

Antonio De Angeli\*, Alessandro Garassino\*\* & Giovanni Pasini\*\*\*

*Retropluma craverii* (Crema, 1895)  
(Crustacea, Decapoda, Brachyura, Retroplumidae)  
from the Pliocene of Reggio Emilia (N Italy)

**Abstract** - We report two specimens of retroplumid crabs from the Pliocene of Reggio Emilia (N Italy), ascribed to *Retropluma craverii* (Crema, 1895), known to date only from the Pliocene of Piemonte. The re-examination of the holotype together with the good state of preservation of the studied specimens has allowed a re-description of this species, poorly known to date.

**Key words:** Crustacea, Decapoda, Brachyura, Pliocene, Italy.

**Riassunto** - *Retropluma craverii* (Crema, 1895) (Crustacea, Decapoda, Brachyura, Retroplumidae) del Pliocene di Reggio Emilia (N Italia).

Segnaliamo due esemplari di brachiuri retroplumidi del Pliocene di Reggio Emilia (N Italia), attribuiti a *Retropluma craverii* (Crema, 1895), conosciuta finora solo nel Pliocene del Piemonte. Il riesame dell'olotipo insieme al perfetto stato di conservazione degli esemplari studiati ha permesso una ridecrizione di questa specie, finora scarsamente conosciuta.

**Parole chiave:** Crustacea, Decapoda, Brachyura, Pliocene, Italia.

## Introduction

We report, for the first time, the presence of *Retropluma craverii* (Crema, 1895) from the Pliocene of Emilia Romagna (N Italy) based upon two well-preserved specimens that allow the re-description of this species. Previously, *R. craverii* was known only from the Pliocene of Piemonte (N Italy). Moreover, this discovery enlarges the number of crustacean species reported to date from Emilia Romagna and the knowledge on the distribution of this species in the palaeo-Adriatic Gulf during the Pliocene.

---

\* Museo "G. Zannato", Piazza Marconi 15, 36075 Montebelluna Maggiore (Vicenza), Italy;  
e-mail: antonio.deangeli@alice.it

\*\* Museo di Storia Naturale, Corso Venezia 55, 20121 Milano, Italy; e-mail: alegarassino@gmail.com

\*\*\* Museo Civico dei Fossili di Besano, Via Prestini 5, 21050 Besano (Varese), Italy;  
e-mail: juanaldopasini@tiscali.it

### Geological setting

The studied specimens were collected near Castellarano (Reggio Emilia, Emilia Romagna) where light blue clays crop out in an old, quarry abandoned. No detailed stratigraphic data are available for this deposit, belonging to the “Argille di Lugagnano” Formation (Cita *et al.*, 2006), but the lower circalittoral to epibathyal mollusc assemblage is generally comparable, with some few differences, to that from the near Campore outcrop (Parma, Emilia Romagna) from the Pliocene (Piacentian) (Ceregato *et al.*, 2007). Moreover, Bertolaso & Garilli (2009) suggested “an Early to early Middle Pliocene age could be prudentially assigned” to the Castellarano deposit.

Recently, Pasini & Garassino (2010) reported the presence of a single indeterminate *in situ* paguroid from the same deposit.

### Previous report of *Retropluma craverii* from the Pliocene of Italy

*Retropluma craverii* (Crema, 1895), known to date only from Piemonte, was described by Crema (1895) on the basis of one specimen from the late Pliocene (Piacentian) of Bra. The holotype (N° 3, catalogue fossil collection “Craveri”), housed in the Museo Civico “Craveri” di Storia Naturale (Bra - Piemonte) (Fig. 1) was perfunctorily described by the author who assigned it tentatively to *Goneplax* Leach, 1814. However, the presence of three transverse ridges on the dorsal surface of the carapace, reported in the original description, is a typical character of *Retropluma* Gill, 1894, to which, therefore, Crema’s species is now assigned (Vía Boada, 1969, 1980, 1982).

In consequence of the discovery of the retroplumid crabs from the Pliocene of Reggio Emilia, we have re-examined Crema’s holotype identifying some morphological characters, such as the very elongate and narrow rostrum, the wide orbito-frontal margin that is distinctly sinuous, ending with a well-developed tooth directed forward, and the dorsal surface of the carapace with three transverse ridges, similar to those present in the studied specimens that are assigned to *R. craverii*. So the good state of preservation of the holotype and of the studied specimens has allowed a re-description of this species, poorly known to date.



