

Choerolophodon (Proboscidea: Mammalia) from Staro Oryahovo near Varna, NE Bulgaria

Georgi N. Markov

National Museum of Natural History, Bulgarian Academy of Sciences, 1 Tzar Osvoboditel Blvd., 1000 Sofia, Bulgaria;
E-mail: markov@nmnh.com

Abstract: An accidental find of *Choerolophodon* sp. is reported from Staro Oryahovo near Varna, northeast Bulgaria. While its preservation does not permit identification at the species level, the specimen, a mandibular fragment with m3, seems to belong to a species earlier than *Ch. pentelici*. Neither *Ch. chioticus* nor *Ch. anatolicus*, the two other European choerolophodont species, have been reported from Bulgaria so far, and the find from Staro Oryahovo highlights the potential interest of the fossiliferous localities in the vicinity of Varna.

Key words: Proboscidea, Elephantoidea, *Choerolophodon*, Miocene, Bulgaria

Introduction

Recently, VERGIEV & MARKOV (2012) described fossil proboscideans from the Varna Region, including two finds from Staro Oryahovo, a new addition to the list of Bulgarian fossiliferous localities at the time (Fig. 1). In 2015, the National Museum of Natural History in Sofia (NMNH) acquired a newly discovered specimen from a sand quarry near Staro Oryahovo, described below.

Material and Methods

Material studied: NMNH FM3321, left mandibular fragment with m3, Staro Oryahovo near Varna.

Dental nomenclature follows TASSY (1996). All measurements are in mm. Abbreviations used: L: length; W: width; H: height; ET: enamel thickness.

Results

Order Proboscidea ILLIGER, 1811
Family Choerolophodontidae GAZIRY, 1976
Genus *Choerolophodon* SCHLESINGER, 1917
Choerolophodon sp.

NMNH FM3321 (Fig. 2), an accidental find from a sand quarry near Staro Oryahovo, is a left mandibu-

lar fragment with m3 and a remnant of the m2. Only the part of the horizontal branch beneath the molar is preserved, with a maximum height of 160 mm (in front of m3) and width of 106 mm at the point of insertion of the ascending branch, the height at this point being 141 mm. The m3 is well preserved, with four lophids and a posterior cingulum consisting of a large cusp on the pretrite side and two smaller cusps on the posttrite. The tooth is well worn, with dentine

