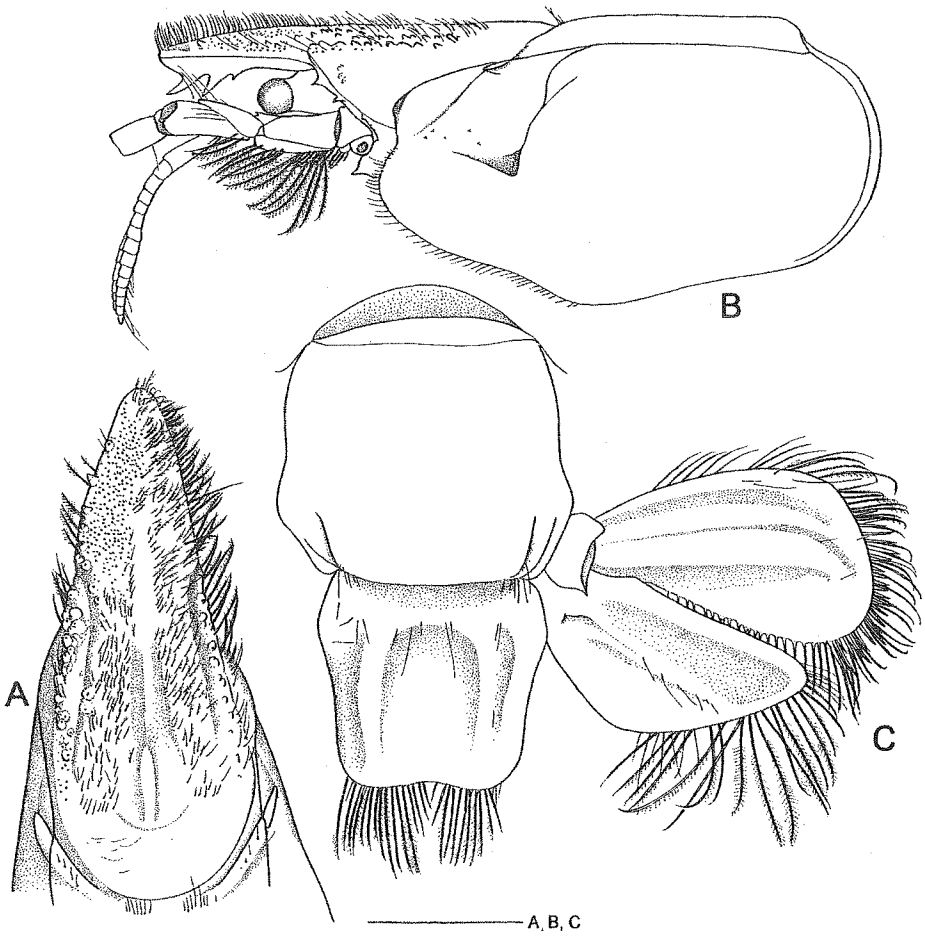


Fig. 4. *Gebicula irawadyensis* sp. nov. A, cephalic region, dorsal view; B, cephalothoracic region, lateral view; C, abdominal somite 6, telson, and uropod of left side. A, B, ZMUC-CRU 9710, paratype, male (TL/CL, 13.0/4.0 mm); C, holotype, male (TL/CL, 17.0/5.5 mm), Batavia (= Jakarta) Bay, 18 m, Danish Expedition to the Kei-Islands, 1922, 20.vii.1922.

strong subdistal spine on dorsal margin, and with 4-5 strong spines on ventral margin, of which the distal ones are diminishing in size and the proximal one is strongly incurved proximally. Carpus triangular, with shallow longitudinal groove laterally, and with one strong distal spine at ventral corner; mesial surface carinate on dorsal margin, on which one spine is present proximal to two nearly uniform, moderately large distal spines, and another strong distal spine on the mesial margin. Chela subchelate, 3 times as long as carpus; mesiodorsal margin beset with row of strong spines, ventral margin bearing a strong spine posterior to short fixed finger; mesial surface beset with long setae and a row of some rounded tubercles in dorsal half. Dactylus slenderly protruded, spineless, and with corneous tip.

P2 (fig. 5C) longer than P1. Coxa spineless. Merus bearing subproximal spine on ventral margin, and subterminal one on dorsal margin. Carpus triangular,

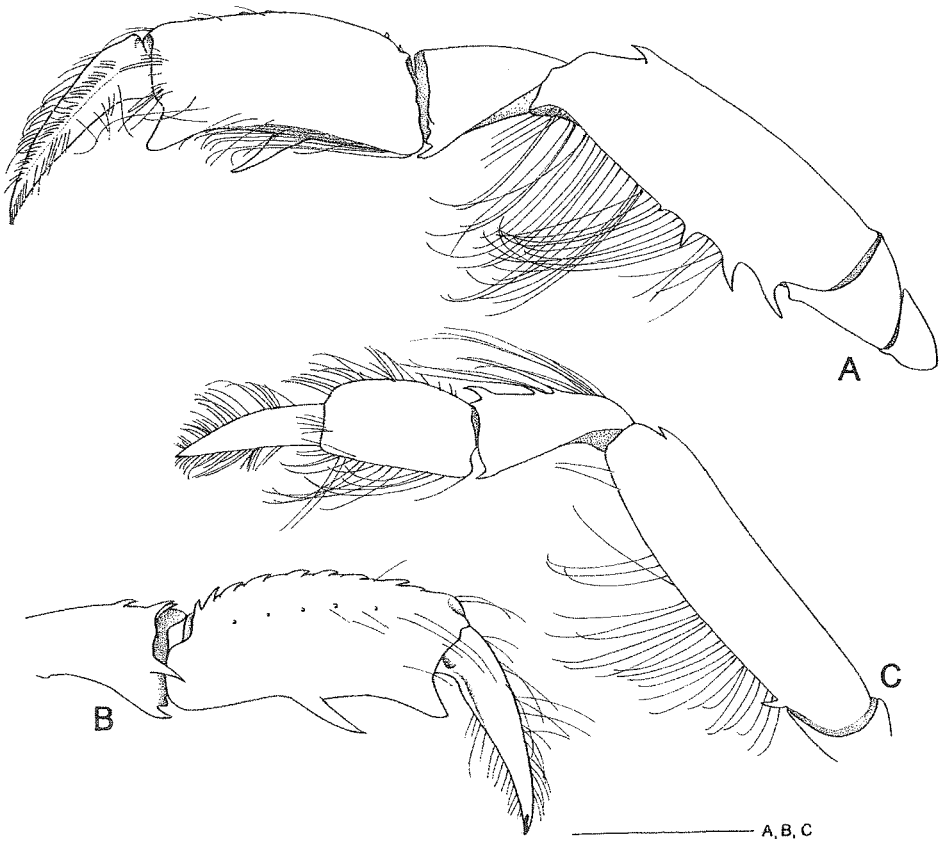


Fig. 5. *Gebicula irawadyensis* sp. nov. A, P1 of left side, lateral view; B, same, mesial view; C, P2 of left side, lateral view. A, B, C, D, ZMUC-CRU 9710, paratype, male (TL/CL, 13.0/4.0 mm), same data as in holotype (see fig. 4).

bearing two spines medially, a subterminal one on the dorsal margin, and a terminal spine on the ventral margin. Propodus subsquare, longer than broad, spineless. Dactylus elongate, about as long as propodus.

Abdominal sternites unarmed. Telson (fig. 4C) convergent laterally in distal two thirds; distal margin slightly biarcuate, and unarmed; dorsal surface marked medially with U-shaped concavity. Protopod beset with strong distolateral spine; uropodal exopod distally divergent, oval in form; uropodal endopod triangularly protruded at posterolateral angle, bearing some setae on mesial rib; proximal knob discernible as a low triangle.

Remarks. — Sakai (1982) described a male specimen from Myanmar, collected off the Irawady Delta, as *Wolffogebia exigua* (Alcock, 1901). However, this male specimen is evidently different from the original figure of *Gebicula exigua* by Alcock (1901) from the Andaman Sea. It is turned out that the present male specimens from Batavia Bay show the same features as the male specimen from Myanmar. The two males now examined as well as the male previously described as *Wolffogebia exigua* from Myanmar, show that the rostrum bears 3 ventral spines, that a single distinct hepatic spine is present on the cervical groove, and that the P1 is subchelate, whereas in *Gebicula exigua* Alcock, 1901 from the Andaman Sea the rostrum is unarmed on the ventral margin, the hepatic spine and tiny spinules are present laterally on the cervical groove, and the P1 is "monodactylous" (cf. Alcock, 1901: 201, who writes that the P1 is "strictly monodactylous", as also depicted in his figure; yet, there is a distinct tooth posterior to the ventrodistal angle of the P1 palm, which makes it difficult to decide whether or not a subchela would actually be present (cf. also Sakai, 1982); the P1 definitely has a subchela in *U. exigua* Sakai, 1982, as well as in *G. irawadyensis* sp. nov.). So, the present specimens from Batavia Bay as well as the male from Myanmar are now proposed as a new species, *Gebicula irawadyensis* sp. nov.

Type locality. — Myanmar (= Burma), off Irawady Delta, 37 m.

Distribution. — Myanmar (Sakai, 1982); Indonesia: Jakarta, 18-37 m.

Etymology. — The species name *irawadyensis* is derived from the type locality, Irawady Delta, Myanmar, with the Latin suffix -ensis for indicating a geographical location. The name is an adjective agreeing in gender with the, feminine, generic name.

Genus **Mantisgebia** n. gen.

Diagnosis. — Rostrum elongate, bearing a median longitudinal groove, and a row of tubercles on each lateral margin; no infrarostral spine present. Anterolateral margins of carapace beset with a set of three spines. Lateral ridges of

gastric region slightly projecting forward and apart from median gastric region. No hepatic spine present. P1-4 slender; P1 subchelate. Telson longer than broad, lateral margins slightly convergent backwards, and posterior margin concave in a V-shape.

Remarks. — This genus is characteristic in that the telson is elongate; the posterior margin is deeply concave in a V-shape; the rostrum is elongate; and the P1-5 are slender. The present new genus *Mantisgebia* is similar to *Gebiacantha* Ngoc-Ho, 1989a, but it differs, because in *Mantisgebia* the infrarostral and the hepatic spine are absent, whereas in *Gebiacantha* the infrarostral and the hepatic spine are present.

Etymology. — The name is derived from the Greek mantis, meaning a mantid, a kind of predatory grasshopper, and the generic name *Gebia*, a mud-shrimp.

Type species. — *Mantisgebia vonvaupeli* sp. nov. by present designation.

Species included. — *Mantisgebia kyusyuensis* (Yokoya, 1933); *M. vonvaupeli* sp. nov.

Mantisgebia kyusyuensis (Yokoya, 1933)

Upogebia kyusyuensis Yokoya, 1933: 53, fig. 27; Itani, 2004, table 2 (list).
Wolffogebia kyusyuensis; Sakai, 1987: 306 (list).

Remarks. — This species has been uncertain in its taxomomic position, but is temporarily included in the genus *Mantisgebia*, because the rostrum is elongate and has a median rostral groove, the infrarostral spine is absent, and the telson is deeply concave on its posterior margin.

Type locality. — East of southern Miyazaki Prefecture, south of Satsuma (= Kagoshima Pref.) or north of Goto-retto, Nagasaki Pref., Tsushima Strait, Japan; 106-192 m.

Distribution. — Japan: east of southern Miyazaki Prefecture, south of Satsuma and north of Goto-retto, 106-192 m.

Mantisgebia vonvaupeli sp. nov. (figs. 6, 7)

Material examined. — ZMUC-CRU 9704, holotype, male (TL/CL, 16.5/5.6 mm; missing both Mxp3, P1 on left side, P2 on both sides, P3 on right side (detached left P3 present), P4-5 on both sides), St. 49, 5°37′10″S 132°23′E, sand, 03.v.1922, 245 m, Danish Expedition to the Kei-Islands, 1922; ZMUC-CRU 9705, paratypes, 2 females (TL/CL, 22.0/7.2 mm, missing Mxp3 and P1-2 on both sides, propodus and dactylus of P3 on left side (detached right P3 present), P4 on both sides; TL/CL, 20.0/6.6 mm, missing Mxp3 on right side, P1-2 on both sides, P3 on right side, P4 on both sides, P5 on right side), St. 49, 5°37′10″S 132°23′E, sand, 03.v.1922, 245 m, Danish Expedition to the Kei-Islands, 1922.

Diagnosis. — Rostrum elongate, beset with seven spines on each lateral margin, and infraventral spine absent. Lateral ridges of gastric region shortly projecting forward distally by an acute spine, and posterior to it beset with a row of 9-11 spines. Anterolateral margin of carapace armed with a set of three postocular spines. Abdominal sternites unarmed. P1 carpus provided distally with three strong spines on mesial margin. P3-4 meri spineless.

Description of male holotype. — Rostrum (figs. 6A, 7A, B) elongate, 2.5 times as long as broad at base, dorsal surface densely setose, slightly bent downward anteriorly, and beset with 7 spines on each lateral margin; infrarostral spine absent. Lateral ridges of gastric region parallel laterally, shortly projecting forward anteriorly and beset with 11 spines on their dorsal margins; mediogastric region convex and slightly divergent posteriorly with a row of 15-17 unequal spines on each lateral margin. Hepatic spine absent. Anterolateral margins of carapace beset with three postocular spines.

Eyestalk stout, reaching to half length of rostrum. A1 peduncle overreaching midlength of A2 terminal segment, length of 2 proximal segments almost equal to terminal one, mesial surface of proximal segment bearing a small ventrodistal spine.

A2 peduncle overreaching rostrum by about half length of penultimate segment; segment 1 beset with ventrodistal spine; segment 2 with small ventrodistal

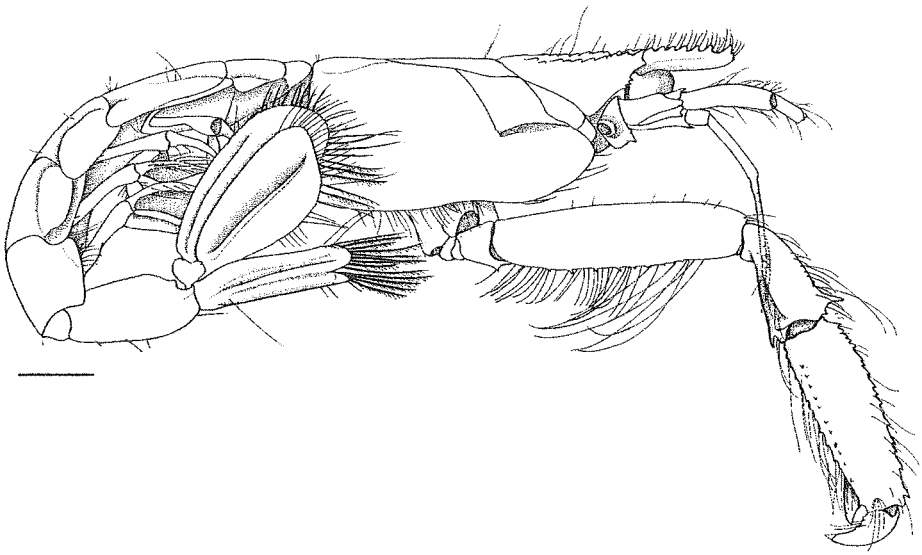


Fig. 6. *Mantisgebia vonvaupeli* sp. nov. Whole body, lateral view, ZMUC-CRU 9704, holotype, male (TL/CL, 16.5/5.6 mm), St. 49, 5°37′10″S 132°23′E, sand, 03.v.1922, 245 m.

spines; scale of moderate size, ending distally by sharp terminal spine, accompanied below by small subterminal spines.

Mxp3 equipped with exopod.

Epistome protruding into a strong spine at ventrodistal apex.

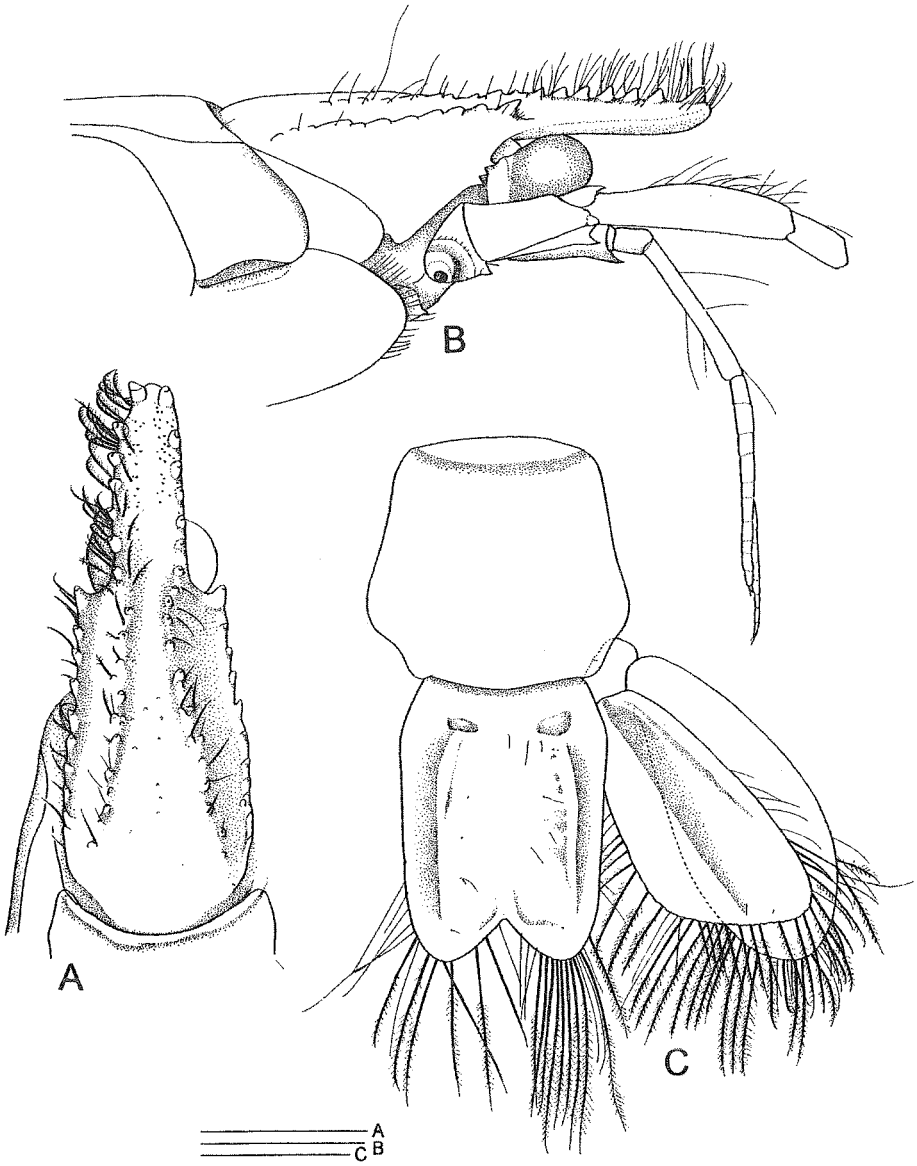
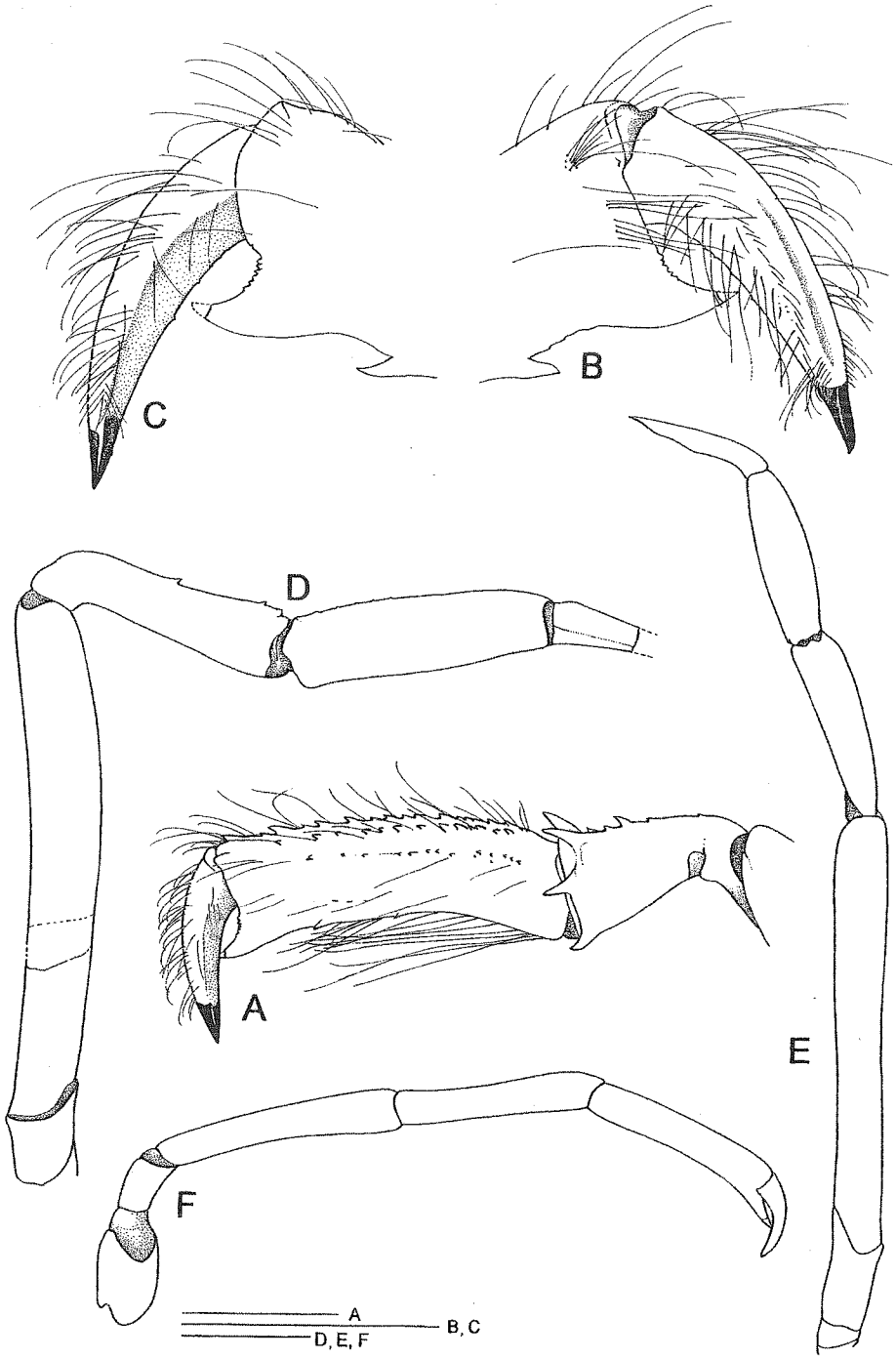


Fig. 7. *Mantisgebia vonvaupeli* sp. nov. A, cephalic region, dorsal view; B, same, lateral view; C, abdominal somite 6 and tail fan of right side, dorsal view. A-C, ZMUC-CRU 9704, holotype, male (TL/CL, 16.5/5.6 mm), St. 49, 5°37′10″S 132°23′E, sand, 03.v.1922, 245 m.


C
B
D
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A
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D, E, F

P1 coxa and basis (fig. 6A) spineless. Ischium usually bearing one subterminal spine on ventral margin. Merus beset with row of 9 spines on ventrolateral margin, decreasing distally in size, with row of long setae on ventromesial margin, and dorsal margin unarmed. Carpus triangular, lateral surface marked ventrally by longitudinal carina, mesial surface beset with a strong distal spine on ventral margin, with one small median spine on dorsal margin, and distal margin dorsally with three prominent spines. Chela about 3 times as long as broad; palm beset with two rows of denticles on dorsal margin (fig. 8A); mesial surface with row of denticles medially; ventral margin beset with distinct spines accompanied by small spine posterior to fixed finger. Fixed finger (fig. 8A, B, C) bearing small teeth proximally on prehensile edge. Dactylus corneous at tip, prehensile margin armed with row of minute interspaced denticles; lateral surface (fig. 8A) flanked by longitudinal groove in dorsal half, bearing row of setae in ventral half, mesial surface (fig. 8C) setose in dorsal half, and smoothly concave in ventral half.

Abdominal sternites unarmed.

Telson (fig. 7C) biarcuate by a V-shaped concavity on posterior margin; longitudinal carinae running along lateral margins on dorsal surface, close to posterior margin.

Uropodal endopod shorter than telson, truncate on distal margin; exopod longer than telson, and oval on distal margin.

Description of other material. — Detached P2 with carpus bearing two denticles on dorsal margin (fig. 8D). P3 and P5 spineless (fig. 8E, F).

Remarks. — The present new species is similar to *Upogebia reunionensis* (Ngoc-Ho, 1989a), and *U. richeri* (Ngoc-Ho, 1989a), because the telson is deeply biarcuate on the posterior margin, and the anterolateral margin of the carapace is armed with spines. However, in the present species the infrarostral spine and the hepatic spine are absent, whereas in the above-cited species of Ngoc-Ho these are present.

Type locality. — Moluccas, 5°37′10″S 132°23′E, sand, 03.v.1922, 245 m.

Distribution. — So far only known from the type locality.

Etymology. — The species name, "vonvaupeli" is heartily dedicated to Dr. J. C. von Vaupel Klein, Leiden, who worked for a long time as an excellent

Fig. 8. *Mantisgebia vonvaupeli* sp. nov. A, P1 carpus, palm, and dactylus, mesial view; B, P1 dactylus and distal part of palm, lateral view; C, same, mesial view; D, P2 of right side, lateral view; E, P4 of left side, lateral view; F, P5 of right side, lateral view. A, B, C, ZMUC-CRU 9704, holotype, male (TL/CL, 16.5/5.6 mm), St. 49, 5°37′10″S 132°23′E, sand, 03.v.1922, 245 m; D, E, F, detached pereiopods, MUC-CRU-9705, paratypes, St. 49, 5°37′10″S 132°23′E, sand, 03.v.1922, 245 m.

reviewer of my manuscripts for the International Journal of Crustacean Research, "Crustaceana", and, together with Prof. J. Forest, of the Muséum national d'Histoire Naturelle, Paris, recently edited the book, "Treatise on Zoology – The Crustacea, 1".

Genus **Pomatogebia** Williams & Ngoc-Ho, 1990

Diagnosis. — Lateral ridges of gastric region protruding forward. Tail-fan and abdominal somites 5-6 forming an opercular plug at the opening of the burrow, and tail-fan armed with multiple longitudinal ribs on its surface.

Remarks. — The present genus is similar to *Arabigebicula* n. gen., because it bears the radiating longitudinal ribs on the dorsal surface of the telson; in *A. rhynchos* sp. nov. the radiating longitudinal ribs look very similar to the ones of *Pomatogebia rugosa* (Lockington, 1878).

Williams & Ngoc-Ho (1990: 615) established the genus *Pomatogebia* for the reason that the operculate abdomen best distinguishes *Pomatogebia operculata* (Schmitt, 1924), its sister species, *P. rugosa*, and *P. cocosia* (Williams, 1986), all from the eastern Pacific, from the members of the genus *Upogebia* Leach, 1814. In *Pomatogebia*, the lateral ridges of the gastric region are projecting forward as in some species of *Upogebia*, but the operculate structure formed by the tail-fan and abdominal somites 5 and 6, bearing multiple longitudinal ribs, are clearly different from those of *Upogebia*.

Type species. — *Pomatogebia operculata* (Schmitt, 1924).

Species included. — *Pomatogebia cocosia* (Williams, 1986); *P. operculata* (Schmitt, 1924); *P. rugosa* (Lockington, 1878).

The West Atlantic species

Pomatogebia operculata (Schmitt, 1924) (fig. 9A)

Upogebia (*Gebiopsis*) *operculata* Schmitt, 1924: 91, pl. 5 figs. 1-4.

Gebiopsis hartmeyeri Balss, 1924: 178, figs. 1-2.

Upogebia (*Calliadne*) *operculata*; De Man, 1928: 24 (list), 37, 39, 50; Schmitt, 1935: 197, fig. 59; Coêlho & Ramos, 1973: 163; Coêlho & Rattacaso, 1988: 387.

Pomatogebia operculata; Williams & Ngoc-Ho, 1990: 614, fig. 1a-c; Dworschak, 1992: 228; Williams, 1993b: 10, fig. 5.

Material examined. — SMF 30174, 1 male (TL/CL, 30.0/7.9 mm), 1 female (TL/CL, 30.0/8.9 mm), Isla Grande, Islas del Rosario, near Cartagena, Bolivar, Colombia, 10 m, 9.ii.1986, leg. T. Luz and Elena Velasquez; SMF 30175, 1 male (TL/CL, 18.0/4.8 mm), 1 ovig. female (TL/CL, 20.0/5.7 mm), Bahia de Chengue, Tayrona-Park, c. 15 km northeast of Santa Marta, Dept. Magdalena, Colombia, 18 m, 29.x.1985, leg. T. Luz and Elena Velasquez.

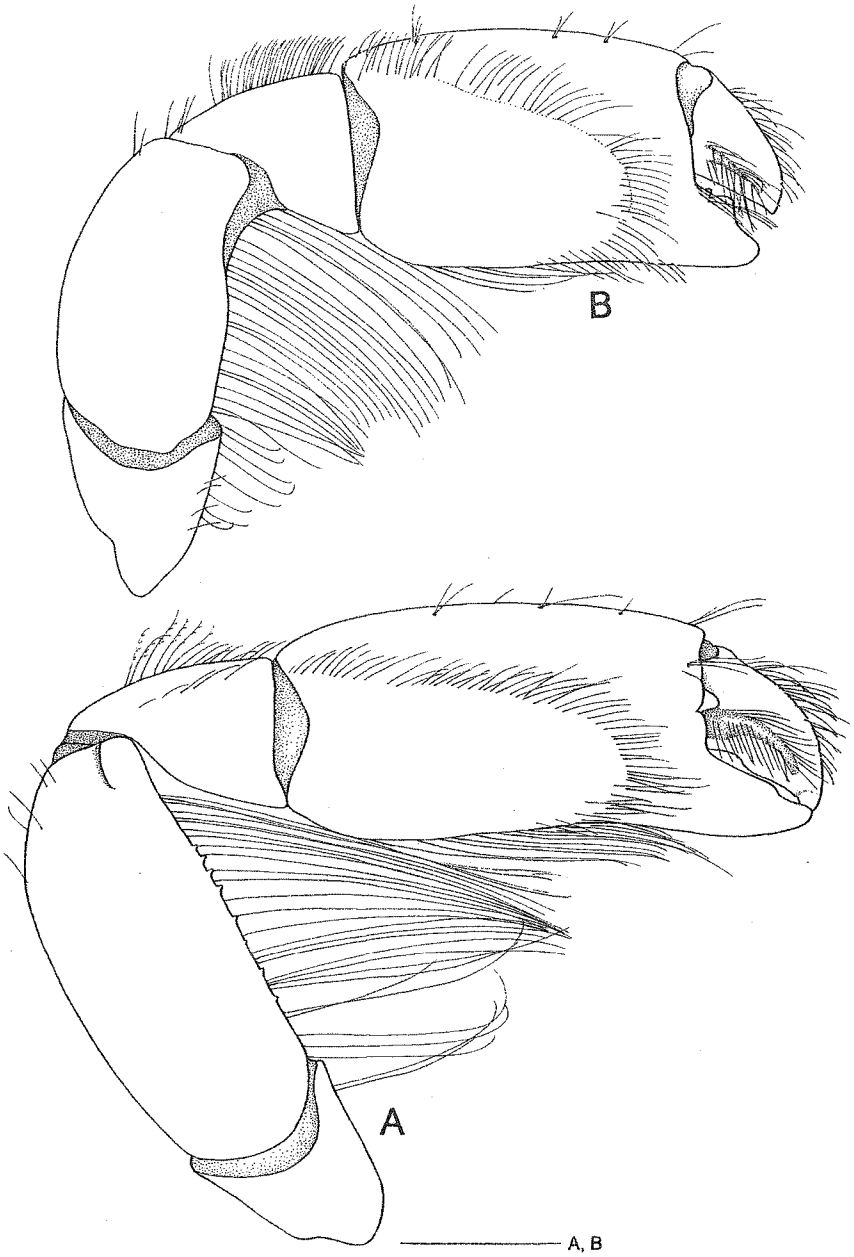

Fig. 9. *Pomatogebia operculata* (Schmitt, 1924) and *P. cocosia* (Williams, 1986). A, P1 of right side of *P. operculata*, lateral view; B, P1 on right side of *P. cocosia*, lateral view. A, SMF 30175, 1 male (TL/CL, 18.0/4.8 mm), Bahia de Chengue, Tayrona-Park, ca. 15 km northeast of Santa Marta, Dept. Magdalena, Colombia, 18 m; B, *P. cocosia*, ZMUC-CRU 9755, 1 male (TL/CL, 17.0/4.6 mm), S.W. point of Rey Island, Panama, Th. Mortensen's Expedition, dredged, 15-27 m.

Diagnosis. — Male P1 merus with a row of tubercles on ventromesial margin; palm c. twice as long as broad (fig. 9A).

Type locality. — Okra Reef, Barbados.

Distribution. — Florida (Williams, 1993b); Bahamas: Green Cay (Williams, 1993b); Jamaica: Discovery Bay (Williams, 1993b); Dominican Republic: off Enriquillo (Williams, 1993b); Puerto Rico: Guanica Harbor (Schmitt, 1935); Virgin Islands: St. Croix (Kleemann, 1984; Dworschak, 1992; Williams, 1993b), St. John and Teague Bay (Williams, 1993b); St. Barthelemy (Williams, 1993b); Antigua (Williams, 1993b); Barbados (Schmitt, 1924; Williams & Ngoc-Ho, 1990; Williams, 1993b), St. Thomas (Balss, 1924); Grenada (Williams, 1993b); Mexico: Veracruz (Williams, 1993b); Honduras (Williams, 1993b); Panama: Agualargana Islands (Williams, 1993b); Colombia: Gorgona Islands (Williams, 1993b); Brazil: Ceará, Rio Grande do Norte, Pernambuco, Bahia, and Espírito Santo (Coêlho & Ramos, 1973; Coêlho & Ramos-Porto, 1987), Espírito Santo (Williams, 1993b); 1-56 m.

The East Pacific species

KEY TO THE SPECIES OF THE GENUS *POMATOGEBIA* WILLIAMS & NGOC-HO, 1990 IN THE EASTERN PACIFIC OCEAN

[After Williams, 1986: 45.]

1. Telson as long as broad at its base, bearing proximal raised area with spinules .... *P. cocosia* (Williams, 1986)
– Telson distinctly broader than long, bearing proximal raised area without spinules .... *P. rugosa* (Lockington, 1878)

Pomatogebia cocosia (Williams, 1986) (fig. 9B)

Upogebia cocosia Williams, 1986: 7 (key), 55, fig. 20.
Pomatogebia cocosia; Hendrickx, 1995: 390 (list).

Material examined. — Eastern Pacific: ZMUC-CRU 9755, 1 male (TL/CL, 17.0/4.6 mm), S.W. point of Rey Island, Panama, Th. Mortensen's Pacific Expedition, dredged at 8-15 fms (14-27 m), 26.i.1916; ZMUC-CRU 9756, 1 male (TL/CL, 19.0/5.4 mm), S. of Rey Island, Panama, Th. Mortensen's Pacific Expedition, dredged, 27.i.1916.

Diagnosis. — Rostrum triangular in dosal view, lacking infrarostral spine and spine on anterolateral margin of carapace. Lateral ridges of gastric region not protruding forward. Tail fan bearing radiating longitudinal ribs; telson about as long as broad on proximal margin, divergent on lateral margins, bearing submarginal elevation with spinules.

Remarks. — Williams (1986: 58) separated *P. cocosia* from *P. rugosa*. *P. cocosia* was recorded from Cocos Island by Williams (1986), who mentioned that *P. cocosia* and *P. operculata* are different from each other, but both closely "allied" to *U. operculata*, and are possibly sibling species.

The present specimens from Panama are identified as *P. cocosia*. It is known that the P1 palm is about twice as long as broad in *P. cocosia* (cf. Williams, 1986, fig. 20c), but in the present specimens the P1 palm is about 1.5 times as long as broad, as in *P. rugosa*. The fixed finger is stout proximally (fig. 9B), and the dactylus is broadened and not incurved distally (ZMUC-CRU 9755), or is strongly incurved distally (ZMUC-CRU 9756).

Williams (1986: 58) mentioned about differences between the species in the key, that the telson has a proximal raised area on either side near the base of the submesial longitudinal rib, which is unarmed in *P. cocosia*, whereas the telson has a proximal raised area on either side near the base of the submesial longitudinal rib, bearing 1 or more small spinules in *P. rugosa* (cf. Williams, 1986: 7). However, in the present specimens examined (ZMUC-CRU 9755; ZMUC-CRU 9756) the telson bears a proximal elevation with spinules, as shown in Williams' (1986) fig. 20i for *P. cocosia*.

Type locality. — Cocos Is., 450 N.M. (c. 833 km) WSW from the southern end of the Panama Gulf.

Distribution. — So far known only from the type locality, Cocos Is., and Panama.

Pomatogebia rugosa (Lockington, 1878)

Gebia rugosa Lockington, 1878: 300.
Upogebia (*Upogebia*) *rugosa*; Borradaile, 1903: 543 (list).
Upogebia (*Gebiopsis*) *rugosa*; Schmitt, 1924: 91, 93.
Upogebia (*Calliadne*) *rugosa*; De Man, 1928: 24 (list), 37, 39, 50.
Upogebia rugosa; Brusca, 1973: 223 (list); Thistle, 1973: 1, 23 (key); Brusca, 1980: 259 (list); Williams, 1986: 7 (key), 58, fig. 21.
Pomatogebia rugosa; Williams & Ngoc-Ho, 1990: 616; Lemaitre & León, 1992: 45; Lemaitre & Ramos, 1992: 352; Hendrickx, 1995: 390 (list).

Diagnosis. — Tail fan bearing radiating longitudinal ribs; telson distinctly broader than long, divergent on lateral margins, bearing submarginal elevation without spinules.

Type locality. — Puerto Escondido, Gulf of California, at low tide.

Distribution. — Baja California: Puerto Escondido (Lockington, 1878), Bahía Agua Verde (Williams, 1986); Colombia: Playa Pizarro, Gorgona Island (Lemaitre & Ramos, 1992); subtidal to 18 m.

Genus **Tuerkayogebia** Sakai, 1982

Tuerkayogebia Sakai, 1982: 84; Sakai, 1987: 306 (list); Poore, 1994: 105 (key).

Type species. — *Tuerkayogebia kiiensis* (Sakai, 1971) by monotypy and original designation.

Species included. — *Tuerkayogebia kiiensis* (Sakai, 1971).

Tuerkayogebia kiiensis (Sakai, 1971)

Upogebia (*Calliadne*) *kiiensis* Sakai, 1971: 243, figs. 1-2; Sakai, 1972: 1, fig. 1.
Tuerkayogebia kiiensis; Sakai, 1982: 84, fig. 17d-e; Sakai, 1987: 306 (list); Itani, 2004, table 2 (list).

Type locality. — Beach of Ezura, Shirahama, Kii Peninsula, Japan, 20 m.
Distribution. — Japan: Shirahama, Kii Peninsula, 20 m.

Genus **Upogebia** Leach, 1814

Gerbios Bosc, 1813: 233. [Type species: *Thalassina littoralis* Risso, 1816, a junior subjective synonym of *Astacus pusillus* Petagna, 1792: suppressed under the plenary powers for the purposes of the law of priority; ICZN, Opinion 749.]

Upogebia Leach, 1814: 400; Gerstäcker, 1891, pl. 73 fig. 4; Stebbing, 1893: 185; Ortmann, 1898: 1143; Stebbing, 1900: 42; Borradaile, 1903: 542; Nobili, 1906b: 96; Stebbing, 1910: 370; Balss, 1914: 89; Selbie, 1914: 102; Kemp, 1915: 257; Balss, 1916: 34; Pesta, 1918: 196; Schmitt, 1921: 115; Hale, 1927a: 85; De Man, 1928: 35; Schellenberg, 1928: 75; Stevens, 1928: 318; Makarov, 1938: 50; Bouvier, 1940: 105; Poulsen, 1940: 216; Edmondson, 1944: 42; Zariquiey Alvarez, 1946: 95 (key), 107; Barnard, 1950: 514; Liu, 1955: 66; Hemming, 1958: 143; Williams, 1965: 103; Zariquiey Alvarez, 1968: 230; De Saint Laurent, 1973: 516; Le Loeuff & Intès, 1974: 50; Poore & Griffin, 1979: 286; De Saint Laurent & Le Loeuff, 1979: 36; Sakai, 1982: 8; Williams, 1986: 6, fig. 2; Coêlho & Ramos-Porto, 1987: 34; Sakai, 1987: 306 (list); Holthuis, 1991: 232; Sakai, 1993: 88; Williams, 1993b: 13; Poore, 1994: 105 (key); Asakura, 1995: 341; Ingle & Christiansen, 2004: 99. [Type species: *Cancer* (*Astacus*) *stellatus* Montagu, 1808.]

Gebia Leach, 1815: 342; H. Milne Edwards, 1837a: 312; H. Milne Edwards, 1837b: 128; De Kay, 1844: 22; Bell, 1846: 222; Dana, 1852b: 509; Heller, 1863: 204; Stalio, 1877: 105; Boas, 1880: 165; Haswell, 1881: 164; Czerniavsky, 1884: 83; Pocock, 1890: 515; Ortmann, 1893: 49; Ortmann, 1894: 21; Lagerberg, 1908: 52 (key), 54. [Type species: *Cancer* (*Astacus*) *stellatus* Montagu, 1808: a junior objective synonym of *Upogebia* Leach, 1814; ICZN, Opinion 748.]

Bigea Nardo, 1847: 7 (nomen nudum); Nardo, 1869: 101; Borradaile, 1903: 544. [Type species: *Bigea tipica* Nardo, 1869: 101, by monotypy.]

Calliadne Strahl, 1862a: 1064; Strahl, 1862b: 390; Stebbing, 1910: 370. [Type species: *Calliadne savignii* Strahl, 1862a, by monotypy.]

Gebiopsis s. str. A. Milne-Edwards, 1868: 63. [Type species: *Gebiopsis nitida* A. Milne-Edwards, 1868, by original designation, a junior subjective synonym of *Upogebia* Leach, 1814.]

Gebiopsis s. str. Ortmann, 1893: 49; Ortmann, 1894: 23; Borradaile, 1903: 542.

Upogebia s. str. Borradaile, 1903: 542.

Gebiacantha Ngoc-Ho, 1989a: 117; Ngoc-Ho, 1994a: 59; 2003: 505; Poore, 1994: 105 (key); Davie, 2002: 481. [Type species: *Upogebia talismani* Bouvier, 1915.]
Austinogebia Ngoc-Ho, 2001b: 47. [Type species: *Upogebia narutensis* Sakai, 1986.]
Non: *Gebios* Risso, 1822: 243.

Remarks. — Ngoc-Ho (2001b: 50) established the genus *Austinogebia* based on the following characters: (1) the presence of two to four infrarostral spines; (2) several spines on the anterolateral margin of the carapace; (3) the lateral ridges of the gastric region projecting forward, dorsal distal half thickened and densely setose, with 1-3 lower distal spines; (4) P1 palm beset with spines and spinules on dorsal margin, but unarmed on ventral margin; (5) P2 merus with 2-3 large proximal lower spines; (6) P3 merus with 2-4 large ventral spines and one or more lateral curved rows of setae; (7) the uropodal endopod beset with a proximal knob on the lateral margin; (8) and others, as the characters of the mandible, Mxp1-3, and arthrobranchs. Ngoc-Ho (2001b) included six species in the new genus: *Upogebia edulis* (Ngoc-Ho & Chan, 1992); *U. narutensis* Sakai, 1986; *U. spinifrons* (Haswell, 1881) (syn.: *U. nobilii* Sakai & Türkay, 1995); *U. takaoensis* Sakai & Türkay, 1995; *U. wuhsienweni* Yü, 1931. She (Ngoc-Ho, 2001b) did not include in *Austinogebia*, however, two species, i.e., *Upogebia snelliusi* Ngoc-Ho, 1989b and *U. poensis* De Saint Laurent & Ngoc-Ho, 1979, which do not match the definition of *Austinogebia*. She mentioned that some characters of *Austinogebia* are shared by the genus *Gebiacantha* Ngoc-Ho, 1989, and also partly match those of *Upogebia* Leach, 1814. This can be seen in *Upogebia plantae* Sakai, 1982 and *U. talismani* Bouvier, 1915, in which the proximal knob on the lateral margin of the uropodal endopod is absent, and the lateral ridges of the gastric region are not projecting forward, so that these two species do not fit in the definition of the genus *Austinogebia*. However, these species have four infrarostral spines; several spines on the anterolateral margin of the carapace; the P1 palm beset with spines and spinules on the dorsal margin; the P2 merus with 2-3 large proximal lower spines; the P3 merus with 2-4 large ventral spines, all as in *Austinogebia*: so, the genus *Austinogebia* is not always clearly separated from the genus *Upogebia*. The proximal knob on the lateral margin of the uropodal endopod is very variable in its degree of development. In *Gebiacantha multispinosa* Ngoc-Ho, 1994b, and *Gebiacantha lifuensis* Ngoc-Ho, 1994b, the proximal knob of the uropodal endopod is distinct, whereas in the species *Gebicula irawadyensis* sp. nov., and some of *Gebiacantha*, i.e., *G. lagonensis* Ngoc-Ho, 1989a, *G. priochela* Sakai, 1993, and *G. richeri* Ngoc-Ho, 1989a, the knob of the uropodal endopod is not distinct, but all the same discernible as a swelling or a small protrusion.

In addition, the genus *Austinogebia* is characterized by the fact that two to four infrarostral spines are present, however, this character also applies to some species of the genus *Upogebia* that usually bear either one, or more than four infrarostral spines. It is certain that in five species of *Austinogebia*, i.e., *Austinogebia edulis*, *A. narutensis*, *A. spinifrons* (syn.: *A. nobilii*), *A. takaoensis*, and *A. wuhsienweni*, the infrarostral spines number 2-4. However, eight other species in the genus *Upogebia* may have 1-2 infrarostral spines: *U. imperfecta* and *U. snelliusi* from the Indo-West Pacific; *U. affinis*, *U. felderi*, *U. pillsbury*, *U. spinistipula*, and *U. paraffinis* from the West Atlantic; and *U. poensis* from the eastern Atlantic Ocean. In seven species, *Upogebia affinis*, *U. felderi*, *U. imperfecta*, *U. paraffinis*, *U. pillsbury*, *U. poensis*, and *U. spinistipula* (not in *U. snelliusi*), the lateral ridges of the gastric region are projecting forward as in most species of *Upogebia*: but in *U. snelliusi* the lateral ridges of the gastric region are not projecting forward, which agrees with the genus *Gebiacantha*. In *U. yokoyai*, the infrarostral spine is absent, whereas the P3 merus bears 2-4 large ventral spines as in *Austinogebia*. In six species of *Upogebia*, *U. imperfecta*, *U. paraffinis*, *U. pillsbury*, *U. poensis*, *U. snelliusi*, and *U. spinistipula*, the telson is not concave medially on the posterior margin as usual in *Upogebia*, but the infrarostral spines number 1-7. In the males of two species of *Austinogebia*, *A. edulis* and *A. wuhsienweni*, the ventral margin of the P1 palm bears a distinct spine posterior to the fixed finger, as it should in *Austinogebia*, whereas in two species, *Austinogebia spinifrons* and *A. takaoensis*, it bears no strong spine posterior to the fixed finger, as is in common in *Upogebia*. Under these conditions, it is difficult to decide which characters are valid to assign a species to *Austinogebia*, so that it is impossible in practice to separate the genus *Austinogebia* from the genera *Upogebia*, *Gebicula*, and *Gebiacantha*. As this applies to all six species of *Austinogebia*, these are not clearly separated from the species of the other genera in the family Upogebiidae. Hence, *Austinogebia* is not accepted as a valid genus, here.

The species, "*Upogebia* sp. De Man, 1928" should be deleted from the list of species, because this species was noted only on page 24 in De Man's index (De Man, 1928: 187): however, no "*Upogebia* sp." is actually present on page 24.

The East Atlantic-Mediterranean species

Species included. — *Upogebia aristata* Le Loeuff & Intès, 1974; *U. capensis* (Krauss, 1843) (syn.: *U. subspinosa* (Stimpson, 1860)); *U. crosnieri* Le Loeuff & Intès, 1974; *U. deltaura* (Leach, 1815) (syn.: *U. littoralis* G. O. Sars, 1883; *Upogebia* sp. γ De Man, 1928); *U. demani* De Saint Laurent & Le Loeuff, 1979;

U. furcata (Aurivillius, 1898); *U. mediterranea* Noël, 1992; *U. nitida* (A. Milne-Edwards, 1868); *U. poensis* De Saint Laurent & Ngoc-Ho, 1979; *U. pusilla* (Petagna, 1792) (syn.: *U. gracilipes* De Man, 1927; *U. tipica* (Nardo, 1869)); *U. senegalensis* Ngoc-Ho, 2001a; *U. stellata* Montagu, 1808; *U. talismani* Bouvier, 1915.

KEY TO THE SPECIES OF THE GENUS *UPOGEBIA* OF THE EASTERN ATLANTIC OCEAN AND THE MEDITERRANEAN SEA

1. Anterolateral margin of carapace unarmed 2
– Anterolateral margin of carapace armed with spine 8
2. A2 segment 3 unarmed 3
– A2 segment 3 distally with ventral spine 4
3. Cervical groove smooth ..... *U. demani* De Saint Laurent & Le Loeuff, 1979
– Cervical groove spinose ..... *U. furcata* Aurivillius, 1898
4. P1 palm with a row of distinct spines on dorsal margin .... *U. crosnieri* Le Loeuff & Intès, 1974
– P1 palm with or without a row of tubercles on dorsal margin 5
5. Cervical goove with row of tubercles. P1 carpus not armed with distinct subdistal spine on dorsal margin; P1 palm lacking subdistal spine on dorsal margin .... *U. nitida* (A. Milne-Edwards, 1868)
– Cervical groove lacking row of tubercles. P1 carpus with distinct subdistal spine on dorsal margin; P1 palm bearing subdistal spine on dorsal margin 6
6. P2 merus lacking subdistal spine on dorsal margin ..... *U. senegalensis* Ngoc-Ho, 2001
– P2 merus bearing subdistal spine on dorsal margin 7
7. Abdominal somite 1 terminating in a sharp ventral spine ..... *U. deltaura* (Leach, 1815)
– Abdominal somite 1 terminating with a rounded ventral end .... *U. mediterranea* Noël, 1992
8. Infrarostral spine present 9
– Infrarostral spine absent 10
9. Lateral ridges of gastric region protruding forward; ventral margin of P1 palm not bearing large spine posterior to fixed finger ..... *U. poensis* De Saint Laurent & Ngoc-Ho, 1979
– Lateral ridges of gastric region not protruding forward; ventral margin of P1 palm bearing large spine posterior to fixed finger ..... *U. talismani* Bouvier, 1915
10. Ventral margin of P1 palm bearing a strong spine posterior to fixed finger .... *U. aristata* Le Loeuff & Intès, 1974
– Ventral margin of P1 palm lacking a strong spine posterior to fixed finger 11
11. Rostrum about as long as broad; P1-3 coxae each bearing a spine .... *U. capensis* (Krauss, 1843)
– Rostrum twice as long as broad 12
12. P1 carpus with a strong spine on mesiodistal margin; dactylus with conical proximal tooth on dorsal margin ..... *U. stellata* (Montagu, 1808)
– P1 carpus without a strong spine on mesiodistal margin; dactylus without conical tooth on dorsal margin ..... *U. pusilla* (Petagna, 1792) (= *U. tipica* (Nardo, 1869))

Upogebia aristata Le Loeuff & Intès, 1974

Upogebia aristata Le Loeuff & Intès, 1974: 50, fig. 16a-s; De Saint Laurent & Le Loeuff, 1979: 37 (key), 43, fig. 5b-c.

Type locality. — Bay of Pointe-Noire, Congo, 5-10 m.

Distribution. — Cape Verde Islands (De Saint Laurent & Le Loeuff, 1979); Senegal (De Saint Laurent & Le Loeuff, 1979); Congo: Pointe-Noire (Le Loeuff & Intès, 1974; De Saint Laurent & Le Loeuff, 1979); Angola: Luanda (De Saint Laurent & Le Loeuff, 1979).

Upogebia capensis (Krauss, 1843)

Gebia major var. *capensis* Krauss, 1843: 54; Ortmann, 1891: 54.
Gebia subspinosa Stimpson, 1860: 91; Ortmann, 1893: 49. [Type locality: Simon's Bay, South Africa, 15 m.]
Gebia capensis; Ortmann, 1893: 49.
Upogebia capensis; Stebbing, 1900: 45; Stebbing, 1910: 370; Balss, 1913: 108, fig. 8; Lenz & Strunck, 1914: 291; Balss, 1916: 34; Barnard, 1947: 380; Barnard, 1950: 515 (partim), fig. 96; Holthuis, 1991: 233 (partim) [not fig. 431 = *U. africana* Ortmann, 1894]; Dworschak, 1992: 222; Ngoc-Ho & Poore, 1992: 187.
Upogebia (*Upogebia*) *subspinosa*; Borradaile, 1903: 543; De Man, 1928: 23 (list), 37, 51; Sakai, 1982: 45 (partim), fig. 9d, pls. B1, E1-2; Sakai, 1984: 150.
Upogebia (*Upogebia*) *capensis*; Borradaile, 1903: 543; De Man, 1927: 32, pl. 3 fig. 12; De Man, 1928: 22 (list), 37, 41, 51; Sakai, 1982: 43 (partim), fig. 9c, pls. A6, D5-6.
Upogebia africana; Hartmann-Schröder & Hartmann, 1974: 49.
Upogebia subspinosa; Stebbing, 1910: 370.
Upogebia (*Upogebia*) aff. *subspinosa*; Sakai, 1984: 150, figs. 1-2.

