

THE BRACHYURA OF THE
"ASKOY" EXPEDITION

WITH REMARKS ON
CARCINOLOGICAL COLLECTING
IN THE PANAMA BIGHT

JOHN S. GARTH

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INTRODUCTION

THE COLLECTION OF BRACHYURA on which the following report is based was made by the "Askoy" Expedition of the American Museum of Natural History under the direction of Dr. Robert Cushman Murphy between February 9 and May 26, 1941. The territory covered by the expedition, defined by Nichols and Murphy (1944, p. 221) as the Panama Bight, embraces the Pacific coast of Panama, Colombia, and Ecuador from the Perlas Islands to Cape Santa Elena and includes the island of Malpelo. As such it is synonymous with the Bay of Panama, *sensu lato*. Considered for convenience as a geographical unit, it represents biologically but the southern and eastern half of the Panamic faunal province, which extends northward to the Gulf of California and westward to the Galápagos Islands.

Previous accounts covering the itinerary,

personnel, and sponsorship of the expedition have already appeared (Murphy, 1941, 1942, 1944, 1945). In the course of its oceanographic explorations, both physical and biological, the "Askoy" occupied some 113 stations, and at 31 of these brachyurans were taken. The greatest number of specimens were accounted for by the diving operations of Mr. John C. Armstrong, second in command, who obtained living heads of *Pocillopora* coral at half a dozen localities, but dredging, seining, dipping, and purchases from a local market all contributed to the total. Included in the present paper because of their pertinence are small collections obtained by Dr. C. M. Breder, Jr., while cruising off Ecuador in the "Wilpet" in December, 1942, and by Dr. R. C. Murphy, who returned briefly to the Perlas Islands in November, 1945.

"ASKOY" STATIONS AT WHICH BRACHYURA WERE COLLECTED

The accompanying chart (fig. 1) shows the course of the "Askoy" in 1941 and indicates by means of enlarged figures the stations at which brachyuran Crustacea were obtained. These stations, their locations, and dates are as follows:

STATION	LOCATION	DATE			
1	Pacheca Island, Perlas Islands	Feb. 10	55	Malpelo Island, Colombia	Mar. 26
2	Saboga Island, Perlas Islands	Feb. 11	76	3 miles west of Cape Santa Elena, Ecuador	Apr. 10
6	Between San José and del Rey Islands, Perlas Islands	Feb. 13	80	La Plata Island, Ecuador	Apr. 12-13
7	South Passage, Perlas Islands	Feb. 13	81	Off Cape Pasado, Ecuador	Apr. 14
8, 9	Santelmo Bay, Perlas Islands	Feb. 14-15	83	22 miles west of Punta Jama, Ecuador	Apr. 15
19	Piñas Bay, Panama	Feb. 24	87	Lat. 01° 07' N., long. 79° 53' W.	Apr. 17
30	Guayabo Chiquito, Panama	Mar. 4	88	Tumaco, Colombia	Apr. 19
31	Ardita Bay, Colombia	Mar. 5-6	89	Gorgona Island, Colombia	Apr. 20-23
32	Octavia Bay, Colombia	Mar. 6-7	91	Lat. 02° 48' N., long. 78° 11' W.	Apr. 24
40	Málaga Bay, Colombia	Mar. 19	93	Cuevita Bay, Colombia	May 11
49	Lat. 04° 01' N., long. 80° 26' W.	Mar. 24	100	Utria Bay, Colombia	May 14-15
54	Lat. 04° 02' N., long. 81° 29' W.	Mar. 25	101	Solano Bay, Colombia	May 16
			102	Limón Bay, Gulf of Cupica, Colombia	May 17
			103	Humboldt Bay, Colombia	May 18-19
			104	Guayabo Chiquito (same as Station 30)	May 20-21
			109	Bayoneta Island, Perlas Islands	May 24
			110	Contadora Island, Perlas Islands	May 25
			111	Saboga Island (same as Station 2)	May 26

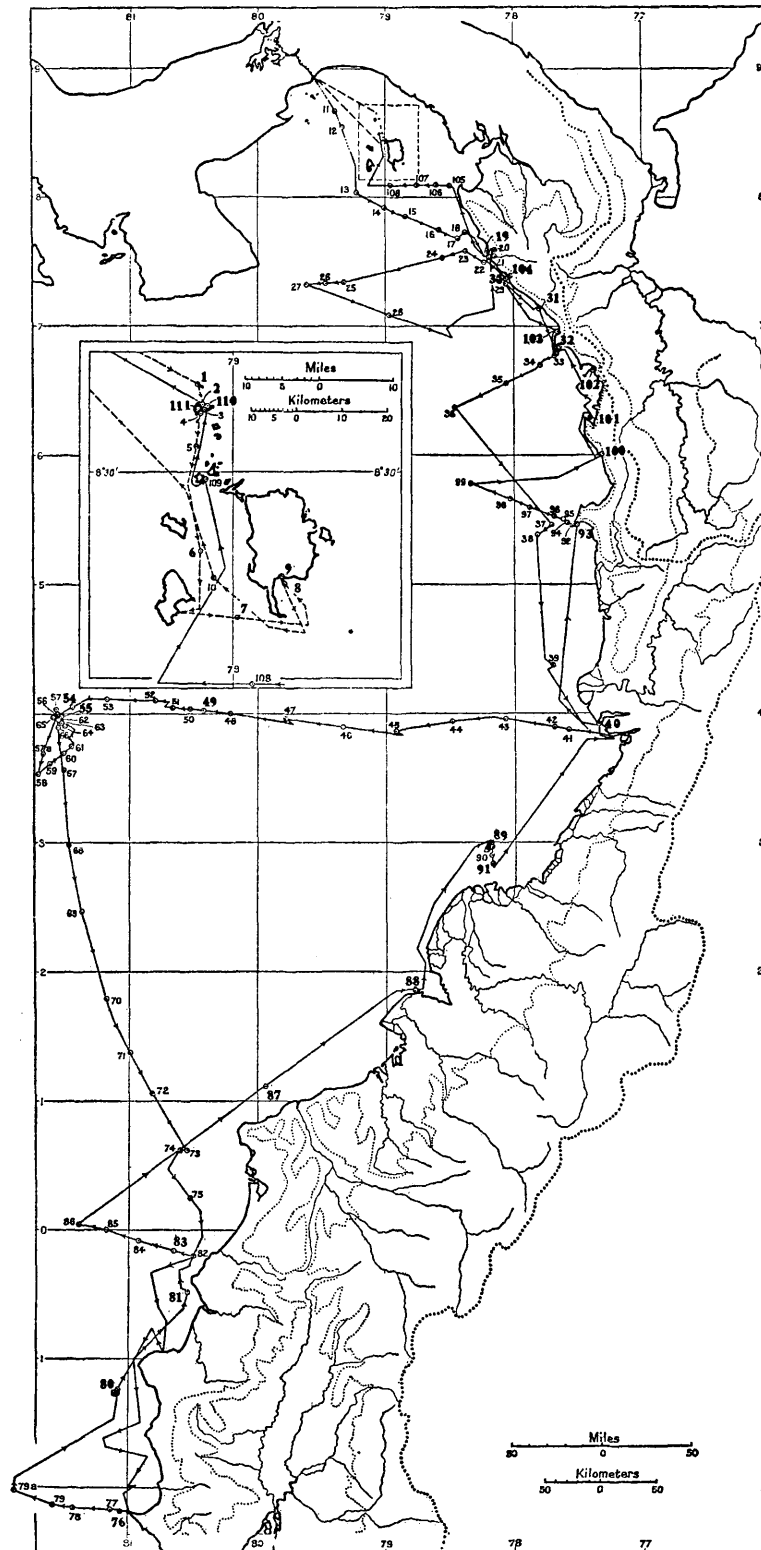


FIG. 1. The Pacific coast of Panama, Colombia, and Ecuador from the Isthmus to Punta Santa Elena, with an enlarged inset of the Perlas Islands. The course of the schooner "Askoy" and the position of 113 stations are plotted. Brachyura were collected at the 31 stations denoted by enlarged figures.

OBSERVATIONS ON BRACHYURA BY "ASKOY" EXPEDITION MEMBERS

The following observations concerning species encountered in particular abundance, made by Dr. R. C. Murphy, are repeated with his permission because of their interest:

Of *Euphylax dovii*: "The beautiful red, purple and blue swimming crab was seen by us only in the general vicinity of Malpelo Island. We first encountered it in the middle of the night at Station 49 (lat. 04° 01' N., long. 80° 26' W.), March 23-24, 1941, when two were captured at the surface along with fishes and other organisms. Next morning (March 24), when we were still nearer Malpelo, hundreds of them became visible all around us in a period when the wind and sea were quieting down. In a calm after 6 A.M. March 25, the "Askoy" was once again surrounded by vast numbers of these crabs on the flat surface. One or more of them sparred with our wire when we lowered the bathythermograph. This was five hours before we sighted Malpelo.

"In the azure water all around the island we became very familiar with the crabs, on one occasion capturing a bucket full of them, which we boiled in salt water and ate. They proved toothsome, but hardly substantial enough to make a meal. With the sea birds it was no doubt different because I found later that the stomachs of the swallow-tailed gulls, were crammed with the crabs, and I have no doubt that the big masked boobies were also feeding upon them. I draw this conclusion merely from the feeding behavior of the boobies because there is no record in my notes of finding the crabs in their stomachs.

"The booby referred to is *Sula dactylatra* and the gull, which is endemic at the Galápagos and Malpelo, is *Creagrus furcatus*" (unpublished notes).

Of *Grapsus grapsus* and *Gecarcinus planatus*: "As to actual inhabitants [of Malpelo], the first that we met ashore were crabs and lizards, of which two species of each were abundant. Red amphibious crabs (*Grapsus*) swarmed all over the rocks at sea level, and I found a large one in a crevice engaged in the cheerful occupation of eating a smaller example of its own kind. Even more ghoulish in appearance were the land crabs, fat and

bloated looking creatures with shells of a ghostly white. They may be quite harmless toward human beings, yet they seem to eye a visitor with an intent that grows uncomfortable. If you sit long enough, the crabs will move up closer and closer, as if with whetted appetites, and I have a feeling that they would make life miserable for anyone who had to sleep ashore" (1945, p. 16).

Of *Ocypode gaudichaudii*: "On the sandy delta of the Cacique [Río Cacique, Isla del Rey, Perlas Islands] we hauled a seine, taking a variety of fishes including the small threadfins upon which the pelicans and gulls were gorging, and a basketful of puffers or blowfish no bigger than grapes, which they much resembled before their balloons collapsed. Wild swine were our fellow-collectors until the crack of a gun, by no means intended for them, sent them scampering to cover. Coral-red ghost crabs were the game that lured the pigs out of the bush at low tide. These crustaceans lived in holes a foot or so in depth. When feeding, they scooped up mouthfuls of wet sand, later ejecting a pellet the size of a pea after they had extracted all the microscopic nutritive contents. The crabs spent much time at the entrances to their tunnels, but now and then they withdrew to damper regions that protected them from the sun but not from the voracious razor backs. Drove of the latter systematically quartered the exposed flats, rooted their way to the bottom of the burrows, and gobbled up each crab in its cul-de-sac" (1944, p. 281).

Of *Gecarcinus quadratus* and *Cardisoma crassum*: "Most conspicuous and startling of all the forest people, however, were land crabs of the genus *Geocarcinus* which measured perhaps four inches across the breadth of their backs. These rattly creatures were nothing short of uncanny in their ubiquitous presence. They scattered before us at almost every footstep and it was not unusual to take in 50 or more at one glance, all sidling or backing away from my companion and me. We pinned down several in order that they might be securely grasped while I wrote in my notebook exactly what the gaudy brutes looked like. The description may be worth recording:

'a purple-backed carapace, with inconspicuous stalked eyes of the same hue; behind and outside of each eye is a large spot of brilliant orange which simulates an eye and which looks weird and baleful in the dim light; the formidable claws are violet-purple, blending into pale porcellaneous tips, and the four pairs of legs upon which the creatures scuttle are clear coral red; just behind the middle of the carapace are two white spots, the hinder edges of which are scalloped with patches of orange and red, which last two colors prevail on the under surface.' [Cf. Pesta, 1931, pl. 5.]

"This crab is only one of several found in the Chocó. At the public market we purchased examples of a kind [*Cardisoma cras-*

sum] that wore only two colors—Prussian blue and carmine. 'A sport-model,' is what Commandante Fallon called it.

"The land crabs range miles inland, but they all return annually to breed in their ancestral ocean home. The migration begins near the end of the dry season. In Panama this means the latter part of Lent, whence the tradition that the crabs are bent upon joining the Good Friday procession. Their pious motive does not deter the human population from capturing and eating vast numbers of them. At the time of the great marches, it is said that the world goes alive with crabs and that the forest floor sounds as though it were being whipped by hail" (1944, p. 481).

A BRIEF RÉSUMÉ OF CARCINOLOGICAL COLLECTING IN THE PANAMA BIGHT

Apparently the first person to collect Crustacea along the stretch of South American coastline between Punta Santa Elena, Ecuador, and Panama was Hugh Cuming, who made a voyage *circa* 1829 on the yacht "Discoverer." Species collected by Cuming within "Askoy" Expedition territory include *Mithrax* (*Mithrax*) *spinipes* (as *Pisa spinipes*) at Santa Elena and *Mithrax* (*Mithrax*) *pygmaeus* and *Tyche lamellifrons* from Panama, the latter two obtained by the "Askoy" as well. Although these were the only localities at which crustaceans were collected, according to Bell (1835, 1836), the following additional localities visited by Cuming have been extracted from the molluscan literature, particularly Carpenter (1856, p. 179): Isla Muerte (old name for Isla Santa Clara in the Gulf of Guayaquil), Isla Plata, Salango, "Mt. Xti" (Montecristi, near Manta), all in Ecuador, and Isla "King" (del Rey), Saboga, Perico, and Taboga, all in Panama. Their importance lies in the fact that Cuming, having dredged at some or all of these mainland localities, may have obtained there certain brachyuran species originally attributed to the Galápagos Islands, among them *Dasygygius depressus* and *gibbosus*, which reappear among "Askoy" collections.

The most important early collections of Brachyura were made by Dr. Enrico Festa during a residence of three years, 1895–1898, in Ecuador and adjacent Colombia. Localities from which he obtained specimens include Santa Elena Point and Bay, Manta, Esmeraldas, and Río Daule, Ecuador; Tumaco, Colombia; and Isla Flamenco, Panama (Nobili, 1901); Punta and Río Sabana, Río Tuira and Río Lara, Gulf of San Miguel, Darien (Nobili, 1897). Of the 47 species of brachyurans (excluding fresh-water crabs) of Festa's collecting, 22 were obtained by "Askoy" collectors as well. Earlier, in 1884, the "Vettor Pisani" explored the coasts of Chile and Peru, but apparently made no stop between Puná, at the mouth of the Río Guayas, and the Bay of Panama. Here, however, they obtained 22 species, five of them in the Perlas Islands (Cano, 1889). Two of Festa's localities, Santa Elena and Tumaco, and one of the "Vettor Pisani's," Perlas Islands, were revisited by the "Askoy."

In 1891 the "Albatross," with Alexander Agassiz in charge, traversed in part the region covered by the "Askoy," dredging off Galera Point, northern Ecuador, and off Malpelo Island. Since the minimum depths involved, 1573 and 52 fathoms, respectively, were be-

yond the "Askoy's" maximum of 30 fathoms, it is not surprising that the results (Faxon, 1893, 1895) are not directly comparable. On a subsequent voyage, 1904-1905, the "Albatross" obtained 11 species from the littoral of Taboguilla and Perico Islands, Bay of Panama (Rathbun, 1907).

In 1924-1925 the "St. George," with Cyril Crossland aboard, stopped at Taboga Island, the Perlas Islands, and Gorgona Island, Colombia. In reporting on this expedition Finnegan (1931) recorded 39 species of brachyurans from the Pacific American mainland, describing several of them as new. Since she was working with an unfamiliar fauna and did not have access to the Rathbun cancrivora volume, or to the collections of the United States National Museum on which the Rathbun monographs were largely based, it is not surprising that the majority of these should have to give way to previously known species. Her zoogeographical discussion reveals a keen grasp of problems of animal distribution and, together with an extensive bibliography, represents the most valuable part of her paper.

In 1926 Waldo L. Schmitt collected at Salinas, Ecuador, his specimens enriching the collections of the United States National Museum. Rathbun (1930, 1937) included the cancrivora and oxystomes in subsequent monographs, but the grapsoid and spider crabs are unreported, except for preliminary descriptions of new species (Rathbun, 1935, p. 49).

The Perlas Islands were visited in the spring of 1928 by William K. Vanderbilt on the yacht "Ara," the few specimens collected being reported by Boone (1930), whose account should be considered in the light of Glassell (1934), with further emendations in order, several of which are indicated in the synonymy to follow.

In 1934, in 1935, and in 1938 the "Velero III" traversed the area of "Askoy" explorations, accompanied by W. L. Schmitt and the writer. Extensive collections of Brachyura were made, of which only the Oxystomata of 1934-1935 have been published (Rathbun, 1937). As it is not intended to issue a separate report on Hancock Expedition Brachyura of the Panama-Colombia-Ecuador area, but rather to incorporate these specimens into a more general report covering the mainland coast from Mexico to Peru, the opportunity afforded by the "Askoy" collection of concentrating upon a particular segment in preparation for the larger task has been welcomed.

