A New Brachyuran Crab from a Late Cretaceous or Danian Geschiebe (glacial erratic boulder) of Westphalia (N-Germany)

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Zusammenfassung. Der Carapax eines brachyuren Krebses wird aus einem Geschiebe des Münsterländer Kiessandzuges in Westfalen, Norddeutschland, beschrieben. Das Stück wird zu *Raninella* ? n. sp. gestellt und stammt wahrscheinlich aus der Oberkreide oder dem Paläogen, worauf die assoziierte Makrofauna schliessen lässt. Aufgrund der Fazies ist die Heimat des krebsführenden Geschiebes nicht in der lokalen Umgebung des Kiessandzuges zu suchen, sondern ist eher dem südlichen Skandinavien zuzuschreiben.

Abstract. A carapax of a brachyuran crab is described from a geschiebe of the Münsterländer Kiessandzug in Westphalia, Northern Germany. It is referred to as *Raninella* ? n. sp. and is supposed to be Late Cretaceous or Paleogene in age based on the associated macrofauna. Judging from the facies of the matrix, the geschiebe containing the crab is not of local origin from the vicinty of the Kiessandzug, but rather originates from southern Scandinavia.

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Introduction

Decapods are usually among the rare crustacean fossils from geschiebes (glacial erratic boulders) in Northern Germany. There are a couple of exceptions from this rule.

On the one hand side there is the outstanding lagerstätte containing Late Eocene to Early Oligocene decapods in the Handorf area near Peine in Lower Saxony (FÖRSTER 1982, FÖRSTER & MUNDLOS 1982; examples figured herein on plate 2, figs. 1-2). These specimens come from a couple of gravel pits containing geschiebes from Scandinavia as well as rock material of local origin. Several thousand malacostracan specimens have been collected so far, mainly from a horizon about 20 m below the surface (FÖRSTER & MUNDLOS 1982, POCKRANDT 1983). These crustacean findings are clearly of local derivation, possibly they do not even represent geschiebes, but are rather eroded by melt waters from the subsurface during the Pleistocene (Saale ice-age). This would explain the high abundance of the crustacean-bearing glauconite concretions at these localities.

The second exceptional occurrence are geschiebes of the Fakse limestone which frequently yield crabs and are also geographically much more widely distributed than the Handorf concretions. The most common species is *Dromiopsis rugosa* (v. SCHLOTHEIM, 1820). Plate 2, fig. 3 shows an example from Schleswig-Holstein. The coral-reef facies of the Fakse limestone is Danian (Paleogene) in age and is named after the homonymous city on the Isle of Zealand in Denmark where it is quarried extensively (BROMLEY & HANSEN 1998). However, it also occurs in the Skane area in southern Sweden and in subaquatic exposures further east. The Fakse limestone was widely displaced as geschiebes into an area ranging from the Kaliningrad district in Russia in the east to the Netherlands in the west (e.g. HUCKE & VOIGT 1967, SCHULZ 2003).

All other occurrences of decapods from geschiebes in northern Germany are less prominent and consequently papers usually deal with isolated specimens mainly from the Tertiary (e.g. MOTHS 1990). For a comprehensive survey of the literature see SCHÖNE 2001.

BARTHOLOMÄUS & WEICKER 1999 gave an overview about papers particularly on Late Cretaceous and Danian material, a more recent supplement is WITTECK 2001. The present material of a Late Cretaceous/Danian crab consists of a fairly well-preserved carapax that shows a unique morphology. It is housed in the Geosciences Collection of the University of Bremen, abbreviated as GSUB in the following, after its German name Geowissenschaftliche Sammlung der Universität Bremen. It is a part of the former collection of the author and was collected in the year 1984 (previous inventory number K134).

Locality details and decapod records from the Münsterländer Kiessandzug

The specimen comes from Lake Offlum in Neuenkirchen near Rheine in Westphalia, Northern Germany. It was found on the rock dump of the Müller gravel pit, the geschiebe originates, however, from digging for grit and sand in the freshwater lake Offlumer See.

