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Late Campanian polyptychoceratine ammonites from the Lehrte West Syncline, Hannover area, northwest Germany

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Abstract

Two faunules of heteromorph ammonites (Polyptychoceratinae) are recorded from the *vulgaris*/*stolleyi* and *minor*/*polyplocum* zones (mid/upper Campanian) as exposed at the Teutonia Nord (Teutonia AG) quarry near Misburg (Lehrte West Syncline, Hannover area, northwest Germany). Four taxa are recognised: *Oxybeloceras* aff. *crassum*, *Pseudoxybeloceras* (*Parasolenoceras*) ?*phaleratum*, *Solenoceras* aff. *texanum* and *Spiroxybeloceras*? *grande* sp. nov. Species of *Oxybeloceras*, *Solenoceras* and *Spiroxybeloceras* are widely distributed in the upper Campanian of the Western Interior and the Atlantic Seaboard of the USA, where their stratigraphic ranges are well known. Comparison of the new northwest German records with these ranges suggests polyptychoceratines are less well suited for strict zone-level correlations than are co-occurring nostoceratid and scaphitid ammonites.

Keywords: Ammonoidea; Diplomoceratidae; Polyptychoceratinae; Upper Cretaceous; Campanian; Northwest Germany; Comparisons; Western Interior; Atlantic Seaboard

1. Introduction

The lower and upper Campanian chalk/marl rhythmites exposed in a number of working quarries east of Hannover (Lehrte West Syncline, northwest Germany; Fig. 1) have yielded numerous heteromorph ammonite taxa, mostly baculitids, as well as scaphitids (genera *Scaphites*, *Trachyscaphites* and *Jeletzkytes*), diplomoceratids [species of *Glyptoxoceras*, *Lewyites*, *Neancyloceras*, *Neoglyptoxoceras*, *Neocrioceras* (*Schlueterella*) and *Scalarites*] and nostoceratids (Table 1; compare Zawischa and Schormann, 1992; Niebuhr, 1996, 2004; Niebuhr et al., 1997; Säbele, 2005). Species represented here compare well with records from elsewhere in northwest and central Europe (Błaszkiewicz, 1980; Wippich, 1995; Kaplan et al., 1996, in press; Kennedy and Kaplan, 1995, 1997; Hauschke et al., 1999; Kennedy and Summesberger, 1999, 2001; Summesberger and Kennedy, 2004).

Previous records of Polyptychoceratinae from this area are few; Niebuhr (2005, fig. 5) listed, but did not illustrate, *Solenoceras mortoni* from the middle *minor*/*polyplocum* Zone at the Teutonia Nord quarry, while Säbele (2005, p. 22, top left-hand figure) figured a specimen under the name of *Solenoceras* sp. from the same quarry, but failed to indicate its stratigraphic level. Although the illustration is too poor to determine this beyond doubt, this specimen appears to be closely related to, if not conspecific with, *Pseudoxybeloceras* (*Pseudoxybeloceras*) *kollmanni* Summesberger and Kennedy, 2004 (p. 182, pls. 8, 9), from the ?upper Campanian of the Gschliefgraben (Ultrahelvetic Nappe, Austria). Without having seen the actual specimen, we cannot comment further at this time.

Here, two lots are described from the Teutonia Nord quarry at Misburg (Fig. 1), one of the key localities in the Lehrte West Syncline (Ernst et al., 1997; Stratigraphische Kommission

