

## A New Species of *Myotis* (Chiroptera, Vespertilionidae) from Hokkaido, Japan

By

Mizuko YOSHIYUKI

Department of Zoology, National Science Museum, Tokyo

### Abstract

A new species of whiskered bat belonging to the subgenus *Selysius* is described from the forest on Petegari, Poroshiri and Rakko of the Hidaka Mountains, Hokkaido, under the name *Myotis yesoensis*. This species is sympatric with *Myotis gracilis* on these mountains. It is easily distinguished from the latter by the shorter ear, bicolored dorsal fur, and the obtuse anteorbital ridge.

There have been described six species and subspecies belonging to the subgenus *Selysius* of the genus *Myotis* from Japan. Since the specimens of the most of the forms are in poor condition, the taxonomic study of this group in Japan is far from complete, and further study has long been awaited.

Recently, I had an opportunity to examine more than one hundred specimens of this group collected by several persons from many remote parts of Japan. While studying taxonomically these fine collection, I noticed an unknown form among them, which was similar to *Myotis hosonoi* but evidently different from it and also from any other forms of the genus *Myotis*. This new form is described here.

### *Myotis yesoensis* sp. nov.

[Japanese name: Ezo-hoohigekōmori]

*Holotype*. NSMT-M14811, adult male, skin and skull, collected in a forest in the basin of the Petegari River, foot of Mt. Petegari, alt. 400 m, Hidaka, Hokkaido on 24 July 1970 by Mr. Kimio ENDO. The holotype is preserved in the National Science Museum, Tokyo.

*Measurements (in mm) of the holotype*. Forearm 35.3, head and body 46.5, tail 41.0, tail percent 88.2%, hind foot cum unguis 9.0, hind foot sine unguis 8.5, tibia 14.6, ear 12.7, tragus 6.9, third metacarpal 31.0, fourth metacarpal 29.5, fifth metacarpal 28.5, greatest length of skull with incisor 14.16, condylobasal length of skull with incisor 13.55, Zygomatic width 8.29, mastoid width 7.17, interorbital constriction 3.71, depth of braincase 5.28, breadth of braincase 6.70, mandible 10.16,  $M^3-M^3$  5.6,  $C-M^3$  5.23.

*Specimens examined*. The materials examined and their measurements are shown in Tables 1-3.



Fig. 1. Dorsal aspect of *Myotis yesoensis* sp. nov., holotype, NSMT-M 14811, ♂.

*Diagnosis.* Belongs to the *Selysius* group. Similar to *Myotis hosonoi* IMAIZUMI, 1954, but calcaneal lobe obsolete or very rudimentary, and tail much longer, tail percent 79.9%. Dorsal fur bicolored; skull without distinct anteorbital ridge; basicochlear fissure long and wide; upper molars without protoconules; second upper pre-molar ( $P^3$ ) completely in toothrow, slightly smaller than anterior upper pre-molar ( $P^2$ ).

*Description.* Mean head and body length 46.0 mm, clearly larger than that of *Myotis hosonoi* (mean 43.5 mm), mean tail length 37.5 mm, much longer than the 33.2 mm of *Myotis hosonoi*; tail percent about 79.9%. Ear comparatively short, mean length 12.7 mm; anterior border turned outward at a level clearly below center; tip comparatively wide, truncated; posterior border deeply concave at center. Tragus with anterior border slightly concave, posterior border convex at center. Mean length of tibia 14.6 mm, that of hind foot cum unguis 8.7 mm, about 63 per cent of former (Table 2).

Wing comparatively wide; third, fourth, and fifth metacarpals subequal in length; wing membrane attached to distal end of metatarsus of first toe; calcaneal lobe nearly lacking or rudimentary.

Fur very soft, silky, and glossy; hair of back and head about 5.0 mm, and of venter 3.0 mm in length; back bicolored with red-brown central portion and blackish sides; ventral surface cinnamon buff with darker sides of breast. Ear and membranes

vandyke brown; frontal surface of ear almost naked.

Skull similar to that of *Myotis hosonoi* in general aspect, but anterior naris much larger, width and length subequal, and posterior margin extending to level of center on internal border of upper canine; dorsal profile rising abruptly at anterior portion of frontals, rostral portion relatively short; anteorbital ridge obscured; lachrymal foramen exposed; posterior border of anteorbital foramen extending to level of posterior edge of second upper premolar ( $P^3$ ); palatal emargination nearly U-shaped, deeper than wide; basicochlear fissures between basioccipital and cochlea wide and long; posterior point of cochlear process of sphenoid not attached to cochlea.

Second upper premolar ( $P^3$ ) sloping anteriorly, two-thirds of first upper premolar ( $P^2$ ) in height.  $P^3$  perfectly in toothrow, clearly visible in lateral aspect; third upper premolar ( $P^4$ ) remarkably wider than upper canine in crown area, with distinct antero-internal angle; upper molars lacking protoconules; second lower premolar ( $P_3$ ) lies in line of toothrow, less than two-thirds of first lower premolar in height.

