



## NEW RECORDS OF DECAPOD CRUSTACEANS IN THE EASTERN PACIFIC

BY

MICHEL E. HENDRICKX<sup>1,3</sup>) and MARY K. WICKSTEN<sup>2</sup>)

<sup>1</sup>) Laboratorio de Invertebrados Bentónicos, Unidad Académica Mazatlán, Instituto de Ciencias del Mar y Limnología, Universidad Nacional Autónoma de México, P.O. Box 811, Mazatlán, Sinaloa, 82000, Mexico

<sup>2</sup>) Department of Biology, Texas A & M University, College Station, TX 77843-3258, U.S.A.

### ABSTRACT

New records are provided for four species of decapod crustaceans in the eastern Pacific. *Hymenopenaeus nereus* (Faxon, 1893) was collected further north and further from the coast than previously known. The distribution of *Heterocarpus hostilis* Faxon, 1893 is extended from off Panama to off Mexico. *Parhippolyte cavernicola* Wicksten, 1996, previously known only from the type locality in the Gulf of California, Mexico, has been found in a cave in the Galapagos Islands, Ecuador. *Moloha faxoni* (Schmitt, 1921) is reported for the first time within the Gulf of California, Mexico.

Key words. — Eastern Pacific, Crustacea, Decapoda

### RESUMEN

Se proporcionan nuevos registros para cuatro especies de crustáceos decápodos en el Pacífico este. *Hymenopenaeus nereus* (Faxon, 1893) fue recolectado más al norte y más lejos de la costa que en los registros anteriores. La distribución de *Heterocarpus hostilis* Faxon, 1893 es ampliada desde Panamá hasta frente a México. *Parhippolyte cavernicola* Wicksten, 1996, conocido previamente solamente de la localidad tipo en el golfo de California, México, fue encontrado en una cueva en las islas Galápagos, Ecuador. *Moloha faxoni* (Schmitt, 1921) es registrado por primera vez dentro del golfo de California, México.

Palabras clave. — Pacífico este, Crustacea, Decapoda

### INTRODUCTION

Multiple records of marine species are important as they allow a more accurate analysis of their geographic distribution and their zoogeographic affinities. New records are occasionally very significant because they considerably increase the

<sup>3</sup>) Corresponding author; e-mail: michel@ola.icmyl.unam.mx

distribution range of species previously believed to be endemic to a certain region or province. With the notable exception of isolated oceanic islands or seamounts, no species registered exclusively in very small areas (e.g., the type locality, a bay, an estuary) should be considered endemic. Dispersal mechanisms of larvae through pelagic phase or active dispersal of adults by swimming or crawling over time allow for transport of species over large distances.

Over the last decades increasing sampling efforts in the eastern Pacific, south of the U.S. border, have led to numerous new records and the discovery of many new species of decapod crustaceans. This is particularly true for pelagic and deep-sea benthic invertebrate communities (see Guzman, 2008; Hendrickx, 2012, 2015). In this paper we provide significant new records for four species of decapod crustaceans collected along and offshore of the west coast of the American continent.

All specimens are deposited in the Regional Marine Invertebrates Collection in Mazatlán, Mexico (ICML-EMU).

#### TAXONOMIC ACCOUNT

##### DENDROBRANCHIATA

##### Family SOLENOCERIDAE

##### **Hymenopenaeus nereus** (Faxon, 1893)

*Haliporus nereus* Faxon, 1893: 213; 1895: 189, pl. 48, figs. 1, 1d; Bouvier, 1906: 3; 1908: 80; De Man, 1911: 7.

*Hymenopenaeus nereus*.—Burkenroad, 1936: 104; 1938: 60; Ramadan, 1938: 60; Crosnier & Forest, 1973: 256, fig. 83c; Pérez Farfante, 1977: 287, figs. 9, 18B, 20-23.

Previous records.— Off Panama (7°06'N 80°34'W) to Galapagos Islands (00°36'S 86°46'W), Ecuador (Pérez Farfante, 1977). The northernmost distribution limit provided by Pérez Farfante off Costa Rica (1977: 289) is in error; the Panama record of the “Albatross” St. 3353 (Pérez Farfante, 1977: 287) is 1°36' more to the north.

