

A new species of *Parthenope* Weber (Crustacea: Brachyura: Parthenopidae) from the Pacific coast of Mexico

by Michel E. HENDRICKX & Victor LANDA-JAIME

Abstract

A new species of Parthenopidae from the East Pacific belonging to the genus *Parthenope* Weber is described and illustrated. *Parthenope johngarthi* n. sp. was collected along the west coast of Mexico, off the coast of Jalisco and Colima. *Parthenope johngarthi* is readily distinguished from species of other genera of Parthenopidae from the East Pacific by the shape of the tuberculate carapace, the relative length and shape of the chelipeds, and the shape and relative size of segments of walking legs. It is closely related to *P. exilipes* (RATHBUN, 1893) but differs from the latter by its slender and almost smooth walking legs, its slender and less densely tuberculate chelipeds, and by its almost straight, narrower rostrum. Comparison of male first gonopods from both species also indicates differences that are considered of specific value.

Key-words: Crustacea, Brachyura, Parthenopidae, *Parthenope*, new species, western Mexico.

Résumé

Une nouvelle espèce de Parthenopidae du Pacifique Est appartenant au genre *Parthenope* Weber est décrite et illustrée. Le matériel de *Parthenope johngarthi* n. sp. a été récolté le long de la côte ouest du Mexique, entre Jalisco et Colima. *Parthenope johngarthi* se distingue des autres espèces de Parthenopidae du Pacifique Est par la forme de sa carapace, par le nombre et la taille des tubercules, ainsi que la taille relative et la forme des articles des pattes locomotrices. *Parthenope johngarthi* présente une forte ressemblance avec *P. exilipes* (RATHBUN, 1893) dont il diffère par ses péréiopodes plus élancés, demunis de forts tubercules, par ses quélipèdes plus grêles, plus étroits et pourvus de tubercules moins marqués et moins abondants, ainsi que par la présence d'un rostre plus étroit, nettement moins incliné par rapport à l'axe longitudinal de la carapace. La comparaison des premiers gonopodes de ces deux espèces permet aussi de discerner des différences de niveau spécifique.

Mots-clefs: Crustacea, Brachyura, Parthenopidae, *Parthenope*, nouvelle espèce, côte ouest du Mexique.

Introduction

The Parthenopidae (sensu BALSS, 1957 and GARTH, 1958) of the Pacific coast of America were extensively reviewed by the late John S. Garth about 40 years ago. In his

monographic text, GARTH (op.cit.) reported 16 species, of which one was recognized as new to science (*Parthenope stimpsoni* GARTH, 1958) and another was renamed (*Thyrolambrus glasselli* GARTH, 1958, for the preoccupied *T. rathbunae* BALSS, 1935). One year later, GARTH (1959) added another species to the American Pacific (*Heterocrypta craneae* GARTH, 1959). Since, the number of species of "Parthenopidae" (sensu GARTH, 1958) reported for the Pacific coast of America (i.e. the continental shelf; 17 species) has remained unchanged (HENDRICKX, 1995). Recently, GARTH (1992a) reported the presence of *Thyrolambrus astroides* RATHBUN, 1894, at the oceanic island of Socorro, Revillagigedo Archipelago, Mexico and reported (GARTH, 1992b) on two species of *Parthenope* occurring in deep water of the Eastern Pacific Ocean: *Parthenope allisoni* GARTH, 1992, dredged at 591 m near the Easter Island Fracture Zone (25°03'S - 97°29'W) and *P. mironovi* (ZARENKOV, 1990) trawled at 228-400 m from Shoal Guyot (25°44'S - 85°25'W) and Ichthyologists' Seamount (25°03.1'S - 97°29.1'W).

