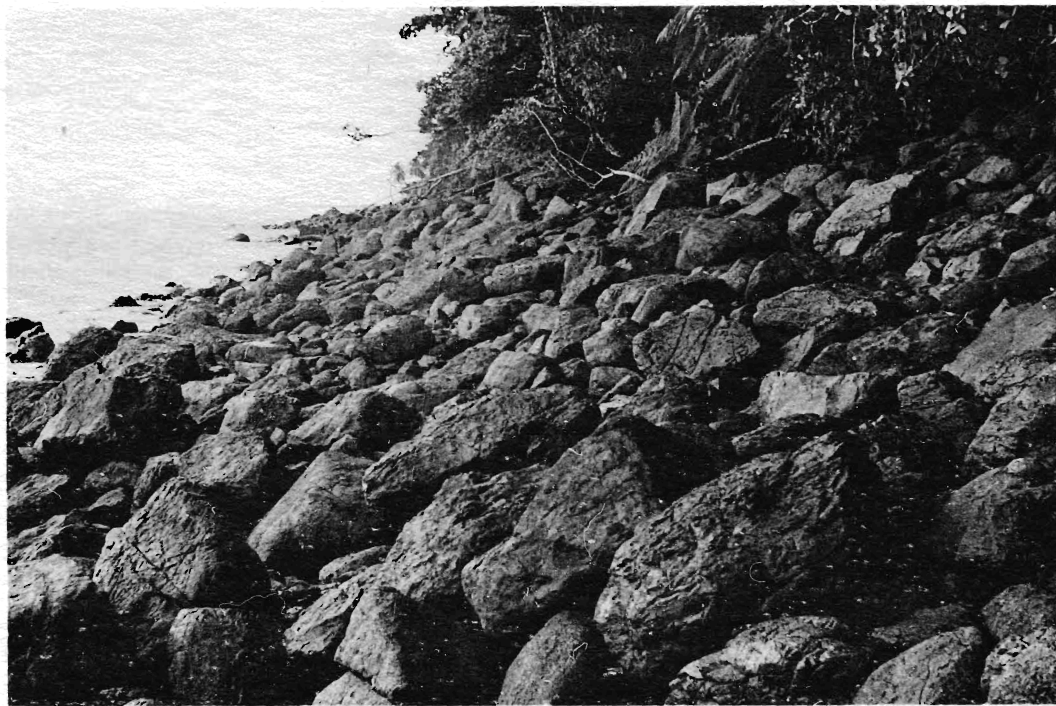




1. "Askoy" Station 89. The steep, rocky shore of Gorgonilla Island, Colombia, affords little footing to *Brachyura* other than inhabitants of the spray zone



2. "Askoy" Station 89. Shingle beach on eastern shore of Gorgonilla Island, Colombia. Diving for coral heads proved more profitable than shore collecting in such austere surroundings



1. "Askoy" Station 89. The steep, rocky shore of Gorgonilla Island, Colombia, affords little footing to *Brachyura* other than inhabitants of the spray zone



2. "Askoy" Station 89. Shingle beach on eastern shore of Gorgona Island, Colombia. Diving for coral heads proved more profitable than shore collecting in such austere surroundings

**MATERIAL EXAMINED:** Latitude 01° 07' N., longitude 79° 53' W., off Ecuador, April 17, 1941, Station 87, sample 343, 9-27 meters, two males, one female.

**MEASUREMENTS:** Largest specimen, a female, length 5.8 mm., width (including lateral spines) 11.2 mm., length of lateral spine 1.2 mm.

**HABITAT:** Hard bottom (rock and coral-lines).

**REMARKS:** This small species shares with *P. (Achelous) stanfordi* Rathbun the areolate character of the carapace and in the Galápagos overlaps it in range. One never failing point of distinction is the small, recurving spine at the posterolateral angle of the carapace, which serves to distinguish *tuberculatus* from all other species of portunids known to inhabit the eastern Tropical Pacific.

The Ecuadorean record above represents an extension of range southward from Gorgona Island, Colombia, where the species was collected by Crossland of the "St. George."

#### *Callinectes arcuatus* Ordway

*Callinectes arcuatus* ORDWAY, 1863, p. 578 (13). NOBILI, 1897, p. 2; 1901, p. 31. RATHBUN, 1930, p. 121, pl. 52.

**RANGE:** From Anaheim Slough, California, to Chile.

**MATERIAL EXAMINED:** Santelmo Bay, Isla del Rey, Perlas Islands, Panama, February 15, 1941, Station 9, sample 5, shore, one male.

**MEASUREMENTS:** Male specimen, length 23 mm., width (including lateral spines) 50 mm., length of lateral spine 5.0 mm.

**HABITAT:** Sandy shore.

**REMARKS:** The geographical distribution of *C. arcuatus* and of its companion species, *C. toxotes* Ordway, is comparatively well known, probably because they inhabit the shallow lagoons and "esteros" where they are most likely to be observed and collected by bathers, by fishermen drawing a beach seine, or by those shore collectors whose equipment may contain a dipnet. Rathbun (1930) lists numbers of records for the two species, including all countries bordering on the Pacific from California to Chile with the exception of Colombia. Nobili (1910) records *C. arcuatus* from Tumaco, Colombia, and Santa Elena

Bay, Ecuador, localities visited by the "Askoy," with an additional locality of Festa's collecting, Río Sabana, Darien (1897).

#### *Callinectes toxotes* Ordway

*Callinectes toxotes* ORDWAY, 1863, p. 576 (11). RATHBUN, 1930, p. 127, pl. 54.

**RANGE:** From Cape San Lucas, Lower California, Mexico, to Juan Fernandez Island, Chile.

**MATERIAL EXAMINED:** Tumaco, Colombia, April 19, 1941, Station 88, sample 344, purchased in market, three large males, one large female.

**MEASUREMENTS:** Largest specimen, a male, length 78 mm., width (including lateral spines) 172 mm., length of lateral spine 19 mm.

**HABITAT:** Shallow lagoons and estuaries.

**REMARKS:** Several structural differences serve to separate this species from the preceding *C. arcuatus*: the male abdominal appendages reach nearly to the end of the abdomen, instead of falling short of the terminal segment; the inner pair of the four frontal teeth are almost as well developed as the outer pair, instead of being only one-third as large; and the intramedial area, defined by Rathbun (1930, p. 98) as "that part of the gastric region behind the posterior of the gastric carinae," is longer than its posterior width, instead of shorter. (See also Remarks under the preceding species.)

The four large specimens of *C. toxotes* were obtained by purchase in the market at Tumaco, Colombia, along with specimens of *Cardisoma crassum* Smith and *Calappa convexa* Saussure.

#### *Arenaeus mexicanus* (Gerstaecker)

*Euctenota mexicana* GERSTAECKER, 1856, p. 131, pl. 5, figs. 3, 4.

*Arenaeus mexicanus* FAXON, 1895, p. 22. RATHBUN, 1930, p. 137, pl. 58, fig. 1, pl. 61.

*Neptunus cribrarius* CANO (not A. Milne Edwards), 1889, p. 102, p. 213.

**RANGE:** From Ballenas Bay, Lower California, and Carmen Island, Gulf of California, Mexico, to Ancon, Peru.

**MATERIAL EXAMINED:** Eleven specimens from three stations:

## COLOMBIA

Cuevita Bay, May 11, 1941, Station 93, sample 359, 9-36 meters, 1 male (soft shell), 1 female.

## ECUADOR

Latitude 01° 07' N., longitude 97° 53' W., April 17, 1941, Station 87, sample 343, 9-27 meters, 2 males, 2 females.

La Plata Island, April 12, 1941, Station 80, sample 304, seine, 3 males, 2 females.

MEASUREMENTS: Largest specimen, a male, length 30 mm., width (including lateral spines) 70 mm., cheliped (extended) 61 mm., chela 34 mm., dactyl 17 mm.

HABITAT: Hard bottom (rock and corallines).

REMARKS: Members of the genus *Arenaeus* are beautifully patterned with small circular dots which blend with the coarse sand or "arena" against which these swimmers are generally seen. Large as *Callinectes*, and superficially resembling them, *Arenaeus* may be distinguished by the acute separation of the teeth, a feature extending even to the orbit, where it is most marked, and by the failure of the male abdomen to outline an inverted letter T.

An early record for the territory covered by the "Askoy" is that of the Italian "Vettor Pisani," which obtained this handsome species in the Gulf of Panama in 1884. Cano (1889) incorrectly referred it to the Atlantic species.

*Cronius ruber* (Lamarck)

*Portunus ruber* LAMARCK, 1818, p. 260.

*Cronius ruber* STIMPSON, 1860, p. 225 (97). NOBILI, 1897, p. 2; 1901, p. 32. RATHBUN, 1930, p. 139, pls. 62, 63. FINNEGAN, 1931, p. 630. GARTH, 1946, p. 422, pl. 72, figs. 3, 4.

RANGE: From Point San Bartholomé, Lower California, Mexico, to Paita, Peru; Galápagos Islands; 4-20 fathoms. Occurs also in the Atlantic.

MATERIAL EXAMINED: Eight specimens from four stations:

## PANAMA

Isla Saboga, Perlas Islands, May 26, 1941, Station 111, sample 432, 4 meters, 1 male.

Guayabo Chiquito, May 20-21, 1941, Station 104, sample 410, 8-10 meters, 2 females, 1 young.

## ECUADOR

Latitude 01° 07' N., longitude 79° 53' W., April

17, 1941, Station 87, sample 343, 9-27 meters, 2 females, 1 young (crushed).

La Plata Island, April 13, 1941, Station 80, sample 302, 5.5 meters, 1 female.

MEASUREMENTS: Largest specimen, a female, length 18.7 mm., width 30.7 mm., cheliped (extended) 34 mm., chela 17.8 mm., dactyl 9.5 mm.

HABITAT: From masses of coral, hard bottom (rock and corallines).

REMARKS: The genus *Cronius* may always be recognized by the tendency of the anterolateral spines to alternate, one large and one small. The species *ruber* enjoys the distinction of having four spines on the hand, two more than members of the genus *Portunus*. However, caution is necessary because the Atlantic species, *C. tumidulus* (Stimpson), with only two spines on the hand, may occur in the Pacific, since *ruber* is said to occur in the Atlantic.

Early records for the species within territory covered by the "Askoy" are those of Nobili (1897, 1901), who lists one male collected at Darien and six males and a female taken by Festa at Santa Elena Bay, Ecuador.

*Euphyllax dovii* Stimpson

Plate 5, figure 2

*Euphyllax dovii* STIMPSON, 1860, p. 226 (98), pl. 5, figs. 5, 5a. RATHBUN, 1930, p. 147, pl. 65. GARTH, 1946, p. 423, pl. 72, figs. 1, 2.

RANGE: West Coast of Mexico? Panama to Talcahuano, Chile; Galápagos Islands.

MATERIAL EXAMINED: Nineteen specimens from three stations:

## COLOMBIA

(All stations approaching or leaving Malpelo Island.)

Latitude 04° 01' N., longitude 80° 26' W., March 24, 1941, Station 49, sample 182, dipnet over side, 2 males.

Latitude 04° 02' N., longitude 81° 29' W., March 25, 1941, Station 54, dipnet over side, 3 males.

Near Malpelo Island, March 26, 1941, 14 large specimens.

MEASUREMENTS: A large male specimen, length 33 mm., width 57 mm., cheliped (extended) 103 mm., chela 53 mm., dactyl 30.5 mm., fronto-orbital width 44 mm., length of eyestalk and eye 19 mm.

HABITAT: Pelagic.

REMARKS: The finding of *E. dovi* at stations far from shore, as at Malpelo Island, is in keeping with what is already known concerning the species. It was encountered by Hancock expeditions at Tagus Cove, Galápagos, and at Wafer Bay, Cocos Island, where tuna fishermen were filling their bait tanks with the stalk-eyed swimmers to be used as chum for tuna. The species is confined to warm tropical waters and is probably a valid indicator of the presence of the Niño current, which seasonally invades the northern Galápagos Islands.

The observations of Dr. Robert Cushman Murphy, leader of the "Askoy" Expedition, with respect to this species are of such general interest that they have been incorporated in the Introduction to this paper. For a discussion of conditions prevailing at Station 49, where specimens of *E. dovi* were taken, the reader is referred to Nichols and Murphy (1944, p. 223).

The measurements given are intended to emphasize the width of the orbits and the length of the periscopic eyes. (See also Remarks under the following species.)

***Euphyllax robustus* A. Milne Edwards**

*Euphyllax robustus* A. MILNE EDWARDS, 1874, p. 249; 1879, p. 205, pl. 37. RATHBUN, 1930, p. 148, pls. 66, 67.

RANGE: Known only from the type locality, Mazatlan, Sinaloa, Mexico.

MATERIAL EXAMINED: Fifty-nine specimens from five stations:

PANAMA

Piñas Bay, February 23, 1941, Station 19, sample 35, 14-23 meters, 3 young.

Guayabo Chiquito, March 4, 1941, Station 30, sample 78, 24-64 meters, 45 young.

COLOMBIA

Ardita Bay, March 6, 1941, Station 31, sample 81, 34-43 meters, 6 young.

Octavia Bay, March 6, 1941, Station 32, sample 82, 24-28 meters, 5 young.

MEASUREMENTS: Largest specimen, a male, length 8.3 mm., width 13.0 mm., chela 8.1 mm.

HABITAT: Gray sandy mud, gray sand.

EARLY STAGES: The great majority of the

specimens are in the first post-megalopa stage and show the greatly enlarged corneas, which, with their sockets, occupy half or more than half of the total length of the eye and eyestalk. The rounded, T-shaped front also occupies relatively more of the total fronto-orbital width than in the adult.

REMARKS: A young male specimen from Guayabo Chiquito and a young female from Piñas Bay form the basis for referring the specimens above, all of which are very young, to *E. robustus*. The balance might with reason have been referred to *E. dovi* Stimpson, since all adult *Euphyllax* obtained by the "Askoy" are definitely of that species. Lacking a specimen of size comparable to A. Milne Edwards's type (56 by 90 mm.), the writer can only express his conviction, based upon the study of these and other immature specimens, that *robustus* is a valid species and not conspecific with *dovi*, as suggested by Rathbun (1930, p. 148).

Particulars in which the largest of the "Askoy" specimens conform with the description and figure of *robustus* are the granulate ridges of the carapace and margins of the orbits, including the prominent suborbital plate, the possession of three prominent lateral spines with a feeble spine between the first and second, and the tendency of the cheliped, particularly the merus, to shorten and broaden, a character presumably suggesting the name *robustus*. The balance of the series from which these best-developed specimens were taken show the incipient fourth spine as frequently between the second and third large spines as between the first and second, suggesting possible development into the five-spined *dovi*. Furthermore, the chelae of all but the young female mentioned above are slender as in *dovi*, rather than stout as in *robustus*, the type of which was, however, also a female.

From the ample data as to depth and habitat furnished by the "Askoy" specimens, it is apparent that the young of *Euphyllax*, of whatever species, spend some time at the bottom of sequestered bays along the mainland coast of middle America before achieving the natatory and ocular propensities which make possible feats of navigation to oceanic islands hundreds of miles distant, albeit at the whim of powerful ocean currents.

The range of the species is extended from Mazatlan, Mexico, to Colombia.

FAMILY XANTHIDAE

*Carpilodes cinctimanus* (White)

*Carpilius cinctimanus* WHITE, 1847, p. 336, pl. 2, fig. 3.

*Carpilodes cinctimanus* MIERS, 1880, p. 234. RATHBUN, 1930, p. 242, pl. 100. CRANE, 1937, p. 69; 1947, p. 74. GARTH, 1946, p. 426, pl. 74, figs. 1-4.

RANGE: From Arena Bank, Gulf of California, Mexico, to Jasper Island, Costa Rica; Cocos Island; Galápagos Islands. Occurs also in Australia, Japan, and islands of the Pacific.

MATERIAL EXAMINED: Gorgona Island, Colombia, April 22, 1941, Station 89, sample 348, 4-6.5 meters, one young female.

MEASUREMENTS: Young female specimen, length 9.2 mm., width 16.8 mm.

HABITAT: This brilliant red crab is customarily cracked from *Pocillopora* coral.

REMARKS: An Indo-Pacific species, *C. cinctimanus* has been reported from the Gulf of California, from Cocos Island, and from the Galápagos. It is now known to occur on Gorgona Island, near the mainland of Colombia, South America.

*Platypodia rotundata* (Stimpson)

*Atergatis rotundatus* STIMPSON, 1860, p. 202 (74).

*Platypodia rotundata* RATHBUN, 1910, p. 584; 1930, p. 248, pl. 102, figs. 1-3. FINNEGAN, 1931, p. 633.

*Platypodia (Lophactaea) rotundata* PESTA, 1931, p. 178.

RANGE: From La Paz, Gulf of California, Mexico, to Punta Santa Elena, Ecuador; Galápagos Islands.

MATERIAL EXAMINED: Humboldt Bay, Colombia, May 18, 1941, Station 103, sample 404, 6-10 feet, one female.

