

A new subspecies of the honey badger *Mellivora capensis* from Central Asia

Gennady BARYSHNIKOV

Baryshnikov G. 2000. A new subspecies of the honey badger *Mellivora capensis* from Central Asia. Acta Theriologica 45: 45–55.

A new subspecies of the honey badger (*Mellivora capensis buechneri* ssp. n.) is described from the western part of Central Asia (Turkmenistan). By the relatively small palatal length it is similar to the subspecies *M. c. indica* (Kerr, 1792) and *M. c. inaurita* (Hodgson, 1838) and differs from them by having larger size and narrower postorbital constriction.

Zoological Institute, Russian Academy of Sciences, Universitetskaya nab. 1, 199034 St. Petersburg, Russia. e-mail: bgf@zisp.spb.su

Key words: *Mellivora*, Mustelidae, Turkmenistan, systematics

Introduction

The honey badger *Mellivora capensis* (Schreber, 1776), is distributed in savanna, steppe, and desert habitats from South Africa to Nepal and India. In Central Asia the species has an isolated distribution, to the east up to the Amudaria River in Turkmenistan, in southwest Uzbekistan and in the southwest of Kazakhstan (Heptner *et al.* 1967, Gorbunov 1995).

For a long period the honey badger from Central Asia has been attributed to the species *M. indica* (Kerr, 1792), described from India (Zarudny and Büchner 1892, Satunin 1905, 1914, Ognev 1931, Bobrinski *et al.* 1944, Novikov 1956). After the establishment of the monotypical status of the genus *Mellivora* (Pocock 1920, 1941, Ellerman and Morrison-Scott 1951) the honey badger from Central Asia has been become considered tentatively close with the subspecies *M. capensis indica* Kerr (Ellerman and Morrison-Scott 1951, Heptner *et al.* 1967, Corbet 1978). My preliminary investigation of the systematic position of the honey badger from Turkmenistan, however, indicated its difference from other Asiatic subspecies of *M. capensis* (Baryshnikov 1988). Its status as a separate subspecies was proposed, but it was not formally designated. The aim of the present study is to strengthen this suggestion on the basis of additional materials and to establish the new subspecies from Central Asia.

Material and methods

Collection materials pertaining to *M. capensis* from Asia are poor. They include collections from the Zoological Institute Russian Academy of Sciences in St. Petersburg (ZIN), Zoological Museum of Moscow University in Moscow (ZMMU), Department of the Zoology of Vertebrates of Saint Petersburg University in St. Petersburg (SPU), Natural History Museum in London (NHM), Field Museum of Natural History in Chicago (FM), Museum National d'Histoire Naturelle in Paris (MNHN) and the Naturhistoriska Riksmuseet in Stockholm (NR).

