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Palaega picena n. sp. (Crustacea, Isopoda, Cirolanidae) from the Miocene of Arcevia, Ancona (Marche, Central Italy)

Abstract - We report a new form of cirolanid ascribed to *Palaega picena* n. sp. (Crustacea, Isopoda, Cirolanidae) from the Miocene of Arcevia, Ancona (Marche, Central Italy). This is the second species of *Palaega* Woodward 1870, reported from the Miocene of Italy, increasing the sparse knowledge and distribution of this genus in the paleo-Mediterranean basin.

Key words: Crustacea, Isopoda, Cirolanidae, Miocene, Central Italy.

Riassunto - *Palaega picena* n. sp. (Crustacea, Isopoda, Cirolanidae) del Miocene (Cenozoico) di Arcevia, Ancona (Marche, Italia centrale).

Viene descritta una nuova forma di cirolanide ascritta a *Palaega picena* n. sp. (Crustacea, Isopoda, Cirolanidae) del Miocene di Arcevia, Ancona (Marche, Italia centrale). Si tratta della seconda specie di *Palaega* Woodward, 1870 segnalata nel Miocene italiano, incrementando le scarsissime conoscenze del genere e la sua distribuzione nel bacino paleo-Mediterraneo.

Parole chiave: Crustacea, Isopoda, Cirolanidae, Miocene, Italia centrale.

Introduction and geological setting

The previous report of fossil isopods from the Miocene of Italy is limited to two very old records by Sismonda (1846) and Andrussow (1886). The first author briefly described a single incomplete isopod assigned to *Sphaeroma gastaldii* Sismonda, 1846, from the Miocene Molassa Fm. of the Torino hill (Piemonte, N Italy). The second species, assigned to *Palaega anconaetana* Andrussow, 1886, comes from the Miocene Schlier Fm. of the Ancona outcrop (Marche, Central Italy), and consists in an incomplete posterior mould and a small fragmentary pleotelson (Andrussow, 1886, Pl. VII, figs. 18, 19). The studied specimen was casually collected near the Arcevia village, located at the bottom of the Appennino Mounts, about 50 km western of the Ancona (Marche, Central Italy), during road works that

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expose grey clays of various lithofacies, pertaining to different formations of the Miocene succession (Carta Geologica Regionale, CTR , Sez. 291080 – Piticchio, 1:10,000). Summarizing, these layers belong in part to the marine Schlier Fm., with a succession of epi-mesopelagic deposits, suggesting a depth between 200 and 1,000 meters maximum; and in part to different environments of muddy hills and underwater planes with scarce, macrofauna remains (De Feyter *et al.*, 1987). The associated fauna is almost absent, limited to some carbonized plant stem remains, and a disarticulated shell of a small indeterminate bivalve. (Silvi, pers. comm., 2010). The specimen presents some encrustations by iron sulphides around the body, notably on the right posterior margin of the pleotelson, evidence of possible anoxic conditions in the environment. No more geological or paleontological data are available for this locality; on this basis we assign the specimen to the Miocene, in generic terms.

Material

One single tridimensional specimen in dorsal view, crushed dorsoventrally, consisting of a posterior mould, lacking part of the cuticle and preserved in a small block (about 8 x 10 mm) of an unlaminated grey clay rock. Partial mineralization of iron sulphides is present, covering partially the original right outline of the caudal shield. The specimen was partially hand prepared on the left side to observe the delicate structure of the body rings and the outline of the pleotelson and, finally, fixed only with a film of polyvinyl acetate for preservation. The studied specimen is housed in a private collection (N° 34) as reported by the protocol n. 247 of 10.01.2000 of the Soprintendenza Archeologica per le Marche.

The systematic paleontology used in this paper follows the recent classification proposed by Brandt and Poore (2003).

Systematic Palaeontology

Order Isopoda Latreille, 1817
Suborder Cymathoidea Wägele, 1989
Family Cirolanidae Dana, 1852
Genus *Palaega* Woodward, 1870

Type species: *Palaega carteri* Woodward, 1870, by original designation.

Fossil species: for an updated list see Feldmann & Goolaerts (2005), Poltz *et al.* (2006) and Pasini & Garassino (2011 a, b).

Note: for a full discussion on the genus see Feldmann & Goolaerts (2005), and Pasini & Garassino (2011a, b).

Palaega picena n. sp.
Figs. 1, 2

Diagnosis: pleurae of pereonites longer than pleonites, ending with elongate pointed spines; pleonites slightly tapering posteriorly, with shorter pleonite 5; epimeres of pleonites shorter than pereonites; abdominal segments slightly tapering posteriorly; subrectangular pleotelson, rounded posteriorly, broader than long with

subtriangular, smooth, elongate, V-shaped central bugle, more carinate on the central axial part; no evident spine or denticulation along the posterior margin.

Etymology: the trivial name alludes to the Picenum, ancient name in Latin language of the Italian County who includes the Marche Region (Central Italy).

Holotype: private collection (N° 34).

Geological age: Miocene.

Type locality: Arcevia, Ancona (Marche, Central Italy).

Occurrence and measurements: one single incomplete specimen. N° 34 - total length: 33 mm; maximum width: 20 mm.

Description. Small sized cirolanid consisting of a posterior mould preserving articulated pereonite 6 and 7, about equal in length (20 mm); well-preserved, articulated five pleonites, with the nearly complete pleotelson. Body slightly flattened medially, moderately convex on both sides, partially broken along the lateral right margin. Small portions of the epicuticle are present along the body. Elongate epimeres of pereonite 6, 7, pointed posteriorly, overlap one another. Pereonite 6 completely exposed: slightly translated forward, slightly rounded dorsally, laterally directed toward, and posterior part with pointed, acute long epimeres. Pereonite 7 about equal in size, partially covered by pereonite 6. Five free pleonites, about 1/3 in width than pereonites (width about 2.6 mm), exposed dorsally, more complete

Fig. 1 - *Palaega picena* n. sp. Holotype/Olotipo, N° 34. General view./Visione d'insieme. (x 3).

