

On two rare species of caridean shrimp from the hydrothermal fields Lucky Strike and Menez Gwen on the Mid-Atlantic Ridge

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Fransen, C.H.J.M. & M.J. Biscoito. On two rare species of caridean shrimp from the hydrothermal fields Lucky Strike and Menez Gwen on the Mid-Atlantic Ridge.

Zool. Med. Leiden 80-4 (4), 10.xi.2006: 45-53, figs 1-4.— ISSN 0024-0672.

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Key words: Crustacea; Decapoda; Caridea; *Plesionika alexandri*, re-description, *Periclimenes kornii*; Mid-Atlantic Ridge.

Introduction

During the DIVA-2 cruise (May 31 - July 4, 1994, see Desbruyères *et al.*, 1994) and the PICO cruise (June 25 - July 11, 1998, N/O Nadir, PI: D. Desbruyères) to the Azores Triple Junction Area, two rare species of caridean shrimp were collected. Seven specimens of the pandalid *Plesionika alexandri* (A. Milne Edwards, 1883) were collected at the Lucky Strike hydrothermal vent field (37°20'N), and one specimen of the pontoniine *Periclimenes kornii* (Lo Bianco, 1903), at the Menez Gwen hydrothermal vent field (37°50'N). These hydrothermal vent fields are located on the Mid-Atlantic Ridge SW of the Azores. Both species of shrimp are only known from a few specimens. The original description of *Plesionika alexandri* was based on an incomplete specimen. It is now re-described on the bases of the present material.

Abbreviations used: MMF = Museu Municipal do Funchal (História Natural); RMNH Rijksmuseum van Natuurlijke Historie; pocl. = postorbital carapace length.

Systematic account

Plesionika alexandri (A. Milne Edwards, 1883) comb. nov.
(figs 1-3)

Heterocarpus Alexandri A. Milne Edwards, 1883 [unnumbered plate] [type locality: Blake dredging no. 2, north of Havana, Cuba, 23°14'00"N 82°25'00"W, 1472 m]; De Man, 1920: 108, 153, 154.

Heterocarpus alexandri - Faxon, 1896: 161; Chace, 1985: 19, 20, fig. 13b; Burukovsky, 1986: 64, 67, 69; Chace, 1989: 84-88, fig. 1; Chan & Crosnier, 1997: 202-204; Forest & Holthuis, 1997: 59, plate 28

Plesionika sp. García Raso, 1996: 741.

not *Heterocarpus alexandri* - Rathbun, 1906: 918 (see Chace, 1989: 86).

Material examined.— **Atlantic Ocean, near Azores, Lucky Strike (37°17'N, 32°17'W)**: 1 ovigerous female pocl. 12.3 mm, MMF no. 26877; 12.vi.1994; 1730 m; bottom trap; DIVA-2.— 1 ovigerous female pocl. 13.9 mm, 1 moult pocl. 13.9 mm, MMF no. 26878; 9.vi.1994; 1670 m; bottom trap; DIVA-2.— 1 non-ovigerous female pocl. 8.6, 1 male pocl. 9.7, MMF 36409; 1 non-ovigerous female pocl. 11.9 mm, 1 male pocl. 9.9 mm, RMNH D 51732; 9.vii.1998; 1700 m; bottom trap; PICO.

