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CONTRIBUTION TOWARD A REVISION OF THE
PORCELLANID GENUS *PORCELLANA*
(CRUSTACEA: DECAPODA: ANOMURA)

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Abstract.—Four new genera of Porcellanidae are proposed for 9 species previously included in genus *Porcellana*: *Capilliporcellana* (type-species *P. murakamii* Miyake), *Ancylocheles* (type-species *P. gravelei* Sankolli), *Lisoporcellana* (type-species *P. quadrilobata* Miers), and *Heteroporcellana* (type-species *P. corbicola* Haig). Genus *Aliaporcellana* Nakasone & Miyake is restricted through transfer of several species to one of the new genera; *Enosteoides* Johnson, originally described as a subgenus of *Porcellana*, is raised to generic rank and three species are assigned to it.

The anomuran crab family Porcellanidae contains about 225 described species (not including several of uncertain status). Nearly 80 of these were originally included in genus *Porcellana*, but by now most of them have been distributed among other genera. However, *Porcellana* still consists of a heterogeneous grouping of species which have little in common aside from the structure of the basal segment of the antennal peduncles: in all these forms it is produced and broadly in contact with the anterior margin of the carapace, thereby excluding the movable segments from the orbit. Several species have been placed or retained in *Porcellana* only because they do not fit into any of several other genera which share this character. I have already drawn attention to the need for a revision of the genus (Haig, 1960:197; 1965:107).

Basing his study on the porcellanid fauna of the Singapore area, Johnson (1970:8, 21) included in *Porcellana* all species having a produced basal antennal segment, the frontal area not (or not greatly) deflexed, and the carapace never much broader than long. He erected a new subgenus, *Enosteoides*, and reduced *Pisidia*, and even the distinctive genus *Porcellanella*, to subgenera. In my opinion this arrangement is not satisfactory—not only because it further obscures natural relationships, but because it was based on only a few species from a limited geographical area.

In the revision which follows I re-establish the generic status of *Pisidia* (and of *Porcellanella*), erect four new genera to accommodate some of the aberrant species of *Porcellana*, elevate Johnson's subgenus *Enosteoides* to generic rank, and make various changes in the generic placement of species. I have been fortunate enough to examine material of almost all the species involved; for others, I suggest possible relationships on the basis of information in the literature. This proposed arrangement should

be considered provisional, but I believe it is a more natural one than those used previously. Future studies on larval development may help to prove or disprove the validity of some of these groupings.

Porcellana Lamarck 1801

Diagnosis.—Carapace usually a little longer than broad; dorsal surface smooth, unarmed, convex. Front horizontal, strongly tridentate or trilobate in dorsal view. Lateral margins unarmed or denticulate posterior to epi-branchial angle. Basal antennal segment broadly in contact with anterior margin of carapace, excluding movable segments from orbit. Orbits deep; eyes large.

Chelipeds subequal; chelae large, compressed, lying obliquely, usually with well developed fringe of setae along outer margin. Dactyl of walking legs with a single terminal claw, and with several movable spinules ventrally.

Telson of abdomen 7-plated.

Remarks.—The following species, closely related to the type, *Porcellana platycheles* (Pennant, 1777), should be retained in this genus:

Indo-West Pacific: *Porcellana pulchra* Stimpson 1858, *P. habeii* Miyake, 1961, and *P. persica* Haig, 1966.

Eastern Pacific: *Porcellana cancrisocialis* Glassell, 1936, *P. paguriconviva* Glassell, 1936, and *P. hancocki* Glassell 1938.

Western Atlantic: *Porcellana sayana* (Leach, 1820) and *P. sigsbeiana* A. Milne Edwards, 1880. *P. stimpsoni* A. Milne Edwards, 1880 is probably a true *Porcellana*, but its status is uncertain. *P. paivacarvalhoi* Rodrigues da Costa, 1968 was only briefly described and not illustrated; it probably belongs to this genus, because it was said to be similar to *P. platycheles* (Rodrigues da Costa, 1968:405).

Eastern Atlantic: *Porcellana platycheles*, with two subspecies, *P. p. platycheles* (Pennant, 1777) and *P. p. africana* Chace, 1956.

Pisidia Leach 1820

Remarks.—Johnson (1970:8, 21) treated *Pisidia* as a subgenus of *Porcellana*, and included in it three species which I place in a new genus in the present paper. Earlier, I gave a diagnosis of *Pisidia* (Haig, 1965:105; 1966:43), and my interpretation remains essentially the same except that I transfer *Pisidia spinuligera* (Dana, 1853) to another genus. *Pisidia* now contains the following species:

Indo-West Pacific: *Pisidia dehaanii* (Krauss, 1843), *P. dispar* (Stimpson, 1858), *P. serratifrons* (Stimpson, 1858), *P. streptocheles* (Stimpson, 1858), *P. inaequalis* (Heller, 1861), *P. delagoae* (Barnard, 1955), and *P. gordonii* (Johnson, 1970).

