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First record of Oligocene retroplumid crab (Crustacea: Decapoda: Brachyura) from Italy

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Abstract

Retropluma sp. cf. *R. eocenica* Via Boada, 1959, a crab of the family Retroplumidae Gill, 1894 from the Oligocene of the Tertiary Piedmont Basin (north-western Italy) is described. *Retropluma* Gill, 1894, actually composed of six species living in the Indo-Pacific area, appeared during the Eocene in the western Tethys with *R. eocenica* Via Boada, until to now known only from the Eocene of Spain and Italy. Besides of *R. eocenica, Retropluma* is reported in the fossil record only by *R. craverii* (Crema, 1895) from the Pliocene of Turin Hill (NW Italy). The present specimen represents not only the first record of *Retropluma* collected from the transitional layers between the Molare Formation and the Rigoroso Marls (NW Italy), but also the first record of retroplumid from the Oligocene.

Key words: Crustacea, Brachyura, Retroplumidae, Oligocene, Rupelian, north-western Italy

Riassunto

Viene descritto un esemplare di *Retropluma* sp. cf. *R. eocenica* Via Boada, 1959, crostaceo brachiuro della famiglia Retroplumidae Gill, 1894 proveniente dall'Oligocene del Bacino Terziario Piemontese (Italia nordoccidentale). Il genere *Retropluma* Gill, 1894, attualmente composto da sei specie viventi nell'area Indo-Pacifica, comparve nella Tetide occidentale durante l'Eocene con la specie *R. eocenica* Via Boada, 1959, rinvenuta, sino ad oggi, solamente nei depositi eocenici spagnoli e italiani. Oltre a *R. eocenica* il genere *Retropluma* era conosciuto allo stato fossile solamente per *R. craverii* (Crema, 1895) proveniente dal Pliocene della Collina di Torino (Italia nordoccidentale). *Retropluma* sp. cf. *R. eocenica*, proveniente dai livelli transizionali tra la Formazione di Molare e le Marne di Rigoros o (Rupeliano superiore), rappresenta la prima segnalazione del genere *Retropluma* e più in generale la prima segnalazione di un retroplumide nell'Oligocene.

Parole Chiave: Crustacea, Brachyura, Retroplumidae, Oligocene, Rupeliano, Piemonte

Introduction

The family Retroplumidae Gill, 1894, which was given its own superfamily Retroplumoidea Gill, 1894 by De Saint Laurent (1989), contains two genera, *Retropluma* Gill, 1894 and *Bathypluma* De Saint Laurent, 1989, occurring in the present seas. According to De Saint Laurent both genera in fact exhibiting unique characters in the abdomen and in the fronto-orbital region thus supporting the erection of a new superfamily, her opinion was accepted by Beschin et al. (1996) and Martin and Davis (2001). The superfamily Retroplumoidea, 1894, would have appeared during the Coniacian (Late Cretaceous) with *Costacopluma concava* Collins and Morris, 1975, in the Atlantic Area (Collins and Morris, 1975, Vega and Feldmann, 1992) and later widespread also in the Tethys, such as is suggested by the report of the Maastrichtian (Upper Cretaceous) of Zanskar (India: Gaetani et al., 1983).

Nevertheless the classification by De Saint Laurent (1989) has not been accepted by all authors. According to Vega and Feldmann (1992) the family Retroplumidae should include also the genera *Archeopus* Rathbun, 1908 and *Cristipluma* Bishop, 1983, excluded from the Retroplumoidea by De Saint Laurent (1989) and retroplumids should be included in the superfamily Ocypodoidea Rafinesque, 1815, as already classified by Glaessner (1969). According to Via Boada (1980, 1982) and Vega and Feldmann (1992) the family Retroplumidae (including for Via Boada also the genus *Ophthalmoplax* Rathbun, 1935, instead excluded by Vega and Feldm-

