

Contr. Tert. Quatern. Geol.	30(3-4)	177-182	3 figs.	Leiden, December 1993
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A NEW EARLY PALAEOCENE GENUS OF RANINID CRAB (CRUSTACEA, DECAPODA) FROM DENMARK, SOUTHERN SWEDEN AND THE NETHERLANDS

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Jagt, J.W.M., J.S.H. Collins & R.H.B. Fraaye. A new early Palaeocene genus of raninid crab (Crustacea, Decapoda) from Denmark, southern Sweden and The Netherlands. — Contr. Tert. Quatern. Geol., 30(3-4): 177-182, 3 figs. Leiden, December 1993.

A new genus of raninid crab, *Raniliformis* gen. nov., is proposed for *Raninella baltica* Segerberg, 1900 from the middle Danian (early Palaeocene, Tylocidaris bruennichi Zone) of Fakse (Sjælland, Denmark) and Limhamn (southern Sweden, Annetorp of earlier writers). This species has recently been collected from the basal part of the Geulhem Member (Houthem Formation, *sensu* Albers & Felder, 1979) of early Palaeocene age, as exposed at the Ankersmit-Curfs quarry (Geulhem/Valkenburg aan de Geul, The Netherlands). It provides additional evidence for the correlation of the type Danian of Denmark and southern Sweden with the Geulhem Member of the Maastricht area, as suggested previously on macrofaunal evidence.

Key words — Crustacea, Decapoda, Raninidae, new genus, Danian, Denmark, Sweden, The Netherlands.

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INTRODUCTION

As part of a revision of Late Cretaceous (Campanian-Maastrichtian) (Collins *et al.*, in press) decapod crustacean faunas from the type area of the Maastrichtian Stage (SE Netherlands and NE Belgium), comparatively few and generally rather poorly preserved crab remains from the overlying biocalcarenes of early Palaeocene age (Houthem Formation, Geulhem Member) have been collected.

Amongst these specimens is a well-preserved carapace of a raninid crab, preserving some peraeopods, including the chelae. A comparison with crab faunas of correlative age (casts of specimens as well as literature data) showed this specimen to be conspecific with *Raninella baltica* Segerberg, 1900, first recorded from the middle Danian of Denmark and southern Sweden. The well-preserved frontal region of the Geulhem specimen reveals generic characters inconsistent with *Raninella* A. Milne Edwards, 1862 and a new genus, *Raniliformis* gen. nov., is proposed. A late Maastrichtian congener from the same area will be described elsewhere (Collins *et al.*, in press).

Amongst the echinoderms from the lower part of the Geulhem Member, and the asteroids in particu-

lar, there are species which are confined to the early Danian of Denmark (Sjælland), such as *Metopaster spenceri* Brünnich Nielsen, 1943 and *M. kagstrupensis* Brünnich Nielsen, 1943. On this evidence, the lower part of the Geulhem Member is correlated with (part of) the oedumi and abildgaardi Zones (Gravesen, 1993) of the Danish echinoid biozonation.

SYSTEMATIC DESCRIPTION

Subsection	Archaeobrachyura Guinot, 1977
Superfamily	Raninoidea de Haan, 1841
Family	Raninidae de Haan, 1841
Subfamily	Notopodinae Serène & Umali, 1972
Genus	<i>Raniliformis</i> gen. nov.

Type species — *Raninella baltica* Segerberg, 1900, p. 22, pl. 2, figs 9-11.

Derivation of name — Like *Ranilia*. The suffix '-formis' is also masculine, but the feminine usage is selected further to coincide with *Ranilia*.

Diagnosis — Carapace elongate ovate, strongly vaulted in transverse section; front narrow, orbits steeply inclined downward and outward, upper orbital margin simple; dorsal surface ornament granulate or granular-terraced.

***Raniliformis baltica* (Segerberg, 1900)** nov. comb.

Figs 1-3

1900 *Raninella baltica* Segerberg, p. 22, pl. 2, figs 9-11.

1924 *Raninella baltica* Segerberg — van Straelen, p. 781 [5].

Type — A part decorticated carapace lacking details of the orbitofrontal region and anterolateral spines, from the middle Danian Tylocidaris bruennichi Zone of Fakse Kalkbrud, Fakse (Sjælland, Denmark) is here designated lectotype (Segerberg, 1900, pl. 2, fig. 9a, b). Geological Museum of Copenhagen University Collections, no. 257.

Additional material — A well-preserved carapace retaining the frontal region and anterolateral spines, as well as some pereopods including the chelae, from the basal part of the Geulhem Member (Houthem Formation), of early Danian age, as exposed at the Ankersmit Holding BV-Curfs quarry, Geulhem (municipality of Valkenburg aan de Geul, The Netherlands). Collections of Geo-Centrum Brabant, no. MAB k.0029 (ex R.W. Dorangs Collection, no. RD 106).

