

AUSTRALIAN MUSEUM SCIENTIFIC PUBLICATIONS

Troughton, Ellis Le G., 1927. Fixation of the habitat, and extended description, of *Pteropus tuberculatus*, Peters. *Records of the Australian Museum* 15(5): 355–359. [6 April 1927].

doi:10.3853/j.0067-1975.15.1927.820

ISSN 0067-1975

Published by the Australian Museum, Sydney

nature culture **discover**

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FIXATION OF THE HABITAT, AND EXTENDED DESCRIPTION,
OF *PTEROPUS TUBERCULATUS*, PETERS.

By

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(Figure 1.)

During July and August, 1926, Mr. A. A. Livingstone and myself were fortunate enough to visit Vanikoro Island, when, for five weeks spent collecting in the Santa Cruz Group on behalf of the Trustees of the Australian Museum, we had the pleasure of being the guests of Mr. N. S. Heffernan, then District Officer of the Group. Considerable interest attaches to Vanikoro as the scene of the loss of La Perouse's two ships the "Boussole" and "Astrolabe" in 1788, the fate of the intrepid navigator remaining a mystery for nearly forty years until Captain Peter Dillon discovered relics at Vanikoro in 1826.

Enhancing the interest of the fauna was the visitation in 1828 by a French expedition in a new "Astrolabe" commanded by Dumont D'Urville and having on board the famous naturalists Quoy and Gaimard, the first to make scientific observations and collections in this region. Their collections were naturally very incomplete and also subject to much confusion; so that it is very satisfactory to be able to clear up, after a lapse of nearly one hundred years, the mystery surrounding the habitat of the smaller of the two fruit-bats occurring at Vanikoro.

History of the two species.—In 1830 Quoy and Gaimard based their *Pteropus vanikorensis*, the large light-mantled fruit-bat of Vanikoro, upon two mounted skins and an odd skull said to have been obtained during the voyage of the "Astrolabe" and now in the Paris Museum. In 1912 Andersen, after examination of this material, retained the name *vanikorensis* for the species represented by the two skins, but decided that the odd skull (Paris Mus. Reg. No. 6746), erroneously described by Quoy and Gaimard and figured by Blainville as the skull of *vanikorensis*, represented a totally different species.

In 1869 Peters had described *Pteropus tuberculatus* based upon an adult female of unknown locality (Reg. No. A. 40) in the Paris Museum. Comparison of Blainville's figure of the odd skull from Vanikoro with Matschie's figure of the skull of Peter's type convinced Andersen of "the perfect identity of the characters of the skull and teeth." He refused, however, to regard the habitat of *tuberculatus* as established owing to the odd Vanikoro skull proving identical with that species, and arrived at the somewhat strained conclusion that "since Quoy and Gaimard were mistaken in referring the skull to *vanikorensis*, they may also have erred in stating that it was from Vanikoro," and that "So much only is sure, that Vanikoro and Guam are the only places visited by the 'Astrolabe' in which it can have been obtained."

On the contrary, in my opinion, it would have been more reasonable to assume that the odd skull had actually come from Vanikoro, since it was associated with skins also said to be from there, and that Quoy and Gaimard's ignorance of the existence of a second species, coupled with their failure to make a critical examination of the material, had led them to refer the odd skull of a second species to the much larger *vanikorensis*. The latter interpretation has proved correct, as we secured eight specimens at Vanikoro, three being collected by Mr. Heffernan, agreeing in all details with the description of *tuberculatus*, and enabling me to record the habitat of the species, unknown since its description, as Vanikoro in the Santa Cruz Group, and not the Marianne Islands, as Andersen suggested. Described by him as "this rare species" and hitherto known only by the unlocalised type and the odd skull, it is satisfactory to report the species as plentiful at Vanikoro, and to amplify the description and list of dimensions supplied by Andersen in his remarkable catalogue of Megachiroptera.

PTEROPUS TUBERCULATUS *Peters.*

(Fig. 1.)

Pteropus vanikorensis (part), Quoy & Gaimard, Voy. "Astrolabe" Zool. 1, 1830, p. 77 (skull, excl. skins and pl. ix), Vanikoro; *Id.*, Temminck, Mon. Mamm., ii, 1837, p. 78 (pt. skull, not specimens), Vanikoro; *Id.*, Blainville, Ostéogr. Mamm., Atl. Chéiropt., 1840 p. 100, pl. vi, fig. 3 (skull), Vanikoro.