Remarks. — A neotype specimen of *U. capensis* Krauss, 1843 designated by Sakai (1982: 43, type locality, Knysna) was set aside under the plenary powers of the ICZN in Opinion 1753 (ICZN, 1994: 56), and a female specimen from Saldanha Bay, South Africa, No. 14895 (ICZN, 1994: 56), was designated as the neotype of *U. capensis*.

Ortmann (1893: 49) designated the original type locality in Table Bay, but Ngoc-Ho & Poore (1992: 188) established a neotype, the ovigerous female specimen no. 14895 in the South African Museum, Cape Town, so that the type locality is now Saldanha Bay, further west than Table Bay, in South Africa.

Williams (1993a: 143) stated that *U. capensis* is further distributed in the area west of Mossel Bay, the eastern limit. The new type locality, Saldanha Bay, is located in the western area of Cape Town, facing the Atlantic Ocean. This is the distribution area of *U. capensis*, and *U. africana* is distributed in the area east of Knysna, the western limit. The type locality of *U. africana* is Port Elizabeth, located to the east of Knysna.

Upogebia subspinosa (Stimpson, 1860) is treated as a synonym of the present species, *U. capensis* by Barnard (1946: 380), although it is occurring on deeper bottoms (Dworschak, 1992: 222). *Upogebia* aff. *subspinosa* Sakai, 1984 is to be synonymized, because in *U.* aff. *subspinosa* the P1 coxae 1-3 each bear a spine, as in *U. capensis*.

Type locality. — Saldanha Bay, South Africa.

Distribution. — Algoa Bay (Stebbing, 1900, 1910; Sakai, 1982, excluding Port Elizabeth); Angola: Mossamedes (Sakai, 1984); Namibia: Lüderitz Bay (Balss, 1913, 1916; De Man, 1927; Sakai, 1982); South Africa: Langebaan, (Sakai, 1982), Table Bay (Krauss, 1843), False Bay (Barnard, 1947), Saldanha Bay (Barnard, 1950), Simon's Bay (Stimpson, 1860; Stebbing, 1910; Lenz & Strunck, 1914; Sakai, 1982), St. James, Kalk Bay, Mossel Bay (Barnard, 1947).

Upogebia crosnieri Le Loeuff & Intès, 1974

Upogebia crosnieri Le Loeuff & Intès, 1974: 54, fig. 17a-s; De Saint Laurent & Le Loeuff, 1979: 37 (key), 42.

Type locality. — Grand Bassam, Ivory Coast, 5°04′7″N 3°48′W, 60 m.

Distribution. — Ivory Coast: Grand Bassam, Vridi, Jacqueville and Sassandra (Le Loeuff & Intès, 1974); Congo: Pointe-Noire (Le Loeuff & Intès, 1974); 60-104 m.

Upogebia deltaura (Leach, 1815)

Gebia deltaura Leach, 1815: 342, figs. 9-10; Bell, 1846: 225; White, 1847a: 71; Carus, 1885: 490; Gourret, 1888: 30, pl. 8 figs. 16-29, pl. 9 figs. 1-4; De Morgan, 1910: 475; Webb, 1919: 81.

Gebia deltura; Leach, 1816, pl. 31 figs. 9, 10; Desmarest, 1825: 204; H. Milne Edwards, 1837a: 314; Bell, 1846: 225, 1 fig.; White, 1857: 97; Fischer, 1872: 428; Van Beneden, 1884: 647; Carus, 1885: 490; Lovett, 1885: 14; Koehler, 1886: 59; Gourret, 1888: 92, pl. 8 figs. 16-29, pl. 9 figs. 1-4; Adensamer, 1898: 621; Stebbing, 1902: 43; Sinel, 1907: 217; De Morgan, 1910: 475, fig. 2; Runnstrøm, 1925: 33.

Gebia littoralis G. O. Sars, 1883: 6, 44; G. O. Sars, 1884: 182, pls. 3-5.

Upogebia (*Gebiopsis*) *deltaura*; Borradaile, 1903: 542; Pesta, 1912: 105; Selbie, 1914: 103; Pesta, 1918: 199, fig. 62; Bouvier, 1940: 106, fig. 70; Gordon, 1957: 249; Bourdillon-Casanova, 1960: 109; O'Céidigh, 1962: 164; Noël, 1992: 82.

Gebia stellata; Lagerberg, 1908: 54, pl. 2 fig. 10; Schlegel, 1912: 239; Grieg, 1927: 35 (part.), 1 fig.

Gebiopsis deltura; Stephensen, 1910: 277.

Gebiopsis deltaura; Balss, 1926: 27, fig. 8.

Upogebia (*Calliadne*) *deltaura*; De Man, 1927: 17, pl. 2 fig. 8-8b; De Man, 1928: 24 (list), 36, 49 (key).

Upogebia (*Calliadne*) sp. γ De Man, 1928 (not 1927): 25, 36, 49. [Type locality: San Thomé, Brazil.]

Upogebia stellata; Grieg, 1927: 35 (part.), fig. (*U. deltaura* (Leach, 1918)).

Upogebia deltaura; Schellenberg, 1928: 77, fig. 58; Miranda y Rivera, 1933: 21; Gustafson, 1934: 6, fig. 4; Bertrand, 1940; 30; Gurney, 1942: 246, fig. 99; Zariquiey Alvarez, 1946: 107 (key), 108; Wilson, 1951, pl. 31, 1 fig.; ?Harmelin, 1954: 94; Rees, 1955: 74, fig. 4, 5 (part.); Kurian, 1956: 76; Holthuis & Gottlieb, 1958: 66; Tambs-Lyche, 1958: 12, fig. 2; Heegaard, 1963: 458, pl. 1 fig. 7, text-figs. 27-33; Bourdon, 1963: 429; Bourdon, 1965: 15; Forest, 1965: 347; Picard, 1965: 60; Holmes, 1966: 421, 452, fig. 14 (part.); Zariquiey Alvarez, 1968: 231; De Gaillande, 1970: 377; De Saint Laurent, 1971: 1261; Seridji, 1971: 49; Christiansen, 1972: 41, fig. 48; Naylor, 1972: 69; Lagardère, 1973: 84; Le Loeuff & Intès, 1974: 56, fig. 19, 19bis; Neves, 1974: 14; Samuelsen, 1974: 131; Pastore, 1976: 107; Tebble, 1976: 85; Thiriot, 1976: 350, 367; Glaçon, 1977: 36; Beaubrun, 1979: 76; Moncharmont, 1979: 73; De Saint Laurent & Le Loeuff, 1979: 37 (key), 40, 93, fig. 3a-b; Domenech et al., 1981: 150; Kocatas, 1981: 161; Ngoc-Ho, 1981: 245; Adema et al., 1982: 28, fig. 8; Manning & Froglia, 1982: 324; Cottiglia, 1983: 78; García Raso, 1983: 318; Ngoc-Ho, 1984: 511, fig. 6; Thessalou-Legaki & Zenetos, 1985: 311; Campbell & Nicholls, 1986: 218, 1 fig.; Holthuis & Heerebout, 1986: 62, fig. 81; Lewinsohn & Holthuis, 1986: 25; Thessalou-Legaki, 1986: 183; Tunberg, 1986: 753; d'Udekem d'Acoz, 1989: 176, fig. 5; García Raso, 1990: 314; Moyse & Smaldon, 1990: 520, fig. 10.13 (part.); Neves, 1990: 670; Ševčić, 1990: 215; Dworschak, 1992: 223; García Raso et al., 1992: 258; Koukouras et al., 1992: 223; Noël, 1992: 82; Froglia, 1995: 8; Hayward et al., 1995: 433, fig. 52 8 (part.); d'Udekem d'Acoz, 1995: 61, fig. 3; Astall et al., 1996: 821, tables, 1, 2; Eneman, 1996: 159, fig. 1; Falciai & Minervini, 1996: 149, 1 fig.; Astall et al., 1997a: 155, figs. 1 (part.), 3, 5, table 1 (part.); Astall et al., 1997b: 671, 675, fig. 1, tables 1-5, pl. 2; Brattegard & Christiansen, 1997: 222; Hughes & Atkinson 1997: 640; Lindahl & Baden, 1997: 33; Christinsen & Stene, 1998: 76; Pinn et al., 1998a: 243, fig. 2B, D; Ševčić, 1998: 652; Hall-Spencer & Atkinson, 1999: 871, figs. 1-5; Moen & Svensen, 1999: 234, 2 figs.; Pinn et al., 1999a: 103, figs. 2G, H, 3A, 4G, H; Pinn et al., 1999b: 1461, figs. 5, 6, tables 1-6; d'Udekem d'Acoz, 1999: 156; Christiansen, 2000: 233; Taylor et al., 2000: 265, figs. 1-3, tables 1-3, 5, 6; González-Gordillo et al., 2001: 279; Livory, 2001: 33; Markham, 2001, tables 1, 2; Marin, 2001: 81, 1 fig.; Türkay, 2001: 289; Ngoc-Ho, 2003: 508, figs. 26-27; Ingle & Christiansen, 2004: 100, 101, fig. 76.

Upogebia deltura; Poulsen, 1940: 208, 226, 235 (key), figs. 6, 8.

Material examined. — SMF 29458, 1 moulted spm., damaged, probably North Sea, 02.viii.1961, leg. Wilhelm Schäfer; SMF 12400, 1 juv. (TL/CL, 13.0/4.2 mm), German Bight, Sta. VH 470 KG1, 54°N 6°E, box-corer, 30.x.1975, R/V "Victor Hensen"; SMF 12401, 1 male (TL/CL, 12.0/4.3 mm), German Bight, Sta. VH 24-VV, 54°01′N 07°49′E, Van Veen grab, 29.i.1981, R/V "Victor Hensen"; SMF 12402, 1 male (TL/CL, 26.0/7.9 mm), German Bight, Sta. WB 5-VV, 55°04′N 06°20′E, 10.iv.1981, Van Veen grab, R/V "Gauss"; SMF 12403, 1 juv. (TL/CL, 5.0/1.8 mm), German Bight, Sta. VH 397-VV, 54°01′N 07°49′E, Van Veen grab, 28.viii.1982, R/V "Victor Hensen"; SMF 12404, 1 juv. (TL/CL, 4.0/1.5 mm), German Bight, Sta. VH 397-VV, 54°01′N 07°49′E, Van Veen grab, 28.viii.1982, R/V "Victor Hensen"; SMF 12399, 1 juv. (TL/CL, 9.0/3.2 mm), German Bight, Sta. VH-470-KG4, 54°N 6°E, box corer, 30.x.1975, R/V "Victor Hensen"; SMF 28335, 1 male (CL 27.3 mm, abdomen and telson missing), 1 ovig. female (TL/CL, 60.0/19.0 mm), off Spiekeroog, German Bight, North Sea; SMF 26924, 1 female (TL/CL, 64.0/19.5 mm), between Light Vessel P8 (54°16′N 07°11′E) and Helgoland, German Bight, R/V "Astarte"; SMF 12412, 1 ovig. female (TL/CL, 67.0/18.3 mm), White Bank, North Sea, Sta. DB-10, 54°48′N 6°20′E, box corer, 38.5 m, 17.v.1977, R/V "Senckenberg"; SMF 28334, 1 female (TL/CL, 36.0/10.8 mm), eastern part of Dogger Bank, DOGD-25 Ku, 54°49.14′N 3°03.30′E – 54°49.10′N 3°01.60′E, 27.2-29.7 m, beam trawl, 27/28.vii.1995 (over midnight), R/V "Senckenberg"; SMF 30176, male (TL/CL, 24.0/7.4 mm), S. of Helgoland,

North Sea, 54°7.4′N 7°56′E, Van Veen grab, 38 m, 8.ix.2004, R/V "Uthörn" leg. Excursion of University of Frankfurt/M.; SMF 28333, 4 males (TL/CL, 35.0/11.7 – 42.0/13.1 mm), 6 females (TL/CL, 23.0/7.4 – 51.0/15.0 mm), Kristineberg Marine Biological Station, Fiskebäckskil, 120 km N. of Göteborg, Göteborg och Bohus, Sweden, ix.1976, leg. U. Pettke; SMF 28332, 4 males (TL/CL, 63.0/20.9 – 60.0/c. 18.0 mm, lacking rostrum), 1 female (TL/CL, 35.0/10.6 mm), Kristineberg Marine Biological Station, Fiskebäckskil, 120 km N. of Göteborg, Göteborg och Bohus, Sweden, ix.1976, leg. U. Pettke; SMF 28331, 25 males (TL/CL, 22.0/6.9 – 62.0/18.7 mm), 34 females (TL/CL 24.0/7.9 – 60.0/18.7 mm), 34 damaged individuals, Kristineberg Marine Biological Station, Fiskebäckskil, 120 km N. of Göteborg, Göteborg och Bohus, Sweden, ix.1976, leg. U. Pettke; SMF 12413, 1 male (TL/CL, 61.0/19.0 mm), off Wight, English Channel, Sta. K14-VV, 50°18.08′N 00°57.40′W, 72.1 m, Van Veen grab, 7.viii.1980, R/V "Senckenberg"; SMF 26923, 3 females (TL/CL, 64.0/18.4 – 78.0/22.8 mm), Roscoff, N-Finistère, France, ded. H. Zibrowius.

Remarks. — De Man (1928: 25, 49) described *Upogebia* (*Calliadne*) sp. γ De Man, 1928, type locality: São Tomé, and mentioned that it is perhaps a juvenile stage of *Upogebia deltaura* Leach, 1815. This is the same material as *Upogebia* (*Calliadne*) sp. α De Man, 1927. It formed the type material of *U. demani*, as below.

As shown by Ngoc-Ho (2003: 513), variation of the spinulation on the P2 carpus is observed in the male specimen from the German Bight, North Sea (SMF 28335, CL 27.3 mm), and the ovigerous female from White Bank, North Sea (SMF 124121, TL/CL, 67.0/18.3 mm): in the male, the P2 carpus on the left side is devoid of a subdistal spine on the dorsal margin (SMF 28335), whereas that on right side bears it as is characteristic for this species, and the P2 carpus bears a subdistal spine on both dorsal and ventral margins in the ovigerous female (SMF 12421).

Type locality. — Kingsbridge Estuary, Devon, England.

Distribution. — Norway (Christiansen, 2000); Sweden: Gullmar fjord (Gustafson, 1934), Skagerrak (Dworschak, 1992); North Sea: Oysterground (Dworschak, 1992); Kattegat (Poulsen, 1940; Stephensen, 1910); Germany: East Friesland, Helgoland (Metzger, 1875); Scotland (Sim, 0000); England: Plymouth (Runnstrøm, 1925; De Man, 1927); Ireland (Selbie, 1914); Channel Islands (Sinel, 1907); Mediterranean: Cadaques, Spain (Zariquiey Alvarez, 1968), Marseille (Bouvier, 1940), Sardinia Island (Manning & Froglia, 1982); Adriatic Sea: (Adensamer, 1898; Pesta, 1918; Dworschak, 1992), Kvarner region (Ševčić, 1998); Aegean Sea (Koukouras et al., 1992); Cyprus (Lewinsohn & Holthuis, 1986); Haifa Bay (Holthuis & Gottlieb, 1958: 66).

Upogebia demani De Saint Laurent & Le Loeuff, 1979

Upogebia (*Calliadne*) sp. α De Man, 1927: 19. [Type locality: São Tomé.]
Upogebia sp. γ De Man, 1928: 25, 36, 49.

Upogebia demani De Saint Laurent & Le Loeuff, 1979: 37 (key), 40, fig. 4a-e.

Type locality. — Island of São Tomé, Gulf of Guinea.

Distribution. — Gulf of Guinea: São Tomé (De Man, 1927), São Tomé and Príncipe (De Saint Laurent & Le Loeuff, 1979).

Upogebia furcata (Aurivillius, 1898)

Gebia furcata Aurivillius, 1898: 13, pl. 1 figs. 5-7.
Upogebia (*Calliadne*) *furcata*; De Man, 1927: 7, pl. 1 fig. 3-3b; Monod, 1927: 601; De Man, 1928: 24 (list), 36, 48 (key).
Upogebia furcata; Rathbun, 1900: 309; Schmitt, 1928: 44, pl. 8 figs. 1-2; Monod, 1928: 252; Longhurst, 1958: 46; Forest, 1958: 150; Le Loeuff & Intès, 1974: 56, fig. 18a-p; De Saint Laurent & Le Loeuff, 1979: 37.
Upogebia (*Upogebia*) *furcata*; Borradaile, 1903: 543.

Type locality. — The river near Bibundi, Cameroon.

Distribution. — Senegal (De Saint Laurent & Le Loeuff, 1979); Sierra Leone: Freetown (De Saint Laurent & Le Loeuff, 1979); Cameroon: (Monod, 1927), Bibundi (Aurivillius, 1898; De Man, 1927); Congo: Loango (Le Loeuff & Intès, 1974).

Upogebia mediterranea Noël, 1992

Upogebia deltaura; ?Harmelin, 1964: 94; ?Pérès & Picard, 1964: 66.
Upogebia nitida; Le Loeuff & Intès, 1974: 58 (part.).
Upogebia cf. *nitida*; De Saint Laurent & Le Loeuff, 1979: 93.
Upogebia cf. *deltaura*; Kocatas, 1981: 162; Dworschak, 1992: 223.
Upogebia n. sp. "*mediterranea*" Noël, 1992: 82.
Upogebia mediterranea; Dworschak, 1983: 40 (nomen nudum); Froglia, 1995: 8; Asgaard et al., 1997: 23; Abed-Navandi & Dworschak, 1998: 609; d'Udekem d'Acoz, 1999: 157; Ngoc-Ho, 2001a: 110, fig. 3; Türkay, 2001: 289; Ngoc-Ho, 2003: 515, figs. 28, 29; Ngoc-Ho, 2005: 115.
Upogebia sp.; Thessalou-Legaki, 1986: 144.
Upogebia nitida mediterranea; d'Udekem d'Acoz, 1995: 60, 61, fig. 2.

Material examined. — OIM 229, 2 males (TL/CL, 26.0/7.8 – 31.0/9.8 mm), 18.xii.1908; OIM 540, 2 females (TL/CL, 34.0/10.7 – 36.0/10.9 mm), 9.iii.1908; SMF 29461, 1 male (TL/CL, 41.0/12.6 mm), Meloria sandflats, Livorno, Toscana, Italy, shallow-waters, 17.ix.1984, leg. G. Reiche; SMF 29462, 1 male (42.0/13.0), 1 female (51.0/14.1), no data; SMF 28328, 1 female (CL, 9.4, missing Abd. IV to telson), Iles d'Hyrères, Ile de Port Cros, Marseille, Provence-Alpes-Côte d'Azur, 1.8 m, 18.v.1983, leg. A. Willsie; SMF 28329, 1 male (34.0/10.3), Marseille, Provence-Alpes-Côte d'Azur, sediment with *Posidonia*, 1988, leg. A. Willsie; SMF 28330, 1 female (39.0/10.1, softly calcified specimen), Ponteau ca. 30 km W. of Marseille, Marseille, Provence-Alpes-Côte d'Azur, dead rhizomes of *Posidonia*, 13.ii.1978, ded. H. Zibrowius; SMF 29460, 1 juv. (8.0/2.9), Ponteau, Marseille, Provence-Alpes-Côte d'Azur, 1.8 m deep, dead rhizomes of *Posidonia*, 03.iii.1983, leg. A. Willsie; SMF 29459, 1 juv. (12.0/4.2), Ponteau,

Marseille, Provence-Alpes-Côte d'Azur, 1.8 m deep, dead rhizomes of *Posidonia*, 03.iii.1983, leg. A. Willsie; SMF 4970, 1 juv. (CL, 3.2 mm, lacking abdomen and telson), Limski Kanal, Rovinj, Croatia, dredged, 10.ix.1964.

Diagnosis. — No infrarostral spines; carapace unarmed on anterolateral margin; cervical groove smooth. A2 segment 3 unarmed. P1-2 meri with subdistal spine on dorsal margin; palm with a subdistal tooth on dorsal margin; dactylus denticulate on dorsal margin. Telson square in dorsal view.

Remarks. — This species is widely distributed in the Mediterranean, but Ngoc-Ho (2003: 516) has reported one female from near Pointe Noire, Congo, collected by dredging.

Type locality. — Tamaris-sur-Mer, near Toulon, France.

Distribution. — Mediterranean, and Congo.

Upogebia nitida (A. Milne-Edwards, 1868)

Gebiopsis nitidus A. Milne-Edwards, 1868: 63, pl. 18 figs. 4-7.
Gebiopsis nitidus; Miers, 1884: 282.
Gebia (*Gebiopsis*) *nitida*; Ortmann, 1893: 50, pl. 4 fig. 2.
Upogebia (*Gebiopsis*) *nitida*; Borradaile, 1903: 542.
Upogebia (*Calliadne*) *nitida*; De Man, 1928: 24 (list), 36, 50 (key).
Upogebia nitida; Le Loeuff & Intès, 1974: 58, figs. 20a-o, 20bis; De Saint Laurent & Le Loeuff, 1979: 37 (key), 38, fig. 2a-I; Ngoc-Ho, 2005: 115.

Material examined. — SMF 28327, 1 female (TL/CL, 52.0/15.1 mm), Livorno, Toscana, Italy, leg. G. Hertweck.

Remarks. — Le Loeuff & Intès (1974: 56) and De Saint Laurent & Le Loeuff (1979: 37) reported this species (as *U. deltaura*) from: Sierra Leone; Ivory Coast: Vridi, Jacqueville and Grand Bassam; and Togo; 37-80 m. However it is most probably the species described from those areas are to be assigned to the present species, *U. nitida*. De Saint Laurent et al. (1979: 40) mentioned that "la forte épine subdistale, mésio-dorsale, du carpe des P1, *U. deltaura* paraît apparentée d'une part à *U. crosnieri* Le Loeuff et Intès, d'autre part à *U. nitida*." However, in *U. nitida* as well as *U. deltaura* the P1 carpus has such a strong subterminal spine on the dorsal margin, so there is no distinction between those two species in this character.

Type locality. — São Vicente, Cape Verde Islands.

Distribution. — Mauritania (De Saint Laurent & Le Loeuff, 1979); Cape Verde Islands: São Vicente (A. Milne-Edwards, 1868; Ortmann, 1893; De Saint Laurent & Le Loeuff, 1979); Senegal (De Saint Laurent & Le Loeuff, 1979); Annobon Island (Le Loeuff & Intès, 1974; De Saint Laurent & Le Loeuff,

1979); São Tomé and Príncipe (De Saint Laurent & Le Loeuff, 1979); Congo: Pointe-Noire (Le Loeuff & Intès, 1974; De Saint Laurent & Le Loeuff, 1979); 18-60 m; Sierra Leone (as *U. deltaura*, De Saint Laurent & Le Loeuff, 1979); Ivory Coast: Vridi, Jacqueville and Grand Bassam (as *U. deltaura*, Le Loeuff & Intès, 1974); Togo (as *U. deltaura*, Le Loeuff & Intès, 1974; De Saint Laurent & Le Loeuff, 1979); 37-80 m.

Upogebia poensis De Saint Laurent & Ngoc-Ho, 1979

Upogebia poensis De Saint Laurent & Ngoc-Ho, 1979: 65, figs. 25-40; De Saint Laurent & Le Loeuff, 1979: 37 (key), 44, fig. 6.

Type locality. — Island of Fernando Póo, near Nigeria, 11 m.

Distribution. — Sierra Leone (De Saint Laurent & Le Loeuff, 1979); Nigeria: Fernando Póo (Balss, 1916; De Saint Laurent & Ngoc-Ho, 1979); 11-12 m.

Upogebia pusilla (Petagna, 1792) (fig. 10)

Astacus pusillus Petagna, 1792: 418, pl. 5 fig. 5. [Type locality: Naples: "Habitat in nostri maris arena."]

Thalassina littoralis Risso, 1816: 76, pl. 3 fig. 2.

Astacus litoralis; Martens, 1824: 495.

Bigea tipica Nardo, 1847: 47 (nomen nudum).

Bigea tipica Nardo, 1869: 67, 101, 123, 126, pl. 2 fig. 4; Borradaile, 1903: 544; De Man, 1928: 25 (list). [Type locality: unknown.]

Gebia venetiana Nardo, 1847: 78.

Thalassina litoralis; Grube, 1861: 125.

Gebia Helleri Marcuzen, 1867: 358.

Gebia Venetiarum Nardo, 1869: 314, pl. 13 fig. 3.

Gebia litoralis; Stalio, 1877: 107; Carus, 1885: 490.

Gebia littoralis; Desmarest, 1825: 234; H. Milne Edwards, 1837a: 313; H. Milne Edwards, 1837b: pl. 49 figs. 1-11; Lucas, 1840: 475; Heller, 1863: 205, pl. 5 figs. 12-15; Czerniavsky, 1868: 126; Lafont, 1868: 522; Fischer, 1872: 429; De Folin & Périer, 1879: 211; Boas, 1880: 82, pl. 1 fig. 33, pl. 2 fig. 54, pl. 3 fig. 113, pl. 4 fig. 140; Stossich, 1880: 206; G. O. Sars, 1883: 44; Claus, 1884: 746; Czerniavsky, 1884: 85; Graeffe, 1902: 69; ?Gibert i Olivé, 1920: 51, 1 fig.

Gebios littoralis; Risso, 1827: 51.

Gebia lacustris Costa, 1840: 4.

Gebia litoralis; Heller, 1863: 205, pl. 6 figs. 12-15; Stalio, 1877: 107; Ortmann, 1891: 53, pl. 1 fig. 6; Ortmann, 1893: 49; Ortmann, 1894: 21 (key); Graeffe, 1902: 69.

Upogebia littoralis; ?G. O. Sars, 1884: 182, pls. 3-5; Stebbing, 1902: 43; Balss, 1926 (key); Tucker, 1930: 1; Monod, 1937: 2; Makarov, 1938: 52; Bouvier, 1940: 107, fig. 71 (not 70); Popovici, 1940: 421, 485; Zariquiey Alvarez, 1946: 107, 108, pl. 5 fig. b, c; Gottlieb, 1953: 441; Dolgopolskaia, 1954: 198, figs. 11-12; Dolgopolskaia, 1969: 315; Heegaard, 1963: 460, figs. 34-39; ?Luther & Fiedler, 1965: 50, 175, fig. on pl. 23; Daguerre de Hureaux, 1971: 67, pls. 1-4; Ngoc-Ho, 1981: 245.

Upogebia (*Upogebia*) *littoralis*; Borradaile, 1903: 543; Pesta, 1912: 105; De Man, 1927: 29, pl. 3 fig. 11-11b; De Man, 1928: 23 (list), 36, 41 (key), 51, 54, 63, 64.

Upogebia (*Upogebia*) *litoralis*; Pesta, 1918: 197, fig. 61a.

Upogebia (*Upogebia*) *gracilipes* De Man, 1927: 40, pl. 4 fig. 15-15a, pl. 5 fig. 15b-d; De Man, 1928: 22 (list), 36, 42.

Upogebia stellata; Nobre, 1936: 122, fig. 102 (= *U. pusilla* (Petagna, 1792)); Webb, 1919: 84.

Upogebia litoralis; Ott et al., 1976: 62, figs. 1-3, tables 1, 2, pls. 1, 2; Balss, 1936: 14.

Upogebia gracilipes; Balss, 1936: 15; Bouvier, 1940: 110, fig. 73; Zariquiey Alvarez, 1946: 107 (key), 108; Bourdillon-Casanova, 1960: 109.

Upogebia littoralis Gottlieb, 1953: 440.

Upogebia pusilla; Holthuis, 1947: 321, fig. 1(5); Holthuis, 1956: 325; Bourdillon-Casanova, 1960: 109; Holthuis, 1961: 32; Lewinsohn & Holthuis, 1964: 54; Pérès & Picard, 1964: 55; Picard, 1965: 60; Băcescu, 1967: 220, figs. 101-103; De Gaillande, 1968: 382; Zariquiey Alvarez, 1968: 231, fig. 94a; Le Gall, 1969: 400; Števčić, 1969: 128; De Gaillande, 1970: 377; Ktari-Chakroun & Azouz, 1971: 21; De Saint Laurent, 1971: 1261 (key); Števčić, 1971: 529; Kattoulas & Koukouras, 1974: 346; Neves, 1974: 15, fig. 5; Pastore, 1976: 107; Thiriot, 1976: 350; Holthuis, 1977: 57; Merker Pocek, 1977: 110; Ngoc-Ho, 1977b: 313; Beaubrun, 1979: 77, fig. 49; Moncharmont, 1979: 73; De Saint Laurent & Le Loeuff, 1979: 37 (key), 43, fig. 5a; Bourdon, 1980: 1; Domenech et al., 1981: 150, figs. 37, 38; Dworschak, 1981: 25, figs. 1-8; Manning & Števčić, 1982: 296; Cottiglia, 1983: 74, figs. 27b, 28, 29; Dworschak, 1983: 20, figs. 1-14; García Raso, 1983: 320, fig. 1; Riedl, 1983: 483, pl. 177, 2 figs.; Chaud, 1984: 194; García Raso, 1985: 21; Thessalou-Legaki & Zenetos, 1985: 311; Müller, 1986: 117; Thessalou-Legaki, 1986: 182; d'Udekem d'Acoz, 1986: 103, figs. 3-5; Dworschak, 1987a: 338, figs. 1-7; Dworschak, 1987b: 421, fig. 1; Neves, 1987: 256; Türkay et al., 1987: 92; Dworschak, 1988: 52, figs. 1-10; d'Udekem d'Acoz, 1989: 176, fig. 6; Geiss, 1990: 208, 1 col. fig.; Moyse & Smaldon, 1990: 520, fig. 10, 13 (part.); Števčić, 1990: 215; Pérez Sánchez & Moreno Batet, 1991: 140, 1 fig.; Holthuis, 1991: 236, figs. 437-438; De Vaugelas, 1991: 56, photo 2; Dworschak, 1992: 224, fig. 18a, c, g, h; García Raso et al., 1992: 258; Koukouras et al., 1992: 223; Noël, 1992: 82; Mayoral et al., 1994: 236; Froglia, 1995: 8; González Pétez, 1995: 136; Hayward et al., 1995: 434, fig. 8.52 (part.); Moosleitner & Patzner, 1995: 120, 1 fig.; d'Udekem d'Acoz, 1995: 60; Falciai & Minervini, 1996: 149, 4 figs.; Astall et al., 1997b: 671, fig. 1, tables 1-5; Ingle, 1997: 80, fig. 7.4; Kevrekidis et al., 1997: 799, figs. 1-7, tables 1-3; De Vaugelas, 1998: 3, figs. 1-3; Pinn et al., 1999a: 103, fig. 2E, F; Pinn et al., 1999b: 1461, figs. 1F-H, 7, 8, tables 1-6; d'Udekem d'Acoz, 1999: 157; González-Gordillo et al., 2001: 279; Markham, 2001: 197, tables 1, 2; Martin, 2001: 82, 1 fig.; Türkay, 2001: 289; Lopez de Rosa et al., 2002: 88; Noël, 2002: 241; Ingle & Christiansen, 2004: 100, 106, figs. 75, 78.

Upogebia tipica; Holthuis & Gottlieb, 1958: 65; Picard, 1965: 114; Zariquiey Alvarez, 1968: 231; Števčić, 1969: 128; De Saint Laurent, 1971: 1261; Kattoulas & Koukouras, 1974: 346; Thiriot, 1976: 350; Beaubrun, 1979: 79, figs. 53, 54; Moncharmont, 1979: 73; Števčić, 1979: 282; Manning & Števčić, 1982: 296; Cottiglia, 1983: 78; García Raso, 1983: 320; Števčić, 1985: 313; Thessalou-Legaki & Zenetos, 1985: 311; Lewinsohn & Holthuis, 1986: 25; Thessalou-Legaki, 1986: 182; Dworschak, 1987c, pl. 3 fig. 11; Števčić, 1990: 216; Dworschak, 1992: 226, fig. 18b, d-f; Koukouras et al., 1992: 223; Noël, 1992: 83; Froglia, 1995: 8; Falciai & Minervini, 1996: 149, 1 fig.; d'Udekem d'Acoz, 1996: 60; Atkinson et al., 1998: 94, fig. 2; Pancucci-Papadopoulou et al., 1999: 393; d'Udekem d'Acoz, 1999: 158; González-Gordillo et al., 2001: 279; Türkay, 2001: 289.

Upogebia (*Upogebia*) *pusilla*; Noël, 1992: 82 (key).

Material examined. — SMF 28974, 14 males (TL/CL, 38.0/12.1 – 49.0/15.5 mm), 3 ovig. females (TL/CL, 43.0/13.8 – 49.0/14.5 mm), 13 females (TL/CL, 32.0/9.6 – 48.0/13.6 mm), Port Ligat, Cadaques, Cataluña, Spain, 1-5 m, leg. G. Fischer; SMF 28975, 5 males (TL/CL, 39.0/12.1 – 47.0/13.9 mm), 2 ovig. females (TL/CL, ca. 46.0/ca. 13.2 – 49.0/14.2 mm), 6 females (TL/CL, 36.0/10.7 – 46.0/14.2 mm), Port Ligat, Cadaques, Cataluña, Spain, leg. U. Pettke; SMF 28976, 8 damaged specimens, Port Ligat, Cadaques, Cataluña, Spain, 30.viii.1985, leg. M. Türkay; SMF 5135, 1 male (TL/CL, 43.0/13.2 mm), Arcachon, Bay of Biscay, France, ix.1962, leg. R. Kinzebach; SMF 4971, 1 female (TL/CL, 32.0/9.9 mm), Bay of St. Jean de Luz, France, 13.ii.1914; SMF 110, 1 male (TL/CL, 32.0/10.9 mm), Nice, France; SMF 4946, 1 male (TL/CL, 31.0/9.7 mm), Nice, France, leg. Bonelli; SMF 28322, 1 female (TL, ca. 45 mm, damaged), Ponteau, ca. 30 km W. of Marseilles, Provence-Alpes-Côte d'Azur, France, dead rhizomes of *Posidonia*, ded. H. Zibrowius; SMF 28321, 2 males (TL/CL, 9.0/2.8 – 15.0/4.3 mm), Campania, Italy, leg. Dörjes; SMF 30180, 2 juvs., Licola near Napoli, Campania, Italy, 26.ix.1968, leg. J. Dörjes; SMF 28326, 1 female (TL/CL, 44.0/12.2 mm), Licola, N. of Napoli, Gaeta Bay, Campania, Italy, 1966-1968, leg. Dörjes; SMF 2550, 1 male (TL/CL, 48.0/14.4 mm), Golfo di Napoli, Italy, 22.vii.1959, leg. R. Bott; SMF 4965, 11 males (TL/CL, 38.0/12.9 – 56.0/17.6 mm), 1 ovig. female (TL/CL, 53.0/15.0 mm), 6 females (TL/CL, 46.0/13.4 – 55.0/16.1 mm), Napoli, Campania, Italy, 1939, leg. Bott; SMF 2570, 1 female (TL/CL, 47.0/14.1 mm), Golfo di Napoli, Italy, 29.vii.1959, leg. R. Bott; SMF 4964, 3 females (TL/CL, 54.0/16.0 – 57.0/16.2 mm), Napoli, Campania, Italy, leg. Bott; SMF 11417, 1 female, damaged on carapace (TL/CL, 46.0/12.0 mm), Gulf of Venice, Italy, 6 m, dredge, 12.vii.1983, leg. A. Allspach; SMF 12101, 1 male (TL/CL, 15.0/5.1 mm), 1 female (TL/CL, 16.0/5.1 mm, lacking Plp1), Sotto Castello, Limski Canal, Rovinj, Croatia, 28 m, mud, ring dredge, 13.ix.1983, Excursion of Frankfurt University; SMF 12098, 1 juv. (TL/CL, 9.0/3.5 mm), 1 female (TL/CL, 14.0/5.0 mm), Sotto Castello, Limski Canal, Rovinj, Croatia, 28 m, mud, ring dredge, 13.ix.1983, Excursion of Frankfurt University; SMF 12098, 1 female (TL/CL, 14.0/5.0 mm), 1 juv. (TL/CL, 9.0/3.5 mm), Sotto Castello, Limski Canal, Rovinj, Croatia, 28 m, mud, ring dredge, 13.ix.1983, Excursion of Frankfurt University; SMF 25689, 2 males (TL/CL, 34.0/10.4 – 37.0/11.8 mm), 5 females (TL/CL, 30.0/9.1 – 55.0/15.6 mm), landward end of Limski Canal, Rovinj, Croatia, tidal zone, Yabby pump, 01.xi.1993, Excursion of Frankfurt University; SMF 4945, 1 female (TL/CL, 27.0/8.8 mm), Vrsar, Limski Canal, N. of Rovinj, Istria, Croatia, 13.v.1911, leg. A. Sendler; SMF 14034, 6 males (TL/CL, 27.0/8.4 – 47.0/15.2 mm), 5 ovig. females (TL/CL, 36.0/10.5 – 49.0/16.0 mm), end of Limski Canal, Rovinj, Istria, Croatia, vii.1982, leg. U. Pettke; SMF 25690, 8 males (TL/CL, 35.0/11.5 – 54.0/17.0 mm), 2 females (TL/CL, 50.0/14.3 – 46.0/10.9 mm), land side of Limski Canal, Rovinj, Istria, Croatia, Rov. 93-13, *Callianassa*-pump, fresh water, 1.ix.1993 in excursion of Univ. Frankfurt; SMF 12087, 17 males (TL/CL, 13.0/3.7 – 35.0/11.3 mm), 4 females (TL/CL, 19.0/5.9 – 49.0/15.0 mm), end of Limski Canal, Rovinj, Istria, Croatia, mud-ground, 0-1 m, 10.ix.1983, in excursion of Univ. Frankfurt; SMF 14015, 1 male (TL/CL, ca. 49.0/ca. 14.0 mm, lacking rostrum), 2 females (TL/CL, 27.0/8.4 – CR, 13.0 mm, lacking Abd3-telson), end of Limski Canal, Rovinj, Istria, Croatia, mud-ground, shallow water level under stones, 12.ix.1985, in excursion of Univ. Frankfurt; SMF 11078, 4 males (TL/CL, 41.0/12.7 – 51.0/17.3 mm), 5 females (TL/CL, 29.0/9.1 – 44.0/13.0 mm), 2 Form II (polymorphic) males (TL/CL, 28.0/8.8 – 49.0/15.7 mm), Val Salina, Rovinj, Croatia, ca. 10 m, collected from living hole in a narrow channel in mud-flats, 4.viii.1981, Excursion of Frankfurt University; SMF 28325, 2 males (TL/CL, 43.0/13.8 – 46.0/14.0 mm), Val Salina, Rovinj, Istria, Croatia, 21.viii.1989, dredge, R/V "Burin"; SMF 4966, 139 males (TL/CL, 19.0/5.8 – 55.0/16.0 mm), 29 ovig. females (TL/CL, 30.0/8.7 – 49.0/14.7 mm), 92 females (TL/CL, 19.0/5.6 – 48.0/14.5), Val Salina, Rovinj, Istria, Croatia, 1914, leg. Nick; SMF 25692, 3 males (TL/CL, 21.0/6.2 – 36.0/11.0 mm), 4 females (TL/CL, 29.0/8.2 – 39.0/11.4 mm), Val Salina, Rovinj, Istria, Croatia, Rov. 97-07, *Callianassa*-pump, salt meadow, muddy fauna, 23.viii.1997, in excursion of Univ. Frankfurt;

SMF 25697, 5 males (TL/CL, 28.0/8.0 – 29.0/8.7 mm), 3 females (TL/CL, 27.0/9.1 – 46.0/13.0 mm), Val Salina, Rovinj, Istria, Croatia, Rov. 99-22, *Callianassa*-pump, salt meadow, in tidal channel, shallow water, 2.ix.1999, leg. R/V "Burin"; SMF 12058, 9 males (TL/CL, 15.0/5.1 – 40.0/13.0 mm), 5 females (TL/CL, 23.0/6.9 – 39.0/12.3 mm), Val Salina, Rovinj, Istria, Croatia, salt field, tidal channel in eulittoral, 5.ix.1983, in excursion of Univ. Frankfurt; SMF 11077, 1 male (TL/CL, 45.0/14.8 mm), surroundings of Rovinj, Istria, Croatia, viii.1981, Excursion of Frankfurt University; SMF 25688, 1 female (TL/CL, 44.0/13.5 mm), Kuvi Bay, S.E. of Rovinj, Croatia, 24.viii.1983, shallow water, Yabby pump, Excursion of Frankfurt University (female Plp1 uniramous, two-segmented); SMF 25694, 6 males (TL/CL, 30.0/9.6 – 47.0/15.3 mm), 4 ovig. females (TL/CL, 33.0/9.3 – 38.0/12.3 mm), 7 females (TL/CL, 27.0/8.3 – 40.0/12.4 mm), 1 male, missing Abd3 to telson (CL, 12.3 mm), 45°05.550′N 013°37.370′E, 24.4 m, Bay of Valdibora, Rovinj, Croatia, Van Veen grab, 24.viii.1999, R/V "Burin"; SMF 25693, 3 males (TL/CL, 32.0/10.7 – 36.0/11.5 mm), 1 ovig. female (TL/CL, 30.0/8.0 mm), 45°05.470′N 013°37.420′E, 25.3 m, Bay of Valdibora, Rovinj, Croatia, Van Veen grab, 24.viii.1999, R/V "Burin"; SMF 25696, 1 male (TL/CL, 26.0/8.3 mm), 1 ovig. female (TL/CL, 40.0/11.8 mm), 5 females (TL/CL, 21.0/6.6 – 39.0/12.0 mm), 45°05.250′N 013°38.000′E, 25.9 m, Bay of Valdibora, Rovinj, Croatia, Van Veen grab, 30.viii.1999, R/V "Burin"; SMF 13947, 3 males (TL/CL, 34.0/10.8 – 46.0/15.3 mm), 3 females (TL/CL, 48.0/13.9 – 49.0/14.1 mm), Rovinj, Istria, Croatia, Kuvi Bay, ca. 2.5 km S. of Rovinj, sea meadow, 1 m, 9.ix.1985, in excursion of Univ. Frankfurt; SMF 23843, 10 males (TL/CL, 16.0/4.9 – 47.0/14.3 mm), 7 females (TL/CL, 9.0/3.2 – 39.0/12.2 mm), Kuvi Bay, S.E. of Rovinj, Istria, Croatia, Rov. 95/6e, muddy and sandy ground, 2.ix.1995, in excursion of Univ. Frankfurt; SMF 25691, 4 males (TL/CL, 28.0/8.7 – 49.0/15.2 mm), 6 females (TL/CL, 26.0/7.5 – 50.0/14.6 mm), Kuvi Bay, Rovinj, Istria, Croatia, Rov. 97-10c, *Callianassa*-pump, sand ground, 26.viii.1997, in excursion of Univ. Frankfurt; SMF 9865, 2 females (TL/CL, 44.0/14.3 – 47.0/10.4 mm), Kuvi Bay, ca. 2.5 km S. of Rovinj, Istria, Croatia, sandy ground, muddy, ca. 1 m, 5.ix.1974, leg. M. Türkay; SMF 13959, 3 females (TL/CL, 27.0/8.1 – 43.0/12.0 mm), Val Salina, Rovinj, Istria, Croatia, salt meadow, 9.ix.1985, in excursion of Univ. Frankfurt; SMF 25695, 1 female (TL/CL, 50.0/13.7 mm), Kuvi Bay, Rovinj, Istria, Croatia, Rov. 99-10c, 0.3-1 m, *Callianassa*-pump, muddy ground, 28.viii.1999, in excursion of Univ. Frankfurt; SMF 26925, 7 males (TL/CL, 25.0/8.0 – 47.0/13.8 mm), 18 females (TL/CL, 24.0/7.0 – 48.0/14.0 mm), Rovinj, Istria, Croatia, Kuvi Bay, ca. 2.5 km S. of Rovinj (Villas Rubin), Yu-87/4c, 0.3-0.5 m, muddy place, 16.ix.1987, in excursion of Univ. Frankfurt; SMF 28323, 2 males (TL/CL, 27.0/8.8 – CL, 14.5 mm, lacking Abd3-telson), 3 females (TL, ca. 13.5 mm, lacking carapace – 47.0/15.3 mm), Rovinj, Istria, Croatia, Kuvi Bay, Yu-89/10, seaweed field, 18.viii.1989, in excursion of Univ. Frankfurt; SMF 12134, 3 females (TL/CL, 44.0/12.9 – 60.0/17.2 mm), Kuvi Bay, Rovinj, Istria, Croatia, ca. 2.5 km S. of Rovinj, sandy ground, 1 m, 8.ix.1983, in excursion of Univ. Frankfurt; SMF 12135, 5 males (TL/CL, 13.0/4.6 – 47.0/12.9 mm), 1 ovig. female (TL/CL, 59.0/17.0 mm), 5 females (TL/CL, 23.0/7.2 – 55.0/16.1 mm), Kuvi Bay, ca. 2.5 km S. of Rovinj, Istria, Croatia, in algae field, 2 m, 8.ix.1983, in excursion of Univ. Frankfurt; SMF 13958, 2 males (TL/CL, 32.0/11.2 – 40.0/12.4 mm), Kuvi Bay, Rovinj, Istria, Croatia, ca. 2.5 km S. of Rovinj, sandy ground, 9.ix.1985, in excursion of Univ. Frankfurt; SMF 14038, 3 ovig. females (TL/CL, 49.0/14.2 – 49.0/14.4 mm), 1 female (TL/CL, 49.0/14.5 mm), Villas Rubin, Rovinj, Istria, Croatia, shallow water level, vii.1982, leg. U. Pettke; SMF 28324, 2 males (TL/CL, 29.0/8.9 – 32.0/9.9 mm), 2 females (ca. 43.0/ca. 12.7, lacking rostrum – 45.0/12.4, in a state of soft shell), Rovinj, Istria, Croatia, Yu-87, 1987, in excursion of Univ. Frankfurt; SMF 30177, 8 males (TL/CL, 22.0/6.9 – 49.0/15.3 mm), 2 ovig. females (TL/CL, 48.0/15.0 – 49.0/15.7 mm), 7 females (TL/CL, 19.0/6.2 – 48.0/14.2 mm), 5 fragments, Thermaikos Gulf, Greece, leg. A. Koukouras; SMF 7393, 1 female (TL/CL, 5.3/15.2 mm), 1 ovig. female (TL/CL, 57.0/15.7 mm), Thermaikos Gulf, Greece, 7.vi.1971,

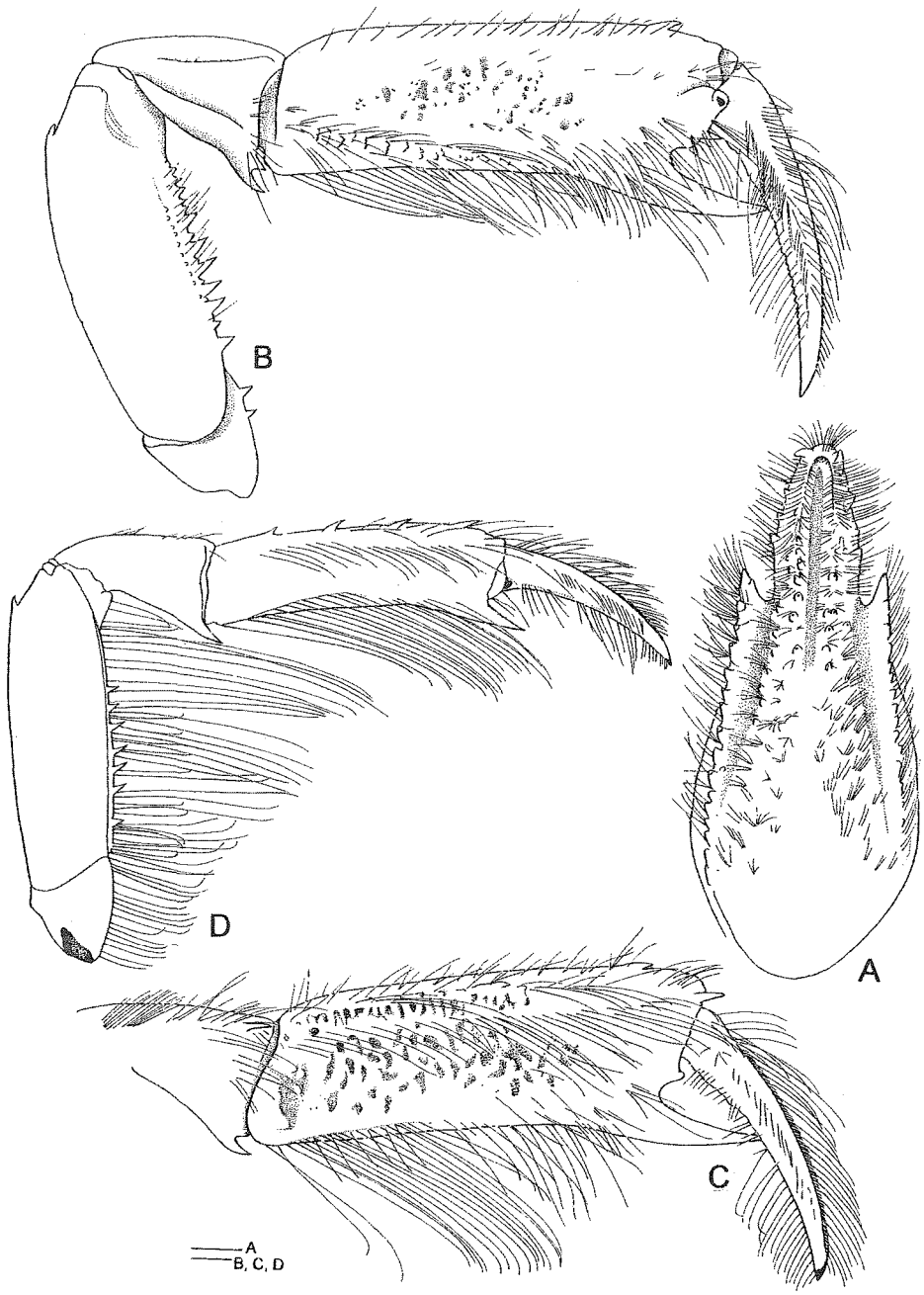

Fig. 10. *Upogebia pusilla* (Petagna, 1792). A, cephalic region, dorsal view; B, male P1 of right side, lateral view; C, same, mesial view; D, female P1 of left side, mesial view. A-D, SMF 30177, Thermaikos Gulf, Greece.

leg. A. Koukouras; SMF 7388, 1 male (TL/CL, 52.0/18.0 mm), 1 male with left Plp1 (TL/CL, 47.0/15.0 mm), Gulf of Evvoia, Greece, 5.vi.1971, leg. Koukouras; SMF 30178, 1 male (TL/CL, 49.0/15.8 mm), 1 male lacking Abd2-telson (CL, 12.5 mm), 1 ovig. female (TL/CL, 44.0/13.1 mm), 1 ovig. female lacking Abd3-telson (CL, 13.5 mm), 1 female (TL/CL, 47.0/13.8 mm), Thermaikos Gulf, Greece, leg. A. Koukouras; SMF 30179, 1 female (TL/CL, 28.0/6.3 mm),Greece, leg. A. Koukouras; SMF 5139, 4 males (TL/CL, 37.0/11.9 – 30.0/9.8 mm), 1 female (TL/CL, 37.0/9.5 mm), Bay of Faliron, Piraeus, Greece, 28.iii.1963, leg. Kinzelbach; SMF 8048, 26 males (TL/CL, 23.0/6.6 – 40.0/13.1 mm), 25 females (TL/CL, 21.0/6.4 – 35.0/11.5 mm), Flavion Bay, Piraeus, Greece, 28.iii.1963, leg. Kinzelbach; SMF 12564, 2 males (TL/CL, 36.0/11.4 – 38.0/12.2 mm); 1 ovig. female (TL/CL, 34.0/10.5 mm), 3 females (TL/CL, 4.0/11.7 – 5.0/14.4 mm), 4 females, Vasilikos Ormoz, Peristera, Northern Sporades, Greece, 33°11.5′N 23°58.35′E, littoral, 7.vii.1978, leg. M. Türkay; SMF 12565, 6 males (TL/CL, 35.0/10.9 – 39.0/12.5 mm), 11 ovig. females (TL/CL, 32.0/9.3 – 41.0/11.9), 5 females (TL/CL, 30.0/9.6 – 44.0/12.4 mm), Vasilikios Ormoz, Peristera, N. Sporades, Greece, 8.vii.1978, leg. M. Türkay; SMF 18343, 1 male (TL/CL, 16.0/5.0 mm), 2 females (TL/CL, ca. 21.0/6.5 – 22.2/7.2 mm), off Tel Aviv, Israel, E. Mediterranean Sea, Stat. Me 5/50-Ku (32°02.38′N 34°35.05′E – 32°00.95′N 34°34.52′E), 95-103 m, beam trawl, 26.i.1987, leg. R/V "Meteor"; SMF 5069, 9 males (TL/CL, 37.0/11.7 – 53.0/17.4 mm), 10 ovig. females (TL/CL, 40.0/12.4 – 50.0/16.0), 17 females (TL/CL, 37.0/11.3 – 56.0/17.3 mm), no data; ZMG, 1 male (TL/CL, 51.0/14.8 mm), 3 females (TL/CL, 33.0/9.8 – 65.0/17.4 mm), no data; SMF 30868, 1 male (TL/CL, 43.0/12.0 mm), Rov. 01-30d, Kuvi (= Villas Rubin), Istria, Croatia, 45°3.934′N 13°39.163′E, muddy sand, 0-1 m, 23.viii.2001, leg. M. Türkay; SMF 30869, 1 ovig. female (TL/CL, 51.0/14.7 mm), Valdibora, Istria, Croatia, 45°5.361′N 13°38.148′E, mud, 19 m, Van Veen grab, 16.viii.2001, R/V "Burin"; SMF 30870, 1 male (CL, 17.0 mm, lacking abdominal somites 2-6 and telson), off Ludias river estuary, inner part of Thermaikos Gulf, Greece, 0.90 m, 23.i.1977, leg. A. Koukouras; ZMMU, 1 male (TL/CL, 63.0/19.6 mm), Sevastopol Bay, Ukraine, Black Sea, 1997, leg. Amozov; ZMTU, 2 females (TL/CL, 56.0/16.8; 56.0/16.2), near Gelinzhik, Russia, Black Sea, 25 m, 9.ix.1999.

