

## On a small collection of thalassinidean shrimp (Crustacea, Decapoda) from Qatar (Persian-Arabian Gulf)

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### Abstract

Environmental quality samples near oilfields off Qatar (Persian-Arabian Gulf) yielded several specimens of thalassinidean shrimp. *Gourretia coolibah* POORE & GRIFFIN, 1979 is reported here on the basis of 6 specimens, one of which is the first known male of the species which is known from a single female from Australia. Both sexes are herein redescribed. *Austinogebia spinifrons* (HASWELL, 1882) (= *Upogebia nobilii* SAKAI & TÜRKAY, 1995) is known for this region from previously published records. Three small specimens are tentatively concluded to represent *Neogebicula wistari* NGOC-HO, 1995.

**Key Words:** Thalassinidea, Ctenochelidae, Upogebiidae, *Gourretia*, *Austinogebia*, *Neogebicula*, new record

### Zusammenfassung

Aufsammlungen im Rahmen einer Umweltverträglichkeitsstudie um Ölfelder bei Qatar (Persisch-Arabischer Golf) enthielten mehrere Exemplare von Maulwurfskrebse. *Gourretia coolibah* POORE & GRIFFIN, 1979 war bisher nur von einem einzigen Weibchen aus Australien bekannt; aus Qatar liegt nun erstmals ein Männchen dieser Art vor. *Austinogebia spinifrons* (HASWELL, 1882) (= *Upogebia nobilii* SAKAI & TÜRKAY, 1995) ist bereits in der Golfregion gefunden worden. Drei sehr kleine und unvollständige Individuen werden vorläufig als *Neogebicula wistari* NGOC-HO, 1995 identifiziert.

### Introduction

The records presented here were collected by Environmental Resources Management Ltd. (ERM) on behalf of a client as part of an impact assessment related to oil extraction.

Three surveys were conducted from two oilfields, in offshore waters of Qatar. The first survey in May 1995 concentrated on one oilfield; the second survey in April 1998 concentrated on the second field. A repeat survey that covered both areas was conducted in August 2003. A total of 55 stations were sampled, mostly situated close to (< 1 km) active platforms or drilling rigs. At most sampling stations, two 0.1 m<sup>2</sup> Day grab samples were taken for macrofaunal analysis. At some sites, however, hard substratum meant that only one sample could be taken. All samples were initially fixed in 4% buffered formaldehyde solution.

For all surveys, Environmental Resources Management Ltd. (ERM) designed the sampling programme and carried out the fieldwork, whilst Unicmarine Ltd. was subcontracted to carry out the macrofaunal sample analysis.

All biological samples were washed over a 500 µm sieve and sorted under a stereomicroscope. Extracted fauna was transferred to 70% ethanol and identified. Thalassinidean shrimps were subsequently accessioned at the Naturhistorisches Museum Wien (NHMW).

Size is expressed as total length (tl in mm) from the tip of the rostrum to the end of the telson and as carapace length (cl in mm) from the tip of the rostrum to the posterior median edge of the carapace. Other abbreviations used include: Unico#, Unicomarine collection number; Mxp3, third maxilliped; P1–P5, first to fifth pereopod.

## Ctenochelidae MANNING & FELDER, 1991

### *Gourretia coolibah* POORE & GRIFFIN, 1979

Figs 1–34

*Gourretia coolibah* POORE & GRIFFIN, 1979: 278, figs 38–39; MANNING & FELDER, 1991: 785; TUDGE et al., 2000: 142 (list); DAVIE, 2002: 465; SAKAI, 2005b: 223.

