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A NEOTYPE DESIGNATION FOR *PETROLISTHES*
TOMENTOSUS (DANA), AND DESCRIPTION OF
PETROLISTHES HETEROCHROUS, NEW SPECIES,
FROM THE MARIANA ISLANDS
(ANOMURA: PORCELLANIDAE)

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Abstract.—*Petrolisthes tomentosus* (Dana) is determined to be a senior synonym of *P. penicillatus* (Heller) and a neotype of the former is designated. *Petrolisthes pubescens* Stimpson, a species previously confused with *P. tomentosus*, is redescribed and compared to the latter. The two can be distinguished primarily by the presence of elevated, setae-topped bosses on the carapace of *P. tomentosus* as compared to the flat carapace of *P. pubescens*. A new species, *P. heterochrous*, is also described.

For over 100 years carcinologists have confused several Indo-Pacific species of *Petrolisthes* characterized by having a very tomentose carapace and a pronounced fringe of plumose setae on the posterior margin of the manus. Lewinsohn (1969, 1979) has unraveled part of the problem. He (1969) recognized *P. pubescens* Stimpson as distinct from a group that includes *P. tomentosus* (Dana 1852), *P. penicillatus* (Heller 1862), and *P. villosus* (Richters 1880). Moreover, he (1979) summarized the confusion over possible synonymy of the latter three species. Briefly, Ortmann (1897) considered *P. villosus* to be a junior synonym of *P. penicillatus*. However, since then, the matter of synonymy between *P. tomentosus* and *P. penicillatus* has been unresolved. Lewinsohn (1979) examined a syntype of *P. penicillatus* and described it thoroughly. He (as well as Haig 1983) speculated that *P. penicillatus* might be a junior synonym of *P. tomentosus*, whose type has been lost. However, Lewinsohn declined to select a neotype for the latter because the type locality for *P. tomentosus* is the Tuamotu Archipelago, and he did not have specimens from French Polynesia.

Here I select and describe a neotype for

P. tomentosus based on a specimen from Tahiti and compare it to *P. penicillatus* and *P. pubescens*. Also, I describe a new species of *Petrolisthes* from a collection of porcellanids from the Mariana Islands.

Materials and Methods

Most of the material on which this report is based was collected by the author in 1979-1981 and 1984. Additional material was obtained from the collection of the National Museum of Natural History (USNM), Smithsonian Institution, Washington, D.C. Some specimens have been deposited in the Allan Hancock Foundation, Los Angeles, California, and the B. P. Bishop Museum, Honolulu, Hawaii.

Specimens were measured to the nearest 0.1 mm using an ocular micrometer on a Wild M-5 microscope. Measurements are given in the text as carapace length (along the midline) × carapace width (at the greatest dimension) for the type specimens and the largest male, the largest female, and the smallest ovigerous female. Other abbreviations used in the text are: OV = ovigerous females; juv. = juveniles; m = meters.

Setal terminology is based on Kunze and Anderson (1979). Setal measurements were

made, but were extremely variable within and among individuals so are not included.

The figures were prepared with the aid of a drawing tube on a Wild M-5 or M-8 microscope.

Systematic Account

Petrolisthes tomentosus (Dana)

Fig. 1

Porcellana tomentosa Dana, 1852:420; 1855: pl. 26, fig. 10.

Petrolisthes tomentosus.—Stimpson, 1858: 227 (list); 1907:182 (list).—Kropp et al., 1981:40 (list).

Porcellana penicillata Heller, 1862:523; 1865:79.

Porcellana villosa Richters, 1880:160, pl. 17, figs. 11–12.

Petrolisthes villosus.—Ortmann, 1892:259 (key), 264; 1894:27 (key).—Ward, 1942: 63.

Petrolisthes penicillatus.—Ortmann, 1897: 287 (key), 288.—Lenz, 1910:566.—Miyake, 1942:347, text-figs. 11–12; 1943:55, 83, text-fig. 18.—Haig, 1964:368; 1966: 42; 1983:283.—Lewinsohn, 1979:45.—Yang, 1983:2, pl. 2.

Petrolisthes villosus?—Miers, 1884:559.

Not *Petrolisthes tomentosus*.—Ortmann, 1892:259 (key), 264; 1894:27 (key); 1897: 287 (key), 288.—Grant and McCulloch, 1906:39.—Miyake, 1943:55 (key), 85, text-figs. 19–21; 1956:310.—Haig, 1964: 364; 1966:47 (key).—Nakasone and Miyake, 1971:4. = *Petrolisthes pubescens* Stimpson.

