

A New Species of the Genus *Ptenochirus* (Chiroptera, Pteropodidae) from the Philippine Islands¹⁾

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The genus *Ptenochirus* PETERS, 1861, is a group of fruit bats endemic to the Philippine Islands. It has been considered to be monotypic, though SANBORN (1952, pp. 97–98) pointed out the great variability shown by the existing specimens. He regarded it as age difference and did not make further scrutiny.

Recently, the present author was given an opportunity to examine fifteen specimens belonging to this bat genus, which had been obtained by Dr. Hiroyuki MORIOKA, Mr. Takaharu SAKANE and Mr. Roger SISON during the Philippine expedition 1977 made by the National Science Museum, Tokyo.

After a careful morphological examination and a cluster analysis by using the method of Penrose's biological distance, it has become clear that these specimens are discriminated into two forms mainly differing in the measurements of the skull. The larger form no doubt belongs to *Ptenochirus jagori* (PETERS, 1861), while the smaller one, which seems to correspond with the "smallest skull" noted by SANBORN (1952, *op. cit.*), seems to the present author to be an independent unnamed species. It will be described in this paper under the new name of *Ptenochirus minor*.

The author wishes herewith to express her cordial thanks to Dr. Hiroyuki MORIOKA, who kindly gave her the opportunity to study on these interesting specimens.

Ptenochirus minor sp. nov.

(Figs. 1–5)

Holotype. Adult male, skin & skull; collected at Baracatan, Mt. Talomo, Davao City Prov., Mindanao Is., Philippine Islands, on 7 July 1977, by Hiroyuki MORIOKA, Takaharu SAKANE and Roger SISON; preserved in the National Museum of the Philippines, Manila.

Measurements (in mm) of the holotype. Forearm 75.5, head and body 98.0, tail 12.0, hind foot cum unguis 17.0, tibia 27.5, ear from meatus 22.5, first metacarpal 14.9, second metacarpal 33.0, third metacarpal 47.8, fourth metacarpal 43.05, fifth metacarpal 46.35, carcar 8.0, greatest length of skull 34.05, canine-condyle length 32.3, zygomatic breadth 21.45, interorbital constriction 6.42, width across canines

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Table 1. External, cranial and dental measurements (in mm) of *Ptenochirus minor*.

	Coll. no. 14	Coll. no. 15	NSMT-M 20236	NSMT-M 20238	NSMT-M 20241	NSMT-M 20240
Sex	Female	Male	Male	Male	Female	Female
Loc.	Mt. Apo	Mt. Apo	Mt.Talomo	Mt.Talomo	Mt.Talomo	Palawan
Forearm			73.82	77.00	70.15	68.10
Head and body	98.00	101.00	100.00	97.00	86.00	89.00
Tail	15.00	15.00	10.00	9.00	9.00	10.00
Hind foot (cu)	19.00	17.00	18.00	19.00	17.00	17.50
Tibia			28.00	31.00	26.00	29.00
Ear	20.00	22.00	19.50	20.00	19.50	19.00
Greatest length of skull	33.65	33.75	33.05	34.40	31.70	29.90
Canine-condyle length	31.70	31.50	31.40	32.70	29.70	27.70
Zygomatic width	20.65	20.40	20.30	20.85	19.30	18.40
Interorbital constriction	6.40	6.20	6.15	6.60	5.93	5.80
C-C	6.75	6.65	6.90	7.45	6.55	6.40
M1-M1	9.60	9.67	9.50	10.42	9.42	9.75
C-M1	11.25	11.20	11.65	12.20	10.42	9.50
c-m2	12.50	12.35	12.70	13.00	11.40	10.50
Mandible	23.95	24.05	23.55	25.15	23.00	20.41

(C-C) 7.10, width across molars (M1-M1) 10.52, upper cheek teeth (C-M1) 12.26, mandible 24.5, lower cheek teeth (c-m2) 13.26.

Description. Nostrils tubular, more strongly diverging at the tips than in *P. jagori*. Eye large; ear relatively short, shorter than in *P. jagori*, rounded at the tip and without white margin, the anterior border being convex, posterior border slightly concave in upper half but gently convex in proximal half.



Fig. 1. *Ptenochirus minor* sp. nov., holotype ♂; dorsal aspect.