**Material:** Persian-Arabian Gulf, off Qatar, fine sand with shells, collected with 0.1 m<sup>2</sup> Day grab: NHMW 21966 (1 female, tl 21, cl 5.4, P3, P4, left P5 missing) Station 26A, 52°22'49.080" E, 25°29'16.368" N, 32.9 m, 25 May 1995, Unico# 7965 – NHMW 21969 (1 female, tl 19, cl 5.2, damaged, right P2, left P3, P4–5 missing), Station 27A, 52°22'59.124" E, 25°29'16.871" N, 33.2 m, 25 May 1995, Unico# 7968 – NHMW 21965 (1 female, tl 39, cl 10.4, broken at abdominal somite 2), Station 9A, 52°21'32.688" E, 25°19'44.906" N, 30.13 m, 24 April 1998, Unico# 12323 – NHMW 21967 (1 male, tl 25, cl 6.4, right P2, P3, P4, right P5 missing), Station 14, 52°23'12.768" E, 25°23'12.768" N, 27.7 m, 27 August 2003, Unico# 31276 – NHMW 21964 (1 female, tl 41, cl 9.8, P2–P5 missing), Station 54, 52°22'28.416" E, 25°27'17.710" N, 35.8 m, 27 August 2003, Unico# 31373 – NHMW 21968 (1 female, tl 25, cl 6.6, right major P1, P5 missing), Station 19, 52°21'58.284" E, 25°19'37.637" N, 32.9 m, 27 August 2003, Unico# 31299.

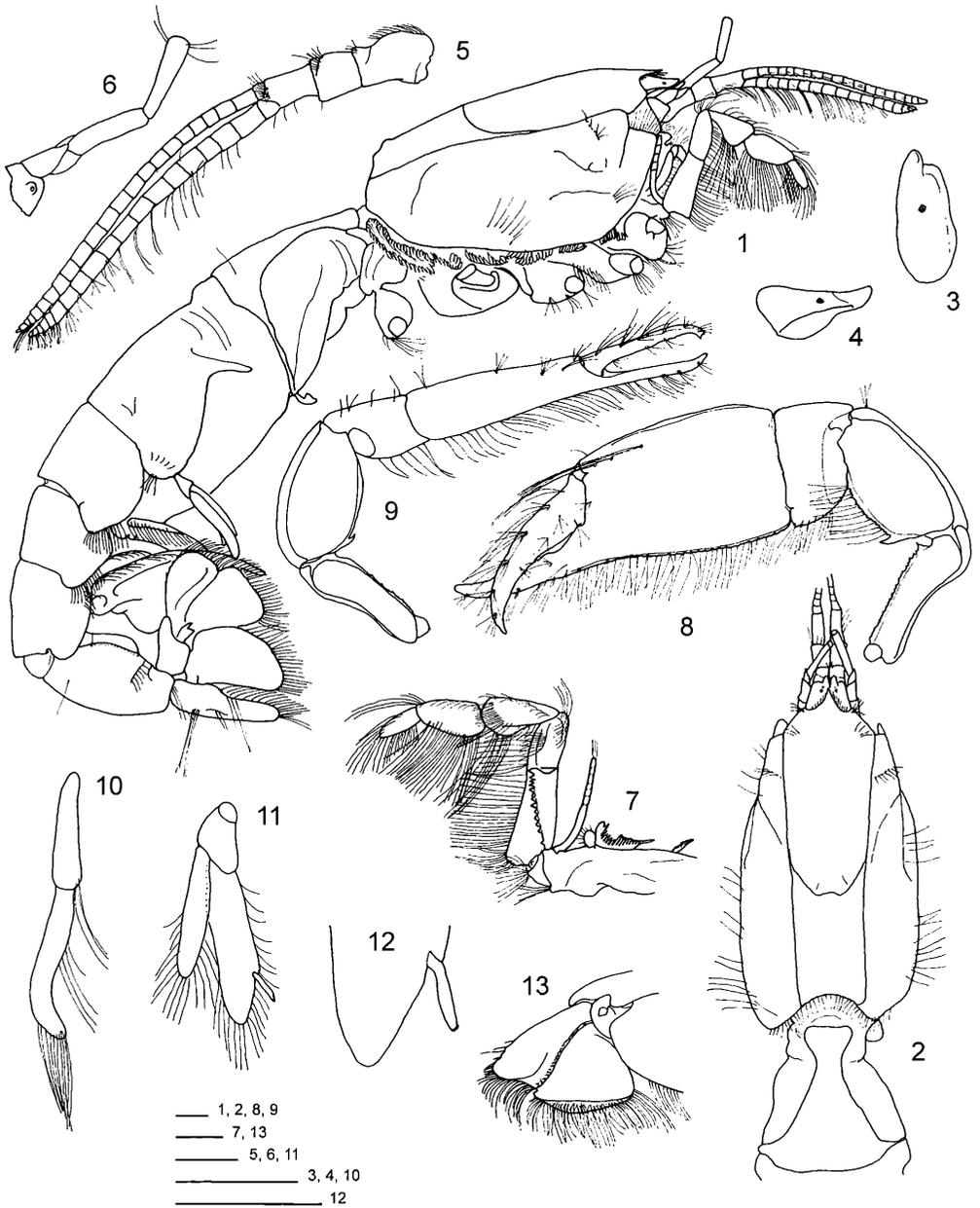
**Redescription.** Carapace dorsally shorter than abdominal somites 1 and 2 combined (Fig. 1). Rostrum broadly triangular and acute, straight or slightly downturned, reaching from 1/4 to 2/3 visible length of eyestalks (Figs 1, 2, 14, 15, 21, 22, 30–33). Lateral projections broad. Carapace with cardiac prominence, lacking dorsal carina and dorsal oval. Transverse cardiac furrow at 3/4 carapace length, linea thalassinica distinct, anterolateral concavity deep. Transverse setal row on anterolateral face of carapace below linea thalassinica.