Description — The new material is comparable in

size to that of the type. Deep, broadly ovate orbits take up the outer two thirds of the orbitofrontal margin which occupies a little less than half the carapace width, they are steeply inclined downward-outward ($\approx 45^\circ$) and taper towards the antennal fossae, which are about half as wide as the orbital cavity. The rostrum is not preserved, but was probably narrowly triangular in dorsal view, its base bounded by more or less parallel sulci extending beyond a shallow postfrontal depression where they become obsolete. The area enclosed by the sulci continues as an obscure ridge to the urogastric region. Fine, irregular-sized granules line the upper orbital margin which is concave from the base of the rostrum, then gently convex to a shallow notch, between this and the outer notch the margin is projected slightly forward and is almost straight to the rounded outer orbital angle. A triangular, forwardly and outwardly directed anterolateral spine, one fifth distant from the front, is flattened in section, almost carinate posteriorly as it passes, with no elevation, into the lateral margin.

The frontal region retains the shell surface; fine granules in the postfrontal depression give way to a series of short, more or less transverse terraces, steeper at their frontal margin where they are minutely granulated. Numerous groups of pits covering the remaining (decorticated) surface suggest it was ornamented like the front. *Raniliformis*, in common with many other raninids and some terrestrial genera, was probably a burrowing crab and the primary purpose of the terraces, according to Savazzi (1981; 1985, p. 153) is to, 'increase the friction against the substrate when these organisms wedge themselves against the walls of the burrow.'

Elements of the first and (?) second pereopod indicate that the walking legs were robust; the merus is ovate in section, about twice as long as high; the outer face of the carpus is about as long as the merus and half the length of the propodus which has a granulate surface. The chela shows a short fixed finger, as in Segerberg's (1900, pl. 2, fig. 9b) illustration, which is one of the typical characters of the subfamily Notopodinae (Serène & Umali, 1972; Goeke, 1985); it is also similar to the claws of the late Maastrichtian *Pseudoraninella muelleri* (van Binkhorst, 1857) and *Raniliformis* sp. nov. (see Collins *et al.*, in press).

Discussion — While the general carapace outline of *P. muelleri* (van Binkhorst, 1857, p. 107, pl. 5 [1], fig. 1; Binkhorst van den Binkhorst, 1861, pl. 9, fig. 1) with its small, anteriorly placed lateral spines,

