

Article XXXIII. — THE TAMANDUA ANTEATERS.

By J. A. ALLEN.

The Tamanduas have a wide geographical distribution, extending throughout the warmer parts of America, from Paraguay to southern Mexico. They likewise vary greatly in size and coloration, but as a rule have all been referred, up to about 1889, to a single species, the *Myrmecophaga tetradactyla* of Linnæus, the *Tamandua tetradactyla* of recent authors, with the exception of the so-called Long-tailed Tamandua (*Tamandua longicaudata* Wagner), which differs markedly from the others in coloration and in the structure of the nasals, but not in the length of the tail, as the name erroneously implies. It is nearly uniform straw-color, thus lacking the peculiar pattern of coloration which characterizes the *T. tetradactyla* group, and stands sufficiently by itself (see this Bulletin, XX, 1904, p. 339) to be omitted from the present consideration.

A few other names may be assigned at once as synonyms of *tetradactyla*. These are: (1) *Myrmecophaga nigra* Desm. (ex Geoffroy MS.) Nouv. Dict. d'Hist. Nat., nouv. éd., XII, 1817), wholly black and probably a melanism; (2) *Myrmecophaga bivittata* Desm. (ex Geoffroy MS., l. c.), adopted by J. E. Gray in 1865 in place of *tetradactyla*.

In 1873, Gray (Hand-List of Edentate, Thick-skinned, and Ruminant Mammals, 1873, p. 27) gave names to two "varieties" of his *Tamandua bivittata* — "Var. 1. *Opisthomelas*," with the hinder part of the back black; and "Var. 3. *Opistholeuca*," with the hinder part of the back white. The first is from "Brazils," the other from Guatemala, Costa Rica, Ecuador, Brazils, etc. Both appear to have been ignored by subsequent writers. In 1899, Cope (Amer. Nat., XXIII, Feb., 1889, p. 132) based the name *Myrmecophaga straminea* on a single skin, the label of which had been lost, but which came either from the west central part of Rio Grande do Sul or Chapada, Matto Grosso, Brazil, — regions quite remote and zoologically quite different. In the same paper he

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founded the name *Myrmecophaga sellata* on a skin brought from Honduras to the World's Exposition at New Orleans. As will be shown later, neither of these names is at present entitled to serious consideration.

A series of nearly 60 specimens from the Santa Marta district of Colombia (nearly all taken at Bonda) affords ample material for the study of individual variation, not only in coloration but in size and cranial characters. The results of an examination of this material will be first recounted, and afterwards material from other localities will be considered.

An average Santa Marta specimen of the *T. tetradactyla* group is dark brown and yellowish white, the two colors generally arranged in sharply defined areas. A dark band (sometimes quite distinct) encloses the eye and extends forward to the side of the nose. A second very large dark area completely encircles the body, covering the ventral surface from the posterior border of the pectoral region to the base of the tail, the sides of the body, and the back from the shoulders to the lumbar region. It is usually divided for some distance down the middle of the back by a line of yellowish white extending from the shoulders posteriorly. From the dark area of the back a broad band of the same color runs forward and downward over the shoulders to the front border of the axillæ. The light-colored parts form two distinct areas wholly separated by the black of the body. The first covers the head and neck all around, the top of the shoulders, from which a V-shaped line extends down the middle of the back, and the whole of the fore limbs. The second light area includes the haired portion of the tail and the hind limbs, except the inside of the thighs, and extends forward more or less upon the rump and lower back.

This general type is endlessly modified, in specimens from the Santa Marta district, through individual variation, it being exceptional to find two specimens closely similar. These modifications affect the pattern of markings as well as the general tone of the coloration. The following are some of the principal variations.

VARIATION IN PATTERN. — *The Dark Areas.* — (1) The dusky eye-stripe is generally not strongly differentiated from the surrounding parts; it varies from a narrow dusky line, barely enclosing the eyes posteriorly, to a much broader indistinct band extending back to the base of the ears.