Fig. 1 - *Retropluma craverii* (Crema, 1895), Museo Civico “Craveri” di Storia Naturale, Bra, N° 3, Holotype/Olotipo.

## Material

The studied sample includes two specimens of retroplumid crabs housed in the Palaeontological Collections of the Museo di Storia Naturale, Milano (MSNM). The specimens have been ascribed to *Retropluma craverii* (Crema, 1895) (Retroplumidae Gill, 1894).

Measurements are given in millimetres (mm).

The systematic arrangement used in this paper follows the recent classification proposed by Schweitzer *et al.* (2010).

Abbreviations. cl: carapace length; cw: carapace width; wo-f: width of orbito-frontal margin; wf: width of frontal margin.

## Systematic Palaeontology

Infraorder Brachyura Linnaeus, 1758  
 Section Eubrachyura de Saint Laurent, 1980  
 Superfamily Retroplumoidea Gill, 1894  
 Family Retroplumidae Gill, 1894  
 Genus *Retropluma* Gill, 1894

Type species: *Archaeoplax notopus* Alcock & Anderson, 1894, by monotypy.

Included fossil species: *R. borealis* Fraaije, Hansen & Hansen, 2005; *R. craverii* (Crema, 1895); *R. eocenica* Vía Boada, 1959; *R. gallica* Artal, Van Bakel & Castillo, 2006, *R. laurentae* Collins, Lee & Noad, 2003.

### *Retropluma craverii* (Crema, 1895)

Figs. 2-4

- 1895 – *Goneplax? craverii* Crema; p. 675, Text-fig. 16  
 1929 – *Goneplax? craverii* Crema in Glaessner; p. 198  
 1969 – *Retropluma craverii* (Crema) in Vía Boada; p. 324, 326  
 1980 – *Retropluma craverii* (Crema) in Vía Boada; p. 2, 3, fig. 1  
 1982 – *Retropluma craverii* (Crema) in Vía Boada; p. 116, fig. 1  
 1996 – *Retropluma craverii* (Crema) in Beschin, Busulini, De Angeli & Tessier; p. 95  
 2003 – *Retropluma craverii* (Crema) in Larghi; p. 58, 59  
 2004 – *Retropluma craverii* (Crema) in Garassino & De Angeli; p. 45  
 2004 – *Retropluma craverii* (Crema) in Garassino, De Angeli, Gallo & Pasini; p. 255  
 2006 – *Retropluma craverii* (Crema) in De Angeli & Garassino; p. 52

**Emended diagnosis:** carapace subrectangular, flat; front very narrow with a very elongate, narrow, cylindrical rostrum; orbitofrontal margin wide, distinctly sinuous, ending with a well-developed tooth directed forward; carapace with three transverse ridges; two ridges parallel, and one in median position, straight, and divided into two parts.

**Geological age:** Pliocene.

**Occurrence and measurements:** two specimens in dorsal view of which one incomplete (MSNM i27524, i27525) from Castellarano (Reggio Emilia).

MSNM i27524: cl: 15; cw: 22; wo-f: 13; wf: 2

**Description.** Carapace subrectangular, weakly convex longitudinally, wider than long, almost flat in transverse section. Rostrum very elongate, narrow, cylindrical, and slightly spatulated in the proximal part. Supraorbital margin wide, sinu-

ous, with small, pointed supraorbital projection. Postorbital tooth well developed, directed forward. Anterolateral margin short and slightly concave. Frontal margin and lateral margins smooth. Posterolateral margin considerably longer and arched. Posterior margin gently rounded, rimmed, and distinctly broader than the orbitofrontal margin. Dorsal surface of carapace with three sharp-crested, smooth transverse ridges. Anterior ridge continuous, straight, parallel to anterior margin, crossing the entire dorsal surface. Median ridge slightly inclined, well developed at the lateral flanks only. Posterior ridge continuous, straight, parallel to the anterior one, located in the posterior regions. Entire surface of carapace smooth, regions weakly marked. Cervical groove weak, located between anterior ridge and median ridge, separating gastric regions from branchial ones. Distal part of cervical groove ornamented by a ridge of small aligned tubercles. Mesogastric region with two blunt tubercles. All segments of chelipeds with finely granulate, imbricate ridges. Palm