In her long and complex study of brachyuran crabs, GUINOT (1966a, 1966b, 1970, 1978a, 1978b) removed several genera of "Parthenopidae" from this family. Complementary studies of species and genera of this group by other authors (SAKAI, 1976; NG & RODRIGUEZ, 1986) led to the rearrangement of the parthenopids in three families: Parthenopidae s.s., Daldorfiidae (genera *Daldorfia* RATHBUN and *Mesorhoea* STIMPSON) and Aethridae (genera *Aethra*). A fourth family, Dairidae, was proposed by NG & RODRIGUEZ (1986) to include the genera *Daira* DE HAAN and *Dairoides* STEBBING (see GUINOT, 1967). The inclusion of three other genera (i.e. *Hepatus* LATREILLE, *Hepatella* SMITH, and *Actaeomorpha* MIERS) in the Aethridae (=Hepatidae) was suggested by GUINOT (1966b) who used also the preliminary appellation of "Parthenoxystomata". Following the classification proposed by GUINOT (1978a: 278, 279), these families are now generally included in the superfamily Parthenopoidea to mark their obvious differences with the members of the family Majidae (sensu BALSS, 1957 and GARTH, 1958), also elevated to the category of superfamily by GUINOT (loc.cit.). Consequently, the number of Eastern Pacific species presently included in the

Parthenopidae s.s. is 15, belonging to 6 genera (Cryptopodia MILNE EDWARDS, *Heterocrypta* STIMPSON, *Leiolambrus* A. MILNE EDWARDS, *Parthenope* WEBER, *Solenolambrus* STIMPSON, and *Thyrolambrus* RATHBUN) (HENDRICKX, 1995).

Samples of benthic decapod crustaceans were recently obtained along the coast of Jalisco and Colima, on the west coast of Mexico, during a research project hosted by the Universidad de Guadalajara, Mexico and aimed at establishing the composition and seasonal variation of benthic and demersal communities. Among the specimens of brachyuran crabs collected in trawls, a relatively large series of individuals belonging to the genus *Parthenope* were obtained. Of these, 10 males and 9 females belong to an undescribed species.

Abbreviations used in this paper are: DEM, "Demersal" cruise, off the coast of Jalisco and Colima, Mexico, Universidad de Guadalajara; st., sampling station; CW, carapace width; CL, carapace length; EMU, Reference Collection of invertebrates, Estacion Mazatlan, UNAM; CEC, Centro de Ecología Costera, Universidad de Guadalajara, Mexico; LACM, Los Angeles County Museum of Natural History, Los Angeles, California USA.

Parthenope (Platylambrus) johngarthi new species
Fig. 1, Pls 1-2

DERIVATION OF NAME

The species is named after the late John S. GARTH, whose contribution to our knowledge of the brachyuran crabs, particularly the Majidae s.l. and Parthenopidae s.l., of the East Pacific will never be equalled.

TYPE LOCALITY

Off Tenacatita Bay (19°15.82'N - 104°50.31'W), Jalisco, Mexico.

TYPE MATERIAL

Holotype, one male (CL 23.8 mm, CW 33.07 mm), off Tenacatita Bay (19°15.82'N - 104°50.31'W), Jalisco, 20 March 1995, st. 2, exploratory trawling at 54 m (EMU-4900); allotype, one female (CL 21.6 mm, CW 29.4 mm), off Manzanillo (19°02.87'N - 104°21.36'W), Colima, 2 June 1995, DEM 1, st. 5, trawling at 36 m (EMU-4901); paratypes, one male (CL 21.6 mm, CW 29.9 mm) and