New record.— One M (CL 9.6 mm), 12 March 2015, Clarion-Clipperton Fault (12°08'40"N 117°14'27"W), trawl, 4001 m depth (ICML-EMU-10984). The northernmost distribution limit is increased by about 5 degrees of latitude, but the new record is located about 2140 km from the previous Panama record, much further away from the coast than all previous records (fig. 1).

Comments.— Pérez Farfante (1977) reported *H. nereus* from Panama to Ecuador. This material corresponds to the syntype series used by Faxon (1893) to describe the species. In fact, none of the authors posterior to Faxon (1893, 1895) has documented additional material and, to our knowledge, the present record is the first available since the syntypes were collected by the “Albatross” in 1891.

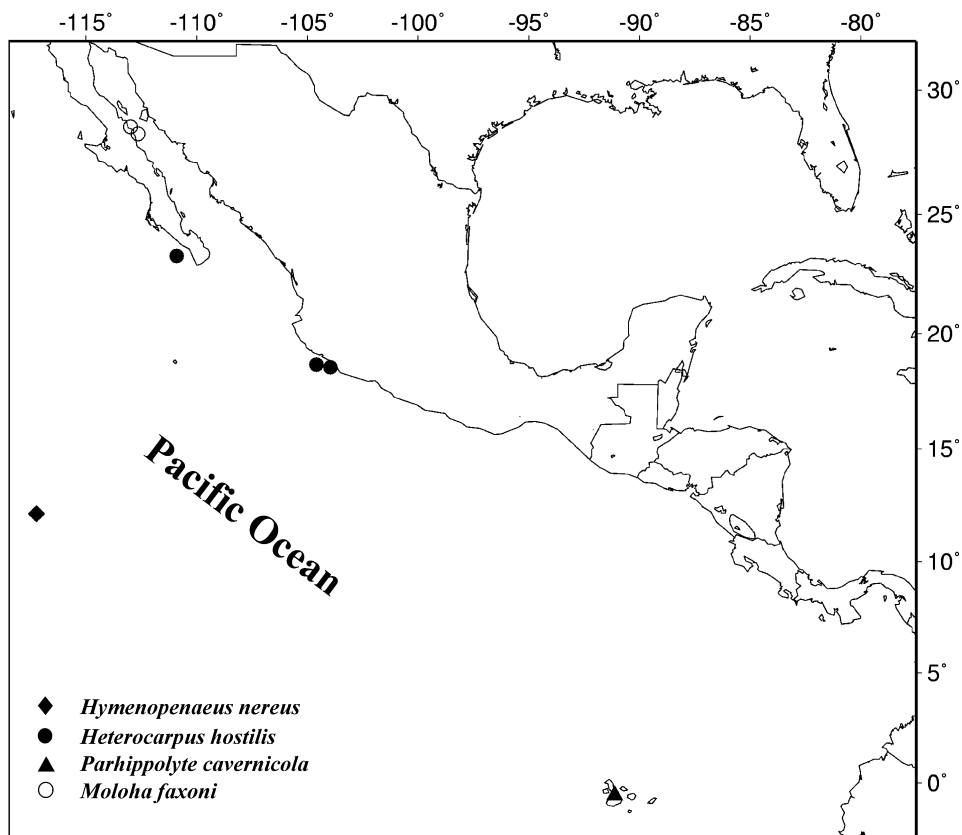


Fig. 1. Localities in the eastern Pacific where the four species of decapod crustaceans were collected.

CARIDEA

Family PANDALIDAE

***Heterocarpus hostilis*** Faxon, 1893

(fig. 2)

*Heterocarpus hostilis* Faxon, 1893: 204; 1895: 151, pl. XLI, fig. 1-1d; del Solar, 1972: 9 (list); 1987: 79 (list); Méndez, 1981: 102, pl. XLII, figs. 304-397; Wicksten, 1989: 313; Wicksten & Hendrickx, 1992: 9 (list); 2003: 69 (list); Hendrickx, 1995a: 472, fig. 4 (key), 476, textfig.; Kameya et al., 1998: 92; De Grave & Fransen, 2011: 442 (list); Moscoso, 2012: 57 (list).

Previous records.— Gulf of Panama (northern limit, 7°30'N) to Supe, Peru; Isla del Coco, Costa Rica.

