

KSM

OCCURRENCE OF TWO LITHODID CRABS  
(CRUSTACEA: DECAPODA: LITHODIDAE)  
IN THE COLD SEEP ZONE OF THE SOUTH  
BARBADOS ACCRETIONARY PRISM

Enrique Macpherson

*Abstract.* — Two species of lithodid crabs from a cold seep area south of the island of Barbados, Caribbean Sea, are reported. One of the species, *Paralomis arethusa*, is new, and is described. The other species is *Lithodes manningi* Macpherson. This is the ~~first report~~ of representatives of this family in areas of emissions of chemically reduced fluids.

not sure

The discovery of new communities associated with emissions of chemically reduced fluids has received great attention in the last years (e.g., Jones 1985). These benthic assemblages were first discovered at hydrothermal vents in the Galapagos Ridge (Lonsdale 1977), and more recently "cold-seep communities" have been found in the Caribbean area (Jolliver et al. 1990), Oregon (Kulm et al. 1986) and Japan (Laubier et al. 1986), revealing the existence of organisms closely related to those inhabiting hydrothermal vents. The study of the fauna of these zones has revealed the existence of many new forms exhibiting adaptations of great scientific interest (e.g., Hecker 1985).

The decapod crustacean fauna of these ecosystems has been studied by several authors (e.g., Williams 1980, Williams & Chace 1982, Williams & van Dover 1983, Williams & Rona 1986, Guinot 1988, Saint-Laurent 1988, Guinot 1989). The discovery of two species of lithodid crabs, one of them new, in the cold seep community south of Barbados is the first report of this family in these zones.

The specimens are deposited in the Muséum national d'Histoire naturelle, Paris. Measurements given refer to the length of the carapace, excluding rostrum (CL), and the maximum width of the carapace, excluding the lateral spines (CW).

*Paralomis arethusa*, new species  
Figs. 1, 2

*Material examined.* — Holotype, DIAPISUB Expedition, sta DS01/2, 10°19'64"N, 58°53'42"W, 1691 m, 24 Dec 1992, Female (CL 15 mm, CW 14.5 mm).

*Description.* — Carapace as long as wide, somewhat hexagonal in contour. Dorsal surface of carapace covered with minute granules of various sizes, but without spines. Regions well-defined. Gastric region more prominent than others, with thick granule on apex and 2 thick granules posteriorly, near the gastro-cardiac groove. Cardiac region more prominent than branchial regions. Each branchial region with 1 thick median granule.

Rostrum with straight lower median spine slightly directed downwards, smooth ventrally; with 2 slightly divergent dorsolateral spines.

Carapace margins armed with few spines. Postocular spine not overreaching cornea. First anterolateral spine larger than postocular. Three or 4 spines of various sizes and several large granules on each branchial edge. Posterior margin smooth.

Abdominal segments covered with minute granules.

Ocular peduncles with distodorsal spine. First segment of antennal peduncle with 1