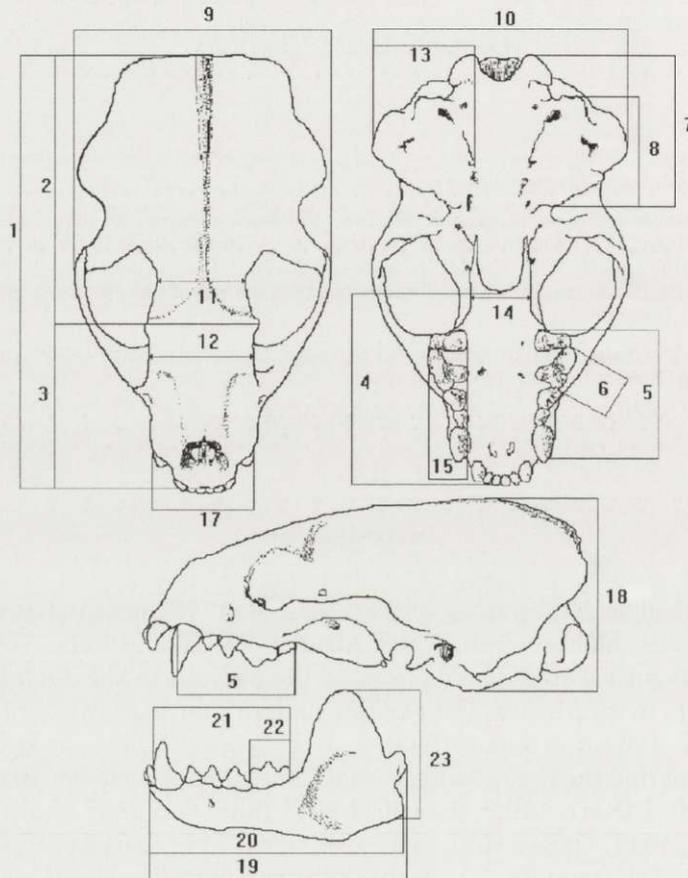


Fig. 1. Skull measurements used in this paper: 1 - condylbasal length, 2 - upper neurocranium length, 3 - facial length, 4 - palatal length, 5 - length of the upper tooth row C^1-M^1 , 6 - length of upper carnassial tooth P^4 , 7 - length from the most oral point of the auditory bulla to aboral border of the occipital condyle, 8 - greatest length of the auditory bulla, 9 - zygomatic breadth, 10 - greatest mastoid breadth, 11 - least breadth of the postorbital constriction, 12 - least breadth between the orbits, 13 - greatest breadth of the auditory bulla, 14 - breadth of palatine in choane region, 15 - breadth of upper molar M^1 , 16 - greatest palatal breadth, 17 - breadth at the canine alveoli, 18 - height in the auditory bullas, 19 - total length of the mandible, 20 - length of mandible between the angular process and infradentale, 21 - length of the lower tooth row C_1-M_1 , 22 - length of lower carnassial tooth M_1 , 23 - height of the vertical ramus of mandible.

The material studied from Asia is distributed in the following manner. The new subspecies from Turkmenistan: skulls – 8 (ZIN – 2, ZMMU – 3, SPU – 1, without mandible), skins – 6 (ZIN); *M. c. indica*: skulls – 10 (NHM – 6, FM – 1, MNHN – 3), skins – 2 (NMH); *M. c. inaurita*: skulls – 5 (NHM); *M. c. wilsoni*: skulls – 2 (NHM – 1, including type: 5.10.4.21 Ran Hormuz, east of Ahuraz, Persia, female; FM – 1), skins – 5 (NHM); *M. c. pumillio*: skulls – 3 (NHM, including type: 4.5.1 Hadramaut, South Arabia, female), skins – 6 (NHM). 21 skulls (ZIN – 3, ZMMU – 1, NHM – 6, FM – 1, MNHN – 4, NR – 6) and 4 skins (ZIN, NHM) were also studied from Africa.

The basic emphasis has been paid to the craniometrical analysis of skulls. Only adult specimens were measured. Twenty-three measurements were made from all skulls of Asiatic subspecies by caliper with accuracy up to 0.1 mm. The scheme of measurements is shown in Fig. 1. Only 2 measurements were made for African subspecies: condylobasal length and palatal length.

These craniometric data were used for Factor Analysis from STATISTICA for Windows.

Results

The measurements of skulls of *M. capensis* from Turkmenistan are given in the Table 1. They indicate the significant sexual dimorphism of honey badgers in the

Table 1. Size of skulls in *Mellivora capensis buechneri* ssp. nov. from the Turkmenistan.