This locality is part of the Münsterländer Kiessandzug, a gravel deposit of the Saale ice-age in northern Westphalia, ranging from Schüttorf in the NW to Ennigerloh in the SE. The Münsterländer Kiessandzug has a total length of approximately 80km, but this gravel belt is usually not much broader than about 1km (e.g. LEHMANN 1995; SERAPHIM 1972, 1979). It contains a broad spectrum of erratic and/or fluviatile boulders, quite a lot of different sediments from Scandinavia, but also many of local or regional origin (e.g. AKKERMAN & LEHMANN 1986, LEHMANN 1993,1995; SCHÄFER 1993, 1994a-c). However, although the spectrum of Mesozoic and Cenozoic sediments is very broad only Jurassic boulders of local origin yielded a significant number of decapod remains. These Jurassic specimens were reported by AKKERMAN & LEHMANN (1986, p. 37, upper figure) and SCHÄFER (1994c, pl. 12, figs. 7, 7a, 7b). In contrast, only one decapod fossil was figured from the Cretaceous and Tertiary yet. This single specimen is *Mecochirus rapax* from the Early Valanginian *Platylenticeras* beds. The specimen was figured as cf. *Meyeria* by AKKERMAN & LEHMANN 1986; p. 37, lower figure) and originally considered to be Jurassic in age. The very similar lithofacies of the geschiebes of the *Platylenticeras* beds and the Lower Jurassic rocks led occasionally to confusion (concerning the geschiebes of the Münsterländer Kiessandzug), e.g., the supposed Jurassic bivalve figured by SCHÄFER 1993 on pl. 5, fig. 2 as *Plagiostoma giganteum* is a fragmentary *Tracia phillipsii* of the *Platylenticeras* beds.

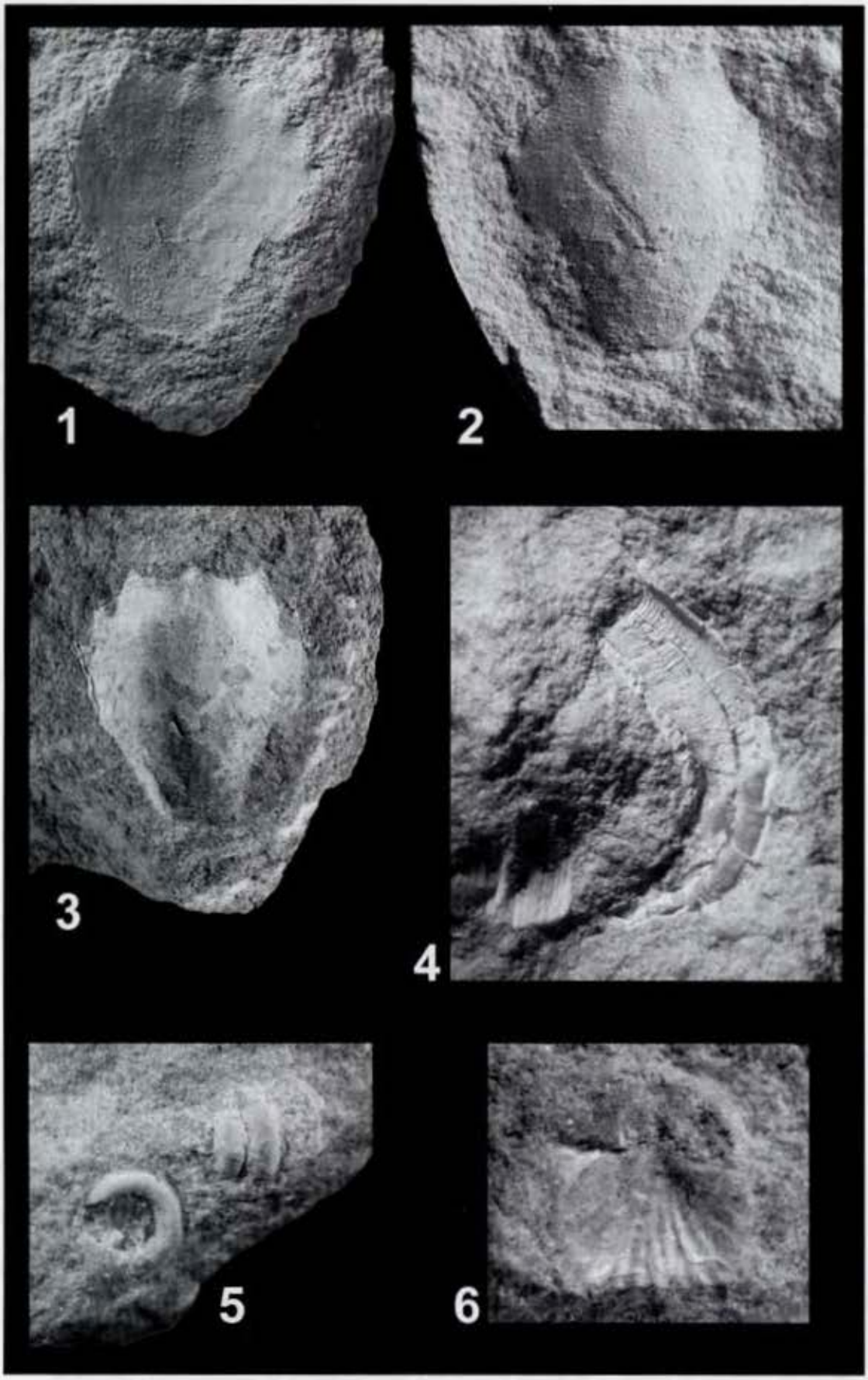
Furthermore, no Cretaceous and Tertiary decapods were recorded from the Münsterländer Kiessandzug so far, except for the new material described herein.