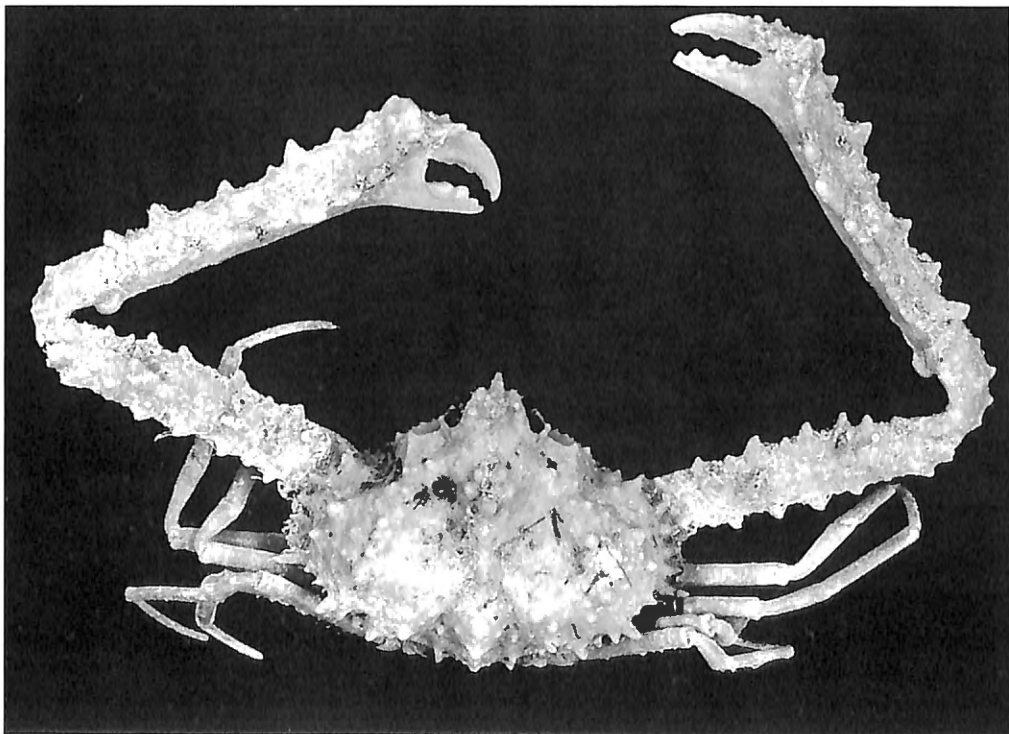


Plate 1. – *Parthenope johngarthi*, holotype, male (CL 23.8 mm, CW 33.07 mm), off Tenacatita Bay, Jalisco, Mexico, dorsal view (EMU-4900).

one female (CL 19.2, CW 26.95), off Barra de Navidad ($19^{\circ}10.50'N - 104^{\circ}44.18'W$), Jalisco, 1 June 1995, DEM 1, st. 3, trawling at 72 m (EMU-4902); paratypes, one male (CL 22.55 mm, CW 31.5 mm; right cheliped missing) and one female (CL 18.8 mm, CW 24.3 mm), off Manzanillo ($19^{\circ}02.87'N - 104^{\circ}21.36'W$), Colima, 2 June 1995, DEM 1, st. 5, trawling at 36 m (EMU-4903);

paratypes, one male (CL 22.9 mm, CW 33.0 mm), off Barra de Navidad ($19^{\circ}10.50'N - 104^{\circ}44.18'W$), Jalisco, 1 June 1995, DEM 1, st. 3, trawling at 72 m, and one ovigerous female (CL 20.2 mm, CW 27.1 mm), off Manzanillo ($19^{\circ}02.87'N - 104^{\circ}21.36'W$), Colima, 2 June 1995, DEM 1, st. 5, trawling at 36 m (LACM-95-153.1 and LACM 95-154.1).