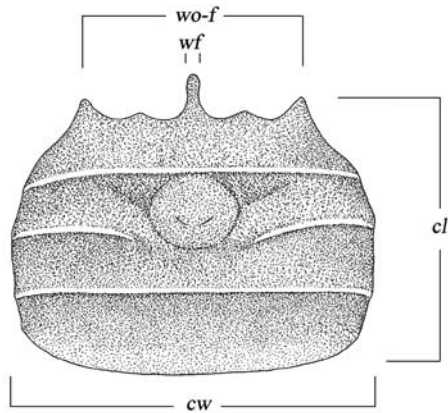


Fig. 2 - *Retropiuma craverii* (Crema, 1895), Reconstruction of the carapace. / Ricostruzione del carapace.



Fig. 3 - *Retropiuma craverii* (Crema, 1895), MSNM i27524 (x 2.5).

of chelipeds subrectangular. Movable and fixed fingers slightly curved downward, with smooth occlusal margins. All segments of walking legs with finely granulate, imbricate ridges. Walking legs 2-4 achelate, with same length, dactyli long, slender. Walking leg 5 and abdomen unknown.

**Discussion.** *Retropluma* Gill, 1894, is known in the fossil record from four species, *R. borealis* Fraaije, Hansen & Hansen, 2005 (Miocene - Denmark), *R. eocenica* Via Boada, 1959 (Eocene - Spain and Italy), *R. gallica* Artal, Van Bakel & Castillo, 2006 (Eocene - Spain and France), and *R. laurentae* Collins, Lee & Noad, 2003 (Miocene - Sabah, Federation of Malaysia) (Via Boada, 1959; Collins *et al.*, 2003; Fraaije *et al.*, 2005; Artal *et al.*, 2006). *Retropluma craverii*, the most recent species of the genus in the fossil record, is distinguished from the other species essentially on two characters; the very elongate, narrow, cylindrical rostrum slightly spatulated in the proximal part, and the anterior and continuous, straight, and parallel posterior ridges.

### Conclusion

The Retroplumidae includes *Archaeopus* Rathbun, 1908, *Bathypium* de Saint Laurent, 1989, *Costacopluma* Collins & Morris, 1975, *Cristipluma* Bishop, 1983, *Loerentheyia* Beurlen in Lörenthey & Beurlen, 1929, *Loerenthopluma* Beschin, Busulini, De Angeli & Tessier, 1996, *Retrocypoda* Via Boada, 1959, and *Retropluma* Gill, 1894, to which belong species from the Late Cretaceous to Recent.




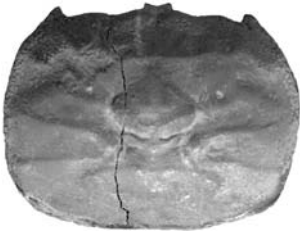
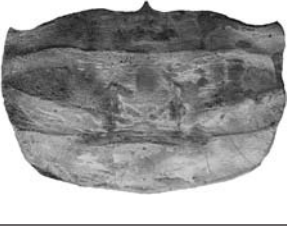
The extant species, belonging to *Bathypium* and *Retropluma*, live in the Indo-Pacific from muddy or sandy bottoms spanning the depth from 50-600 m (de Saint Laurent, 1989; McLay, 2006).

The retroplumids are known in the Italian fossil record with three genera and five species from the Cenozoic (Tab. 1).



Fig. 4 - *Retropluma craverii* (Crema, 1895), MSNM i27525 (x 2.5).

Tab. 1 - Geological distribution of the Retroplumoidea of Italian Cenozoic. / Distribuzione geologica dei Retroplumoidea del Terziario italiano. *Retropluma craverii* (Crema, 1895); *Retropluma* n. sp., MSNM i2688 (from Marangon & De Angeli, 2007, modified/modificato); *R. eocenica* Via Boada, 1959, MCZ 1478; *Retrocypoda almelai* Via Boada, 1959, MCZ 1475; *Loerenthopluma lata* Beschin, Busulini, De Angeli & Tessier, 1996, MCZ 1476 (from Beschin *et al.*, 1996, modified/modificato).

