

## SYNOPSIS OF NORTH-AMERICAN INVERTEBRATES.

### XI. THE CATOMETOPOUS OR GRAPSOID CRABS OF NORTH AMERICA.

MARY J. RATHBUN.

ONE of the most familiar forms of the Catometopa is the common ocy-pode, or sand crab, which lives on the beaches in abundance south of New England. It digs holes in the sand, occasionally retreating to the water when frightened. It is protected by its color, resembling that of the sand, and by the swiftness of its movements.

The fiddlers, which may be recognized by the extraordinary development of one of the claws of the male, are represented by many species which burrow in sand beaches or in muddy banks of streams and ditches in the salt marshes, while at least one species, *Uca minax*, extends up rivers quite to fresh water.

Of the Grapsidæ, the *Sesarma reticulatum* also burrows in muddy banks. Its congener, *S. cinereum*, is sometimes known as the "wood crab," from its occurrence under logs and drift and about wharves, wood piles, etc. On the Pacific coast, the species of Hemigrapsus are abundant under stones and on mud flats in salt or brackish water.

The common land crab of tropical America and the West Indies, *Cardisoma guanhumi*, occasionally makes its appearance in Texas. It is the only member of the Gecarcinidæ which comes within the limit of this paper.

The Pinnotheridæ are readily known by their small size, small eyes, often soft or membranaceous integument, and commensal habit, dwelling often in the shells of bivalve mollusks, in the tubes of annelids, or on sea-urchins. The best known species is the common oyster crab, *Pinnotheres ostreum*, which is often cooked and eaten with oysters.

The Palicidæ, some of which appear in our list, are small anomalous forms, inhabitants, chiefly, of warm waters or of considerable depths. Four species are known to occur either in the Gulf or in the Cape Hatteras region in less than one hundred fathoms.

TRIBE CATOMETOPA OR GRAPSOIDEA.

Carapace broad anteriorly, often subquadrate, sometimes subglobose, truncate or arcuate anteriorly, but not rostrate. Front bent downward. Epistome short, often almost linear. The pairs of branchiæ are usually fewer than nine in number; the efferent channels open at the sides of the endostome. The male verges are inserted either in the sternal plastron, or in the basal joints of the last pair of legs, thence passing through channels in the sternum beneath the pleon.

KEY TO THE FAMILIES OF THE TRIBE CATOMETOPA.

- A. Carapace hard and firm. Front, orbits and eyestalks not very small. Buccal frame quadrate anteriorly.
- B. Last pair of feet not remarkably reduced.
  - C. Carapace moderately convex or depressed; branchial regions not greatly dilated.
  - D. Third maxillipeds with the fifth joint articulated at the front inner angle usually. Front of moderate width or very narrow. Eyestalks often greatly elongate
    - OCYPODIDÆ Leach
  - D'. Third maxillipeds with fifth joint articulated at apex or front outer angle of fourth. Front usually broad. Eyestalks of moderate size
    - GRAPSIDÆ Milne Edwards
- C'. Carapace very convex, especially dilated over and in front of the branchial regions; antero-lateral margins entire or sub-entire, and strongly arcuate. Terminal joint of walking legs often armed with longitudinal rows of spines
  - GECARCINIDÆ Milne Edwards
- B'. Last pair of feet remarkably reduced. . . . PALICIDÆ Rathbun
- A'. Carapace often more or less membranaceous. Front, orbits and eyestalks usually very small. Buccal frame arcuate anteriorly. Of small size . . . . . PINNOTHERIDÆ Milne Edwards

KEY TO THE GENERA OF THE FAMILY OCYPODIDÆ.

- A. Carapace trapezoidal or quadrate. Eyestalks often elongate.
- B. Lateral margins entire.

- C. Eyestalks stout. Chelæ in male somewhat unequal. Ocypode
- C. Eyestalks slender. Chelæ in male extremely unequal. Uca
- B'. Lateral margins toothed.
  - C. Lateral margins parallel or nearly so. . . . . Euchirograpsus
  - C. Postero-lateral margins posteriorly converging . . . . . Euryplax
- A'. Carapace with antero-lateral margins arcuate. Eyestalks of moderate length.
  - B. Carapace with margins spinous . . . . . Geryon
  - B'. Carapace with margins feebly dentate . . . . . Speocarcinus

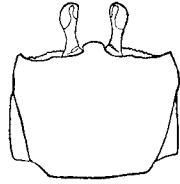


FIG. 1.—Ocypode albicans, carapace.



