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A review of *Fukomys ochraceocinereus*, an enigmatic mole-rat from Central Africa (Rodentia: Bathyergidae)

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Abstract. Although the biology of common mole-rats of the genus *Fukomys* has been intensively studied over the last three decades, some lineages of this speciose group of subterranean rodents remain virtually unknown to science. One of these poorly studied species is the Central African mole-rat, *Fukomys ochraceocinereus* (von Heuglin, 1864), which occurs in the tropical savannahs and woodlands of the northern Democratic Republic of the Congo, South Sudan, Uganda, and the Central African Republic. Here I summarize the taxonomic history and available data on the distribution and morphology of this enigmatic mole-rat, adding selected observations from museum collections. *F. ochraceocinereus* is a comparatively large representative of its genus that appears to express little sexual dimorphism and notable variation in pelage color. Its genetics and karyology remain severely understudied. The review highlights both apparent peculiarities of the species as well as research gaps which should be addressed by future studies on *F. ochraeocinereus* and its relatives, including taxonomic revisions.

Key words. Bathyergidae, taxonomy, South Sudan, subterranean rodent.

INTRODUCTION

Although our knowledge on the phylogeny and speciation patterns of common mole-rats (genera *Cryptomys* and *Fukomys*, family Bathyergidae) has improved substantially over the last two decades (Ingram et al. 2004, Kock et al. 2006, Van Daele et al. 2007, Faulkes et al. 2017, Visser et al. 2019), major questions about the diversity and biogeography of these animals remain unanswered. The most enigmatic lineage of common mole-rats, and arguably of the family Bathyergidae as a whole, is comprised by the species of *Fukomys* occurring north of the equator in the woodland habitats south to the Sahel zone. This Northern species group is assumed to represent the basalmost radiation of the genus (Ingram et al. 2004). Traditionally, taxonomists recognize three species within this clade, the Nigerian mole-rat, *F. foxi* (Thomas, 1911), from Nigeria and Cameroon, the Ghana or Zech's mole-rat, *F. zechi* (Matschie, 1900), from Ghana, and the Ochre or Central African mole-rat, *F. ochraceocinereus* (von Heuglin, 1864), from the South Sudan and adjacent regions (Ingram et al. 2004, Honeycutt 2016, Visser et al. 2019). Gippoliti & Amori (2011) named a fourth northern *Fukomys* species, *F. ilariae*, which has been described from a single strongly damaged study skin presumably deriving from the vicinity of Mogadishu in Somalia. However, whether this specimen is indeed affiliated with *Fukomys* remains unvalidated on molecular grounds and numerous morphological traits, from

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its fur structure to the anatomy of the hands and feet, do not resemble other species in the genus. *Fukomys ilariae* will thus not be considered further here.

The phylogenetic interrelations of the Northern species group of *Fukomys* remain unclear (Monadjem et al. 2015) and have never been systematically addressed so far, neither by morphological nor by molecular approaches. In fact, it is not yet established, whether this assumed clade is actually monophyletic. *F. ochraceocinereus* stands out from the species assemblage due to its wide range across Central Africa. Despite that, almost nothing is known about its biology. Here I synthesize the available information on the distribution, ecology, and morphology of this critically under-researched species, adding selected personal observations from museum collections.

Taxonomic history of *Fukomys ochraceocinereus*

Fukomys ochraceocinereus was described in 1864 from the headwaters of the Bar el Ghazal in what is now the western South Sudan by German naturalist Theodor von Heuglin. Hence, it was the first species of *Fukomys* described from the Northern hemisphere. In his report, von Heuglin (1864) provided basic behavioral observations and rough morphological measurements on these rodents, which he noted to occur near the River Wau, and throughout the Bongo and Dembo regions to the Kosanga River in the West ["Wir fanden Spuren von ihr am Waufluss und in ganz Bongo und Dembo westlich bis zum Kosanga"]. Unfortunately, an exact type locality for the species cannot be reconstructed from von Heuglin's writings (compare Dieterlen et al. 2013). He further remarked that the mole-rats dwell in woodland regions as well as in areas covered by high grass and frequently burrow within abandoned termite mounds (von Heuglin 1864). Despite their local abundance, von Heuglin only collected a single female specimen, which now constitutes the holotype of the species and is housed at the State Museum of Natural History in Stuttgart, Germany (SMNS 1095; Fig. 1).

Three decades later, Oldfield Thomas of the British Museum in London (BMNH) started to work on mole-rats from the Sudanian region. He named two further species that he deemed to be closely related to von Heuglin's mole-rat and which today are universally synonymized with it, *Georychus lechei* and *Georychus kummi* (Thomas 1895, 1911). The binomen *Georychus lechei* commemorates the Swedish mammologist Wilhelm Leche, who previously published a detailed report on Central African mole-rat specimens originally collected by Mehmed Emin Pasha (Leche 1888). Seeking taxonomic advice from Thomas, Leche sent vouchers of different pelage coloration, some pale ochre, others greyish brown, to London. Thomas (1895) eventually diagnosed the pale form as *Georychus ochraceo-cinereus* and provided *G. lechei* as a new name for the dark one, which he as well as Leche previously believed to represent a Congolese population of Damaraland mole-rats (*Fukomys damarensis*). The type locality of *Georychus lechei* is "Bellima, Monbuttu", which corresponds to Niangara in the north-eastern DR Congo. The respective mole-rats have been illustrated by Gustav Mützel in Leche's original account (Fig. 2).

