

New mammal from the Early Eocene of Morocco exemplifying unexpected early diversity of Proboscideans

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SUMMARY: We report a new primitive proboscidean from the basal Eocene phosphatic beds of the Ouled Abdoun Basin, Morocco, which is both the earliest large placental mammal known in Africa and one of the earliest known proboscideans with *Phosphatherium* from the same locality. This discovery evidences an unexpected precocious diversity of proboscideans in Africa.

Since the description in 1996 of the earliest known proboscidean *Phosphatherium escuilliei* from the phosphatic beds of the Ouled Abdoun Basin, Morocco, new data have been collected on the mammals from this locality. An important new material exemplifies several new taxa of archaic ungulates (“condylarths”) and early proboscideans and hyracoideans (Gheerbrant *et al.* 2001 a,b). It adds especially significant data on the small *Phosphatherium* (Gheerbrant *et al.* 1996, 1998), for which we now know the skull and the lower dentition. Recent field studies, especially the recognition of the fossiliferous level yielding mammals in the phosphatic local series and our selachians samples in this level, indicate an earliest Ypresian age, in accordance with the classical stratigraphy established in the Ouled Abdoun basin by Arambourg (1952). The Thanetian selachian taxa previously identified in the matrix of the holotype of *P. escuilliei* (see Gheerbrant *et al.* 1996, 1998) are actually reworked from the underlying phosphate level (level 2 of the local stratigraphical terminology).

Among this new Ouled Abdoun mammal material, mostly recovered from local fossil deal-

ers, we report a new primitive proboscidean from the same early Ypresian phosphatic beds yielding *P. escuilliei*. Its early Ypresian age is supported by the selachian taxa identified in the matrix of the specimens.

This species, studied and described as a new genus and species by Gheerbrant *et al.* (in prep.), is characterized by its large size close to *Numidothierium koholense* Jaeger 1986 from the early/middle Eocene of El Kohol, Algeria. This is indeed the oldest known large mammal from Africa and one of the oldest known proboscideans with *P. escuilliei*.

The new Ouled Abdoun proboscidean is known mainly by the lower dentition documented by two well preserved dentaries bearing the jugal teeth. The molars are characterized by a bilophodont and true lophodont pattern, very close to *Numidothierium* and *Barytherium* ones. The new taxon is closer to these genera and more advanced than *Phosphatherium* in several noticeable features (lower jaw with high articular condyle and horizontal ramus, premolars molarized, P/4 sub-bilophodont and large size), but it is also very

primitive in several striking features known in *Phosphatherium*, such as, the short anterior dentition which lacks diastema and retains two additional anterior teeth in front of P/2 (C/1 and I/3 or P/1 and C/1 according to the preserved alveoli). This is indeed a distinctive primitive brevirostrine large-sized proboscidean. With the help of the program Hennig86, a parsimony analysis of the features of the new taxon with respect to other primitive lophodont proboscideans supports its intermediate phylogenetic position between the basal small *Phosphatherium* and the large, more derived *Numidotherium* and *Barytherium*. Because of several shared derived features, the new taxon would be a closer candidate to the direct ancestry of *Numidotherium* than *Phosphatherium* would be (hypothesis of Gheerbrant *et al.* 1996, 1998). However it appears already specialized with respect to *N. koholense* in some features, such as more molarized lower premolars. The new Ouled Abdoun proboscidean may represent the same basal radiation of “Barytherioidea” with *Numidotherium*, but its familial position (Numidotheriidae?) remains uncertain. The discovery of such a large and derived proboscidean with respect to *Phosphatherium* in the same old African beds points out an unsuspected early diversity of proboscideans. It supports for the order Proboscidea (traditional concept, i.e. excluding Anthracobunidae) an African origin and its old age, with at least late Paleocene roots.

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