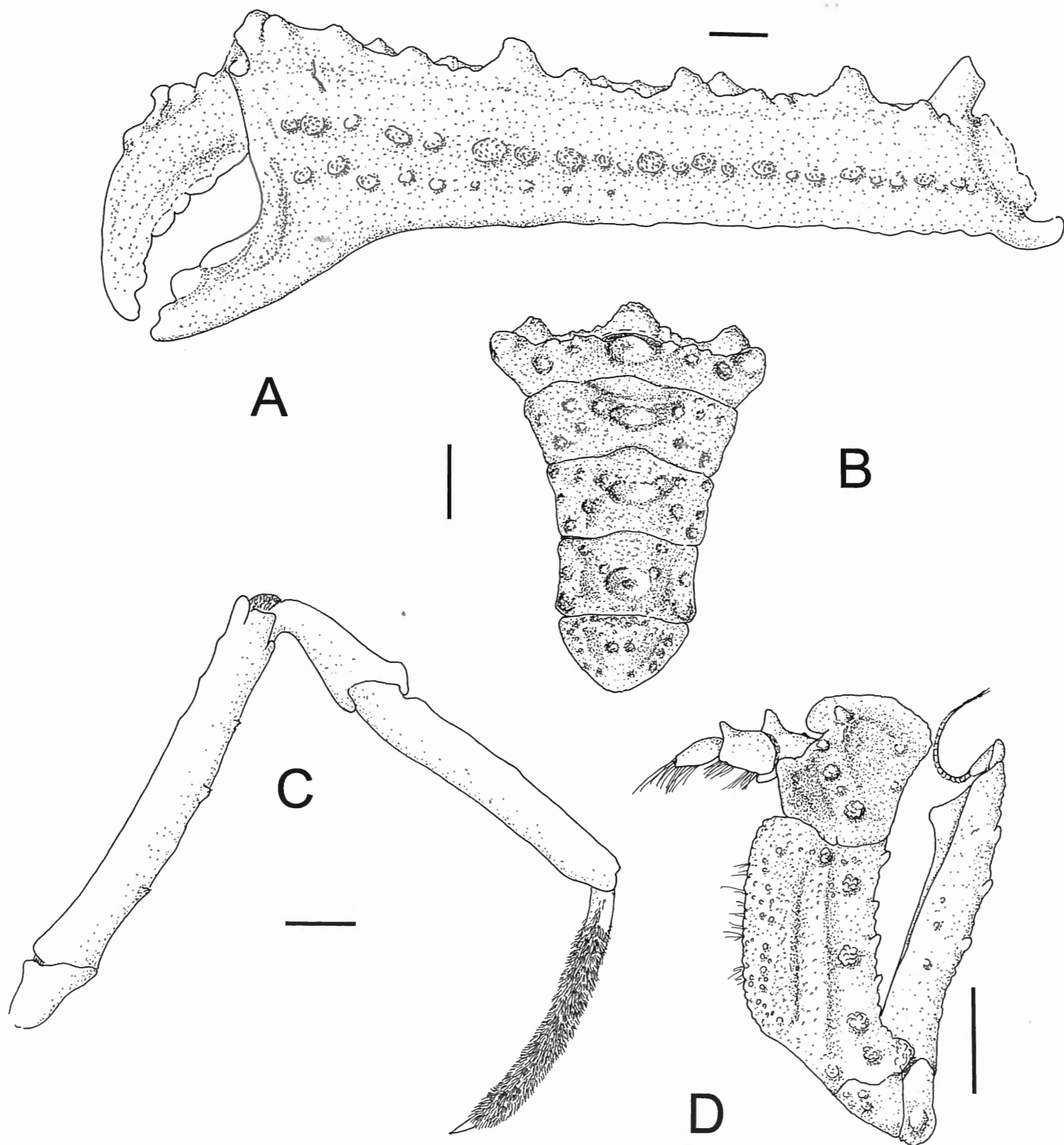


Fig. 1. – *Parthenope johngarthi*, holotype, male (CL 23.8 mm, CW 33.07 mm), off Tenacatita Bay, Jalisco, Mexico (EMU-4900): A, major (left) cheliped, frontal view; B, abdomen, ventral view; C, right pereopod 5, posterior view; D, left third maxilliped, ventral view (scale bar = 2 mm).

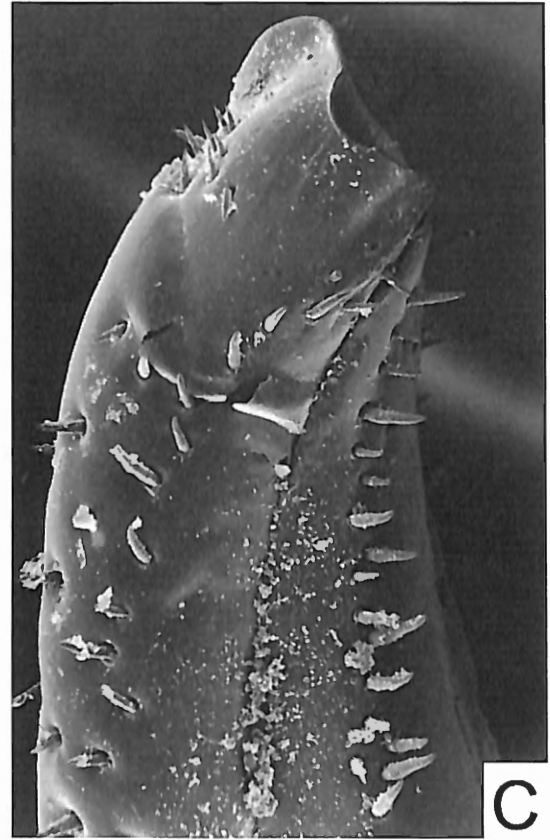
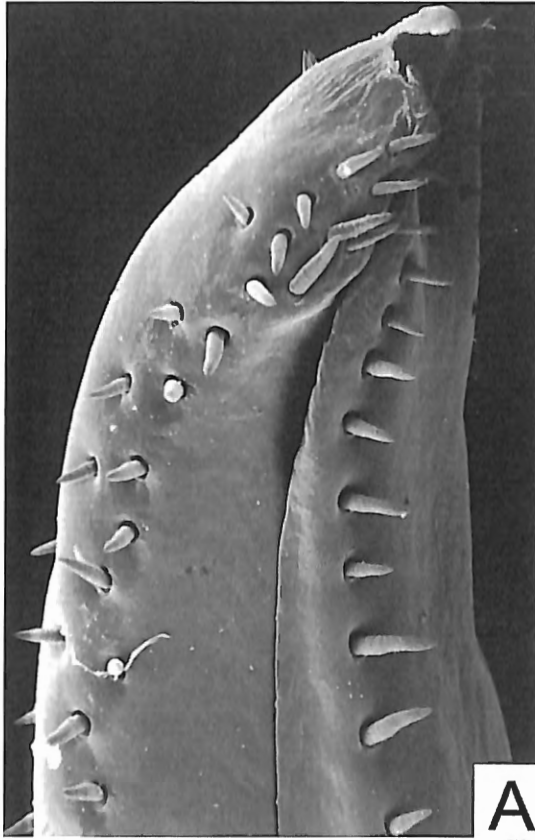


