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**THE SHALLOW WATER ANOMURAN CRAB FAUNA  
OF SOUTHWESTERN BAJA CALIFORNIA, MEXICO**

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AND THOMAS B. SCANLAND**

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# THE SHALLOW WATER ANOMURAN CRAB FAUNA OF SOUTHWESTERN BAJA CALIFORNIA, MEXICO

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ABSTRACT. — Thirty-five species of anomuran crabs are reported from the 1964 "Mag Bay" Expedition, 19 of which are new records for the outer coast of southern Baja California, Mexico. A checklist and keys are appended for the 52 species of Anomura now known to inhabit this area.

RESUMEN. — Durante la Expedición "Mag Bay" en 1964, se observaron treinta y cinco especies de cangrejos anomuros, diez y nueve de ellas encontradas por primera vez, en las costas occidentales de la zona meridional de Baja California, México. Se incluye una lista y las claves correspondientes para las 52 especies de Anomuros observados hasta la fecha en aquellas regiones.

The purpose of the "Mag Bay" Expedition of 1964 was to study the maritime biota along the coast of Baja California, Mexico, from Punta San Eugenio (Punta Eugenia) to the lower entrance of Bahía Magdalena (Figs. 1, 2). Dr. Carl L. Hubbs, Scripps Institution of Oceanography, was the originator and leader of the expedition, which was supported by the Office of Naval Research. The scientific party was divided into three teams: Team 1, aboard the R/V HORIZON, was responsible for sampling in deep water; Team 2, in small craft, worked in the mangrove-estuarine environment; Team 3, aboard the Scripps vessel T-441, was responsible for "on site" fish poisonings, invertebrate and algal collecting, and otter trawling along the 20- and 40 m depth contours in the area of study.

Two of the authors (TSH and TBS) were members of Team 2, where SCUBA was used in depths of one to 30 meters. A concerted effort was made to collect decapod crustaceans and echinoderms, as well as fish. The specimens were returned to the T-441, where they were kept alive until color notes and tentative identifications could be recorded. At the conclusion of the cruise, the anomuran crabs were forwarded to the Allan Hancock Foundation for study by the senior author (JH).

Thirty-five species of Anomura were collected, of which 19 constitute new records for the outer coast of southern Baja California (Punta San Eugenio and southward) within the 40 m contour. A checklist and keys to all species known to fall within these geographical and bathymetrical limits are appended.

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## HISTORICAL RESUME

The following anomuran crabs are presently known from the region under consideration: *Munida mexicana* (Benedict, 1902), *Dardanus sinistripes* (Rathbun, 1910), *Pleuroncodes planipes*, and *Emerita analoga* (Schmitt, 1921). In addition, Glassell (1936) reported on several porcellanids which he collected at Bahía Magdalena. These included *Petrolisthes hirtipes* (Lockington), and the new species *Orthochela pumila*, *Pisosoma erosa* (= *Megalobrachium erosum*), and *Porcellana magdalenensis* (= *Pisidia magdalenensis*). He also treated the porcellanid and hermit crabs from the Templeton Crocker Expedition of

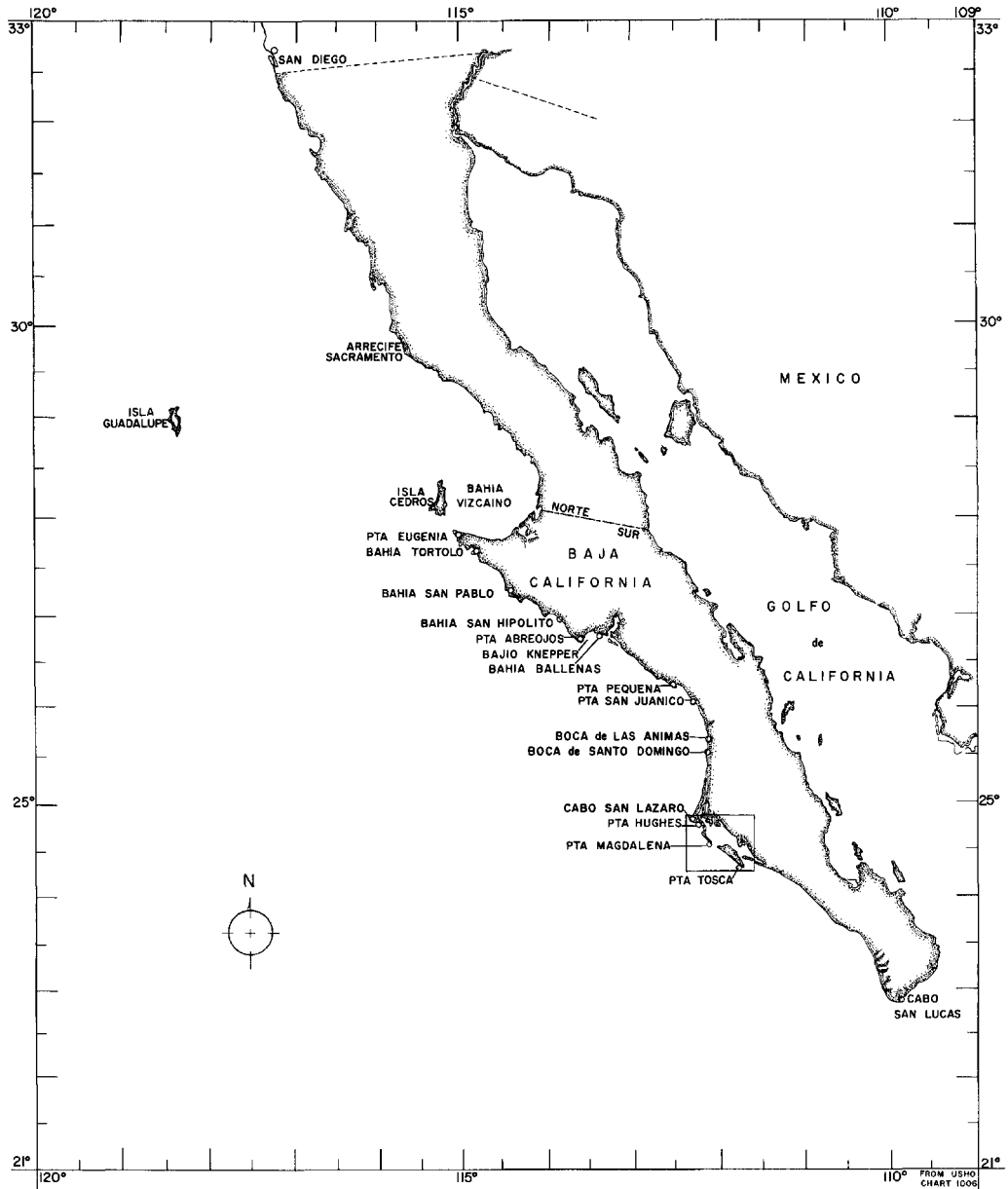


Figure 1. Map of Baja California, Mexico. Area delimited by the box on the western side of the peninsula is shown enlarged in figure 2.

1936 (Glassell, 1937a, 1937b). However, only one species comes within the scope of the present work, *Paguristes bakeri* Holmes, which was collected off Isla Cedros (Glassell, 1937b.) Schmitt (1939) listed "*Paguristes* species" from Bahía Magdalena, a form still awaiting description. To the known fauna Haig (1960) added 16 species of Porcellanidae.

