



<http://dx.doi.org/10.11646/zootaxa.3774.6.4>

<http://zoobank.org/urn:lsid:zoobank.org:pub:8BC832E1-060F-41FC-9973-5909AB7DEB24>

Redescription of *Odontozona edwardsi* (Bouvier, 1908) (Decapoda: Stenopodidea: Stenopodidae) and description of a new species of *Odontozona* commensal on the deep-water coral, *Lophelia pertusa* (Linnaeus, 1758)

JOSEPH W. GOY¹ & IRENE A. CARDOSO²

¹Department of Biology, Harding University, 915 E. Market Avenue, Searcy, Arkansas 72149-5615, USA. E-mail: jwgoy@harding.edu

²Setor de Carcinologia, Museu Nacional/UFRJ, Quinta da Boa Vista, São Cristóvão s/n 20940-040, Rio de Janeiro, Brazil.

E-mail: irenecardoso@mn.ufrj.br

Abstract

Odontozona edwardsi, a rare stenopodid shrimp from deep waters of the northwest African coast off Morocco and Western Sahara is redescribed and figured based on type material and an additional 26 specimens including some from the Gulf of Cadiz and off Roscoff, France. Specimens of another *Odontozona* from the Gulf of Mexico, off Sapelo Island, Georgia, and off Rio de Janeiro, Brazil have been confused with *O. edwardsi* and *O. spongicola*. This *Odontozona* is associated with the deep sea hard coral *Lophelia pertusa* and is herewith designated as a new species. Both these Atlantic species of *Odontozona* are distinguished from the deep-water Pacific *O. spongicola* as well as the recently described southwestern Atlantic *O. meloi* by several morphological characters. A key to the Atlantic species of *Odontozona* is presented.

Key words: *Odontozona*, Stenopodidae, Atlantic Ocean, Gulf of Mexico, *Lophelia pertusa*, new species

Introduction

Odontozona edwardsi was first mentioned as a new species of *Richardina* by Bouvier (1908a) from specimens collected by the R/V *Talisman* along the Moroccan and Sudanese (present Western Sahara) coasts. The only characters that Bouvier (1908a) gave for this new species were that the dactyli of the fourth and fifth pereopods were biunguiculate with the carpi subdivided into four and the propodi into five segments. The gill formula was given as the same as that for *Stenopus spinosus* Risso, 1826. Holthuis (1946) divided the genus *Richardina* considering those species with biunguiculate dactyli on the fourth and fifth pereopods as a new genus *Odontozona*, which includes *O. edwardsi* and stated that this species badly needed a more extensive description. García Raso (1996) reported on five specimens of *O. edwardsi* collected during the Balgim-84 Expedition off the Ibero-Moroccan coasts and provided illustrations of some morphological characters of two specimens.

Extensive sampling of cold seep and deep-water hard coral habitats on the northern upper continental slope of the Gulf of Mexico revealed some shrimp first designated as *Stenopus* sp. (Cordes *et al.* 2005; Cordes *et al.* 2006; Cordes *et al.* 2008). These studies of the seep-associated fauna of the Gulf of Mexico show a tight biogeographical connection with the mid-slope fauna of West Africa and the Gulf of Cadiz. Therefore, one of us (JWG) examined some of these *Stenopus* sp. specimens and tentatively assigned them to *O. edwardsi* (Becker *et al.* 2009; Lessard-Pilon *et al.* 2010; Goy 2010). Two additional specimens of this same species were collected off Sapelo Island, Georgia with one photographed live that were thought to belong to *O. spongicola* (Alcock & Anderson 1899) (D. Knott per. comm.). Finally, one of us (IAC) found another specimen of this *Odontozona* off Rio de Janeiro, Brazil. Through the courtesy of Dr. Alain Crosnier the type material and an additional 26 specimens of *O. edwardsi* in the holdings of the Muséum national d'Histoire Naturelle, Paris were allowed to be examined by us enabling a thorough redescription of *O. edwardsi* and a description of the Gulf of Mexico, Georgian and Brazilian specimens as a new species. The distributions of the species of *Odontozona* known from the Atlantic are reviewed and a key to the Atlantic species is presented.

holotypes, the first sampled in deep waters off Cape San Antonio, Cuba and the latter sampled on Brazilian continental shelf (off Espírito Santo state) at a depth of 81.6 m. *Odontozona minoica* Dounas & Koukouras, 1989 is a deep-water species known from 125 m and 300 m in Aegean Sea off Crete (Koukouras & Dounas 2000). Besides that, two of the Atlantic species are restricted to shallow waters: *Odontozona libertae* Gore, 1981 presently known from 56 m off Key Largo, Florida and from 23 m in Granate Bay, Columbia (Criales 1997) and *Odontozona anaphorae* Manning & Chace, 1990, known only from the holotype from 10 m off Ascension Island in the South Atlantic Ocean. *Odontozona addaia* Pretus, 1990 is presently known from a marine cave in the western Mediterranean on the coast of Menorca at a depth of 5 m.