Plate 2. – Apex of male first left gonopod of *Parthenope*: A-B. *Parthenope johngarthi*, holotype, off Tenacatita Bay, Jalisco, Mexico, dorsal view (EMU-4900); C-D. *Parthenope exilipes*, Gulf of California, Mexico (EMU-3377) (SEM photographs).

ADDITIONAL MATERIAL

3 males (CL 23.2 mm, CW 32.35 mm; CL 25.2 mm, CW 35.0 mm; CL 25.2 mm, CW 36.15 mm), one female (CL 19.8 mm, CW 26.4 mm) and 3 ovigerous females (CL 20.1 mm, CW 26.55 mm; CL 19.3 mm, CW 26.25 mm; CL 20.1 mm, CW 26.65 mm), off Manzanillo (19°02.87'N - 104°21.36'W), Colima, 2 June 1995, DEM 1, st. 5, trawling at 36 m (crustacean collection, CEC); 2 males (CL 16.05 mm, CW 20.75 mm; CL 22.05 mm, CW 30.55 mm), off Tenacatita Bay (19°14'N - 104°51.09'W), Jalisco, 11 June 1996, DEM 4, st. 2, trawling at 72 m (crustacean collection, CEC); one male (CL 24.3 mm, CW 34.1 mm), off Tenacatita Bay (19°14'N - 104°51.09'W), Jalisco, 11 June 1996, DEM 4, st. 2, trawling at 72 m (EMU-4961); one ovigerous female (CL 18.7 mm, CW 25.3 mm), off Barra de Navidad (19°10.50'N - 104°44.18'W), Jalisco, 1 June 1995, DEM 1, st. 3, trawling at 72 m (crustacean collection, CEC).

DESCRIPTION

Carapace 1.3-1.4 times as wide as long (including lateral spines), high, tuberculate, narrow at the hepatic regions, spreading at the branchial regions; interregional depressions shallow to moderate, hepatic and interbranchial pits deep; branchial regions inflated. A cavity near margin between branchial and hepatic region; another cavity between the branchial and the cardiac and gastric regions. Four median tubercles, one on gastric (preceded by a pair of smaller tubercles), one on genital, one on cardiac and one (the smallest) on intestinal region. A prominent tubercle at summit of branchial region, surrounded by numerous smaller tubercles.

Anterolateral margin convex, about nine-toothed, teeth not denticulate but finely granulate, becoming smaller anteriorly, the row continued on subhepatic region; tooth at lateral angle the largest of marginal teeth, this and the four preceding teeth triangular, flattened, all five teeth slightly upturned. Posterolateral margin concave, arched upward, with five small teeth and a large upturned spine at the tip of the arch. Posterior margin slightly convex, tuberculate; a pair of lateral and a median tubercle of about the same size, and 3-4 intermediate, much smaller tubercles on each side of the median tubercle. Supraorbital arch with a prominent tubercle, pointing upwards and forwards and bearing several long setae. Rostrum narrow, faintly trilobed, deflexed at an angle of less than 30°. Sternum minutely tuberculate, tubercles larger and sharper on margins, close to base of coxae; abdomen finely tuberculate, with a few moderate tubercles and a very large median tubercle on each segments (none on telson), the one on sixth abdominal segment being the highest. Third maxillipeds tuberculate.