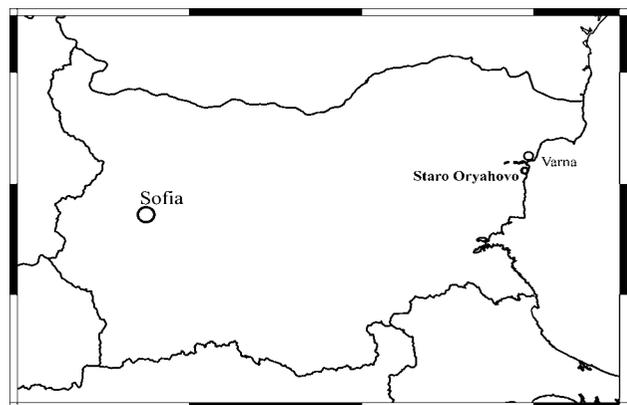


Fig. 1. Geographic position of Staro Oryahovo

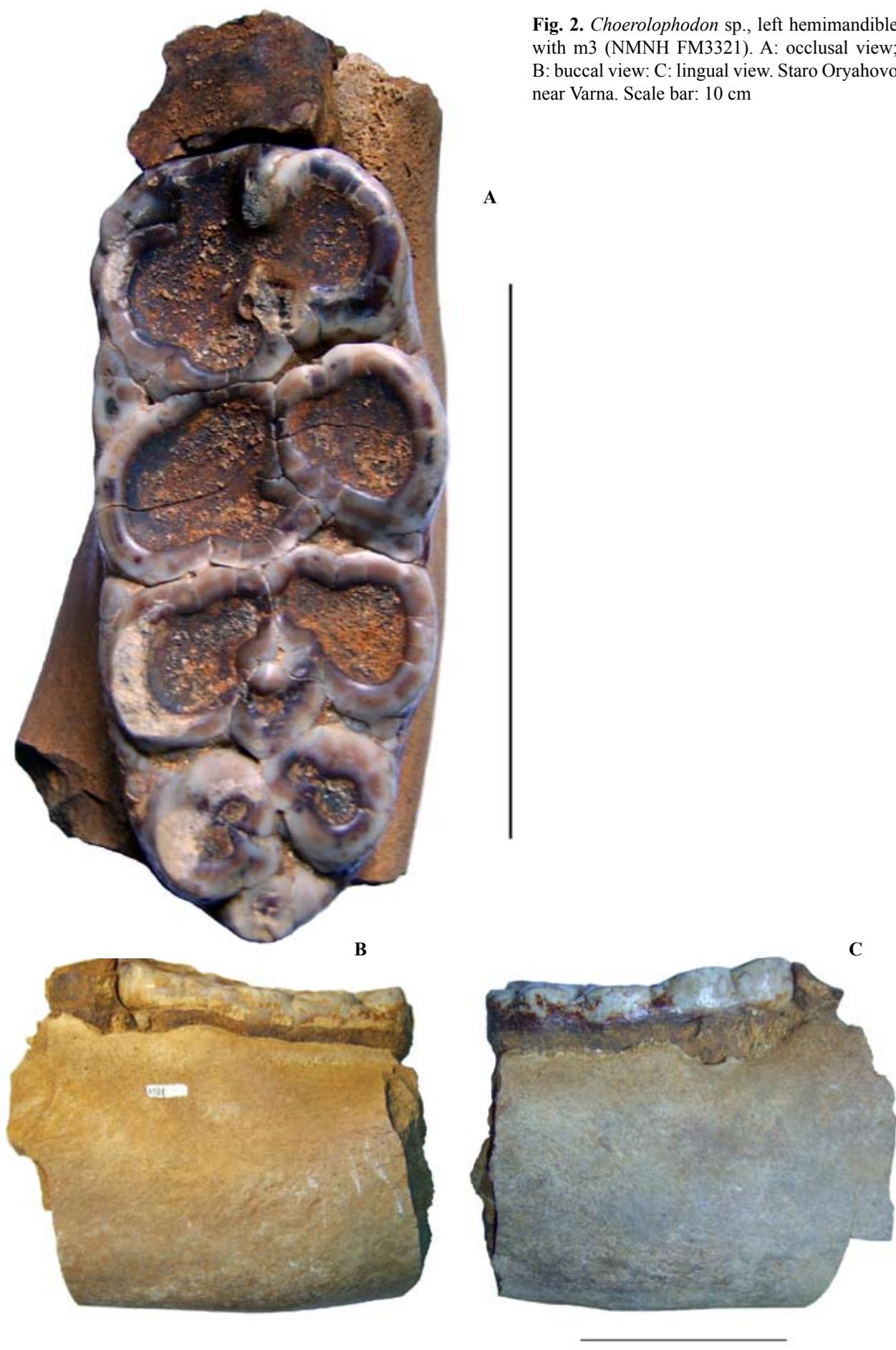


Fig. 2. *Choerolophodon* sp., left hemimandible with m3 (NMNH FM3321). A: occlusal view; B: buccal view; C: lingual view. Staro Oryahovo near Varna. Scale bar: 10 cm

exposed on all lophids, and traces of wear on the posterior cingulum. Finer details are obliterated by wear but the choerodont structure of the crown is seen on the fourth lophid, with a large cusp connecting the fourth posttrite semilophid with the third lophid, and the mesoconelets are anteriorly displaced in regard to the main cuspids (chevroning). Ptychodonty is weak, traces of cement are still visible on the crown. L: 162; W: 70/76.5/72.5/53.5; H>30 (on 4th pretrite); ET: 6-7.