In 1938 also the "Zaca," with William Beebe aboard, spent several days at Gorgona Island at the termination of an extended cruise devoted largely to Mexico and Central America. Of the Brachyura from this expedition, only the intertidal brachygnathous crabs have been reported (Crane, 1940, 1941, 1947), and from these the Portunidae, Goneplacidae, Pinnotheridae, and the grapsid genera *Sesarma* and *Plagusia* have been excluded.

A collector whose work should be mentioned in passing, although his field of operations lay outside "Askoy" territory, is R. E. Coker, who in 1906-1908 visited Peru. The representative collection of Crustacea that he obtained provided the incentive for Mary J. Rathbun to review the literature for the entire west coast of South America, revising and modernizing the nomenclature, discarding doubtful records, and otherwise facilitating the preparation of the present report. Her "Stalk-eyed Crustacea of Peru and the adjacent coast," appearing in 1910, stood as the authoritative work for the region, until parts of it were incorporated successively into the four monographs on crabs of America (1918, 1925, 1930, 1937).

EARLY RECORDS OF "ASKOY" COLLECTED SPECIES ESTABLISHED BY ITALIAN CARCINOLOGISTS OF THE NINETEENTH CENTURY

Since, before the turn of the century, the Crustacea of the Panama Bight were better known to Italian carcinologists than to those

of the English speaking nations, a review of Targioni-Tozzetti (1872, 1877), Cano (1889), and Nobili (1897, 1901) was undertaken. The

first, although omitted from Rathbun's 1910 bibliography, is cited in her 1925 and 1930 monographs. The second named, while containing, as Rathbun has pointed out, many Asiatic species incorrectly referred to American shores and others for one reason or another indeterminable, does give the earliest available record for the occurrence of many species within the territory under consideration. Early Panamanian records of "Askoy"-collected species not mentioned in the monographs but dating from Cano include the following, all incorrectly referred by him to the analogous Atlantic species:

Calappa convexa (as *C. flammea*)
Stenorynchus debilis (as *Leptopodia sagittaria*)
Arenaeus mexicanus (as *Neptunus cribrarius*)
Glyptoxanthus labyrinthicus (as *G. erosus* in the geographical section)

Nobili's papers, although lacking in illustrations, contain a wealth of descriptive material, amplified by color notes, measurements, and enumeration of specimens by age, sex, and provenance, and are the best original source of information on the Crustacea of the region. Early records of "Askoy"-collected species not appearing in the Rathbun monographs but amply substantiated by Nobili include the following:

From the Darien coast of Panama:

Callinectes arcuatus
Cronius ruber
Goniopsis pulchra
Uca brevifrons (as *Gelasimus vocator*)

From Ecuador:

Calappa convexa

Callinectes arcuatus
Cronius ruber
Xanthodius sternbergii
Eurypanopeus planus
Micropanope xantusii (as *Xanthias xantusii*)
Heteractaea lunata
Grapsus grapsus
Pachygrapsus transversus
Plagusia immaculata (as *P. tuberculata*)
Ocyropsis gaudichaudii

Of these *Calappa convexa*, *Eurypanopeus planus*, *Micropanope xantusii*, *Plagusia immaculata*, and *Uca brevifrons* are particularly important, as they represent the southernmost occurrence of the species concerned on the American mainland.

Maccagno (1928) presents a modern review of a portion of Nobili's work, that covering the genus *Uca*. From her descriptions and figures it is possible to recognize his *Uca vocator* var., listed as indeterminable by Rathbun (1910), as *U. ecuadoriensis* Maccagno, and to declare *U. guayaquilensis* Rathbun (1935) conspecific with *U. festae* Nobili. (Cf. Crane, 1941, p. 167.)

In the light of present knowledge concerning geographical distribution, Rathbun's synonymy of several of Cano's and Nobili's designations stands in need of revision. In the following pages *Thoe edentata* Cano (not Lockington) is referred to *T. sulcata panamensis* rather than to *T. s. sulcata*, and *Gecarcinus ruricola* of both Cano and Nobili (not Linnaeus) to *G. quadratus* rather than to *G. lateralis*. (See Remarks under these species.)

GENERAL OBSERVATIONS REGARDING THE "ASKOY" BRACHYURA

The 106 species of Brachyura included in the present paper are truly representative of the region covered, considering the "Askoy's" limitation to comparatively shallow dredging and the absence of fluvial collecting. None of the Cymopoliidae are represented, although *C. fragilis* has been dredged off Malpelo Island in 52 fathoms (not off Ecuador, as recorded by Rathbun, 1918), and four species of *Cymopolia* occur in the Galápagos Islands (Garth, 1946). Nor are the Potamonidae present, although ?*Pseudothelphusa bouvieri* was obtained by the "St. George" from a

stream on Gorgona Island (Finnegan, 1931), and eight species of *Pseudothelphusa* are recorded by Rathbun (1910) as occurring in Colombia and Ecuador. The inclusion of a representative of the Pinnotheridae was accidental, as no attempt was made to obtain commensals other than those obligatory to the *Pocillopora* colony. The absence of *Mithrax* (*Mithraculus*) *denticulatus* from the coral is remarkable in view of the fact that a representative of this subgenus, either *denticulatus* along the mainland coast or *nodosus* in the Galápagos Islands, was found by "Velero

III" collectors wherever coral heads were examined. Noteworthy also is the fact that the single *Sesarma* obtained by the "Askoy" was none of the four species obtained by Festa in Pacific Colombia and Ecuador (Nobili, 1901), but a fifth species, *S. (Holometopus) angusta*, known previously from Central America only. The scant representation of the genus *Uca*, abundant in species as well as individuals, as Crane (1941) has so well demonstrated, was in part overcome by later independent additions of Dr. R. C. Murphy.

The use of Brachyura of several species for food by the inhabitants of the Nariño coast is indicated by the presence in the collection of large specimens of *Calappa convexa*, *Calinectes toxotes*, and *Cardisoma crassum* purchased in the public market place at Tumaco, Colombia.

Comparative information useful in studies of breeding habits was obtained by the return of the "Askoy" in late May to two localities visited in February and early March, Saboga Island, Perlas Islands, and Guayabo Chiquito, Panama. In a number of species the percentages of ovigerous females taken at the two dates indicate a breeding cycle culminating in late June or early July. These are data of a type not furnished by private yachts whose visits invariably coincide with the northern winter.

The chief contribution of the "Askoy" collection, however, is in extending the known range of numerous species southward along the American mainland coast. A list of 45 such species follows. In it the ranges of nine species are extended from Colombia to Ecuador only; those of 16 species are extended from Panama to Colombia or Ecuador; while of those extended from territory outside the Panama Bight, seven are from Costa Rica (including two from Cocos Island), 12 are from Mexico north of Manzanillo (including 10 from the Gulf of California-Lower California region), and one is from the Galápagos Islands, although 15 additional species included in the aforementioned categories occur in the Galápagos as well. None represent extensions northward from Chile or Peru, a circumstance which attests the effectiveness of Punta Santa Elena as a faunistic barrier.

SPECIES	RANGE EXTENDED	
	FROM	TO
<i>Ethusa mascarone panamensis</i>	Panama	Ecuador
<i>Ilacantha hancocki</i>	Colombia	Ecuador
<i>Podochela vestita</i>	L. Calif.	Ecuador
<i>Podochela angulata</i>	Colombia	Ecuador
<i>Inachoides laevis</i>	Panama	Colombia
<i>Euprognatha bifida</i>	L. Calif.	Colombia
<i>Collodes granosus</i>	L. Calif.	Ecuador
<i>Pyromaia tuberculata</i>	Panama	Colombia
<i>Dasygyius gibbosus</i>	?Galápagos	Mainland
<i>Dasygyius depressus</i>	Cocos I.	Colombia
<i>Notolopas lamellatus</i>	Panama	Colombia
<i>Herbstia pubescens</i>	Mexico	Ecuador
<i>Lissa tuberosa</i>	L. Calif.	Colombia
<i>Anaptychus cornutus</i>	Panama	Colombia
<i>Mithrax (Mithrax) pygmaeus</i>	Panama	Ecuador ¹
<i>Mithrax (Mithrax) sinensis</i>	L. Calif.	Ecuador
<i>Teleophrys cristulipes</i>	Colombia	Ecuador ¹
<i>Tyche lamellifrons</i>	Panama	Ecuador ¹
<i>Parthenope (Parthenope) hyponca</i>	Panama	Ecuador
<i>Parthenope (Platylambrus) depressiuscula</i>	Panama	Colombia
<i>Thyrolambrus erosus</i>	L. Calif.	Ecuador
<i>Solenolambrus arcuatus</i>	Panama	Ecuador ¹
<i>Leiolumbrus punctatissimus</i>	Colombia	Ecuador
<i>Mesorhoea bellii</i>	Panama	Ecuador ¹
<i>Cryptopodia hassleri</i>	L. Calif.	Colombia
<i>Heterocrypta macrobrachia</i>	Panama	Ecuador
<i>Heterocrypta colombiana</i>	Colombia	Ecuador
<i>Portunus (Achelous) tuberculatus</i>	Colombia	Ecuador ¹
<i>Euphyllax robustus</i>	Mexico	Colombia
<i>Carpilodes cinctimanus</i>	Cocos I.	Colombia ¹
<i>Actaea sulcata</i>	Colombia	Ecuador ¹
<i>Hexapanopeus sinaloensis</i>	Panama	Colombia
<i>Menippe obtusa</i>	Panama	Ecuador ¹
<i>Pilumnus pygmaeus</i>	Costa Rica	Colombia ¹
<i>Pilumnus xantusii</i>	Costa Rica	Ecuador ¹
<i>Medaenus spinulifer</i>	L. Calif.	Colombia ¹
<i>Domacia hispida</i>	Colombia	Ecuador ¹
<i>Trapezia cymodoce ferruginea</i>	Colombia	Ecuador ¹
<i>Trapezia digitalis</i>	Panama	Ecuador ¹
<i>Trizocarcinus dentatus</i>	Gulf Calif.	Ecuador
<i>Chasmocarcinus latipes</i>	L. Calif.	Ecuador
<i>Sesarma (Holometopus) angusta</i>	Panama	Colombia
<i>Uca schmitti</i>	Costa Rica	Colombia
<i>Uca pygmaea</i>	Costa Rica	Panama
<i>Uca argillicola</i>	Costa Rica	Colombia

¹ Known also from the Galápagos Islands.

No new Indo-Pacific element is present among "Askoy" Brachyura comparable to *Hapalocarcinus marsupialis* from among Hancock Colombian collections (Schmitt, 1936, p. 34). *Carpilodes cinctimanus* and the two *Trapezia* species obtained as a result of diving operations, plus several other Indo-Pacific species not encountered by the "Askoy," were familiar to Nobili (1901, p. 1), who refers to Faxon (1895, p. 237) for an exposition of the character of the Panamic fauna.

That few novelties are present among "Askoy" collections of Brachyura is in part attributable to the policy by which new species obtained by the "Velero III" were published almost as rapidly as they became known. Five of these, *Raninoides ecuadorensis* and *Iliacantha hancocki* (Rathbun, 1935, p. 1), *Heterocrypta colombiana* and *Chasmocarcinus longipes* (Garth, 1940), and *Daldorfia garthi* (Glassell, 1940), were obtained by the "Askoy," as was *Podochela veleronis*, manuscript name. Species herein described for the first time are *Epialtus murphyi*, *Micropanope armstrongi*, *Pilumnus nobilii*, and *Pinnotheres malagueña*. Species previously known but of which supplementary description, usually of the sex opposite to that of the holotype, is given are *Podochela angulata* (Finnegan, 1931), *Hexapanopeus sinaloensis* (Rathbun, 1930), and *Chasmocarcinus longipes* (Garth, 1940). Species for the first time relegated to synonymy are *Pelia orbiculata* Finnegan (1931), which is referred to *Notolopas lamel-*

latus Stimpson, *Hexapanopeus setipalpus* Finnegan (1931), which falls to *H. sinaloensis* Rathbun, and *Daira ecuadorensis* Rathbun (1935, p. 49), which gives way to *Xanthodius stimpsoni* (A. Milne Edwards).

In view of the complete synonymy available in the Rathbun monographs, only two prior references have been considered necessary here, the original description and the first use of the name in its current combination. Excepted are those pertinent records, previously mentioned, placing the organism for the first time in the territory under consideration but for some unaccountable reason omitted from the monographs. Because of the intensified field activities of a younger group of workers, many additions to knowledge of distribution, habitat, and relationship of the species treated have been made in the last two decades, requiring a preponderance of citations following, rather than preceding, the comparatively recent Rathbun monographic entry.

Since the specimens collected by the "Askoy" represent in many cases the southernmost recorded occurrence of the species concerned on the American mainland, every effort has been made to define precisely the northern mainland and western insular limit of range of these species as well. Accordingly, under the heading Range, exact rather than general localities are given, each supported by a reference to the literature in the synonymy above.

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SYSTEMATIC ACCOUNT

TRIBE BRACHYURA SUBTRIBE GYMNOPLEURA

FAMILY RANINIDAE

Raninoides benedicti Rathbun

Raninoides benedicti RATHBUN, 1935, p. 1; 1937, p. 9, text figs. 4, 5, pl. 1, figs. 7, 8.

Raninoides laevis lamarcki BOONE, 1930, p. 48 (part), pl. 9, figs. B, C.

RANGE: From off La Paz Bay, Gulf of California, Mexico, to Cape San Francisco, Ecuador; 2–26½ fathoms.

MATERIAL EXAMINED: One hundred and ninety-six specimens (including fragmentary specimens) from nine stations:

PANAMA

Bahia Santelmo, Isla del Rey, Perlas Islands, February 14, 1941, Station 8, 11–14 meters, 2 specimens anterior portion only.

Piñas Bay, February 23, 1941, Station 19, sample 35, 14–33 meters, 4 males, 9 females, 2 specimens anterior portion only.

Guayabo Chiquito, March 4, 1941, Station 30, sample 78, 24–64 meters, 6 males, 13 females, 7 specimens anterior portion only.

COLOMBIA

Ardita Bay, March 6, 1941, Station 31, sample 81, 34–43 meters, 7 males, 3 females, 1 young, 3 specimens anterior portion only.

Octavia Bay, March 6, 1941, Station 32, sample 82, 24–28 meters, 33 males, 32 females, 1 specimen anterior portion only; sample 83, 25 meters, 7 males, 9 females.

Utria Bay, May 14, 1941, Station 100, sample 395, 12–22 meters, 1 male.

Cuevita Bay, May 11, 1941, Station 93, sample 359, 9–36 meters, 22 males, 18 females (9 ovigerous).

ECUADOR

Latitude 00° 55' N., longitude 80° 08' W., April 17, 1941, Station 87, sample 342, 36–54 meters, 2 males, 2 females (1 ovigerous).

Latitude 00° 32' S., longitude 80° 31' W., April 14, 1941, Station 81, sample 306, 18 meters, 1 male; sample 307, 27 meters, 7 males, 4 females.

MEASUREMENTS: Largest specimen, an ovigerous female, length 33.9 mm., width 17.5 mm., length of movable finger 9.0 mm.

HABITAT: Where recorded, the type of bottom is mud, mud and sand, or sand.

REMARKS: The large series of specimens

taken over a four-month period indicates a breeding cycle culminating in the early summer, perhaps in June. It will be observed that no egg-bearing females were taken in February and March, but one in April, while on May 11 at Cuevita Bay half of the females were gravid, although some of the egg masses were small. This is information of a nature not obtained by recent expeditions whose activities were limited to the winter months, and considerably extends our knowledge of the species.

The shearing edge of the dredge must have cut very close to the surface of the ocean floor, judging from the number of specimens of which the posterior third was missing. Had a raking device preceded the dredge to loosen the "top soil," it is believed that almost all of the specimens would have been recovered intact.

Although the very large female measured is not so long as the male holotype (U.S.N.M. No. 57685), it is slightly wider at the midline.

Raninoides ecuadorensis Rathbun

Raninoides ecuadorensis RATHBUN, 1935, p. 1; 1937, p. 15, pl. 80, figs. 5–7. GARTH, 1946, p. 344, pl. 49, figs. 1–5.

RANGE: La Plata Island and Galápagos Islands, Ecuador; 35–55 fathoms.

MATERIAL EXAMINED: Twenty-two miles west of Punta Jama, Ecuador, latitude 00° 08' N., longitude 80° 42' W., April 15, 1941, Station 83, sample 323, 61 meters, one female.

MEASUREMENTS: Female specimen, length 20.2 mm., width 11.7 mm.

HABITAT: Sand bottom.

REMARKS: The following note was made on the field label: "Animal from sand picked up in 50 CM silk plankton tow net which accidentally touched bottom in 61 M."

This is the first specimen to have been recorded since the type series was obtained by the "Velero III" at La Plata Island, Ecuador, in 1934, with the exception of a single specimen obtained by the same vessel in the Galápagos Islands in 1938. A pen and ink drawing of the species by Mr. Anker Petersen appears in Garth (1946).