Diagnosis. — Anterolateral margin of carapace with spine. A1 segment 1 bearing ventrodistal spine. A2 segment 3 bearing ventrodistal spine. Rostrum variable in length and spinulation, less or more than 1.5 times as long as broad at base, and bearing 4-8 teeth on each lateral margin.

P1 (fig. 10A, B, C) variable in shape and spinulation. Merus beset with 3-12 spines and spinules on ventromesial margin; palm 1.1-3.7 times (table I) as long as broad, dorsal margin distinctly or weakly carinate, and with or without subdistal spine; mesial surface bearing two subdorsal carinae, upper subdorsal carina denticulate or spinulose, and lower subdorsal carina with long setae, bearing one distal spine or a row of 2-4 interspaced spines below upper subdorsal carinae (in larger female specimens); lateral surface bearing subdorsal carina with sparsely distributed long setae. Distal margin of mesial surface with or without distal spine, another one just above fixed finger; distal margin of lateral surface with or without distal spine just above fixed finger, and another subdorsal spine. All of those spines present or not, depending on the individual (see table II). Telson approximately quadrate or broader than long; uropodal exopod about as long as broad or longer than broad.

Remarks. — Ngoc-Ho (2003: 528, 538) described the differences between *Upogebia pusilla* and *U. tipica* as below:

1. The rostrum is 1.2-1.3 times as long as broad with four or five teeth on each lateral margin in *U. pusilla*, whereas 1.5-2.2 times as long as broad with six to eight teeth on each lateral margin in *U. tipica*.
2. P1 merus bears three to six spines and spinules on proximal half of the ventral margin in *U. pusilla*, whereas it bears 7-12 spines and spinules on two-thirds or the whole ventral margin in *U. tipica*.
3. Pl palm slenderness: the ratio of length/width is 1.7-2.65 in males, 2.15-2.8 in females, and 2.8-3.8 in juveniles in *U. pusilla*; whereas it is 3-4 in the east Mediterranean, 2.5-3.0 in the west in *U. tipica*.
4. P1 palm bears a dorsal tuberculate crest on the mesial surface, a dorsomesial subdistal, and a distal spine present, and a median distal spine near the prehensile margin of the dactylus present, a dorsolateral smooth crest often present, in *U. pusilla*; whereas it bears a dorsal row of two to four spines on the mesial surface and a dorsomesial subdistal and a distal spine present, and there is no mesial distal spine near the prehensile margin of the dactylus, no dorsal smooth crest on the lateral surface, in *U. tipica*.

De Saint Laurent also separated these two species, *U. pusilla* and *U. tipica*, in her unpublished key (in French) as shown below:

1a. Rostrum less than twice as long as broad. Mesial surface of P1 palm bearing low carina near dorsal margin, sometimes denticulate. P1 palm 1-2 times as long as broad in males, and 2.8 times in females ..... *U. pusilla*

1b. Rostrum more than twice as long as broad. Mesial surface of P1 palm bearing carina near dorsal margin, strongly denticulate. P1 palm 3 times as long as broad in males and 4 times in females ..... *U. tipica*

It is known that the ratio of the rostral length to width is different between *U. pusilla* and *U. tipica*. In *U. pusilla*, the rostrum ratio is 1.2-1.3, whereas it is 1.5-2.2 in *U. tipica*. However, those differences are not discriminative as a specific character, because it is certain that the rostrum is elongate, i.e., 2.0-2.5 times as long as broad, in the small male and female specimens from Tel Aviv (SMF 18343), whereas the rostrum is less than twice as long as broad in most male and female specimens from Spain, Croatia, and Greece (table I).

In one of the female specimens (SMF 30177, TL/CL, 49.0/15.3 mm, from Thermaikos Gulf, Greece), the rostrum is 1.8 times as long as broad at base (table I), as in *U. tipica* (according to the above-cited criterion of Ngoc-Ho, 2003, no. 1) or as in *U. pusilla* (according to the above-cited criterion of De Saint Laurent, key 1a). However, the ratio of length/width of P1 palm is 3.5 as in juveniles of *U. pusilla*, or in *U. tipica* in the eastern Mediterranean (Ngoc-Ho's, 2003, criterion no. 3); or as in *U. tipica* (De Saint Laurent's criterion, key 1b); P1 merus armed with a row of 15 spines and spinules on the ventromesial

TABLE I

Relative ratios of the P1 palm according to body length and sex in specimens either assigned to *Upogebia pusilla* (Petagna, 1792), or to *U. tipica* (Nardo, 1869)

TL (mm)	Sex	Rostrum length mm	Rostrum width mm	Rostrum length/ width ratio	P1 palm length mm	P1 palm width mm	P1 palm length/ width ratio
			SMF 28974 from Spain, 1-5 m depth				
36.0	male	2.0	1.3	1.5	5.1	2.7	1.9
38.0	male	2.0	1.4	1.4	6.0	3.3	1.8
44.0	male	2.2	1.3	1.7	7.4	3.9	1.9
46.0	male	2.2	1.5	1.5	7.8	4.3	1.8
49.0	male	2.2	1.6	1.4	8.7	4.8	1.8
32.0	female	1.4	1.3	1.1	3.7	1.5	2.5
35.0	female	1.6	1.2	1.3	4.2	1.9	2.2
44.0	female	1.8	1.1	1.6	5.4	2.5	2.2
47.0	female	1.8	1.1	1.6	6.3	3.2	2.0
49.0	female	1.8	1.4	1.3	6.3	2.9	2.2
			SMF 25689, Rovinj, Croatia, tidal zone				
33.0	male	1.2	0.7	1.7	4.7	2.4	2.0
36.0	male	1.3	1.0	1.3	5.8	2.8	2.1
29.0	female	1.4	1.1	1.3	4.3	2.0	2.2
36.0	female	–	–	–	5.4	2.6	2.1
46.0	female	1.8	1.6	1.1	6.0	2.6	2.3
46.0	female	1.8	1.3	1.4	7.1	3.7	1.9
54.0	female	2.0	1.8	1.1	7.6	3.4	2.2
			SMF 12565, Greece, 20 cm depth				
34.0	male	1.8	1.3	1.4	6.7	3.8	1.8
38.0	male	2.0	1.3	1.5	7.6	3.8	2.0
38.0	male	2.0	1.2	1.7	7.6	4.7	1.6
39.0	male	2.0	1.2	1.7	7.4	4.2	1.7
42.0	male	2.1	1.2	1.8	7.5	4.3	1.7
30.0	female	1.5	1.1	1.4	3.6	1.3	2.8
32.0	female	1.5	1.1	1.4	4.1	1.8	2.3
32.0	female	1.6	1.0	1.6	4.6	2.2	2.1
33.0	female	1.6	1.0	1.6	4.2	1.7	2.5
34.0	female	1.8	1.1	1.5	4.4	2.2	2.0
40.0	female	1.9	1.3	1.5	5.2	2.5	2.1
			SMF 30177, Greece				
21.0	male	1.1	0.7	1.4	3.0	1.1	2.7
29.0	male	1.1	0.7	1.6	3.7	1.5	2.5
33.0	male	1.3	0.9	1.4	4.5	1.9	2.4

TABLE I

(Continued)

TL (mm)	Sex	Rostrum length mm	Rostrum width mm	Rostrum length/ width ratio	P1 palm length mm	P1 palm width mm	P1 palm length/ width ratio
46.0	male	2.6	1.2	2.2	8.8	3.1	2.8
48.0	male	2.7	1.4	1.9	10.4	3.4	3.1
23.0	female	1.3	0.9	1.4	3.4	1.1	3.1
34.0	female	1.3	0.8	1.6	4.9	1.7	2.9
45.0	female*)	1.8	0.9	2.0	6.5	2.9	2.2
49.0	female**)	2.2	1.2	1.8	6.9	2.0	3.5
50.0	female***)	2.3	1.2	1.9	6.0	2.2	2.7
		SMF 18343, Tel Aviv, 95-103 m depth					
16.0	male	1.2	0.6	2.0	–	–	–
22.2	female*)	1.0	0.4	2.5	3.3	0.7	4.7

*) 3 spines present along upper subdorsal carina on mesial surface of P1 palm; **) 4 spines; ***) one spine.

margin, though 7-12 spines in *U. pusilla* (cf. Ngoc-Ho's, 2003, criterion no. 2); the rostrum is armed with only four teeth (fig. 10A) on each lateral margin as in *U. pusilla* (cf. Ngoc-Ho's, 2003, criterion no. 1) (cf. Ngoc-Ho, 2003, fig. 32A, B); the mesial surface of the P1 palm beset with a dorsal row of tubercles as in *U. pusilla* (cf. Ngoc-Ho's, 2003, criterion no. 4, as spines), and the mesiodistal margin of the P1 palm with a dorsal and a ventral spine above the prehensile edge of the dactylus as in *U. pusilla* (cf. Ngoc-Ho's, 2003, criterion no. 4); the dactylus is denticulate on the prehensile margin, the telson is broader than long, and the uropodal exopod has a subterminal spinule on the lateral margin as in *U. tipica* (cf. Ngoc-Ho, 2003, fig. 36H, I). In regard to the distribution of spines on the Pl palm, it is difficult to separate these two species as shown in table II.

Regarding the slenderness of the P1 palm, the ratio length/width would allegedly be 3.0-4.0 in specimens from the eastern Mediterranean, against 2.5-3.0 in those from the western part (Ngoc-Ho, 2003: 540). However, such differences between eastern (from Greece, SMF 30177) and western specimens (from Spain, SMF 28974) were not observed in the present study. Also, the spinulation of the P1 palm is not constant in the females examined, as shown in table I. Hence, this makes it impossible to distinguish the two species, as neither the ratio of breadth and length of the P1 palm, nor the spinulation constitute decisive characters to separate these two nominal species.

TABLE II

Distribution of spines on the P1 palm in specimens either assigned to *Upogebia pusilla* (Petagna, 1792), or to *U. tipica* (Nardo, 1869)

Specimens SMF 28974, size (mm)	Dorsal margin of P1 palm	Mesial surface of P1 palm			Lateral surface of P1 palm	
	Subddistal spine(s) on dorsal carina	Distal spine just above fixed finger	Distal spine on upper subdorsal carina	Subdistal or interspaced spines on upper and lower subdorsal carinae	Distal spine just above fixed finger	Subdorsal spine on distal margin of fixed finger
Male (CL, 15.5)	1	–	1	1 spine and a scanty spinous row	1	–
Male (CL, 14.7)	–	–	1	2 spines, 0 and 4 spinulose rows	1	–
Male (CL, 6.1)	1	–	1	1 spinulose row	1	–
Ovig. female (CL, 12.8)	3 interspaced	–	–	1	–	1
Ovig. female (CL, 14.5)	1	–	–	1	1	–
Female (CL, 14.0)	1	1	1	–	1	1
Female (CL, 11.1)	1	1	1	–	1	–

In larger females (from Greece, SMF 30177), the rostrum bears 5-6 lateral teeth as in *U. pusilla* (cf. Ngoc-Ho's, 2003, criterion no. 1), and the P1 palm is slender, bearing four dorsal teeth (fig. 10D) as in *U. tipica* (cf. Ngoc-Ho's, 2003, criterion no. 4). In the larger one of the two small females (Tel Aviv, approx. 100 m depth, SMF 18343) from off Israel, E. Mediterranean Sea (= the eastern specimens), the rostrum is triangular, with three spines on each lateral margin as in *U. pusilla* (4 or 5 spines in Ngoc-Ho's, 2003, criterion no. 1); the ratio of length/breadth of the palm on the left side is 5.0, more slender than in *U. tipica* (3.8 in juvenile *U. pusilla*, and 4.0 in *U. tipica* from the eastern Mediterranean, as in Ngoc-Ho's, 2003, criterion no. 3), and it bears two sharp spines on the dorsomesial carina in the proximal half, and another sharp spine subdistally on the dorsal carina as in *U. pusilla* or *U. tipica* (cf. Ngoc-Ho's, 2003, criterion

no. 4). In the small female specimen (SMF 12101) from Sotto Castello, Limski Canal, Rovinj, Istria, Croatia (the middle Mediterranean specimen), the rostrum is elongate and armed with eight spines on each lateral margin as in *U. tipica* (cf. Ngoc-Ho's, 2003, criterion no. 1); the P1 palm is elongate, armed with two sharp spines below the dorsomesial carina, and subdistally with another sharp spine on the dorsal margin, while the mesial distal margin lacks a spine near the prehensile margin of the dactylus as in *U. tipica* (cf. Ngoc-Ho's, 2003, criterion no. 4). In the small male specimens, the rostrum is elongate and also armed with eight spines on each lateral margin as in *U. tipica*; the P1 palm is elongate, bearing three sharp spines below the dorsomesial carina and subdistally another sharp spine on the dorsal margin, while the mesiodistal margin is lacking a spine near the prehensile margin of the dactylus as in *U. tipica*.

In the western specimens from Port Ligat, Cadaqués, Cataluña, Spain (SMF 28974) (table I), the mesiodistal margin of the P1 palm bears either no spine, or only a mesial distal spine near the prehensile margin of the dactylus as seen in table I. The dorsal margin of the P1 palm bears 3 spines in one female, whereas no spines are seen in the other female and male specimens.

As a result, it is possible to say that characters that could be used to separate those two nominal species are not found on the rostrum, nor in the relative length of the P1 palm, nor in body size, nor in sexual characters, nor in localities between the western and the eastern Mediterranea, nor in habitat in either the littoral or sublittoral zones: so that it is most probable that *U. tipica* is to be synonymized with *U. pusilla*, as has consequently been done herein.

Type locality. — Naples, Italy.

Distribution. — Atlantic: Mauritania (De Saint Laurent & Le Loeuff, 1979); Canary Islands (Pérez Sánchez & Moreno Batet, 1991); Tenerife? (Dworschak, 1992); Morocco, Atlantic side (Beaubrun, 1979); France: Atlantic side of France (d'Udekem d'Acoz, 1986, 1989; Bourdon, 1989); Bay of Biscay (Domenech et al., 1981; Chaud, 1984); Portugal (De Man, 1928; Neves, 1974, 1987); Mediterranean (H. Milne Edwards, 1837a; Moncharmont, 1979); Alboran Sea (García Raso, 1983); Spain: south-west coast of Spain (García Raso, 1985; Mayoral et al., 1994), Cataluña, Baleares, Cabo Creus, and Isla Massina, Cadaqués (Zariquiey Alvarez, 1946, 1968); Mediterranean side of France, Marseille (Bouvier, 1940), Nice (Borradaile, 1903; De Man, 1928); Italy: Sicily (De Man, 1928, from Messina; Dworschak, 1992), Naples (Ortmann, 1891; De Man, 1928; Dworschak, 1992), Gulf of Naples (De Man, 1927), southern central Mediterranean (Heller, 1863; De Gaillande, 1970; Ktari-Chakroun & Azouz, 1971); Adriatic Sea: (Stalio, 1877; Pesta, 1918; De Man, 1928; Ševčić, 1990); Piran Gulf (Manning & Ševčić, 1982; Dworschak, 1992), Spalato [= Split], Cadaqués,

Ajaccio, Lio di Staranzano, Lagoon of Grado, Punta Sabbioni, Emilia Romagna near Bellaria, Slovenia, Bay of Strunjan, Croatia (Dworschak, 1992); Ionia Sea (Thessalou-Legaki, 1986; d'Udekem d'Acoz, 1996); Aegean Sea (Koukouras et al., 1992); Turkey: Smyrna [= Izmir] (Dworschak, 1992); eastern Mediterranean (Balss, 1936, as *U. littoralis*; Lewinsohn & Holthuis, 1964; Kocatas, 1981); Cyprus (Lewinsohn & Holthuis, 1986, as *U. tipica*); Israel (Holthuis & Gottlieb, 1968); Sea of Marmara (Müller, 1986); Black Sea (Czerniavsky, 1884; De Man, 1928; Makarov, 1938; Dolgopolskaia, 1954, 1969; Băcescu, 1967); Suez Canal (Monod, 1937, as *U. littoralis*).

Upogebia senegalensis Ngoc-Ho, 2001

Upogebia senegalensis Ngoc-Ho, 2001a: 109-116, 3 figs., 1 table.

Remarks. — The species, *U. senegalensis* Ngoc-Ho, 2001 from Dakar, Senegal was separated from *U. nitida* (A. Milne-Edwards, 1868), from São Vicente, Cape Verde Islands, by Ngoc-Ho (2001a), because *U. senegalensis* differs from *U. nitida* by the elongated triangular shape of its rostrum as well as the spinulation of its pereiopod 1, with a dorsal subdistal spine or tooth on the merus and propodus.

Type locality. — Dakar, Senegal.

Distribution. — Dakar, Senegal.

Upogebia stellata (Montagu, 1808)

Cancer (*Astacus*) *stellatus* Montagu, 1808: 89, pl. 3 fig. 5.

Gebia stellata; Leach, 1815: 342, pl. 31 figs. 1-8; Desmarest, 1825: 204; Bell, 1846: 223, 1 fig.; White, 1847a: 70; Bell, 1853: 223, fig.; White, 1857: 97, pl. 7 fig. 3; ?Bonnier, 1887: 248; Stebbing, 1902: 43; Stephensen, 1910: 277; Lagerberg, 1908: 55, pl. 2 fig. 10; Schlegel, 1912: 239, 250; Runnstrøm, 1925: 28, pl. 1 figs. 5-6, 8-9, pl. 3 fig. 30; Grieg, 1927: 35 (part.) [not fig.]; Vilela, 1936: 226.

Upogebia stellata; Risso, 1816: 76; Stebbing, 1893: 185; Norman & Scott, 1906: 12; Norman, 1907: 357; De Morgan, 1910: 475, fig. 1; Selbie, 1914: 104; Pesta, 1918: 197; Webb, 1919: 102, pl. 10 figs. 2-11, pl. 11 figs. 2-6, pl. 12 figs. 5, 6, 9, 10; Schellenberg, 1928: 75, fig. 57; Gustafson, 1934: 12; Bouvier, 1940: 108, fig. 72; Poulsen, 1940: 208, 224, 235 (key), figs. 5, 7, 9; Gurney, 1942: 249, fig. 100; Holthuis, 1950: 111, fig. 39; Gordon, 1957: 250; Holthuis, 1958: 6, fig. 9; Tambs-Lyche, 1958: 14; Holmes, 1961: 415, 416; Bourdon, 1965: 16; Holmes, 1966: 352, 433; Allen, 1967: 18; Christiansen, 1972: 41, fig. 47; Naylor, 1972: 73; Samuelsen, 1974: 132; Tebble, 1976: 85; Thiriot, 1976: 350, 367; Lacourt, 1977: 246; Adema et al., 1982: 28, fig. 5, table 6; Holthuis & Heerebout, 1986: 62, fig. 80; Thessalou-Legaki, 1986: 183; Moyse & Smaldon, 1990: 520, fig. 10, 13 (part.); Koukouras et al., 1992: 223; Froglia, 1995: 8; Hayward et al., 1995: 434, fig. 8.52 (part.); Nickell & Atkinson, 1995: 181, fig. 2D, E, table 3; Astall et al., 1996: 821, tables 1, 2; d'Udekem d'Acoz, 1996: 60; Astall et al., 1997a: 155, fig. 1 (par), 2, 4, 6, table 1 (part); Astall et al., 1997b: 669, fig. 1, pls.

2, 3, 5, tables 1-5; Brattegard & Christiansen, 1997: 222; Pinn et al., 1997: 1083, figs. 1, 2, tables 1-3; Christiansen & Stene, 1998: 76; Nickell et al., 1998: 745, 752, figs. 6, 7; Pinn et al., 1998a: 243, fig. 2B, D; Pinn et al., 1998b: 211, figs. 1A, 2A; Pinn et al., 1999a: 103, figs. 3B-F, 5H; Pinn et al., 1999b: 1461, tables 1-6; Pancucci-Papadopulou et al., 1999: 393; d'Udekem d'Acoz, 1999: 157; Christiansen, 2000: 233; Taylor et al., 2000: 265, figs. 1, 2, tables 1-3, 5, 6; Markham, 2001, tables 1, 2; Martin, 2001: 83, 1 fig.; Türkay, 2001: 289; Ingle & Christiansen, 2004: 100, 102, figs. 74, 77.

Upogebia (*Upogebia*) *stellata*; Borradaile, 1903: 543; De Man, 1927: 36, pl. 4 fig. 14-14d; De Man, 1928: 23 (list), 36, 39, 42 (key); Noël, 1992: 83.

Non: *Upogebia stellata* Grieg, 1927: 35 (part.), fig. (= *U. deltaura* (Leach, 1918)); Nobre, 1931: 195, fig. 109; Nobre, 1936: 122, fig. 102 (= *U. pusilla* (Petagna, 1972)).

Material examined. — SMF 21875, 1 male (TL/CL, 38.0/12.3 mm), off Whitby, 54°30.17′N 0°24.72′W – 54°30.17′N 0°24.72′W, North Sea, 57.5 m, Van Veen grab, 13.vii.1988, leg. R/V "Senckenberg".

Type locality. — Kingsbridge, England.

Distribution. — Norway (Christiansen, 2000); Scotland: St. Andrews (M'Intosh, 1927); England: Northumberland and Durham (Norman & Brady, 1909), Salcombe estuary (Montagu, 1808; Allen, 1967; De Morgan, 1910), Plymouth (Montagu, 1808; Runnstrøm, 1925; De Man, 1927), Falmouth (Norman & Scott, 1906); Channel Islands (Norman, 1907); France: Roscoff (Schlegel, 1912), Naples (Runnstrøm, 1925); Belgium (?Tesch, 1913); Germany: East Friesland (?Metzger, 1875); northern Kattegat (Meinert, 1893; Poulsen, 1940); Sweden: Kolvik, Tova, and Kronbojen (Gustafson, 1934); Adriatic Sea (Runnstrøm, 1925).

Upogebia talismani Bouvier, 1915

Upogebia Talismani Bouvier, 1915: 184; De Man, 1927: 56.

Gebicula Hupferi Balss, 1916: 35, figs. 11-13; De Man, 1928: 25 (list).

Upogebia (*Upogebia*) *Talismani*; De Man, 1928: 24 (list), 36, 38, 47 (key).

Upogebia talismani; Buchanan, 1958: 24, 28; De Saint Laurent, 1971: 1259, figs. 1-3; Le Loeuff & Intès, 1974: 52, fig. 15d-n; Beaubrun, 1979: 79; De Saint Laurent & Le Loeuff, 1979: 37 (key), 45, fig. 7a-b; Ševčić, 1979: 128; Koukouras et al., 1992: 223, 227; Koukouras et al., 1993: 195; Falciai & Minervini, 1996: 149, 3 figs.

Gebiacantha talismani; Ngoc-Ho, 1989a: 118, 121; Noël, 1992: 82; Froglia, 1995: 8; d'Udekem d'Acoz, 1995: 61; García Raso, 1996: 738; Pancucci-Papadopoulou et al., 1999: 393; d'Udekem d'Acoz, 1999: 156; González-Gordillo et al., 2001: 279; Markham, 2001: tables 1-2; Ngoc-Ho, 2001b: 54; Türkay, 2001: 289; Ngoc-Ho, 2003: 506, figs. 24, 25.

Type locality. — Cape Blanc, Morocco, 33°16′N 08°53′W, 120 m.

Distribution. — Mediterranean: Libya (De Saint Laurent, 1971); Aegean Sea (Koukouras et al., 1992); Morocco: Cape Blanc, 66 fathoms (109.7 m) (De Man, 1928; Bouvier, 1915; De Saint Laurent, 1971); Sierra Leone (De Saint

Laurent & Le Loeuff, 1979); Liberia: Cap des Palmes (Le Loeuff & Intès, 1974); Ivory Coast: (De Saint Laurent & Le Loeuff, 1979), Vridi, Jacqueville, Grand Lahou and Sassandra (Le Loeuff & Intès, 1974); Príncipe (De Saint Laurent & Le Loeuff, 1979); Equatorial Guinea: Bata (Balss, 1916; De Saint Laurent & Le Loeuff, 1979); Gabon (De Saint Laurent & Le Loeuff, 1979); Congo: Pointe-Noire (Le Loeuff & Intès, 1974); 11-150 m.

The West Atlantic species

Species included. — *Upogebia acanthura* (Coêlho & Ramos, 1973); *U. aestuari* Williams, 1993b; *U. affinis* (Say, 1818); *U. annae* Thistle, 1973; *U. aquilina* Williams, 1993b; *U. bermudensis* Williams, 1993b; *U. brasiliensis* Holthuis, 1956; *U. careospina* Williams, 1993b; *U. casis* Williams, 1993b; *U. corallifora* Williams & Scott, 1989; *U. felderi* Williams, 1993b; *U. inomissa* Williams, 1993b; *U. jamaicensis* Thistle, 1973; *U. marina* Coêlho, 1973b; *U. molipollex* Williams, 1993b; *U. noronhensis* Fausto-Filho, 1969; *U. omissa* Gomes Corrêa, 1968; *U. omissago* Williams, 1993b; *U. paraffinis* Williams, 1993b; *U. pillsbury* Williams, 1993b; *U. spinistipula* Williams & Heard, 1991; *U. vasquezi* Ngoc-Ho, 1989b.

KEY TO THE SPECIES OF THE GENUS *UPOGEBIA* IN THE WESTERN ATLANTIC OCEAN

1. Infrarostral spine present 2
– Infrarostral spine absent 7
2. Lateral ridges of gastric region projecting forward as a moderate spine 3
– Lateral ridges of gastric region distinctly projecting forward 4
3. Infrarostral spines small; anterolateral margin of carapace with strong ocular spine .... *U. felderi* Williams, 1993
– Infrarostral spine showing three strong spines; anterolateral margin of carapace with ocular spine and some additional spines ..... *U. bermudensis* Williams, 1993
4. Anterolateral margin of carapace bearing some small spinules .... *U. pillsbury* Williams, 1993
– Anterolateral margin of carapace bearing single postocular spine 5
5. Dorsal margin of P1 palm smooth, bearing proximal and distal spines .... *U. affinis* (Say, 1818)
– Dorsal margin of P1 palm denticulate 6
6. P1 dactylus bearing denticulate carina on mesial surface; A2 penultimate segment unarmed ..... *U. paraffinis* Williams, 1993
– P1 dactylus lacking denticulate carina; A2 penultimate segment bearing spines on ventral margin ..... *U. spinistipula* Williams & Heard, 1991
7. Anterolateral margin of carapace lacking postocular spine .... *U. acanthura* (Coêlho & Ramos, 1973)
– Anterolateral margin of carapace bearing postocular spine, or some spines 9

9. Postocular spines multiple, 4 or more ..... *U. jamaicensis* Thistle, 1973
– Postocular spines usually single, occasionally double 10
10. A2 segment 3 with a distoventral spine 11
– A2 segments 3 without spine 12
11. Telson square, posterior margin convex; eyestalks with ventrodistal spine .... *U. omissago* Williams, 1993
– Telson subsquare, posterior margin medially concave; eyestalks without distoventral spine ..... *U. vasquezi* Ngoc-Ho, 1989
12. P1 dactylus with subterminal corneous tooth on prehensile margin 13
– P1 dactylus without subterminal corneous tooth on prehensile margin 17
13. P1 palm denticulate on dorsal margin ..... *U. omissa* Gomes Corrêa, 1968
– P1 palm not denticulate on dorsal margin 14
14. P2 merus unarmed on ventral margin ..... *U. brasiliensis* Holthuis, 1956
– P2 merus bearing single subproximal spine on ventral margin 15
15. P3 merus armed with three spines on ventral margin ..... *U. inomissa* Williams, 1993
– P3 merus unarmed on ventral margin 16
16. P1 merus beset with spinulate row on ventral margin ..... *U. careospina* Williams, 1993
– P1 merus scarcely armed or unarmed on ventral margin ..... *U. marina* Coêlho, 1973
17. P2 merus bearing strong subproximal spine on ventral margin 18
– P2 merus devoid of strong subproximal spine on ventral margin 21
18. P2 carpus bearing a distal and a ventral spine on distal margin 19
– P2 carpus unarmed on distal margin 20
19. P3 merus with three strong spines on ventral margin ..... *U. aestuari* Williams, 1993
– P3 merus with some spinules on ventral margin ... *U. corallifora* Williams & Scott, 1989
20. P1 palm with three rows of spinules on mesial surface .... *U. noronhensis* Fausto-Filho, 1969
– P1 palm with one subdorsal row of spinules on mesial surface .... *U. aquilina* Williams, 1993
21. P1 palm without terminal spine on dorsal margin ..... *U. molipollex* Williams, 1993
– P1 palm with terminal spine on dorsal margin 22
22. P1 carpus with row of spinules on lateral margin ..... *U. casis* Williams, 1993
– P1 carpus without row of spinules on lateral margin ..... *U. annae* Thistle, 1973

Upogebia acanthura (Coêlho & Ramos, 1973)

Upogebia (*Calliadne*) sp. Coêlho & Ramos, 1973: 163.
Upogebia (*Calliadne*) *acanthura* Coêlho, 1973a: 344.
Upogebia synagelas Williams, 1987: 590, figs. 1-3.
Upogebia acanthura; Coêlho & Ramos-Porto, 1987: 35 (key), 37; Williams, 1993b: 16, figs. 6-7.
Upogebia (*Calliadne*) *acanthura*; Coêlho & Rattacaso, 1988: 386.

Type locality. — Belém, Brazil, 02°15′N 48°15′W, "Almirante Saldanha" Geomar stn 166, 68 m.

Distribution. — Gulf of Mexico: Florida Middle Grounds (Williams, 1987); Florida (Williams, 1993b); Bahamas: Grand Bahama Island (Williams, 1987, 1993b); Jamaica: Discovery Bay (Williams, 1987), E. Palisadoes, Discovery Bay, and Pedro Bank (Williams, 1993b); Turks and Caicos Islands: off Pine

Cay (Williams, 1993b); Redonda (Williams, 1993b); Barbados (Williams, 1987, 1993b); Grenada (Williams, 1993b); Belize: Carrie Bow Cay (Williams, 1993b); Costa Rica: Limón (Williams, 1993b); Curaçao (Williams, 1993b); Brazil: Espírito Santo (Coêlho & Ramos, 1973), Pará, Pernambuco, and Bancos (Coêlho & Ramos-Porto, 1987), Belém and Fortaleza (Williams, 1993b), Recife and Vila Velha; 6-70 m, rarely 358-359 m.

Upogebia aestuari Williams, 1993

Upogebia aestuari Williams, 1993b: 31, fig. 13.

Type locality. — Approx. 8-9 km S. of Stann Creek, E. of Commerce Bight pier, Belize, Gulf of Honduras, 1.5 m.

Distribution. — Belize: S. of Stann Creek (Williams, 1993b); 1.5 m.

Upogebia affinis (Say, 1818)

Gebia affinis Say, 1818: 241; De Kay, 1844: 22; White, 1847a: 71; Leidy, 1855: 150; Smith, 1873: 549; Verrill, 1873: 368, 519, 520, 530, pl. 2 fig. 7; Kingsley, 1878: 327; Leidy, 1888: 333; Kingsley, 1899: 824; Rathbun, 1905: 17.

Upogebia affinis; Stebbing, 1893: 185; Fowler, 1912: 361, pl. 108; Hay & Shore, 1917: 408, pl. 29 fig. 9; Schmitt, 1924: 90; Behre, 1950: 21; Deevey, 1960: 41; Williams, 1965: 103, 197, fig. 80; Gomes Corrêa, 1968: 106, 107, 108; Thompson & Pritchard, 1969: 114; Rouse, 1970: 140; Van Engel & Sandifer, 1972: 157; Williams, 1974: 16, fig. 44A-B; Frey & Howard, 1975: 283; Dörjes, 1977: 401, 405, 415; Williams & Wigley, 1977: 9, 43; Frey & Basan, 1981: 117; Rabalais et al., 1981: 100; Chester et al., 1983: 282; Williams, 1984: 191, fig. 133; Williams, 1986: 10 (key), 12 (part.); Williams et al., 1989: 28; Williams & Ngoc-Ho, 1990: fig. 1d; Dworschak, 1992: 220; Williams, 1993b: 33, fig. 14.

Upogebia (*Upogebia*) *affinis*; Borradaile, 1903: 543; De Man, 1927: 50, pl. 6 fig. 19-19g; De Man, 1928: 22, 36, 38, 46; Schmitt, 1935: 196 (part.), fig. 58.

Non *Upogebia affinis*; Rathbun, 1900: 151; Williams, 1965: 103 (part.); Coêlho, 1966: 163, 168; Gomes Corrêa, 1968: 107, 108; Coêlho, 1970: 56; Coêlho et al., 1970: 508; Thistle, 1973: 1, 14, 23 (part.); Williams, 1974: 41; Williams & Wigley, 1977: 9 (part.); Williams, 1984: 191; Williams, 1986: 12 (part.); Coêlho & Ramos-Porto, 1987: 35 (key), 36. [= *Upogebia paraffinis* Williams, 1993b.]

Non *Upogebia* (*Upogebia*) *affinis*; De Man, 1928: 22 (list), 36, 38, 46; Schmitt, 1935: 196 (part.); Coêlho & Ramos, 1973: 163; Coêlho & Rattacaso, 1988: 383 (part.), 384. [= *Upogebia paraffinis* Williams, 1993b.]

Material examined. — SMF 30181, 1 female (TL/CL, 16.0/4.4 mm), Punta de Betín, Santa Marta, Dept. Magdalena, Colombia, 6-7 m, 03.xii.1985, leg. H.-G. Müller; SMF 30182, 1 female (TL/CL, 19.0/5.2 mm), Bahia de Chengue, Tayrona-Park, ca. 15 km northeast of Santa Marta, Dept. Magdalena, Colombia, 7-8 m, 27.ix.1985, leg. H.-G. Müller; SMF 30183, 13 males (TL/CL, 9.0/3.5 – 30.0/9.5 mm, lacking Plp1, with genital pores on P3 and 5), 12 females (TL/CL, 15.0/4.5 – 30.0/8.3 mm, bearing Plp1, with P3 genital pores), 6 ovig. females (TL/CL, 22.0/6.2 – 28.0/7.4 mm), Pensacola West, Florida, U.S.A., 10 m depth, 13.ix.1972, leg. J. Dörjes; SMF 30184, 1 female (TL/CL, 31.0/8.5 mm), Crow Point Beach, S.E. of Wild Harbour, N.W. of West Falmouth,

Massachussetts, U.S.A., 5.vii.1975, leg. J. Dörjes; SMF 30185, 1 male (TL/CL, 43.0/12.6 mm, lacking Plp1, with P3 and 5 genital pores), Massachussetts, U.S.A., no more data, 14 m depth, leg. J. Dörjes; SMF 30186, 2 females (TL/CL, 38.0/11.1 and CL, 11.1 mm lacking abdomen and tail-fan), Blackbeard Island, Blackbeard Creek, Point Bar, Georgia, U.S.A., tidal flat, 2.xi.1972, leg. J. Dörjes; SMF 30187, 3 males (TL/CL, 11.0/3.5 – 16.0/6.3 and CL, 4.3 mm), 1 female (TL/CL, 17.0/5.1 mm), Caribbean Sea, St. Croix, South Coast, Great Pond Bay, U.S. Virgin Islands, shallow water with sea grass (*Thalassia*), 100 m from shore, 4.xii.1972, leg. J. Dörjes.

Remarks. — This species is distributed in the western Atlantic and in the eastern Pacific Ocean.

Type locality. — Georgia, U.S.A.

Distribution. — Georgia (Say, 1818; De Kay, 1844), Mullica River, Cape May Point and Maurice River Cove, New Jersey (Leidy, 1855), Beaufort and Charleston Bay (De Man, 1927), Beaufort, N. Carolina (Hay & Shore, 1917), Gulf of Mexico, Texas (Rabalais et al., 1981), Sixty Bass Creek, Massachusetts, Bogue Sound, North Carolina, North Inlet, South Carolina (Dworschak, 1992), Martha's Vineyard Sound and Head of Buzzards Bay, Massachusetts, Rhode Island, Long Island Sound, Connecticut, Mullica River, Cape May Point and Maurice River Cove, New Jersey, Chesapeake Bay, Virginia, Beaufort, Bogue Sound, North Carolina, Parris Island and May River, South Carolina, Cabbage Island, Sapelo Island, off Georgia and St. Catherines Island, Georgia, Hutchinson Island, Ten Thousand Islands, Marco Island, Tampa Bay, Egmont Key, Hillsborough River, Crystal River, Rum Key, Indian River, Jim Island, Coon Island, Sarasota Bay and Alligator Point, Florida, Dauphin Island, Alabama, Deer Island, Little Deer Island, Mississippi Gulf coast and St. Louis Bay, Mississippi, Louisiana, Matagorda Island, Corpus Christi, Fathom Reef and Sauseway Blvd., Texas (Williams, 1993b); Barbados: Pelican Island (Schmitt, 1924); 10-36 m.

Upogebia annae Thistle, 1973

Upogebia annae Thistle, 1973: 12, 17, fig. 5; Williams, 1986: 10 (key); Williams, 1993b: 20, fig. 8.

Non *Upogebia annae*; Scott et al., 1988: 483. [= *Upogebia casis* Williams, 1993b.]

Type locality. — South of Great Inagua Island, Bahamas, 20°54′N 73°36′W, "Oregon" stn 5421, 229 m.

Distribution. — Bahamas: Great Inagua Island (Thistle, 1973; Williams, 1993b); Grand Turk Island (Williams, 1993b); 183-229 m.

Upogebia aquilina Williams, 1993

Upogebia aquilina Williams, 1993b: 37, fig. 15.

Type locality. — Seminole Shores, Martin Co., Florida, intertidal.

Distribution. — Florida: Seminole Shores and Jupiter Inlet (Williams, 1993b); intertidal.

Upogebia bermudensis Williams, 1993

Upogebia bermudensis Williams, 1993b: 22, fig. 9; Ngoc-Ho, 2001b: 54.

Type locality. — Castle Harbor, Bermuda.

Distribution. — Bermuda: Castle Harbor (Williams, 1993b).

Upogebia brasiliensis Holthuis, 1956

Upogebia brasiliensis Holthuis, 1956: 175, figs. 1-2; Gomes Corrêa, 1968: 97, figs. 22-27, 32, 33; Ngoc-Ho, 1979b: 147, 151, figs. 3a-b; Williams, 1986: 10 (key); Coêlho & Ramos-Porto, 1987: 35; Coêlho & Rattacaso, 1988: 83; Williams, 1993b: 24, fig. 10; Williams, 1997a: 415.
Upogebia (*Upogebia*) *brasiliensis*; Coêlho, 1971: 231; Coêlho & Ramos, 1973:162.

Type locality. — Cananeia, S. Brazil.

Distribution. — Belize (Williams, 1993b); Surinam (Williams, 1993b); Venezuela (Williams, 1997a); French Guiana: Golfe de Cayenne (Williams, 1993b); Brazil: Maranhão, Recife, and Bahia (Coêlho & Ramos, 1973), Maranhão and Bahia (Coêlho & Ramos-Porto, 1987), Itaparica and Prado Praia do Torora, Bahia (Williams, 1993b), Antonina, Paraná (Williams, 1993b), São Francisco, Santa Catarina (Williams, 1993b).

Upogebia careospina Williams, 1993

Upogebia careospina Williams, 1993b: 39, fig. 16.

Type locality. — North of Camocim, Ceará, Brazil, 02°31′S 40°51′W, "Oregon" stn 4247, 27.5 m.

Distribution. — Brazil: N. of Camocim (Williams, 1993b); 27.5 m.

Upogebia casis Williams, 1993

Upogebia annae; Scott et al., 1988: 483 [not *Upogebia annae* Thistle, 1973].
Upogebia casis Williams, 1993b: 27, fig. 11.

Type locality. — 125 km ENE of Cabo Gracias a Dios, 15°15′N 81°51′W, "Pillsbury" stn 1358, 18 m.

Distribution. — Honduras: Cabo Gracias a Dios and Cabo de Honduras (Williams, 1993b); Jamaica (Williams, 1993b); Dominican Republic (Williams, 1993b); Saba Bank (Williams, 1993b); Nevis (Williams, 1993b); Antigua (Williams, 1993b); Dominica (Williams, 1993b); Martinique (Williams, 1993b); Panama: near Colón (Williams, 1993b); Surinam (Williams, 1993b); 18-73 m.

Upogebia corallifora Williams & Scott, 1989

Upogebia corallifora Williams & Scott, 1989: 405, figs. 1-2; Williams, 1993b: 41, figs. 17-18.

Type locality. — Port Royal, Drunkenmans Cay, Jamaica, 3-4 m.

Distribution. — Jamaica: Drunkenmans Cay (Williams & Scott, 1989; Williams, 1993), Discovery Bay (Williams, 1993b); Virgin Islands: St. Croix (Williams, 1993b); Barbados; Puerto Rico: Cabo Rojo (Williams, 1993b); Mexico: Ascension Bay (Williams, 1993b).

Upogebia felderi Williams, 1993

Upogebia felderi Williams, 1993b: 44, fig. 19.

Type locality. — Barra del Tordo, Mexico.

Distribution. — Texas: Port O'Connor (Williams, 1993b); Mexico: Barra del Tordo (Williams, 1993b).

Upogebia inomissa Williams, 1993

Upogebia inomissa Williams, 1993b: 46, fig. 20.

Type locality. — W. end of Horn Island, Dog Keys Pass, Mississippi, U.S.A.

Distribution. — U.S.A.: Horn Island, Mississippi (Williams, 1993b), Vero Beach, Seminole Shores, Jim Island, Sawyer Key and Andrews Bay, Florida (Williams, 1993b).

Upogebia jamaicensis Thistle, 1973

Upogebia jamaicensis Thistle, 1973: 16, fig. 4; Williams, 1986: 10 (key); Williams, 1993b: 48, fig. 21.

Type locality. — Montego Bay, Jamaica.

Distribution. — Jamaica: Montego Bay (Thistle, 1973; Williams, 1993b); Panama: Maria Chiquita (Williams, 1993b); Colombia: Ciénaga and Bahía de Barbacoas (Williams, 1993b).

Upogebia marina Coêlho, 1973

Upogebia (*Upogebia*) sp. C Coêlho & Ramos, 1973: 163.
Upogebia (*Upogebia*) *marina* Coêlho, 1973b: 345; Coêlho & Rattacaso, 1988: 385.
Upogebia marina; Coêlho & Ramos-Porto, 1987: 35 (key), 36; Williams, 1993b: 51, fig. 22.

Type locality. — Piauí, Brazil, 21 m.

Distribution. — Venezuela: Cumaná (Williams, 1993b); Brazil: Piauí and Rio Grande do Norte (Coêlho & Ramos, 1973), Piauí (Coêlho, 1973b), Piauí, Rio Grande do Norte, Paraíba, Pernambuco, Alagoas, and Sergipe (Coêlho & Ramos-Porto, 1987), Alagoas (Williams, 1993b).

Upogebia molipollex Williams, 1993

Upogebia (*Upogebia*) *affinis*; [not Say, 1818] Schmitt, 1935: 196 (part.).
Upogebia molipollex Williams, 1993b: 29, fig. 12.

Type locality. — Guayanilla Harbor, Puerto Rico.

Distribution. — Puerto Rico: Guayanilla Harbor (Schmitt, 1935; Williams, 1993b).

Upogebia noronhensis Fausto-Filho, 1969

Gebia spinigera; [not: Smith, 1869] Pocock, 1890: 515.
Upogebia noronhensis Fausto-Filho, 1969: 1, 15 figs.; Fausto-Filho, 1970: 58; Coêlho & Ramos, 1973: 163; Thistle, 1973: 2, 12, 23; Williams, 1986: 10 (key); Coêlho & Ramos-Porto, 1987: 35 (key), 36; Coêlho & Rattacaso, 1988: 383; Williams, 1993b: 51, fig. 23.

Type locality. — Baia de Sueste, Fernando de Noronha, Brazil.

Distribution. — Brazil: Fernando de Noronha (Fausto-Filho, 1969; Williams, 1993b).

Upogebia omissa Gomes Corrêa, 1968

Upogebia omissa Gomes Corrêa, 1968: 98, figs. 1-15, 28, 29; Coêlho, 1970: 56; Coêlho et al., 1970: 508; Fausto-Filho, 1970: 58; Williams, 1986: 10 (key); Coêlho & Ramos-Porto, 1987: 35 (key), 36; Williams, 1993b: 54, fig. 24; Williams, 1997a: 415.
Upogebia (*Upogebia*) sp. B Coêlho, 1971: 231; Coêlho & Ramos, 1973: 162.
Upogebia (*Upogebia*) *omissa*; Coêlho & Ramos, 1973: 163; Coêlho & Rattacaso, 1988: 383.

Type locality. — Barra do Ceará, Fortaleza, Brazil.

Distribution. — Florida: Dunedin (Williams, 1993b); Dominican Republic: Playa de Monte Cristi (Williams, 1993b); Puerto Rico: Parguera (Williams, 1993b); Panama: Limon Bay (Williams, 1993b); Colombia: Bahía de Barbacoas (Williams, 1993b, 1997); Venezuela: Isla Margarita (Williams, 1993b), Isla Margarita and La Ensenada (Williams, 1997a); Trinidad: Diego Martin River and Blue River mouth (Williams, 1993b); Brazil: Maranhão, Rio Grande do Norte, Paraíba, Pernambuco, and Bahia (Coêlho & Ramos, 1973; Coêlho & Ramos-Porto, 1987), Ponta do Trapia, Ceará, Natal, Rio Grande do Norte, Mamanguape stone reef, Rio Paraíba, Contello Bay and João Pessoa, Paraíba, Prado Praia do Tororo, between Ponta Imbacuaba and Cumuruztiba, Bahia, Santa Cruz, Espírito Santo, Ilha da Marambaia, Rio de Janeiro, São Francisco, São Paulo, Ilha de Canobá, Paraná, and Ponta da Cruz, Santa Catarina (Williams, 1993b).

Upogebia omissago Williams, 1993

Upogebia omissago Williams, 1993b: 57, fig. 25; Williams, 1997a: 412, fig. 1.

Material examined. — SMF 30206, 2 males (TL/CL, 21.0/6.4 – 27.0/8.3 mm), 6 ovig. females (TL/CL, 51.0/13.5 – 39.0/9.4 mm), Penha, Estado de Santa Catarina, Brazil, 25.ii.1914, leg. F. A. Juy; SMF 2058, 1 female (TL/CL, 20.0/5.6 mm), Penha, Estado de Santa Catarina, Brazil, 25.ii.1914, leg. F. A. Juy; SMF 30207, 3 females (TL/CL, 18.0/6.0 – 19.0/6.6 mm), Caribbean Sea, St. Croix, South Coast, Great Pond Bay, U.S. Virgin Islands, shallow water with sea grass (*Thalassia*), near entrance of pond, xii.1972, leg. J. Dörjes; SMF 30872, 1 female (TL/CL, 20.0/5.6), Penha, Estado de Santa Catarina, Brazil, 25.ii.1914, leg. F. A. Juy.

Remarks. — A new commensal, *Leptalpheus* sp. (Decapoda, Alpheidae) living in burrows of *Upogebia omissago* has been reported from Venezuela (A. Anker, e-mail; 23.i.2004).

Type locality. — Luis Correia, Praia do Coqueiro, Piauf, Brazil.

Distribution. — Venezuela (Williams, 1997a); Brazil: Luis Correia, Praia do Coqueiro, Piauf (Williams, 1993b).

Upogebia paraffinis Williams, 1993

Upogebia affinis; [non *Upogebia affinis* Say, 1818] Rathbun, 1900: 151; Williams, 1965: 103 (part.); Coêlho, 1966: 163, 168; Gomes Corrêa, 1968: 107, 108; Coêlho, 1970: 56; Coêlho et al., 1970: 508; Thistle, 1973: 1, 14, 23 (part.); Williams, 1974: 41; Williams & Wigley, 1977: 9 (part.); Williams, 1984: 191; Williams, 1986: 12 (part.); Coêlho & Ramos-Porto, 1987: 35 (key), 36.

Upogebia (*Upogebia*) *affinis*; [non *Upogebia affinis* Say, 1818] De Man, 1928: 22, 45, 46; Schmitt, 1935: 196 (part.); Coêlho & Ramos, 1973: 163; Coêlho & Rattacaso, 1988: 383 (part.), 284.

Upogebia paraffinis Williams, 1993b: 60, fig. 26.

Type locality. — São Sebastião, Praia do Araçá, São Paulo, Brazil.

Distribution. — Brazil: Recife (Coêlho & Ramos, 1973), Pernambuco and Alagoas (Coêlho & Ramos-Porto, 1987), Ponta do Trapia, Ceará (Williams, 1993b), Ilha da Restinga, Paraíba (Williams, 1993b), São Sebastião, São Paulo (Williams, 1993b).

Upogebia pillsbury Williams, 1993

Upogebia pillsbury Williams, 1993b: 62, fig. 27.

Type locality. — Caribbean Sea off Cabo Tiburon, Colombia, 08°41′N 77°13′W, "Pillsbury" stn 412, 57 m.

Distribution. — Colombia: off Cabo Tiburon (Williams, 1993b); 57 m.

Upogebia spinistipula Williams & Heard, 1991

Upogebia spinistipula Williams & Heard, 1991: 49, figs. 2-3; Williams, 1993b: 64, figs. 28-29.

Type locality. — Florida, 27°56′29.5″N 83°52′59.5″W, 43 m.

Distribution. — U.S.A.: Gulf of Mexico, Florida (Williams & Heard, 1991; Williams, 1993b); 10-177 m.

Upogebia vasquezi Ngoc-Ho, 1989

Upogebia affinis; [non *Upogebia affinis* Say, 1818] Schmitt, 1936: 375.
Upogebia vasquezi Ngoc-Ho, 1989b: 866, figs. 1-2; Markham et al., 1990: 424; Williams, 1993b: 67, figs. 30-31.

Material examined. — SMF 25817, 1 male (TL/CL, 18.0/5.1 mm), 1 ovig. female (TL/CL, 21.0/5.5 mm), Bahia Ballena, Golfo de Nicoya, Costa Rica, GN-TBB-20, 09.44N, 85.00W, 20 m, KG-1, 04.ii.1944, leg. R/V "Victor Hensen".

Type locality. — Panama.

Distribution. — Florida: Coon Island, Fort Pierce Inlet and Dry Tortugas (Williams, 1993b); Bahamas: San Salvador (Williams, 1993b); Turks and Caicos Islands (Williams, 1993b); Dominican Republic (Williams, 1993b); St. Croix (Williams, 1993b); Barbuda (Williams, 1993b); Antigua (Williams, 1993b); Barbados (Williams, 1993b); Tobago (Williams, 1993b); Mexico: Puerto Morelos and Ascension Bay (Williams, 1993b); Panama: (Ngoc-Ho, 1989b), Galeta Island, Isla Pico Feo and Isla Mira (Williams, 1993b); Columbia: Caribbean Sea (Williams, 1993b); Aruba and Bonaire (Schmitt, 1936); Curaçao (Williams, 1993b); Brazil: Natal, João Pessoa, between Ponta Imbacuaba and Cumuruztiba (Williams, 1993b).

The East Pacific species

Species included. — *Upogebia acanthops* Williams, 1986; *U. affinis* (Say, 1818); *U. baldwini* Williams, 1997b; *U. burkenroadi* Williams, 1986; *U. cortesi* Williams & Vargas, 2000; *U. dawsoni* Williams, 1986; *U. galapagensis* Williams, 1986; *U. jonesi* Williams, 1986; *U. lepta* Williams, 1986; *U. longipollex* (Streets, 1871); *U. maccraryae* Williams, 1986; *U. macginitieorum* Williams, 1986; *U. onychion* Williams, 1986; *U. pugettensis* (Dana, 1852a); *U. ramphula* Williams, 1986; *U. schmitti* Williams, 1986; *U. spinigera* (Smith, 1871) (syn.: *U. sturgisae* Boone, 1931; *U. rostrospinosa* Bott, 1955); *U. tenuipollex* Williams, 1986; *U. thistlei* Williams, 1986; *U. vargasae* Williams, 1997b; *U. veleronis* Williams, 1986.

Key to the Species of the Genus *Upogebia* in the Eastern Pacific Ocean

1. Infrarostral spine present ..... *U. affinis* (Say, 1818) (W. Atlantic species)
– Infrarostral spine absent 2
2. Anterolateral margin of carapace devoid of postocular spine 3
– Anterolateral margin of carapace bearing postocular spine(s) 6
3. P1 dactylus bearing strong subdistal conical tooth on prehensile margin; P1 merus beset with subdistal spine on dorsal margin ..... *U. tenuipollex* Williams, 1986
– P1 dactylus devoid of subdistal conical tooth on prehensile margin; P1 merus unarmed on dorsal margin 4
4. P1 chelae equal, finely and evenly toothed on prehensile margins .... *U. ramphula* Williams, 1986
– P1 subchelate 5
5. P1 robust, merus denticulate on ventral margin; carpus with more than one strong spine dorsally; fixed finger with a distinct, stout middle tooth on prehensile margin .... *U. macginitieorum* Williams, 1986
– P1 slender, merus unarmed on ventral margin; carpus spineless dorsally; fixed finger unarmed on prehensile margin ..... *U. cortesi* Williams & Vargas, 2000
6. P1 dactylus bearing subdistal conical tooth on dorsal margin .... *U. vargasae* Williams, 1997
– P1 dactylus lacking subdistal conical tooth on dorsal margin 7
7. P1 dactylus denticulate, usually bearing subdistal conical tooth on prehensile margin ... 8
– P1 dactylus smooth in its distal half, not armed with subdistal conical tooth on prehensile margin 15
8. P2 merus bearing single subproximal spine on ventral margin 9
– P2 merus unarmed on ventral margin 13
9. Telson bearing distinct transverse carina 10
– Telson bearing inconspicuous transverse carina 11
10. Telson distinctly broader than long; its denticulate transverse carina located at middle part ..... *U. baldwini* Williams, 1997
– Telson broader than long; its denticulate transverse carina located at proximal third .... *U. spinigera* (Smith, 1871)

11. Tail fan spinulose on dorsal surface ..... *U. longipollex* (Streets, 1871)
 – Tail fan not spinulose on dorsal surface 12
12. P2 carpus devoid of subdistal spine on distal margin ..... *U. acanthops* Williams, 1986
 – P2 carpus bearing dorsal subdistal spine on distal margin ..... *U. thistlei* Williams, 1986
13. P2 merus devoid of spine on dorsal margin ..... *U. burkenroadi* Williams, 1986
 – P2 merus bearing subdistal spine on dorsal margin 14
14. P2 carpus bearing subdistal spine on dorsal margin ..... *U. veleronis* Williams, 1986
 – P2 carpus devoid of spine on dorsal margin ..... *U. maccraryae* Williams, 1986
15. Telson bearing denticulate transverse carina ..... *U. onychion* Williams, 1986
 – Telson inconspicuously marked with transverse carina 16
16. Rostrum elongate, twice as long as broad ..... *U. lepta* Williams, 1986
 – Rostrum triangular 17
17. P1 fixed finger armed on prehensile margin 18
 – P1 fixed finger smooth on prehensile margin 19
18. Prehensile margin of P1 fixed finger bearing a stout tooth ... *U. pugettensis* (Dana, 1852)
 – Prehensile margin of P1 fixed finger denticulate ..... *U. dawsoni* Williams, 1986
19. Cervical groove spinose ..... *U. schmitti* Williams, 1986
 – Cervical groove unarmed 20
20. P1 carpus smooth, bearing only distal spine on dorsal margin .. *U. jonesi* Williams, 1986
 – P1 carpus denticulous on dorsal margin ..... *U. galapagensis* Williams, 1986

Upogebia acanthops Williams, 1986

Upogebia acanthops Williams, 1986: 8 (key), 10, fig. 3; Hendrickx, 1995: 390 (list).

