

FOSSIL CRABS FROM THE REPUBLIC OF HAITI.

By MARY J. RATHBUN,

Associate in Zoology, United States National Museum.

The fossil crustaceans in the collections made by the United States Geological Survey Expedition to the Republic of Haiti in 1921 are few and fragmentary. They consist exclusively of brachyuran crabs. To only one was it considered advisable to give a specific name. A Xanthid crab, either *Zanthopsis* or an allied genus, is represented by a hand and may eventually be linked up with a known species of which only a carapace has yet been found. Various fingers of *Panopeus* might belong to any one of three common West Indian species. Other fingers of the *Panopeus* shape differ in having an oblique ridge on the upper surface, a character not before noted. A single article which is thought to be the propodus (palm) of a Parthenopid is so different from the known types as to hint at a generic separation. A fragment out of the middle of a carapace of *Mithrax* is akin to *Mithrax spinosissimus*,¹ although not corresponding in detail. This genus has not before been found fossil, but its presence in the Pleistocene was to be expected, as the genus is very abundantly distributed at the present day throughout the West Indies.

LIST OF CRABS STRATIGRAPHICALLY ARRANGED.

Pleistocene series: About 3 km S. of Môle St.-Nicolas; 9844:

MITHRAX, species.

Lower Miocene series: Right bank of River Fond Bleu; station 14 of traverse; Maïssade tongue of Thomonde formation; 9717:

PORTUNUS (PORTUNUS) HAITENSIS.

Lower Miocene series: Long bluff on right bank of River Blanche below gorge; bed 47 of section (highest bed); Maïssade tongue of Thomonde formation; 9722:

PORTUNUS (PORTUNUS) HAITENSIS.

Lower Miocene series: Trail from Las Cahobas to Thomonde, about 1.5 km S. S. E. of Thomonde; top of Thomonde formation; 9778:

PORTUNUS (PORTUNUS) HAITENSIS.

¹ See Milne Edwards, Mag. de Zool., vol. 2, 1832, cl. 7, pls. 2 and 3.

Lower Miocene series: High bluff on left bank of River l'Ayaye about 1 km above trail crossing; Thomonde formation; 9907:

PANOPEUS, species indeterminable.

? **PANOPEUS**, species.

? **PARTHENOPE**, species.

Middle Eocene series: Road from St.-Michel to Ennery, W. slope about 1 km from divide; Plaisance limestone; 9792:

? **ZANTHOPSIS**, species.

DESCRIPTIONS OF SPECIES.

PORTUNUS (PORTUNUS) HAITENSIS, new species.

Plate 1, figs. 1-3; plate 2, figs. 1-3.

Type-locality.—Republic of Haiti: Long bluff on right bank of River Blanche below gorge; bed 47 of section (highest bed); Maïssade tongue of the Thomonde formation; lower Miocene series; February 5, 1921; W. P. Woodring (9722); 5 carapaces, incomplete, and palm of a right cheliped; Cat. No. 333430, U.S.N.M.

Measurements (approximate).—Largest carapace (pl. 1, fig. 2), length 26.2, width to base of lateral spine 36.4 mm.

Diagnosis.—A large lateral spine. Orbit very large and oblique. Front well advanced. Carapace very uneven especially in small specimens. Hand short and high.

Description.—Carapace very uneven. Deep grooves separate the branchial from the gastric and cardiac regions. A linear, median, gastric ridge, diminishing toward the front; a high, longitudinal, protogastric tubercle, distant from the median line; a deep, suboval depression on anterior half of cardiac region. A well-marked oval lobule is situated at the inner angle of the branchial region. Surface of posterolateral region extensively hollowed out.

Front well advanced, medially furrowed, interantennal margin four-lobed, lobes of median pair narrower and more advanced than those of the outer pair; median sinus V-shaped, lateral sinuses wider than any lobe, U-shaped. The tooth between the antenna and the orbit is visible in one specimen only; it appears much less advanced than the interantennal teeth, is broad, anteriorly rounded and somewhat falcate, concave on the orbital side.

The anterolateral margin is short, the orbit correspondingly wider than commonly, the number of anterolateral teeth is apparently eight in addition to the strong lateral spine.

The palm (pl. 2, fig. 1), which is supposed to belong to the same species, is short and high for a *Portunus*, being 13 mm. long through its middle and 10.5 mm. high at its highest point, a little behind the fingers. There is a wide, shallow, longitudinal furrow below the middle; upper margin convex; lower margin straight to near the finger, where it gradually ascends. The two fingers are of subequal width at their base; the dactylus has a large, purplish-

black, backward-pointing tooth at its base. At the distal end of the carpus, above the middle, a rounded lobe projects toward the palm.