In 1911 Thomas further described *Georychus kummi* as yet another species allied to von Heuglin's mole-rat. This one derived from what is now the eastern Central African Republic and was noted to show a mix of characters mediating between *G. lechei* and *G. ochraceocinereus* (Thomas 1911). Whereas the validity of these alleged Central African species became accepted by some taxonomists in the mid-20th century (Allen 1939, Ellerman 1940), later authors disagreed: According to Rosevaer (1969), for instance, *Georychus kummi* and *G.*

lechei should be considered forms of what is now known as *Fukomys foxi*. De Graaff (1975) instead suggested to subsumize them into what is today recognized as *F. ochraceocinereus* instead, an opinion that is now universally accepted (e.g., Bennett 2013, Honeycutt 2016, MDD 2022).

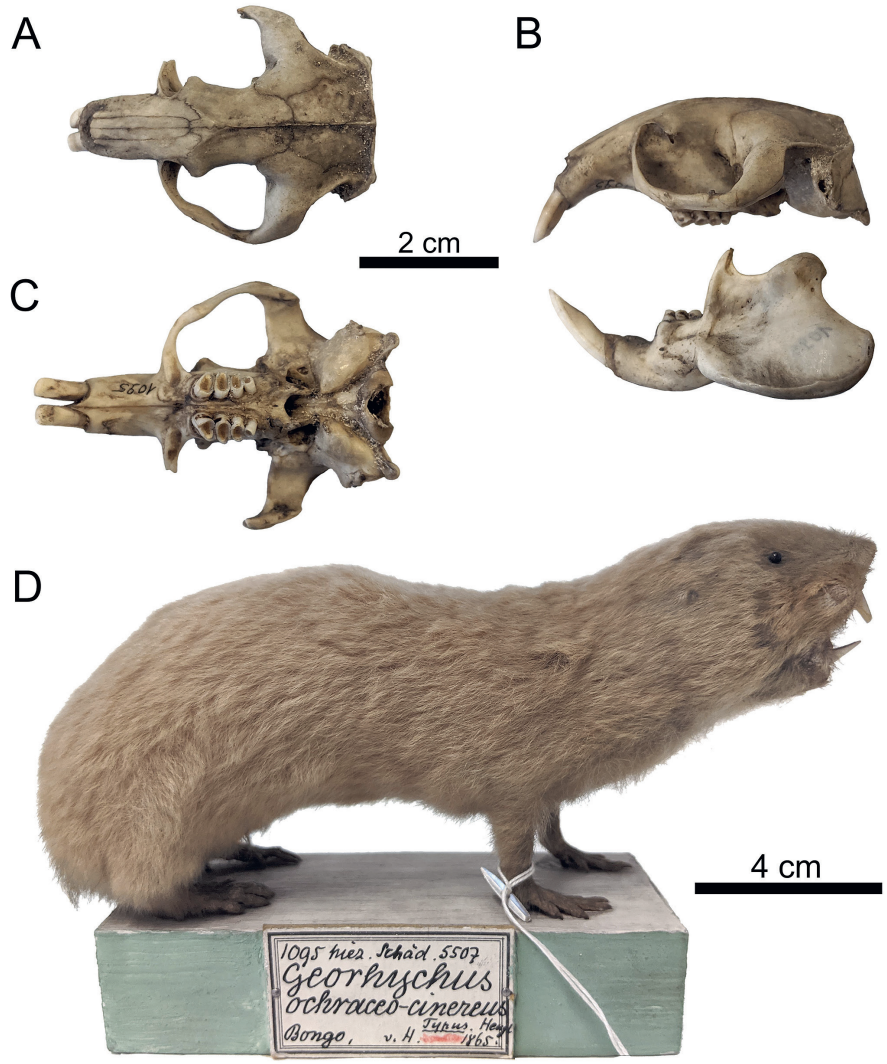

Fig. 1. The holotype of *Fukomys ochraceocinereus* (von Heuglin, 1864) from the Natural History Museum of Stuttgart, Germany; an adult female. A – cranium, dorsal view; B – cranium and mandible, lateral view; C – cranium, ventral view; D – mounted skin.