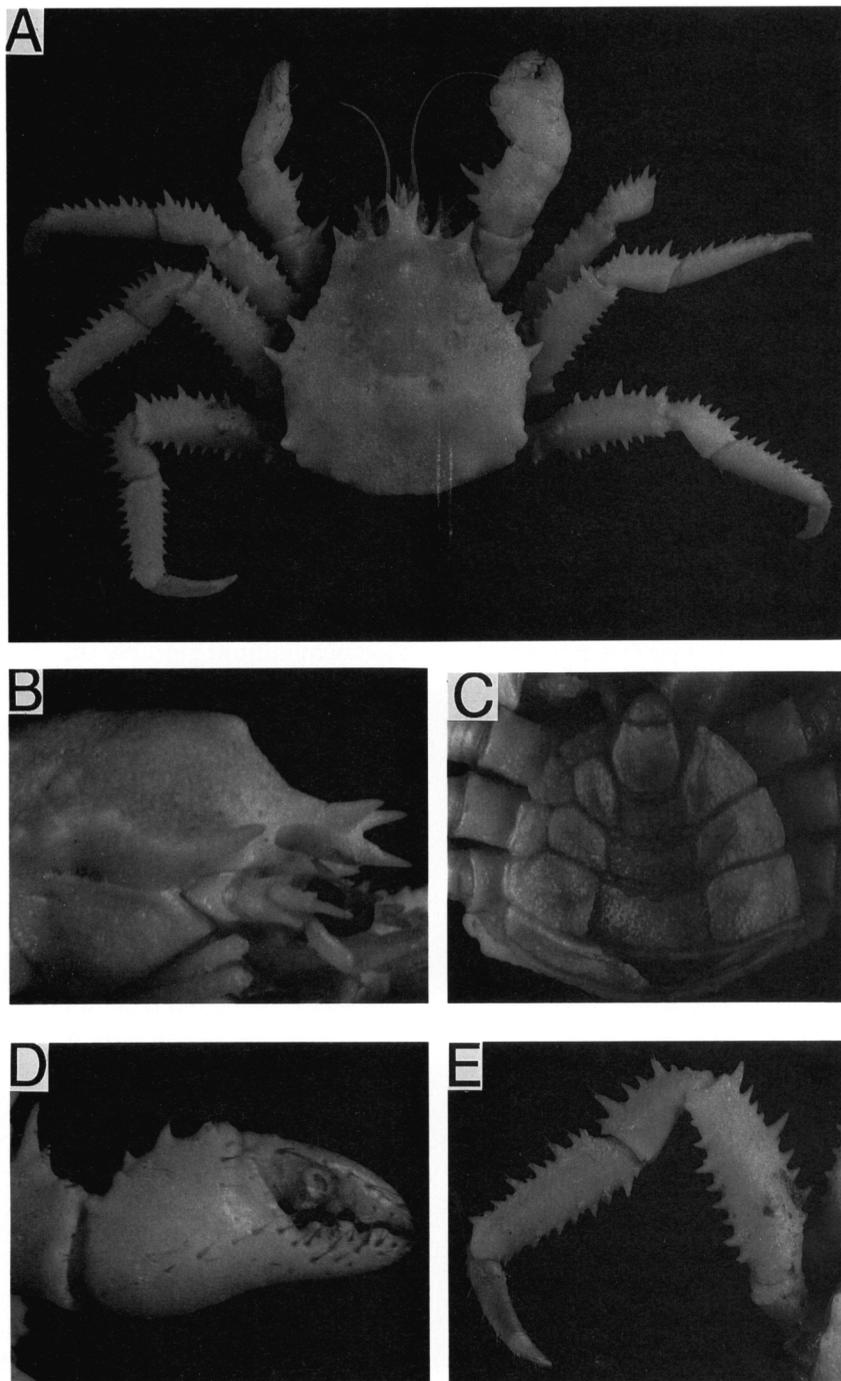


Fig. 1. *Paralomis arethusa*, new species, holotype, female, CL 15 mm. A, dorsal view; B, anterior part of the carapace, lateral view; C, abdomen; D, right cheliped; E, third left ambulatory leg.

spine on outer margin. Second segment with 2 spines on outer border. Acicle with large central spine not overreaching antennal peduncle, and 2 spines on outer border; inner border smooth.

Chelipeds subequal in length, right stouter than left. Merus bearing 2–3 spines and few granules at end of dorsal border, 2 small spines on outer surface. Carpus with 3 strong spines on dorsal border, rest of article smooth, except for some granules. Dorsal border of hand with 5–6 small spines, few granules on outer and ventral surfaces. Fingers without granules, bearing numerous tufts of setae.

Walking legs moderately long and depressed. First and second walking legs slightly longer than third.

