THE CRABS (CRUSTACEA: DECAPODA: BRACHYURA) OF THE PACIFIC COAST OF COLOMBIA*

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ABSTRACT

An annotated checklist of the 213 species of brachyuran crabs known up to now from Pacific coast of Colombia, is presented. This list is the first attempt to compile all information about the biachyuran crabs reported from this coast. Brief comments on the zoogeographic affinities of the Pacific Colombian crab fauna, are included.

RESUMEN

Se presenta una lista anotada de las 213 especies de cangrejos braquiuros conocidos hasta ahora de la Costa Pacífica de Colombia. Esta lista es el primer intento para recopilar toda la información de los cangrejos de esta costa. Se incluye un breve análisis sobre las afinidades zoogeográficas de la fauna de cangrejos braquiuros del Pacífico de Colombia.

INTRODUCCION

The Pacific coast of Colombia presents a wide variety of habitats for brachyuran crabs, such as mangrove swamps and estuaries that are strongly affected by freshwater outflows, and having surface water temperatures ranging from 27^0 to 30^0C and salinities from 0 to 28 ppt. The brachyurans found in

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these habitats are mostly estuarine species adapted to turbid waters and muddy substrates. However, the coastline also has rocky and sandy shores, mud flats, and coral reefs.The corals reefs are poorly developed and restricted to Gorgona and Malpelo Islands, as well as some areas between Cabo Corrientes and Punta Arditas, such as the Sound of Utria. The reefs are dominated by branching corals of the genus *Pocillopora*, particularly *P. damicornis*, a species that harbors numerous obligatory and facultative commensals decapod crustaceans.

Apparently the first known collection of crabs for the Pacific coast of Colombia was made by the "U.S.Fish Commission Steamer *Albatross*", which visited Malpelo Island in March 1891; a single male specimen of the common land crab was described by Faxon (1893) as *Gecarcinus malpilensis*. Faxon (1895) gave new crab records from this area. A collection of shallow water and semiterrestrial crabs was made by Dr Enrico Festa during 1895-1898 in Tumaco, Nobili (1901) described the collected material. In 1924 - 1925 the "St. George" stopped at Gorgona Island, and the crabs collected were described by Finnegan (1931). Subsequently, the "Velero III" traversed the area in 1934 and 1935, but only the Oxystomata were reported (Rathbun, 1937). In 1938 the "Zaca" visited Gorgona Island, and the Brachygnathous crabs were reported by Crane (1940, 1941, 1947) and Garth (1961), although the Goneplacidae and Pinnotheridae were not included. In 1941 the "Askoy" expedition sampled several localities along the coast of Colombia, including stations at Gorgona Islands, Málaga, Cuevita, Utría, Solano, Humboldt Bay, and the Gulf of Cupica. The material thus obtained was reported by Garth (1946, 1948, 1958). Finally, the expedition of the University of Lund to Chile visited Buenaventura, Colombia for a few days, and the small crab collection obtained was published by Garth and Haig (1956).

Since that time, a considerable number of species have been added, primarily as result of the collecctions by Prahl et al. (1978), Prahl and Guhl (1979), Prahl (1981a, 1981b) and Prahl (1982a, 1982b). Prahl and Guhl (1982) described a new spider crab, *Tyche sulae*, and Prahl (1983a) described a new fresh-water crab, *Hypolobocera gorgonensis*, collected from Gorgona Island. Prahl (1983b) gave the first report of *Gecarcinus planatus* and Prahl (1983c) reported new crabs of the genus *Uca* for the Pacific coast of Colombia. Prahl and Manjarres (1984) published a paper on the crabs of the family Gecarcinidae known from Colombia. Prahl and Toro (1985) described a new fiddler crab, *Uca (Uca) intermedia*, and Prahl and Froidefond (1985) reported 37 Xanthid crabs for the Pacific coast of Colombia. Also, two reviews have been published, that of the family Grapsidae (Prahl and Sánchez, 1985) and another of the Calappidae (Prahl and Sanchez,1986) Finally, a new *Potamocarcinus* was described from the Serranía del Baudó, Chocó.(Prahl and Ramos,1987), and 4 news *Hipolobocera* from the Pacific Colombian drainage (Prahl, 1988).