The measurements of the female given above are almost identical with those given for a male by Rathbun (1937).

Ranilia fornicata (Faxon)

Raninops fornicata FAXON, 1893, p. 162; 1895, p. 41, pl. 7, figs. 1, 1a, 1b.

Ranilia fornicata MILNE EDWARDS AND BOUVIER, 1923, p. 302. RATHBUN, 1937, p. 20, pl. 5, figs. 3, 4. GARTH, 1946, p. 345, pl. 60, figs. 1, 2.

RANGE: From Magdalena Bay, Lower California, Mexico, to La Plata Island, Ecuador; Galápagos Islands; 7–100 fathoms.

MATERIAL EXAMINED: Three miles west of light on Cape Santa Elena, Ecuador, April 10, 1941, 41 meters, one female, one young.

MEASUREMENTS: Largest specimen, a female, length 14.3 mm., width 9.2 mm.

HABITAT: Sand bottom.

REMARKS: The "Askoy" specimens extend the range of the species southward from La Plata Island to Cape Santa Elena, Ecuador.

SUBTRIBE DROMIACEA

FAMILY DROMIIDAE

Hypoconcha panamensis Smith

Hypoconcha panamensis SMITH, in Verrill, 1869, p. 249. RATHBUN, 1937, p. 47, pl. 9, figs. 6, 7. GARTH, 1946, p. 348, pl. 61, figs. 3, 4.

RANGE: From Angeles Bay, Gulf of California, Mexico, to Matapalo, Peru; Galápagos Islands; 3–100 fathoms.

MATERIAL EXAMINED: Two specimens from as many stations:

COLOMBIA

Utria Bay, May 14, 1941, Station 100, sample 395, 12–22 meters, 1 male.

Málaga Bay, March 19, 1941, Station 40, sample 129, 4–9 meters, 1 male.

MEASUREMENTS: Largest specimen, a male, length 12.2 mm., width 11.9 mm.

HABITAT: Black mud and gray sand bottom.

REMARKS: *Hypoconcha panamensis* is but one of three species of *Hypoconcha* to be expected in territory covered by the "Askoy" Expedition. The others are *H. lowei* Rathbun, which ranges from the Gulf of California to Ecuador, and *H. californiensis* Bouvier, which has been found as far south as Taboga Island,

Panama. All carry a single valve of a pelecypod dorsally as protective armor. Their distinguishing characters are given in Rathbun (1937).

Hypoconcha lowei Rathbun

Hypoconcha lowei RATHBUN, 1933, p. 149; 1937, p. 50, pl. 8, figs. 5, 6.

RANGE: From San Felipe, Gulf coast of Lower California, Mexico, to Punta Santa Elena, Ecuador; 7–55 fathoms.

MATERIAL EXAMINED: Three miles west of light on Cape Santa Elena, Ecuador, April 10, 1941, Station 76, sample 274, 41 meters, two females, one young male.

MEASUREMENTS: Largest specimen, a female, length 16.5 mm., width 16.9 mm.

HABITAT: Sand bottom.

REMARKS: The young male was recovered with the half clam shell carried dorsally for protection still intact.

The dredging of this distinctive species off Cape Santa Elena duplicates an earlier record of the "Velero III" at the apparent southern limit of its range.

FAMILY DYNOMENIDAE

Dynomene ursula Stimpson

Dynomene ursula STIMPSON, 1860, p. 239 (111). RATHBUN, 1937, p. 54, pl. 12, figs. 1–4. GARTH, 1946, p. 349, pl. 61, figs. 5, 6.

RANGE: From Ensenada de los Muertos, Gulf of California, Mexico, to La Plata Island, Ecuador; Galápagos Islands; shore to 70 fathoms.

MATERIAL EXAMINED: Twenty-six specimens from three stations:

COLOMBIA

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

Gorgona Island, April 20–23, 1941, Station 89, sample 346, 5 meters, 1 male, 1 young; sample 348, 4–7 meters, coral, 1 male, 4 young.

ECUADOR

La Plata Island, April 12–13, 1941, Station 80, sample 304, seine, 1 male, 1 female, 3 young; sample 302, 5.5 meters, 1 male, 1 ovigerous female, 11 young.

MEASUREMENTS: Largest specimen, a male, length 15.0 mm., width 19.5 mm.

HABITAT: All specimens recovered from masses of coral with the exception of those attributed to sample 304, a seine haul. According to Mr. John C. Armstrong this seine haul was made on a small beach between rocky headlands, and there is a possibility that the seine dragged over some of the rocks at the edge of the beach, capturing specimens ordinarily associated with rocky, rather than sandy, shore.

REMARKS: The La Plata Island station duplicates an earlier record of the "Velero III" at the southernmost locality at which the species has been taken along South American mainland shores.

SUBTRIBE OXYSTOMATA

FAMILY DORIPPIDAE

Ethusa mascarone americana A. Milne Edwards

Ethusa americana A. MILNE EDWARDS, 1880, p. 30.

Ethusa mascarone americana RATHBUN, 1897, p. 109; 1937, p. 78, pl. 22, fig. 2, pl. 23, fig. 2. FINNEGAN, 1931, p. 615. CRANE, 1937, p. 105.

RANGE: From Tiburon Island, Gulf of California, Mexico, to Taboga Island, Panama; 5-35 fathoms. Occurs also in the Atlantic.

MATERIAL EXAMINED: Eight specimens from three stations:

PANAMA

Bahia Santelmo, Isla del Rey, Perlas Islands, February 14, 1941, Station 8, sample 4, 11-14 meters, 1 male.

COLOMBIA

Malaga Bay, March 19, 1941, Station 40, sample 129, 4-9 meters, 1 male, 2 ovigerous females.

ECUADOR

Latitude 00° 32' S., longitude 80° 31' W., April 14, 1941, Station 81, sample 306, 18 meters, 2 males, 2 females (1 ovigerous).

MEASUREMENTS: Largest specimen, a male, length 10.0 mm., width 9.1 mm.

HABITAT: Black mud and gray sand, sand and dead shell fragments.

REMARKS: Two of the above stations represent valuable extensions of range for the subspecies, which occurs in the Gulf of California, at Taboga Island in the Bay of Pan-

ama, and also in the Atlantic. Although in young specimens the anterolateral spine is small and by no means as advanced as the median frontal sulcus, the more mature specimens in the same series show the longer and typically outwardly directed spine and so should be referred to *E. m. americana* A. Milne Edwards, rather than to *E. m. panamensis* Finnegan, in which the spine is small and longitudinally directed.

The range of *E. m. americana* is now extended to Ecuador.

Ethusa lata Rathbun

Ethusa lata RATHBUN, 1893, p. 258; 1937, p. 84, text fig. 19, pl. 24, fig. 1, pl. 25, fig. 1, pl. 28, fig. 3. CRANE, 1937, p. 105. GARTH, 1946, p. 352, pl. 60, fig. 3.

RANGE: From Cedros Island, west coast of Lower California, and San Felipe Bay, Gulf of California, Mexico, to La Plata Island, Ecuador; Galápagos Islands; 2-100 fathoms.

MATERIAL EXAMINED: Ten specimens from five stations:

PANAMA

Guayabo Chiquito, March 4, 1941, Station 30, sample 78, 24-64 meters, 1 male.

COLOMBIA

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

Octavia Bay, March 6, 1941, Station 32, sample 82, 24-28 meters, 2 males, 2 large females.

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

Cuevita Bay, May 11, 1941, Station 93, sample 359, 9-36 meters, 1 male, 1 large female.

MEASUREMENTS: Largest specimen, a female, length 18.0 mm., width 19.7 mm. Large male, length 14.5 mm., width 11.2 mm.

HABITAT: Gray sand and black mud bottom.

REMARKS: The measured specimens, while not so large as the type of Faxon's *Aethusa pubescens* (a synonym of *E. lata* Rathbun), are by far the largest to have come under the observation of the writer, who is accustomed to thinking of ethusids in general as small to minute specimens. The two females from Octavia Bay are nearly as large as the Cuevita Bay specimen, the measurements of which appear above.

FAMILY LEUCOSIIDAE

Persephona townsendi (Rathbun)

Myra townsendi RATHBUN, 1893, p. 255.

Persephona townsendi RATHBUN, 1898, p. 613; 1937, p. 160, pl. 42, fig. 1, pl. 43, fig. 1. CRANE, 1937, p. 104.

RANGE: From off Punta San Fermin, Gulf of California, Mexico, to Cape San Francisco, Ecuador; 2–58 fathoms.

MATERIAL EXAMINED: Fourteen specimens from six stations:

PANAMA

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

Guayabo Chiquito, March 4, 1941, Station 30, sample 78, 24–64 meters, 1 young female.

COLOMBIA

Ardita Bay, March 6, 1941, Station 31, sample 81, 31 meters, 1 large female.

Octavia Bay, March 7, 1941, Station 32, sample 83, 24–28 meters, 1 large female.

Cuevita Bay, May 11, 1941, Station 93, sample 359, 9–36 meters, 2 females, including the largest specimen.

ECUADOR

Latitude 00° 32' S., longitude 80° 31' W., April 14, 1941, Station 81, sample 306, 18 meters, 1 male, 3 young; latitude 00° 31' S., longitude 80° 32' W., sample 307, 27 meters, 2 males, 1 female.

MEASUREMENTS: Largest specimen, a female, length including posterior spine 32.3 mm., width 26.9 mm., cheliped (extended) 50 mm., chela 26.4 mm., dactyl 15.7 mm.

HABITAT: Green mud, gray sandy mud, sand and dead shell fragments.

REMARKS: In the largest specimen the median posterior spine measures 5.0 mm. in length. Slightly smaller specimens show an even greater proportional length of this spine to length of carapace, along with a corresponding attenuation of the lateral posterior spines and the subcylindrical hepatic spines.

The Ecuadorean specimens obtained by the "Askoy" from slightly south of the Equator extend the range of the species southward from Cape San Francisco, where it was taken by the "Velero III."

Randallia bulligera Rathbun

Randallia bulligera RATHBUN, 1898, p. 614, pl. 44, fig. 6; 1937, p. 176, text fig. 38, pl. 50, figs. 1, 2.

Randallia ornata BOONE (not Randall), 1930, p. 59, pl. 12.

RANGE: From Madgalena Bay, Lower California, Mexico, to Callao, Peru; 2–28 fathoms.

MATERIAL EXAMINED: Off Ecuador, latitude 00° 32' S., longitude 80° 31' W., April 14, 1941, Station 81, sample 306, 18 meters, eight males, four females.

MEASUREMENTS: Largest specimen, a male, length 13.5 mm., width 12.7 mm., cheliped (extended) 23 mm., chela 11.6 mm., dactyl 5.6 mm.

HABITAT: Sand and dead shell fragments.

REMARKS: Although from but a single station, the series shows well the changes that take place with growth.

Iliacantha hancocki Rathbun

Iliacantha hancocki RATHBUN, 1935, p. 2; 1937, p. 187, pl. 57, figs. 1, 2.

Persephona edwardsii BOONE (not Bell), 1930, p. 53, fig. A.

RANGE: From Santa Maria Bay, Lower California, Mexico, to Port Utria, Colombia; 10–40 fathoms.

MATERIAL EXAMINED: Twelve specimens from six stations:

PANAMA

Guayabo Chiquito, March 4, 1941, Station 30, sample 78, 24–64 meters, 1 young male, 2 young females.

COLOMBIA

Ardita Bay, March 6, 1941, Station 31, sample 81, 34–43 meters, 1 young male.

Octavia Bay, March 6, 1941, Station 32, sample 82, 24–28 meters, 2 young.

Cuevita Bay, May 11, 1941, Station 93, sample 359, 9–36 meters, 1 male, 1 female.

ECUADOR

Latitude 00° 32' S., longitude 80° 31' W., April 14, 1941, Station 81, sample 306, 18 meters, 1 young specimen; latitude 00° 31' S., longitude 80° 32' W., sample 307, 27 meters, 2 young specimens.

Three miles west of light on Cape Santa Elena, April 10, 1941, Station 76, sample 274, 41 meters, 1 large male.

MEASUREMENTS: Largest specimen, a male, length 28.6 mm., width 21.7 mm., cheliped (extended) 41 mm., chela 20 mm., dactyl 11.8 mm.

HABITAT: Gray mud, gray sand, mud and live shells.

REMARKS: The species is well represented among the "Askoy" collections, although the size of the specimens is for the most part small. The largest specimen is measured with the posterior spine included in the carapace length; this accounts for the apparent disparity between the measurements above and the key character "chelipeds twice as long as carapace" given as diagnostic by Rathbun (1937).

The range of *I. hancocki* is extended southward from Port Utria, Colombia, to Cape Santa Elena, Ecuador.

FAMILY CALAPPIDAE

Calappa convexa Saussure

Calappa convexa SAUSSURE, 1853, p. 362 (9), pl. 13, fig. 3. NOBILI, 1901, p. 29. RATHBUN, 1937, p. 206, pl. 52, figs. 1-3. GARTH, 1946, p. 360, pl. 62, fig. 6.

Calappa flammea CANO (not Herbst), 1889, p. 249.

RANGE: From Magdalena Bay, Lower California, Mexico, to Santa Elena Bay, Ecuador; Galápagos Islands; 0-32 fathoms.

MATERIAL EXAMINED: Four specimens from three stations:

COLOMBIA

Tumaco, April 19, 1941, Station 88, sample 344, purchased in market, 2 large males.

ECUADOR

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

Salinas, December, 1942, C. M. Breder, Jr., collector, 1 large male.

MEASUREMENTS: Largest specimen, a male, length 82 mm., width 116 mm., width at lateral sinus 106.5 mm., height of palm 66 mm.

HABITAT: Rock and corallines.

REMARKS: Although not mentioned by Rathbun (1937, p. 206), credit for the first record of *C. convexa* from Ecuador should go to Dr. Enrico Festa, whose four specimens, collected at Santa Elena Bay and Point, were recorded by Nobili (1901). Dr. Waldo L. Schmitt duplicated this record in 1926, and "Velero III" collectors added Cape San Francisco and La Plata Island in 1934.

An early Panamanian record for the species is that of Cano (1889) for February, 1884. The specimen was referred erroneously to the Atlantic *C. flammea* (Herbst), and so was in all probability its Pacific analogue, *C. convexa*, rather than *C. saussurei*. This was the conclusion of Rathbun (1910, p. 610).

The male specimen collected by C. M. Breder, Jr., at Salinas is larger than the measured male (U.S.N.M. No. 59275) recorded in Rathbun (1937, p. 206) in two out of three dimensions given. It is not, however, so large as the measured female, nor so large as a male in the collections of the Los Angeles Museum, which measures 98 by 114.5 mm.

Calappa saussurei Rathbun

Calappa saussurei RATHBUN, 1898, p. 609, pl. 41, fig. 6; 1937, p. 206, text fig. 43, pl. 63, figs. 1-4. FINNEGAN, 1931, p. 611, fig. 1. CRANE, 1937, p. 98.

RANGE: From Inez Bay, Gulf of California, Mexico, to La Plata Island, Ecuador; 7-150 fathoms.

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

MEASUREMENTS: Female specimen, length 9.4 mm., width 10.5 mm.

HABITAT: Gray mud.

REMARKS: This species was already well known within territory covered by the "Askoy," having been collected at Gorgona Island by the "St. George" and at La Plata Island by the "Velero III."

Cycloë bairdii Stimpson

Cycloë bairdii STIMPSON, 1860, p. 237 (109).

Cycloë bairdii RATHBUN, 1898, p. 610; 1937, p. 225, pl. 69, figs. 3, 4. FINNEGAN, 1931, p. 613. CRANE, 1937, p. 100. GARTH, 1946, p. 362, pl. 62, figs. 7, 8.

RANGE: From Arena Bank, Gulf of California, Mexico, to La Libertad, Ecuador; Galápagos Islands; 2-70 fathoms. Occurs also in the Atlantic.

MATERIAL EXAMINED: Six specimens from two stations:

PANAMA

Guayabo Chiquito, March 4, 1941, Station 30, sample 78, 24-64 meters, 2 males, 1 female, 1 young, 1 crushed specimen.

ECUADOR

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

MEASUREMENTS: Largest specimen, a male, length 29 mm., width 30 mm. Largest female, length 20 mm., width 20.8 mm.

HABITAT: Gray sand, green sand, hard bottom (rocks and corallines).

REMARKS: The variety of bottom types on which this species is encountered perhaps explains in part its widespread occurrence in both Pacific and Atlantic oceans.

***Hepatus kossmanni* Neumann**

Hepatus kossmanni NEUMANN, 1878, p. 28.

Hepatus kossmanni RATHBUN, 1910, p. 593, part (Panama Bay); 1937, p. 239, pl. 72, figs. 3, 4. CRANE, 1937, p. 101, pl. 1, figs. 5, 6.

RANGE: From Abreojos Point, west coast of Lower California, Mexico, and Santa Inez Bay, Gulf of California, Mexico, to La Libertad, Ecuador; 2–25 fathoms.

MATERIAL EXAMINED: Seven specimens from three stations:

PANAMA

Piñas Bay, February 23, 1941, Station 19, sample 35, 14–33 meters, 1 large female, 1 young.

