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A new crab, *Rogueus robustus*, from the Middle Palaeocene of Denmark

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Abstract

A new raninid crab, *Rogueus robustus* from the Middle Palaeocene (Lower Selandian), Lellinge Greensand Limestone of Klintebjerg, northern Sjaelland (Zealand), Denmark, is the earliest known and first member of that genus to be described from Europe. Comparisons are made with *Rogueus orri* Berglund and Feldmann, 1989 and a revised list of other known Selandian macro-fossils is given.

Key words: Crustacea, Decapoda, Raninidae, new species, Palaeocene, Denmark.

Introduction

Among palaeontologists it is often said that the best collecting is to be done in Museums. The truth of this became evident to one of us (SLJ) during a recent routine curatorial inspection of the collections of the Geological Museum, Copenhagen, when he encountered two fragmentary specimens of unidentified crabs of Middle Palaeocene, (Lower Selandian) Lellinge Greensand Limestone age and recognised them as belonging to the recently described genus *Rogueus* Berglund and Feldmann, 1989.

Crabs from the Lellinge Greensand Limestone, found as isolated boulders forming part of the very mixed assemblage of rock types exposed in a Quaternary melt-water exposure at Klintebjerg, northern Sjaelland, Denmark, are very rare; hitherto, only two species, the lobster-like *Oncopareia klintebjergensis* Jakobsen and Collins, 1979 and a crab, *Camarocarcinus obtusus* Jakobsen and Collins, 1979 have been described from that age and locality. The present discovery of the new crab carapaces, therefore is not only a significant contribution to our knowledge of decapods of Selandian age, but allows description of the earliest known and first European member of the genus *Rogueus*.

Oncopareia klintebjergensis known by a fragmentary carapace and associated cheliped was considered (Jakobsen and Collins, 1979) to have a greater affinity to *Oncopareia coelsfeldensis* (Schlüter, 1862) from the Senonian of Germany. The calappid genus *Camarocarcinus* from the Palaeocene Cannonball Formation of North Dakota was erected by Holland and Cvancara, 1958 to contain *Camarocarcinus arnesoni* Holland and Cvancara, 1958 (recte name 1959); *C. obtusus* described from two carapaces, is the only known European member of this genus. The genus is also known by *Camarocarcinus quinquetuberculatus* Collins and Rasmussen, 1992 from the Upper Danian of Central Nuqssuag, West Greenland, and this species is considered to be closer in development to *C. arnesoni* than *C. obtusus*.

The Lellinge Greensand Limestone Formation

Of boulders of Selandian age present at Klintebjerg some are composed of basal conglomerates and contain derived fossils, but the majority of the Selandian boulders are of so-called Lellinge Greenland Limestone (Gry, 1935) and consist of a fine-grained sand with a dense conglomerate of comminuted shelly fragments, some of which are glauconitized; grains of lobate or rounded glauconite are also present, while grains of feldspar and quartz make up the allochthonous-clastic constituents and the whole is cemented by calcite (Gry, 1935). The only other crustacean remains recorded from the Lellinge Greensand Limestone are numerous thalassinoid burrows.

Generally speaking the boulders from Klintebjerg are not very fossiliferous; a short list of the associated fauna was included in Jakobsen and Collins, 1979; the following species (*) have since been determined and the revised list represents the most comprehensive survey of the known macro-fauna from Klintebjerg to date.

NAUTILOIDEA
- *Cimomita* sp. nov.
- *Eutrephoceras* sp.

GASTROPODA
- *Discohelix* sp.*
- *Lacuna* sp.*
- *Natica* (*Lunatia*) *detracta* von Koenen, 1885*
- *Natica* (*Lunatia*) *detritta* von Koenen, 1885*
- *Eucycloscala*? *crassilabris* (von Koenen, 1885)*
- *Turritella* (*Haustator*) *nana* von Koenen, 1885*
- *Odostomia* sp.*
- *Syola* sp.*
- *Metacerithium hauniense* (von Koenen, 1885)*
- *Metacerithium* sp.*
- *Arrhoges gracilis* (von Koenen, 1885)*
- *Cassidaria elongata* von Koenen, 1885*
- *Charonia* (*Sassia*) sp.*
- *Exilia crassistria* (von Koenen, 1885)
- *Busycon* sp.*
- *Ancilla* (*Sparella*) *flexuousa* von Koenen, 1885*
- *Volutilithes nodifer* (von Koenen, 1885)*
- Cancellariidae gen. et sp. indet.*
- *Surcula hauniensis* (von Koenen, 1885)*
- *Surcula torelli* (von Koenen, 1885)*
- *Surcula* (*Cochlespira*) *boeggildi* Ravn, 1939*
- *Borsonia* (*Cordieria*) *binodosa* von Koenen, 1885*
- *Acteaon pusillus* Ravn, 1939*
- *Actaeonidea* (*Crenilabium*) *elata* (von Koenen, 1885)*
- *Tornatellaea regularis* (von Koenen, 1885)
- *Gilbertina ultima* (von Koenen, 1885)*
- *Roxania clausa* (von Koenen, 1885)*
- *Bulla* (*Haminea*?) sp.*
- *Cylichna discifera* von Koenen, 1885*
- Gastropoda indet.: 3 spp.