Table 1. Selected localities of *Fukomys ochraceocinereus*, delineating its geographic range. GPS coordinates (latitude [°N], longitude [°E]) are either directly derived from the cited references or were inferred from the locality descriptions provided therein. Abbreviations: AMNH – American Museum of Natural History, New York, USA; BMNH – Natural History Museum, London, UK; FMNH – Field Museum of Natural History, Chicago, USA; MNHN – National Museum of Natural History, Paris, France; NMR – Natural History Museum Rotterdam, Rotterdam, the Netherlands; SMNS – State Museum of Natural History, Stuttgart, Germany; UGA – field numbering, University of South Bohemia, České Budějovice, Czech Republic; countries: CAR – Central African Republic, DRC – Democratic Republic of the Congo; T – holotype specimen (name associated); * locality not included in Fig. 3

country	locality	coordinates	voucher	reference
CAR	Haute-Kotto	8, 22	BMNH 1911.4.2.1, T *kummi*	Thomas 1911
CAR	N'Délé, Bamingui-Bangoran	8.24, 20.39	MNHN ZM-MO-1947-264	VertNet
DRC	Faradje, Haut-Uélé	3.44, 29.43	AMNH M-50923	Hatt et al. 1940
DRC	Garamba, Haut-Uélé	4.0, 29.30	AMNH M-50935	Hatt et al. 1940, Verheyen & Verschuren 1966
DRC	Niangara, Haut-Uélé	3.11, 28.46	BMNH 1889.12.1.96, T *lechei*	Thomas 1895
DRC	Bondo, Bas-Uele	3.48, 23.41	NMR 999000001145	VertNet
DRC	Blukwa, Ituri	1.45, 30.37	AMNH M-167641	VertNet
South Sudan	400 mi west of Juba, W Equatoria	4.85, 25.77	FMNH M 56294	VertNet
South Sudan	36 mi south-west of Magwi, E Equatoria	4.13, 32.28	FMNH M 79485, T *oweni*	Setzer 1956
South Sudan	"Upper Bahr-el-Ghazal"	7–8, 24–26	SMNS 1095, T *ochraceo-cinereus*	von Heuglin 1864
South Sudan	Watoka near Yei, Central Equatoria	3.45, 30.38	SMNS 27865	this study
Uganda	Mount Morungole Karamoja	3.81, 34.03	FMNH M 232383	VertNet
Uganda	Kacheri, Karamoja	3.10, 33.56	N.A.	Delany 1975
Uganda	Lira, Lango	2.15, 32.52	N.A.	Delany 1975
Uganda	Serere, Teso	1.31, 33.26	N.A.	Delany 1975
Uganda	Soroti, Teso	1.44, 33.36	N.A.	Delany 1975
Uganda	Arua, West Nile	3.1, 30.55	N.A.	Delany 1975
Uganda	vicinity to Mount Kei, West Nile*	3.59, 31.11	N.A.	M. Uhrová & R. Šumbera, pers. comm.

Finally, the American mammologist Henry W. Setzer (1956) named the subspecies *Cryptomys ochraceocinereus oweni* from Magwi, southern South Sudan, which is foremost characterized by a blackish brown pelage. However, it has not been considered valid by most later taxonomists. Whereas the distinctiveness of *Cryptomys o. oweni* indeed appears to be doubtful (see below), it is frustrating that the inner taxonomy of the species has been virtually untouched since Setzer. Fritz Dieterlen of the State Museum of Natural History in Stuttgart announced a revision of *F. ochraceocinereus* (Dieterlen et al. 2013) but passed away before the completion of the work. Gaining further knowledge on the intraspecific variation and biogeography of the species will be crucial to robustly distinguish it from congeneric lineages and thus for its effective conservation.

Distribution and Ecology

Fig. 3 provides an approximation of the range of *Fukomys ochraceocinereus*. Localities were derived from vouchers studied in the Stuttgart collection, the species' entries in VertNet (Constable et al. 2010), and additional literature sources (Leche 1888, Setzer 1956, Delany

Fig. 2. Life reconstructions of *Georychus lechei* Thomas, 1895 (above, herein misidentified by Leche (1888) as *Georychus damarensis* [= *Fukomys damarensis*]) and a specimen assigned to *Georychus ochraceocinereus* von Heuglin, 1864 by Leche (1888). Today, these forms are recognized as color phases of *Fukomys ochraceocinereus* instead of distinct taxa.

