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A NEW SPECIES OF FAT-TAILED MARSUPIAL MOUSE, AND THE STATUS OF *ANTECHINUS* *FROGGATTI* RAMSAY.

By

ELLIS LE G. TROUGHTON,
Zoologist, Australian Museum.

(Figure 1.)

A review of the extensive collection of *Sminthopsis* in the Australian Museum in 1929, revealed a wide range of variation in the structure of the pads of both manus and pes in specimens hitherto allocated to the fat-tailed species, *Sm. crassicaudatus*. These pads become so shrunken and distorted by drying that spirit series are essential, and there is no doubt that lack of such material has resulted in far too great a range being accorded to individual species in the past.

In his remarkable Catalogue of 1888 Thomas gave the range of *crassicaudatus* as the "Whole of Australia (not yet recorded from the extreme north)", and included Ramsay's *Antechinus froggatti* from Derby, N.W. Australia, in the synonymy of that species. Examination of Ramsay's holotype, however, provides characters warranting the distinction of the Derby form, and it is proposed later on to deal with several races occurring in eastern Australia, as indicated by the Museum material.

During the review, a most interesting fat-tailed specimen was discovered amongst the "old collection" from King George's Sound, Western Australia, which possesses characters markedly differentiating it from the true *crassicaudatus*, and warranting description as a new species. The pads of both manus and pes appeared to agree somewhat with those of the unfigured *Sm. hirtipes* from Central Australia, but my recent examination of the holotype in the British Museum showed them to be quite different.

In his "Mammals of South Australia" in 1923, Wood Jones remarked upon the usefulness of these little animals, and that havoc by insect pests would be considerably lessened if the *Sminthopsis* were not preyed upon by domestic cats. It is therefore interesting to note that the type of *crassicaudatus*, described by Gould in 1844, and obtained by his collector, Gilbert, while at the military station on the William's River, south Western Australia, "was brought into the station by a domestic cat, which is constantly in the habit of going into the bush and returning several times during the night with a small mammal or bird in her mouth". When the present writer collected in this region in 1921 wild cats were very numerous and it is most regrettable to think of the serious wastage of the fauna which has gone on since the earliest days of settlement. It is hoped that residents in this interesting faunal area may be encouraged to conserve any

small mammals brought in by cats so that injured ones may be preserved and possibly interesting material brought to light.

My best thanks are due to the Committee of the Macleay Museum for permission to examine Ramsay's type, kindly made available by the Curator, Mr. John Shewan, and to Miss Joyce K. Allan, who provided the very helpful illustrations.

Sminthopsis granulipes, sp. nov.

(Fig. 1.)

Diagnosis.—Head and body, and tail, of similar dimensions to *Sm. crassicaudatus*, but the skull decidedly larger and heavier; readily distinguished externally by the shorter, much broader and differently shaped ear, which lacks the conspicuous black patch externally, the shorter hindfoot, and the structure and much finer granulation of the pads of both manus and pes. The tail is whitish instead of greyish-blue, and sparsely though evenly covered with whitish hairs instead of the close-set brownish and buffy bristles of *crassicaudatus*.

Colour.—The holotype female, old spirit specimen, doubtless considerably faded: general tone of back mottled rusty-buffy, composed of the light buff ends and tawny tipping of the fur, through which the dark greyish-brown (Ridgway) of the basal colouring appears; the tawny tips form a rusty wash from the crown to the tail-root, and on the upper sides of the body, and a faint line from front of eye to ear-base. Centre of snout, cheeks, and entire undersurface of a clear pale

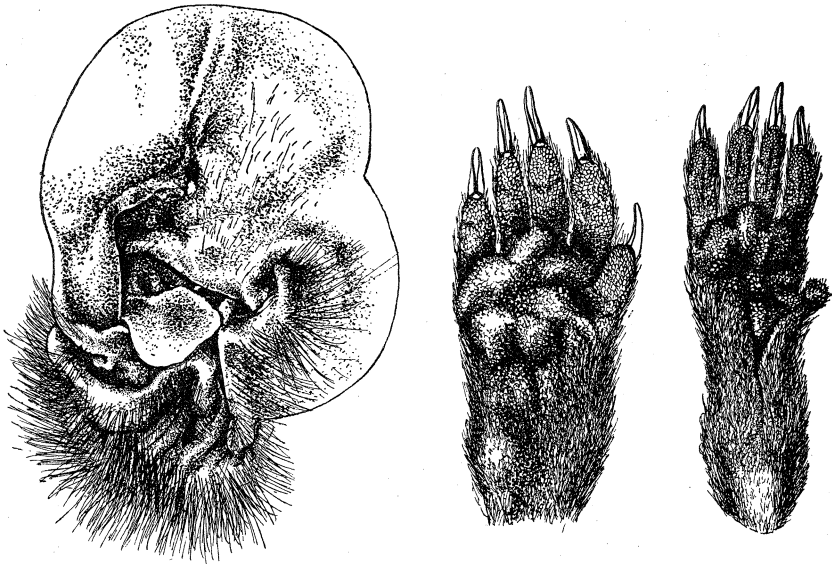


FIGURE 1.