One specimen (pl. 2, fig. 2) shows a ventral view of the sternum and abdomen of a male. The sternum has a nearly transverse ridge between the bases of the chelipeds. The abdomen is triangular from the fourth segment to the tip; terminal segment triangular, appearing a little broader than long, although the full length may not be shown; the real length of the sixth segment does not appear, as it has been encroached upon by the long, coalesced segment (third to fifth), which is moved anteriorly out of its place.

Additional lot of specimens.—Republic of Haiti; right bank of River Fond Bleu; station 14 of traverse; Maïssade tongue of the Thomonde formation; lower Miocene series; February 2, 1921; W. P. Woodring (9717); two carapaces, fragmentary; also parts of one male abdomen and sternum; Cat. No. 333429, U.S.N.M. These are considerably larger than the type lot, one specimen (*a*) measuring about 54 mm. wide to base of lateral spine, the other (*b*) much larger, over 82 mm. wide to base of spine. These are not so uneven as smaller carapaces; the same elevations and depressions are present, but are less striking. Similar growth changes occur in other Portunids. In the smaller specimen the size and general direction of the orbit are shown; its width to the outer base of the antennal tooth is 8 mm., while the width across the front (6 teeth) is 11 mm.; upper margin of orbit oblique (the outer orbital tooth being well behind the inner tooth) and little concave; no notches can be made out. A row of punctae subparallel to the anterolateral margin begins at the base of the preorbital tooth (pl. 1, fig. 1). In the larger specimen the fifth abdominal segment is separated from the sixth (pl. 2, fig. 3).

Doubtful specimen.—Republic of Haiti: Trail from Las Cahobas to Thomonde, about 1.5 km S. S. E. of Thomonde; top of Thomonde formation; lower Miocene series; January 15, 1921; W. P. Woodring (9778); one carapace with sternum and male abdomen, one fragment of cheliped and one of an ambulatory leg; Cat. No. 333431, U.S.N.M.

The surface of the carapace is obliterated and nearly all of the border; the outline of the orbit indicates the genus; the abdomen may perhaps be the same as male, No. 9717*b*; its outlines are much broken away, but it shows a suture between fifth and sixth segments.

? *ZANTHOPSIS*, species.

Plate 2, figs. 6 and 7.

Republic of Haiti: Road from St.-Michel to Ennery, W. slope about 1 km from divide; Plaisance limestone; Middle Eocene series; March 4, 1921; T. W. Vaughan and W. P. Woodring (9792); palm

of right cheliped, with bases of fingers attached; Cat. No. 333436, U.S.N.M.

Measurements.—Greatest length of palm (from between the fingers) 26, superior or shortest length 16, greatest height, at distal-end 19.6, greatest thickness 12 mm.

As shown by the measurements, this is a short, stout hand; the distal end is vertical, the proximal end very oblique; the outer surface is very convex in a vertical direction, slightly convex from end to end; the upper surface ends proximally in a thick lobe above the articulation of the wrist; there is a small hump also at the proximal end where the hand is longest. The surface is partly overlaid by a hard matrix, but the palm appears to be without ornamentation.

A cross section of the fingers near their bases (pl. 2, fig. 7) is broad-oval, a little higher than wide, the dactylus smaller than the propodal or fixed finger.

The only *Zanthopsis* known from the West Indies is *Z. bartholomaeensis*² from the Eocene of St. Bartholomew, which was described from the carapace only.

ANOPEUS, species indeterminable.

Republic of Haiti: High bluff on left bank of River l'Ayaye about 1 km above trail crossing; Thomonde formation; lower Miocene series; W. P. Woodring (1907); fragments of five fingers from the chelae of a *Anopeus*; Cat. No. 333434. They might be any of the three common Recent species in the West Indies. One specimen is the proximal end of a dactyl showing the large, dark brown, backward-pointing tooth of the major cheliped; two others are, respectively, a dactyl and a fixed finger of a major cheliped, from both of which the proximal portion is lacking; the remaining two are dactyls of a minor cheliped.

A similar specimen was found in the Dominican Republic in the Yaqui Valley at Cercado de Mao.³

? ANOPEUS, species.

Plate 1, figs. 4-6.

Republic of Haiti: High bluff on left bank of River l'Ayaye, about 1 km above trail crossing; Thomonde formation; lower Miocene series; W. P. Woodring (1907); three dactyli from minor chelipeds of a different species from the preceding, and not referable to any of the West Indian species now existing; Cat. No. 333433, U.S.N.M.

Characterized by the superior ridge, the proximal end of which begins inside the middle of the upper surface; it gradually slants

² Publ. No. 291, Carnegie Inst. Washington, 1919, p. 176.

³ Idem., p. 179.

over to the middle line which it reaches when about half the length of the finger; it then widens and flattens into the general surface of the finger. Outside the proximal half of the ridge there is a deep groove, broad at first but narrowing into a linear furrow. Proximal half of upper surface finely granulate; outer and inner surfaces each with three lines of elongate punctae. Largest finger 6 mm long, tip missing.