(2) The band encircling the body varies in antero-posterior extent, usually reaching, on the dorsal surface, from the posterior part of the shoulders to a little beyond the hips, and on the ventral surface from the posterior part of the pectoral region to the base of the tail, and over the proximal half of the inner surface of the hind limbs. Its posterior extension varies between wide limits, it sometimes only reaching to the line of the hips, and again extending to, and even somewhat upon, the base of the tail. These extremes cover, respectively, Gray's "*var. opisthomelas*" and "*var. opistholeuca*." Anteriorly, if we include the shoulder bands, the variation is much greater. These may be very narrow or very broad, ranging in width from 10 to 40 mm. at their narrowest point. They usually are wider anteriorly than at the middle, but sometimes gradually diminish in width as they proceed forward, thus tapering anteriorly instead of widening to twice their mid-diameter.

*The Light Areas.* — The light areas of course vary conversely with the extent of the dark areas. But a special variation consists in the extent of the light median dorsal line. This, in a few specimens, is entirely absent; in a few others it extends the whole length of the back, completely dividing the dorsal black area into halves. Usually it is a broad, symmetrically wedge-shaped mark, extending back from the nape to enclose the hair-whorl at the withers, and then, abruptly narrowing to a width of about 15 mm., continues posteriorly, with constantly diminishing breadth, to the point of disappearance. It varies in width, when present, from a sharply defined conspicuous band to obsolescence, when it is merely indicated by an irregular line of scattered whitish hairs. In several specimens there is not only no trace of a median dorsal light line, but the whole of the interscapular area and nape are dusky, only a little less dark

than the shoulder bands, which are thus internally obscurely defined.

VARIATION IN COLOR. — The light and dark areas not only vary in extent and form, as above described, but in color. The dark areas vary in tone from light reddish brown, or brownish rufous, to clear black, the average condition being dark brown. The posterior border of the dark area on the back is sometimes sharply defined, and sometimes shades off gradually into the light color of the rump. This is due to the hairs being dark basally at the edge of the white area and light apically, and the transition is either abrupt or gradual, according to the extent of the junctional area covered by light-tipped hairs. Also there are not infrequently light-tipped hairs on the back and sides of the body within the dark area, giving a superficial yellowish-gray wash to the surface, as is commonly the case in one-fourth- to half-grown young.

The light areas vary from nearly clear white (several specimens) to deep rusty yellow. The nuchal region is generally much deeper colored than the limbs and tail. In an average specimen the light parts are yellowish white or pale buffy, shading to ochraceous buff, or even ochraceous on the nuchal region.

SKULLS. — The skulls are found to be remarkably constant in their characters. A series of 24 adult skulls selected at random for study shows that the skull varies very little individually, or with age. It is smooth or wholly without crests or ridges, even in old age. A young adult skull is distinguishable from a very old skull only by the comparative obsolescence of the sutures and the denser structure of the bone in the latter. The variation in size is not great, as is shown by the subjoined table of measurements (p. 397), which includes measurements of young adult, middle-aged, and old skulls. One specimen (No. 23423) is noticeably different from the others in being unusually short and broad, with an unusual convexity of the interorbital region. Another (No. 14675) differs in the rostral portion of the skull being unusually narrow and deep. The nasals vary in depth and

outline, especially in the outline of the posterior border, which is usually convex posteriorly, but may be square, or even slightly emarginate. They are usually slightly narrower near the middle than at the front border, and expand abruptly at their extreme postero-lateral border, varying from this general form only slightly in different individuals. The constancy of the skull characters is thus in strong contrast with the extreme variability of the coloration.