The ear, manus, and pes of *Sminthopsis granulipes* sp. nov. The breadth of the supratragus, and marked convexity of the hind margin of the ear, with a decided notch above, are shown. The apices of the pads of both manus and pes lack the enlarged granules or smooth areas of other forms, and are not hirsute as in *Sm. hirtipes*.

olive buff, the fur below definitely bicoloured, the basal fur as dark as that of the back. The ear conch lacks the dark, closely haired and strongly contrasting anterior band characteristic of *crassicaudatus*. The manus and pes above, and the tail are buffy white, the tail covered with white, longish, soft hairs which are sparser and quite different to the closely set crisp bristles of the *crassicaudatus* tail.

External characters.—Fur of back long, about 10 mm., interspersed with stronger piles up to 15 mm. in length. Ear shorter, and much broader than in *crassicaudatus*, not surpassing the centre of the eye when laid forward, the greater breadth due to the marked convexity of the outer lower third of the conch. Inner margin more boldly convex to the tip, which is more evenly and broadly rounded; outer margin with a pronounced notch just below the upper third, which is accentuated by the bold convexity of the lower two-thirds. Supratragus very broad, its breadth equal to the greatest length anteriorly; not noticeably folded, but the hinder margin bent up owing to its arising from near the centre of the narrower basal part.

Pads of manus and pes very finely and evenly granulated, not surmounted by enlarged granules or smooth areas as in *crassicaudatus*, or covered with hairs as in *Sm. hirtipes*. The palmar area much elevated and consisting of a series of convolutions, divided by shallow wrinkles which do not isolate definite pads. There is no outer ulnar pad, with a smooth elongated crown, as in *crassicaudatus*, its place being taken by a low evenly granulated area not forming a pad. Pes with the central pad smaller, more elevated, and the apex more acutely pointed, and not differentiated from the two outer pads by deep grooves; foot completely haired from the heel to within 1 mm. of the hallux. Rhinarium much as in *crassicaudatus*, except that the concave margin below the nostril is more deeply emarginate, the rami of the philtrum being therefore more elongated. Tail definitely incrassated, though not as bulbous as in *crassicaudatus*. Mammæ five on one side, six on the other, probably twelve normally, as there are traces of a twelfth teat.

Palate-ridges.—There are ten undivided ridges, inclusive of the inter-incisor one and the hindmost which borders the palate, the series differing markedly in appearance from those of *crassicaudatus* and *froggatti* both in the general coarseness of the ridges and the tubercles between them, and in the acute triangularity of the inter-canine, and the possession of pronounced tubercles near the inner cusp of m^4 .

Skull and teeth.—Skull much larger and heavier than in *crassicaudatus*, the nasals squared off posteriorly at their greatest width, instead of tapering. Upper first incisors obtusely rounded off and not exceeding the others in length, differing markedly from those of *crassicaudatus*, which are slender, cylindrical, and twice as high as the others. Upper tooth row longer, but molars not noticeably wider than in *crassicaudatus*, the outer cusps less tubercular, and more blade-like, and m^4 smaller and simpler in structure.

Dimensions of holotype.—In spirit: head and body, 87; tail, 55; hindfoot, 13.5; ear, length from outer base 17.5, greatest width 15.5.

Skull: Greatest length, to back of occipital crest, 27.3; zygomatic breadth, 15.2; nasals, 10×2.3 ; interorbital width, 5.5; breadth of brain-case, 11.7; palate, length 15.6, ant. foramina 3.4; upper tooth row 14.1, lower 13; molars¹⁻³, 4.9 mm.

Holotype.—Adult female, Palmer's register No. 669 in the "old collection" of the Australian Museum.

Locality.—King George's Sound, south Western Australia.