The only recent species approaching this is *Rhithropanopeus harrisi* (Gould),⁴ which occurs locally on the east coast of the United States in brackish water or in estuaries. In *harrisi* the superior ridge of the dactylus of the minor chela is less askew, the neighboring groove is shorter and the granulation is very coarse.

? PARTHENOPE, species.

Plate 2, figs. 4 and 5.

Republic of Haiti: High bluff on left bank of River l'Ayaye about 1 km above trail crossing; Thomonde formation; lower Miocene series; W. P. Woodring (9907); a right palm, showing part of upper and outer (or lower) surfaces; Cat. No. 333432, U.S.N.M.

Measurements.—Length of palm, along upper-outer margin, 11 mm, greatest width of upper surface (tip of spine broken off), 4.4 mm.

The two surfaces visible are nearly at a right angle to each other, instead of an acute angle, as usual in Parthenopids; at their union there is a narrow raised rim on the upper surface; this rim is a little convex and without spines or tubercles. The inner (or upper) edge of this surface is provided with a few spines, how many is not known, but three spines occupy the distal half of the margin; they are broad at base, rather flat, smooth, and rise very gradually and slightly above the general surface; the space between the first (or distal) and second spines is twice as great as the space between the second and third. The tips of all the spines are missing. At the distal end of the same surface, and a little above or within the outer margin there is a conical spine normal to the surface; a little higher there is indication of another spine, broken off at base. Near the margins and on the lower or outer proximal quarter, the surface is smooth; elsewhere it is granulate, granules very unequal and irregularly disposed, those on the distal half very coarse, those on the proximal half very fine. Proximal margin of surface broadly rounded. The outer surface, or lower-outer surface, according as the chela is oriented, is smooth; while its upper part is at right angles to the surface above described, its lower part curves inward. As the shell is very fragile and is embedded in a matrix, it is impossible to discover further characters.

⁴ *Pilumnus harrisi* Gould, Invert. Massachusetts, 1841, p. 326.

MITHRAX, species.

Plate 2, fig. 8.

Republic of Haiti: About 3 km south of Môle St.-Nicolas; Pleistocene series; January 31, 1921; J. S. Brown (9844); part of the center of carapace; Cat. No. 333435, U.S.N.M.

Surface curved irregularly with acute or subacute tubercles of unequal size, the larger ones being toward the lateral margin. Cervical suture well marked. A shallow groove defines the areole at the inner angle of the branchial region.

The features of the left side of the carapace have been obliterated by encrustations.

EXPLANATION OF PLATES.

PLATE 1.

FIGS. 1-3. *Portunus (Portunus) haitensis*.

- FIG. 1. Dorsal view of carapace of paratype (9717a), natural size.
2. Dorsal view of carapace of holotype (9722a), natural size.
3. Restoration of carapace, based on figures 1 and 2. $\times 2$.

FIGS. 4-6. *?Panopeus*, species, three movable fingers (9907). $\times 3$.

- FIG. 4. Right dactylus, upper-outer view.
5. Left dactylus, upper view.
6. Right dactylus, outer view.

PLATE 2.

FIGS. 1-3. *Portunus (Portunus) haitensis*, natural size.

- FIG. 1. Outer surface of right manus, paratype (9722c).
2. Ventral surface of paratype (9722d).
3. Ventral surface of paratype (9717b).

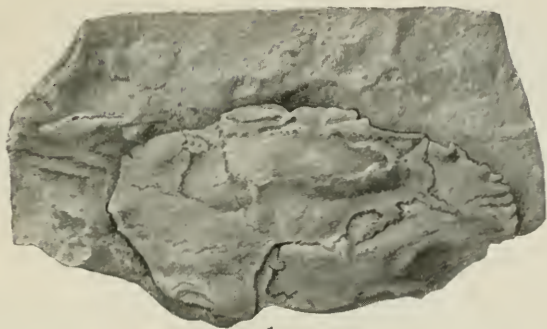
FIGS. 4 and 5. *Parthenope*, species, right palm (9907). $\times 3$.

- FIG. 4. Upper and outer surfaces, viewed obliquely.
5. Upper surface.

FIGS. 6 and 7. *Zanthopsis*, species (9792), natural size.

- FIG. 6. Outer view of right palm.
7. Cross section at base of fingers.

FIG. 8. *Mithrax*, species, portion of center of carapace (9844), natural size.



