C. R. Biologies 333 (2010) 235–240

Contents lists available at ScienceDirect

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Evolution / Évolution

Sussemionus, a new subgenus of *Equus* (Perissodactyla, Mammalia)

Sussemionus, *un nouveau sous-genre d'*Equus *(Perissodactyla, Mammalia)*

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ARTICLE INFO

Article history:
Received 19 November 2009
Accepted after revision 17 December 2009
Available online 27 January 2010

Keywords:
Sussemionus n. subgen.
Equidae
Pleistocene
Eurasia
North America

Mots clés :
Sussemionus n. subgen.
Equidae
Pléistocène
Eurasie
Amérique du Nord

ABSTRACT

The new subgenus of *Equus*, *Sussemionus*, is defined by peculiar dental characters so far unknown, or exceptional in late Pleistocene and extant *Equus*; it was in consequence assumed to be restricted to the early and middle Pleistocene. During that period, it was highly successful, ranging from North America to Ethiopia, and included dry-adapted (*E. granatensis*-like) and more humid-adapted (*E. coliemensis*-like) species. Recent molecular and osteological analyses concurred to prove its survival until ca 45 KYBP in Khakassia, southwest Siberia, Russia.

RÉSUMÉ

Le nouveau sous-genre d'*Equus*, *Sussemionus*, très répandu au cours du Pléistocène moyen, est défini par l'originalité de ses caractères dentaires : plis caballins à large base, parfois multiples ou renflés, protocones parfois très courts ; développement extraordinaire des stylides, métaconides très allongés et parfois bilobés, sillons linguaux à peine marqués, sillons vestibulaires parfois très profonds, même sur les prémolaires. De telles morphologies, rarissimes chez les *Equus* actuels, étaient jusqu'à présent inconnues au Pléistocène supérieur ; on supposait donc le groupe éteint depuis le Pléistocène moyen. De récentes études moléculaires et paléontologiques ont montré que ce n'était pas le cas : une espèce appartenant à ce sous-genre est en effet documentée dans une grotte du sud-ouest de la Sibérie ; le matériel date d'environ 45 000 ans.

1. Description

The term "Sussemiones" was first used in an informal way to group early and middle Pleistocene equid species with characteristic teeth [1]. Discoveries of new data, both paleontological and molecular [2,3], recommend a formal description and extend the temporal range of this group.

Sussemionus, n. subgenus.

Derivatio nominis:

In reference to the mixture of osteological characters, some of which are observed (namely) in the fossil equids from Süssenborn, Germany, and some others in extant hemiones.

Diagnosis:

Upper cheek teeth (Fig. 1) with peculiar plis caballin: multiple and/or with a very large base (Fig. 1A, Fig. 4A, Fig. 6), sometimes club-shaped (Fig. 1B). Such morphologies are unknown in extant species of *Equus* and in *Allohippus*. The enamel is often very plicated and the postprotoconal valley may be very deep. Protocones may be extremely short.

On the lower cheek teeth (Fig. 2), the occurence of stylids, sometimes isolated, is remarkable. Isolated ectostylids are characteristic of late African hipparions but exceptional in extant *Equus*. Plis protostylids on P/2

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1631-0691/$ – see front matter
doi:10.1016/j.crvi.2009.12.013

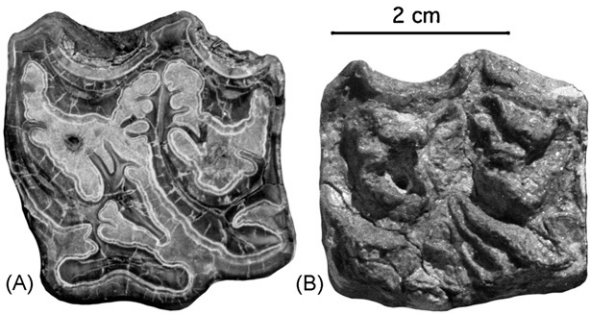

Fig. 1. Upper premolars of *Sussemionus*. A. *E.* cf. *verae*, section of PIN 2998-243, Chukochya, loc. 26. B. *E. hipparionoides*, P4/ of Akha 100, Akhalkalaki. Illustrations of these teeth were also published in [1].