*Remarks.* This new species, *Myotis yesoensis*, is clearly sympatric with *Myotis gracilis* in the forests of Mts. Petegari, Poroshiri and Rakko of the Hidaka Mountains, Hokkaido. In size and general aspects, this species is somewhat similar to *gracilis*, but it is easily distinguished from the latter by following characters: the inner margin of the ear turns outward at a level clearly below the center, instead of higher than the center as in *gracilis*; the dorsal fur is not unicolored as in *gracilis*, which lacks blackish lateral border, but is clearly bicolored, with a bright median portion bordered by blackish brown belts.

Moreover, the ear of this species is much shorter than that of *gracilis*; the mean and standard deviation of the ear are  $12.71 \pm 0.26$  mm ( $N=11$ ) in this species and  $14.04 \pm 0.86$  mm ( $N=20$ ) in *gracilis*, and the coefficient of difference between them is 1.188, only slightly lower than the level conventionally used to divide a taxon. This means that about 88 percent of the individuals of each species can be distinguished by this character only.

In the skull profile, the braincase of this species is relatively high, with a dorsal border gradually rising from frontal to occipital region, instead of the much lower and nearly horizontal braincase of *gracilis*. In *gracilis*, there is a distinct anteorbital ridge bordering the frontal edge of the orbit, and this nearly conceals the lachrymal

Table 1. Examined materials of *Myotis yesoensis* sp. nov. from Hokkaido.

Locality index	♂	♀	Collecting site
431-433-41	1	0	Alt. 970 m, the basin of the Nukabira River, Hidaka, Hokkaido.
424-423-24	1	0	Alt. 1100 m, Mt. Petegari, Hidaka, Hokkaido.
Ditto	1	0	Alt. 600 m, Mt. Petegari, Hidaka, Hokkaido.
Ditto	1	0	Alt. 550 m, Mt. Petegari, Hidaka, Hokkaido.
Ditto	2	0	Alt. 500 m, the basin of the Petegari River, Hidaka, Hokkaido.
Ditto	3	0	Alt. 400 m, the basin of the Petegari River, Hidaka, Hokkaido.
431-422-23	1	1	Alt. 400 m, Mt. Rakko, Hidaka, Hokkaido.

Table 2. External measurements of *Myotis yesoensis* sp. nov. from Hokkaido.

Museum Number	Sex	Age	Locality	Forearm	Head and body	Tail	T %	Hind foot (cu)	Tibia	HFcu/Tibia (%)	Ear	Tragus
Type												
14811	♂	ad.	Mt. Petegari	35.3	46.5	41.0	88.2	9.0	14.6	61.6	12.7	6.9
15202	♂	subad.	Nukabira River	33.3	46.5	37.5	80.6	8.4	13.3	63.2	12.3	6.6
14806	♂	ad.	Mt. Petegari	32.8	45.7	36.5	79.9	8.5	13.7	62.0	12.5	6.5
14807	♂	ad.	Ditto	33.5	44.2	34.5	78.1	9.0	13.5	66.7	12.8	7.5
14810	♂	ad.	Ditto	33.6	44.0	36.0	81.8	9.0	13.7	65.7	13.1	7.3
14814	♂	ad.	Ditto	34.5	51.0	37.0	72.5	8.6	13.9	61.9	12.8	7.9
14815	♂	ad.	Ditto	35.0	46.1	39.0	84.6	8.7	14.5	60.0	12.5	7.0
14808	♂	subad.	Ditto	33.9	47.0	36.0	76.6	8.2	14.4	56.9	13.0	7.0
14813	♂	subad.	Ditto	33.5	51.3	39.5	77.0	9.0	14.8	60.8	12.5	7.0
14812	♂	ad.	Mt. Rakko	34.1	47.9	38.2	79.7	9.0	13.7	65.7	12.5	6.8
14959	♂	ad.	Ditto	33.6	46.0	37.0	80.4	8.5	13.3	63.9	13.1	7.0

Table 3. Cranial and dental measurements of *Myotis yesoensis* sp. nov. from Hokkaido.

Museum Number	Sex	Age	Locality	Condylbasal length of skull	Zygomatic width	Interorbital constriction	Depth of braincase	Breadth of braincase	Mandible	D. BC/B.BC (%)	M <sup>3</sup> -M <sup>3</sup>	C <sup>L</sup> -M <sup>3</sup>
Type												
14811	♂	ad.	Mt. Petegari	13.55	8.29	3.71	5.28	6.70	10.16	78.8	5.60	5.23
15202	♂	subad.	Nukabira River	12.78	7.82	3.56	4.90	6.50	9.32	75.4	5.25	4.90
14806	♂	ad.	Mt. Petegari	12.59	8.00	3.69	4.95	6.56	9.36	75.5	5.38	4.97
14807	♂	ad.	Ditto	12.92	8.33	3.66	5.22	6.58	9.75	79.3	5.26	4.93
14810	♂	ad.	Ditto	12.73	8.32	3.69	5.10	6.70	9.55	76.1	5.30	4.88
14814	♂	ad.	Ditto	12.89	8.17	3.66	5.20	6.65	9.50	78.2	5.42	4.93
14815	♂	ad.	Ditto	13.25	8.26	3.76	5.08	6.65	9.92	76.4	5.63	5.13
14808	♂	subad.	Ditto	13.06	—	3.68	4.70	6.60	9.85	71.2	5.46	5.11
14813	♂	subad.	Ditto	12.94	8.20	3.66	5.25	6.60	9.75	79.5	5.25	4.86
14812	♂	ad.	Mt. Rakko	13.48	8.43	3.58	5.05	6.56	10.08	77.0	5.35	5.10
14959	♂	ad.	Ditto	13.17	8.41	3.56	4.90	6.56	9.75	74.7	5.43	5.08