Rousette de Vanikoro, Jourdan, Echo du Monde Sav.—iv, 1837, p. 156 (dentition compared with that of *Acerodon*).

Acerodon vanikorensis (part), Lesson, N. Tabl. R. Anim., Mamm., 1842, p. 14, No. 194, Vanikoro.

Pteropus tuberculatus, Peters, M.B. Akad. Berlin, 1869, p. 393 (habitat unknown); *Id.*, Dobson, Cat. Chir. B.M., 1878, p. 58 (habitat unknown); *Id.*, Trouessart, Cat. Mamm., i, 1897, p. 82 (hab. unknown); *Id.*, Matschie, Megachir., 1899, pl. viii, figs. 3, 3a-b (skull; hab. unknown); *Id.*, Andersen, Cat. Chir. B.M., i, 1912, p. 309 (? Vanikoro or Marianne Is.).

Pteropus (Spectrum) tuberculatus, Matschie, Megachir., 1899, p. 29 (hab. unknown); *Id.*, Trouessart, Cat. Mamm., Suppl., 1904, p. 54.

Diagnosis.—Similar in skull and dentition to *Pt. pselaphon* and *pilosus*, but with a small cusp-like projection on the hinder trenchant margin of the upper canine about the middle of the tooth. Fur shorter than in *pilosus*, mantle not paler but actually darker than the head and back. Size considerably smaller: forearm 119.5-124.5 mm. Hab. Vanikoro, Santa Cruz Group.

Dentition.—Examination of the teeth of my crania shows them to agree perfectly with Andersen's very complete description which is as follows:—

"Essentially as in *Pt. pselaphon* and *pilosus* but some of the chief characters of the dentition in these species (strong development of cingulum in upper incisors, upper and lower canines; enlargement of i_2 and p_1 ; tendency in longitudinal ridges of cheek-teeth to break up into tubercles) still more pronounced.—Upper incisors large; cingulum

excessively strong, forming a broad ledge on posterior face of teeth, in i^2 extending a little beyond external vertical margin of tooth, so as to be visible in front view of incisor as a small basal cusp on external side. Upper canines long, recurved, stout (as in *pilosus*); cingulum as in *pselaphon*, subdivided into a series of small tubercles; a small, well-marked cusp-like projection on posterior trenchant edge of canine above middle of tooth. Inner longitudinal ridge of m^1 and m_1 with pronounced tendency to break up into small, rounded, incompletely differentiated tubercles.— i_2 very large, between four and five times the bulk of i_1 , p_1 unusually large, larger than i_2 , and more than twice the size of m_3 .—Other characters as in *pselaphon* and *pilosus*."

The measurements of individual teeth are also in accord with those tabulated by Andersen.

Fur.—As in *pilosus*, but rather shorter; approximate length of hairs, back 16, mantle 16 mm.; hairs of back about 14 mm. in female. Glandular tuft of hairs present on each side of the neck in the male. Wing membrane below sparsely haired along the proximal half of the forearm and outwards to a line between the elbow and knee. Upper side of tibia furred for proximal half or two thirds.

Colour.—According to Andersen "The type and only skin known (Paris Museum) is probably faded by exposure to light. In its present condition the whole pelage above and beneath is some shade of russet-brown, darkest (almost vandyck-brown) on mantle, sides of neck, fore-neck and face; palest (russet washed with a peculiar tinge of ochraceous) on back, breast, belly, and flanks."

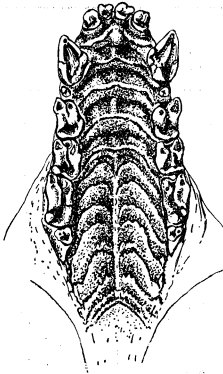


Fig. 1.

Pteropus tuberculatus Peters. The fresh skin of an adult female does not show marked variation from the male, though the general colouration is richer above and below; the ochraceous tawny wash of the back is warmer and especially marked in a band edging the mantle behind. The under surface is decidedly darker in tone, the vandyke shade being more pronounced.

Palate-ridges.—No special modifications (Fig. 1). Formula $5 + 5 + 3$, though there is an indication in one male of an additional ridge between the normal ninth and tenth ridges, approaching the formula $5 + 6 + 3$; the additional ridge is not indicated in a female.

EXTERNAL MEASUREMENTS OF *Pteropus tuberculatus*.