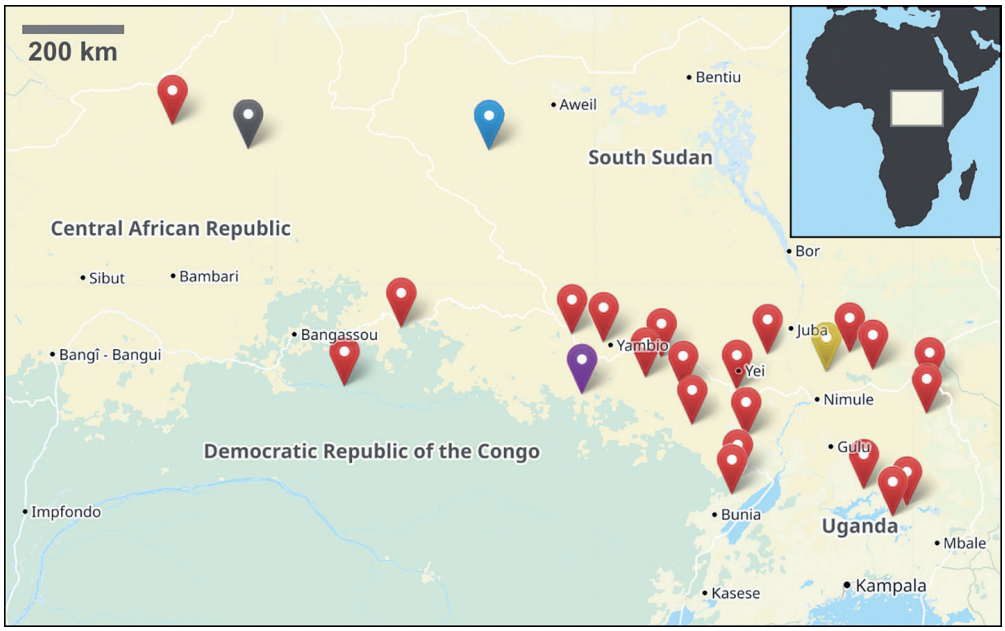

Fig. 3. Available records for *Fukomys ochraceocinereus*. Localities of name-bearing specimens are color-coded (other than by red): blue (tentative): *Georychus ochraceo-cinereus* von Heuglin, 1864; violet: *Georychus lechei* Thomas, 1895; grey: *Georychus kummi* Thomas, 1911; yellow: *Cryptomys ochraceocinereus oweni* Setzer, 1956. Map modified from openstreetmap.org.

1975). Selected localities are highlighted in Table 1. The available vouchers indicate that it is occurring in tropical savannah and forest-savannah mosaic habitats, neither venturing far into the rain forest ecosystems that spread south to its distribution, nor into the semi-arid Sahel zone that stretches to the North. At the south-eastern fringes of its range, it is found east of Lake Kyoga in Uganda and close to the Western shore of Lake Albert in the Democratic Republic of the Congo (Delany 1975; Fig. 3). It seems to not occur further south and is, for instance, absent in Virunga National Park (Verschuren 1987). It evidently dwells in montane regions (compare Setzer 1956), and has been recorded from Mt. Morungole in Uganda at an elevation of 2520 m a. s. l. (FMNH 232380, Table 1). Whether its distribution is continuous, particularly in the western portion of its range, remains to be determined.

The consulted references provide no evidence for *F. ochraceocinereus* occurring in Cameroon. Indeed, sources illustrating its range to include Cameroon emphasize that its presence there is tentative (Bennett 2013, Maree & Faulkes 2016). Given that *F. foxi* has been recorded from Cameroon (Williams et al. 1983) and both species have been synonymized by some authors in the past (e.g., Rosevaer 1969), it appears likely that the assumed occurrence of *F. ochraceocinereus* so far west is the result of the two simply having been confused. I am unaware of records for *F. ochraceocinereus* occurring west to approximately 20° E. It should be briefly noted here that Monadjem et al. (2015) proposed that Cameroonian *F. foxi* from Ngaoundere

might be synonymous with *F. ochraceocinereus*. However, genetic data firmly suggest that the two taxa are only distantly related (Ingram et al. 2004).

There is also no direct evidence for the presence of *F. ochraceocinereus* in Kenya (apart from an alleged specimen collected in Nairobi [TCWC Mammals 27897], perhaps a misidentified *Heliophobius*) but since it occurs close to the Ugandan-Kenyan border (Table 1, Fig. 3), it seems plausible that it may indeed be found in the north-eastern parts of the country (as tentatively suggested by Bennett 2013 and Maree & Faulkes 2016).

One reported specimen is not shown in Fig. 3 due to concerns of it being erroneously assigned. The respective voucher (MNHN-ZM-MO-1956-717) was collected in the vicinity of Khartoum in the Sudan according to the collection database of the National Museum of Natural History in Paris. Thus, it would derive from a semi-desert environment about 1000 km away from the documented range of *F. ochraceocinereus* and in a region from which other sources report no mole-rats at all (e.g., Happold 1967). If indeed a *Fukomys* specimen, this voucher would represent the northernmost record of the genus and in fact of the family Bathyergidae in general. However, until its characteristics and origin have been validated, one should be wary about its identity.

Very little is known about the ecology of *F. ochraceocinereus*. The only field study that generated ecological data on the species has been carried out by Verheyen & Verschuren (1966) in Garamba National Park, DR Congo. The authors excavated and mapped a 315 m long tunnel system in *Isoberlinia* woodland that had been inhabited by at least three individuals. Food chambers contained roots and tubers, in particular of *Dioscorea abyssinica* (Verheyen & Verschuren 1966).