Having passed in review the large Santa Marta series we may take up the scanty material available for examination from other localities, namely, Chapada, Brazil (6 skulls and 1 skin), Chiriqui, Panama (4 skulls and 4 skins), and Passa Nueva, State of Vera Cruz, Mexico (5 skulls and 6 skins), and single specimens from elsewhere,

(1) The Chapada series of skulls stands apart from all the others in (a) the relative shortness of the nasals, due mainly to the great anterior extension of the frontals, which thus gives a short rostrum; and (b) in the greater posterior extension of the occipital condyles beyond the plane of the occiput, as expressed in the tables of measurements<sup>1</sup> given beyond. In this series the basal length of the skull slightly exceeds the occipito-nasal length, while in all the specimens from elsewhere it is considerably less. (c) The braincase is also flatter or much less convex, both antero-posteriorly and transversely, than in the skulls from other localities.

(2) The Santa Marta series differs from the Chapada series in all the points above specified, and from this and all the other series by much smaller size, the skulls averaging one tenth less than those from any other locality, with correspondingly smaller external dimensions, as will be shown beyond. The average occipito-nasal length of the skull is only 118 mm. against 131 in Chiriqui specimens, and the total length of the

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<sup>1</sup> In this connection it should be explained that in all cases the basal length is taken from the posterior border of the occipital condyles to the front border of the maxillaries, for the reason that in most museum skulls the premaxillaries have either been wholly lost or are detached from the skull, with which in life their connection is merely ligamentary. They can be preserved attached to the skull only by the greatest care in its preparation; and then they are liable to become separated later, even with careful handling; and the same is true of the malar bone.

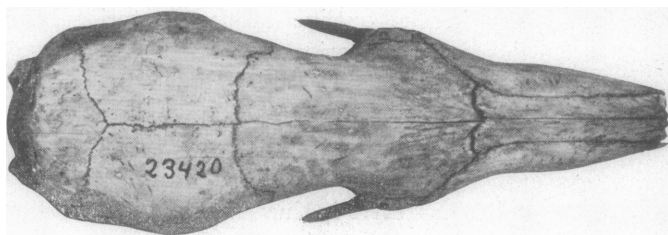


Fig. 1. *Tamandua tetradactyla instabilis*, Bonda, Colombia.  $\frac{3}{4}$  nat. size.



Fig. 2 *Tamandua tetradactyla chapadensis*, Chapada, Matto Grosso, Brazil.  $\frac{3}{4}$  nat. size.

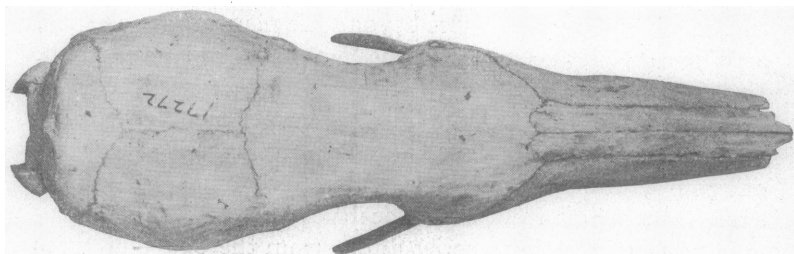


Fig. 3. *Tamandua tetradactyla tenuirostris*, Passa Nueva, Vera Cruz, Mexico.  $\frac{3}{4}$  nat. size.

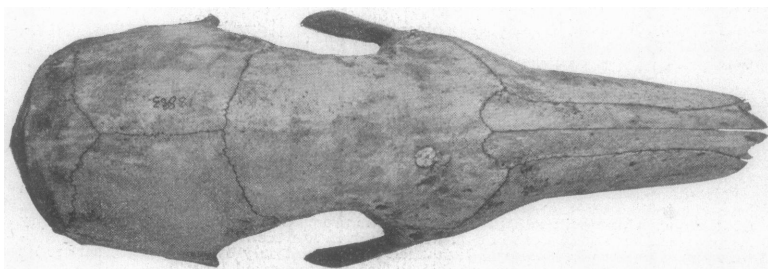


Fig. 4. *Tamandua tetradactyla chiriquensis*, Boqueron, Chiriqui, Panama.  $\frac{3}{4}$  nat. size.

animal in the flesh is 957 mm. against 1155 in the Chiriqui form.