Eastern Pacific: *Pisidia magdalenensis* (Glassell, 1936).

Western Atlantic: *Pisidia brasiliensis* Haig (in Rodrigues da Costa, 1968). *P. melloleitaoi* Rodrigues da Costa, 1968, which was very briefly described without an illustration, is probably assigned correctly to this genus because it was said (Rodrigues da Costa, 1968:406) to resemble *P. bluteli*.

Eastern Atlantic: *Pisidia longicornis* (Linnaeus, 1767) (the type-species), *P. bluteli* (Risso, 1816), and *P. longimana* (Risso, 1816).

Aliaporcellana Nakasone & Miyake, 1969, restricted

Diagnosis.—Carapace as long as broad or slightly broader than long, strongly convex front to back, smooth or roughened, regions usually well marked. Front broad, strongly deflexed; in dorsal view usually appearing rounded-triangular, in frontal view trilobate with median lobe much more produced than lateral lobes. Lateral margins with a few spines posterior to epibranchial angle. Basal antennal segment broadly in contact with anterior margin of carapace, excluding movable segments from orbit. Orbits rather deep; eyes large.

Chelipeds unequal, one larger than the other and the two usually armed differently, these differences dependent on age and sex; chelae lying on or near their outer margin with fingers opening vertically or in sharply oblique plane. Dactyl of walking legs biunguiculate, the 2 fixed spines usually subequal in size, and sometimes with a single movable spinule ventrally.

Telson of abdomen 7-plated.

Remarks.—In a review of the Indo-West Pacific species of *Polyonyx*, Johnson (1958:97) divided the genus into three natural groups. One, which he designated the *P. denticulatus* group, consisted of species which "appear to be transitional towards the genus *Porcellana*." Included were *Polyonyx pygmaeus* (De Man, 1902), *P. pugilator* Nobili, 1905 (a synonym of *P. pygmaeus*), *P. denticulatus* Paulson, 1875 (a synonym of *Porcellana suluensis* Dana, 1852), and a new species, *P. telestophilus*. Nakasone & Miyake (1969:20) proposed a new genus, *Aliaporcellana*, for a number of species having two or more well developed fixed spines on the dactyl of the walking legs, and (usually) the carapace armed with spines posterior to the cervical groove. These included *Aliaporcellana suluensis*, *A. pygmaea*, *A. pugilator*, and *A. telestophila*; a new species allied to them, *A. kikuchii*; *A. carinata* (Ortmann, 1892), which Johnson (1958) had only doubtfully retained in *Polyonyx*; and three species previously included among the aberrant species of *Porcellana*, *A. nitida* (Haswell, 1882), *A. quadrilobata* (Miers, 1884), and *A. furcillata* (Haig, 1965).

Polyonyx carinatus was published with an inadequate description and

illustration and, in my opinion, should be considered a nomen dubium until its status can be determined by reexamination of the type-specimens. In this paper I transfer *Porcellana nitida*, *P. quadrilobata*, and *P. furcillata* to a new genus. *Aliaporcellana*, as hereby restricted, is thus the equivalent of Johnson's *denticulatus* group of *Polyonyx*.

The following Indo-West Pacific species are included: *Aliaporcellana suluensis* (Dana, 1852) (the type-species), *A. pygmaea* (De Man, 1902), *A. telestophila* (Johnson, 1958), and *A. kikuchii* Nakasone & Miyake, 1969.

Enosteoides Johnson, 1970, new rank

Diagnosis.—Carapace rounded, about as broad as long; dorsal surface strongly arcolate, regions distinct and separated by deep grooves; dorsal surface sometimes spinulate. Front broad, deflexed near tip, sinuously trilobate; in dorsal view the median lobe broad, triangular or rounded, and with a median notch, lateral lobes small, frequently obsolescent; in frontal view, median lobe prominent, subtriangular. Lateral margins ridged, with spines posterior to epibranchial angle. Basal antennal segment broadly in contact with anterior margin of carapace, excluding movable segments from orbit. Orbits deep; eyes small.

Chelipeds subequal; chelae broad, flattened, *Petrolisthes*-like, lying obliquely, often with spines and ridges. Dactyl of walking legs with a single terminal claw, and with several movable spinules ventrally.

Telson of abdomen 7-plated.

Remarks.—*Enosteoides* was established by Johnson (1970:8, 32) as a subgenus of *Porcellana*, and contained only the type-species, *Porcellana corallicola* Haswell 1882 (a synonym of *Porcellana ornata* Stimpson, 1858). It is hereby raised to generic rank and its diagnosis slightly emended to include two closely related species from among the aberrant *Porcellana* forms.