Taking into consideration all available information about the brachyuran crabs from the Pacific coast of Colombia, a list of them is presented. This effort is the first attemp to compile a list, which will contribute to knowledge of crab fauna of relatively unknown part of the Panama Bight as well as that of the Pacific drainage of western Colombia.

MATERIALS AND METHODS

During a 10-year period (1979-1988) we collected brachyuran crabs from intertidal and shallow waters (no more than 20m. depth), from the mouth of the Rio Mira in the south to Punta Arditas in the north. Most of the crab collection obtained has been deposited in the Colección de Referencia de la Sección de Biología Marina de la Universidad del Valle (CRBMUV), in Cali. The present list is mainly based on material from the reference collection, and includes material of terrestrial and fresh-water crabs of the Pacific drainage collected by us during the same period.

The nomenclature adopted here is that used by Bowman and Abele (1982); for the family Xanthidae we also considered the nomenclature introduced by Guinot (1968, 1969, 1971).

In the list, the symbol "*" indicates those species reported by other authors from the Pacific coast of Colombia, but not examined by us. Species marked with a "+" have been included based in verbal communication by the senior author to the junior authors and have not been located at the CRBMUV (the senior author died before this manuscript was completed).

SYSTEMATIC LIST

Order DECAPODA Latreille, 1803
Suborder PLEOCYEMATA Burkenroad, 1963
Infraorder BRACHYURA Latreille, 1803
Section DROMIACEA De Haan, 1833
Superfamily DROMIOIDEA De Haan, 1833

Family DROMIIDAE De Haan, 1833
*** Dromidia larraburel,** Rathbun, 1910
Hypoconcha panamensis Smith, 1869

Family DYNOMEDIDAE Ortmann, 1892
Dynomene ursula Stimpson, 1860

Section ARCHAEOBRACHYURA Guinot, 1977
Superfamily RANINOIDEA De Hann, 1839

Family RANINIDAE De Haan, 1839
***Ranilia fornicata** (Faxon, 1893)
***Raninoides Loevis** (Latreille, 1825)

Section OXYSTOMATA H. Milne Edwards, 1834
Superfamily DORIPPOIDEA MacLeay, 1838

Family DORIPPIDAE MacLeay, 1838
Ethusa ciliatifrons Faxon,1893
Ethusa lata Rathbun, 1893
Ethusa mascarone panamensis Finnegan, 1931

***Ethusina gracilipes** (Miers, 1886)
***Ethusina smithiana** Faxon, 1893

Superfamily LEUCOSIOIDEA Samouelle, 1819

Family CALAPPIDAE De Haan, 1833
Acanthocarpus delsolari Garth, 1973
Calappa convexa Saussure, 1853
Calappa saussurei Rathbun, 1898
Cycloes bairdii Stimpson, 1860
Hepatus kossmanni Neumann, 1878

Family LEUCOSIIDAE Samouelle, 1819
Iliacantha hancocki Rathbun, 1935
***Iliacantha schmitti** Rathbun, 1935
Iliacantha sp.
Leucosilia jurinei (Saussure,1853)
***Lithadia cumingii** Bell, 1855
Persephona townsendi (Rathbun, 1893)
***Randallia agaricias** Rathbun, 1898

Section OXYRHYNCHA Latreille, 1803
Superfamily MAJOIDEA Samouelle, 1819

Family MAJIDAE Samouelle, 1819
Ala cornuta (Stimpson, 1860)
Collodes gibbosus (Bell, 1835)
***Collodes granosus** Stimpson, 1860
***Collodes tenuirostris** Rathbun, 1893
***Epialtoides murphyi** (Garth, 1948)
Eucinetops panamensis Rathbun, 1923
***Euprognatha bifida** Rathbun, 1893
Hemus finneganae Garth, 1958
Herbstia pubescens Stimpson, 1871
Herbstia tumida (Stimpson, 1871)
***Inachoides laevis** Stimpson, 1860
***Lissa aurivillius!** Rathbun, 1898
***Lissa tuberosa** Rathbun, 1898
Macrocoeloma villosum (Bell, 1835)
Maiopsis panamensis Faxon, 1893
***Microphrys branchialis** Rathbun, 1892
Microphrys platisoma (Stimpson, 1860)
Mithrax denticulatus Bell, 1835
Mithrax pygmaeus Bell, 1835
Mithrax sinensis Rathbun, 1892
Mithrax tuberculatus Stimpson, 1860
Neodoclea boneti Buitendijk, 1950