(3) The distinguishing feature of the Vera Cruz skulls is the narrowness of the whole preparietal portion of the skull in comparison with any of the other forms, the braincase being of about the usual width but flat, with the interorbital and preorbital portions of the skull, especially the latter, slender and tapering. It shares in a measure the backward position of the occipital condyles with the Chapada form.

(4) The Chiriqui skulls are the largest of all. The braincase is relatively narrow, in comparison with the anteorbital region, and also very convex antero-posteriorly in contrast with the depressed and very flat frontal region. The occipital condyles are anterior in position, in strong contrast with the Chapada and Vera Cruz forms. The great length of the rostrum distinguishes it also from the Chapada and Santa Marta types, from which latter it further differs in its large size.

With these four series of skulls before one for comparison, the differences *inter se* are impressive and important (see Eigs. 1-4), though hard to express adequately in descriptions. They certainly indicate that the *Tamandua* group of Anteaters is subject to a degree of local variation, at least in the skulls, entitled to recognition. Although some of the forms, and possibly all, are subject to a wide range of individual variation in color, there are still other features by which they, and doubtless other forms, can be separated.

In view of the apparent continuity of the distribution of the group, it seems best to treat the local forms above indicated as merely subspecies. As a starting-point, it seems proper to take Guiana as the type locality of the Linnæan *Myrmecophaga tetradactyla*, since it was based on the accounts of early writers whose material or observations were made either in the Guianas or in "Brazil." It is at least following the precedents established in similar cases to accept Guiana as the type locality for *tetradactyla*.

***Tamandua tetradactyla chapadensis*, subsp. nov.**

Fig. 2, p. 390.

*Myrmecophaga bivittata* COPE, Amer. Nat., XXIII, Feb., 1889, 132. Chapada specimens. (Separates dated May 25, 1889.)

*Myrmecophaga ?sellata* COPE, *ibid.*, p. 133 (the Chapada specimen only).

*Tamandua tetradactyla* THOMAS, Proc. Zool. Soc. London, 1903, II, 242 (April 1, 1904).

Type, No. 369, ♀ ad., skull, Chapada, Matto Grosso, Brazil, July, 1885; coll. Herbert H. Smith. Cotype, No. 1417, skin, same locality and collector.

Size medium; nasals short; frontals prolonged anteriorly; occipital condyles extending considerably beyond the occipital plane. Occipito-nasal length, 125; basal length (without premaxillaries), 127; greatest breadth at front edge of orbits, 37; width of braincase, 42; length of nasals, 42.5 (equal to width of braincase). (For further skull measurements see table, p. 398; for comparison with allied forms see p. 396.)

Light areas ochraceous buff; shoulder bands as usual in the group; dark area of body reaching to base of tail; light dorsal stripe extending to posterior third of dark area; hairs of dark area very long, light buffy ash for basal half and tipped (many of them) with the same color, mixed with many wholly black, giving a grizzled grayish black general effect.

The pelage is much longer, coarser, and heavier, and the light band at the base of the hairs several times broader than in any of the Santa Marta specimens. Unfortunately external measurements are lacking,<sup>1</sup> but apparently it is a short-tailed form, like the Santa Marta animal, in comparison with the Mexican and Panama forms.

Cope distinguished his *M. bivittata straminea* as being straw-color, with two black bands on the shoulders and a black patch on the abdomen. As the locality is in doubt, and no cranial characters were given, it must remain at present indeterminable. The common form, here named *chapadensis*, of which he had several specimens (part of the series here under consideration), he distinguished as *M. bivittata* Desm. (= *tetradactyla* Linn.).

***Tamandua tetradactyla instabilis*, subsp. nov.**

Fig. 1, p. 390.

*Tamandua tetradactyla* SCLATER, Proc. Zool. Soc. London, 1871, 546, pl., xliii (colored figure of a Santa Marta specimen).

<sup>1</sup> It is to be regretted that Mr. Thomas failed to publish the flesh measurements of the large series of Chapada specimens collected for the British Museum by Mr. A. Robert (Cf. Proc. Zool. Soc., 1903, II, p. 242). Such measurements are always of the greatest value to subsequent investigators.



