

LOERENTHOPLUMA DANIELAE, A NEW CRAB (DECAPODA,
BRACHYURA, RETROPLUMIDAE) FROM THE LOWER
EOCENE OF NORTHWEST BELGIUM

BY

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ABSTRACT

A new species of retroplumid crab, *Loerenthopluma danielae*, is described from the Egemkapel Clay Member (Tielt Formation; lower Eocene, Ypresian) at the Ampe sand and clay pit near Egem, northwest Belgium. It is characterized by prominent outer orbital spines, wide orbits and a narrow, spatulate rostrum.

RÉSUMÉ

Une nouvelle espèce de crabe Retroplumidae, *Loerenthopluma danielae*, est décrit des argiles de Egemkapel (Formation de Tielt; Eocène inférieur, Yprésien), de la carrière d'argile et de sable d'Ampe près de Egem, au nord-ouest de la Belgique. Ce nouveau crabe est caractérisé par des épines orbitales externes proéminentes, des orbites larges et un rostre étroit et spatulé.

INTRODUCTION

Paleogene and Neogene crustaceans are fairly common in Belgium (see Van Bakel et al., 2006; Jagt et al., 2007). A number of new taxa have been described

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subsequently (Fraaije et al., 2007; Van Bakel et al., 2009a, b). The Ampe sand and clay pit near Egem (West-Vlaanderen province), where specimens are commonly collected as a “by-product” of screening and wet sieving of sediment for shark teeth, has yielded the richest crustacean fauna. So far, only a single species from this locality, *Upogebia lambrechtsi* Fraaije, Van Bakel, Jagt & Coole, 2007, has been described and formally named (Fraaije et al., 2007). Associated lobsters and crabs are *Hoploparia* sp., *Linuparus scyllariformis* (Bell, 1857), *Silvacarcinus laurae* Collins & Smith, 1993, *Glyphithyreus wetherelli* (Bell, 1858), *Raninoides gottschei* (Böhm, 1928), *Goniochele* n. sp., *Cyclocorystes* cf. *pulchellus* (Bell, 1858), and *Orthakrolophos* n. sp. A new genus and species of stomatopod is also represented. Here we describe a new retroplumid, *Loerenthopluma danielae* n. sp., based on a dozen well-preserved specimens.

Two extant and six fossil genera are currently recognized in the primitive eubranchyuran family Retroplumidae (cf. Beschin et al., 1996; Feldmann & Portell, 2007: 90; Ng et al., 2008: 181). The type genus, *Retropluma* Gill, 1894, first occurs in the early Eocene and continues to the present. Its fossil representatives appear to have preferred soft-bottom shelf settings (Artal et al., 2006: 65).

One of the Egem specimens retains a well-preserved ventral side with sternites, abdomen, and pereopods; this was prepared using a technique applied and described as “negative preparation” by Collins & Jakobsen (2004: 67). The crab remains, inclusive of the cuticle, were removed with pneumatic tools and finally with a sharp needle. The remaining cavity was filled with silicone rubber, which resulted in a detailed cast. It is, thus, possible to examine fragile details such as the thin pereopods, including the reduced P5, which normally are not preserved in fossils. Specimens were darkened with black water colour and subsequently coated with ammonium chloride prior to photography.

SYSTEMATIC PART

Abbreviations used to denote the repository of specimens referred to in the text are as follows: MAB, Oertijdmuseum De Groene Poort, Boxtel, Netherlands; MGSB, Museo Geológico del Seminario de Barcelona, Barcelona, Spain.

Infraorder BRACHYURA Linnaeus, 1758
Section EUBRACHYURA de Saint Laurent, 1980
Superfamily RETROPLUMOIDEA Gill, 1894
Family RETROPLUMIDAE Gill, 1894

Genus **Loerenthopluma** Beschin, Busulini, De Angeli & Tessier, 1996

Type species. — *Loerenthopluma lata* Beschin, Busulini, De Angeli & Tessier, 1996, by original designation.