Measure- ments, mm	Males				Females			
	Tedzhen	Zaunguz Karakum	Kushka	Atry	Ash- khabad	Ash- khabad	Kunia- Urgench	Turk- menistan
	ZIN 10000 Holotype	ZMMU 67011 Paratype	ZMMU 58055 Paratype	ZMMU 11903	ZIN 34748 Paratype	ZMMU 5587 Paratype	ZMMU 67035	SPU
1	144.7	139.1	140.3	–	131.1	129.8	–	134.2
2	92.1	91.8	90.1	–	78.5	83.1	–	–
3	59.9	62.0	58.8	57.8	55.4	53.2	55.0	–
4	61.8	59.4	60.2	61.2	54.3	56.7	57.5	58.8
5	39.9	38.3	38.1	38.8	36.9	36.9	37.0	38.5
6	13.7	13.9	13.5	13.8	12.5	13.1	12.9	13.0
7	54.8	49.9	51.0	–	49.6	47.1	–	–
8	32.7	38.6	39.2	41.4	31.0	37.0	38.7	–
9	86.0	80.1	80.2	–	73.5	80.0	75.0	78.2
10	86.2	83.5	82.6	85.2	77.1	80.3	–	79.6
11	27.2	24.4	25.7	27.1	28.1	30.2	27.7	27.3
12	33.0	32.7	31.5	33.6	31.6	31.2	33.0	–
13	25.0	20.0	22.5	23.5	24.5	22.0	23.1	–
14	18.6	17.0	16.7	20.0	17.7	17.5	18.3	–
15	12.1	10.6	10.7	10.9	9.6	10.2	10.0	–
16	47.4	45.4	44.7	46.5	43.6	45.0	43.2	–
17	34.4	33.0	32.5	34.1	30.2	31.0	29.0	–
18	62.2	60.3	61.4	65.2	57.2	58.0	–	–
19	89.3	90.0	88.2	88.4	81.1	84.2	82.9	–
20	90.7	89.0	88.1	90.7	81.8	83.9	82.7	–
21	46.4	46.9	45.6	45.3	42.1	44.0	43.2	–
22	14.7	14.9	14.0	14.5	12.6	13.8	13.1	–
23	45.9	44.0	45.0	44.0	38.9	41.0	41.2	–

Table 2. Measurements (mm) of skulls in *Mellivora capensis* from Asia.

Subspecies	Males				Females			
	<i>n</i>	Min-Max	Avg	SD	<i>n</i>	Min-Max	Avg	SD
Condylbasal length (1)								
<i>buechneri</i> ssp. n.	3	139.1–144.7	141.37		3	129.8–134.2	131.70	
<i>indica</i>	5	131.9–138.8	134.44	2.84	2	122.9, 125.6		
<i>inaurita</i>	1	135.8			2	122.9, 125.6		
<i>wilsoni</i>					2	119.6, 125.6		
<i>pumillio</i>	2	119.4, 123.8			1	115.2		
Palatal length (4)								
<i>buechneri</i> ssp. n.	4	59.4–61.8	60.65	1.06	4	54.3–58.8	56.82	1.89
<i>indica</i>	6	55.0–59.2	56.70	1.53	4	50.3–57.1	53.87	2.79
<i>inaurita</i>	3	58.5–61.5	59.77		2	52.7, 55.9		
<i>wilsoni</i>					2	56.2, 59.9		
<i>pumillio</i>	2	56.8, 59.4			1	53.4		
Zygomatic breadth (9)								
<i>buechneri</i> ssp. n.	3	80.1–86.0	82.10		4	73.5–80.0	76.67	2.96
<i>indica</i>	6	77.7–83.8	79.60	2.34	3	73.1–76.5	74.32	
<i>inaurita</i>	3	77.4–79.8	78.67		2	72.1, 72.6		
<i>wilsoni</i>					2	70.7, 70.8		
<i>pumillio</i>	2	64.5, 71.5			1	67.4		
Breadth of the postorbital constriction (11)								
<i>buechneri</i> ssp. n.	4	24.4–27.2	26.10	1.32	4	27.3–30.2	28.32	1.29
<i>indica</i>	6	28.9–35.0	31.73	2.01	4	30.0–32.4	31.47	1.12
<i>inaurita</i>	3	28.8–30.1	29.57		2	28.8, 30.5		
<i>wilsoni</i>					2	31.3, 32.7		
<i>pumillio</i>	2	31.2, 31.6			1	32.5		

size of skull. Therefore the comparison of skull size were made separately between males and females.

The comparison demonstrated (Table 2) that the sample from Turkmenistan, on the basis of the average value of condylbasal length and zygomatic breadth, exceeded other samples studied from Asia. Size of *M. c. indica* and *M. c. inaurita* are somewhat smaller and similar to each other. The condylbasal length values close to them are in *M. c. wilsoni*, for which I know only the measurements for females. According to our and Harrison's (1968) data, the smallest subspecies in Asia is *M. c. pumillio*.

Values of the palatal length of honey badgers from Turkmenistan are similar to those of the subspecies *M. c. inaurita*, *M. c. wilsoni* and *M. c. pumillio*, although cranial size in the latter two are significantly smaller. The subspecies *M. c. indica* has a shorter palatal length.