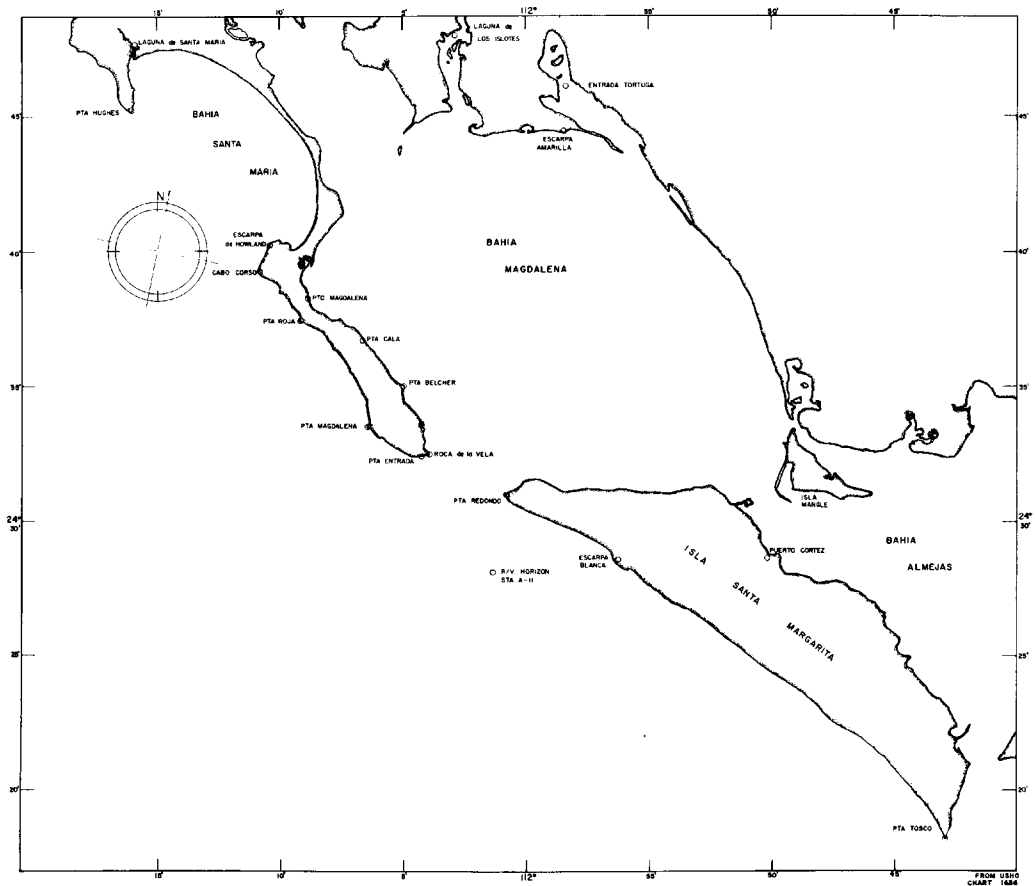


Figure 2. Map of Bahia Magdalena region, Baja California, Mexico.

The presence of 19 additional species in this fauna, and the larger number of new records, attests to the effectiveness of SCUBA in an area already well surveyed by dredging and intertidal collecting.

## ANNOTATED SPECIES LIST

### Family COENOBITIDAE

#### *Coenobita compressus* H. Milne Edwards

*Coenobita compressa* H. Milne Edwards, 1837: 241.

*Coenobita compressus*: Boone, 1931: 145, text-fig. 3; Holthuis, 1954: 16, text-figs. 4a-b.

Recorded Range. — Santa Rosalía, Golfo de California, to Estrecho de Magallanes. Islas Revillagigedo; Isla del Coco; Archipiélago de Galápagos.

Material. — Punta Belcher; above high tide at night; 2 Feb. 1964; 1♂, 2♀.

Remarks. — Glassell (1937b: 242-243) stated: "For the most part these terrestrial hermit crabs inhabit the land bordering on the sea. They select heavy shells for their abode. They are, in the main, vegetarians, though they do not limit their diet and may at times act as scavengers, or become carnivorous . . . In addition they are good tree climbers."

On Punta Belcher we observed that these animals are nocturnal. A search for their homesites was fruitless, although the crabs "appeared" within 17m of the camp just after dark, and could not be found after daybreak. Probably they had remained inactive in their shells along the upper tide marks during the day, and thus went unnoticed.

Six to 10 individuals were observed feeding on dead or molted *Pleuroncodes planipes* which formed windrows on the beach.

The range of this species is extended to the outer Baja California coast, and 300 km north along the outer coast.

#### Family DIOGENIDAE

##### *Dardanus sinistripes* (Stimpson)

*Pagurus sinistripes* Stimpson, 1858: 223 (*nom. nud.*); 1859: 82.

*Dardanus sinistripes*: Glassell, 1937b: 251.

Recorded Range. — Bahía Magdalena (Rathbun, 1910) and Isla Tiburón, Golfo de California, to Bahía de Sechura, Perú.

Material. — Off Boca de Santo Domingo; otter trawl; 40 m; 27 Jan. 1964; 1♀. Laguna de Santa Maria; 1.2 m; 29 Jan. 1964; 1♂.

Color. — "In alcohol, the carapace is buff with red markings. The chelipeds, purple and red, with the interior margins of the meri white; the teeth of the fingers white, bordered with yellow. The ambulatory legs are purple, their dactyli with dark brown setae, their meri and carpi blotched on a light ground with red" (Glassell, 1937b). There are two narrow, dark bands, one median and the other proximal, on the eyestalk.

##### *Calcinus californiensis* Bouvier

*Calcinus californiensis* Bouvier, 1898: 380; Glassell, 1937b: 252.

*Calcinus californiensis*: Chace, 1962: 627, text-figs. 5-6.

Recorded Range. — Isla San José, Golfo de California, to Acapulco, México. Isla Clipperton.

Material. — Punta Cala; 3 m; 31 Jan. 1964; 2♂, 1♀.

Roca de la Vela; 6 m; 1 Feb. 1964; 2♀. Inside Punta Tosca, in lagoon; 5 m; 4 Feb. 1964; 5♂, 2♀.

Color. — The coloration of this and allied species, in both live and preserved material, was discussed in some detail by Chace (1962: 628). A broad white band at the base of the cornea and the solid dark color of the dactyls of the walking legs unmistakably identify the above specimens as *Calcinus californiensis*.

Remarks. — The range of this species is extended to the outer Baja California coast, and 300 km north.

##### *Aniculus elegans* Stimpson

*Aniculus elegans* Stimpson, 1858: 234 (*nom. nud.*); 1859: 83; Boone, 1931: 140, text-fig. 1.

Recorded Range. — Golfo de California (exact locality not stated) to Cabo de San Francisco, Ecuador.

Material. — Outside Bahía Magdalena; 18 m; 1 Feb. 1964; 1 juv. Inside Punta Tosca, in lagoon; 5 m; 4 Feb. 1964; 1♀. Off Punta Redonda; 15 m; 5 Feb. 1964; 6♂, 5♀.

Color. — Carapace red, with a pink area on the posterior part of the shield. Eyestalks tan. Chelipeds pink, with red on the fingers and on the distal half of the chelae. Dactyls of walking legs dark red; other segments pink. A broad, submedian red band on the propodus, a submedian red blotch on the anterior margin of the carpus, and a smaller median blotch on the anterior margin of the merus.

Remarks. — Off Punta Redonda these hermits occurred under rocks in aggregates of

five or more. *Porcellana paguriconviva* Glassell were found in the shells of specimens collected at the same locality, an association that has not been recorded previously.

The range of this species is extended to the outer Baja California coast, and 300 km north.

*Trizopagurus magnificus* (Bouvier)

*Clibanarius magnificus* Bouvier, 1898: 378.

*Clibanarius chetyrkini* Boone, 1932: 29, text-fig. 8.

*Trizopagurus magnificus*: Forest, 1952: 4, 12, text-figs. 2, 11, 18.

Recorded Range. — Golfo de California (exact locality not stated) to Isla de la Plata, Ecuador. Archipiélago de Galápagos.

Material. — Roca de la Vela; 6 m; 1 Feb. 1964; 1 ♀. Off Punta Redonda; 15 m; 5 Feb. 1964; 1 ♀.

Color. — The species may be readily identified by the large, irregular pale blotches on a dark background which cover the carapace shield, eyestalks, chelipeds, and walking legs.

Remarks. — The range of this species is extended to the outer Baja California coast, and 300 km north.