Emended diagnosis. — Small-sized carapace (width ranging between 7 and 32 mm), subrectangular in outline; orbitofrontal margin notably broad, distinctly sinuous; orbits wide; rostrum narrowing posteriorly; 3 transverse ridges cross the entire carapace surface, anterior one slightly sinuous, median ridge defined by 2 markedly straight, oblique crests interrupted by broad urogastric lobe, posterior one discontinuous on account of shallow branchiocardiac grooves, with median portion displaced posteriorly. Sternum broad, sternites 5-7 crossed by well-developed oblique ridges, sternite 8 extremely reduced; abdominal cavity deep, border well defined, male abdomen triangular, narrow, with all pleomeres free, transversely ridged, telson elongate; abdominal holding represented by moderate projection on sternite 5, salient posterior portion of pleomere 6; pereopods 5 strongly reduced.

Remarks. — The genus is considered to be close to *Retropluma*, which ranges from the lower Eocene to the present day. *Loerenthopluma* is distinguished from *Retropluma* by a very narrow, long rostrum; very broad orbitofrontal margins bounded by prominent outer orbital corners; wide orbits; and a posteriorly displaced median portion of the posterior dorsal ridge.

Loerenthopluma danielae n. sp. (fig. 1A-G)

Types. — The holotype, a well-preserved carapace with remains of the abdomen and pereopods, is MAB k.2550 (ex E. Wille Collection); carapace width and length (inclusive of rostrum) 9 and 7.5 mm, respectively. There are twelve paratypes (MAB k.2551A-L); all fragmentary carapaces, some retaining venters. MAB k.2551M is a small nodule with a natural mould of a ventral side, of which MAB k.2551N is the corresponding silicone rubber cast. All specimens are from the basal portion of the Egemkapel Clay Member (Tielt Formation), of early Eocene (Ypresian) age, as exposed at the Ampe sand and clay pit, Egem (northwest Belgium). For further details, reference to Fraaije et al. (2007) is made.

Etymology. — The species is named in honour of Danièle Guinot (Muséum national d'Histoire naturelle, Paris), renowned carcinologist and a good friend.

Diagnosis. — As for the genus.

Description. — Carapace subrectangular in outline, small sized, wider than long (length/width ratio ca. 0.7), with lateral, posterior margins gently arched; greatest width between median, posterior dorsal ridges. Carapace steeply convex longitudinally, nearly flat transversely; orbitofrontal margin broad, dorsal border strongly sinuous with blunt supraorbital nodes clearly projected anteriorly, bounded by salient outer orbital spines that are slightly directed outwards. Advanced front, broad at base, narrowing in median portion of spatulate rostrum. Anterolateral margins short, straight, posterolateral ones longer, broadly arched, densely covered with granules. First portion of lateral margins meets ventral regions at acute angle, posterior portion having vertical flanks, inclined at about right angles from dorsal surface. Posterior margin gently convex with horizontal median portion, in size similar to, or somewhat shorter than, orbitofrontal margin. Dorsal regions of carapace weakly defined, dorsal surface transversely ridged. Anterior ridge gently sinuous, slightly arched in central portion, curving downwards at lateral margins; median ridge, broadly interrupted at level of urogastric region, formed by 2 fairly straight, oblique lateral ridges; posterior ridge, subparallel to anterior one, markedly divided by shallow branchiocardiac grooves, with central portion slightly displaced towards posterior margin. Mesogastric region broad, distinctly inflated, rhomboid, separated from protogastric lobes by shallow grooves, posterolaterally delimited by short longitudinal depressions. Gastric pits visible as short, convergent slits. Urogastric region narrow, crescent-shaped, marked only by subtle depressions. Cardiac region large, bounded by weak depressions, entirely crossed by median portion of posterior ridge, with 2 subtle, granular swellings positioned laterally below crest. Intestinal region slightly inflated, suboval in shape, extending towards posterior margin. Ventral regions of carapace (subhepatic, pterygostome) strongly ornamented, marked by deep, oblique groove, followed by longitudinal swelling covered with granules. Dorsal surface of carapace covered by delicate pits not uniformly distributed, scattered over entire surface; small granules or denticles along lateral portions of carapace. Sternum nearly completely preserved, anterior portion (sternites 2-4) subtrapezoidal, posterior (sternites 5-7) subrectangular; phragmal divisions extraordinarily well preserved (see fig. 1C). Sternite 2 weakly ridged, axially depressed; sternites 3-4 fused, large, with small projection in front of large ginglyme for insertion of chelae. Sternites 5-7 bear oblique, weakly granulated ridges. Sternite 8 is very much reduced, tilted in different plane than preceding sternites. Abdominal cavity well defined, deep, rimmed at sternite 3-4, strongly sloping at lateral walls. Male abdomen with all pleomeres free, markedly triangular,