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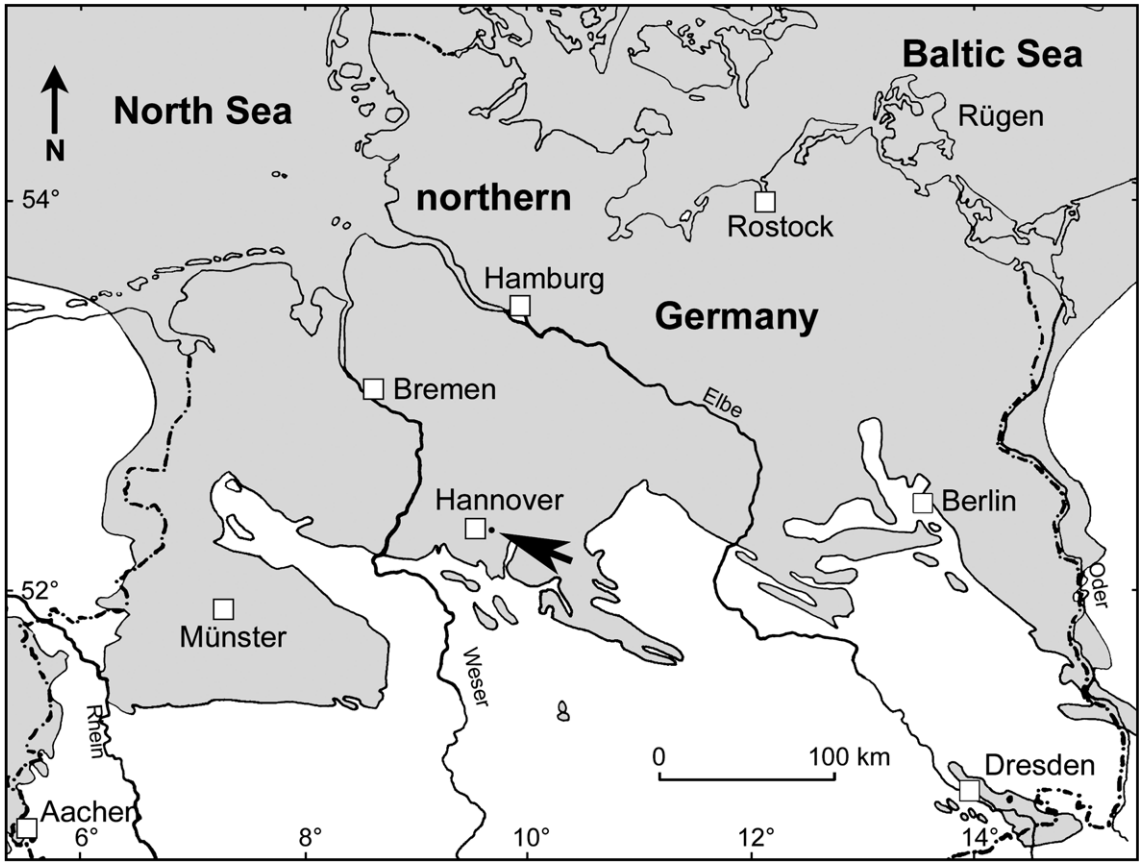

Fig. 1. Location (arrow) of the Teutonia Nord (Teutonia AG) quarry at Misburg (Lehrte West Syncline), east of Hannover, northern Germany; Cretaceous strata, both surface and subsurface, are shaded (modified after Niebuhr, 2004); see Niebuhr and Reich (2004) for a detailed map and a stratigraphic section of this quarry.

Deutschlands, 2000; Niebuhr and Reich, 2004). One of them is preserved in a matrix block, in an association reminiscent of material from the Pierre Shale of the Western Interior illustrated by Larson et al. (1997), and comprises two taxa. Unfortunately, this block was collected loose, but from information provided by the collectors it is here assumed to have originated from the *vulgaris*/*stolleyi* Zone (Table 2). Additional material, supplied by Berlin-based private collectors, is from the new easterly extension in the Teutonia Nord quarry, exposing the overlying *minor*/*polyplocum* Zone (see Niebuhr and Reich, 2004, fig. 2).

All specimens are preserved as fragmentary, diagenetically flattened and/or distorted composite moulds, which means that whorl breadth/whorl height ratios are difficult to determine. Consequently, generic and specific assignments are tentative at best, pending the discovery of more and better-preserved material. In general, species assignment within Diplomoceratidae (and Polyptychoceratinae) remains difficult (see Cooper, 1994), a view also expressed by Klinger and Kennedy (2003) in their treatment of Late Cretaceous nostoceratids and diplomoceratids from Zululand and Natal, South Africa.

In comparison to nostoceratid and scaphitid ammonites, on which transatlantic correlations have been based in recent literature, polyptychoceratine taxa appear less well suited for this purpose. Ranges of species of *Oxybeloceras*, *Solenoceras* and *Spiroxybeloceras* in the Western Interior and Atlantic Seaboard are well known, and suggest the new northwest German records the span the interval between the *Baculites scotti* Zone below and *B. reesidei* Zone (Table 3) above. However, the scaphitids *Trachyscaphites spiniger* and *T. pulcherrimus*, known from Europe as well as North America, provide much more reliable correlation tools (see Niebuhr and Reich, 2004, fig. 3).

Abbreviations. To denote the repositories of specimens referred to in the text, the following abbreviations are used: GPIG, Geologisch-Paläontologisches Institut und Museum der Georg-August Universität, Göttingen; MAB, Oertijdmuseum de Groene Poort, Boxtel (The Netherlands); MNB, Museum für Naturkunde, Humboldt Universität, Berlin; USNM, United States National Museum, Washington DC. Other abbreviations: Wb, whorl breadth; Wh, whorl height; RI, rib index.

2. Systematic palaeontology

Suborder: Ancyloceratina Wiedmann, 1966
Superfamily: Turrilitoidea Gill, 1871
Family: Diplomoceratidae Spath, 1926
Subfamily: Polyptychoceratinae Matsumoto, 1938
Genus *Oxybeloceras* Hyatt, 1900

Type species. *Ptychoceras crassum* Whitfield, 1877, by original designation.