



Bathynomus A. Milne-Edwards, 1879 (Crustacea: Isopoda: Cirolanidae) from the early Oligocene of the Ligure-Piemontese Basin (NW Italy)

Authors: Pasini, Giovanni, and Garassino, Alessandro

Source: Palaeodiversity, 12(1) : 95-98

Published By: Stuttgart State Museum of Natural History

URL: <https://doi.org/10.18476/pale.v12.a8>

BioOne Complete (complete.BioOne.org) is a full-text database of 200 subscribed and open-access titles in the biological, ecological, and environmental sciences published by nonprofit societies, associations, museums, institutions, and presses.

Your use of this PDF, the BioOne Complete website, and all posted and associated content indicates your acceptance of BioOne's Terms of Use, available at www.bioone.org/terms-of-use.

Usage of BioOne Complete content is strictly limited to personal, educational, and non - commercial use. Commercial inquiries or rights and permissions requests should be directed to the individual publisher as copyright holder.

BioOne sees sustainable scholarly publishing as an inherently collaborative enterprise connecting authors, nonprofit publishers, academic institutions, research libraries, and research funders in the common goal of maximizing access to critical research.

Bathynomus A. MILNE-EDWARDS, 1879 (Crustacea: Isopoda: Cirolanidae) from the early Oligocene of the Ligure-Piemontese Basin (NW Italy)

GIOVANNI PASINI & ALESSANDRO GARASSINO

Abstract

A posterior moult assigned to *Bathynomus* A. MILNE-EDWARDS, 1879 (Crustacea, Isopoda, Cirolanidae) is reported from turbidites of the early Oligocene Ranzano Formation cropping out near Parogna, Alessandria (Piemonte, NW Italy). This is the oldest fossil record of this genus from Italy, thus enlarging the scarce knowledge on its presence and distribution in the Proto-Mediterranean Basin.

Key words: *Bathynomus*, Isopoda, Cirolanidae, early Oligocene, NW Italy.

1. Introduction and geological setting

The fossil record of cirolanid isopods from Italy is actually very scarce, limited to just two reports. Indeed, according to PASINI & GARASSINO (2012) and HYŽNÝ et al. (2019) only two species are known to date, *Palaega picena* PASINI & GARASSINO, 2012, from the Miocene of Arcevia (Ancona, Marche, central Italy) and *Bathynomus sismondai* (RISTORI, 1891), from the Plio-Pleistocene of several localities of Tuscany and Emilia Romagna (central Italy).

The purpose of this short note is to report a posterior moult assigned to *Bathynomus* A. MILNE-EDWARDS, 1879 from the early Oligocene of Ligure-Piemontese Basin, considered the oldest report of this genus from Italy. The studied specimen comes from a ravine nearby Parogna (Dernice, Alessandria) in the southern Piemonte Apennine Mountains (NW Italy) (44° 45' 22.10" N, 9° 02' 03.30" E). In this locality, a succession of poorly fossiliferous turbidites is exposed belonging to the mostly deep-water Epi-Ligurian cycle. The studied specimen has been recovered from a small block of light grey sandstone detached by natural erosion along a gully located east of Parogna. The original deposit is actually covered by the sliding down of the overlapping coarse sandstones and conglomerates. Only a bivalve shell (possibly *Parvamusium* sp.) and some badly preserved fish otolites (*Diaphus* sp.) have been recovered from the same levels as the isopod (RATTAZZI, pers. comm. 2018). Sedimentological or stratigraphic studies have never been carried out in this area. However, according to VERCESI & PEROTTI (2016), the sediments are generically referred to the Ranzano Formation (early Oligocene – late Priabonian to late Rupelian), to which the studied specimen is herein referred as well.

This report indicates the presence of the genus in the Proto-Mediterranean Basin since the early Oligocene.