Eyestalks reaching to 3/4 or end of first antennal peduncle, tapering to a lobe mesially, with ridge laterally, few pigment spots subdistally (Figs. 3, 4).

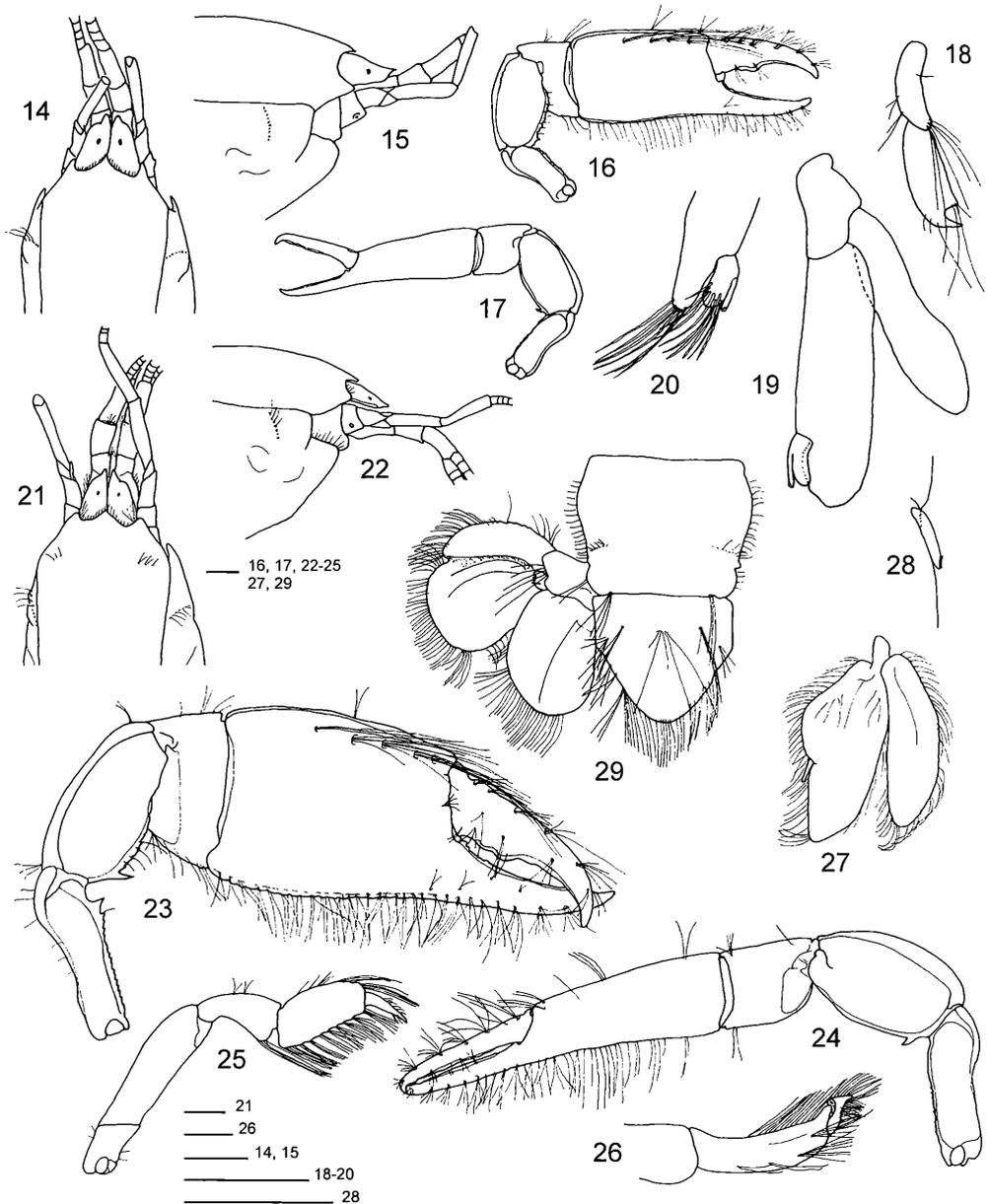
Antennular peduncle (Fig. 5) thicker, but shorter than antennal peduncle; second article shorter than basal article; terminal article as long as second one.

