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Earliest Man and Environments in the Lake Rudolf Basin

Stratigraphy, Paleoecology, and Evolution

Edited by

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21. A PRELIMINARY NOTE ON EQUIDAE FROM THE KOOBI FORA FORMATION, KENYA

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The distribution of Equidae from localities in each of the faunal zones of Maglio (1972) of the Koobi Fora Formation, north Kenya, is given in table 1. The relative frequency of remains of *Equus* and of *Hipparion* is given in table 2.

Hipparion

Remains of *Hipparion* are fairly rare. Of 37 specimens recovered to date, 32 can be definitely referred to one of Maglio's three faunal zones (table 2). All lower cheek teeth (14 isolated finds and 17 associated in dental series) have generally well developed ectostylids. These teeth are the same size as or slightly larger than *Hipparion* cf. *ethiopicum* (Joleaud) from the Shungura Formation, Member C and upward. There does not seem to be any change in either tooth size or ectostylid size from one faunal zone to another. Table 3 gives the mesiodistal length (mm) of cheek teeth and their ectostylids in a *Hipparion* mandible from the Lower Member of the Koobi Fora Formation (*Mesochoerus limnetes* zone) and in a mandible from Member F of the Shungura Formation, Omo. An astragalus from the Upper Member of the Koobi Fora Formation (*Metridiochoerus andrewsi* zone) approaches in size a specimen from Shungura Formation, Member G. The former has a height of 55.2 mm and the latter a height of 56 mm.

In conclusion all these specimens from the Koobi Fora Formation can be referred to *Hipparion* cf. *ethiopicum*, species of moderate size with a constant ectostylid.

Equus

Remains of *Equus* are substantially more abundant than those of *Hipparion*. Of 178 specimens recovered to date, 135 can be definitely referred to one of Maglio's three faunal zones (table 2).

Equus sp. nov. A and *Equus* cf. *oldowayensis*

The Lower Member (*Mesochoerus limnetes* zone) of the Koobi Fora Formation has yielded a well-preserved and exceptionally large skull of *Equus*. The basal length is 20 mm larger than the largest of 23 specimens of *Equus grevyi* I have measured. The upper cheek teeth are also remarkably large. This appears to represent a new species which I provisionally designate as *Equus* sp. nov. A. There are also two upper molars from the Upper Member (*Metridiochoerus andrewsi* zone) of the Koobi Fora Formation which are similar in their great size (28.5 and 29.5 mm length).

Table 1

Areas of Occurrence of Specimens of Equidae in the Three Faunal Zones of the Koobi Fora Formation

Mesochoerus limnetes Zone	*Equus*	*Hipparion*	Indeterminate
102 0213	+		
103 0115	+		
01 15/23	+		
0222	+		
105 0101	+		
0109	+		
0205	+		
0209	+	+	
123			+
130	+	+	
131	+	+	
Mesochoerus limnetes zone?			
102 0201	+	+	
121	+	+	
130	+	+	

Metridiochoerus andrewsi Zone	*Equus*	*Hipparion*	Indeterminate
08 B 0306	+		
0308	+		
10	+		
10 1001	+	+	
1002		+	
1004		+	
12		+	
102			+
103	+	+	
103 0223/5	+		
0230/1	+		
0235/9	+	+	
0246/57	+	+	
0257/64	+		
0265/78	+	+	
104	+	+	+
104 B	+		
104 B 0114/6	+		
0120	+		
0121	+	+	
0126/9	+		
105 0121	+		
0222	+		
124	+		
129		+	
131		+	
Metridiochoerus andrewsi zone ?			
30	+	+	
102	+		
103	+		
123	+		
Above KBS tuff	+	+	

Loxodonta africana Zone	*Equus*	*Hipparion*	Indeterminate
01	+		
01 A	+		
01 0103	+		+
0104	+		
0107	+		
03 0106	+		
0107	+		
06 0101	+		
0104		+	
06 0301	+		
0308	+		
0309	+	+	+
0311	+		+
07			+
07 A	+		
08 0103	+		+
08 A 0302	+		
1105		+	
1106	+		
108	+		
Loxodonta africana zone ?			
01 0103		+	

Table 2

Skeletal Parts of Equidae Recovered from the Three Faunal Zones of the Koobi Fora Formation

Specimen		*Equus*	*Hipparion*
Loxodonta africana zone			
Skull fragment		1	0
Isolated cheek teeth and fragments	(upper	20	1
	(lower	11	1
Limb bones and fragments		2	2
Metridiochoerus andrewsi zone			
Skull fragments		2	0
Mandibular fragments		2	1
Isolated cheek teeth and fragments	(upper	29	8
	(lower	14	12
Limb bones and fragments		17	2
Mesochoerus limnetes zone			
Skull		1	0
Mandibular fragments		1	1
Isolated cheek teeth and fragments	(upper	8	3
	(lower	5	1
Limb bones and fragments		22	0
Certain origin		135	32
Uncertain origin		43	5