Discussion

While the morphology of the molar safely allocates it to *Choerolophodon*, identification at the species level is difficult. *Choerolophodon* is represented in (southeast) Europe with three species: middle Miocene *Ch. chioticus*, Vallesian *Ch. anatolicus* and Turolian *Ch. pentelici*, type species of the genus. In its size, NMNH FM3321 differs from *Ch. pentelici* and fits within the range of specimens referred to *Ch. anatolicus* (see KONIDARIS *et al.* 2016: Fig. 8). The low number of lophids (4) is primitive but of no diagnostic value, occurring in *Ch. anatolicus* as well as *Ch. pentelici*. Yet, as noted by KONIDARIS *et al.* (2016), a posterior cingulum connected to the fourth lophid is a character recorded in *Ch. anatolicus* (and other more primitive choerolophodonts) but not *Ch. pentelici*; even considering the degree of wear, this is apparently the case with NMNH FM3321. No comparable material from *Ch. chioticus* is known so far: the holotype, a skull with mandible from Thymiana, Chios, Greece (TOBIEN 1980) has third molars that are still in their crypts. Middle Miocene Turkish material described by GAZIRY (1976), and most probably belonging to *Ch. chioticus* (TASSY 1990, KONIDARIS *et al.* 2016), includes no m3s either. NMNH FM3321 lacks the symphysis (inclined in *Ch. chioticus* and *Ch. anatolicus*, straight in *Ch. pentelici*); with the ascending branch missing, presence or absence (or degree of development) of a retromolar gap (on which see TASSY 2016) can only be speculative: insertion point of the ascending branch is well in front of the m3's distal end but the tooth might have still been visible in buccal view (e.g. KONIDARIS *et al.* 2016: Fig. 4H,I). The weak cementodonty could be explained as a result of wear; weak ptychodonty is primitive.

In a paper dealing with fossil proboscideans from the Varna Province, VERGIEV & MARKOV (2012) described two molar fragments from Staro Oryahovo and hypothesized that their age should

be pre-Turolian, possibly middle Miocene, based on the morphology of one of them (VERGIEV & MARKOV 2012: Fig. 10). The specimen, while not positively identifiable, can hardly be allocated to any Turolian elephantoid, displaying some similarities with *Protanancus*, a genus seemingly present in northeast Bulgaria (MARKOV & VERGIEV 2010). This suggestion was further influenced by the pre-Turolian age of Neogene fossils found in the vicinities of Varna (e.g. Pochivka, Galata, Yarebichna and Aksakovo: MARKOV 2008, VERGIEV & MARKOV 2010, 2012). Indeed, the *Choerolophodon* specimen described here need not necessarily be contemporaneous with the two previous finds, considering the size of the Staro Oryahovo sand quarries. In any case, however, molar size and morphology – posterior cingulum connected to the fourth lophid (KONIDARIS *et al.* 2016), together with weak ptychodonty and, probably, anterior position of ascending branch insertion point, make allocation of NMNH FM3321 to *Ch. pentelici* unlikely. Thus, it seems to belong to either the middle Miocene species *Ch. chioticus* or, alternatively, to the Vallesian *Ch. anatolicus*, none of which has been reported from Bulgaria so far (but see MARKOV 2008: 146-147 on a *Choerolophodon* find from Balchik originally published by BAKALOV 1911 and BAKALOV & NIKOLOV 1962, now apparently lost, and HRISTOVA *et al.* 2013 on the somewhat dubious status of the *Choerolophodon* from Kocherinovo, southwest Bulgaria).

