On some weasels *Mustela* from eastern Asia

Colin GROVES

Abstract

Comparisons of pelage and skull features validate *Mustela russelliana* Thomas, 1911, *Mustela tonkinensis* Björkgren, 1942, and *Mustela aistoodonnivialis* Wu & Kao, 1991, as species under a phylogenetic species concept. *Mustela russelliana* is the world’s smallest species of the order Carnivora. All are known from only few specimens and tiny geographic ranges.

Keywords: morphology, *Mustela aistoodonnivialis*, *Mustela kathiah*, *Mustela nivalis*, *Mustela russelliana*, *Mustela tonkinensis*, systematics, taxonomy

In the autumn of 1909, the Duke of Bedford organised a collecting trip to western China (Gansu and Sichuan) under his employee Malcolm Anderson. The several new mammals which resulted from this trip were announced in a preliminary presentation by the leading British mammalogist of the time, Oldfield Thomas of the British Museum (Natural History). They included a new species of weasel, *Mustela russelliana*, diagnosed as follows:

“Size excessively small. Colour nearly as in *M. kathiah*. Tail not tufted” (Thomas 1911a).

Later the same year (Thomas 1911b), the description was elaborated, stressing the extremely small size (“about that of the very smallest known weasel – the American *M. rixosa Bangs*”), the sharp contrast between upper and lower parts (“as in *M. kathiah* and the stoats, not as in *M. nivalis*”), the “beautiful pinkish buff” of the underside, turning into white in the interramal region, and the tail shorter than in *M. kathiah*. (Some of the other characters mentioned are individually variable, so are not diagnostic). The type (and only) locality is Tatsienlu (now Lucheng, 30°03’N, 102°01’E, 4,480 m a.s.l.), in Sichuan. The description ends on a sycophantic note:

“The combination *Mustela bedfordi* being already in use, I have given to this striking new species a designation based on the family name of the donor of the present magnificent accession to the National Collection of Mammalia”.

Allen (1938) was one of the few to examine the type series or even mention the species, which he accepted as valid. He mentioned its similarity in size to the Pygmy Weasel, which he called *M. rixosa pygmaea* and of which he had earlier described some specimens from Siberia and Mongolia, but “the tail is much longer in proportion, and all the series have the throat white, but the remaining under parts contrastingly pale orange buff”.

Ellerman & Morrison Scott’s (1951) influential checklist set the tone for the whole of mammalian taxonomy for the next quarter-century—indeed, its legacy of wholesale lumping of species is still with us. In this compilation, the Sichuan weasel was relegated to the status of subspecies as *M. nivalis russelliana*. The best way to ensure that a taxon gets forgotten or overlooked is to reduce it to the status of subspecies; unsurprisingly, *russelliana* dropped off the radar for the remainder of the century and beyond, to the extent that when in 1991 a further new species was described from China, *russelliana* was mentioned, but, being supposedly a mere subspecies of *Mustela nivalis*, not specially compared with the new species.

The “further new species” was the magnificently named *Mustela aistoodonnivialis* Wu & Kao, 1991, dubbed the Lackedteeth Pygmy Weasel by its describers, based on four specimens from the Qinling Range, central China: three from Mt Taibai (1,950–2,750 m a.s.l.), in Zhouzhi County, approx. 34°N, 108°E, and one from 2,400 m a.s.l. in Zhashui County, approx. 34°N, 109°E. I am unaware of any other specimens of this species. The specimens are presumably held in the collections of Northwestern University, Xian, China. It was diagnosed as follows (English abstract from Chinese paper):

“External features of the new species are very similar to *M. nivalis*. The tail is very long…exceeding one third of the length of body and head. The summer fur of the back, tail and head is dark brown, no dark markings on face or head. Under the lip, chin and throat, the fur is white but the chest and belly are a pale yellow with some irregular and rusty-red spots. The backs of front legs are brown, and the hind limbs are similarly brown but the inner lateral parts are white hairs with brown spots. The palms and soles have shorter hair. The second lower molar (*M*) is absent” (Wu & Kao 1991: 93–94).

As far as the Palaearctic and Continental ranges are concerned, the reputed subspecies of *Mustela nivalis* are continuously distributed with the exception of *russelliana* and the Vietnamese *tonkinensis* (Abramov & Bar'yshnikov 2000). In 2006, I examined the type series of *russelliana* in the Natural History Museum, London, and compared it with other Asian representatives of *M. nivalis* (particularly *tonkinensis*), with *M. kathiah*, to which Thomas (1911a, 1911b) likened it, and with the description of *M. aistoodonnivialis*; I have not seen the original specimens (Tables 1, 2). *Mustela kathiah* is itself closely related to *M. nivalis*, and belongs (together with *M. subpalmata* and *M. altaica*) in the subgenus *Gale* Wagner, 1841 (see Abramov 2000).