Third leg 1.5 times carapace length. Coxa with several granules. Merus 3 times longer than high, about twice carpus length, and slightly longer than propodus. Row of 8–9 spines on dorsal border, another row of 9–10 spines on ventral margin and 4 spines on proximal half of posterior surface. Carpus with row of 7–9 spines on dorsal margin. Propodus 2.5 times longer than high, somewhat longer than dactylus, with row of 10–11 spines on dorsal margin and another row of 10 spines on ventral margin. Dactylus slightly curved, with row of 13 corneous spines on ventral margin; tuft of setae along dorsal border.

*Etymology.*—The name refers to the Nymph of the Fountains, *Arethusa*, of the Greek mythology, in reference to the emissions of fluids that characterize these areas.

*Remarks.*—There are about 47 species in the genus *Paralomis* White, 1856 (Macpherson 1988, 1992), four of which occur in the Caribbean area: *P. cubensis* Chace, 1939, *P. grossmani* Macpherson, 1988, *P. pectinata* Macpherson, 1988 and *P. serrata* Macpherson, 1988. The new species resembles *P. serrata* from the coast of Colombia, in having the dorsal surface of the carapace smooth, covered with minute granules, without spines or large granules, and with-

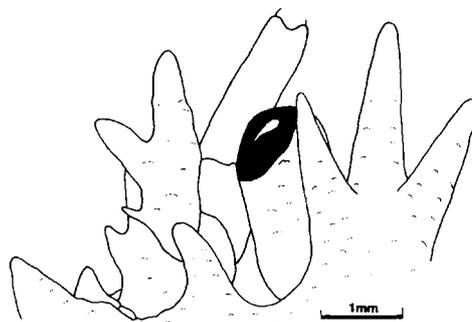


Fig. 2. *Paralomis arethusa*, new species, holotype, female, CL 15 mm. Rostrum and anterior left part of carapace, dorsal view, showing antennal peduncle.

out crest on the terminal borders of the merus and carpus of each cheliped. However, they can be distinguished by several features. The carapace is more or less pyriform in *P. serrata*, clearly hexagonal in the new species. The anterolateral and lateral spines of the carapace are clearly larger in *P. arethusa* than in *P. serrata*. The inner border of the scaphocerite is smooth in the new species, but with two spines in *P. serrata*.

Among the remaining species in the genus, *P. formosa* Henderson, 1888 from the southeastern Atlantic (Macpherson 1988) is morphologically the closest species to *P. arethusa*. The new species resembles *P. formosa* in the shape of the carapace and the armature of the chelipeds and legs. However, the two species can be readily separated by several characters. *P. formosa* has several well-developed spines on the dorsal surface of the carapace, whereas these spines are absent in the new species. The antennal acicle bears two or three spines on each side in *P. formosa*, whereas only two on the outer border in *P. arethusa*.

*Lithodes manningi* Macpherson, 1988

*Lithodes manningi* Macpherson, 1988:62, figs. 27, 28, pl. 14.

*Material examined.*—DIAPISUB Expedition, sta DS16/7, 11°13'82"N, 59°21'82"W, 1236 m, 8 Jan 1993, Male (CL 15.6 mm, CW 14.0 mm).

*Remarks.*—This species was described from two large specimens (CL 103 and 120 mm) collected in Dominica and French Guiana, at depths between 640 and 777 m. Except for the size difference, the specimen examined agrees quite well with the type specimens.

#### Acknowledgments

I am very grateful to Karine Olu (IFREMER, Brest, France) for providing the specimens used in this study. The photographs were taken by J. Biosca.