Type locality. — Fort Kobbe Beach, Panama, 8°53′45″N 79°34′35″W, 0-90 m.

Distribution. — Panama: Fort Kobbe Beach (Williams, 1986); 0-90 m.

Upogebia affinis (Say, 1818)

Gebia affinis Say, 1818: 241.

Material examined. — SMF 30871, 1 female (TL/CL, 34.0/10.3) (Form II), Peru, S-258, from ground water, 5.v.1985.

Remarks. — This species was found together with *U. thistlei* Williams, 1986 from Peru. It is more extensively dealt with, above.

Type locality. — Georgia, U.S.A.

Distribution. — Massachussetts, southern Texas, Florida, and Colombia.

Upogebia baldwini Williams, 1997

Upogebia baldwini Williams, 1997b: 617, fig. 1.

Type locality. — Estero Playa Novillero, Nayarit, Mexico.

Distribution. — Mexico: Estero Playa Novillero, Nayarit (Williams, 1997b).

Upogebia burkenroadi Williams, 1986

Upogebia burkenroadi Williams, 1986: 8 (key), 12, fig. 4; Hendrickx, 1995: 390 (list); Williams, 1997b: 623.

Material examined. — ZMUC-CRU 9706, 2 males (TL/CL, 12.0/3.2 – 10.0/2.9 mm), 3 females (TL/CL, 30.0/7.8 – 12.0/3.4 mm), Bahia Malago at Buenaventura, W. coast of Colombia, Pacific side, bore holes in clay rocks, 19.ix.1948, leg. E. M. Poulsen.

Type locality. — La Libertad, Sonora, Mexico, 29°55′N 112°43′W.

Distribution. — Gulf of California: La Libertad (Williams, 1986); Costa Rica: Punta Pitahaya, Guanacaste (Williams, 1997b); Buenaventura, W. coast of Colombia.

Upogebia cortesi Williams & Vargas, 2000

Upogebia cortesi Williams & Vargas, 2000: 13, fig. 1.

Type locality. — N.W. side of Isla Cabo Blanco, Costa Rica, dredged parallel to coast, 30-40 m.

Distribution. — Costa Rica: Isla Cabo Blanco (Williams & Vargas, 2000); 30-40 m.

Upogebia dawsoni Williams, 1986

Upogebia dawsoni Williams, 1986: 10 (key), 14, fig. 5; Hendrickx, 1995: 390 (list).

Type locality. — Laguna de Navidad, Barra de Navidad, Jalisco, Mexico, 19°11′14″N 104°41′25″W.

Distribution. — Mexico: New Kino, Angel de la Guarda Islands, San Felipe, Espíritu Santo Island, estuary of Mulegé River, Sonora, and Jalisco (Williams, 1986); Costa Rica: Rio Potrero (Williams, 1986); Panama: Bahia Honda (Williams, 1986).

Upogebia galapagensis Williams, 1986

Upogebia galapagensis Williams, 1986: 10 (key), 17, fig. 6; Hendrickx, 1995: 390 (list).

Type locality. — South of Rader's place, Academy Bay, Indefatigable Island, Galapagos Islands.

Distribution. — Galapagos Islands (Williams, 1986).

Upogebia jonesi Williams, 1986

Upogebia jonesi Williams, 1986: 10 (key), 19, fig. 7; Hendrickx, 1995: 390 (list).

Material examined. — ZMUC-CRU 9707, 1 male (TL/CL, 12.0/3.3 mm), 1 ovig. female (TL/CL, 15.6/4.6 mm), Bahia Utivia, W. coast of Colombia, beach, 5.x.1943, leg. E. M. Poulson; ZMUC-CRU 9708, 1 female (TL/CL, 11.0/3.3 mm), Bahia Utivia, W. coast of Colombia, plankton net, 5.x.1948, leg. E. M. Poulson; SMF 30503, 12 males (TL/CL, 9.0/2.3 mm), 1 female (TL/CL, 21.0/6.1 mm), 4 ovig. females (TL/CL, 17.0/4.8 – 26.0/7.2 mm), Martinique, Grande Anse des Salines, 14°23.962′N 60°52.552′W, 0.4 m depth, boring in dead coral, 12.i.2004, leg. M. Türkay.

Remarks. — This species is very characteristic in that the distal part of the rostum bears no tubercles, and the merus of the P2 bears a strong ventroproximal tooth.

Type locality. — Pilot House Beach, Naos Is., Panama.

Distribution. — Mexico: off Consag Rock, Bahia San Luis Gonzaga, and off Punta Rocosa (Williams, 1986); Costa Rica: Golfo de Nicoya (Williams, 1986); Panama (Williams, 1986).

Upogebia lepta Williams, 1986

Upogebia lepta Williams, 1986: 8 (key), 22, fig. 8; Williams et al., 1989: 28.

Type locality. — Los Coronados Is., Baja California, 32°25′N 117°15′W, 73-91 m.

Distribution. — California: Santa Catalina Island (Williams, 1986); Baja California: Los Coronados Islands (Williams, 1986).

Upogebia longipollex (Streets, 1871)

Gebia longipollex Streets, 1871: 242; Lockington, 1878: 300.
Upogebia (*Upogebia*) *longipollex*; Borradaile, 1903: 543; De Man, 1928: 23 (list), 35, 39, 51.
Upogebia spinigera; Holthuis, 1952: 3 (part.).
Upogebia longipollex; Williams, 1986: 8 (key), 24, fig. 9; Hendrickx, 1995: 390 (list).

Remarks. — Williams (1986: 24) included parts of *U. rostrospinosa* Bott, 1955 in *U. longipollex*, but the material examined by him does not include any specimen of *U. longipollex*. He most probably misidentified the female paratype of *U. rostrospinosa* Bott as *U. longipollex*, because the specimen lacks the P1 chela.

Type locality. — Isthmus of Panama (Pacific side).

Distribution. — El Salvador: Puerto El Triunfo (Bott, 1955); Panama (De Man, 1928; Williams, 1986); Ecuador: Isla Puna (Williams, 1986).

Upogebia maccraryae Williams, 1986

Upogebia rostrospinosa Bott, 1955: 49 (part.).
Upogebia maccraryae Williams, 1986: 8 (key), 27, fig. 10; Lemaitre & León, 1992: 45; Lemaitre & Ramos, 1992: 353; Hendrickx, 1995: 390 (list).

Material examined. — SMF 30168, 2 males (TL/CL, 19.0/5.3 – 29.0/9.6 mm), 2 females (TL/CL, 26.0/7.4 – 30.0/8.3 mm), 2 shrunken specimens, separated from the paratypes of *Upogebia rostrospinosa* Bott, 1955, El Salvador, Usultan, surroundings of Puerto el Triunfo, 1952, leg. H. Peters.

Type locality. — Isla Puna, Golfo de Guayaquil, Ecuador.

Distribution. — El Salvador: Puerto El Triunfo (Bott, 1955; Williams, 1986); Panama: Golfo de Panama (Williams, 1986); Ecuador: Guayaquil (Williams, 1986); Colombia: Tumaco and Playa Basura (Lemaitre & Ramos, 1992); intertidal to 5.4 m.

Upogebia macginitieorum Williams, 1986

Gebia pugettensis; [not Dana, 1852a] Lockington, 1878: 300 (part., Bahia de San Quintín).
Upogebia pugettensis; Rathbun, 1904: 153 (part., Baja California material); MacGinitie, 1930: 37 (part., Newport Bay, California material); MacGinitie & MacGinitie, 1949: 292 (part., southern California material); Frey, 1971: 9 (part.); Brusca, 1973: 223; Allen, 1976: 13, 37, 232 (list and key), pl. 30 figs. 363-364; Brusca, 1980: 159 (part.).
Upogebia (*Upogebia*) *pugettensis*; De Man, 1929: 120 (Bahía de San Quintín material).
Upogebia cf. *pugettensis*; Anonymous, 1972: 9, 7 unnumbered figs.
Upogebia aff. *pugettensis*; Homziak, 1981: 943.
Upogebia macginitieorum Williams, 1986: 8 (key), 30, fig. 11; Williams et al., 1989: 28; Dworschak, 1992: 224.

Type locality. — Tijuana Slough, California.

Distribution. — California: Anaheim Bay, Santa Catalina Island, Mission Bay, La Jolla, Coronado Bay, Newport Bay, Balboa, and Tijuana Slough (Williams, 1986); Mexico: Bahia de San Quintin, Baja California (Dworschak, 1992).

Upogebia onychion Williams, 1986

Upogebia onychion Williams, 1986: 8 (key), 33, fig. 12; Williams et al., 1989: 28.

Type locality. — E. of Cardwell Point, San Miguel Is., 34°00′55″N 120°16′30″W – 34°00′45″N 120°15′W, 38 m.

Distribution. — California: San Miguel Island (Williams, 1986); 38 m.

Upogebia pugettensis (Dana, 1852)

Gebia pugettensis Dana, 1852a: 19; Dana, 1852b: 510; Dana, 1855, pl. 32 fig. 1a-d; Stimpson, 1857: 488, pl. 21 fig. 2; Stimpson, 1860: 24; Lockington, 1878: 299 (part.); Ortmann, 1893: 49.

Gebia californica Stimpson, 1856: 88.

Gebia pugetensis; Dall, 1899: 880, pl. 87 fig. 4.

Upogebia pugettensis; Holmes, 1900: 157; Rathbun, 1904: 153 (part., California material); Schmitt, 1921: 115, fig. 77; Johnson & Snook, 1927: 327, figs. 274, 277D; Stevens, 1928: 318, figs. 1-5, 20-37; Stevens, 1929: 400, figs. 1, 3; MacGinitie, 1930: 36 (part., from Elkhorn Slough), pls. 1-3; Hart, 1937: 183, 197, figs. 5A-E, 6A-O; Ricketts & Calvin, 1939: 179, 227, pl. 44; Light, 1941: 113 (key); MacGinitie & MacGinitie, 1949: 291 (part., from Elkhorn Slough), figs. 135-137; Schmitt, 1965: 136, fig. 56; Thompson & Pritchard, 1969a: 114; Thompson & Pritchard, 1969b: 274; Frey, 1971: 9 (part.); Thistle, 1973: 23 (key); Brusca, 1973: 223; Abbott, 1974: 471, fig. 5435; Kozloff, 1974: 168 (key); Powell, 1974: 28; Carlton & Kuris, 1975, pl. 132 fig. 70; Kuris, 1975: 382, fig. 12A, b; Brusca & Brusca, 1978: 86, 89; Pritchard & Eddy, 1979: 249; Brusca, 1980: 259 (part., from Elkhorn Slough); Haig & Abbott, 1980: 579, pl. 166 fig. 24.1; Williams, 1986: 8 (key), 35, fig. 13; Williams et al., 1989: 28; Holthuis, 1991: 235, figs. 435-436; Dworschak, 1992: 224.

Upogebia (*Upogebia*) *pugettensis*; Borradaile, 1903: 543; De Man, 1929: 120 (not Bahía de San Quintín material), fig. 6-6d.

Upogebia (*Upogebia*) *Pugettensis*; De Man, 1928: 23 (distribution in part), 39, 40, 56.

Non *Gebia pugettensis*; [not Dana, 1852a] Lockington, 1878: 300 (part., Bahia de San Quintín). [= *Upogebia macginitieorum* Williams, 1986.]

Non *Upogebia pugettensis*; Rathbun, 1904: 153 (part., Baja California material); MacGinitie, 1930: 37 (part., Newport Bay, California, material); MacGinitie & MacGinitie, 1949: 292 (part., southern California material); Frey, 1971: 9 (part.); Brusca, 1973: 223; Allen, 1976: 13, 37, 232 (list and key), pl. 30 figs. 363-364; Brusca, 1980: 159 (part.). [= *Upogebia macginitieorum* Williams, 1986.]

Non *Upogebia* (*Upogebia*) *pugettensis*; De Man, 1929: 120 (Bahía de San Quintín material). [= *Upogebia macginitieorum* Williams, 1986.]

Non *Upogebia* cf. *pugettensis*; Anonymous, 1972: 9, 7 unnumbered figs. [= *Upogebia macginitieorum* Williams, 1986.]

Non *Upogebia* aff. *pugettensis*; Homziak, 1981: 943. [= *Upogebia macginitieorum* Williams, 1986.]

Material examined. — ZMUC-CRU 9757, 1 male (TL/CL, 53.0/16.1 mm), False Bay, La Jolla, California, shore collection, Th. Mortensen's Pacific Exped., 15.viii.1915; ZMUC-CRU 9758, 3 males (TL/CL, 15.0/4.8 – 18.0/5.4 mm), Nanaimo, Strait of Georgia, Vancouver Is., Columbia, leg. Th. Mortensen, 28.vii.1915; ZMUC-CRU 9759, 1 male (TL/CL, 29.0/8.1 mm), Nanaimo, Strait of Georgia, Vancouver Is., Columbia, 3.vi.1915, leg. Th. Mortensen.

Remarks. — In the large-sized male from False Bay, La Jolla, California (ZMUC-CRU 9757), the ocular spine is deformed to an obtuse protuberance.

Type locality. — Puget Sound, Washington State, U.S.A.

Distribution. — Alaska: Cape Fox (Rathbun, 1904), Sawmill Bay, Freshwater Bay, Humpback Bay, Union Bay, Kasaan Bay, Loring, and Thorn Arm (Williams, 1986); British Columbia: off Lasqueti Island, Locke Bay and Roberts

Bay (Stevens, 1928), Departure Bay, Taylor Bay, Seymour Narrows, Comox, Union Bay, Otter Bay, and Calvert Island (Williams, 1986); Washington: (Dworschak, 1992), Fossil Bay, East Sound, Samish, Blakely Island, Brown Island, Friday Harbor, Minnesota Reef, Davis Bay, Poulsbo, Seabeck, Tracyton, Des Moines, Allyn, and Oyster Bay (Stevens, 1928), Puget Sound, Washington Sound (Williams, 1986); Oregon: Coos Bay (Stevens, 1928), Middle Bay, Yaquina Bay, and Coos Bay (Williams, 1986); California: San Francisco and Tomales Bay (Lockington, 1878), Dillon Beach, Tomales Bay, Elkhorn Slough, Morro Bay, Moss Beach, Half Moon Bay, San Francisco Bay, and Bodega Harbor (Williams, 1986), San Francisco (Dworschak, 1992); intertidal mudflats.

Upogebia ramphula Williams, 1986

Upogebia ramphula Williams, 1986: 7 (key), 52, fig. 19; Hendrickx, 1995: 390 (list).

Type locality. — Isla María Madre, Nayarit, Mexico, 21°35′N 106°33′W, 7-18 m.

Distribution. — Mexico: Isla María Madre (Williams, 1986); 7-18 m.

Upogebia schmitti Williams, 1986

Upogebia schmitti Williams, 1986: 10 (key), 40, fig. 14; Hendrickx, 1995: 390 (list).

Type locality. — Bahia Honda, Panama.

Distribution. — Panama: Bahia Honda (Williams, 1986).

Upogebia spinigera (Smith, 1871)

Gebia spinigera Smith, 1871: 92; Lockington, 1878: 300.
Upogebia (*Upogebia*) *spinigera*; Borradaile, 1903: 543; De Man, 1928: 23 (list), 39, 45, 51.
Upogebia (*Upogebia*) *sturgisae* Boone, 1931: 161, fig. 11.
Upogebia spinigera; Holthuis, 1952: 3 (part.), figs. 1-2; Williams, 1986: 8 (key), 10 (key), 41, fig. 15; Lemaitre & León, 1992: 45; Lemaitre & Ramos, 1992: 353; Hendrickx, 1995: 390 (list).
Upogebia rostrospinosa Bott, 1955: 49 (part. = *U. maccraryae* Williams, 1986), pl. 3 fig. 3a-b; Thistle, 1973: 2, 23, fig. 6.
Non *Gebia spinigera*; Pocock, 1890: 515. [= *Upogebia noronhensis* Fausto-Filho, 1969.]

Material examined. — ZMUC-CRU 9760, 1 male (TL/CL, 42.0/12.3 mm), 2 males, Form II (TL/CL, 48.0/13.8 – 52.0/14.0 mm), 3 females (TL/CL, 47.0/12.6 – 50.0/12.9 mm, and one without carapace), Panama, low tide, rocks, leg. Deichmann, 5.vii.1931; SMF 7940, 1 male, Form II (TL/CL, 33.0/9.8 mm), 1 female (TL/CL, 39.0/10.5 mm), no data; SMF 2116, 1 male, Form II (TL/CL, 49.0/13.2 mm) (holotype of *Upogebia rostrospinosa* Bott, 1955); SMF 2117, 1 ovig. female (TL/CL, 48.0/12.7 mm), 1 male (TL/CL, 21.0/6.5 mm), paratypes of *Upogebia rostrospinosa* Bott, 1955, surroundings of Triunfo, 1952, leg H. Peters; SMF 30730, 2 males

(TL/CL, 24.0/7.2 – 32.0/9.5 mm), 1 female (TL/CL 36.0/9.3 mm), Buenaventura, Colombia, Pacific side, 29.i.1979, leg. H. v. Prahl.

Remarks. — In the material examined there are one normal male with a genital pore on the P5 coxa, bearing no Plp1; two polymorphic males with genital pores on the P3 and P5 coxae, bearing no Plp1; two normal females with a genital pore on the P3 coxa, bearing Plp1; and one polymorphic female with a genital pore on the P3 coxa on the left side, and on the P5 coxa on the right side.

Type locality. — Isla de Aserradores, 32.18 km northwest of Corinto, and Golfo de Fonseca, Nicaragua, eastern Pacific.

Distribution. — El Salvador: Puerto El Triunfo (Bott, 1955; Williams, 1986); Nicaragua: Golfo de Fonseca and Isla de Aserradores (Lockington, 1878), west coast of Nicaragua (Williams, 1986); Costa Rica: Golfo de Nicoya (Williams, 1986); Panama (Williams, 1986); Colombia: Aguacate Bay, Málaga Bay and Buenaventura Bay (Lemaitre & Ramos, 1992); Ecuador: Puerto de El Morro (Williams, 1986); intertidal to shallow subtidal.

Upogebia tenuipollex Williams, 1986

Upogebia tenuipollex Williams, 1986: 7 (key), 45, fig. 16; Lemaitre & León, 1992: 45; Lemaitre & Ramos, 1992: 353; Hendrickx, 1995: 390 (list).

Material examined. — SMF 30169, 4 males (TL/CL, 22.0/5.8 – 34.0/9.2 mm); 4 females (TL/CL, 26.0/6.5 – 34.0/8.7 mm), 6 ovig. females (TL/CL, 31.0/7.7 – 33.0/7.9 mm), Buenaventura, Columbia, Pacific side, 29.i.1979, leg. H. v. Prahl; SMF 30170, 3 males (TL/CL, 21.0/6.6 – 28.0/7.7 mm), 4 females (TL/CL, 26.0/7.2 – 27.0/7.9 mm), Isla Gorgona, Cauca, Colombia, Pacific side, 26.i.1979, leg. H. v. Prahl et al.

Type locality. — Bahía de Caráquez, Ecuador, eastern Pacific.

Distribution. — Colombia: Málaga Bay and Gorgona Island (Lemaitre & Ramos, 1992); Ecuador: Golfo de Guayaquil, Bahía de Caráquez, and off Cabo de San Francisco (Williams, 1986); intertidal up to 3.6 m.

Upogebia thistlei Williams, 1986

Upogebia thistlei Williams, 1986: 10 (key), 47, fig. 17; Lemaitre & León, 1992: 45; Lemaitre & Ramos, 1992: 354; Hendrickx, 1995: 390 (list).
Upogebia rostrospinosa; Williams, 1986: 47 (part.).

Material examined. — SMF 30171, 3 males (TL/CL, 26.0/7.4 – 29.0/8.6 mm), 1 female (TL/CL, 30.0/8.5 mm), Peru, S-258, from ground water, 5.v.1955 (no detailed data).

Remarks. — Williams (1986: 47) synonymized parts of the paratypes of *Upogebia rostrospinosa* Bott, 1955 with *U. thistlei* Williams, 1986, however, they belong to *U. maccraryae* Williams, 1986, because the P2 merus is devoid of the proximal spine on the ventral margin.

Type locality. — Pilot Pier area near Naos Is., Panama, eastern Pacific, intertidal.

Distribution. — Mexico: San Felipe, Bahía de Los Angeles, Puerto Escondido, Bahía Concepción, Isla Espíritu Santo, Bahía de la Paz, Bahía de Guaymas, and Punta Cholla (Williams, 1986); El Salvador: Puerto El Triunfo (Bott, 1955; Williams, 1986); Panama (Williams, 1986); Colombia: Bahía Cuevita and Buenaventura (Williams, 1986), Gorgona Island (Lemaitre & Ramos, 1992); northern Ecuador: Las Palmas near Esmeraldas (Williams, 1986); intertidal to shallow subtidal.

Upogebia vargasae Williams, 1997

Upogebia vargasae Williams, 1997b: 620, fig. 2.

Material examined. — SMF-30172, 1 female Form II (TL/CL, 35.0/9.7 mm), Buenaventura, Valle del Cauca, Columbia, Pacific side, 29.i.1979, leg. H. v. Prahl.

Type locality. — Boca Guarumal, Puntarenas Province, Costa Rica.

Distribution. — Costa Rica: Boca Guarumal, Puntarenas Province (Williams, 1997b).

Upogebia veleronis Williams, 1986

Upogebia veleronis Williams, 1986: 8 (key), 50, fig. 18; Hendrickx, 1995: 390 (list).

Material examined. — SMF 30504, 2 females (TL/CL, 26.0/6.9 mm); 2 ovig. females (TL/CL, 31.0/8.9 – 38.0/9.3 mm), Buenaventura, Colombia, Pacific side, 29.i.1979, leg. H. v. Prahl.

Type locality. — Isla María Magdalena, Islas Tres Marías, Mexico, 21°25′N 106°24′W, 24 m.

Distribution. — Mexico: Isla María Magdalena (Williams, 1986); Ecuador: Cabo San Francisco (Williams, 1986).

The Indo-West Pacific species

Species included. — *Upogebia acanthochela* Sakai, 1967, *U. acarinicauda* sp. nov.; *U. acutispina* De Saint Laurent & Ngoc-Ho, 1979, *U. africana* Ortmann,

1894; *U. allobranchus* Ngoc-Ho, 1991; *U. allspachi* sp. nov.; *U. amboinensis* (De Man, 1888); *U. anacanthus* Ngoc-Ho, 1994a; *U. ancylodactyla* De Man, 1905; *U. arabica* (Ngoc-Ho, 1989a); *U. assisi* Barnard, 1947; *U. balmaorum* Ngoc-Ho, 1990; *U. barbata* (Strahl, 1862a) (syn.: partim *U. intermedia* (De Man, 1887)); *U. baweana* Tirmizi & Kazmi, 1979; *U. borradailei* Sakai, 1982; *U. bowerbankii* (Miers, 1884) (syn.: *U.* (*Calliadne*) *octoceras* var. *australiensis* De Man, 1927); *U. brucei* Sakai, 1975; *U. cargadensis* Borradaile, 1910; *U. carinicauda* (Stimpson, 1860) (syn.: partim *U. intermedia* (De Man, 1887)); *U. ceratophora* De Man, 1905; *U. darwinii* (Miers, 1884) (syn.: *U. hexaceras* (Ortmann, 1894), *U. octoceras* Nobili, 1904); *U. digitina* (Sakai, 1975); *U. dromana* Poore & Griffin, 1979; *U. edulis* Ngoc-Ho & Chan, 1992; *U. fijiensis* Sakai, 1982; *U. kempi* Sankolli, 1972 (= *U. foresti* Ngoc-Ho, 1989b); *U. hirtifrons* (White, 1847b); *U. holthuisi* Sakai, 1982; *U. imperfecta* Sakai, 1982; *U. issaeffi* (Balss, 1913); *U. kuekenthali* Sakai, 1982; *U. laemanu* Ngoc-Ho, 1990; *U. lagonensis* (Ngoc-Ho, 1989a), *U. laurentae* (Ngoc-Ho, 1989a), *U. lenzrichtersi* Sakai, 1982; *U. lifuensis* (Ngoc-Ho, 1994b); *U. lincolni* Ngoc-Ho, 1977b; *U. longicauda* Sakai, 1975; *U. major* (De Haan, 1839) (syn.: *U. trispinosa* Sakai & Mukai, 1991); *U. miyakei* Sakai, 1967; *U. monoceros* De Man, 1905, *U. mortenseni* sp. nov.; *U. multispinosa* (Ngoc-Ho, 1994b); *U. narutensis* Sakai, 1986; *U. neglecta* De Man, 1927; *U. osiridis* Nobili, 1904; *U. ovalis* Ngoc-Ho, 1991; *U. plantae* Sakai, 1982; *U. poorei* (Ngoc-Ho, 1994a); *U. priochela* Sakai, 1993; *U. pseudochelata* Tattersall, 1921 (= *Upogebia balssi* De Man, 1927); *U. pugnax* De Man, 1905; *U. reunionensis* (Ngoc-Ho, 1989a); *U. richeri* (Ngoc-Ho, 1989a), *U. sakaii* Ngoc-Ho, 1994b; *U. savignyi* (Strahl, 1862a) (syn.: *U. isodactyla* (Ortmann, 1891), *U. rhadames* Nobili, 1904); *U. seychellensis* Sakai, 1982; *U. shenchiajuii* Yü, 1931; *U. snelliusi* Ngoc-Ho, 1989b; *U. spinifrons* (Haswell, 1881) (syn.: *U. nobilii* Sakai & Türkay, 1995); *U. spinimanus* Ngoc-Ho, 1994b; *U. spongium* Sakai, 1975; *U. srilankaensis* sp. nov.; *U. stenorhynchus* Ngoc-Ho, 1991; *U. takaoensis* Sakai & Türkay, 1995; *U. tractabilis* Hale, 1941; *U. wuhsienweni* Yü, 1931; *U. yokoyai* Makarov, 1938; *U.* sp. Borradaile, 1904; *U.* sp. Edmondson, 1944; *U.* sp. Sakai, 1995; *U.* sp. β De Man, 1928.

KEY TO THE SPECIES OF THE GENUS *UPOGEBIA* IN THE INDO-WEST PACIFIC OCEANS

1. Lateral ridges of gastric region not projecting forward 2
– Lateral ridges of gastric region projecting forward 27
2. Infrarostral spine present 3
– Infrarostral spine absent 16

3. Infrarostral spine numbers only one 4
– Infrarostral spines number more than one 6
4. A2 segments 3-4 with four ventral spines ..... *U. reunionensis* (Ngoc-Ho, 1989)
– A2 segments 3-4 each with one ventral spine 5
5. P1 palm bearing no spinose row; telson distinctly concave on posterior margin .... *U. monoceros* De Man, 1905
– P1 palm bearing spinose row; telson slightly concave on posterior margin .... *U. ceratophora* De Man, 1905
6. Infrarostral spines two in number, one subventrodistal spine attached anteriorly to a small distal spine 7
– Infrarostral spines counting more than three 10
7. Cervical groove bearing spinulose row; A2 penultimate segment with one distal spine on ventral margin ..... *U. lagonensis* (Ngoc-Ho, 1989)
– Cervical groove bearing only single hepatic spine; A2 penultimate segment with three spines on ventral margin 8
8. P1 carpus bearing two strong dorsodistal spines on mesial surface .... *U. arabica* (Ngoc-Ho, 1989)
– P1 carpus bearing three strong dorsodistal spines on mesial surface 9
9. Rostrum elongate; two infrarostral spines closely to each other, located distally, distal one smaller than proximal ..... *U. acanthochela* Sakai, 1967
– Rostrum rounded; two infrarostral spines separately located distally, almost equal in size ..... *U. poorei* (Ngoc-Ho, 1994)
10. Infrarostral spines located distally, forming a set of three spines 11
– Infrarostral spines separately located distally 12
11. Mesial surface of P1 palm lacking spinose rows ..... *U. laurentae* (Ngoc-Ho, 1989)
– Mesial surface of P1 palm bearing spinose rows 13
12. Ventral margin of P1 palm bearing series of strong spines posterior to fixed finger .... *U. richeri* (Ngoc-Ho, 1989)
– Ventral margin of P1 palm bearing one strong spine accompanied by small spine posterior to fixed finger 14
13. Proximal knob on lateral margin of uropodal endopod distinct .... *U. multispinosa* (Ngoc-Ho, 1994)
– Proximal knob on lateral margin of uropodal endopod indiscernible .... *U. acutispina* De Saint Laurent & Ngoc-Ho, 1979
14. P1 dactylus dorsally carinate on mesial surface ..... *U. plantae* Sakai, 1982
– P1 dactylus dorsally denticulate on mesial surface 15
15. P1 dactylus mesially tuberculate along prehensile margin ..... *U. priochela* (Sakai, 1993)
– P1 dactylus mesially smooth along prehensile margin ..... *U. lifuensis* (Ngoc-Ho, 1994)
16. P1 chelate; anterolateral margin of carapace armed or not armed with ocular spine 17
– P1 subchelate; anterolateral margin of carapace armed with ocular spine 24
17. Anterolateral margin of carapace armed with ocular spine ..... *U. mortenseni* sp. nov.
– Anterolateral margin of carapace unarmed 18
18. Rostrum narrow and elongate, bearing four front teeth ..... *U. srilankaensis* sp. nov.
– Rostrum triangular in dorsal view 19
19. Rostrum with two frontal teeth 20
– Rostrum with four frontal teeth 22
20. P1 merus unarmed on ventral margin ..... *U. amboinensis* (De Man, 1888)
– P1 merus armed with a row of tubercles or spines 21
21. P1 merus with a row of tubercles on ventral margin ..... *U. holthuisi* Sakai, 1982

– P1 merus with a row of distinct spines on ventral margin ..... *U. fijiensis* Sakai, 1982
22. P1 fixed finger unarmed on prehensile margin. Telson subquadrate, broader than long .... *U. barbata* (Strahl, 1862)
– P1 fixed finger proximally denticulate on prehensile margin 23
23. Telson not with tubercles, beset with a distinct transverse carina .... *U. baweana* Tirmizi & Kazmi, 1979
– Telson with tubercles, beset with U-shaped carina ..... *U. ancylodactyla* De Man, 1905
24. Telson bearing two transverse carinae ..... *U. dromana* Poore & Griffin, 1979
– Telson bearing U-shaped carina 25
25. Rostrum short, bearing four frontal teeth; P1 palm smooth on dorsal margin; P2 merus unarmed on dorsal margin ..... *U. kempi* Sankolli, 1972
– Rostrum triangularly elongate, brimmed with more than four marginal teeth; P1 palm denticulate on dorsal margin 26
26. Epistome unarmed ..... *U. sakaii* Ngoc-Ho, 1994
– Epistome with a terminal spine ..... *U. pugnax* De Man, 1905
27. Infrarostral spine present 28
– Infrarostral spine absent 34
28. Uropodal endopod lacking a proximal knob on lateral margin 29
– Uropodal endopod bearing a proximal knob on lateral margin 30
29. Anterolateral margin of carapace bearing an ocular spine; two short infrarostral spines located ventrodistally; telson lacking a transverse carina ..... *U. imperfecta* Sakai, 1982
– Anterolateral margin of carapace bearing one distinct ocular spine and four spinules; one infrarostral spine located distally; telson bearing a strong transverse carina .... *U. snelliusi* Ngoc-Ho, 1989
30. Ventral margin of P1 palm posterior to fixed finger armed with a large spine 31
– Ventral margin of P1 palm posterior to fixed finger not armed with a large spine 32
31. Male P1 fixed finger with a tubercle on prehensile edge ..... *U. wuhsienweni* Yü, 1931
– Male P1 fixed finger unarmed on prehensile edge ..... *U. edulis* Ngoc-Ho & Chan, 1992
32. Male P1 palm mesially lacking any translucent ridge ..... *U. narutensis* Sakai, 1986
– Male P1 palm mesially bearing some translucent ridges 33
33. Rostrum narrowly elongate; dactylus tuberculate on dorsal margin .... *U. takaoensis* Sakai & Türkay, 1995
– Rostrum triangularly protruded forward; dactylus smooth on dorsal margin .... *U. spinifrons* (Haswell, 1881)
34. P1 chelate 35
– P1 subchelate 51
35. Anterolateral margin of carapace armed with an ocular spine 36
– Anterolateral margin of carapace unarmed 37
36. P1 palm unarmed on dorsal margin .... *U. darwinii* (Miers, 1884) (in unusual case only)
– P1 palm denticulate on dorsal margin ..... *U. allspachi* sp. nov.
37. Abd6 denticulate on posterior margin 38
– Abd6 smooth on posterior margin 39
38. Rostrum triangular, bearing 4-10 marginal front teeth; P1 fixed finger bearing a row of denticles or obtuse teeth on prehensile margin ..... *U. darwinii* (Miers, 1884)
– Rostrum triangular, bearing 13 frontal teeth; P1 fixed finger armed with a dozen of forwardly directed, acute teeth on prehensile margin ..... *U. bowerbankii* (Miers, 1884)
39. P1 merus unarmed on ventral margin; P1 chela shortened .... *U. kuekenthali* Sakai, 1982
– P1 merus armed with denticles or spines on ventral margin; P1 chela of moderate length 40

40. Eyestalks reaching to or overreaching rostral tip 41
– Eyestalks failing to reach rostral tip 43
41. Telson truncate on posterior margin; P1 dactylus unarmed on prehensile margin .... *U. brucei* Sakai, 1975
– Telson convex on posterior margin; P1 dactylus armed with tooth or spine 42
42. P1 dactylus armed with a strong tooth on prehensile margin .... *U. digitina* (Sakai, 1975)
– P1 dactylus armed with sparse denticles on prehensile margin .... *U. tractabilis* Hale, 1941
43. Telson rounded on posterior margin 44
– Telson convex or truncate on posterior margin 46
44. Uropodal endopod truncate distally ..... *U. ovalis* Ngoc-Ho, 1991
– Uropodal endopod rounded distally 45
45. P1 dactylus bearing median tuberculate carina on mesial surface .... *U. stenorhynchus* Ngoc-Ho, 1991
– P1 dactylus lacking median carina on mesial surface ..... *U. longicauda* Sakai, 1975
46. Rostrum triangular, bearing marginal spines 47
– Rostrum only a low triangle, bearing inconspicuous marginal spines 48
47. P1 carpus without ventrodistal spine ..... *U. balmaorum* Ngoc-Ho, 1990
– P1 carpus with ventrodistal spine ..... *U. laemanu* Ngoc-Ho, 1990
48. P1 dactylus bearing a triangular tooth on prehensile margin 49
– P1 dactylus unarmed on prehensile margin 50
49. P1 chela ending in translucent tip; P1 merus either bearing a few spines, or being spinulose on ventral margin ..... *U. borradailei* Sakai, 1982
– P1 chela ending in a calcified tip; P1 merus distinctly denticulate on ventral margin .... *U. cargadensis* Borradaile, 1910
50. P1 fixed finger denticulate; P1 merus denticulate on ventral margin .... *U. savignyi* (Strahl, 1862)
– P1 fixed finger smooth; P1 merus bearing sharp spines on ventral margin .... *U. spongium* Sakai, 1975
51. Anterolateral margin of carapace lacking a postocular spine 52
– Anterolateral margin of carapace armed with a postocular spine 55
52. P1 merus armed with denticles or spines on ventral margin ..... *U. osiridis* Nobili, 1904
– P1 merus unarmed on ventral margin 53
53. P1 dactylus largely concave and denticulate on prehensile margin, A1 peduncle unarmed ..... *U.* sp. β De Man, 1928
– P1 dactylus bearing a triangular tooth medially on prehensile margin 54
54. P1 dactylus denticulate on distodorsal margin; tip not transparent .... *U. assisi* Barnard, 1947
– P1 dactylus smooth on distodorsal margin; tip transparent .... *U. pseudochelata* Tattersall, 1921
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59. Dorsal margin of P1 palm bearing some spines, but not entirely denticulate 60
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60. Ventral margin of P1 bearing fixed finger distinctly distant from its distal angle .... *U. lincolni* Ngoc-Ho, 1977
– Ventral margin of P1 bearing fixed finger just around distal corner of palm 61
61. Distolateral margin of P1 palm lacking a tooth above fixed finger 62
– Distolateral margin of P1 palm bearing a tooth above fixed finger 63
62. Dorsal margin of P1 palm bearing a median tooth ..... *U. spinimanus* Ngoc-Ho, 1994
– Dorsal margin of P1 palm bearing a dorsal carina in its proximal half .... *U. lenzrichtersi* Sakai, 1982
63. Dorsal margin of P1 palm bearing a distal and a proximal spine .... *U. seychellensis* Sakai, 1982
– Dorsal margin of P1 palm bearing only a distal spine 64
64. Rostrum separated from lateral ridge of gastric region by a wide groove .... *U. allobranchus* Ngoc-Ho, 1991
– Rostrum separated from lateral ridge of gastric region by a narrow groove .... *U. neglecta* De Man, 1927
65. Rostrum and gastric region marked with a transverse groove .... *U. yokoyai* Makarov, 1938
– Rostrum and gastric region continuous 66
66. P1 fixed finger with median tooth on prehensile margin 67
– P1 fixed finger short and smooth, without a median tooth on prehensile margin 68
67. P1 dactylus smooth on dorsal margin, laterally with a smooth dorsal carina in dorsal half ..... *U. hirtifrons* (White, 1847)
– Male P1 dactylus dorsally with a row of fine transverse carinae; in males mesial surface bearing a row of 8-12 distinct oblique ridges, and in females a row of short transverse ridges ..... *U. issaeffi* (Balss, 1913)
68. P1 dactylus tuberculate on prehensile margin ..... *U. africana* Ortmann, 1894
– P1 dactylus armed with a large truncate (male) or a simple tooth (female) on prehensile margin 69
69. P1 dactylus dorsally with a yellow-transparent carina, mesially with a row of three large oblique ridges ..... *U. major* (De Haan, 1841), male
– P1 dactylus dorsally with a row of transverse ridges, mesially with a row of short oblique ridges ..... *U. major* (De Haan, 1841), female

Upogebia acanthochela Sakai, 1967

Upogebia acanthochela Sakai, 1967: 44, pl. 4 fig. 2A-G; De Saint Laurent & Ngoc-Ho, 1979: 63, figs. 6-8, 22-24 (in part); Itani, 2004, table 2 (list).
Upogebia (*Upogebia*) *ceratophora*; Sakai, 1982: 49 (partly *Gebiacantha acutispina*).
Upogebia (*Upogebia*) *acanthochela*; Sakai, 1987: 306 (list).
Gebiacantha acanthochela; Ngoc-Ho, 1989a: 121; Ngoc-Ho, 2001: 54.

Material examined. — SMF 30865, 1 male (TL/CL, 22.0/7.6 mm), 1 female (TL/CL, 23.0/7.6 mm), R/V "Yoko-maru", Seikai National Fisheries Research Institute, Fisheries Research Agency, St. 11-D, probably Yellow Sea, trawl.

Type locality. — Yellow Sea, 100 m.

Distribution. — Yellow Sea (Sakai, 1967); 100 m.

Upogebia acarinicauda sp. nov. (fig. 11)

Material examined. — ZMUC-CRU 9711, holotype, female (TL/CL, 9.0/2.4 mm), Bay at Cape Diego, Diego Suarez, Madagascar, "Galathea" St. No. 227, Galathea Expedition, Gear D 45, mud, 4-8 m, 4.iii.1951.

Diagnosis. — Infrarostral spine absent. Lateral ridges projecting forward. Anterolateral margin of carapace with single spine. Abdominal sternites unarmed. P1 carpus with two strong distal spines on mesial surface. P2 merus bearing one subdistal spine on dorsal margin; P3 merus unarmed.

Description. — Rostrum (fig. 11A, B) obtuse anteriorly, slightly longer than broad. Rostrum and gastric region scantly setose and tuberculate laterally on dorsal surface, but smooth medially, gastric region divergent posteriorly along lateral margin: shallow median groove discernible from rostrum posteriorly to anterior part of gastric region; infrarostral spine absent. Lateral ridges of gastric region triangularly projecting forward with wide distance from median gastric region, reaching to proximal 1/3-1/2 length of eyestalks. Cervical groove unarmed. Postocular spine present.

Eyestalk stout. A1 peduncle (fig. 11B) reaching to terminal segment of A2 peduncle. A2 peduncle overreaching rostrum by distal margin of penultimate segment; scaphocerite distinct, showing triangular shape. Mxp3 bearing exopod with flagellum. Epistomial projection with one strong distal spine.

P1 coxa bearing one small distal spine on mesial surface. Ischium unarmed on ventral margin. Merus (fig. 11C) with two spines on ventral margin, and unarmed on dorsal margin. Carpus triangular, bearing one strong dorsal and also strong ventral spine on distal margin, and small distal spine on mesial surface. Palm 3 times as long as broad, dorsal margin mesially armed with a median spine, lateral surface with distal denticle just above dactylar condyle, ventral margin distally carinate, extending to fixed finger. Fixed finger (fig. 11D) short, bearing four denticles on prehensile margin, declining forward with a small triangular dactylar condyle to tip. Dactylus slender, lateral and mesial surfaces flanked on each side by longitudinal ridge, above which bearing sparse row of setae; tip corneous.

Abdominal sternites unarmed. Telson (fig. 11f) subsquare, lateral margins divergent in proximal third, distal to that convergent in distal two-thirds to postlateral angle; distal margin bearing obsolescent median spine; transverse proximal ridge discernible.

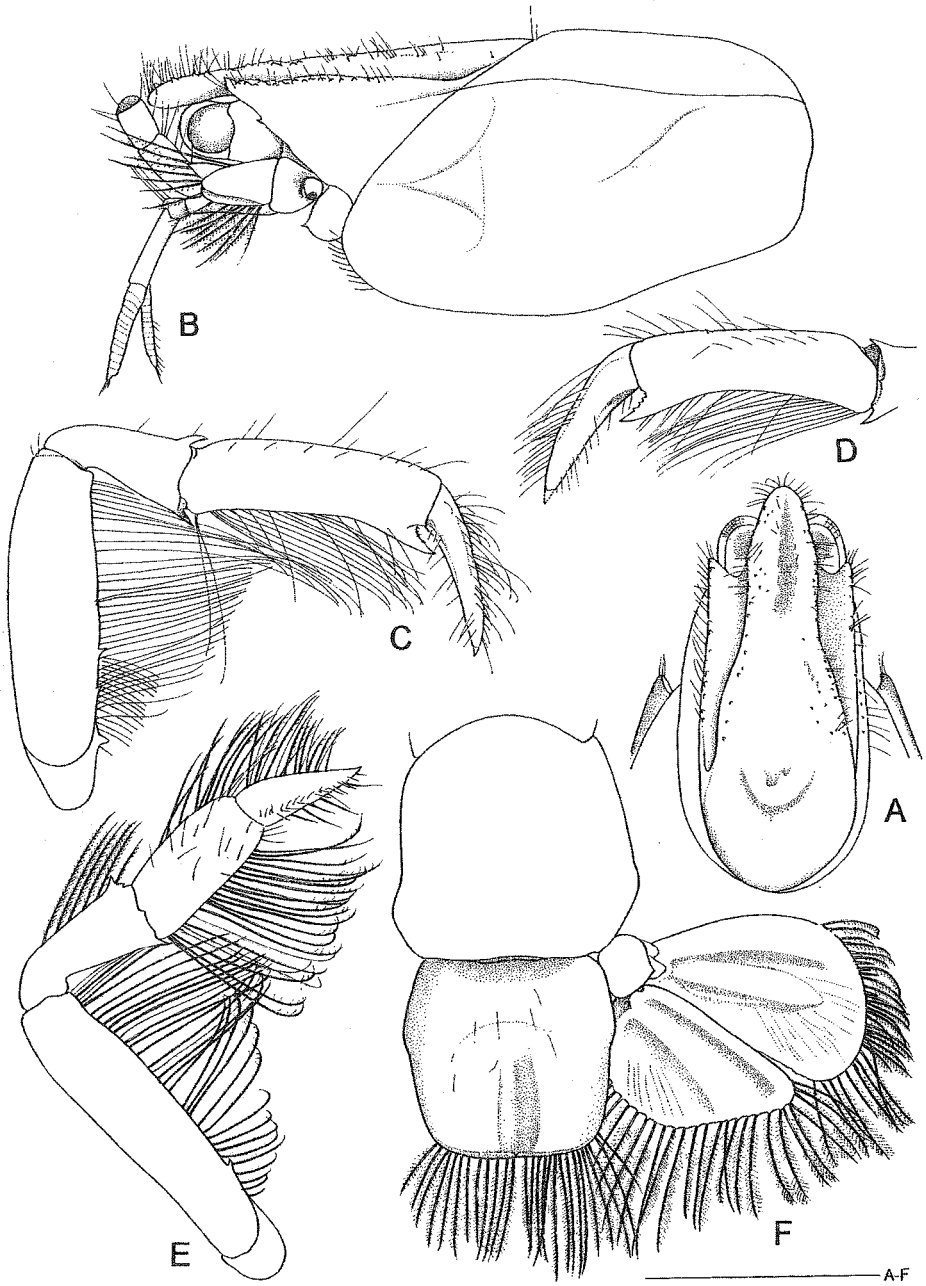

Fig. 11. *Upogebia acarinicauda* sp. nov. A, cephalic region, dorsal view; B, cephalothoracic region, lateral view; C, P1 of right side, lateral view; D, same, mesial view; E, P2 of right side, lateral view; F, abdominal somite 6, telson, and uropod of right side. A-F, ZMUC-CRU 9711, holotype, female (TL/CL, 9.0/2.4 mm), Bay at Cape Diego, Diego Suarez, Madagascar, "Galathea" Expedition, mud, 4-8 m.

Uropodal protopod with posterior spine on lateral margin; uropodal endopod triangularly protruding on posterolateral angle, bearing mesial rib, uropodal exopod distally broadened, with convex distal margin.

Remarks. — The present species, *Upogebia acarinicauda* sp. nov., is similar to *Upogebia carinicauda* (Stimpson, 1860) in that the P1 fixed finger bears four denticles on the prehensile margin, the infrarostral spine is absent, the anterolateral margin of the carapace is provided with one ocular spine, the telson is diverging in width in the proximal third, and the P1 merus is unarmed on the dorsal margin. The new species, however, differs from *U. carinicauda*, because in *U. carinicauda* the telson bears a characteristic transverse carina, and the P2 merus bears a subterminal spine on the dorsal margin, whereas in the present species the telson bears no transverse carina, even if the specimen is young, and the P2 merus (fig. 11E) bears no subterminal spine on the dorsal margin.

Type locality. — Cape Diego, Diego Suarez, Madagascar, 4-8 m.

Distribution. — So far only known from the type locality.

Etymology. — The prefix "a" meaning without or away in Latin, is placed before the roots of the existing species name, *carinicauda*, whence *acarinicauda* means: the telson without a characteristic carina. The name is a noun in apposition to the generic name.

Upogebia acutispina De Saint Laurent & Ngoc-Ho, 1979

Upogebia acutispina De Saint Laurent & Ngoc-Ho, 1979: 57, figs. 1-5, 9-21.
Upogebia (*Upogebia*) *ceratophora*; Sakai, 1982: 49 (partly *Gebiacantha acanthochela*).
Upogebia niugini Poore, 1982: 169, figs. 1-2.
Gebiacantha acutispina; Ngoc-Ho, 1989a: 122; Sakai, 1993: 98, fig. 6; Ngoc-Ho, 2001b: 54; Davie, 2002: 481.

Remarks. — This species is hardly different from *U. multispinosa* Ngoc-Ho, 1994 from the Loyalty Islands, but the shape of the infrarostral spines differs between the two species. In *U. multispinosa*, the median one of three distal infrarostral spines is more projecting forward than the others, whereas in *U. acutispina* it is the ventral spine of the three that is more projecting forward.

Type locality. — Holothuria Bank, 13°35′S 126°00′E, Australia.

Distribution. — Australia: Holothuria Bank (De Saint Laurent & Ngoc-Ho, 1979; Sakai, 1993); Papua New Guinea: Port Moresby (Poore, 1982; Sakai, 1993).

Upogebia africana (Ortmann, 1894)

Gebia africana Ortmann, 1894: 21 (key), 22, pl. 2, fig. 4a-b; ICZN, 2001: 2.
Upogebia (*Upogebia*) *africana*; Borradaile, 1903: 543; De Man, 1928: 22 (list), 37, 51.
Upogebia africana; Barnard, 1947: 380; Barnard, 1950: 515 (key), 519 (partim); Ngoc-Ho & Poore, 1992: 187.
Upogebia africana; Siegfried, 1962: 1-24, 9 figs., 3 tables; Hill et al., 1972: 337-343, figs. 1-8; Hanekom et al., 1988: 259-264, figs. 1-12; Zoutendyk et al., 1988: 236, figs. 4-5, table 1.
Upogebia (*Upogebia*) *capensis*; Sakai, 1982: 43 (partim).

Remarks. — *U. africana* is distributed along the east coast of South Africa east of Knysna, the western limit; the type locality is Port Elizabeth, located to the east of Knysna. The specimen of *U. capensis*, described as *U. subspinosa* from Knysna (Sakai, 1984) is to be assigned to *U. africana* based on the locality alone.

Type locality. — Port Elizabeth, South Africa.

Distribution. — South Africa: Port Elizabeth (Ortmann, 1894), Port Beaufort, Plettenberg Bay, East London, Port St. Johns, and Durban Bay (Barnard, 1950), Knysna and Langebaan (Sakai, 1982), Port Elizabeth (Ortmann, 1894), Kowie, Port Alfred, and Keurbooms estuary (Dworschak, 1992).

Upogebia allobranchus Ngoc-Ho, 1991

Upogebia allobranchus Ngoc-Ho, 1991: 297, fig. 7.

Remarks. — Though Ngoc-Ho (1991: 289) compared this species with *U. capensis* (Krauss, 1843) and *U. africana* (Ortmann, 1894), this species is more closely related to *U. neglecta* De Man, 1927 in that the P1 palm is armed with a distal spine on the dorsal margin and two distal spines on the mesial surface, and also the shapes of the A2, the telson, and the P2 and 3 are almost the same as those in *U. neglecta*. However, in *U. neglecta* the lateral ridges of the gastric region are projecting forward, whereas in *U. allobranchus* they are projecting laterally.

Type locality. — New Caledonia.

Distribution. — New Caledonia (Ngoc-Ho, 1991).

Upogebia allspachi sp. nov. (figs. 12-13)

Material examined. — SMF 30209, holotype, male (TL/CL, 19.0/6.0 mm); SMF 30210, paratypes, males (TL/CL, 19.0/5.9 – 19.0/6.0 mm), 4 km W. of Lami, Veisari, Viti Levu, Fiji, river, mangrove, bridge, under stones, fresh-brackish water ca. 1 km to coast, 1.ii.1995, leg. A. Allspach & M. Türkay.

Diagnosis. — Rostrum narrowly triangular and distally equipped with four strong frontal teeth; infrarostral spine absent. Lateral ridges of the gastric region distinctly projecting forward as strong teeth, followed posteriorly by 10-11 denticles. Cervical groove laterally denticulate. Postocular spine strong. P1 ischium bearing ventral tooth on mesial margin; merus with subdistal spine on dorsal margin, unarmed on ventral margin; carpus bearing three strong distal spines on mesial surface; palm denticulate on dorsal margin. Chelae equal and chelate; dactylus and fixed finger denticulate on each prehensile margin. P2 merus with subdistal spine on dorsal margin. P3 merus unarmed on dorsal

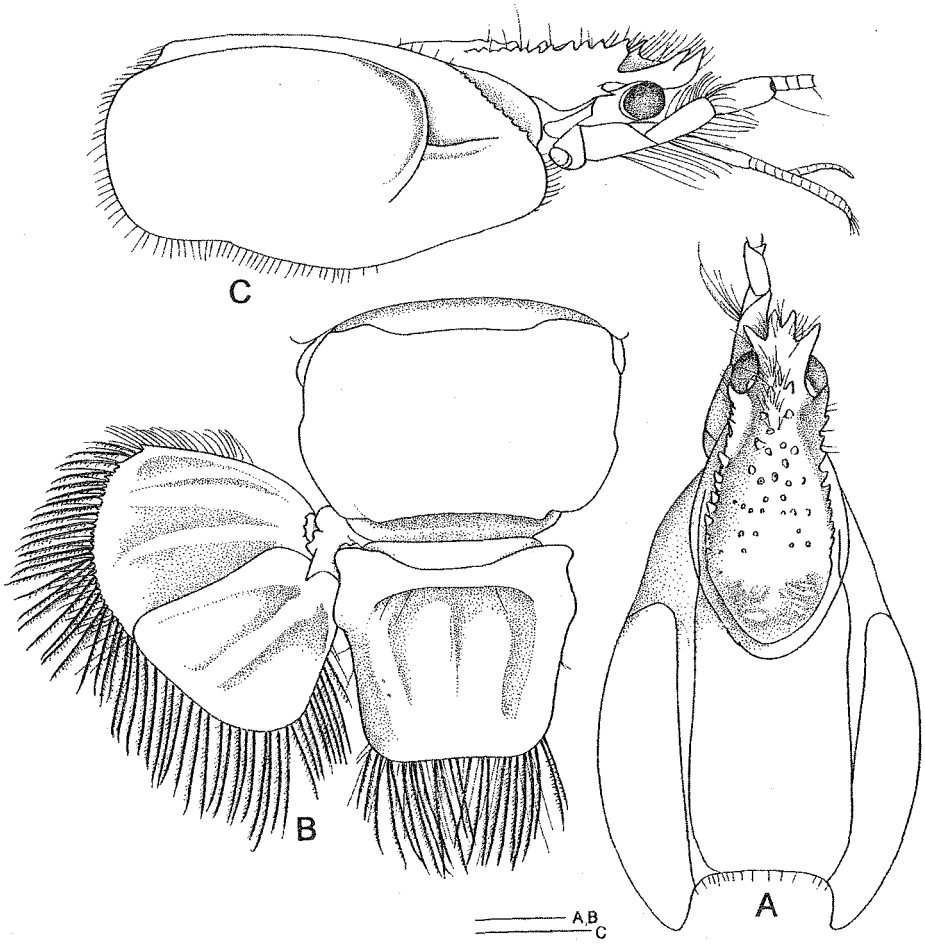

Fig. 12. *Upogebia allspachi* sp. nov. A, carapace, dorsal view; B, abdominal somite 6, telson, and uropod of left side; C, carapace, lateral view. A-C, SMF 30210, paratype, male (TL/CL, 19.0/6.0 mm), 4 km W. of Lami, Veisari, Viti Levu, Fiji, river, mangrove, bridge, under stones, fresh-brackish water, ca. 1 km to coast, 1.ii.1995.

margin. P4-5 spineless. Telson trapezoid in dorsal view, proximally bearing a strong transverse carina.