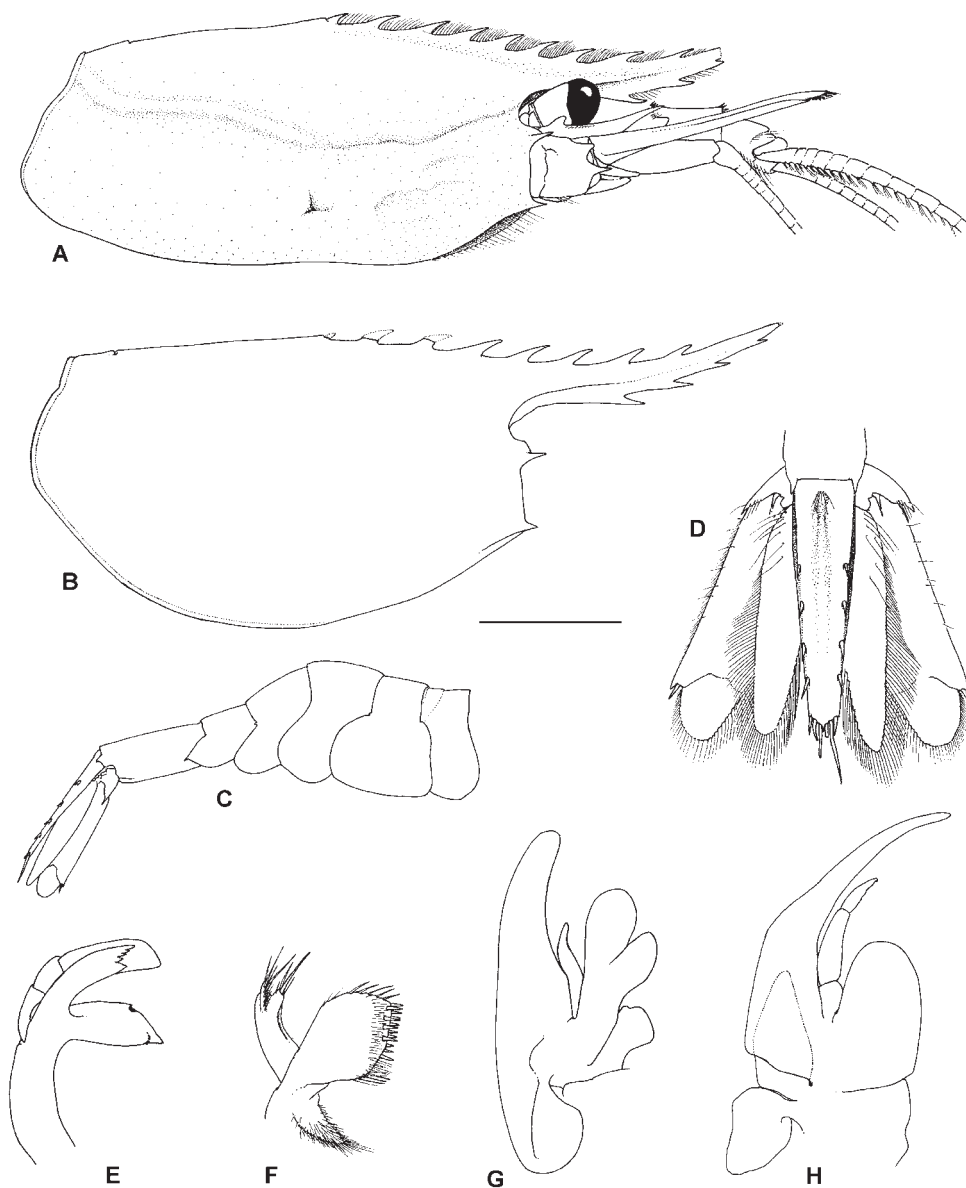


Fig. 1. *Plesionika alexandri* (A. Milne Edwards, 1883). A, C-H, moulted pocl. 13.9 mm; B, ovigerous female pocl. 13.9 mm, MMF no. 26878. A, carapace and anterior appendages, lateral aspect; B, carapace, lateral aspect; C, abdomen, lateral aspect; D, telson and uropods, dorsal aspect; E, right mandible, setae on palp omitted; F, right maxillula; G, right maxilla, setae omitted; H, right first maxilliped, setae omitted. Scale: A, B, D = 4 mm; C = 8 mm; E-F = 2 mm.

Description.— Rostrum about as long as scaphocerite, sabre-like, with sharp lateral carina arising from orbital margin, immovably connected to carapace; dorsal lamina not elevated proximally; 8-10 dorsal, regularly spaced, fixed, large teeth present of which proximalmost just anterior to midlength of carapace; proximal 4-6 teeth postorbital; distal third of rostrum devoid of teeth. Ventral lamina with 4-7 acute teeth. Antennal spine strong, acute. Pterygostomial tooth stout buttressed by submarginal carina in distal fourth of carapace; anterior margin of carapace almost straight. Carapace with shallow, indistinct, sinuous, lateral carina in posterior half; anterior half with indistinct groove from anterior end of lateral carina to orbit. Tegumental scales present.