COLOMBIA

Ardita Bay, March 6, 1941, Station 31, sample 81, 34–43 meters, 1 male.

ECUADOR

Latitude 00° 32' S., longitude 80° 31' W., April 14, 1941, Station 81, sample 306, 18 meters, 3 young; sample 307, latitude 00° 31' S., longitude 80° 32' W., 27 meters, 1 large male.

MEASUREMENTS: Largest specimen, a female, length 43.7 mm., width 61.3 mm.

HABITAT: Green sandy mud, mud and live shells.

REMARKS: Although the nearly related *Hepatella amica* Smith was expected to be present in the "Askoy" collections because of its having been taken by the "Velero III" off Cape San Francisco, Ecuador, none of the specimens listed above proved to be of this species, all having eight clusters of tubercles, three gastric, one cardiac, and two branchial, characteristic of *Hepatus kossmanni*, rather

than the smooth carapace of *Hepatella amica*. The largest specimen approaches in size the 50 by 70 mm. male recorded by Rathbun (1937).

SUBTRIBE BRACHYGNATHA

SUPERFAMILY OXYRHYNCHA

FAMILY MAJIDAE

***Stenorynchus debilis* (Smith)**

Leptopodia debilis SMITH, 1871, p. 87.

Leptopodia sagittaria CANO, 1889, pp. 101, 170 (not *L. sagittaria* Leach).

Stenorynchus debilis RATHBUN, 1898, p. 568; 1925, p. 18, pls. 4, 5. FINNEGAN, 1931, p. 617. CRANE, 1937, p. 50. GARTH, 1946, p. 366, pl. 63, fig. 1.

RANGE: From Magdalena Bay, west coast of Lower California, and Patos Island Anchorage, Gulf of California, Mexico, to Chile; Galápagos Islands; low water to 50 fathoms.

MATERIAL EXAMINED: Seven specimens from six stations:

PANAMA

Isla Contadora, Perlas Islands, May 25, 1941, Station 110, sample 431, 10–11 meters, 1 male, 1 female.

Guayabo Chiquito, March 4, 1941, Station 30, sample 78, 24–64 meters, 1 male; May 20–21, 1941, Station 104, sample 410, 9–11 meters, 1 female.

COLOMBIA

Octavia Bay, March 6, 1941, Station 32, sample 82, 24–28 meters, 1 female.

Utria Bay, May 14, 1941, Station 100, sample 395, 12–22 meters, 1 large male.

Gorgona Island, April 23, 1941, Station 89, sample 348, 4–6 meters, 1 young female.

MEASUREMENTS: Largest specimen, a male, length including rostral spine 35.6 mm., rostral spine 20.6 mm., width 12.4 mm., first walking leg (longest) 100 mm., cheliped 58 mm., chela 27.2 mm., dactyl 9.6 mm.

HABITAT: Soft mud, gray sand, coral.

REMARKS: The earliest record for the species within "Askoy" Expedition territory appears to have been that of the "Vettor Pisani," which obtained one female specimen from Pacific Panama in 1884 (Cano, 1889).

The measured specimen above is of exceptional size, exceeding both in length and

breadth the measurements recorded in Rathbun (1925) for a male from the Gulf of California. The first walking leg is exactly 1 decimeter long.

***Podochela vestita* (Stimpson)**

Podonema vestita STIMPSON, 1871, p. 97 (7).

Podochela vestita A. MILNE EDWARDS, 1879, p. 195. RATHBUN, 1925, p. 42, pl. 14. CRANE, 1937, p. 52, pl. 1.

RANGE: From Adair Bay to Cape San Lucas, Gulf of California, Mexico; 11–35 fathoms.

MATERIAL EXAMINED: Latitude 01° 07' N., longitude 79° 53' W., off Ecuador, April 17, 1941, Station 87, sample 343, 9–27 meters, one male, two ovigerous females.

MEASUREMENTS: Largest specimen, a female, length including rostrum 9.4 mm., width 6.4 mm.

HABITAT: Hard bottom, rock and coral lines.

REMARKS: *Podochela vestita* is one of two species of *Podochela* with a hood-shaped rostrum inhabiting the eastern tropical Pacific, the other being *P. margaritaria* Rathbun of the Galápagos Islands. As noted previously (Garth, 1946, p. 371), the females of both species share the vermiculate sternum given as diagnostic of *vestita*, only the males of *margaritaria* showing the granulation supposedly characteristic of that species. The male specimen recorded above is beautifully decorated with hydroids, including not only hydranths but gonangia as well.

The species, formerly known only from the Gulf of California, ranges widely throughout the Panamic province, as demonstrated by the extensive series collected by the Hancock expeditions with which the "Askoy" specimens were compared. The Ecuadorean locality above is the southernmost record of its occurrence.

***Podochela angulata* Finnegan**

Podochela angulata FINNEGAN, 1931, p. 617, text fig. 3.

RANGE: Known only from the type locality, Gorgona Island, Colombia.

MATERIAL EXAMINED: Two specimens from as many stations:

COLOMBIA

Utria Bay, May 14, 1941, Station 100, sample 395, 12–22 meters, 1 male.

ECUADOR

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

MEASUREMENTS: Male specimen, length including rostrum 10.3 mm., width 7.25 mm.; chela 5.2 mm., dactyl 2.2 mm.; first ambulatory leg 36.3 mm., propodus 13.5 mm., dactyl 4.4 mm.; fourth leg 10.7 mm., propodus 3.0 mm., dactyl 2.2 mm.

SUPPLEMENTARY DESCRIPTION: Since the specimens listed above include the first recorded male of the species, the following supplementary description of the male is given: Chelipeds both finely and coarsely pubescent, manus moderately inflated, fingers meeting with a narrow gape, gape without teeth for its basal third, teeth alternating. First ambulatory leg three and one-half times length of carapace, its dactylus slender, unarmed, and equal to one-third the length of the propodus; dactyli of remaining legs spinulose, that of leg 4 almost as long as the propodus; all legs bearing clusters of curved hairs above and single straight hairs below. Sternal plates not deeply separated from one another; sternum with two setose tubercles in advance of abdomen. Otherwise as in female.

HABITAT: Soft gray mud.

REMARKS: The ovigerous female from Ecuador compares very well with a female from the Secas Islands, Panama, identified for the writer from among Hancock Expedition material by the late Mary J. Rathbun as *P. angulata* Finnegan. This specimen was later sent to the British Museum for comparison with the type, also a female, along with a male from the type locality, Gorgona Island. Of these specimens Isabella Gordon writes: "Unfortunately the holotype of *Podochela angulata* Finnegan is incomplete since most of the appendages are missing. But I think there can be no doubt that the male specimen from the type locality (Gorgona Island) belongs to *P. angulata*. I think also that the rostrum of the holotype may have been damaged at some time (during the crab's life). It may be that the rostrum is

variable in shape and that the specimen determined as *P. angulata* by Miss Rathbun represents the opposite extreme to that found in your male specimen." Gordon is inclined to regard all three specimens (the holotype, the topotype, and the specimen from Secas Islands) as conspecific. To this list the writer would now add the two "Askoy" specimens.

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

***Podochela veleronis*, manuscript name**

RANGE: From Tres Marias Islands, Mexico, to La Plata Island, Ecuador; 0-15 fathoms.

MATERIAL EXAMINED: Four specimens from three stations:

COLOMBIA

Humboldt Bay, May 18, 1941, Station 103, sample 404, 6-10 feet, coral, 1 male and 1 female, badly fragmented.

Utria Bay, May 15, 1941, Station 100, sample 397, low tide, 1 male.

ECUADOR

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

MEASUREMENTS: Largest specimen, a male, length including rostral spine 5.35 mm., width 3.75 mm.

HABITAT: Hard bottom, rock and coral-lines but no coral. Also occurs intertidally and in the *Pocillopora* coral colony.

REMARKS: The species has been known to the writer since 1934, when a single specimen was collected at La Plata Island, Ecuador, by the "Velero III." However, it was not until 1939 that sufficient material was obtained, including ovigerous females, to warrant description. These proved it to be a small and distinct species, rather than the young of *P. hemphillii* (Lockington), as believed by Rathbun. An apparent ecological factor also exists, *P. veleronis* having been found at low tide but not at depths greater than 15 fathoms (27 meters) whereas *hemphillii* occurs to 50 fathoms, but not usually intertidally. A complete description and figures of the new species will appear in the forthcoming report of the Hancock Expedition collections from the mainland.

***Inachoides laevis* Stimpson**

Inachoides laevis STIMPSON, 1860, p. 192 (64). RATHBUN, 1925, p. 61, pl. 22, figs. 3-6. CRANE, 1937, p. 53.

RANGE: From Magdalena Bay, west coast of Lower California, and Inez Bay, Gulf of California, Mexico, to Panama; 3-29 fathoms.

MATERIAL EXAMINED: From Málaga Bay, Colombia, March 19, 1941, Station 40, sample 129, 4-9 meters, one male.

MEASUREMENTS: Male specimen, length including rostrum 5.9 mm., width 4.25 mm., cheliped: merus 4.6 mm., carpus 1.4 mm., chela 4.3 mm., dactyl 2.2 mm.

HABITAT: Black mud and gray sand.

REMARKS: With recent additions to its range by the "Zaca" (Crane, above) and the "Askoy," *I. laevis* is now known to occur on both sides of the peninsula of Lower California, in the Bay of Panama, and south along the mainland coast to Málaga Bay, Colombia.

***Eucinetops panamensis* Rathbun**

Eucinetops panamensis RATHBUN, 1923, p. 73; 1925, p. 87, pl. 23, figs. 3, 4. CRANE, 1947, p. 71.

RANGE: From San Francisquito Bay, Gulf of California, Mexico, to Perlas Islands, Panama.

MATERIAL EXAMINED: From Saboga Island, Perlas Islands, February 11, 1941, Station 2, sample 1, shore, one male.

Measurements: Male specimen, length 6.5 mm., width 5.3 mm.

HABITAT: Intertidal.

REMARKS: The "Askoy" Expedition was fortunate in duplicating Garman's record for the species, the Perlas Islands being the southernmost station at which *panamensis* is known to occur. The other Pacific members of the genus are limited in range to the Gulf of California, where *panamensis* also occurs.

***Euprognatha bifida* Rathbun**

Euprognatha bifida RATHBUN, 1893, p. 231; 1925, p. 103, pl. 34, figs. 5, 6. CRANE, 1937, p. 55.

RANGE: From off Cedros Island, Lower California, and southeast of Tiburon Island, Gulf of California, to the Cape San Lucas Region, Mexico; $\frac{1}{2}$ -45 fathoms.

MATERIAL EXAMINED: Three specimens from two stations:

PANAMA

Piñas Bay, February 23, 1941, Station 19, sample 35, 14–33 meters, 2 males.

COLOMBIA

Utria Bay, May 14, 1941, Station 100, sample 395, 12–22 meters, 1 male.

MEASUREMENTS: Male specimen, length 6.4 mm., width 6.0 mm.

HABITAT: Green mud, green sandy mud.

REMARKS: Known previously from the Lower California-Gulf of California region, the range of the species is extended by the "Askoy" explorations to include the Bay of Panama and the Colombian coast.

Collodes granosus Stimpson

Collodes granosus STIMPSON, 1860, p. 194 (66), pl. 2, fig. 4. RATHBUN, 1925, p. 106, pl. 36, figs. 1, 2, pl. 217, fig. 1. Not Boone, 1930, p. 76, pl. 21, figs. A, B.

RANGE: From east of La Paz, Gulf of California, to Cape San Lucas, Lower California, Mexico; shallow water to 10 fathoms.

MATERIAL EXAMINED: Three specimens from two samples of a single station:

ECUADOR

Latitude 00° 32' S., longitude 80° 31' W., April 14, 1941, Station 81, sample 306, 18 meters, 1 female; latitude 00° 31' S., longitude 80° 32' W., sample 307, 27 meters, 2 females.

MEASUREMENTS: Largest specimen, a female, length 7.6 mm., width 7.3 mm.

HABITAT: Mud and live shell bottom.

REMARKS: *Collodes granosus* Stimpson is another species previously known only from the Gulf of California. Its range is now extended to Cape Pasado, Ecuador. Only the three specimens listed above are typical. Other specimens from Station 81, as well as from Panamanian and Colombian stations, lacking the characteristic dorsal spines of *granosus* and more finely granulate in appearance have been referred to *Dasygyius gibbosus* (Bell).

Pyromaia tuberculata (Lockington)

Inachus tuberculatus LOCKINGTON, 1876 (1877), p. 30 (3).

Pyromaia tuberculata RATHBUN, 1925, p. 133, pl. 40, fig. 3, pl. 218, figs. 1–4. CRANE, 1937, p. 56.

Collodes granosus BOONE (not Stimpson), 1930, p. 76, pl. 21, figs. A, B.

RANGE: From Monterey Bay, California, to the Bay of Panama; 3½–66 fathoms.

MATERIAL EXAMINED: Utria Bay, Colombia, May 14, 1941, Station 100, sample 395, 12–22 meters, one female.

MEASUREMENTS: Female specimen, length 6.5 mm., width 4.9 mm.

HABITAT: Soft gray mud.

REMARKS: The single specimen obtained by the "Askoy" fits the description of Rathbun's "var. B" (1925, p. 136) from Panama Bay. Apparently southern specimens differ sufficiently from northern to justify lettered varieties, or perhaps even subspecific names; not sufficiently, however, to justify their reference to a species of another genus, as was done by one recent writer.

The range of the species is extended southward to Utria Bay, Colombia.

Dasygyius gibbosus (Bell)

Microhynchus gibbosus BELL, 1835, p. 88; 1836, p. 41, pl. 8, figs. 1–1c.

Dasygyius gibbosus RATHBUN, 1925, p. 138, pl. 274, figs. 1–4.

RANGE: Known only from the type locality, Galápagos Islands, 6 fathoms, sandy mud.

MATERIAL EXAMINED: Fifteen specimens from four (possibly five) stations:

PANAMA

Piñas Bay, February 23–24, 1941, Station 19, sample 35, 14–33 meters, 2 females.

Guayabo Chiquito, March 4, 1941, Station 30, sample 78, 24–64 meters, 1 male.

COLOMBIA

Ardita Bay, March 6, 1941, Station 31, sample 81, 34–43 meters, 3 males, 4 females.

ECUADOR

Off Cape Pasado, April 14, 1941, Station 81, sample 306, 18 meters, 1 female; sample 307, 27 meters, 2 females.

Two additional young females without data.

MEASUREMENTS: Largest specimen, male, length 13.0 mm., width 10.7 mm., cheliped 14.3 mm., chela 6.2 mm., dactyl 3.2 mm., second ambulatory leg (longest) 27.2 mm.

HABITAT: Green sandy mud, gray mud.

REMARKS: The finding of specimens refer-

able to *Dasygyius gibbosus* in the Bay of Panama and near Santa Elena, Ecuador, is not surprising in view of the fact that these localities were visited by Cuming, on whose collection the Bell report was based. Since the species has not been found again in the Galápagos Islands, and since sandy mud, its designated habitat, is not the usual bottom encountered in the archipelago, it seems reasonable to assume that the type specimen came from either Panama or the Ecuadorean mainland, and not from the Galápagos. The degree of correspondence between the measured male from Ardita Bay, Colombia, and the original figures in Bell from which the Rathbun illustrations are copied, particularly those of the male chela and abdomen, is striking.

For the record, the range of the species may be said to have been extended from the Galápagos.

Dasygyius depressus (Bell)

Microrhynchus depressus BELL, 1835, p. 88; 1836, p. 42, pl. 8, figs. 2, 2d-f.

Dasygyius depressus RATHBUN, 1898, p. 570; 1925, p. 138, pl. 1, pl. 274, figs. 5-8. BOONE, 1930, p. 78, pl. 22. CRANE, 1937, p. 56.

RANGE: From the Santa Inez area to the Gordon Banks, Gulf of California, Mexico; Galápagos and Cocos Islands; 6-60 fathoms.

MATERIAL EXAMINED: Thirty-six specimens from five stations:

PANAMA

Piñas Bay, February 23-24, 1941, Station 19, sample 35, 14-33 meters, 1 male, 3 females (2 with soft shell).

Guayabo Chiquito, March 4, 1941, Station 30, sample 78, 24-64 meters, 4 females (2 with soft shell, 1 fragmentary).

COLOMBIA

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

Octavia Bay, March 6-7, 1941, Station 32, sample 82, 24-28 meters, 6 males, 10 females; sample 83, same depth, 1 male, 3 females.

Utria Bay, May 14, 1941, Station 100, sample 395, 12-22 meters, 4 males, 3 females.

MEASUREMENTS: Largest specimen, a female, length 15.4 mm., width 14.8 mm.

HABITAT: Gray sand, green sandy mud, green mud, gray mud.

REMARKS: Unlike the preceding *Dasygyius gibbosus* (Bell), which has been unreported since first taken by Cuming circa 1829, *D. depressus* has been taken frequently and in good numbers by the "Albatross," the "Ara," the "Zaca," and the "Velero III." It is one of the most characteristic inhabitants of the detritus-rich mud which occurs in shallow bays bordered by tropical rain forest and hence offering an abundance of decomposing animal and vegetable matter for food. At three of the five stations above, the two *Dasygyius* species were taken together, as they were originally by Cuming, judging by the identical data, 6 fathoms, sandy mud.