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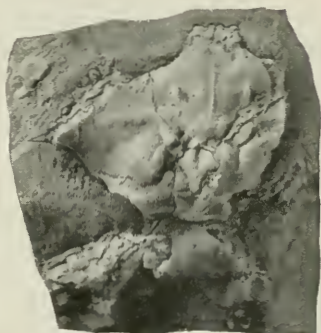
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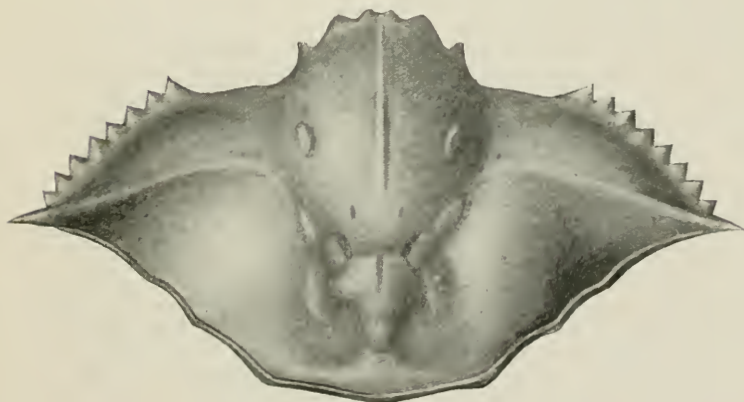
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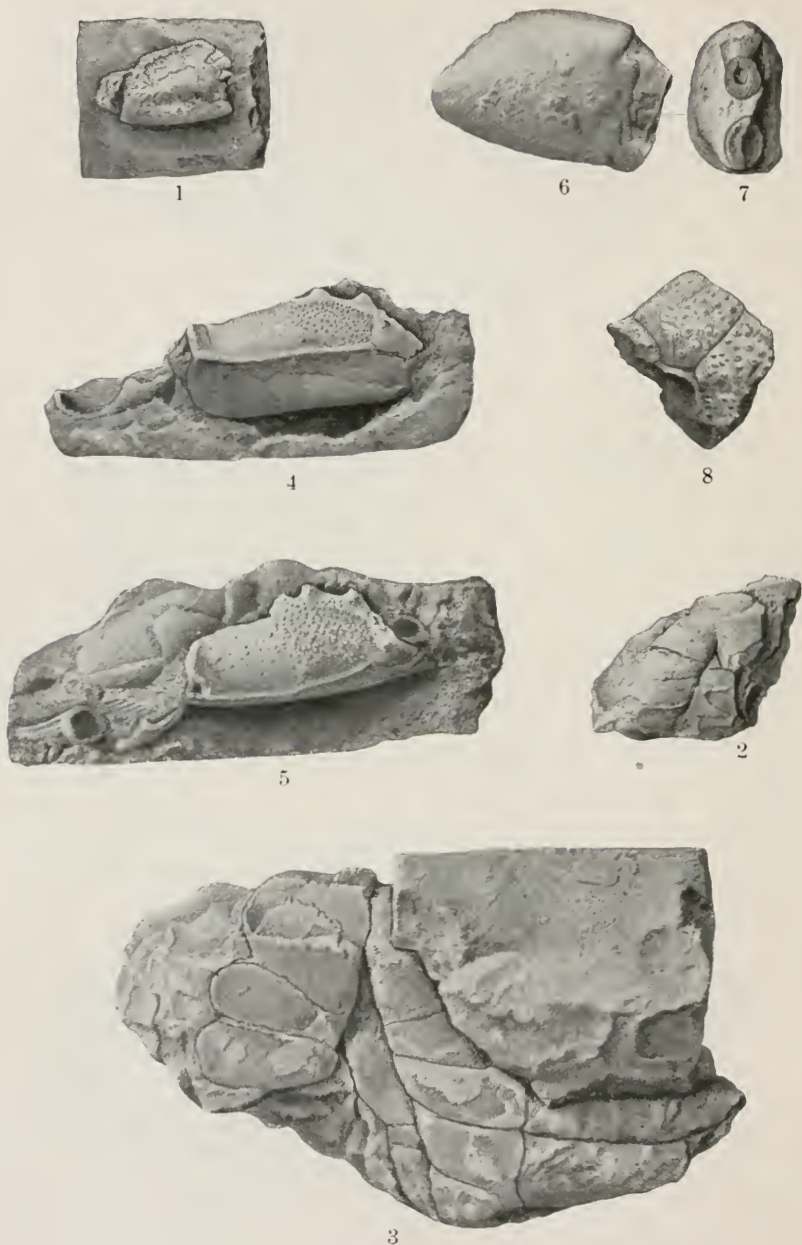
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PORTUNUS HAITENSIS AND PANOPEUS, SPECIES.

FOR EXPLANATION OF PLATE SEE PAGE 6.



PORTUNUS HAITENSIS, PARTHENOPE, ZANTHOPSIS, AND MITHRAX, SPECIES.

FOR EXPLANATION OF PLATE SEE PAGE 6.