*Clibanarius panamensis* Stimpson

*Clibanarius panamensis* Stimpson, 1858:235 (*nom nud.*); 1859: 84; Holthuis, 1954: 23, text-figs. 7-8.

Recorded Range. — Santa Rosalía, Golfo de California, to Isla de la Correa, Perú.

Material. — Laguna de Santa María; in +1 m and out of water; 29 Jan. 1964; 8♂, 1♀.

Color. — Hermits of this species may be recognized immediately by the color pattern of the walking legs, which consists of longitudinal dark and light stripes, subequal in width, on each segment.

Remarks. — The range of this species is extended to the outer Baja California coast, and 300 km north.

*Isocheles pilosus* (Holmes)

*Holopagurus pilosus* Holmes, 1900: 154; Schmitt, 1921: 127, pl. 17 fig. 2; Ricketts and Calvin, 1939: 189, pl. 39 fig. 2.

*Isocheles pilosus*: Forest, 1964: 294.

Recorded Range. — Off San Francisco Bay, California, to Estero de Punta Banda, outer Baja California.

Material. — Punta Abreojos, Bahía de Ballenas; +.7 m while wading; 29 Jan. 1964; 1 . 2.5 miles west of Boca de Santo Domingo; 16' otter trawl; 14-20 m; 26 Jan. 1964; 1♂. Outside Punta Hughes; 20 m; 30 Jan. 1964; 1♀ (juv.). Punta Pequeña, Bahía de San Juanico; 3 m; 8 Feb. 1964; 1♂, 1 juv.

Remarks. — Identification of the above specimens with *Isocheles pilosus* is tentative, pending a revision of genus *Isocheles* by J. Forest of the Muséum National d'Histoire Naturelle, Paris. Some of the material may belong to *I. pacificus* Bouvier (see Forest, 1964: 291, text-fig. 11). Neither *I. pilosus* nor *I. pacificus* has heretofore been reported from the outer coast of southern Baja California, and the range is extended 850 km south.

*Paguristes bakeri* Holmes

*Paguristes bakeri* Holmes, 1900: 152; Schmitt, 1921: 122, 124, pl. 18 figs. 2, 6; Glassell, 1937b: 243, 244.

*Paguristes holmesi* Glassell, 1937b: 243, 247.

Recorded Range. — Outside San Francisco Bay, California, southward along the California and outer Baja California coast (Glassell, 1937b; Parker, 1964), and in Golfo de California as far north as Punta Baja.

Material. — HORIZON Sta. A-11, 8 miles west of Punta Redonda; Isaacs-Kidd

midwater trawl, scraped on sand bottom; 106-116 m; 29 Jan. 1964; 1 juv.

Remarks. — Studies now in progress by JH indicate that *Paguristes holmesi* is a synonym of *P. bakeri* Holmes. *Paguristes bakeri* has been recovered from shallow water (generally in the northern half of its range), but it occurs more commonly in over 40 m and has been reported from depths as great as 232 m.

*Paguristes ulreyi* Schmitt

*Paguristes ulreyi* Schmitt, 1921: 123, 125, pl. 18 figs. 3-5, 7.

*Paguristes occator* Glassell, 1937b: 243, 244.

Recorded Range. — Monterey Bay, California, southward along the California and outer Baja California coast, and in Golfo de California as far north as Punta Gorda.

Material. — Bajío Knepper, Punta Abrejos; 17-20 m; 9 Feb. 1964; 1 ♀ ovig. Bahía de San Hipólito; 10-13 m; 9 Feb. 1964; 5 ♂, 3 ♀ ovig., 1 juv. Without data; 1 ♂, 2 ♀ (1 ovig.), 2 juv.

Remarks. — Examination of specimens in the collections of the Allan Hancock Foundation indicates that this species is not uncommon in the southernmost part of Golfo de California, where it occurs in deeper water than it does in higher latitudes. *Paguristes occator* Glassell seems to be a synonym.

*Paguristes parvus* Holmes

*Paguristes parvus* Holmes, 1900: 151, pl. 2 fig. 26; Schmitt, 1921: 123, 124, pl. 17 fig. 1, text-fig. 83.

Recorded Range. — Known only from White's Point near San Pedro, California.

Material. — Arrecife Sacramento; 13 m, from kelp holdfast; 25 Jan. 1964; 1 ♂.

Remarks. — On the basis of the above specimen, the range of *Paguristes parvus* is extended southward 550 km.

*Paguristes anahuacus* Glassell

*Paguristes anahuacus* Glassell, 1938: 421.

Recorded Range. — Reported only from Punta Peñasco, Golfo de California.

Material. — Outside Punta Hughes; 20 m; 30 Jan. 1964; 1 ♂. Roca de la Vela; 6 m; 1 Feb. 1964; 1 ♂, 1 ♀. Outside Isla Santa Margarita, west of Punta Tosca; 21-25 m; 3 Feb. 1964; 1 ♀. Off Punta Redonda; 15 m; 5 Feb. 1964; 1 ♂, 1 ♀. Bajío Knepper, Punta Abrejos; 16-20 m; 9 Feb. 1964; 11 ♀. Without data; 3 ♀ ovig.

Color. — Carapace shield with a broad median longitudinal orange stripe on anterior half; orange blotches on median portion of lateral margins. Proximal half of eyestalk orange; distal half bright purple, with a narrow white band at base of cornea. Antennal and antennular flagella purple. Pereiopods orange.

Remarks. — Punta Peñasco is 1000 km north of Cabo San Lucas on the mainland side of the Gulf. The range of this species is further extended to the outer coast of Baja California, and 550 km north.

*Paguristes praedator* Glassell

*Paguristes praedator* Glassell, 1937b: 243, 245.

Recorded Range. — Golfo de California, from Bahía de Santa Inés and Isla Tiburón south to Isla Isabel.

Material. — Off Boca de Santo Domingo; 16' otter trawl; 40 m; 27 Jan. 1964; 1 juv.

Remarks. — Examination of a long series of specimens in the collections of the Allan Hancock Foundation shows that this species occurs infrequently within the 40 m line; it has been most often dredged in 60 m or deeper. The range is extended to the outer Baja California coast, and 350 km north.

*Paguristes*, undescribed species

*Paguristes* species, Schmitt, 1939: 9.

Material. — Off Boca de las Ánimas; 16' otter trawl; 40 m; 27 Jan. 1964; 1♂ (juv.). Off Boca de Santo Domingo; 16' otter trawl; 40 m; 27 Jan. 1964; 2♂ (1 juv.).

Color. — Carpus of chelipeds red; chelae white with red blotches, which merge to form a transverse band about midway along each finger. Walking legs white; propodus and dactyl each with a proximal and subdistal red ring.

Remarks. — This species, which will be described and illustrated in a future report, appears to be abundant on the outer Baja California coast. The ovigerous female noted by Schmitt (1939) was collected by the HOUSTON (Presidential Cruise of 1938) in Bahía Magdalena between Punta Belcher and the anchorage, in 20-30 m.

## Family PAGURIDAE

*Pagurus smithi* (Benedict)

*Eupagurus smithi* Benedict, 1892: 4.

*Pagurus smithi*: Glassell, 1937b: 256, 259.

Recorded Range. — Golfo de California, from Estero de Tasiota to Punta Piaxtla on the east side (Parker, 1964) and from Bahía de Santa Ines to Bahía de la Paz on the Baja California peninsula.

Material. — Off Boca de Santo Domingo; 16' otter trawl; 40 m; 27 Jan. 1964; 2 juv.

Remarks. — This species is well represented in the collections of the Allan Hancock Foundation from depths greater than 40 m; it seems to occur rarely within the 40 m contour. The range is extended 150 km south to the outer Baja California coast, 350 km north along the outer coast.

*Pagurus*, undescribed species (1)

Material. — Off Boca de las Animas; 16' otter trawl; 20 and 40 m; 27 Jan. 1964; 2♂, 2♀ ovig., 3 juv.

Remarks. — This small species, represented by considerable material in the collections of the Allan Hancock Foundation, will be described elsewhere. It belongs to the group of *Pagurus* species having multispinulate eyescales.