Antennal peduncle (Fig. 6) 1.35 times length of antennular peduncle; basal article with ventrolaterally produced excretory pore; second article ventrolaterally with suture; acute dorsal scale at joint proximal to third article; third article twice as long as second; fourth article as long as third.

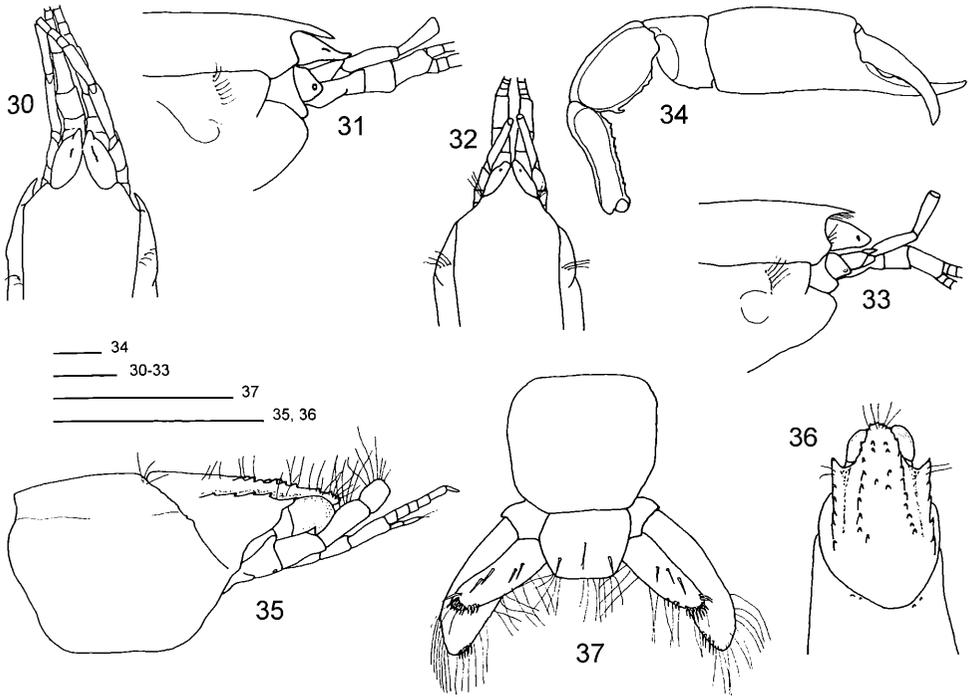
Third maxilliped (Figs. 1, 7) with exopod overreaching endopodal ischium, small epiopod and two arthrobranchs and large endopod; endopodal ischium 2.3 times as long as broad, mesial surface with prominent oblique ridge of teeth becoming stronger distally