Chelipeds long and slender (major cheliped ca. 5 times as long as wide; width measured without teeth; length measured along ventral margin), left cheliped slightly

stronger than right; merus and hand (chela) triangular in cross-section. Hand dorsally flattened; inner (posterior) and outer (anterior) dorsal margins irregularly dentate, teeth somewhat flattened and slightly upturned; dorsal side narrow, with one longitudinal row of irregular tubercles; ventral margin almost smooth, slightly sinuous, with some obsolete flattened tubercles; inner side of hand smooth; outer side with two longitudinal rows of flattened tubercles, the upper one complete, the lower one obsolete in proximal half or two third; faces of merus almost completely smooth, some microscopic or obsolete tubercles visible under magnification.

Ambulatory legs long, slender (merus and propodus of fifth pereopod 5-6 times as long as wide); dorsal margin of merus and propodus with few scattered spiny tubercles, without a crest; ventral margin of merus and propodus almost rounded, that of the merus almost entirely smooth, with only a few scattered tubercles on lower margin, these tubercles more obvious on pereopod 5; dactylus long, almost entirely covered by a muff of short pubescence.

Male first pleopod stout, tapering to tip. Apex as illustrated (Plate 2).

REMARKS

Parthenope johngarthi is readily distinguished from species of other genera of Parthenopidae from the East Pacific by the shape of the carapace (ovate-pentagonal, not expanded laterally), the presence of numerous dorsal tubercles, the size of the basal antennal article (not reaching the orbital hiatus), and the relative length of the chelipeds (more than twice as long as the carapace). It is closely related to *P. exilipes* (RATHBUN, 1893) (known from western Baja California and the Gulf of California, Mexico, to Peru, in depths ranging between 22 and 160 m) and as a whole, the new species presents a similar pattern of tubercles on the entire carapace, sternum, abdomen and maxillipeds. The tubercles are much smaller, however, than in *P. exilipes*, particularly on the sternum and the abdomen. The most obvious difference between the two species consists in the much longer, slender and almost smooth walking legs observed in *P. johngarthi*. In *P. exilipes* the walking legs are stronger and wider (merus and propodus of fifth pereopod 4.0-4.3 and 4.1-4.3 times as long as wide, respectively), and relatively shorter; the ventral side of merus of all pereopods is flat and provided with longitudinal rows of long, sharp, denticulate tubercles. In *P. johngarthi* the ventral margin of the merus is almost smooth, rounded, with only a few scattered tubercles. The chelipeds are also much heavier and wider in *P. exilipes*, the hand (propodus) being ca. 3.5 times (vs. ca. 5 times in *P. johngarthi*) as long as wide (width measured without spines; length measured along the ventral margin), and its ventral margin is provided with a marginal row of strong (spiny) tubercles (obsolete, flattened tubercles in *P. johngarthi*); the tubercles on the

outer face of the hand are also much stronger than in *P. johngarthi*, and *P. exilipes* features strongly tuberculate faces of merus of the cheliped, while these faces are almost smooth in *P. johngarthi*. In *P. exilipes* the rostrum is wide and bend at an angle of ca. 45°, while it is almost straight (deflexed at an angle of less than 30°) and much narrower in *P. johngarthi*. Finally, comparison of male first gonopods from both species indicates differences that warrant the recognition of a new species (Plate 2).

DISTRIBUTION AND HABITAT

Parthenope johngarthi is presently known from the west coast of Mexico, from off Tenacatita Bay (19°15.82'N - 104°50.31'W), Jalisco, to off Manzanillo (19°02.87'N - 104°21.36'W), Colima. All specimens were captured in trawls on the continental shelf, in the depth range of 36-72 m, on soft bottom.