Abdomen with third somite dorsally smooth, not with middorsal boss; sixth somite twice as long as fifth, armed posteroventrally with small but discrete tooth; pleura of 4 anterior somites with irregularly convex margins, pleura of fifth somite with sharp posteroventral tooth. Telson slightly longer than sixth abdominal somite; deeply sulcate middorsally on anterior half of length, armed with five pairs of dorsolateral spines, including pair lateral to long, intermediate posterior spines; distal margin with distinct acute medial tooth.

Eye with subspherical cornea slightly broader than stalk; ocellus absent.

Basal segment of antennular peduncle with small ventromesial tooth; stylocerite narrowly tapering to sharp point, just overreaching basal segment of antennular peduncle, lateral margin straight; intermediate segment 0.6 times as long as basal segment; ultimate segment short, 0.3 times as long as basal segment.

Scaphocerite slightly longer than antennular peduncle; distolateral tooth not reaching distal margin of lamina. Basicerite with strong lateral tooth.

Incisor process of right mandible with 5 teeth; ventralmost tooth largest; molar process ending in area with series of short setae. Mandibular palp three-segmented; basal segment short, widening distally, penultimate segment slightly shorter than basal segment, ultimate segment about twice length of basal segment, distally flattened.

First maxilla with lower and upper endites well developed; upper endite broad, with two rows of strong spines; lower endite distally acute, with many simple setae; palp bilobed, with each lobe ending in one large seta and several slender setae.

Second maxilla with lower endite somewhat reduced; upper endite bilobed, upper lobe largest; palp well developed, tapering distally; scaphognathite with posterior lobe rounded.

First maxilliped with endites of basis and coxa separated; palp slender, three-segmented; exopod with faint caridean lobe; epipod bilobed.

Second maxilliped with ultimate segment broad, with many bristle-like setae and one robust proximal spine; penultimate segment oblong, with row of median, robust spines; carpal segment as long as wide; meral segment nearly twice as long as its distal width; basis and ischium partly fused, distinctly excavate medially; exopod well developed; epipod with podobranch.

Third maxilliped long and slender, reaching beyond scaphocerite with ultimate and distal fourth of penultimate segment; ultimate segment 1.22-1.32 times as long as penultimate segment, with many rows of short serrate setae and strong spines; penultimate segment with several rows of serrate setae and strong spines; antepenultimate segment twice as long as penultimate segment, with movable ventrolateral distal and sometimes subdistal spine; exopod short, less than 3rd of length of antepenultimate