MEASUREMENTS: Small female specimen, length 5.2 mm., width 7.7 mm.

HABITAT: "From broken up masses of coral."

REMARKS: Previous records of the species, although few in number, are from such widely separated localities as to give a very good idea of its range. The present record from Humboldt Bay, Colombia, helps to fill in the large gap between Panama, where it was

taken by Dow and Deichmann, and Punta Santa Elena, Ecuador, where it was taken by Schmitt. Needed now are records between the even more widely separated localities of Panama and Manzanillo, Mexico, where the species was collected by Orcutt. Members of the genus *Platypodia* are likely to be overlooked because of their small size and their habit of concealing themselves in round or oval holes in rocks or sponges into which their rotund bodies fit snugly.

*Actaea dovii* Stimpson

*Actaea dovii* STIMPSON, 1871, p. 104 (14). NOBILI, 1901, p. 35. RATHBUN, 1930, p. 254, pl. 104, figs. 1, 2. FINNEGAN, 1931, p. 632. SIVERTSEN, 1933, p. 15. SCHMITT, 1939, pp. 21, 25. GARTH, 1946, p. 431, pl. 79, figs. 2, 6. CRANE, 1947, p. 74.

RANGE: From El Salvador to Ecuador; Galápagos Islands; Clipperton Island; shore, occasionally to 15 fathoms.

MATERIAL EXAMINED: Nineteen specimens from four stations:

PANAMA

Saboga Island, Perlas Islands, February 11, 1941, Station 2, sample 1, shore, 1 male, 1 female.

Guayabo Chiquito, May 20, 1941, Station 104, sample 410, 8-10 meters, 2 males.

COLOMBIA

Humboldt Bay, May 18, 1941, Station 103, sample 404, 6-10 feet, 1 female.

Gorgona Island, April 20-23, 1941, Station 89, sample 346, 4.5 meters, 1 male; sample 348, 4-6.5 meters, 7 males, 6 females.

MEASUREMENTS: Female specimen, length 10.0 mm., width 15.0 mm.

HABITAT: Rocky shore, coral.

REMARKS: Although the depths given above suggest that *A. dovii* is primarily a species dredged from shallow water, it has been the writer's experience that it is most frequently encountered in ordinary shore collecting under rocks at low tide. It should be remembered, however, that because of the great rise and fall of tide on the Pacific side of the Isthmus of Panama, a portion of beach exposed at extreme low tide may be covered at high tide by two, or even three, fathoms of water.

An early record for the species within "As-

koy" Expedition territory is that of Enrico Festa, who collected *A. dovi* at Santa Elena Bay, Ecuador, and at Flamenco Island, Panama (Nobili, 1901).

#### *Actaea sulcata* Stimpson

*Actaea sulcata* STIMPSON, 1860, p. 203 (75). RATHBUN, 1930, p. 259, pl. 105, figs. 3, 4. FINNEGAN, 1931, p. 632. CRANE, 1937, p. 69; 1947, p. 74. GARTH, 1946, p. 434, pl. 77, fig. 1.

RANGE: From Arena Bank, Gulf of California, Mexico, to Gorgona Island, Colombia; Galápagos Islands; shore to 15 fathoms.

MATERIAL EXAMINED: Ten specimens from four stations:

#### PANAMA

Isla Saboga, Perlas Islands, May 26, 1941, Station 111, sample 432, 4 meters, 1 female.

Guayabo Chiquito, May 20, 1941, Station 104, 8-10 meters, 1 male.

#### COLOMBIA

Gorgona Island, April 23, 1941, Station 89, sample 348, 4-6.5 meters, 1 male, 2 females.

#### ECUADOR

La Plata Island, April 12-13, 1941, Station 80, sample 302, 5.5 meters, 1 male, 4 females.

MEASUREMENTS: Largest specimen, a female, length 8.4 mm., width 13.2 mm.

HABITAT: In every instance above, from masses of living coral.

REMARKS: The remarks made concerning the preceding *A. dovi* Stimpson apply equally here, *A. sulcata* being a species of like ecological requirements. To find two species belonging to the same genus existing side by side throughout the same extensive range would be unusual were it not for the fact that each belongs to a group of species which might be given subgeneric recognition, the first mentioned having the areoles of the carapace but little raised and not deeply separated, like the preceding *Platypodia*, the latter to a group having the areoles deeply separated in the manner of the following *Glyptoxanthus*.

The range of the species is extended southward from Gorgona Island, Colombia, to La Plata Island, Ecuador.

#### *Glyptoxanthus labyrinthicus* (Stimpson)

*Actaea labyrinthica* STIMPSON, 1860, p. 204 (76). *Glyptoxanthus labyrinthicus* A. MILNE EDWARDS, 1879, p. 255, pl. 43, figs. 4-4b. CANO, 1889, p. 194. RATHBUN, 1930, p. 266, pl. 108, figs. 1-3 (exclusive of the Galápagos specimen). FINNEGAN, 1931, p. 632. GARTH, 1939, p. 16, pl. 4, fig. 2, pl. 5, figs. 1b, 2b, 3b.

RANGE: From Panama and the Perlas Islands, Panama Bay, to Gorgona Island, Colombia. Not the Gulf of California nor the Galápagos Islands, which are inhabited by endemic species of *Glyptoxanthus*. (See Remarks below.)

MATERIAL EXAMINED: Guayabo Chiquito, Panama, May 20-21, 1941, Station 104, sample 410, 8-10 meters, one male.

MEASUREMENTS: Male specimen, length 8.0 mm., width 10.3 mm.

HABITAT: The specimen above was recovered from coral.

REMARKS: At the time of describing *Glyptoxanthus hancocki* (Garth, 1939, p. 15) from the Galápagos Islands, the writer had before him for comparison only a single specimen of *G. labyrinthicus*, taken by the "Velero III" at Port Utria, Colombia, although specimens at the Museum of Comparative Zoölogy at Harvard had been examined previously. It is therefore gratifying to note that the "Askoy" specimen recorded above corresponds to the Colombian, rather than to the Galápagan, specimens, emphasizing the truly endemic nature of the latter. A third species, *G. meandricus* (Lockington), occurs in the Gulf of California.

An early record from the Bay of Panama, that of the "Vettor Pisani" in 1884, has been overlooked, probably for the reason that Cano (1889) in the same paper but in the geographical section, lists the species incorrectly as *G. erosus* of the Atlantic.

#### *Medaeus lobipes* Rathbun

*Medaeus lobipes* RATHBUN, 1898, p. 583, pl. 44, fig. 1; 1930, p. 275, text fig. 44, pl. 114. CRANE, 1937, p. 70. GARTH, 1946, p. 442, pl. 77, fig. 2.

RANGE: From Santa Inez Bay, Gulf of California, Mexico, to Panama; Galápagos Islands; 5½-150 fathoms.

MATERIAL EXAMINED: Guayabo Chiquito, Panama, March 4, 1941, Station 30, sample 78, 24-64 meters, one female.

MEASUREMENTS: Female specimen, length 11.0 mm., width 16.0 mm.

HABITAT: Gray mud.

REMARKS: A distinctive species because of the conspicuous lobes of the carpal and propodal joints of the ambulatory legs. The corresponding projections in *M. spinulifer* and in some *Actaeas*, notably *A. crosslandi* (Finnegan), are spinulous.

**Medaeus spinulifer** (Rathbun)

*Pilumnus spinulifer* RATHBUN, 1898, p. 585, pl. 42, figs. 6-8. FINNEGAN, 1931, p. 643.

*Medaeus spinulifer* RATHBUN, 1930, p. 276, text fig. 45. GARTH, 1946, p. 443, pl. 75, figs. 5, 6. CRANE, 1947, p. 75.

RANGE: From Cape San Lucas, Lower California, Mexico, to Jasper Island, Costa Rica; Galápagos Islands; shore to 73 fathoms.

MATERIAL EXAMINED: Utria Bay, Colombia, May 15, 1941, Station 100, sample 398, 8 feet, one female.

MEASUREMENTS: Female specimen, length 6.3 mm., width 9.4 mm., including spines.

HABITAT: The specimen above was obtained from coral.

REMARKS: This species, originally described as a *Pilumnus*, will continue to be so regarded by those who fail to note that the anterolateral margin trends downward to terminate at the corner of the buccal cavity, instead of at the orbit, as with most Xanthidae. This feature places it close to *Lipaes-thesius*, to which it otherwise bears little resemblance.

The "Askoy" Expedition record is the first from the South American mainland.

**Leptodius taboganus** Rathbun

*Leptodius taboganus* RATHBUN, 1912, p. 3; 1930, p. 304, pl. 140. CRANE, 1947, p. 75.

RANGE: From Port Parker, Costa Rica, to Salinas, Ecuador.

MATERIAL EXAMINED: San José Island, Perlas Islands, Panama, November, 1945, "Playa Grande and adjacent rock pools," R. C. Murphy, collector, one male.

MEASUREMENTS: Male specimen, length 8.8 mm., width 14.2 mm.

HABITAT: Rocks at low tide.

REMARKS: A beautifully sculptured species,

reminiscent of *L. snodgrassi* Rathbun of the Galápagos Islands, from which it may be distinguished by the lack of longitudinal ridges on the palm, and by the lateral direction of the last lateral tooth, that of *snodgrassi* pointing forward.

Had Murphy been content to rest upon the carcinological accomplishments of the "Askoy" Expedition, this handsome species could not have been included in the present report. It was obtained by him on a subsequent visit to the Perlas Islands.

**Xanthodius sternberghii** Stimpson

*Xanthodius sternberghii* STIMPSON, 1859, p. 52 (6). NOBILI, 1901, p. 35. RATHBUN, 1930, p. 311, pl. 144, pl. 145, fig. 2. CRANE, 1947, p. 75.

*Xanthodius hebes* STIMPSON, 1860, p. 208 (80). RATHBUN, 1930, p. 313, and synonymy.

RANGE: From Magdalena Bay, Lower California, and Mulege Bay, Gulf of California, Mexico, to Paita, Peru, accepting Crane's synonymy of *Xanthodius hebes* Stimpson (see Remarks below).

MATERIAL EXAMINED: Twenty-six specimens from two stations:

PANAMA

Saboga Island, Perlas Islands, February 11, 1941, Station 2, sample 1, 1 female.

COLOMBIA

Humboldt Bay, May 19, 1941, Station 103, sample 408, 14 males, 11 females.

MEASUREMENTS: Largest specimen, a male, length 17.5 mm., width 30.3 mm.

HABITAT: "Under and among stones near low water mark" (field label).

REMARKS: The large series from Humboldt Bay taken on rocky shore at low tide confirms the writer's experience in collecting at such places as Utria, Cupica, and Cabita bays, Colombia, where *X. sternberghii* was found to be the common xanthid crab. The measured male above is not the largest on record, Rathbun (1930, p. 312) recording one measuring 19.4 by 34.2 mm.

Earlier records for the species within territory covered by the "Askoy" Expedition include those of Festa (Nobili, 1901) at Santa Elena Bay and Isla Flamenco, and Schmitt (Rathbun, 1930) at Salinas, Ecuador.



Crane (1947, p. 76) presents convincing evidence that *Xanthodius hebes* Stimpson is merely a variant of *X. sternberghii* characterized by a heavier deposition of lime. Her findings, based upon the study of 165 specimens collected by the "Zaca," are accepted pending a critical examination of an even more extensive series from many localities obtained by the "Velero III."

***Xanthodius stimpsoni* (A. Milne Edwards)**

*Xantho denticulata* STIMPSON ("nov. sp." not *X. denticulatus* White), 1860, p. 207 (79).

*Xantho stimpsoni* A. MILNE EDWARDS, 1879, p. 252, pl. 46, figs. 2-2b. NOBILI, 1901, p. 34. FINNEGAN, 1931, p. 631.

*Xanthodius stimpsoni* RATHBUN, 1930, p. 315, pl. 143, figs. 5-7. CRANE, 1947, p. 77.

*Daira ecuadorensis* RATHBUN, 1935, p. 49.

RANGE: From Cape San Lucas, Lower California, Mexico, to Santa Elena Bay, Ecuador.

MATERIAL EXAMINED: Two specimens from as many stations:

COLOMBIA

Humboldt Bay, May 18, 1941, Station 103, sample 404, 6-10 feet, 1 ovigerous female.

ECUADOR

Latitude 01° 07' N., longitude 79° 53' W., April 17, 1941, Station 87, sample 343, 9-27 meters, 1 young.

MEASUREMENTS: Female specimen, length 5.3 mm., width 7.9 mm.

HABITAT: Coral, hard bottom (rock and corallines).

REMARKS: *Xanthodius stimpsoni* is another xanthid which ranges widely throughout the Panamic province, which includes the lower portion of the Gulf of California on the north and the Bay of Santa Elena on the south, where it was collected by Festa (Nobili, 1901). It has not yet been recorded from the Galápagos Islands. This species is distinguished at once from the preceding *X. sternberghii* by the dentate anterolateral margins, those of *sternberghii* being lobed.

The small size of the ovigerous female measured above should be noted.

While at the United States National Museum in 1939 the writer examined the type of *Daira ecuadorensis* Rathbun (1935, p. 49),

collected by W. L. Schmitt at Salinas, Ecuador. That Rathbun subsequently became aware of her error in assigning this specimen to *Daira*, a genus represented in the eastern Pacific by Stimpson's unmistakable *D. americana*, was evident by the substitution in her handwriting of the name *Paraxanthias taylori* on the type label. *P. taylori*, however, is a northern species ranging south to Magdalena Bay, Lower California, and would scarcely be expected to occur south of the Equator. This specimen collected by Schmitt is instead an example of *Xanthodius stimpsoni*.

***Lophoxanthus lamellipes* (Stimpson)**

*Xantho lamellipes* STIMPSON, 1860, p. 205 (77).

*Lophoxanthus lamellipes* A. MILNE EDWARDS, 1879, p. 256, figs. 3, 3a. RATHBUN, 1930, p. 317, pl. 148, figs. 3, 4. HULT, 1938, p. 13. GARTH, 1946, p. 451, pl. 77, fig. 5. CRANE, 1947, p. 77.

RANGE: From La Paz, Gulf of California, Mexico, to Salinas, Ecuador; Galápagos Islands.

MATERIAL EXAMINED: Two specimens from as many stations:

PANAMA

Isla Saboga, Perlas Islands, May 26, 1941, Station 111, sample 432, 4 meters, 1 young.

Guayabo Chiquito, May 20-21, 1941, Station 104, sample 410, 8-10 meters, 1 male.

MEASUREMENTS: Male specimen, length 4.5 mm., width 6.5 mm.

HABITAT: From masses of coral.

REMARKS: The specimen from Saboga Island is remarkably ornate; that is, the reticulations of the carapace and the crests of the ambulatory legs are beautifully distinct. In spite of its small size, the species usually gives the impression of grossness, rather than of refinement, because of the thick, obtuse, anterolateral margins of the carapace.

***Hexapanopeus sinaloensis* Rathbun**

*Hexapanopeus sinaloensis* RATHBUN, 1930, p. 398, pl. 170, figs. 1, 2.

*Hexapanopeus setipalpus* FINNEGAN, 1931, p. 641.

RANGE: Known previously only from the type locality, Tecapan, Sinaloa, Mexico, and from Panama (as *H. setipalpus*), with the exception of unpublished data included under Remarks below.

**MATERIAL EXAMINED:** Málaga Bay, Colombia, March 19, 1941, Station 40, sample 129, 4-9 meters, nine males, six females.

**MEASUREMENTS:** Largest specimen, a male, length 5.2 mm., width 7.4 mm., chela (inferior border) 6.1 mm., chela (superior border) 6.7 mm., dactyl 4.0 mm., height of palm 3.4 mm.

**HABITAT:** Black mud and gray sand bottom.

**REMARKS:** One might hesitate to apply to specimens from southern Colombia a name given to a single specimen from northern Mexico which has remained unique in the collections of the United States National Museum were it not for the fact that the gap is bridged quite neatly by Costa Rican specimens in the Hancock collections which have been compared with the type of *H. sinaloensis* and with which the smaller males in the "Askoy" series agree in all important particulars. As was suggested by Rathbun (1930, p. 398), the chelipeds figured with the type specimen are both minor chelipeds, and only one of them belongs with the type. The major chela of the male is high and lacks the basal tooth usual in the genus. Its measurements are recorded above by way of supplementary description.

Paratypes of *H. setipalpus* Finnegan from Taboga Island, Panama, were examined through the courtesy of Dr. I. M. Gordon of the British Museum (Natural History) and proved to be identical with *sinaloensis*.

The range of the species is extended from Panama to Colombia.

#### **Eurypanopeus planus** (Smith)

*Panopeus planus* SMITH, 1869, p. 283. NOBILI, 1897, p. 2.

*Eurypanopeus planus* A. MILNE EDWARDS, 1880, p. 321, pl. 59, figs. 4-4c. NOBILI, 1901, p. 34. RATHBUN, 1930, p. 420, pl. 175, figs. 3-5. CRANE, 1947, p. 79.