No data is available on the typical size and composition of the species' social groups. In *Fukomys zechi* from Ghana, mean family sizes are remarkably small, averaging at just 4.2 (maximum: 7) animals (Yeboah & Dakwa 2002; but note that data on grouping behavior in *F. zechi* is only available from few localities in the vicinity of Atebubu so far). This indicates a timing of births and offspring dispersal that leaves only little opportunity for offspring from different litters to interact. Therefore, these mole-rats might not exhibit cooperative breeding, which is characteristic for other *Fukomys* lineages (Honeycutt 2016). If indeed typical for *F. zechi*, studies on *F. foxi* and *F. ochraceocinereus* need to clarify, whether this social pattern is representative for the whole Northern species group.

Morphology

Only few morphological descriptions and photographs are available for this species. Fig. 4 shows the habitus of two adult *Fukomys ochraceocinereus* caught in north-western Uganda. Further black and white photos of living animals are included in Hatt et al. (1940) and a picture of a presumably dead juvenile specimen posed for photography was published by Verheyen & Verschuren (1966). Previously published morphometric data and original measurements collected from specimens of the Stuttgart collection are summarized in Table 2 and will be discussed further below.

Pelage color in *F. ochraceocinereus* is highly variable, but not necessarily to an extent that exceeds what can be observed in some other *Fukomys* species (Fig. 5; compare e.g. Bennett & Jarvis 2004). The holotype (Wau river region, South Sudan) as well as other similarly pale specimens (vicinity of Wandi, South Sudan – Leche 1888; vicinity of Yambio, South Sudan – BMNH 1948.318) display a uniform ochre coat (Fig. 5A). The type specimen of *Cryptomys*

Table 2. Morphological measurements for *Fukomys ochraceocinereus*. Body mass is provided in grams, all other measures in millimetres. See Table 1 for further information on collections and localities. Abbreviations: gsl – greatest length of skull; zw – width of zygomatic arches; uiw – width of upper incisors, measured at the alveolus; M – body mass; hbl – head and body length; HT – holotype of *Georychus ochraceo-cinereus*; * – M. Uhrová & R. Šumbera, pers. comm.

collection ID	sex	gsl	zw	uiw	M	hbl	locality	reference
?	♂	–	34.0	–	–	–	–	Leche (1888)
?	♀	–	29.0	–	–	–	–	Leche (1888)
BMNH 1911.4.2.1	♀	42.4	31.5	–	–	–	8°N, 22°E	Thomas (1911)
AMNH M-50923	♀	45.3	31.3	–	–	–	Faradje	Hatt et al. (1940)
AMNH M-50925	♀	44.1	30.7	–	–	–	Faradje	Hatt et al. (1940)
AMNH M-50926	♀	43.1	30.4	–	–	–	Faradje	Hatt et al. (1940)
AMNH M-50927	♀	45.5	31.3	–	–	–	Faradje	Hatt et al. (1940)
AMNH M-50929	♀	48.2	–	–	–	–	Faradje	Hatt et al. (1940)
AMNH M-50934	♀	44.1	–	–	–	–	Faradje	Hatt et al. (1940)
AMNH M-50938	♀	39.7	26.6	–	–	–	Faradje	Hatt et al. (1940)
AMNH M-50945	♀	40.0	27.1	–	–	–	Faradje	Hatt et al. (1940)
AMNH M-50948	♀	42.1	28.8	–	–	–	Faradje	Hatt et al. (1940)
AMNH M-50951	♀	39.7	27.0	–	–	–	Faradje	Hatt et al. (1940)
AMNH M-50928	♂	43.0	28.5	–	–	–	Faradje	Hatt et al. (1940)
AMNH M-50935	♂	47.1	32.5	–	–	–	Garamba	Hatt et al. (1940)
AMNH M-50937	♂	43.1	29.3	–	–	–	Garamba	Hatt et al. (1940)
AMNH M-50949	♂	45.9	30.4	–	–	–	Garamba	Hatt et al. (1940)
AMNH M-50950	♂	46.0	31.5	–	–	–	Garamba	Hatt et al. (1940)
AMNH M-50955	♂	44.3	31.5	–	–	–	Garamba	Hatt et al. (1940)
SMNS 27865	♂	43.6	32.3	6.94	190	167	Watoka near Yei	this paper
SMNS 27867	♀	42.6	31.0	6.44	130	141	Watoka near Yei	this paper
SMNS 27861	♀	–	–	6.86	213	183	Watoka near Yei	this paper
SMNS 27864	♀	43.1	32.2	6.49	175	173	Watoka near Yei	this paper
SMNS 27860	♂	43.5	32.8	6.69	180	162	Watoka near Yei	this paper
SMNS 27875	♂	41.9	30.9	6.19	125	153	Watoka near Yei	this paper
SMNS 27862	♂	42.1	35.4	6.67	160	153	Watoka near Yei	this paper
SMNS 27873	♀	40.9	31.8	6.43	140	164	Watoka near Yei	this paper
SMNS 27859	♀	40.2	27.4	5.45	120	151	Watoka near Yei	this paper
SMNS 27868	♀	42.0	31.3	6.48	170	158	Watoka near Yei	this paper
SMNS 27869	♀	43.1	30.0	6.3	150	146	Watoka near Yei	this paper
SMNS 27870	♀	–	–	6.68	175	185	Watoka near Yei	this paper
SMNS 1095 (HT)	♀	43.3	34.3	6.39	–	–	7–8°N, 24–26°E	this paper
SMNS 30715	♀	–	–	–	220	177	Watoka near Yei	this paper
UGA 619	♂	–	–	–	243	181	near Mt. Kei	this paper*
UGA 621	♀	–	–	–	180	146	near Mt. Kei	this paper*