Systematic palaeontology

Superfamily Raninoidea DE HAAN, 1841
Family Raninidae DE HAAN, 1841
Subfamily Notopodinae SERÈNE & UMALI, 1972

Plate 1 (p. 803)

1-3 *Raninella* ? n. sp., geschiebe, Müller pit in Neuenkirchen-Offlum near Rheine, Westphalia, N-Germany. x 2. 1 & 3 negative mould with inner test of carapax preserved, 2 steinkern of carapax, GSUB A10 (formerly K134 J. Lehmann collection). 4 Crushed tube of an indeterminable serpulid, the fossil in the left lower corner is a fragmentary oyster (compare pl. 2, figs. 4-5). X 3. 5 *Neovermilia ampullacea* (SOWERBY, 1829) ?, trochospiral tubes of serpulids. x 5. 6 *Argyrotheca* sp., negative mould of an external side of a dorsal valve, with parts of the shell preserved; note perforation of the test. x 5. 4-6 are associated fossils from the same geschiebe as the carapax figured in 1-3. – 1-2 with coating of ammonium chloride.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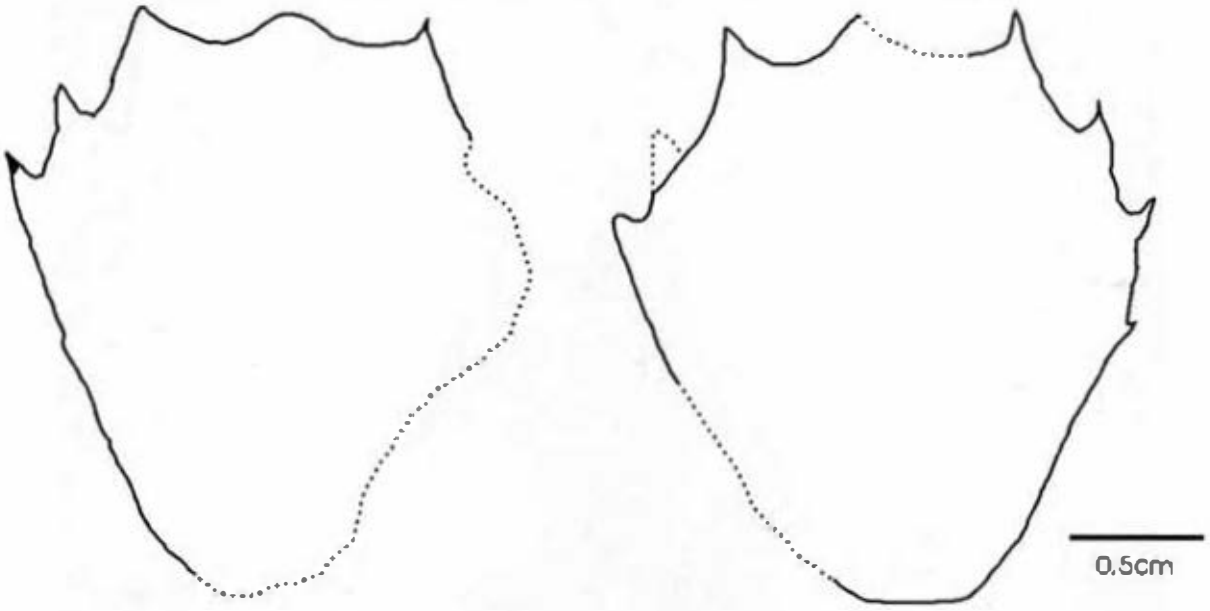
Genus *Raninella* MILNE-EDWARDS, 1862