**RANGE:** From San Carlos Bay, Sonora, Mexico, to Santa Elena Bay, Ecuador.

**MATERIAL EXAMINED:** Eight specimens from three stations:

#### PANAMA

Guayabo Chiquito, March 4, 1941, Station 30, sample 79, shore, 1 male.

#### COLOMBIA

Humboldt Bay, May 19, 1941, Station 103, sample 408, shore, 3 males, 1 female.

Limón Bay, Cupica Bay, May 17, 1941, Station 102, sample 400, shore, 1 male (atypical as to chelae), 2 females.

**MEASUREMENTS:** Largest specimen, a male, length 12.6 mm., width 19.4 mm.

**HABITAT:** "From masses of agglutinated sand worm tubes formed on the sides of stones and rocks between tides." "Under and among stones near low water mark."

**REMARKS:** *Eurypanopeus planus* occurs in ordinary shore collecting on rocky beaches at low tide in company with *Xanthodius sternberghii* Stimpson, although less abundantly. It is readily recognized because of the flatness of the carapace, which presents almost a plane surface, and the well-defined, truncate anterolateral teeth.

To E. Festa (Nobili, 1901) goes the credit for what is apparently the first record for the species within territory covered by the "Askoy" Expedition, a record later duplicated by Waldo Schmitt, who in 1926 also collected in the Santa Elena Bay region while on a Walter Rathbone Bacon scholarship.

#### **Micropanope xantusii** (Stimpson)

*Xanthodes xantusii* STIMPSON, 1871, p. 105 (15).

*Xanthias xantusii* NOBILI, 1901, p. 34.

*Micropanope xantusii* RATHBUN, 1930, p. 438, pl. 179, figs. 1-4. CRANE, 1937, p. 72; 1947, p. 80.

GARTH, 1946, p. 457, pl. 77, fig. 6.

*Xanthias serrulata* FINNEGAN, 1931, p. 634, text fig. 6.

**RANGE:** From Arena Bank, Gulf of California, Mexico, to Santa Elena Bay, Ecuador; Galápagos Islands.

**MATERIAL EXAMINED:** Thirty-six specimens from four stations:

#### PANAMA

Saboga Island, Perlas Islands, May 26, 1941, Station 111, sample 432, 4 meters, 1 ovigerous female (see Remarks below).

#### COLOMBIA

Utria Bay, May 15, 1941, Station 100, sample 398, 8 feet, 1 female, 1 young.

Gorgona Island, April 20-23, 1941, Station 89, sample 346, 4.5 meters, 1 young; sample 348, 4-6.5 meters, 13 males, 18 females (4 ovigerous).

## ECUADOR

La Plata Island, April 13, 1941, Station 80, sample 302, 5.5 meters, 1 male.

MEASUREMENTS: Male specimen, length 7.3 mm., width 10.1 mm.

HABITAT: All specimens above were recovered from coral clumps.

REMARKS: Rathbun (1907, p. 69) described specimens from Taboga Island, Panama, having pearl-like rather than squamous granules, as *Micropanope taboguillensis*, later (1930) coupling the name subspecifically to *M. xantusii*. If this were intended in a geographic or racial sense, the writer would be justified in referring the Saboga Island specimen above to the Rathbun subspecies because of the proximity of the Perlas Islands to Taboga Island. However, in view of the fact that Nobili (1901) described as pearly granulate the four males and two females obtained by E. Festa at Santa Elena Bay, at the opposite end of the "Askoy" itinerary, it seems best to regard the Rathbun designation as a *forma*, likely to be present in any extensive series from whatever locality. It is in this sense that the "Askoy" specimens have all been referred to *xantusii* (Stimpson), none of them being sufficiently ornate to justify the application of the name *taboguillensis* Rathbun.

Paratypes of *Xanthias serrulata* Finnegan have been examined through the kindness of Dr. Isabella Gordon of the British Museum (Natural History) and were found to be identical with *Micropanope xantusii*.

***Micropanope armstrongi*, new species**

## Figure 3

TYPE: Male holotype, A.M.N.H. No. 10010, from La Plata Island, Ecuador, 5.5 meters, April 13, 1941; female allotype and two female paratypes, same locality and date. Specimens obtained by the "Askoy" Expedition at Station 80, sample 302.

MEASUREMENTS: Male holotype: length of carapace 3.1 mm., width of carapace 4.5 mm., width of front 1.6 mm., of fronto-orbit 3.4 mm., length of major cheliped 5.9 mm., of hand 3.6 mm., of dactyl 1.9 mm., height of palm 2.0 mm. Female allotype: length 3.0 mm., width 4.5 mm.

DIAGNOSIS: Last lateral tooth small but

easily discernible. Color of immovable finger not continued on palm. Palms mostly rough. Granulations of carapace not in lines to any great extent. Second lateral tooth replaced by a cluster of spinules. Lateral projections spiniform. Carapace, chelipeds, and walking legs with plumose hairs.

DESCRIPTION: Carapace considerably broader than long, slightly convex laterally and moderately so anteroposteriorly, roughened towards the anterior and lateral margins by short rows of flattened granules from which arise sparse clusters of long, plumose hairs. Front wide, the two convex, granulated lobes separated by a distinct median V, and marked laterally by a granule but slightly larger than the rest. A transverse row of setae well back of front. Orbital margins sharply granulate, a suggestion of a tooth at inner angle, two slight indentations delimiting a shallow lobe, and an exorbital tooth which becomes the first of five anterolateral teeth. Second anterolateral tooth represented by a cluster of spinules which group themselves in two levels. Third and fourth teeth subequal, each consisting of a sharp spine inserted in a broad spinulose base, the third rectangular, arching forward, the fourth subacute, outwardly directed, and bearing a cluster of hairs on its base. Carapace widest at level of fourth tooth. Fifth tooth much reduced in size, postlateral in position, sharp, and clearly visible. Regions scarcely defined, with the exception of the linear mesogastric.

Chelipeds unequal in both sexes. Carpus of major cheliped broad as manus in superior view, granules increasing in size and sharpness from inner proximal to outer distal margin, which is clothed with shaggy, plumose hairs; a sharp spine at inner angle and another located just below it. Manus granulate, granules arranged in rows, sharpened towards superior margin and gradually flattening towards base of pollex, which is smooth and bare. Upper proximal portion of manus covered with shaggy hair, leaving an equal area towards the middle of the manus which is granulate but not hirsute. Fingers meeting without gape, tips crossing, pollex slightly deflexed, color not extending onto palm, largest of teeth median, dactyl with a basal tooth. Minor manus completely rough

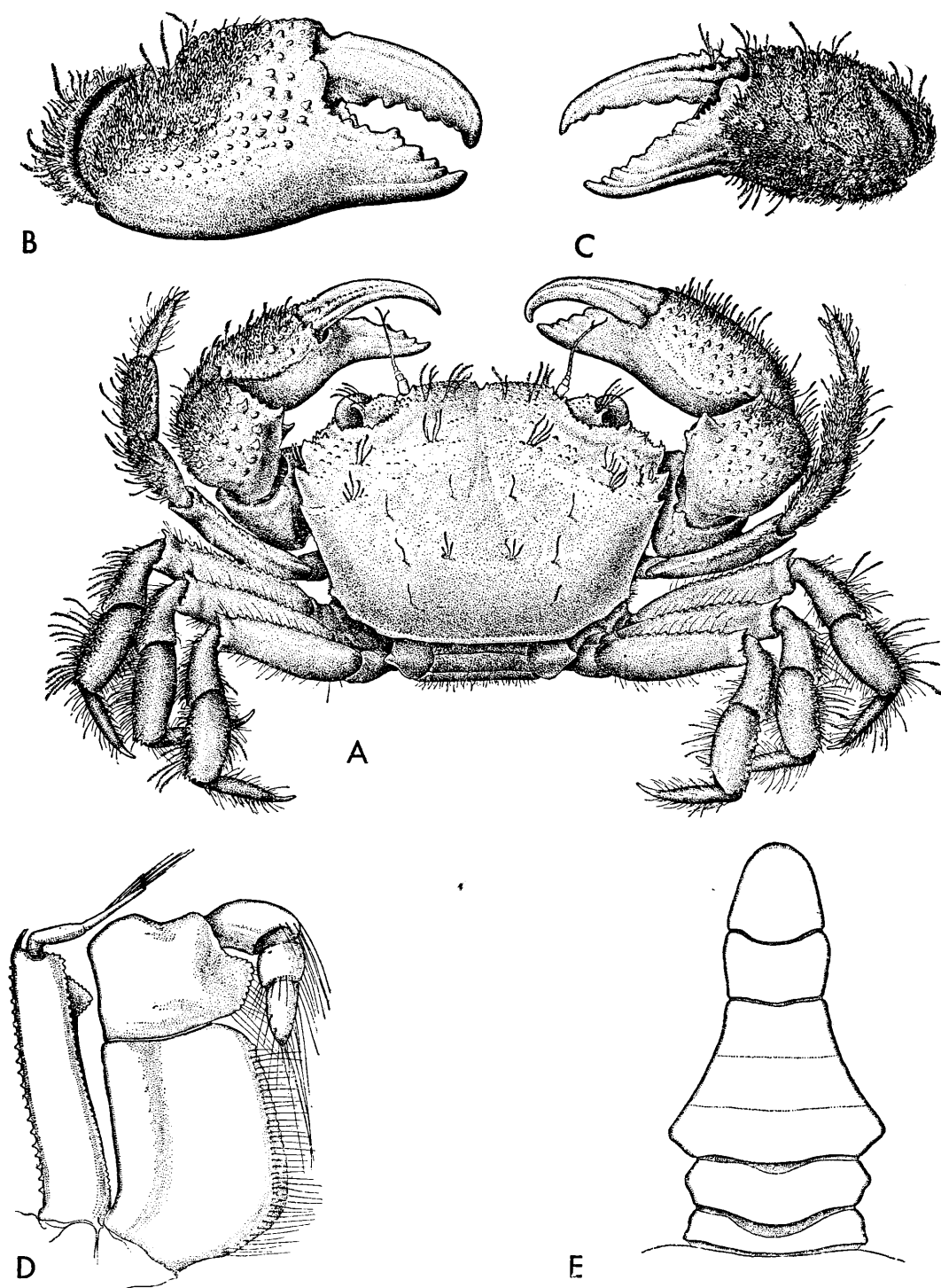


FIG. 3. *Micropanope armstrongi*, new species, male holotype. A. Dorsal view,  $\times 12.5$ . B. Major chela,  $\times 14.8$ . C. Minor chela,  $\times 14.8$ . D. Right outer maxilliped,  $\times 49.5$ . E. Male abdomen (hairs omitted),  $\times 22.2$ .

and hairy, fingers slender, deeply grooved, tips crossing, pollex strongly deflexed.

Ambulatory legs spinulose and hairy; merus with a line of spinules above, sparsely long-hairy; carpus and propodus densely spinulose and short-pubescent; dactylus straight except for nail, which is slightly incurving, bearing a third type of long, clear yellow hair.

Merus of third maxilliped broader than long, inwardly notched for insertion of palpus, outwardly square cut and moderately extended.

Abdomen of male fringed with hair, segments 3-5 fused, segment 6 broader than long, 7 longer than broad, tip rounded.

Female identical with male in all important respects, including size and ornamentation of major cheliped.

**ADDITIONAL MATERIAL:** In addition to the type series from La Plata Island, Ecuador, the "Askoy" collections include one young specimen from Guayabo Chiquito, Panama, May 20-21, 1941, Station 104, sample 410, 8-10 meters, coral.

**REMARKS:** The new species finds its nearest Pacific relative in *Micropanope fraseri* Garth from the Galápagos Islands, which it appears to replace in the *Pocillopora* colony along the mainland coast, not, however, to the exclusion of the foregoing *M. xantusii* (Stimpson), which is found in both localities. It is of smaller size (assuming specimens at hand to be mature), less spinulose of carapace than *M. fraseri*, but has the outer surface of the hand almost completely granulate, whereas that of *fraseri* is smooth and bare. The proportions of length to breadth of carapace differ, the new species being remarkably broad. The diagnostic characters given bring it into line with *M. urinator* (A. Milne Edwards), an Atlantic species, in the Rathbun key (1930, p. 428).

I take pleasure in naming this distinctive species for Mr. John C. Armstrong, carcinologist and second in command of the "Askoy" Expedition, by means of whose diving activities it was retrieved from masses of living coral.

#### *Menippe obtusa* Stimpson

*Menippe obtusa* STIMPSON, 1859, p. 53 (7).  
RATHBUN, 1930, p. 478, pl. 197, pl. 198, figs. 1, 2.

SIVERTSEN, 1933, p. 16. GARTH, 1946, p. 470, pl. 82, figs. 3, 4. CRANE, 1947, p. 80.

**RANGE:** From Corinto, Nicaragua, to Panama; Galápagos Islands.

**MATERIAL EXAMINED:** Two specimens from as many stations:

#### COLOMBIA

Gorgona Island, April 22, 1941, Station 89, sample 348, 4-6.5 meters, 1 young.

#### ECUADOR

La Plata Island, April 12, 1941, Station 80, sample 302, 5.5 meters, 1 male.

**MEASUREMENTS:** Largest specimen, a male, length 11.0 mm., width 15.2 mm.

**HABITAT:** The specimens above were retrieved from coral.

**REMARKS:** There are two species of *Menippe* on the Pacific side of middle America, the above species and *M. frontalis* A. Milne Edwards. The second has been known since Nobili's time to range southward to Santa Elena Bay, Ecuador, but the "Askoy" records given above are the first for *M. obtusa* south of Panama on or near the mainland. *M. obtusa* is distinguished by the entire frontal lobes, those of *M. frontalis* being quadridentate.

#### *Pilumnus xantusii* Stimpson

*Pilumnus xantusii* STIMPSON, 1860, p. 213 (85).  
RATHBUN, 1930, p. 486, pl. 201, figs. 1-3. GARTH, 1946, p. 471, pl. 59, figs. 1-5, pl. 79, fig. 4. CRANE, 1947, p. 81.

*Pilumnus crosslandi* FINNEGAN, 1931, p. 643.

*Eriphides hispida* BOONE, 1927, p. 237, fig. 87B (not fig. 87A).

**RANGE:** From Cape San Lucas, Lower California, Mexico, to Puerto Culebra, Costa Rica; Galápagos Islands.

**MATERIAL EXAMINED:** La Plata Island, Ecuador, April 12, 1941, Station 80, sample 302, 5.5 meters, one large male and female.

**MEASUREMENTS:** Male specimen, length 14.6 mm., width 19.0., including spines.

**HABITAT:** The *Pocillopora* coral colony.

**REMARKS:** The finding of this species at La Plata Island, Ecuador, by the "Askoy" Expedition completes the triangle, the other two points of which are the tip of the peninsula of Lower California and the Galápagos Islands. As in the case of *Microphrys platysoma* (Stimpson), already referred to, the

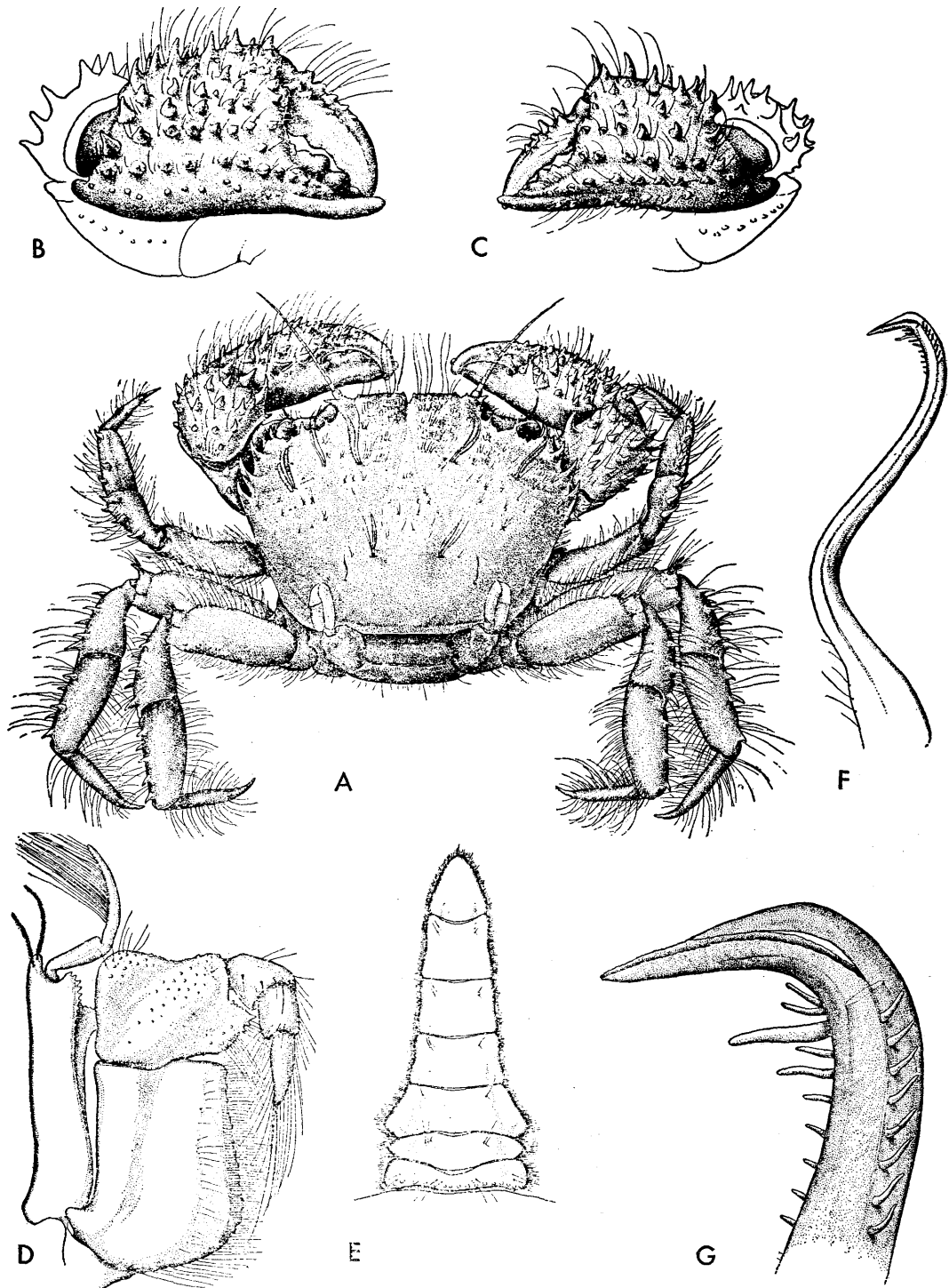


FIG. 4. *Pilumnus nobilii*, new species, male holotype. A. Dorsal view,  $\times 7.4$ , fourth ambulatory legs regenerating. B. Major chela,  $\times 10.8$ . C. Minor chela,  $\times 10.8$ . D. Right outer maxilliped,  $\times 28.4$ . E. Male abdomen,  $\times 10.3$ . F. Right first pleopod,  $\times 23.3$ . G. Tip of first pleopod,  $\times 145$ .

writer would have done better to have selected other examples of Gulf of California species to illustrate the infiltration of a northern element into the Galápagos Islands. It seems to him significant, however, that the South American "mainland" habitus of each is an offshore island: in the case of *Pilumnus xantusii*, La Plata; in the case of *Microphrys platysoma*, Gorgona. Certainly, either the ocean currents bring species to these islands and not to the adjacent mainland shores, or else the islands, being removed from the muddy outwash of great rivers, support a peculiar fauna requiring clear water, sand bottom, and an abundance of oxygen.