BIVALVIA
- *Nucula densistria* von Koenen 1885*
- *Leda ovoides* von Koenen, 1885*
- *Leda* sp.
- *Glycymeris* sp. nov.*
- *Cucullaea dewalquei* von Koenen, 1885*
- *Barbatia praescabra* (von Koenen, 1885)*
- *Arcopsis limopsis* (von Koenen, 1885)*
- *Pinna* sp. nov.*
- *Mytilus* sp.*
- *Lithophaga* sp.*
- *Propeamussium bisculptum* (von Koenen, 1885)*
- *Propeamussium hauniense* (von Koenen, 1885)*
- *Lima* (*Limea*) *geinitzi* von Hagenow, 1842*
- *Ostrea* sp.*
- *Lucina* (*Phacoides*) *planistria* von Koenen, 1885*
- *Pholadomya margaritacea* Sowerby, 1823
- *Corbula koeneni* Cossmann, 1908*
- *Cuspidaria* sp.
- *Verticordia* sp.*
- Teridinidae gen. et sp. indet.*

SCAPHOPODA
- *Dentalium rugiferum* von Koenen, 1885*
- *Dentalium undiferum* von Koenen, 1885*
- *Siphonodentalium intumescens* (von Koenen, 1885)*

ANTHOZOA
- *Trochocyathus*? *calcitrapa* von Koenen, 1885*

CRINOIPEA

Nielsenicrinus obsoletus (Nielsen, 1913)

Isselicrinus paucicirrhus (Nielsen, 1913)

ECHINOIDEA

2 genera indet.

This assemblage would indicate a moderate energy environment within the upper part of the sublittoral zone.

The only localities where the Lellinge Greensand Limestone remain in situ are at Lellinge about 6 kilometers west of Køge where small, poorly fossiliferous, sections are exposed along stream banks and, as recently (1994) exposed, in Central Copenhagen (Tårnby).

Systematic Description

Section Podotremata Guinot, 1978

Family Raninidae de Haan, 1841

Genus *Rogueus* Berglund and Feldmann 1989

Type species: *Rogueus orri* Berglund and Feldmann 1989 by monotypy.

Range: Middle Palaeocene (Lower Selandian) to Middle Eocene.

Rogueus robustus sp. nov.

Figs. 1a, b

Derivation of name: With reference to the stout anterolateral spines.



Fig. 1. *Rogueus robustus* sp. nov. a, holotype MCUH 22370, × 2. b, paratype MCUH 22371, × 2.

Fig. 2. *Rogueus orri* Berglund and Feldmann, 1989; plaster cast of holotype, × 2.

Diagnosis: A *Rogueus* with stout anterolateral spines each with an ancillary spine two thirds distant from the base.

Material: Anterior fragment of a carapace, holotype MGUH 22370 and paratype, a posterior portion of a carapace, MGUH 22371, from the Selandian, Lellinge Greensand Limestone of Klintebjerg (55°29′ N, 10°28′ E), Sjaelland, Denmark, The specimens are the in type collection of the Geologisk Museum, Copenhagen.

Description: Carapace length including outer orbital spines almost twice the greatest carapace width which occurs rather more than half the distance from the front; subovate in transverse section and gently rounded longitudinally. The rostrum and part of the frontal region between the outer orbital spines are missing; the outer orbital spines are short, stout at the base and slightly incurved distally, their outer margin is sigmoid. The upper orbital margin has two very narrow notches—the inner one probably very weak and the lobe between them is bluntly rounded. About one fifth distant from the front stout anterolateral spines project forward and outward at an angle of 31° from the median longitudinal axis and each has a forwardly directed ancillary spine diverging two thirds distant from the base, there is the merest constriction behind the spines and the posterolateral margins converge by broadly rounded posterior angles to the posterior margin which is slightly concave and about half the carapace width. The anterior parts of shallow branchiocardiac furrows are seen on the holotype. Numerous pits crowd the dorsal surface, especially towards the lateral margins, they extend onto the posterolateral margin and continue round the posterior margin. A group of three or four deeper pits some distance behind the upper orbital margin notches mark the position of the attachment of the antennar extensor muscles and a cuneiform gastric pit lays either side of the midline.

Discussion: As preserved the difference between *R. robustus* and *R. orri* (Fig. 2) described from the lower Middle Eocene, Lookingglass Formation (Ulatisian Stage) of southwest Oregon are most noticeable about the anterolateral spines which in *R. orri* are almost delicate by comparison, they occur closer to the front, are inclined at an angle of 60° to the median axis and the ancillary spine is median rather than distal as in *R. robustus*. The greatest carapace width of *R. robustus* occurs further from the front than in *R. orri* and the posterior margin appears to be proportionately wider although this could be a sexual character rather than specific.

The earlier age of *R. robustus* suggests a possible European origin for *Rogueus* and a westerly migration. In all characters the new species agrees with the remarks of Berglund and Feldmann (1989, p. 70) concerning the relationship of *Rogueus* with other raninids and no new light can be thrown on the origins of the genus.

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デンマークの中部暁新統産新種カニ化石, *Rogueus robustus*

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要　　旨

デンマークの北 Sjaelland (Zealand)・Klintebjerg の中部暁新統 (Lower Selandian) Lellinge Greensand Limestone 産アサヒガニ科新種 *Rogueus robustus* を記載する．*Rogueus* 属のヨーロッパからの産出は，この属の起源を中期暁新世まで遡らせる．