2. Material and measurements

The studied specimen, part and counterpart, consists of a three-dimensionally preserved posterior body moult ventrally exposed, including pereonites 5–7, pleonites and pleotelson; uropods are not preserved. The original light grey sandstone has been artificially darkened around the fossil for emphasizing the body outline and to provide more accurate photographs of the specimen.

The specimen is housed in the palaeontological collection of the Museo Paleontologico di Crocefieschi (Genova, Italy) (MPC).

MPC 5548 – total length: ≈ 980 mm; pleotelson length: 390 mm (including central spine); pleotelson width: 350 mm; maximum width: 424 mm.

3. Systematic palaeontology

Order Isopoda LATREILLE, 1817

Suborder Cymothoidea WÄGELE, 1989

Family Cirolanidae DANA, 1852

Genus *Bathynomus* A. MILNE-EDWARDS, 1879

Bathynomus sp.

Fig. 1

Type species: *Bathynomus giganteus* A. MILNE-EDWARDS, 1879, by monotypy.

Description: Elongate, rectangular incomplete posterior body with parallel lateral margins. Pereonites 5–7 sub-rectangular of approximately equal length, twice the length of the pleonites. Pleonites badly preserved, of approximately equal length, slightly overlapping each



Fig. 1. *Bathynomus* sp., MPC 5548, showing the broken right lateral margin of the pleotelson and the outermost posterior right preserved spine, ventral view. Scale bar equals 1 cm.

other with pleurae pointed posteriorly. Pleotelson subtrapezoidal, tapering posteriorly with convex lateral plicate margins, longer than wide; posterior margin slightly convex. Dorsal surface convex, with minute granulated

pores (in ventral view); conspicuous median longitudinal carina. Posterior pleotelsonic margin with seven strong triangular pointed spines, two most lateral one shorter, slightly curved distally towards the median longitudinal axis of the body, followed by two spines of similar length, longer than the lateral ones and nearly straight. Central spine clearly triangular, straight, simple (not bifid) and slightly longer than the other ones.

Discussion: According to the recent concept of *Bathynomus* (BRUCE 1986; LOWRY & DEMPSEY 2006 among others), shared also by some palaeontologists (ETTER 2014; HYŽNÝ et al. 2013, 2019, among others), the outline of the pleotelson with sinuous lateral margins and a set of large spines on its posterior margin is typical of the genus. Moreover, although the number of pleotelsonic spines is considered as variable within the genus (LOWRY & DEMPSEY 2006; KOU et al. 2017), following HYŽNÝ et al. (2019), we consider it a taxonomically important diagnostic character if combined with the shape of the uropod rami (SHIPLEY et al. 2016). Unfortunately, the uropods are not preserved in the studied specimen, thus not allowing a specific assignment. However, the estimated total length of the body, based on the length of the pleotelson (approximately $\frac{1}{4}$ of the total length as noted by MAGALHÃES & YOUNG 2003), suggests that the studied specimen, ranging over 140 mm in size, might be a representative of the giant or supergiant group of *Bathynomus* (*sensu* LOWRY & DEMPSEY 2006). Indeed, we cannot clarify if the studied specimen could belong to one of these two groups, because it has a body size between the minimum size of the representatives of the giant group and the small size of the representatives of the supergiant group. Moreover, we cannot establish whether the studied specimen was an adult specimen or a juvenile.

Based on the general pleotelsonic proxy characters (mainly the number of marginal spines), apparently the closer extant species, both belonging to the giant group, are *Bathynomus immanis* BRUCE, 1986, from the East Australian Coral Sea (Pacific Ocean), showing a pleotelson with a conspicuous median longitudinal ridge, seven pleotelsonic marginal spines with a simple (not bifid) central spine and reaching 139 mm in total length (LOWRY & DEMPSEY 2006: 178, figs. 12, 13); and *B. doederleini* ORTMANN, 1894, from the Western Pacific Ocean, with the same pleotelsonic characters but occasionally bearing nine marginal spines and of smaller body size (\approx 133 mm) (LOWRY & DEMPSEY 2006: 176, fig. 10).