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References

- BALSS, H., 1935. Brachyura of the Hamburg Museum expedition to south-western Australia, 1905. *Journal of the Royal Society of Western Australia*, 21: 113-151.
- BALSS, H., 1957. Decapoda. In: *Dr. H.G. Bronns Klassen und Ordnungen des Tierreichs*. Fünftes Band, I. Abteilung, 7. Buch, 12. Lief., 1505-1672.
- GARTH, J.S., 1958. Brachyura of the Pacific coast of America Oxyrhyncha. *Allan Hancock Pacific Expeditions*, 21 (1-2): 1-854.
- GARTH, J.S., 1959. Eastern Pacific expeditions of the New York Zoological Society. XLIV. Non-intertidal brachygnathous crabs from the west coast of tropical America. Part 1: Brachygnatha Oxyrhyncha. *Zoologica*, 44 (7): 105-126.
- GARTH, J.S., 1992a. On the occurrence of *Thyrolambrus astroides* Rathbun in the eastern Pacific ocean. *Proceedings of the San Diego Society of Natural History*, 23: 1-3.
- GARTH, J.S., 1992b. The brachyuran crabs of the Revillagigedo Islands, Colima, México, with remarks on insular endemism in the Eastern Tropical Pacific. *Proceedings of the San Diego Society of Natural History*, 24: 1-6.
- GUINOT, D., 1966a. Recherches préliminaires sur les groupements naturels chez les Crustacés Décapodes Brachyours. I. Les affinités des genres *Aethra*, *Osachila*, *Hepatus*, *Hepatella* et *Actaeomorpha*. *Bulletin du Muséum national d'Histoire naturelle*, 2e. Sér. 38 (5): 744-762.
- GUINOT, D., 1966b. Recherches préliminaires sur les groupements naturels chez les Crustacés Décapodes Brachyours. I. Les affinités des genres *Aethra*, *Osachila*, *Hepatus*, *Hepatella* et *Actaeomorpha*. (Suite et fin). *Bulletin du Muséum national d'Histoire naturelle*, 2e. Sér. 38 (6): 828-845.
- GUINOT, D., 1967. Recherches préliminaires sur les groupements naturels chez les Crustacés Décapodes Brachyours. III. A propos des affinités des genres *Dairoides* Stebbing et *Daira* de Haan. *Bulletin du Muséum national d'Histoire naturelle*, 2e. Sér. 39 (3): 540-563.
- GUINOT, D., 1970. Recherches préliminaires sur les groupements naturels chez les Crustacés Décapodes Brachyours. VIII. Synthèse et bibliographie. *Bulletin du Muséum national d'Histoire naturelle*, 2e. Sér. 42 (5): 1063-1090.
- GUINOT, D., 1978a. Principes d'une classification évolutive des Crustacés Décapodes Brachyours. *Bulletin Biologique de la France et de la Belgique*, 112 (3): 211-292.
- GUINOT, D., 1978b. Analyse morphogénétique d'une lignée de crabes: la lignée parthénostomiennne et position systématique du genre *Drachiella* Guinot (Crustacea, Decapoda, Brachyura). *Archives de Zoologie Expérimentale et générale*, 119: 7-20.
- HENDRICKX, M.E., 1995. Checklist of brachyuran crabs (Decapoda: Brachyura) from the eastern tropical Pacific. *Bulletin de l'Institut Royal des Sciences Naturelles de Belgique*, 65: 125-150.
- NG, P.K.L., & RODRIGUEZ, G., 1986. New records of *Minilambrus wileyi* Williams, 1979 (Crustacea: Decapoda: Brachyura), with notes on the systematics of the Minilambridae Williams, 1979, and Parthenopidae McLeay, 1838, sensu Guinot, 1978. *Proceedings of the Biological Society of Washington*, 99 (1): 88-89.
- RATHBUN, M.J., 1893. Scientific results of exploration by the U.S. Fish Commission Steamer Albatross. XXIV. Descriptions of new genera and species of crabs from the west coast of North America and the Sandwich Islands. *Proceedings of the U.S. National Museum*, 16: 223-260.
- RATHBUN, M.J., 1894. Descriptions of a new genus and four new species of crabs from the Antillean Region. *Proceedings of the U.S. National Museum*, 17: 83-86.
- SAKAI, T., 1976. Crabs of Japan and adjacent seas. 773 p. Tokyo, Kodansha Ltd.
- ZARENKOV, N.A., 1990. Decapoda (Stenopodidea, Brachyura, Anomura) of the Nazca and Sala-y-Gomes Ridges. *Transactions P.P. Shirshov Institute Oceanol., Akademie Nauk SSR*, 124: 218-244.

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