Fur dense and velvety, the hairs being about 13 mm in length at the middle of back, covering proximal third of forearm on the dorsal surface and extending far beyond the line from elbow to knee on the ventral surface of lateral wing membrane. Interfemoral membrane densely covered with wavy hairs on the dorsal surface, and thinly haired on the ventral. Antebrachial membrane almost naked on the dorsal surface, but thinly covered with short hairs on the ventral. Third and fifth metacarpals subequal, both reaching the base of nail of second finger.

Colour:— Males generally darker than females, clove brown on the dorsal surface of body, becoming dark brown on head, buffy brown on neck and avellaneous on loin and interfemoral membrane; ventral surface light drab, with mingling light

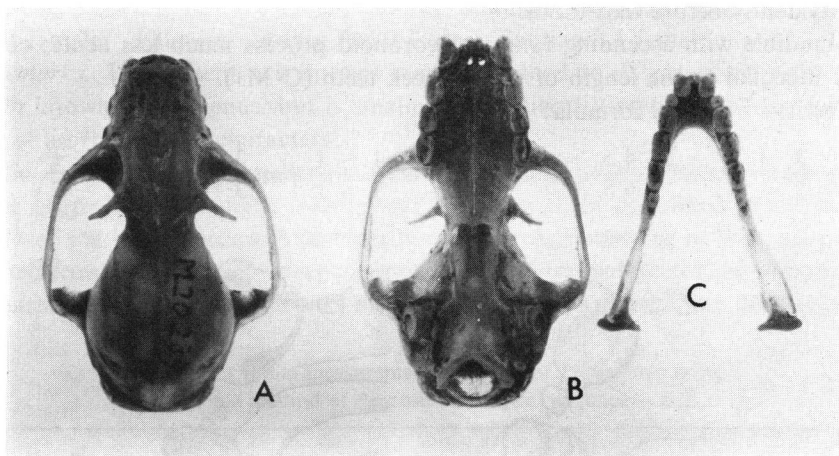


Fig. 2. *Ptenochirus minor* sp. nov., holotype ♂. — A. Skull, dorsal aspect. B. Same, ventral aspect. C. Lower jaw, ventral aspect.

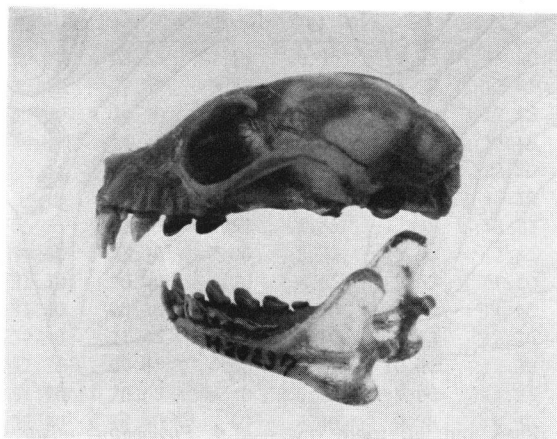


Fig. 3. Skull of *Ptenochirus minor* sp. nov., holotype, ♂; lateral aspect.

grayish hairs. Sides of neck orange rufous in males, but ochreous buff in females.

Skull:— Generally similar to that of *P. jagori*, but the sagittal and lambdoid crests are weakly developed, the braincase is about two-thirds as wide as the zygomatic width and rather low at middle, the facial portion is comparatively long, and the postorbital process is well developed though slender. Interorbital region abruptly convex above low rostrum in profile. Palate with nine thick anterior and three thin posterior ridges; palatal region behind the level of last molar rather narrow, widest at its anterior portion and narrowest at the posterior end. Auditory bullae relatively large. Palatine rather long, the length from the posterior corner of last molar (M1) to the posterior extremity being longer than that in *P. jagori*. Posterior ends of palatine foramina being at the level of the posterior end of last upper molar (M1), instead of being evidently before that tooth.

Mandible with ascending ramus of coronoid process much less acute; coronoid height subequal to the length of upper cheek teeth (C-M1).

Teeth:— Dental formula:

$$\frac{-2 \quad 3. \quad 1. \quad - \quad 2 \quad 3 \quad 4 \quad 5 \quad - \quad -}{-2 \quad - \quad 1. \quad - \quad 2 \quad 3 \quad 4 \quad 5 \quad 6 \quad -} \quad i \quad \frac{2 \quad - \quad 2}{1 \quad - \quad 1} \quad c \quad \frac{1 \quad - \quad 1}{1 \quad - \quad 1} \quad pm \quad \frac{3 \quad - \quad 3}{3 \quad - \quad 3} \quad m \quad \frac{1 \quad - \quad 1}{2 \quad - \quad 2} = 28$$