*Pagurus lepidus* (Bouvier)

*Eupagurus lepidus* Bouvier, 1898: 381.

*Pagurus lepidus*: Glassell, 1937b: 256.

?*Pagurus lepidus*: Chace, 1962: 623, text-fig. 2.

Recorded Range. — Golfo de California, from Puerto Peñasco to El Mogote. ?Isla Clipperton.

Material. — Off Boca de Santo Domingo; 16' otter trawl; 40 m; 27 Jan. 1964; 1♂, 1♀ ovig. Outside Punta Hughes; 20 m; 30 Jan. 1964; 4♂, 1♀ ovig. Punta Cala; 3 m; 31 Jan. 1964; 1 juv. Outside Bahía Magdalena; 20 m; 1 Feb. 1964; 2♂. Isla Santa Margarita; 16' otter trawl; 20 m; 4 Feb. 1964; 1♂, 1♀. Punta Redonda; 15 m; 5 Feb. 1964; 1♂. Punta Pequeña, Bahía de San Juanico; 3 m; 8 Feb. 1964; 2♂, 1♀. Bahía de San Hipolito; 10-13 m; 9 Feb. 1964; 3♂, 2♀ (1 ovig.). Bajío Knepper, Punta Abreojos; 16-20 m; 9 Feb. 1964; 7♂, 6♀ (3 ovig.), 1 juv.

Color. — Most of the specimens showed a color pattern on the walking legs like that in Chace's illustration (1962, text-fig. 2). In a few individuals the longitudinal stripes were less well developed, and pigment was concentrated at the proximal end of the dactyl to form a narrow ring. Current studies by JH show that there is a series of eastern Pacific *Pagurus* species closely allied to *P. lepidus* and probably confused under that name; this



problem, as it concerns the "Mag Bay" material, will be discussed elsewhere.

Remarks. — The range of this species is extended to the outer Baja California coast and 550 km north.

*Pagurus galapagensis* (Boone), new combination

*Nympagurus galapagensis* Boone, 1932: 17, text-fig. 5.

Recorded Range. — Known only from Bahía de Gardner, Isla Hood (or Espanola), Archipiélago de Galápagos.

Material. — Roca de la Vela; 6 m; 1 Feb. 1964; 1♂, 1♀.

Color. — Hand under dense tomentum pale orange, with tubercles of darker orange; fingers white with an intense orange spot at tip of each. Walking legs with longitudinal orange stripes, overlying a broad median orange ring on carpus and propodus and two rings on dactyl.

Remarks. — Studies currently in progress by JH indicate that this species occurs throughout the Panamic faunal province. Examination of the holotype (Cat. No. 12238 in the American Museum of Natural History, New York) showed that it falls within *Pagurus* as that genus is currently (although too broadly) defined. Its affinities are with a natural group of *Pagurus* species recently discussed and designated as "groupe *miamensis*" (Forest and Saint Laurent, 1968: 116).

*Pagurus*, undescribed species (2)

Material. — HORIZON Sta. A-11; 8 miles west of Punta Redonda; Issacs-Kidd midwater trawl scraped on sand bottom; 106-116 m; 29 Jan. 1964; 2♂, 2♀ (1 ovig.).

Remarks. — This species has been collected on several occasions around the southern part of the Baja California peninsula, never in less than 104 m. It will be described in a future report.

*Pylopagurus californiensis* (Benedict), new combination

*Eupagurus californiensis* Benedict, 1892: 21; Faxon, 1895: 55, pl. 11 figs. 2, 2a-f.

*Pagurus californiensis*: Glassell, 1937b: 256, 257.

Recorded Range. — Santa Catalina Island, California, and Cabo Tepoca, Golfo de California, to Darién, Panamá. Isla del Coco; Archipiélago de Galápagos.

Material. — Outside Bahía Magdalena; 20 m; 1 Feb. 1964; 1♂. Without data; 1♂.

Color. — Carapace shield with longitudinal dark and light streaks anteriorly; solid color toward anterolateral margins. Eyestalks orange, with broad white ring submedially. Basal antennal article and acicle orange; acicle darker along outer edge. Manus and fingers of major cheliped with diffused orange; raised granular areas white; outer margin with alternating white and orange spots. Carpus solid dark orange except for narrow longitudinal white area along inner margin, and a few very small white spots on dorsal surface. Merus mostly orange, with small white spots. Manus of minor cheliped with a large irregular orange area on dorsal surface; a longitudinal orange stripe, not continued far onto pollex, along outer edge. Carpus with thin orange stripe along each dorsolateral margin; a broader stripe midway along both outer and inner lateral surfaces; another along ventral surface. Merus of walking legs with two longitudinal red stripes on outer surface, one on upper margin, and two on inner surface; carpus with three on outer surface, one on dorsal margin, and two on inner surface; propodus with two on outer surface, one on dorsal margin, one on ventral margin, and two on inner surface; dactyl with one each on outer surface, dorsal margin, and inner surface. With the exception of those on inner surface of merus, which are incomplete, none of these stripes are interrupted. All these stripes are imposed on broad transverse bands of white and pale orange.

Remarks. — This species, and the two that follow, have not been recognized as members of the genus *Pylopagurus* and were consequently not included in Walton's (1954) review of the eastern Pacific forms of that genus. The shape of the major chela and the presence of paired first pleopods in the female place all three species with *Pylopagurus*.

Although there are no published records of *Pylopagurus californiensis* along the outer coast of Baja California, the distribution between Santa Catalina Island and Bahía Magdalena is not interrupted; specimens from many intermediate localities are in the collections of the Allan Hancock Foundation.

*Pylopagurus venustus* (Bouvier), new combination

*Eupagurus venustus* Bouvier, 1898: 383.

Recorded Range. — Known only from Bahía de la Paz, Golfo de California.

Material. — Outside Punta Hughes; 20 m; 30 Jan. 1964; 1 ♀ ovig.

Color. — Ground color white and pale orange, with darker shades of orange-brown. Carapace pale brown, with two irregular small brown blotches anteriorly. A narrow band of pale orange on eyestalks at about level of tip of eyescales. Major chela with irregular diffused brown except on fingers and distal half of lateral expansion. A few small dots on fingers. Other segments of major cheliped with irregular blotches; darker on lateral surfaces. Minor cheliped with two broad bands on manus, one on carpus, one on hand and basal part of fingers; these bands are brown, edged in darker brown, and with an irregular, sinuous outline. Walking legs with similar, sinuous-margined bands: two on merus, a distal one on carpus, a median one on propodus, and a proximal one on dactyl. Non-banded areas white and very pale orange.

Remarks. — The characteristic broad bands with sinuous margins which decorate the walking legs unfortunately fade rapidly in alcohol; specimens can then best be distinguished from faded specimens of *Pylopagurus californiensis* by the carpus of the right cheliped, which in *P. venustus* is covered dorsally by numerous forward-directed spinules.

The range is extended 150 km south to the outer Baja California coast, and 300 km north along the outer coast.

*Pylopagurus roseus* (Benedict), new combination

*Eupagurus roseus* Benedict, 1892: 22.

Recorded Range. — The type locality was given only as "Gulf of California" by Benedict. According to the accompanying label, however, the holotype and only known specimen was collected off Bahía Adair, in the northernmost part of the Gulf, 1000 km north of Cabo San Lucas.

Material. — North of Punta Belcher; 8 m; 2 Feb. 1964; 1 ♂, 1 ♀. Punta Cala; 5 m; 6 Feb. 1964; 1 ♂, 2 ♀ ovig.

Color. — Eyestalks white, with broad orange band at about level of tips of eyescales. Chelipeds orange-brown; carpus with many small white spots. Walking legs orange-brown; merus with large white blotches; propodus and dactyl each with a broad, subdistal white ring and a distal narrower one.

Remarks. — The range is extended to the outer Baja California coast, and 300 km north.