***Pilumnus nobilii*, new species**

Figure 4

?*Pilumnus spinohirsutus* NOBILI (not Rathbun), 1901, p. 32.

TYPE: Male holotype, A.M.N.H. No. 10011, from Málaga Bay, Colombia, 9 meters, March 19, 1941; specimen obtained by "Askoy" Expedition at Station 40, sample 129. Female allotype, A.H.F. No. 342, from Santa Elena Bay, Ecuador, 9-12 meters, February 9, 1934; specimen obtained by Allan Hancock Expedition of 1934 at "Velero" Station 210-34.

MEASUREMENTS: Male holotype: length of carapace 4.9 mm., width of carapace at level of third anterolateral spine (including spines) 7.2 mm., (without spines) 6.4 mm., length of chela 4.3 mm., of dactyl 2.2 mm. Female allotype: length 3.8 mm., width (including spines) 5.9 mm.

DIAGNOSIS: Four anterolateral spines, including the exorbital; a subhepatic spinule. Front truncate, lobes devoid of spines, although sharp granules may be present. Dorsal surface of carapace sparsely hairy and studded with sharp granules. Palms of both sexes completely spinulous. Subhepatic and pterygostomial regions spinulous; a spinulous projection at inner angle of merus of third maxilliped.

DESCRIPTION: Carapace strongly convex anteroposteriorly, moderately so from side to side, roughened by granules most numerous on hepatic and branchial regions, and covered with a sparse pubescence consisting of long clavate and short to medium length

yellow hairs. Frontal lobes subtruncate, margin devoid of sharp spinules, but bearing a granule suggestive of the worn base of a spinule on either side of the broad and deep median V, followed by a cluster of long hairs set in the margin, and delimited laterally by a spinulous granule. Orbits strongly spinulous above and below. Anterolateral spines four, including the exorbital, cylindrical, acuminate, and directed forward, outward, and conspicuously *upward*. Third spine most prominent, tending to curve anteriorly, fourth spine shorter, space between it and third spine slightly less than between third and second, making it appear somewhat post-lateral. Subhepatic spine visible between first and second lateral spines but the most prominent of numerous subhepatic spinules.

Major and minor chelipeds in both sexes strongly spinulous and pubescent. Merus triangular, outer surface smooth and bare, two curved spines on upper margin and a row of sharp granules on lower; carpus quadrilateral, sparsely studded with forward curving spines arranged in rows of four or five each; major manus of male completely covered with spinules arranged in rows and varying in length and sharpness from three prominent arching spines forming a superior crest to a dozen low but pointed granules arranged in an irregular row opposite the slight sulcus leading to the base of the tip of the pollex. (It is this last row of granules which is entirely wanting in *P. townsendi*.) Fingers slender, grooved, meeting closely, tips crossing, spines continued on fingers but color of pollex not continued on palm; dactyl with three rows of spinules above, two small basal teeth below; pollex with two teeth and an upturned tip, evenly spaced. Minor chela similar to major except for more elongate fingers, absence of digital teeth, and presence of five, instead of three, propodal teeth.

Merus of third maxilliped broader than long, minutely granulate, anterior margin crenate, a surface depression opposite the base of an internally produced, spinulous flange. Clusters of spinules also found at tip of exognath of third maxilliped and on lateral extensions of the endostomial ridges.

Ambulatory legs spinulous and hairy, spines of merus reduced to sharpened granules; carpus and propodus armed anteriorly

with stout, sharp spines, those of the carpus arranged in a double row; dactylus unarmed but densely hairy, amber tip corneous, incurving. The fourth pair of walking legs of the type specimen are regenerating.

Abdomen of male with seven free segments, last segment longer than broad, tip rounded. Tips of male verges sharply recurving, slender, pointed. A transverse row of granules across sternum.

REMARKS: The two ovigerous females collected at Santa Elena Bay by Enrico Festa and recorded by Nobili (1901) form the basis of Rathbun's (1910) Ecuadorean record for *Pilumnus spinohirsutus* (Lockington). As noted by Rathbun (1923, p. 623) in erecting *P. townsendi* in part upon specimens formerly referred to *P. spinohirsutus*, Lockington's description would apply to either species, depending upon whether or not he intended to include the external orbital spine with the anterolateral spines, as is done in Rathbun's monograph and in the present paper. In the absence of Lockington's type she rightly used topotypical material from San Diego in the collections of the United States National Museum to establish the fact that, whereas the Californian species possessed five spines, including the exorbital, the Gulf of California-Lower Californian species, *P. townsendi* (their ranges overlapping at Magdalena Bay), had but four. By the same reasoning, and with the assurance of two specimens, also females, from Nobili's locality, Santa Elena Bay, it is now possible to establish the fact that the Ecuadorean species, like the Gulf of Californian, differs from the Californian in having but four spines, but also differs from *P. townsendi* in the following particulars:

1. The dorsal surface of the carapace, instead of being predominately hairy, is predominately sharp-granulate, the granules being most conspicuous on the hepatic and branchial regions.

2. The frontal lobes, instead of being rounded, and bearing three spines each, are subtruncate, with only a suggestion of a granule on either side of the median V and a minute spinule externally.

3. No portion of the chela, major or minor, in either sex, is smooth and bare, there

being an entire inferior row of granules on the major chela not present in *P. townsendi*.

4. Spinules, or spinulous granules, are present in *P. nobilii* in the following locations: endognath and exognath of third maxilliped, lateral extensions of ridges of the endostome, subhepatic area, and in a line across the sternum.

This distinctive species is named in memory of Dr. Giuseppe Nobili, upon whose skill in interpreting the collections of Dr. Enrico Festa is based our comparatively accurate knowledge of the crustacean fauna of Ecuador.

#### *Pilumnus pygmaeus* Boone

*Pilumnus pygmaeus* BOONE, 1927, p. 221, fig. 81. RATHBUN, 1930, p. 515, pl. 207, figs. 4, 5. GARTH, 1946, p. 472, pl. 80, fig. 4. CRANE, 1947, p. 81.

RANGE: Galápagos Islands; Costa Rica.

MATERIAL EXAMINED: Utria Bay, Colombia, May 15, 1941, Station 100, sample 397, shore, one female.

MEASUREMENTS: Female specimen, length 2.3 mm., width 3.1 mm.

HABITAT: Shore at low tide.

REMARKS: This diminutive species was encountered in the Galápagos Islands by the Hancock expeditions in a variety of situations, including ordinary shore collecting at low tide, dredging in depths as great as 15-25 fathoms, and cracking from *Pocillopora* coral. Only the first of these situations is duplicated by the "Askoy" record above, which extends the published range of the species to the South American mainland, although the "Zaca" had previously obtained it at two localities in Costa Rica, Central America (Crane, 1947, p. 81).

#### *Pilumnus reticulatus* Stimpson

*Pilumnus reticulatus* STIMPSON, 1860, p. 214 (86). RATHBUN, 1930, p. 521, pl. 209, figs. 4, 5, pl. 210.

*Pilumnus tessellatus* A. MILNE EDWARDS, 1880, p. 295, pl. 51, figs. 2-2d.

*Pilumnus fragosus* A. MILNE EDWARDS, 1880, p. 296, pl. 52, fig. 1. FINNEGAN, 1931, p. 642.

RANGE: Pacific Panama. Occurs also in the Atlantic from Jamaica and Puerto Rico to Patagonia.

MATERIAL EXAMINED: Isla Contadora,



Perlas Islands, May 25, 1941, Station 110, sample 431, 9-10 meters, one male.

MEASUREMENTS: Small male specimen, length 3.6 mm., width 4.9 mm.

HABITAT: The specimen above was obtained from coral.

REMARKS: Pending the outcome of the study of a larger series of specimens in Hancock collections belonging to this interesting complex, in which the names *tessellatus* and *fragosus* of A. Milne Edwards and *meridionalis* of Nobili all figure, the "Askoy" specimen is tentatively referred to Rathbun's *Pilumnus reticulatus* forma *tessellata* (1930, p. 522), as were the Pacific Panamanian specimens collected earlier by Liska Deichmann and Melbourne Ward, rather than to forma *fragosa*, as were specimens from Taboga Island, Bay of Panama, collected by the "St. George" (Finnegan, 1931, p. 642). The type localities of all these forms are Atlantic.

**Heteractaea lunata** (Milne Edwards and Lucas)

*Pilumnus lunatus* MILNE EDWARDS AND LUCAS, 1843, p. 20; 1847, atlas, pl. 9, figs. 2-2d.

*Heteractaea lunata* KINGSLEY, 1879, p. 396. CANO, 1889, p. 102, p. 198. NOBILI, 1901, p. 34. RATHBUN, 1930, p. 532, pl. 212, figs. 1-4, pl. 214. FINNEGAN, 1931, p. 644. CRANE, 1937, p. 72; 1947, p. 81.

RANGE: From San Diego, California, to Valparaiso, Chile.

MATERIAL EXAMINED: Thirty-three specimens from seven stations:

PANAMA

Isla Contadora, Perlas Islands, May 25, 1941, Station 110, sample 431, 9-10 meters, 3 males, 1 female.

Isla Saboga, Perlas Islands, May 26, 1941, Station 111, sample 432, 4 meters, 4 males, 2 females, 2 young.

Guayabo Chiquito, May 20, 1941, Station 104, sample 410, 8-10 meters, 2 young.

COLOMBIA

Humboldt Bay, May 18, 1941, Station 103, sample 404, 6-10 feet, 1 male, 3 females.

Utria Bay, May 15, 1941, Station 100, sample 397, shore, 1 male, 1 small female.

Gorgona Island, April 22, 1941, Station 89, sample 348, 4-6.5 meters, 1 female.

ECUADOR

La Plata Island, April 12-13, 1941, Station 80, sample 302, 5.5 meters, 7 males, 5 females.

MEASUREMENTS: Largest specimen, a male, length 11.7 mm., width 19.3 mm.

HABITAT: Coral, under stones at low tide.

REMARKS: This species, which enjoys the widest latitudinal range of any Pacific American shore form known to the writer, was obtained by "Askoy" collectors at seven localities, or at one more than the ubiquitous *Eriphia squamata*.

Early records for the species within territory covered by the "Askoy" Expedition were those of the "Vettor Pisani" (Cano, 1889), which obtained it in the Perlas Islands in 1884, and E. Festa (Nobili, 1901), who collected a single female specimen at Santa Elena Bay, Ecuador.

**Ozius tenuidactylus** (Lockington)

*Xantho tenuidactylos* LOCKINGTON, 1877, p. 98 (5).

*Ozius tenuidactylos* GLASSELL, 1935, p. 104.

*Ozius tenuidactylus* SCHMITT, 1939, p. 25. GARTH, 1946, p. 479, pl. 81, fig. 1. CRANE, 1947, p. 81.

*Ozius agassizi* A. MILNE EDWARDS, 1880, p. 279, pl. 55, figs. 1-1d. NOBILI, 1901, p. 36. RATHBUN, 1930, p. 544, pl. 221, figs. 3, 4.

RANGE: From the Gulf of California to Ecuador; Galápagos Islands.

MATERIAL EXAMINED: Humboldt Bay, Colombia, May 19, 1941, Station 103, sample 408, shore, five females (three ovigerous).

MEASUREMENTS: Largest specimen, a female, length 8.4 mm., width 13.2 mm.

HABITAT: Under rocks at low tide.

REMARKS: This is the familiar *Ozius agassizi* of A. Milne Edwards, Rathbun, and others, referred to the earlier designation of Lockington because of the acuity of S. A. Glassell in recognizing the correspondence between the unmistakable slender minor chela of the crab in question and a brief written description, and particularly, a name, applied to a specimen no longer existing and of which no illustration was provided.

A check on the Rathbun (1930) record for Ecuador reveals that Nobili recorded three males and two females from Isla Flamenco, Colombia (now Panama), and three males of uncertain locality. While these were in all

probability from one of Festa's Ecuadorean localities, a strict interpretation would require the substitution of Panama for Ecuador as the certain southern limit of range for the species. Under this interpretation the "Askoy" specimens would represent an extension of range southward to Colombia.

***Eriphia squamata* Stimpson**

*Eriphia squamata* STIMPSON, 1859, p. 56 (10). NOBILI, 1901, p. 37. RATHBUN, 1930, p. 550, text fig. 84, pl. 223, pl. 224, fig. 1. CRANE, 1947, p. 81.

*Eriphia laevimana* var. *smithii* CANO (not MacLeay), 1889, pp. 102, 210.

**RANGE:** From Magdalena Bay, west coast of Lower California, and Agua Verde Bay, Gulf of California, Mexico, to Santa Elena Bay, Ecuador; Galápagos Islands.

**MATERIAL EXAMINED:** Thirty-six specimens from seven stations:

**PANAMA**

Pacheca Island, Perlas Islands, February 10, 1941, Station 1, sample 2, 1 male, 2 females.

Saboga Island, Perlas Islands, February 11, 1941, Station 2, sample 1, 2 females; sample 2, 1 male, 1 female.

San José Island, Perlas Islands, November, 1945, "Playa Grande and adjacent rock pools," R. C. Murphy, collector, 1 female.

Guayabo Chiquito, March 4, 1941, Station 30, sample 79, 6 males, 11 females, 3 young.

**COLOMBIA**

Ardita Bay, March 5, 1941, Station 31, sample 80, 1 large female.

Humboldt Bay, May 19, 1941, Station 103, sample 408, 1 male, 1 young female.

Limón Bay, Cupica Bay, May 17, 1941, Station 102, sample 400, 1 male, 3 large females, 1 young.

**MEASUREMENTS:** Largest specimen, a female, length 25.7 mm., width 36.5 mm.

**HABITAT:** "From crevices of rocks." "From masses of sandy worm tubes on sides of rocks." "Under and among stones near low water mark." "Picked up along beach near village." (Excerpts from field data.)

**REMARKS:** In mentioning the abundance of *Xanthodius sternberghii* Stimpson in ordinary low-tide collecting on rocky shore, the writer had forgotten the ubiquitous nature of *Eriphia squamata*. Thus, although a single series of the former yielded 14 males and 11

females to the "Askoy" collectors, it was obtained at only two stations; whereas the latter appears in lesser numbers, but at six ports of call. (The seventh station above is the independent work of Murphy at a later date.) Tolerance to a wider variety of conditions would seem to provide the explanation, judging from the four habitats recorded at random from among collecting data.

Rathbun (1910, p. 609) lists the Gulf of Panama as a doubtful locality for *E. laevimana* var. *smithii*, also recorded by Cano from the reefs of Pernambuco. In 1930 (p. 550), however, she separated Cano's Atlantic and Pacific records, placing the Panama record under *E. squamata*, where it undoubtedly belongs.