Figs 1–13: *Gourretia coolibah* POORE & GRIFFIN, 1979, Qatar. 1–8: NHMW 21964, female tl 41; (1) lateral face; (2) carapace and first abdominal somite, dorsal face; (3) eyestalk, dorsal face; (4) same, lateral face; (5) right antennule, mesial face; (6) right antenna, lateral view; (7) third maxilliped, mesial face; (8) major cheliped, mesial face; (9) minor cheliped, mesial face; (10) left first pleopod, ventral (posterior) face; (11) right second pleopod, anterior face; (12) same, detail of appendix interna (setae omitted); (13) uropodal exopod, posterolateral view. Scale is 1 mm.



Figs 14–29: *Gourretia coolibah* POORE & GRIFFIN, 1979, Qatar. 14–20: NHMW 21967, male tl 25; (14) front, dorsal face; (15) same, lateral face; (16) major cheliped, mesial face; (17) minor cheliped, mesial face (setae omitted); (18) left first pleopod, ventral (posterior) face; (19) right second pleopod, posterior view (setae omitted); (20) same, detail of appendices, anterior face. 21–29: NHMW 21965, female tl 39; (21) front, dorsal face; (22) same, lateral face; (23) major cheliped, mesial face; (24) minor cheliped, mesial face; (25) third pereopod, mesial face; (26) fifth pereopod, propodus and dactylus, lateral face; (27) right third pleopod, posterior face; (28) same, appendix interna, anterior face (setae omitted); (29) sixth abdominal somite, left uropod, dorsal face. Scale is 1 mm.



Figs 30–37. 30–34: *Gourretia coolibah* POORE & GRIFFIN, 1979, Qatar. 30, 31: NHMW 21968, female tl 25; (30) front, dorsal face; (31) same, lateral face. 32–34: NHMW 21966, female tl 21: (32) front, dorsal face; (33) same, lateral face; (34) major cheliped, mesial face (setae omitted). 35–37: *Neogebicula* cf. *wistari* Ngoc-Ho, 1995, Qatar, NHMW 23008, juvenile tl 4.8; (35) carapace, lateral face; (36) carapace front, dorsal view; (37) sixth abdominal somite and tailfan, dorsal face. Scale is 1 mm.

(crista dentata); merus 0.6 times the length of ischium; carpus longer than merus, subtriangular; propodus subovate and tapering; dactylus 0.6 times length of propodus, narrower than propodus.

Major cheliped (Figs. 8, 16, 23, 34) located on either right or left side of body; ischium dentate ventrally, teeth becoming larger distally, dorsal border smooth, sinuous; merus 1.75 times as long as high, with dentate convex ventral margin and curved proximal tooth; carpus 1.6 times as high as long; propodus 1.2 to 1.5 times as long as high, smooth dorsally, smooth or crenulate ventrally; fixed finger 0.66 to 0.76 times length of propodus, evenly tapering to blunt tip, cutting edge smooth or slightly crenulate proximally; dactylus as long as fixed finger, strongly curved distally, cutting edge with low tooth on proximal half.

Minor cheliped (Figs. 9, 17, 24) 0.8 to 0.9 times as long and 0.4 to 0.5 times as high as major cheliped; ischium dentate ventrally; merus with ventral spine proximally; carpus longer than high; propodus uniformly tapering; fixed finger and dactylus equal, cutting edges smooth.

