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## NOTES ON THE NAKED-TAILED ARMADILLOS.\*

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The following notes on the naked-tailed armadillos are the result of an attempt to name some specimens belonging to the United States National Museum, the Academy of Natural Sciences of Philadelphia, the American Museum of Natural History, and Mr. Outram Bangs. The subject naturally divides itself into four sections: 1, History of the generic and subgeneric names; 2, The genus *Tatoua* and its subgenera; 3, The naked-tailed armadillo of Central America, and 4, Comparison of three small species of *Tatoua*.

## 1. HISTORY OF THE GENERIC AND SUBGENERIC NAMES.

Wagler, in 1830, was the first author to recognize the naked-tailed armadillos as a distinct genus. He called the group *Xenurus*, unaware that, four years earlier, this name had been used by Boie in Ornithology. The large species then recently described as *Dasypus gymnurus* by Wied, but previously named *Dasypus uncinatus* by Linnæus, served as the type of his new genus.

Gray, in 1865 and 1869, divided Wagler's genus into two subgenera, the first containing the large species known to Wagler, the second the small *Dasypus hispidus* described by Burmeister in 1854. To the second, which he expressly states that he had never seen, he transferred the name *Xenurus* in a restricted sense, while to the first he applied a new name, *Tatoua*. *Tatoua*, thus exactly equivalent to Wagler's *Xenurus*, is therefore the first tenable generic name for the naked-tailed armadillos.

In 1873 Gray again applied the name *Xenurus* to the large species, mak-

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ing no reference to his previous subdivisions, and describing the small *hispidus* as a new species, '*X. latirostris*.' Another small armadillo, which he regarded as the representative of a new genus, he described under the name *Ziphila lugubris*.

Not until 1891 was the fact recognized that the name *Xenurus* is untenable for a mammal. Then Ameghino pointed out the long-standing error, but overlooking Gray's *Tatoua*, proposed as a substitute for *Xenurus* the new name *Lysiurus*.

In this course Ameghino has recently been followed by Trouessart, who refers the naked-tailed armadillos as a whole to *Lysiurus*, and places under it as a subgenus Gray's *Ziphila*, notwithstanding that the latter was named eighteen years earlier.

The little known *Ziphila lugubris* has been a source of continual uncertainty, though since Gray, most writers, Trouessart excepted, have agreed in regarding it as very doubtfully distinct from '*Xenurus*' *hispidus*, an animal much better represented in collections. It is, however, in no way closely related to *Tatoua hispida*, but a distinct species, the representative of a well-marked subgenus, for which, of course, the name *Ziphila* is available.

## 2. THE GENUS TATOUA AND ITS SUBGENERA.

### Genus TATOUA Gray.

1830. *Xenurus* Wagler, Natürl. Syst. der Amphibien, mit vorang. Classif. der Säugeth. und Vögel, p. 36. Type *Dasyppus gymnurus* Wied = *D. uncinatus* Linnæus. (Not *Xenurus* Boie, 1826.)
1865. *Xenurus* Gray, Proc. Zool. Soc. London, p. 377.
1865. *Tatoua* Gray, Proc. Zool. Soc. London, p. 378.
1869. *Xenurus* Gray, Catal. Carnivorous, Pachydermatous and Edentate Mammalia in the British Museum, p. 383.
1869. *Tatoua* Gray, Catal. Carnivorous, Pachydermatous and Edentate Mammalia in the British Museum, p. 384. Type *Dasyppus uncinatus* Linnæus.
1873. *Xenurus* Gray, Hand-List of the Edentate, Thick-Skinned and Ruminant Mammals in the British Museum, p. 21.
1891. *Lysiurus* Ameghino, Revista Argentina de Hist. Natural, I, p. 254. Type *Dasyppus uncinatus* Linnæus.
1898. *Lysiurus* Trouessart, Catal. Mamm. tam vivent. quam foss., p. 1146.

*Type species*.—*Tatoua uncinata* (Linnæus).

*Characters*.—Teeth  $\frac{8-8}{8-8} = 32$  to  $\frac{9-9}{9-9} = 36$ , subcylindrical in form, the last about opposite middle of zygomatic arch and some distance in advance of posterior border of palate; tail long, covered with minute, thin widely spaced plates; claws on front feet very greatly developed.

## Subgenus TATOUA Gray.

1865. *Tatoua* Gray, Proc. Zool. Soc. London, p. 378.  
 1869. *Tatoua* Gray, Catal. Carnivorous, Pachydermatous and Edentate Mammalia in the British Museum, p. 384.  
 1873. *Xenurus* Gray, Hand-List of the Edentate, Thick-Skinned and Ruminant Mammals in the British Museum, p. 21.  
 1898. *Lysiurus* Trouessart, Catal. Mamm. tam vivent. quam foss., p. 1146.