foramen which is situated deeply on the posterior surface of the ridge. In *yesoensis*, however, the anteorbital ridge is not well developed, and the lachrymal foramen is fully exposed.

This species is different from *M. ikonnikovi*, which is known in Hokkaido only from Nakano-shima in Lake Toya, by the distinctly larger dimensions of forearm,

ear, tibia, and tail. The coefficient of difference on the tail length between them is as remarkable as 2.727. This means that about 99 percent of the individuals of these two species can be distinguished with this character.

*Myotis yesoensis* seems to be closely related to *M. hosonoi* of Central Honshu, and both the head and body and the condylobasal length of skull of the former are only slightly larger than those of *hosonoi*. However, *yesoensis* is clearly different from *hosonoi* in the much longer tail, vestigial calcaneal lobe and much longer basicochlear fissure. Since there are no intermediate stages observed in the state of the basicochlear fissure, this fissure seems to be important as a distinguishing character between *yesoensis* and *hosonoi*.

Undoubtedly, this species is clearly different from *gracilis* and *fujiensis* that are both similar in many respects and constitute a distinct group by themselves, and *yesoensis* is related more closely to *ikonnikovi* and *hosonoi*. Also, there are no intermediate populations recognized among *ikonnikovi*, *gracilis* and *yesoensis*. Therefore, this form is a fully distinct species.

#### Acknowledgement

I wish to express my cordial thanks to Mr. Kimio ENDO who collected the type specimen of this new species as a member of the Hidaka research party organized by the National Science Museum, Tokyo, and also to Dr. Hansaku HATTORI, Hokkaido Institute of Public Health, and Dr. Kimiyuki TSUCHIYA, Miyazaki Medical College, for their donation of many important specimens of the subgenus *Selysius*.

#### Literature

- CORBET, G. B., 1978. The Mammals of the Palaearctic Region: a taxonomic review. 314 pp. London, Brit. Mus. (Nat. Hist.)
- ELLERMAN, J. R., & T. C. S. MORRISON-SCOTT, 1951. Checklist of Palaearctic and Indian Mammals, 1958 to 1946. 810 pp. London, Brit. Mus. (Nat. Hist.)
- HANAK, V., 1965. Zur Systematik der Bartfledermaus *Myotis mystacinus* und über das Vorkommen von *Myotis ikonnikovi* in Europa. *Věst čsl. zeměd. Mus.* **29**: 353–367.
- 1970. Notes on the distribution and systematics of *Myotis mystacinus*. *Bijdr. Dierk.* **40**: 40–44.
- HATTORI, H., 1971. Studies on the Chiroptera in Hokkaido. 1. Historical review, Chiroptera in Hokkaido. *Rep. Hokkaido Inst. Pub. Health*, (21): 68–100.
- IMAIZUMI, Y., 1954. Taxonomic studies on Japanese *Myotis* with descriptions of three new forms. *Bull. natn. Sci. Mus., Tokyo*, (34): 40–58.
- 1956. A new species of *Myotis* from Japan. *Ibid.*, (38): 42–46.
- Огнева. С. И. 1912. О коллекции млекопитающих из Уссурийского края. *Annu. Mus. Zool. Acad. St. Pétersb.*, **16**: 475–511, pls. VI–VII.
- 1927. A synopsis of the Russian bats. *J. Mamm.*, **8**: 140–157.
- TATE, G. H. H., 1941. Results of the Archbold expeditions. No. 39. A review of the genus *Myotis* (Chiroptera) of Eurasia, with special reference to species occurring in the East Indies. *Bull. Amer. Mus. nat. Hist.*, **78**: 537–565.

- YOSHIYUKI, M., 1965. On the subspecific characters of *Myotis frater kaguyae*. *J. mammal. Soc. Jap.*, **2**: 136-141.
- & K. ENDO, 1972. The bats from the Hidaka Mountains, Hokkaido. *Mem. natn. Sci. Mus., Tokyo*, (5): 123-130, pl. 1.

### Explanation of Plate 1

Skull of *Myotis yesoensis* sp. nov., holotype, NSMT-M14811, ♂, by stereophotographs ( $\times 4$ ).

- A. Dorsal aspect of cranium.
- B. Ventral aspect of cranium.
- C. Dorsal aspect of mandible.
- D. Lateral aspect of cranium.