The range of the species is extended from Cocos Island, Costa Rica, to Utria Bay, Colombia. The Galápagos record is open to doubt (see Remarks under the preceding species).

Epialtus murphyi, new species

Figure 2

TYPE: Female holotype, A.M.N.H. No. 10009, from La Plata Island, Ecuador, 5.5 meters; specimen collected by "Askoy" Expedition, Station 80, sample 302, April 13, 1941.

MEASUREMENTS: Female holotype: length of carapace including rostrum 6.15 mm., length of rostrum 1.1 mm., width of carapace at hepatic level 6.15 mm., at branchial level 5.8 mm.; length of cheliped extended 6.9 mm., of manus 3.5 mm., of dactyl 1.2 mm.; height of hand 1.2 mm.

DIAGNOSIS: Rostrum bilobed, preorbital lobe prominent. Hepatic lobe larger than branchial, anterior margins horizontal and minutely dentate. Carapace posteriorly eroded, two tubercles at gastric level. Legs cristate, propodal tuft absent. Hand tuberculate.

DESCRIPTION: Carapace broad as long, widest at hepatic level, smooth anteriorly, eroded posterior to cardiac and branchial regions. Front produced to equal or exceed in length its constricted basal width, sides tapering forward of a single lateral setose tubercle, tip bilobed, the indentation between lobes displacing the equivalent of one lobe inverted; tip thickened and hollowed beneath in frontal view. A prominent postorbital lobe

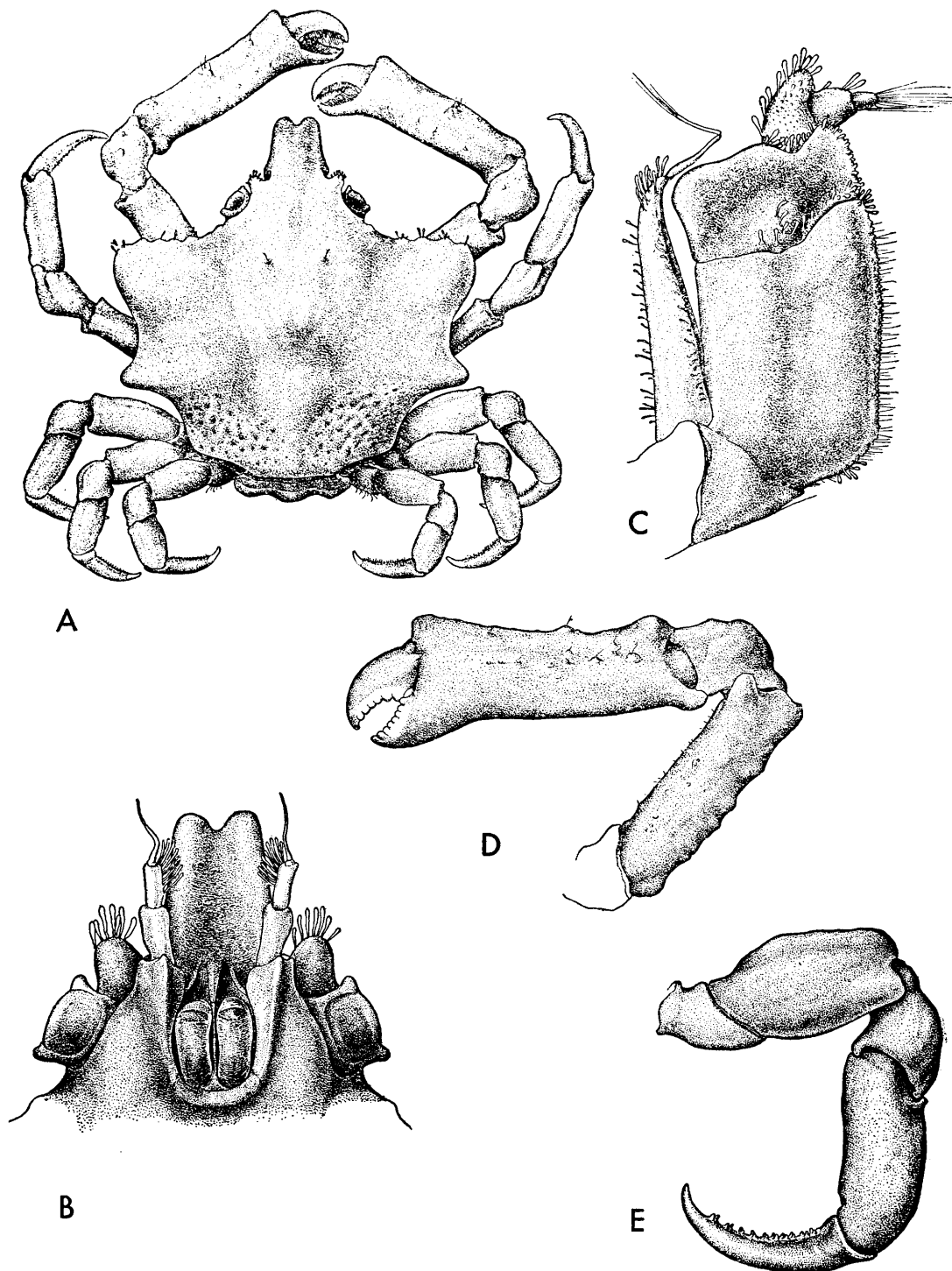


FIG. 2. *Epialtus murphyi*, new species, female holotype. A. Dorsal view, $\times 8.8$. B. Ventral view of frontal region, $\times 21.5$. C. Right outer maxilliped, $\times 38.3$. D. Left cheliped, $\times 12.7$. E. Right fourth ambulatory leg, $\times 22.2$.

bearing a cluster of six or seven clavate hairs above and hollow beneath. A minute postorbital denticle. Hepatic margins anteriorly almost horizontal, bearing three or four setose tubercles, laterally broadly rounded, giving a "broad shouldered" effect. Branchial lobes much sharper, culminating in a non-setose tubercle. Branchial width almost equaling hepatic width in the type specimen; in the Gorgona Island specimen (see Variation below) it exceeds the hepatic width. Regions slightly elevated and obscurely defined, except for cardiac and gastric, which are rounded, elevated, and together form a low, median ridge occupying about one-third of the carapace and clearly set off from the "wings." Gastric region bearing a pair of low tubercles in advance of its summit.

Basal antennal article slender, bearing a thickened ridge internally which culminates in a blunt tooth. First two segments of antenna thickened and compressed, only the hair-like flagellum produced beyond tips of rostrum. Merus of third maxilliped broader than long, notched internally to receive palpus.

Female chelipeds robust, tuberculate, massive, the chelae in particular elongated and broadened. Merus with three or four low tubercles on outer margin. Carpus with several tubercles and a median ridge. Manus elongated, crested above, bearing setose tubercles on both its internal and external surfaces, at least some of which tend to form a median longitudinal row. Fingers short, stout, convex and toothed exteriorly, the concave inner margins lined with shaggy hairs to which particles of dirt cling. Dactyl with rounded superior margin, pollex slightly deflexed; teeth and ridges of both dactyl and pollex outlined in white, emphasizing "parrot beak" effect. Ambulatory legs cristate; first leg the longest, merus with two sharpened tubercles along its lower anterior border; remaining pairs of legs similar, meri bearing a lamellate ridge most advanced medially and distally, carpi with a similar rounded crest; propodi but slightly thickened medially and without a distal tooth; dactyli of all legs spinulous, dactylus of the fourth pair overreaching propodus by the length of its curved, yellow nail.

Female abdomen and sternum covered

with the same type of erosion that characterizes the posterior portion of the carapace.

VARIATION: A second specimen, also a female, from Gorgona Island, Colombia, "Askoy" Station 89, sample 348, 4-7 meters, April 23, 1941, departs in important particulars from the description above, which is based on the holotype. The width of the carapace exceeds the length (measurements: length 8.0 mm., width 8.15 mm.), which may be owing to a short rostrum, which appears to have been injured; and the branchial width exceeds the hepatic, making these two proportions of doubtful value in diagnosing the new species. Being slightly larger, it is correspondingly more mature and shows the arrangement of tubercles on the carpus and manus of the cheliped to better advantage. These are four in a diamond on the carpus and four in a square at the base of the hand, the upper two falling in line with a median longitudinal row of tubercles.

REMARKS: In key characters the new species conforms with *E. dilatatus* A. Milne Edwards, an Atlantic species. The outline of the carapace agrees with Rathbun (1925, text fig. 53j) rather closely, but not with her plate 45, figure 2, from which it is also apparent that the female of *dilatatus* lacks the robust chelipeds of the new species. Nothing is said about erosion on the carapace of *dilatatus*, from which it is assumed to be smooth. The presence of gastric tubercles (as in *E. minimus* Lockington) and the absence of anything resembling a propodal tuft of hairs also serve to distinguish the new species.

I take pleasure in naming the new *Epialtus* for Dr. Robert Cushman Murphy, a friend of long standing, and leader of the "Askoy" Expedition on which it was obtained.

***Notolopas lamellatus* Stimpson**

Notolopas lamellatus STIMPSON, 1871, p. 97 (7). RATHBUN, 1925, p. 287, pl. 81, pl. 238, fig. 1.

Pelia orbiculata FINNEGAN, 1931, p. 621, text fig. 4.

RANGE: From Manzanillo, Mexico, to Panama. Also off Beaufort, North Carolina.

MATERIAL EXAMINED: Ten specimens from four stations:

PANAMA

Piñas Bay, February 24, 1941, Station 19, sample 35, 14-33 meters, 1 male.

Guayabo Chiquito, March 4, 1941, Station 30, sample 78, 24-64 meters, 1 young male, 2 young females.

COLOMBIA

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

Málaga Bay, March 19, 1941, Station 40, sample 129, 4-9 meters, 1 male, 4 females.

MEASUREMENTS: Largest specimen, a male, length 10.2 mm., width 5.8 mm.

HABITAT: Gray sand, green sandy mud.

REMARKS: It is out of geographical considerations, rather than purely morphological ones, that *Pelia orbiculata* Finnegan, the type of which was taken at Balboa, Panama (Canal Zone), is referred to *Notolopas lamellatus* Stimpson rather than to *N. brasiliensis* Miers. While it is possible that each species may occur on both sides of the Isthmus of Panama, as indicated by the single record off Beaufort, North Carolina, of a *Notolopas* attributed to the Pacific species *N. lamellatus*, it seems more probable that each is restricted to one side, and that occasional individuals of both species show characters reverting to the common ancestor from which they have been derived, possibly as recently as early Pliocene, certainly no more remotely than middle Miocene, when the two oceans were last confluent. The character in question is the relative length of the rostral spines and the depth of the division between them, in respect to which the holotype of Finnegan's species tends to favor the longer and more deeply cleft rostrum of *N. brasiliensis*.

The range of the species is extended from Panama southward to Málaga Bay, Colombia.

Herbstia tumida (Stimpson)

Herbstiella tumida STIMPSON, 1871, p. 95 (5).

Herbstia tumida RATHBUN, 1925, p. 299, pl. 105, figs. 5, 6. FINNEGAN, 1931, p. 623. ?CRANE, 1937, p. 59; 1947, p. 72.

RANGE: From the Gulf of California, Mexico, to Gorgona Island, Colombia.

MATERIAL EXAMINED: Fourteen specimens from three 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, 1 male, 1 female, 3 young.

COLOMBIA

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

MEASUREMENTS: Largest specimen, a male, length 10.9 mm., width 9.1 mm., cheliped (extended) 14.4 mm., chela 8.1 mm., dactyl 3.5 mm.

HABITAT: The specimens at each of the above stations were recovered from masses of living coral.

REMARKS: The "Askoy" collections duplicate the southernmost record for the species, that of the Crossland ("St. George") Expedition at Gorgona Island, Colombia, and help to fill in the large gap between it and Manzanillo, Mexico, with stations in Panama.

The largest specimen in the "Askoy" series, a male, is not so large as a female specimen from the Gulf of California already in the collection of the American Museum, which measures 13.5 by 10.7 mm.

Herbstia pubescens Stimpson

Herbstia pubescens STIMPSON, 1871, p. 92 (2). RATHBUN, 1925, p. 302.

RANGE: Known only from the type locality, Manzanillo, Mexico.

MATERIAL EXAMINED: Six specimens from three stations:

PANAMA

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

COLOMBIA

Gorgona Island, April 20-23, 1941, Station 89, sample 346, 4.5 meters, 1 young male; sample 348, 4-6.5 meters, 1 male, 1 ovigerous female.

ECUADOR

La Plata Island, April 13, 1941, Station 80, sample 302, 5.5 meters, 2 young males.

MEASUREMENTS: Largest specimen, a female, length 14.6 mm., width 11.0 mm.

HABITAT: As with the preceding species, *H. tumida* (Stimpson), all specimens were recovered from clumps of *Pocillopora* coral.

REMARKS: *Herbstia pubescens* is one of the few spider crabs of which no illustration appeared in Rathbun (1925), no specimen having been taken at that time since Stimpson's non-existent type. It is one of the rare pleasures in systematic work, in some respects more gratifying than the discovery of a new species, to come upon a specimen or specimens which fit the description of a "lost" species as accurately as the "Askoy" specimens recorded above fit Stimpson's description of *H. pubescens*.

The range of the species is extended from Manzanillo, Mexico, to La Plata Island, Ecuador, and the male of the species is now known.

***Lissa tuberosa* Rathbun**

Lissa tuberosa RATHBUN, 1898, p. 574, pl. 41, fig. 3; 1925, p. 333, pl. 246, fig. 1. CRANE, 1937, p. 59.

RANGE: Southern part of the Gulf of California, Mexico; 7-30 fathoms.

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

MEASUREMENTS: Female specimen, length 13.0 mm., width 12.2 mm.

HABITAT: The specimen above was obtained from coral.

REMARKS: The range of the species is extended from the Gulf of California, in the neighborhood of latitude 24° N., to Utria Bay, Colombia, latitude 06° N. for a latitudinal distance of 18 degrees, or 1080 nautical miles.

***Thoe sulcata panamensis* Nobili**

Thoe panamensis NOBILI, 1901, p. 30. RATHBUN, 1925, p. 351, text fig. 113, pl. 125, figs. 5, 6. FINNEGAN, 1931, p. 624.

Thoe sulcata panamensis CRANE, 1947, p. 71, text fig. 2A.

Thoe edentata CANO (not Lockington), 1889, pp. 101, 183.

RANGE: From Corinto, Nicaragua, to Gorgona Island, Colombia.

MATERIAL EXAMINED: Eight specimens from two stations:

COLOMBIA

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

Gorgona Island, April 20, 1941, Station 89, sam-

ple 346, 4.5 meters, 4 males, 3 females (1 ovigerous).

MEASUREMENTS: Largest specimen, a male, length 8.85 mm., width 7.7 mm.

HABITAT: Coral.

REMARKS: Following the suggestion of Rathbun (1925, p. 351) that *Thoe panamensis* Nobili might not be specifically distinct from *T. sulcata* Stimpson, Crane (1947, p. 71) has combined the two, retaining *panamensis* as a subspecies on the basis of the rather sharply differentiated male pleopod. The distinction formerly used to separate the two species, namely, the degree of obsolescence of the outer row of excavations on the arm, is apparently of questionable value. Crane reports finding Nicaraguan specimens that on the basis of this character would have to be referred to the northern subspecies, *sulcata*, in which the outer row of excavations is as deeply eroded as the inner row, although with respect to the pleopod they conform with the southern subspecies, *panamensis*, in which the outer row of excavations is normally obsolescent. Only a long series of specimens from localities between Manzanillo, Mexico, and Corinto, Nicaragua, will elucidate this problem further, and in this respect the "Askoy" material adds nothing to that of the "Zaca." The Gorgona Island station duplicates the earlier record of the Crossland ("St. George") Expedition.

The writer departs from the synonymy of Rathbun (1910, p. 618) in considering Cano's *Thoe edentata* a synonym of *T. s. panamensis* Nobili, rather than *T. s. sulcata* Stimpson, because of the Perlas Islands locality at which the "Vettor Pisani" specimens were taken. Lockington's *Platydes edentata* is a different matter, since Lockington's type localities were northern and well within the known Gulf of Californian and Mexican range of *T. s. sulcata*.

***Anaptychus cornutus* Stimpson**

Anaptychus cornutus STIMPSON, 1860, p. 184 (56), pl. 2, figs. 1, 1a, 1b. RATHBUN, 1925, p. 378, text fig. 122, pl. 134, figs. 4, 5, pl. 254, fig. 1. CRANE, 1947, p. 72.

Mitrax trigonopus CANO, 1889, p. 183, pl. 7, fig. 8.

RANGE: From Tepoca Bay, Sonora, Mexico, to Perlas Islands, Bay of Panama.

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

MEASUREMENTS: Male specimen, length 9.3 mm., width 9.1 mm.

HABITAT: "From under stones along shore at low tide in $\frac{1}{2}$ foot of water" (field label).