Description of male holotype. — Rostrum (fig. 12A, B) narrowly triangular, 1.2 times as long as broad at base, setose on dorsal surface, bearing 4 strong

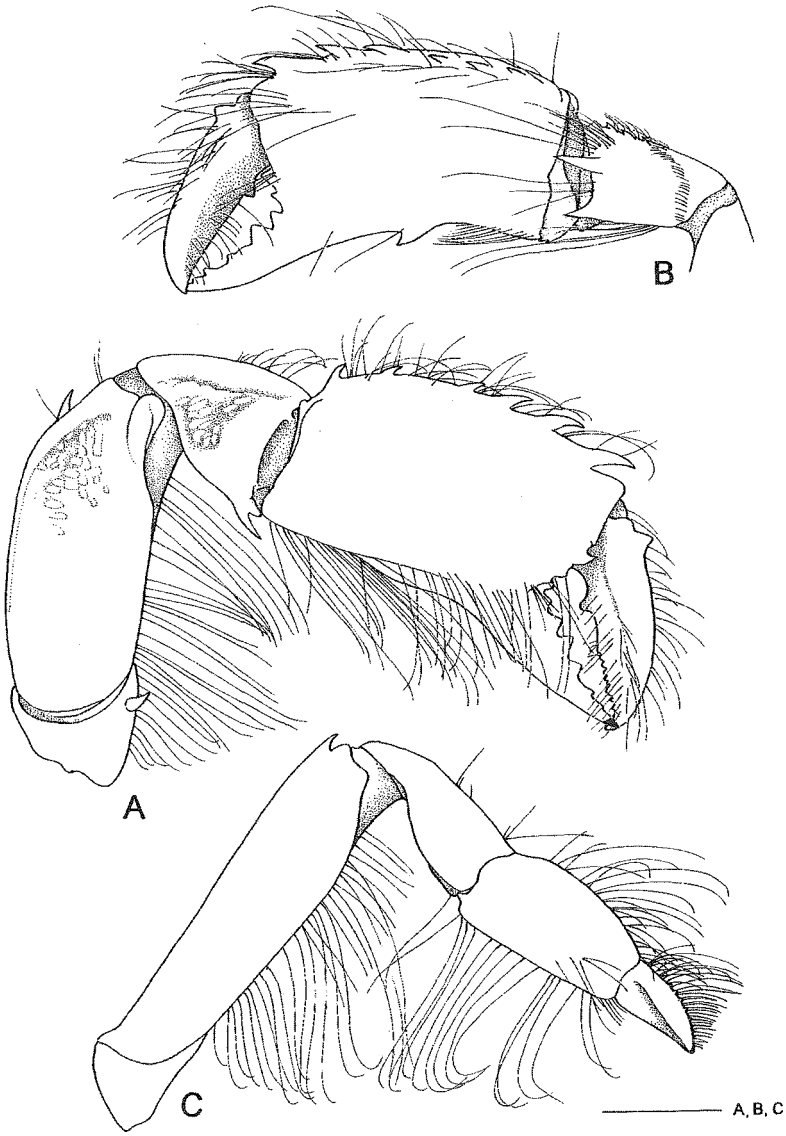

Fig. 13. *Upogebia allspachi* sp. nov. A, P1 of right side, lateral view; B, same, mesial view; C, P2 of right side, lateral view. A-C, SMF 30210, paratype, male (TL/CL, 19.0/6.0 mm), 4 km W. of Lami, Veisari, Viti Levu, Fiji, river, mangrove, bridge, under stones, fresh-brackish water, ca. 1 km to coast, 1.ii.1995.

frontal teeth; infrarostral spine absent; lateral ridges of gastric region each projecting as a strong tooth, separated by a wide anterior concavity from the mid dorsal area of the gastric region, and extending posteriorly with a row of 10-11 unequal denticles. Cervical groove laterally denticulate. Postocular spine distinct.

Eyestalks (fig. 12B) elongate, reaching to middle of rostrum. A1 peduncle reaching to middle of A2 distal segment; proximal segment bearing distal spine on ventral margin. A2 segment 3 with distal spine on ventral margin, overreaching rostrum by proximal margin of terminal segment; scaphocerite pointed at tip.

Mxp3 exopod bearing flagellum that fails to reach distal margin of merus of endopod.

Epistome protruding forward with obtuse tooth in lateral view.

P1 coxa (fig. 13A) bearing distal tooth on mesial margin; basis unarmed; ischium bearing one subterminal spine on ventral margin. Merus unarmed on ventral margin, and with subdistal spines on dorsal margin. Carpus triangular, showing longitudinal ventral carina on lateral surface; ventral margin bearing strong distal spine; mesial surface (fig. 13B) bearing three strong dorsal spines on distal margin. Chela about 2.2 times as long as broad; palm 1.5 times as long as broad; dorsal margin bearing a row of six spines; lateral surface beset with distinct sharp ventral tooth on distal margin, below which two low triangular teeth; ventral margin bearing median tooth. Fixed finger bent downward, bearing a row of distinct denticles on prehensile margin. Dactylus armed with a distinct subproximal tooth on dorsal margin, and also with a distinct subproximal tooth, and slightly distant from it, distally with row of denticles in distal half of prehensile margin. P2 simple; merus bearing subterminal tooth on dorsal margin; dactylus laterally forming a longitudinal plate in dorsal half, concave in ventral half; dorsal margin with a row of tubercles (fig. 13C).

Abdominal sternites unarmed; Abd somite 6 smooth on posterior margin.

Telson (fig. 12C) trapezoid in dorsal view; dorsal surface with sharp transverse proximal carina in proximal part, lateral longitudinal margins convex in proximal fourth, slightly convergent posteriorly, and continuing as straight posterior margin.

Uropodal endopod slightly shorter than telson, distally broadened with straight distal margin, exopod distally more broadened than endopod, and rounded on distal margin.

Ecology. — Suva, 4 km W. of Lami, mangrove at the Veisari River, under the bridge of the road, on the very moist riverbank, not awash, under stone (all specimens under the same stone, of ca. 20 cm in diameter), the animals were

lying horizontally in burrows, like earthworms, under the stone. Very muddy sediment, ca. 2 m to the river water [after note by A. Allspach].

Remarks. — The present new species is characteristic in that the P1 shows a chelate cheliped and bears a strong ocular spine. However, the form of the tail-fan is similar to that of most species bearing a subchelate cheliped in the family Upogebiidae.

Etymology. — The species name, *allspachi* is dedicated to my sincere colleague, Mr. Andreas Allspach of the Senckenberg Museum, Frankfurt am Main, who collected this species together with Dr. M. Türkay during an excursion to the Fiji Islands. The name is a noun in the genitive singular.

Upogebia amboinensis (De Man, 1888)

Gebiopsis intermedia var. *amboinensis* De Man, 1888: 462.
Upogebia (*Calliadne*) *ancylodactyla* var. *amboinensis*; De Man, 1928: 24 (list), 38, 50, 89, pl. 10 fig. 14-14a.
Upogebia amboinensis; Holthuis, 1953a: 51.
Upogebia (*Upogebia*) *amboinensis*; Sakai, 1982: 25, figs. 3d, 5a.
Upogebia ?amboinensis; Dworschak, 1992: 220.
Non *Gebiopsis intermedia* var. *amboinensis*; De Man, 1902: 759. [= *Upogebia kuekenthali* Sakai, 1982.]

Type locality. — Ambon, Indonesia.

Distribution. — Indonesia: Ambon (De Man, 1888; Sakai, 1982; Dworschak, 1992).

Upogebia anacanthus Ngoc-Ho, 1994

Upogebia anacanthus Ngoc-Ho, 1994a: 70, fig. 9.

Type locality. — Queensland, N.E. of Townsville, 18°43′S 146°45′E, 34 m, muddy sand.

Distribution. — Australia: N.E. of Townsville and Pandora Reef (Ngoc-Ho, 1994a); 12-34 m.

Upogebia ancylodactyla De Man, 1905

Gebiopsis darwinii Miers, 1884: 281 (part.), pl. 32 fig. A.
Upogebia (*Gebiopsis*) *ancylodactyla* De Man, 1905: 599.
Upogebia (*Calliadne*) *ancylodactyla*; De Man, 1928: 24 (list), 87 (part.), pl. 9 fig. 13-13h, pl. 10 fig. 13i-j [not fig. 13a].
Upogebia darwini; Ngoc-Ho, 1977a: 439 (part.), figs. 1-3 [not: fig. 4f-h = *U. darwinii* (Miers, 1884)].
Upogebia (*Upogebia*) *ancylodactyla*; Sakai, 1982: 27, figs. 3e, 5c; Sakai, 1984: 160.
Upogebia ancylodactyla; Tirmizi & Kazmi, 1979: 106, fig. 1; Sakai, 1993: 90.

Upogebia darwini; Sakai, 1982: 18 (BM 82-24, one male and one ovig. female from Singapore) [not *U. darwinii*].

Material examined. — ZMUC-CRU 9761, 14 males (TL/CL, 14.0/4.1 – 35.0/10.1 mm), 4 females (TL/CL, 26.0/8.0 – 38.0/10.9 mm), 12 ovig. females (TL/CL, 39.0/8.3 – 40.0/10.9 mm), Th. Mortensen's Java-S. Africa Expedition, 1929-30, 24.iv.1929; ZMUC-CRU 9762, 1 female (TL/CL, 31.0/10.0 mm), Trincomalee, Sri Lanka, 7 fathoms (12.8 m), K. Frisber, iii.1889; ZMUC-CRU 9763, 3 males (TL/CL, 24.0/6.4 mm), 4 ovig. females (TL/CL, 22.0/6.3 – 26.0/7.5 mm), 3 females (TL/CL, 21.0/5.7 – 26.0/7.2 mm), Koh Chang, coral reef, Th. Mortensen Expedition, i-iii.1900; ZMUC-CRU 9766, 1 male (TL/CL, 12.0/3.7 mm), 1 ovig. female (TL/CL, 13.0/3.6 mm), Koh Chang, coral reef, Th. Mortensen Expedition, i-iii.1900; SMF 30864, 2 males (TL/CL, 18.0/5.4 – 19.0/67.0 mm), 2 ovig. females (TL/CL, 22.0/6.9 – 28.0/8.1 mm), Amboina, Moluccas, Indonesia, gift from A. Strubell.

Remarks. — In 1905 De Man described two syntypes of *Upogebia ancylodactyla*, a male from the Siboga Expedition St. 60 and an ovigerous female (cf. Sakai, 1982: 28) from Siboga Expedition St. 323. Later, in 1928, De Man described a (the?) male as with the distal margin of the P1 palm unarmed on the lateral surface (De Man, 1928, pl. 9 fig. 13e, a male from St. 60), and a (the?) female as with the distal margin of the P1 palm armed with a spine (De Man, 1928, pl. 10 fig. 13j, a female from St. 323). De Man's female from Siboga Expedition St. 323 was later recognized as *U. baweana* Tirmizi & Kazmi, 1979 (Sakai, 1998: 27-28).

Though De Man (1928) described that the male of *U. ancylodactyla* bears a squarish telson as in his pl. 13a, whereas the female of *U. baweana* bears a broader telson as in his pl. 13h, Tirmizi & Kazmi (1979, fig. 2D) have separated those two species on the shape of the telson. They (Tirmizi & Kazmi, 1979) described a female type of *U. baweana* as "the telson is broader than long, narrows very slightly towards the posterior margin" (Tirmizi & Kazmi, 1979: 108, fig. 2D), whereas they described the male of *U. ancylodactyla* as "the telson is broader than long, it bears a sharp inverted U-shaped ridge, which is armed, a pair of sub-median tubercles can also be seen just posterior to the transverse ridge" (Tirmizi & Kazmi, 1979, fig. 1C). As the male from St. 60 and the female from St. 323 are apparently different in the shape of the telson, they have to be identified as *U. ancylodactyla* (the specimen from St. 60, bearing a squarish telson as in De Man's (1928) pl. 13a), and *U. baweana* (the specimen from St. 323, bearing a broader telson as in De Man's (1928) pl. 13h).

Type locality. — Haingsisi, Samau Island, near Timor, Indonesia, "Siboga" stn 60, shore.

Distribution. — Red Sea: northern Nocra Island and Kamaran Island (Sakai, 1984); Singapore (Miers, 1884, as *Gebiopsis darwinii*; Sakai, 1982); Philippines: Luzon (Sakai, 1982); Indonesia: Semau Island (De Man, 1905; Sakai, 1982),

Semau Island and Bawean Island (De Man, 1928); Australia: Port Essington, N.T. (Sakai, 1993).

Upogebia arabica (Ngoc-Ho, 1989)

Gebiacantha arabica Ngoc-Ho, 1989a: 129, fig. 4; Ngoc-Ho, 2001: 54.

Type locality. — Gulf of Suez, 29°N 33°3′E – 29°N 32°50′E, 50-60 m.
Distribution. — Gulf of Suez (Ngoc-Ho, 1989a); 50-60 m.

Upogebia assisi Barnard, 1947

Upogebia assisi Barnard, 1947: 381; Barnard, 1950: 515 (key), 520, fig. 97a-d.
Upogebia (*Upogebia*) *assisi*; Sakai, 1982: 42, figs. 9b, 10d-e.

Type locality. — St. Francis Bay, South Africa.
Distribution. — South Africa: St. Francis Bay (Barnard, 1947, 1950; Sakai, 1982).

Upogebia balmaorum Ngoc-Ho, 1990

Upogebia balmaorum Ngoc-Ho, 1990: 966, figs. 1-2.

Material examined. — ZMUC-CRU 9764, 1 ovig. female (TL/CL, 19.0/5.1 mm), 1 female (TL/CL, 17.0/4.6 mm), Trincomalee, Sri Lanka, 7 fathoms (12.8 m), iii.1889, leg. K. Frisber.

Remarks. — This species is closely similar to *U. laemanu* Ngoc-Ho, 1990 and *U. tractabilis* (Hale, 1941). Though *U. balmaorum* was once synonymized with *U. tractabilis* by Sakai (1993), it is treated as a good species in the present paper. This is because, the specimens examined at present have been observed to be in accordance with Ngoc-Ho's (1990) description, with the exception only of the number of triangular teeth on the prehensile edge of the P1 dactylus: these number 10-12 in the specimens from the Seychelles Islands (Ngoc-Ho, 1990: 971), whereas there are only two teeth in the present females.
Type locality. — Seychelles Islands, 50 m, in a sponge.
Distribution. — Seychelles Islands, 50 m; Trincomalee, Sri Lanka.

Upogebia balssi De Man, 1927

Upogebia (*Upogebia*) *Balssi* De Man, 1927: 43, pl. 5 fig. 16-16f; De Man, 1928: 22 (list), 37, 43.
Upogebia balssi; Sakai, 1982: 3, 38.
Not: *Upogebia hirtifrons*; Balss, 1915: 2. [= *Upogebia pseudochelata* Tattersall, 1921; not *Gebia hirtifrons* White, 1874b.]

Remarks. — This species was synonymized with *Upogebia pseudochelata* Tattersall, 1921 by Sakai (1982: 3, 38).

Type locality. — Suez.

Distribution. — Suez (De Man, 1927).

Upogebia barbata (Strahl, 1862)

Gebia barbata Strahl, 1862a: 1062 (part.), figs. 7-9; Strahl, 1862b: 388; Estampador, 1937: 499.
Gebiopsis intermedia De Man, 1887: 256 (pl. 16 figs. 6-8 = *U. carinicauda*; erratum pl. XVI, not fig. 2 but fig. 6-8 on p. 256); Lanchester, 1902: 555.
Upogebia (*Calliadne*) *Darwini*; Nobili, 1906b: 97.
Upogebia (*Upogebia*) *barbata*; Borradaile, 1903: 543; Sakai, 1982: 34, figs. 6c, 8b-c; Sakai, 1984: 159.
Upogebia (*Calliadne*) *Darwini*; De Man, 1928: 24 (list), 84, pl. 8 fig. 12-12b, pl. 9 fig. 12c-f.
Upogebia darwini; Ngoc-Ho, 1977a: 444, fig. 4f-i (= *U. barbata*).
Upogebia barbata; Liu & Zhong, 1994: 562.

Material examined. — SMF 4944, 2 males (TL/CL, 32.0/9.1 – 34.0/9.6 mm), 2 ovig. females (TL/CL, 42.0/10.5 – 42.0/11.0 mm), Red Sea, x.1914, leg. A. Sendler.

Description. — Rostrum with four anterodorsal teeth. Lateral ridges of gastric region not projecting forward. Infrarostral spines absent. Anterolateral margin of carapace unarmed. A1 peduncle reaching to middle of A2 terminal segment, bearing no spines. P1 merus spinulose on ventromesial margin, unarmed on dorsal margin; carpus with one sharp dorsal, one ventral spine on distal margin, and no spines on dorsal margin; palm elongate and unarmed; dactylus about as long as fixed finger, slightly less than one-third length of palm, and bearing proximal denticle mesially on smooth prehensile margin, no median carina on either lateral or mesial surface; prehensile margin of fixed finger roughly denticulate. Abdominal somite 6 smooth on posterior margin. Telson subquadrate, broader than long.

Remarks. — This species is closely similar to *U. darwinii*, but in *U. barbata*, the posterior margin of abdominal somite 6 is not denticulate, whereas in *U. darwinii* it is denticulate.

Type locality. — Albay, Luzon, Philippines.

Distribution. — Red Sea (Sakai, 1982); Gulf of Aden: Aden, Obock and Perim (Nobili, 1906b), Djibouti, Aden, Obock, and Perim (Sakai, 1982); Somalia (Sakai, 1982); Sri Lanka (Sakai, 1982); Mergui Archipelago (Sakai, 1982); Malaysia (Sakai, 1982); Singapore (Miers, 1884); Pinang (Lanchester, 1902); Philippines: Luzon (Strahl, 1862a), Albay and Bohol (Sakai, 1982); Indonesia: Ambon (De Man, 1928), Bay of Djakarta (Sakai, 1984).

Upogebia baweana Tirmizi & Kazmi, 1979

Upogebia (*Calliadne*) *ancylodactyla*; De Man, 1928: 24 (list), 87 (part.), pl. 9 fig. 13g-h, pl. 10 fig. 13i-j [not fig. 13, 13a-f = *U. ancylodactyla*].
Upogebia baweana Tirmizi & Kazmi, 1979: 108, fig. 2; Ngoc-Ho, 1990: 971, fig. 4.
Upogebia (*Upogebia*) *baweana*; Sakai, 1984: 157, fig. 3.

Material examined. — ZMUC-CRU 9768, 1 female (TL/CL, 16.0/4.6 mm), Puerto Galera, Mindoro, Philippines, leg. Th. Mortensen; ZMUC-CRU 9767, 6 males (TL/CL, 10.0/3.3 – 16.0/5.2 mm), 1 ovig. female (TL/CL, 19.0/5.5 mm), 1 female missing abdominal somite 3 to telson, 9°40′N 125°56′E, "Galathea" St. 426, 30.vii.1951; ZMG 1269, 1 ovig. female (TL/CL, 28.0/7.2 mm), no data.

Remarks. — *U. baweana* was separated from *U. ancylodactyla* by Tirmizi & Kazmi (1979), because it possesses an unarmed telson, by which it is close to *U. carinicauda* (Stimpson, 1860) (cf. Tirmizi & Kazmi, 1979: 108). In fact, the telson of *U. baweana* is armed with a distinct, transverse carina, but the transverse carinae of *U. baweana* and *U. carinicauda* differ in shape, because in *U. baweana* the transverse carina is not so distinctly elevated as in *U. carinicauda*. Tirmizi & Kazmi (1979) mentioned that *U. baweana* can be readily separated by the absence of a spine on the anterolateral margin of the carapace. However, it seems that this character probably shows individual variation, because the anterolateral margin of the carapace bears an obscure protuberance just below the A2 peduncle in the female material from Siboga Expedition St. 323, as Tirmizi & Kazmi (1979, fig. 2A) figured, and in the present female material (ZMUC-CRU 9768) from Mindro, Philippines, whereas the anterolateral margin is smooth in the other specimens (ZMUC-CRU 9767) from the E. Philippines. It is most characteristic for *U. baweana* that the P1 palm bears a distal triangular tooth on the lateral surface; the dactylus and the fixed finger are denticulate on each prehensile margin; and the P1 dactylus bears a mesial tuberculate carina on the median surface.

U. darwinii has been described as "Minute spine (= ocular spine) on the anterolateral margin of the carapace (right side only in WAM 32-75) is present" (Poore & Griffin, 1979: 292), but *U. darwinii* only sometimes bears such a small ocular spine, as in *U. baweana*, as an exception.

Type locality. — Sangkapura roads, Bawean Island, Java Sea, Indonesia, 12 m (Siboga St. 323).

Distribution. — Indonesia: Sangkapura roads, Bawean Island; Koepang, Timor, Kambang Island near Semau, and Biak Island (Sakai, 1984), Haroekoe (Ngoc-Ho, 1990); Mindoro, Philippines.

Upogebia borradailei Sakai, 1982

Upogebia (*Calliadne*) *cargadensis* var. Borradaile, 1910: 263 (part.).
Upogebia (*Calliadne*) *cargadensis*; De Man, 1927: 12, pl. 2 fig. 5.
Upogebia (*Upogebia*) *borradailei* Sakai, 1982: 8, figs. 1a, 2a.

Type locality. — Cargados Carajos Is. (W. Indian Ocean), 55 m.
Distribution. — Cargados Carajos (Borradaile, 1910; Sakai, 1982); 55 m.

Upogebia bowerbankii (Miers, 1884) (fig. 14A)

Gebiopsis bowerbankii Miers, 1884: 282. [Type locality: Fremantle, Western Australia.]
Upogebia (*Gebiopsis*) *Bowerbanki*; Borradaile, 1903: 542.
Upogebia (*Gebiopsis*) *bowerbankii*; Hale, 1924: 69; Hale, 1927b: 309.
Upogebia (*Calliadne*) *bowerbankii*; De Man, 1927: 9, pl. 1 fig. 4-4f; Hale, 1941: 274, fig. 10; Sakai, 1975: 13, fig. 3; Poore & Griffin, 1979: 289, figs. 44-45.
Upogebia (*Calliadne*) *octoceras* var. *australiensis* De Man, 1927: 14, pl. 2 fig. 7-7c; De Man, 1928: 24 (list), 38, 49. [Type locality: Sydney.]
Upogebia bowerbankii; Hale, 1927a: 85; Sakai, 1993: 90; Davie, 2002: 483.
Upogebia (*Calliadne*) *australiensis*; Hale, 1941: 273, fig. 9; Poore & Griffin, 1979: 287, fig. 43.
Upogebia (*Calliadne*) *Bowerbankii*; De Man, 1928: 24 (list), 37, 48.
Upogebia (*Upogebia*) *bowerbanki*; Sakai, 1982: 24, figs. 3b-c, 4d-g.

Material examined. — QMB w18379, 1 female (TL/CL, 15.0/4.6 mm), Julian Rocks, Byron Bay, "Mackerel Boulders", NSW, Australia, 28°36′4″S 153°37′7″E, leg. J. Hooper and S. Cook, 20 m, 03.ii.1993, marine, reef, symbiotic with sponge; QMB w18438 (see fig. 14A herein), 3 males (TL/CL, 23.0/6.9 mm), 1 female (TL/CL, 36.0/10.3 mm), 2 ovig. females (TL/CL, 30.0/8.7 – 36.0/10.1 mm), 28°12′S 153°34′0″E, Wommin Reef, S. of Cook Is., NSW, Australia, leg. J. Hooper and S. Cook, 21 m, 04.ii.1993, marine, reef, symbiotic with sponge; QMB w19728, 1 female (TL/CL, 36.0/11.0 mm, with bopyrids inside right branchial chamber), 2 ovig. females (TL/CL, 36.0/9.9 – 37.0/10.8 mm), Jew Shoals, off Noosa, S.E. Queensland, 26°21′9″S 153°06′6″E, 20 m, extracted from sponge, leg. J. Short, 9.ii.1994.

Diagnosis. — Rostrum triangular, about two-thirds as long as broad, bearing 13 teeth on frontal margin. Lateral ridges of gastric region protruding forward. Anterolateral margin of carapace unarmed. Eyestalks shorter than rostrum, placed in concavity along ventral margin of rostrum. P1 ischium and merus smooth on ventral margins; carpus bearing a dorsal spine and ventral tooth on distal margin; palm bearing triangular distal tooth on lateral surface, distal spinule on dorsal margin, and three distal spinules on mesial surface; fixed finger armed with row of obliquely forwardly directed teeth. Abdominal somite 6 bearing triangular projection on each lateral margin, and row of acute spinules on posterior margin. Telson (fig. 14A) square, longer than broad, and bearing spinules on dorsal surface.

Remarks. — *U. bowerbankii* is characterized by "a sharp spine on the anterolateral margin of the carapace present just between the eyestalk and the base of A2 peduncle" (De Man, 1927: 10, pl. 1 fig. 4a). However, this sharp spine is not present in the specimens from QMB w18438, i.e., 3 males, 1 female, and 2 ovigerous females from Wommin Reef as examined in this study (see

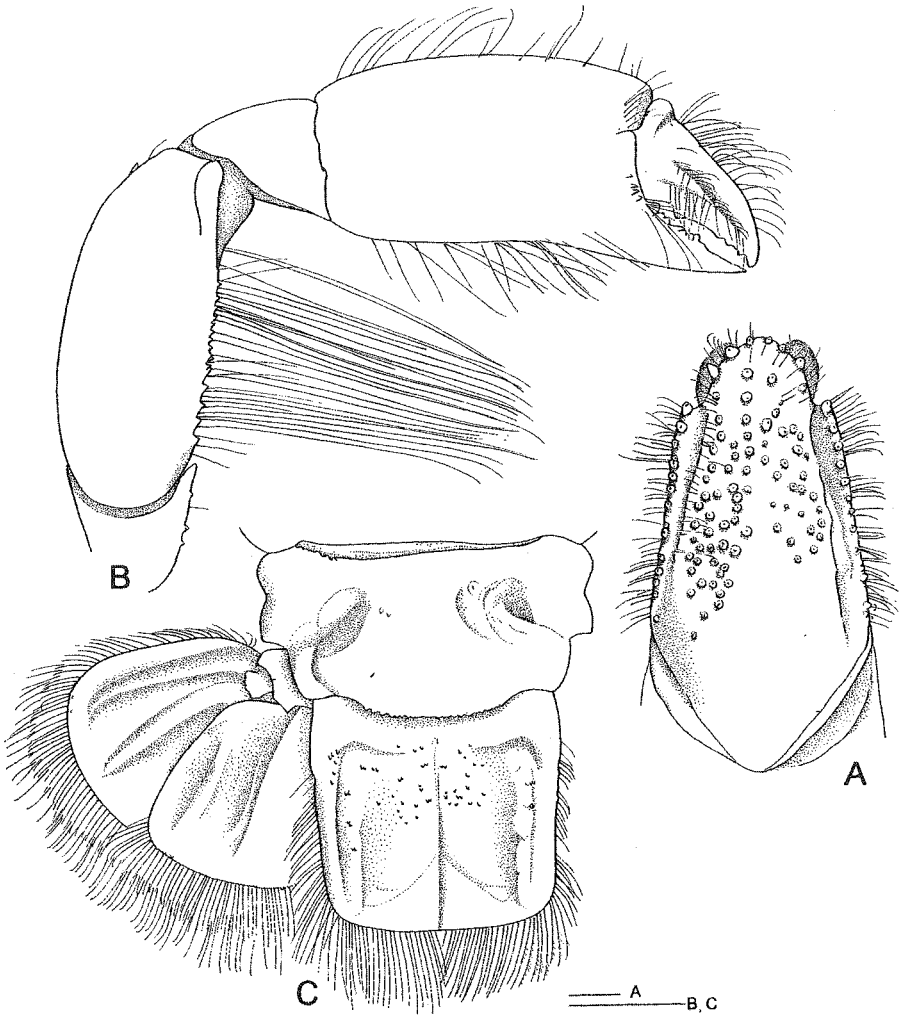

Fig. 14. *Upogebia bowerbankii* (Miers, 1884) and *Upogebia darwinii* (Miers, 1884) from Singapore. A, cephalic region of *U. darwinii*, dorsal view; B, P1 of *U. darwinii* of left side, lateral view; C, abdominal somite 6, telson, and uropod of *U. bowerbankii*, of left side, dorsal view. A, B, *U. darwinii*, ZMUC-CRU 9782, 1 male (TL/CL, 21.0/5.9 mm), S.E. of Sultan Shoal Lighthouse, Singapore, "Galathea" St. 355, 30 m depth. C, *U. bowerbankii*, QMB w18438, 28° 12′S 153°34′0″E, Wommin Reef, S. of Cook Is., N.S.W., Australia, 04.ii.1993, marine reef, symbiotic with sponge.

above), so it seems that an exposed protuberance of the sternum between the eyestalks and the A2 peduncle has erroneously been mistaken for a spine.

De Man (1927: 14-17) mentioned that in *U. australiensis* De Man, 1927 the rostrum "appears rather triangular with slightly curved lateral borders"; and that the prehensile margin of the fixed finger "is armed with a dozen, forwardly directed, acute teeth". Those two characters are not different from those in *U. bowerbankii*, so *U. australiensis* is included as a synonym under *U. bowerbankii*.

Type locality. — Fremantle, Western Australia.

Distribution. — Australia: Fremantle (Miers, 1884), and Cottesloe, Perth, Western Australia; Sydney (Haswell, 1882), Byron Bay, and Wommin Reef, S. of Cook Is., NSW; Jew Shoals, off Noosa, S.E. Queensland.

Upogebia brucei Sakai, 1975

Upogebia (*Calliadne*) *brucei* Sakai, 1975: 18, figs. 4-5.
Upogebia (*Upogebia*) *brucei*; Sakai, 1982: 16, fig. 1f.

Type locality. — Kenya, S. of Washin Is., 04°43.8′S 39°24.9′E, 0.9 m.

Distribution. — Kenya: S. of Washin Island (Sakai, 1982); Aldabra (Sakai, 1982); 0.9-20 m.

Upogebia cargadensis Borradaile, 1910

Upogebia (*Calliadne*) *cargadensis* Borradaile, 1910: 263 (part.), pl. 16 fig. 6; De Man, 1928: 24 (list), 37, 48.
Upogebia (*Upogebia*) *cargadensis*; Sakai, 1982: 12, figs. 1b, 2b, pl. C 1-2; Sakai, 1984: 154.
Non *Upogebia* (*Calliadne*) *cargadensis*; De Man, 1927: 12, pl. 2 fig. 5.

Type locality. — Cargados Carajos Is. (W. Indian Ocean).

Distribution. — Red Sea: Dahlak Archipelago (Sakai, 1984); Kenya: Simoni, Mombasa, and Wasin (Sakai, 1982); Zanzibar (Sakai, 1982); Madagascar, off Nosy Bé, Tany-Kely, Mitsio, and St. Luce (Sakai, 1982); South Africa: Natal (Barnard, 1947, 1950; Sakai, 1982); Indian Ocean: Cargados Carajos Is. (between Seychelles and Mauritius).

Upogebia carinicauda (Stimpson, 1860)

Gebia carinicauda Stimpson, 1860: 23; Miers, 1884: 280; De Man, 1887: 256 (part.); Ortmann, 1893: 49; Ortmann, 1894: 22 (key).
Gebia barbata Strahl, 1862a: 1062 (part.); Ortmann, 1891: 54, pl. 1 fig. 8; Ortmann, 1893: 49; Ortmann, 1894: 21 (key), 22.
Gebiopsis intermedia De Man, 1887: 256 (part.), pl. 16 figs. 6-8; Zehntner, 1894: 194. [Type locality: Elphinstone Island, Queensland.]

Gebia (*Gebiopsis*) *intermedia*; Ortmann, 1893: 50; Ortmann, 1894: 23.
Gebiopsis Darwini; Henderson, 1893: 432 (part.).
Upogebia (*Upogebia*) *carinicauda*; Borradaile, 1903: 543; De Man, 1928: 22 (list), 44 (key), 60, pl. 3 fig. 6-6c, pl. 4 fig. 6d-n; Poore & Griffin, 1979: 292; Sakai, 1982: 35, figs. 6d, 8a, pls. A5, C5-6; Sakai, 1984: 156.
Upogebia (*Calliadne*) *darwini*; Poore & Griffin, 1979: 292 (part.), fig. 46.
Upogebia carinicauda; Sakai, 1993: 91; Liu & Zhong, 1994: 562; Sakai & Takeda, 1995: 204, figs. 1-3; Davie, 2002: 483; Itani, 2004: 384-390, figs. 2, 4.
Upogebia rupicola Komai, 2005: 259-268, figs. 1-4.

Material examined. — SMF 23043, 1 male (TL/CL, 38.0/11.4), 1 female (TL/CL, 36.0/10.7), Yanyu-higata, Tatsugo-cho, Amami-Ohshima, Amami Is., Kagoshima Pref., 16.v.1995, leg. M. Sato; CBM-ZC 3618, 1 male (TL/CL, 39.0/11.8 mm), Nashiro Beach, Itoman, Okinawa Island, burrow in slit stone, 18.viii.2002, leg. Y. Kano et al. (holotype of *U. rupicola* Komai, 2005); CBM-ZC 3619, 1 male (TL/CL, 38.0/11.5 mm), 1 ovig. female (TL/CL, 48.0/13.5 mm), 1 female (TL/CL, 47.0/14.1 mm), same data as for CBM-ZC 3618 (paratypes of *U. rupicola*); ZMUC-CRU 9769, 1 ovig. female (TL/CL, 21.0/5.9 mm), 2 females (TL/CL, 17.0/5.0 – 29.0/8.0 mm), Juva, Viti-Livu, Fiji Islands, 0-0.5 m, 27.v.1934; ZMUC-CRU 9770, 1 ovig. female (TL/CL 35.0/9.9 mm), Pulau Sudong, Singapore, coral reef, Galathea Expedition, Stn 337, 19.v.1951; ZMUC-CRU 9771, 1 male (TL/CL, 29.0/8.1 mm), Persian-Arabian Gulf, St. 14, Khark, 6.iii.1938; SMF 30211, 1 male (TL/CL, 16.0/4.9, lacking pereiopods), locality unknown.

Remarks. — The dorsal margin of the P1 palm is smooth, or obscurely denticulate in the ovigerous female from Saigon (Sakai, 1993, pl. C5-6), and also in an ovigerous female from the Fiji Islands (ZMUC-CRU 9769). However, it is denticulate over its whole length in an ovigerous female from Pulau Sudong, Singapore (ZMUC-CRU 9770), and a male from the Persian Gulf (ZMUC-CRU 9771).

Upogebia rupicola Komai, 2005 is probably synonymous with *U. carinicauda* (Stimpson, 1860). Komai (2005) mentioned that *U. rupicola* and *U. carinicauda* are congeneric, but that *U. rupicola* can be distinguished from *U. carinicauda* by the fully chelate P1: in *U. carinicauda* the P1 is subchelate, with the fixed finger distinctly shorter than the dactylus. The P1 palm is armed with a dorsomesial row of distinct spines in *U. rupicola*, which is absent or represented by a row of small granules or tubercles in *U. carinicauda*.

As mentioned above, *U. rupicola* is distinguished from *U. carinicauda* by the form of the P1, which is chelate in *U. rupicola* and subchelate in *U. carinicauda*, and also by the presence or absence of spines, granules or tubercles on the P1 palm. However, those characters are to be considered to remain within the realm of normal variation. Komai (2005) apparently did not compare the description of *U. carinicauda* from Amami-Ohshima, Ryukyu Islands (Sakai & Takeda, 1995: 203-210, fig. 3), in which we figured the denticulate dorsal margin of the P1 palm of a female (Sakai & Takeda, 1995, fig. 2g), the shape of which

is similar to that of the dorsal teeth of the P1 palm (Komai, 2005, figs. 3A, 4A). In addition, Komai (2005) must also have overlooked the description of *U. kempi* Sankolli, 1972, in which Sankolli (1972) mentioned that "The upper outer border of palm is armed with small spine-like teeth all along the border", and "Dactylus nearly twice the length of the fixed finger and slightly longer than or as long as carpus or a little more than one half the length of palm", though in Sankolli's (1972) figure of the P1 (his fig. 10b, c) the dactylus is the proximal two-thirds of the length of the fixed finger. The chelate form is difficult to decide exactly: whether it is truly chelate or subchelate, because the fixed finger of the P1 is located laterally and obliquely over the dactylus.

Though Komai (2005) mentioned, following Ngoc-Ho's suggestion (in litt.), that *U. foresti* Ngoc-Ho, 1989 may be synonymous with *U. carinicauda,* those two species are different, because in *U. foresti* the P2 merus bears a subdistal spine on the dorsal margin as in *U. kempi*, whereas in *U. carinicauda* and *U. rupicola* the P2 merus is unarmed. As a result, *U. foresti* is considered a synonym of *U. kempi*, because P2 bears a subdistal spine on the dorsal margin in *U. kempi* and *U. foresti*, but not synonymous with *U. carinicauda.*

Komai (2005) did not touch on the polymorphism mentioned by Sakai et al. (2004), which is listed in his literature, where his male holotype of *U. rupicola* is figured with male and female genital pores: accordingly, it is a Form I male.

The present author earlier (Sakai, 1982: 35) identified the *U. darwinii* reported by Ngoc-Ho (1977a, her fig. 4a-e) as *U. carinicauda* (Stimpson, 1860): however, the width of the uropodal endopod is indeed larger than that in *U. carinicauda* (cf. Ngoc-Ho, 1977a), so it does belong to *U. darwinii.*

Type locality. — Hong Kong.

Distribution. — East Asia: Japan: Amami-Oshima (Sakai & Takeda, 1995); Ryukyu (Itani, 2004); Hong Kong (Stimpson, 1860; Sakai, 1982). Pacific: Philippines: Albay, Luzon (Sakai, 1982); South China Sea (Sakai, 1982); Tonkin (Sakai, 1982); Vietnam: Cap. St. Jacques (Sakai, 1982); Indonesia: Ambon (Ortmann, 1894; Zehntner, 1894), Lombok, Savu, Semau Island, Great Sangir Island, Ambon, Saleyer Island, and Dammer (De Man, 1928), Seba and Ambon (Sakai, 1982), Paleleh, Celebes, Tidore near Halmahera, off Seba, Koepang, and Kambang Island near Semau (Sakai, 1984); Papua New Guinea: Buka Island (De Man, 1926), Buka and New Britain (Sakai, 1982); Samoa (Ortmann, 1891; Sakai, 1982, 1984). Australian Region: Torres Strait (Sakai, 1982); Australia: Cockatoo Island, Western Australia (Poore & Griffin, 1979), Thursday Island and N.W. of Cape Arnhem (Sakai, 1982), Port Essington, Darwin, and Barracuda Reef (Sakai, 1993). Indian Ocean: India: Bombay (Sakai, 1982), Bombay and Ratnagiri (Sakai, 1984); Sri Lanka: Bay of Weligama (Sakai, 1982); Mergui

Archipelago (De Man, 1887); Red Sea: Dahlak Archipelago (Sakai, 1984); Madagascar: Nosy Bé (Sakai, 1982).

Upogebia ceratophora De Man, 1905

Upogebia (*Upogebia*) *ceratophora* De Man, 1905: 602; De Man, 1928: 22 (list), 69, pl. 6 fig. 9-9g; Sakai, 1982: 49 (partly: *Gebiacantha acutispina*), 105.
Upogebia ceratophora; De Saint Laurent & Ngoc-Ho, 1979: 63, figs. 6-8, 22-24.
Gebiacantha ceratophora; Ngoc-Ho, 1989a: 122; Ngoc-Ho, 1994a: 64, fig. 5; Ngoc-Ho, 2001b: 54; Davie, 2002: 481.

Type locality. — Bay of Nangamessi, Sumba, 36 m, "Siboga" stn 53, up to 36 m.

Distribution. — Indonesia: Bay of Nangamessi, Sumba, and off Seba, Savu (De Man, 1905, 1928; Sakai, 1982); Australia: Holothuria Bank, N.W. Australia (Sakai, 1982), N.E. of Townsville and Pandora Reef, Queensland (Ngoc-Ho, 1994a).

Upogebia darwinii (Miers, 1884) (figs. 14B, C, 15, 16, 17)

Gebia hirtifrons; [not *Gebia hirtifrons* White, 1874b] Haswell, 1881: 164.
Gebiopsis darwinii Miers, 1884: 281 (part.), pl. 32 fig. A. [Type locality: Port Darwin, Australia.]
Gebia (*Gebiopsis*) *darwini*; Ortmann, 1893: 50.
Gebia (*Gebiopsis*) *hexaceras* Ortmann, 1894: 23, pl. 3 fig. 1. [Type locality: Thursday Island, Queensland, Australia.]
Upogebia (*Gebiopsis*) *Darwini*; Borradaile, 1903: 542.
Upogebia (*Gebiopsis*) *hexacerus*; Borradaile, 1903: 542.
Upogebia (*Gebiopsis*) *octoceras* Nobili, 1904: 236. [Type locality: Aden, Obock and Perim.]
Upogebia (*Calliadne*) *hexaceras*; Nobili, 1906a: 60.
Upogebia hirtifrons; Nobili, 1906a: 61, pl. 4 fig. 13. [Not White, 1847b.]
Upogebia (*Calliadne*) *octoceras*; Nobili, 1906b: 96 (key), 98; De Man, 1927: 13, pl. 2 fig. 6-6e; De Man, 1928: 24 (list), 37, 49.
Upogebia (*Calliadne*) *darwini*; Borradaile, 1910: 262.
Upogebia darwinii; Hale, 1927b, fig. 82; Sakai, 1993: 88; Liu & Zhong, 1994: 562; Davie, 2002: 483.
Upogebia (*Calliadne*) *hexaceras*; De Man, 1928: 24 (list), 81, pl. 8 fig. 11-11f; Poore & Griffin, 1979: 299, fig. 50.
Upogebia darwini; Ngoc-Ho, 1977a: 439 (part.), figs. 1-3, fig. 4a-e (fig. 4f-h = *U. barbata* Strahl, 1862a).
Upogebia darwini; Ngoc-Ho, 1977a: 439 (part.), fig. 4a-e (not *U. darwinii*).
Upogebia (*Calliadne*) *darwinii*; Poore & Griffin, 1979: 292, fig. 46.
Upogebia (*Upogebia*) *darwinii*; Sakai, 1982: 17, 105, figs. 3a, 4a-c, pls. A1-3, C3.
Upogebia (*Upogebia*) *hexaceras*; Sakai, 1982: 23, pls. A4, C4.
Upogebia (*Upogebia*) *darwini*; Sakai, 1984: 159.
Upogebia hexaceras; Ngoc-Ho, 1990: 979, fig. 8.
Upogebia octoceras; Ngoc-Ho, 1990: 982, fig. 9; Sakai & Apel, 2002: 285.
Upogebia ?darwini; Dworschak, 1992: 222.

Non *Upogebia* (*Calliadne*) *Darwini*; Nobili, 1906b: 96 (key), 97 [= *Upogebia barbata* (Strahl, 1862a)].

Non *Upogebia* (*Calliadne*) *Darwinii*; De Man, 1928: 24 (list), 84, pl. 8 fig. 12-12b, pl. 9 fig. 12c-f (= *Upogebia barbata* (Strahl, 1862a)).

Material examined. — SMF 5070, once dried specimens: 6 ovig. females (TL/CL, 30.0/11.1 – 40.0/17.4 mm), 1 female (30.0/7.6), Red Sea; SMF 26521, 1 male (45.0/14.2) (see fig. 17A-E herein), 1 ovig. female (49.0/14.2), N.E. coast of Darsah, Sokotra (= Socotra), Jemen, SOC/St-723 (12°07.050′N 053°18.290′E), 28-29 m, from sponge, 08.iv.2000, leg. M. Apel; ZMUC-CRU 9791, 4 males (TL/CL, 23.0/6.0 mm), 5 ovig. females (TL/CL, 26.0/7.3 – 29.0/8.1 mm), 1 female with soft shell, Persian-Arabian Gulf, St. 2, Coral reef, 22-24.iii.1937; ZMUC-CRU 9784, 1 male (TL/CL, 21.0/5.3 mm), 1 female (TL/CL, 28.0/7.1 mm), Persian-Arabian Gulf, leg. Ynermere Sok, 1938; ZMUC-CRU 9785, 1 male (TL/CL, 19.0/6.0 mm), 1 ovig. female (TL/CL, 28.0/7.4 mm), Danish Expedition to Kei-Islands, 21.iii.1922; ZMUC-CRU 9786, 2 males (TL/CL, 14.0/3.9 – ca. 17.0/4.1 mm), 1 female (TL/CL, 22.0/5.8 mm), Persian-Arabian Gulf, St. 15, Rheden near Bokchil, 3-5 m, 8.iii.1937; ZMUC-CRU 9787, 1 male (TL/CL, 11.0/3.0 mm), Danish Expedition to Kei-Islands, 1922, St. 68, 55 m, 27.vii.1922; ZMUC 4989, 1 male (TL/CL, 17.0/5.2 mm), 5°52′S 106°40′E, 38 m, stone and sponges, 4.viii.1922, leg. Danish Expedition to the Kei-Islands, 1922; ZMUC-CRU 9774, 1 male (TL/CL, 29.0/8.1 mm), 1 female (TL/CL, 29.0/8.3 mm, with attached *Peregrinamor* sp. (Bivalvia)), Persian-Arabian Gulf, ii.1938, leg. Løppenthin; ZMUC-CRU 9783, 1 male (TL/CL, 44.0/13.3 mm), 1 ovig. female (TL/CL, 43.0/12.6 mm), Watsons Bay, Australia, dredging, Th. Mortensen Expedition, 9.x.1914; QMB 19534, 1 female (TL/CL, 14.0/6.8 mm), Moreton Bay, S.E. Queensland, Australia, 27°29′0″S 153°18′2″E, trawled, st. JH 93-016, 9.8 m, marine, sublittoral, symbiotic with sponge, leg. P. Davie, J. Short, A. Humphreys, 03.vi.1993; QMB 19535, 1 male (TL/CL, 37.0/10.8 mm), 1 ovig. female (TL/CL, 44.0/11.8 mm), Moreton Bay, S.E. Queensland, Australia, 27°29′0″S 153°18′2″E, trawled, st. JH 93-016, 9.8 m, marine, sublittoral, symbiotic with sponge, leg. P. Davie, J. Short, A. Humphreys, 03.vi.1993; ZMUC-CRU 9780, 1 male (TL/CL, 22.0/6.8 mm), 1 ovig. female (TL/CL, 24.0/6.9 mm), Trincomalee, Sri-Lanka, ?3.ii.1989, leg. K. Fristed; ZMUC-CRU 9790, 2 males (TL/CL, 14.0/4.3 – 18.0/5.5 mm) (see fig. 16A-E herein), 1 ovig. female (TL/CL, 23.0/6.4 mm), Koh Chang, Thailand, coral reef, Th. Mortensen's Expedition, i-iii.1900; ZMUC-CRU 9776, 1 male (TL/CL, 7.0/2.0 mm), E. of Koh Mak, Thailand, ca. 37 m depth, mud, Th. Mortensen's Expedition, 28.i.1900; ZMUC-CRU 9775, 1 male (TL/CL, 7.0/2.3 mm), 7(8) km N.W. of Koh si Chang, Thailand, 18.3 m, mud, dredging, Th. Mortensen's Expedition, 24.ii.1900; ZMUC-CRU 9782, 1 male (TL/CL, 21.0/5.9 mm) (see fig. 14B-C herein), S.E. of Sultan Shoal Lighthouse, Singapore, "Galathea" St. 355, 30 m depth, 31.v.1951; ZMUC-CRU 9772, 20 males (TL/CL, 18.0/5.4 – 39.0/11.3 mm) (see fig. 15A-E herein), 16 females (TL/CL, 30.0/8.9 – 39.0/11.5 mm, including one specimen lacking tail fan), 1 polymorphic female (TL/CL, 30.0/8.5 mm), 7 ovig. females (TL/CL, 23.0/7.0 – 35.0/9.9 mm), Banda, 15 m, sandy coral, Danish Expedition to Kei-Islands, 02.vi.1922; ZMUC-CRU 9777, 1 male Form II (TL/CL, 30.0/9.0 mm), Danish Expedition to Kei-Islands, 1922, st. 68, 5°47′S 106°14′E, South Java, Stones, numerous sponges, 55 m, 27.vii.1922; ZMUC-CRU 9778, 1 ovig. female (TL/CL, 29.0/7.9 mm), off Jolo, Sulu Islands, coral, leg. Th. Mortensen, 19.iii.1914; ZMUC-CRU 9779, 1 male (ca. 20 mm in total length, carapace damaged), (same station as ZMUC 39), Danish Expedition to Kei-Islands, 1922, St. 107m, Java Sea, 49 m, 5.viii.1922; ZMUC-CRU 9788, 1 male (TL/CL, 15.0/4.5 mm), 5°36′S 106°13′E, sandy mud, Danish Expedition to the Kei-Islands, 1922, St. 111, 6.viii.1922; ZMUC-CRU 9789, 1 female (TL/CL, 25.0/7.9 mm), S. Java, Danish Expedition to Kei-Islands, 1922, st. 104, 5°52′S 106°45′E, 38 m, 4.viii.1922; ZMUC-CRU 9781, 1 female (TL/CL, 17.0/5.4 mm), Taiwan Strait, 23°20′N 118°30′E, 1869, leg. Andréa (separated from samples, 10 Nov. 1917).

Diagnosis. — Rostrum as long as broad, or half as long as broad in dorsal view, rounded (figs. 14B, 15A, 17A) or subtriangular (fig. 16A) on frontal margin, bearing 4-13 frontal teeth; no infrarostral teeth. Anterolateral margin of carapace usually unarmed. Eyestalks as long as, or, usually, shorter than rostrum. P1 chelate; merus usually unarmed on dorsal margin (figs. 14C, 15C, 16B, 17B), and either unarmed (fig. 17B), or armed with a row of denticles or spines (figs. 14C, 15C, 16B) on mesioventral margin. P1 carpus with or without some spinules or denticles on dorsal margin, and with (fig. 17C) or without (figs. 15C, 16C) a dorsal spine or a blunt dorsal tooth, and with (fig. 15C) or without a sharp ventral spine or blunt ventral tooth on distal margin. P1 palm with (figs. 15C, D, 17B, C) or without (figs. 14C, 16B, C) distal spines on dorsal margin, and with (figs. 15D, 17C) or without (fig. 16B) distal spines or obtuse denticles on lateral and mesial margins. P1 dactylus with a smooth longitudinal carina on lateral surface and with a row of denticles on mesial surface (figs. 16C, 17C); fixed finger bearing a row of denticles or obtuse teeth. Lateral margin of Abd6 armed with two protrusions: median one simply truncate (fig. 17E), or triangular distally (fig. 15E), or protruded as a rod-like projection (fig. 16D, E), and posterior one usually rounded; posterior margin unarmed, or evidently or obscurely denticulate (figs. 15E, 16D, 17E), or finely spinulate, in males and females. Telson usually broader than long (figs. 15E, 17E), bearing medial U-shaped carina with denticles.

Remarks. — This species, *U. darwinii* (Miers, 1884) from Port Darwin, has been largely confused with other taxa, i.e., *U. hexaceras* (Ortmann, 1894) from Thursday Island, Queensland, Australia, and *U. octoceras* Nobili, 1904 from Aden, Obock, and Perim. Ngoc-Ho (1990: 982) mentioned that *U. hexaceras* and *U. octoceras* are not conspecific with *U. darwinii* (Miers, 1884) as Sakai (1982) proposed, and compared those three species, *U. darwinii*, *U. hexaceras*, and *U. octoceras*, in a table (Ngoc-Ho, 1990, table 3). In the present paper, however, many larger and smaller specimens brought from various localities, as distant as from Australia to the Red Sea, have been re-examined in order to prove their specific differentiation. This has been done, because those three species were recorded from widely separated localities in the Indo-West Pacific region, such as Port Darwin, N. Australia, the type locality of *U. darwinii*, Thursday Island, Queensland, the type locality of *U. hexaceras*, and Aden, Obock, and Perim, as the type locality of *U. octoceras*. As a result, it can be reported that the present specimens, examined in this paper, show various forms in the shape of the rostum, the number of frontal rostral teeth, the armature on the ventromesial margin of the P1 merus, the spinulations on the carpus, the palm, and the chelae, as well as in the feature of the lateral and posterior margins of abdominal somite

6, so that it is difficult to assign those closely related species to a restricted locality, because they are widely distributed, and show variable morphologies.

