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A first record of Insecta from the Late Jurassic sequence of the Langenberg near Oker, Lower Saxony (Germany)

CARSTEN BRAUCKMANN & ELKE GRÖNING

Abstract: From the Late Jurassic sequence („Kimmeridgian“ in the lithostratigraphical terminology for northwestern Germany) of the Langenberg near Oker in Lower Saxony (Germany) a first record of Insecta is described. It is a nearly complete elytra of a small beetle (Coleoptera). Due to the lack of diagnostic characters, it cannot be identified further.

Key words: Insecta, Coleoptera, Late Jurassic, Middle Kimmeridgian, Langenberg, Oker

Zusammenfassung: Aus Schichten des Oberen Jura („Kimmeridge“ im Sinne der für NW-Deutschland gebräuchlichen lithostratigraphischen Terminologie) wird ein erster Nachweis von Insecta vorgestellt. Es handelt sich um eine nahezu vollständig erhaltene Käfer-Elytre (Coleoptera). Da keine diagnostisch verwertbaren Merkmale erhalten sind, kann das Fossil nicht näher bestimmt werden.

Schlüsselwörter: Insecta, Coleoptera, Ober-Jura, Mittel-Kimmeridgium, Langenberg, Oker

1 Introduction

Insect remains are still extremely rare in sediments of Late Jurassic age in northern Germany. There are no citations for this region in the stratigraphic and regional surveys by HANDLIRSCH (1906-1908; 1939) and by HENNIG (1981). The first record was published by SCHULTKA (1991) who mentioned two Coleoptera elytrae (*Hyperomima* sp. and an indeterminate fragment) which were collected in the “Sudbrack Quarry” (former “Petring Quarry”) at Hille-Oberlütbe in the Wiehengebirge (northeastern North Rhine-Westphalia). The age of these remains can be approximately delimited to the base of the „Kimmeridgian“ (as used in the lithostratigraphical terminology for the Late Jurassic in northwestern Germany; see GRAMANN & al. 1997).

Two additional insect remains have been described more recently by POPOV et al. (2000) from the Late Jurassic (“Middle Kimmeridgian”) sequence of the “Schwarze Quarry” S Nettelstedt, just about two km W of the insects mentioned by SCHULTKA (1991). One of them is an isolated forewing of an early derivative group of Belostomatidae (Hemiptera: Heteroptera: Nepomorpha: Nepoidea) and was named *Nettelstedtia breitkreuzi* POPOV, RUST & BRAUCKMANN, 2000. The other one is again an indeterminate fragment of a coleopteran elytra.

Recently, a further coleopteran elytra has been collected by UDO RESCH (Berlin) from the “Middle Kimmeridgian” section in the large “Langenberg Quarry” near Oker in Lower Saxony. Since it is the first record from this important locality, it is briefly described in the present article.

The locality is well-known for its fossiliferous Late Jurassic sequence. Common fossils of the “Kimmeridgian” in the Langenberg are Bivalvia, Gastropoda, Brachiopoda and ichnofossils; in higher parts of the section, even Nautilida occur. As already pointed out by STURM & BRAUCKMANN (1999: 53) and KARL et al. (2006), remnants of the original colouration are not rare in certain bivalves and gastropods. Some layers, in particular in the so-called “Second Quarry” at the eastern slope of the Langenberg (where the same sequence is exposed), yield very small fragments of an amber-like resin.

The Langenberg quarry became still more famous after the discovery of dinosaur skulls and other remains in 1998. Other vertebrate fossils include, for example, Osteichthyes, Actinopterygii, etc. (MURDOCH & THIES, 1996), Crocodylia (KARL et al. 2006), and Chelonii. Recently, FASTNACHT (2005) presented a detailed description of a pterosaur belonging to the Dsungaripteridae.

In the meantime a team of palaeontologists jointly with the “Dinosaur Park Muenchehagen” (“Dino-

saurierpark Münchehagen”) are carefully securing, collecting and preparing the now considerable material of the “Dinosaur Cemetery” of the Langenberg. In the future, a special “Jurassic Museum” in the Langenberg is planned in cooperation with the “Dinosaur Park Muenchehagen”.

2 Geology and stratigraphy

The complete sequence of the “Langenberg Quarry” has been described in detail by PAPE (1970), ZIHRUL (1990) and FISCHER (1991). KARL et al. (2006) presented remarks on the geological and stratigraphical settings as well as on the quarrying history of the “Langenberg Quarry”. A new sketch of the section – including the main fossiliferous layers – has been prepared by MUDROCH & KNÖTSCHKE (2007, unpublished); NILS KNÖTSCHKE kindly supplied us with this version.

3 Systematics

Order Coleoptera LINNÉ, 1758

Coleoptera, fam., gen. et sp. indet.
(Fig. 1a-b)

Material: Specimen GSUB A91, collected by UDO RESCH (Berlin), deposited in the Geosciences Collection of the University of Bremen at the Faculty 5 (Geosciences), a left elytra.