A sample from Turkmenistan, on the contrary, has a smaller average value of the breadth of the postorbital constriction than other Asiatic subspecies, indicating

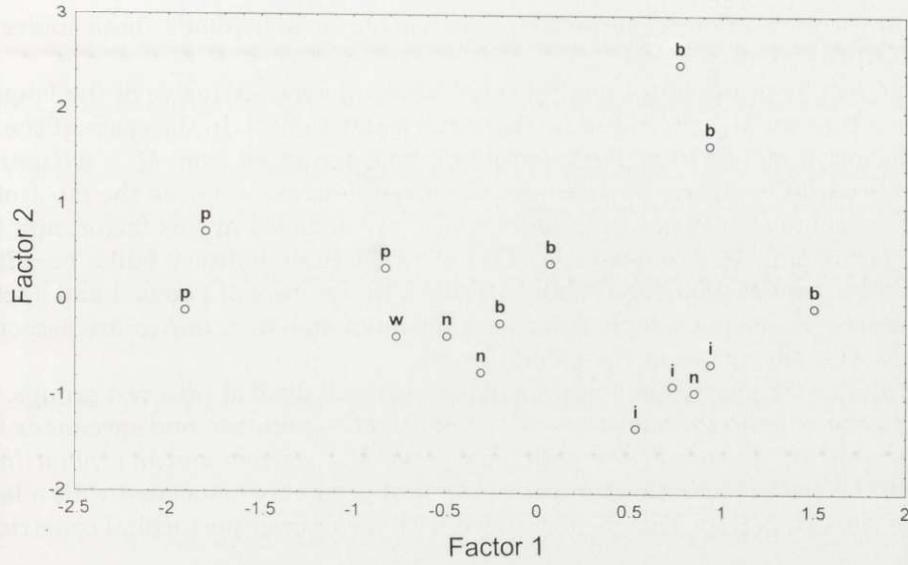


Fig. 2. Principal component analysis based on means of 22 skull measurements (exclusive of the length of lower carnassial M_1) in *Mellivora capensis* from Asia (Factors 1 and 2). Subspecies: b - *buechneri* ssp. n., i - *indica*, n - *inaurita*, p - *pumillio*, w - *wilsoni*.

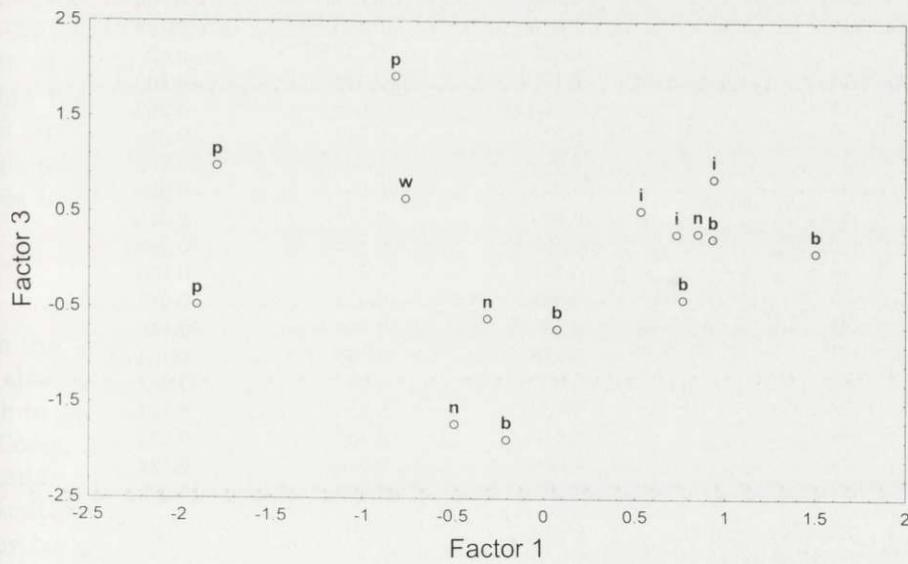


Fig. 3. Principal component analysis based on means of 22 skull measurements (exclusive of the length of lower carnassial M_1) in *Mellivora capensis* from Asia (Factors 1 and 3). Lettering as in Fig. 2.

a stronger expression of postorbital constriction in individuals (both males and females) from Central Asia.