Again it appears to have been Festa who first collected the species in Ecuador (Nobili, 1901). His record was duplicated by Schmitt at Salinas in 1926.

***Domècia hispida* Eydoux and Souleyet**

*Domècie hérissée* EYDOUX AND SOULEYET, 1841 (?), pl. 2, figs. 5-10.

*Domècia hispida* EYDOUX AND SOULEYET, 1842, p. 235. RATHBUN, 1930, p. 554, pl. 227. FINNEGAN, 1931, p. 647. CRANE, 1937, p. 73; 1947, p. 82. GARTH, 1946, p. 489, pl. 81, fig. 5.

**RANGE:** From Arena Bank, Gulf of California, Mexico, to Gorgona Island, Colombia; Galápagos Islands. Occurs also in eastern Atlantic, Indian, and western Pacific oceans.

**MATERIAL EXAMINED:** One hundred and one specimens from four stations:

**PANAMA**

Guayabo Chiquito, May 20-21, 1941, Station 104, sample 410, 8-10 meters, 5 males, 12 females (4 ovigerous), 13 young.

**COLOMBIA**

Utria Bay, May 15, 1941, Station 100, sample 398, 8 feet, 3 males, 2 females.

Gorgona Island, April 20-23, 1941, Station 89, sample 346, 4.5 meters, 3 males, 12 females (8 ovigerous), 1 young; sample 348, 4-6.5 meters, 2 males, 3 females (2 ovigerous).

**ECUADOR**

La Plata Island, April 12-13, 1941, Station 80, sample 302, 5.5 meters, 18 males, 25 females (11 ovigerous), 2 young.

**MEASUREMENTS:** Female specimen, length 8.1 mm., width 10.9 mm.

**HABITAT:** Specimens were recovered from broken-up masses of coral.

**REMARKS:** *Domecia hispida* is a member of the *Pocillopora* coral fauna, where it is found in company with the following *Trapezia* species.

The range of the species is extended southward along the South American mainland from Gorgona Island, Colombia, to La Plata Island, Ecuador.

***Trapezia cymodoce ferruginea* Latreille**

*Trapezia ferruginea* LATREILLE, 1825, p. 695.

*Trapezia cymodoce ferruginea* RATHBUN, 1907, p. 58; 1930, p. 557, pl. 228, figs. 1, 2. FINNEGAN, 1931, p. 645. CRANE, 1937, p. 73; 1947, p. 83. GARTH, 1946, p. 491, pl. 81, fig. 4.

**RANGE:** From Arena Bank, Gulf of California, Mexico, to Gorgona Island, Colombia; Galápagos Islands; Clarion Island. Occurs also in the Red Sea and Indo-Pacific Ocean.

**MATERIAL EXAMINED:** Five hundred and seventeen specimens from five stations:

**PANAMA**

Isla Saboga, Perlas Islands, May 26, 1941, Station 111, sample 432, 4 meters, 44 specimens.

Guayabo Chiquito, May 20-21, 1941, Station 104, sample 410, 9-10 meters, 46 specimens.

**COLOMBIA**

Utria Bay, May 15, 1941, Station 100, sample 398, 8 feet, 84 specimens.

Gorgona Island, April 20-23, 1941, Station 89, sample 346, 4.5 meters, 52 specimens; sample 348, 4-6.5 meters, 62 specimens.

**ECUADOR**

La Plata Island, April 12-13, 1941, station 80, sample 302, 5.5 meters, 229 specimens.

**MEASUREMENTS:** Largest specimen, a male, length 14.4 mm., width 17.4 mm.

**HABITAT:** All specimens above were obtained from masses of coral brought up from depths of 3 fathoms or less and cracked on board ship.

**REMARKS:** In enumerating such species as *Xanthodius sternberghii* Stimpson and *Eriphia squamata* Stimpson as among the most abundant of the Xanthidae obtained by ordinary shore collecting, it was intended to exclude members of the *Pocillopora* colony, the gathering of which requires a special technique. It would hardly be fair to compare in num-

bers specimens that must be picked up one by one from rocky beaches with specimens that fairly swarm out of coral heads at the touch of a geological hammer. The *Pocillopora* head is a collecting ground in miniature. It is as if one were able to transport to the deck laboratory an entire sector of shore for examination at leisure, knowing that not one crustacean could escape in the process. So it is that *T. cymodoce ferruginea*, which outnumbers other brachyuran members of the colony by three or four to one, is present among "Askoy" collections in numbers too large to be conveniently sexed, although they may still be counted.

The riches of the *Pocillopora* colony have already been tapped along the Colombian coast by Crossland of the "St. George" Expedition. It remained for "Askoy" collectors to investigate the colony at La Plata Island, thereby extending the known range of its crustacean inhabitants to Ecuador. The measured specimen is believed to represent a record in size for the species.

***Trapezia digitalis* Latreille**

*Trapezia digitalis* LATREILLE, 1825, p. 696. RATHBUN, 1930, p. 559, pl. 228, figs. 5, 6. CRANE, 1937, p. 73; 1947, p. 83. GARTH, 1946, p. 493, pl. 81, fig. 6.

**RANGE:** From Arena Bank, Gulf of California, Mexico, to Panama; Galápagos Islands. Occurs also in the Red Sea and Indo-Pacific Ocean.

**MATERIAL EXAMINED:** Fifty-two specimens from two stations:

**COLOMBIA**

Gorgona Island, April 20-21, 1941, Station 89, sample 346, 4.5 meters, 1 male, 1 female; sample 348, 4-6.5 meters, 11 specimens.

**ECUADOR**

La Plata Island, April 12-13, 1941, Station 80, sample 302, 5.5 meters, 39 specimens.

**MEASUREMENTS:** Female specimen, length 10.8 mm., width 13.7 mm.

**HABITAT:** The *Pocillopora* colony.

**REMARKS:** Apparently the "St. George" Expedition failed to obtain specimens of this species from Gorgona Island, or failed to separate them from the "numerous specimens [of *T. cymodoce ferruginea*] from Gorgona,

Taboga, and Coiba Islands" (Finnegan, 1931, p. 645), and it remained for the "Askoy" Expedition to add *T. digitalis* to the growing list of species from Pacific Colombia and Ecuador. The brown and yellow color serves at once to separate *digitalis* from red *ferruginea*, although there are morphological differences as well.

#### FAMILY GONEPLACIDAE

##### *Trizocarcinus dentatus* (Rathbun)

*Carcinoplax dentatus* RATHBUN, 1893, p. 243.

*Trizocarcinus dentatus* RATHBUN, 1914, p. 117, text fig. 1, pl. 1; 1918, p. 18, text fig. 3, pl. 1.

RANGE: Gulf of California, Mexico; 30-70 fathoms.

MATERIAL EXAMINED: Latitude 00° 55' N., longitude 80° 08' W., off Ecuador, Station 87, sample 342, 36-54 meters, one female.

MEASUREMENTS: Female specimen, length 7.3 mm., width 9.0 mm.

HABITAT: Dredged on mud bottom.

REMARKS: This exceedingly rare grapsoid crab has been heretofore considered restricted in range to the upper part of the Gulf of California. The "Askoy" specimen has been compared with a specimen in the Hancock collections which had in turn been compared with the type, so that it is without hesitation that the specific name is applied. A difference of 29 degrees in latitude and a distance of nearly 2600 nautical miles is involved between the two localities.

*Trizocarcinus dentatus* is now recorded from Ecuador, and for the first time in South American waters.

##### *Chasmocarcinus latipes* Rathbun

*Chasmocarcinus latipes* RATHBUN, 1898, p. 602, pl. 43, fig. 5; 1918, p. 57, text figs. 25, 26. CRANE, 1937, p. 75.

*Chasmocarcinus ferrugineus* GLASSELL, 1936, p. 216. CRANE, 1937, p. 75, pl. 7, fig. 24.

RANGE: Cedros Island and Magdalena Bay, west coast of Lower California, and Arena Bank, Gulf of California, Mexico; 38-51 fathoms.

MATERIAL EXAMINED: Nine specimens from two stations:

#### COLOMBIA

Solano Bay, May 16, 1941, Station 101, sample 399, 36-54 meters, 1 male, 2 females.

#### ECUADOR

Latitude 00° 55' N., longitude 80° 08' W., April 17, 1941, Station 87, sample 342, 36-54 meters, 5 males, 1 female.

MEASUREMENTS: Largest specimen, a male, length 11.5 mm., width (across posterior border) 14.8 mm.

HABITAT: Black mud bottom, also reddish mud.

REMARKS: As remarked in a previous paper (Garth, 1940, p. 92), the type of *C. ferrugineus* Glassell was examined in the laboratories of the New York Zoological Society through the courtesy of Dr. William Beebe and was found to be identical with *C. latipes* Rathbun. It is interesting to note that many of the "Askoy" specimens are covered with the same rust-colored mud that suggested the name *ferrugineus*. Apparently there is one widely ranging species of *Chasmocarcinus*, *C. latipes*, found both within and without the Gulf of California, and another, the following *C. longipes*, restricted to the Panama Bight, where their ranges overlap. For differentiation between them, see Remarks under the next species.

*Chasmocarcinus latipes* is now recorded from Colombia and Ecuador, extending its range southward from the Lower California-Gulf of California region.

##### *Chasmocarcinus longipes* Garth

*Chasmocarcinus longipes* GARTH, 1940, p. 90, pl. 26, figs. 1-5.

*Chasmocarcinus latipes* BOONE (not Rathbun), 1930, p. 201, pl. 68, figs. A, B.

RANGE: From Secas Islands, Panama, to La Plata Island, Ecuador; Cocos Island, Costa Rica (as *C. latipes* Boone); shore to 50 fathoms.

MATERIAL EXAMINED: One hundred and forty-three specimens from six stations:

#### PANAMA

Piñas Bay, February 23, 1941, Station 19, sample 35, 14-33 meters, 2 males, 6 females, 2 young.

#### COLOMBIA

Ardita Bay, March 6, 1941, Station 31, sample 81, 34-43 meters, 1 female.

Octavia Bay, March 1, 1941, Station 32, sample 83, 24-28 meters, 126 specimens, medium to small size.

Utria Bay, May 14, 1941, Station 100, sample 395, 12-22 meters, 1 female.

Cuevita Bay, May 11, 1941, Station 93, sample 359, 9-36 meters, 3 males, 1 female, well developed.

#### ECUADOR

Off Cape Pasado, April 14, 1941, Station 81, sample 307, 27 meters, 1 female.

**MEASUREMENTS:** Largest specimen, a male, length 8.5 mm., width (along posterior margin) 11.5 mm., cheliped: merus 5.2 mm., carpus 5.3 mm., chela (inferior length) 13.0 mm., chela (superior length) 11.5 mm., dactyl 7.8 mm., height of palm 6.0 mm.

**HABITAT:** Mud bottom, green mud, gray sandy mud.

**REMARKS:** The large specimens from Cuevita Bay show to best advantage the characters that separate *C. longipes* from the foregoing *C. latipes* Rathbun. When adult males of *C. longipes* are present, the unequal chelae and the high palm and deflexed fingers of the major hand are unmistakable. When females and immature males only are present, as in the Octavia Bay series of 126 specimens, the slender merus and propodus of the ambulatory legs may be relied upon, although there are good differences in the external maxilliped and orbital configuration as well.

Measurements of the male cheliped are given above in the hope that they will be used to supplement the original description. Only a half-grown male was available at the time *C. longipes* was first described, and the existing illustration (Garth, 1940, pl. 26, fig. 2) does not do justice to this feature. Since the dissimilarity of the male chelae increases with size and age, the massive major manus becomes a striking character.

#### FAMILY PINNOTHERIDAE

##### *Pinnotheres malagueña*, new species

Figure 5

**TYPE:** Male holotype, A.M.N.H. No. 10012, from Málaga Bay, Colombia, 4-9 meters, March 19, 1941; specimen obtained by "Askoy" Expedition at Station 40, sample 129.

**MEASUREMENTS:** Male holotype, length of carapace 2.6 mm., width of carapace 2.3 mm., fronto-orbital width 1.1 mm., length of chela 1.1 mm., of dactyl 0.5 mm., height of manus 0.6 mm.

**DIAGNOSIS:** Carapace suboctagonal, front advanced, anterolateral margins with heavy fringe of hair. Merus of external maxilliped truncate, propodus broad, flat, and bearing a transverse ridge; dactylus not reaching its tip. Legs symmetrical, decreasing in order 2.3.1.4. Male abdomen with segments 5-7 fused.

**DESCRIPTION:** Carapace slightly longer than broad, suboctagonal, angles rounded, moderately convex anteroposteriorly, more strongly so laterally, sides sloping abruptly from highest, or cardiac, portion, surface smooth and bare, with no indication of regions, almost to frontal and anterolateral margins, which are clothed with shaggy hair. Front advanced considerably beyond orbits, its sides representing a continuation of the anterolateral margins interrupted only by the sinuous indentation of the orbits, anterior margin broadly truncate, edge concealed by fringing hair. Anterolateral margins longer than posterolateral, sloping at a fairly steep angle from the orbits, their gentle arching accentuated by a thick fringe of fur-like pile longest medially. Branchial regions bare and tumid, carapace widest at this level. A suggestion of a short, transverse line of hairs at gastric level. Posterior margin almost straight, rimmed, and devoid of fringing hairs. Orbits small and circular, eyestalks short, eyes filling sockets, corneas when retracted just visible in dorsal view. Antennae short, basal article lodged in orbital hiatus, flagellum only extending beyond margin of front.

Chelipeds stout, equal, merus and carpus fringed with hair above and below, leaving a smooth, bare space between; chela with a similar open area broadening distally, fringing hairs as dense as those of the anterolateral margins forming a superior crest. Fingers slender, thin, tapering, sharply pointed, movable finger curving strongly downward, immovable finger little deflexed, finely toothed, a few long hairs visible in narrow gape, tips crossing until pointed in almost opposite directions.

Merus of third maxilliped nearly transverse in position, distally truncate; carpus longer than wide, cylindrical, curving inward and broadening distally; propodus enlarged, flattened, and broadened medially, a row of long hairs originating from a transverse ridge

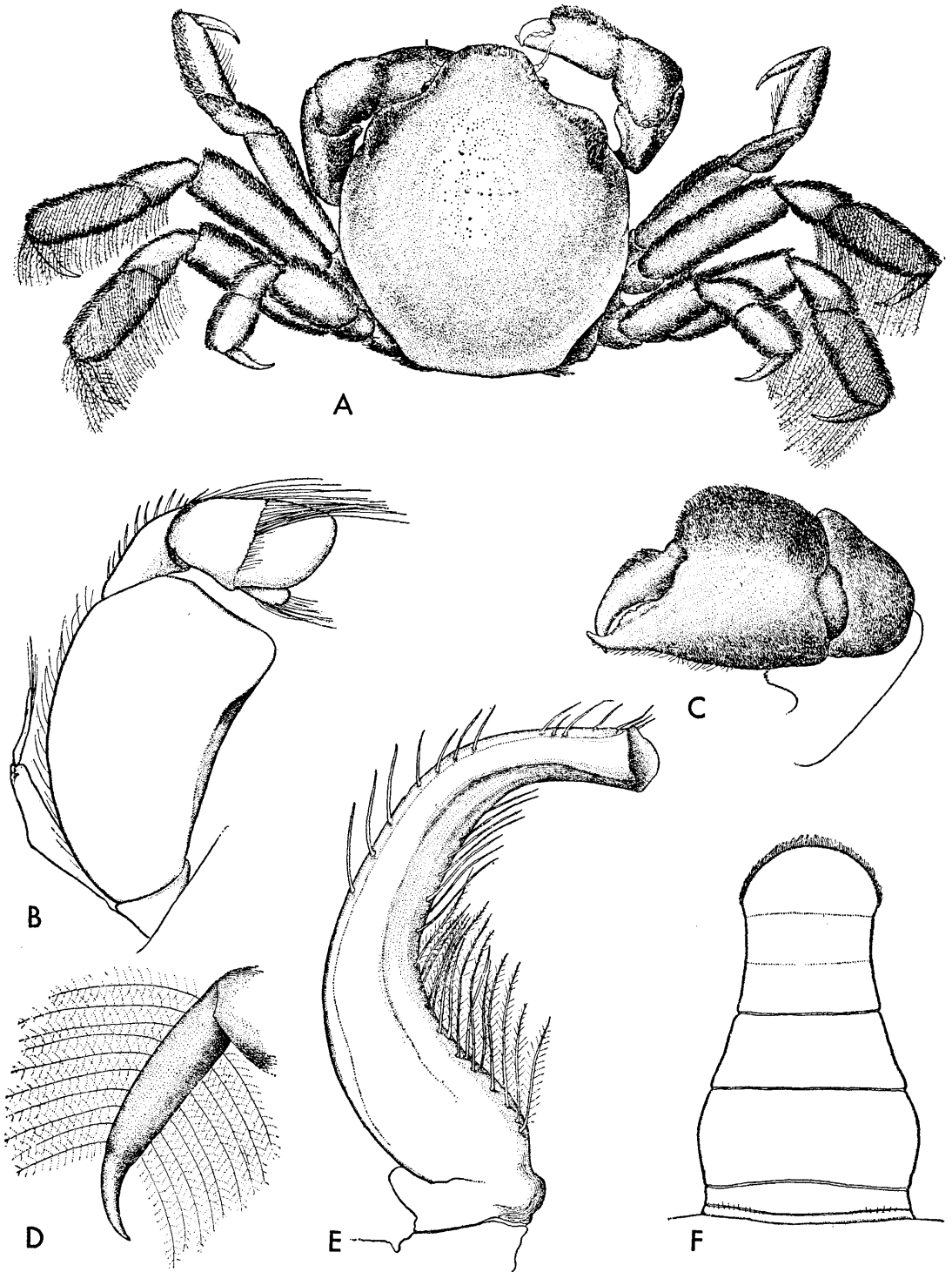


FIG. 5. *Pinnotheres malagueña*, new species, male holotype. A. Dorsal view,  $\times 18.7$ . B. Right outer maxilliped,  $\times 116$ . C. Left chela,  $\times 29.2$ . D. Dactyl of left second walking leg,  $\times 70.2$ . E. Left first pleopod,  $\times 91.2$ . F. Male abdomen,  $\times 38.6$ .

beyond which the small, rounded dactylus takes its origin, following the contour of the propodus but not reaching its obliquely rounded tip.