Type data.—Much of the type material collected by Dana during the United States Exploring Expedition (1838–1842) was studied by Stimpson in Chicago. This material, along with Stimpson's North Pacific Exploring Expedition (1853–1856) was destroyed in the 1871 Chicago fire (Deiss and Manning 1981). Although some of Dana's types have since been rediscovered (Deiss and Manning 1981), I have been unable to locate the type of *Porcellana tomentosa*. I

have searched the USNM, Yale Peabody Museum, and the Philadelphia Academy of Sciences without success. Dr. R. B. Manning has compiled an unpublished list of Dana material at the Museum of Comparative Zoology (Harvard) and the major European museums. A type of *P. tomentosa* is not among them. It is very probable that the type for this species has been destroyed. I located a disarticulated, but complete, specimen of Dana's species in the USNM. It is from Tahiti, close to the original type locality (Tuamotu) and is herein designated as the neotype.

Neotype.—TAHITI: Arue; under dead coral; 1963; Coll. H. A. Rehder; ♀ (OV); 5.3 × 4.8 mm; USNM 190776.

Other material examined.—OKINAWA: W of Onna, S of Manzamo Precipice; reef flat; 20 May 1984; Coll. R. B. Manning et al.; 1 ♀ (OV). MARIANA ISLANDS: PANGAN: Puntan Lagona; on dead coral; 1 m; 13 Mar 1981; 1 ♀. Bandeera Peninsula; intertidal; 11 Mar 1981; 1 ♀. Palapala Bay; subtidal under rock; 1.5 m; 14 Mar 1981; 1 ♂. Liyan; on base of *Pocillopora setchelli*; 1.5 m; 9 Mar 1981; 1 ♀ (OV). Apan Santati; reef flat under rock; <1 m; 10 Mar 1981; 1 ♂, 1 ♀. SAIPAN: Tanapag Barrier Reef; on dead coral; 6 m; 20 Nov 1980; 1 ♀. Agingan Pt.; reef margin on coralline algae; <1 m; 19 Nov 1980; 3 ♂ (1 with bopyrid isopod). GUAM: Tanguisson Pt.; reef front on dead branching coral; 11 m; 25 May 1984; 1 ♂. Piti Bay; outer reef flat S of Camel Rock; intertidal and subtidal on dead coral; 0–1.5 m; 13 Jun 1980; 5 ♂, 2 ♀ (OV). Luminao; reef flat on dead coral or under rocks; 1 m; 28 Mar 1980, 5 Apr 1980; 4 ♂, 6 ♀ (2 OV). Neye Is.; on *Pocillopora* sp.; 29 Jan 1981; Coll. R. H. Randall; 1 ♀. Toguan Bay; at reef margin on reef rock; <1 m; 14 Feb 1984; Coll. J. H. Dominguez; 1 ♂. Pago Bay; reef flat on coralline algae or intertidal under rock; 0–1 m; 18 May 1981, 16 Feb 1984; 2 ♂. FIJI: Nananu-i-Ra; intertidal pool; 3 Jun 1980; 1 ♀.