Examination of the four (sic) specimens in the type series (see colour plate on page 25) shows that *M. russelliana* is on average the smallest of all *nivalis*-group weasels and is longer-tailed than any but *M. n. numidica* from Morocco and the Azores. It is exceptionally dark in colour, a rich almost maroon brown, with a
beautiful golden-toned underside, quickly becoming whitish on the upper throat and interramal region. Hands and feet are dark like the rest of the upper side; the palms and soles are hairy. There is no white spot between eye and ear.

Among the other Asian M. cf. QLYDOLV, those closest in distribution to the Chinese and Vietnamese weasels are creamy-white on the underside, and most are lighter on the upper side (one from 4RVWDQD). Specimens of 0QQLYDOLV are nearly as dark as M. russelliana. The pelage of M. kathiah is much more similar to M. russelliana. The underside is creamy gold or golden, but unlike the latter the throat is also golden, not white, although it can be paler than the ventral, only the interramal region being white; and the underside of the paws is not hairy, and not white.

The skull of M. russelliana resembles M. kathiah in many respects (Figs 1–2). Notably, the postorbital constriction is sharply marked and deep relative to the width of the brain case, though not necessarily relative to the size of the skull as a whole (see Abramov & Baryshnikov 2000, Fig. 2). The zygomatic arches are straight as in M. kathiah, not outwardly bowed as in M. nivalis. The post-palatal notch is V-shaped as in M. kathiah, not widely U-shaped as in M. nivalis. Unlike either M. kathiah or M. nivalis,
Table 2. Comparisons of Mustela russelliana and related taxa.

<table>
<thead>
<tr>
<th>Morphological character</th>
<th>M. tonkinensis</th>
<th>M. cf. nivalis</th>
<th>M. russelliana</th>
<th>M. aistoodonnivalis</th>
<th>M. kathiah</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dorsum</td>
<td>dark brown</td>
<td>brown</td>
<td>rich maroon-brown</td>
<td>“deep brown”</td>
<td>rich maroon-brown</td>
</tr>
<tr>
<td>Pattern</td>
<td>V (vulgaris)</td>
<td>N or V</td>
<td>N (nivalis)</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Venter</td>
<td>white, yellowish tinge</td>
<td>white or yellow-tinged</td>
<td>pale yellow to rust-red</td>
<td>pale yellow to red</td>
<td>bright golden</td>
</tr>
<tr>
<td>Throat, interramal</td>
<td>white as venter</td>
<td>white as venter</td>
<td>white, contrasting</td>
<td>white, contrasting</td>
<td>white (throat only)</td>
</tr>
<tr>
<td>White spot between eye and ear</td>
<td>yes</td>
<td>no</td>
<td>no</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>White spot below ear</td>
<td>indistinct</td>
<td>clear</td>
<td>no</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>Lower molars</td>
<td>1</td>
<td>usually 2</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Postorbital constriction</td>
<td>deep</td>
<td>less</td>
<td>deep</td>
<td>deep</td>
<td>deep</td>
</tr>
<tr>
<td>Basioccipital</td>
<td>widens posteriorly</td>
<td>parallel-sided</td>
<td>widens posteriorly</td>
<td>widens posteriorly</td>
<td>parallel-sided</td>
</tr>
<tr>
<td>Rostrum</td>
<td>very short, square</td>
<td>short, square</td>
<td>narrowing anteriorly</td>
<td>narrowing anteriorly</td>
<td>square</td>
</tr>
<tr>
<td>Zygomata</td>
<td>bowed</td>
<td>less</td>
<td>straight</td>
<td>straight</td>
<td>straight</td>
</tr>
<tr>
<td>Temporal fossa</td>
<td>width nearly = length</td>
<td>width &gt; length</td>
<td>width &lt; length</td>
<td>width &lt; length</td>
<td>width &lt; length</td>
</tr>
<tr>
<td>Sagittal crest</td>
<td>no</td>
<td>maybe</td>
<td>no?</td>
<td>no</td>
<td>maybe</td>
</tr>
<tr>
<td>Post-palatine notch</td>
<td>U-shaped</td>
<td>U-shaped</td>
<td>V-shaped</td>
<td>V-shaped</td>
<td>V-shaped</td>
</tr>
<tr>
<td>Head + body length, HB, M (mm)</td>
<td>200</td>
<td>152-310</td>
<td>136-138</td>
<td>160</td>
<td>235-280</td>
</tr>
<tr>
<td>Tail as % HB</td>
<td>45</td>
<td>17-31</td>
<td>39.1-40.6</td>
<td>38.0-41.1</td>
<td>62.1-66.0</td>
</tr>
<tr>
<td>Condylarbasal length, Cbl, M (mm)</td>
<td>36.2</td>
<td>29.8-46.1</td>
<td>29.9</td>
<td>31</td>
<td>48.0-51.4</td>
</tr>
</tbody>
</table>