Notolapas lamellatus Stimpson, 1871
Paradasygyius depressus (Bell, 1835)
Pelia pacifica A. Milne Edwards, 1875
Pelia sp.
Pelia tumida (Lockington, 1877)
Pitho quinquedentata Bell, 1835
Pitho picteti (Saussure, 1853)
Podochela angulata Finnegan, 1931
***Podochela hemphilli** (Lockington, 1877)
Podochela veleronis Garth, 1948
***Podochela vestita** (Stimpson, 1871)
***Podochela ziesenhennel** Garth, 1940
Pyromaia tuberculata mexicana (Rathbun, 1893)
Sphenocarcinus agassizi Rathbun, 1893
Stenoclonops ovata (Bell, 1835)
Stenorhynchus debilis (Smith, 1871)
Teleophrys cristulipes Stimpson, 1860
Teleophrys tumidus (Cano, 1889)
Thoe sulcata panamensis Nobili, 1901
Tyche lamellifrons Bell, 1835
Tyche sulae von Prahl & Guhl, 1982

Superfamily PARTHENOPOIDEA MacLeay, 1838

Family PARTHENOPIDAE MacLeay, 1838
***Cryptopodia hassleri** Rathbun, 1925
Daldorphia garthi Glassell, 1940
Heterocrypta colombiana Garth, 1940
Leiolambrus punctatissimus (Owen, 1839)
***Mesorhoea belli** (A. Milne Edwards,1878)
Parthenope hyponca (Stimpson, 1871)
Parthenope depressiuscula (Stimpson, 1871)
***Parthenope exilipes** (Rathbun, 1893)
Parthenope stimpsoni Garth, 1958
Solenolambrus arcuatus Stimpson, 1871
Thyrolambrus glasselli Garth, 1958

Section BRACHYRYNCHA Borradaile, 1907
Superfamily PORTUNOIDEA Rafinesque, 1815

Family PORTUNIDAE Rafinesque, 1815
Arenaeus mexicanus (Gerstaecker, 1856)
Callinectes arcuatus Ordway, 1863
Callinectes toxotes Ordway, 1863
Cronius ruber (Lamarck, 1818)
Euphylax dovii Stimpson, 1860
Euphylax robustus A Milne Edwards,1874
Portunus acuminatus (Stimpson, 1871)

Portunus asper A. Milne Edwards, 1861
Portunus brevimanus (Faxon, 1893)
Portunus iridescens IRathbun, 1893)
Portunus panamensis (Stimpson, 1871)
Portunus tuberculatus (Stimpson, 1860)
Portunus xantusii affinis (Faxon, 1893)
+**Portunus xantusii xantusii** (Faxon, 1893)

Superfamily XANTHOIDEA MacLeay, 1838

Family GONEPLACIDAE MacLeay, 1838
Chasmocarcinus latipes Rathbun, 1898
*__Chasmocarcinus longipes__ Garth, 1940
+**Chasmocarcinus ostrearicola** Rathbun
Cyrtoplax panamensis Garth, 1940
Pseudorhombila xanthiformis Garth, 1940