*Pylopagurus diegensis* Scanland and Hopkins

*Pylopagurus diegensis* Scanland and Hopkins, 1969: 257, fig. 1.

Material. — Uncertain locality data; 1 ♀.

Remarks. — This species has been collected at several localities in southern California and northern Baja California.

## Family GALATHEIDAE

*Pleuroncodes planipes* Stimpson

*Pleuroncodes planipes* Stimpson, 1860: 245; Schmitt, 1921: 163, pl. 31 fig. 2.

Recorded Range. — Monterey Bay, California, and northern Golfo de California, to about 250 km south of Cabo San Lucas.

Material. — These crabs were very abundant at the surface just inside Punta Entrada and many were collected during the expedition but were not critically examined. Large windrows of either dead or molted individuals littered the beach just south of Punta Belcher and were fed on by *Coenobita compressus*.

Remarks. — *Pleuroncodes planipes* normally ranges from Baja California southward; Radovich (1961: 49-50) discussed the history of its occurrence off the California coast during periods of high ocean temperatures. Crabs of this species are pelagic, frequently occurring near the surface in swarms several miles wide, and may be washed ashore in great numbers; at other times they are not visible near the surface, but may be taken by mid-depth or bottom trawling (Radovich 1961: 50). Swarming and mass strandings on the outer coast of southern Baja California were noted by several authors, including Matthews (1932: 472), Steinbeck and Ricketts (1941: 455), and Radovich (1961: 50).

## Family PORCELLANIDAE

*Orthochela pumila* Glassell

*Orthochela pumila* Glassell, 1936: 296, pl. 21 fig. 1; Haig, 1960: 14, pl. 18 fig. 1, text-fig. 1.

Recorded Range. — Bahía Magdalena, outer Baja California, and Mazatlan, Mexico, to Bahía de Caraquez, Ecuador.

Material. — Inside Punta Hughes; 3-8 m; 29 Jan. 1964; 19♂, 21 ♀ (18 ovig.), 1 juv. Near Mexican naval establishment at Puerto Cortez, northwest end of Bahía de Almejas; 1.5 m; 5 Feb. 1964; 1 . Punta Pequeña, Bahía de San Juanico; 3 m; 9 Feb. 1964; 7♂, 6 ♀ (4 ovig.). Bahía de San Hipólito; 10-13 m; 9 Feb. 1964; 4♂, 3 ♀ ovig.

Color. — The specimens collected and described by Glassell were yellow, with red striations on the carapace and some red areas on the chelae; they were found clinging to yellow gorgonian corals. During the "Mag Bay" expedition collectors took some yellow individuals with red markings; other specimens were solid purple; blotched red and yellow; brown with white spots; and white with rust-colored spots. Each specimen perfectly matched the color of the gorgonian coral upon which it was found.

Remarks. — Several other porcellanids were found associated with *Orthochela pumila* on gorgonians. Unlike *Orthochela*, however, they are not obligatory commensals but take shelter in a variety of situations.

*Orthochela pumila* was previously collected by Glassell at Bahía Magdalena, the type locality. On the basis of specimens collected during this expedition, the range of the species is extended northward along the outer Baja California coast 300 km to Bahía de San Hipólito.

*Petrolisthes sanfelipensis* Glassell

*Petrolisthes sanfelipensis* Glassell, 1936: 281; Haig, 1960: 24, 30, pl. 20 fig. 3.

Recorded Range. — Bahía de San Juanico to Bahía Magdalena, outer Baja California (Haig, 1960); Punta Peñasco to Guaymas, Golfo de California.

Material. — Outside Punta Hughes; 20 m; 30 Jan. 1964; 1♂ (juv.). Near Mexican naval establishment at Puerto Cortez, northwest end of Bahía de Almejas; 1.5 m; 5 Feb. 1964; 1♀. Punta Pequeña, Bahía de San Juanico; 3 m; 9 Feb. 1964; 1♂ (juv.).

Remarks. — The specimen from Punta Pequeña was taken from a gorgonian. The

range of this species is now extended slightly northward in Bahía de San Juanico to Punta Pequena.

*Petrolisthes hians* Nobili

*Petrolisthes hians* Nobili, 1901: 17; Haig, 1960: 26, 121, pl. 22 fig. 3.

*Pisosoma flagraciliata* Glassell, 1937a: 82, pl. 1 fig. 2.

Recorded Range. — Bahía de Santa María, outer Baja California, and Guaymas, Golfo de California, to Bahía de Santa Elena, Ecuador. Islas Revillagigedo.

Material. — Inside Bahía Magdalena about 300 m north of Punta Belcher; 6 m; 1 Feb. 1964; 1 ovig. Inside Punta Tosca, in lagoon; 5 m; 4 Feb. 1964; 1 ♀.

Remarks. — The specimen from Punta Tosca was taken from a sponge. The only previous record for this species from the outer Baja California coast is from Bahía de Santa María (Haig, 1960).

*Pachycheles marcortezensis* Glassell

*Pachycheles marcortezensis* Glassell, 1936: 290; Haig, 1960: 134, 149, pl. 33 fig. 3.

Recorded Range. — Bahía de Santa María, outer Baja California (Haig, 1960); Isla Ángel de la Guarda to Banco Arena, Golfo de California.

Material. — Off Isla Santa Margarita; otter trawl; 20 m; 4 Feb. 1964; 1 ♂.

*Pachycheles panamensis* Faxon

*Pachycheles panamensis* Faxon, 1893: 175; 1895: 71, pl. 15 figs. 2, 2a; Haig, 1960: 134, 155, pl. 33 fig. 1.

*Pachycheles sonorensis* Glassell, 1936: 291.

Recorded Range. — Isla Tiburón, Golfo de California, to Bahía de Santa Elena, Ecuador.

Material. — Inside Punta Hughes; 6 m; 29 Jan. 1964; 1 ♂ (juv.).

Remarks. — The specimen was collected from a yellow gorgonian. The range is extended to the outer Baja California coast, and 300 km north.

*Pachycheles pubescens* Holmes

*Pachycheles pubescens* Holmes, 1900: 110; Schmitt, 1921: 175, 177, pl. 33 fig. 4, text-fig. 112; Haig, 1960: 133, 162, pl. 34 fig. 3.

Recorded Range. — Goose Island, British Columbia, to Cabeza de Thurloe, outer Baja California (Haig, 1960).

Material. — Without data; 1 juv.

*Pachycheles holosericus* Schmitt

*Pachycheles holosericus* Schmitt, in Nininger, 1918: 39, text-fig. 18 (*nom. nud.*) Schmitt, 1921: 175, 177, pl. 33 fig. 3; Haig, 1960: 133, 173, pl. 34 fig. 2.

Recorded Range. — Santa Barbara, California, to Bahía Magdalena, outer Baja California (Haig, 1960).

Material. — Bahía de San Hipólito; 10-13 m; 9 Feb. 1964; 3 juv.

Remarks. — The specimens were collected from a gorgonian coral.

*Porcellana cancrisocialis* Glassell

*Porcellana cancrisocialis* Glassell, 1936: 292; Haig, 1960: 198, 200, pl. 38 fig. 2, text-fig. 9 (2).

Recorded Range. — Bahía de Santa María and Punta Tosca, outer Baja California (Haig, 1960); Punta Peñasco, Golfo de California, to Bahía de Santa Elena, Ecuador.

Material. — Off Bahía de San Juanico; 16' otter trawl; 40 m; 27 Jan. 1964; 1 .

Remarks. — *Porcellana cancrisocialis* is often found associated with large hermit crabs, but is sometimes free-living as was the above specimen. The range of this species is

extended northward from Bahía de Santa Maria 150 km to Bahía de San Juanico.

*Porcellana paguriconviva* Glassell

*Porcellana paguriconviva* Glassell, 1936: 293; Haig, 1960: 198, 203, pl. 38 fig. 1, text-fig. 9 (3).

Recorded Range. — Bahía Magdalena, outer Baja California (Haig, 1960), and Punta Peñasco, Golfo de California, to Islas Toboga and Taboguilla, Panamá (Haig, 1962).