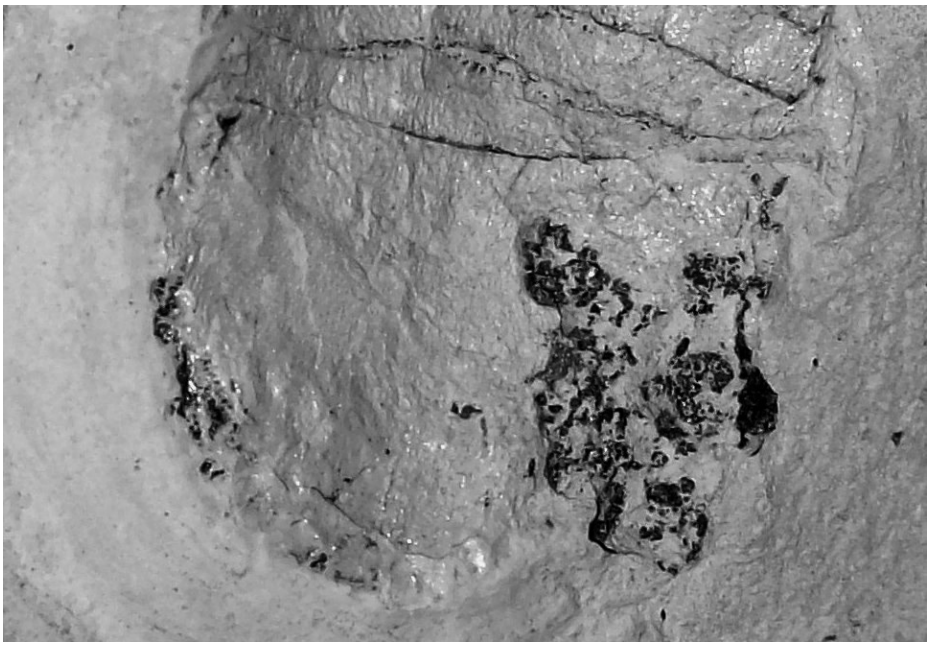

Fig. 2 - *Palaega picena* n. sp. Holotype/Olotipo, N° 34. Detail of the pleotelson./Dettaglio del pleotelson. (x 4.5).

on the left margin; subparallel to one another, slightly convex medially, with triangular pointed epimeres shorther than the anterior ones and directed toward, ranged parallels to the axial midline of the body; all tapering slightly posteriorly. Pleonite 5 shorter (length: 18 mm) and more compressed (width: 1.7 mm) than 2-4, partially covered on the right margin by pleonite 4, with straight posterior articulation with pleotelson. Subrectangular pleotelson crushed (length: about 13 mm; width: 18 mm), gently rounded posteriorly, wider than long, slightly wider than total five pleonites; slightly convex in section with a central subtriangular bulge forming a smooth flattened axial medial costa, decreasing posteriorly. Convex posterior margin, flattened along the margins, without evident tracks of spines or denticles. Only part of the epicuticle, is preserved, primarily on pereonites and the pleotelson, ornamented by small, sparse granulation. The endocuticle is ornamented by short striae oriented parallel or transverse to the medial axis, alternated by some irregular pits, more evident along the margins of the pleonites and on the pleotelson.

Discussion. *Palaega picena* n. sp. can be compared with the type species *Palaega carteri* Woodward, 1870, from the Cretaceous of England, and with the two other species from the Miocene, *Palaega anconaetana* Andrussow, 1886, from Italy the species was erroneously reported from Russia by Feldmann & Rust (2006, 412. Tab. 1), and *Palaega undecimspinosus* Karasawa, Nobuara & Matsuoka, 1992, from Japan. According to Feldmann & Rust (2006), *Sphaeroma gastaldii* [reported as *Palaega gastaldii* by Fabiani (1910)], doesn't show the typical characters of the genus *s. str.*, and it should be not referred to *Palaega*. In any event, this species differs notably in the diagnostic characters and the general form from *P. picena* n. sp.

Palaega anconaetana has more similar characters on the abdominal regions, body size and proportions, but differs from *P. picena* n. sp. in having pereonite 7 similar to pleonite 1 in width. Flat subrectangular narrow and slender pleotelson, with straight lateral margins tapering toward the posterior part, and an acute spine along the posterior margin. Lacking the soft central triangular bulge, the pointed epimeres on pereonites and pleonites and in the different ornamentation characterized by close ranged pits. Due to the incomplete preservation of the two species and in the impossibility to study directly Andrussow's material (?lost), we believe, on the basis of the original description, that the differences described between the two taxa are adequate to justify the attribution to a new species for the studied specimen, more than to speculate on a possible sexual dimorphism in a fossil form.

Palaega undecimspinosus differs from *P. picena* n. sp. in having longer pleurae directed postero-laterally, strong distal keel and a spinose pleotelson.

Finally *P. carteri* differs from *P. picena* n. sp. in the pleotelson having nine posterior spines on the type species.

Finally we remark that the two specimens, strictly ascribed to *Palaega* (*P. anconaetana* and *P. picena* n. sp.), from the Italian Miocene, becomes from deep water sediments, supporting the observations previously reported on the species from the Italian Pliocene by Pasini & Garassino (2011 a, b). This environmental preference partially confirms the environmental behavior of the genus, at least regards the scarce fossil species known to date from the paleo Mediterranean Basin.

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