Measurements.—Largest male—5.4 ×

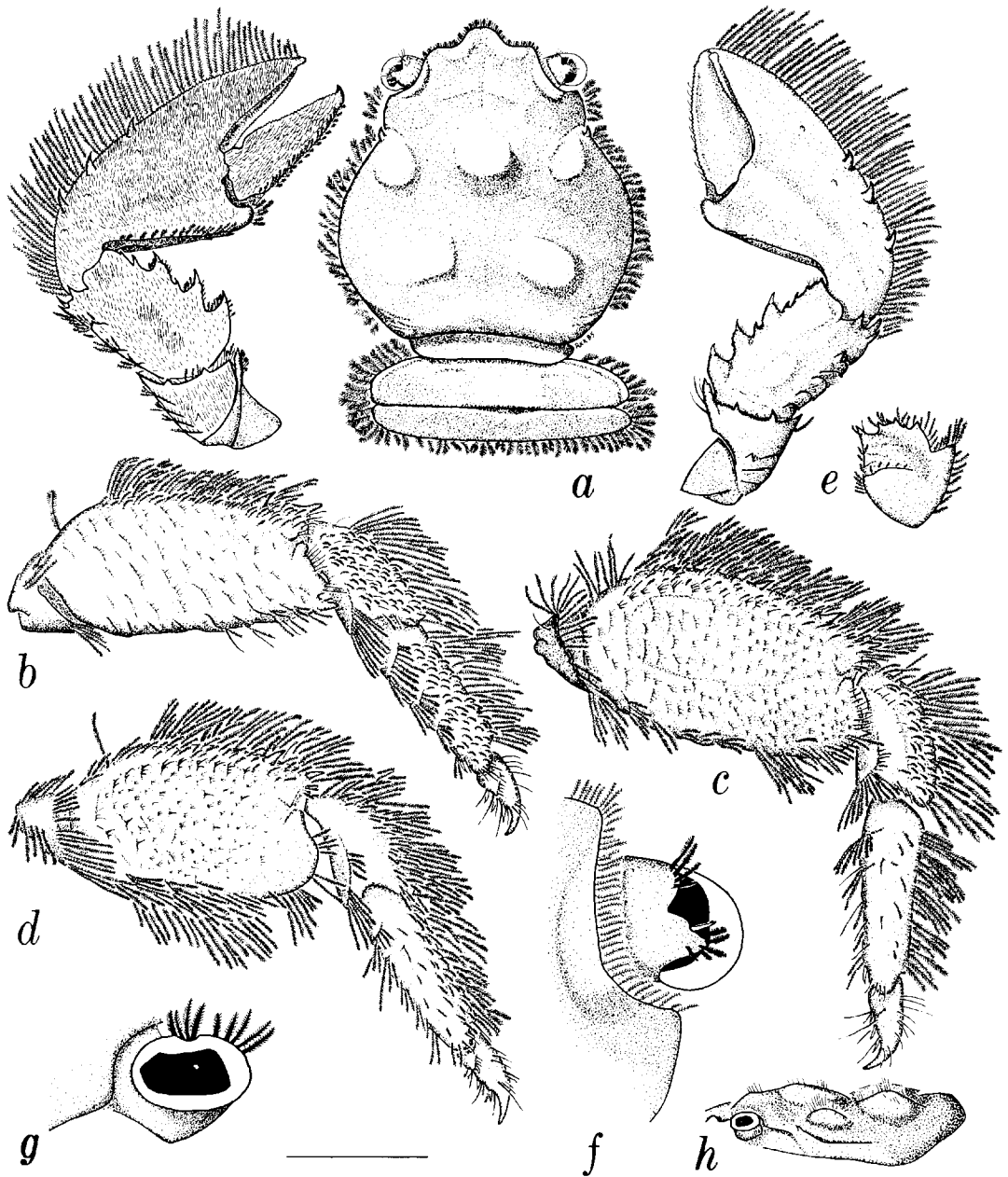


Fig. 1. *Petrolisthes tomentosus* (Dana), neotype ♀: a, Carapace and chelipeds; b, c, d, Right walking legs 1, 2, 3; e, Right antennule base; f, Right eye (dorsal view); g, Right eye (lateral view); h, Carapace (lateral view). Scale: 3 mm (a); 2 mm (b-e); 1 mm (f, g); 4 mm (h). [Surface setae on carapace and right cheliped not shown.]

5.2 mm; largest female— 5.9×5.6 mm; smallest ovigerous female— 4.1×3.9 mm.

Neotype description.—Carapace: Surface smooth; with 5 conspicuous rounded elevations, largest on gastric region, 1 on each medial epibranchial region, 2 flanking cardiac region; covered with distally-curved setae; elevations, frontal-gastric ridge with distally-pappose setae. Frontal-gastric ridge present, front indistinctly trilobate, median lobe most projecting; surface slightly concave; margin entire, fringed with plumose, simple setae; no supraocular spine. Lateral margin cristate at epibranchial region, 1 epibranchial spine; rounded posteriorly, no mesobranchial spines. Epimera with fringe of plumose setae.

Chelipeds: Subequal. Dorsal surface of all segments covered with distally-curved pappose setae. Merus with dorsal surface smooth; posterior margin rounded, with 1 subproximal spine; distal margin with 1 medial, 1 posterior spine; anterior margin with spine-tipped tooth; ventral surface smooth, distal margin with 2 spines anteriorly. Carpus with dorsal surface smooth, proximal median swelling, topped with distally-pappose setae; similar setae in clump distally near anterior margin; posterior margin with serrate squamae, 3 spines, distal spine single-pointed; anterior margin with 3 serrated, spine-tipped teeth (having plumose setae on distal margin), and 2–4 spines (other specimens with 3–5 teeth, 0–3 spines); distal margin entire, incised medially, with 1 spine posterior to incision. Manus with dorsal surface divided into upper and lower portions by rounded, longitudinal ridge, topped with distally-plumose setae; upper surface smooth, slightly concave; lower surface smooth, slightly concave, but with 5 biconical tubercles and 3 spines near posterior margin (other specimens with tubercles indistinct, 2–4 spines). Anterior margin of manus finely scalloped, no distal spine; posterior margin coarsely serrated, with fringe of plumose setae along entire length. Dac-

tylus with dorsal rounded median longitudinal swelling; upper margin coarsely serrated, lined with stout, plumose setae; occlusal surfaces serrated; gape with scattered setae.

Walking legs: Merus with dorsal surface bearing fine transverse striae, covered with simple setae arising from striae; anterior margin fringed with plumose setae, of leg 1 with 2–3 spines, leg 2 with 3 spines, leg 3 with 1–2 spines; posterodistal spines 1, 2, 0 (other specimens 1–2, 1–2, 0). Carpus with plumose, scattered simple setae on anterior margin; leg 1 with, legs 2, 3 without anterodistal spine. Propodus with anterior and posterior margins bearing plumose, scattered simple setae; posterior surface with 2 movable spinules (1 medial, 1 subdistal), 2 laterally-placed movable spinules at distal margin. Dactylus with scattered simple setae; 3 movable spinules on posterior margin.