PLIOCENE	 <i>Retropluma craverii</i>	
MIOCENE		
OLIGOCENE	 <i>Retropluma</i> n. sp.	
EOCENE	 <i>Retropluma eocenica</i>	 <i>Retrocypoda almelai</i>   <i>Loerenthopluma lata</i>

*Retropluma eocenica* Vía Boada, 1959, and *Retrocypoda almelai* Vía Boada, 1959, were described from the middle Eocene (Lutetian) of Chiampo Valley (Vicenza) (Beschin *et al.*, 1996); *Loerenthopluma lata* Beschin, Busulini, De Angeli & Tessier, 1996, from the middle Eocene (Lutetian) of “Rossi” quarry of Monte di Malo (Vicenza) (Beschin *et al.*, 1996); *Retropluma* cf. *R. eocenica* and *Retropluma* n. sp. are known from the early Oligocene (Rupelian) of Bacino Ligure Piemontese (Larghi, 2003; Marangon & De Angeli, 2007, in press) and *R. craverii* (Crema, 1895) described from the Pliocene of Bra (Piemonte) and Reggio Emilia (Emilia Romagna).

The presence of fossil retroplumids in Italy is very important for the stratigraphic distribution of this family. *Retrocypoda* has known with the type species *R. almelai* Vía Boada, 1959, from the middle Eocene of Spain and Italy; *Loerenthopluma* has known with the type species *L. lata* from the middle Eocene of Italy and Oligocene of Hungary and *L. danielae* van Bakel, Artal, Fraaije & Jagt, 2010, from the lower Eocene of Belgium (Hyžny & Müller, 2010; van Bakel *et al.*, 2010) and *Retropluma*, widespread from the Eocene-Pliocene in Europe, is at present known with seven extant Indo-Pacific species (Ng *et al.*, 2008).

### Acknowledgements

We wish to thank L. Bertolaso, Società Reggiana di Scienze Naturali, Reggio Emilia, for useful collaboration and information on stratigraphy, geology, and faunal assemblage of the outcrops, R. Brancato and L. Garombo, Museo Civico “Craveri” di Storia Naturale, Bra, for the useful information regards the holotype of *R. craverii*, and R. M. Feldmann, Kent State University, Ohio, for careful review and criticism.

### References

- Artal P., Van Bakel B. W. M. & Castello J., 2006 – *Retropluma* Gill, 1894 (Crustacea, Decapoda) from the Eocene of the eastern Pyrenees (Spain, France). *Cainozoic Research*, 5 (1-2): 65-71.
- Bakel B. W. M. van, Artal P., Fraaije R. H. B. & Jagt J. W. M., 2010 – *Loerenthopluma danielae*, a new crab (Decapoda, Brachyura, Retroplumidae) from the lower Eocene of northwest Belgium. *Crustaceana Monographs*, Leiden, 11: 41-49.
- Bertolaso L. & Garilli V., 2009 – Description of *Aclis aurisparva* n. sp. (Gastropoda, Aclididae) from the Pliocene of Emilia Romagna (N. Italy). *Bollettino della Società Paleontologica Italiana*, Modena, 48 (1): 15-19.
- Beschin C., Busulini A., De Angeli A. & Tessier G., 1996 – *Retroplumoidea* (Crustacea, Brachyura) nel Terziario del Vicentino (Italia settentrionale). *Lavori - Società Veneziana di Scienze Naturali*, Venezia, 21: 83-102.
- Ceregato A., Raffi S. & Scarponi D., 2007 – The circolittoral/bathyal paleocommunities in the middle Pliocene of Northern Italy. The case of the *Korobkovia oblonga-Jupiteria concava*. *Geobios*, Lyon, 40 (59): 555-572.
- Cita Sironi M. B., Abbate E., Balini M., Conti M. A., Germani D., Groppelli G., Manetti P. & Petti M. N., 2006 – Catalogo delle formazioni. Unità tradizionali. Carta Geologica d’Italia 1:50000. Quaderni, serie III, 7 (VII).
- Collins J. S. H., Lee C. & Noad J., 2003 – Miocene and Pleistocene crabs (Crustacea, Decapoda) from Sabah and Sarawak. *Journal of Systematic Palaeontology*, 1 (3): 187-226.
- Crema C., 1895 – Sopra alcuni decapodi terziario del Piemonte. *Atti della Reale Accademia di Scienze di Torino*, Torino, 30: 664-681.