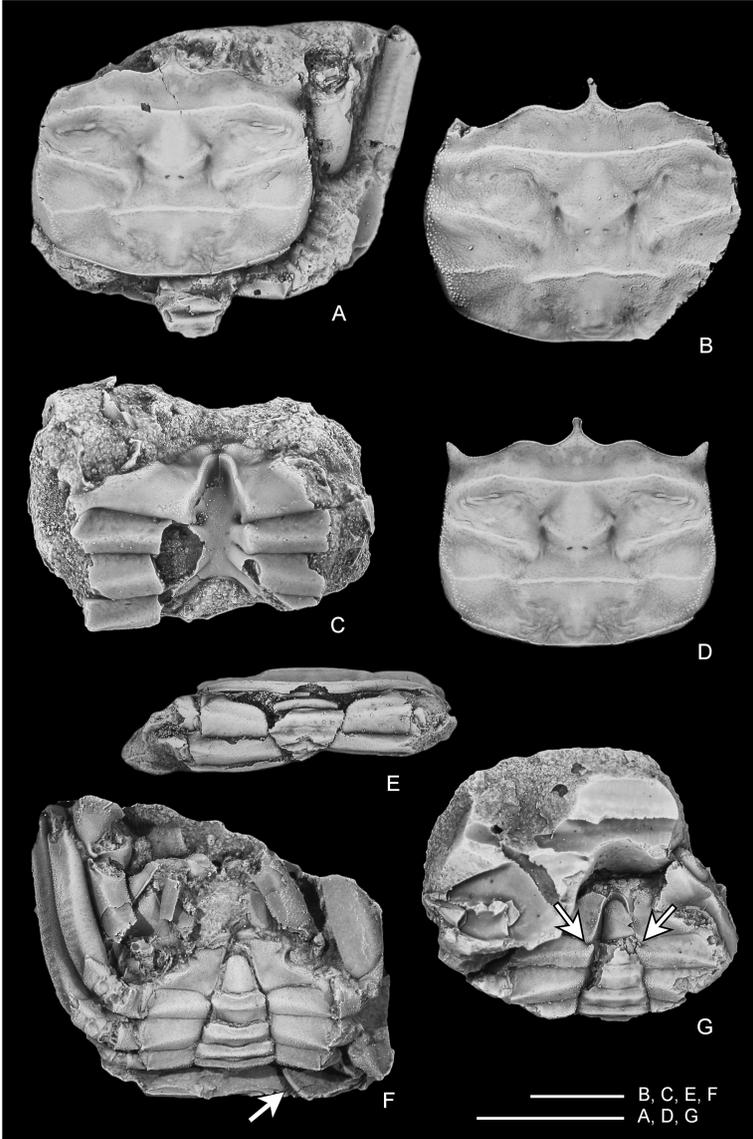


Fig. 1. *Loerenthopluma danielae* n. sp. from the basal portion of the Egemkapel Clay Member (Tielt Formation; lower Eocene, Ypresian) at the Ampe sand and clay pit near Egem, province of West-Vlaanderen (northwest Belgium). Scale bars represent 5 mm. A, D, holotype, MAB k.2550, dorsal view and digital reconstruction of the carapace, respectively; B, paratype, MAB k.2551A, dorsal view of carapace; C, paratype, MAB k.2551C, ventral view showing sternum; E, paratype, MAB k.2551D, posterior view showing abdomen and sternites; F, paratype, MAB k.2551N, silicone rubber cast of natural mould, showing well-preserved ventral side with abdomen, sternites, and pereiopods: arrow indicates merus of reduced P5; G, paratype, MAB k.2551J, ventral view of male specimen: arrows indicate abdominal holding on sternite 5.