Table 1. Branchial formula in *Gourretia coolibah*

	Mxp1	Mxp2	Mxp3	P1	P2	P3	P4	P5
arthrobranchs			2	2	2	2	2	
podobranchs		1						
epipods	1	1	1					
exopods	1	1	1					

Third pereopod (Fig. 25) propodus subrectangular, twice as long as high, not heeled.

The branchial formula is shown in Table 1.

Abdomen 3.2 times as long as carapace; dorsal length ratio (along midline) of first to sixth abdominal somites 1 1.12 0.56: 0.5 0.6: 0.8. First somite saddle-shaped dorsally (Fig. 2), pleuron triangular, thin, extending to insertion of first pleopod, lateral and ventral faces soft. Second somite expanded posterolaterally, with one setal row near and one at the posterior margin. Third to fifth somites each distinctly shorter than second; pleura of third and fourth each with tuft of setae on posterolateral margin, pleura of fifth somite with tuft of setae on anterolateral margin. Sixth somite (Fig. 29) rectangular in dorsal view, broader than long, with lateral constriction in posterior 1/3 and transversal setal row anterior to constriction, ventral margin of pleurite with short setae, posterior margin with two tufts of long setae.

Male first pleopod (Fig. 18) uniramous, composed of two articles, total length 1/2 that of second pleopod; second article longer than first, with a deep U-shaped notch at the end of the mesially curved apex. Female first pleopod (Fig. 10) simple, consisting of two articles.

Male second pleopod (Fig. 19) biramous, exopod 0.9 times length of endopod, endopod 3 times as long as wide, well-demarcated appendix masculina mesially, appendix interna mesially on appendix masculina (Fig. 20). Female second pleopod (Fig. 11) biramous, endopod with appendix interna (Fig. 12).

Third to fifth pleopod (Fig. 27) with endopod 1.4 times as long and 1.1 times as broad as that of second pleopod, with appendix interna projecting beyond mesial margin of endopod (Fig. 28).

Telson (Fig. 29) 0.9 times as wide as long, proximal half parallel-sided, then tapering to rounded end, terminal margin with long setae, and tufts of long setae dorsally. Uropod with endopod 1.4 times as long as wide, as long as telson, lateral and distal margins convex, continuous; exopod convex laterally, distal margin notched and convex medially of notch, with long setae marginally, anterior part elevated over posterior part, separated by transverse furrow terminating distally in notch (Fig. 13).

**Variations.** The shape and length of the rostrum in relation to the eyestalks and the shape and lengths of the eyestalks in relation to the first antennular peduncle are variable (compare Figs 1, 2, 14, 15, 21, 22, 30–33).

The only male present is rather small (tl 25) and has a similar major cheliped (Fig. 16) as the larger females (tl > 25) (Figs. 8, 23) and a comparable cheliped shape as the only small female with a major cheliped present (Fig. 34). In these small specimens (tl < 25) the crenulation on the ventral border of the propodus is lacking.

**Remarks.** POORE & GRIFFIN (1979) mention a dorsal oval in the description. However, in their figures (fig. 38a,b), no depressions are indicated in the anterior part of the carapace. In the description, they also mention that the antennular peduncle is longer than the antennal peduncle. This does not comply with their fig. 38a, which shows that the antennular peduncle overreaches the penultimate article of the antenna, which obviously lacked the ultimate article.

### Upogebiidae BORRADAILE, 1903

#### *Austinogebia spinifrons* (HASWELL, 1881)

*Gebia spinifrons* HASWELL, 1881: 762; 1882: 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) [not: figs 11c, 12c–e, 13e–f, pl. F1, 3 = *Upogebia takaoensis* SAKAI & TÜRKAY, 1995]

*Upogebia spinifrons*; SAKAI, 1986: 24, fig. 1; LIU & ZHONG, 1994: 562; SAKAI & TÜRKAY, 1995: 202, fig. 4; DAVIE, 2002: 484; SAKAI, 2006: 138

*Upogebia nobilii* SAKAI & TÜRKAY, 1995: 198, figs 1–3

*Austinogebia spinifrons*; NGOC-HO, 2001: 50, 52

*Austinogebia nobilii*; NGOC-HO, 2001: 52, fig. 1 (after SAKAI & TÜRKAY, 1995)