Family XANTHIDAE MacLeay, 1838
Cataleptodius taboganus (Rathbun, 1912)
+**Coralliope armstrongi** Garth
Cycloxanthops vittatus (Stimpson, 1860)
Daira americana Stimpson, 1860
Domecia hispida Eydoux & Souleyet, 1842
Edwardsium lobipes (Rathbun, 1898)
Epixanthus tenuidactylus (Lockington,1877)
Eriphia squamata Stimpson, 1859
Eriphides hispida (Stimpson, 1860)
Eurypanopeus planus (Smith, 1869)
Eurypanopeus transversus (Stimpson, 1860)
Eurytium affine (Streets & Kingsley, 1877)
Eurytium tristani Rathbun, 1906
Globoplumnus xanthusii (Stimpson, 1860)
Glyptoxanthus labyrinthicus (Stimpson, 1860)
Heteractea lunata (H. Milne Edwards & Lucas, 1843)
*__Heteractea peterseni__ Garth, 1940
Hexapanopeus nicaraguensis (Rathbun, 1904)
Hexapanopeus sinaloensis Rathbun, 1930
Liomera cinctimanus (White, 1847)
Lipaesthesius leeanus Rathbun, 1898
Lophopanopeus maculatus Rathbun, 1898
Lophoxanthus lamellipes (Stimpson, 1860)
Medaeus pelagicus (Glasell, 1936)
Medaeus spinulifer (Rathbun, 1898)
Menippe frontalis A. Milne Edwards, 1879
Menippe obtusa Stimpson, 1860
+**Metapocarcinus truncatus** Stimpson,1860
+**Micropanope taylori** Garth

Micropanope xanthusii (Stimpson, 1871)
***Ozius perlatus** Stimpson, 1860
***Ozius tenuidactylus** (lockington, 1877)
Ozius verreauxii Saussure, 1853
Panopeus bermudensis Benedict & Rathbun, 1891
Panopeus chilensis H. Milne Edwards & Lucas, 1844
Panopeus purpureus Lockington, 1877
Paractaea sulcata (Stimpson, 1860)
Pilumnus nobilii Garth, 1948
Pilumnus pygmaeus Boone, 1927
Pilumnus townsendi Rathbun, 1923
Platyactaea dovii (Stimpson, 1871)
Platypodiella rotundata (Stimpson, 1860)
***Quadrella nitida** Smith, 1869
Trapezia corallina Gerstaeker, 1856
Trapezia digitalis Latreille, 1825
Trapezia ferruginea Latreille, 1825
Trapezia formosa Smith, 1869
***Xanthias serrulata** Finnegan, 1931
Xanthodius sternberghii Stimpson, 1859
Xanthodius stimpsoni (A. Milne Edwards, 1879)

Superfamily GRAPSIDOIDEA MacLeay, 1838

Family GECARCINIDAE MacLeay, 1838
Cardisoma crassum Smith, 1870
Gecarcinus quadratus Saussure, 1853
Gecarcinus planatus Stimpson, 1860
Gecarcinus malpilensis Faxon, 1893

Family GRAPSIDAE MacLeay, 1838
Aratus pisonii H. Milne Edwards, 1837
***Cyclograpsus integer** H. Milne Edwards, 1837
Geograpsus lividus (H. Milne Edwards, 1837)
Glyptograpsus impressus Smith, 1870
Goniopsis pulchra (Lockington, 1876)
Grapsus grapsus (Linnaeus, 1758)
Pachygrapsus transversus (Gibbes, 1850)
Percnon gibbesi (H. Milne Edwards, 1853)
Plagusia immaculata (Lamarck, 1818)
Planes minutus (Linnaeus, 1758)
Sesarma aequatoriale Ortmann, 1894
Sesarma angustum Smith, 1870
Sesarma occidentale Smith, 1870
Sesarma rhizophorae Rathbun, 1906
Sesarma sulcatum Smith, 1870

Superfamily PINNOTHEROIDEA De Haan, 1833

Family PINNOTHERIDAE De Haan, 1833
Pinnixa richardsoni Glasell, 1936
+**Pinnixa valerii** Rathbun,
Pinnotheres angelicus Lockington, 1877
Pinnotheres malagueña Garth, 1948

Superfamily POTAMOIDEA Ortmann, 1896
Family PSEUDOTHELPHUSIDAE Ortmann, 1893
Hypolobocera andagoyensis Pretzmann, 1965
Hypolobocera beieri Pretzmann, 1968
Hypolobocera buenaventurensis Rathbun, 1905
Hypolobocera cajambrensis von Prahl, 1988
Hypolobocera chocoensis Rodriguez, 1980
Hypolobocera dentata von Prahl, 1987
Hypolobocera gorgonensis von Prahl, 1983
Hypolobocera malagueña von Prahl, 1988
Hypolobocera meineli von Prahl, 1988
Hypolobocera mutisi von Prahl, 1988
Hypolobocera orientalis Pretzmann, 1968
Potamocarcinus colombiensis von Prahl & Ramos, 1987