Type, No. 23420, ♀ ad., Bonda, April 7, 1899; coll. Herbert H. Smith.

Size small; tail short, about .80 of length of head and body. Coloration and pattern of markings variable. Type, a medium example: Dark area blackish brown with a tinge of reddish, extending, below, from the chest to the tail, including proximal portion of the hind limbs, and above from the shoulders to the hips, with a median extension to the base of the tail, with two bands, averaging about 15 mm. wide, extending obliquely forward and downward to the front edge of axillæ; light area straw-yellow, brightening to pale ochraceous on the posterior part of head, sides of neck and nuchal region, from which a median dorsal stripe, about 10 mm. wide at its inception, runs backward to a point opposite the hips; an indistinct dusky band on the side of the face extending back only to the posterior canthus of the eye.

About half the specimens in a series of 40 now available for inspection, conform in pattern, in a general way, to this type, but the color of the dark area varies from pale reddish brown to black, and the light areas from nearly clear white to deep ochraceous, generally most intense on the nuchal region, with the light median dorsal stripe varying in extent, sometimes terminating about the middle or anterior third of the dark area or extending entirely through it, dividing it into right and left halves. In four specimens the light median line is cut off anteriorly at the hair-whorl on the withers by the interscapular and nuchal regions being dark rusty brown, scarcely different in color from the adjoining dark areas. In another specimen, in which the nuchal-interscapular space is quite as dark as the body, there is nowhere any trace of a light median stripe. In specimens in which the dark areas are nearly black, the white areas may be either nearly pure white or strongly ochraceous, darkening on the nuchal region to ochraceous brown.

*Measurements.*—Type: Total length, 979; head and body, 546; tail, 433. Fourteen specimens give the following: Total length, 957 (865-1056); head and body, 542 (513-607); tail, 414 (347-465). Skull, type, occipito-nasal length, 115; width of braincase, 39; length of nasals, 39. (For additional measurements of the skull see table, p. 397; for further comparison with other forms see p. 396.)

This is another Santa Marta form which differs from its nearest allies in markedly smaller size, paler tints, and excessive color variability. The other especially notable cases are the Raccoon (*Procyon cancrivorus proteus*) and the Tayra (*Tayra barbara irara*); the Kinkajou (*Potos flavus megalotus*) and the Peccary (*Tagassu torvum*) are also small forms.

Other cases of small size and instability in color occur among the Rodents and Marsupials.

As Gray cites under his var. *opistholeuca* (Hand-List Edentates, etc., p. 27) Sclater's figure of a Santa Marta specimen, it may be claimed that Gray's name should be adopted for the Santa Marta form. He indicated no type and gave no description beyond the phrase "Rump to the middle of the back white," which is wholly meaningless in view of the variability of Anteaters in general in respect to this feature of the coloration. He enumerates under the name *opistholeuca* 10 specimens, 2 of which are from New Grenada, 3 from Guatemala, 1 from Costa Rica, 1 from Brazil, and 2 from "tropical America." It is safe to say that none of these specimens are likely to prove closely related to the Santa Marta form. The chance citation, therefore, of Sclater's then recently published colored plate seems insufficient to fix Gray's name *opistholeuca* on the Santa Marta animal.

It is of interest to note that Sclater on receiving, later, other living specimens of the Tamandua, "probably from Brazil" (*l. c.*, p. 624, 625), noted "well-marked points of difference" between them and the Santa Marta specimen.

***Tamandua tetradactyla tenuirostris*, subsp. nov.**

Fig. 3, p. 390.

Type, No. 17272, ♀ ad., Passa Nueva, State of Vera Cruz, Mexico, April 11, 1901; coll. A. E. Colburn.

Size large; tail long, equalling the length of head and body. Coloration and pattern of markings apparently showing little variation. Type: Light areas white faintly tinged with yellowish, the yellow tint a little stronger on the nuchal-interscapular space than elsewhere; median light dorsal line extending to hips; dark area purplish black, sharply defined against the white, and reaching the base of the tail, both above and below.