Conclusions

NMNH FM3321 is the first find from the sand quarries near Staro Oryahovo that is identifiable, if only at the genus level. Preservation permits no definite specific identification but the small size and a combination of primitive characters make allocation to Turolian *Ch. pentelici* unlikely. Neither of the two other European choerolophodont species, *Ch. chioticus* and *Ch. anatolicus*, has been reported from Bulgaria so far. A pre-Turolian age was hypothesized for Staro Oryahovo by VERGIEV & MARKOV (2012), and the new find described here does not contradict this. Bulgarian proboscideans of pre-Turolian age are still insufficiently known and localities are rare; the Staro Oryahovo *Choerolophodon*, though an isolated and fragmentary find, highlights the potential interest of the fossiliferous area around the village.

Acknowledgements: Two anonymous reviewers are gratefully acknowledged for their most helpful comments and suggestions.

References

- BAKALOV P. 1911. Beiträge zur Paläontologie Bulgariens. I. Mastodonreste aus Bulgarien. – *Annuary of the Sofia University*, **6**: 1-41. (In Bulgarian, German summary).
- BAKALOV P. & I. NIKOLOV 1962. Les Fossiles de Bulgarie. X. Mammifères Tertiaires. Sofia (BAS). 162 p. (In Bulgarian, French summary).
- GAZIRY A.W. 1976. Jungtertiäre Mastodonten aus Anatolien (Türkei). – *Geologisches Jahrbuch*, **22**: 3-143.
- HRISTOVA L., D. GERAADS, G. N. MARKOV & N. SPASSOV 2013. Late Miocene Mammals from Kocherinovo, Southwestern Bulgaria. – *Acta zoologica bulgarica*, **65** (4): 517-529.
- KONIDARIS G. E., G. D. KOUFOS, D. S. KOSTOPOULOS & G. MERCERON 2016. Taxonomy, biostratigraphy and palaeoecology of *Choerolophodon* (Proboscidea, Mammalia) in the Miocene of SE Europe-SW Asia: implications for phylogeny and biogeography. – *Journal of Systematic Palaeontology*, **14** (1): 1-27.
- MARKOV G.N. 2008. Fossil proboscideans (Mammalia) from the vicinities of Varna: a rare indication of middle Miocene vertebrate fauna in Bulgaria. – *Historia naturalis bulgarica*, **19**: 137-152.
- MARKOV G.N. & S. VERGIEV 2010. First report of cf. *Protanancus* (Mammalia, Proboscidea, Amebelodontidae) from Europe. – *Geodiversitas*, **32** (3): 493-500.
- TASSY P. 1990. The “proboscidean datum event”: how many proboscideans and how many events? – In: LINDSAY E. H., V. FAHLBUSCH & P. MEIN (Eds.): *European Neogene Mammal Chronology*. New York (Plenum Press), 237-252.
- TASSY P. 1996. Dental homologies and nomenclature in Proboscidea. – In: SHOSHANI J. & P. TASSY (Eds.): *The Proboscidea. Evolution and Palaeoecology of Elephants and their Relatives*. Oxford (Oxford University Press): 21-25.
- TASSY P. 2016. Proboscidea. – In: Sen S. (Ed.): *Late Miocene mammal locality of Küçükçekmece, European Turkey*. – *Geodiversitas*, **38** (2): 261-271.
- TOBIEN H. 1980. A note on the skull and mandible of a new choerolophodont mastodont (Proboscidea, Mammalia) from the middle Miocene of Chios (Aegean Sea, Greece). – In: JACOBS L. L. (ed): *Aspects of Vertebrate History. Essays in honor of Edwin Harris Colbert*. Flagstaff (Museum of Northern Arizona Press): 299-307.
- VERGIEV S. & G.N. MARKOV 2010. A mandible of *Deinotherium* (Mammalia: Proboscidea) from Aksakovo near Varna, Northeast Bulgaria. – *Palaeodiversity*, **3**: 241-247.
- VERGIEV S. & G.N. MARKOV 2012. Fossil Proboscideans (Mammalia) from the Collections of the Varna Regional Museum of History – *Acta zoologica bulgarica*, **64** (4): 427-438.

Received: 22.03.2016

Accepted: 14.04.2016