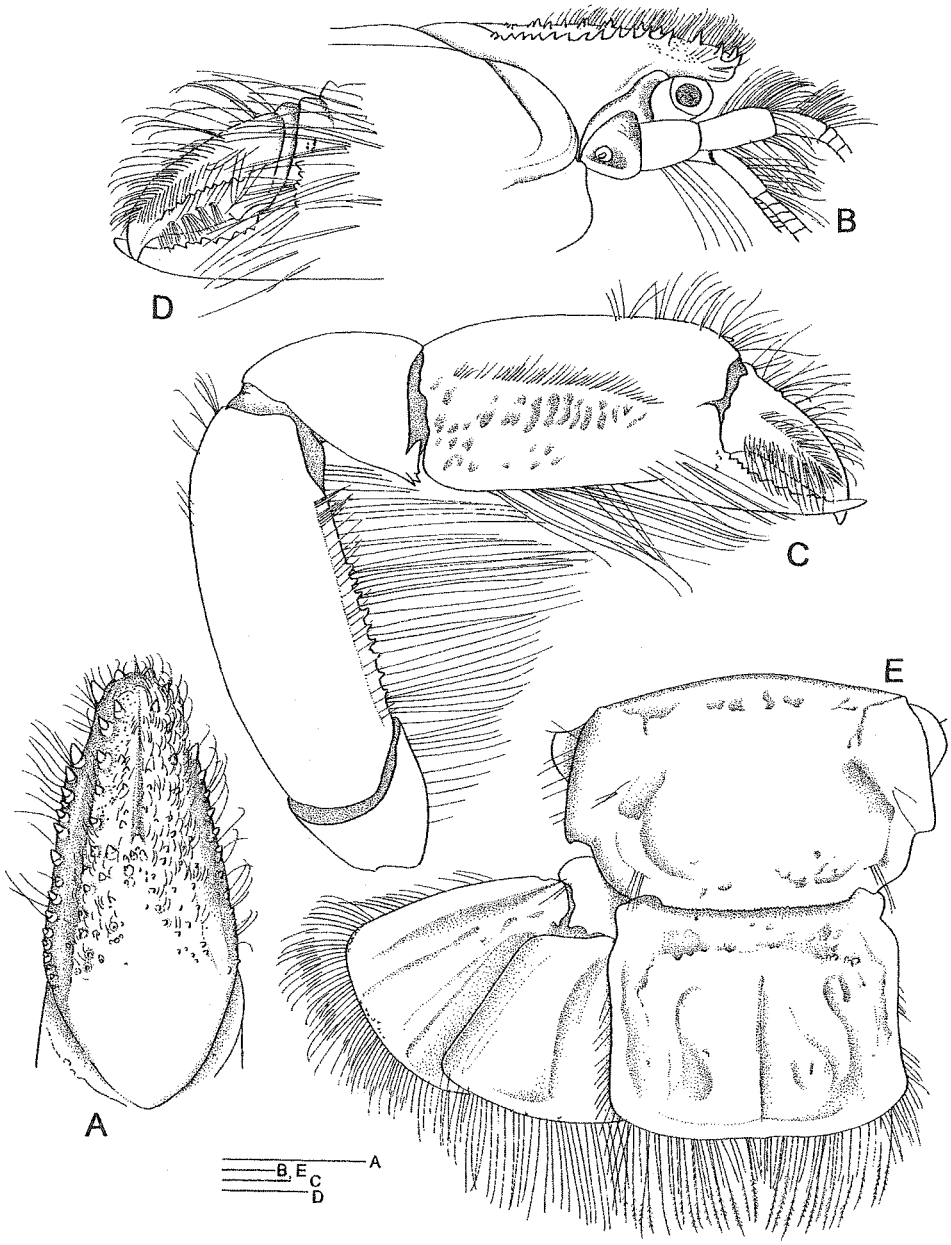

Fig. 15. *Upogebia darwinii* (Miers, 1884) from the Banda Sea. A, cephalic region, dorsal view; B, same, lateral view; C, male P1 of right side, lateral view; D, male P1 dactylus and distal part of palm, mesial view; E, abdominal somite 6, telson, and uropod of left side. A-E, ZMUC-CRU 9772, Banda, 15 m.

As a result, it can be said that *U. octoceras* and *U. hexaceras* are to be definitely synonymized with *U. darwinii*, as proven below in items 1-11.

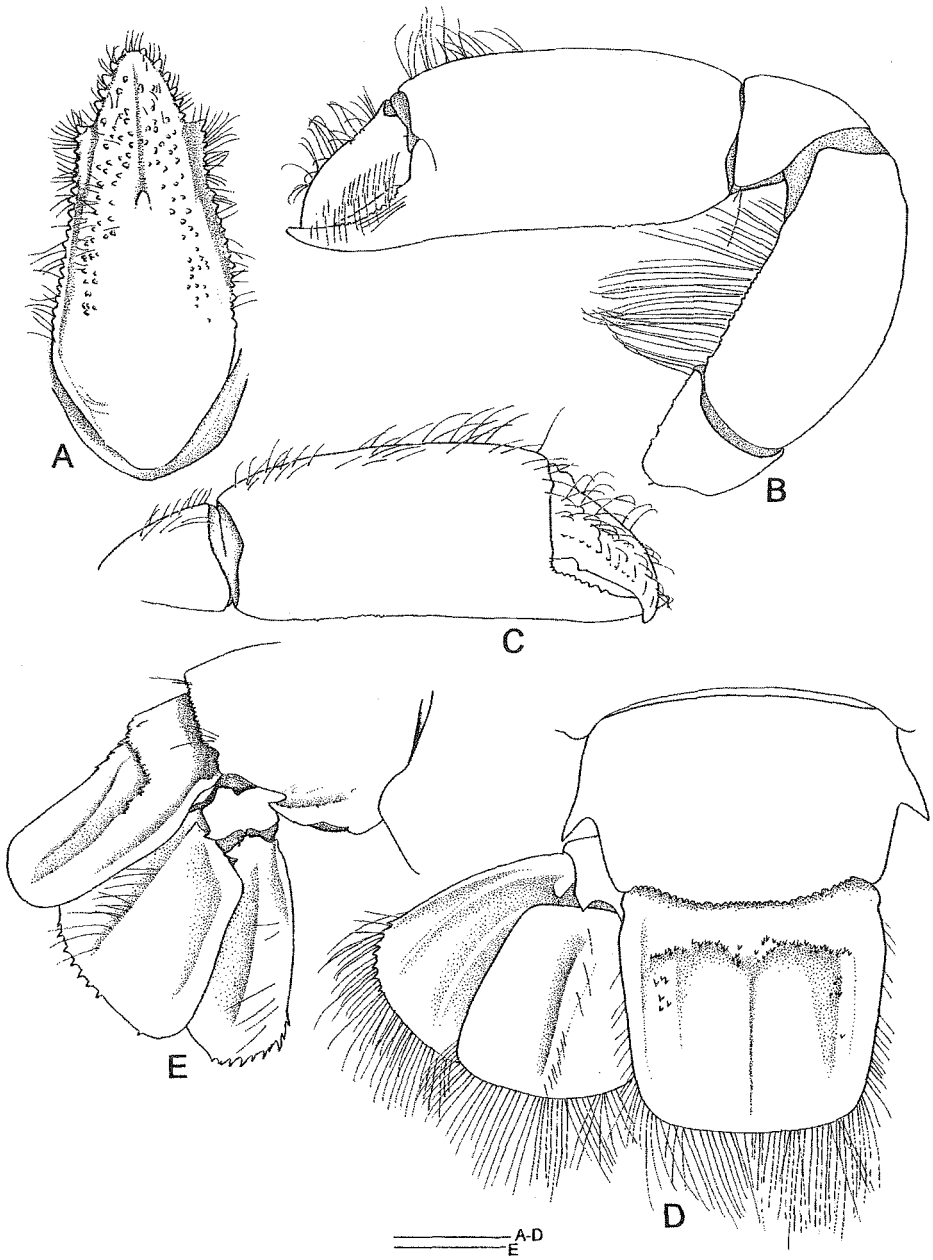

Fig. 16. *Upogebia darwinii* (Miers, 1884) from Thailand. A, cephalic region, dorsal view; B, male P1 of left side, lateral view; C, same, mesial view; D, abdominal somite 6, telson, and uropod of left side, dorsal view; E, abdominal somite 6, telson, and uropod of right side, lateral view. ZMUC-CRU 9790, Koh Chang, Thailand, coral reef.

The conspicuous characters of these three species are observed in the following specimens:

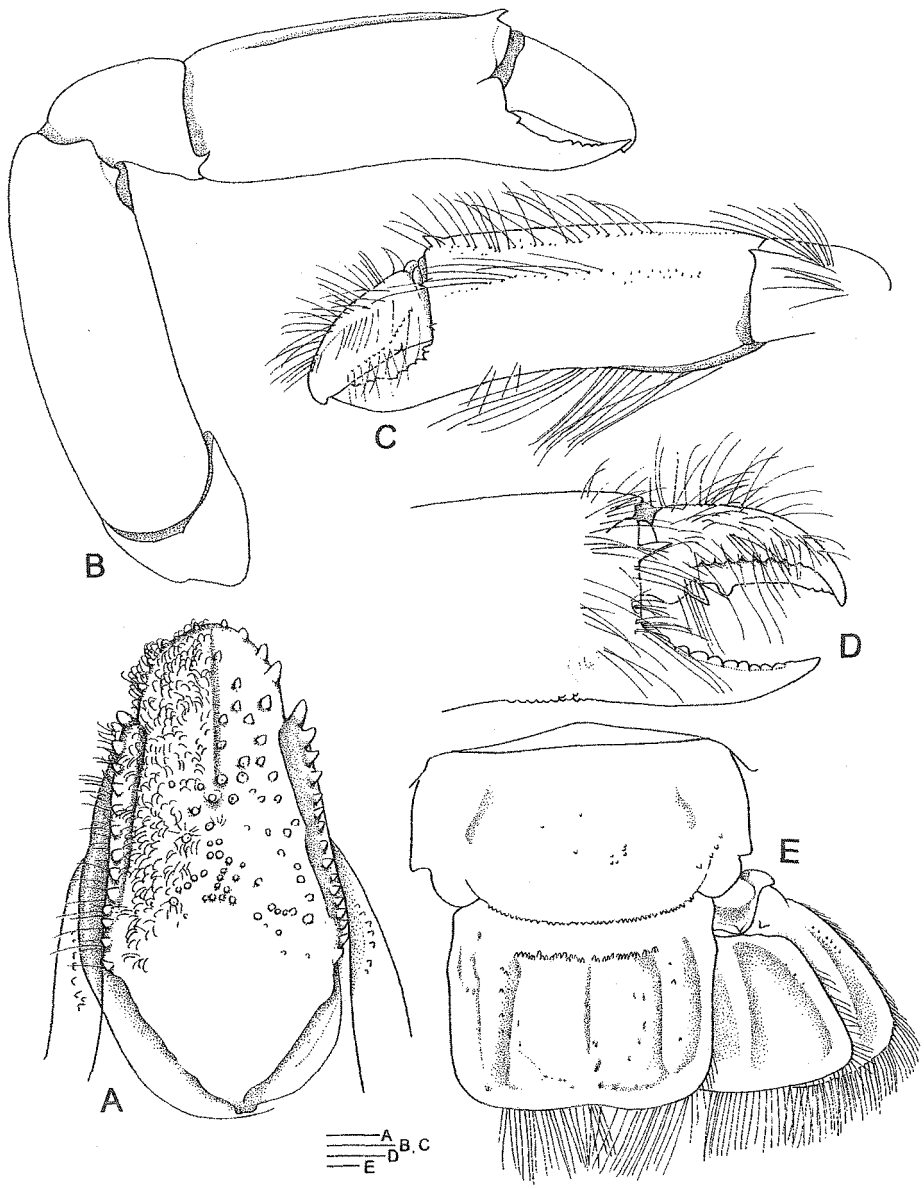

Fig. 17. *Upogebia darwinii* (Miers, 1884) from Socotra. A, cephalic region, dorsal view; B, male P1 of right side, lateral view; C, same, mesial view; D, P1 dactylus and distal part of palm, mesial view; E, abdominal somite 6, telson, and uropod of right side, dorsal view. A-E, SMF 26521, N.E. coast of Darsah, Socotra, Jemen.

1. The male (TL/CL, 45.0/14.2 mm) from Socotra (SMF 26521) (fig. 17A-E), near the Red Sea, shows that the rostrum is broadened, slightly longer than half its width, and armed with 8 denticles on the rounded frontal margin (fig. 17A); the eyestalks slightly overreach the middle of the rostrum. The P1 merus is unarmed on the ventral margin (fig. 17B), the carpus has a dorsal and an obtuse ventral tooth on the distal margin; the palm has a sharp distal tooth on the dorsal margin, and 1-2, or 7 distal spines on the mesial surface (fig. 17C, D), as well as one sharp distal spine proximal to the dactylus on the lateral margin; the fixed finger is beset with irregularly arranged, obtuse teeth on the prehensile margin, and the dactylus bears a proximal conical tooth on the prehensile margin as usual, or exceptionally bears an additional proximal sharp tooth on the prehensile margin (fig. 17D), as well as a row of median tubercles on the mesial surface. Abdominal somite 6 shows a broad, posteriorly directed median protrusion with a rounded posterolateral tip on each lateral margin; the posterior margin is armed with a row of triangular denticles. The telson is broader than long (fig. 17E), dorsally bearing a denticulate, transverse carina bordering a U-shaped concavity.

This specimen is to be identified as *U. octoceras*.

2. The ovigerous female (TL/CL, 49.0/14.2 mm) from Socotra (SMF 26521) has the rostrum also broadened, about two-thirds as long as wide, rounded, and bearing 11 denticles on the frontal margin; the eyestalks slightly overreach the middle of the rostrum. The P1 merus has minute ventral denticles on the mesial surface; the carpus bears a dorsal and a ventral tooth on the distal margin; the palm is beset with one small distal tooth on the dorsal margin, one sharp dorsodistal spine on the mesial surface, one sharp distal spine at the level of the dactylus on the lateral surface, and the fixed finger is beset with a row of triangular teeth. The lateral margin of abdominal somite 6 bears a broad, truncate median protrusion with a rounded posterodistal corner, and the posterior margin has a row of irregularly arranged denticles. The telson is broader than long.

This specimen is, according to most of its chearacters, to be identified as *U. octoceras*, though the marginal frontal teeth of the rostrum count 11, which is more than the usual 6-10 observed in *U. octoceras*.

3. In the six ovigerous females (TL/CL, 30.0/11.1 – 40.0/17.4 mm), and one female (TL/CL, 30.0/7.6 mm) from the Red Sea (SMF 5070), the rostrum and its spinulation are almost the same as in the specimens from Socotra as described above. The rostrum is broadened, two-thirds or half as long as wide, exceptionally being unarmed, but bearing 6-8, usually 6-7, teeth on the rounded frontal margin; the eyestalks are usually slightly (or barely, in one ovigerous female) shorter than the rostrum. The P1 merus bears a row of minute denticles

on the ventral margin, the carpus is beset with one dorsal and one ventral tooth on the distal margin; the palm bears one distal spine on the dorsal margin, slightly below which usually another dorsal spine is present on the mesial surface, and one sharp distal spine on the lateral surface, and the fixed finger has a row of triangular teeth on the prehensile margin. The lateral margin of abdominal somite 6 shows a broad, posteriorly directed median protrusion with a rounded posterolateral end, and the posterior margin bears a row of obscure denticles. The telson is broader than long.

This specimen is to be determined as *U. hexaceras* by the shape of abdominal somite 6, bearing a pointed protrusion on the lateral margin.

4. The ovigerous female (TL/CL, 23.0/6.4 mm) from the Red Sea (SMF 5070) has the rostrum about half as long as wide, bearing 9 marginal denticles on the subtriangular frontal margin, which is accompanied on both lateral sides by a swelling. The eyestalks are slightly shorter than the rostrum. The P1 ischium is unarmed on the ventral margin; the merus bears a row of interspaced denticles on the ventral margin; the carpus is beset with a dorsal and a ventral tooth on the distal margin; the palm has a distal denticle (not spinulose) on the dorsal margin, and two distal denticles (not spinulose) on the mesial surface, and lacks a distal spine on the lateral surface; the fixed finger has a row of fine, closely-set denticles on the prehensile margin. Abdominal somite 6 bears a posteriorly directed, stout median tooth on the lateral margin, and is armed with a row of acute spinules on the posterior margin. The telson is broader than long.

This specimen is to be assigned to *U. hexaceras* by the form of abdominal somite 6, although the form of the telson is different from that of *U. hexaceras*, in which it is much broader than long.

5. In the larger males (TL/CL, 14.0/4.3 mm) from Thailand (ZMUC-CRU), the rostrum is subtriangular (fig. 16A), as long as broad, bearing 13 denticles on the frontal margin. The eyestalks are slightly shorter than the rostrum. The P1 ischium is armed with two tubercles on the ventral margin; the merus has a row of tubercles (fig. 16B) or denticles on the ventral margin; the carpus has a dorsal and a ventral tooth on the distal margin; the palm has three distal tubercles at the base of the dactylus on the lateral surface, and four obscure distal denticles on the mesial surface, but lacks a distal spine on the dorsal margin (fig. 16B); the dactylus bears a subproximal conical tubercle on the prehensile margin and a row of tubercles on the mesial surface (fig. 16C), and the fixed finger has a row of tubercles on the mesial surface and a row of denticles on the prehensile margin. Abdominal somite 6 bears a posteriorly directed, stout median tooth on the lateral margin (fig. 16D, E), and is armed with a row of acute denticles on the posterior margin. The telson is subquadrate.

This specimen is to be determined as *U. hexaceras* by the form of abdominal somite 6 and the telson, though in the larger ovigerous female of the same collection the telson is distinctly broader than long as in *U. darwinii* and *U. octoceras*, and the rostral frontal teeth count 13, thus are more numerous than those in *U. octoceras*.

6. In the smaller male (TL/CL, 18.0/5.5 mm) (ZMUC-CRU 9790) (fig. 16A-E) from Thailand, the rostrum is two-thirds as long as broad, bearing 10 denticles on the rounded frontal margin. The eyestalks are as long as the rostrum. The right P1 ischium has one tubercle on the ventral margin, but is smooth on the left appendage; the merus is armed with a row of irregularly arranged denticles on the ventral margin; the carpus has a dorsal and a ventral denticle on the distal margin; the palm is denticulate on the distal margin in both the lateral and the mesial surfaces, lacking a distal tooth on the dorsal margin; the fixed finger is crenulate-dentate on the prehensile margin. Abdominal somite 6 is armed with a stout median tooth on the lateral margin, and denticulate on the posterior margin. The telson is subquadrate.

This specimen is to be determined as *U. hexaceras* by the characters of abdominal somite 6 and the telson, though it bears 10 frontal teeth on the rostum as in *U. octoceras*.

7. In the female (TL/CL, 25.0/7.9 mm) from Java (ZMUC-CRU 9789), the rostrum is slightly broader than long, bearing four denticles on a circulate frontal margin. The eyestalks overreach the middle of the rostrum. The lateral ridge of the gastric region is beset with a row of 12 denticles. The P1 ischium is armed with two denticles on the right side, but unarmed on the left side; the merus has a row of subacute denticles on the ventral margin; the carpus has a sharp ventral and a sharp dorsal tooth on the distal margin; the palm has a distal tubercle on the dorsal margin, two distal tubercles on the mesial surface, and two distinct distal tubercles on the lateral surface; the fixed finger is armed with a row of distinct triangular teeth on the prehensile margin. Abdominal somite 6 is armed with a truncate protrusion medially, and with a row of inconspicuous denticles on the posterior margin. The telson is broader than long.

This specimen is to be determined as *U. hexaceras* by the form of abdominal somite 6, though the form of the telson should rather be attributed to *U. darwinii* or *U. octoceras*.

8. In the male (TL/CL, 37.0/10.8 mm) from Moreton Bay, Queensland (QMB 19535), the rostrum is about as long as broad, bearing 5 denticles on the circular frontal margin. The eyestalks overreach the middle of the rostrum in length. The P1 ischium has two spinules on the ventral margin on the left side, and is unarmed on the right side; the merus has a row of interspaced spinules on the

ventromesial margin; the carpus has some denticles on the dorsal margin, and a distinct distal spine on the ventral margin; the palm has 2-3 triangular distal teeth on the lateral surface and one distal tooth on the mesial surface, but lacks a distal tooth on the dorsal margin; the fixed finger is crenulate. Abdominal somite 6 has a triangular median tooth on the lateral margin, and a row of subacute denticles on the posterior margin. The telson is broader than long.

This specimen is to be defined as *U. hexaceras* by the form of abdominal somite 6, though the form of the telson is rather attributed to *U. darwinii* and *U. octoceras*.

9. In the ovigerous female (TL/CL, 44.0/11.8 mm) from Moreton Bay, Queensland, Australia (QMB 19535), the rostrum is slightly broader than long, bearing 5 denticles on the rounded frontal margin. The eyestalks overreach the middle of the rostrum. The right P1 ischium is beset with one acute denticle on the ventral margin, and with two acute denticles on the left appendage; the merus has a row of acute spinules on the ventromesial margin; the carpus has a row of obtuse denticles on the dorsomesial margin, and an obtuse ventrodistal tooth; the palm has some distal denticles on the lateral surface, and also distal denticles on the mesial suface, but lacks a distal tooth on the dorsal margin; the dactylus is dorsally carinate, bearing one or three rounded proximal denticles and a median row of rounded tubercles on the mesial surface; the fixed finger is armed with a row of triangular denticles on the prehensile margin. Abdominal somite 6 has a median triangular projection on the lateral margin, and a row of fine denticles on the posterior margin. The telson is broader than long.

This specimen is to be determined as *U. hexaceras* by the form of abdominal somite 6, but the form of the telson belongs to *U. darwinii* and *U. octoceras*.

10. In the ovigerous female (TL/CL, 43.0/12.6 mm) from Watsons Bay, South Australia (ZMUC-CRU-9783), the rostrum is more than half as wide as long, bearing 9 denticles on the triangular frontal margin. The eyestalks are slightly shorter than the rostrum. The P1 ischium and merus are each smooth on the ventral margin; the carpus is smooth on the dorsal margin and armed with a dorsal and a ventral tooth on the distal margin; the palm has a strong distomesial and a strong distolateral spine, the dactylus a median row of denticles on the mesial surface; the fixed finger has a row of obliquely forwardly directed teeth on the prehensile margin. Abdominal somite 6 bears a rounded median projection on the lateral margin, and is armed with a row of denticles on the posterior margin. The telson is broader than long.

This specimen is to be determined as *U. australiensis* by the form of the rostrum (Sakai, 1982, fig. 3c) and the row of obliquely forwardly directed teeth

on the prehensile margin of the fixed finger, though the telson shows the same form as in *U. darwinii* and *U. octoceras*.

11. In the male (TL/CL, 44.0/13.3 mm) from Watsons Bay (ZMUC-CRU-9783), the rostrum is two-thirds as long as broad, triangular with an obtuse tip, and bears 12 denticles. The eyestalks are slightly shorter than the rostrum. The P1 merus is unarmed on the ventromesial margin; the carpus has a distinct dorsodistal and a distinct ventrodistal tooth, and a smooth dorsomesial margin; the palm has a sharp dorsodistal spine, a sharp distolateral spine, and a triangular distomesial spine; the fixed finger has a row of obliquely forwardly directed teeth. Abdominal somite 6 bears a triangular projection on the lateral margin and a row of triangular denticles on the posterior margin. The telson is broader than long.

This specimen is to be identified as *U. australiensis* by the triangular rostrum (Sakai, 1982, fig. 3c), and the row of obliquely forwardly directed teeth on the prehensile margin of the fixed finger, though the form of the telson is the same as in *U. darwinii* and *U. octoceras*.

The types of *U. octoceras* from Aden, Obock, and Perim were redescribed by Ngoc-Ho (1990: 982, table 3), and in these the abdominal somite 6 lacks the pointed lateral expansions as in *U. darwinii*, which makes it possible to say that (1) the lateral margins of abdominal somite 6 are bordered with a broad, posteriorly directed median expansion with a rounded posterolateral corner (Ngoc-Ho, 1990, fig. 9h). This form is found in both the male and the ovigerous female specimens from Socotra (SMF 26521) (fig. 17A-E); in the smaller male (TL/CL, 18.0/5.5 mm) (ZMUC-CRU 9790) (fig. 16A-E) from Thailand; in the male from the Banda Sea (ZMUC-CRU 9772) (fig. 15A-E); and in the adult male from the Mergui Archipelago, which is reported as the syntype of *U. intermedia* De Man, 1887, though it was synonymized with *U. darwinii* (cf. De Man, 1928, pl. 8 fig. 12a).

In the type specimen of *U. hexaceras* (Ortmann, 1894) from Thursday Island, Queensland, Australia, the median lateral expansion of abdominal somite 6 is described as a pointed protrusion (Ngoc-Ho, 1990, table 3). However, such a protrusion or spine is observed in the six ovigerous females (TL/CL, 30.0/11.1 – 40.0/17.4 mm), and one female (TL/CL, 30.0/7.6 mm) from the Red Sea (SMF 5070), in the ovigerous female (TL/CL, 23.0/6.4 mm) and two males (TL/CL, 14.0/4.3 – 18.0/5.5 mm) from Thailand (ZMUC-CRU 9790) (fig. 16A-E), and in the ovigerous female (TL/CL, 43.0/12.6 mm) from Watsons Bay, South Australia (ZMUC-CRU 9783).

(2) In the type of *U. octoceras*, the eyestalks almost reach the distal end of the rostrum. However, in most of the specimens examined, the eyestalks fail to reach the rostral tip, as in six ovigerous females (TL/CL, 30.0/11.1 – 40.0/17.4 mm) and one female (TL/CL, 30.0/7.6 mm) from the Red Sea (SMF 5070), an ovigerous female (TL/CL, 23.0/6.4 mm) from Thailand (ZMUC-CRU 9790) (fig. 16A-E), a larger male (TL/CL, 14.0/4.3 mm) (ZMUC-CRU 9790) (fig. 16A-E), and an ovigerous female (TL/CL, 43.0/12.6 mm) from Watsons Bay (ZMUC-CRU 9783), whereas in the rest of the specimens examined, the eyestalks scarcely overreach the middle of the rostrum.

(3) The rostrum is rounded on the frontal margin in the type of *U. octoceras*, as in *U. darwinii* (cf. Miers, 1884: 281; Sakai, 1982: fig. 3a), and in *U. hexaceras* (cf. Sakai, 1982: 23; Ngoc-Ho, 1990: 980). It is also rounded in the six ovigerous females (TL/CL, 30.0/11.1 – 40.0/17.4 mm) and 1 female (TL/CL, 30.0/7.6 mm) from the Red Sea, in the smaller male (TL/CL, 18.0/5.5 mm) (ZMUC-CRU 9790) (fig. 13A-E) from Thailand, in the female (TL/CL, 25.0/7.9 mm) from Java (ZMUC-CRU 9789), and in the ovigerous female (TL/CL, 44.0/11.8 mm) from Moreton Bay, Queensland (QMB 19535). However, it is rather triangular, as in *U. australiensis* (cf. Sakai, 1982, fig. 3c), in the larger males (TL/CL, 14.0/4.3 mm) from Thailand (ZMUC-CRU 9790), and in larger specimens of *U. bowerbankii*. Or, it is elongately triangular in smaller specimens (Sakai, 1982: 20), or subtriangular in the ovigerous female (TL/CL, 23.0/6.4 mm), and two males (TL/CL, 14.0/4.3 – 18.0/5.5 mm) from Thailand (ZMUC-CRU 9790) (fig. 16A).

(4) In the type specimens of *U. octoceras*, the frontal margin of the rostrum bears 6-10 teeth (Ngoc-Ho, 1990: 982). However, 12 teeth are observed in a male (TL/CL, 44.0/13.3 mm) from Watsons Bay (ZMUC-CRU 9783), 9 teeth in a male (TL/CL, 45.0/14.2 mm), or 11 teeth in an ovigerous female (TL/CL, 49.0/14.2 mm) from Socotra (SMF 26521); there are 6-8 teeth, exceptionally unarmed, but usually 6-7 teeth, in the six ovigerous females (TL/CL, 30.0/11.1 – 40.0/17.4 mm) and one female (TL/CL, 30.0/7.6 mm) from the Red Sea (SMF 5070), 13 teeth in a larger male (TL/CL, 14.0/4.3 mm) from Thailand (ZMUC-CRU 9790), 10 teeth in a smaller male (TL/CL, 18.0/5.5 mm) from Thailand (ZMUC-CRU 9790), 4 teeth in a female (TL/CL, 25.0/7.9 mm) from Java (ZMUC-CRU 9789), 5 teeth in a male (TL/CL, 37.0/10.8 mm) and an ovigerous female (TL/CL, 44.0/11.8 mm) from Moreton Bay, Queensland (QMB 19535), 9 teeth in an ovigerous female (TL/CL, 43.0/12.6 mm) from Watsons Bay, South Australia (ZMUC-CRU 9783), 12 teeth in a male (TL/CL, 44.0/13.3 mm) from Watsons Bay (ZMUC-CRU 9783), and 4 teeth in a male syntype of *U. darwinii* (cf. Sakai, 1982, fig. 3a).

(5) In *U. octoceras*, the mesioventral margin of the P1 merus is unarmed or bears minute granules (Ngoc-Ho, 1990: 982). It is unarmed in the male (TL/CL, 45.0/14.2 mm) from Socotra (SMF 26521) (fig. 17B); in an ovigerous female (TL/CL, 43.0/12.6 mm) from Watsons Bay, South Australia (ZMUC-CRU 9783), and in a male (TL/CL, 44.0/13.3 mm) Watsons Bay (ZMUC-CRU 9783). However, it is minutely denticulate in an ovigerous female (TL/CL, 49.0/14.2 mm) from Socotra (SMF 26521); as it is in the six ovigerous females (TL/CL, 30.0/11.1 – 40.0/17.4 mm) and a female (TL/CL, 30.0/7.6 mm) from the Red Sea (SMF 5070), or it is spinulose as in the males from Moreton Bay, South Australia (QMB 19535), from Thailand (ZMUC-CRU 9790) (fig. 16A), and from S. Java (ZMUC-CRU 9789).

U. darwinii was described based on syntypes: three males and three females from Port Darwin, Australia (BM 82-7), and one male and one female from Singapore (BM 82-24). These type specimens were re-examined by Ngoc-Ho (1977) and by Sakai (1982). In the type specimens, the rostrum bears four frontal teeth, and the P1 merus is unarmed on the ventral margin. However, in a female (TL/CL 25.0/7.9 mm) from S. Java (ZMUC-CRU 9789), and a male Form II (TL/CL 30.0/9.0 mm) from S. Java (ZMUC-CRU 9777), the rostrum bears four frontal teeth as in the type specimens of *U. darwinii*, whereas the P1 merus is armed with a row of denticles on the ventral margin as in *U. hexaceras*.

The syntypes of *U. darwinii*, BM 82-24, 1 male and 1 female, from Singapore, were clearly identified as *U. barbata* (not *U. ancylodactyla* as mentioned by Sakai 1982: 18) as shown by Sakai (1982: 34), because the dactylus is concave, and devoid of a proximal denticle on the prehensile margin, and the fixed inger is unarmed as in *U. barbata*.

From the above observations, it seems clear that the nominal species, *Upogebia hexaceras* (Ortmann, 1894) and *U. octoceras* Nobili, 1904, cannot properly be separated from *U. darwinii* Miers, 1884. Hence, the two former names should be synonymized with *U. darwinii*.

Type locality. — Port Darwin, Northern Territory, Australia, 22 m.

Distribution. — Red Sea (Nobili, 1906b; Sakai, 1984); Massanah (Dworschak, 1992); Gulf of Aden (De Man, 1927; Ngoc-Ho, 1990); Aden, Obock, and Perim (Nobili, 1904, 1906b; Sakai, 1982); Kenya: Washin Island and off northern Kenya (Sakai, 1982); Zanzibar (Sakai, 1982); Saya de Malha Bank (Borradaile, 1910); Persian-Arabian Gulf (Ngoc-Ho, 1990); west of Oman, Arzanah, and Bancs d'Huitres (Nobili, 1906a; Sakai, 1982); western Sumatra (Sakai, 1982); Thailand: Phuket (Ngoc-Ho, 1977a; Sakai, 1982); South China Sea (Sakai, 1982); Singapore; Philippines: Bohol (Sakai, 1982); Indonesia: south of Salawatti Island (De Man, 1928; Sakai, 1982); Banka Strait and Java Sea

(Sakai, 1982); Kaipoer Village, Geelvink Bay, Irian Jaya (Ngoc-Ho, 1990); Australia: Thursday Island (Ortmann, 1894); Darwin, Gulf of Carpentalia, Dampier Archipelago, Cottesloe, and Bunbury (Poore & Griffin, 1979); Port Darwin and Dampier Archipelago (Sakai, 1982); Torres Strait (Sakai, 1982); Bynoe Harbour, Darwin, North West Shelf, Port Essington, and Barracuda Reef (Sakai, 1993); Port Jackson, N.S.W. (Haswell, 1881; De Man, 1927); Smoky Bay, South Australia (Hale, 1924); Investigator Strait and Backstairs Passage, South Australia (Hale, 1927a); Fremantle, W.A. (De Man, 1927); Investigator Strait, Backstairs Passage, St. Vincent Gulf, Smoky Bay, and Denial Bay (Hale, 1941); Port Molle, Broughton Island, Avalon, Collaroy, Balmoral Beach, Port Jackson, Sydney, Bondi Beach, Bunbury, Decres Bay, Backstairs Passage, Spencer Gulf, Lancelin Island, Cottesloe, Perth, northeast of Rottnest Island, Fremantle, west of Garden Island, Esperance, Oyster Harbour, and west of Eucla (Poore & Griffin, 1979); Perth, Fremantle, Sydney, and Port Jackson (Sakai, 1982); Port Essington and North West Shelf (Sakai, 1993); intertidal to 32 m.

Upogebia digitina (Sakai, 1975)

Upogebia (*Calliadne*) *digitina* Sakai, 1975: 34, figs. 11-13.
Upogebia (*Upogebia*) *digitina*; Sakai, 1982: 15, fig. 1d.

Type locality. — Kenya, off Ras Iwatin, 02°28.5′S 41°04.5′E, 146 m.
Distribution. — Kenya, off Ras Iwatin (Sakai, 1982), 146 m.

Upogebia dromana Poore & Griffin, 1979

Upogebia (*Upogebia*) *dromana* Poore & Griffin, 1979: 295, figs. 47-48.
Upogebia dromana; Davie, 2002: 484.

Material examined. — ZMUC-CRU 9792, 1 male (TL/CL, 18.0/5.1 mm, fragile), between Rangitoto and Devon Port, Tasmania, 36°49′S 174°50′E, "Galathea" St. 648, slightly muddy shell gravel, 10 m, 8.ii.1952.

Type locality. — At 2 km W. of Fisherman Point, Mornington, Port Phillip Bay, Victoria, Australia.
Distribution. — Australia: Port Phillip Bay, Western Port, off Malabar, and off Burnie, Tasmania (Poore & Griffin, 1979); 10-20 m.

Upogebia edulis Ngoc-Ho & Chan, 1992

Upogebia edulis Ngoc-Ho & Chan, 1992: 34, figs. 1-3.
Austinogebia edulis; Ngoc-Ho & Chan, 1992: 50.

Material examined. — SMF 8805, 26 males Form II (TL/CL, 15.0/4.6 – 56.0/17.9 mm), 4 females (TL/CL, 41.0/12.6 – 49.0/13.9 mm), west coast near Mai Liao, Taiwan, 23°47′N 120°11.5′E, silt stones and sand, muddy flat, 2.viii.1977, leg. J. Dörjes.

Remarks. — This species, *Upogebia edulis*, is recorded from Taiwan and North Vietnam by Ngoc-Ho & Chan (1992). *U. edulis* is slightly different from *U. wuhsienweni* Yü, 1931. In *U. edulis*, the P1 fixed finger is unarmed on the prehensile margin in males, and the P1 dactylus bears a distinct subproximal tooth on the prehensile margin in males and females; whereas in *U. wuhsienweni* the P1 fixed finger bears a median tooth on the prehensile margin in males, and the P1 dactylus bears an obscure subproximal tooth on the prehensile margin in males and females.

Type locality. — Luk-Kong, Chang-Hua County, Taiwan.

Distribution. — Luk-Kong, central west Taiwan; Tainan; North Vietnam.

Upogebia fijiensis Sakai, 1982 (fig. 18)

Upogebia (*Calliadne*) *amboinensis*; Sakai, 1975: 9, fig. 2.
Upogebia fijiensis Sakai, 1982: 28, figs. 3f, 5b.

Material examined. — ZSM 597, paratypes, 1 male (TL/CL, 24.0/6.1 mm), 1 female (TL/CL, 15.0/4.1 mm), Sigatoga, Viti Levu, Fiji Islands, 44 m.

Diagnosis. — Rostrum with 2 frontal teeth and unarmed on ventral surface. Lateral ridges of gastric region not projecting forward. Anterolateral margin of carapace unarmed. P1 chelate; merus with a row of distinct spines on ventral margin; chela shortened, dactylus unarmed on prehensile margin, and fixed finger convex and denticulate in proximal half. Abd6 smooth on posterior margin. Telson convex or truncate on posterior margin (fig. 18D).

Remarks. — *U. fijiensis* is similar to *U. holthuisi* Sakai, 1982, because two frontal denticles are present on the rostrum, and the lateral ridges of the gastric region are not projecting forward. However, in *U. holthuisi* the P1 merus is armed with a row of tubercles on the ventral margin (fig. 19A), and the dactylus bears a denticulate median carina on the mesial surface (fig. 19B, C), whereas in *U. fijiensis* the P1 merus has a row of distinct spines on the ventral margin (fig. 18A), and the dactylus lacks a median carina on the mesial surface (fig. 18B, C).

Type locality. — Sigatoga, Viti Levu, Fiji, 44 m.

Distribution. — Fiji (Sakai, 1982); 44 m.

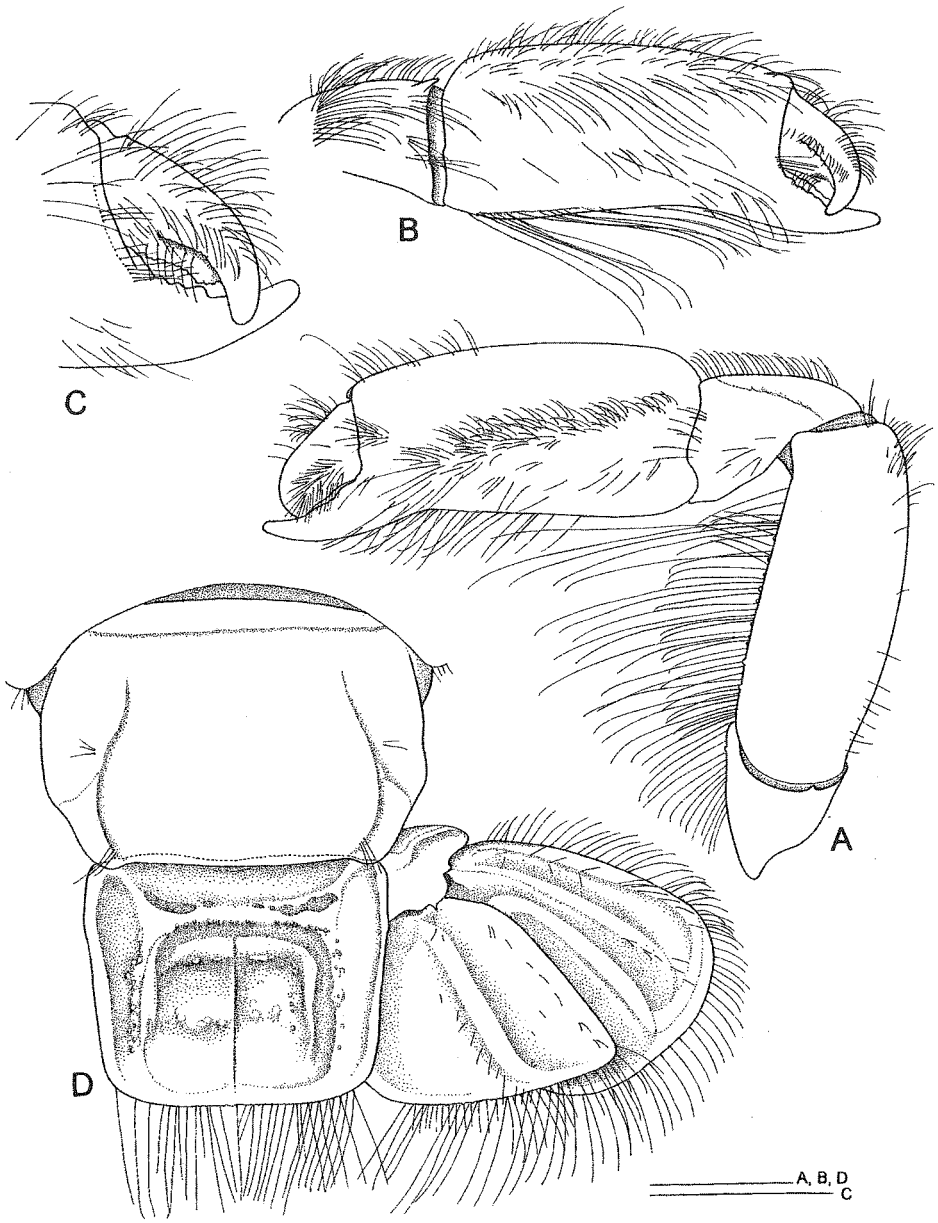

Fig. 18. *Upogebia fijiensis* Sakai, 1982. A, male P1 of right side, lateral view; B, same, mesial view; C, P1 dactylus and distal part of palm, mesial view; D, abdominal somite 6, telson, and uropod of right side, dorsal view. A-D, ZSM 597, paratype, 1 male, Sigatoga, Viti Levu, Fiji Islands, 44 m.

Upogebia hirtifrons (White, 1847)

Gebia hirtifrons White, 1847a: 71 (nomen nudum); White, 1847b: 122; White, 1848: 225; Miers, 1874: 4, pl. 3 figs. 5-5a; Ortmann, 1893: 49; Ortmann, 1894: 21 (key).
Upogebia hirtifrons; Chilton, 1907: 457.
Upogebia (*Upogebia*) *hirtifrons*; Borradaile, 1903: 543; De Man, 1927: 45, pl. 5 fig. 17-17b; De Man, 1928: 22 (list), 38, 43, 65; Sakai, 1982: 54, figs. 11a, 13c-d, pl. E 7-8.
Non *Gebia hirtifrons* Dana, 1855, pl. 32 fig. 2a-f (= *Acutigebia danai* (Miers, 1876a)).
Non *Upogebia hirtifrons*; Nobili, 1906a: 61, pl. 4 fig. 13 (= *Upogebia darwinii* (Miers, 1884)).
Non *Upogebia hirtifrons*; Nobili, 1906b: 96 (key), 97.
Non *Upogebia hirtifrons*; Balss, 1915: 2 (= *Upogebia pseudochelata* Tattersall, 1921).

Material examined. — SMF 4949, 1 male (TL/CL, 58.0/17.4 mm), Manukau, New Zealand.

Type locality. — "South Sea" (= Pacific Ocean).

Distribution. — New Zealand: Auckland, Manukau Harbours, and Kenepuru (Chilton, 1907), Kenepuru Sound (De Man, 1927), Manukan (Sakai, 1982); South Sea (White, 1847a; Sakai, 1982).

Upogebia holthuisi Sakai, 1982 (fig. 19)

Upogebia amboinensis; [not De Man, 1888] Holthuis, 1953a: 51.
Upogebia (*Upogebia*) *holthuisi* Sakai, 1982: 33, figs. 6b, 7d-f, 8d; Sakai, 1984: 160; Ngoc-Ho, 1991: 299, fig. 8.

Material examined. — ZMUC-CRU 9793, 1 male (TL/CL, 22.0/5.2 mm), 1 ovig. female (TL/CL, 23.0/5.5 mm, rostrum broken proximally), 2 females (TL/CL, 28.0/7.2 – 18.0/5.0 mm), off Jolo, Sulu Islands, coral, leg. Th. Mortensen, 19.iii.1914; SMF 30212, 1 male (TL/CL, 27.0/8.4 mm), 1 ovig. female (TL/CL, 30.0/7.4 mm), Weligama Bay, Sri Lanka, 03.ii.1912, leg. Löw-Beer; ZMUC-CRU-9765, 1 ovig. female (TL/CL, 36.0/10.3 mm), Trincomalee, Sri Lanka, 7 fathoms (approx. 10.5 m), leg. K. Frisber, March 1889.

Diagnosis. — Rostrum with 2 frontal teeth, unarmed on ventral surface. Lateral ridges of gastric region not projecting forward. Anterolateral margin of carapace unarmed. P1 chelate; merus with a row of tubercles on ventral margin (fig. 19A), chela shortened; dactylus unarmed on prehensile margin; mesial surface lacking median carina (fig. 19B, C); fixed finger convex and denticulate in proximal half. Abd6 slightly convex on lateral margin, smooth on posterior margin. Telson broader than long, tuberculate on dorsal surface and truncate on posterior margin.

Type locality. — Onotoa, Gilbert Islands, 4 m.

Distribution. — New Caledonia (Ngoc-Ho, 1991); Gilbert Islands: Onotoa (Sakai, 1982, 1984); 4-75 m.

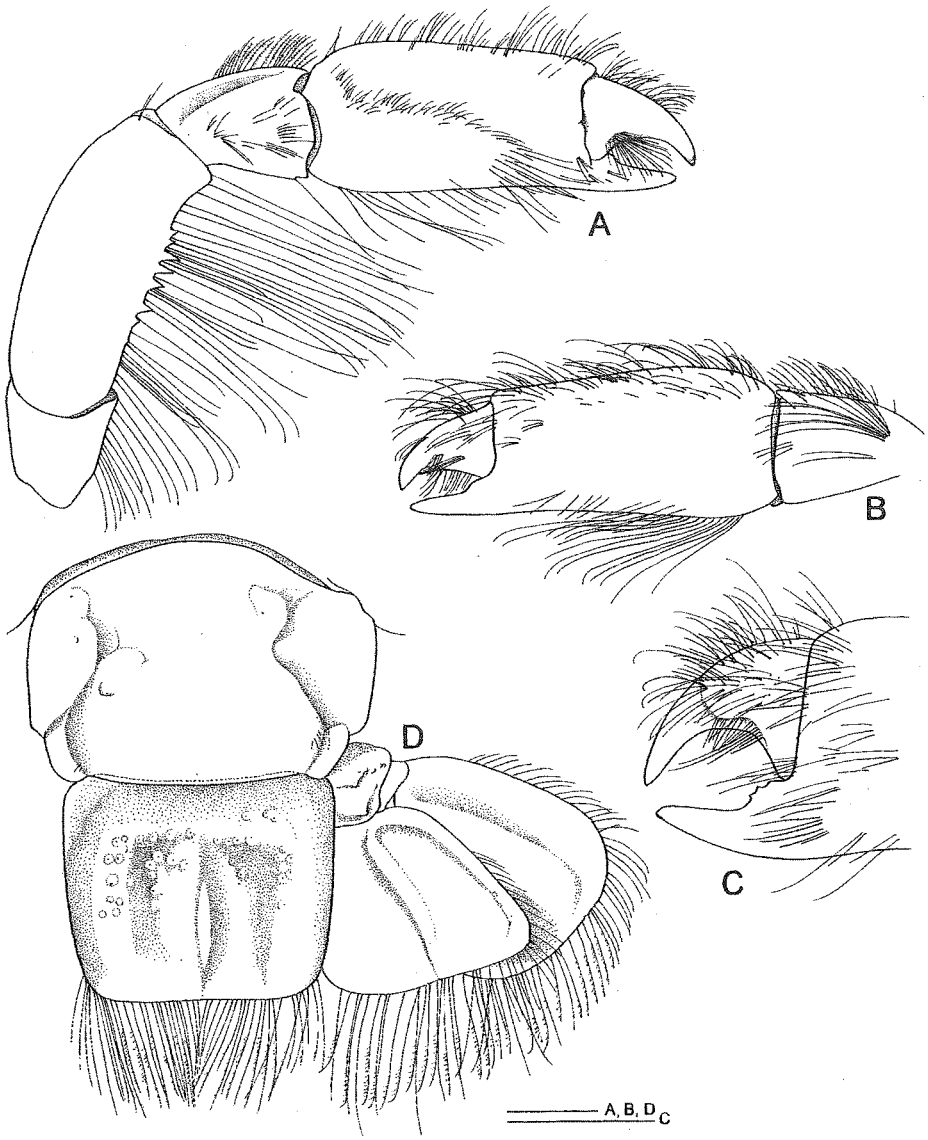

Fig. 19. *Upogebia holthuisi* Sakai, 1982. A, male P1 of left side, lateral view; B, same, mesial view; C, male P1 dactylus and distal part of palm, mesial view; D, abdominal somite 6, telson, and uropod of right side, dorsal view. A-D, ZMUC-CRU 9793, 1 male (TL/CL, 22.0/5.2 mm), off Jolo, Sulu Islands, coral.

Upogebia imperfecta Sakai, 1982

Upogebia (*Upogebia*) *issaeffi*; [not Balss, 1913] Sakai, 1968a: 47, fig. 1D.

Upogebia (*Upogebia*) *imperfecta* Sakai, 1982: 63, figs. 11f, 15c-d, pls. B3, F4, F6; Sakai, 1987: 306 (list).

Upogebia imperfecta; Liu & Zhong, 1994: 562; Komai et al., 1999: 17, figs. 1-5; Itani, 2004: table 2 (list).

Type locality. — Yellow Sea, 36°02′N 121°56′E, 50 m.

Distribution. — Yellow Sea, 50 m; off Yokohama-Shiba area, Tokyo Bay, 20-40 m.

[**Upogebia intermedia** (De Man, 1887)]

Gebiopsis intermedia De Man, 1887: 256 (part. = *Upogebia barbata* (Strahl, 1862a)).
Gebiopsis intermedia De Man, 1887: 256 (part.), pl. 16 figs. 6-8 (part. = *Upogebia carinicauda* (Stimpson, 1860)).

Remarks. — This species was handled as a synonym of *U. darwinii* (Miers, 1884) by Ngoc-Ho (1977: 444), but later identified as a complex of two species, *Upogebia barbata* (Strahl, 1862a) and *U. carinicauda* (Stimpson, 1860) by Sakai (1982: 34). De Man's (1887) pl. 16 fig. 6 of a whole body in lateral aspect showing a distinct tooth on the anterolateral margin of the carapace, and his pl. 16 fig. 7 showing the distinct transverse carina of the telson, can clearly not be attributed to *U. darwinii*, but rather to *U. carinicauda*. This obviously means that the name *U. intermedia* (De Man, 1887) now only exists in synonymy.

Type locality. — Elphinstone Island, Queensland.

[**Upogebia isodactyla** (Ortmann, 1891) (fig. 20)]

Gebia isodactyla Ortmann, 1891: 55, pl. 1 fig. 9; Nakazawa, 1927: 1038, fig. 1998.
Upogebia isodactyla; Itani, 2004: 390.

Material examined. — MZS, 2 male P1 chelae and 2 female chelae, otherwise damaged.

Diagnosis. — The types are damaged, and, but for the distal parts of the P1 palm and dactylus, are indiscernible. From the chelipeds that remained, it can be reconstructed that the two damaged specimens were one male and one female. In the male, the P1 palm (fig. 20A, B) bears thick setae on the lateral surface, the dorsal margin bears a distal spine, and the distal margin of the mesial surface bears a spine; the fixed finger is tuberculate on the prehensile margin; and the dactylus bears two subproximal conical tubercles on the dorsal margin, one subproximal conical denticle on the prehensile margin, and a row of tubercles on the mesial surface. In the female specimen, the P1 fixed finger is denticulate on the prehensile margin and the dactylus bears a subproximal conical tubercle on the dorsal margin (fig. 20C, D).

Remarks. — The type specimens of *Gebia isodactyla* from the Red Sea (Mus. Godeffroy vend.) were examined, and it turned out that this name is a synonym of *U. savignyi* (Strahl, 1862), from the features of the P1 palm and dactylus as described above. Nakazawa (1927) reported this species from the Inland Sea, Japan, but his specimens are no longer available.

Type locality. — Red Sea.

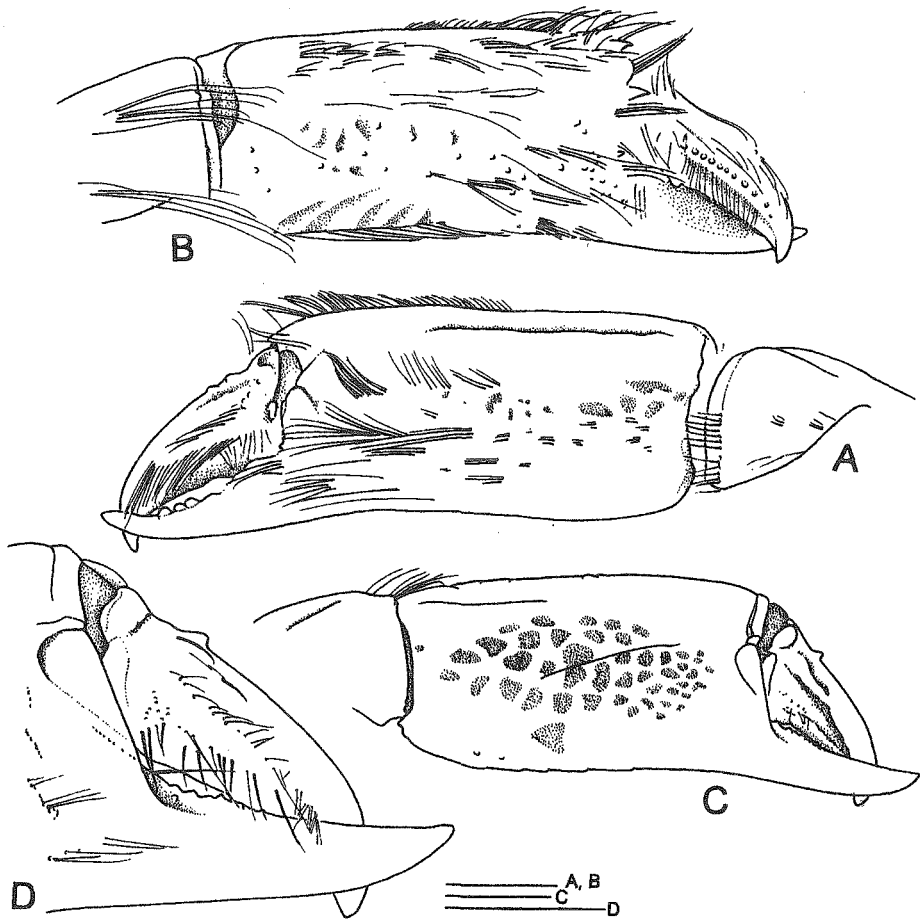

Fig. 20. *Upogebia isodactyla* Ortmann, 1891 (synonym of *U. savignyi* (Strahl, 1862). Two syntypes (Musée Zoologique de l'Université Louis Pasteur & de la Ville de Strasbourg). A, male P1 palm and dactylus, lateral view; B, same, mesial view; C, female P1 palm and dactylus, lateral view; D, P1 fixed finger and dactylus, lateral view.