The Atlantic species of *Odontozona* can be separated base on the key below.

Key to the Atlantic species of *Odontozona*

1. Posterior half of carapace behind spinous cervical groove smooth 2
 - Posterior half of carapace behind spinous cervical groove with scattered spinules or with post-cervical groove bearing cincture of spines or spinules organized in transverse rows 3
2. Cervical groove cincture of spines with fewer than 26 spines. Transverse grooves on first three abdominal somites. Dorsotransverse carina on sixth abdominal somite, posterior pleural teeth *O. edwardsii* (Bouvier, 1908)
 - Cervical groove cincture of spines with more than 26 spines. Abdomen smooth *O. lopheliae* **sp. nov.**
3. Posterior half of carapace behind spinous cervical groove with scattered and inconspicuous spines elsewhere not arranged in transverse rows *O. anaphorae* Manning & Chace, 1990
 - Posterior half of carapace behind spinous cervical groove with post-cervical groove bearing cincture of spines or spinules organized in transverse rows 4
4. Propodus of third pereopod with dorsal margin without spines, with 2 rows of long setae on dorsal and ventral margins
 - *O. meloi* Anker & Tavares, 2013
 - Propodus of third pereopod with no rows of long setae on dorsal and ventral margins 5
5. Pleuron of abdominal somite 3 with 3 medial teeth *O. striata* Goy, 1981
 - Pleuron of abdominal somite 3 with 0–2 medial teeth 6
6. Pleura of abdominal somites 3 and 4 without medial teeth *O. libertae* Gore, 1981
 - Pleura of abdominal somites 3 and 4 with 1 or 2 medial teeth 7
7. Pleura of abdominal somite 3 and 4 with one medial tooth *O. minoica* Dounas & Koukouras, 1989
 - Pleura of abdominal somites 3 and 4 with two medial teeth *O. addaia* Pretus, 1990

Acknowledgements

Specimens examined during this study were kindly made available by A. Crosnier (MHNH), D. Knott (SERTC), R. Lemaitre (USNM), and E. Podowski (Biology Dept., Pennsylvania State University). Specimen from off Brazilian waters was made available by the Brazilian energy company, Petrobras. Dany Burgess (SERTC) provided the high-resolution photo of *O. lopheliae* **sp. nov.**

Literature cited

- Alcock, A. & Anderson, A.R. (1899) An Account of the Deep-sea Crustacea dredged during the Surveying-season of 1897–98. Natural history notes from H.M. Royal Indian Marine Survey Ship ‘Investigator’, Commander T.H. Heming, R.N., commanding. Series III, No. 2. *Annals and Magazine of Natural History*, Ser. 7, 1–27, 278–292.
<http://dx.doi.org/10.1080/00222939908678123>
- Anker, A. & Tavares, M. (2013) Description of a new deep-water stenopodid shrimp of the genus *Odontozona* Hothuis, 1946 (Crustacea, Decapoda) from Brazil. *Marine Biology Research*, 9, 421–430.
<http://dx.doi.org/10.1080/17451000.2012.745004>
- Becker, E.L., Cordes, E.E., Macko, S.A. & Fisher, C.R. (2009) Importance of seep primary production to *Lophelia pertusa* and associated fauna in the Gulf of Mexico. *Deep-Sea Research I*, 56, 786–800.
<http://dx.doi.org/10.1016/j.dsr.2008.12.006>
- Bouvier, E.L. (1908a) Sur les relations zoologiques de crevettes de la tribu des Sténopidés. *Comptes Rendus Hebdomadaires des Séances de l’Académie des Sciences*, 146, 887–891.
- Bouvier, E.L. (1908b) Catalogue des Crustacés de la famille des Sténopides des collections du Muséum d’histoire naturelle. *Bulletin du Muséum d’Histoire naturelle, Paris*, 14, 150–151.