Locality: „Langenberg Quarry“ of the Rohstoffbetriebe Oker GmbH & Co (manager: FABIAN VON PUPKA) near Oker, Lower Saxony, close to the northern slope of the Harz Mountains.

Stratum: Late Jurassic, Middle Kimmeridgian (carbonate rock in a sequence of more terrestrial influence), bed 96 (this bed is characterized by its rather complete plant fossils). The elytra was collected on the upper stope.

Description: Small left elytra (ratio length : width estimated at 2.5:1), internal mould in dorsal view. Shape: suboval, external margin slightly convex; apex rather bluntly rounded, median region of anterior margin oblique, slightly straightened (space for a small scutellum?). Sculpture: 10 moderately incised and slightly irregularly arranged striate submarginal furrows. Apical region strengthened by a narrow ledge (preservation?).

Measurements: Length = 4.6 mm; width = 1.9 mm.

Discussion: Due to the lack of diagnostic characters and the relatively poor preservation, a more detailed identification is impossible. In its general morphology the Langenberg specimen is similar to the elytra from Nettelstedt (POPOV et al. 2000) which could also not be determined below order level, but with a total length of 2 mm and a width of 0.65 mm, the latter is less than half as long and distinctly more slender, whereas its surface seems to be even more smooth. Thus both specimens cannot be conspecific.

The elytra described by SCHULTKA (1991) as *Hyperomima* sp. is distinctly longer (total length = 5.6 mm), but a little bit more slender (width = 1.8 mm) and differs moreover mainly by only 7 (but coarser) submarginal striae. Closer relationships between the Langenberg elytra and this slightly more ancient specimen from Hille-Oberlübbe can therefore be excluded.

The second elytra from SCHULTKA’s material is too poorly preserved and cannot be compared.

PONOMARENKO et al. (1999) described several Coleoptera from the Late Jurassic Purbeck Limestone Group of Dorset (England). A few of them have a sculpture similar to the “Oker beetle” [Gyrinidae (fig. 5); Byrrhidae (fig. 8)], but they also differ distinctly in their shape and dimensions.

If a small scutellum really was present (as indicated by its straightened, oblique median region of anterior margin), the Langenberg specimen resembles several families of different systematic position, habitats, and habits, as for example the Buprestidae, Elateridae, Alleculidae, Chrysomelidae, and even Carabidae which all include species with elytrae of similar shape and sculpture. All these families have been recorded since the Triassic or Jurassic, respectively.

Due to the different habits and habitats of the families mentioned above, no detailed ecological data can be concluded for the Langenberg specimen.

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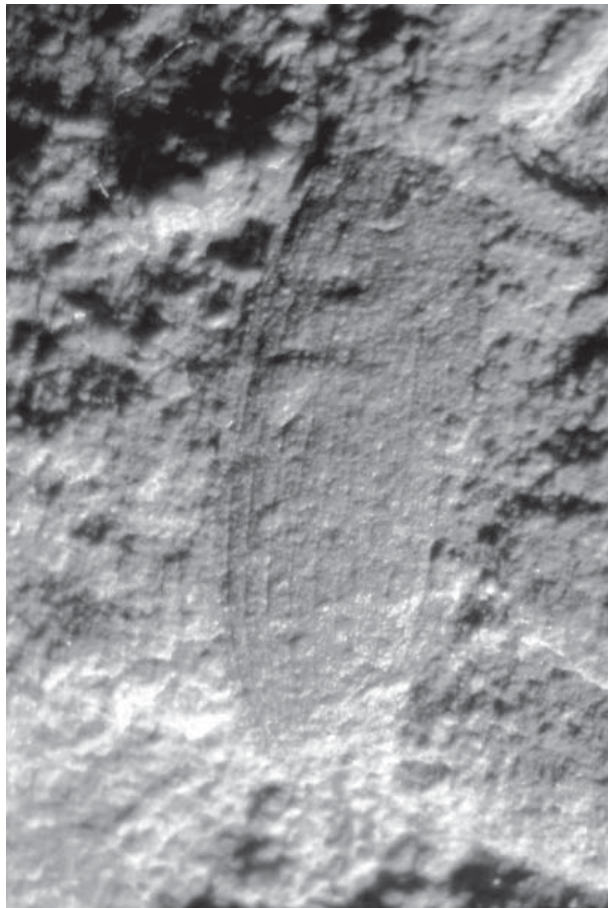


Fig. 1: Coleoptera, fam., gen. et sp. indet., left elytra; Late Jurassic, „Middle Kimmeridgian“ (Langenberg Formation), bed 96; „Langenberg Quarry“ near Oker, Lower Saxony. left: Photograph. right: Drawing. – Scale bar 1 mm.

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Authors' addresses:

Carsten Brauckmann and Elke Gröning,
 Institut für Geologie und Paläontologie,
 Technische Universität Clausthal (Clausthal University of
 Technology),
 Leibnizstraße 10,
 D-38678 Clausthal-Zellerfeld, Germany,
 e-mail addresses: Carsten.Brauckmann@tu-clausthal.de
 and
 Elke.Groening@tu-clausthal.de