The results of the factor analysis over 22 characters (exclusive of the length of lower carnassial M_1) are shown in Figs 2 and 3 and Table 3. In the space of the first two factors a sample from Turkmenistan is well separated from *M. c. wilsoni* and *M. c. pumillio* by Factor 1, that is by the general value, so far as the most of the measurements of cranial length and breadth are included in this factor, and from *M. c. indica* and *M. c. inaurita*, by Factor 2 (length of auditory bulla, breadth of postorbital constriction, interorbital breadth). In the space of Factor 1 and Factor 3 differences between a sample from Turkmenistan and *M. c. indica* are associated mainly with the values of the palatal length.

In the factor space, the studied samples are well divided into two groups. The first group includes the subspecies *M. c. indica*, *M. c. inaurita*, and specimens from Turkmenistan; the second group, the subspecies *M. c. wilsoni* and *M. c. pumillio*.

Differences between the samples in the first group are associated with a larger size of the skulls from Turkmenistan and with a narrower postorbital constriction

Table 3. Correlation of characters with the first three factors.

Measurements	Factor 1	Factor 2	Factor 3
1	0.953	0.102	-0.011
2	0.810	0.438	0.137
3	0.896	0.152	-0.009
4	0.548	0.307	0.620
5	0.910	-0.143	0.169
6	0.888	0.177	-0.02
7	0.709	-0.474	-0.169
8	0.563	0.645	-0.267
9	0.917	-0.047	-0.018
10	0.921	0.005	-0.202
11	-0.578	-0.604	0.338
12	0.657	-0.374	0.375
13	0.660	-0.332	-0.380
14	0.716	-0.564	-0.150
15	0.866	-0.053	-0.015
16	0.902	-0.168	-0.118
17	0.915	-0.233	0.151
18	0.926	0.037	-0.251
19	0.923	0.215	0.171
20	0.946	0.137	0.095
21	0.936	0.070	0.121
23	0.831	-0.326	0.083
Explained variance by components	15.08	2.21	1.15
Percent of total variance explained	68.56	10.05	5.25

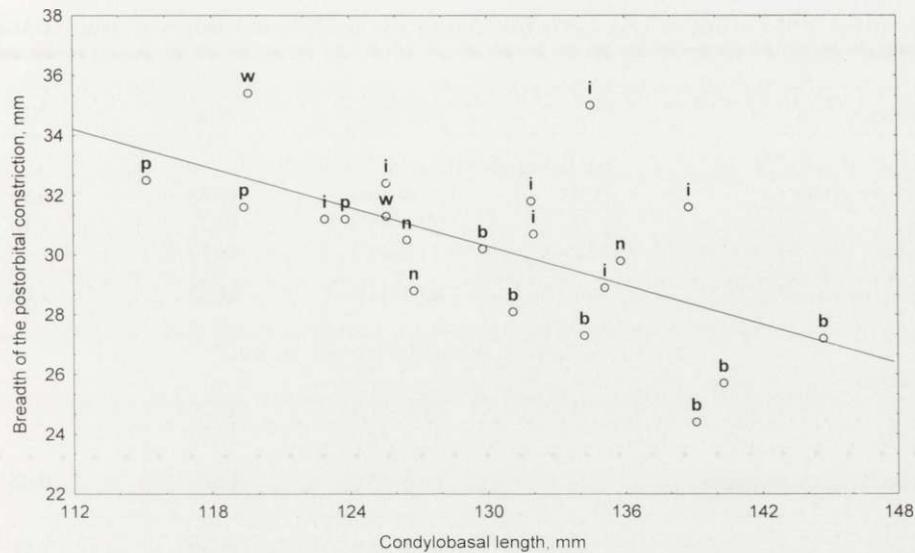


Fig. 4. Correlation of the postorbital constriction breadth and condylobasal length in the *Mellivora capensis* from Asia. Lettering as in Fig. 2.