kummi from the north-western portions of the species range is of a darker, light grayish-brown (Fig. 5B). Contrasting with these pale forms, animals from the north-eastern DR Congo, southern South Sudan, and Uganda (including the type series of *Cryptomys ochraceocinereus oweni* and the type of *Georychus lechei*) typically have a medium brown to blackish brown pelage (Figs. 5C–D) but greyish forms occur as well (Fig. 4). Whether differences in fur color

are continuous and correspond to regional phenotypic variation or represent morphs that might coexist at certain localities (e.g. pale and dark brown forms in the southern South Sudan), as is the case with the color phases of *F. damarensis* (Bennett & Jarvis 2004), is not known. Accordingly, their potential taxonomic significance remains unexplored. In any case, the vernacular name "ochre mole-rat" is highly misleading and should be reconsidered in favor of "Central African mole-rat".

The occipital patch is extremely variable in size and shape, as is typical for *Fukomys* species exhibiting this character. It might be absent in some *F. ochraceocinereus* individuals, while it tapers caudally down the neck and rump in others, similar to the condition in *F. damarensis* and *F. micklemi* (Bennett & Jarvis 2004; pers. obs.). Just as these two Zambezian species, *F. ochraceocinereus* might also display white markings in the chin region and/or medial stripes on the throat and ventrum (Thomas 1911, Setzer 1956; Fig. 4). Verheyen & Verschuren (1966) noted that the specimens they collected at Garamba National Park (Haut-Uélé, DR Congo) displayed white facial markings encircling the eyes. These eye rings were even listed

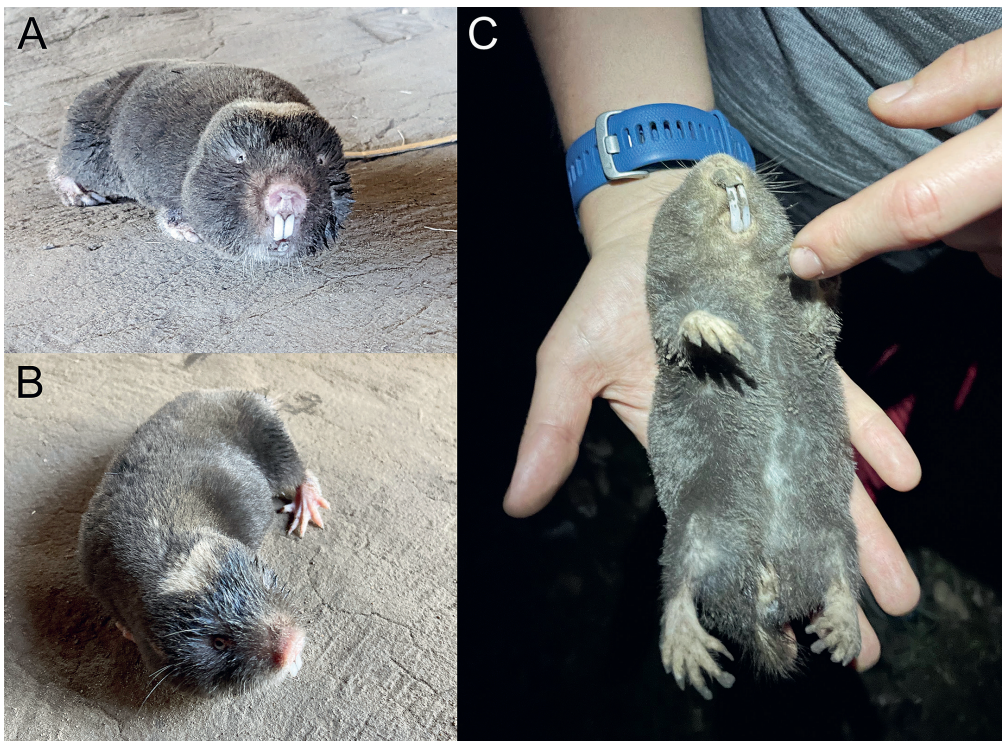

Fig. 4. Photos of two adult *Fukomys ochraceocinereus* (male – A, B; female – C) captured in the vicinity of Mount Kei, in the West Nile subregion of Uganda, in 2022. Note the comparatively large size of the animals, the greyish brown pelage coloration and white markings on the occiput (A, B) and ventrum (C). Photo credits: A, C – Alena Fornůsková, B – Michaela Uhrová.

