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A NOTE ON THE MANDIBLE OF ACERATHERIUM ACUTIROSTRATUM (DERANIYAGALA) FROM MORUARET HILL, TURKANA DISTRICT, KENYA

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The genus and species *Turkanatherium acutirostratus* was proposed by Deraniyagala (1951) for a skull, without the mandible, collected by Dr. H. B. S. Cooke, a member of the Wendell-Phillips Expedition to Africa in 1948, at Moruaret Hill (or Moruorot) near Losodok (or Lothidok) in the Turkana district, Kenya. The holotype is in the Colombo Museum, Ceylon. Dr. Deraniyagala has had the courtesy to send me a series of good photographs of the specimen to supplement his own descriptions and published figures, for which I am very grateful. This has enabled me to identify among material in the Tervuren Museum, Belgium, originating from (Early) Miocene deposits at Karugamania, Lake Albert, Western Rift Valley in Congo, a number of teeth pertaining to the very same species (Hooijer, 1963), henceforth named *Aceratherium acutirostratum* (Deraniyagala). A few years later, studying Miocene rhinocerotids from East Africa housed in the Centre for Prehistory and Palaeontology, National Museum, Nairobi, I found the same species to occur at a number of sites and sub-sites on Rusinga Island and Ngira, Karungu, in Kenya, as well as at Napak 1 in Uganda (the Uganda material kindly supplied by Dr. W. W. Bishop). Among the Kenya material, entrusted to me by Dr. L. S. B. Leakey, there is a mandible originating from R.1, Rusinga, 1947 (no. 850) associated with a skull featuring the distinctive characters of *A. acutirostratum* such as the weak, hornless nasals, absence of a frontal horn boss, and the shallow nasomaxillary notch and elevated occiput. The upper dentition of *A. acutirostratum* is characterized by the marked protocone constriction and prominent antecrochet in the molars as well as in the premolars, which latter have the antecrochet blocking the

medisinus and the internal cingulum forming a ledge between protoloph and metaloph inside of which the medisinus deepens and forms a pit. The teeth are easily distinguished from those of the slightly smaller *Dicerorhinus leakeyi* Hooijer (1966) concurring in the Miocene East African beds, as well as from those of *Brachypotherium heinzelini* Hooijer (1963) and of *Chilotherium* sp., two short-footed forms found with the long-limbed *Aceratherium* and *Dicerorhinus*. These four genera and species constitute the Miocene rhinocerotid group as we know it at present from East Africa as well as from Western Congo (whence *Chilotherium* has not yet been recorded and *Dicerorhinus* may be present, but sparingly at any rate).

Deraniyagala (1965) is at variance with my identifications of the Congo teeth as representing his Turkana species, a criticism to which I have already replied (Hooijer, 1967). One of the main, non-morphological arguments against my point of view seems to be Dr. Deraniyagala's contention that the Turkana form is Pliocene, not Miocene as are my Congo, Kenya and Uganda specimens. The age of the specimen from the area of Moruaret Hill, an area where Professor Arambourg worked many years ago, and whose considered opinion is that a Pliocene age is out of the question (Arambourg, 1959: 74), may be somewhat uncertain. The finding of the very same form in the Miocene of Congo and East Africa is, therefore, important for correlation purposes.

When recently working at the Centre for Prehistory and Palaeontology, National Museum, Nairobi, rhinocerotid specimens from Moruaret Hill, collected in 1951, were shown to me by Dr. L. S. B. Leakey, who has asked me to report on them. They comprise a mandible and an upper premolar to be described in the following pages. My thanks are due to Dr. Leakey for entrusting this material to me, and to the Wenner-Gren Foundation for Anthropological Research in New York, for a travel grant (no. 2147-1834).

With the mandible from R.1, Rusinga, 1947 (no. 850) belonging to the *Aceratherium* skull there are two mandibular canines, not in situ as the symphysial portion of the mandible is broken. They needed very little repair, and are shown in Hooijer (1966, pl. 4 figs. 2-3). Flattened dorso-ventrally, they form transverse ovals in cross section, and they are curved outward at their tips and at their root apices, thus with the convexities towards each other. This is as in other *Aceratherium* species (l.c., p. 141), in contrast to *Dicerorhinus* in which the lower canines are not so bowed. The root length of the Rusinga *Aceratherium* canines is over 11 cm, but exactly how they fitted into the symphysis I had no means of finding out. The symphysis, at any rate, must have been very long to accommodate such long roots.

