



Fig. 6. *Petrolisthes eldredgei*, new species. (Holotype. Enewetak Atoll, Marshall islands, coll. C. A. Child.) Scale in millimeters.

surface with transverse rugae, inner margin distinctly crenulate. Palm with low, submedian longitudinal ridge, latter frequently with row of prominent, strongly projecting tubercles; surface on both sides of this ridge with small, widely separated, raised granules, latter also occurring on fixed finger; outer margin, including that of fixed finger, strongly crenulate; surface of dactyl with row of raised or flattened imbricated tubercles, these beaded on their distal edge; smaller, raised granules to inside of this row and deep, smooth, longitudinal groove to outside, latter defined on its outer side by double row of marginal granules; ventral surface of chela with prominent oblique rugae, these strongly beaded on their free (distal) edge. Dorsal surface of chelipeds with very short, fine pubescence, this developed into short tufts of plumose setae on margins of merus and carpus. Gape of fingers frequently with trace of pubescence.

All walking legs with merus transversely rugose on outer surface, that of leg 1 with four to six spines on anterior margin, two posterodistal spines, inner surface with strong spine on distal fourth of posterior margin, this sometimes lacking in small specimens; carpus with anterodistal spine; propodus with three movable spinules on posterior margin in addition to distal pair; dactyl with three movable spinules on posterior margin. Merus of leg 2 with three to five spines on anterior margin, posterodistal angle with two or three spines; carpus with anterodistal spine; propodus and dactyl armed as in leg 1. Merus of leg

3 with two or three spines on anterior margin, posterodistal angle unarmed or with one or two small spines; carpus usually unarmed anterodistally, rarely with very small spine; propodus and dactyl armed as in leg 1. Setation: Meri and carpi with dense fringe of short plumose setae on anterior margin, these setae concealing spines, and with tufts of long, non-plumose setae on outer surface and posterior margin; propodi and dactyli with long, non-plumose setae on margins and outer surface.

Abdomen rugose; striae of dorsally visible articles densely setose, and all articles with fringe of long setae on outer margins. Telson with seven plates.

VARIATIONS: In occasional individuals the orbital margin is armed with a minute spinule, but never with a distinct supraocular spine as in *Petrolisthes decacanthus*. Rarely, in large specimens, the subdistal spine on the inner posterior margin of the merus of walking leg 1 is missing or obsolescent.

HOLOTYPE: ♂ (CL 10.1 mm), USNM 216664; Enewetak Id., Enewetak Atoll, Marshall Islands; 10 Oct. 1969; C. A. Child, Enewetak Atoll Diving Expedition (Sta. CAC 038-69).

PARATYPES: Mariana Islands. Guam, Luminao; reef margin on consolidated coralline algae; 29 July 1980; R. K. Kropp; 1♂, 2 juv., AHF 2098-01.—Guam, Agana Bay, shelf under Guam Memorial Hospital; Flora and Fauna class, University of Guam; 1♀, AHF 2685-01.—Guam, Piti Bay; 0 m, outer reef flat at reef margin; 3 June 1981; R. K. Kropp; 1♂, 3♀, BPBM 510625.—Guam, Pago Bay, Taogam Point; 0 m, from consolidated coralline algae at seaward edge of erosion bench; 11 Aug. and 3 Sept. 1984; R. K. Kropp; 3♂, 2♀, USNM 222555.—Guam; 1945; D. M. Johnson; 1♂, 1 juv., USNM 222328.

Marshall Islands. Enewetak Atoll, Enewetak Id.; reef; 2 Sept. 1968; A. Havens (Sta. 0902-E1); 1♂, AHF 2683-01.—Enewetak Atoll, JWK-383, 1♀, AHF 2682-01; JWK-411, 1♀, AHF 2681-01.—Enewetak Atoll, CAC 038-69, 2♂, 5♀, 2 juv., USNM 222325; 1♂ (illustrated specimen), USNM 222326; 1♂, 1♀, AHF 2684-01.—Likiep Atoll, Nado Id.; 1951–52; S. F. MacNeil (Sta. 827); 1♂, USNM 222327.

Society Islands. Tahiti; 1925–26; C. Crossland; 1♂, BMNH 1982:589.

Tuamotu Archipelago. Raroia Atoll, north end Ngarumaoa Id.; from holes in reef near lithothamnion ridge; 9 July 1952; J. P. E. Morrison (# 1904); 1♀, USNM 222329.

MEASUREMENTS: Males, 3.5 to 10.1 mm; non-ovigerous females, 5.3 to 9.6 mm; ovigerous females, 5.3 to 8.1 mm; juveniles, 1.9 to 3.5 mm.

LIVE COLORATION: There are two distinct color forms. Both have red and white areas on the carapace, but the overall hue of the carapace of the dark form is dark green. The chelipeds in the dark form are predominantly dark green but have some red, particularly on the tubercles and other raised areas. The chelae of the light form are mainly white with some light red on raised areas. Many variations of the two forms exist and can be found in the same habitats.

