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Vertebrates from the Early Miocene lignite deposits of the opencast mine Oberdorf (Western Styrian Basin, Austria):

8. Rhinocerotidae (Mammalia)

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(With 1 text-figure and 1 plate)

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Abstract

New and old collections from Oberdorf include fossils of rhinos. However, the material is too poor to arrive at a reliable determination.

Key words: Oberdorf, Rhinocerotidae.

Zusammenfassung

Nashorn-Fossilien kommen in den alten und neuen Aufsammlungen von Oberdorf vor. Dennoch ist das Material zu dürftig, um zu einer verläßlichen Bestimmung zu kommen.

Introduction

As part of the "Köflach-Voitsberg Project", fossil mammals were collected in the opencast mine Oberdorf, north of Voitsberg in the Köflach-Voitsberg coalfield, in Styria (Steiermark). Coal and clay layers O3 and O4 in the north section of the eastern part of the coal field yielded large mammals. Remains of Rhinocerotidae come from layer 3 (referred to as Oberdorf 3), but are also present in older collections from Oberdorf.

MOTTL (1970) cited cf. *Aceratherium tetradactylum* from Oberorf. The exact provenance (within the mine) of this material is, however, no longer known and therefore it is referred to here as from Oberdorf oc (old collections). This material has never been described or figured. The citation is probably based on some specimens in the Steiermärkisches Landesmusuem Joanneum, Graz (SLJG). SLJG 9533 is a right I_2. A box contains a label with the numbers 2141-43, but the specimens must have been lost or mislaid, since in pencil it was added to the label: "2142-43 fehlen!". The remaining number 2141 is a right M_3.

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Description

1997z0191/0001/1 – the posterior part of a right **P_2** from Oberdorf 3 (Pl. 1, fig. 1). It is heavily worn and most of its morphology has disappeared. Its width is 16.4 mm. At the buccal side, the remains of the crown seem to reach nearly the anterior end of the tooth. The length must have been more than 19.2 mm. The impression is of a short and wide tooth, but then most teeth appear short and wide when nearly completely worn down.

1997z0191/0001/2 – a fragment of what is possibly a right **P_2** from Oberdorf 3 (Pl. 1, fig. 2). The posterior roots and a tiny scrap of enamel at the postero-buccal side are preserved.

1997z0191/0001/3 – the lingual half of a right **$P^{3/4}$** from Oberdorf 3 (Pl. 1, fig. 3). There was a well developed lingual cingulum along the protocone and lingual end of the transverse valley. The height of the cingulum is about 5 mm. The length of the lingual half of the right P^3 or P^4 is 30.0 mm, the buccal length must have been slightly more. In upper cheekteeth the length is measured buccally.

1997z0191/0001/4 – the postero-buccal side of a left **$M^{1/2}$** from Oberdorf 3 (Pl. 1, fig. 4). The tooth is extremely worn. There is a not well developed cingulum at the posteriormost end of the buccal side. The roots are short.

1997z0191/0001/5 – **fragments of roots** from Oberdorf 3.

All rhino specimens from Oberdorf 3 seem to indicate the same size of animal and all are heavily worn. This suggests that all specimens belonged to the same individual.

SLJG 9533 – a right **I_2**, Oberdorf oc (Pl. 1, fig. 5). It has a low crown, possibly because of heavy wear. The upper part of the root is straight; in its lower part there is a slight curvature, but mainly of the labial surface. Probably the root was not much longer. The mesio-distal diameter of the crown is 22.1 mm, the labio-lingual diameter 11.3 mm, and the remaining height of the crown 35.8 mm.

SLJG 2141 – a right **M_3** from Oberdorf oc (Pl. 1, fig. 6). It is lingually damaged. Its length is 46.9 mm and its posterior width 24.7 mm. The place where the anterior wing of the hypoconid is fused to the protoconid is not yet affected by wear. The height of the crown is here 20.9 mm.

There is no reason to asume, a priori, that the new collections represent the same species as the old collections, not even that the incisor and molar of the old collections represent the same species.

Discussion

Fossils, including rhinos, from the classic stryrian localities were described during the later half of the 19th century and the earlier part of 20th century. A series of papers by THENIUS and MOTTL revised the faunas during the 1950's to 1970's. However, for the rhinos no detailed revisions are available.