Remarks.—The holotype, old spirit specimen, is entered in the earliest Australian Museum register as "Coll. George Masters 1869?" and it is remarkable that the striking features did not lead to earlier description. In the handwriting of the original entry is written a specific name which indicated that it was regarded as new and that as a fresh specimen the white coloration of the hair of the tail, and possibly skin, was a remarkable feature.

As additional material, however, has often proved coloration to be variable, it was considered preferable to afford a name indicative of the unusually fine and rasp-like granulations of the paw-pads, which contrast markedly with the larger grain-like ones of *crassicaudatus*.

Sminthopsis froggatti Ramsay.

Antechinus (Podabrus) froggatti Ramsay, Proc. Linn. Soc. N. S. Wales (2), ii, 1887, p. 552.

Sminthopsis crassicaudata Thomas, nec Gould, Cat. Mars. Monotr. Brit. Mus., 1888, p. 306, pl. xxiii, fig. 8.

Diagnosis.—Of similar total length to *crassicaudatus*, but with a much longer tail and correspondingly shorter and more slender body, shorter hindfoot, and much smaller ear; fur of undersurface not bicoloured, whitish from base to tips.

Colour.—Holotype female, dried from spirit: general colour of back reminiscent of that of *Mus musculus*, the tone about dark grizzled olive brown, being a mixture of the warm buff and dark mummy brown tips; basal fur of back deep neutral grey. Dark pencilling of back continuing over the crown and down the centre of the snout. Cheeks and sides of the limbs clearer, about buffy grey. There is a light patch about the base of the ear, which lacks a heavy dark mark on its anterior margin. Fur of undersurface not bicoloured, but yellowish-white from base to tips, about ivory yellow in tone, contrasting strongly with the upper surface. Manus and pes buffy white. Tail, above similar to back, buffy white underneath.

External characters.—Fur of back shorter and sparser than in *crassicaudatus*, about 6.5 mm., interspersed with longer piles of about 8 mm. Manus and pes much more delicate but pads similar, excepting that the enlarged granules of the central areas are relatively much larger, especially on the pes, where they form a crest antero-posteriorly along the apex of the three pads. Naked line on centre of pes extending back, as in *crassicaudatus*, to about proximal third of sole, which is completely haired to the heel. Ear much smaller, laid forward it only reaches middle of eye, instead of well beyond; its outline as in the allied species, but hind margin less broadly convex, and the anterior border lacks the heavy dark band or hairing. Supratragus small, considerably twisted owing to the hind margin arising at the centre of its base. Tail much longer and more tapered than in *crassicaudatus*, the definite incassation being nearer the root. Mammæ 8.

Palate-ridges.—Much as in *crassicaudatus*, nine counting the inter-incisor one, the interspaces seemingly more granular. Inter-canine ridge evenly arched as in *crassicaudatus*, not acutely triangular as in *granulipes*; minute tubercles at inner corners of m^4 much less pronounced.

Skull and teeth.—Skull relatively smaller and lighter than in *crassicaudatus*, and the nasals shorter but broader, and less tapered posteriorly; anterior palatal vacuities shorter. Incisors much as in *crassicaudatus*, but size of premolars not increasing so evenly, pm^1 three-fourths the size of pm^2 and both conspicuously smaller than pm^4 ; m^4 relatively broad and of similar structure.

Dimensions of holotype.—In spirit: head and body 73.5; tail 71; hindfoot 14; ear, from outer base 14, greatest width 9.5.

Skull: basal length, 21.3; zygomatic breadth, c12.5; nasals, 8.3 × 2.5; interorbital width, 4; breadth of brain-case, c10; palate, length 11.6, ant. foramina 2.8; upper tooth row 11.2, lower 10.3; molars¹⁻³, 4.5 mm.

Holotype.—Adult female in the Macleay Museum at the University of Sydney; collected by Mr. W. W. Froggatt, F.L.S., F.R.Z.S., when he was zoological collector for the Hon. William Macleay.

Habitat.—Found under debris near the beach in the "dindan" scrub bordering King Sound, near Derby, north Western Australia.

Remarks.—This species was sunk in the synonymy of *crassicaudatus* by Thomas within a year of its description, the outcome of the prevalent exaggerated conception of the range of the smaller Australian mammals.

Although Ramsay's description was rather indefinite, the decision was not justified, as the dimensions given conflicted with the type of *crassicaudatus*, the only correctly localized Western Australian specimen available to Thomas; he might also have considered the different faunal conditions of *froggatti*, about a thousand miles to the north. Examination of the holotype having removed all doubt as to its distinction, it is pleasing to record that a species with such interesting personal associations is now restored to the list of valid marsupial forms.
