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A NEW SPECIES OF *PILUMNOPEUS* (CRUSTACEA: DECAPODA: PILUMNIDAE) FROM PAKISTAN

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ABSTRACT.- A new species of subtidal pilumnid crab, *Pilumnopeus pereiodontus*, is described from Pakistan. It is characterised by having: the anterolateral teeth weakly projecting; rows of large granules on the palms of the chelipeds; and by the presence of tubercles on the inferior border of the ischium and merus of the fourth leg, P4 near the articulation. The new species is compared with *Heteropanope changensis* (Rathbun), "*Parapilumnus*" *quadridentatus* (De Man), "*Parapilumnus*" *trispinosus* Sakai, *Pilumnopeus makiana* (Rathbun) and *Pilumnopeus marginatus* (Stimpson). The generic status of *Pilumnopeus* is briefly discussed.

INTRODUCTION

The present specimens were collected as part of the ongoing work of the Marine Reference Collection Centre, University of Karachi, to catalogue and describe the brachyuran fauna of Pakistan. Tirmizi & Kazmi (1988) in Volume 4 of the *Marine Fauna of Pakistan*, entitled "Crustacea: Brachyura (Dromiacea, Archaeobrachyura, Oxystomata, Oxyrhyncha)", have given a brief historical review of taxonomic studies on Pakistan crabs. Tirmizi & Ghani (in press) have subsequently prepared a volume dealing with the brachyrhynchan crabs (excluding the Portunidae).

Abbreviations: G1 refers to the first male gonopod, P3, P4 to the third and fourth walking legs. Specimens are deposited in the Marine Reference Collection Centre, University of Karachi (MRCC), and the Queensland Museum, Brisbane (QM).

SYSTEMATICS

FAMILY PILUMNIDAE

***Pilumnopeus pereiodontus*, new species**
(Figs. 1, 2)

Material. - Holotype - male (7.4 by 5.4 mm), Churna Is., Pakistan, 5.xi.1991 (MRCC).

Paratypes - male (4.6 by 3.4 mm), ovigerous female (6.8 by 4.8mm), data as for holotype (QM).

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Description. - Carapace ovoid; greatest width behind exorbital angles; 1.35-1.4 times broader than long; convex in both directions. Regions poorly defined; lateral margins convergent posteriorly; strongly convex. Anterolateral margins coarsely granular; with three teeth behind the exorbital angle. Exorbital angle bluntly triangular. First anterolateral tooth sharp (blunt on right side of holotype), outer margin convex; similar in size to exorbital angle. Second anterolateral tooth triangular, outer margin convex; similar in size to first; third tooth much smaller and less prominent than first two. Front *c.* 0.4 times carapace width; bilobed; lateral angles acute, granular; pre-orbital teeth obsolete, indicated by a slightly larger granule. Carapace surface smooth and shining but with scattering of small granules; setae medium to long, forming distinct close packed rows especially on anterior half, feathered. Upper orbital border evenly granular; concave. Lower orbital border continuous with lower edge of outer orbital tooth (not separated by a notch); armed with several large granules; inner angle formed by a bluntly triangular rounded lobe bearing several minute granules. Antennal flagellum entering orbit; orbital hiatus open. Basal antennal segment short, not touching front; unarmed; outer lobe well developed but not reaching to top of inner orbital angle.

Third maxilliped: merus distinctly smaller than ischium; wider than long; outer margin straight; *c.* 0.55 times length of ischium. Suture between merus and ischium horizontal. Ischium rectangular. Palp articulates at inner distal margin of merus.

Chelipeds markedly unequal; large and robust; merus with posterior border minutely granulate; with a small subdistal notch; lower border indistinctly granulate, broadly rounded; anterior border sparsely granulate; carpus with a broad tooth at inner angle; outer margin granular; small round tubercles distally. Outer surface of palm coarsely granular, 4-5 longitudinal rows of larger tubercles, largest medially. Outer surface of palm densely covered by setae. Inner surface of palm sparsely minutely granular. Immovable finger short. Length cutting edge *c.* 0.3 times length propodus. Ventral border of chela slightly concave at base of fixed finger. Dorsal surface of dactyl granular proximally; smooth, rounded distally. Fingers spooned, with tips toothed and intermeshing; a moderate proximal gape between cutting margins. Smaller chela of similar form to larger, but less robust and with smaller gape.