	Peter's Type. Ad. fmle. Paris M.	3 ad. females Austr. Mus. M.3851-3.		5 ad. males Austr. Mus. M.3846-3850.	
	mm.	Min. mm.	Max. mm.	Min. mm.	Max. mm.
Forearm	119.5	119.5	125	112	124.5
Pollex, total length, c.u.	50	47.5	51	51	51.8
" metacarpal	12.5	11.2	12	12	12
" 1st phalanx	25	22.5	25	23.5	24.3
2nd digit, metacarpal	59.5	57.5	60	56	61
" 1st phalanx	14	14	15	14	14.5
" 2nd-3rd phalanx, c.u.	13.5	12.5	12	13.8	15
3rd digit, metacarpal	83	76.8	84	78	82.8
" 1st phalanx	65	60.5	64	61	63
" 2nd phalanx ... ..	...	88.5	93	85	88.5
4th digit, metacarpal	80.5	76	81	77	82.5
" 1st phalanx	53.5	49	53	50.5	52.5
" 2nd phalanx	56.5	51.3	55	52.3	53.5
5th digit, metacarpal	88	84	90.2	83.3	90.5
" 1st phalanx	38.5	35.5	37.5	37	37
" 2nd phalanx	42	39.8	41	38.5	39.5
Ear, length from orifice ... ..	...	20	18.5	18.5	20.2
" max. width, flattened ... ..	...	13	13	12.5	13.2
Front of eye to tip of muzzle ... ..	...	20.5	22.3	22.2	23
Lower leg	49	49.5	52	51.5	51.5
Foot, c.u. ... ..	...	35	38	35.5	37.5
Calcar ... ..	...	12	13	11.5	14.3

CRANIAL MEASUREMENTS OF *Pteropus tuberculatus*.

	Adult Paris Mus. 6746.	Ad. male. Aust. Mus. M.3850	Ad. female. Aust. Mus. M.3852
	mm.	mm.	mm.
Total length to gnathion	56.8	55.5	54.3
Palation to incisive foramina	25.7	26.7	25.7
Front of orbit to tip of nasals... ..	15.5	16.7	15.6
Width of brain-case at zygomata	22.8	21.7	22.5
Zygomatic width	33	33	33.8
Width across m ¹ , externally	15.8	15.9	15.8
Lachrymal width	13	13	13
Width across canines, externally	13.8	13.6	13.7
Postorbital constriction	7.7	6.5	7.7
Interorbital constriction	8.5	8.4	8.4
Width of mesopterygoid fossa	7.2	7	7
Between p ¹ -p ⁴ , internally	8.8	8.8	9
Between gingula of canines	7	7	7.2
Orbital diameter	11.7	11.5	11.5
Mandible, length	43.2	43	42.5
" coronoid height	25	23.9	25.5
Upper teeth, c-m ²	21.5	21.3	20
Lower teeth, c-m ₃	23.8	23.7	23
Upper incisors, combined width	7	7	6.9

Specimens examined.—A series of eight specimens comprising five males and three females, all adult.

Range.—Vanikoro Island, Santa Cruz Group.

Type.—In the Paris Museum.

General affinities.—The species belongs to the *Pt. pselaphon* group of Micronesian range, which is closely related to the south Polynesian *Pt. samoënsis* group, the characters of the skull being nearly identical, and the dentition similar in many important points. The unusually broad posterior basal ledges of the upper incisors in the *Pt. pselaphon* group serve to distinguish its members from those of the latter group, in which the posterior ledges of the upper incisors are of normal breadth. Both in cranial and dental characters the *pselaphon* group shows a decided tendency towards the highly specialised genus *Pteralopex* of the Solomon Islands.

Specific affinities.—Peters considered this species allied to *Pt. mackloti*, but Matschie pointed out, and Andersen concurred, that that view had no foundation whatever; the closest relatives amongst known species are *pselaphon* (Bonin and Volcano Islands) and *pilosus* (Pelew Islands), from which it differs only in characters of minor importance—details of dentition, length and colour of fur, and size. The two most important distinguishing features are the presence of the small secondary cusp on the hinder margin of the upper canines, and the shorter forearm (119·5-124·5), as opposed to 132-151 mm. of the allied species.

The definite recording of the locality of *tuberculatus* clears up an uncertainty of long standing, and should facilitate further study of the affinities of other insular groups and their species.