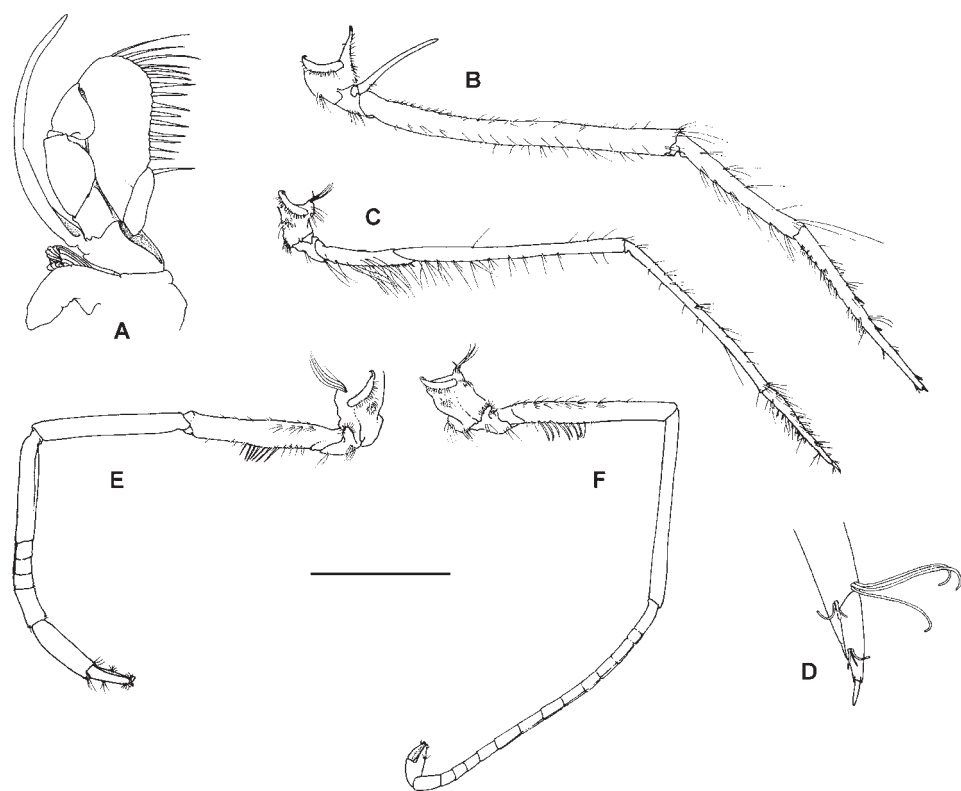


Fig. 2. *Plesionika alexandri* (A. Milne Edwards, 1883). A-F, moult pochl. 13.9 mm, MMF no. 26878. A, right second maxilliped, setae omitted; B, right third maxilliped; C, right first pereopod; D, idem, chela; E, left second pereopod; F, right second pereopod. Scale: A = 2 mm; B, C, E, F = 4 mm; D = 0.6 mm.

segment; lamellar and strap-like epipod well developed; 2 arthrobranchs present.
Branchial formula as in table 1. Epipod on third pereopod slightly reduced, that on fourth somewhat more reduced.

	Maxillipeds			Pereopods				
	I	II	III	I	II	III	IV	V
Pleurobranchs	-	-	-	1	1	1	1	1
Arthrobranchs	-	-	2	1	1	1	1	-
Podobbranchs	-	1	-	-	-	-	-	-
Epipods	1	1	1	1	1	1	r	-
Setobbranchs	-	-	-	1	1	1	-	-
Exopods	1	1	1	-	-	-	-	-

First pereopod minutely subchelate, reaching beyond scaphocerite with dactylus, fixed finger a spine like extension of propodus, reaching halfway dactylus; propodus and distal fifth of carpus; dactylus short, simple; propodus half as long as carpus, proximally broadening, with many rows of serrate setae; carpus unarmed; merus

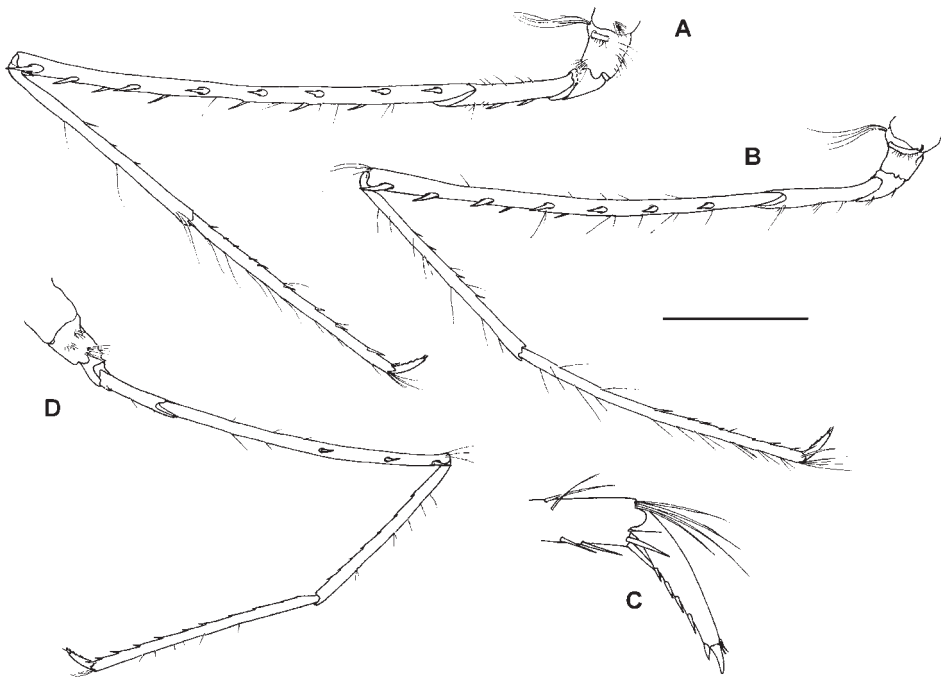


Fig. 3. *Plesionika alexandri* (A. Milne Edwards, 1883). A-D, moult pocl. 13.9 mm, MMF no. 26878. A, left third pereiopod; B, left fourth pereiopod; C, idem, dactylus; D, fifth right pereiopod. Scale: A, B, D = 4 mm; C = 1 mm.