transversely ridged. Pleomere 6 longer, broadened posteriorly as mechanism for abdominal holding. Telson long, subtrapezoidal in shape with rounded tip. Chelipeds only partially preserved, left palm higher distally, inner surface with protuberance at articulation with dactylus; fingers long, slender, flattened, with crest. P2, P3 partially preserved; coxae short, basis-ischium fused with suture visible, merus long, with flattened lower face; surface of articles granular. P5 preserved in silicone rubber mould; much reduced in size, with thin, arched merus.

Discussion. — The new species differs from the type, *Loerenthopluma lata*, in having the greatest carapace width more posteriorly, much more prominent outer orbital corners, a wider base of the rostrum, and clearly granular lateral margins. In addition, distinct gastric pits occur (unknown in *L. lata*; however, this needs to be verified when better-preserved material of the type species becomes available).

Loerenthopluma is considered to be closely related to *Retropluma*. The first described extinct representative of *Retropluma*, *R. eocenica*, was erected by Via (1959; see also Via, 1969, 1980), who also recognized that a species recorded by Crema (1895) as *Goneplax craverii* was congeneric. Artal et al. (2006) have recently emended Via's (1959) description of the type species. De Saint Laurent (1989) and McLay (2006a) revised all extant species of the genus.

Five fossil species of *Retropluma* (see below) are so far known; *Loerenthopluma danielae* n. sp. is easily distinguished from all of these by the shape and position of the dorsal ridges, the wide orbitofrontal margin with prominent outer orbital corners, as well as the long and narrow rostrum. The new species is apparently close to *Retropluma gallica* Artal, Van Bakel & Castillo, 2006 from the lower Eocene (Ypresian) of Fontcouverte (Aude, southern France), with which it shares the advanced supraorbital nodes, oblique median carapace ridges, and a discontinuous posterior carina. However, the French species is more subquadratic in outline (length/width ratio approximately 0.8), has a narrower orbitofrontal margin, and the median portion of the posterior carina is less posteriorly displaced.

Retropluma eocenica Via, 1959, from the lower and middle Eocene (Ypresian and Lutetian) of Spain and northern Italy (see Via, 1959; Beschin et al., 1996; Artal et al., 2006), has a narrower orbitofrontal margin, a straighter anterior dorsal ridge, less oblique median dorsal ridges, as well as a continuous posterior dorsal ridge. *Retropluma* cf. *eocenica* was described from the Oligocene (Rupelian) of the Turin area, northwest Italy, by Larghi (2004).

Retropluma laurentae Collins, Lee & Noad, 2003, from the Miocene of Sabah (Indonesia), is more suboval in outline and has a narrower orbitofrontal margin; moreover, the posterior carapace ridge is not discontinuous but interrupted by cardiac tubercles (Collins et al., 2003).

Retropluma borealis Fraaije, Hansen & Hansen, 2005, from the upper Miocene of Denmark (Fraaije et al., 2005), has straighter parallel lateral margins, a narrower orbitofrontal margin, and straighter dorsal ridges, with the posterior ridge entire, continuing from side to side.

Retropluma craverii (Crema, 1895), from the Pliocene of northwest Italy, differs in having the most subquadratic outline. According to Larghi (2004: 59), the length/width ratio is approximately 0.9. This species also differs in having less distinct median ridges as well as a robust node at the intersection of the anterior carina with the lateral margins.

All extant members of the genus, including the recently described *Retropluma solomonensis* McLay, 2006b (= *R. laurentae* McLay, 2006a [non Collins, Lee & Noad, 2003]), differ from *Loerenthopluma danielae* n. sp. in having a more subquadratic carapace outline and a distinctly narrower orbital margin.

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