Not *Upogebia spinifrons*; SAKAI, 1984: 209, figs 1–3 (= *Upogebia narutensis* SAKAI, 1986)

**Material:** Persian-Arabian Gulf, off Qatar, fine sand with shells, 0.1 m<sup>2</sup> Day grab: NHMW 23005 (1 male hermaphrodite, tl 42, cl 11.6, Mxp3 and all legs detached; 1 female, tl 36, cl 10.6, P1–P4 detached; 1 female, tl 33, cl 10.4, broken, P2–P5 detached), Station 25C, 52°22'52.212" E, 25°29'18.560" N, 32.8 m, Unico# 7962, 25 May 1995 – NHMW 23006 (1 male, tl 38, cl 11.8, left P1, left P2, P3–5 missing), Station 32A, 52°24'07.596" E, 25°28'22.224" N, 34.2 m, Unico# 7971, 25 May 1995 – NHMW 23007 (1 female, tl 59, cl 17.1, all legs detached), Station 26A, 52°22'49.080" E, 25°29'16.368" N, 32.9 m, Unico# 7964, 25 May 1995.

**Remarks.** Only the male NHMW 23005 bears gonopores on the coxae of both P3 and P5. All pereopods 1 are slender and only that of the male (NHMW 23006) shows 6 carinae on the inner face of the propodus. The length:width ratio of the rostrum ranges from 1.21 to 1.69, the width:length ratio of the telson from 1.98 to 1.36.

SAKAI & TÜRKAY (1995) erected the species *U. nobilii* for material from the Persian-Arabian Gulf. It was distinguished from *U. spinifrons* by – among other characters – a shorter rostrum (1.3 times as long as broad vs. 1.7 times as long as broad in *U. spinifrons*) and a broader telson (1.2 times as broad as long vs. 1.3 to 1.4 times as broad as long in *U. spinifrons*). NGOC-HO (2001) placed *U. nobilii* in her genus *Austinogebia* and mentioned that most characters are subject to variation, whereas the above-mentioned ratios for rostrum and telson appear more reliable to separate these two species. SAKAI (2006), who did not recognise the genus *Austinogebia*, concludes that the morphological differences fall within the variation for *U. spinifrons* and synonymised *U. nobilii* with *U. spinifrons*. The ranges observed for telson width and rostrum length in the present material, which span over the range given for both species, support this synonymisation.

*Neogebicula cf. wistari* NGOC-HO, 1995

Figs. 35–37

[*Neogebicula wistari* NGOC-HO, 1995: 81, fig. 1; SAKAI, 2006: 6.]

**Material:** Persian-Arabian Gulf, off Qatar, fine sand with shells, 0.1 m<sup>2</sup> Day grab: NHMW 23008 (3 juveniles, tl 4.8 cl 1.35, cl 1.39 broken, cl 1.5 broken), Station 1C, 52°22'24.312" E, 25°19'22.296" N, 29.85 m, 25 May 1995, Unico# 7950.

**Remarks.** The three specimens are very small and lack all legs. The shape of the uropods clearly show that these specimens belong to the genus *Neogebicula* SAKAI, 1982. According to the telson shape they could be either *N. wistari* NGOC-HO, 1995 or *N. monochela* (SAKAI, 1967): the number of spines on the lateral edges of the rostrum (3 to 4) are between those reported for *N. monochela* (3) and *N. wistari* (6), and the length of the rostrum places it closer to *N. wistari*.