New records.— TALUD XII. St. 23 (18°33'43"N 103°57'45"W), 1 April 2008, 1 M (CL 20.9 mm) and 2 F (CL 20.7-22.3 mm), benthic sledge, 1058-1088 m (ICML-EMU-11037); St. 27 (18°40'28"N 104°35'51"W), 2 April 2008, 2 F (CL 13.7-15.7 mm), benthic sledge, 1040-1095 m (ICML-EMU-10088). TALUD XV,



Fig. 2. *Heterocarpus hostilis* Faxon, 1893, F, CL 22.3 mm (ICML-EMU-11037), lateral view. This figure is published in colour in the online edition of this journal, which can be accessed via <http://booksandjournals.brillonline.com/content/journals/15685403>.

St. 5C (23°16'42"N 110°54'55"W), 5 August 2012, 1 M (CL 22.7 mm), 890-1036 m (ICML-EMU-11038).

These are the first records for the Pacific coast of Mexico (fig. 1). The northernmost distribution limit is increased by nearly 16 degrees of latitude (about 1850 km).

Comments.— *Heterocarpus hostilis* possesses several morphological characters that make it distinct from the other species of the genus in the region, including: a body much more slender compared to that of *H. affinis* Faxon, 1893, *H. vicarius* Faxon, 1893 and *H. reedi* Bahamonde, 1955; a single postorbital tooth on the dorsal margin of the carapace (vs. 2-5 in the other species); a rostrum longer than the carapace length (shorter in *H. affinis* and *H. vicarius*); and 2 pairs of mobile spines on the tip of the telson (vs. 3 in *H. affinis* and *H. vicarius*).

Ecology.— Specimens were collected in the following environmental conditions: dissolved oxygen, 0.22-0.26 ml O<sub>2</sub>/l; T, 4.3-4.7°C; C org: 1.21-1.96%; salinity, 34.53-34.56; sediments, 60% sand, 34% silt, 6% clay.

#### Family BARBOURIIDAE

#### ***Parhippolyte cavernicola* Wicksten, 1996**

*Parhippolyte cavernicola* Wicksten, 1996: 201, figs. 1-4; Wicksten & Hendrickx, 2003: 68 (list); De Grave & Fransen, 2011: 413 (list).

Previous record.— Known only from the type locality, San Diego Reef, north of San José Island (25°20'N 110°40'W), Gulf of California, Mexico.

New record.— “Shrimp cave” 0.5 km inland but within 15 m of lagoon connected to sea, Cabo Rosa, 20 km west of Puerto Villamil, Isla Isabel (1°1.7'N

91°10.8'W), Galapagos, Ecuador, 17 May 1987 (ICML-EMU-10981) (fig. 1). The known distribution of this species is extended by about 3500 km to the south (approx. 26 degrees of latitude).

## BRACHYURA

Family HOMOLIDAE De Haan, 1839

### ***Moloha faxoni*** (Schmitt, 1921)

*Homola faxoni* Schmitt, 1921: 184, pl. 31, fig. 7.

*Paramola faxoni*.— Rathbun, 1937: 68, pls. 18-19, fig. 1; Crane, 1937: 107; Griffin, 1965: 86 (key); Luke, 1977: 32; Guinot & Richer de Forges, 1981: 536; Wicksten, 1983: 187, fig. 1b; 1985: 476; 1986: 364; Kuck & Martin, 1994: 177, figs. 1-4.

*Moloha faxoni*.— Guinot & Richer de Forges, 1995: 383, fig. 33 c-d, g-h; Hendrickx, 1995b: 127 (list); 1997: 33, fig. 41; Wicksten, 2012: 202, fig. 47A; Ng et al., 2008: 41 (list).

*Paraloma faxoni*.— Hendrickx, 1993: 311 (list) (by error).

Previous record.— From Tajiguas (34°24'07"N 120°00'37"W), California, U.S.A., to Cedros Islands (28°05'48"N 115°31'18"W), western Baja California (Kuck & Martin, 1994; Hendrickx, 1995b). A doubtful record for San José Island, Gulf of California, Mexico (Hendrickx, 1997; see remarks).