Sternal plastron of male flattened at the center, slightly concave towards margins, which are fringed with hair, segmentation clearly indicated. Male abdomen widest at third segment, the sides of which are broadly rounded, tapering to narrowest point at middle of fused fifth to seventh segments, then broadening slightly before the semicircular tip, which is edged with fine hair. Male pleopod cylindrical, sickle shaped, tapering gradually from base almost to tip, which flares slightly, margins hairy, long plumose hairs extending to the base of the appendage externally.

Second walking leg slightly the longest; third, first, and fourth shorter in order. Leg joints compressed for overriding one another, meri of equal width throughout; carpi slender at origins, broadening distally; propodi widest at midpoints, obliquely rounded distally; all three joints fringed with furry hair, in addition to which a line of fine yellow hairs crosses the carpus and extends along the anterior margin of the propodus of each leg but the last. A cluster of long hairs originating in the distal margin of the carpus on these legs reaches almost the full length of the propodus, which is fringed with longer hairs below. Dactyli long, tapering abruptly to sharp, transparent, curved nails, prehensile edges serrate, all but the last furnished with inferior marginal hairs. Relative lengths of dactyli to propodi varying in proportion to relative lengths of legs, that of leg 2 being little more than half the length of its propodus, while that of leg 4 almost equals the propodal length.

REMARKS: Because of the dissimilarity of the sexes and the fact that many more *Pinnotheres* species are known from the female than from the male, it is not possible to suggest the affinities of the new species within the genus. While the unsatisfactory nature of the material at hand is recognized, the writer knows of no better way to call attention to the existence of a single specimen of the free-swimming male than by describing it as adequately as possible, and by publishing

a complete illustration, including the usually diagnostic pleopod and external maxilliped. Allowing for the known dissimilarity that exists between maxillipeds of male and female within the species, as well as for the phenomenon of asymmetry as exemplified in the genus, it should be possible for someone fortunate enough to obtain the sedentary female in its as yet unknown host, be it worm, echinoderm, or mollusk, to recognize the specific relationship and so complete a fascinating life history.

According to Mr. S. A. Glassell of Beverly Hills, California, to whom I am indebted for assistance in the preparation of the foregoing description, it is necessary, in describing any new species of *Pinnotheres* from the Pacific coast of either North or South America, to rule out the possibility that one may be dealing with *P. trapeziformis* (Nauck, 1880) because of Bürger's reference (1895) to a male specimen taken at Mazatlan in *Holothuria impatiens* Semper. The type specimen, a female, was obtained from an unknown locality, but from an Indo-Pacific host, *Holothuria maxima*.

The adjective *malagueña*, in common usage to denote something having its origin in Málaga, Spain, is here applied, with equally good reason, to the *Pinnotheres* found for the first time at Málaga Bay, Colombia.

#### FAMILY GRAPSIDAE

##### *Grapsus grapsus* (Linnaeus)

*Cancer grapsus* LINNAEUS, 1758, p. 630.

*Grapsus grapsus* IVES, 1891, p. 190. NOBILI, 1901, p. 41. RATHBUN, 1918, p. 227, pls. 53, 54. BOONE, 1927, p. 244, fig. 90. SIVERTSEN, 1933, p. 18. CRANE, 1937, p. 77; 1947, p. 83. GARTH, 1946, p. 504, pl. 86, figs. 1, 2.

*Pacyhgrapsus crassipes* BOONE (not Randall), 1927, p. 257, fig. 93 (part: Galápagos and Cocos Island specimens).

RANGE: From San Benito Islands, Lower California, and Santa Inez Bay, Gulf of California, Mexico, to Mollendo, Peru; Socorro and Clarion Islands; Galápagos Islands. Occurs also in the Atlantic Ocean.

MATERIAL EXAMINED: Malpelo Island, Colombia, March 26, 1941, Station 55, sample 195, shore, two large males.

MEASUREMENTS: Male specimen, length 62.5 mm., width 69.5 mm.

HABITAT: Rocky shore, spray zone.

REMARKS: Although not previously recorded from Malpelo Island, *Grapsus grapsus*, or "Sally Lightfoot" as this ubiquitous resident of the spray zone is commonly known, has been taken at Socorro, Clarion, and Galápagos, as noted under Range above. It seems to be able to negotiate large water barriers, being found on the tropical coasts of America (east and west) and Africa (west), but is replaced by a subspecies in the Indo-Pacific.

The earliest record of this "crab of all crabs" within territory covered by the "Askoy" Expedition appears to have been that of Festa, who collected specimens at both Flamenco Island, Panama, and Santa Elena Bay, Ecuador (Nobili, 1901).

***Goniopsis pulchra* (Lockington)**

*Goniograpsus pulcher* LOCKINGTON, 1876 (1877), p. 152 (8).

*Goniopsis pulcher* NOBILI, 1897, p. 3.

*Goniopsis pulchra* RATHBUN, 1910, p. 574, pl. 47, fig. 3; 1918, p. 239, pl. 58. CRANE, 1947, p. 85.

RANGE: From Magdalena Bay, Lower California, and Guaymas, Sonora, Mexico, to Capon, Peru.

MATERIAL EXAMINED: San José Island, Perlas Islands, Panama, November, 1945, "Playa Grande and adjacent rock pools," R. C. Murphy, collector, one male.

MEASUREMENTS: Male specimen, length 17.3 mm., width 21.9 mm.

HABITAT: Rocky shore.

REMARKS: *Goniopsis pulchra*, as its name implies, is one of the most beautifully colored of the Grapsidae. Rathbun (1918) mentions citrine blotches against purplish or dark brown becoming yellow on the legs. Unfortunately, much of the original color of the specimen obtained by Murphy has been lost; specimens collected by the writer in the Gulf of California at an earlier date (1937) retain much of a striking pattern of yellow green against dark purple.

The habitat given by Coker for his Peruvian specimens: "Common along muddy beaches; noted especially among and about the mangrove swamps," does not agree with the habitat noted above, but the species may be equally at home in more than one situa-

tion. (Cf. habitat notes by Crane, 1947, p. 85.) Festa's specimens (Nobili, 1897) were from Río Lara, Darien.

***Pachygrapsus transversus* (Gibbes)**

*Grapsus transversus* GIBBES, 1850, p. 181.

*Pachygrapsus transversus* GIBBES, 1850, p. 182. NOBILI, 1901, p. 41. RATHBUN, 1918, p. 244, pl. 61, figs. 2, 3. BOONE, 1927, p. 253, fig. 92. FINNEGAN, 1931, p. 649. PESTA, 1931, p. 179. SIVERTSEN, 1933, p. 19. GARTH, 1946, p. 507, pl. 87, fig. 2. CRANE, 1947, p. 85.

RANGE: From Agua Verde Bay, Gulf of California, Mexico, to Matapalo, Peru; Galápagos Islands. Occurs also in the Atlantic Ocean.

MATERIAL EXAMINED: Thirty-one specimens from five stations:

PANAMA

Pacheca Island, Perlas Islands, February 10, 1941, Station 1, sample 2, shore, 3 males.

San José Island, Perlas Islands, November, 1945, R. C. Murphy, collector, 1 female.

Guayabo Chiquito, March 4, 1941, Station 30, sample 79, shore, 9 males, 9 females, 5 young, and 1 megalops.

COLOMBIA

Humboldt Bay, May 19, 1941, Station 103, sample 408, shore, 1 male, 1 ovigerous female.

Limón Bay, Cupica Bay, May 17, 1941, Station 102, sample 400, shore, 1 ovigerous female.

MEASUREMENTS: Largest specimen, a male, length 13.8 mm., width 17.0 mm.

HABITAT: "From masses of agglutinated sand worm tubes formed on the sides of rocks." "From and among rocks and stones at low tide." (Extracts from field data.)

REMARKS: Aside from the Gorgona Island station of the "St. George" Expedition, there are no published records for this species along the South American mainland from Taboga Island, Panama, to Santa Elena Bay, Ecuador, where it was obtained by Festa (Nobili, 1901). The "Askoy" collections bridge this gap in four stages, Murphy's independent work adding a fifth. For notes on feeding behavior, the reader is referred to Crane (1947, p. 85).

***Sesarma (Holometopus) angusta* Smith**

*Sesarma angusta* SMITH, 1870, p. 159.

*Sesarma (Holometopus) angustum* RATHBUN, 1918, p. 314, pl. 92.



*Sesarma (Holometopus) angusta* FINNEGAN, 1931, p. 651.

RANGE: From Punta Arenas, Costa Rica, to Perlas Islands, Panama.

MATERIAL EXAMINED: Three specimens from two stations:

PANAMA

San José Island, Perlas Islands, November, 1945, "Playa Grande and adjacent rock pools," R. C. Murphy, collector, 1 male.

COLOMBIA

Limón Bay, Cupica Bay, May 17, 1941, Station 102, sample 402, 1 male, 1 female.

MEASUREMENTS: Male specimen, length 19.2 mm., width 18.7 mm.

HABITAT: Customarily mangroves. The Limón Bay specimens were obtained "from forest back of beach, altitude 100 M."

REMARKS: These rather small, flat crabs with squarish carapaces are often encountered considerable distance from shore, as noted under Habitat above. Several species of *Sesarma* have long been known to occur in western Colombia and northern Ecuador, four species of Enrico Festa's collecting having been reported by Nobili (1901). The "Askoy," however, accomplished the unexpected by obtaining a fifth species, *S. angusta*, known previously from Panama and Costa Rica only.

The range of *Sesarma (Holometopus) angusta* is extended from Panama to Colombia.

*Aratus pisonii* (Milne Edwards)

*Sesarma pisonii* MILNE EDWARDS, 1837, p. 76, pl. 19, figs. 4, 5.

*Aratus pisonii* MILNE EDWARDS, 1853, p. 187. RATHBUN, 1918, p. 323, pl. 96.

RANGE: From Corinto, Nicaragua, to Capon, Peru. Occurs also in the Atlantic.

MATERIAL EXAMINED: Piñas Bay, Panama, February 22, 1941, Station 19, one male.

MEASUREMENTS: Male specimen, length 12.7 mm., width 12.6 mm.

HABITAT: "From the tidal estuary forming the lower part of the Río Piñas."

REMARKS: Although members of the foregoing genus *Sesarma* also inhabit mangrove swamps, *Aratus pisonii* is so inseparably linked with this habitat that it deserves the name mangrove crab. The writer has col-

lected it from Tenacatita, Mexico, to Panama and on the Atlantic side in Florida and Trinidad. Significantly, it does not appear to have reached the Galápagos Islands, where mangroves are well established.

*Plagusia immaculata* Lamarck

*Plagusia immaculata* LAMARCK, 1818, p. 247. RATHBUN, 1918, p. 335, pl. 103. BOONE, 1927, p. 264, fig. 95. FINNEGAN, 1931, p. 652.

*Plagusia tuberculata* NOBILI (not Lamarck), 1901, p. 46.

RANGE: From Punta Arenas, Costa Rica, to Santa Elena Bay, Ecuador (see Remarks below); Galápagos Islands. Also occurs in the Indo-Pacific.

MATERIAL EXAMINED: Gorgona Island, Colombia, April 20, 1941, Station 89, sample 347, six immature specimens, the largest a female.

HABITAT: The above specimens were taken "from inside an abandoned cayuca which was found capsized and righted."

REMARKS: The half dozen small specimens of the Pacific log rider, as this crab is commonly known, were taken near the anchorage at the eastern end of Gorgona Island.

Judging from Nobili's synonymy, which includes Miers, 1878 (p. 148), and Rathbun, 1898 (p. 605), Festa's two female specimens should be referred to *immaculata* Lamarck, rather than to *tuberculata* Lamarck, which Rathbun (1918, p. 334) treats as a subspecies of *P. depressa* (Fabricius). This interpretation results in the extension of the range of the species as given by Rathbun from Taboga Island, Panama, to Santa Elena Bay, Ecuador, along the American mainland.

*Percnon gibbesi* (Milne Edwards)

*Acanthopus gibbesi* MILNE EDWARDS, 1853, pp. 146, 180.

*Percnon gibbesi* RATHBUN, 1918, p. 337, pl. 105. HULT, 1938, p. 14. SCHMITT, 1939, p. 25. GARTH, 1946, p. 512, pl. 86, figs. 5, 6.

RANGE: From Cape San Lucas, Lower California, Mexico, to Chile; Galápagos Islands. Occurs also in the Atlantic Ocean.

MATERIAL EXAMINED: La Plata Island, Ecuador, April 12, 1941, station 80, 5.5 meters, one young.

MEASUREMENTS: Young specimen, length 10.6 mm., width 9.8 mm.

**HABITAT:** Usually encountered in white water of from knee to hip depth.

**REMARKS:** The writer has learned to associate *P. gibbesi* with shore collecting of a kind that takes the collector into boiling surf over rocky shore, where footing is insecure and the crustacean has every advantage. Hence he felt constrained to question the authenticity of a field label which attributes to the species a depth of 3 fathoms. The depth conforms with that of a coral station made on April 13 at La Plata Island, but the date is that of a beach seine haul. Armstrong's explanation is that the seine haul was made on a small beach between rocky headlands and that either some member of the party picked up the *Percnon* and tossed it into the bucket, or else that the seine dragged over the rocks near the edge of the beach and so caught the crab.

FAMILY **GEARCINIDAE**

**Cardisoma crassum** Smith

*Cardisoma crassum* SMITH, 1870, p. 144, pl. 5. NOBILI, 1897, p. 3. RATHBUN, 1918, p. 345, pls. 108, 109. FINNEGAN, 1931, p. 652.

**RANGE:** From San José, Lower California, Mexico, to the mouth of the Tumbes River, Peru; possibly Chile.

**MATERIAL EXAMINED:** Four specimens from three stations:

PANAMA

Isla Saboga, Perlas Islands, May 26, 1941, Station 111, sample 433, 1 large male (found dead about 100 yards from shore).

Isla San José, Perlas Islands, November 26, 1945, "Forest floor along lower Río Marina," R. C. Murphy, collector, 1 male.

COLOMBIA

Tumaco, April 19, 1941, Station 88, sample 344, 2 large males (bought in market).

**MEASUREMENTS:** Large male, length 72 mm., width 89 mm., length of hand 92 mm., height of palm 50 mm., length of dactyl 63 mm.

**HABITAT:** In forests, especially near swamps and brackish lagoons.

**REMARKS:** The fact that these specimens were being offered for sale in the market at Tumaco, Colombia, along with *Callinectes*

*toxotes* Ordway and *Calappa convexa* Saussure shows that crabs must be relied upon to a considerable degree as an article of diet. The measured specimen is by no means the largest on record; Rathbun (1918, p. 346) notes a male measuring 100 by 128 mm., the length of the propodus of the large chela being 142 mm. and the height of the hand being 72 mm., respectively. These figures are half again as large as those cited above.

A male of Festa's collecting is in the United States National Museum. His localities, according to Nobili (1897), were Río Sabana, Punta Sabana, and Río Tuirá, all on the Darien coast.

**Gecarcinus quadratus** Saussure

*Gecarcinus quadratus* SAUSSURE, 1853, p. 360 (7), pl. 12, fig. 2. RATHBUN, 1918, p. 358, text fig. 162, pls. 121, 122. FINNEGAN, 1931, p. 653. PESTA, 1931, p. 180, pls. 5, 6.

*Gecarcinus ruricola* CANO, 1889, p. 101, p. 227. NOBILI, 1901, p. 46.

**RANGE:** From Acapulco, Mexico, to Ecuador (see Remarks below). Also said to occur on the Atlantic side of the Isthmus.