Raninella ? n. sp.
Plate 1, figs. 1-3 and text-figure 1

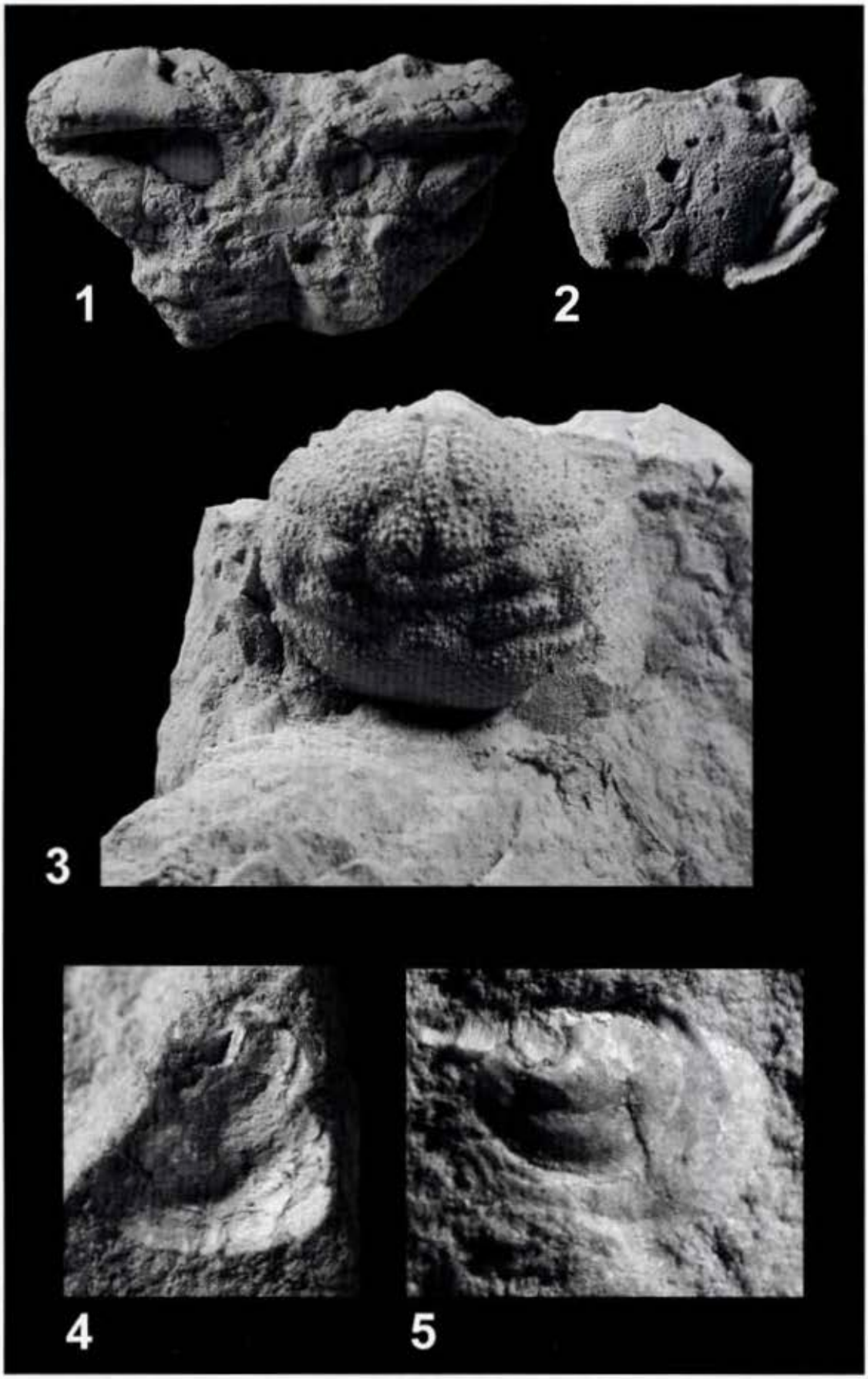
Description: Specimen GSUB A5 consists of a steinkern of a carapax and its negative imprint. The carapax is approximately 18 mm in length, with a maximum breadth of about 17 mm. It is evenly inflated, reaching the greatest height in the posterior half. The center of the anterior margin with well-rounded and not pointed swell occupies nearly a quarter of the carapax width. There is a single, triangular rostrum with sulcate axes. Four pairs of spines in the first half of the carapax can be observed. They are completely preserved in the right half of the steinkern only (cf. text-figure 1). The spines are delicate, merely their short bases are fairly broad. The posterior margin is straight and occupies more than a third of the width of the carapax. The outline is ovate, the lateral margins are straight in the posterior half, with an angle of 55° to the longitudinal axis, and are broadening significantly anteriorly, with the greatest breadth in the first third. The width of the posterior margin is less than the fronto-orbital margin. The carapax is smooth on the steinkern as well as inside of the negative mould that shows the test still preserved.



