First record of *Prionocrangon* Wood Mason & Alcock, 1891 (Crustacea: Decapoda: Caridea: Crangonidae) in the East Pacific and description of a new species from western Mexico

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Abstract

A new species of the rare genus *Prionocrangon* is described from the central Gulf of California, Mexico. This is the first record for this genus of Crangonidae in the east Pacific which is otherwise widely distributed in the Atlantic, Pacific and Indian oceans. *Prionocrangon incisum sp. nov.* differs from all other known species of *Prionocrangon* by the presence of a deep notch near the posteroverentral margin of the sixth abdominal somite. Presence of post-embryonic larvae in one partly spent female indicates that *P. incisum sp. nov.* exhibits abbreviated larval development.

Key words: Crangonidae, *Prionocrangon incisum sp. nov.*, Pacific Mexico

Introduction

Crangonid shrimps are distributed worldwide and, in some regions, are an important fishery resource (Holthuis 1980). East Pacific species of Crangonidae include both shallow and deep-water species. Shallow water crangonids are particularly diverse and important along the west coast of the United States (Rathbun 1904; Word & Chawart 1976; Hendrickx 2012). Deep-water crangonids are relatively well known from a systematic viewpoint, but their bathymetric distribution, abundance and geographic distribution are still in need of complementary information.

Although a few records have been reported in the literature, Mexican crangonids are not well known at all as a group. Several Californian shallow–water species might prove to be present in the California Current, all the way to the tip of the Baja California Peninsula, but are still undetected. Also, the Gulf of California shallow-water crangonids have been very superficially studied and little is known about their distribution and abundance. Thanks to a recent deep-water sampling program, more emphasis has been given to Mexican deep-water Crangonidae and Glyphocrangonidae, and one new species and several new records have been reported in recent literature. Heretofore, seven species of shallow water and five species of deep-water Crangonidae have been reported in Pacific Mexico, belonging to the genera *Argis*, *Crangon*, *Mesocrangon*, *Metacrangon*, *Neocrangon*, *Paracrangon*, *Parapontophilus*, and *Sclerocrangon* (Hendrickx 1993, 2001, 2010, 2012).

According to Chace (1984: 55) and Holthuis (1993: key) diagnostic characters of the genus *Prionocrangon* Wood Mason & Alcock, 1891 include a triangular, laterally unarmed rostrum; a longitudinal suture on the carapace extending posteriorly from near the branchiostegal spine; eye reduced (vestigial) and without cornea, ending in a small, pointed process; antennal scale without a blade; 1st pereopod without exopod and 2nd pereopod present, simple (not chelate), marginally setose and overreaching the distal end of the merus of the anteriorly extended 1st pereopod. The material collected in the northern Gulf of California combines all these features and can therefore safely be assigned to *Prionocrangon*.

The genus *Prionocrangon* was recently reviewed by Kim & Chan (2005) who described three new species from the West Pacific (Taiwan, New Caledonia, Indonesia and the Philippines), and redescribed the four previously
known species, with special emphasis on *P. dofleini* Balss, 1913. De Grave & Fransen (2011) concur with Kim & Chan (2005) and cited the same seven species within the genus, none from the East Pacific (type localities are indicated in the parenthesis): *P. ommatosteres* Wood-Mason & Alcock, 1891 (type species; Andaman Sea, Indian Ocean); *P. curvicaulis* Yaldwyn, 1960 (Chatham Rise, New Zealand, 43°40'S 179°28'E); *P. demani* Kim & Chan, 2005 (Sulu Sea, Indonesia); *P. dofleini* Balss, 1913 (Sagami Bay, Japan, Pacific Ocean); *P. formosa* Kim & Chan, 2005 (24°48.86'N 122°5.31'E); *P. paucispina* Kim & Chan, 2005 (22°0.54'N 119°27.94'E); and *P. pectinata* Faxon, 1896 (off Martinique, Atlantic Ocean). The depth range of the genus is quite extensive, from 350 to 2543 m.

During a sampling program aimed at collecting deep-water fauna, a series of specimens of an undescribed species of *Prionocrangon* were collected in the northern part of the central Gulf of California, Mexico. This material represents the first record for the genus in the entire East Pacific.

**Material and methods**

The material was obtained during the TALUD XIV cruise aboard the R/V “El Puma” of the “Universidad Nacional Autónoma de México”, in the northern part of the Gulf of California, roughly between 28°10’ and 29°10’N. A total of 30 stations were visited (5–11 April, 2011), with depth ranging from 148 to 1346 m. Specimens were collected with a 2.35 m wide by 0.95 m high standard benthic sledge equipped with an outer collecting net of ca 5.5 cm (2 1/4") stretch mesh and an inner net of ca 2.0 cm (3/4") stretch mesh. Sampling depth was estimated with a digital SIMRAD echo sounder and epibenthic temperature and oxygen concentration were measured ca 10 m above bottom level with a Seabird CTD-O2 probe; oxygen concentration was also measured by the Winkler method using water samples collected close to bottom.