of the latter (Fig. 4). The index of correlation between the breadth of postorbital constriction and condylobasal length is: new subspecies from Turkmenistan – 17.5–18.20–18.8% ($n = 3$) for males, 20.3–21.67–23.3% ($n = 3$) for females; *M. c. indica* – 21.4–23.52–26.0% ($n = 5$) for males, 25.4, 25.8% ($n = 2$) for females; *M. c. inaurita* – 21.9% ($n = 1$) for male, 22.7, 24.1% ($n = 2$) for females. If one takes into consideration the additional data on the condylobasal length of two males (139.6 and 142.8 mm) and one female (124 mm) published by Gorbunov (1995), the differences in this measurement between the new subspecies and the subspecies *M. c. indica* proves to be reliably considerable for males ($t = 4.15$, $p < 0.01$).

Discussion

In the limits of the area of *M. capensis* a considerable variation in general size, and also of the skin colour on the dorsal side (Rosevear 1974) is observed. In the south to north direction the size of animals changes from large in South Africa and the Congo River basin (subspecies *M. c. capensis*, *M. c. cottoni*) to moderate on the savannas of East and North East Africa (*M. c. maxwelli*, *M. c. consica*) to small in the southern Arabian Peninsula (*M. c. pumillio*). Then size again increases in the honey badger from Turkmenistan.

In African subspecies the colour of the dorsal side of the body and head (“shabrak”) may be light or completely dark, but in both cases there is a lighter coloured border on its margins. In the Indian subspecies *M. c. indica* and *M. c.*

Table 4. Index of correlation between palatal length and condylobasal length of skull in *Mellivora capensis* (in %).

Subspecies	<i>n</i>	Min–Max	Avg	SD
Asiatic subspecies group (“ <i>indica</i> ”)				
<i>buechneri</i> ssp. nov	6	41.4–43.8	42.83	0.88
<i>indica</i>	7	40.0–43.8	42.21	1.16
<i>inaurita</i>	3	41.6–44.2	43.17	–
Total in “ <i>indica</i> ”	16	40.0–44.2	42.62	1.06
African and Arabian subspecies group (“ <i>capensis</i> ”)				
Arabia				
<i>wilsoni</i>	2	47.0–47.4	47.20	–
<i>pumillio</i>	3	46.3–48.0	47.30	–
Total in Arabian subspecies	5	46.3–48.0	47.26	0.65
Africa				
<i>consica</i>	7	44.0–48.7	47.26	1.71
<i>signata</i>	2	42.6–48.1	45.35	–
<i>maxwelli</i>	3	44.0–52.7	46.97	–
<i>cottoni</i>	7	43.8–48.2	47.24	1.57
<i>capensis</i>	2	44.7–46.3	45.50	–
Total in Africa	21	42.6–52.7	46.89	2.27

inaurita such lighter marginal border colour is absent. It is also absent in the specimens from Turkmenistan, in which the light zone covers not only the back and the head, but occupies the whole upper side of the tail (the only black hairs present are on the very tip of it). The light strip along the margin of the “shabrak” is well developed in *M. c. wilsoni*, but in *M. c. pumillio* it is vague and distinguishable only on the neck region (it is absent on the male skin from Aden (NHM 99.11.6.88)).

African and Indian subspecies are well distinguished also by the correlation of the palatal length and condylobasal length (Table 4). On the basis of this index the individuals from Turkmenistan are similar to the subspecies *M. c. indica* and *M. c. inaurita*, but *M. c. wilsoni* and *M. c. pumillio*, with individuals of the subspecies from Africa, are different.

Summarizing, two groups of subspecies *M. capensis* are distinguished: the first group (“*capensis*”), in which all African subspecies and *M. c. wilsoni* and *M. c. pumillio* from Asia are included, and the second group (“*indica*”), comprising the other Asiatic forms. The resemblance of honey badgers from the Arabian Peninsula to the African ones was noted previously (Cheesman 1920, Pocock 1946).

In the group “*indica*,” specimens of *M. c. indica* and *M. c. inaurita* on the bases of their size and proportion of the skull are more similar to each other than to the sample from Turkmenistan. Consequently, the taxonomical isolation of honey badgers from Central Asia is apparent and the new subspecies of *M. capensis*

buechneri ssp. n. may be described. Morphological peculiarity of it is quite in agreement with the geographical isolation of its distribution, separated as it is from the distribution area of Indian subspecies by high-mountain regions of Afghanistan.