Table 3

Length (mm) of Lower Cheek Teeth and of Ectostylids in Hipparion *Mandibles from the Lower Member of the Koobi Fora Formation (Kenya) and from Member F of the Shungura Formation, Omo (Ethiopia)*

				P_3-P_4		M_1-M_2		
Specimen	Total Length	Length of Premolar Series	P_2 Length	Length	Ectostylid Length	Length	Ectostylid Length	M_3 Length
KNM.ER 1626	145	74.5	28.2	23.9; 22.5	8.7	22; 22.2	5.8; 4.4	24.5
Omo 118.72.5	141	73.5	28	23; 22.5	6.5	21.5; 21	6; 4.5	24.5

All the other upper cheek teeth of *Equus* from the Koobi Fora Formation are smaller. They are the same size as two teeth from Member G of the Shungura Formation, Omo (see preceding chapter). This form from the upper members of the Shungura Formation has been attributed by Hooijer (this symposium) to *Equus* cf. *oldowayensis*. I am provisionally attributing most of the *Equus* upper cheek teeth from the Koobi Fora Formation to this same species. The upper cheek teeth of *Equus numidicus* from Ain Boucherit (Algeria) are larger than those of *Equus* cf. *oldowayensis* and smaller than those of *Equus* sp. nov. A (cf. table 4).

The attribution of lower cheek teeth and postcranial parts to one or the other of these two species of *Equus* from the Koobi Fora Formation is still an unresolved problem.

Table 4

Dimensions of Upper Cheek Teeth of Recent Equus grevyi *and Earlier Pleistocene Species of* Equus *from Koobi Fora, Omo, and Ain Boucherit*

Specimen		P^3 - P^4			M^1 - M^2		
		n	Mean and SD	Range	*n*	Mean and SD	Range
Equus grevyi		20	28.6 ± 1.53	25.8 - 31	23	25.3 ± 1.87	22 - 29.2
Equus cf. *oldowayensis*	Koobi Fora	35	28.7 ± 1.60	25.1 - 31.5	30	25.5 ± 1.38	22.5 - 27.9
	Omo (G)	1		29	1		26.5
Equus sp. nov. *A*	Koobi Fora	2		31.9 - 34.2	2		31.5 - 31.5
Equus numidicus	Ain Boucherit	8	30.9 ± 1.26	29 - 33	6	27.75 ± 1.44	27 - 29.5

Equus sp. nov. B?

There are some postcranial bones and a lower cheek tooth from the *Metridiochoerus andrewsi* zone and the *Loxodonta africana* zone which demonstrate the presence of an asinine species of *Equus*. From its size and proportions this *Equus* sp. nov. B? resembles *Equus tabeti* Arambourg (1970) from Ain Hanech (in Biozone III of Coppens 1972). However, the lack of sufficient material makes this attribution uncertain.

Conclusions

Equids are present in all the members of the Koobi Fora Formation.

Hipparion cf. *ethiopicum*, rather infrequent but present throughout the succession, always shows a well-developed ectostylid. Thus far there are no specimens referrable to the large hipparionine *Hipparion albertense*, which lacks an ectostylid and which is present at Laetolil, Langebaanweg, and in members A and B of the Shungura Formation, Omo.

An *Equus* similar to that characteristic of Shungura Formation, Member G, is present in all the members of the Koobi Fora Formation and is referred to *Equus* cf. *oldowayensis*. An exceptionally large skull with large upper dentition from the *Mesochoerus limnetes* zone apparently represents a new species of *Equus*. An asinine *Equus*, perhaps comparable to *Equus tabeti*, occurs in the *Metridiochoerus andrewsi* and *Loxodonta africana* zones, but its precise affinities are still uncertain.

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References

Arambourg, C. 1970. Les vertébrés du Pléistocène de l'Afrique du Nord. *Arch. Muséum Nat. Hist. Nat.* (Paris), ser. 7, 10:1-126.

Coppens, Y. 1972. Tentative de zonation du Pliocène et du Pléistocène d'Afrique par les grands mammifères. *C. R. Acad. Sci. (Paris)*, ser. D, 274:181-84.

Maglio, V. J. 1972. Vertebrate faunas and chronology of hominid-bearing sediments east of Lake Rudolf, Kenya. *Nature* 239:379-85.

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