Walking legs relatively long; compressed; moderately broad; first pair slightly the longest, *c.* 1.2 times maximum carapace width. P3 merus *c.* 2 times as long as wide; carpus *c.* 1.9 times as long as wide; propodus *c.* 1.6 times as long as wide. Dactyli slightly longer than propodi; terminating in acute chitinous tips. Meri anterior margins unarmed terminally. Carpi without accessory carinae on upper surfaces. P4 merus and propodus each with 2-3 strong tubercles near articulation. Leg segments smooth; fringed with short and long feathered setae.

Male abdomen relatively narrow; seven free segments; third segment the widest. First segment *c.* 0.85 times width third segment; covers entire width of sternum between 4th pereiopods, such that no part of sternite 8 visible. Segments three-five tapering. Width segment three *c.* 0.3 times length. Segment six *c.* 1.25 times wider than long. Telson longer than preceding segments; *c.* 1.2 times longer than wide; bluntly pointed.

G1 long; slender; sigmoid. Setae simple, placed distally on inner edge of curve below apex (Fig. 2E).

Habitat. - Lives in holes and crevices in stones.

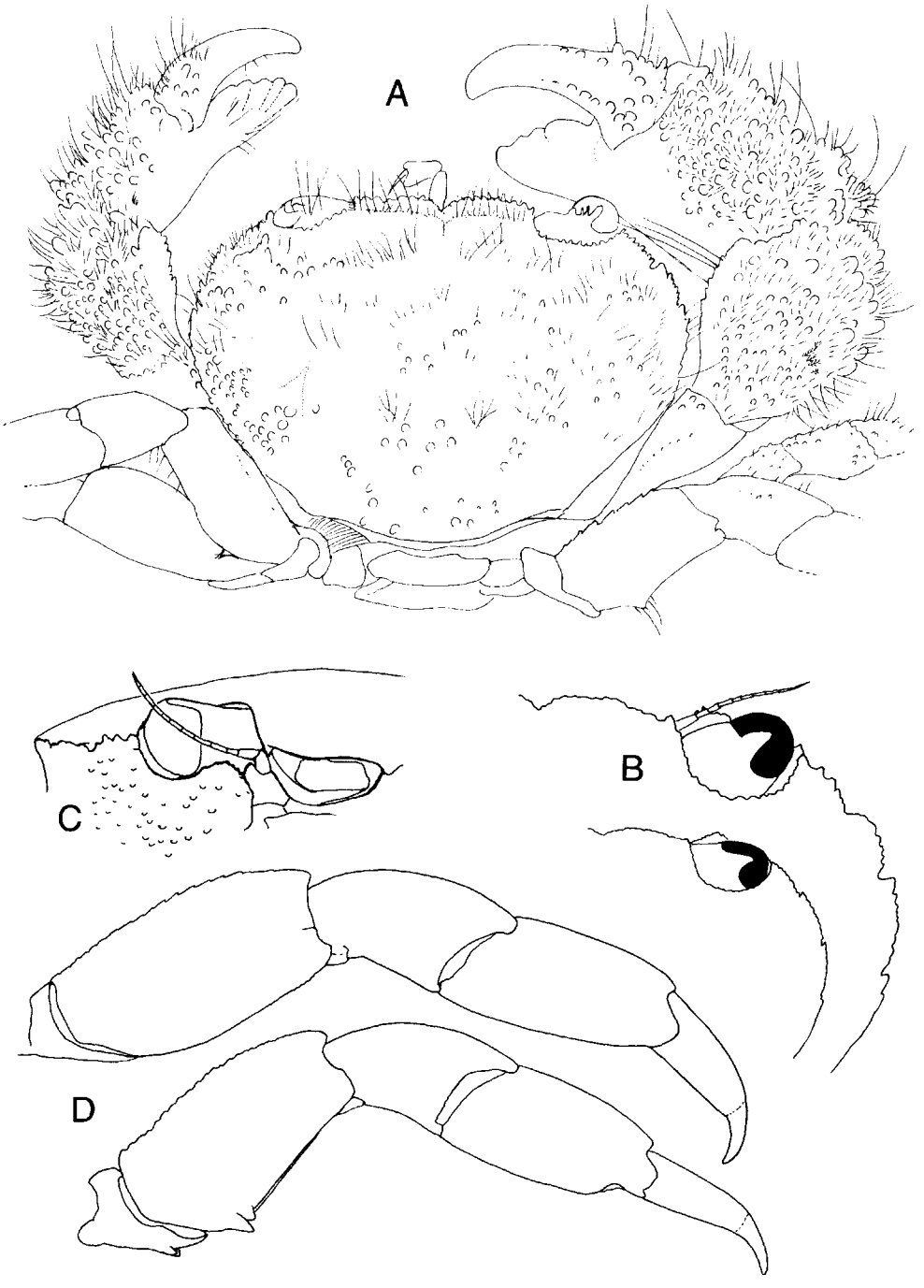

Fig. 1. *Pilumnopeus pereiodontus*, new species, holotype male. A, dorsal view of carapace and claws; B, detail of frontal and anterolateral margins of holotype male and small paratype male (first anterolateral tooth of holotype is truncated on right side of holotype but acutely angled on left side); C, frontal view of orbit, antenna and antennule; D, P3 (above) and P4 (below), denuded.

Etymology. - Named in reference to the prominent tubercles on the infero-distal border of the fourth pereiopod.

Remarks. - This species is difficult to place generically with absolute certainty. It is closest in overall appearance to *Heteropanope changensis* (Rathbun, 1909). *Heteropanope changensis* was transfered into *Heteropanope* from *Actumnus*, where it was clearly misplaced, by Balss (1933) without any strong reasons given for the decision. It was later allowed to stay in *Heteropanope* by Davie (1989a) who did not examine any specimens. The similarities between *H. changensis* and *P. pereiodontus* are very great, and include the structure of the carapace, chelipeds, and walking legs. In particular, it appears from the figure of Rathbun (1910: fig. 41)