REMARKS: From a study of the figure in Cano (1889, pl. 7, fig. 8) it is apparent that his *Mithrax trigonopus* should be referred to *Anaptychus cornutus* Stimpson, thus giving us another early record from Panama, the type locality of the species.

The range of the species is extended southward from the Perlas Islands, Panama, to Utria Bay, Colombia.

***Mithrax (Mithrax) pygmaeus* Bell**

Mithrax pygmaeus BELL, 1835, p. 172; 1836, p. 55, pl. 11, figs. 3, 3f-h. FINNEGAN, 1931, p. 624. CRANE, 1947, p. 73.

Mithrax (Mithrax) pygmaeus RATHBUN, 1925, p. 406, pl. 262, figs. 1-4.

RANGE: From Port Parker, Costa Rica, to Perlas Islands, Bay of Panama; Galápagos Islands.

MATERIAL EXAMINED: Twenty-two specimens from five stations:

PANAMA

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

Isla Saboga, Perlas Islands, May 26, 1941, Station 111, sample 432, 4 meters, 6 males (2 large), 6 females (5 ovigerous).

COLOMBIA

Utria Bay, May 15, 1941, Station 100, sample 397, low tide, 1 female.

Gorgona Island, April 20, 1941, Station 89, sample 346, 4.5 meters, 2 males, 5 females (4 ovigerous).

ECUADOR

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

MEASUREMENTS: Largest specimen, a male, length 7.7 mm., width 9.3 mm., cheliped (extended) 16.7 mm., chela 9.4 mm., dactyl 3.6 mm.

HABITAT: Coral, under stones at low tide, dredged on hard bottom (rock and corallines).

REMARKS: This tiny species appears to occur in a variety of situations, as the data given under habitat above tend to show. The proportionately large number of ovigerous females at the Saboga Island and Gorgona Island localities suggests that the breeding cycle was well advanced by mid-May. The range of the species is extended from the Perlas Islands southward to Ecuador.

***Mithrax (Mithrax) sinensis* Rathbun**

Mithrax sinensis RATHBUN, 1892, p. 266, pl. 38, fig. 2.

Mithrax (Mithrax) sinensis RATHBUN, 1925, p. 419, pl. 151, figs. 3, 4, pl. 260. CRANE, 1931, p. 60.

RANGE: From San Esteban Island to Gorda Banks, Gulf of California, Mexico; 7-30 fathoms.

MATERIAL EXAMINED: Two specimens from as many stations:

COLOMBIA

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

ECUADOR

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

MEASUREMENTS: Male specimen, length 12.0 mm., width 13.65 mm.

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

REMARKS: The very young specimen from Ecuador was taken in the same dredge haul with *M. (M.) pygmaeus* Bell, and it is perhaps straining a point to segregate it from that species. The range of *M. (M.) sinensis* is now known to include at least Humboldt Bay, Colombia, and perhaps extends to Ecuador.

***Teleophrys cristulipes* Stimpson**

Teleophrys cristulipes STIMPSON, 1860, p. 190 (62), pl. 2, fig. 2. RATHBUN, 1925, p. 441, pl. 159, figs. 1, 2, 7, pl. 262, fig. 7. FINNEGAN, 1931, p. 625. GARTH, 1946, p. 396, pl. 68, figs. 5, 6. CRANE, 1937, p. 61; 1947, p. 73.

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

MATERIAL EXAMINED: Fifty-five specimens from five stations:

PANAMA

Guayabo Chiquito, May 20–21, 1941, Station 104, sample 410, 8–10 meters, 2 females (1 ovigerous).

COLOMBIA

Humboldt Bay, May 18, 1941, Station 103, sample 404, 6–10 feet, 3 males, 4 females (3 ovigerous).

Utria Bay, May 15, 1941, Station 100, sample 397, shore, 2 males, 1 female.

Gorgona Island, April 20–23, 1941, Station 89, sample 346, 4.5 meters, 2 males, 3 females (2 ovigerous); sample 348, 4–6.5 meters, 5 males, 7 females (1 ovigerous).

ECUADOR

La Plata Island, April 12–13, 1941, Station 80, sample 302, 5.5 meters, 3 males, 3 females (2 ovigerous); sample 304, 9 males, 7 females (4 ovigerous), 4 young.

MEASUREMENTS: Largest specimen, a male, length 9.2 mm., width 10.1 mm., cheliped (extended) 14.5 mm., chela 8.1 mm., dactyl 4.5 mm.

HABITAT: Coral, under stones at low tide.

REMARKS: In examining the several score specimens which make up the "Askoy" series of *Teleophrys*, careful watch was kept for the appearance of *T. tumidus* Cano among them. The fact that representatives of this genus as far south along mainland shores as La Plata Island, Ecuador, as well as in the Galápagos Islands, are of the Stimpson species would seem to bear out the writer's expressed belief (Garth, 1946, p. 400) that *tumidus* does not occur north of Peru.

Microphrys platysoma (Stimpson)

Milnia platysoma STIMPSON, 1860, p. 180 (52).

Microphrys platysoma A. MILNE EDWARDS, 1875, p. 62. RATHBUN, 1925, p. 497, pl. 176, figs. 1, 2. CRANE, 1937, p. 63; 1947, p. 74. GARTH, 1946, p. 405, pl. 68, figs. 3, 4.

RANGE: From Patos Island, Gulf of California, Mexico, to Salinas, Ecuador; Galápagos Islands; low tide to 70 fathoms.

MATERIAL EXAMINED: Gorgona Island, Colombia, April 20, 1941, Station 89, sample 346, 4.5 meters, three males, one ovigerous female.

MEASUREMENTS: Largest specimen, a male, length 13.9 mm., width 12.0 mm., cheliped (extended) 11.8 mm., chela 5.9 mm., dactyl 2.5 mm.

HABITAT: Coral.

REMARKS: The repeated occurrence of this species, thought to belong principally to the Gulf of California fauna, in the Bay of Panama (Meek and Hildebrand, collectors) and now in Colombian waters ("Askoy" Expedition), suggests that other species might better have been cited by this writer as examples of the infiltration into the Galápagos Islands of a northern element. (Cf. Garth, 1946.)

The Chilean and Peruvian species, *M. weddelli* Milne Edwards, is also known to occur within territory covered by the "Askoy," the species having been taken by Festa in Santa Elena Bay, Ecuador (Nobili, 1901).

Tyche lamellifrons Bell

Tyche lamellifrons BELL, 1835, p. 173; 1836, p. 58, pl. 12, figs. 3, 3f–j. RATHBUN, 1925, p. 508, pl. 273, figs. 1–6. CRANE, 1937, p. 64. GARTH, 1946, p. 406, pl. 54, figs. 1–6.

RANGE: From the Santa Inez area, Gulf of California, Mexico, to Panama; Galápagos Islands; 0–29 fathoms.

MATERIAL EXAMINED: Latitude 01° 07' N., longitude 79° 53' W., off Ecuador, April 17, 1941, Station 87, sample 343, 9–27 meters, two females (one ovigerous), one young.

MEASUREMENTS: Largest specimen, a female, length 18.2 mm., width 11.2 mm.

HABITAT: Hard bottom, rock and coral lines.

REMARKS: One of the female specimens is decorated with algae in such a manner as to make it almost unrecognizable as a crab. The other carries coralline algae and a barnacle covering almost a fourth of the carapace.

The range of the species is extended from Panama south to Ecuador along the mainland of South America, although it has been recorded as occurring in the Ecuadorean Islands of Galápagos.

FAMILY PARTHENOPIDAE

Parthenope (Parthenope) hyponca (Stimpson)

Lambrus hyponcus STIMPSON, 1871, p. 100 (10).

Parthenope (Parthenope) hyponca RATHBUN, 1925, p. 514, pl. 275, figs. 4–6.

RANGE: From Mazatlan, Mexico, to Panama.

MATERIAL EXAMINED: Three specimens from three stations:

PANAMA

Piñas Bay, February 23, 1941, Station 19, sample 35, 14–33 meters, 1 male.

ECUADOR

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

Three miles west of Cape Santa Elena, April 10, 1941, Station 76, sample 274, 41 meters, 1 male.

MEASUREMENTS: Largest specimen, a female, length 13.9 mm., width 15.6 mm., cheliped (extended) 33 mm., chela 17 mm., dactyl 6.8 mm.

HABITAT: Gray sandy mud.

REMARKS: This species was one of several Pacific parthenopids not represented in the collections of the United States National Museum at the time of the writing of the Rathbun monograph (1925), necessitating the repetition of the A. Milne Edwards (1878) figures.

The range of the species is extended southward from Panama to Cape Santa Elena, Ecuador.

Parthenope (Platylambrus) depressiuscula
(Stimpson)

Lambrus depressiusculus STIMPSON, 1871, p. 101 (11).

Parthenope (Platylambrus) depressiuscula RATHBUN, 1925, p. 524, pl. 188.

RANGE: From Manzanillo, Mexico, to Panama.

MATERIAL EXAMINED: Three specimens from two stations:

PANAMA

Isla Bayoneta, Perlas Islands, May 24, 1941, Station 109, sample 428, 8–9 meters, 1 female.

COLOMBIA

Málaga Bay, March 19, 1941, Station 40, sample 129, 4–9 meters, 1 male, 1 female.

MEASUREMENTS: Largest specimen, a female, length 16.1 mm., width 20.4 mm., cheliped (extended) 37 mm., chela 18.3 mm., dactyl 8.4 mm. Male, length 12.6 mm., width 15.7 mm.

HABITAT: Sand bottom is recorded for the

Perlas Islands specimen, black mud and gray sand for the Málaga Bay specimens.

REMARKS: This species, represented in the collections of the United States National Museum at the time of the writing of the Rathbun monograph (1925) by two female specimens purchased from Henry Ward, has heretofore been considered a rarity. Apparently it occurs sparingly throughout the Panamic province. The present records extend its known range southward from Panama to Málaga Bay, Colombia.

Thyrolambrus erosus Rathbun

Thyrolambrus erosus RATHBUN, 1898, p. 579, pl. 42, fig. 1; 1925, p. 533, pl. 197, pl. 281, fig. 2.

RANGE: From San Lorenzo Channel to Cape San Lucas, Gulf of California, Mexico; 8–31 fathoms.

MATERIAL EXAMINED: Latitude 01° 07' N., longitude 79° 53' W., April 17, 1941, Station 87, sample 343, 9–27 meters, one young female.

MEASUREMENTS: A young female specimen, length 7.8 mm., width 10.0 mm.

HABITAT: Hard bottom (rock and coralines).

REMARKS: The delicate beauty of the reticulations of the carapace and of the two rows of compound spinules on the chela can be appreciated only in very young specimens like the above. In older specimens these details are eroded away.

The species is superficially similar to *Daldorfia garthi* Glassell (1940), from which it may be separated by the thin fingers, the less massive chelipeds, and the marked separation of the hepatic and branchial regions.

The range of the species is extended greatly, from the Gulf of California region to Ecuador.

Solenolambrus arcuatus Stimpson

Solenolambrus arcuatus STIMPSON, 1871, p. 101 (11). RATHBUN, 1925, p. 538. FINNEGAN, 1931, p. 625. GARTH, 1946, p. 413, pl. 69, figs. 3, 4.

Solenolambrus typicus CANO (not Stimpson), 1889, pp. 102, 187.

RANGE: Panama and St. Elmo (Santelmo) Bay, Perlas Islands; Galápagos Islands; 10–60 fathoms.

MATERIAL EXAMINED: Five specimens from three stations:

PANAMA

Bahia Santelmo, Isla del Rey, Perlas Islands, February 14, 1941, Station 8, sample 4, 11–14 meters, 1 young.

COLOMBIA

Málaga Bay, March 19, 1941, Station 40, sample 129, 4–9 meters, 1 male, 2 females.

ECUADOR

Off Cape Pasado, April 14, 1941, Station 81, sample 306, 18 meters, 1 male.

MEASUREMENTS: Largest specimen, a male, length 10.5 mm., width 13.2 mm., cheliped (extended) 30 mm., chela 14.3 mm., dactyl 5.2 mm.

HABITAT: Sand, black mud and gray sand, sand and dead shell bottom.

REMARKS: While this species has been known since the time of Wm. Stimpson, no illustration of it appeared prior to 1946. It is not common, even in the Galápagos Islands, where five specimens were obtained by Hancock expeditions. The Perlas Island station above duplicates the Finnegan record for the species, whereas the Colombian and Ecuadorean records represent extensions of range southward.

Leiolambrus punctatissimus (Owen)

Parthenope punctatissima OWEN, 1839, p. 81, pl. 24, fig. 4.

Leiolambrus punctatissimus HOLMES, 1900, p. 46. RATHBUN, 1925, p. 543, pl. 198. FINNEGAN, 1931, p. 626.

RANGE: California (?). From off Guaymas, Gulf of California, Mexico, to Gorgona Island, Colombia; 20–26½ fathoms.

MATERIAL EXAMINED: Four specimens from two stations:

COLOMBIA

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

ECUADOR

Latitude 00° 55' N., longitude 80° 08' W., April 17, 1941, Station 87, sample 342, 36–54 meters, 1 large male, 1 young male, 1 young female.

MEASUREMENTS: Largest specimen, a male, length 19.6 mm., width 24.8 mm., cheliped 52 mm., chela 25 mm., dactyl 8.3 mm.

HABITAT: Black mud.

REMARKS: The young specimens above show particularly well a feature not mentioned in the description of the species, long golden hairs which grow from each of the many teeth along the margins of the cheliped, including not only merus and propodus, but even the denticles of the movable finger.

The range of the species, until recently known only from the Gulf of California, is extended to Ecuador from Gorgona Island, Colombia, where it was taken by the "St. George."

Mesorhoea bellii (A. Milne Edwards)

Solenolambrus bellii A. MILNE EDWARDS, 1878, p. 163, pl. 29, figs. 6–6d.

Mesorhoea bellii RATHBUN, 1925, p. 548, pl. 201, figs. 1–4. CRANE, 1937, p. 65. GARTH, 1946, p. 414, pl. 69, figs. 5, 6.

RANGE: From Abreojos Point, west coast of Lower California, and Consag Rock, Gulf of California, Mexico, to Bay of Panama; Galápagos Islands; 9–80 fathoms.

MATERIAL EXAMINED: Latitude 00° 55' N., longitude 80° 08' W., off Ecuador, April 17, 1941, Station 87, sample 342, 36–54 meters, one male.

MEASUREMENTS: Male specimen, length 16.0 mm., width 20.8 mm., cheliped 35 mm., chela 18 mm., dactyl 5.3 mm.

HABITAT: Mud bottom.

REMARKS: The male specimen in the "Askoy" collection compares favorably with the measured female specimen in Rathbun (1925).

The range of the species is extended southward along the mainland coast from Panama Bay, where it was taken by the "Albatross," to Ecuador. It also occurs in the Galápagos Islands, where some eight specimens were obtained by the "Velero III."

Cryptopodia hassleri Rathbun

Cryptopodia hassleri RATHBUN, 1925, p. 554, pl. 202, figs. 1, 2.

RANGE: Known only from the type locality, Magdalena Bay, Lower California, Mexico.

MATERIAL EXAMINED: Málaga Bay, Colombia, March 19, 1941, Station 40, sample 129, 9 meters, one male.

MEASUREMENTS: Male specimen, length 6.6 mm., width 10.3 mm.

HABITAT: Black mud and gray sand.

REMARKS: This small species, unique among parthenopids in that the walking legs are completely hidden from dorsal view by the projecting carapace, has been known heretofore only from the Gulf of California. Its range is now extended to Colombia.

Heterocrypta macrobrachia Stimpson

Heterocrypta macrobrachia STIMPSON, 1871, p. 103 (13). RATHBUN, 1925, p. 558, pl. 203, figs. 3, 4, pl. 282, figs. 4, 5.

RANGE: From Magdalena Bay, Lower California, Mexico, to Panama; 12–51 fathoms.

MATERIAL EXAMINED: Off Cape Pasado, Ecuador, April 14, 1941, Station 81, sample 306, 18 meters, two males, one female.

MEASUREMENTS: Largest specimen, a male, length 10.4 mm., width 13.7 mm., cheliped (extended) 27 mm., chela 13 mm., dactyl 4.5 mm.

HABITAT: Sand and dead shell fragments.

REMARKS: The range of the species is extended southward from Panama to Ecuador.

Heterocrypta colombiana Garth

Heterocrypta colombiana GARTH, 1940, p. 71, pl. 18, figs. 1, 2.

RANGE: From Salinas Bay, Costa Rica, to Port Utria, Colombia; $1\frac{1}{2}$ fathoms.

MATERIAL EXAMINED: Latitude $01^{\circ} 07' N.$, longitude $79^{\circ} 53' W.$, off Ecuador, April 17, 1941, Station 87, sample 343, 9–27 meters, one male.

MEASUREMENTS: Male specimen, length 5.8 mm., width 7.9 mm.

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

REMARKS: The male specimen above is the third representative of the species known, and the first to have been collected since the types were obtained by Hancock expeditions. The range of the species is extended from Colombia to Ecuador, its vertical range from 3 to 27 meters.

SUPERFAMILY **BRACHYRHYNCHA**

FAMILY **PORTUNIDAE**

Portunus (Portunus) acuminatus (Stimpson)

Achelous acuminatus STIMPSON, 1871, p. 112 (22).