(characteristic of extant Grevy's zebras [4]) occur frequently (Fig. 2A). Plis protostylids on P/3-M/3 may be extremely developed (Fig. 2B) as well as plis hypostylids (Fig. 2C); the latter may even be isolated on M/3. The shape of the double knot of many lower premolars resembles extant hemiones, sometimes in an extreme, caricatural way: the metaconid is elongated, sometimes bilobated, the lingual valley is shallow, at times nearly absent (Fig. 2D and E). Unlike Hemiones, another particularity is the frequency of very deep vestibular valleys, on molars and even on some premolars (Fig. 2F). But the depth of the vestibular valley is very variable: associated teeth may have very deep and very shallow valleys (Fig. 2G). Both features are uncommon in extant species.

Type species: *E. coliemensis* Lazarev 1980 [5].

Origin: Kolyma, NE Siberia, Russia.

Age: late Early Pleistocene.

1.1. Description of the type material

Although not perfectly preserved, the skull IA 1741, type of *E. coliemensis* (Fig. 3, Table 1) belongs to *Equus*. The skull is as large as a Grevy's Zebra but with proportions more like Hemiones [6].

Table 1
Measurements in mm of *E. coliemensis* skull. The numerotation of the measurements refers to the system illustrated on the web site www.vera-eisenmann.com. Approximate dimensions between brackets.

		Chukochya *E. coliemensis* IA 1741
1	Basilar length	538
2	Overall palatal length	282
2–5	Palatal length s.s.	140
3	Vomerine length	[133]
4	Post-vomerine length	[123]
5	Muzzle length	[140]
6	Diastema	112
7	P2/-P4 length	[101]
7bis	M1/-M2/ length	82
8	P2/-M3/ length	[180]
10	Greatest choanal breadth	53
10bis	Least choanal breadth	42
11	Facial breadth	164
12	Length from Basion to anterior borders of P2/	[398]
13	Frontal breadth	230
14	Bizygomatic breadth	210
15	Cranial breadth	105
16	Breadth of supra-occipital crest	53
17	Muzzle breadth at posterior borders of I3/	70
17bis	Least muzzle breadth (between the crests)	55
18	Greatest length	590
19	Height of the infra-ocular bar	11
20	Height of the external auditive meatus	16.5
21	Antero-posterior orbital diameter	62
22	Dorso-ventral orbital diameter	58.5
23	Anterior ocular line	440
24	Posterior ocular line	225
29	Breadth at the occipital condyles	90
30	Breadth of foramen magnum	34

The upper cheek teeth of the type are plicated and have plis caballins wide at their base (Fig. 4A, Table 2). There are

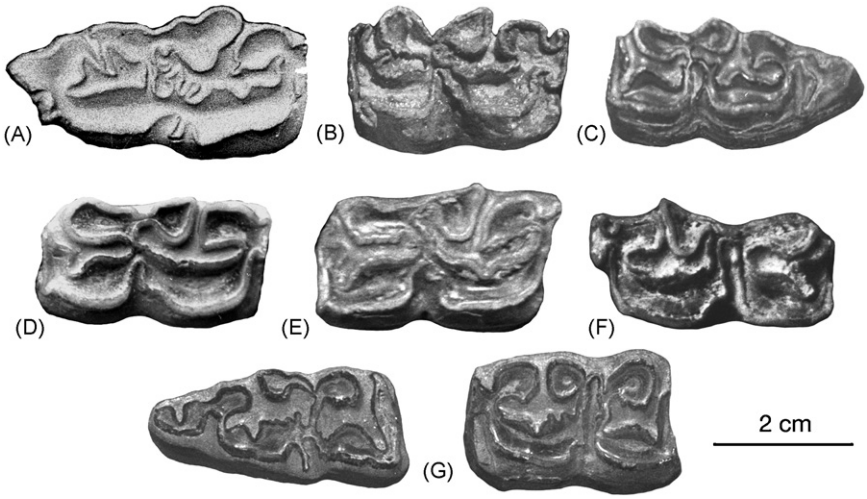

Fig. 2. Lower cheek teeth of *Sussemionus*. A. P/2 of *E. verae*, Chukochya loc. 21, PIN 835-123. B. P/4 of *E. hipparionoides*, Akhalkalaki, no. 99. C. M/3 of *E.* cf. *verae*, Yukon, Old Crow loc. 9, NMC 32165. D. P/3 of *E. granatensis*, Venta Micena, VM 84/C3-B9-12. E. P/3 of *E. verae*, Krestovka, PIN 3020-47 (851-74/8). F. P/3 of *E. suessenbornensis*, Süssenborn, S 9281. G. Associated M/3 and M/1 of *E. verae*, Chukochya loc. 37, PIN 3100-333. Illustrations of B, C, D, E, and G were also published in [1].