Upogebia issaeffi (Balss, 1913)

Gebia (*Upogebia*) *issaeffi* Balss, 1913: 239.
Gebia (*Upogebia*) *Issaeffi*; Balss, 1914: 89, figs. 48-49.
Upogebia (*Upogebia*) *Issaeffi*; De Man, 1927: 27; De Man, 1928: 23 (list), 39, 41.
Upogebia (*Upogebia*) *issaeffi*; Makarov, 1938: 59, figs. 19-20; Sakai, 1968a: 47; Sakai, 1982: 64, figs. 14a, 15e-f, pls. B4, F5, F7; Sakai, 1984: 161; Sakai, 1987: 306 (list).
Upogebia issaeffi, Yokoya, 1939: 278; Liu & Zhong, 1994: 562; Itani, 2004: 383-392, figs. 3-5, tables 1, 2; Itani, 2005: 943-946, figs. 2-3, table 1.

Material examined. — SMF 30597, 20 males (TL/CL, 22.0/6.7 – 64.0/19.2 mm), 10 females (TL/CL, 59.0/16.6 – 84.0/24.5 mm), Kokatu-jima, Anan, Tokushima Pref., 26.iv.1992, leg. K. Sakai; SMF 30598, 1 female (TL/CL, 36.0/10.5 mm), Kokatu-jima, Anan, Tokushima Pref.,

26.v.1993, leg. S. Maeda; SMF 30599, 7 males (TL/CL, 27.0/8.4 – 61.0/18.6 mm), Kokatu-jima, Anan, Tokushima Pref., 15.vi.1993, leg. K. Sakai; SMF 30600, 25 males (TL/CL, 26.0/7.3 – 66.0/19.2 mm), 2 males lacking abdomen (CL, 18.0; 17.7 mm), 17 females (TL/CL, 33.0/10.1 – 68.0/17/5 mm), 1 female lacking abdomen (CL, 11.2 mm) Kokatu-jima, Anan, Tokushima Pref., 20.vi.1993, leg. K. Sakai; SMF 30601, 1 male with *Peregrinamor ohshimai*[1]) (TL/CL, 30.0/8.3 mm), Kokatu-jima, Anan, Tokushima Pref., 20.vi.1993, leg. K. Sakai; SMF 30602, 10 males (TL, 30.0-59.0 mm), 10 females (TL, 30.0-52.0 mm), Kokatu-jima, Anan, Tokushima Pref., 1.viii.1993, leg. K. Sakai and S. Maeda; SMF 30603, 3 males with *Peregrinamor ohshimai* (TL/CL, 44.0/11.3 – 40.0/11.5 mm), 3 females with *Peregrinamor ohshimai* (TL/CL, 31.0/9.9 – 52.0/14.2 mm), Kokatu-jima, Anan, Tokushima Pref., 1.viii.1993, leg. K. Sakai; SMF 30604, 6 males (TL/CL, 32.0/9.6 – 117.0/17.4 mm), 6 females (TL/CL, 36.0/10.6 – 44.0/12.3 mm), Kokatu-jima, Anan, Tokushima Pref., 15.ix.1993, leg. K. Sakai and S. Maeda; SMF 30605, 10 males (TL/CL, 31.0/10.9 – 52.0/15.3 mm), Kokatu-jima, Anan, Tokushima Pref., 15.ix.1993, leg. K. Sakai and S. Maeda; SMF 30606, 2 males with *Peregrinamor ohshimai* (TL/CL, 36.0/11.2 – 39.0/12.1 mm), Kokatu-jima, Anan, Tokushima Pref., 15.ix.1993, leg. K. Sakai and S. Maeda; SMF 30607, 5 males with *Peregrinamor ohshimai* (TL/CL, 32.0/9.3 – 40.0/11.8 mm), Kokatu-jima, Anan, Tokushima Pref., 15.ix.1993, leg. K. Sakai and S. Maeda; SMF 30608, 4 females (3 with *Peregrinamor ohshimai*) (TL/CL, 29.0/9.8 – 42.0/11.6 mm), Hakamabouchi, Anan, Tokushima Pref., 1.viii.1993, leg K. Sakai and S. Maeda; SMF 30609 (= BLT 3026), 2 males (TL/CL, 40.0/11.0 – 74.0/20.4 mm), 1 male Form II (TL/CL, 75.0/19.9 mm), 1 female (TL/CL, 74.0/20.4 mm), Uranouchi Inlet, Inoshiri, Usa city, Kochi Pref., 28.vii.1980, leg. K. Sakai; SMF 30610, 1 specimen lacking Abd4 to tail-fan (CL, 13.0 mm), Warabi-jima, Izumi city, Kagoshima Pref., 2.vi.1989, leg. H. Mukai.

Remarks. — The number of teeth on the P2 coxa and ischium are variable: the P2 coxa is usually unarmed, but in two males (TL, 62; 45 mm) and one female (TL, 42 mm) there is a mesial subdistal tooth; and the ischium usually has 1-2 ventral teeth proximally, but is exceptionally unarmed on the ventral margin.

Komai et al. (1999: 18) mentioned, without giving any reason, that *U. issaeffi* as reported by Sakai (1968a) would partly not be assignable to *U. issaeffi* (Balss, 1913). However, Sakai's (1968a) fig. 1D is clearly in agreement with the male of *U. issaeffi*, because the P1 fixed finger bears a distinct tooth on the prehensile margin (Sakai, 1968a, fig. 1D).

Type locality. — Vladivostok.

Distribution. — Russia: Vladivostok (Balss, 1913, 1914; De Man, 1927; Makarov, 1938; Sakai, 1982); Japan: Honshu, Shikoku, Kyushu (Itani, 2004), Onagawa, Miyagi Pref. (Yokoya, 1939), Sugashima, Mie Pref., and Uchiyama-river, Hyogo Pref., (Sakai, 1982), Sugashima, Mie Prefecture (Sakai, 1984); Kokatsu-jima, Anan, Tokushima Pref., Uranouchi Inlet, Inoshiri, Usa city, Kochi Pref., Munakata-Oshima, Fukuoka Pref., off Shimabara, Ariake Sea, Warabi-jima, Izumi city, Kagoshima Pref., Yellow Sea (Sakai, 1968a).

[1]) The ectosymbiotic bivalve (Mollusca, Bivalvia) *Peregrinamor ohshimai* Shôji, 1938.

Upogebia kempi Sankolli, 1972

Upogebia (*Upogebia*) *kempi* Sankolli, 1972: 671, figs. 9-11.
Upogebia foresti Ngoc-Ho, 1989b: 870, fig. 3.

Remarks. — *Upogebia foresti* and *U. kempi* both bear a subdistal spine on the dorsal margin of the P1 merus, so those two nominal species are conspecific, separated from *U. carinicauda* (Stimpson, 1860).

Type locality. — Chowpatty, Bombay, India.

Distribution. — India: Chowpatty and Cuffe-parade, Bombay; Indonesia: Timor, Celebes, and Haroekoe (Ngoc-Ho, 1989b).

Upogebia kuekenthali Sakai, 1982

Gebiopsis intermedia var. *amboinensis*, De Man, 1902: 759.
Upogebia (*Upogebia*) *kuekenthali* Sakai, 1982: 29, figs. 6a, 7a-c.

Type locality. — Ternate Island, Indonesia.

Distribution. — Indonesia: Ternate (De Man, 1902; Sakai, 1982).

Upogebia laemanu Ngoc-Ho, 1990

Upogebia laemanu Ngoc-Ho, 1990: 969, figs. 2e-g, 3.

Remarks. — This species is closely similar to *Upogebia tractabilis* Hale, 1941; in *U. laemanu* the proximal joint of the A1 peduncle bears no ventral spine, whereas in *U. tractabilis* it bears a large spine (Ngoc-Ho, 1990: 971).

Type locality. — Seychelles Islands, 33-61 m.

Distribution. — So far only known from the type locality.

Upogebia lagonensis (Ngoc-Ho, 1989)

Gebiacantha lagonensis Ngoc-Ho, 1989a: 132, figs. 5-7; Ngoc-Ho, 1991: 297.

Material examined. — ZMUC-CRU 9723, 1 male (TL/CL, 13.0/4.3 mm), 1 male (TL/CL, 13.0/4.4 mm, detached between Abd2-3), Gulf of Thailand, "Galathea" St. 386, 72 m, 10°29′N 101°26′E, muddy clay with a little sand and shells, 10.vi.1951; ZMUC-CRU 9726, 2 males (TL/CL, 11.0/3.7 – 12.0/3.8 mm), 1 female (TL/CL, 11.0/4.1 mm), Gulf of Thailand, "Galathea" St. 381 IV, 7°00′N 103°18′E, 55 m, mud with a little sand and shells, 6.viii.1951; ZMUC-CRU 9727, 1 male (TL/CL, 12.0/3.5 mm), 1 ovig. female (TL/CL, 13.0/4.3 mm), Gulf of Thailand, "Galathea" St. 381 IV, 7°00′N 103°18′E, 55 m, mud with a little sand and shells, 6.viii.1951; ZMUC-CRU 9728, 1 male (TL/CL, 13.0/4.3 mm), 1 female (TL/CL, ca. 134.0/4.0 mm, missing rostrum), Gulf of Thailand, "Galathea" St. 387, 10°25′N 101°29′E, 72 m, muddy clay with a little sand, 10.vi.1951; ZMUC-CRU 9724, 1 ovig. female (TL/CL, 17.0/4.9 mm), Java Sea, 5°52′S 112°41′E, coralline clay, 66 m deep, 26.viii.1951, "Galathea" St. N. 455.

Type locality. — East Lagoon, New Caledonia, 47-49 m.

Distribution. — New Caledonia (Ngoc-Ho, 1989a, 1991); 10-50 m; Gulf of Thailand, 55-72 m.

Upogebia laurentae (Ngoc-Ho, 1989)

Gebiacantha laurentae Ngoc-Ho, 1989a: 140, fig. 9; Ngoc-Ho, 1994b: 193, fig. 1; Ngoc-Ho, 2001b: 54.

Type locality. — Strait of Makassar, Indonesia, 0°53.7′S 119°31.0′E, 35 m.

Distribution. — Indonesia: Makassar Strait (Ngoc-Ho, 1989a); Papua New Guinea: Sek Harbour (Ngoc-Ho, 1994b).

Upogebia lenzrichtersi Sakai, 1982

Gebia sp. Lenz & Richters, 1881: 427.
Upogebia (*Upogebia*) *lenzrichtersi* Sakai, 1982: 41, figs. 9a, 10a-c, pl. D 3-4.

Material examined. — SMF 5071, 1 male (TL/CL, 21.0/7.2 mm), data unknown.

Type locality. — Nosy Bé, Madagascar.

Distribution. — Madagascar: Nosy Bé (Lenz & Richters, 1881), Nosy Bé and Tuléar (Sakai, 1982).

Upogebia lifuensis (Ngoc-Ho, 1994)

Gebiacantha lifuensis Ngoc-Ho, 1994b: 196, fig. 3.

Type locality. — Loyalty Islands, 6-10 m.

Distribution. — Loyalty Islands (Ngoc-Ho, 1994b); 6-10 m.

Upogebia lincolni Ngoc-Ho, 1977

Upogebia lincolni Ngoc-Ho, 1977b: 309, figs. 1-3; Holthuis, 1977: 312, fig. 3; Ngoc-Ho, 1979a: 319, fig. 1B.

Type locality. — Madura Strait coast, east Java, Indonesia.

Distribution. — Indonesia: Madura Strait coast, east Java (Ngoc-Ho, 1977b).

Upogebia longicauda Sakai, 1975

Upogebia (*Calliadne*) *longicauda* Sakai, 1975: 39, figs. 14-15.

Remarks. — This species was once synonymized with *Upogebia cargadensis* Borradaile, 1910 (cf. Sakai, 1982: 12). However, it seems that it is indeed different from *U. cargadensis*, because in *U. longicauda* Sakai, 1975 the telson is converging backwards, whereas in *U. cargadensis* it is merely oblong.

Type locality. — Off Ras Iwatin, Kenya, 02°28′00″S 41°04′05″E, 146 m depth.

Distribution. — So far only known from the type locality.

Upogebia major (De Haan, 1841)

Gebia major De Haan, 1841, pl. 35 fig. 7; De Haan, 1849: 165; Miers, 1879: 21, 52; Ortmann, 1891: 54, pl. 1 fig. 7a-b; Ortmann, 1893: 49; Ortmann, 1894: 21 (key); Doflein, 1902: 643; Balss, 1913, fig. 7; Balss, 1914: 90; Nakazawa, 1927: 1037, fig. 1997; Yokoya, 1930: 543, fig. 4; T. Sakai, 1935: 60.

Upogebia (*Upogebia*) *major*; Borradaile, 1903: 543; Parisi, 1917: 23; De Man, 1927: 47, pl. 6 fig. 18; De Man, 1928: 23 (list), 39, 45, 62; Makarov, 1938: 54, figs. 16-17; Miyake, 1961: 10; Sakai, 1968a: 45, fig. 1A-C; Sakai, 1982: 67, fig. 15g-h, pls. B5, G3-4; Sakai, 1987: 306 (list).

Upogebia major; Miyazaki, 1936: 320, fig. 4; Urita, 1942: 39; Kubo & Nakazawa, 1947: 755, fig. 2176; Liu, 1955: 66, pl. 24 figs. 1-6; Utinomi, 1956: 63, pl. 32 fig. 1; Kamita, 1958: 59, fig. 45; Miyake et al., 1962: 124; Sakai, 1968b: 3; Suzuki, 1979: 296; Holthuis, 1991: 234, fig. 433; Dworschak, 1992: 224; Komai et al., 1992: 196 (list); Liu & Zhong, 1994: 562; Asakura, 1995: 342, pl. 91 fig. 8; Komai, 1999: 64; Itani, 2004: 383-392, fig. 2, tables 1, 2.

Non *Gebia major*; Takahashi, 1934: 20 (= *U. wuhsienweni*).

Upogebia trispinosa Sakai & Mukai, 1991: 321, figs. 4, 5; Itani, 2004, table 2 (list). [= *Upogebia major* (De Haan, 1841).] [Type locality: Japan: Yoshino-gawa, Tokushima.]

Material examined. — SMF 30572, 17 females (TL/CL, 114.0/35.5 – 92.0/26.8 mm), Atsukeshi Bay, Hokkaido, vii.1992, leg. M. Tsuchiya; SMF 30573, 15 males (TL/CL, 96.0/28.5 – 111.0/34.5 mm) Atsukeshi Bay, Hokkaido, vii.1992, leg. M. Tsuchiya; SMF 30574, 1 male (TL/CL, 132.0/37.9 mm), Atsukeshi Bay, Hokkaido, vii.1992, leg. H. Mukai; SMF 30575, 12 males (TL/CL, 87.0/29.6 – 113.0/32.6 mm), Atsukeshi Bay, 2.xi.1982, leg. M. Tsuchiya; SMF 30576 (= BLT 18241), 1 male (TL/CL, 114.0/33.7 mm), Atsukeshi Bay, Hokkaido, ca. 1982, leg. H. Mukai; SMF 30577 (= BLT 921), 5 males (TL/CL, 76.0/26.4 – 80.0/24.7 mm), 5 females (TL/CL, 67.0/21.1 – 78.0/26.5 mm), Asadokoro coast, Aomori Pref., 3.xi.1982, leg. M. Tsuchiya; SMF 30578, 1 male (TL/CL, 99.0/28.4 mm), 3 females (TL/CL, 84.0/26.2 – 99.6/28.6 mm), Yamada-cho, Funakoshi Bay, Iwate Pref., facing the Japan Sea, 26.vi.1991, leg. K. Sakai; SMF 30579, 1 male (TL/CL, 26.0/8.2 mm), Ohzuchi, Iwate Pref., facing the Pacific Ocean, 14 m, 25.vi.1991, leg. K. Sakai; SMF 30580 (= BLT 1870B), *Upogebia trispinosa*, paratype, 1 male (TL/CL, 32.0/9.2 mm), 1 female Form II (TL/CL, 27.0/7.8 mm), 1 female lacking Abd3-tail-fan (CL, 9.4 mm), Jotocho, Yoshino-gawa, Tokushima city, muddy sand, 9.viii.1983, leg. K. Sakai; SMF 30581 (= BLT 1881), 3 males (TL/CL, 70.0/20.1 – 82.0/24.5 mm), 2 males lacking abdomen (CL, 22.5; 23.4 mm), 8 females (TL/CL, 69.0/19.6 – 88.0/24.6 mm), estuary of Yoshino-gawa, Tokushima, 11.viii.1983, leg. K. Sakai; SMF 30582, 1 male (TL/CL, 54.0/15.9 mm), 1 female (TL/CL, 82.0/23.5 mm), Yoshino-gawa, Tokushima city, vi.1986, leg. K. Sakai; SMF 30583, 1 female (TL/CL, 34.0/10.5 mm), Yoshino-gawa, 28.vi.1987, leg. Nakama & Omagari; SMF 30584, 4 males (TL/CL, 28.0/8.5 – 46.0/12.2 mm), 3 females (TL/CL, 42.0/12.0 – 49.0/13.6 mm), Sumiyo, Yoshino-gawa, Tokushima city, 24.v.2002, leg. K. Sakai; SMF 30585 (= BLT 1725), 1 male

(TL/CL, 75.0/20.1 mm), Uragami-gawa, Asakawa, Tokushima Pref., facing the Pacific Ocean, 11.vii.1982, leg. K. Sakai; SMF 30586, 1 female with *Peregrinamor ohshimai* (TL/CL, 59.0/16.6 mm), Kokatu-jima, Anan, Tokushima Pref., 15.ix.1993, leg. K. Sakai and S. Maeda; SMF 30587, 12 males (TL/CL, 32.0/8.8 – 88.0/28.2 mm), 10 females (TL/CL, 37.0/11.1 – 44.0/13.0 mm), Kokatu-jima, Anan, Tokushima Pref., 15.ix.1993, leg. K. Sakai and S. Maeda; SMF 30588, 7 males (TL/CL, 53.0/15.5 – 8.2/22.0 mm), 3 females (TL/CL, 44.0/12.8 – 57.0/16.1 mm), Kokatu-jima, Anan, Tokushima Pref., 26.iv.1994, leg. K. Sakai; SMF 30589, 3 males (TL/CL, 66.0/18.5 – 65.0/19.0 mm), 1 male with *Peregrinamor ohshimai* (TL/CL, 65.0/19.6 mm), 4 females (TL/CL, 47.0/14.3 – 87.0/24.0 mm), Kokatu-jima, Anan, Tokushima Pref., 20.vi.1993, leg. K. Sakai; SMF 30590, 1 male with *Peregrinamor ohshimai* (TL/CL, 73.0/22.3 mm) Kokatu-jima, Anan, Tokushima Pref., 20.vi.1993, leg. K. Sakai; SMF 30591, 1 male with *Peregrinamor ohshimai* (TL/CL, 54.0/16.3 mm), Kokatu-jima, Anan, Tokushima Pref., 20.vi.1993, leg. K. Sakai; SMF 30592, 2 males with *Peregrinamor ohshimai* (TL/CL, 28.0/8.1 – 70.0/21.3 mm), Kokatu-jima, Anan, Tokushima Pref., 1.viii.1993, leg. K. Sakai; SMF 30593, 2 females (TL/CL, 33.0/10.0 – 38.0/10.6 mm), Kokatu-jima, Anan, Tokushima Pref., 1.viii.1993, leg. K. Sakai; SMF 30594, 1 male with *Peregrinamor ohshimai* (TL/CL, 82.0/23.0 mm), Kokatu-jima, Anan, Tokushima Pref., 15.ix.1993, leg. K. Sakai; SMF 30595, 1 male (TL/CL, 32.0/9.9 mm), Kokatu-jima, Anan, Tokushima Pref., 19.ix.1993, leg. K. Sakai; SMF 30596, 1 male (TL/CL, 123.0/32.0 mm), Fuchun, Zhejiang China, flat, ca. 1990, leg. Dr. Frey.

Remarks. — *Upogebia trispinosa* Sakai & Mukai, 1991 is to be synonymized with *Upogebia major* (De Haan, 1841). The type specimens are young, measuring 27.0-49.0 mm in total length. It is observed in those type specimens that the P1 palm is denticulate on the dorsal margin and in males the dactylus bears a wave-like band on its dorsolateral margin (BLT 1870B, Sakai & Mukai, 1991, fig. 5D), as in *U. major*.

Regarding the spinulation on the P1 coxa and basis, that is variable in the larger specimens from Iwate Pref.; the P1 coxa and basis each bear one mesial tooth in one female (TL, 10.5 mm), and the P1 basis bears one mesial tooth in two females (TL, 4.4-5.8 mm), but the P1 coxa and basis are unarmed in six females including one ogiverous female (TL, 9.7-6.1 mm), while the P1 coxa and basis, respectively, bear one mesial tooth in two males. In 16 female specimens from Akkeshi, Hokkaido, it is observed that the P1 coxa usually bears a mesial tooth, and the P1 basis bears 0-3, but usually one, mesial teeth.

Type locality. — Japan.

Distribution. — Russia: Olga Bay and Vladivostok (Makarov, 1938), Vladivostok (Sakai, 1982); Sakhalin: Aniva Bay (Urita, 1942); Japan: (De Haan, 1849; Parisi, 1917; Dworschak, 1992), Honshu, Shikoku, Kyushu (Itani, 2004); Tokyo Bay and Sagami Bay (Ortmann, 1891), Yokohama (Doflein, 1902; De Man, 1927), Tokyo Bay, Sagami Bay, Bingo Province, Hiroshima, and Ise (Balss, 1914), Kanagawa and Yokohama (Parisi, 1917), Asadokoro, Mutsu Bay (Yokoya, 1930), Shimoda (Sakai, 1935), Kanazawa (Miyazaki, 1936), Amakusa, Sea of Ariake, Tsuyazaki, and Tottori (Miyake et al., 1962), Yatsushiro (Sakai, 1968a),

Sakata and Nezumigaseki, Yamagata Pref. (Suzuki, 1979), Yokohama and Atami (Sakai, 1982), Oshoro, Hakodate, Usu, Uchiura Bay, Hokkaido; China: Liaoning and Shandong (Liu, 1955); Korea.

Upogebia miyakei Sakai, 1967

Upogebia (*Upogebia*) *miyakei* Sakai, 1967: 319, fig. 1, pl. 11A; Sakai, 1987: 306 (list).
Upogebia miyakei; Ngoc-Ho, 1979a: 319, fig. 1A; Ngoc-Ho, 1990: 973, fig. 5a-b; Itani, 2004: table 2 (list).

Material examined. — RMNH 37845, 2 ovig. females (TL/CL, 20.0/6.0; 20.1/6.0 mm), Haroekoe Island, off Ambon, Indonesia, 3-7 May 1930, leg. "Snellius" Expedition; SMF-30954, 1 female (TL/CL, 8.0/2.9 mm), Ishigaki-jima, Ryukyu Islands, 3-27.vii.1933, leg. H. Ohshima, S. Miyake, and H. Ikeda.

Type locality. — Ishigaki-jima, Ryukyu Is.

Distribution. — Japan: Ishigaki-jima (Sakai, 1967); Indonesia: Haroekoe (Ngoc-Ho, 1990).

Upogebia monoceros De Man, 1905

Upogebia (*Upogebia*) *monoceros* De Man, 1905: 603; De Man, 1928: 23 (list), 46 (key), 75, pl. 6 fig. 10, pl. 7 fig. 10a-d.
Upogebia monoceros; Sakai, 1982: 82, 84.
Gebiacantha monoceros; Ngoc-Ho, 1989a: 121; Ngoc-Ho, 2001: 54.

Material examined. — ZMUC-CRU 9734, 1 male (TL/CL, 18.0/5.9 mm), 1 ovig. female (TL/CL, 19.0/5.5 mm), 7(8) km N.W. of Koh si Chang, Thailand, 18.3 m, mud, dredging, Th. Mortensen's Exped., 24.ii.1900; ZMUC-CRU 9735, 2 males (TL/CL, 15.0/5.0 – 18.0/5.7 mm), 1 ovig. female (tip of carapace missing); E. of Koh Mak, Thailand, ca. 37 m depth, mud, Th. Mortensen's Exped., 28.i.1900; ZMUC-CRU 9736, 139 males (TL/CL, 16.0/5.2 – 23.0/7.6 mm), west Malay Peninsula, 9°42′N 98°21′E, sandy clay, 5th Thai Danish Expedition, St. 1164, 6.iii.1966; ZMUC-CRU 9737, 1 male (TL/CL, 14.0/4.5 mm), 1 ovig. female (TL/CL, 19.0/5.6 mm), West Malay Peninsula, S. Thai, 7°00′N 99°22′E, Thai Danish Expedition, St. 1052, 10.ii.1966; ZMUC-CRU 9738, 150 females (TL/CL, 18.0/5.8 – 20.0/6.3 mm), 14 damaged specimens, west Malay Peninsula, 9°42′N 98°21′E, sandy clay, 5th Thai Danish Expedition, St. 1164, 6.iii.1966; ZMUC-CRU 9740, 5 males (TL/CL, 14.0/4.6 – 16.0/5.3 mm), 3 ovig. females (TL/CL, 16.0/5.2 – 19.0/5.4 mm), west Malay Peninsula, 7°00′N 99°22′E, Thai Danish Expedition, St. 1052, 27 m, 10.x.1966; ZMUC-CRU 9741, 1 male (damaged), 1 female (TL/CL, 7.0/2.2 mm), off Tranuebar, S.E. India, 11°10′N 79°59′E, "Galathea" St. 295, 75 m, 22.iv.1959; ZMUC-CRU 9742, 2 males (TL/CL, 17.0/5.7 – 19.0/6.6 mm), 2 ovig. females (TL/CL, 17.0/5.5 – 20.0/5.8 mm), 1 female (TL/CL, 20.0/5.8 mm), Koh Mak, S. of Koh Chang, Gulf of Thailand, Th. Mortensen's Expedition, 09.i.1900; ZMUC-CRU 9743, 2 males (TL/CL, 15.0/5.2 – 17.0/5.5 mm), 2 females (TL/CL, 14.0/4.1; CL, 6.1 mm, missing posterior from abdominal somite 3 to tail-fan), 1 detached part of abdominal somites and tail-fan without carapace, west Malay Peninsula, 9°42′N 98°21′E, 22 m, sandy clay, Thai Danish Expedition, St. 1164, 06.iii.1966; ZMUC-CRU 9744, 1 male (TL/CL, ca. 18.0/5.6 mm, carapace broken), S. of Koh Kut, 31-37 m, Th. Mortensen's Exped.,

28.i.1900; ZMUC-CRU 9745, 1 ovig. female (TL/CL, 19.0/5.5 mm), 4-5 km S. of Koh Sann, 25-33 m, Th. Mortensen' Expedition, 01.i.1900; ZMUC-CRU 9746, 1 male (TL/CL, 15.0/5.2 mm), 10°33′N 101°24′E, Gulf of Thailand, sand and shell, 70 m, "Galathea" St. 388, 10.vi.1951; ZMUC-CRU 9747, 1 ovig. female (TL/CL, 23.0/7.4 mm), 13°09′N 100°45′E, Gulf of Thailand, 12 m, "Galathea" Expedition, St. 393, 11.vi.1951; ZMUC-CRU 9748, 1 male (TL/CL, 10.0/3.3 mm), 13°07′N 100°33′E, Gulf of Thailand, "Galathea" Expedition, St. 391, 11.vi.1951; ZMUC-CRU 9749, 1 ovig. female (TL/CL, 17.0/5.2 mm), 1 female (TL/CL, 19.0/5.6 mm), W. of Koh Chang, Th. Mortensen's Expedition, 16. i.1900; ZMUC-CRU 9750, 1 female (TL/CL, 10.0/3.4 mm), Gulf of Thailand, 13°13′N 100°34′E, "Galathea" Expedition, St. 394, 11.vi.1951; ZMUC-CRU 9751, 1 female (TL/CL, 13.0/4.5 mm), west Malay Peninsula, 07°00′N 99°2″E, 27 m, Thai Danish Expedition, St. 52, 10.ii.1966; ZMUC-CRU 9752, 14 males (TL/CL, 8.0/2.6 – 19.0/6.3 mm), 5 females (TL/CL, 16.0/4.9 – 19.0/5.5 mm), 2 carapaces (4.9; 5.6 mm), N. of Koh Kut, Th. Mortensen's Expedition, 23.i.1900; ZMUC-CRU 9753, 1 ovig. female (TL/CL, 17.0/5.9 mm), 1 female (TL/CL, 22.0/6.4 mm), S. of Koh Kahdat, 14.6-9.2 m, mud and sand, and W. of Koh Kut, 27.5 m, Th. Mortensen's Expedition, 4.iii.1900.

Remarks. — In the male specimen from Thailand (ZMUC-CRU 9746), the rostrum bears two ventral spines, of which the anterior one is smaller than the posterior. In *U. monoceros*, the P1 palm bears no spinose row on the median surface, whereas in the ovigerous female from Thailand (ZMUC-CRU 9734) it bears a row of spinules, and the ventral margin bears an elongate spine posterior to the fixed finger as typical for this species.

Recently, Ngoc-Ho (1989a: 121) identified *Wolffogebia exigua* Sakai, 1982 (nec Alcock, 1901) as a synonym of *Upogebia monoceros* De Man, 1905, and included it in a species of the genus *Gebiacantha* Ngoc-Ho, 1989a. However, *W. exigua* Sakai, 1982 is the same species as *Gebicula irawadyensis* sp. nov., and it is different from *Upogebia* (= *Gebiacantha*) *monoceros*.

Type locality. — Anchorage off Djangkar, Java, 7°42′S 114°12.6′E, "Siboga" stn. 4, 9 m.

Distribution. — Indonesia: off Djangkar, Java (De Man, 1905, 1928; Sakai, 1982), 9 m.

Upogebia mortenseni sp. nov. (fig. 21)

Material examined. — ZMUC-CRU 9709, holotype (TL/CL, ca. 32.0/5.1 mm, with polymorphism, lacking distal part of telson, A1-2, P2-5), Amboina Bay, scraper, 50 fathoms (91.4 m), stone, sand, 3.iii.1922, leg. Danish Expedition to the Kei-Islands, 1922.

Diagnosis. — Rostrum broadened, and rounded on frontal margin, bearing four distinct spines; infrarostral spine absent. Lateral ridges of gastric region shortly protruding forward by acute distal spine. Postocular spine present. Abdominal sternites unarmed. P1 chelate; palm denticulate on dorsal margin. Telson bearing conspicuous transverse carina.

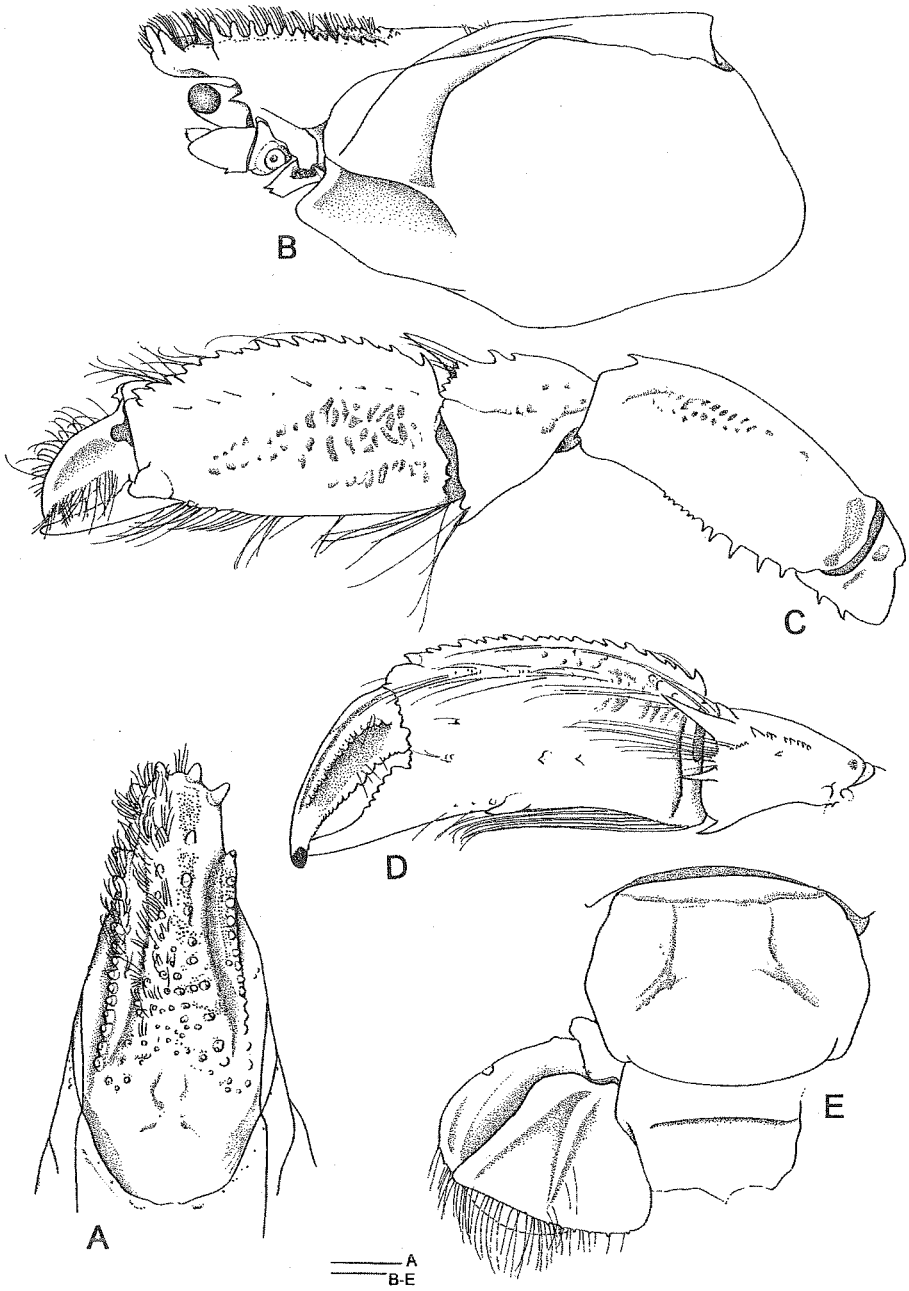

Fig. 21. *Upogebia mortenseni* sp. nov. A, cephalic region, dorsal view; B, carapace, lateral view; C, male P1 of left side, lateral view; D, same, mesial view; E, abdominal somite 6, telson (damaged), and uropod of left side. A-E, ZMUC-CRU 9709, holotype (TL/CL, ca. 32.0/5.1 mm, polymorphism), Amboina Bay, 50 fathoms (91.4 m), stone, sand.

Description. — Rostrum (fig. 21A) broadened, slightly broader at base than long; frontal margin rounded, bearing four distinct spines; lateral ridges of gastric region shortly projecting forward by acute spine each; infrarostral spine absent, overreaching eyestalks by half length of rostrum. Dorsal surface of rostrum bearing pair of subapical spines, which are located apart from the succeeding lateral spine on each side; a pair of spines present in middorsal area at level of proximal region of rostrum, and posterior to it obscure pair of median spines present; lateral ridges of gastric region posteriorly diverging, bearing crest of about 13-14 spines, strongest in anterior row, decreasing in size posteriorly, with anterior spines hidden in densely set setae; 1-2 hepatic spines present on cervical groove. Postocular spine present (fig. 21B).

Eyestalks stout, convex ventrally, almost straight dorsal surface; cornea prominent and located distally. A1 peduncle absent. A2 peduncle damaged, missing 3-5 segments; segment 2 with median ventral spine; scaphognathite with minute distal and subdistal spines. Mxp3 absent. Epistomial projection narrow in lateral view, bearing 2 strong spines on distal angle.

P1 chelate; coxa and basis lacking spine. Ischium bearing 2 spines on ventral margin (fig. 21C); merus with five strong spines in proximal half, distal to these six small spines on ventral margin, and one subdistal spine on dorsal margin. Carpus triangular, bearing shallow longitudinal dorsal groove on lateral surface; dorsal margin beset with two spines; lateral surface bearing series of five small spines dorsally on distal margin; mesial surface (fig. 21D) bearing two strong and one small dorsal spines, and one strong ventral spine on distal margin. Chela about 2.3 times as long as high; palm 1.8 times as long as broad, dorsal margin bearing series of distinct denticles; mesial surface bearing row of long setae accompanied proximally by some distinct spines slightly below dorsal margin; denticulate on distal margin, and thickened on proximal margin, bearing marginal denticles; ventral margin bearing a strong median spine and a short row of spinules proximally. Fixed finger about as long as dactylus, continuing from contour of lower margin of palm by a triangular condyle, prehensile margin bearing about 6 small teeth in proximal half, and smooth in distal half. Dactylus distorted inwards to fixed finger, tip corneous, and lateral surface bearing a smooth, corneous plate with shallow concavity in its dorsal half; mesial surface (fig. 21D) bearing a row of tubercles medially, and above and below it forming pilose regions; prehensile margin denticulate.

Abdominal sternites unarmed. Abdominal somite 6 (fig. 21E) broadened, lateral margin medially convex. Telson (fig. 21E) damaged; dorsal surface proximally with a strong transverse ridge not confluent with lateral ridges.

Uropod with small spine on protopod above base of endopod; endopod broadened with a median rib, and exopod broad with a rounded posterior margin.

Remarks. — The present new species, *Upogebia mortenseni* sp. nov., is very characteristic in its morphology, because it bears chelate chelipeds as in the species of the genus *Calliadne* Strahl, 1862, which now is a junior subjective synonym of *Upogebia* Leach, 1814 (cf. Sakai, 1982: 2). In the species belonging to *Calliadne*, the anterolateral margin of the carapace bears no ocular spine, however, *U. mortenseni* bears a strong ocular spine.

Etymology. — The species name *mortenseni* is dedicated to the memory of the famous Dr. Th. Mortensen, who, while on Th. Mortensen's Expedition, 1922, collected, by scraper, the type specimen of this species in Amboina Bay.

Type locality. — Amboina Bay, Indonesia.

Distribution. — Know only from the type locality.

Upogebia multispinosa (Ngoc-Ho, 1994)

Gebiacantha multispinosa Ngoc-Ho, 1994b: 194, fig. 2.

Type locality. — Loyalty Islands, 6-10 m.

Distribution. — Loyalty Islands; 6-10 m.

Upogebia narutensis Sakai, 1986

Upogebia major; [not De Haan, 1849, but De Haan, 1841, after Direction 85 on the Official List] Miyake, 1982, pl. 31 fig. 5.

Upogebia spinifrons; [not Haswell, 1881] Sakai, 1984: 209, figs. 1-3.

Upogebia narutensis Sakai, 1986: 25, pl. 1; Ngoc-Ho, 1994b: 198, figs. 4, 5A-D (in part).

Upogebia (*Upogebia*) *narutensis*; Sakai, 1987: 303, 306 (list).

Austinogebia narutensis; Ngoc-Ho, 2001b: 50, fig. 3; Itani, 2004: 384-393, figs. 4, 5; Itani, 2005: 943–946, figs. 2–3, table 1.

Material examined. — SMF 30543, 6 females (TL/CL, 36.0/10.5 – 50.0/14.0 mm), Omaezaki, Shizuoka Pref., 5-30 m, dredged, 19.ix.1980, leg. H. Mukai; SMF 30544, 3 males Form II (TL/CL, 31.0/9.4 – 43.0/12.4 mm), 1 female (TL/CL, 42.0/13.8 mm), Omaezaki, Shizuoka Pref., 5-30 m, dredged, 19.ix.1980, leg. H. Mukai; SMF 30545 (= BLT 1719), 1 ovig. female lacking Abd3-tail-fan (CL, 22.4 mm), Tosa-domari, Naruto city, Tokushima Pref., *Zostera* vegetation, 14.vi.1983, leg. K. Sakai and T. Nakano; SMF 30546 (= BLT 1721), 1 ovig. female, carapace broken (TL/CL, 89.0/ca. 22.9 mm), 1 female (TL/CL, 80.0/19.4 mm), W. of Muya-cho, Naruto city, Uchino-Umi, Tokushima Pref., 14.vi.1983, leg. K. Sakai and T. Nakano; SMF 30547 (BLT 1718), paratypes, 1 male (TL/CL, 80.0/20.9 mm, with *Bopyrus* in left gill chamber), 1 female (TL/CL, 90.0/23.1 mm, damaged), Tosa-domari, Naruto city, Tokushima Pref., *Zostera* vegetation, 14.vi.1983, leg. K. Sakai and T. Nakano; SMF 30548, 3 males (TL/CL, 34.0/9.7 – 53.0/13.9 mm), 1 female (TL/CL, 31.0/7.9 mm), ?Tokushima Pref., 19.vi.1986, leg. S. Scribner; SMF 30549 (= BLT 4525), 5 males Form II (TL/CL, 50.1/14.7 – 80.0/22.0 mm), 5 females (TL/CL, 71.0/20.6 – 75.0/22.1 mm), Minoshima, Hiroshima Pref., Inland Sea, 1.iii-10.viii, 1983; SMF 30550 (= BLT

4539), 3 males Form II (TL/CL, 47.0/14.0; 61.0/16.2; 68.0/20.0 mm, fragile), off Urado-Bay, Kochi city, ca. 15 m, Otter trawl, R/V "Toyohata", 7.x.1985, leg. K. Sakai; SMF 30551 (= BLT 4539), fragments including at least 30 individuals, off Urado-Bay, Kochi city, ca. 15 m, Otter trawl, R/V "Toyohata", 7.x.1985, leg. K. Sakai; SMF 30552, 2 male Form II (TL/CL, 49.0/14.8 – 60.0/17.0 mm), 1 ovig. female (TL/CL, 35.0/14.6 mm), Warabi-jima, Izumi city, Kagoshima Pref., 2.vi.1989, leg. H. Mukai; SMF 30553, 4 ovig. females (TL/CL, 53.0/14.2 – 55.0/15.3 mm), 2 females (TL/CL, 47.0/12.9 – 52.0/13.8 mm), Warabi-jima, Izumi city, Kagoshima Pref., 2.vi.1989, leg. H. Mukai; SMF 30554, 3 males Form II (TL/CL, 49.0/14.0 – 52.0/14.3 mm), Warabi-jima, Izumi city, Kagoshima Pref., 2.vi.1989, leg. H. Mukai.

Type locality. — Ohge-jima, Naruto city, Tokoshima Pref., Japan.

Distribution. — Japan: Omaezaki, Shizuoka Pref., 5-30 m; Ryuguno-Iso, Ohge-jima, Naruto city, littoral (Sakai, 1984); Minoshima, Fukuyama, Hiroshima Pref. (Sakai, 1986); off Katsura-hama, Kochi city, 15 m (Sakai, 1987); Izumi city, Kagoshima, Taiwan: Peng-Hu Island (Ngoc-Ho, 1994b).

Upogebia neglecta De Man, 1927

Upogebia (*Upogebia*) *neglecta* De Man, 1927: 34, pl. 4 fig. 13-13e; De Man, 1928: 23 (list), 38, 42; Poore & Griffin, 1979: 301, fig. 51.
Upogebia neglecta; Davie, 2002: 484.

Type locality. — Port Stephens, New South Wales, Australia.

Distribution. — Australia: Port Stephens, N.S.W. (De Man, 1927; Poore & Griffin, 1979).

[**Upogebia octoceras** Nobili, 1904]

Upogebia (*Gebiopsis*) *octoceras* Nobili, 1904: 236.

Remarks. — This nominal species is a synonym of *Upogebia darwinii* (Miers, 1884), as described in the Remarks on *U. darwinii* (p. 103 ff.).

Type locality. — Aden, Obock and Perim.

Upogebia osiridis Nobili, 1904

Upogebia Osiridis Nobili, 1904: 235; Nobili, 1906a: 62, pl. 4 fig. 14; Nobili, 1906b: 96 (key), 97.
Upogebia (*Upogebia*) *Osiridis*; De Man, 1927: 26, pl. 3 fig. 10-10b; De Man, 1928: 23 (list), 35, 37, 40.
Upogebia (*Upogebia*) *osiridis*; Sakai, 1982: 38, fig. 6f, pl. D 1-2.

Material examined. — ZMUC-CRU 9794, 1 male (TL/CL, 13.0/4.0 mm), Persian-Arabian Gulf, St. 34A, 29°27′N 50°16′E, 28.5 m, 23.iii.1937.

Type locality. — Red Sea.

Distribution. — Red Sea: (Nobili, 1904, 1906b), Massawa (Sakai, 1982); Gulf of Aden: Djibouti and Aden (Nobili, 1906b), Aden (Nobili, 1906b; De Man, 1927; Sakai, 1982).

Upogebia ovalis Ngoc-Ho, 1991

Upogebia ovalis Ngoc-Ho, 1991: 302, fig. 9.

Remarks. — This species is similar to *U. cargadensis* Borradaile, 1910 in the shape of the rostrum, the P1 palm with denticulation on the dorsal margin, and the Pl dactylus with a denticulate row mesially. However, it is different from *U. cargadensis* as follows: in *U. ovalipes* the telson is oval, and the P1 merus is scarcely spinulose on the ventral margin and unarmed on the dorsal margin, whereas in *U. cargadensis* the telson has parallel lateral margins, and the P1 merus is spinulose on the ventral margin and bears some subdistal spines on the dorsal margin.

Type locality. — Nouméa, New Caledonia.

Distribution. — New Caledonia (Ngoc-Ho, 1991).

Upogebia plantae Sakai, 1982

Upogebia (*Upogebia*) *plantae* Sakai, 1982: 47, figs. 9f, 13a-b, pls. E3, E5.
Gebiacantha plantae; Ngoc-Ho, 1989a: 122, fig. 3; Ngoc-Ho, 2001b: 54.
Upogebia plantae; Sakai & Türkay, 1995: 263, figs. 5-8.

Material examined. — ZMUC-CRU 9754, 1 male (TL/CL, 54.0/16.0 mm), 1 abdomen without carapace, Persian-Arabian Gulf, St. 24, 29°07′N 49°56′E, ca. 40 m, 13.iii.1937; SMF 22173, 1 male (TL/CL, 22.0/7.9 mm), Persian-Arabian Gulf, PG-14 KG, 28°40.032′N 49°55.226′E, 54 m, KG, 11.xii.1991, R/V "Akademik"; SMF 22174, 1 male lacking Abd3-tail-fan (CL, 16.8 mm), 2 females (TL/CL, 50.0/15.6 – 51.0/15.7 mm), Persian-Arabian Gulf, PG-22 KG, 28°56.494′N 49°43.812′E, 45 m, KG, 14.xii.1991, R/V "Akademik".

Remarks. — The P1 dactylus is translucently carinate on the dorsolateral margin in the larger male, whereas it is denticulate in the females and the smaller male (SMF 22173); the telson is slightly concave on the posterior margin; the P1 coxae are beset with a strong, anteriorly curved spine on the mesial surface.

Type locality. — Nosy Bé, Madagascar, 25 m.

Distribution. — Madagascar: Nosy Bé (Sakai, 1982); Seychelles, Mahé, 43 m (Sakai, 1982); Persian-Arabian Gulf (Sakai & Türkay, 1995); 24-54 m.

Upogebia poorei (Ngoc-Ho, 1994)

Gebiacantha poorei Ngoc-Ho, 1994a: 64, fig. 6; Ngoc-Ho, 2001b: 54; Davie, 2002: 481.

Type locality. — N.E. of Townsville, Queensland, Australia, 18°50′S 146°47′E, 23 m, muddy sand.

Distribution. — Australia: N.E. of Townsville (Ngoc-Ho, 1994a); 23-34 m.

Upogebia priochela (Sakai, 1993)

Gebiacantha priochela Sakai, 1993: 100, figs. 7-9; Ngoc-Ho, 1994a: 66, figs. 7-8; Ngoc-Ho, 2001b: 54; Davie, 2002: 481.

Material examined. — QMB 17366, 1 male (TL/CL, 37.0/12.2 mm), Gulf of Carpentaria, F.N. [Far North] Queensland, 13°29′2″S 140°12′E, dredged CSIRO, Fish. R/V "Southern Surveyor", 62 m, 30.xi.1990; SMF 19478, paratypes, 2 males (TL/CL, 34.0/10.5 – 36.0/11.2 mm), 2 females (TL/CL, 36.0/10.1 – 37.0/10.7 mm), Timor-Sea, off Darwin, N. Territory, Australia, 12°32′S 129°30′E, 26.vi.1990, leg. N.T. Fisheries; SMF 30862 (= BLT 5667), 2 males (TL, 34.0-36.0 mm), 2 females (TL, 35.0; 35.0 mm), Timor Sea, 12°32′S 129°39′E, on surface, 26.vi.1990, leg. N.T. Fisheries.

Type locality. — West of Fog Bay, N.T., Australia, 12°41.5′S 129°26.0′E, 54 m.

Distribution. — Australia: west of Fog Bay, central Great Barrier Reef, North West Shelf (Sakai, 1993), North West Shelf, W.A., and N.E. of Townsville, Queensland (Ngoc-Ho, 1994a).

Upogebia pseudochelata Tattersall, 1921

Upogebia hirtifrons; [not *Gebia hirtifrons* White, 1847b] Balss, 1915: 2.
Upogebia (*Upogebia*) *pseudochelata* Tattersall, 1921: 395, pl. 28 figs. 16-22; De Man, 1928: 23 (list), 37, 43; Sakai, 1982: 37, figs. 6e, 8e-f; Sakai, 1984: 155.
Upogebia pseudochelata; Sakai & Apel, 2002: 286.

Material examined. — SMF 26523, 1 male (TL/CL, 11.0/3.6 mm), 1 female (TL/CL, 23.0/5.8 mm), N.W. coast, near Qalasiyah, Socotra, Jemen, SOC/IT-163, 12°41.150′N 053°28.630′E, under rocks, intertidal and shallow sublittoral, 11.iv.1999, leg. M. Apel; SMF 30863, 1 ovig. female (TL/CL, 11.0/2.9), San 13, Red Sea, Sudan, Sanganeb-reef 28 km N.E. of Port Sudan, north jetty, reef platform, from dead *Stylophora pistillata* (Esper, 1797) and stones, 1 m depth, 8.iv.1991, leg. V. Neumann.

Type locality. — Suakin (Sudan, Red Sea).

Distribution. — Red Sea: Suakin, Sudan (Tattersall, 1921), Sherm Sheikh (Balss, 1915), Sherm Sheikh, Egypt, and Sheik Seid, Eritrea (Sakai, 1982), Dahlak Archipelago and Massawa (Sakai, 1984); Socotra (Sakai et al., 2002).

Upogebia pugnax De Man, 1905

Upogebia (*Upogebia*) *pugnax* De Man, 1905: 600; De Man, 1928: 23 (list), 66, pl. 5 fig. 8-8e, pl. 6 fig. 8f; Sakai, 1982: 52 (partim, nec fig. 11b, pls. E4, E6 = *U. sakaii* Ngoc-Ho, 1994b).
Upogebia pugnax; Ngoc-Ho, 1990: 978, fig. 7; Ngoc-Ho, 1991: 305, fig. 10; Ngoc-Ho, 1994b: 202, fig. 6.
Non: *Upogebia* (*Upogebia*) *pugnax*, Sakai, 1984: 161 (= *Upogebia fallax* De Man, 1905); Sakai, 1987: 302, 306 (list); Sakai, 1995: 382, figs. 1-4 (= *U. sakaii* Ngoc-Ho, 1994b).

Type locality. — Teluk Sape, east coast of Sumbawa, Indonesia, "Siboga" stn. 311, up to 36 m.

Distribution. — Maldives: Mulaku Atoll (Sakai, 1982); Indonesia: Teluk Sape (De Man, 1905, 1928; Sakai, 1982; Ngoc-Ho, 1990); Loyalty Islands (Ngoc-Ho, 1994b).

Upogebia reunionensis (Ngoc-Ho, 1989)

Gebiacantha reunionensis Ngoc-Ho, 1989a: 123, figs. 1-2; Ngoc-Ho, 2001b: 54.

Type locality. — Réunion, 20°52.2′S 55°37.6′E, 110 m.

Distribution. — Réunion (Ngoc-Ho, 1989a); 110 m.

Upogebia richeri (Ngoc-Ho, 1989)

Gebiacantha richeri Ngoc-Ho, 1989a: 137, fig. 8.

Type locality. — East Lagoon, New Caledonia, 21°20.6′S 165°52.4′E, 43-47 m.

Distribution. — New Caledonia (Ngoc-Ho, 1989a); 43-47 m.

Upogebia sakaii Ngoc-Ho, 1994

Upogebia sakaii Ngoc-Ho, 1994b: 204, fig. 7; Itani, 2004: 390.
Upogebia (*Upogebia*) *pugnax*; Shiino, 1969, fig. 14-38 (with "*Pseudione villosa*", Bopyrina, Epicaridea); Sakai, 1982: 52 (part.), fig. 11b, pls. E4, E6; Sakai, 1987: 302 (partim), 306; Sakai, 1995: 382, figs. 1-4; Itani, 2004: 384-393, figs. 3, 4, tables 1, 2. [nec *U. pugnax* De Man, 1905].
Non: *Upogebia* (*Upogebia*) *pugnax*; Sakai, 1984: 161 [= *Upogebia fallax* De Man, 1905].