New records.— TALUD XIV, St. 7 (28°15'27"N 112°39'36"W), 1 F (CW 24.5 mm), 7 April 2011, Agassiz dredge, 270-309 m (ICML-EMU-10980); St. 30 (28°32'57"N 112°59'26"W), 11 April 2011, 1 F (CW 18.2 mm), benthic sledge, 203-204 m (ICML-EMU-10979).

Present records are the first confirmed captures of *M. faxoni* within the Gulf of California (see remarks) (fig. 1). This species presents a disjunct distribution pattern along both sides of the Baja California Peninsula.

Ecology.— Reported in depth of 70-460 m (Kuck & Martin, 1994). Material reported herein is from 203 to 309 m depth. Specimens were collected in the following environmental conditions: dissolved oxygen, 2.48-2.90 ml O<sub>2</sub>/l; T, 12.7°C; C org, 2.21-2.77%; salinity, 34.99-35.00%.

Remarks.— Correa-Sandoval (1991) reported *M. faxoni* from a locality in the southern Gulf of California (i.e., "isla San José, México"). According to Hendrickx (1997), however, there are no records for this species within the Gulf of California. The locality "San José" is probably a misinterpretation of the sample reported for the "West of San José Point", on the west coast of the Baja California Peninsula (Crane, 1937).

The most complete study of material of *M. faxoni* is found in Kuck & Martin (1994) who redescribed the male and provided further information on juveniles, colour and ecology, and a synthesis of the biology and behaviour of this species.

## ACKNOWLEDGEMENTS

Ship time aboard the R/V “El Puma” was provided by the Coordinación de la Investigación Científica, UNAM (TALUD XII, XIV and XV), and partly supported by CONACyT (project 179467 for the TALUD XV cruise), Mexico. The TALUD project has also received laboratory support from CONACyT (Project 179467 for the TALUD XV). Study of the decapod crustaceans of the TALUD XII and XIV was supported by PAPPIT project IN-203013-2, UNAM. The specimen of *Parhippolyte cavernicola* was collected by Thomas Iliffe, Texas A&M University at Galveston, and the specimen of *Hymenopenaeus nereus* was collected during the ABYSSLINE project by Clifton Nunnally, University of Hawaii at Manoa. The authors thank all scientists, students and crew members who took an active part in the TALUD cruises, Mercedes Cordero for editing the manuscript and preparing fig. 1, and José Salgado-Barragán for preparing fig. 2.

## REFERENCES

- BOUVIER, E.-L., 1906. Observations sur les Pénéides du genre *Haliporus* sp. Bate. Bull. Mus. Océanogr. Monaco, **81**: 1-10.
- —, 1908. Crustacés décapodes (Pénéidés) provenant des campagnes de “L’Hirondelle” et de la “Princesse Alice” (1886-1907). Résultats des Campagnes Scientifiques accomplies sur son yacht par Albert Ier Prince Souverain de Monaco, **33**: 1-122.
- BURKENROAD, M. D., 1936. The Aristaenae, Solenocerinae and pelagic Penaeinae of the Bingham Oceanographic Collection. Bull. Bingham Oceanogr. Coll., **5**(2): 1-151.
- —, 1938. The Templeton Crocker expedition. XIII. Penaeidae from the region of lower California and Clarion Island, with descriptions of four new species. Zoologica, N.Y., **23**(1): 55-91.
- CORREA-SANDOVAL, F., 1991. Catálogo y bibliografía de los cangrejos (Brachyura) del Golfo de California. Serie de Acuicultura: 1-117. (Comunicaciones Académicas CICESE, B.C., Mexico).
- CRANE, J., 1937. The Templeton Crocker expedition. VI. Oxystomatus and dromiacean crabs from the Gulf of California and the West Coast of Lower California. Zoologica, N.Y., **22**(2): 97-108.
- CROSNIER, A. & J. FOREST, 1973. Les crevettes profondes de l’Atlantique oriental tropical. Faune trop., **XIX**: 1-410. (ORSTOM).
- DE GRAVE, S. & C. H. J. M. FRANSEN, 2011. Carideorum catalogus: the recent species of the dendrobranchiate, stenopodidean, procarididean and caridean shrimps (Crustacea: Decapoda). Zool. Meded., **85**: 195-588.
- DE MAN, J. G., 1911. The Decapoda of the Siboga expedition. Part I. Family Penaeidae. Siboga-Exped. Monogr., **39a**: 1-131.
- DEL SOLAR, E. M., 1972. Addenda al catálogo de crustáceos del Perú. Informes Instituto del Mar del Perú, **38**: 1-21.
- —, 1987. Recursos marinos de la zona arquibentónica peruana. Bol. Lima, **50**: 77-85.
- FAXON, W., 1893. Reports on the dredging operations off the west coast of Central America to the Galapagos, to the west coast of Mexico, and in the Gulf of California, in charge of Alexander Agassiz, carried on by the U.S. fish commission steamer “Albatross”, during 1891, lieut. commander Z.L. Tanner, U.S.N., commanding. VI. Preliminary descriptions of new species of Crustacea. Bull. Mus. Comp. Zool. Harv. Univ., **24**(7): 149-220.