In the mandible from Moruaret Hill collected in 1951 (MT 66), the left

half of which is preserved, the symphysis is, again, not complete, but in what remains we see part of the deepest portions of both of the canine alveoli, the teeth themselves having dropped out before fossilization. It is seen that the alveoli converge to the front, as curved canines in the *Aceratherium* fashion do in their proximal root parts. Exact diameters cannot be given; the roots in the Rusinga canines are 28 by 23 mm in section, and the Moruaret canines may have been slightly smaller. The alveolus of the left canine extends backwards to the end of the symphysis, on a level with the P_2/P_3 junction, which is also the position of the mental foramen on the outer surface of the ramus. P_1, if present, is not preserved as the alveolar rim in front of P_2 is broken. P_2 is incomplete anteriorly, and P_3 postero-internally, but the teeth are well preserved otherwise. It is an adult individual, with M_3 worn although metalophid and hypolophid have not united yet occlusally. Their outer surfaces show a groove where the two lophs meet instead of the flattening that we find in advanced brachypotheres.

I had been unable to distinguish the lower cheek teeth of *Aceratherium* from those of *Dicerorhinus* in the East African Miocene collection, finding only that the jaw definitely acerathere had some of the teeth slightly longer than those in the dicerorhine mandibles. The Moruaret mandible, with its acerathere configuration of the canines, may safely be regarded as an *Aceratherium*, and the measurements are given in table 1 together with those of the Rusinga mandible of 1947. It will be seen that there are no appreciable differences in dental measurements; P_4 is rather wider behind in the Moruaret specimen, but this varies from 18 to 26 mm in only four mandibles of *Aceratherium tetradactylum* (Lartet) (Hooijer, 1966: 141). The ramus increases steadily in height from before backwards (height below P_4 70 mm, below M_3 90 mm), and at the angulus mandibulae, or rather just below the front border of the ascending portion, the ventral border is curved outward so as to form a flange, quite unlike anything seen in *Dicerorhinus* mandibles, although indications of such a development can be seen in many adult recent mandibles bordering the generally concave outer face of the angular portion of the mandible below. Both the coronoid and the condyloid process of the jawbone are partially preserved only, and their height cannot be given. The semilunar notch in between is about 22 cm above the lower border of the ramus, and the length from front of P_2 to back of angular process about 42 cm.

The premolar, a P^2 dext. (1951, MT 24) is unworn and has the inner cingular ledge at the medisinus entrance and the pit inside it; the cingulum is only 9 mm high. This is a characteristic *Aceratherium* premolar fitting in nicely with the dentition described from Karugamania, Congo (Hooijer,

TABLE I

Measurements of lower teeth of *Aceratherium acutirostratum* (mm)

	Moruaret	Rusinga
P_2, ant. post.	22+	—
post transv.	ca. 20	—
P_3, ant. post.	35	36
ant. transv.	22	20
post. transv.	—	22
P_4, ant. post.	ca. 39	—
ant. transv.	26	25
post. transv.	30	26
M_1, ant. post.	42+	—
ant. transv.	28	26
post. transv.	29	29
M_2, ant. post.	50	48
ant. transv.	31	30
post. transv.	31	31
M_3, ant. post.	52	53
ant. transv	30	30
post. transv.	28	29
Length P_2-M_3	ca. 245	ca. 240

1963). The crown height at the ectoloph is 38 mm against an anteroposterior length (32 mm in the Congo P^2) of 33 mm, and the antero-transverse and postero-transverse basal diameters are 38 mm, and 41 mm, respectively, just slightly larger than in the P^2 of *Dicerorhinus leakeyi* (cf. Hooijer, 1966: 127) that is characterized by its high internal wall. Both crochet and crista were present, but have broken off.

There is also in the collection in Nairobi the cast of a P_2 sin. from Moruaret (MCZ 7670) giving 28 mm for the length and 22 mm for the posterior width, a tooth that has just the right size for *Aceratherium acutirostratum*.

Thus, the above described specimens supplement the material from Moruaret as the mandible had not been found with the type skull of 1948, and the dimensions of an unworn P^2 were not before available. This material, coming from the same area if not locality as the type of *Aceratherium acutirostratum* demonstrates once more the identity of the Moruaret rhinocerotid with that of the Miocene of Central and East Africa.

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NOTE: In a publication just received, Dr. Leakey (in W. W. Bishop & J. D. Clark (editors), Background to Evolution in Africa, Chicago & London (Univ. of Chicago Press), 1967, p. 47) remarks that there are two faunally distinct sites in the Losodok Hills both named Moruorot, one in Early Miocene, the other in either Late Miocene or Pliocene deposits. Professor Bryan Patterson (in litt.) finds the faunal stage represented in the Moruaret sediments to be post-Burdigalian, i.e., post-Early Miocene throughout.