Ocular peduncle: Dorsal extension onto cornea triangular, with clump of pappose setae; cornea round in lateral view.

Antennules: Basal segment with few transverse striae on outer surface; anterior margin finely denticulate.

Third maxillipeds: Ischium smooth; upper portion with 3–4 lines of setae (absent in some specimens).

Color alive.—Based on material from the Mariana Islands. Overall color of carapace, chelipeds, walking legs off-white. Carapace with 6 or more pink areas. Chelipeds with more numerous pink areas of variable size, shape; similar blotches on walking legs. Body setae usually clear, sometimes yellow.

Remarks.—The pattern of elevations on the carapace and chelipeds, and the setation patterns on the carapace, chelipeds, and walking legs were consistent among all specimens examined. Setae on the elevated areas frequently may be worn away.

Comparison.—The neotype and other material examined fit Dana's description and illustration of *Porcellana tomentosa*.

Contrary to Lewinsohn (1979), I think Dana's figure is adequate to permit identification of this species.

Lewinsohn (1979) based his observations on the type of *P. penicillata* Heller. I compared the neotype of *P. tomentosus* and other material to his description and find that they agree very well. The number of spines near the posterior margin of the manus varies from 2–4 for my material, versus 4 for Heller's syntype. I found 2–3 anterior marginal spines on the meri of legs 1, 2 and 1–2 on leg 3, whereas Lewinsohn reported 2, 2, and 1 spines, respectively. There is no doubt in my mind that *Petrolisthes tomentosus* (Dana) is a senior synonym of *P. penicillatus* (Heller) and *P. villosus* (Richters).

Petrolisthes tomentosus was separated from *P. pubescens* by Lewinsohn (1969) and Haig (1979). The two species are most easily distinguished by the elevations on the carapace and the single-pointed distal spine on the posterior margin of the cheliped carpus in the former species, and the flat carapace and double-pointed distal spine on the posterior margin of the cheliped carpus in the latter.

Habitat.—Low intertidal under rocks; subtidal on dead coral, under rocks, or on the base of living corals to a depth of 11 m.

Distribution.—Widespread Indo-Pacific (summarized by Haig 1983:284).

Petrolisthes pubescens Stimpson

Fig. 2

Petrolisthes pubescens Stimpson, 1858:228 (list), 241; 1907:183, pl. 22, fig. 3.—Lewinsohn, 1969:146.—Haig, 1979:126, figs. 8–9.—Kropp et al., 1981:39 (list).

Petrolisthes tomentosus.—Ortmann, 1892:259 (key), 264; 1894:27 (key); 1897:287 (key), 288.—Grant and McCulloch, 1906:39.—Miyake, 1943:55 (key), 85, text-figs. 19–21; 1956:310.—Haig, 1964:367; 1966:47 (key).—Nakasone and Miyake, 1971:4. Not *P. tomentosus* (Dana).

?*Petrolisthes tomentosus*.—Nobili, 1906:129

(key).—Bouvier, 1915:205.—Ramadan, 1936:3 (list).—Imanaka et al., 1984:54. These authors did not provide descriptions permitting confident assignment of their specimens to either nominal species. The first three records are placed here because the authors were probably following the thought of the period. The record of Imanaka et al. (1984) is probably following the thoughts of present Japanese authors, but additional evidence that they are referring to *P. pubescens* is the size of their specimen (9.3 mm carapace length) which is much larger than any specimen I have seen of *P. tomentosus* and which is near the range I have observed for *P. pubescens*.

Not *Petrolisthes pubescens*.—Balss, 1913:30, pl. 1, fig. 2. = *P. coccineus* (Owen). Misidentification. I agree with Laurie's (1926) supposition that the figure published by Balss (pl. 1, fig. 2) is of *P. coccineus*.

Type data.—It is very probable that Stimpson's type was destroyed by the 1871 Chicago fire (Deiss and Manning 1981). However, the identity of *P. pubescens* has been well-established (Lewinsohn 1969, Haig 1979) and a neotype designation is not warranted.

Material examined.—TAIWAN: Yeh Liu Pi; 28 Jun 1978; Coll. unknown; 1 ♀, USNM 210635. San Hsien Tai; under rock; 3 m; 25 Jul 1979; 1 ♂, USNM 210576. MARIANA ISLANDS: PAGAN: Banderera Peninsula; intertidal; 11 Mar 1981; 1 ♂, 1 ♀ (OV), 2 juv. Palapala Bay; under rock; 1.5 m; 14 Mar 1981; 1 ♂, USNM 210572, 1 ♀. ANATAHAN: Observation spot; intertidal and subtidal under rocks; 0, 5–7 m; 19 Jul 1981; Coll. L. G. Eldredge, R. K. Kropp; 2 ♂, 4 ♀ (2 OV), USNM 210574 (in part). GUAM: Cabras Is.; intertidal at landward edge of bench; 18 Jun 1981; 1 ♂, 1 ♀ (OV). LUMINAO; reef front under rocks; 6 m; 8 Sep 1980; Coll. V. Tyndzik; 4 ♀ (2 OV), USNM 210573. MARQUESA ISLANDS: NUKU HIVA: Taiohae Bay; 1967; Coll. H. A.