HABITAT: Found by R. K. Kropp only among the numerous crevices and crannies of the consolidated coralline algae crust at the seaward edge of erosion benches, or among similar algal structures at some other reef margins. The species occurs with two other porcellanids, *Pachycheles pisoides* (Heller) and *Petrolisthes elegans* Haig.

REMARKS: In addition to the absence of a supraocular and hepatic spine and the presence of a row of strong tubercles on the carpus of the chelipeds, this species can be

distinguished from the closely related *P. decacanthus* by details in the rugosities and granulations of the pereopods, and by the heavier setation of the walking legs.

DERIVATION OF NAME: For Dr. Lucius G. Eldredge, in recognition of his contributions to the knowledge of the marine fauna of the Indo-West Pacific.

Discussion

Petrolisthes bispinosus, *P. decacanthus*, and *P. eldredgei* inhabit coral reefs in the central and western Pacific Ocean, from French Polynesia westward to the southern Mariana Islands. The geographical distribution of *P. decacanthus* also includes the Maldive Islands and westward nearly to the east coast of Africa, but it has not yet been reported from such intervening areas as Australia, the East Indian Archipelago, and the eastern Indian Ocean. In the Pacific Ocean two, or all three, species have occasionally been collected at the same locality.

Alone among Indo-West Pacific members of genus *Petrolisthes* with transversely striate carapaces, these three species are characterized by having two epibranchial spines on each side of the carapace, in combination with unarmed mesobranchial margins and the presence of a strong spine on the inner posterior margin of the merus of the first walking leg. Thus, as a group they stand out quite distinctly from their Indo-West Pacific congeners. Their closest relatives are to be found in the New World, where another three coral reef species have strongly rugose carapaces with two epibranchial spines on each side and unarmed mesobranchials. *Petrolisthes glasselli* Haig, 1957 inhabits the eastern Pacific from Mexico to Colombia, and oceanic islands including Clipperton and the Galapagos. *P. rosariensis* Werding, 1978 and *P. columbiensis* Werding, 1983 are known only from the Caribbean coast of Colombia.

Several characters of *Petrolisthes glasselli*, *P. rosariensis* and *P. columbiensis* have recently been compared by Werding (1983: 408). However, he did not mention the armature of the inner posterior margin of the merus of walking leg 1. An examination of material of *P. glasselli* in the collections of the Allan Hancock Foundation showed that, unlike the three related Indo-West Pacific species, it lacks a spine in this position. Of eight type specimens of *P. rosariensis* in the AHF collections which were examined for this character, two have a strong spine, three a very small or obsolescent spine, and the rest none. We have not been able to examine material of *P. columbiensis*.

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APPENDIX

Collecting data from Enewetak Atoll, Marshall Islands

CAC.—Collections of C. Allan Child, Enewetak Diving Expedition.

021-69. Enewetak Id., outer reef rim and surge channels along northern 1/3 of island; 2-3 ft., lithothamnion reef flat and ridge; 27 Sept. 1969; C. A. Dawson and C. A. Child. *Petrolisthes bispinosus*, *P. decacanthus*.

038-69. Enewetak Id., ocean side, surge channel and blow hole about 20 ft. back from outer reef edge, ca. 200 ft. north of runway and 100 ft. out from beach; 0-2 ft. at blow hole; 10 Oct. 1969; C. A. Child. The whole small surge channel was poisoned and the results were carried up by incoming tide to rear of channel and out through blow hole onto reef flat to be scooped up. *Petrolisthes bispinosus*, *P. decacanthus*, *P. eldredgei*.

JWK.—Collections of Jens W. Knudsen.

56. Enewetak Id., north end, seaward reef flat; crabs from under rocks and/or dead and live coral; 16 Mar. 1965; J. W. Knudsen. *Petrolisthes bispinosus*.

196. Enewetak Id. on outer reef, study site between Enewetak and Bokandretok [Sand] Islands; specimens from live and dead encrusted *Pocillopora elegans* removed from inside of algal ridge; 14 Aug. 1966; J. W. Knudsen. *Petrolisthes bispinosus*.

333. Bokandretok [Sand] Id., study site; collections made on algal ridge by cracking overgrown encrusting corals which harbored many crabs in the numerous larger burrows; 22 July 1967; J. W. Knudsen. *Petrolisthes bispinosus*.

383. Enewetak Id., study site; crabs from dead and algal encrusted coral on the algal ridge; 4 Aug. 1967; J. W. Knudsen. *Petrolisthes eldredgei*.

396. Enewetak Id., study site; crabs removed at random along the entire algal ridge; 5 Aug. 1967; J. W. Knudsen. *Petrolisthes bispinosus*, *P. decacanthus*.

407. Mui [Buganegan] Id., west end, seaward reef; crabs cracked from corals; 8 Aug. 1967; Tim Smith. *Petrolisthes bispinosus*.

411. Engebi Id., algal ridge; crabs from corals; 9 Aug. 1967; J. W. Knudsen. *Petrolisthes eldredgei*.

615. Muti [Japtan] Id.; random collecting on the algal ridge north of island; 28 Aug. 1968; J. W. Knudsen. *Petrolisthes bispinosus*.

Petrolisthes bispinosus