*Type species*.—*Tatoua uncineta* (Linnæus).

*Subgeneric characters*.—Crown armor consisting of 50 to 60 small, roundish, irregularly arranged plates; ears rounded, funnel-formed, densely coated with minute scales on outer side; cheeks covered with thin plates arranged in distinct rows.

## Subgenus ZIPHILA Gray.

1873. *Ziphila* Gray, Hand-List of the Edentate, Thick-Skinned and Ruminant Mammals in the British Museum, p. 22. Type *Z. lugubris* Gray.  
 1898. *Ziphila* Trouessart, Catal. Mamm. tam vivent. quam foss., p. 1148.

*Type species*.—*Tatoua lugubris* (Gray).

*Subgeneric characters*.—Crown armor consisting of 30 to 40 symmetrically arranged, mostly pentagonal or hexagonal plates; ears pointed, not funnel-formed, the outer side bare except along margin; cheeks with a few widely spaced, irregularly scattered scales.

## 3. THE NAKED-TAILED ARMADILLO OF CENTRAL AMERICA.

Dr. A. von Frantzius published the first record of the occurrence of a naked-tailed armadillo in Central America in 1869. He was uncertain as to the identification of the animal—the ‘armadillo de zopilote’ of the Costa Ricans, so called on account of the disagreeable buzzard-like odor of its flesh—as he saw only a living individual and a skull. Both, however, indicated an animal smaller than the *Dasyurus gymmurus* of Illiger (= *D. uncinatus* Linnæus), to which he with hesitation referred the species. Doubt was cast on this record by Alston in 1880, who found no naked-tailed armadillos among the collections that served for the elaboration of the mammals of the Biologia Centrali-Americana.

In 1895 Mr. Frederick W. True recorded a small *Tatoua* from Chameli-con, Honduras, the first positively known to have been taken in Central America. In the absence of material for comparison, he regarded the animal as “presumably the *X[enurus] hispidus* of Burmeister.”

Two years later Mr. A. Alfaro and Dr. J. A. Allen confirmed Dr. von Frantzius’ Costa Rican observations by recording the capture of a specimen at Suerre, Costa Rica. This animal is referred to ‘*Xenurus gymmurus*’ (= *Tatoua uncineta*) without comments on the doubts expressed by Dr. von Frantzius, or on Mr. True’s identification of the Honduras specimen.

So far as I know, this completes the published history of the naked-tailed armadillo in Central America. I may add, however, that Mr. José C. Zeledon has recently informed me that the armadillo de zopilote is well known in Costa Rica, where the worthlessness of its flesh for food is everywhere recognized.

I have recently compared the two Central American specimens with one from Santa Marta, Colombia, and two from Matto Grosso, Brazil. The latter prove to be representatives of the subgenus *Tatoua*, while all of the others are referable to *Ziphila*. The Costa Rican and Honduras specimens are precisely alike in all important characters, but they differ in many details from the Colombian animal, which in all probability is the same as Gray's *Ziphila lugubris*. While the fact that Gray's type came from Brazil throws some doubt on this determination of the specimen from Colombia, it does not lessen the probability that the Central American *Ziphila* is distinct from the one hitherto described. The Central American animal may stand as:

*Tatoua (Ziphila) centralis* sp. nov.



FIG. 1.—Head from side: upper figure, *Tatoua (Tatoua) hispida*; lower figure, *T. (Ziphila) centralis* (type).  $\frac{2}{8}$  nat. size.

1869. *Dasyopus gymnurus* Frantzius, Wiegmann's Archiv für Naturgeschichte, XXXV, Bd. I, p. 309 (not *Dasyopus gymnurus* Illiger, 1815).

1895. *Xenurus hispidus* True, Proc. U. S. National Museum, XVIII, p. 435 (not *Dasyopus hispidus* Burmeister, 1854).

1897. *Xenurus gymnurus* Alfaro, Mammíferos de Costa Rica, p. 46.

1897. *Xenurus gymnurus* Allen, Bull. Am. Mus. Nat. Hist., IX, p. 43.

*Type*, adult ♀ (skin and skull), No. 12464, United States National Museum, collected at Chamelicon, Honduras, January 8, 1891, by Erich Wittkugel.

*General characters*.—Smaller than *Tatoua (Ziphila) lugubris* (Gray); cheeks with fewer scales; plates in central rings of carapace more numerous (29–31, instead of 27); occipital region of skull much less elevated; zygomata when viewed from above nearly parallel with each other and with main axis of skull; hamular processes of pterygoids neither thickened nor bent inward at tips.