The specimens examined are deposited in the Regional Collection of Invertebrates at the Mazatlán Marine Station, ICML, UNAM, in Mazatlán, Mexico (EMU), at the Natural History Museum of Los Angeles County, Los Angeles, California, USA (LACM-CR), and at the Oxford University Museum of Natural History, Oxford, United Kingdom (OUMNH-ZC). Abbreviation used are: CL, carapace length; St. sampling station.

**Taxonomy**

**Prionocrangon incisum** sp nov.

(Fig. 1)

**Type material.** *Holotype*. One female (CL 8.31 mm), St. 21 (29°00'53"N, 112°51'31"W), 9/April/2011, 412–425 m, benthic sledge (EMU-8926).

*Paratypes*. Four females (CL 8.47–10.45 mm), St. 21 (29°00'53"N, 112°51'31"W), 9 April 2011, 412–425 m, benthic sledge (EMU-8927); one female (CL 9.6 mm), same station (LACM-CR 2011-2); one ovigerous female (CL 9.1 mm), same station (OUMNH.ZC.2011-09-0051). Two females (CL 6.04 and 10.60 mm), St. 22 (29°05'27"N, 112°46'44"W), 9 April 2011, 380–390 m, benthic sledge (EMU-8929). One male (CL 8.38 mm), St. 24 (29°08'06"N, 112°58'42"W), 9 April 2011, 532–594 m (EMU-8930). Two females (CL 9.24 and 10.68 mm), same station (EMU-8931). One male (CL 5.81 mm), St. 26 (29°02'41"N, 113°17'44"W), 10 April 2011, 1050–1165 m, benthic sledge (EMU-8932).

*Additional material*. Seven females (CL 7.89-9.74 mm), and three ovigerous female (CL 8.33–10.45 mm), St. 26 (29°02'41"N, 113°17'44"W), 1050–1165 m, benthic sledge (EMU-8928).

**Description.** Rostrum moderately long, reaching basis of branchiostegal spine, little elevated, 0.10–0.12 times as long as carapace (Fig. 1A, B, C, D). Mid-dorsal carina of carapace armed with 7–11 spines, 1 or 2 spines beyond carapace mid-length (Fig. 1A, C, D), posteriormost spine located just behind carapace mid-length. Fourth and fifth abdominal somites without carina; sixth somite 0.50 times as long as carapace, posterior margin of posterolateral process truncated, without spine, with a tuft of setae, inferolateral angle deeply notched (Fig. 1G, H). Telson slightly shorter than sixth abdominal somite, 0.45 times as long as carapace, three pair of dorsal spines on posterior half, lateral margin of the latter strongly convergent; posterior margin rounded, armed with 3–6 long spines, without minute median denticle (Fig. 2G). Eyestalks with bluntly cylindrical extremities, curving ventrally in-between...
FIGURE 1. Prionocrangon incisum sp. nov. Holotype female, CL 8.31 mm (A–C, E, G–J) (EMU-8926), paratype female, CL 8.70 mm (D) (EMU-8927), paratype female, CL 6.04 mm (F) (EMU-8929). A, entire animal, lateral; B, anterior part of carapace, lateral; C, carapace, stylocerite, antennules and antennae, dorsal; D, dorsal margin of carapace, lateral; E, eyes, dorsal; F, eyes, lateral; G, sixth abdominal somite, lateral; H, posterovertral margin of sixth abdominal somite, lateral, enlarged; I, chela and carpus of left first pereopod, ventral; J, same, external. Scale bars: A–C, D, 5 mm; B, J, 2 mm; E–G, I, 1 mm.
antennules (Fig. 1C, E, F). Antennular peduncle with proximal segment moderately long, 0.66 to 0.70 times as long as carapace (Fig. 1A, C). Stylocerite oval in dorsal view, with tip elongate, sharp (Fig. 1C, 2H, I). Scaphocerite equaling or slightly shorter than proximal segment of antennular peduncle, 0.55–0.60 times as long as carapace (Fig. 1A, C). Palm of first pereopod moderately stout, 4.30–5.30 times as long as wide; distomesial spine long (Fig. 1I). Dactyli of fourth and fifth pereopods short, 0.40–0.50 times as long as propodi (Fig. 2A). Females with endopod of second pleopod about 0.25 times as long as exopod (Fig. 2E); endopods and protopods of pleopods without lateral lobe or distoventral projection (Fig. 2E, F). Male second pleopod with appendix masculina (Fig. 2B, C, D) well developed, but shorter than endopod.