Superfamily OCYPODOIDEA Rafinesque, 1815
Family OCYPODIDAE Rafinesque, 1815
Ocypode gaudichaudii H. Milne Edwards & Lucas, 1843
Ocypode occidentalis Stimpson, 1860
+**Uca argillicola** Crane, 1941
+**Uca batuenta** Crane,1941
Uca beebei Crane, 1941
Uca brevifrons (Stimpson, 1860)
Uca deichmanni Rathbun, 1935
+**Uca dorotheae** (von Hagen, 1968)
Uca festae Nobili, 1901
Uca galapagensis galapagensis Rathbun, 1902
Uca galapagensis herradurensis (Bott, 1954)
Uca heteropleura (Smith, 1870)
+**Uca inaequalis** Rathbun, 1935
Uca intermedia von Prahl & Toro, 1985
Uca latimanus (Rathbun, 1893)
Uca maracoani insignis (H. Milne Edwards, 1852)
Uca musica musica (Rathbun, 1914)
Uca musica terpsichores Crane, 1941
+**Uca oerstedi** Rathbun, 1904
Uca ornata (Smith, 1870)
Uca panamensis Stimpson, 1859
Uca pygmaea Crane, 1941

Uca saltitanta Crane, 1941
+**Uca stenodactylus** (H. Milne Edwards & Lucas, 1843)
Uca stylifera (H. Milne Edwards, 1852)
Uca tenuipedis Crane, 1941
Uca thayeri umbratila Crane, 1941
Uca vocator ecuadoriensis Maccagno, 1928
+**Uca zacae** (Crane, 1941)
Ucides cordatus occidentalis (Ortmann, 1898)

Family PALICIDAE Rathbun, 1898
***Palicus fragilis** (Rathbun, 1893)

Superfamily HAPALOCARCINOIDEA Calman, 1900

Family CRIPTOCHIRIDAE Kropp & Manning, 1985
Hapalocarcinus marsupiales Stimpson, 1859
Pseudocriptochirus crescentus (Edmonson, 1925)

ZOOGEOGRAPHIC CONSIDERATIONS

Oceanographic conditions are an important in that they can influence the distributions of animals and the development of biological communities. Therefore, in order to discuss the distribution of the brachyuran crabs the circulation patterns and thermal structure of the Tropical Eastern Pacific should be considered.The oceanographic conditions of the eastern tropical Pacific have been described by Wyrtki:(1965,1966).

The Pacific coast of Colombia forms part of the Panama Bight, an area of warm surface water of low salinity, which extends from the entrance of the Gulfof Panama (7º30' N) south to Punta Galeras (1º N) in Ecuador. The Panama Bight area is limited in the south by an abrupt transitional region between the tropical waters of the Bight and the cool saline waters of the Peru Current, located between Punta Galeras and Cabo Blanco (4º S),Peru (Stevenson et al. 1970).

A large number (111, 52%) of the crabs from the Pacific coast of Colombia are distributed in the Eastern Pacific Zoogeographic Region, which extends from 3º S in the Gulf of Guayaquil,Ecuador, to Cape San Lucas (23º N), Baja California. The region includes three subdivisions, the Galapagos Province, the Panamic Province (3º N to 16º N) and the Mexican Province (from 16º N to 23ºN) (Fig. 1).

The circulation pattern in the Eastern Pacific Zoogeographic Region is relatively complex and undergoes variations in response to the shifting of the trade wind system (the Intertropical Convergence Zone). The most important surface currents are the North Equatorial Counter current, the current off the coast of Central American, the California Current and the Panama Current system (Fig. 2)