The studied specimen differs notably from the only known fossil species from the Plio-Pleistocene of Italy, *Bathynomus sismondai* (RISTORI, 1891), recently revised by HYŽNÝ et al. (2019), by an indistinct dorsal median carina and nine or eleven marginal pleotelsonic spines. Moreover, the studied specimen has been compared with *Palaega scrobiculata* v. AMMON, 1882, described from the

Eastern Alps of Austria, sharing a very similar pleotelsonic shape (HYŽNÝ, pers. comm. 2019), with seven posterior spines and a similar geological age (Oligocene). However, the type material of *Palaega scrobiculata* seems to have a straighter posterior pleotelsonic margin, with posterior serrate subequal parallel spines, less strong and distinct, not separated by a wide deep concave notch. The systematic position of that taxon has been previously discussed by other authors, and *P. scrobiculata* could be considered a representative of *Bathynomus*, based on the genus concept proposed by HYŽNÝ et al. (2013, 2019). Unfortunately, we cannot confidently compare the Italian specimen with the Austrian type material based on the illustrations reported by v. AMMON (1882, pls. 1–4), due to the different and more compressed preservation of the specimens from Austria.

Moreover, only a direct and close observation and revision of the type material of this and other doubtful *Palaega* species, not purpose of this paper, could confirm their potential re-assignment to *Bathynomus*. As previously remarked, due to the absence of the uropods in the studied specimen, a specific assignment is impossible. According to HYŽNÝ et al. (2019) and based on the preserved generic proxy characters, we prudentially ascribe the studied specimen to *Bathynomus*. At the same time we cannot totally exclude that, after a revision of *Palaega scrobiculata*, the studied specimen could be tentatively assigned to the latter species.

Finally, based on the present state of knowledge, the studied specimen represents the oldest fossil record of *Bathynomus* from Italy, attesting and backdating the presence of the genus in the early Oligocene Proto-Mediterranean.

R e m a r k s : PASINI & GARASSINO (2012) reported also *Palaega picena* from the Miocene of the Apennine Mountains. This species, for its size and shape, could be better accommodated in *Bathynomus*, suggesting the possible presence of the genus in the Mediterranean Basin during the Miocene (see discussion in HYŽNÝ et al. 2019: 295). If confirmed, this record would attest an uninterrupted presence of *Bathynomus* in the Mediterranean Basin from the early Oligocene to the early Pleistocene.

A c k n o w l e d g e m e n t s

We wish to thank B. RATTAZZI (Fondazione Luigi, Cesare e Liliana Bertora; Museo Paleontologico di Crocefieschi, Genova) for the permission to study the specimen, providing useful information on the Parogna outcrop; and M. HYŽNÝ, Department of Geology and Paleontology, Faculty of Natural History, Comenius University, Bratislava, Slovakia, and G. SCHWEIGERT, Staatliches Museum für Naturkunde, Stuttgart, Germany, for careful reviews and suggestions.