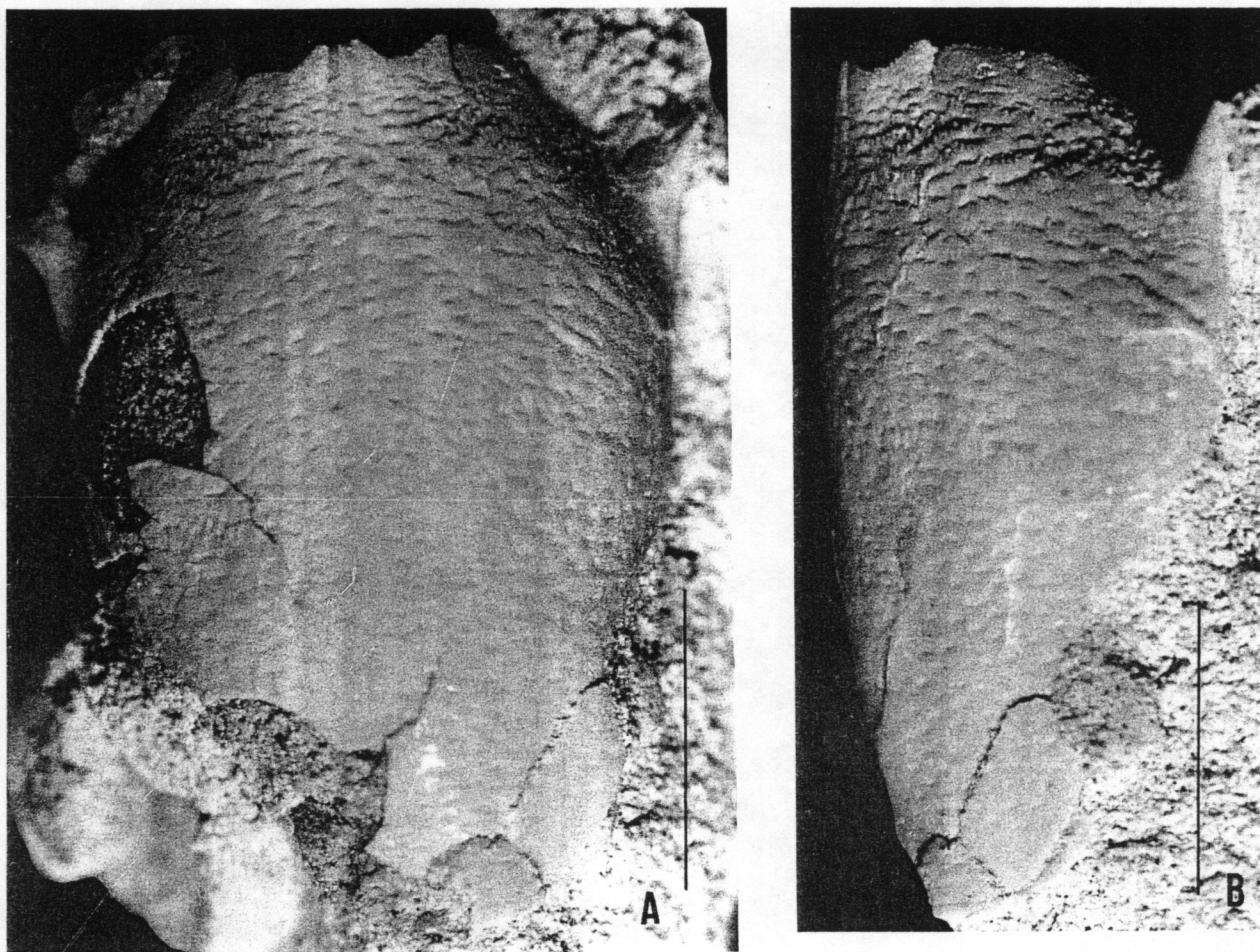


Fig. 1. *Raniliformis baltica* (Segerberg, 1900) nov. comb. Basal part of Geulhem Member (Houthem Formation), benthic foraminifer zone P of Hofker (1966), Ankersmit Holding BV-Curf's quarry, Geulhem (Valkenburg aan de Geul), southern Limburg, The Netherlands. Collections GeoCentrum Brabant, Boxtel, no. MAB k.0029 (ex R.W. Dortangs Coll.). a - dorsal view of carapace; b - lateral view of carapace. Scale bar equals 10 mm.

ridged rostrum and well-rounded posterior margin compares favourably with *Raniliformis*, it differs in having a wider, straight orbitofrontal margin, transversely directed orbits and an upper orbital margin with six fine spinules. By and large, *R. baltica* has much in common with the extant genus *Ranilia* H. Milne Edwards, 1837, represented by a handful of species inhabiting the east and west Atlantic and eastern and western Pacific Oceans (Rathbun, 1937), and two Eocene species, *Ranilia pororariensis* Glaessner, 1980 (late Eocene of New Zealand), and *R. punctulata* Beschin *et al.*, 1988 (early Eocene of Italy). All the Recent species have the rostrum enclosed to a greater or lesser degree according to the width of the orbitofrontal margin which takes up from more than half to less than half of the carapace width and all have similarly inclined orbits, but a diagnostic requirement of the genus is the presence

of between two and three pairs of spines between the rostrum and the anterolateral spines, whereas the upper orbital margin of *R. baltica* is unadorned. Glaessner (1969) synonymised *Notopella* Lőrenthey, 1929 (containing but a single species, *N. vareolata* Lőrenthey in Lőrenthey & Beurlen, 1929, late Eocene of Hungary and Spain) with *Ranilia*. Via (1969) on the other hand, regarded it as a distinct genus, while Müller & Collins (1991) followed Glaessner's opinion. The front of *R. punctulata* is typically spinous and almost transverse; *R. pororariensis* was subsequently transferred to *Laeviranina* Lőrenthey & Beurlen, 1929 by Feldmann & Maxwell (1990). It is evident from an examination of specimens that Lőrenthey's figure of *N. vareolata* is not so much idealised, as restored from several specimens. The anterior transverse section is only moderately arched and the orbits, although poorly pre-