slightly longer than carpus; ischium third of merus length, with row of medioventral spines distally.

Second pereiopods different in form and length. Left pereiopod short and stout; chela simple, palm 1.5 times as long as fingers; carpus 1.5 times as long as merus, 5-segmented, proximal segment longer than 4 distal segments, distal segment as long as 2 subdistal segments; merus straight, unarmed; ischium as long as merus, with row of 7 slender ventromedial spines forming basket to receive chela. Right second pereiopod more slender than left, reaching beyond scaphocerite with chela and distal half of carpus; carpus 1.6 times longer than merus, with 14-18 segments; merus slightly longer than ischium; ischium with row of slender curved ventromedial spines to receive chela.

Third, fourth and fifth pereiopods similar, third pereiopod largest, fifth relatively short. Third pereiopod reaching beyond scaphocerite with dactylus, propodus and distal 4/5th of carpus. Dactyli short, with 3-4 spines on slightly concave flexor margin of corpus; subdistal spine half length of simple unguis; propodus about 7 times dactylus length, armed with row of spines along ventral margin; carpus 0.8 times propodus length, with few ventral spinules; merus almost twice as long as carpus in third and fourth pereiopod, 1.5 times in fifth; merus of third with row of 8-10 movable, lateral, and 5-10 movable, ventral spines; fourth with row of 7-9 movable, lateral and 3-6 movable, ventral spines; fifth with 3-6 movable, lateral spines only; ischium of third with 2, of fourth with 1 and of fifth without movable, ventromedial spines.

Type.— Oviparous female holotype (pocl. 12.8 mm), collection of the Museum of Comparative Zoology, Harvard University, U.S.A.

Remarks.— The features of the present material match those described by Chace (1989) from the incomplete holotype. The only difference with the holotype is the absence of a middorsal boss on the tergum of the third abdominal somite. The dorsal surface of the sixth abdominal somite is rounded in the present material while described as "...dorsal surface shallowly convex and bluntly distinct from lateral surface.." by Chace (1989: 85, fig. 1e). García Raso (1996: 741, fig. 1, as *Plesionika* sp.) found a damaged specimen similar to the present material in the East Atlantic (34°23.5'N 7°40.3'W, 1,255 m depth). He wrote: "Probably, the single captured specimen (1 female, St. DW-96) belongs to a new species (Fig. 1); but, because this one is not well preserved and a relative variability exists in this *Plesionika* group, no specific name can be given". Although the presence or absence of a middorsal boss could be a specific character, we hesitate to describe the present material as belonging to a new species. The variability in this character is not well known. Apart from the holotype, Chace (1989) also studied a male specimen of *P. alexandri* from the Bahamas. This specimen possesses a middorsal boss on the third abdominal segment but it is somewhat different in form from that of the holotype. More material should become available to be more definite about the status of this feature in distinguishing species.

Crosnier, 1986 transferred *Heterocarpus laevis* A. Milne Edwards, 1883, and similar species without or with indistinct lateral carinae on the carapace, to the genus *Plesionika*. This is followed here for *Heterocarpus alexandri*. Chace (1989) suggested that the *Heterocarpus laevis* species group might be sufficiently distinct to form a separate genus. As some of the pandalid genera are so obscurely differentiated, he did not erect a new genus for this group, neither did he transfer the species involved to *Plesionika*. A phylogenetic analysis of the genera *Plesionika* and *Heterocarpus* could reveal apomorphic characters on which a separate genus for this group could be based.

Periclimenes kornii (Lo Bianco, 1903)
(fig. 4)

Anchistia Kornii Lo Bianco, 1903: 250, plate 7 figure 13.