- Claus, C.F.W. (1872) *Grundzüge der Zoologie zum Gebrauche an Universitäten und höherem Lehranstalten sowie zum Selbststudium. Zweite vermehrte Auflage.* Marburg und Leipzig. N.G. Elwert'sche Universitäts-Bihandlung, 1170 pp.
- Cordes, E.E., Hourdez, S., Predmore, B.L., Redding, M.L. & Fisher, C.R. (2005) Succession of hydrocarbon seep communities associated with the long-lived foundation species *Lamellibrachia luymeri*. *Marine Ecology Progress Series*, 305, 17–29. <http://dx.doi.org/10.3354/meps305017>
- Cordes, E.E., Begquist, D.C., Predmore, B.L., Jones, C., Deines, P., Telesnicki, G. & Fisher, C.R. (2006) Alternate unstable states: Convergent paths of succession in hydrogen-seep tubeworm-associated communities. *Journal of Experimental Marine Biology and Ecology*, 339, 159–176. <http://dx.doi.org/10.1016/j.jembe.2006.07.017>
- Cordes, E.E., McGinley, M.P., Podowski, E.L., Becker, E.L., Lessard-Pilon, S., Viada, S.T. & Fisher, C.R. (2008) Coral communities of the deep Gulf of Mexico. *Deep-Sea Research I*, 55, 777–787. <http://dx.doi.org/10.1016/j.dsr.2008.03.005>
- Criales, M.M. (1997) *Microprosthema granatense*, new species, from the southern Caribbean, with a key to shrimps of the genus *Microprosthema* from the western Atlantic and a new record of *Odontozona liberate* (Decapoda: Stenopodidea). *Journal of Crustacean Biology*, 17, 538–545. <http://dx.doi.org/10.2307/1549446>
- De Grave, S. & Franssen, C.H.J.M. (2011) Carideorum Catalogus: the Recent Species of the Dendrobranchiate, Stenopodidean, Procarididean and Caridean Shrimps (Crustacea: Decapoda). *Zoologische Mededelingen*, 85, 195–588.
- Dounas, C. & Koukouras, A. (1989) *Odontozona minoica*, new species, from the Eastern Mediterranean Sea (Decapoda: Stenopodidae). *Journal of Crustacean Biology*, 9, 341–348. <http://dx.doi.org/10.2307/1548509>
- García Raso, J.E. (1996) Crustacea Decapoda (excl. Sergestidae) from Ibero-Moroccan waters. Results of Balgim-84 Expedition. *Bulletin of Marine Science*, 58, 730–752.
- Gore, R.H. (1981) Three new shrimps, and some interesting new records of decapod Crustacea from a deepwater coral reef in the Florida Keys. *Proceedings of the Biological Society of Washington*, 94, 135–162.
- Goy, J.W. (1981) Studies on West Indian Stenopodidae: 1. *Odontozona striata* new species from off the western coast of Cuba (Crustacea: Decapoda: Stenopodidea). *Bulletin of Marine Science*, 31, 843–852.
- Goy, J.W. (1992) Systematics and zoogeography of Eastern Pacific Stenopodidean shrimps (Crustacea: Decapoda). *Proceedings of the San Diego Society of Natural History*, 22, 1–6.
- Goy, J.W. (2010) Infraorder Stenopodidea Claus 1872. In: Schram, F.R., von Vaupel Klein, J.C., Forest, J. & Charmantier-Daures, M. (Eds.), *Treatise on Zoology – Anatomy, Taxonomy, Biology. The Crustacea, Decapoda. Vol. 9. Part A. Eucarida: Euphausiacea, Amphionidacea and Decapoda partim*. Brill, Leiden, pp. 215–265.
- Hendrickx, M.E. (2002) A new deep water species of *Odontozona* Holthuis (Decapoda, Stenopodidae) from the southern Gulf of California, Mexico. *Crustaceana*, 75, 405–412. <http://dx.doi.org/10.1163/156854002760095471>
- Holthuis, L.B. (1946) Biological Results of the Snellius Expedition. The Decapoda Macrura of the Snellius Expedition XIV. The Stenopodidae, Nephropsidae, Scyllaridae and Palinuridae. *Temminkia*, 7, 1–178, pl. 1–11.
- Koukouras, A. & Dounas, C. (2000) Decapod crustaceans new to the fauna of the Aegean Sea. *Crustaceana*, 73, 497–502.
- Lessard-Pilon, S.A., Podowski, E.L., Cordes, E.E. & Fisher, C.R. (2010) Megafauna community composition associated with *Lophelia pertusa* colonies in the Gulf of Mexico. *Deep-Sea Research II*, 57, 1882–1890. <http://dx.doi.org/10.1016/j.dsr2.2010.05.013>
- Manning, R.B. & Chace, F.A. (1990) Decapod and Stomatopod Crustacea from Ascension Island, South Atlantic Ocean. *Smithsonian Contribution to Zoology*, 503, 1–91. <http://dx.doi.org/10.5479/si.00810282.503>
- Milne Edwards, A. & Bouvier, E.L. (1909) Les Pénéides et Sténopides. Reports on the results of dredging under the supervision of Alexander Agassiz in the Gulf of Mexico (1877–78), in the Caribbean Sea (1878–79) and along the Atlantic coast of the United States (1880) by U.S. coast survey steamer “Blake”. XLIV. *Memoirs Museum Comparative Zoology*, 27, 181–274.
- Pretus, J.L. (1990) Description of *Odontozona addaia* spec. nov. (Crustacea: Decapoda: Stenopodidae) from a marine cave in the Island of Minorca, western Mediterranean. *Zoologische Mededelingen*, 63, 343–357.
- Rogers, A.D. (1999) The biology of *Lophelia pertusa* (Linnaeus, 1758) and other deepwater reef-forming corals and impacts from human activities. *International Review of Hydrobiology*, 84, 315–406. <http://dx.doi.org/10.1002/iroh.199900032>