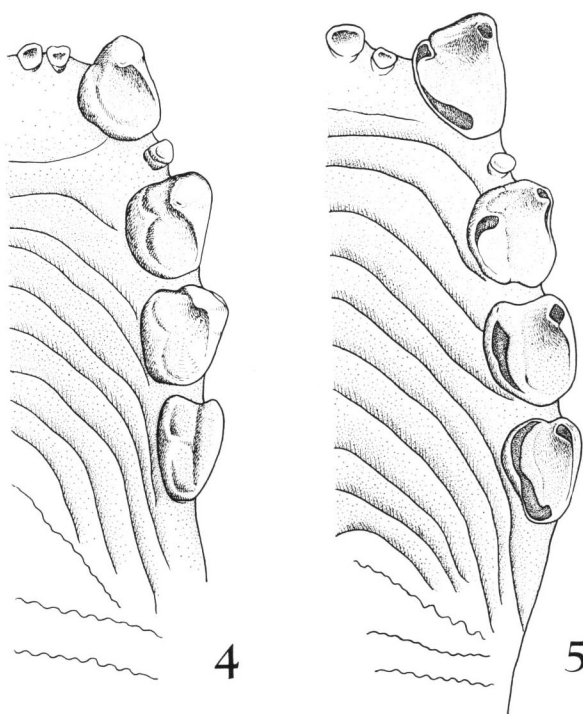


Fig. 4-5. Palatal ridges and left tooth row. — 4. *Ptenochirus minor* sp. nov., from Mt. Talomo, Mindanao. — 5. *P. jagori* (PETERS), from the same locality.

Inner upper incisor somewhat spatulate, with broad rounded summit; outer upper incisor much smaller than the inner, less than half as large as the latter both in height and bulk. Lower incisors crowded between lower canines, with the cutting edge incised at middle. Lower canine about two-thirds as large as the upper. Anterior upper premolar (PM 2) minute, distinctly external to the centre line of toothrow. Second and third upper premolar (PM 3, 4) subequal, distinctly larger than upper molar (M 1). First lower premolar (pm 2) clearly in toothrow, small, less than half in size of second lower premolar (pm 3), which is subequal to the third (pm 4) in the crown area. First lower molar (m 1) somewhat smaller than third lower premolar (pm 4); second lower molar (m 2) less than half the first in crown area.

Specimens examined. Total 7. Mindanao: Baracatan, Mt. Talomo, alt. 1,500 m, Davao City Prov., 3 males, 1 female; Golog, southern side, Mt. Apo, alt. 1,500 m, 1 male, 1 female. Palawan: Iwahig Penal Colony Santiago, 1 female.

Remarks. The present new species is closely allied to *P. jagori*, only the species hitherto known in the genus, but is smaller and easily distinguished by the following points of morphological characters:

The skull is evidently smaller than that of *P. jagori* in the greatest length, canine-condyle length and zygomatic width; their values are not contained in the range of $M \pm SD$ of the latter species. The nostrils more strongly diverge at the tips and are separated from each other by deeper groove. The ventral surface of the proximal part of forearm and the dorsal surface of interfemoral membrane are more densely covered

Table 2. Cranial measurements (in mm) of *Ptenochirus* using the method of Penrose's biological distance.

No. & Sex	Greatest length of skull	Canine-condyle length	Zygomatic width	Interorbital constriction	C-C	M1-M1	C-M1	c-m2	Mandible
1 ♂	37.90	35.22	23.35	7.15	8.35	11.45	13.90	14.55	27.70
2 ♀	37.10	35.10	22.80	7.50	7.60	11.20	12.45	13.34	27.00
3 ♂	37.45	35.20	24.90	6.86	8.12	11.40	12.85	14.10	27.26
4 ♂	36.92	34.92	24.20	7.50	8.07	11.26	13.15	14.25	26.80
5 ♂	38.50	36.05	24.05	7.05	8.25	11.60	12.80	14.20	27.60
6 ♂	36.40	34.10	24.50	7.55	8.20	11.60	12.50	14.18	26.32
7 ♂	37.90	35.25	25.35	7.57	8.65	12.35	13.22	14.45	27.26
8 ♂	38.80	36.60	25.30	7.00	8.30	11.80	12.85	14.45	27.45
9 ♂	33.75	31.50	20.40	6.20	6.65	9.67	11.20	12.35	24.05
10 ♂	33.05	31.40	20.30	6.15	6.90	9.50	11.65	12.70	23.55
11 ♂	34.05	32.30	21.45	6.42	7.10	10.52	12.26	13.26	24.50
12 ♂	34.40	32.70	20.85	6.60	7.45	10.42	12.20	13.00	25.15
13 ♀	33.65	31.70	20.65	6.40	6.75	9.60	11.25	12.50	23.95
14 ♀	29.90	27.70	18.40	5.80	6.40	9.75	9.50	10.50	20.41
15 ♀	31.70	29.70	19.30	5.93	6.55	9.42	10.42	11.40	23.00