FIG. 2.—Ocypode albicans, chela.

THE SPECIES OF OCYPODIDÆ.

Genus Ocypode Fabricius . . . . . *O. albicans* Bosc, *MSG*  
 = *O. arenaria* Say

Genus Uca Leach.

*Key to Species.*

- A. Inner surface of palm of large cheliped without an oblique ridge.
  - B. Carapace very short, broad, and convex. Abdomen of male wide, increasing noticeably in width towards proximal end  
*U. subcylindrica* (Stimpson), *G*<sup>1</sup>
  - B'. Carapace of moderate width and convexity. Abdomen of male of moderate width, its sides subparallel  
*U. pugilator* (Bosc), *MSG*
- A'. Inner surface of palm with an oblique ridge.
  - B. Oblique ridge terminating at carpal cavity.
    - C. Front (between the eyes), very shallow and broad. Claws with red spots at the articulations  
*U. minax* (Le Conte), *MSG*
    - C'. Front narrow, its sides oblique.
      - D. Eyebrow (or surface between the orbit and the dorsum) nearly vertical, scarcely visible in a dorsal view. Space on inner surface of palm, between carpal cavity and dactylus, coarsely granulate  
*U. pugnax* (Smith), *MSG*
      - D'. Eyebrow inclined, visible in a dorsal view. Space between carpal cavity and dactylus finely granulate  
*U. pugnax rapax* (Smith), *G*

<sup>1</sup> Texas.

- B'. Oblique ridge not terminating at carpal cavity, but continued by an angular turn to near the superior margin.
- C. A tooth or spine on the inner surface of the carpus of the large cheliped. Ridge on inner surface of palm strongly produced . . . . *U. spinicarpa* Rathbun, sp. nov.,<sup>1</sup> G
- C'. No tooth nor spine on inner surface of carpus.
  - D. Superior surface of palm turned abruptly at right angles with outer surface, and forming a flat or concave surface  
*U. coloradensis* Rathbun, mouth of Colorado River
  - D'. Superior surface of palm rounding gradually into outer surface . . . . . *U. gracilis* Rathbun, D

Genus *Euchirograpsus* Milne Edwards *E. americanus* A. Milne Edwards, S

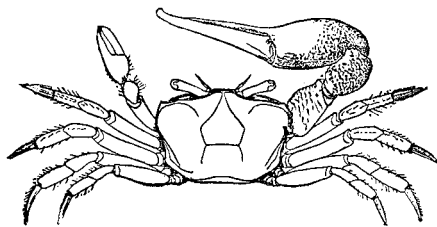


FIG. 3.



FIG. 4.

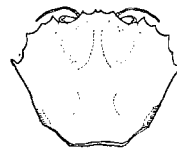


FIG. 5.

FIG. 3.—*Uca pugilator*.

FIG. 4.—*Uca pugilator*, inner side of large chela.

FIG. 5.—*Geryon quinquedens*, carapace.

- Genus *Euryplax* Stimpson . . . . . *E. nitida* Stimpson, G
- Genus *Geryon* Krøyer . . . . . *G. quinquedens* Smith, A.M
- Genus *Speocarcinus* Stimpson.

*Key to Species.*

- A. Lateral margin of carapace with three notches  
*S. carolinensis* Stimpson, S
- A'. Lateral margin of carapace with two notches  
*S. californiensis* (Lockington), D

THE SPECIES OF GECARCINIDÆ.

- Genus *Cardisoma* Latreille . . . . . *C. guanhumii* Latreille, G

KEY TO THE GENERA OF THE FAMILY GRAPSIDÆ.

- A. Antennæ covered by the front.
- B. External maxillipeds without a piliferous ridge.
  - C. Carapace as long as or longer than broad . . . . Planes
  - C'. Carapace considerably broader than long.

<sup>1</sup> Type, U. S. Nat. Mus., No. 22,183, Galveston, Texas; Boll, collector.