Text-fig. 1 Sketch of the outline of negative imprint (left) and steinkern (right) of GSUB A5.

Plate 2 (p. 805)

1 *Galenopsis* sp. Ventral view of an almost complete specimen, Gravel pit in Handorf near Peine, Lower Saxony, N-Germany. GSUB A12, x 1. 2 *Galenopsis* sp. Dorsal view of a carapax with parts of the right legs preserved, from the same locality as figure 1. GSUB A11, x 1. 3 *Dromiopsis rugosa* (v. SCHLOTHEIM, 1820), carapax was glued on a slab supposed to originate from the same geschiebe, containing the coral *Haplophyllia (Dendrophyllia) faxensis*. Palaeogene, Danian, Fakse limestone. Gravel pit near Ohe, SE of Rendsburg, Schleswig-Holstein, N-Germany. GSUB A5 (leg. Schwenzer 1956). 4-5 *Pycnodonte* sp., juvenile oysters. 3-5 each x 5. Associated fossils from the same geschiebe as the carapax figured in plate 1, figures 1-3. – 1-3 with coating of ammonium chloride.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D i s c u s s i o n: Some features of the present specimen fit with the definition of the genus *Raninella* MILNE-EDWARDS, 1862. This is in particular the absence of the cervical and branchiocardiac grooves, a rostrum that is single and triangular with sulcate axes, a smooth or finely punctate surface of the carapace and a number of two anterolateral spines. Furthermore, there is a simple, single major anterolateral spine in GSUB A5 like in *Raninella*, the extraorbital spine is also single with a convex outer margin and the inner orbital tooth shows a supraorbital ridge. Additionally, the width of the posterior margin that is less than that of the fronto-orbital margin agrees with that of *Raninella* (S. L. JAKOBSEN, pers. comm. Nov. 2003).