Material. — Off Punta Redonda; 15 m; 5 Feb. 1964; 9♂, 4♀.

Color. — Ground color in life bright lavender, with uniform longitudinal stripes of bright orange. Chelipeds bright lavender; legs with a white spot on propodus. Ventral side iridescent, pinkish white; longitudinal stripes on carapace continued on first three segments of abdomen (Glassell, 1936).

Remarks. — The specimens were found living in shells in association with *Aniculus elegans* Stimpson. *Porcellana paguriconviva* was previously reported in association with two other large hermits, *Petrochirus californiensis* Bouvier and *Paguristes digueti* Bouvier.

*Pisidia magdalenensis* (Glassell)

*Porcellana magdalenensis* Glassell, 1936: 295; 1938: 431, pl. 32.

*Pisidia magdalenensis*: Haig, 1960: 209, pl. 38 fig. 4, text-fig. 10.

Recorded Range. — Bahía de Santa Maria, outer Baja California (Glassell, 1936), to Bahía de Santa Elena, Ecuador. Apparently absent from Golfo de California.

Material. — Inside Punta Hughes; 6 m; 29 Jan. 1964; 3♂, 2♀. Outside Punta Hughes; 20 m; 30 Jan. 1964; 1♂, 1♀ ovig. Off Isla Santa Margarita; otter trawl; 20 m; 4 Feb. 1964; 1♂.

Remarks. — The specimens collected inside Punta Hughes were associated with yellow gorgonian corals.

*Megalobrachium garthi* Haig

*Megalobrachium garthi* Haig, 1957: 39, pl. 10; 1960: 213, 220, pl. 16 fig. 7, pl. 39 fig. 4.

Recorded Range. — Isla Turner, Golfo de California, to Puerto Utría, Colombia.

Material. — Inside Punta Hughes; 6 m; 29 Jan. 1964; 1♂. Outside Bahía Magdalena; 20 m; 1 Feb. 1964; 1♂. Inside Punta Tosca, in lagoon; 5 m; 4 Feb. 1964; 1♂.

Remarks. — The specimen from Punta Hughes was taken from a yellow gorgonian, and the one from Punta Tosca from a sponge. The range of this species is extended to the outer coast of Baja California, and 300 km north.

*Megalobrachium tuberculipes* (Lockington)

*Pachycheles tuberculipes* Lockington, 1878: 396, 404.

*Pisonella tuberculipes*: Glassell, 1938: 437, 440, pl. 34 fig. 1.

*Megalobrachium tuberculipes*: Haig, 1960: 213, 227, pl. 16 fig. 11, pl. 40 fig. 4.

Recorded Range. — Punta Peñasco and San Felipe, Golfo de California, to Bahía de Santa Elena, Ecuador.

Material. — Inside Punta Hughes; 6 m; 29 Jan. 1964; 1♂, 1♀. Inside Punta Tosca, in lagoon; 5 m; 4 Feb. 1964; 2♂. Bahía de San Hipólito; 10-13 m; 9 Feb. 1964; 1♀.

Remarks. — Specimens were taken from a yellow gorgonian at Punta Hughes and from sponge at Punta Tosca.

The range of this species is extended to the outer coast of Baja California, and 550 km north.

## APPENDIX

The checklist and keys which follow include all species of anomuran crabs known to occur on the west coast of Baja California from Punta San Eugenio (Punta Eugenia) southward, in depths of 40 m or less. Nineteen of these species are included as a result of the expedition reported upon in the first part of this paper; 26 species on the basis of published records; and 7 species on the strength of records, as yet unpublished, in the Allan Hancock Foundation of the University of Southern California.

CHECKLIST OF ANOMURAN CRABS FROM  
SOUTHWESTERN BAJA CALIFORNIA, MEXICO

Unpublished records are marked with an asterisk (\*)

## Family HIPPIDAE

*Emerita analoga* (Stimpson)

*Hippa analoga* Stimpson, 1857: 85. *Emerita analoga*: Schmitt, 1921: 173, pl. 31 fig. 5, text-fig. 110; 1935: 214, 216, text-figs. 75a, b. Range: Alaska to southwest Baja California; also Perú and Chile. Bahía de San Bartolomé (Schmitt 1921); Bahía Magdalena (Schmitt 1935).

## Family ALBUNEIDAE

*Lepidopa myops* Stimpson

*Lepidops myops* Stimpson, 1860: 241. *Lepidopa myops*: Schmitt, 1921: 172, pl. 31 fig. 4. Range: Southern California to Cabo de San Lucas, Golfo de California. \*Bahía de Santa María.

## Family COENOBITIDAE

*Coenobita compressus* H. Milne Edwards. See p.15.

## Family DIOGENIDAE

*Dardanus sinistripes* (Stimpson). See p.16.

*Calcinus californiensis* Bouvier. See p.16.

*Petrochirus californiensis* Bouvier.

*Petrochirus californiensis* Bouvier, 1895: 6. Glassell, 1937b: 251. Range: northern Golfo de California to Ecuador. \*Bahía de Santa María.

*Aniculus elegans* Stimpson. See p.16.

*Trizopagurus magnificus* (Bouvier). See p.17.

*Clibanarius panamensis* Stimpson. See p.17.

*Isocheles* sp. See p.17.

*Paguristes bakeri* Holmes. See p.17.

*Paguristes ulreyi* Schmitt. See p.18.

*Paguristes digueti* Bouvier

*Paguristes digueti* Bouvier, 1893: 18, text-fig. 1-4. Glassell, 1937b: 243. Range: Golfo de California. \*Bahía de Santa María; \*Bahía Magdalena.

*Paguristes anahuacus* Glassell. See p.18.

*Paguristes praedator* Glassell. See p.18.

*Paguristes*, undescribed species. See p.19.

## Family PAGURIDAE

*Pagurus gladius* (Benedict)

*Eupagurus gladius* Benedict, 1892: 7. *Pagurus gladius*: Glassell, 1937b: 256, 257. Range: Golfo de California to Ecuador. \*Bahía de Santa María; \*Bahía Magdalena; \*Punta Tosca.

*Pagurus smithi* (Benedict). See p.19.

*Pagurus*, undescribed species (1). See p.19.

*Pagurus lepidus* (Bouvier). See p.19.

*Pagurus galapagensis* (Boone). See p.20.

*Pagurus samuelis* (Stimpson)

*Eupagurus samuelis* Stimpson, 1857: 86. *Pagurus samuelis*: Schmitt, 1921: 129, 139, pl. 16 figs. 2-3, text-fig. 90. Range: Northern California to northwest Baja California. \*Punta San Eugenio; \*Punta San Bartolomé; \*Bahía de Tortuga; \*Punta Asunción; \*Punta Abreojos.

*Pylopagurus californiensis* (Benedict). See p.20.

*Pylopagurus venustus* (Bouvier). See p.21.

*Pylopagurus roseus* (Benedict). See p.21.

## Family GALATHEIDAE

*Munida mexicana* Benedict

- Munida mexicana* Benedict, 1902: 251, 264, text-fig. 13. Range: Northern Golfo de California to Archipiélago de Galápagos. Bahía de Santa María (Benedict).  
*Munida refulgens* Faxon  
*Munida refulgens* Faxon, 1893: 177; 1895: 75, pl. 17. Range: Southern Golfo de California to Panama. \*Bahía Magdalena.  
*Munida tenella* Benedict  
*Munida tenella* Benedict, 1902: 252, 274, text-fig. 20. Range: Golfo de California. \*Bahía Magdalena.  
*Pleuromcodes planipes* Stimpson. See p. 22.