Periclimenes sp. Coutière, 1905a: 1113; 1905b: 34; 1907: 59, fig. 22; 1938a: 189; 1938b, 211; 1938c: 257, pl. 8 fig. 11.

Periclimenes Kornii ? - Kemp, 1910: 411.

Urocaris korni - Borradaile, 1917: 354.

Periclimenes (Ancylocaris) korni - Kemp, 1922: 185.

Anchistia kornii - Parenzan, 1940: 137, 139, 141, fig. 3 no. 3.

Periclimenes (Harpilius) korni - Holthuis, 1952: 11.

Periclimenes (Periclimenes) sp. Sollaud, 1955: 116.

Periclimenes kornii - de Saint Laurent & García Raso, 1993: 101-104; Grippa & d'Udekem d'Acoz, 1996: 409; d'Udekem d'Acoz, 1993: 143 (key); García Raso, 1996: 736; d'Udekem d'Acoz, 1999a: 100; d'Udekem d'Acoz, 1999b: 143-149, figs. 1-3 (re-description)

Material examined.— 1 oviparous female pocl. 3.3 mm, MMF no. 26879: Atlantic Ocean, near Azores, Menez Gwen; 13.vi.1994; ca. 800 m; bottom trap; DIVA-2.

Remarks.— The specimen is in agreement with the descriptions by de Saint Laurent & García Raso (1993) and d'Udekem d'Acoz (1999b). The species has been recorded



Fig. 4. *Periclimenes kornii* (Lo Bianco, 1903). Carapace of ovigerous female, pocl. 3.3 mm, MMF no. 26879.

from various localities in the Mediterranean Sea, the Ibero-moroccan Gulf and the northern part of the Bay of Biscay. According to d'Udekem d'Acoz (1999b) the specimens referred to by Coutière as *Periclimenes* sp., and collected at the Azores, most likely belong to this species. The present finding at least confirms the presence of the species near the Azores.

Acknowledgements

Drs L.B. Holthuis, T.-Y. Chan and S. De Grave are thanked for their comments on the manuscript. Thanks are also due to Daniel Desbruyères, Anne Marie Alayse and the crews of N/O Nadir during the DIVA-2 and PICO cruises for the invaluable help in the collection of the specimens and to the European Union Marine Science and Technology Programme (MAST II MARFLUX-ATJ Project (contract MAS2-CT93-0070) and MAST III AMORES Project (contract MAS3-CT95-0040) for granting support to one of the authors (MJB). The cruises DIVA-2 and PICO were supported by IFREMER, France.

Literature cited

- Borradaile, L.A., 1917. The Percy Sladen Trust Expedition to the Indian Ocean in 1905, under the Leadership of Mr J. Stanley Gardiner, M.A. Volume 6, number VIII. On the Pontoniinae.— Transactions of the Linnean Society of London (2) 17 (2): 323-396, plates 52-57.
- Burukovsky, R.N., 1986. [A new shrimp species from the genus *Heterocarpus* (Crustacea: Decapoda: Pandalidae) and a brief review of the genus.].— Byulleten Moskovskogo Obshchestva Ispytateley Prirody Otdel Biologicheskiiy 91(5): 62-73, figures 1-4. [Russian with English summary].
- Chace, F.A., Jr, 1985. The caridean shrimps (Crustacea: Decapoda) of the *Albatross* Philippine Expedition, 1907-1910, part 3: Families Thalassocarididae and Pandalidae.— Smithsonian Contributions to Zoology 411: 1-143, figures 1-62.
- Chace, F.A., Jr, 1989. The holotype of *Heterocarpus alexandri* A. Milne-Edwards (Crustacea: Decapoda: Pandalidae).— Proceedings of the Biological Society of Washington 102 (1): 84-88, fig. 1.
- Chan T.-Y. & A. Crosnier, 1997. Crustacea Decapoda: Deep-sea shrimps of the genus *Plesionika* Bate, 1888 (Pandalidae) from French Polynesia, with descriptions of five new species. In: A. Crosnier (ed.), Résultats des Campagnes Musorstom, Volume 18.— Mémoires du Muséum national d'Histoire naturelle 176: 187-234 figures 1-41.
- Coutière, H., 1905a. Sur quelques Crustacés provenant des campagnes de la "Princesse Alice" (filet à grande ouverture).— Comptes rendus hebdomadaires des Séances de l'Académie des Sciences, Paris, 140: 1113-1115.
- Coutière, H., 1905b. Note préliminaire sur les Eucyphotes recueillis par S.A.S. le Prince de Monaco à l'aide du filet à grande ouverture.— Bulletin du Musée océanographique, Monaco 48: 1-35.