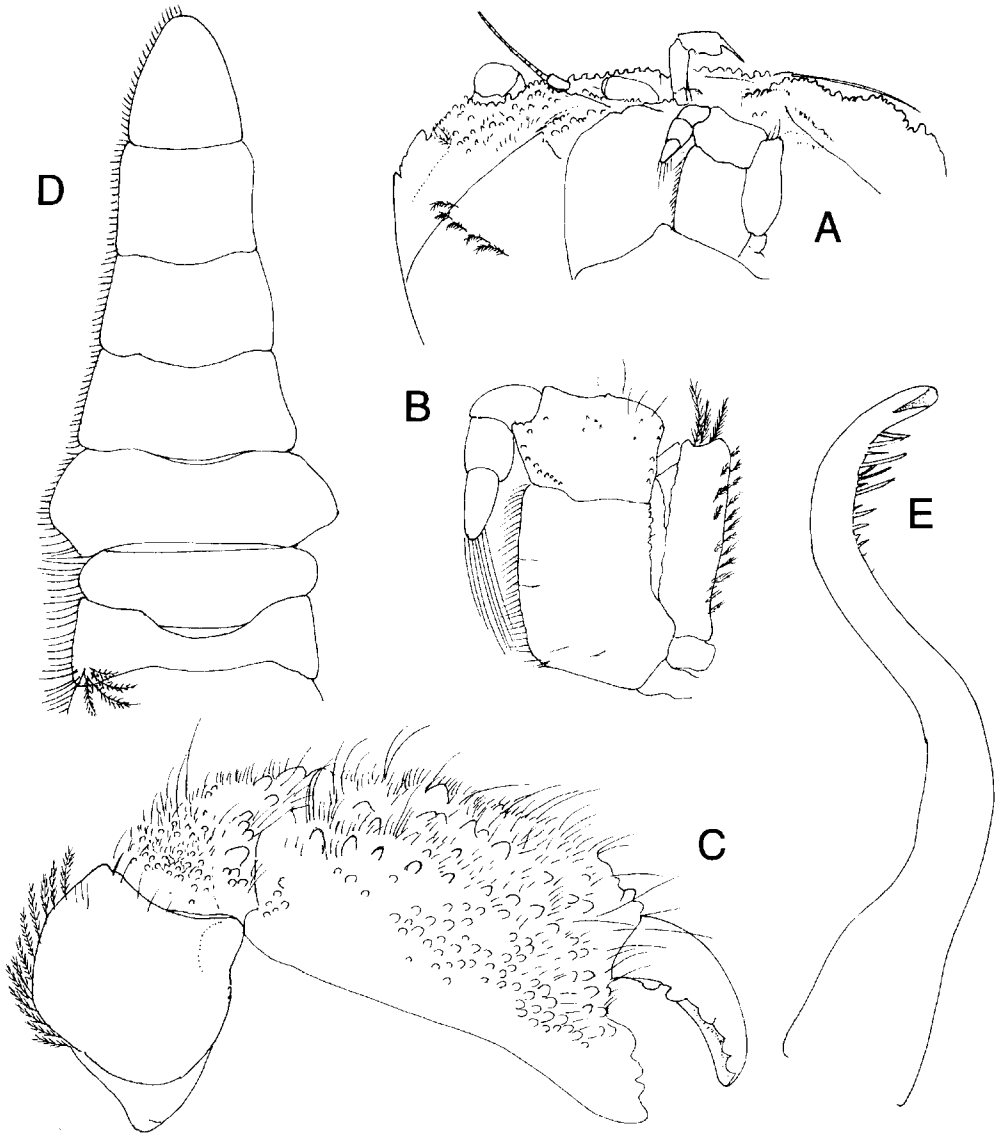

Fig. 2. *Pilumnopeus pereiodontus*, new species, holotype male. A, fronto-ventral view of carapace and mouth-frame; B, third maxilliped; C, fronto-ventral view of large cheliped; D, abdomen; E, first gonopod.

that the infero-proximal border of the merus of P4 has several large tubercles similar to those on the new species. However this character has not been mentioned in descriptions. *Pilumnus pereiodontus* differs most conspicuously from *H. changensis* by having less prominent anterolateral teeth; by having rows of much larger granules on the palms of the chelipeds; and by having a much greater covering of setae. Because of the apparent strong similarities, the two species could be considered congeneric and therefore *Heteropanope changensis* should be transfered to *Pilumnopeus*. The main difficulty with this action is that *P. pereiodontus* itself, does not fully agree with the generic diagnosis of *Pilumnopeus* given by Davie (1989a). The points of departure are that the lateral frontal teeth are almost obsolete, and sternite 8 is not visible laterally beside the male abdomen. It will be necessary to re-examine all the species currently in *Pilumnopeus* before the generic significance of these features can be properly evaluated.

Of the recognised *Pilumnopeus* species, *P. pereiodontus* appears closest to *P. makiana* (Rathbun) and *P. marginatus* (Stimpson) but differs from both these by its less protruding frontal lobes, the more strongly tubercular chelipeds, and the armature of P4.

Pilumnus pereiodontus is also similar to several of the "*Parapilumnus*" species. Türkay and Schuhmacher (1985) and Davie (1989b) have discussed the fact that *Parapilumnus* is nomenclaturally untenable, however as a replacement name has not yet been proposed, we use *Parapilumnus* for convenience. *Parapilumnus quadridentatus* (De Man) shares the tubercles on the inferior margins of the ischium and merus of P4, but differs in having a more finely granulate major chela, and by having the first anterolateral tooth separated from the exorbital angle. *Parapilumnus trispinosus* Sakai, is generally similar but also lacks the large granules on the chelae, and does not have any armature on the inferior border of the merus and ischium of P4.

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