Re-evaluation of the taxonomic and systematic status of “*Halitherium*” *antillense* Matthew, 1916 (Mammalia, Sirenia)

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Abstract

Halitherium antillense Matthew, 1916 was established on a left mandibular fragment and two vertebrae from late Oligocene deposits of Puerto Rico. This species was only provisionally referred to the genus *Halitherium* and its taxonomic status and systematic affinities remained doubtful. In the course of the revision of the *Halitherium*-species complex and the meanwhile invalid generic name “*Halitherium*”, the holotype, and only known specimen, is re-investigated. A number of morphological characters usually diagnostic in sirenians are determined. However, the holotype material of “*H.*” *antillense* is not informative enough and, as such, neither can be assigned to any known species nor is it possible to define a taxon that can be clearly distinguished from other species. Unlike other, now revised species originally grouped under “*Halitherium*”, the establishment of a new taxonomic combination for “*H.*” *antillense* is not possible. As a nomenclatural consequence, the name “*H.*” *antillense* is only applicable to a single specimen, the holotype, and declared as a *nomen dubium*.

Keywords Sea cows · Oligocene · Puerto Rico · Taxonomy · Morphology

Introduction

From its establishment, the genus “*Halitherium*” Kaup, 1838 has served as a mangle-mangle term for poorly known sirenian fossils found world-wide (Domning et al. 2010), as is also the case for the late Oligocene “*H.*” *antillense* Matthew, 1916 from Puerto Rico. Matthew (1916), only provisionally, referred this sirenian to “*Halitherium*”, which is also indicated in Domning (1996), who additionally stated that the status and affinities of this species are uncertain. The re-evaluation of “*H.*” *antillense* especially proved necessary after the revision of the genus “*Halitherium*” (Voss 2013). Due to a non-diagnostic premolar holotype, the early Oligocene-type species “*H. schinzii*” is recognized as a *nomen dubium* (Voss 2014; Voss and Hampe 2017). As one of the consequences, this generic name is not applicable to any sirenian species, including all other congeneric taxa. This short communication complements the taxonomic revision

of species originally referred to “*Halitherium*” based on a morphological re-investigation as objective as possible.

Systematic palaeontology

Abbreviations. AMNH, American Museum of Natural History New York (USA). **Amr**, ascending mandibular ramus; **bl of cnp**, break line coronoid process; **cnf**, coronoid foramen; **hmr**, horizontal mandibular ramus; **m1-3**, lower molar or alveolus 1–3; **ma**, mandibular angle; **mdf**, mandibular foramen.

Order **Sirenia** Illiger, 1811

Family **Dugongidae** Gray, 1821

Genus “*Halitherium*” Kaup, 1838

“*Halitherium*” *antillense* Matthew, 1916

Figure 1

Holotype. AMNH 9844, posterior part of left mandible with m1–3 and one cervical and one thoracic.

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Fig. 1 Posterior part of left mandible and holotype specimen of “*Halitherium antillense*” AMNH 9844: **a** in lateral view; **b** in medial view. Scale bar equals 2 cm

Referred material. No other material has ever been referred to this nominal species. As such, only the holotype is known.

Type horizon and locality. Bluff, west bank of Rio Jacaguas, 1 km N and 1 km W of Juana Diaz, Puerto Rico. Principal reference section of the Juana Diaz Formation (Monroe 1980: 68) within the higher *Globigerina ampliapertura* zone (Moussa and Seiglie 1970: 1892), lower Chattian, late Oligocene.

Description.

Mandible—Although broken anteriorly (Fig. 1), the horizontal mandibular ramus appears to be slender with its ventral border moderately concave and not tangent to the angle. The anterior border of the coronoid process extends slightly anteriorly having an enlarged coronoid foramen at its basis. The mandibular foramen is undivided revealing the dental capsule exposed posteroventrally (Fig. 1b).

Dentition—In front of the heavily worn m1–3, the alveoli for a three-rooted dp5 are present indicating no tooth replacement at this locus. Anteriorly to dp5, two alveoli are interpreted to represent p3 and p4, which are single-rooted. The remains of m1–3 prevent most details of their cusp pattern. However, all molars can be identified as being characteristically two-rooted with mesiodistally elongated crowns that slightly increase in relative size from anterior to posterior within the tooth arcade (Fig. 1). Two transverse lophs, the protolophid and hypolophid, are still indicated. On the labial side of the molars, the maximum height of the preserved crowns measures 4 mm in m1, 5 mm in m2, and 7 mm in m3 (Fig. 1b). The maximum thickness of enamel varies from less than 1 mm in m1, 2 mm in m2, and about 2.5 mm in m3.

Vertebral column—Two vertebrae, one cervical and one thoracic, are present mainly preserving the vertebral body,

which is flat and oval in the first and thick and heart-shaped in the latter.

Discussion and conclusions

It is assessed that the diagnostic quality of the holotype, and only known specimen, of “*H.*” *antillense* is extremely low. The posterior fragment of the left mandible (Fig. 1) and two vertebral elements yield no identifying features on species level. This is corroborated by direct morphological comparisons. Taking into account the representatives of the former “*Halitherium*”-species complex alone, the preserved character combination described above is likewise shared by “*H.*” *taulannense*, the taxonomic–morphological revision of it is still in progress (Voss 2013), *Kaupitherium gruelli* Voss and Hampe, 2017, *K. bronni* (Krauss, 1858) Voss and Hampe, 2017, and *Lentiaenium cristolii* (Fitzinger, 1842) Voss et al. 2016. As such, neither it is possible to define a species on the holotype material that can be clearly distinguished from other taxa, nor is this West Indian sirenian unambiguously assignable to any known species.

Additionally, Voss (2013) pointed out that a cladistic treatment of “*H.*” *antillense* does not lead to a reliable phylogenetic signal. In practical terms, “*H.*” *antillense* covers less than 9% of the characters contained in the data matrix from Voss (2013: Appendix 4), and this does not provide a sufficient morphological data basis for the establishment of any phylogenetic hypothesis. This becomes clear when “*H.*” *antillense* is included into the cladistic analyses, which resolved in random positions within Sirenia causing a disruptive impact on the topology of other sirenian groupings.

For these reasons, it is concluded that a taxonomic and, in further consequence, a systematic assignment of “*H.*” *antillense* is not possible and that the respective species name must be declared a *nomen dubium*.

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