#### Literature Cited

- Chace, F. A., Jr. 1939. Reports on the scientific results of the first Atlantis Expedition to the West Indies, under the joint auspices of the University of Havana and Harvard University. Preliminary descriptions of one new genus and seventeen new species of decapod and stomatopod Crustacea.—*Memorias de la Sociedad Cubana de Historia Natural* 13:31–54.
- Guinot, D. 1988. Les crabes des sources hydrothermales de la dorsale du Pacifique oriental (campagne *Biocyarise*, 1984).—*Oceanologica Acta*, Special Volume 8:109–118.
- . 1989. Description de *Segonzacia* gen. nov. et remarques sur *Segonzacia mesatlantica* (Williams): campagne HYDROSLAKE 1988 sur la dorsale médio-Atlantique (Crustacea Decapoda Brachyura).—*Bulletin du Muséum national d'Histoire naturelle*, Paris, 4 série, 11, section A, n. 1:203–231.
- Hecker, B. 1985. Fauna from a cold sulfur-seep in the Gulf of Mexico: comparison with hydrothermal vent communities and evolutionary implications.—*Bulletin of the Biological Society of Washington* 6:465–473.
- Henderson, J. R. 1888. Report on the Anomura collected by H.M.S. *Challenger* during the years 1873–76.—Report on the scientific results of the voyage of H.M.S. *Challenger* during the years 1873–76, *Zoology*, 27(69):1–221, 21 plates.
- Jolliver, D., J. C. Faugeres, R. Griboulard, D. Desbroyeres, & G. Blanc. 1990. Composition and spatial organization of a cold seep community on the South Barbados accretionary prism: tectonic, geochemical and sedimentary context.—*Progress in Oceanography* 24:25–45.
- Jones, M. L. (ed.). 1985. Hydrothermal vents of the Eastern Pacific: an overview.—*Bulletin of the Biological Society of Washington* 6:1–545.
- Kulm, L. D., et al. 1986. Oregon subduction zone: venting, fauna, and carbonates.—*Science* 231:561–566.
- Laubier, L., S. Ohta, & M. Sibuet. 1986. Découverte de communautés animales profondes durant la campagne franco-japonaise KAIKO de plongées dans les fosses de subduction autour du Japon.—*Comptes Rendus de l'Académie des Sciences*, Paris, série 3, 2:25–29.
- Lonsdale, P. 1977. Clustering of suspension-feeding macrobenthos near abyssal hydrothermal vents at oceanic spreading centres.—*Deep-Sea Research* 24:857–863.
- Macpherson, E. 1988. Revision of the family Lithodidae Samouelle, 1819 (Crustacea, Decapoda, Anomura) in the Atlantic Ocean.—*Monografias de Zoología Marina* 2:9–153.
- . 1992. *Paralomis phriza* (Decapoda, Anomura, Lithodidae), a new species from northern Peru, and a key to the eastern Pacific species of the genus.—*Crustaceana* 63:313–317.
- Saint-Laurent, M. de. 1988. Les mégalopes et jeunes stades crabe de trois espèces du genre *Bythograea* Williams, 1980 (Crustacea Decapoda Brachyura).—*Oceanologica Acta*, Special Volume 8:99–107.
- White, A. 1856. Some remarks on Crustacea of the genus *Lithodes* with a brief description of a species apparently hitherto unrecorded.—*Proceedings of the Zoological Society of London* 1856:132–135, pl. 42.
- Williams, A. B. 1980. A new crab family from the vicinity of submarine thermal vents on the Galapagos rift (Crustacea: Decapoda: Brachyura).—*Proceedings of the Biological Society of Washington* 93:443–472.
- , & F. A. Chace, Jr. 1982. A new caridean shrimp of the family Bresiliidae from thermal vents of the Galapagos rift.—*Journal of Crustacean Biology* 2:136–147.
- , & P. A. Rona. 1986. Two new caridean shrimps (Bresiliidae) from a hydrothermal field on the mid-Atlantic ridge.—*Journal of Crustacean Biology* 6:446–462.
- , & C. L. van Dover. 1983. A new species of *Munidopsis* from submarine thermal vents of the East Pacific rise at 21°N (Anomura: Galatheidae).—*Proceedings of the Biological Society of Washington* 96:481–488.

Instituto de Ciencias del Mar (CSIC), P<sup>o</sup>  
Joan de Borbo s/n, 08039 Barcelona, Spain.