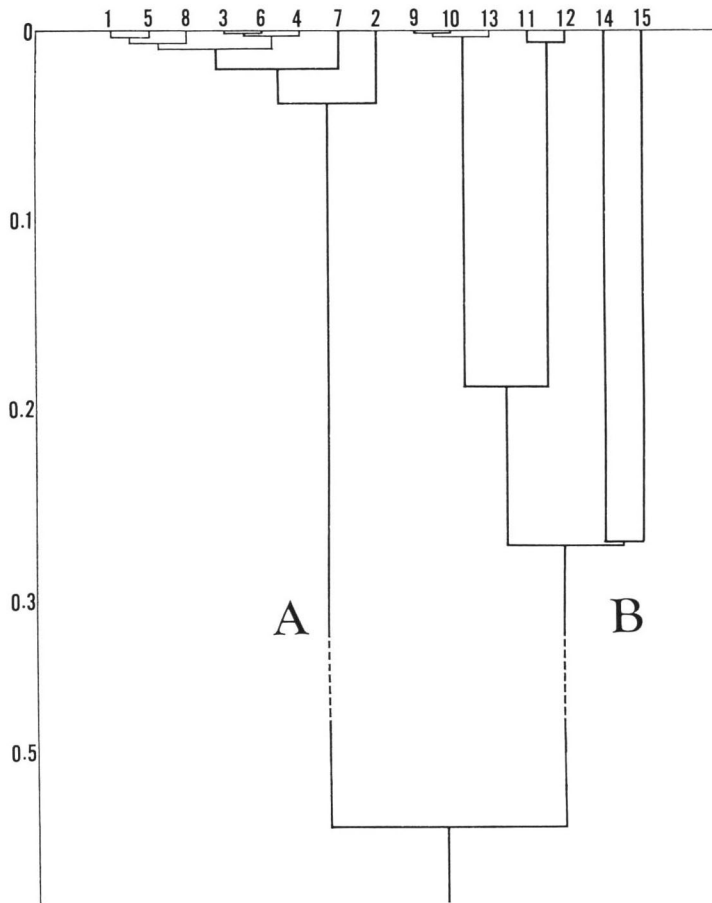


Fig. 6. Dendrogram based upon hierarchical cluster analysis by Penrose's size distance; Group A includes all the specimens examined of *Ptenochirus jagori*, Group B includes those of *Ptenochirus minor*. Numerals on the horizontal axis indicate specimen numbers; those on the vertical axis are size distances between specimens.

with hairs. The body is much darker in colour on both the dorsal and ventral surfaces. The sagittal and lambdoid crests are weakly developed even in fully mature stages. The palatine is larger, and the palate bears nine thick anterior ridges instead of ten. The coronoid is about as high as the length of the upper cheek teeth (C-M1), having the ascending ramus of the process much less acute, while in *P. jagori*, the coronoid height is evidently larger than the length of the upper cheek teeth.

To verify the specific independency of *P. minor*, an examination was made based on the hierarchical cluster analysis by Penrose's size distance. The material used for this analysis were fifteen adult and subadult specimens, eleven males and four females, of *Ptenochirus* bats from Mindanao and Palawan. Size distances between these speci-

mens were estimated by combining the following nine cranial measurements: greatest length of skull, canine-condyle length, zygomatic width, interorbital constriction, canine width (C-C), width across molars (M1-M1), length from upper canine to first upper molar (C-M1), length from lower canine to second lower molar (c-m2), length of mandible.

The result obtained is shown as a dendrogram drawn by the nearest neighbour method (Fig. 6). As is clearly seen, the specimens are separated into two distinctive groups, A and B. Eight adult specimens from nos. 1-8 constitute the group A, the bats of which are larger in dimension and are identified with *Ptenochirus jagori*. The remaining seven, nos. 9-15, fall in the group B, being evidently smaller in certain dimensions. All of these belong to *Ptenochirus minor*, whose validity is thus confirmed beyond all reasonable doubt.

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