5. References

- AMMON, L. v. (1882): Ein Beitrag zur Kenntniss der fossilen Asseln. – Sitzungsberichte der Königlich Bayerischen Akademie der Wissenschaften, Mathematisch-Physikalische Classe, **12**: 507–551.
- BRUCE, N. L. (1986): Cirolanidae (Crustacea: Isopoda) of Australia. – Records of the Australian Museum, **6** (Supplements): 1–239.
- DANA, J. D. (1852): On the Classification of the Crustacea Choristopoda or Tetracapoda. – American Journal of Science and Arts, **14**: 297–316.
- ETTER, W. (2014): A well-preserved isopod from the Middle Jurassic of southern Germany and implications for the isopod fossil record. – Palaeontology, **57**: 931–949.
- HYŽNÝ, M., BRUCE, N. I. & SCHLÖGL, J. (2013): Appraisal of the fossil record for the Cirolanidae (Malacostraca: Peracarida: Isopoda: Cymothoidea), with a description of a new cirolanid isopod crustacean from the early Miocene of the Vienna Basin (Western Carpathians). – Palaeontology, **56**: 615–630.
- HYŽNÝ, M., PASINI, G. & GARASSINO, A. (2019): Supergiants in Europe: on the cirolanid isopod *Bathynomus* A. MILNE EDWARDS, 1879 (Malacostraca, Peracarida) from the Plio-Pleistocene of Italy. – Neues Jahrbuch für Geologie und Paläontologie, Abhandlungen, **291** (3): 283–298.
- KOU, Q., CHEN, J., LI, X., HE, L. & WANG, Y. (2017): New species of the giant deep-sea isopod genus *Bathynomus* A. Milne Edwards, 1879 (Crustacea, Isopoda, Cirolanidae) from Hainan Island, South China Sea. – Integrative Zoology, **12**: 283–291.
- LATREILLE, P. A. (1817): Les crustacés, les arachnides et les insectes. – In: CUVIER, G. (ed.): Le règne animal distribué d'après son organisation, pour servir de base à l'histoire naturelle des animaux et d'introduction à l'anatomie comparée. Paris (Deterville).
- LOWRY, J. K. & DEMPSEY, K. (2006): The giant deep-sea scavenger genus *Bathynomus* (Crustacea, Isopoda, Cirolanidae) in the Indo-West Pacific. – In: RICHER DE FORGES, B. & JUSTONE, J.-L. (eds.): Tropical Deep-Sea Benthos, volume 24. – Mémoires du Muséum national d'Histoire naturelle, **193**: 163–192.
- MAGALHÃES, N. & YOUNG, P. (2003): *Bathynomus* A. MILNE EDWARDS, 1879 (Isopoda, Cirolanidae) from the Brazilian coast, with description of a new species. – Arquivos do Museu Nacional, Rio de Janeiro, **61**: 221–239.
- MILNE-EDWARDS, A. (1879): Sur un isopode gigantesque des grandes profondeur de la mer. – Comptes rendus hebdomadaires des Séances de l'Académie des Sciences, **88**: 21–23.
- ORTMANN, A. (1894): A new species of the isopod-genus *Bathynomus*. – Proceedings of the National Academy of Science, Philadelphia, **1894**: 191–193.
- PASINI, G. & GARASSINO, A. (2012): *Palaega picena* n. sp. (Crustacea, Isopoda, Cirolanidae) from the Miocene of Arcevia, Ancona (Marche, Central Italy). – Atti della Società italiana di Scienze naturali e del Museo civico di Storia naturale in Milano, **153** (1): 21–26.
- RISTORI, G. (1891): Contributo alla fauna carcinologica del Pliocene italiano. – Atti della Società Toscana di Scienze Naturali, **2**: 3–18.
- SHIPLEY, O. N., BRUCE, N. L., VIOLICH, M., BACO, A., MORGAN, N. & RAWLING, S. (2016): A new species of *Bathynomus* MILNE EDWARDS, 1879 (Isopoda, Cirolanidae) from The Bahamas, Western Atlantic. – Zootaxa, **4147** (1): 82–88.

- VERCESI, P. L. & PEROTTI, C. (2016): Note illustrative alla Carta Geologica d'Italia 1:50000, Foglio 178 Voghera. – ISPRA, Servizio Geologico d'Italia.
- WÄGELE, J. W. (1989): Evolution und phylogenetisches System der Isopoda. Stand der Forschung und neue Erkenntnisse. – *Zoologica*, **140**: 1–262.

Addresses of the authors

ALESSANDRO GARASSINO (corresponding author), Research Adjunct, Department of Earth and Biological Sciences, Loma Linda University, Loma Linda, CA 92354, U.S.A.; e-mail: aegarassino@gmail.com

GIOVANNI PASINI, Via Alessandro Volta 16, 22070 Appiano Gentile (Como), Italy; e-mail: giovannialdopasini@gmail.com

Manuscript received: 2 July 2019, revised version accepted: 5 July 2019.