Four other adults and one young specimen agree almost exactly with the type in coloration and pattern of the markings, except in the posterior extension of the black on the dorsal surface, which in some extends on to the base of the tail and in others terminates on the rump. In a fifth specimen the black extends only to the hips, and is divided the whole length by the light median line; the shoulder bands are greatly narrowed posteriorly and become obsolete at their junction with the black area behind the shoulders. The black area in two specimens is purplish black and in the others clear black.

*Measurements.*—Total length, 1185; head and body, 585; tail, 600; hind foot, 95. Three adults, all females, measure, total length, 1178 (1155–1195); head and body, 598 (583–627); tail, 580 (568–600); hind foot, 94 (93–95). Skull, occipito-nasal length, 133; width of braincase, 42; length of nasals, 55 (much longer than width of braincase). Four skulls measure, total length, 127.5 (122–133); width of brain case, 41 (40–42); length of nasals, 47.2 (43–51).

The present form is especially characterized by the narrow and tapering form of the skull anterior to the braincase. In size it agrees well with the Chiriqui form, described below, but in coloration the light area is clearer white, and the form of the skull is strikingly different.

The relation of Cope's *Myrmecophaga sellata* (Amer. Nat., XXIII, 1889, p. 133), founded on a somewhat imperfect skin, without skull, from "Honduras," to the present form cannot now be determined. His description of the color and markings of this specimen does not, however, agree well with the present series from Vera Cruz.

***Tamandua tetradactyla chiriquensis*, subsp. nov.**

Fig. 4, p. 390.

Type, No. 18883, ♀ ad., Boqueron, Chiriqui, Panama, Oct. 16, 1901; coll. J. H. Batty.

Size large; length of tail about equal to length of head and body. Dark areas deep brownish black; light areas dull brownish buffy white, instead of nearly clear white as in *T. t. tenuirostris*, more deeply colored on the nuchal-intercapular region. The black extends for nearly four inches on the basal portion of the tail, but mixed more or less with light hairs. The light median dorsal stripe terminates considerably in front of the hips. Two other specimens are similar, with the black on the base of the tail equally extensive but clearer black.

*Measurements* (type).—Total length, 1180; head and body, 610; tail, 555; hind foot, 100; ear, 50. Two other females, not fully adult (as shown by the skulls), measure, respectively: Total length, 1120, 1165; head and body, 540, 580; tail 580, 600; hind foot, 90, 90; ear, 40, 45. Skull (type), occipito-nasal length, 132.5; width of braincase, 42; length of nasals, 55. Another younger skull (female) measures a little less, as follows: Occipito-nasal length, 129; width of braincase, 41; length of nasals, 51.

An adult female from the Rio Cauquita, southwestern Colombia, is exactly like the Boqueron specimens in size,

coloration, and cranial details. A skull, without skin, from near San José, Costa Rica, is also indistinguishable from the adult Boqueron skulls. Apparently *T. t. chiriquensis* will be found to range from Costa Rica to the Cauca region of western Colombia. A young specimen, from Boquete (alt. 5500 feet), Chiriqui, has the light area clear white, but in cranial characters agrees with the Boqueron specimens.

The relation of Cope's *Myrmecophaga sellata*, already referred to, to *T. t. chiriquensis* and *T. t. tenuirostris* can only be determined by an examination of a series of specimens from the type locality.

The four subspecies of *Tamandua tetradactyla* above described fall into two groups characterized by the character of the rostral portion of the skull, as follows:

- A. Rostral portion of the skull short and broad, with the ratio of nasals to occipito-nasal length as 35 to 100, and the ratio of the greatest breadth of the skull at the anterior edge of orbits to the occipito-nasal length as 28.5 to 100; length of nasals about equal to width of braincase.
  - a. Size small (occipito-nasal length, 118).....*instabilis*.
  - b. Size medium (occipito-nasal length, 124.5).....*chapadensis*
- B. Rostral portion of the skull long, with the ratio of nasals to occipito-nasal length as 39 to 100; nasals much longer than the width of the braincase.
  - a. Rostral portion of the skull narrow; ratio of greatest breadth of skull at anterior edge of orbits to occipito-nasal length as 24.4 to 100.....*tenuirostris*.
  - b. Rostral portion of skull broad; ratio of greatest breadth of skull at anterior edge of orbits to occipito-nasal length as 27.5 to 100.....*chiriquensis*.