- Coutière, H., 1907. Sur quelques formes larvaires énigmatiques d'Eucyphotes, provenant des collections de S.A.S. le Prince de Monaco.— Bulletin du Musée océanographique, Monaco, 104: 1-70.
- Coutière, H., 1938a. Sur quelques Crustacés provenant des campagnes de la "Princesse Alice" (filet à grande ouverture).— Résultats des Campagnes Scientifiques accomplies sur son yacht par Albert 1er, Prince Souverain de Monaco, 97: 188-190 (second edition of Coutière, 1905a).
- Coutière, H., 1938b. Note préliminaire sur les Eucyphotes recueillis par S.A.S. le Prince de Monaco à l'aide du filet à grande ouverture.— Résultats des Campagnes Scientifiques accomplies sur son yacht par Albert 1er, Prince Souverain de Monaco, 97: 193-212, plate 6 figure 1-4, plate 7 figure 2-8 (second edition of Coutière, 1905b).
- Coutière, H., 1938c. Sur quelques formes larvaires énigmatiques d'Eucyphotes, provenant des collections de S.A.S. le Prince de Monaco.— Résultats des Campagnes Scientifiques accomplies sur son yacht par Albert 1er, Prince Souverain de Monaco, 97: 225-264, plate 5 figure 1, 3-7, plate 6 figures 8-11, plate 8 figures 1-12 (second edition of Coutière, 1907).
- Crosnier, A., 1986. Crevettes de la famille des Pandalidae récoltées durant ces dernières années en Polynésie française. Description de *Plesionika chacei* et *P. carsini* spp. nov.— Bulletin du Muséum National d'Histoire Naturelle, sér. 4, 8, sect. A(2): 361-377, figures 1-4.
- Desbruyères, D.; Alayse, A.M.; Antoine, E.; Barbier, G.; Barriga, F.; Biscoito, M.; Briand, P.; Brulport, J.P.; Comtet, T.; Cornec, L.; Crassous, P.; Dando, P.; Fabri, M.C.; Felbeck, H.; Lallier, F.; Médioni, A.F.; Gonçalves, J.; Ménard, F.; Kerdoncuff, F.; Patching, J.; Saldanha, L. & Sarradin, P. M., 1994. New information on the ecology of deep-sea vent communities in the Azores Triple Junction Area: preliminary results of the DIVA 2 cruise (May 31 - July 4, 1994).— InterRidge News 3(2): 18-19.
- Forest, J. & L.B. Holthuis, 1997. Milne Edwards, A., 1883: Recueil de figures de Crustacés nouveaux ou peu connus. Nouvelle édition en fac-similé avec des commentaires et annotations = new facsimile edition with comments and annotations / par / by Jacques Forest et L.B. Holthuis: 1-128. Backhuys Publishers, Leiden, The Netherlands.
- García Raso, E., 1996. Crustacea Decapoda (Excl. Sergestidae) from Ibero-Moroccan waters. Results of the Balgim-84 Expedition.— Bulletin of marine Science of the University of Miami 58 (3): 730-752, figure 1.
- Grippa, G.B., & C. d'Udekem d'Acoz, 1996. The genus *Periclimenes* Costa, 1844 in the Mediterranean Sea and the Northeastern Atlantic Ocean: review of the species and descriptions of *Periclimenes sagittifer aegylios* subsp. nov. (Crustacea, Decapoda, Caridea, Pontoniinae).— Atti della Società Italiana di Scienze Naturali e del Museo Civico di Storia Naturale di Milano 135 (2): 401-412.
- Holthuis, L.B., 1952. The Decapoda of the Siboga Expedition, XI. The Palaemonidae collected by the Siboga and Snellius Expeditions with remarks on other species. II. Subfamily Pontoniinae.— Siboga Expedition Monographs 39a¹⁰: 1-253, figures 1-110, table 1.
- Kemp, S., 1910. The Decapoda collected by the "Huxley" from the North side of the Bay of Biscay in August, 1906.— Journal of the Marine Biological Association of the United Kingdom, new series, 8: 407-420.
- Kemp, S., 1922. Notes on Crustacea Decapoda in the Indian Museum, XV. Pontoniinae. Records of the Indian Museum 24 (2): 113-288, plates 1-8.
- Lo Bianco, S., 1903. Le Pesche abissali eseguite de F.A. Krupp col Yacht Puritan nelle adiacenze di Capri ed in altre località del Mediterraneo.— Mittheilungen aus der Zoologischen Station zu Neapel 16 (1): 109-179, plates 7-9.
- Man, J.G. de, 1920. The Decapoda of the Siboga Expedition, IV: Families Pasiphaeidae, Stylodactylidae, Hoplophoridae, Nematocarcinidae, Thalassocaridae, Pandalidae, Psalidopidae, Gnathophyllidae, Processidae, Glyphocrangonidae and Crangonidae.— Siboga-Expeditie Monographie 39a: 1-318, plates 1-25.
- Faxon, W., 1896. Reports on the results of dredging, under the supervision of Alexander Agassiz, in the Gulf of Mexico and the Caribbean Sea, and on the coast of the United States 1877 to 1880, to the U.S. Coast Survey Steamer "Blake," Lieut.-Commander C.D. Sigsbee, U.S.N., and Commander J.R. Bartlett, U.S.N., commanding. 37. Supplementary notes on the Crustacea.— Bulletin of the Museum of Comparative Zoology at Harvard College 30(3): 153-166.