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**References**

- BORRADAILE L.A., 1903: On the classification of the Thalassinidea. – *Annals and Magazines of Natural History* (7)12: 534–551 + Addendum on p.638.
- DAVIE P.J.F., 2002: Crustacea: Malacostraca: Eucarida (Part 2) Decapoda Anomura, Brachyura. – In: WELLS, A. & HOUSTON, W.W.K. (eds): *Zoological Catalogue of Australia* 19(3B): 1–641. – Melbourne: CSIRO Publishing.
- HASWELL W.A., 1881: Description of some new species of Australian Decapoda. – *Proceedings of the Linnean Society of New South Wales* 6: 750–763
- HASWELL W.A., 1882: *Catalogue of the Australian stalk- and sessile-eyed Crustacea*. – Sydney, Australian Museum, 324 pp.
- LIU, R. & ZHONG Z., 1994: Crustacea. Decapoda: Dendrobranchiata, Caridea, Astacidea, Thalassinidea, Palinuridea. – In: HUANG, Z.-G. (ed.), *Marine Species and their distributions in China's Seas*. – Beijing: China Ocean Press, pp. 545–568. [in Chinese]
- MAN J.G. DE, 1927: A contribution to the knowledge of 21 species of the genus *Upogebia* Leach. – *Capita Zoologica* 2(5): 1–58
- MAN J.G. DE, 1928: The Decapoda of the Siboga Expedition VII. The Thalassinidea and Callianassidae collected by the Siboga Expedition with some remarks on the Laomediidae. – *Siboga Expedition Monographs* 39a(6): 1–187.
- MANNING R.B. & FELDER D.L., 1991: Revision of the American Callianassidae (Crustacea, Decapoda, Thalassinidea). – *Proceedings of the Biological Society of Washington* 104(4): 764–792.
- NGOC-HO N., 1995: *Neogebicula wistari* new species from Australia, with a redefinition of *Neogebicula* SAKAI, 1982 (Crustacea: Thalassinidea: Upogebiidae). – *Crustacean Research* 24: 78–84.

- NGOC-HO N., 2001: *Austinogebia*, a new genus in the Upogebiidae and rediagnosis of its close relative, *Gebiacantha* NGOC-HO, 1989 (Crustacea: Decapoda: Thalassinidea). – In: PAULA J.P.M., FLORES A.A.V. & FRANSEN C.H.J. (eds.): Advances in decapod crustacean research. Proceedings of the 7th Colloquium Crustacea Decapoda Mediterranea. Lisbon, 6–9 September 1999. Kluwer, Dordrecht. – *Hydrobiologia* 449: 47–58.
- POORE G.C.B. & GRIFFIN D.J.G., 1979: The Thalassinidea (Crustacea: Decapoda) of Australia. – *Records of the Australian Museum* 32: 217–321.
- SAKAI K. & TÜRKAY M., 1995: Two upogebiid species from the Persian-Arabian Gulf, with the description of a related new species from Taiwan (Crustacea: Decapoda: Upogebiidae). – *Senckenbergiana maritima* 25: 197–208.
- SAKAI K., 1967: Three new species of Thalassinidea (decapod Crustacea) from south-west Japan. – *Publications of the Seto Marine Biology Laboratory* 15(4): 319–328.
- SAKAI K., 1982: Revision of Upogebiidae (Decapoda, Thalassinidea) in the Indo-West Pacific region. – *Researches on Crustacea, Special Number 1*: 1–106.
- SAKAI K., 1984: A new record of *Upogebia spinifrons* (HASWELL, 1882) (Decapoda, Thalassinidea) from Naruto, Japan, showing possible hermaphroditism. – *Crustaceana* 47: 209–214.
- SAKAI K., 1986: On *Upogebia narutensis*, a new thalassinid (Decapoda: Crustacea) from Japan. – *Researches on Crustacea* 15: 23–28.
- SAKAI K., 2005: Callianassoidea of the world (Decapoda, Thalassinidea). – *Crustaceana Monographs* 4: 1–285.
- SAKAI K., 2006: Upogebiidae of the world (Decapoda, Thalassinidea). – *Crustaceana Monographs* 6: 1–185.
- TUDGE C., POORE G.C.B. & LEMAITRE R., 2000: Preliminary phylogenetic analysis of generic relationships within the Callianassidae and Ctenochelidae (Decapoda: Thalassinidea: Callianassoidea). – *Journal of Crustacean Biology* 20 (Special Number 2): 129–149.