- D. External maxillipeds with a wide rhomboidal gape . . . . . Pachygrapsus
- D'. External maxillipeds with a narrow gape . . . . . Hemigrapsus
- B'. External maxillipeds with a piliferous ridge . . . . . Sesarma
- A'. Antennæ visible from above . . . . . Plagusia

THE SPECIES OF GRAPSIDÆ.<sup>1</sup>

Genus *Planes* Leach

*P. minutus* (Linnæus), *MSAPD*, at surface, on floating weed

Genus *Pachygrapsus* Randall.

*Key to Species.*

- A. Lateral margins strongly arcuate . . . . . *P. crassipes* Randall, *PD*
- A'. Lateral margins converging posteriorly from the lateral tooth . . . . . *P. transversus* Gibbes, *M<sup>2</sup>GD<sup>3</sup>*

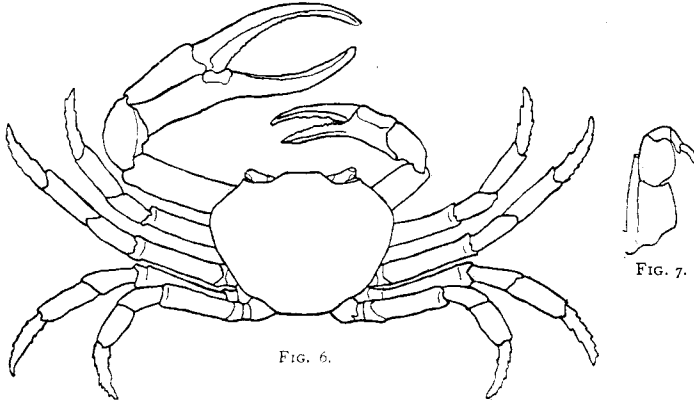


FIG. 6.—*Cardisoma guanhumi*.

FIG. 7.—*Cardisoma guanhumi*, outer maxilliped.

Genus *Hemigrapsus* Dana.

*Key to Species.*

- A. Front with a deep sinus at the middle . . . . . *H. oregonensis* (Dana), *APD*
- A'. Front arcuate, very slightly sinuous . . . . . *H. nudus* (Dana), *APD*

Genus *Sesarma* Say.

*Key to Species.*

- A. Lateral margin toothed behind the orbital angle . . . . . *S. (Sesarma) reticulatum* Say, *MSG*
  - A'. Lateral margin entire . . . . . *S. (Holometopus) cinereum* (Bosc), *MSG*
- Genus *Plagusia* Latreille . . . . . *P. depressa* (Fabricius), *S*

<sup>1</sup> *Grapsus grapsus* (Linnæus), a tropical species, has been taken at Cape Cod from the bottom of a whaler just returned from a voyage.

<sup>2</sup> Occasional.

<sup>3</sup> California (Kingsley).

KEY TO THE GENERA OF THE FAMILY PINNOTHERIDÆ.

- A. Carapace convex. Eyes small.
  - B. Ischium of outer maxillipeds rudimentary.
    - C. Palpus of outer maxillipeds with three joints.
      - D. Last joint of palpus articulated on inner margin of preceding joint.
        - E. Third ambulatory leg longer and stronger than the others, usually considerably so . . . Pinnixa
        - E'. Third ambulatory leg very little, if any, longer than the others.
          - F. Carapace without a longitudinal suture behind the orbits . . . Pinnotheres

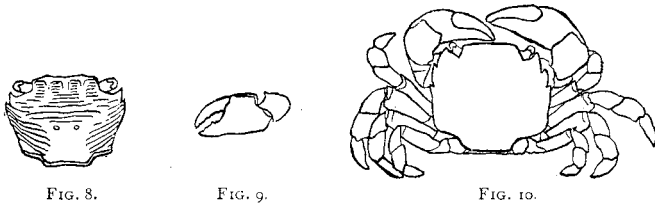


FIG. 8. — *Pachygrapsus transversus*, carapace.  
 FIG. 9. — *Pachygrapsus transversus*, chela.  
 FIG. 10. — *Hemigrapsus nudus*.

- F. Carapace with a longitudinal suture behind the orbits enclosing between them the median area . . . Raphonotus
- D'. Last joint of palpus articulated at end of preceding joint
  - Echinophilus
- C'. Palpus of outer maxillipeds with two joints . . . Cryptophrys
- B'. Ischium of outer maxillipeds distinctly developed . . . Opisthopus
- A'. Carapace flat, suborbicular, truncate behind. Eyes large (for the family), each eyestalk as long as half the width of the front . . . Zaops

THE SPECIES OF PINNOTHERIDÆ.