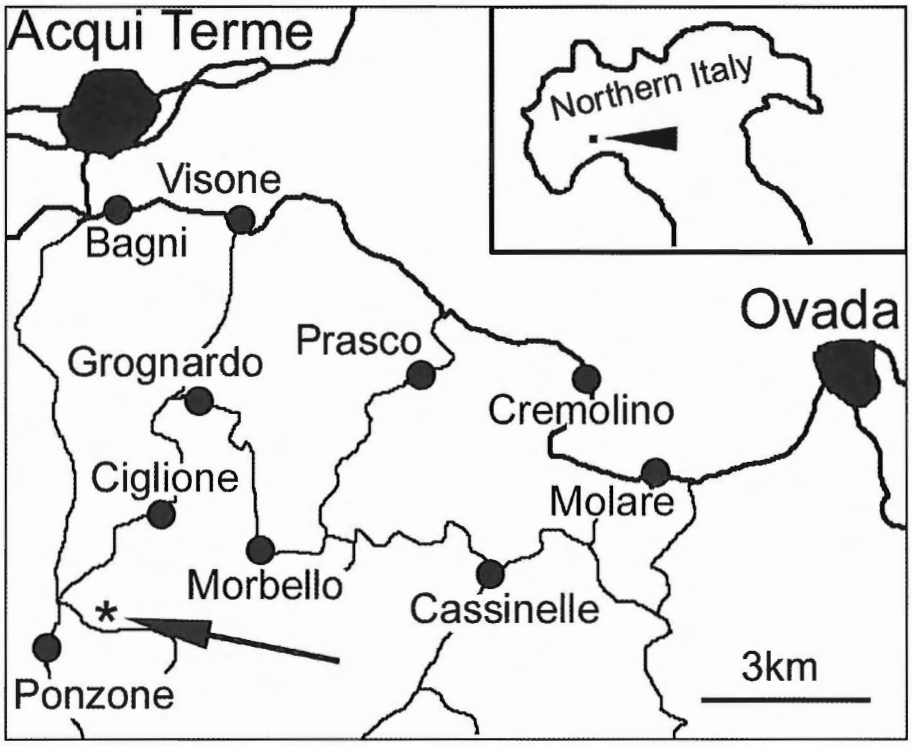


Fig 1. Map showing the fossil-bearing locality (see the arrow) near Ponzone.

ann), has appeared during the Early Cretaceous (Albian?) in America and later widespread in the Tethyan-Pacific seas.

According to De Saint Laurent (1989) the genus *Retropluma* is actually composed of six species living in the Indo-Pacific Oceans, *R. notopus* (the type species), *R. plumosa, R. denticulata, R. planiforma, R. serenei* and *R. quadrata. Retropluma* appeared in the western Tethys during the Early Eocene with *R. eocenica* Via Boada, 1959, reported from the Illerdian-Biarritzian levels (corresponding to Ypresian-Bartonian, Lower-Middle Eocene) in eastern Spain (Via Boada, 1959, 1969, 1980, 1982) and from the Lutetian (Middle Eocene) of Nogarole Vicentino and Arzignano (Vicenza, north-western Italy: Beschin et al., 1996). Until to now no species have been reported from Oligocene and Miocene levels and the only other fossil species, *R. craveri* (Crema, 1895), was reported from the Pliocene of the Turin Hill (north-western Italy: Crema, 1895, Via Boada, 1959).

The new specimen, attributed to *Retropluma* sp. cf. *R. eocenica* collected from the Oligocene levels of Ponzone (Piemonte, Italy: fig. 1), represents the first report of the genus but also the first record of the family from Oligocene levels.

Geological setting, fauna and age

The first works on Crustacea from the Oligocene levels of the Tertiary Piedmont Basin were those of Ristori (1886, 1889), most recent works are those of Mastrorilli (1974), Allasinaz (1987) Marangon and De Angeli (1997) and De Angeli and Marangon (2001).

The brachyurans come from the fossiliferous transitional layers between the "Formazione di Molare" (= Molare Formation) and the "Marne di Rigoroso" (= Rigoroso Marls, corresponding also to the "Formazione di Rocchetta" = Rocchetta Formation). These layers are a litozone, topographically located from Ovada to Moglia and Dego (Piemonte and Liguria, North-western Italy), which is part of the Oligo-Miocene transgressive sequence of the Tertiary Piedmont Basin.

In the transitional layers, besides the crustaceans, a very rich fauna of bivalves, gastropods, echinoids, bryozoans and large foraminifers (*Nummulites* and *Lepidocyclina*), together with plant remains can be collected.

Facies analysis and faunistic assemblages suggest for the upper levels of the Molare Formation still shallow water environments, near the coastal line, and suggest for the finest levels of the Rigoroso Marls deeper water conditions. The fossils are often included in nodular carbonate concretions, as the specimen herein described (fig. 3b) which is associated to fragments of chelipeds of indeterminable crabs (fig. 3c). According to Allasinaz (1987) the transitional layers are assigned to the *Operculina complanata* Zone of Bianco (1985) and Balossino and Bianco (1986), regarded as late Rupelian (Early Oligocene).

Systematics

Section Thoracotremata Guinot, 1977
Family Retroplumidae Gill, 1894
Genus *Retropluma* Gill, 1894

***Retropluma* sp. cf. *R. eocenica* Via Boada, 1959**
(Figs. 2, 3 a)

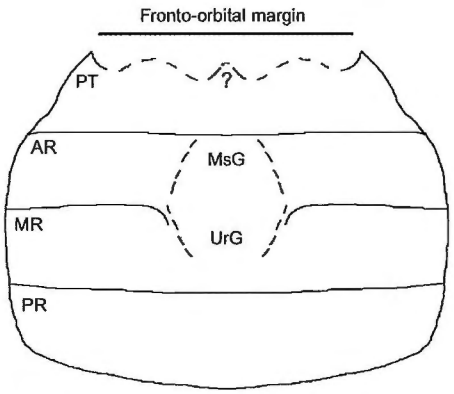


Fig. 2. *Retropluma* sp. cf. *R. eocenica* Via Boada, 1959, carapace reconstruction (×7): PT = postorbital tooth, AR = anterior ridge, MR = median ridge, PR = posterior ridge, MsG = mesogastric region, UrG = urogastric region.