Thus there are five subspecies in Asia: *M. c. indica* (Kerr, 1792) (Pakistan and India), *M. c. inaurita* (Hodgson, 1836) (southern slopes of the Himalaya), *M. c. buechneri* ssp. n. (west part of Central Asia), *M. c. wilsoni* Cheesman, 1920 (southwest Iran, Syria, Israel, Iraq, Kuwait, northern Saudi Arabia; see Harrison 1968) and *M. c. pumillio* Pocock, 1946 (southern Arabian Peninsula).

Systematic part

Order Carnivora Bowdich, 1821

Family Mustelidae G. Fischer, 1817

Subfamily Mustelinae s. str.

Tribe Mellivorini Gray, 1865

Genus *Mellivora* Storr, 1780

M. capensis buechneri ssp. nov.

E t y m o l o g y. Named in honour of the Russian zoologist E. Büchner.

T e r r a t y p i c a: Tedzhen, Central Asia (Turkmenistan).

H o l o t y p e: skull 10000 (= 15534), skin 25700, male, coll. ZIN; P. Varentsov, January 1895 (Fig. 5).

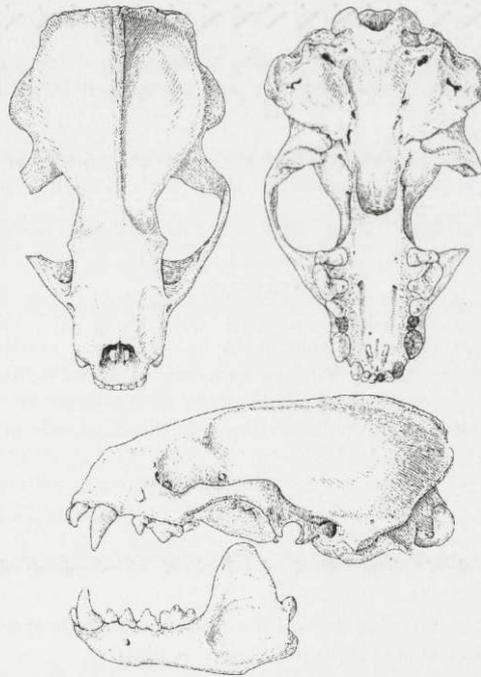


Fig. 5. The skull of *Mellivora capensis buechneri* ssp. n. Holotype, ZIN 10 000 (=15534).

P a r a t y p e s: skull 67011, male, coll. ZMMU, Zaunguz Karakum, 1961; skull 58055, male, coll. ZMMU, Kushka, 1952; skull 11903, male, coll. ZMMU, Atryk, Ashkhabad District, 1926; skull 34748, female, coll. ZIN, Ashkhabad, 1990; skull 5587, female, coll. ZMMU, Ashkhabad, 1929–1930; skull 67035, female, coll. ZMMU, Kunia-Urgench, 1962. Measurements of the type material are given in the Table 1.

D i a g n o s i s. The largest subspecies in Asia. The palatine is relatively shorter than those in *M. capensis wilsoni* and *M. c. pumillio*. The index of the correlation between palatal length and condylobasal length is less than 44%. The postorbital constriction of skulls is narrower than in *M. c. indica* and *M. c. inaurita*. The index of the correlation between breadth of the postorbital constriction and condylobasal length is less than 19% for males and less than 23% for females. Dorsal “shabrak” is light, but without the white border on its margins.

S i z e. Total length of body in males 750–870 mm ($n = 7$), in females 640–680 mm ($n = 3$); length of tail in males 162–180 mm, in females 156–172 mm (Gorbunov 1995). Condylobasal length of skull in males 139.1–141.30–144.7 mm ($n = 5$), in females 124.0–129.77–134.2 ($n = 4$); zygomatic breadth in males 80.1–82.24–86.0 mm, in females 74.1–77.77–80.3 (Gorbunov 1995 and my data).

D i s t r i b u t i o n. Turkmenistan (to the east up to the Amudaria River), West Uzbekistan (south of Karakalpakia), southwest Kazakhstan (Ustiurt Plato to the north up to Karynzharyk), and, possibly, northern portions of Iran and Afghanistan.

