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New Material of the Hornless Rhinocerotid *Chilotherium* (Mammalia, Perissodactyla) from the Turolian Fauna of Samos Island, Greece

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The paleontological wealth of the island of Samos, Greece had sparked the interest of researchers since the middle of the 19th century (Solounias, 1981; Koufos, 2009). The diverse fauna of this renowned Late Miocene locality is characterized by the notable presence of the hornless rhinocerotid *Chilotherium* (Ringström, 1924), along with the two-horned species *Dihoplus pikermiensis* (Toula, 1906) and “*Diceros*” *neumayri* (Osborn, 1900). In this preliminary report, we examine and evaluate for the first time previously undescribed specimens of the hornless rhinocerotid *Chilotherium* excavated during the first decade of the 1900s by Prof. Theodore Skoufos in Samos, which are stored at the collections of the Museum of Palaeontology and Geology in Athens (AMPG).

The presence of two different two-horned rhinocerotids on Samos has been known since their first dedicated study by Weber (1904). “*Diceros*” *neumayri*, is a common element of the Late Miocene mammal faunas of the Eastern Mediterranean, and it is the dominant tandem-horned rhinocerotid on Samos Island. The frequently sympatric *Dihoplus pikermiensis* is also present in Samos fauna, but in a significant lower percentage (Giaourtsakis, 2009).

Weber (1905) was also the first author to recognize the presence of hornless rhinocerotids (subfamily Aceratheriinae) in the fauna of Samos, which he assigned to two different new species, *Aceratherium schlosseri* and *Aceratherium samium*. Andree (1920) named two additional hornless species based on material from Samos, *Aceratherium wegneri* and *Aceratherium angustifrons*. Ringström (1924) included all aforementioned hornless species into his newly erected genus *Chilotherium*. Later, Heissig (1975) merged *C. wegneri* with *C. schlosseri*, and attributed *C. angustifrons* to *C. kowalevskii* (Pavlov, 1913). Recently, Giaourtsakis (2009) suggested that both *C. wegneri* and *C. angustifrons* might be junior synonyms of *C. schlosseri*, thus recognizing the presence of only two hornless species in Samos, *C. schlosseri* and *C. samium*. Since the current nomenclatural status of the Eastern Mediterranean chilothers and their systematic affinities remain unsettled, we have preliminary limited our specimens’ assignment at generic level.

Among the most impressive specimens of the AMPG collection is a well-preserved *Chilotherium* cranium with associated mandible, currently under preparation (Fig. 1.1). The cranium, which is missing the nasals and the occipital region, is characterized by the following salient features: the flattened and hornless frontals, the retracted nasal notch that terminates above the mesial half of the P4, the highly placed orbital fossa with a rostral margin located above the M1, and the very short distance between the orbit and the nasal notch. On the contrary, the crania of the sympatric horned species *Dihoplus pikermiensis* and “*Diceros*” *neumayri* are characterized by the presence of a frontal horn boss, the markedly less retracted nasal notch, the relatively lower placed orbits, and the longer distance between the orbit and the nasal notch (Geraads, 1988; Giaourtsakis, 2009).

Another interesting specimen of the AMPG collection is a partial mandible missing the ascending rami and the caudal half of the mandibular body, but preserving the symphysis (Fig. 1.2). It belongs to a female individual, as deduced by the relatively small size of the second lower incisors, which are partially preserved. The mandibular symphysis is notably widened, demonstrating one of the most prominent apomorphic features of the genus *Chilotherium*. It is also characterized by a rather long diastema with a marked crest along the interalveolar margin, and a concave ventral profile. The mandible of *Dihoplus pikermiensis* is characterized by a narrower symphyseal region, featuring significantly smaller second lower incisors (Giaourtsakis *et al.*, 2006). The symphyseal region of “*Diceros*” *neumayri* is abbreviated, and permanent second lower incisors are missing (Giaourtsakis, 2009). The postcranial material of the AMPG collection is of particular interest, as it includes several partially associated specimens that are presently under preparation. The postcranial elements of *Chilotherium* can be readily distinguished from the ones of the sympatric horned species, since they have significantly smaller size and relatively more robust proportions (Fig. 1.3, 1.4).

The biogeographical and paleoecological implications of the rhinocerotid dispersal during the Late Miocene in Greece are of particular interest. The hornless genera *Chilotherium* and *Acerorhinus* migrated into Greece from Central Asia through Anatolia, at the beginning of the Vallesian (Heissig, 1975; Giaourtsakis, 2003). The Vallesian locality of Pentalophos-1 is the only Greek site where both *Acerorhinus* and *Chilotherium* are found sympatric, along with the horned rhinocerotid “*Diceros*” *neumayri* (Geraads & Koufos, 1990; Athanassiou *et al.*, 2014). The Greek Turolian localities have yielded only one of the two hornless genera, thus far. Furthermore, in Turolian localities where both of the horned taxa *Dihoplus pikermiensis* and “*Diceros*” *neumayri* co-occur, one of them is usually more abundant, signifying a clear interspecific dominance (Giaourtsakis *et al.*, 2006; Giaourtsakis, 2009). In Samos, “*Diceros*” *neumayri* is the dominant horned species, *Dihoplus pikermiensis* is rare, and hornless *Chilotherium* is present. On the contrary, in the locality of Pikermi, *Dihoplus pikermiensis* emerges as the dominant horned species, “*Diceros*” *neumayri* is less frequent, whereas *Acerorhinus* is the sole hornless rhinocerotid taxon present.



Fig. 1: (1) *Chilotherium* sp. cranium and mandible in left lateral view. (2) *Chilotherium* sp. mandible in dorsal view; note the widened symphysis, arrows indicate the position of the partially preserved second lower incisors. (3) *Chilotherium* sp. calcaneus in lateral view. (4) “*Diceros*” *neumayri* calcaneus in lateral view. (All specimens from AMPG collections).

These marked differences observed in the relative distribution and abundance of rhinocerotid taxa among the Turolian localities of Greece and adjacent regions appear to have been primarily influenced by environmentally controlled provincial differences. The relatively slender and brachyodont *Acerorhinus* and *Dihoplus pikermiensis* seem to have preferred more closed and temperate niches, whereas the more robust and specialized “*Diceros*” *neumayri* and *Chilotherium* favoured more open and dry habitats. In cases of sympatry, a potential resource partitioning with limited dietary competition has been suggested (Giaourtsakis *et al.*, 2006; Giaourtsakis, 2009; Athanassiou *et al.*, 2014).

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