Material examined: a small carapace (MSNMi26238), partially deformed and weathered, deposited in the collections of the Museo Civico di Storia Naturale di Milano.

Measurements: length = 6.4 mm, width = 8.8 mm, fronto-orbital margin = 5.6 mm.

Description: Carapace subrectangular in outline, wider than long (L/W = 0.7), widest in medial part of branchial regions. Fronto-orbital region narrow; fronto-orbital margin not well preserved, possibly sinuous with large postorbital tooth. Regions poorly defined. Dorsal surface with three sharp, rectilinear, transverse ridges, the median one interrupted in correspondence of meso- and urogastric regions and probably subparallel to the other two. Dorsal surface minutely granulated.

Remarks: Previously known fossil members of *Retropluma* include: *R. eocenica* Via Boada, 1959, *R. eocenica folgarolensis* Via Boada, 1980, and *R. craverii* (Crema, 1895). The ridges of *R.* sp. cf. *R. eocenica* seem less prominent than in *R. eocenica* and the median one subparallel to the other two, nevertheless these characters could depend by the bad preservation of the specimen. Only the discovery of new specimens coming from the same levels could permit to clarify these differences and eventually lead to the erection of a new species.

Retropluma craverii exhibits a most subquadrate outline (L/W = 0.9) and a less distinguishable median ridge, shows, similarly to many modern species, two robust nodes on the lateral ends of the anterior ridge. *Retropluma* sp. cf. *R. eocenica* is most similar to the extant *Retropluma denticulata* Rathbun, 1932, but differs in the more subquadrate outline (L/W = 0.8) and in the more tumid regions.

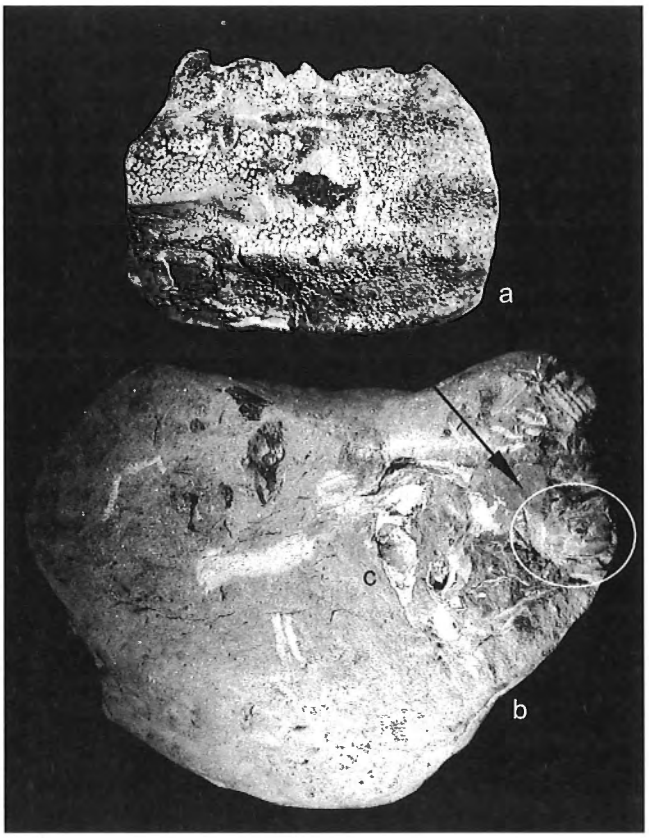


Fig. 3. a: *Retropluma* sp. cf. *R. eocenica* Via Boada, 1959 (MSNMi26238), × 7; b: nodular concretion with crabs remains, × 1.25; c: chelipeds of indeterminate crabs.

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References

Allasinaz, A. (1987), Brachyura Decapoda oligocenici (Rupeliano) del Bacino Ligure Piemontese. *Boll. Mus. Reg. Sci. Nat. Torino*, **5**(2), 509-566.

Balossino, P. and Bianco, P. (1986), Nota preliminare sulla biostratigrafia dell'area di Ponzone Cimaferle e Bandita (Piemonte SE). *Boll. Mus. Reg. Sci. Nat. Torino*, **4**(2), 469-481.