- —, 1895. The stalk-eyed Crustacea. Reports on an exploration off the West Coasts of Mexico, Central and South America, and off Galapagos Islands, in charge of Alexander Agassiz, by the U.S. fish commission steamer "Albatross", during 1891, lieut.-commander Z.L. Tanner, U.S.N., commanding. Mem. Mus. Comp. Zool. Harv. Coll., **18**: 1-192.
- GRIFFIN, D. J. G., 1965. A new species of *Paromola* (Crustacea, Decapoda, Thelxiopidae) from New Zealand. Trans. R. Soc. N.Z., **7**: 85-91.
- GUINOT, D. & B. RICHER DE FORGES, 1981. Homolidae, rares ou nouveaux, de l'Indo-Pacifique (Crustacea, Decapoda, Brachyura). Bull. Mus. Natl. Hist. Nat., Paris, 4th ser., **3**(sec. A2): 523-581.
- — & — —, 1995. Crustacea Decapoda Brachyura: Révision de la famille des Homolidae de Haan, 1839. In: A. CROSNIER (ed.), Résultats des Campagnes MUSORSTOM, **13**. Mém. Mus. Natl. Hist. Nat., **163**: 283-517. (Éditions du Muséum, Paris).
- GUZMAN, G., 2008. Camarones pelágicos (Crustacea: Decapoda) en aguas del Pacífico sureste. Contrib. Study East Pac. Crust. [Contrib. Estudio Crust. Pac. Este], **5**(1): 27-45.
- HENDRICKX, M. E., 1993. Crustáceos decápodos del Pacífico Mexicano. In: S. I. SALAZAR-VALLEJO & N. E. GONZÁLEZ (eds.), Biodiversidad Marina y Costera de México: 271-318. (Comisión Nacional para el Estudio de la Biodiversidad y CIQRO, Mexico).
- —, 1995a. Camarones. In: W. FISCHER, F. KRUPP, W. SCHNEIDER, C. SOMMER, K. E. CARPENTER & V. H. NIEM (eds.), Guía FAO para la identificación de especies para los fines de la pesca. Pacífico centro-oriental. Vol. I. Plantas e Invertebrados: 417-537. (Food and Agriculture Organization of the United Nations, Rome).
- —, 1995b. Checklist of brachyuran crabs (Crustacea: Decapoda) from the Eastern Tropical Pacific. Bull. Inst. Roy. Sci. Nat. Belgique, **65**: 125-150.
- —, 1997. Los cangrejos braquiuros (Crustacea: Brachyura: Dromiidae, hasta Leucosiidae) del Pacífico mexicano: 1-178. (Comisión Nacional para el Conocimiento y Uso de la Biodiversidad e Instituto de Ciencias del Mar y Limnología, UNAM, Mexico).
- —, 2012. Crustáceos decápodos (Arthropoda: Crustacea: Decapoda) de aguas profundas del Pacífico mexicano: Lista de especies y material recolectado durante el proyecto TALUD. In: P. ZAMORANO, M. E. HENDRICKX & M. CASO (eds.), Biodiversidad y comunidades del talud continental del Pacífico mexicano: 283-317. (Secretaría del Medio Ambiente y Recursos Naturales, SEMARNAT, Instituto Nacional de Ecología, INE, Mexico).
- —, 2015. Further records of species of *Gennadas* (Crustacea, Decapoda, Dendrobranchiata, Benthescymidae) in the Mexican Pacific. Zootaxa, **3980**(3): 417-426.
- KAMEYA, A., V. MOSCOSO & M. LELLISH, 1998. Los crustáceos decápodos y estomatópodos del Perú. Inf. Inst. Mar del Perú, **136**: 80-109.
- KAMEYA, A., J. VÉLEZ & V. RIVADENEIRA, 1991. Fauna acompañante de los langostinos y su utilización como recurso alimenticio. Rev. Tec. Alimentos, **4**: 81-100.
- KUCK, H. G. & J. W. MARTIN, 1994. Redescription, description of the male, and new distribution records for the homolid crab *Paromola faxoni* (Schmitt) in the eastern Pacific Ocean. Journ. Crust. Biol., **14**(1): 177-187.
- LUKE, S. R., 1977. Catalog of the benthic invertebrate collections. I. Decapod Crustacea and Stomatopoda. SIO. Ref. Scripps Inst. Oceanogr, **77-9**: 1-72.
- MÉNDEZ, M., 1981. Claves de identificación y distribución de los langostinos y camarones (Crustacea: Decapoda) del mar y ríos de la costa del Perú. Bol. Inst. Mar del Perú, **5**: 1-170.
- MOSCOSO, V., 2012. Catálogo de crustáceos decápodos y estomatópodos del Perú. Bol. Inst. Mar del Perú, **27**(1-2): 1-208.
- NG, P. K. L., D. GUINOT & P. J. DAVIE, 2008. Systema Brachyurorum: part I. An annotated checklist of extant brachyuran crabs of the world. Raffles Bull. Zool., **17**: 1-286.
- PÉREZ FARFANTE, I., 1977. American solenocerid shrimps of the genera *Hymenopenaeus*, *Halioporoides*, *Hadropenaeus* new genus and *Mesopenaeus* new genus. Fish. Bull., **75**: 262-346.