**MATERIAL EXAMINED:** Eight specimens from three stations:

PANAMA

San José Island, Perlas Islands, November 25, 1945, laboratory floor, 1 female; November 26, 1945, "Forest along Río Marina," 1 male; November, 1945, "Playa Grande and adjacent rock pools," 1 young; R. C. Murphy, collector.

COLOMBIA

Utria Bay, May 15, 1941, Station 100, 1 male, 1 female.

ECUADOR

La Plata Island, December, 1942, C. M. Breder, Jr., collector, 2 males, 1 female.

**MEASUREMENTS:** Male specimen, length 49 mm., width 62 mm.

**HABITAT:** The Utria Bay specimens were obtained along a trail which skirts the west side of the bay. The writer has also collected them at this locality.

**REMARKS:** Although Rathbun (1918, p. 358) includes Colombia in her Pacific range for the species, her only Colombian record is for Turbo, on the Atlantic side. The "Askoy"

specimens confirm the Pacific Colombian distribution, and the specimens collected by Breder would extend the range of the species to La Plata Island, Ecuador, were it not for the following considerations:

Rathbun (1910, p. 612) lists *Gecarcinus ruricola* of both Cano and Nobili as synonymous with *G. lateralis* (Fremerville), repeating the records, but not the synonymy, in 1918. To this view the writer takes exception for the following reasons: 1. Apart from their Ecuadorean records, *G. lateralis* is exclusively an Atlantic species. 2. Although Cano gives no description to aid in the reidentification of his specimens, Nobili distinctly states of his that the merus of the maxilliped is non-emarginate at the apex, a character which distinguishes *quadratus* from *lateralis*. 3. Nobili's specimens were all young or half grown, not adult, as are those of the "Askoy." 4. While the "Askoy" specimens do not duplicate Nobili's localities of Santa Elena, Esmeraldas, and Tumaco, they serve to establish the presence of *quadratus* in these latitudes.

It must be concluded, therefore, that the Ecuadorean range of *G. quadratus* was established before the coming of the "Askoy" or Breder, and that Festa certainly, and perhaps the "Vettor Pisani," were the original collectors. A handsome color plate of the species will be found in Pesta (1931, pl. 5).

#### *Gecarcinus planatus* Stimpson

##### Plate 7

*Gecarcinus planatus* STIMPSON, 1860, p. 234 (106). RATHBUN, 1918, p. 359, text fig. 163, pls. 123, 124.

*Gecarcinus malpilensis* FAXON, 1893, p. 157; 1895, p. 28, pl. 4, figs. 2-2b.

RANGE: From Lower California to Acapulco, Mexico; Revilla Gigedo Islands; Cliperton Island; Malpelo Island.

MATERIAL EXAMINED: Malpelo Island, Colombia, March 26, 1941, Station 55, sample 195, shore, one male, one female.

MEASUREMENTS: Male specimen, length 55.5 mm., width 76 mm.

HABITAT: "Caught along rocks near edge of water, East side of Island."

REMARKS: This large and handsome land crab has managed to find its way from the Mexican mainland to all of the important

island groups off the west coast of North and Central America, as noted under Range above. It has not, however, become established on the Galápagos Islands. The writer has collected *G. planatus* on Malpelo Island, and believes that it, along with the eggs of the oceanic birds which nest there, provides food for the large endemic lizard, *Diploglossus hancocki*.

#### FAMILY OCYPODIDAE

##### *Ocyopode occidentalis* Stimpson

*Ocyopoda occidentalis* STIMPSON, 1860, p. 229 (101).

*Ocyopode occidentalis* RATHBUN, 1918, p. 372, pl. 129, figs. 2, 3. CRANE, 1940, p. 65; 1941, p. 308.

RANGE: From Turtle Bay, Lower California, Mexico, to Ancon, Peru.

MATERIAL EXAMINED: San José Island, Perlas Islands, November, 1945, "Playa Grande and adjacent rock pools," R. C. Murphy, collector, one young.

MEASUREMENTS: Young specimen, length 5.7 mm., width 7.0 mm.

HABITAT: Sandy beach.

REMARKS: The early growth stages of this and the nearly related Pacific American species, *O. gaudichaudii* Milne Edwards and Lucas, are shown by a series of comparative diagrams in Crane (1941, figs. 2 and 3).

But for the independent efforts of Murphy, this species would not have been included in the present paper, all *Ocyopode* collected by the "Askoy" belonging to the following species.

##### *Ocyopode gaudichaudii* Milne Edwards and Lucas

##### Plate 5, figure 1

*Ocyopoda gaudichaudii* MILNE EDWARDS AND LUCAS, 1843, p. 26; 1847 (atlas), pl. 11, figs. 4-4b. NOBILI, 1901, p. 53. PESTA, 1931, p. 180.

*Ocyopode gaudichaudii* RATHBUN, 1918, p. 373, pl. 129, fig. 1, pl. 130, fig. 1; not 1924, p. 155, pl. 7, figs. 1-3. BOONE, 1927, p. 268, fig. 96A (not fig. 96B). SIVERTSEN, 1933, p. 19. CRANE, 1940, p. 65; 1941, p. 299. GARTH, 1946, p. 514, pl. 87, fig. 7.

RANGE: Gulf of Fonseca, El Salvador, to Chile; Galápagos Islands.

MATERIAL EXAMINED: Twenty-one specimens from five stations:

##### PANAMA

Saboga Island, Perlas Islands, February 11,

1941, Station 2, sample 1, shore, 6 males, 1 female.

Santelmo Bay, Isla del Rey, Perlas Islands, February 15, 1941, Station 9, sample 5, shore, 2 males, 1 female.

Piñas Bay, March 2, 1941, Station 19, shore, 1 female.

#### ECUADOR

La Plata Island, December, 1942, C. M. Breder, Jr., collector, 3 females (1 ovigerous).

Salinas, December, 1942, C. M. Breder, Jr., collector, 7 females (1 ovigerous).

MEASUREMENTS: Largest specimen, a male, length 30 mm., width 37.8 mm.

HABITAT: The Piñas Bay specimen was collected "from tidal sand flats in front of village."

REMARKS: Since the writer last collected *O. gaudichaudii* along the Central and South American coastline, Crane (1940, p. 65) has published a meticulous account of the early stages of this and the related species, *O. albicans* Bosc and *O. occidentalis* Stimpson, and has shown that the specimen formerly identified with some uncertainty as the megalops of *O. gaudichaudii* (Rathbun, 1924, p. 155, pl. 7; Boone, 1927, p. 271, fig. 96A) is not of that species.

Early published records for the species along the coast of Ecuador and Colombia include those of W. H. Jones, U.S.N. (Rathbun, 1918), who collected *gaudichaudii* at Manta, Bahia, and (questionably) Guayaquil in 1884, and E. Festa (Nobili, 1901), who collected them at Manta, Santa Elena Bay, and Tumaco, Colombia.

#### *Uca schmitti* Crane

*Uca schmitti* CRANE, 1943, p. 31, pl. 1, figs. 1-4.

*Uca mordax* RATHBUN, 1918, p. 393, part (the Pacific specimens). CRANE, 1941, p. 176, text figs. 2, 3, 4E, 5.

RANGE: From San Blas, Tepic, Mexico, to Golfito, Costa Rica.

MATERIAL EXAMINED: Humboldt Bay, Colombia, May 19, 1941, Station 103, sample 406, one male, one female.

MEASUREMENTS: Male specimen, length 12.3 mm., width 17.2 mm., over-all length of manus 20.4 mm., superior crest 8.4 mm., dactyl 12.0 mm.

HABITAT: From muddy banks of fresh and slightly brackish streams (Crane, 1941, of *U. mordax*).

REMARKS: The significance of this species is found in the fact that its separation from *Uca mordax* (Smith) leaves no species of the genus common to both the east and west coasts of Middle America. The identification was made by Miss Jocelyn Crane of the New York Zoological Society, who kindly examined the specimens.

#### *Uca brevifrons* (Stimpson)

*Gelasimus brevifrons* STIMPSON, 1860, p. 229 (101). LOCKINGTON, 1876 (1877), p. 147 (3).

*Gelasimus vocator* NOBILI, 1897, p. 3.

*Uca brevifrons* HOLMES, 1904, p. 308, pl. 35, figs. 1-5. RATHBUN, 1918, p. 393, pl. 138. CRANE, 1941, p. 177, text figs. 4F, 5, pl. 7, fig. 35.

*Uca brevifrons* var. *delicata* MACCAGNO, 1928, p. 51, text fig. 33.

*Uca (Gelasimus) brevifrons* PESTA, 1931, p. 180.

RANGE: From Magdalena Bay, Lower California, Mexico, to Río Lara, Darien.

MATERIAL EXAMINED: Piñas Bay, Panama, March 2, 1941, Station 19, 11 males, one female.

MEASUREMENTS: Largest specimen, a male, length 20.2 mm., width 29.0 mm., over-all length of manus 61.3 mm., dactyl 43.5 mm.

HABITAT: "Caught by native boys along banks of Río Piñas above the village where the water felt and tasted fresh" (field label).

REMARKS: In this large and handsome species the males possess a formidable weapon in a pinching claw which displaces a volume equal to that of the carapace. The dozen specimens above, mostly males in which the cheliped is intact, suggest that the native boys of Piñas Bay are adept at collecting them, for too often the writer came away with only the detached member to show for his efforts while collecting *brevifrons* at Bahia Honda, Panama.

Festa's early locality, Río Lara, Darien (Nobili, 1897, as *Gelasimus vocator*), appears to be the southernmost locality at which the species has been taken previous to the "Askoy's" collecting, as it is some distance beyond Meek and Hildebrand's Río Calabre (Rathbun, 1918).

#### *Uca panamensis* (Stimpson)

*Gelasimus panamensis* STIMPSON, 1859, p. 63 (17). CANO, 1889, pp. 102, 235.

*Uca panamensis* NOBILI, 1901, p. 49. RATHBUN,

1918, p. 412, pl. 149. CRANE, 1941, p. 204, text figs. 4X, 5.

*Uca galapagensis* BOONE, 1927, p. 272, lower part of fig. 97.

RANGE: From the Gulf of Fonseca, El Salvador, to Payta, Peru.

MATERIAL EXAMINED: Fifteen specimens from two stations:

#### COLOMBIA

Humboldt Bay, May 19, 1941, Station 103, sample 408, 11 males, 3 females.

Limón Bay, Cupica Bay, May 17, 1941, Station 102, sample 400, 1 male.

MEASUREMENTS: Largest specimen, a male, length, 12.3 mm., width 17.7 mm., over-all length of hand 29 mm., superior margin 11 mm., dactyl 17 mm.

HABITAT: "Under and among stones near low water mark."

REMARKS: A female specimen obtained at Isla Flamenco, Colombia (now Panama), by Enrico Festa (Nobili, 1901) appears to be the only record for the territory embraced by the "Askoy" collections, apart from the rather general designation "Gulf of Panama" for specimens obtained in 1884 by the "Vettor Pisani" (Cano, 1889).

Crane, in her excellent paper "Crabs of the genus *Uca* from the west coast of Central America" (1941), rates *panamensis* as one of the most abundant crabs of the tropical eastern Pacific coast. "It is almost always present whenever stones are mingled with sand at the end of a beach, or, rarely, just beyond the beach in shallow tidepools under stones." Miss Crane has kindly examined the "Askoy" specimens of *Uca*, and this and the following determinations are hers.

#### *Uca latimanus* (Rathbun)

*Gelasimus latimanus* RATHBUN, 1893, p. 245.

*Uca latimana* NOBILI, 1901, p. 52.

*Uca latimanus* RATHBUN, 1918, p. 422, pl. 157. CRANE, 1941, p. 201, text figs. 2, 3, 4V, 5, pl. 6, fig. 33, pl. 7, fig. 36, pl. 8, figs. 38, 39, 40.

RANGE: From La Paz, Lower California, Mexico, to Tumaco, Colombia.

MATERIAL EXAMINED: Humboldt Bay, Colombia, May 19, 1941, Station 103, sample 406, one small male.

MEASUREMENTS: Small male, length 6.0 mm., width 10.0 mm., hand 10.2 mm., dactyl 4.9 mm.

HABITAT: Sandy-mud and muddy banks of fresh- and brackish-water streams and lagoons (Crane). "From a mangrove swamp" ("Askoy" field data).

REMARKS: Two males collected by E. Festa at Tumaco (Nobili, 1901) are the basis for the previous Colombian record for the species.

*Uca latimanus* is one of the group having no oblique granulate ridge on the inner surface of the palm. The carapace is quite noticeably cylindrical, and the fingers are shorter than the palm. Crane (1941) reports a large series taken by the "Zaca" from Tenacatita Bay, Jalisco, Mexico, to Panama City, Panama.

The determination is by Miss Jocelyn Crane of the New York Zoological Society.

#### *Uca pygmaea* Crane

*Uca pygmaea* CRANE, 1941, p. 174, text figs. 4B, 5, pl. 1, fig. 1, pl. 2, fig. 4.

RANGE: Known only from the type locality, Golfito, Costa Rica.

MATERIAL EXAMINED: Banks of lower Río Marina, San José Island, Perlas Islands, Panama, November 26, 1945, two males, R. C. Murphy, collector.

MEASUREMENTS: Largest specimen, male, length 7.2 mm., width 10.9 mm., over-all length of manus 15.3 mm., superior crest 4.9 mm., dactyl 10.3 mm.

HABITAT: Muddy banks of fresh-water streams (Crane).

REMARKS: As compared to the holotype, N.Y.Z.S. No. 381110, the chelae are relatively longer, the lower part of the manus is rougher, and there is variation (as in the type series) in the development of teeth on the prehensile edges of the chelae. The first two differences noted are to be attributed to the greater age of the San José Island specimens, according to Crane, by whom the comparison was made.

The range of the species is extended from Golfito, Costa Rica, to the Perlas Islands, Panama.

#### *Uca argillicola* Crane

*Uca argillicola* CRANE, 1941, p. 183, text figs. 4J, 5, pl. 1, fig. 3, pl. 2, fig. 6.

RANGE: Known only from the type locality, Golfito, Costa Rica.

MATERIAL EXAMINED: Five specimens from two localities:

PANAMA

Banks of lower Río Marina, San José Island, Perlas Islands, November 26, 1945, R. C. Murphy, collector, 3 males, 1 female.

COLOMBIA

Humboldt Bay, May 19, 1941, Station 103, sample 406, 1 male.

MEASUREMENTS: Largest specimen, male, length 10.3 mm., width 16.0 mm., over-all length of manus 22.4 mm., superior crest 9.4 mm., dactyl 13.7 mm.

HABITAT: Yellowish white clay banks above a slightly brackish stream (Crane). "From a mangrove swamp" ("Askoy" station data).

REMARKS: The largest male differs in the following respects from the holotype, N.Y.Z.S. No. 381134, according to Jocelyn Crane, who examined the specimens:

1. There are fewer spoon-tipped hairs on the merus of the second maxilliped.

2. There is a relatively well-marked oblique row of granules on the cheliped, in place of the indistinct granules of the holotype.

3. The manus is more massive, and it and the chelae are relatively longer than in the holotype.

Points 2 and 3 are felt by Crane to be owing to a difference in growth stage, the present series being more advanced than the "Zaca" series from which the type was selected. Other details, even to the abdominal appendage, appear virtually identical.

The range of the species is extended from Costa Rica to Humboldt Bay, Colombia.

## LITERATURE CITED

Since page references have been given in the synonymy and, where necessary, in the text, no additional means has been considered necessary for locating a given reference among two or more works published by the same author in any one year.

BELL, T.

1835. Some account of the Crustacea of the coasts of South America, with description of new genera and species, founded principally on the collections obtained by Mr. Cuming and Mr. Miller. Proc. Zool. Soc. London, vol. 3, pp. 169-173.
1836. [Same title.] Trans. Zool. Soc. London, vol. 2, pp. 39-66, pls. 8-13.

BOONE, L.

1927. The littoral crustacean fauna of the Galapagos Islands. Part I: Brachyura. Zoologica, vol. 8, no. 4, pp. 127-288, text figs. 34-102.
1930. Scientific results of the cruises of the yachts "Eagle" and "Ara," 1921-1928, William K. Vanderbilt, commanding. Crustacea: Stomatopoda and Brachyura. Bull. Vanderbilt Marine Mus., vol. 2, pp. 1-228, pls. 1-74.

BÜRGER, OTTO

1895. Ein Beitrag zur Kenntnis der Pinnotherinen. Zool. Jahrb., vol. 8, pt. 3, pp. 361-390, pls. 9, 10.

CANO, G.

1889. Crostacei Brachiuri ed Anomuri raccolti nel viaggio della "Vettor Pisani" intorno al globo. Boll. Soc. Nat. Napoli, ser. 1, vol. 3, pp. 79-105 (lists only), 169-268 (accounts of species), pl. 7.

CARPENTER, P. P.

1857. On the present state of our knowledge with regard to the Mollusca of the west coast of North America. Rept. Brit. Assoc. Adv. Sci., pp. 159-368 (remarks on Cuming, pp. 179-189).

CRANE, J.