It is hesitated to establish a new species on the account of a single carapax herein. Since the sum of features is unique and only a few of the characters observed fit into a definition of *Raninella* or of that of another well established genus described from the Late Cretaceous or Palaeogene, the present specimen is referred to as *Raninella* ? n. sp. in open nomenclature herein. This paper might call attention to this taxon and possibly additional material can be detected.

O c c u r r e n c e: Known from a geschiebe from the Münsterländer Kiessandzug in Westphalia only and supposed to be Late Cretaceous or Paleogene in age (see beneath). Probably originating from southern Scandinavia as described in the following. The genus *Raninella* ranges from the Early Cenomanian to the Eocene (cf. BROOKS & al. in MOORE 1969).

Age and origin of the geschiebe

The matrix of the geschiebe containing the carapax is of yellowish grey colour (5y 7/2), following the THE ROCK-COLOR CHART COMMITTEE (1991). It is a sorted biosparite (FOLK nomenclature), containing mainly ostracod shells and foraminifera tests as bioclasts. The rock contains few glauconite, about 1 %, estimated after evaluation charts (FLÜGEL 1978). The biogenic allochems are too badly preserved to be useful for determing the geologic age.

The geschiebe containing the carapax also yielded a few other macrofossils. Most of these are oysters, all of them are juveniles that can not be determined more exactly than *Pycnodonte* sp. (pl. 2, figs. 4-5). Since the genus *Pycnodonte* ranges from the Cretaceous into the early Neogene (MÜLLER 1980), it does not help to rule out either a Cretaceous or a Tertiary age of the geschiebe. A single dorsal valve of a brachiopod (pl. 1, fig. 6) belongs to a genus not relevant for the exact geologic age either. There are several index species of brachiopods in the Late Cretaceous and Paleogene, however, the present material is determinable as *Argyrotheca* sp. only. It is a juvenile valve of an external side of a dorsal valve. Its negative mould viewed from inside is figured here. This genus ranges from the Cenomanian to the present-day (HARPER et al. 1993).

The third group of organisms associated with the decapod carapax are serpulids. The two specimens on plate 1, figure 5 might belong to *Neovermilia amputlacea* (SOWERBY, 1829), a species ranging from the Cenomanian to the Danian (M. Jäger pers. comm.). The trochospiral tubes are circular in cross section, with whorls closely attached but not fused. Delicate growth lines are visible. The second serpulid is a crushed fragment of a curved tube that is indeterminable (plate 1, figure 4). Like the other accompanying fossils the recorded serpulids do not give hints on the precise stratigraphic position of the geschiebe, although some species of this strongly facies bound group are useful in biostratigraphy (e.g., JÄGER 1983).

The geschiebe is a carbonate of high textural maturity typical of fairly high energetic shallow water deposits. It therefore is of different origin to most carbonate deposits of the Upper Cretaceous that crop out in the northern vicinity of the Münsterland Kiessandzug, since they represent fairly low energy deposits, although some of them are macroscopically simi-

lar. There is also no similarity with samples of the Stemweder Berg area (GSUB collection), that represent a packed biomicrite, containing quartz grains as well as distinctly more glauconite (5-10 %) than in the geschiebe. Furthermore, sponge spiculae are abundant in all the samples from Stemwede in contrast to the boulder that does not reveal any.

The distinctive facies type of the boulder is different from the facies encountered in the area just north of the Kiessandzug and makes an origin in southern Scandinavia likely, where similar Late Cretaceous and Early Palaeocene deposits occur. However, there are no findings of crabs from southern Scandinavia alike to the specimen described here, although there is a rich material of brachyuran crabs known from profiles as well as from erractic boulders in Denmark contrary to northern Germany (pers. comm. S. L. JAKOBSEN). To summarise the age of the geschiebe is difficult to determine, but is supposed to be of late Late Cretaceous or Danian age. Judging from the facies it presumably originates from southern Scandinavia.

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