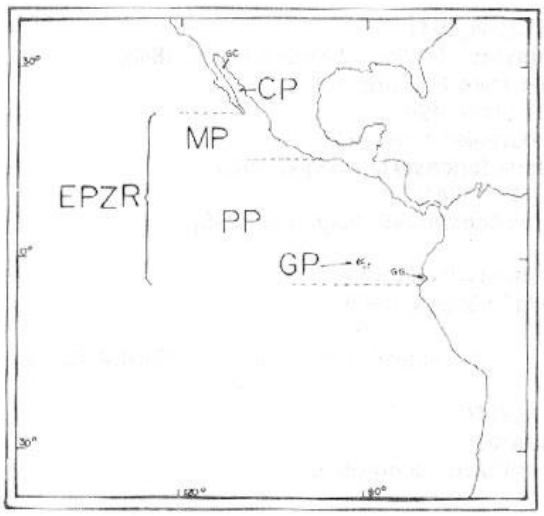

Fig. 1 Zoogeographic provinces of the Eastern Pacific Zoogeographic Region (EPZR); GC. Gulf of California; GG, Gulf of Guayaquil; CP Cortez Province; GP. Galapagos Province; MP, Mexican Province; and PP, Panamic Province

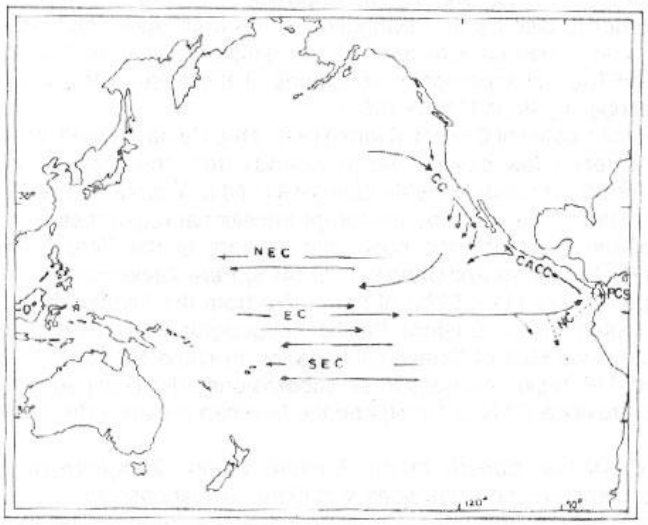

Fig. 2. Patterns of oceanic circulation in the Eastern Pacific Zoogeographic Region. CACC, Central America Coastal Current; CC, California Current, EC, Equatorial Current; NC, Niño Current or Panama Current; NEC, North Equatorial Current; PSC, Panama Current System; SEC, South Equatorial Current.

The 48% of the collected crabs are strongly related to the subtropical Cortez Province (the Gulf of California). A possible path of acces the south is bylarvae of - species the California Current, because it flows south along Baja California to about 25º N, where it then swing westward to join the North Equatorial Current. In the southern summer, (February - April), when the Convergence zone is at its more southerly positions, and the Equatorial Countercurrent is weak or absent, the California Current joined at "Mexican Current"(composed of remnants of the California Current and waters leaving the Gulf of California) may split at about 20º N and part of it flows southward to Guatemala and Costa Rica. At about the coast of Costa Rica, the California Current turns westward, becoming part of a great clockwise flowing gyre existing in this area. The seasonal current from Panama is the southern limb of this clock-wise pool and therefore it is conceivable that the transport of crabs larvae might be possible from the Gulf of California along this route to the Colombian Pacific coast and off shore islands.

The Current of Panama (or Niño Current) which originates in the Panama Bay from January to April, may serve to transport crab larvae to the Galapagos Islands It is reasonable to expect that thePanama Bight functions as a distribution area, for a large number of larvae that are transferred to the southern out lying regions with the shift to the south of tropical Panamic waters. In this fashion, it is possible to explain the relationship of Galapagos crabs with those from the Pacific coast of Colombia (51species, 24%) and Gulf of California.

The cyclonic gyre in the Panama Bight is also affected by the Equatorial Countercurrent, which flows eastward from the Central Pacific, between 4º N and 11º N, and entering the circulation of the Bight (Wyrtki, 1965). Most brachyuran crabs from the eastern Pacific that are also found in the Indo-Pacific, are commensals with **Pocillopora** corals. Garth (1974) considered that the larvae of these crabs reach the east coast of America transported by the Equatorial Countercurrent, and that because they find a favorable coral habitat, their chances of survival virtually assured. As noted by Garth, this commensal relationship explains the success of these commensal crabs in colonizing the eastern Pacific.

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