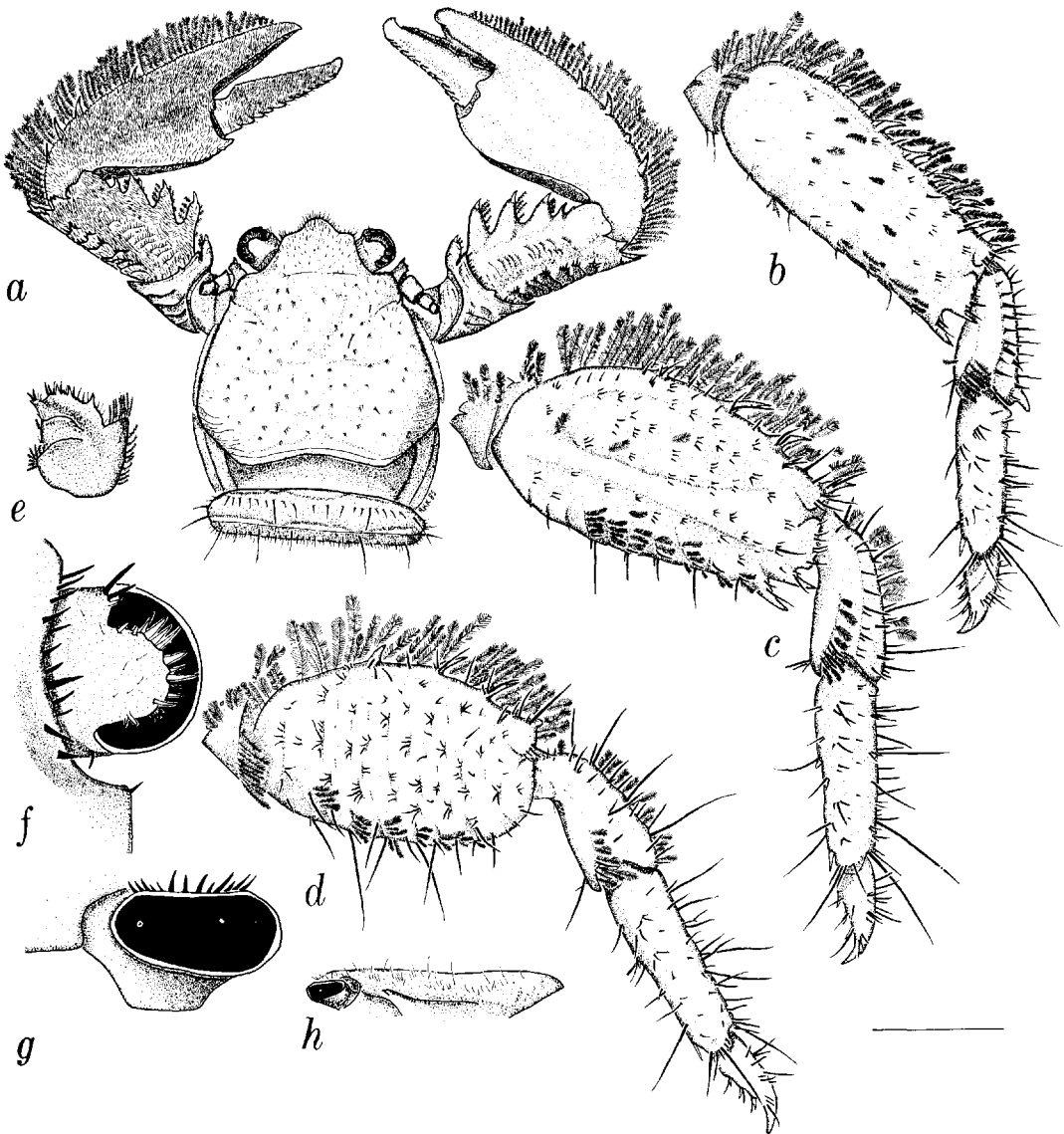


Fig. 2. *Petrolisthes pubescens* Stimpson, ♀ (USNM 210574): a, Carapace and chelipeds; b, c, d, Right walking legs 1, 2, 3; e, Right antennule base; f, Right eye (dorsal view); g, Right eye (lateral view); h, Carapace (lateral view). Scale: 4 mm (a, h); 2 mm (b–e); 1 mm (f, g). [Surface setae on carapace and right cheliped not shown.]