- Milne Edwards, A., 1883. Recueil de figures de Crustacés nouveaux ou peu connus: 3 pp, 44 plates. Paris.
- Parenzan, P., 1940. Biocenologia bentonica dei fondi marini a fango (Golfo di Napoli).— Bollettino di Idrobiologia, Caccia e Pesca dell'Africa Orientale Italiana 1: 117-142, figures 1-3.
- Rathbun, M.J., 1906. The Brachyura and Macrura of the Hawaiian Islands.— Bulletin of the United States Fish Commission (1903) 23(3): 827-930, figures 1-79, plates 1-24.
- Saint Laurent, M. de & E. García Raso, 1993. A new record and redescription of *Periclimenes kornii* (Lo Bianco, 1903) (Crustacea, Decapoda, Palaemonidae) from the Straits of Gibraltar.— Scientia Marina 57 (1): 101-104, figure 1.
- Sollaud, E., 1955. Liste des espèces de Decapoda Natantia récoltées en Juin-Juillet 1952 par le "Professeur Lacaze-Duthiers" sur côtes d'Algérie.— Vie et Milieu 2, supplément 6: 116.
- Udekem d'Acoz, C.d', 1996. Description of *Periclimenes wirtzi* sp. nov., a new pontoniine shrimp from Madeira and the Azores, with a checklist of Eastern Atlantic and Mediterranean pontoniinae (Crustacea, Decapoda, Caridea).— Bulletin de l'Institut royal des Sciences Naturelles de Belgique, Biologie 66: 133-149, figures 1-7.
- Udekem d'Acoz, C. d', 1999a. Inventaire et distribution des crustacés décapodes de l'Atlantique oriental, de la Méditerranée et des eaux continentales au nord de 25° N.— Collection Patrimoines Naturels 40: I-x, 1-383 (Service du Patrimoine Naturel, Muséum National d'Histoire Naturelle, Paris).
- Udekem d'Acoz, C. d', 1999b. New observations on *Periclimenes kornii* (Lo Bianco, 1903) (Crustacea, Decapoda, Caridea, Pontoniinae).— Bulletin de l'Institut royal des Sciences Naturelles de Belgique, Biologie, 69: 143-149, figures 1-3.

Received: 13.vi.2006

Accepted: 16.viii.2006

Edited: N.J. de Voogd