- RAMADAN, M. M., 1938. Crustacea: Penaeidae. John Murray exped. 1933-34. Sci. Rep., **5**(3): 35-76.
- RATHBUN, M. J., 1937. The oxystomatous and allied crabs of America. Bull. U.S. Nat. Mus., **166**: 1-278.
- SCHMITT, W. L., 1921. The marine decapod Crustacea of California with special reference to the decapod Crustacea collected by the United States Bureau of fisheries steamer "Albatross" in connection with the biological survey of San Francisco Bay during the years 1912-1913. Univ. Cal. Publ. Zool., **23**: 1-470.
- WICKSTEN, M. K., 1983. Camouflage in marine invertebrates. Oceanogr. Mar. Biol. Annu. Rev., **21**: 177-193.
- , 1985. Carrying behavior in the family Homolidae (Decapoda: Brachyura). Journ. Crust. Biol., **5**(3): 476-479.
- , 1986. Carrying behavior in brachyuran crabs. Journ. Crust. Biol., **6**(3): 364-369.
- , 1989. Ranges of offshore decapod crustaceans in the eastern Pacific Ocean. Trans. San Diego Soc. Nat. Hist., **21**(19): 291-316.
- , 1996. *Parhippolyte cavernicola*, new species (Decapoda: Caridea: Hippolytidae) from the tropical eastern Pacific, with taxonomic remarks on the genera *Somersiella* and *Koror*. Journ. Crust. Biol., **16**(1): 201-207.
- , 2012. Decapod Crustacea of the Californian and Oregonian zoogeographic provinces. Zootaxa, **3371**: 1-307.
- WICKSTEN, M. K. & M. E. HENDRICKX, 1992. Checklist of penaeoid and caridean shrimps (Decapoda: Penaeoidea, Caridea) from the eastern tropical Pacific. Proc. San Diego Soc. Nat. Hist., **9**: 1-11.
- & —, 2003. An updated checklist of benthic marine and brackish water shrimps (Decapoda: Penaeoidea, Stenopodidea, Caridea) from the Eastern Tropical Pacific. In: M. E. HENDRICKX (ed.), Contributions to the study of East Pacific crustaceans [Contribuciones al Estudio de los Crustáceos del Pacífico Este], **2**: 49-76. (Instituto de Ciencias del Mar y Limnología, UNAM, Mexico).