Thus emended, the genus contains the following Indo-West Pacific species: *Enosteoides ornatus* (Stimpson, 1858) (the type-species), *E. melissa* (Miyake, 1942), and *E. palauensis* (Nakasone & Miyake, 1968).

Porcellana caparti Chace, 1956, from the eastern Atlantic, appears to belong near here and should perhaps be included in *Enosteoides*.

Capilliporcellana, new genus

Diagnosis.—Carapace as long as, or a little longer than, broad; dorsal surface rather convex, strongly areolate, regions well defined. Front broad, horizontal, produced beyond eyes, faintly trilobate in dorsal view; dorsal surface concave. Lateral margins unarmed, somewhat expanded posterior to epibranchial angle to form laminiiform crest. Basal antennal segment broadly in contact with anterior margin of carapace, excluding movable

segments from orbit. Orbits deep; eyes small, partly hidden behind orbital margin.

Chelipeds somewhat unequal in size, large, robust, tuberculated and longitudinally ridged; one or both chelae lying on or near their outer margin with fingers opening vertically or nearly so. Dactyl of walking legs with a single terminal claw, and with several movable spinules ventrally.

Telson of abdomen 7-plated.

Type-species.—*Porcellana murakamii* Miyake, 1942:362, pl. 1 fig. 3, text-figs. 23, 34.

Etymology.—From Latin “capillus,” hair, in combination with the generic name *Porcellana*; referring to the heavily setose condition of the epimera of the carapace and the outer margins of the chelae.

Remarks.—This genus resembles *Enosteoides* in several characters, including the strongly areolate carapace and the form of the dactyl of the walking legs. The shape of the front and the structure of the chelipeds are quite different from those of *Enosteoides*. The neotropical genus *Megalobrachium* seems to be close to *Capilliporcellana*, but is characterized by having a deflexed front, the antennules reduced in size, and the fingers opening obliquely.

Capilliporcellana includes only the type-species, *C. murakamii* (Miyake, 1942); the description of a second member of the genus is in preparation. Both these species inhabit the Indo-West Pacific. *Porcellana elegans* Chace, 1956, from the eastern Atlantic, should possibly be placed here as well.

Ancylocheles, new genus

Diagnosis.—Carapace about as long as broad, strongly convex front to back, smooth or somewhat roughened, regions clearly marked. Front horizontal or somewhat deflexed, appearing broadly triangular or rounded in dorsal view; median lobe strongly deflexed, visible only in frontal view. Lateral margins ridged, unarmed posterior to epibranchial angle. Basal antennal segment broadly in contact with anterior margin of carapace, excluding movable segments from orbit. Orbits shallow; eyes large, partly concealed behind orbital margin.

Chelipeds unequal, one distinctly larger than the other, especially in large males; chelae broad, flattened, lying obliquely; dactyl of smaller chela twisted out of plane with manus, this distortion generally more pronounced in large males. Dactyl of walking legs with a single terminal claw, and with several movable spinules ventrally.

Telson of abdomen 7-plated.

Type-species.—*Porcellana gravelei* Sankolli, 1963:280, fig. 1.

Etymology.—From Greek “ankylos,” bent or crooked, and “chele,” claw.

Remarks.—*Ancylocheles* superficially resembles *Pachycheles* and the neotropical genus *Neopisosoma* in the general aspect of the carapace and frontal area, and in having one cheliped larger than the other. Both *Pachycheles* and *Neopisosoma*, however, belong to the group of genera in which the basal segment of the antennae is short and not, or only narrowly, in contact with the anterior margin of the carapace. *Ancylocheles* agrees with *Pisidia* in having unequal chelipeds with some twisting of the fingers in the smaller chela; but in the latter genus the frontal region is strongly tridentate or trilobate, and there is pronounced sexual dimorphism in the spinulation of the carapace and chelipeds as well as in the degree of distortion of the chelae.

The new genus is proposed for a single species, *Ancylocheles gravelei* (Sankolli, 1963), an inhabitant of the Indo-West Pacific. An eastern Atlantic species, *Porcellana foresti* Chace, 1956, appears to be related to *A. gravelei* but I have not had the opportunity to compare these two species directly.

Lissoporcellana, new genus

Diagnosis.—Carapace as long as, or slightly longer than, broad; smooth dorsally, regions not marked. Front broad, horizontal, tridentate or trilobate, the median lobe broad and usually subdivided medially by a notch or cut into a series of teeth. Lateral margins usually with strong teeth or spines posterior to epibranchial angle. Basal antennal segment broadly in contact with anterior margin of carapace, excluding movable segments from orbit. Orbits shallow, strongly oblique; eyes large, partly hidden behind orbital margin.