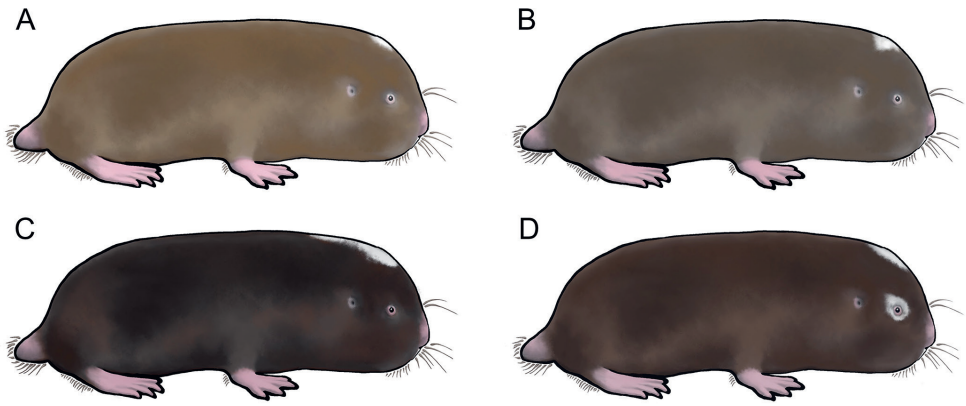

Fig. 5. Pelage color variation in *Fukomys ochraceocinereus*, inferred from museum skins and/or literature reports. A – pale color phase, corresponding to the holotype specimen (SMNS 30715); B – grey-brown color phase, corresponding to the type of *Georychus kummi* Thomas, 1911 (BMNH 1911.4.2.1); C – brown color phase, corresponding to *Cryptomys ochraceocinereus oweni* Setzer, 1956 (depicted after SMNS 27874); D – brown color phase with white eye ring, as described from Garamba National Park (DR Congo) by Verheyen & Verschuren (1966), emphasizing individual variation in pigmentation.

erroneously as diagnostic for *F. ochraceocinereus* by Bennett (2013). However, this condition certainly corresponds to individual variation in pigmentation. Even Hatt et al. (1940), who collected from the same locality, did not describe this rather remarkable trait for the mole-rats they captured.

Although information on body size is extremely scarce, it is obvious that *F. ochraceocinereus* is a large-bodied representative of its genus. Only Verheyen & Verschuren (1966) have so far reported measurements of its body mass, noting that a single female of unknown reproductive status weighed 200 g. Michaela Uhrová and Radim Šumbera were kind enough to share additional unpublished body mass data from two adult, likely non-reproductive animals, caught in north-western Uganda (Fig. 4). The male weighed 243 g, while a body mass of 180 g was recorded for the female (Table 2). Deduced from a series of *F. ochraceocinereus* originating from Watoka, South Sudan, housed in the Stuttgart collection, the adult body mass range of mole-rats from that locality is 130–220 g (n=9; mean 165.9 g; SD 34.7) for females and 125–190 g (n=4; mean 163.8 g; SD 28.7) for males (Table 2, animals with crania >4 cm long were classified as adults). However, given that geographic variation in body size can be pronounced in other *Fukomys* (e.g., Caspar et al. 2021a), the respective data may not be representative for the species. Since it is not known, whether entire families were captured, it may be expected that these figures underestimate the upper range of body mass in adult animals: When trapping wild *Fukomys*, subadult non-reproductive animals are typically captured first, whereas the less active breeders are often collected last (Yeboah & Dakwa 2002, Zöttl et al. 2022).

Interestingly, these preliminary data suggest that *F. ochraceocinereus* is not strongly sexually dimorphic. Most other *Fukomys* lineages display notable male-biased sexual dimorphism, which tends to be more extreme in larger-bodied lineages (Caspar et al. 2021b). Apart from that, males in several *Fukomys* species display longer rostra and especially wider skulls and

incisors relative to their body size than females, which might serve in physical intrasexual competition (Caspar et al. 2021b). In *F. ochraceocinereus*, however, sex differences in these traits appear to be minor: The mean greatest cranial length is 44.1 mm (n=10; SD 1.75) in males and 42.7 mm (n=18; SD 1.90) in females, while the mean greatest zygomatic width is 31.7 mm (n=11; SD 1.90) in male and 30.1 mm (n=17; SD 2.14) in female specimens. Similarly, the mean upper incisor width is rather monomorphic, at 6.62 mm (n=4; SD 0.31) in males and 6.39 mm (n=9; SD 0.39) in females (note however, that we lack robust criteria yet to determine whether a *F. ochraceocinereus* skull corresponds to an adult individual). Whether differences in dimorphism between *F. ochraceocinereus* and other *Fukomys* species of comparable body size are reflected in social behaviors might constitute an interesting topic for future research.