Rehder; 2 ♂, USNM 190769. Taiohae Bay; beach near wharf; 4 Oct 1967; Coll. B. R. Wilson; 1 ♀ (OV). Anse Haka Paa Baie du Controleur; shore of Smerres; 17 Sep 1967; Coll. B. R. Wilson; 1 ♀ (OV, with bopyrid isopod), USNM 210978.

Measurements.—Largest male—7.9 ×

7.9 mm; largest female—8.5 × 8.5 mm; smallest ovigerous female—4.2 × 4.1 mm.

Description.—Based on all material examined. Carapace: Surface smooth, flat, sparsely to thickly covered with simple setae. Frontal-gastric ridge indistinct; front indistinctly trilobate, median lobe most pro-

jecting; with slight median longitudinal concavity; margin entire, with some setae; no supraocular spine. Lateral margin cristate anteriorly, 1 epibranchial spine; rounded posteriorly, no mesobranchial spines. Epimera with scattered plumose setae.

Chelipeds: Subequal. Dorsal surface of all segments covered with pappose setae. Merus with few transverse striae on dorsal surface; posterior margin rounded, with scalloped squamae, no spine; distal margin with 1 medial, 2 posterior spines; anterior margin with spine-tipped tooth; ventral surface smooth, distal margin with 1 spine anteriorly. Carpus with dorsal surface smooth, longitudinal swelling of transverse striae; posterior margin with raised squamae, 2–3 spines, distal spine double-pointed; anterior margin with 3–4 serrated or entire, spine-tipped teeth, (having plumose setae on distal margin), and 0–2 spines; distal margin entire, incised medially, with 1 spine posterior to incision. Manus with dorsal surface divided into upper and lower portions by indistinct, longitudinal swelling; upper and lower surfaces smooth, slightly concave; lower surface with few biconical tubercles proximally, with 4–8 spines near posterior margin. Anterior margin cristate, with squamae distally; posterior margin serrated, with fringe of plumose setae along entire length. Dactylus with prominent medial swelling on dorsal surface; upper margin with raised squamae; occlusal surfaces finely serrated; gape with cover of setae.

Walking legs: Merus with dorsal surface smooth, simple setae posteriorly; anterior margin with fringe of plumose setae, margin of leg 1 with 4–5 spines, leg 2 with 3–5 spines, leg 3 with 3–4 spines; posterodistal spines 1–2, 1–2, 0. Carpus with scattered simple setae, leg 1 with, legs 2, 3 without anterodistal spine. Propodus with scattered simple setae; posterior surface with 2 movable spinules (1 medial, 1 subdistal), distal margin with 2 laterally-placed movable spinules. Dactylus with scattered simple setae; posterior margin with 3 movable spinules.

Ocular peduncle: Dorsal extension onto cornea oval, lined with stout simple setae; cornea slightly flattened in lateral view.

Antennules: Basal segment with few transverse striae on outer surface; anterior margin irregularly spinose.

Third maxillipeds: Ischium with transverse striae; without rows of setae.

Remarks.—The specimens from Taiwan agree well with Stimpson's (1858, 1907) description and figure except that they have fewer spines on the posterior margin of the manus. The Marianas and Marquesas specimens differ from the Taiwan material by having three more regularly-shaped teeth and only one spine on the anterior margin of the cheliped carpus.

Comparison.—For comparison see this section under *P. tomentosus*.

Habitat.—Low intertidal or subtidal under rocks.

Distribution.—Previously known from the Indian Ocean and the extreme western Pacific (Haig 1979), now known as far east as the Marquesa Islands.

Petrolisthes heterochrous, new species

Fig. 3

Petrolisthes n. sp. 3.—Kropp et al., 1981:39 (list).

Holotype.—GUAM: Agana Bay; reef front on dead coral; 10 m; 11 Sep 1984; Coll. J. H. Dominguez; ♂ (3.1 mm × 2.9 mm) USNM 222529.

Paratypes.—GUAM: same collection as holotype; 1 ♂ (2.6 mm × 2.4 mm), 1 ♀ (OV) (3.3 mm × 3.2 mm); USNM 222530. Tanguisson Pt., reef front on dead coral; 11–12 m; 25 May 1984; 1 ♂ (3.0 mm × 2.9 mm), 1 ♀ (OV) (3.6 mm × 3.6 mm); AHF 841; 1 ♂ (2.9 mm × 2.6 mm), 1 ♀ (OV) (3.2 mm × 3.2 mm); BPBM S10460. Tanguisson Pt.; reef front on dead branching coral; 18 m; 7 Feb 1984; 1 ♂ (3.0 mm × 2.7 mm), 1 ♀ (2.8 mm × 2.6 mm); USNM 222552.