1937. The Templeton Crocker expedition. III. Brachygnathous crabs from the Gulf of California and the west coast of Lower California. Zoologica, vol. 22, no. 3, pp. 47-78, pls. 1-8.
1937. The Templeton Crocker expedition. VI. Oxystomatous and dromiaceus crabs from the Gulf of California and the west coast of Lower California. *Ibid.*, vol. 22, no. 7, pp. 97-108, pls. 1-2.
1940. Eastern Pacific expeditions of the New York Zoological Society. XVIII. On the post-embryonic development of brachyuran crabs of the genus *Ocypode*. *Ibid.*, vol. 25, no. 6, pp. 65-82, text figs. 1-8.

1941. Crabs of the genus *Uca* from the west coast of Central America. *Ibid.*, vol. 26, no. 19, pp. 145-208, pls. 1-9, text figs. 1-8.
1941. Eastern Pacific expeditions of the New York Zoological Society. XXIX. On the growth and ecology of brachyuran crabs of the genus *Ocypode*. *Ibid.*, vol. 26, no. 29, pp. 297-310, pls. 1-2, text figs. 1-7.
1943. Eastern Pacific expeditions of the New York Zoological Society. XXXI. *Uca schmitti*, a new species of brachyuran crab from the west coast of Central America. *Ibid.*, vol. 28, no. 6, pp. 31-32, pl. 1, text fig. 1.
1947. Eastern Pacific expeditions of the New York Zoological Society. XXXVIII. Intertidal brachygnathous crabs from the west coast of tropical America with special reference to ecology. *Ibid.*, vol. 32, no. 9, pp. 69-95, text figs. 1-3.

EYDOUX, F., AND L. F. A. SOULEYET

- 1841-1852. Voyage autour du monde exécuté pendant les années 1836 et 1837 sur la corvette la Bonite, commandée par M. Vaillant. Paris, 2 vols., atlas.

FAXON, W.

1893. Reports on the dredging operations off the west coast of Central America, etc. VI. Preliminary descriptions of new species of Crustacea. Bull. Mus. Comp. Zool. Harvard, vol. 24, no. 7, pp. 149-220.
1895. Reports on an exploration off the west coasts of Mexico, etc. XV. The stalk-eyed Crustacea. Mem. Mus. Comp. Zool. Harvard, vol. 18, pp. 1-292, pls. A-K, 1-56.

FINNEGAN, S.

1931. Report on the Brachyura collected in Central America, the Gorgona and Galapagos Islands, by Dr. Crossland on the "St. George" expedition to the Pacific, 1924-25. Jour. Linnean Soc. London, Zool., vol. 37, no. 255, pp. 607-673, text figs. 1-6.

GARTH, J. S.

1939. New brachyuran crabs from the Galapagos Islands. Allan Hancock Pacific Exped., vol. 5, no. 2, pp. 9-29, pls. 1-10.
1940. Some new species of brachyuran crabs from Mexico and the Central and South American mainland. *Ibid.*, vol. 5, no. 3, pp. 53-127, pls. 11-26.

1946. Littoral brachyuran fauna of the Galapagos Archipelago. *Ibid.*, vol. 5, no. 10, pp. 341-601, pls. 49-87, text fig. 1.
- GERSTAECKER, A.  
1856. Carcinologische Beiträge. Arch. Naturgesch., vol. 22, pt. 1, pp. 101-162, pls. 4-6.
- GIBBES, L. R.  
1850. On the carcinological collections of the United States and an enumeration of the species contained in them, with notes on the most remarkable, and descriptions of new species. Proc. Amer. Assoc. Adv. Sci., vol. 3, pp. 167-201.
- GLASSELL, S. A.  
1934. Some corrections needed in recent carcinological literature. Trans. San Diego Soc. Nat. Hist., vol. 7, no. 38, pp. 453-454.  
1935. New or little known crabs from the Pacific coast of northern Mexico. *Ibid.*, vol. 8, no. 14, pp. 91-106, pls. 9-16.  
1936. The Templeton Crocker expedition. I. Six new brachyuran crabs from the Gulf of California. Zoologica, vol. 21, no. 17, pp. 213-218.  
1940. In Garth, J. S., Some new species of brachyuran crabs from Mexico and the Central and South American mainland. Allan Hancock Pacific Exped., vol. 5, no. 3, pp. 67-70, pl. 18.
- HOLMES, S. J.  
1900. Synopsis of California stalk-eyed Crustacea. Occas. Papers California Acad. Sci., vol. 7, pp. 1-262, pls. 1-4.  
1904. On some new or imperfectly known species of west American Crustacea. Proc. California Acad. Sci., ser. 3, vol. 3, pp. 307-330, pls. 35-37.
- HULT, J.  
1938. Crustacea Decapoda from the Galapagos Islands collected by Mr. Rolf Blomberg. Arkiv Zool., Stockholm, vol. 30A, no. 5, pp. 1-18, pl. 1, text figs. 1-4.
- IVES, J. E.  
1891. Crustacea from the northern coast of Yucatan, the harbor of Vera Cruz, the west coast of Florida, and the Bermuda Islands. Proc. Acad. Nat. Sci. Philadelphia, vol. 43, pp. 176-207, pls. 5, 6.
- KINGLSEY, J. S.  
1879. On a collection of Crustacea from Virginia, North Carolina, and Florida, with a revision of the genera of Crangonidae and Palaemonidae. Proc. Acad. Nat. Sci. Philadelphia, pp. 383-427, pl. 14.
- LAMARCK, J. B.  
1818. Histoire naturelle des animaux sans vertèbres. Paris, vol. 5.
- LATREILLE, P. A.  
1825. Histoire naturelle; entomologie, ou histoire naturelle des crustacés, des arachnides, et des insectes. In Encyclopédie méthodique. Paris, vol. 10, pp. 1-832.
- LINNAEUS, C.  
1758. Systema naturae, . . . Editio decima. Stockholm, vol. 1, pp. 1-823.
- LOCKINGTON, W. N.  
1877. Remarks on the Crustacea of the Pacific coast, with descriptions of some new species. Proc. California Acad. Sci., vol. 7, for the year 1876, pt. 1, pp. 28-36 (1-9).  
1877. Remarks on the Crustacea of the west coast of North America, with a catalogue of the species in the museum of the California Academy of Sciences. *Ibid.*, vol. 7, for the year 1876, pt. 1, pp. 94-108 (1-15), 145-156 (1-12).
- MACCAGNO, T.  
1928. Crostacei decapodi. Le specie del genere *Uca* conservate nel regio Mus. Zool. Torino. Boll. Mus. Zool. Anat. Comp. Torino, ser. 3, vol. 41, no. 11, pp. 1-52.
- MIERS, E. J.  
1878. Revision of the Plagusinae. Ann. Mag. Nat. Hist., ser. 5, vol. 1, pp. 147-154.  
1880. On a collection of Crustacea from the Malaysian region. Part I. Crustacea Oxyrhyncha and Cyclometopa, except Telphusidea. *Ibid.*, ser. 5, vol. 5, pp. 226-239.
- MILNE EDWARDS, A.  
1861. Études zoologiques sur les crustacés récents de la famille des portuniens. Arch. Mus. Hist. Nat. Paris, vol. 10, pp. 309-428, pls. 28-38.  
1874. [No title.] In Fischer, P., L. de Folin, and L. Perier, Les fonds de la mer. Paris, vol. 2.  
1875-1880. Études sur les xiphosures et les crustacés de la région Mexicaine. Mission Scientifique au Mexique et dans l'Amérique Centrale, pt. 5, pp. 1-368, pls. 1-61.  
1880. Reports on the results of dredging under the supervision of Alexander Agassiz in the Gulf of Mexico, etc. 8. Études préliminaires sur les crustacés, pt. 1. Bull. Mus. Comp. Zool. Harvard, vol. 8, pp. 1-68, pls. 1-2.
- MILNE EDWARDS, A., AND E. L. BOUVIER  
1923. Reports of the results of dredging under the supervision of Alexander Agassiz



- in the Gulf of Mexico, etc. 47. Les porcellanides et les brachyures. Mem. Mus. Comp. Zool. Harvard, vol. 47, no. 4, pp. 283-395, pls. 1-12.
- MILNE EDWARDS, H.  
1837. Histoire naturelle des crustacés. Paris, vol. 2, pp. 1-532.  
1853. Memoire sur la famille des ocyropodiens. Ann. Sci. Nat., Paris, ser. 3, zool., vol. 20, pp. 163-228, pl. 6-11.
- MILNE EDWARDS, H., AND H. LUCAS  
1843. Crustacés. In d'Orbigny, A., Voyage dans l'Amérique méridionale. Paris, vol. 6, pt. 1, pp. 1-39; atlas, *op. cit.*, vol. 9, 1847, pls. 1-17.
- MURPHY, R. C.  
1941. The Askoy expedition of the American Museum of Natural History to the eastern tropical Pacific. Science, vol. 94, pp. 57-58.  
1942. Pacific campaign of the schooner *Askoy*—Darién, Colombia, Ecuador. Trans. Amer. Geophys. Union, pt. 2, pp. 336-338, fig. 1.  
1944. Among the Pearl Islands. [The second installment in the story of the "Askoy" expedition.] Nat. Hist., New York, vol. 53, pp. 274-281.  
1944. Mountain and sea in the Chocó. [The sixth installment in the story of the "Askoy" expedition.] *Ibid.*, vol. 53, pp. 474-481.  
1944. See also Nichols, J. T., and R. C. Murphy.  
1945. Island contrasts. [The seventh installment in the story of the "Askoy" expedition.] Nat. Hist., New York, vol. 54, pp. 14-23.
- NAUCK, E.  
1880. Das Kaugerüst der Brachyuren. Zeitschr. Wiss. Zool., vol. 34, pt. 1, pp. 1-69, pl. 1.
- NEUMANN, R.  
1878. Catalog der Podophthalmen Crustaceen des Heidelberger Museums. Leipzig, pp. 1-39.
- NICHOLS, J. T., AND R. C. MURPHY  
1944. A collection of fishes from the Panama Bight, Pacific Ocean. Bull. Amer. Mus. Nat. Hist., vol. 83, art. 4, pp. 217-260, text. figs. 1-6, pls. 15-18.
- NOBILI, G.  
1897. Decapodi e Stomatopodi raccolti dal Dr. Enrico Festa nel Darién, a Curaçao, La Guayra, Porto Cabello, Colon, Panama, ecc. Boll. Mus. Zool. Anat. Comp. Torino, vol. 12, no. 280, pp. 1-8.  
1901. Viaggio del Dr. Enrico Festa nella Repubblica dell'Ecuador e regione vicine. Decapodi e Stomatopodi. *Ibid.*, vol. 16, no. 415, pp. 1-58.
- ORDWAY, A.  
1863. Monograph of the genus *Callinectes*. Boston Jour. Nat. Hist., vol. 7, no. 4, pp. 567-583 (1-18).
- OWEN, R.  
1839. Crustacea. In Beechey, F. W., The zoology of Capt. Beechey's voyage . . . to the Pacific and Behring's Straits. London, pp. 77-92, pls. 24-28.
- PESTA, M.  
1931. Ergebnisse der Osterreichischen Biologischen Costa-Rica Expedition 1930. I. Teil. Crustacea Decapoda aus Costa Rica. Ann. Naturhist. Mus. Wien, vol. 45, pp. 173-181, pls. 5, 6.
- RATHBUN, M. J.  
1892. Catalogue of the crabs of the family Periceridae in the U. S. National Museum. Proc. U. S. Natl. Mus., vol. 15, pp. 231-277, pls. 28-40.  
1893. Scientific results of explorations by the U. S. Fish Commission steamer "Albatross." XXIV. Descriptions of new genera and species of crabs from the west coast of North America and the Sandwich Islands. *Ibid.*, vol. 16, pp. 223-260.  
1897. Synopsis of the American species of *Ethusa* with description of a new species. Proc. Biol. Soc. Washington, vol. 11, pp. 109-110.  
1898. The Brachyura collected by the U. S. Fish Commission steamer "Albatross" on the voyage from Norfolk, Virginia, to San Francisco, California, 1887-1888. Proc. U. S. Natl. Mus., vol. 21, pp. 567-616, pls. 41-44.  
1907. Reports on the scientific results of the expedition to the tropical Pacific, in charge of Alexander Agassiz, by the U. S. Fish Commission steamer "Albatross." X. Brachyura. Mem. Mus. Comp. Zool. Harvard, vol. 35, no. 2, pp. 23-74, pls. 1-9.  
1910. The stalk-eyed Crustacea of Peru and the adjacent coast. Proc. U. S. Natl. Mus., vol. 38, pp. 531-620, pls. 36-56.  
1912. New decapod crustaceans from Panama. Smithsonian Misc. Coll., vol. 59, no. 13, pp. 1-3.  
1914. New genera and species of American brachyrynchous crabs. Proc. U. S. Natl. Mus., vol. 47, pp. 117-129, pls. 1-10.  
1918. The grapsoid crabs of America. Bull.

- U. S. Natl. Mus., no. 97, pp. 1-461, pls. 1-161.
1923. New species of American spider crabs. Proc. Biol. Soc. Washington, vol. 36, pp. 71-74.
1924. Brachyuran crabs collected by the Williams Galapagos expedition, 1923. Zoologica, vol. 5, no. 14, pp. 153-159, pl. 7, fig. 38.
1925. The spider crabs of America. Bull. U. S. Natl. Mus., no. 129, pp. 1-613, pls. 1-283.
1930. The cancrivora crabs of America of the families Euryalidae, Portunidae, Atelecyclidae, Cancridae, and Xanthidae. *Ibid.*, no. 152, pp. 1-593, pls. 1-230.
1933. Descriptions of new species of crabs from the Gulf of California. Proc. Biol. Soc. Washington, vol. 46, pp. 147-150.
1935. Preliminary descriptions of seven new species of oxystomatous and allied crabs. *Ibid.*, vol. 48, pp. 1-4.
1935. Preliminary descriptions of six new species of crabs from the Pacific coast of America. *Ibid.*, vol. 48, pp. 49-52.
1937. The oxystomatous and allied crabs of America. Bull. U. S. Natl. Mus., no. 166, pp. 1-272, pls. 1-86, text figs. 1-47.
- SAUSSURE, H. DE  
1853. Description de quelques crustacés nouveaux de la côte occidentale du Mexique. Rev. et Mag. Zool., ser. 2, vol. 5, pp. 354-368 (1-15), pls. 12-13.
- SCHMITT, W. L.  
1936. Hancock Pacific expedition, 1935. Explorations and field-work of the Smithsonian Institution in 1935, pp. 34-36, figs. 36a-f.  
1939. Decapod and other Crustacea collected on the presidential cruise of 1938. Smithsonian Misc. Coll., vol. 98, no. 6, pp. 1-29, pls. 1-3.
- SIVERTSEN, E.  
1933. The Norwegian zoological expedition to the Galapagos Islands 1925, conducted by Alf Wollebaek. VII. Littoral Crustacea Decapoda from the Galapagos Islands. Meddel. Zool. Mus. Oslo, no. 38, pp. 1-38, pls. 1-4.
- SMITH, S. I.  
1869. *In* Verrill, A. E., On the parasitic habits of some Crustacea. Amer. Nat., vol. 3, no. 5, pp. 239-250, text figs. 41-42.  
1869. Notes on new or little-known species of American cancrivora Crustacea. Proc. Boston Soc. Nat. Hist., vol. 12, pp. 274-289.  
1870. Notes on American Crustacea. No. 1. Ocypodoidea. Trans. Connecticut Acad. Arts Sci., vol. 2, pp. 113-176.  
1871. Thirty-two species of Crustacea collected by J. A. McNeil at west coast of Central America, Nicaragua, and Bay of Fonsora. Rept. Peabody Acad. Nat. Sci. for 1869, pp. 87-98.
- STIMPSON, W.  
1859. Notes on North American Crustacea, No. I. Ann. Lyc. Nat. Hist. New York, vol. 7, pp. 49-93 (3-47), pl. 1.  
1860. Notes on North American Crustacea, in the museum of the Smithsonian Institution. No. II. *Ibid.*, vol. 7, pp. 176-246 (49-118), pls. 2, 5.  
1871. Notes on North American Crustacea, in the museum of the Smithsonian Institution. No. III. *Ibid.*, vol. 10, pp. 92-136 (2-46).
- TARGIONI-TOZZETTI, A.  
1872. Catalogo di Crostacei Podottalmi Brachiuri e Anomouri raccolti nel viaggio circumnavigazione della Fregata Italiana Magenta. Bull. Soc. Ent. Italiana, vol. 4, pp. 389-399.  
1877. Crostacei, Brachiuri, e Anomouri. *In* Zoologia del Viaggio intorno al Globo della R. pirocorvetta "Magenta." Florence, pp. 1-257, pls. 1-13.
- WHITE, A.  
1847. Descriptions of a new genus and five new species of Crustacea. *In* Jukes, J. B., Narrative of the surveying voyage of H.M.S. Fly, commanded by Captain F. P. Blackwood, R. N., in Torres Strait, New Guinea, and other islands of the Eastern Archipelago during the years 1842-1846. London, vol. 2, app. no. 8, pp. 335-338, 1 pl.