## 4. COMPARISON OF THREE SMALL SPECIES OF TATOUA.

**Tatoua (Tatoua) hispida** (Burmeister).

1854. *Dasypus hispidus* Burmeister, Syst. Uebers. der Thiere Brasiliens, 1st Theil (Mammalia), p. 287 (Lagoa Santa, Brazil).

1873. *Xenurus latirostris* Gray, Hand-List of the Edentate, Thick-Skinned, and Ruminant Animals in the British Museum, p. 22 (St. Catharines, Brazil).

Crown shields about 55 (50-60), very irregular both in form and arrangement, their sides and angles rounded, none regularly pentagonal or hexagonal, those at front of shield gradually diminishing in size and distinctness. Cheeks covered with thin scales, closely set in distinct rows. Ears rounded above, the lower lobe greatly developed, the resulting form of the conch roughly funnel-shaped, with a distinct notch in the periphery in front below, and another behind above. A long, low ridge on inner side of conch above and in front of meatus. Internal surface of ear naked. External surface densely coated with roundish scales about 1 mm. in diameter.

Rough periphery of plates of body armature very conspicuous, the smoother central portion generally irregular and much pitted. Scapular shield consisting of seven or eight rows, the longest of which contains about 28 plates. On neck in front of scapular shield are three rows (the longest containing about 8 plates) of rectangular, closely appressed plates, the anterior rows regularly imbricating over the posterior. Dorsal rings 9, the longest containing 25 plates. Pelvic shield containing 9 rows, the longest with about 25 plates; the

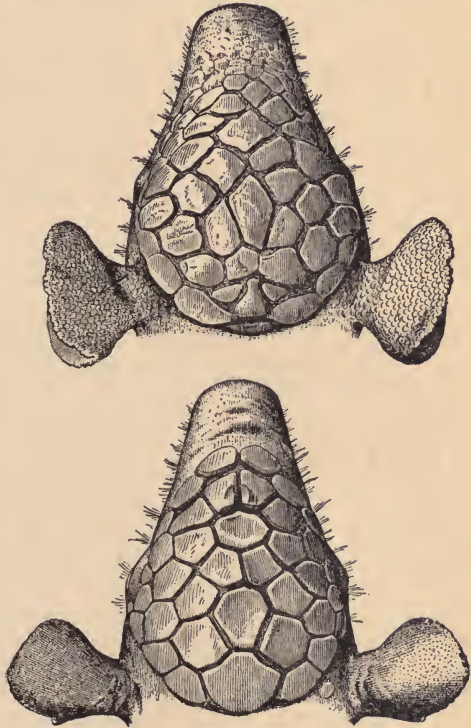


FIG. 2.—Head from above: upper figure, *Tatoua (Tatoua) hispida*; lower figure, *T. (Ziphila) centralis* (type).  $\frac{2}{3}$  nat. size.

and much pitted. Scapular shield consisting of seven or eight rows, the longest of which contains about 28 plates. On neck in front of scapular shield are three rows (the longest containing about 8 plates) of rectangular, closely appressed plates, the anterior rows regularly imbricating over the posterior. Dorsal rings 9, the longest containing 25 plates. Pelvic shield containing 9 rows, the longest with about 25 plates; the

furrows between the plates wide and irregular. The majority of the plates of the dorsal armature are provided with from one to four conspicuous, grayish, bristle-like hairs, which spring from the posterior borders and mostly from the corners of the plates; when from the posterior edge, away from the corners, each hair stands in a distinct excavation or scallop. These bristles are most conspicuous on the sides of the body, where they are often 15 mm. in length.

Tail about one-half as long as body armature, the scales arranged in about 10 rows; longest scales (near base of tail) oval, about 4 mm. long and half as broad; most of the scales on dorsal surface of tail with 1-3 short bristles springing from posterior edge.

Skin of belly with transverse rows of well-developed scales, the rows about 7 mm. apart; each scale with a tuft of 4-6 appressed bristles springing from its posterior edge, the scales themselves averaging about 2 mm. by 3 mm. in size. Outer side of feet and legs covered with large scales (the largest 7 mm. by 9 mm.), from the posterior edges of which spring conspicuous tufts of bristles.

Skull triangular in profile, the facial line little broken by supraorbital swellings or postorbital depression. Zygomata greatly expanded and thickened at middle.

#### **Tatoua (*Ziphila*) lugubris (Gray).**

1873. *Ziphila lugubris* Gray, Hand-List of the Edentate, Thick-Skinned, and Ruminant Mammals in the British Museum, p. 23 (St. Catharines, Brazil).