Portunus (Portunus) acuminatus GARTH, 1940, p. 73, pl. 19, figs. 1–3. Not *Portunus (Portunus) acuminatus* Rathbun, 1930, p. 56, pl. 19.

RANGE: From Isabel Island, Mexico, to La Libertad, Ecuador; 2–50 fathoms.

MATERIAL EXAMINED: Off Cape Pasado, Ecuador, April 14, 1941, Station 81, sample 306, 18 meters, two males.

MEASUREMENTS: Male specimen, length 10.0 mm., width 16.4 mm. (excluding lateral spines).

HABITAT: Sand and dead shell bottom.

REMARKS: The finding among collections of the "Velero III" of an entire series of *Portunus* ranging from Isabel Island, Mexico, to La Libertad, Ecuador, which could not be determined according to the system proposed by Rathbun (1930), in which *acuminatus*, *asper*, and *panamensis* are grouped as possible forms of a single species, and the application to them of the name *acuminatus* Stimpson in what was presumably its original intent have already been set forth (Garth, 1940, p. 73). The slender chelate and long-spined species represented by the Hancock expeditions series and by the two "Askoy" specimens recorded above was not among the limited number of specimens from the Bay of Panama available to Rathbun, who applied Stimpson's name to the most likely specimen before her, an atypical *asper* with an unusually long lateral spine.

Portunus (Portunus) asper

(A. Milne Edwards)

Neptunus asper A. MILNE EDWARDS, 1861, p. 325, pl. 30, figs. 3–3c.

Portunus (Portunus) asper RATHBUN, 1930, p. 56, pl. 20, figs. 2, 3, pl. 21, pl. 22, figs. 1, 2.

RANGE: From Panama to Chile; shoal water to 16 fathoms.

MATERIAL EXAMINED: Twenty specimens from 10 stations:

PANAMA

Bahia Santelmo, Isla del Rey, Perlas Islands, February 14, 1941, Station 8, sample 4, 11–14 meters, 1 male.

Piñas Bay, February 24, 1941, Station 19, mud bottom sample 35, 10–33 meters, 3 males, 2 females.

Guayabo Chiquito, March 4, 1941, Station 30, sample 78, 24–64 meters, 2 males.

COLOMBIA

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

Octavia Bay, March 6, 1941, Station 32, sample 82, 24-28 meters, 1 female.

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

Cuevita Bay, May 11, 1941, Station 93, sample 359, 9-26 meters, 1 male, 2 females.

ECUADOR

Latitude 02° 48' N., longitude 78° 11' W., April 24, 1941, dipnet at current measurement station, 1 male, 1 young female.

Latitude 01° 07' N., longitude 79° 53' W., April 17, 1941, Station 87, sample 342, 36-54 meters, 1 female.

Off Cape Pasado, April 14, 1941, Station 81, sample 306, 18 meters, 3 males.

MEASUREMENTS: Largest specimen, a female, length 31.9 mm., width (including lateral spines) 70 mm., length of lateral spine 10.5 mm., cheliped (extended) 68 mm., chela 36 mm., dactyl 17.5 mm.

HABITAT: Sand, gray sandy mud, sand and dead shell, mud.

REMARKS: Judging from the number of stations at which it was taken, *Portunus* (*P.*) *asper* is the widely distributed portunid of the Panama Bight, conceived of as extending southward to Cape Santa Elena, Ecuador. For a discussion of the three common Pacific Panamanian species of *Portunus* and the manner in which they can be readily distinguished from one another, the reader is referred to the citation mentioned under the foregoing *P. (P.) acuminatus* (Garth, 1940, p. 73), rather than to the discussion in Rathbun (1930, p. 53) under the heading "the *acuminatus-asper-panamensis* group." The latter will prove misleading to one desirous of understanding the portunids of the greater Bay of Panama, as Rathbun labored without knowledge of the true identity of *acuminatus*. (See also Remarks under this species.)

It is interesting to note that the most extensive series was obtained with a mud bottom sampling device, and to note that the species was dipped from the surface at a current measurement station some distance from shore.

Portunus (Portunus) panamensis (Stimpson)

Achelous panamensis STIMPSON, 1871, p. 112 (22).

Portunus (Portunus) panamensis RATHBUN, 1910, pp. 577, 610; 1930, p. 58, pl. 20, fig. 1, pl. 22, fig. 3, pls. 23, 24. FINNEGAN, 1931, p. 626, text fig. 5.

RANGE: From Panama Bay to Bay of Sechura, Peru (from Angeles and Mulege bays, Gulf of California, Mexico, only if Rathbun's synonymy of *Amphitrite paucispinis* Lockington be accepted); to 33 fathoms.

MATERIAL EXAMINED: Twenty-five specimens from five stations:

PANAMA

South Passage, Perlas Islands, February 13, 1941, Station 7, 27 meters, 1 male, 1 female.

Piñas Bay, February 23, 1941, Station 19, 14-33 meters, 2 young males, plus 3 young doubtfully referred to the same species.

Guayabo Chiquito, March 4, 1941, Station 30, sample 78, 24-64 meters, 1 male, 11 young.

COLOMBIA

Octavia Bay, March 7, 1941, Station 32, sample 83, 25 meters, 1 male, chelipeds lacking.

ECUADOR

Three miles west of light on Cape Santa Elena, April 10, 1941, Station 76, 41 meters, 2 males, 3 females.

MEASUREMENTS: Male specimen, length 14 mm., width (including lateral spines) 30.3 mm., length of lateral spine 4.0 mm.

HABITAT: Sand, gray mud, black mud.

REMARKS: Although *Portunus (P.) panamensis* and the preceding *P. (P.) asper* enjoy essentially the same range, from Panama to Peru, or even Chile, the former appears to be more abundant in the northern portion of its range, the latter in the southern.

Portunus (Achelous) tuberculatus
(Stimpson)

Achelous tuberculatus STIMPSON, 1860, p. 223 (95).

Portunus (Achelous) tuberculatus RATHBUN, 1898, p. 596; 1930, p. 90, pl. 44. FINNEGAN, 1931, p. 629. CRANE, 1937, p. 68. GARTH, 1946, p. 421, pl. 71, fig. 2.

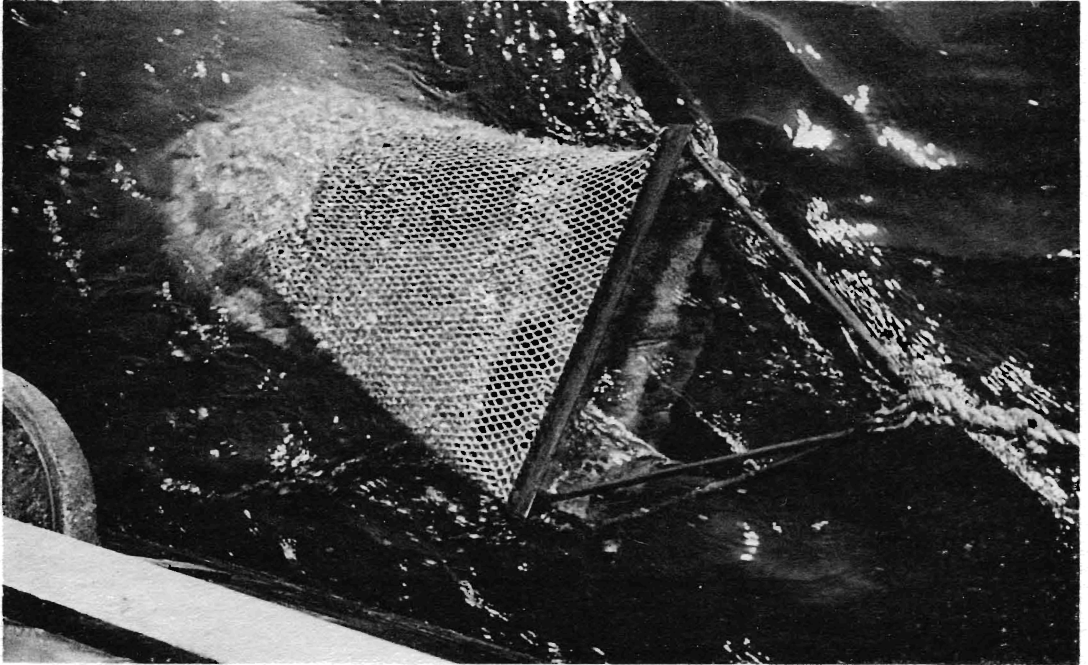
RANGE: From Cape San Lucas, Lower California, Mexico, to Gorgona Island, Colombia; Galápagos Islands; 3-70 fathoms.



1. Stations 1 and 110, the Alpha and Omega of "Askoy" exploration. Beyond the "Askoy," riding at anchor off Contadora Island, Perlas Islands, Panama (Station 110), are Pacheca and Pachequilla Islands (Station 1) at which collecting was commenced some three and one-half months earlier



2. "Askoy" Station 40. Entrance to Malaga Bay, Colombia, showing the remarkable sea caves on the northern side. This is the type locality for *Pilumnus nobilii* and *Pinnotheres malagueña*, new species (see text)



1. Dredge surfacing at Ardita Bay, Colombia, "Askoy" Station 31. Mud washing out leaves a trail of murkiness astern



2. Scientists emptying small dredge at Cueva Bay, Colombia, "Askoy" Station 93. A canvas skirt is sometimes used to prevent the fine mesh from tearing on sharp submarine projections



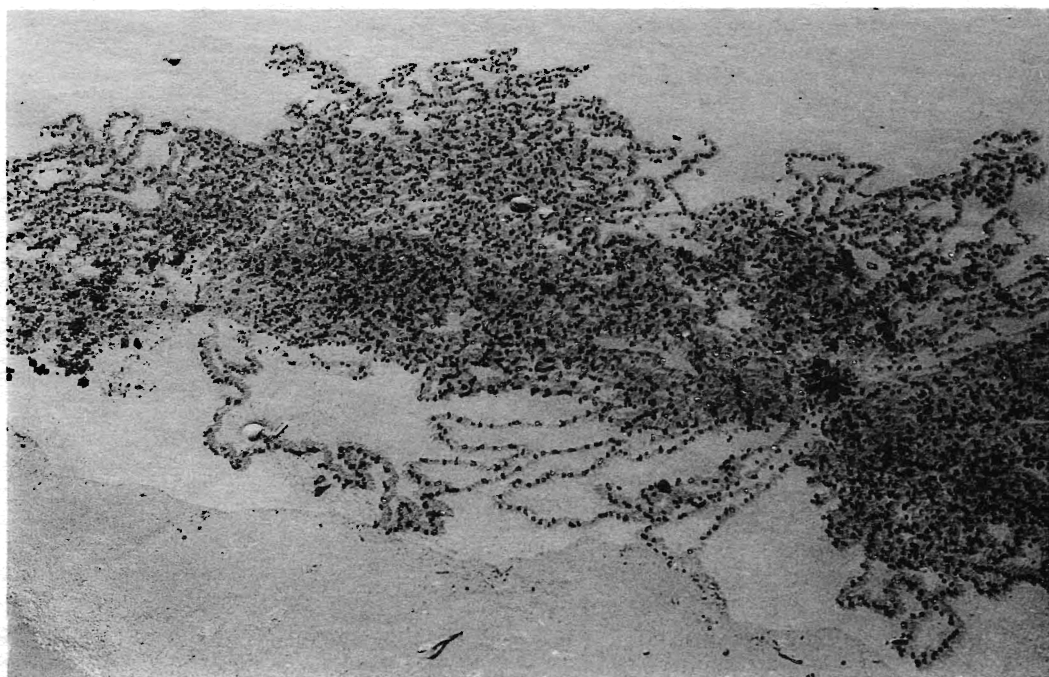
1. "Askoy" Station 100. Puerto Utria, Colombia, looking southward towards the entrance of the bay, with the "Askoy" at anchor



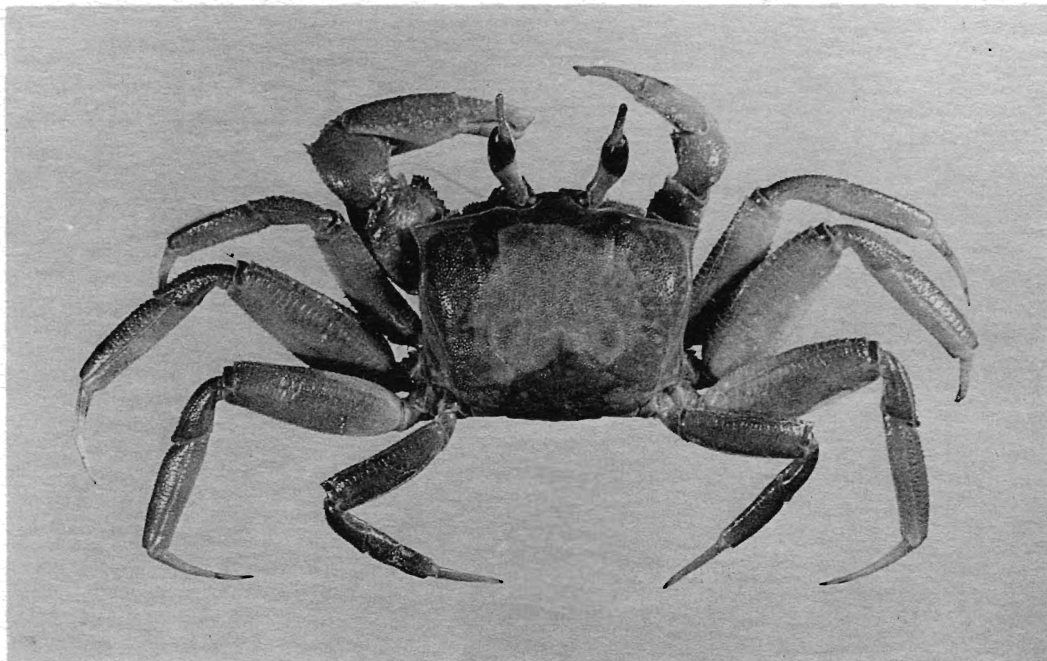
2. Puerto Utria, Colombia, looking southward through the mouth of the bay towards Cape Corrientes. *Gecarcinus quadratus* is found at the base of the coconut palms



1. Ghost crab, *Ocypode gaudichaudii*, at entrance to its burrow, Puerto Utria, Colombia (see text)



2. Crab castings at San José Island, Perlas Islands, Panama. *Ocypode occidentalis* was obtained by Dr. R. C. Murphy at this locality (see text)



1. "El Carretero," the cart driver, is the name locally applied to the ghost crab, *Ocypode gaudichaudii*, for his manner of racing up and down the broad sand beaches. Note eyestalks prolonged beyond corneas



2. Purple swimming crab, *Euphylax dovii*, encountered in great numbers off Malpelo Island, Colombia, in the vicinity of "Askoy" Station 54 (see text)



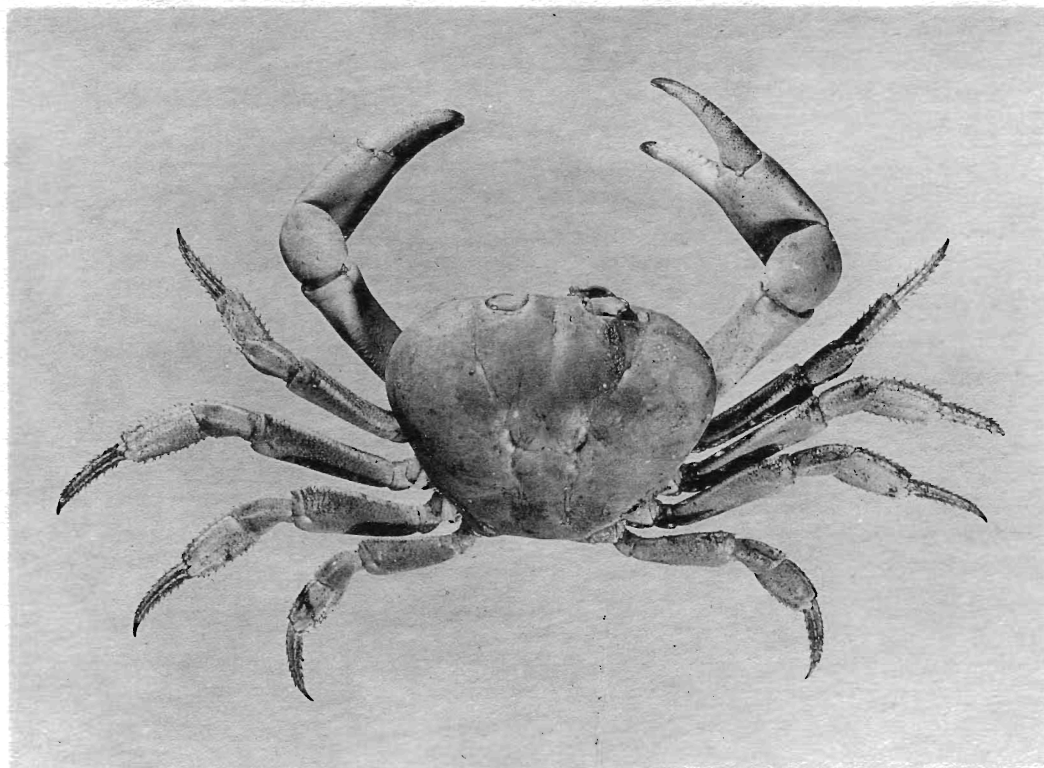
1. "Askoy" Station 103. Río Changamé, a short distance above its mouth on the Ensenada de Coredó (Humboldt Bay), Colombia. The burrows of fiddler crabs may be seen on the far bank. *Uca schmitti* and *U. latimanus* were taken at this station