MOTTL (1970) reviewed the Styrian localities and their stratigraphy. She gave faunal lists but no descriptions or discussions on taxonomy and cited "cf. *A. tetradactylum*" from Oberdorf and *Aceratherium tetradactylum, Rhinoceros steinheimensis, Brachypotherium brachypus* and the "*Dicerorhinus sansaniensis-germanicus* Gruppe" from other localities that she placed, like Oberdorf, in the Karpathian (Figure 1). The updated classification of

Updated taxonomy	*Hoploaceratherium tetradactylum*	*Aceratherium incicivum*	*Lartetotherium sansaniense Prosantorhinus germanicus*	*Brachypotherium brachypus*	*"Dicerorhinus" steinheimensis*
Taxonomy after MOTTL, 1970	*Aceratherium tetradactylum*	*Aceratherium incicivum*	*Dicerorhinus sansaniensis -germanicus* Gruppe	*Brachypotherium brachypus*	*Rhinoceros steinheimensis*
Sarmatian		Prebensdorf Sandriegel Trössing - cf.	Löffelbach	Trössing	
Badenian	Göriach			St. Oswald Mantscha	Göriach
Karpathian	Seegraben Münzenberg Vordersdorf Eibiswald Feisternitz Schönegg Schwanberg Rosental Voitsberg Oberdorf - cf.		Seegraben Münzenberg Vorderdorf Ebiswald Feisternitz Schönegg Schwanberg Rosental Voitsberg Steieregg Wies Köflach Fohnsdorf	Seegraben Münzenberg Labitschberg	Vordersdorf

Fig. 1: Rhinocerotidae cited from the Early and Middle Miocene of Styria (MOTTL 1979). Stratigraphy after MOTTL (1970). Updated taxonomy after CERDEÑO (1987, 1992) and HEISSIG (1996).

those taxa is: *Hoploaceratherium tetradactylum, "Dicerorhinus" steinheimensis, Brachypotherium brachypus*, *Prosantorhinus germanicus* and *Lartetotherium sansaniense* (CERDEÑO 1989 & 1992; HEISSIG 1996).

The system of Neogene Mammal Units (MN units) that currently is in use was introduced in 1975 and some of the Karpathian rhino localities were placed in MN5 (DE BRUIJN et al. 1992). Oberdorf is placed in MN4 and in the Ottnangian (HÖCK, pers. comm.). It is not clear whether the stratigraphic assignations of other "Karpathian" rhino localities also need to be altered. Nor is it clear whether a different stratigraphy would have influenced MOTTL's determinations of the rhinos.

CERDEÑO & NIETO (1995) seemed to consider the Spanish and western European rhino record to be identical. They mention for MN4: *Protaceratherium (=Plesiaceratherium) mirallesi, P. platyodon, Hispanotherium matritense, Lartetotherium montesi* and some of the species mentioned above. CERDEÑO (1996) cited *Prosantorhinus douvillei* from MN3 till MN 7+8. HEISSIG (1972, 1996) cited from MN5–6 of central Europe: *A. simorrensis* and *Plesiaceratherium fahlbuschi. Begertherium* is cited from MN4 in France as well as from Turkey (HEIZMANN et al. 1996) and is likely to have been present in the area in between. The genus might be identical to *Hispanotherium*, which has also been cited from France and Turkey and from the Iberian Peninsula as well (GINSBURG et al. 1987). The latter authors also cite *Gandaitherium rexmanuelli* from MN5 in France. There are over ten species, to which the material from Oberdorf may have belonged.

Some of those species can easily be eliminated. *Hispanotherium* and *Begertherium* have cementum in the valleys of the cheek teeth. This is not present in Oberdorf. *"Dicerorhinus" steinheimensis* is present in Göriach (SLJG, Naturhistorisches Museum Wien). It is

much smaller than the rhino(s) from Oberdorf. The P_2 from Oberdorf is wider than that of *P. germanicus* (data from CERDEÑO 1996).

Between rhino species, there are differences in the size of the P_2 relative to the other cheek teeth. However, there are no reliable measurements of molars from Oberdorf 3. The presence of a cingulum in upper premolars seems to be variable in the various species, or at least it is so in the material assigned to these species, limiting the value of the character. There are not enough morphological and metrical data to come to reliable result; the material from Oberdorf is assigned to Rhinocerotidae indet.