EXTERNAL MEASUREMENTS OF 19 SPECIMENS OF *Tamandua tetradactyla instabilis*.

[The determination of the sex of the Santa Marta series has been made from an examination of the skins, adults being readily distinguishable by the presence of a pectoral pair of well-developed nipples in the females. The absence of nipples has been taken to indicate males. Where no sex is indicated the specimen is a skull or skeleton, and hence the sex indeterminable. The external measurements, "total length" and "tail," are from the collector's labels. All the specimens are from Bonda, near Santa Marta, Colombia.]

14666	♂	Total length, 945; head and body, 518; tail vertebræ, 427.
14672	♂	" " 941; " " 533; " " 408.
23563	"	" " 1018; " " 607; " " 408.
23440	"	" " 939; " " 543; " " 396.
23405	♀	" " 865; " " 513; " " 347.
23416	♂	" " 978; " " 570; " " 408.
23417	♀	" " 992; " " 559; " " 433.
23419	♀	" " 981; " " 579; " " 402.
23420	♀	" " 979; " " 546; " " 433.
23422	♀	" " 929; " " 559; " " 370.
23423	♀	" " 941; " " 533; " " 408.
23424	♂	" " 992; " " 584; " " 408.
23426	♀	" " 967; " " 534; " " 433.
23427	♀	" " 992; " " 533; " " 459.
23430	"	" " 967; " " 521; " " 446.
23432	♂	" " 891; " " 483; " " 408.
23434	"	" " 1056; " " 591; " " 465.
23436	"	" " 1018; " " 559; " " 459.
23440	"	" " 929; " " 534; " " 395.
Average Total length, 964; head and body, 547; tail vertebræ, 427.		

MEASUREMENTS<sup>1</sup> OF 20 SKULLS OF *Tamandua tetradactyla instabilis*.

Mus. No.	Sex.	Occip.-nasal length.	Basal length.	Antorb. breadth.	Interorb. breadth.	Width of brain-case.	Width across bullæ.	NASALS.			
								Length.	Width at front border.	Least width.	Width at post. border.
14667	y. ♀	118.5	116	30	23	41	36	42	7	6	10
14673	m. ♀	119	115	33	23.5	40	33.5	43	8	8	10.5
14675	o. ?	116	113	32	23	39	34.5	42	8	7	11
14666	y. ♂	110	108	—	22	38	33.5	37.5	7	7	12
14866	y. ♂	119	119	34	25	41	33	43.5	8	6.5	11
14664	y. ?	113	109	32.5	22.5	39	36	41	8	—	13
14668	o. ♂	118	115	33	24	40	34.5	44.5	9	5.5	13
14669	o. ♂	110	106	30.5	22.5	39	33.5	37	8	7	12
23410	o. ♂	119.5	115.5	32	24	40.5	34	43	10	8	14
23417	o. ♂	120	117	34	24.6	40	34	45	10	8	12
23408	o. ♂	119	115	34	24.3	41.5	36	41.5	8	8	13
23409	o. ♂	115	112	31	23.4	40	33	42	8	8	14
23422	o. ♂	121	119	34	25.6	40	33.5	46	9	8	13.5
23420	m. ♂	115	112	33	22.5	39	34.5	39	9.3	8	12
23426	o. ♂	118	114	32	24	39.3	33	41.5	18	7.5	12
23425	o. ♂	116	112	32.5	23	40	33.5	41	10	9	14
23427	o. ♂	112	110	33	23	—	—	39	10	8.5	12
23423	o. ♂	110	108	34.7	25	41	34	38.5	9	8	11
23424	o. ♂	119.5	115.5	33	24	39	35.3	48	9	7	12
23428	o. ♂	121	118	34	25	41.5	37.5	41	10	10	14
Average..		118	113.5	32.8	23.7	39.4	34.2	41.8	8.7	7.7	12.3

<sup>1</sup> Explanation of Measurements.