Genus *Pinnixa* White.

*Key to Species.*

- A. Carapace firm.
  - B. Pollex of cheliped distinctly developed.
    - C. Pollex much shorter than the dactylus, and usually bent downwards toward the extremity.
      - D. Transverse crest on the cardiac region short, not extending across the entire carapace.

E. Propodus of third ambulatory leg as broad as long, or nearly so . . . *P. chatopterana* Stimpson, *M*

E'. Propodus of third ambulatory leg distinctly longer than broad.

F. Dactylus of third ambulatory leg more than half the length of the propodus, measured on the posterior margin.

G. Second pair of ambulatory legs slender, filiform, subcylindrical

*P. sayana* Stimpson, *M*

G'. Second pair of ambulatory legs compressed, not extremely slender nor filiform.

H. Cardiac ridge sinuous, in dorsal view

*P. occidentalis* Rathbun, *AP*

H'. Cardiac ridge straight, or nearly so, in dorsal view

*P. californiensis* Rathbun, *D*

F'. Dactylus of third ambulatory leg less than half the length of the propodus, measured on the posterior margin . . . *P. littoralis* Holmes, *P*

D'. Transverse crest on the cardiac region extending across the entire carapace *P. cristata* Rathbun, sp. nov.,<sup>1</sup> *M*

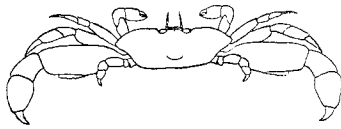


FIG. 11.



FIG. 12.



FIG. 13.

FIG. 11. — *Pinnixa longipes*.

FIG. 12. — *Pinnixa longipes*, outer maxilliped.

FIG. 13. — *Pinnotheres ostreum*, ♀.

C'. Pollex as long, or nearly as long, as the dactylus, and not bent downward.

D. Merus of third ambulatory leg longer than half the width of the carapace . . . *P. longipes* (Lockington), *P*

D'. Merus of third ambulatory leg shorter than half the width of the carapace.

E. Length of carapace half its width

*P. cylindrica* (Say), *SG*

E'. Length of carapace much less than half its width

*P. tubicola* Holmes, *D*

B'. Pollex wanting, represented only by the spiniform angle of the palm . . . . . *P. monodactyla* (Say), American?

<sup>1</sup> Type, one female, Beaufort, N. C. (Union College collection).

A'. Carapace thin, membranaceous, yielding to slight pressure

*P. faba* (Dana), *AP*

Genus *Pinnotheres* Latreille.

*Key to Species.*

A. Palm widening towards the distal end.

B. Last joint of palpus of outer maxilliped very slender and much smaller than the preceding joint.

C. Carapace of female very thin and membranaceous. Surface smooth and shining . . . . . *P. ostreum* Say, *MS*

C'. Carapace thicker and firmer. Surface covered with a dense pubescence . . . . . *P. maculatus* Say, *MSG*



FIG. 14. — *Pinnotheres maculatus*, ♂.

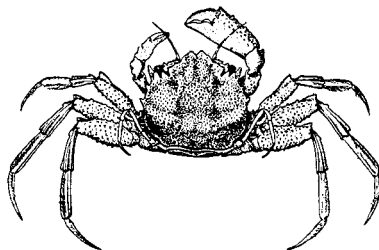


FIG. 15. — *Palicus bahamensis*.

B'. Last joint of palpus of outer maxilliped large, more than half the width of the preceding joint . . . . . *P. nudus* Holmes, *D*

A'. Palm linear . . . . . *P. byssomiæ* Say, "Our southern coast."

Genus *Raphonotus* Rathbun.

*Key to Species.*

A. Palm of cheliped widening from the proximal to the distal end

*R. subquadratus* (Dana), *AP*

A'. Palm of cheliped not widening from the proximal to the distal end; slightly swollen at the middle . . . . . *R. lowei* Rathbun, sp. nov.,<sup>1</sup> *D*

Genus *Echinophilus* Rathbun, nov. *E. mellitæ* Rathbun, sp. nov.,<sup>2</sup> *MSG*

Genus *Cryptophrys* Rathbun . . . . . *C. concharum* Rathbun, *PD*

Genus *Opisthopus* Rathbun . . . . . *O. transversus* Rathbun, *D*

Genus *Zaops* Rathbun, nov. . . . . Type, *Z. depressa* (Say), *M*

<sup>1</sup> Types, U. S. Nat. Mus., No. 23,437, San Pedro Bay, Cal., in siphon of *Pholas pacifica*; H. N. Lowe, collector; 2 ♀.