## Family PORCELLANIDAE

- Orthochela pumila* Glassell. See p. 22.  
*Petrolisthes sanfelipensis* Glassell. See p. 22.  
*Petrolisthes edwardsii* (Saussure)  
*Porcellana edwardsii* Saussure, 1853: 366, pl. 12 fig. 3. *Petrolisthes edwardsii*: Haig, 1960: 24, 33, pl. 21. Range: Southwest Baja California and southern Golfo de California to Ecuador. Bahía de Santa María; Bahía Magdalena (Haig).  
*Petrolisthes hirtipes* Lockington  
*Petrolisthes hirtipes* Lockington, 1878: 395, 397. Glassell, 1936: 284. Haig, 1960: 26, 60, pl. 24 fig. 3. Range: Golfo de California and southwest Baja California. Bahía Magdalena (Glassell).  
*Petrolisthes manimaculis* Glassell  
*Petrolisthes manimaculis* Glassell, 1945: 223, text-fig. 1. Haig, 1960: 28, 77, pl. 27 fig. 1. Range: Northern California to southwest Baja California. Punta San Eugenio (Haig).  
*Petrolisthes gracilis* Stimpson  
*Petrolisthes gracilis* Stimpson, 1858: 227 (*nom. nud.*); 1859: 74. Haig, 1960: 28, 79, pl. 27 fig. 2. Range: Northern Golfo de California to southern Mexico. Bahía de Santa Maria (Haig).  
*Petrolisthes cabrilloi* Glassell  
*Petrolisthes cabrilloa* Glassell, 1945: 225, text-fig. 4. *Petrolisthes cabrilloi*: Haig, 1960: 28, 88, pl. 26 fig. 3. Range: Central California to southwest Baja California. Punta San Eugenio; Punta San Bartolomé; Punta Asunción; Punta Abrejos; Bahía de San Juanico; Bahía Magdalena (Haig).  
*Petrolisthes crenulatus* Lockington  
*Petrolisthes crenulatus* Lockington, 1878: 395, 398. Haig, 1960: 27, 110, pl. 23 fig. 4. Range: Golfo de California and southwest Baja California. Bahía Magdalena (Haig).  
*Petrolisthes hians* Nobili. See p. 23.  
*Pachycheles marcortezensis* Glassell. See p. 23.  
*Pachycheles spinidactylus* Haig  
*Pachycheles spinidactylus* Haig, 1957: 31, pl. 7; 1960: 134, 153, pl. 33 fig. 2. Range: Southwest Baja California and southern Golfo de California to Colombia. Bahía de Santa Maria (Haig, 1960).  
*Pachycheles panamensis* Faxon. See p. 23.  
*Pachycheles pubescens* Holmes. See p. 23.  
*Pachycheles rudis* Stimpson  
*Pachycheles rudis* Stimpson, 1858: 228 (*nom. nud.*); 1859: 76, pl. 1 fig. 5. Haig, 1960: 133, 170, pl. 34 fig. 1. Range: Alaska to southwest Baja California. Punta San Bartolomé; Bahía Magdalena (Haig).  
*Pachycheles holosericus* Schmitt. See p. 23.  
*Euceramus transversilineatus* (Lockington)  
*Porcellana transversilineata* Lockington, 1878: 396, 405. *Euceramus transversilineatus*: Glassell; 1938: 426, pl. 30. Haig, 1960: 188, 190, pl. 36 fig. 2, text-fig. 7(2). Range: Northern Golfo de California to Panama. Bahía de Santa María; Bahía Magdalena (Haig).  
*Porcellana cancrisocialis* Glassell. See p. 23.  
*Porcellana paguriconviva* Glassell. See p. 24.  
*Pisidia magdalenensis* (Glassell). See p. 24.  
*Megalobrachium garthi* Haig. See p. 24.  
*Megalobrachium erosum* (Glassell)  
*Pisosoma erosa* Glassell, 1936: 289. *Megalobrachium erosum*: Haig, 1960: 213, 222, pl. 16 fig. 8, pl. 40 fig. 2. Range: Golfo de California and southwest Baja California. Punta Malarrimo; Bahía de San Juanico (Haig). Bahía Magdalena (Glassell).  
*Megalobrachium tuberculipes* (Lockington). See p. 24.  
*Polyonyx quadriungulatus* Glassell  
*Polyonyx quadriungulatus* Glassell, 1935: 93, pl. 9. Haig, 1960: 233, 236, pl. 41 fig. 2, text-fig. 12(1). Range: Southern California to southwest Baja California. Punta San Eugenio (Haig).

KEYS TO ANOMURAN CRABS KNOWN FROM  
SOUTHWESTERN BAJA CALIFORNIA, MEXICO

Identifications made with these keys should be considered tentative until specimens can be checked against descriptions and illustrations. The two sand crabs falling within the scope of our report were dealt with by Schmitt (1921). The hermit crabs of the eastern Pacific are currently being revised, but published information available at this writing is widely scattered and in some cases inadequate; a number of references are given in the preceding sections of this paper. For the Galatheidae, *Pleuroncodes planipes* was treated by Schmitt (1921), and descriptions and illustrations of the remaining species are found in either Faxon (1895) or Benedict (1902). The eastern Pacific Porcellanidae were monographed recently by Haig (1960).

Sand Crabs

- 1a. Carapace suboval; first pair of legs simple: HIPPIDAE . . . . . *Emerita analoga*  
1b. Carapace subquadrangular; first pair of legs subchelate: ALBUNEIDAE . . . . . *Lepidopa myops*

Hermit Crabs

- 1a. Antennular peduncles several times length of eyestalks; antennular flagellum compressed and truncated at tip: COENOBITIDAE . . . . . *Coenobita compressus* 2  
1b. Antennular peduncle less than twice length of eyestalks; antennular flagellum ending in a filament . . . . . 2  
2a. Outer maxillipeds approximated at their bases; chelipeds equal or subequal in size, or left cheliped larger than right (in *Petrochirus*, right larger than left): DIOGENIDAE . . . . . 3  
2b. Outer maxillipeds widely separated at their bases; right cheliped always larger than left: PAGURIDAE 15  
3a. Chelipeds markedly unequal in size and form . . . . . 4  
3b. Chelipeds equal or subequal in size and form . . . . . 6  
4a. Right cheliped larger than left . . . . . *Petrochirus californiensis*  
4b. Left cheliped larger than right . . . . . 5  
5a. Major chela smooth; fingertips calcareous . . . . . *Calcinus californiensis*  
5b. Major chela tuberculate; fingertips corneous and dark . . . . . *Dardanus sinistripes*  
6a. No paired abdominal appendages in either sex . . . . . 7  
6b. Paired pleopods present on first and second abdominal segments of male, and usually on first abdominal segment of female . . . . . 10  
7a. Fingertips acuminate; antennal flagella heavily setose . . . . . *Isocheles* sp.  
7b. Fingertips spooned or hoof-shaped; antennal flagella nude or sparsely setose . . . . . 8  
8a. Chelipeds and walking legs with strong, grooved rings . . . . . *Aniculus elegans*  
8b. No such rings on legs . . . . . 9  
9a. Fingers open horizontally; no white spots on chelae; walking legs with longitudinal dark and light stripes . . . . . *Clibanarius panamensis*  
9b. Fingers open obliquely; chelae and walking legs with large white spots . . . . . *Trizopagurus magnificus*  
10a. Fingertips acuminate; rostrum scarcely developed, broadly rounded; no paired pleopods in females . . . . . *Paguristes*, undescribed sp.  
10b. Fingertips spooned; rostrum a well-developed, acute projection; females with a pair of pleopods . . . . . 11  
11a. Rostrum long, acuminate, extending well between eyescales . . . . . 12  
11b. Rostrum broad, well-produced but falling short of or barely reaching base of eyescales . . . . . 13  
12a. Chelae narrow, covered with dense tomentum; eyestalks and antennae blue . . . . . *Paguristes anahuacus*  
12b. Chelae very broad, not tomentose; eyestalks and antennae not blue . . . . . *Paguristes digueti*  
13a. Eyescales with margins entire; in adults, spines on chelipeds not densely pigmented . . . . . *Paguristes praedator*  
13b. Eyescales toothed; in adults, spines on chelipeds densely pigmented . . . . . 14  
14a. Antennal flagellum with very long hairs on lower surface; rostrum extending beyond lateral frontal lobes . . . . . *Paguristes ulreyi*  
14b. Antennal flagellum with short hairs on lower surface; rostrum about equal in length to lateral frontal lobes . . . . . *Paguristes bakeri*  
15a. Major chela narrow, not forming an operculum; no paired pleopods in female . . . . . 16  
15b. Major chela broad, forming an operculum; female with a pair of pleopods . . . . . 21  
16a. Eyescales with 2 or more spines . . . . . 17  
16b. Eyescales with a single spine . . . . . 18  
17a. Tip of eyescale rounded and bearing 2 or 3 spines . . . . . *Pagurus*, undescribed sp.  
17b. Tip of eyescale truncate and bearing 4 spines . . . . . *Pagurus lepidus*  
18a. Carapace shield wider than long; eyestalks greatly expanded distally . . . . . 19  
18b. Carapace shield longer than wide; eyestalks not greatly expanded distally . . . . . 20