Other material examined.—GUGUAN: "Western Bay"; reef front on base of *Po-*

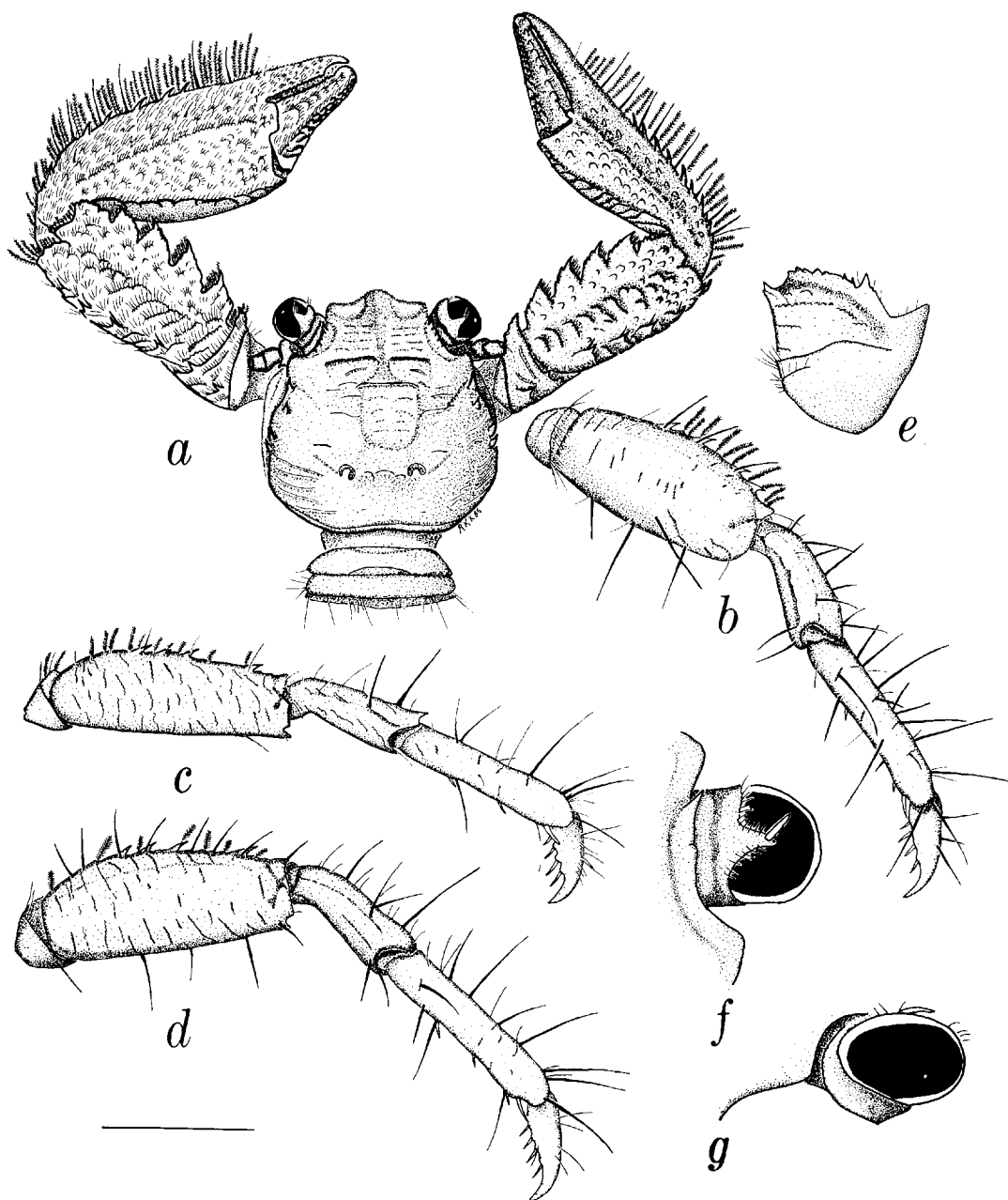


Fig. 3. *Petrolisthes heterochrous*, new species, holotype ♂ (a, f, g), ♂ paratype, USNM 222530 (b–e): a, Carapace and chelipeds; b, c, d, Right walking legs 1, 2, 3; e, Right antennule base; f, Right eye (dorsal view), g, Right eye (lateral view). Scale: 2 mm (a); 1.2 mm (b–d); 1 mm (e–g). [Surface setae on carapace and right cheliped not shown.]

cillopora sp.; 10 m; 2 Jan 1975; Coll. unknown; 1 ♂, 2 ♀ (OV). SAIPAN: Tanapag Barrier Reef; reef front on dead coral; 6 m; 20 Nov 1980; 4 ♂, 5 ♀ (3 OV). Tanapag Lagoon; from base of *Stylophora mordax*; 3 m; 19 Nov 1980; 1 ♀ (OV). GUAM: Adelpup Pt.; reef front on articulated coralline algae; 11 m; 22 Nov 1979; 1 ♂, 1 ♀. Calalan Bank; reef front on dead branching coral; 10 m; 16 Oct 1984; 1 ♀ (OV), 2 juv. Pago Bay; reef front on dead coral; 20, 23 m; 17 Sep 1980, 28 Feb 1984; 3 ♂, 2 ♀. All collected by the author unless stated otherwise.