Occipito-nasal length = front edge of nasals to most projecting part of occipital plane.

Basal length = front edge of maxillaries to posterior border of occipital condyles, the premaxillaries being usually detached or wholly lacking in museum specimens.

Antorbital breadth = greatest breadth at front edge of orbits.

Width across bullæ = distance between outer edges of bullæ.

The letters y., m., and o., placed before the sign for sex, refer to age, and mean, respectively, young, middle-aged, and old.

Sex determined as explained in the preceding table of external measurements.

MEASUREMENTS OF TAMANDUA SKULLS.<sup>1</sup>

Mus. No.	Sex.	Occip.-nasal length.	Basal length.	Antorb. length.	Interorb. breadth.	Width of brain-case.	Width across bullæ.	NASALS.				
								Length.	Width at front border.	Least width.	Width at posterior border.	
<i>T. chapadensis</i> . <sup>2</sup>	370	m. ♀	121	121	33.5	25.5	41	36	41	7	6	11
	371	y. ♀	114.5	—	33.5	24	40	36	42.5	8	7	11
	372	o. ♀	133	132.5	37	28	43	39	41.5	7.5	7.5	11.5
	373	o. ♀	125.5	123	35	27	43	38	43.5	8	7.3	12.5
	368	o. ♀	127	124.5	37	26	42	37.5	45	9	7.3	15.5
	369	o. ♀	125	127	37	25.5	42	36	42.5	7	5.5	10
Average..		124.3	125.6	35.5	26	42	37	42.7	7.8	6.8	11.9	
<i>T. chiriquensis</i> . <sup>3</sup>	18883	o. ♀	132.5	124	38.5	27	42	36.5	55	10	7	14
	18884	m. ♀	120	126	33.5	24.3	41	37	51	8	6	12.5
	14222	y. ♀	120.5	125	34.8	24	40	37	49	8	7	12
	10087	o. ♀	124.5	120	35.3	25.3	39.3	35.5	47	8	6.5	10.5
	Average..		120	124	35.5	25	41.8	36.5	50.5	8.5	6.6	12.2
<i>T. tenuirostris</i> . <sup>4</sup>	17270	o. ♀	130	126	32	24	41	35	51	8.5	7.5	10
	17271	m. ♀	124	123	32	24	40.5	34	43	7	8	9.3
	17273	o. ♀	122	119	31	24	40	34	44	7.5	7.3	10
	17272	o. ♀	133	132.5	32.3	24	42	37	51	8	8	11
	Average..		127	125	32	24	40.9	35	47.2	7.8	7.7	10.1
<i>T. longicauda</i> . <sup>5</sup>	16935	o. ♀	131.5	128	35	26	42.5	35	48	9	8	12
	16936	m. ♀	124	121	35	26.5	40	36	41	8	7	11.5
	17561	y. ♀	125	121	34.8	24.5	40.5	35	48.5	9	8.5	13
	21303	m. ♂	125	121.5	33	23	39	35	45.3	9	7	10.5
Average..		126.4	123	34.5	25	40.5	35.2	45.7	8.8	7.6	11.8	

<sup>1</sup> For explanation of measurements see preceding table.<sup>2</sup> All from Chapada, Matto Grosso, Brazil.<sup>3</sup> Nos. 18883 and 18884, Boqueron, Chiriqui, Panama; No. 14222, Rio Cauquita, Colombia; No. 10087, near San José, Costa Rica.<sup>4</sup> All from Passa Nueva, Vera Cruz, Mexico.<sup>5</sup> All from Caura district, Venezuela.