Beschin, C., Busulini, A., De Angeli, A. and Tessier, G. (1996), Retroplumoidea (Crustacea, Brachyura) nel Terziario del Vicentino (Italia settentrionale). *Lavori, Soc. Veneziana Sci. Nat.*, **21**, 83-102.

Bianco, P. (1985), Nota preliminare sulla biostratigrafia dell'area di Spigno Monferrato, Pareto e Mioglia (Alpi Liguri, Italia nord-occidentale).

Atti Acc. dei Lincei, Rend. fis., s. 8, **78**, 34-43.

Bishop, G. A. (1983), Fossil decapod crustaceans from the Late Cretaceous Coon Creek Tongue, Ripley Formation, Union County, Mississippi, *J. Crust. Biol.*, **3**, 417-430.

Collins, J. S. H. and Morris, S. F. (1975), A new crab *Costacopluma concava* from the Upper Cretaceous of Nigeria. *Palaeontology*, **18**(4), 823-829.

Crema, C. (1895), Sopra alcuni decapodi terziari del Piemonte. *Acc. Reale Sci. Torino*, **30**, 5-22.

De Angeli, A. and Marangon, S. (2001), *Paralbunea galatensis*, nuova specie di anomuro oligocenico del Bacino Ligure-Piemontese (Italia settentrionale). *Studi Trentini di Scienze Naturali - Acta Geologica*, **76**, 99-105.

Gaetani, M., Nicora, A., Premoli, Silva I., Fois, E., Garzanti, E. and Tintori, A. (1983), Upper Cretaceous and Paleocene in Zanskar Range (NW Himalaya). *Riv. Ital. Paleont. Stratigr.*, **89**, 81-118.

Gill, T. (1894), A new bassalian type of crabs. *Am. Nat.*, **28**, 1043-1045.

Glaessner, M. F. (1969), Decapoda. p. R399-R651. *In* R. C. MOORE (ed.), *Treatise on Invertebrate Paleontology. Part.* (*R*). *Arthropoda* 4. Geol. Soc. Am., Lawrence.

Marangon, S. and De Angeli, A. (1997), *Cherpiocarcinus*, nuovo genere di brachiuro (Decapoda) dell'Oligocene del Bacino Ligure-Piemontese (Italia settentrionale). *Lavori, Soc. Veneziana Sci. Nat.* **22**, 97-106.

Martin, J. W. and Davis, G. (2001), An updated classification of recent Crustacea. *Nat. Hist. Mus. Los Angeles County*, Science Series, **39**, 124 p.

Mastrorilli, V. I. (1974), Nota preliminare sui crostacei oligocenici dei dintorni di Ponzone (Acqui) contenuti nella collezione Briata. *Ann. Mus. Civ. St. Nat.* "*G. Doria*", **5** (211), 7 p.

Rathbun, M. J. (1908), Descriptions of fossil Crabs from California. *Proc. U. S. natn. Mus.* **35**, 341-349.

Rathbun, M. J. (1932), Preliminary descriptions of new species of Japanese crabs. *Proceed. Biol. Soc. Washington*, **45**, 29-38.

Rathbun, M. J. (1935), Fossil Crustacea of the Atlantic and Gulf Coastal Plain. *Geol. Soc. Am.*, Special Paper, **2**, 160 p.

Ristori, A. (1886), I crostacei Brachiuri e Anomuri del Pliocene italiano. *Boll. Soc. Geol. Ital.*, **5**, 93-129.

Ristori, A. (1889), I crostacei piemontesi del Miocene inferiore. *Boll. Soc. Geol. Ital.*, **7**, 397-412.

Saint Laurent, M. De (1989), La nouvelle superfamille des Retroplumoidea Gill, 1894 (Decapoda Bracyura): systématique, affinités et évolution, p. 103-179. *In* J. Forest (ed.), *Résultats des Campagnes Murostom, Volume* 5. *Mémoires, Mus. Nat. Hist. Nat.*, (A).

Vega, F. J. and Feldmann, R. M. (1992), Occurence of *Costacopluma* (Decapoda: Brachyura: Retroplumidae) in the Maastrichtian of Southern Mexico and its paleobiogeographic implications. *Ann. Carnegie Mus.*, **61**, 133-152.

Via Boada, L. (1959), Decapodos fosiles del Eoceno espanol. *Boll. Inst. Geol. Min. Espana*, **70**, 331-402.

Via Boada, L. (1969), Crustaceos Decapodos del Eoceno espanol. *Pirineos*, **91-94**, 479 p.

Via Boada, L. (1980), Ocypodoidea (Crustaces Decapodos) du Cenozoique mediterraneen. Origine et evolution de cette superfamille. *Ann. Paleont.* (Invert.), **66**, 51-66.

Via Boada, L. (1982), Nueva contribution al estudo paleontologico de la superfamilia Ocypodoidea (Crustaceos Decapodos). *Bol. Geol. Min.*, **93**, 115-119.

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