Holotype description.—Carapace: Surface with fine, beaded transverse rugae; relatively flat; rugae lined with setae, most evident on posterolateral and gastric regions. Frontal-gastric ridge distinct, front trilobate, median lobe most projecting; surface concave; margin finely denticulate, no setae; supraocular spine present. Lateral margin cristate anteriorly, 2 epibranchial spines present; rounded posteriorly, 2 mesobranchial spines. Epimera with few scattered, plumose setae.

Chelipeds: Slightly unequal. Merus with dorsal surface transversely striated; posterior margin rounded, with 1 subproximal, distal margin with 0–1 medial, 1 posterior spine; anterior margin with spine-tipped tooth. Merus with ventral surface transversely striated; distal margin with 2–3 spines anteriorly. Carpus with dorsal surface bearing distinct longitudinal ridge of raised, scalloped squamae along midline, without obvious setation; posterior, anterior surfaces with smaller, scalloped squamae; posterior margin with raised squamae, and 4 spines (paratypes with 4–7 spines), distal spine double-pointed; anterior margin with 4 serrate, spine-tipped teeth having plumose setae on distal margin; distal margin roundly serrated, incised medially, without posterior spine. Manus with dorsal surface divided into upper and lower portions by longitudinal row of scalloped squamae placed end-to-end; upper surface with raised, scalloped tubercles, slightly convex; lower

surface with irregularly-placed conical tubercles of varying size, slightly convex, row of 7–9 spines near posterior margin (paratypes with 7–10 spines). Anterior margin of manus with row of raised scalloped squamae, and distal spine; posterior margin serrated, with fringe of plumose, scattered simple setae extending from carpal joint to beginning or middle of immovable finger. Dactylus with dorsal raised, serrated squamae; upper margin with row of overlapping, scalloped squamae; occlusal surfaces finely serrated; gape without setae.

Walking legs: Merus with few transverse striae on dorsal surface, and scattered simple setae; anterior margin with few scattered plumose, simple setae; margin of legs 1, 2 with 5 spines (paratypes, leg 1 with 3–6, leg 2 with 3–5 spines), leg 3 with 4 spines (paratypes with 3–4 spines); posterodistal spines 1-1-0. Carpus with few scattered simple setae; carpus of leg 1 only with anterodistal spine. Propodus with scattered simple setae; posterior surface of legs 1, 2 with 3 movable spinules, leg 3 with 2 movable spinules; distal margins of all legs with 1 laterally-placed movable spinule. Dactylus with scattered simple setae; posterior margin with 4 movable spinules.

Ocular peduncle: Dorsal extension onto cornea triangular, with 1 simple seta distally; cornea round in lateral view.

Antennules: Basal segment with few transverse striae on outer surface; anterior margin irregularly denticulate.

Third maxillipeds: Ischium with transverse beaded rugae, each lined with stout simple setae on free margin.

Variations.—Among the non-paratype material examined, I have observed the following variations from the holotype. There may be three spines on the mesobranchial region of the carapace. The anterior margin of the cheliped carpus may have five teeth and the posterior margin four spines. The outer margin of the manus may have as few as six spines.

Color alive.—Color extremely variable.

One extreme, carapace almost uniform red-purple with 2 white spots at mesobranchial spines; sometimes reddish with scattered orange patches, with transverse white, orange band on rostrum. Other extreme, carapace light tan with mottled pattern of blue-green, tan-orange. Penultimate segment of third maxilliped palp of all specimens with series of longitudinal red-purple lines. Both extremes, as well as many intermediate patterns, occur within the same collection.

Comparison.—Among Indo-Pacific species of *Petrolisthes*, *P. heterochrous* is most similar to *P. militaris* (Heller) and *P. scabriculus* (Dana). All have a transversely rugose carapace, two epibranchial spines, and marginal mesobranchial spines. The new species can be distinguished from the other two by its trilobate front and distinct longitudinal ridge of raised squamae on the cheliped carpus. *Petrolisthes militaris* and *P. scabriculus* each have a triangular front and no ridge on the cheliped carpus. Neither of the latter species occurs in the Mariana Islands.

Etymology.—From the Greek “heterochrous,” meaning “of different colors,” a noun in apposition, referring to the variety of color patterns among the specimens of this species.

Habitat.—Subtidal to a depth of 23 m, occurring in crevices in dead coral rubble, dead branching coral, and on the base of living coral.

Distribution.—Known only from the Mariana Islands.

Discussion

During this study I observed and used characters not previously used in systematic studies of porcellanids. These characters were the shape of the dorsal extension of the ocular peduncle onto the cornea, the setae found on this extension, and the shape of the cornea in lateral view. The three species discussed here can be distinguished by these three characters, in combination with others. These characters may also be

useful in distinguishing among other species of porcelain crabs.

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