<sup>2</sup> Types, U. S. Nat. Mus., No. 23,434, Pensacola, Florida, on *Mellita testudinata*; J. E. Benedict, collector.



## THE SPECIES OF PALICIDÆ.

Genus *Palicus* Philippi.<sup>1</sup>*Key to Species.*

- A.* Crests on the second and third abdominal segments, and on the fifth sternal segment, not forming conspicuous laminiform expansions visible in a dorsal view.
- B.* Anterior margin of meri of second and third ambulatory legs terminating in a nearly rectangular non-projecting tooth  
*P. alternatus* Rathbun, *M(CH)G*
- B'*. Anterior margin of meri of second and third ambulatory legs terminating in a spiniform, projecting tooth.
- C.* Branchial regions much swollen  
*P. obesus* (A. Milne Edwards), *G*
- C'*. Branchial regions not swollen *P. faxoni* Rathbun, *M(CH)*
- A'*. Crests on the second and third abdominal segments, and on the fifth sternal segment forming conspicuous laminiform expansions visible in a dorsal view . . . . . *P. sica* (A. Milne Edwards), *G*

## BIBLIOGRAPHY.

The following citations are additional to those given in Synopses Nos. VII and X.

- '37 MILNE EDWARDS, H. Histoire naturelle des crustacés. Vol. ii, pp. 1-95, and atlas.
- '52 DANA, JAMES D. Crustacea of the United States Exploring Expedition. Vol. i, pp. 306-389, and atlas.
- '70 SMITH, SIDNEY I. Notes on American Crustacea. No. I. Ocyptoidea. *Trans. Conn. Acad. Sci.* Vol. ii, pp. 113-176, Pls. II-V.
- '77 LOCKINGTON, W. N. Description of a New Genus and Species of Decapod Crustacean. *Proc. Cal. Acad. Sci.* Vol. vii, pp. 55-57. May 1, 1876.
- '77 LOCKINGTON, W. N. Remarks on the Crustacea of the West Coast of North America, with a Catalogue of the Species in the Museum of the California Academy of Sciences. *Proc. Cal. Acad. Sci.* Vol. vii, pp. 145-156. Dec. 1, 1876.
- '80 SMITH, S. I. On the species of *Pinnixa* inhabiting the New England Coast, with remarks on their early stages. *Trans. Conn. Acad. Sci.* Vol. iv, pp. 248-253.

<sup>1</sup> The species figured, though not entered in the list, is inserted to illustrate the genus.

- '80 SMITH, S. I. Occasional occurrence of tropical and subtropical species of Decapod Crustacea on the Coast of New England. *Trans. Conn. Acad. Sci.* Vol. iv, pp. 254-267.
- '80 KINGSLEY, J. S. Carcinological Notes. No. II, Revision of the Gelasimi. *Proc. Acad. Nat. Sci. Philadelphia for 1880.* Pp. 135-155, Pls. IX, X.
- '80 KINGSLEY, J. S. Carcinological Notes. No. III, Revision of the Genus Ocyroda. *Proc. Acad. Nat. Sci. Philadelphia for 1880.* Pp. 179-186.
- '80 KINGSLEY, J. S. Carcinological Notes. No. IV, Synopsis of the Grapsidæ. *Proc. Acad. Nat. Sci. Philadelphia for 1880.* Pp. 187-224.
- '94 HOLMES, SAMUEL J. Notes on West American Crustacea. *Proc. Cal. Acad. Sci.* Series 2, vol. iv, pp. 563-588, Pls. XX, XXI.
- '97 RATHBUN, MARY J. Synopsis of the American Sesarmæ, with description of a new species. *Proc. Biol. Soc. Washington.* Vol. xi, pp. 89-92.
- '97 RATHBUN, MARY J. Synopsis of the American Species of *Palicus Philippi* (= *Cymopolia* Roux), with descriptions of six new species. *Proc. Biol. Soc. Washington.* Vol. xi, pp. 93-99.