2. "Askoy" Station 110. Northwest corner of Contadora Island, Perlas Islands, Panama. *Uca panamensis* is found under stones at the ends of such beaches



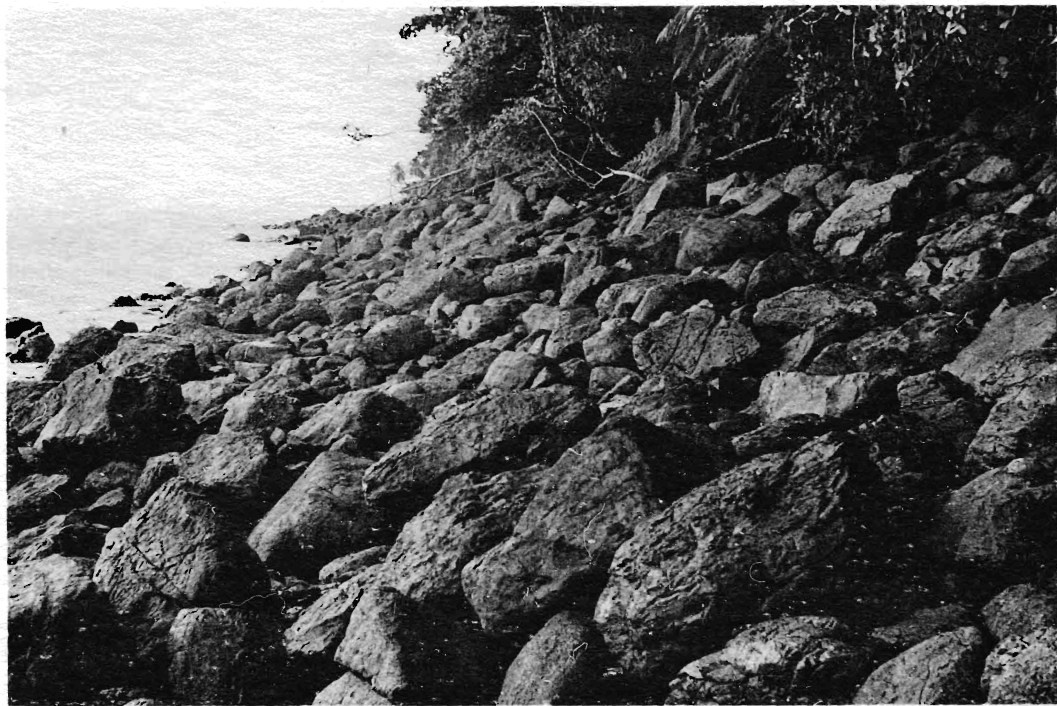
1. "Askoy" Station 55. At Malpelo Island, Colombia, land crabs of ghoulish appearance and with shells of ghostly white eye the visitor with uncomfortable intent



2. Land crab of Malpelo Island, Colombia, *Gecarcinus planatus* (see text)



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 antero-lateral 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.

Euphylax dovii Stimpson

Plate 5, figure 2

Euphylax 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. dovii* 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. dovii* 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.)

***Euphylax robustus* A. Milne Edwards**

Euphylax 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. dovii* Stimpson, since all adult *Euphylax* 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 *dovii*, 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 *dovii*. Furthermore, the chelae of all but the young female mentioned above are slender as in *dovii*, 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 *Euphylax*, 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. dovii* 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. dovii* 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

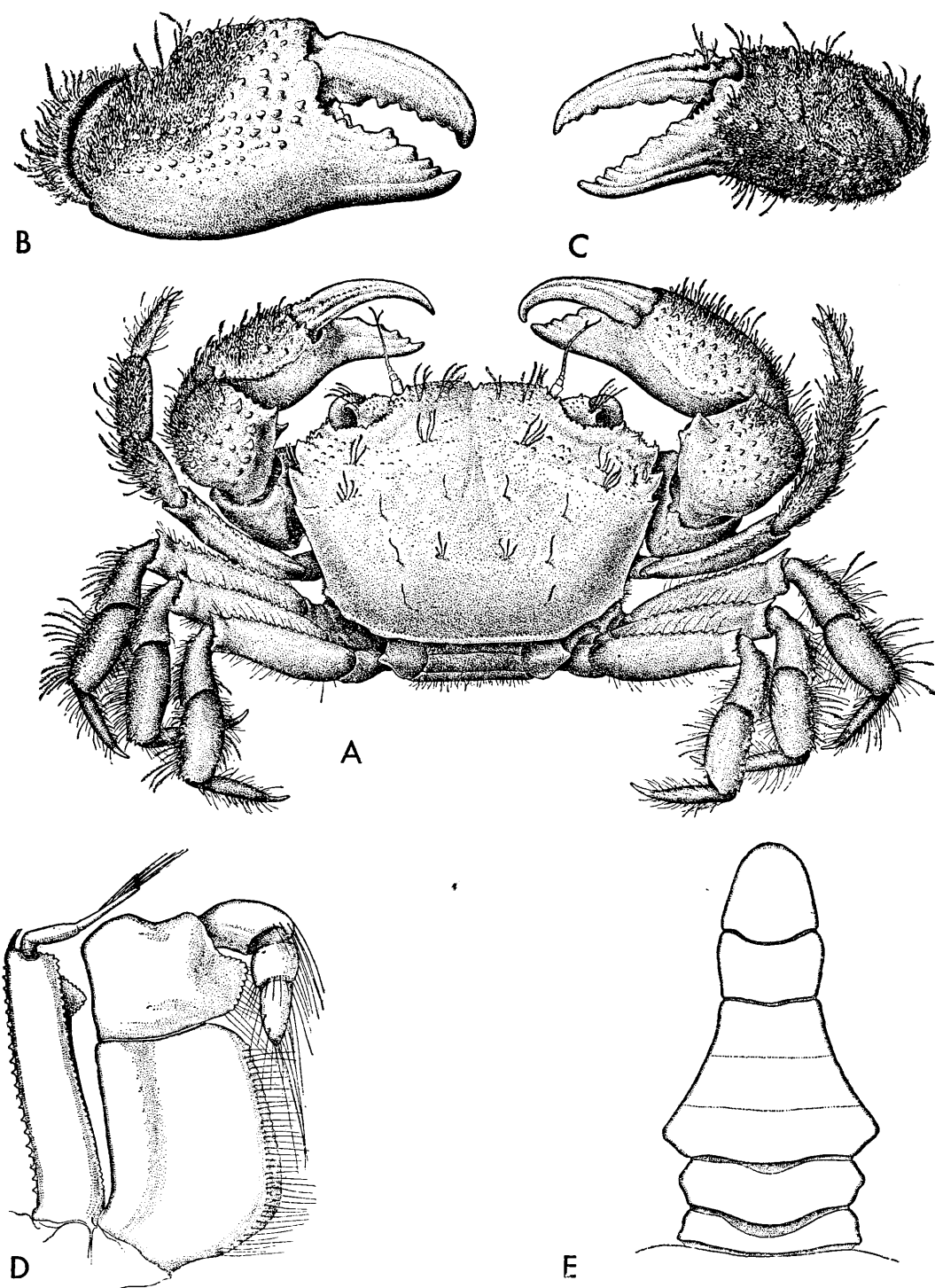


FIG. 3. *Micropanope armstrongi*, new species, male holotype. A. Dorsal view, $\times 12.5$. B. Major chela, $\times 14.8$. C. Minor chela, $\times 14.8$. D. Right outer maxilliped, $\times 49.5$. E. Male abdomen (hairs omitted), $\times 22.2$.

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

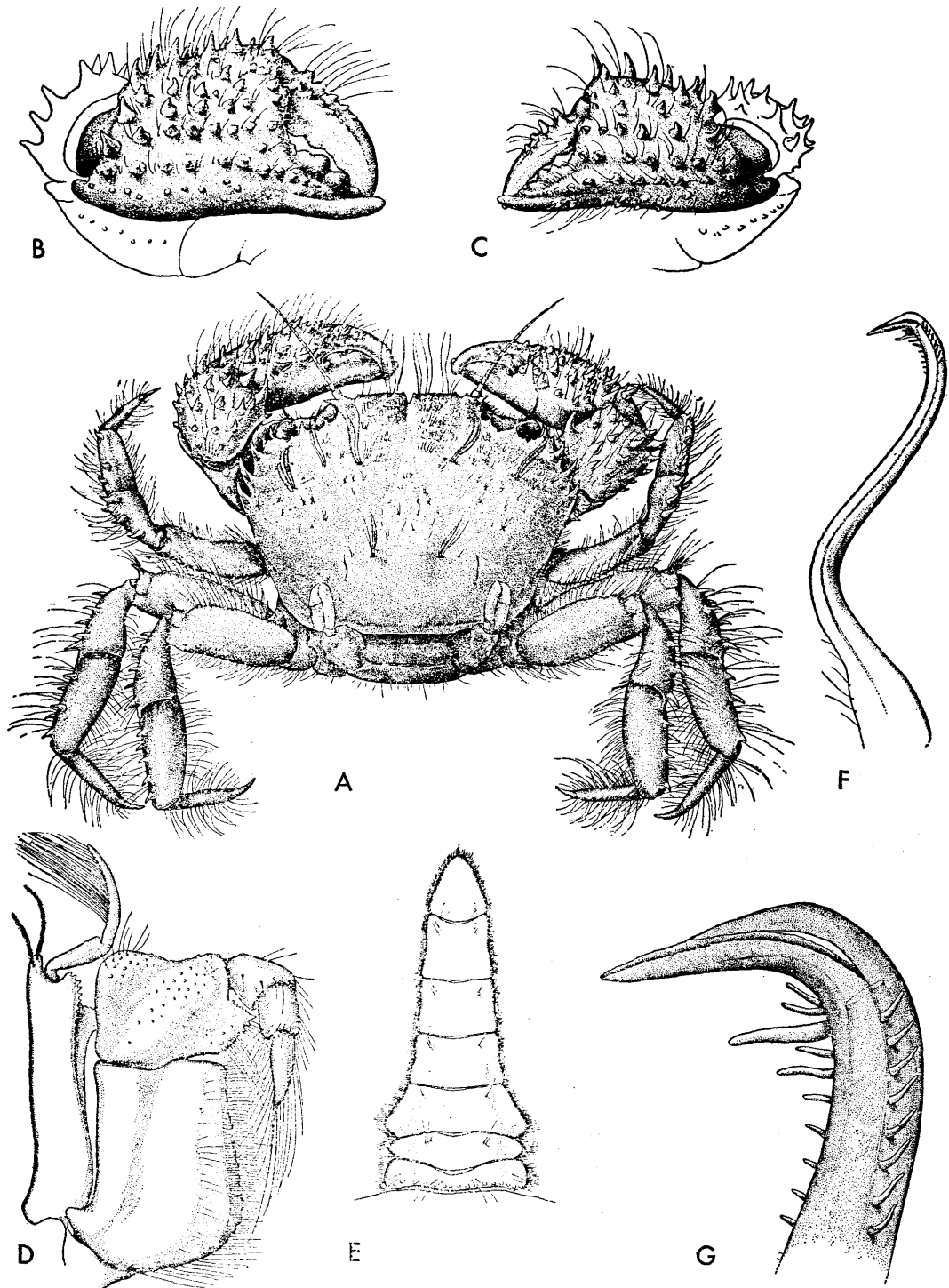


FIG. 4. *Pilumnus nobilii*, new species, male holotype. A. Dorsal view, $\times 7.4$, fourth ambulatory legs regenerating. B. Major chela, $\times 10.8$. C. Minor chela, $\times 10.8$. D. Right outer maxilliped, $\times 28.4$. E. Male abdomen, $\times 10.3$. F. Right first pleopod, $\times 23.3$. G. 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 spinulose. Subhepatic and pterygostomial regions spinulose; a spinulose 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 spinulose granule. Orbits strongly spinulose 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 spinulose 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, spinulose flange. Clusters of spinules also found at tip of exognath of third maxilliped and on lateral extensions of the endostomial ridges.

Ambulatory legs spinulose 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.

***Domecia hispida* Eydoux and Souleyet**

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

Domecia 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

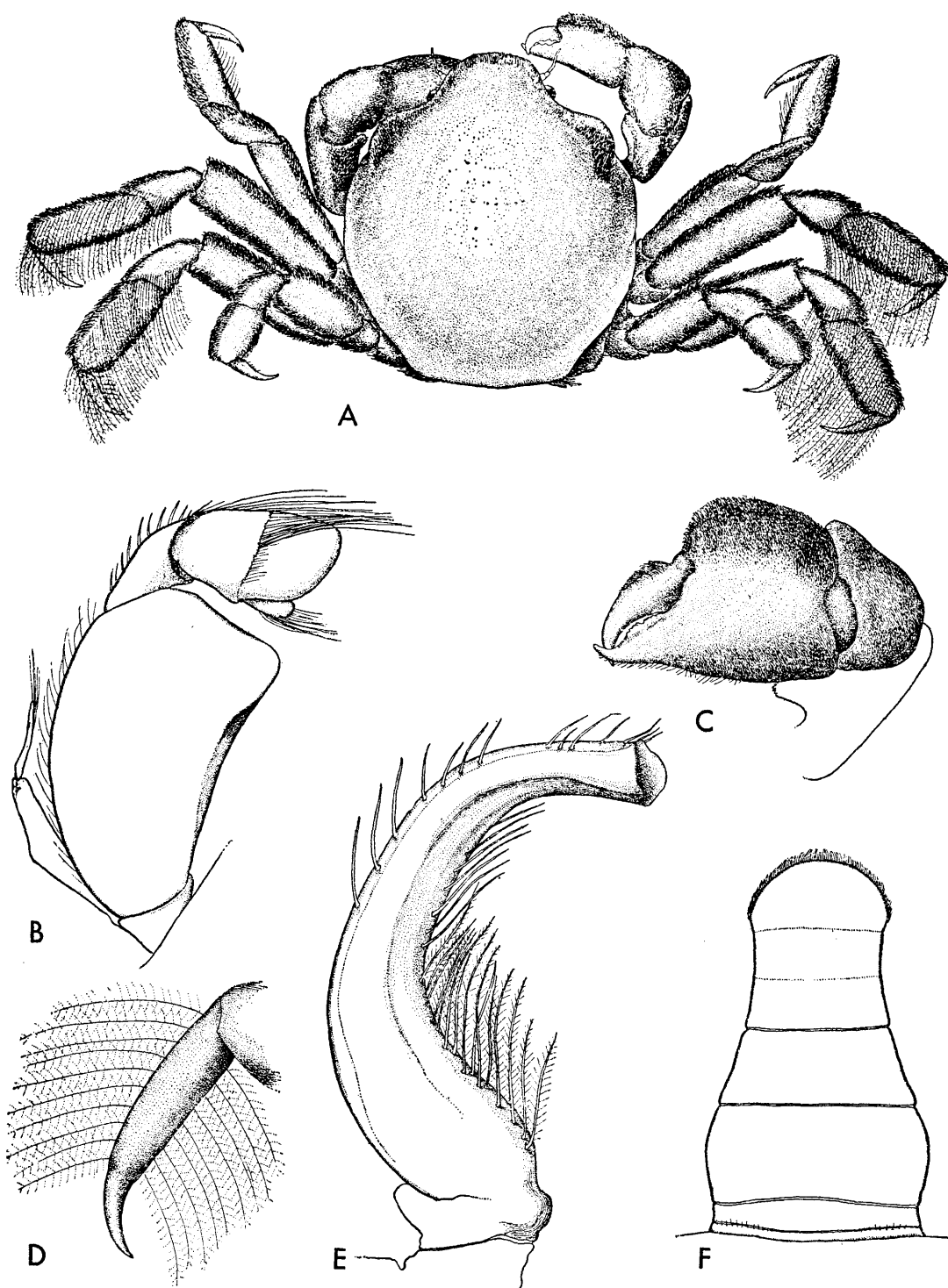


FIG. 5. *Pinnotheres malagueña*, new species, male holotype. A. Dorsal view, $\times 18.7$. B. Right outer maxilliped, $\times 116$. C. Left chela, $\times 29.2$. D. Dactyl of left second walking leg, $\times 70.2$. E. Left first pleopod, $\times 91.2$. F. Male abdomen, $\times 38.6$.

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 pulchra 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 GECARCINIDAE

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 Tuira, 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* (Fremenville), 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; Clipperton 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

Ocypode occidentalis Stimpson

Ocypode occidentalis STIMPSON, 1860, p. 229 (101).

Ocypode 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 *Ocypode* collected by the "Askoy" belonging to the following species.

Ocypode gaudichaudii Milne Edwards and Lucas

Plate 5, figure 1

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

Ocypode 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.

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