- 19a. Major chela granulate on outer margin, about 2½-3 times as long as wide, narrower than carpus except at base of fingers ..... *Pagurus gladius*
- 19b. Major chela with sharp teeth on outer margin, about twice as long as wide and about as wide as carpus ..... *Pagurus smithi*
- 20a. Major chela with a thick fringe of hairs on margins, its dorsal surface tomentose and spiny ..... *Pagurus galapagensis*
- 20b. Major chela not hairy, its dorsal surface granulose ..... *Pagurus samuelis*
- 21a. Inner margin of major chela not expanded; no longitudinal ridge on movable finger ..... *Pylopagurus roseus*
- 21b. Inner margin of major chela usually expanded laterally; movable finger with a longitudinal ridge ..... 22
- 22a. Carpus of major cheliped nearly smooth; walking legs with longitudinal stripes overlying diffuse broad bands ..... *Pylopagurus californiensis*
- 22b. Carpus of major cheliped with small, forward-directed spines covering its dorsal surface; walking legs with broad bands whose margins are sinuous and sharply defined ..... *Pylopagurus venustus*

## Galatheid Crabs

- 1a. Sides of carapace greatly swollen and visible in dorsal view; chelipeds and walking legs with a thick fringe of long, fine hairs on margins. Often pelagic ..... *Pleuroncodes planipes*
- 1b. Sides of carapace not visible in dorsal view; no thick fringe of hairs on chelipeds and walking legs. Bottom living ..... 2
- 2a. Second, third, and fourth segments of abdomen armed with spines ..... *Munida tenella*
- 2b. Abdomen unarmed ..... 3
- 3a. Fingers about as long as, or shorter than palm; rostrum with several lateral spines near its apex ..... *Munida refulgens*
- 3b. Fingers much longer than palm; rostrum without spines at apex ..... *Munida mexicana*

## Porcelain Crabs

- 1a. Carapace nearly or quite half again as long as broad ..... 2
- 1b. Carapace scarcely or not at all longer than broad ..... 3
- 2a. Carapace and chelipeds nearly smooth, without hairs; lateral margins of carapace with a series of about 12-15 minute, close-set spinules ..... *Orthochelapumila*
- 2b. Carapace and chelipeds rugose, with long, scattered hairs; no marginal spinules on carapace posterior to epibranchial spine ..... *Euceramus transversilineatus*
- 3a. Movable segments of antennal peduncle with free access to orbit ..... 4
- 3b. Movable segments of antennal peduncle separated from orbit by a broad projection of basal segment ..... 17
- 4a. Side walls of carapace entire; chelipeds flattened, subequal ..... 5
- 4b. Posterior portion of side walls of carapace separated by membranous interspace from anterior portion; chelipeds thick, robust, one distinctly larger than the other ..... 12
- 5a. Carapace with transverse striations; a row of spines on anterior margin of merus of walking legs ..... 6
- 5b. Carapace not transversely striate; anterior margin of merus of walking legs unarmed ..... 7
- 6a. Carapace with groups of spines on dorsal surface, and a row of spines on lateral margins posterior to epibranchial spine ..... *Petrolisthes sanfelipensis*
- 6b. No spines on dorsal surface of carapace, nor on lateral margins posterior to epibranchial spine ..... *Petrolisthes edwardsii*
- 7a. Carpus of chelipeds armed on anterior margin with strong teeth or tubercles ..... 8
- 7b. Carpus not armed with strong teeth or tubercles ..... 10
- 8a. Carpus of chelipeds with wide-set conical tubercles on anterior margin; chela with a thick fringe of hair on outer margin ..... *Petrolisthes hirtipes*
- 8b. Carpus with strong teeth on anterior margin; chela without a thick fringe of hairs ..... 9
- 9a. Telson 5-plated; outer orbital angle produced into a distinct tooth ..... *Petrolisthes hians*
- 9b. Telson 7-plated; outer orbital angle not strongly produced ..... *Petrolisthes crenulatus*
- 10a. Carpus of cheliped about twice as long as wide, a lobe occupying proximal ¼ of its anterior margin ..... *Petrolisthes cabrilloi*
- 10b. Carpus more than twice as long as wide, its margins subparallel ..... 11
- 11a. Carapace nearly smooth posteriorly, often granular anteriorly; merus of walking legs with a fringe of hairs on anterior margin ..... *Petrolisthes manimaculis*
- 11b. Carapace nearly smooth anteriorly as well as posteriorly; merus of walking legs nude or with only traces of hair ..... *Petrolisthes gracilis*
- 12a. Front with a distinct tuft of hairs ..... 13
- 12b. Hairs sometimes present on frontal area, but not forming a distinct tuft ..... 16

13a. Manus with a large granulate protuberance at base of pollex; telson 5-plated in both sexes; males with a pair of pleopods; chelipeds with either long, scattered hairs or short, close-set hairs	14
13b. No distinct protuberance on manus at base of pollex; telson 7-plated in males, 7- or 5-plated in females; male pleopods present or absent; chelipeds with both long, scattered hairs and short, close-set hairs	15
14a. Carpus of chelipeds with a broad triangular lobe; chelipeds with long, scattered hairs	<i>Pachycheles rudis</i>
14b. Carpus with a broad, serrate-edged lobe; chelipeds with short, close-set hairs	<i>Pachycheles holosericus</i>
15a. Carpus of chelipeds with a broad lobe cut into 3 or 4 uneven, serrate teeth; males with a pair of pleopods	<i>Pachycheles pubescens</i>
15b. Carpus armed with 3 (rarely 4) spine-tipped teeth; no pleopods in males	<i>Pachycheles spinidactylus</i>
16a. Carpus of chelipeds with 2 broad teeth; telson 7-plated; males with a pair of pleopods	<i>Pachycheles panamensis</i>
16b. Carpus with 3-5 narrow teeth; telson 5-plated; no pleopods in males	<i>Pachycheles marcortezensis</i>
17a. Carapace broader than long; dactyl of walking legs with 4 fixed spines	<i>Polyonyx quadriungulatus</i>
17b. Carapace not broader than long; dactyl of walking legs with a single terminal claw and several movable spinules	18
18a. Front prominent, strongly tridentate or trilobate in dorsal view	19
18b. Front deflexed, appearing rounded or faintly trilobate in dorsal view	21
19a. Lateral margins of carapace unarmed posterior to epibranchial angle	20
19b. Lateral margins of carapace with minute spinules	<i>Pisidia magdalenensis</i>
20a. Epibranchial angle with 2 or 3 spinules; frontal teeth pointed at tips	<i>Porcellana cancrisocialis</i>
20b. Epibranchial angle unarmed; frontal teeth rounded at tips	<i>Porcellana paguriconviva</i>
21a. Telson of abdomen 7-plated	<i>Megalobrachium erosum</i>
21b. Telson 5-plated	22
22a. Carapace, chelipeds, and walking legs covered with small, shallow pits	<i>Megalobrachium garthi</i>
22b. Carapace, chelipeds, and walking legs tuberculate	<i>Megalobrachium tuberculipes</i>

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