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Plate 1

Rhinocerotidae indet. from Oberdorf 3 (figs. 1–4) and of the old collections from Oberdorf (figs. 5–6).

Fig. 1: Right P_2.

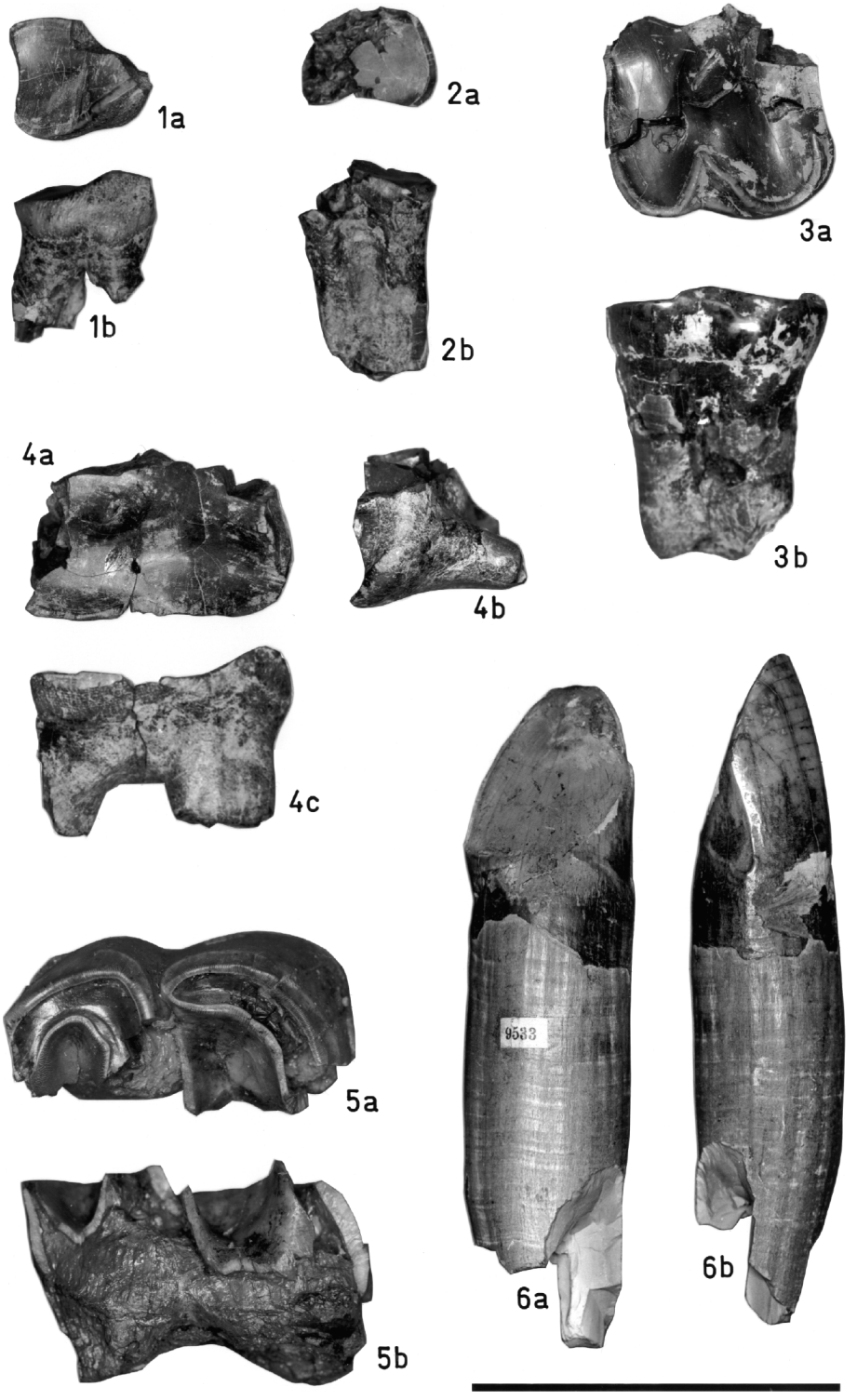
Fig. 2: Right P_3 (?).

Fig. 3: Right $P^{3/4}$.

Fig. 4: Left $M^{1/2}$.

Fig. 5: Left I_2.

Fig. 6: Right M_3.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