M–male

However, the basioccipital widens posteriorly rather than being parallel-sided, and the rostrum narrows anteriorly instead of being blunt and square.

As far as can be told from the description, and from photographs of the holotype skull kindly supplied by Professor Wang Ying-xiang, the skull features of *M. aistoodonnivalis* are exactly the same as in *M. russelliana*. Strikingly, all of the type series of *M. russelliana* lack *M. aistoodonnivalis* takes its name; this feature does occur in *M. nivalis*, but is uncommon (and it also occurs in other species of *Mustela*, outside the *M. nivalis* group), so it cannot be considered diagnostic of these two Chinese species. Its presence at high frequency (perhaps fixed?) is noteworthy, and is a further indication that the two are very close: in fact, only the greater size of *M. aistoodonnivalis* seems to separate them. A number of other mammalian taxa or species-groups are likewise distributed between the Qinling range and the mountains of Sichuan, including the Giant Panda *Ailuropoda melanoleuca*, Golden Snub-nosed Monkey *Rhinopithecus*

![Fig. 2. Skulls from above. Left: two M. nivalis (BMNH 12.6.2.7, -9, from Djarkent, Kazakhstan); right, three M. russelliana (BMNH 11.12.1.84, -7, -6 (holotype)). Notice the much deeper, more angulated, postorbital region constriction in M. russelliana, the short, anteriorly narrowing rostrum, and the straight zygomatic arches, so that the temporal fossa in dorsal view is long and narrow. Photo: Colin Groves.](image-url)
roxellana and takin Budorcas spp. (I take takin to be three or four distinct species, not the one as commonly held).

The holotype and only known specimen of M. tonkinensis, in the Naturhistoriska Riksmuseet, Stockholm, is said by the de-

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Thomas, O. 1911b. The Duke Bedford’s zoological exploration of eastern


Lackedteeth Pygmy Weasel (Mustela aistoodonnivalis sp.nov.).


School of Archaeology & Anthropology, Australian National
University, Canberra, ACT 0200, Australia.

Email: Colin.Groves@anu.edu.au

Conclusions

1. Mustela russelliana is the world’s smallest weasel—indeed, it
is the smallest species of the order Carnivora.

2. M. russelliana and M. aistoodonnivalis are sister species, dif-
ferring (apparently) only in size.

3. Their closest relative is not M. nivalis but M. kathiah.

4. Geographic diversity within M. nivalis has been clarified by
Abramov & Baryshnikov (2000), but many (most?) of the subspe-
cies recognised by them may well be diagnosably distinct, hence
would rank as distinct species under a phylogenetic species con-
cept.

5. I hypothesise that Mustela tonkinensis, distributed at the south-
eastern margin of the subgenus Gale, is a primitive species, standing
close to the point of separation of the nivalis and kathiah groups.

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School of Archaeology & Anthropology, Australian National
University, Canberra, ACT 0200, Australia.

Email: Colin.Groves@anu.edu.au
Skins of *Mustela russelliana* and related taxa.

Top to bottom:

*M. tonkinensis* (holotype, NRS A.63.0148)

Four skins of *M. russelliana* (BMNH 11.2.1.86 [holotype], -84, -87, -85)

*M. mosanensis* (BM 1938.8.8.8, Chosin, north Korea).

*M. nivalis* (BM 14.5.10.68, Djarkent, Kazakhstan)

*M. nivalis* (BM 14.11.1.14, Alzamai, Yenisei, Russia)

*M. heptneri* (BM 1938.4.14.16, Qostanay, Kazakhstan)

*M. stoliczkana* (BM 75.3.30.8, Yarkand, China)

The status of *mosanensis, heptneri* and *stoliczkana* as full species or as subspecies of *M. nivalis* remains to be determined under a phylogenetic species concept.

Photos: top, Annika Felton; others, Colin Groves.