Chelipeds unequal, one somewhat larger than the other; chelae subcylindrical, smooth, generally lying on their outer margin with fingers opening vertically; fingers of smaller chela sometimes twisted and opening in sharply oblique plane. Dactyl of walking legs usually with a strongly developed fixed spine, frequently with movable spinule at its tip, on ventral margin adjacent to terminal claw; also a few movable spinules ventrally.

Telson of abdomen 7-plated.

Type-species.—*Porcellana quadrilobata* Miers, 1884:276, pl. 30 fig. D.

Etymology.—From Greek "lissos," smooth, in combination with the generic name *Porcellana*.

Remarks.—*Lissoporcellana* agrees with *Porcellanella* in having a smooth carapace with a broad, horizontal frontal region; smooth, subcylindrical chelae with the fingers opening vertically; and (usually) more than one fixed spine on the dactyl of the walking legs. *Porcellanella* differs in having the carapace distinctly elongate, and the walking legs short and stout with short, quadriunguiculate dactyls. *Lissoporcellana* resembles *Pisidia* in hav-

ing a trilobate or tridentate horizontal front, in the twisting of the fingers of the smaller chela (at least in some species), and, to some extent, in the form of the ventral spine adjacent to the terminal claw of the dactyl of the walking legs. In one or two species of *Lissoporcellana* this spine takes the form of a movable spinule with an enlarged, fixed base, as in *Pisidia*. However, the new genus differs from *Pisidia* in that the dissimilarity of the two chelae is not due to sexual dimorphism—the sexes are alike in having one cheliped larger than the other, and the degree of distortion of the fingers appears to be a function of size rather than sex—and the females are not more strongly spinulate than males. The genus further differs from *Pisidia* in the smooth carapace, with the regions not indicated, and the smooth, subcylindrical chelae with vertically opening fingers.

This genus contains the following described species, all from the Indo-West Pacific: *Lissoporcellana spinuligera* (Dana, 1853), *L. nitida* (Haswell, 1882), *L. quadrilobata* (Miers, 1884), *L. maculata* (Miyake, 1957), *L. furcillata* (Haig, 1965), and *L. streptochiroides* (Johnson, 1970). The descriptions of two additional species are in preparation.

The illustration of *Porcellana hornelli* Southwell (1906:218, fig. 1) appears to be of a juvenile of some species of *Lissoporcellana*, but specimens will have to be reexamined before the status of this form can be determined.

The specimen cited and illustrated by Monod (1973:11, figs. 44–51) as "*Porcellana* sp." certainly belongs to *Lissoporcellana*; I have seen this specimen but not material of *L. maculata* (Miyake, 1957), of which it is perhaps a synonym. (It should be noted that Miyake's species requires a new name, being a junior primary homonym of *Porcellana maculata* H. Milne Edwards, 1837 = *Neopetrolisthes*.)

Czerniavsky (1884:109) briefly described a new genus, *Porcellanides*. Most of the nominal taxa included in it belong to *Pisidia* (see Holthuis, 1961:43), but the identity of the type-species, *Porcellanides kriczagini* from Singapore, is unknown. From Czerniavsky's diagnosis (p. 111) it might be a member of genus *Lissoporcellana*. If this could be confirmed by direct examination of the type, *Lissoporcellana* would fall as a junior synonym of *Porcellanides*.

Heteroporcellana, new genus

Diagnosis.—Carapace longer than broad, nearly smooth dorsally, regions scarcely indicated. Front horizontal, with a broad median lobe and two narrow lateral teeth. Lateral margins subparallel, unarmed posterior to epibranchial angle. Basal antennal segment broadly in contact with anterior margin of carapace, excluding movable segments from orbit. Orbits shallow, oblique; eyes small.

Chelipeds subequal; chelae subcylindrical, smooth, lying on their outer

margin, with fingers opening vertically. Dactyl of walking legs with a single terminal claw; no movable spinules on ventral margin.

Telson of abdomen 5-plated.

Type-species.—*Porcellana corbicola* Haig, 1960:205, pl. 15.

Etymology.—From Greek "heteros," different, in combination with the generic name *Porcellana*.

Remarks.—*Heteroporcellana* resembles *Porcellanella* because of its trilobed, horizontal front; smooth, subcylindrical chelae with the fingers opening vertically; and smooth carapace with unarmed posterolateral margins. *Porcellanella*, however, differs in having a 7-plated telson, a much more elongate carapace and frontal region, and short, stout walking legs with quadriunguiculate dactyls.

The genus contains only the type-species, *Heteroporcellana corbicola* (Haig, 1960). It inhabits the eastern Pacific.

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