- Fraaije R., Hansen J. & Hansen T., 2005 – Late Miocene decapod fauna from Gram, Denmark. *Palaeontos*, Antwerpen, 7: 51-61.
- Hyžny M. & Müller P. M., 2010 – *Loerenthopluma* Beschin, Busulini, De Angeli, & Tessier, 1996 (Decapoda, Brachyura, Retroplumidae) from the Oligocene of Hungary. *Atti della Società italiana di Scienze naturali e del Museo civico di Storia naturale in Milano*, Milano, 151 (2): 123-134.
- Larghi C., 2003 – First record of Oligocene retroplumid crab (Crustacea: Decapoda: Brachyura) from Italy. *Bulletin of the Mizunami Fossil Museum*, Mizunami, 30: 57-60.
- McLay C. L., 2006 – Retroplumidae (Crustacea, Decapoda) from the Indo-Malayan Archipelago (Indonesia, Phillipine) and the Melanesian arc Islands (Solomon Islands, Fiji and new Caledonia), and paleogeographical comments. In: Tropical Deep-Sea Benthos vol. 24. Richer de Forges B. & Justine J.-L. (eds.). *Mémoire du Muséum national d'Histoire naturelle*, Paris, 193: 375-391.
- Marangon S. & De Angeli A., 2007 – New decapod assemblage from the lower Oligocene (Rupelian) of Bacino Ligure Piemontese (NW Italy). In: 3<sup>rd</sup> Symposium on Mesozoic and Cenozoic Decapod Crustaceans. Museo di Storia Naturale di Milano, May 23-25, 2007. *Memorie della Società italiana di Scienze naturali e del Museo civico di Storia naturale di Milano*, Milano, 35 (2): 73-75.
- Marangon S. & De Angeli A., in press – New decapod assemblage from the lower Oligocene of Bacino Ligure Piemontese (NW Italy). *Atti della Società italiana di Scienze naturali e del Museo civico di Storia naturale di Milano*, Milano.
- Ng P. K. L., Guinot D. & Davie P. J. F., 2008 – Systema Brachyurorum: Part I. An annotated checklist of extant brachyuran crabs of the world. *The Raffles Bulletin of Zoology*, Singapore, Supplement 17: 1-286.
- Pasini G. & Garassino A., 2010 – *In situ* hermit crabs (Crustacea, Anomura, Paguroidea) from the Pliocene of Parma and Reggio Emilia (Emilia Romagna - N Italy). *Atti della Società italiana di Scienze naturali e del Museo civico di Storia naturale in Milano*, Milano, 151 (1): 105-116.
- Saint Laurent de M., 1989 – La nouvelle superfamille des Retroplumoidea Gill, 1894 (Decapoda, Brachyura): systématique, affinités et évolution. In: Résultats des Campagnes Musorstom, 5. Forest J. (ed.). *Mémoire du Muséum national d'Histoire naturelle*, Paris, A, 144: 103-179.
- Schweitzer C. E., Feldmann R. M., Garassino A., Karasawa H. & Schweigert G., 2010 – Systematic List of Fossil Decapod Crustacean Species. *Crustaceana*, Leiden, Monograph 10.
- Vía Boada L., 1959 – Décapodos fósiles del Eoceno español (Resumen - avance de la tesis doctoral). *Boletín del Instituto Geológico y Minero de España*, 70: 313-402.
- Vía Boada L., 1969 – Crustacéos Decápodos del Eoceno español. *Piriñeos*, Barcellona.
- Vía Boada L., 1980 – Ocy-podoidea (Crustacés Décapodos) du Cénozoïque méditerranéen. Origine et évolution de cette superfamille. *Annales de Paléontologie (Invertébrés)*, Paris, 66 (1): 51-66.
- Vía Boada L., 1982 – Nueva contribución al estudio paleontológico de la superfamilia Ocy-podoidea (Crustáceos Decápodos). *Boletín Geológico y Minero*, 93 (2): 115-119.

Ricevuto: 1 marzo 2010

Approvato: 23 marzo 2010