All these results suggest that at least in parts of its range, *F. ochraceocinereus* is a conspicuously large representative of the genus *Fukomys*, with body mass and cranial measurements overlapping with those of giant mole-rat (*Fukomys mechowii*) females (Caspar et al. 2021a). In that respect *F. ochraceocinereus* resembles Cameroonian populations of *F. foxi* as well as *F. zechi* (Rosevear 1969, Williams et al. 1983, Yeboah & Dakwa 2002).

Curiously, there is some uncertainty about the number of nipples in this species. Hatt et al. (1940) identified two pectoral and one inguinal pair of nipples, as is the case in all remaining species of *Fukomys* as well as *Cryptomys* that have been studied so far. However, Verheyen & Verschuren (1966) emphasize the presence of only four nipples (one pectoral and one inguinal pair). When examining an alcohol-preserved reproductive female of *F. ochraceocinereus* in the Stuttgart collection (SMNS 30715 from Watoka, South Sudan), I found just two pairs of nipples myself. Further examinations on this trait seem to be warranted.

Karyology

Traditionally, karyology has informed various decisions on bathyergid taxonomy and was utilized in particular to justify the species status of numerous *Fukomys* lineages (e.g., Van Daele et al. 2004). So far, no karyological data on *F. ochraceocinereus* have been published. Honeycutt (2016) erroneously lists 2n=44 as the diploid number of chromosomes and FN=76 as the fundamental number for the species. However, this figure actually refers to *Fukomys vandewoestijneae* and has been confused during the preparation of the work (R. L. Honeycutt, pers. comm.). The only *Fukomys* population from the Northern species group which has been karyotyped, derives from Ngaoundere in Cameroon, and is assigned to *F. foxi* (2n=66/70, Williams et al. 1983, see also Ingram et al. 2004).

Conclusions and synonymy

Fukomys ochraceocinereus is one of the most puzzling of all bathyergids. Besides the obvious knowledge gaps concerning its ecology and behavior, urgent taxonomic questions remain unresolved. A sufficient genetic and morphological characterization of the various populations traditionally assigned to *F. ochraceocinereus* has not yet been attempted and its affiliation to both *Fukomys foxi* and *F. zechi* requires clarification. So far, the three species have not been included alongside each other in any molecular taxonomic work. The single available phylogenetic study leveraging genetic data that considered *F. ochraceocinereus*, found specimens from the western South Sudan to be highly distinct from *F. foxi* deriving from Ngaoundere in Cameroon (Ingram et al. 2004). Since *F. foxi* and *F. ochraceocinereus* are so little known, it is certainly possible that they both may actually encompass multiple species. In the wake of such revisions,

some historical names might need to be resurrected. For orientation, and to complement the historical account laid out before, a full synonymy for *F. ochraceocinereus* is provided below:

***Fukomys ochraceocinereus* (von Heuglin, 1864)**
Central African Mole-rat

Georychus ochraceo-cinereus von Heuglin, 1864: 1; type locality "Im Gebiet der Quellflüsse des Bahr el ghasál, unter 7–8° N. Br. und 24–26° O. v. Greenwich" (= western South Sudan); amended by Dieterlen et al. (2013) to "Bongo, Dembo, Kosanga-River, Bahr-el-Ghazal, Sudan".
Typhloryctes ochraceo-cinereus: Fitzinger 1867: 503. Name combination.
Georhychus ochraceo-cinereus: Hartmann 1868: 242. Incorrect subsequent spelling of generic name.
Georychus Coetomys ochraceo-cinereus: Trouessart 1881: 160. Name combination (*Coetomys* Gray, 1864 is here applied as subgeneric name).
Georychus Lechei Thomas, 1895: 241; type locality "Bellima, Monbuttu" (= near Niangara, current DR Congo).
Georychus kummi Thomas, 1911: 592; type locality "French Shari Protectorate, about 8° N., 22° E., on the Ironstone Plateau. Alt. 2000 ″" (= eastern Central African Republic).
Cryptomys ochraceo-cinereus: Allen 1939: 430. Name combination.
Cryptomys ochracea-cinereus: Anderson 1949: 258. Incorrect subsequent spelling of epitheton.
Cryptomys kummi: Ellerman 1940: 91. Name combination.
Cryptomys lechei: Ellerman 1940: 91. Name combination.
Cryptomys ochraceocinereus: Ellerman 1940: 91. Name combination.
Cryptomys ochraceocinereus oweni Setzer, 1956: 548; type locality "Magwe, 36 miles southwest of Torit, Equatoria Province, Anglo-Egyptian Sudan" (current southern South Sudan).
C[*oetomys*]. *ochraceocinereus*: Ingram et al. 2004: 1008. Name combination.
F[*ukomys*]. *ochraceocinereus*: Kock et al. 2006: 1142. First use of current name combination.

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