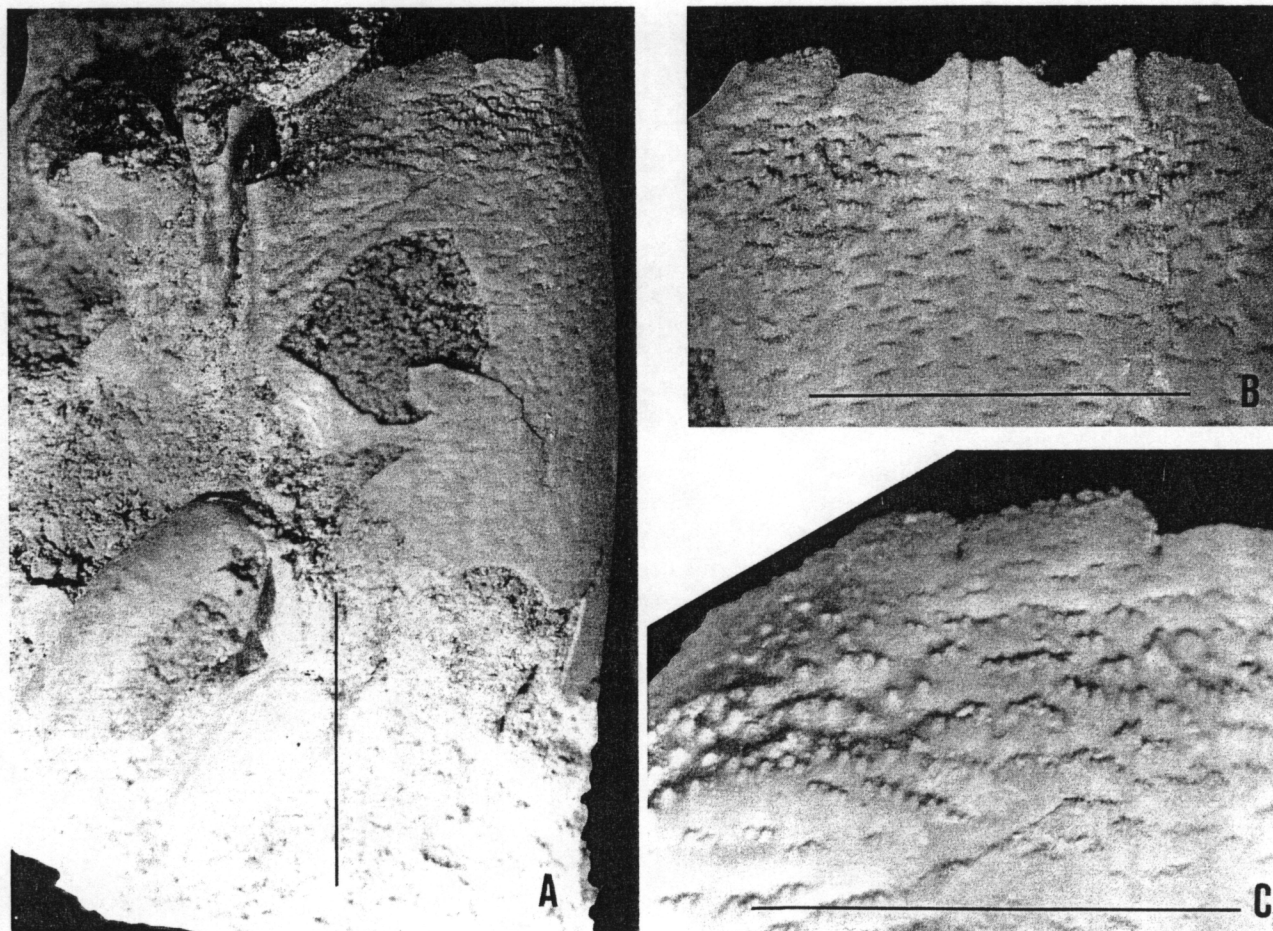


Fig. 2. *Raniliformis baltica* (Segeber, 1900) nov. comb. As Fig. 1; a - lateral view of carapace; b, c - details of the frontal margin and anterior ornament of cuticular terraces. Scale bar equals 10 mm (a, b) and 5 mm (c).

served, seem to be only moderately inclined to the midline; the rostral median ridge continues the length of the carapace and there is a noticeable postfrontal depression. Apart from the ridged rostrum, none of these characters is common to *Raniliformis* or *Ranilia*, thus substantiating *Notopella* as a valid genus. Milne Edwards & Bouvier (1923) figured a male of *Ranilia constricta* A. Milne Edwards, 1830 as being medially carinate for half its length — a condition not depicted by Manning & Holthuis (1981, fig. 1).

Raniliformis differs from *Ranilia* in little more than the absence of the orbital margin spines and could be considered as being close to the ancestral root of that genus. *Notopella vareolata* may have developed as a late Eocene offshoot of that line.

The discovery of the present species provides additional evidence for the correlation of the Geulhem Member of the Maastricht area with the type Danian of Denmark and southern Sweden, as suggested

previously on other macrofaunal evidence (Jagt & Collins, 1988; Jäger, 1993).

ACKNOWLEDGEMENTS

We wish to extend our best thanks to R.W. Dorstangs for donation of the specimen described herein, to S.F. Morris for critical reading of an earlier version of the typescript, and to J.P.M.T. Meessen for benthic foraminifer analysis.

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