Acknowledgements: The possibility to study the collections has been presented to me by Dr I. Pavlinov (ZMMU), Dr P. Jenkins (NHM), Dr V. Eisenmann (MNHN), Dr J. Englund (NR), Miss M. Morales (FM) and also Dr A. Abramov (ZIN) and Mr A. Belov (Ashkhabad). I am grateful to Dr A. Averianov (ZIN) and anonymous reviewers for reading the manuscript and Dr S. Baryshnikova (ZIN) for assistance in working with the paper. I am thankful to Dr J. Saunders (Illinois State Museum, Springfield) for editing the English text.

I am much obliged to the Royal Society (UK) for the financial support of my visit to the Natural History Museum in London. This investigation is fulfilled with the help of a grant from the Russian State Scientific Program “Biological Diversity”.

References

- Baryshnikov G. 1988. The taxonomic position of *Mellivora* species of the USSR fauna. Bulletin Moskovskogo Obshchestva Ispytateley Prirody. Otdelenie Biologii 93 (5): 50–58 [In Russian with English summary]
- Bobrinski N., Kuznetsov B., Kuzyakin A. 1944. [Key for the mammals of the USSR]. Sovetskaya Nauka, Moscow: 1–440. [In Russian]
- Cheesman R. A. 1920. Report on the mammals of Mesopotamia collected by members of the Mesopotamia Expeditionary Force, 1915 to 1919. Journal Bombay Nature History Society 27: 323–346.
- Corbet G. B. 1978. The mammals of the Palaearctic Region: a taxonomic review. Cornell University Press, London and Ithaca: 1–314.
- Ellerman J. R. and Morrison-Scott T. C. S. 1951. Checklist of Palaearctic and Indian mammals 1758 to 1946. British Museum (Natural History) Publ., London: 1–810.
- Gorbunov A. V. 1995. [Honey badger – *Mellivora capensis* Schreber, 1776]. [In: Mammals of Turkmenistan. V. V. Kucheruk, ed]. Ylym, Ashkhabad Vol. 1: 111–121. [In Russian]

- Harrison D. 1968. The Mammals of Arabia. Ernest Benn Limited, London Vol. II: 1-381.
- Heptner V. G., Naumov N. P., Yurgenson P. B., Sludsky A. A., Chirkova A. F. and Bannikov A. G. 1967. [Mammals of the Soviet Union]. Vysshaya Shkola, Moscow Vol. II, Part 1: 1-1004. [In Russian]
- Novikov G. A. 1956. [Carnivora from the fauna of the USSR]. Izdatelstvo Akademii Nauk SSSR, Moscow and Leningrad: 1-294. [In Russian]
- Ognev S. I. 1931. [The mammals of the Eastern Europe and Northern Asia]. Gosudarstvennoe Izdatelstvo, Moscow and Leningrad Vol. II: 1-776. [In Russian]
- Pocock R. I. 1920. On the external characters of the ratel (*Mellivora*) and the wolverine (*Gulo*). Proceedings of Zoological Society London: 179-187.
- Pocock R. I. 1941. The fauna of British India, including Ceylon and Burma. Mammalia. Taylor and Francis Publ., London Vol. II: 1-503.
- Pocock R. I. 1946. External and cranial characters of some rare Asiatic mammals recently exhibited by the society. Proceedings of Zoological Society London 115: 310-318.
- Rosevear D. R. 1974. The carnivores of West Africa. British Museum (Natural History) Publ., London: 1-548.
- Satunin K. A. 1905. [Observations on the mammals of the Transcaspian region]. Zapiski Kavkazskogo Otdelenia Russkogo Geographicheskogo Obshchestva 25: 1-25. [In Russian]
- Satunin K. A. 1914. [Key for mammals of the Russian Empire]. Tipographia Kantzelyarii Namestnichestva, Tiflis Vol. 1: 1-184. [In Russian]
- Zarudny N. and Büchner E. 1892. [Finding of *Mellivora indica* in the Transcaspian Region]. Zapiski Imperatorskoy Akademii Nauk 69 (2): 73-77. [In Russian]

Received 26 June 1998, accepted 24 March 1999.