**Variations.** In the 23 specimens examined, the number of dorsal spines on the carapace (ranging from 7–11) is as follows: eight specimens with seven spines, seven each with eight or nine spines, and one with eleven spines. In 21 specimens with the telson intact, the number of posterior spines (ranging from 3–6) is: one specimen with three spines, five with four spines, four with five spines, and 11 with six spines. No sign of missing spines were observed in specimens with an odd number of posterior spines.
Etymology. From the Latin “incisum” (incision), a noun in apposition referring to the deep lateral notch in the sixth abdominal somite.

Remarks. Of the seven previously known species of Prionocrangon, three (P. paucispina, P. pectinata, and P. demani) feature triangular eyestalks and are therefore easy to separate from the new species. Eyestalks of the other four species (P. curvicaulis, P. formosa, P. dofleini, and P. ommatosteres) have bluntly cylindrical or villiform extremities, as in P. incisum sp. nov. In P. incisum sp. nov. the dactyls of the fourth and fifth pereopods are short, 0.40–0.50 times as long as propodi, while in P. curvicaulis and P. formosa the dactyls are much longer (0.70–0.74 times as long as propodi). The scaphocerite of P. formosa is also proportionally much wider than in P. incisum sp. nov., and the stylocerite is triangular-shaped in P. curvicaulis, whilst it is oval-shaped in P. incisum sp. nov. The absence of a dorsal carina on the fourth and fifth abdominal somite separates P. incisum sp. nov. from P. dofleini (a low carina on fifth and fourth somite present); in the later species, there are 3 or 4 carapace dorsal spines beyond the carapace mid-length versus only 1 or 2 in P. incisum sp. nov.. The absence of a proximolateral lobe on the female endopods of pleopods also separates P. incisum sp. nov. from P. ommatosteres (proximolateral lobe present). Prionocrangon incisum sp. nov. is also distinct from all seven species known to date given the deeply notched sixth abdominal segment (in lateral view), a feature unique within the genus. Indeed, in other species the posteroveranal angle of the sixth somite is either acute or provided with a small, sharp spine (P. ommatosteres, the dactyls of the fourth and fifth pereopods are short, 0.40–0.50 times as long as propodi). The scaphocerite of P. formosa is also proportionally much wider than in P. incisum sp. nov., and the stylocerite is triangular-shaped in P. curvicaulis, whilst it is oval-shaped in P. incisum sp. nov. The absence of a dorsal carina on the fourth and fifth abdominal somite separates P. incisum sp. nov. from P. dofleini (a low carina on fifth and fourth somite present); in the later species, there are 3 or 4 carapace dorsal spines beyond the carapace mid-length versus only 1 or 2 in P. incisum sp. nov.. The absence of a proximolateral lobe on the female endopods of pleopods also separates P. incisum sp. nov. from P. ommatosteres (proximolateral lobe present). Prionocrangon incisum sp. nov. is also distinct from all seven species known to date given the deeply notched sixth abdominal segment (in lateral view), a feature unique within the genus. Indeed, in other species the posteroveranal angle of the sixth somite is either acute or provided with a small, sharp spine (P. ommatosteres, P. pectinata, P. curvicaulis, P. formosa, and P. demani), or forming a shallow, angular notch (P. dofleini).

The series of specimens (23 in total) of P. incisum sp. nov. collected during the TALUD XIV cruise is one of the most numerous samples for any species of this genus. Two of the three ovigerous females are partly spent. The third bears 11 large eggs, about 1.50 mm × 2.10 mm. First post-embryonic stage and broken eggs were found among the pleopods of partly spent females. All larvae examined are similar to first larvae described for Notocrangon antarcticus (Pfeffer, 1887), a deep-water species with abbreviated development (Gurney 1939).

The material examined here was collected in four stations at 380–1165 m depth on muddy bottoms. Epibenthic dissolved oxygen concentrations and temperature were 1.20–1.56 ml O2/l and 11.2–11.4 °C, respectively. We agree with Yaldwyn’s (1960) opinion that species of Prionocrangon have a burrowing habit. Fresh specimens of P. incisum sp. nov. were covered with dispersed, very small clumps of black mud that remained stuck to the body, even after these were gently rinsed, thus indicating that this species probably digs into the sediment. The long, setose head appendages might be used to facilitate respiration.

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References

Hendrickx, M.E. (2012) Los Glyphocrangonidae y Crangonidae (Crustacea: Decapoda: Caridea) recolectados durante los cru-