Crown shields about 33 (30-35), regular in form and bilaterally symmetrical in arrangement, their angles distinct and sides (usually 5 or 6) straight, those at front of shield large and equal to the others in definiteness of form. Each cheek with about 20 small, irregularly scattered scales. Ears pointed above, the lower lobe very slightly developed, the resulting form of conch not at all funnel-shaped. A short high ridge on inner side of conch above and in front of meatus. Internal surface of ear naked. External surface of ear naked except for a row of scales, each about 1 mm. in diameter, along entire external border of conch, and a secondary row 7 mm. in length extending downward from slightly developed notch between upper and lower lobes.

Rough periphery of plates of body armature inconspicuous, the smooth central portion generally flat and polished. Scapular shield consisting of 7 or 8 rows, the longest of which contains about 28 plates. On neck in front of scapular shield are two or three rows (the longest containing about 8 plates) of irregularly lenticular, widely spaced plates, the rows not imbricating. Dorsal rings 10, the longest consisting of 26-27 plates. Pelvic shield containing 10 rows, the longest with about 25 plates; the furrows between the plates narrow and regular in outline. The majority of the plates of the dorsal armature are provided with one or two small, very inconspicuous bristles growing from the extremities of the posterior

borders. These bristles, the longest of which are less than 10 mm. in length, are more readily detected by touch than by sight.

Tail considerably more than half as long as body armature, the scales arranged in about 14 rows; longest scales (near base of tail) roundish, about 3 mm. in diameter; most of the scales on dorsal surface, with one (never more) bristle springing from posterior edge.

Skin of belly with transverse rows of poorly developed scales, the rows about 7 mm. apart; each scale with a tuft of 3-5 appressed bristles; the largest of the scales slightly smaller and less definite in form than those of *T. hispida*; the smaller reduced to mere elevations in the skin, surmounted by the tuft of bristles. Outer side of feet and legs covered with scales, the largest of which are not more than 5 mm. by 7 mm. in diameter.

Skull triangular in profile, the facial line distinctly broken by the prominent supraorbital swellings. Rostrum noticeably more slender than in *T. hispida*; zygomata much more lightly built than in *T. hispida*, bent outward so as form almost an angle at middle. Palate behind tooth row narrower than in *T. hispida* and abruptly raised to a slightly higher plane. Hamulars thickened and strongly bent inward at tips.

#### **Tatoua (*Ziphila*) *centralis* Miller.**

1899. *Tatoua (Ziphila) centralis* Miller, Proc. Biol. Soc. Washington, XIII, p. 4.

Crown shields about 38 (37-39), otherwise as in *T. lugubris*. Each cheek with less than a dozen small, irregularly scattered scales. Ears as in *T. lugubris*, except that scales along border of conch are less conspicuous and secondary row on back of ear is lacking.

General character of plates of body armature as in *Z. lugubris*. Scapular shield consisting of seven or eight rows, the longest of which contains about 28 plates. Neck shields as in *T. lugubris*. Dorsal rings 10, the longest containing 29-31 plates. Pelvic shield as in *T. lugubris*. Bristles, tail, and scales on belly and legs as in *T. lugubris*.

Skull slightly larger than in *T. lugubris*; rostrum distinctly longer. Hamulars neither thickened nor bent inward at tip. Zygomata much less strongly bent outward than in *T. lugubris*, so that, when viewed from above, they are nearly parallel.

## Cranial Measurements of Three Species of Tatoua.

	<i>T. hispida</i> ,* Brazil.	<i>T. hispida</i> ,* Brazil.	<i>T. lugubris</i> ,† Colombia.	<i>T. centralis</i> ,‡ Honduras.	<i>T. centralis</i> ,§ Costa Rica.
Greatest length.....	83	75	73	80	78
Basal length.....	75	69	67	73	72
Basilar length.....	68	62	61	65	64
Occipital depth.....	29	26	27	29	28
Depth of rostrum at tip of premaxil- laries.....	11.6	11	9	9.4	9.4
Mastoid breadth.....	36	36	35	38	37
Zygomatic breadth.....	46	42	38.6	41	39
Interorbital constriction.....	27	25	24.4	24	26
Rostral constriction.....	19	17	16.4	17	18
Length of nasals.....	29	.....	23	27	28
Palatal length.....	47	44	44	47	47
Mandible.....	30	26	28	28.4	29
Upper tooth row.....	63	58	58	62	60
Lower tooth row.....	27.4	24	24	25	26.4

\* Academy of Natural Sciences, Philadelphia.

† Bangs collection.

‡ Type, U. S. National Museum.

§ American Museum of Natural History.