Material examined. — SMF 30555 (= BLT 2956), 1 male (TL/CL, 20.0/6.6 mm), Uranouchi Inlet, Inoshiri, Usa city, Kochi Pref., coarse sand, littoral, 7.v.1979, leg. K. Sakai; SMF 30556 (= BLT 2957), 1 female (TL/CL, 35.0/10.9 mm), Uranouchi Inlet, Inoshiri, Usa city, Kochi Pref., coarse sand, littoral, 7.v.1979, leg. K. Sakai; SMF 30557 (= BLT 2877), 1 male (TL/CL, 43.0/13.6 mm), 1 female (TL/CL, 37.0/10.9 mm), Uranouchi Inlet, Inoshiri, Usa city, Kochi Pref., coarse sand, littoral, 7.v.1979, leg. K. Sakai; SMF 30558 (= BLT 2877), 1 female (TL/CL, 35.0/10.9 mm), Uranouchi Inlet, Inoshiri, Usa city, Kochi Pref., coarse sand, littoral, 7.v.1979,

leg. K. Sakai; SMF 30559 (= BLT 2877), 1 male (TL/CL, 42.0/13.4 mm), 1 female (TL/CL, 37.0/11.3 mm), Uranouchi Inlet, Inoshiri, Usa city, Kochi Pref., coarse sand, littoral, 7.v.1979, leg. K. Sakai; SMF 30560 (= BLT 2877), 1 male (TL/CL, 44.0/13.3 mm), 1 female (TL/CL, 35.0/10.7 mm); Uranouchi Inlet, Inoshiri, Usa city, Kochi Pref., coarse sand, littoral, 7.v.1979, leg. K. Sakai; SMF 30561 (= BLT 2877), 11 males (TL/CL, 17.0/5.8 – 37.0/11.5 mm), Uranouchi Inlet, Inoshiri, Usa city, Kochi Pref., coarse sand, littoral, 7.v.1979, leg. K. Sakai; SMF 30562 (= BLT 2877), 25 males (TL/CL, 30.0/9.9 – 38.0/12.2 mm), Uranouchi Inlet, Utsuga, Usa city, Kochi Pref., coarse sand, littoral, 27.v.1979, leg. K. Sakai; SMF 30563 (= BLT 2877), 1 male (TL/CL, 43.0/13.9 mm) Uranouchi Inlet, Inoshiri, Usa city, Kochi Pref., coarse sand, littoral, 7.v.1979, leg. K. Sakai; SMF 30564 (= BLT 2878), 1 male (TL/CL, 44.0/14.1 mm), Uranouchi Inlet, Inoshiri, Usa city, 7.v.1979, leg. K. Sakai; SMF 30565, 27 females (TL/CL, 20.0/6.7 – 34.0/11.1 mm), Uranouchi Inlet, Utsuga, Usa city, Kochi Pref., coarse sand, littoral, 7.v.1979, leg. K. Sakai; SMF 30566, 3 females (TL/CL, 25.0/8.2 – 39.0/12.5 mm), Uranouchi Inlet, Inoshiri, Usa city, Kochi Pref., coarse sand, littoral, 7.v.1979, leg. K. Sakai; SMF 25764, 1 male (TL/CL, 58.0/17.4 mm), Uranouchi Inlet, Inoshiri, Usa city, Kochi Pref., coarse sand, littoral, ca. 1979, leg. K. Sakai; SMF 30567, 2 males (TL/CL, 34.0/11.0 – 34.0/12.2 mm); 5 females (TL/CL, 29.0/9.5 – 30.0/9.6 mm), Uranouchi Inlet, Inoshiri, Usa city, Kochi Pref., coarse sand, littoral, ca.1979, leg. K. Sakai; SMF 30568, 2 males (TL/CL, 39.0/12.7 – 42.0/13.8 mm), 3 females (TL/CL, 32.0/10.7 – 42.0/14.0 mm), Uranouchi Inlet, Utsuga, Usa city, Kochi Pref., coarse sand, littoral, 22-26.vii.1980, leg. K. Sakai; SMF 30569, 27 males (TL/CL, 19.0/6.3 – 34.0/11.2 mm); 1 female (TL/CL, 25.0/8.3 mm), Uranouchi Inlet, Inoshiri, Usa city, Kochi Pref., coarse sand, littoral, 20.v.1990, leg. K. Sakai; SMF 30570, 2 males (TL/CL, 23.0/7.7 – 25.0/8.4 mm), 12 females (TL/CL, 22.0/7.9 – 37.0/11.1 mm), Uranouchi Inlet, Inoshiri, Usa city, Kochi Pref., coarse sand, littoral, 20.v.1990, leg. K. Sakai; SMF 30571, 1 female (TL/CL, 33.0/10.1 mm), Shishikui-cho, Tokushima Pref., facing the Pacific Ocean, 28.iv.1991, leg. Yoshida, Seko, Sasagawa, and Sakai.

Remarks. — Itani (2004) reported the Indonesian species, *U. pugnax*, from Kyushu and Ryukyu, but those specimens probably are *U. sakaii*, a species known from Uranouchi Inlet, Kochi Prefecture.

Type locality. — Utsuga, Uranouchi Inlet, Usa city, Kochi Prefecture, Japan, tidal zone.

Distribution. — Japan: Kyushu, Ryukyu (Itani, 2004); Kaifu-cho, Tokushima Pref.; Uranouchi Inlet, Usa city, Kochi Pref. (Sakai, 1987, 1995); Matsugaura, Kagoshima Pref., and Sumiyo-gawa, Amami-Oshima (Sakai, 1982).

Upogebia savignyi (Strahl, 1862)

Gebia sp. Savigny, 1817, pl. 9 fig. 3 (2-2′).
Calliadne Savignii Strahl, 1862a: 1064; Strahl, 1862b: 390.
Gebia isodactyla Ortmann, 1891: 55, pl. 1 fig. 9.
Gebia (*Gebiopsis*) *isodactyla*; Ortmann, 1893: 50.7
Upogebia (*Gebiopsis*) *isodactyla*; Borradaile, 1903: 542.
Upogebia (*Gebiopsis*) *Savignyi*; Borradaile, 1903: 542.
Upogebia (*Gebiopsis*) *rhadames* Nobili, 1904: 235. (Type locality: Red Sea and Gulf of Aden.)
Upogebia (*Calliadne*) *Savignyi*; Nobili, 1906b: 97 (key), 98.
Calliadne savignyi; Stebbing, 1910: 371.

Upogebia (*Calliadne*) *rhadames*; Nobili, 1906b: 97 (key), 100; De Man, 1927: 6, pl. 1 fig. 2; De Man, 1928: 24 (list), 37, 47 (key); Sakai, 1975: 23, figs. 6-8.

Upogebia savignyi; Balss, 1915: 2; Dworschak, 1992: 225; Ngoc-Ho, 1994b: 206, fig. 8; Sakai & Apel, 2002: 286.

Upogebia (*Calliadne*) *savignii*; De Man, 1927: 5, pl. 1 fig. 1.

Upogebia (*Calliadne*) *Savignii*; De Man, 1928: 25 (list), 35, 37, 47 (key).

Upogebia (*Calliadne*) *savignyi*; Tattersall, 1921: 396; Ramadan, 1936: 25; Barnard, 1950: 515 (key), 522, fig. 97e-h.

Upogebia cf. *rhadames*; Barnard, 1947: 381 [not Nobili, 1904].

Upogebia (*Calliadne*) cf. *rhadames*; Barnard, 1950: 523.

Upogebia (*Upogebia*) *savignyi*; Sakai, 1982: 14, figs. 1c, 2f-h; Sakai, 1984: 154.

Upogebia (*Upogebia*) *isodactyla*; Sakai, 1987: 306 (list).

Upogebia (*Upogebia*) *cargadensis*; Sakai, 1982: 12 (in part, material from Kenya only).

Material examined. — ZMUC-CRU 9730, 8 males (Form II, polymorphic) (TL/CL, 23.0/7.4 – 27.0/8.0 mm), 1 female (Form II, polymorphic) (TL/CL, 39.0/10.6 mm), 2 females (TL/CL, 25.0/7.3 – 37.0/10.9 mm), 1 ovig. female (Form II, polymorphic) (TL/CL, 34.0/9.3 mm), 6 ovig. females (TL/CL, 31.0/8.7 – 37.0/10.9 mm), Ghardaqa, Red Sea, from sponge, viii.1937, leg. Th. Mortensen, 6.v.1938; SMF 4948, 1 male (TL/CL, 20.0/6.0 mm); 1 ovig. female (TL/CL, 28.0/6.6 mm); 2 females (TL/CL, 25.0/6.6 – 25.0/6.6 mm), Red Sea, 10.i.1914, leg. E. Rüppell; SMF 4950, 1 ovig. female (TL/CL, 35.0/9.2 mm), 1 female (TL/CL, 29.0/6.5 mm), Red Sea, leg. E. Rüppell; SMF 4968, 1 damaged spm., Red Sea, 12.v.1914, leg. A. Bannwarth; SMF 4969, 1 female (TL/CL, 30.0/8.2 mm), Red Sea, 24.iv.1913, leg. A. Bannwarth; SMF 4967, 1 male (Form II, polymorphic) (TL/CL, 13.0/4.0 mm), Red Sea, 12.v.1914, leg. A. Bannwarth; SMF 7797, 1 male (TL/CL, 27.0/8.5 mm), Red Sea, leg. capt. Pöhl; ZMG 1327, 1 female (TL/CL, 33.0/10.0 mm), no data; SMF 26522, 1 male (TL/CL, 14.0/4.9 mm), 1 male (Form II, polymorphic) (TL/CL, 14.0/4.5 mm), 2 females (TL/CL, 17.0/5.3 – 23.0/7.2 mm, with bopyrid in left gill chamber), Darsah, Socotra, Jemen, N.E. coast, SOC/ST-723 (12°07.050′N 053°18.290′E), from sponge, 08.iv.2000, leg. M. Apel; SMF 30866, 1 ovig. female (TL/CL, 28.0/7.9 mm), YEM04-29, Kamaran Island, Yemen, E. coast of the island, trawl over sand and shelly bottom, sponges very common, 15°22.02′N 42°37.78′E, 8-15 m, 12.iv.2004, leg. M. Apel; SMF 30867, 1 female (TL/CL, 14.0/3.9 mm), N. of Jubail, Saudi Arabia, Persian Gulf, "Pole Reef", 22.xii.1993, leg. M. Apel.

Remarks. — *Upogebia rhadames* Nobili, 1904 is to be synonymized with *U. savignyi* (Strahl, 1862a). It is observed that in *U. rhadames* the rostrum is narrowly triangular in dorsal view, the P1 merus is armed with 10-12 spinules on the ventral margin, and the carpus is armed with a ventrodistal tooth (De Man, 1927: 7), whereas in *U. savignyi* the rostrum is broadly triangular, the P1 merus is unarmed on the ventral margin, and the carpus has a small obtuse ventrodistal tooth, which may sometimes be wanting. The specimens from Socotra (SMF 26522) fit *U. rhadames*, because in the female (SMF 7796) the rostrum is narrowly triangular as in *U. rhadames*, though the P1 carpus is unarmed on the ventrodistal tooth as in *U. savignyi*. The specimens examined bear a ventrodistal denticle on the A1 segment 1, and the P1 merus is armed or not armed with a row of spines. Regarding the subdistal denticles on the dorsal margin of the

P1 merus, these are present in some specimens (SMF 4948; 26522; 4950, in the ovig. female), whereas they are absent in some others (SMF 30866 (Apel) in the ovig. female; SMF 4950 in the male), so this character is also variable.

In the specimens from the Red Sea (ZMUC-CRU 9755) the polymorphic males and females are mixed; the polymorphic males bear no Plp1 and the genital pores are on the coxae of P3 and P5, and the polymorphic female specimens also bear Plp1 and the genital pores on the coxae of P3 and P5.

Type locality. — Suez.

Distribution. — Suez (Sakai, 1982, 1984); Gulf of Aqaba (Sakai, 1984); Red Sea: Suakim and Massawa (Nobili, 1904, 1906), Berenice (Balss, 1915; Dworschak, 1992), Massawa (De Man, 1927), Suakim (De Man, 1927; Sakai, 1982), Hurghada (Ramadan, 1936), Derom Island, Dahlak Archipelago, and Massawa (Sakai, 1984); Gulf of Aden: Djibouti (Nobili, 1904, 1906; Sakai, 1982); Persian-Arabian Gulf (Sakai, 1984); Kenya (Ngoc-Ho, 1994b); South Africa: (De Man, 1927), off East London (Stebbing, 1910; Barnard, 1950).

Upogebia seychellensis Sakai, 1982

Upogebia (*Upogebia*) *seychellensis* Sakai, 1982: 46, figs. 9e, 12a-b.

Type locality. — Southwest of Iioe, Seychelles.

Distribution. — Seychelles (Sakai, 1982).

Upogebia shenchiajuii Yü, 1931

Upogebia Shenchiajuii Yü, 1931: 86, fig. 1.
Upogebia (*Upogebia*) *shenchiajuii*; Sakai, 1982: 61.
Upogebia shenjiajuii; Liu & Zhong, 1994: 562.

Type locality. — Jiaozhou Bay, China.

Distribution. — China: Jiaozhou Bay (Yü, 1931).

Upogebia snelliusi Ngoc-Ho, 1989

Upogebia snelliusi Ngoc-Ho, 1989b: 874, figs. 4-5.

Type locality. — Maratoea, east Kalimantan, Indonesia, 5-6 m.

Distribution. — Indonesia: Maratoea, east Kalimantan (Ngoc-Ho, 1989b); 5-6 m.

Upogebia spinifrons (Haswell, 1881)

Gebia spinifrons Haswell, 1881: 762; Haswell, 1881: 165, pl. 3 fig. 5.
Upogebia (*Upogebia*) *spinifrons*; Borradaile, 1903: 543; De Man, 1927: 53, pl. 6 fig. 20-20e; De Man, 1928: 23 (list), 38, 46, 53; Poore & Griffin, 1979: 305, figs. 53-54; Sakai, 1982: 58 (part.) [nec: figs. 11c, 12c-e 13e-f, pls. F1, 3 = *U. takaoensis* Sakai & Türkay, 1995].
Upogebia spinifrons; Sakai, 1986: 24, fig. 1; Liu & Zhong, 1994: 562; Sakai & Türkay, 1995: 202, fig. 4; Davie, 2002: 484.
Upogebia nobilii Sakai & Türkay, 1995: 198, figs. 1-3. [Type locality: Persian-Arabian Gulf, 28°40.034′N 49°55.226′E, 54 m.]
Austinogebia spinifrons; Ngoc-Ho, 2001b: 50, 52.
Austinogebia nobilii; Ngoc-Ho, 2001b: 50, fig. 1 (after Sakai & Türkay, 1955).
Non *Upogebia spinifrons*; Sakai, 1984: 209, figs. 1-3. (= *Gebia narutensis* Sakai, 1986).

Material from Australia. — QMB w1071, 1 female (TL/CL, 77.0/22.3 mm), Moreton Bay, S.E. Queensland, leg. V.F. Collin, 07.vi.1941; QMB w1218, 2 males Form III (TL/CL, 65.0/20.0 – 78.0/22.0 mm), Mud Is., Moreton Bay, S.E. Queensland, leg. V.F. Collin, 26.ii.1941; QMB w 1234, 1 female (TL/CL, 74.0/21.8 mm), Mud Is., Moreton Bay, S.E. Queensland, leg. V.F. Collin, 21.iv.1941; QMB w 1435, 1 male Form III (TL/CL, 78.0/22.7 mm), 2 females (TL/CL, 67.0/20.2 – 75.0/22.2 mm) Mud Is., Moreton Bay, S.E. Queensland, leg. V.F. Collin, 14.x.1941; QMB w 17367, 1 female (TL/CL, 51.0/14.5 mm), Gulf of Carpentaria, F.N. [Far North] Queensland, 14°01′4″S 137°42′E, dredged CSIRO, Fish. R/V "Southern Surveyor", 51 m; QMB w 2892, 1 male Form II (TL/CL, 47.0/13.2 mm), Sta. 328, 4.75 miles N.E. of Pat's Pt., Macleay Is., R. M. et al. coll., 3.x.1968; QMB w 3968, 1 male Form II (TL/CL, 25.0/7.0 mm), 1/2 mile S.E. of Southwest Rocks, Moreton Bay, S.E. Queensland, mud grab, Stn. IB 3, vi.1976; QMB 3969, 1 juv. (TL/CL, 13.0/4.1 mm), 0.5 miles S.E. of Southwest Rocks, Moreton Bay, S.E. Queensland, mud grab, Stn. ID1, vi.1970, leg. Zoological Department of the University of Queensland, det. G. Poore.

Material from the Persian Gulf. — SMF 22170, 3 males Form II (TL/CL, 47.0/13.3 – 32.0/9.8 mm), 1 male Form III (see below), carapace broken (TL/CL, 49.0/ca. 13.0 mm), 2 females (TL/CL, 50.0/14.4 – 38.0/10.8); SMF 22171, 1 male Form II (TL/CL, 44.5/13.8 mm); SMF 22172, 1 female (TL/CL, 45.0/13.4 mm), St. PG-21, 29°11.508′N 49°41.040′E, Persian-Arabian Gulf, 39 m, 13.xii.1991, R/V "Akademik".

Remarks. — The Arabian form, *U. nobilii* Sakai & Türkay, 1995, was once distinguished from the Australian species, *U. spinifrons* (Haswell, 1881). *U. nobilii* was admitted as a good species for the reason that *U. nobilii* has a shorter rostrum compared with *U. spinifrons*, 1.3 times as long as broad vs. 1.7 times as long as broad, and an approximately quadrate telson, 1.2 times as broad as long vs. 1.3-1.4 times as broad as long (Ngoc-Ho, 2001b: 53). The localities of distribution of the two species are so distant, that it was considered these were to be treated as separate species. However, after examining some Australian specimens it is now concluded that such morphological differences as the rostrum being broader or narrower, or the telson being broader or narrower, may probably be considered to fall within the variation as observed in *U. darwinii*. Hence, *U. nobilii* is to be synonymized with *U. spinifrons*.

The polymorphism in both males and females was discussed by Sakai et al. (2004) for *Upogebia snelliusi* Ngoc-Ho, 1989b, in which there are two forms, i.e., I and II, in both sexes: the normal males with a genital pore on the P5 coxae, bearing no Plp1 (Form I male); the aberrant males with a genital pore on both the P3 and P5 coxae, bearing no Plp1 either (Form II male); the normal female with a genital pore only on the P3 coxa, bearing Plp 1 (Form I female), and, finally, the aberrant females with a genital pore only on the P3 coxa, having no Plp 1 (Form II female).

Polymorphic specimens of the female Form II (Hartnoll, 1982; Ngoc-Ho, 1992: 40), and also the male Form III are found among the Australian specimens of *U. spinifrons*. The present Arabian form does not always show Form I and Form II males and females, as mentioned above for *U. snelliusi*. However, one Arabian specimen (SMF 22170) was found that bears a Plp1 as in females, but whose cheliped is masculine in shape, though it bears its genital pores on the P3 and P5 coxae. As a result, this Form III male occurs as a male with aberrant morphology.

Type locality. — Port Stephens, New South Wales, Australia, 15 m.

Distribution. — Gulf of Aden: Aden, Obock, and Perim (Sakai, 1982); Malaysia: Melaka (Sakai, 1982); Australia: Port Stephens (Haswell, 1881; De Man, 1927; Sakai, 1982, 1986; Sakai & Türkay, 1995), Gulf of Carpentaria, Moreton Bay, Port Stephens, near Brooklyn, and Port Jackson (Poore & Griffin, 1979), Port Jackson and Moreton Bay (Sakai & Türkay, 1995), Gulf of Carpentaria and Hawkesbury River near Brooklyn (Sakai, 1986); 12-25 m; Persian-Arabian Gulf (Sakai & Türkay, 1995); 39-54 m.

Upogebia spinimanus Ngoc-Ho, 1994

Upogebia spinimanus Ngoc-Ho, 1994b: 208, fig. 9.

Type locality. — Bombétoké Bay, Madagascar.

Distribution. — Madagascar: Bombétoké Bay (Ngoc-Ho, 1994b).

Upogebia spongium Sakai, 1975

Upogebia (*Calliadne*) *spongium* Sakai, 1975: 29, figs. 9-10.

Remarks. — This species was once synonymized with *Upogebia cargadensis* Borradaile, 1910 by Sakai (1982: 12). However, it differs from *U. cargadensis*, because in *U. spongium* the telson is square in form, while in *U. cargadensis* it is oblong.

Type locality. — Off Nosi Bé, Madagascar, 13°27′00″S 47°56′00″E, 21.96 m depth.

Distribution. — So far only known from the type locality.

Upogebia srilankaensis sp. nov. (figs. 22, 23)

Material examined. — SMF 30213, holotype, male (TL/CL, 24.0/7.4 mm), Weligama Bay, Sri Lanka, 03.ii.1912, leg. Löw-Beer.

Diagnosis. — Rostrum elongate with four strong distal spines, lacking infrarostral spine. Lateral ridges of gastric region scarcely developed, with obtuse distal tooth and posterior to that 9-11 tubercles. Postocular spine absent. Abdominal sternites unarmed. P1 merus lacking subdistal dorsal spine and bearing row of obtuse ventral teeth; carpus bearing one strong ventrodistal spine. P3-5 meri spineless.

Description of male holotype. — Rostrum (fig. 23A-C) elongate, twice as long as broad at base, setose on dorsal surface, bearing 4 distal spines; lacking infrarostral spine; lateral ridges of gastric region scarcely protruding forward, bearing row of 9-11 unequal tubercles, middorsal area of gastric region with scattered spines. Cervical groove lacking spines. No postocular spine present.

Eyestalk stout, reaching in normal position to halfway rostrum, and unarmed. A1 peduncle slightly overreaching A2 peduncle; A2 peduncle overreaching rostrum by distal margin of penultimate segment; segment 1 bearing ventrodistal

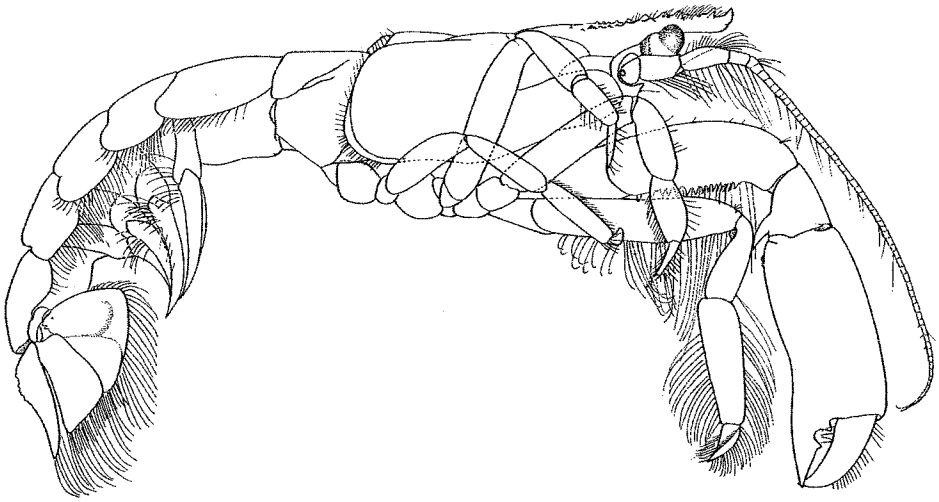

Fig. 22. *Upogebia srilankaensis* sp. nov. A, whole body, lateral view, SMF 30213, holotype, male (TL/CL, 24.0/7.4 mm), Weligama Bay, Sri Lanka.

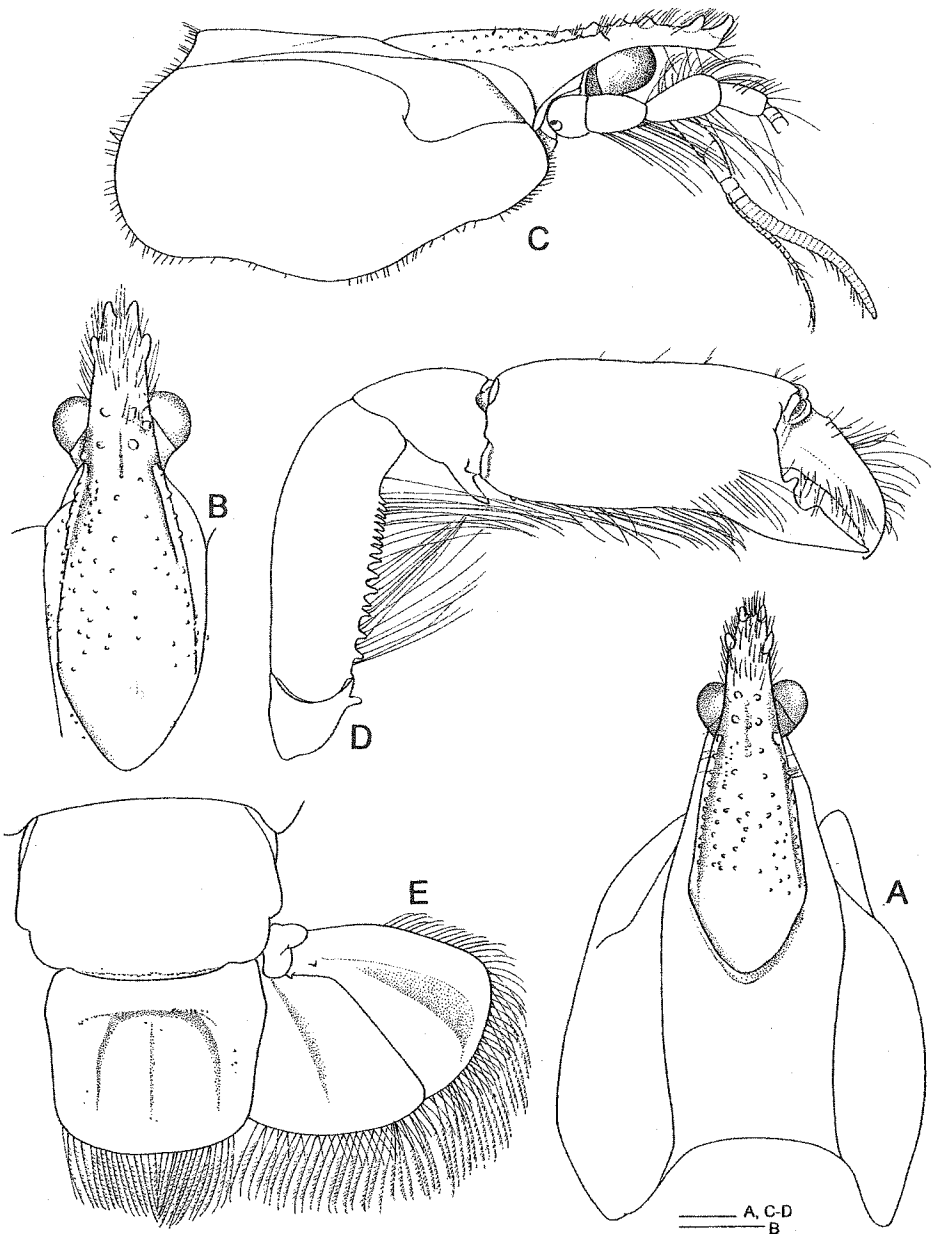

Fig. 23. *Upogebia srilankaensis* sp. nov. A, carapace, dorsal view; B, detail of same; C, same, lateral view; D, male P1 of right side, lateral view; E, abdominal somite 6, telson, and uropod of right side, dorsal view. A-D, SMF 30213, holotype, male (TL/CL, 24.0/7.4 mm), Weligama Bay, Sri Lanka.

spine; segment 2 unarmed; scaphocerite not developed. Mxp3 exopod with flagellum, reaching to middle of endopodal merus. Epistomial projection protruded, rounded in lateral view.

P1 chelate (fig. 23D); coxa and basis spineless. Ischium bearing one subterminal spine on ventral margin. Merus bearing row of 16 obtuse, thick spines on ventral margin, distal ones diminishing in size and more tightly set than proximal ones, dorsal margin unarmed. Carpus triangular, lateral surface bearing longitudinal ventral carina; a strong ventral and a distinct dorsal spine present on distal margin. Chela about 3 times as long as broad; palm twice as long as broad, lateral surface spineless; mesial surface also spineless. Fixed finger bearing proximal tooth, distal to that a distinct concavity on prehensile margin. Dactylus unarmed on prehensile edge.

Abdominal sternites unarmed; Abd6 roughly denticulate on posterior margin.

Telson (fig. 23E) subsquare; dorsal surface with U-shaped concavity, of which transverse carina spinulate at proximal third; and both lateral longitudinal margins slightly divergent posteriorly, continuing to convex posterior margin.

Uropodal endopod broadened and about as long as telson, broadly convex on distal margin; uropodal exopod also broadened and about as long as endopod.

Remarks. — The present new species is characteristic by the elongated rostrum lacking ventral spines, no anterolateral spine on the carapace, and the P1 chelate. However, it is similar to most upogebiid species with a subchelate cheliped, in the form of the tail-fan.

Etymology. — The species name, *srilankaensis*, is derived from the type locality, Sri Lanka. It is an adjective agreeing in gender with the (feminine) generic name.

Type locality. — Weligama Bay, Sri Lanka.

Distribution. — So far only known from the type locality.

Upogebia stenorhynchus Ngoc-Ho, 1991

Upogebia stenorhynchus Ngoc-Ho, 1991: 307, fig. 11.

Remarks. — The present species is similar to *U. longicauda* Sakai, 1975, but in *U. longicauda* the P1 dactylus is smooth on the mesial surface, whereas in *U. stenorhynchus* it bears a tuberculate median carina.

Type locality. — Nouméa, New Caledonia.

Distribution. — Nouméa, New Caledonia.

Upogebia takaoensis Sakai & Türkay, 1995

Upogebia (*Upogebia*) *spinifrons*; Sakai, 1982: 58 (part.), figs. 11c, 12c, 13e-f, pls. F1, F3.
Upogebia takaoensis Sakai & Türkay, 1995: 203.
Upogebia aff. *takaoensis*; Anker et al., 2001: 1049.
Austinogebia takaoensis; Ngoc-Ho, 2001b: 50, 53, fig. 5.

Remarks. — Anker et al. (2001) mentioned that *Athanas dentirostris* Anker, Jeng & Chan, 2001, has been found associated with the present speies, *U. takaoensis*.

Type locality. — Kaohsiung, Taiwan.

Distribution. — Taiwan: Kaohsiung (Sakai, 1982; Sakai & Türkay, 1995).

Upogebia tractabilis Hale, 1941

Upogebia (*Calliadne*) *tractabilis* Hale, 1941: 276, fig. 11; Poore & Griffin, 1979: 307, fig. 55.
Upogebia (*Upogebia*) *tractabilis*; Sakai, 1982: 16, figs. 1e, 2c-e.
Upogebia tractabilis; Ngoc-Ho, 1990: 971; Sakai, 1993: 91; Ngoc-Ho, 1994a: 74, figs. 11, 12b-d; Davie, 2002: 484.

Type locality. — St. Vincent Gulf, South Australia.

Distribution. — Madagascar: Tuléar, St Luce, and southern part (Sakai, 1982); Seychelles; Australia: St. Vincent Gulf (Hale, 1941; Sakai, 1982), St. Vincent Gulf, Spencer Gulf, Cottesloe, northwest of Rottnest Island, and Bunbury (Poore & Griffin, 1979), St. Vincent Gulf and Seaforth Island, Queensland (Ngoc-Ho, 1994a), North West Shelf (Sakai, 1993).

Upogebia wuhsienweni Yü, 1931

Upogebia Wuhsienweni Yü, 1931: 89, fig. 2.
Gebia major; Takahashi, 1934: 20.
Upogebia wuhsienweni; Liu, 1955: 68, pl. 24 figs. 7-12; Holthuis, 1991: 238, figs. 439-440; Ngoc-Ho & Chan, 1992: 38, fig. 4; Sakai, 1993: 92, figs. 1-2; Liu & Zhong, 1994: 562; Ngoc-Ho, 1994b: 202, fig. 5E-H.
Upogebia (*Upogebia*) *wuhsienweni*; Sakai, 1982: 59, figs. 11d, 12f-g, 13g-h, pls. G 1-2.
Austinogebia wuhsienweni; Ngoc-Ho, 2001b: 50, 53, fig. 4.

Material examined. — ZMUC-CRU 9795, 1 male (TL/CL, 71.0/20.0 mm), 1 female (TL/CL, 69.0/18.3 mm), Nagasaki, 1.vii.1911, leg. J. Jordan; SMF 30861, 1 ovig. female (TL/CL, 42.0/11.2 mm), China, Qingdao, Jiaozhou Bay, trawl, 21.viii.1987, R/V "Science II".

Remarks. — This species was distinguished from the closely similar *U. edulis* Ngoc-Ho & Chan, 1992. The Chinese species, *U. wuhsienweni* is recorded for the first time from Nagasaki, Japan.

Type locality. — Jiaozhou Bay, China.

Distribution. — Japan: Nagasaki; China: Jiaozhou Bay (Yü, 1931), Liaoning, Hebei, Shandong, and Jiangsu (Liu, 1955), Yentai, Guantao, and Amoy (Sakai, 1982), Yentai, Amoy, and Guantao (Ngoc-Ho & Chan, 1992); Hong Kong (Sakai, 1993); North Vietnam (Ngoc-Ho & Chan, 1992); Taiwan: How-Long, northwestern Taiwan (Ngoc-Ho, 1994b); Luk-Kong, Chang-Hua County, Taichu (Ngoc-Ho & Chan, 1992); Tan-shui (Takahashi, 1934), Taichu and Tainan (Sakai, 1982).

Upogebia yokoyai Makarov, 1938

Gebia affinis Yokoya, 1930: 544, fig. 5 [junior homonym of *Gebia affinis* Say, 1818].

Upogebia (*Upogebia*) *yokoyai* Makarov, 1938: 57, fig. 18; Sakai, 1968a: 47, fig. 1E-F; Sakai, 1982: 61, figs. 11e, 15a-b, pls. B2, F2; Sakai, 1987: 306 (list).

Upogebia major; Mukai & Koike, 1984: 191.

Upogebia yokoyai; Sakai & Mukai, 1991: 317, figs. 1-3; Asakura, 1995: 342, pl. 91 fig. 9; Komai, 1999, 64; Itani, 2004: 383-392, fig. 2, tables 1, 2.

Material examined. — SMF 30506, 2 males (TL/CL, 19.0/5.4 – 69.0/20.7 mm), 1 female (TL/CL, 62.0/19.0 mm), Obuchi-numa, Rotsukasyo-mura, Aomori Pref., 30.v.1992, leg. H. Mukai; SMF 30507, 2 males (TL/CL, 60.0/16.2 – 71.0/20.6 mm), Takase-gawa, Rotsukasyo-mura, Aomori Pref., 1.vi.1992, leg. H. Mukai; SMF 30508, 6 males (TL/CL, 51.0/15.4 – 28.0/8.2 mm), 5 females (TL/CL, 31.0/9.6 – 49.0/14.0 mm), Yamada-cho, Funakoshi Bay, Iwate Pref., facing the Japan Sea, muddy flat, 1982, leg. H. Mukai; SMF 30509, 3 males (TL/CL, 49.0/14.1 – 61.0/17.7 mm), 1 ovig. female (TL/CL, 55.0/15.1 mm), 6 females (TL/CL, 33.0/12.5 – 57.0/15.8 mm), Yamada-cho, Funakoshi Bay, Iwate Pref., facing the Japan Sea, 26.vi.1991, leg. K. Sakai; SMF 30510 (= BLT 5670), 12 males (TL/CL, 37.0/11.0 – 58.0/16.9 mm), 5 females (TL/CL, 51.0/13.7 – 59.0/16.6 mm), 1 female carapace (CL, 15.2 mm), Jyadani, Tsuda, Tokushima city, 29.iv.1990, leg. K. Sakai; SMF 30511, 1 male, with *Bopyrus* in left gill chamber (TL/CL, 51.0/14.3 mm), 1 female (TL/CL, 57.0/15.1 mm), Jyadani, Tsuda, Tokushima city, 14.vi.1992, leg. K. Sakai; SMF 30512 (= BLT 217), 1 male (TL/CL, 67.0/18.8 mm); 8 females (TL/CL, 31.0/9.7 – 62.0/17.4 mm); 1 female (CL, 17.9 mm, lacking Abd and tail-fan), Yoshinogawa, Tokushima city, 21.iv.1981, leg. K. Sakai; SMF 30513 (= BLT 206), 1 male (TL/CL, 36.0/9.8 mm), 4 ovig. females (TL/CL, 55.0/14.0 – 55.0/14.9 mm), 1 female with broken rostrum (TL, ca. 58.0 mm), Yoshino-gawa, Tokushima city, 7.ix.1982, leg. K. Sakai; SMF 30514, 4 males (TL/CL, 57.0/15.5 – 62.0/17.2 mm), 1 female (TL/CL, 54.0/14.0 mm), Yoshinogawa, Tokushima city, 9.viii.1983, leg. K. Sakai; SMF 30515, 1 male (TL/CL, 62.0/19.1 mm), 1 ovig. female (TL/CL, 60.0/16.4 mm), 2 females (TL/CL, 54.0/16.1 – 60.0/15.5 mm), estuary of Yoshino-gawa, Tokushima city, vi.1986, leg. K. Sakai; SMF 30516, 3 males (TL/CL, 36.0/10.0 – 40.0/11.2 mm), 2 females (TL/CL, 35.0/10.8 – 60.0/15.8 mm), 4 ovig. females (TL/CL, 62.0/16.3 – 67.0/18.7 mm), Yoshino-gawa, Tokushima city, muddy sand, 11.vii.1987, leg. K. Sakai; SMF 30517, 1 ovig. female (TL/CL, 60.0/15.9 mm), 1 female (TL/CL, 39.0/11.7 mm), Sumiyoshi, Yoshinogawa, Tokushima city, 12.vi.1992, leg. K. Sakai; SMF 30518, 1 male (TL/CL, 50.0/13.5 mm), 1 male lacking abdomen (CL, 13.4 mm), 1 female lacking abdomen (CL, 12.0 mm), Yoshino-gawa, Tokushima city, 18.vi.1999, leg. K. Sakai; SMF 30523, 1 female (TL/CL, 60.0/15.4 mm), Yoshino-gawa, Tokushima city, 8.ix.1983, leg. K. Sakai; SMF 30519 (= BLT 1531), 1 female (TL/CL, 49.0/14.8 mm), Asakawa, Kainancyo, Tokushima, 29.iv.1983, leg. K. Sakai; SMF 30520, 4 males (TL/CL, 18.0/5.1 –

20.0/6.3 mm), 1 female (TL/CL, 20.0/6.3 mm), Uranouchi Inlet, Inoshiri, Usa city, Kochi Pref., coarse sand, littoral, 7.v.1979, leg. K. Sakai; SMF 30521, 1 male (TL/CL, 19.0/5.5 mm), 1 female (TL/CL, 26.0/7.2 mm), Uranouchi Inlet, Inoshiri, Usa city, Kochi Pref., coarse sand, littoral, 7.v.1979, leg. K. Sakai; SMF 30522, 13 males (TL/CL, 25.0/7.0 – 53.0/15.1 mm), 6 females (TL/CL, 43.0/12.5 – 49.0/14.2 mm), Uranouchi Inlet, Utsuga, Usa city, Kochi Pref., coarse sand, littoral, 22-26.vii.1980, leg. K. Sakai; SMF 30524, 3 males (TL/CL, 19.0/5.6 – 54.0/16.2 mm), Uranouchi Inlet, Utsuga, Usa city, Kochi Pref., coarse sand, littoral, 20.v.1990, leg. K. Sakai; SMF 30525, 2 males with *Peregrinamor ohshimai* (TL/CL, 26.0/7.9 – 26.0/8.1 mm), Uranouchi Inlet, Inoshiri, Usa city, Kochi Pref., coarse sand, littoral, 20.v.1990, leg. K. Sakai; SMF 30526, 7 males (TL/CL, 26.0/8.4 – 42.0/11.8 mm), 2 females (TL/CL, 33.0/10.1 – 35.0/10.7 mm), Shimanto-gawa, Nakamura city, Kochi Pref., 20.viii.1997, leg. M. Hosogi; SMF 30527, 1 male (TL/CL, 19.0/6.0 mm), Shimanto-gawa, Nakamura city, Kochi Pref., vii.1995, leg. M. Hosogi; SMF 30528, 5 males (TL/CL, 26.0/7.4 – 42.0/12.3 mm), 2 females (TL/CL, 37.0/9.8 – 52.0/14.8 mm), Minamata-gawa, Minamata, Kumamoto Pref., 3.iv.1992, leg. H. Mukai; SMF 30529, 4 males (TL/CL, 19.0/5.2 – 32.0/9.5 mm), 1 male with *Peregrinamor ohshimai* (TL/CL, 31.0/9.9 mm), 1 female (TL/CL, 23.0/7.2 mm), 1 female with *Peregrinamor ohshimai* (TL/CL, 27.0/8.0 mm), Warabi-jima, Izumi city, Kagoshima Pref., 2.vi.1989, 14.iii.1993, leg. H. Mukai; SMF 30530, 8 males (TL/CL, 28.0/8.2 – 51.0/13.9 mm), 4 females (TL/CL, 43.0/11.5 – 46.0/13.0 mm), Yabusa-gawa, Irikimachi, Kagoshima Pref., 8.v.1989, leg. H. Mukai; SMF 30172, 1 female (TL/CL, 30.0/8.7 mm), Kaiike (locality uncertain), leg. Mukai; SMF 30532, 1 male (TL/CL, 29.0/8.4 mm), 1 female (TL/CL, 30.0/9.1 mm), Isaku-gawa, Fukiagecho, Kagoshima Pref., 31.v.1991, leg. H. Mukai; SMF 30533, 1 male (TL/CL, 55.0/14.9 mm), Nagata-gawa, Kagoshima city, Kagoshima Pref., 1.v.1992, leg. H. Mukai; SMF 30534, 1 male (TL/CL, 31.0/8.7 mm), Omoi-gawa, Airacho, Kagoshima Pref., 10.xi.1986, leg. H. Mukai; SMF 30535, 2 young spms. (TL/CL, 10.0/3.3 – 15.0/4.4 mm), Omoi-gawa, Airacho, Kagoshima Pref., 20.vi.1989, leg. H. Mukai; SMF 30536, 3 males (TL/CL, 31.0/8.6 – 37.0/11.3 mm); Omoi-gawa, Airacho, Kagoshima Pref., 20.vi.1989, leg. H. Mukai; SMF 30537, 2 males (TL/CL, 22.0/6.8 – 26.0/8.3 mm), 1 female (TL/CL, 32.0/9.2 mm), Omoi-gawa, Airacho, Kagoshima Pref., 22.vi.1989, leg. H. Mukai; SMF 30538, 3 females (TL/CL, 24.0/7.0 – 42.0/12.4 mm), Koniya, Amami-Ohshima, Kagoshima Pref. 20.xii.1990, leg. A. Tamaki; SMF 30539, 2 males moulted (TL/CL, 38.0/11.9 – 41.0/12.9 mm), Nagara, Ishigaki-jima, Ryukyu Islands, 12.ii.1995, leg. K. Sakai; SMF 30956, 1 female (TL/CL, 8.0/2.9), Ishigaki-jima, Ryukyus, 3-27.vii.1933, leg. H. Oshima, S. Miyake, and H. Ikeda; SMF 30540 (= BLT 5674), 2 males (TL/CL, 38.0/11.1 – 40.0/11.3 mm), 2 females (TL/CL, 36.0/10.8 – 39.0/13.1 mm), Kuira-gawa, Iriomote-jima, Ryukyu Islands, vii.1980-vii.1981, leg. S. Furukawa; SMF 30541, 3 males (TL/CL, 30.0/9.9 – 52.0/14.0 mm), 1 ovig. female (TL/CL, 44.0/11.2 mm), 8 females (TL/CL, 29.0/7.8 – 45.0/12.5 mm), 1 female with *Bopyrus* in left gill chamber (CL, 12.0 mm), Umino-nakamichi, Iriomote-jima, Ryukyu Islands, 14.ii.1995, leg. K. Sakai; SMF 7801, 3 males (TL/CL, 42.0/13.0 – 47.0/14.3 mm), Komi, Iriomote-jima, Ryukyu Is., 16..ii.1973, leg. K. Baba; SMF 30542, 6 males (TL/CL, 32.0/9.6 – 46.0/13.8 mm), 2 ovig. females (TL/CL, 39.0/11.4 – 39.0/11.6 mm), 8 females (TL/CL, 26.0/7.8 – 35.0/9.9 mm), 1 female carapace (CL, 9.1 mm), Uranouchi, Iriomote-jima, Ryukyu Islands, 14.ii.1995, leg. K. Sakai.

Remarks. — The number of teeth on the P1 coxa is variable; among all the specimens examined from Jadani, Tokushima (BLT 5670), four male specimens (TL, 50.0-90.0 mm) have the P1 coxa is unarmed on the mesial margin, but the rest of them has the P1 coxa bearing a subdistal mesial tooth.

Type locality. — Asadokoro, Mutsu Bay, Aomori Pref., Japan.

Distribution. — Japan: Honshu, Shikoku, Kyushu, Ryukyu (Itani, 2004); Asadokoro and Nonai, Mutsu Bay (Yokoya, 1930; Makarov, 1938); Hiroshima, Shimabara, Amami-Oshima, and Yamada Bay, Iwate Prefecture, Yoshinogawa and Katsuuragawa, Tokushima Pref.; Inoshiri, Kochi Pref.; Amami-Oshima, and Iriomote-jima (Sakai, 1982; Sakai & Mukai, 1991).

Upogebia sp. Borradaile, 1904

Upogebia sp. Borradaile, 1904: 752.

Remarks. — Borradaile (1904) cited this *Upogebia* sp. as *Upogebia* sp. aff. *major*. However, *U. major* is a species only known from East Asia around Japan, so it is difficult to identify Borradaile's (1904) record with any known species at present.

Distribution. — Mulaku Atoll, Maldives; 30 fathoms (54.9 m).

Upogebia (**Upogebia**) sp. Edmondson, 1944

Upogebia (*Upogebia*) sp. Edmondson, 1944: 42, fig. 4; Sakai, 1982: 3.

Distribution. — Hawaiian Islands: Oahu (Edmondson, 1944).

Upogebia sp. β De Man, 1928

Upogebia (*Upogebia*) sp. β De Man, 1928: 44 (key), 66, pl. 4 figs. 7, 7a.
Not: *Upogebia* sp. β De Man, 1928: 24 (list).

Remarks. — De Man (1928: 24) refers to *Upogebia* sp. β De Man, 1927. However, *U.* sp. β De Man is not found in De Man (1927).

De Man (1928b: 44) mentioned that "this species should be considered as a different species or variety or as a deformed individual of *Upog. carinicauda*". In this species, the P1 dactylus medially bears five teeth on the prehensile edge, and the fixed finger bears 4 teeth on the proximal half of the prehensile margin. Those characters are closely similar to those of the species, *U. ancylodactyla* De Man, 1905.

Distribution. — Indonesia: Waru Bay, north coast of Ceram (De Man, 1928).

Genus **Wolffogebia** Sakai, 1982

Wolffogebia Sakai, 1982: 75; Sakai, 1987: 306 (list); Sakai, 1993: 109; Ngoc-Ho, 1994b; 210; Ngoc Ho et al., 2001: 102; Davie, 2002: 484.

Diagnosis. — [Adapted from Sakai, 1993 and Ngoc-Ho et al., 2001.] Rostrum rounded or broadened anteriorly, lacking median groove, ventral margin unarmed. Lateral ridge of gastric region projecting forward, either unarmed or dorsally with denticles, longitudinal lateral groove discernible. Gastric region dorsally covered with densely set setae, bearing a non-setose median convexity. No hepatic spine. A1 and A2 peduncles unarmed. P1 subchelate or simple (in the female of *W. heterocheir* Kemp, 1915). Uropodal endopod and exopod broadly foliaceous; exopod convex on distal margin. Telson slightly broader than long, posterior margin nearly straight or slightly concave medially.

Type species. — *Wolffogebia phuketensis* Sakai, 1982, by original designation.

Species included. — *W. giralia* (Poore & Griffin, 1979) (syn. *W. obtifrons* Sakai, 1982); *W. heterocheir* (Kemp, 1915); *W. inermis* Sakai, 1982; *W. nhatrangensis* Ngoc-Ho et al., 2001; *W. phuketensis* Sakai, 1982.

Wolffogebia giralia (Poore & Griffin, 1979)

Upogebia (*Upogebia*) *giralia* Poore & Griffin, 1979: 297, fig. 49.
Wolffogebia obtifrons Sakai, 1982: 80, figs. 17b, 18e-f, 20a; Davie, 2002: 485. [Type locality: Port Hedland, N.W. Australia.]
Upogebia giralia; Ngoc-Ho, 1994a: 72, fig. 10; Ngoc-Ho et al., 2001: 102; Davie, 2002: 484.

Material examined. — QMB w18191, 2 males (TL/CL, 30.0/8.8 – 33.0/9.8 mm), 6 females (TL/CL, 15.0/5.1 – 39.0/11.5 mm), littoral, lower estuary, sandy clay bank, in burrows, salinity 35 ppt, R. Starcle, F.N. [Far North] Queensland, Australia, 14°47′6″S 154°.00′7″E, leg. P. Davie and J. Short, 12.xi.1992; ZMH 41225, 1 ovig. female (TL/CL, 39.0/11.2 mm), Port Headland, Western Australia, mangrove near Pretty Pool, 28.ix.1975, leg. G. Hartmann.

Remarks. — The female holotype of *Wolffogebia obtifrons* Sakai, 1982 from Port Headland, N.W. Australia is 37 mm in total length, and is much larger than the present females. In the female holotype the P1 palm bears four interspaced teeth on its proximal half (Sakai, 1982), whereas in the present females it bears 5-6 teeth on its whole margin, and in a small female specimen (TL, 15.0 mm) those teeth are scarcely developed.

Type locality. — Learmonth, Western Australia, mangroves.

Distribution. — Australia: Melville Islands, N. T. (Poore & Griffin, 1979); Mickitts Creek, near Darwin (Ngoc-Ho, 1994a); Learmonth, W. A. (Poore & Griffin, 1979); Harmer Creek, Queensland (Ngoc-Ho, 1994a); Port Hedland, N.W. Australia (Sakai, 1982). Intertidal.

Wolffogebia heterocheir (Kemp, 1915)

Upogebia (*Upogebia*) *heterocheir* Kemp, 1915: 257 (part.), figs. 22-24, pl. 13 figs. 6-7; Kemp, 1918: 254; Sakai, 1982: 3.
Upogebia (*Upogebia*) *heterocheir*; De Man, 1928: 22 (list), 38, 47 (key).

Remarks. — The characters of *W. heterocheir* fit the definition of the genus *Wolffogebia*, because in *W. heterocheir* the rostrum is setose on the dorsal margin, the lateral ridges of the gastric region are projecting forward, and the telson is concave on the posterior margin.

Type locality. — Chilka Lake, India.

Distribution. — India: Chilka Lake (Kemp, 1915); Thailand: Tale Sap.

Wolffogebia inermis Sakai, 1982

Wolffogebia inermis Sakai, 1982: 81, figs. 17c, 18g, 19a-b, 20e, pl. G 6; Sakai, 1993: 109, figs. 12-14; Ngoc-Ho, 1994b: 213, figs. 10-11; Ngoc-Ho et al., 2001: 108; Davie, 2002: 484.

Material examined. — SMF 25791, 1 male (TL/CL, 27.0/8.2 mm), 2 females (TL/CL, 19.0/5.5 – 24.0/6.9 mm), Cân-gio, Hô-chi-Minh City, Hô-chi-Minh, Thanh-Phô, Vietnam, 10.viii.1999, leg. T. Phi-Hung and D. Ngoc-Dung.

Diagnosis. — Rostrum setose dorsally, gastric region bearing a smooth median carina; infrarostral spine absent. Lateral ridges of gastric region projecting forward, setose, and not denticulate on dorsal surfaces. No hepatic spine present. No ocular spine present. In males and females the P1 merus is provided with a strong proximal spine on the ventral margin and with a subdistal spine on the dorsal margin; carpus with dorsal and ventral spine on distal margin; dactylus with setose dorsal margin, and in parallel to the dorsal margin, the mesial surface bears a row of yellow setae; the fixed finger short, unarmed on prehensile margin.

Remarks. — The P1 palm shows sexual dimorphy: in males the palm bears a stout subterminal dorsal tooth on the mesial surface, whereas in females it bears no such tooth on that mesial surface.

Type locality. — Mocara Tangerang, Java, Indonesia.

Distribution. — Vietnam: Can-gio (Ngoc-Ho, 1994b); Indonesia: Mocara Tangerang, Java (Sakai, 1982); Australia: Darwin (Sakai, 1993).

Wolffogebia nhatrangensis Ngoc-Ho, Ngoc-Dung & Phi-Hung, 2001

Wolffogebia nhatrangensis Ngoc-Ho, Ngoc-Dung & Phi-Hung, 2001: 101, figs. 1-3, table 1.

Material examined. — SMF 25785, paratypes, 2 males (TL/CL, 28.0/8.5 – 28.0/8.6 mm), 2 females (TL/CL, 27.0/8.2 – 29.0/8.3 mm), Binh Au, Nha-Trang, Khanh, Vietnam, muddy, near shrimp pools, 24.xi.1999, leg. T. Phui-Hung and D. Ngoc-Dung.

Type locality. — Nhatrang, Vietnam.

Distribution. — Binh An; Mouth of Lo River, Nhatrang, Vietnam.

Wolffogebia phuketensis Sakai, 1982

Upogebia sp. Frith, 1976: 18.

Wolffogebia phuketensis Sakai, 1982: 75, figs. 17a, 18c-d, 20b; Ngoc-Ho, 1994b: 213, fig. 12; Ngoc-Ho, 2001a: 108.

Type locality. — Phuket, Thailand.

Distribution. — Thailand: Phuket (Sakai, 1982; Ngoc-Ho, 1994b); Singapore (Ngoc-Ho, 1994b).

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