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QUEENSLAND RATS OF ECONOMIC IMPORTANCE, AND NEW FORMS OF *RATTUS* AND *THETOMYS*.

By

E. LE G. TROUGHTON, C.M.Z.S.,
Zoologist, The Australian Museum.

Since the latter part of 1935 large numbers of indigenous and introduced Murinae have been submitted for identification to the Australian Museum by the School of Public Health and Tropical Medicine within the University of Sydney, also the Health Department and Bureau of Sugar Experiment Stations of Queensland, and the Colonial Sugar Refining Company, in connection with various investigations relating to the incidence of disease and economic damage in cane field areas, caused by the prolific rat population attracted thereto.

The importance of an ecological survey of the mammalian fauna is emphasized by the fact that no less than six genera of indigenous rats, including eleven species, have been identified from coastal Queensland, of which several are involved as carriers of Leptospirosis (Weil's disease). A great deal of economic loss is caused by the gnawing and breaking down of the cane, which has been vastly increased of recent years by the burning-off necessary to prevent infection, with a corresponding increase in the cost of gathering the crop. It is notable that the two introduced rats have not so far played a part in the cane fields comparable with that of several indigenous species which thrive under the specially favourable conditions. One of these, which may be known as the "Dusky Field Rat", *Rattus conatus*,¹ hitherto tentatively named *R. culmorum*, has apparently assumed the role played by the "Brown" or "Norway Rat" as a reservoir of Leptospirosis in other countries.

The work of identification has been complicated by the absence of original specimens of the old and most of the newly described species, as well as by the very unsatisfactory descriptions, and lack of illustration. The apparently complete disappearance of *R. sordidus* from the Darling Downs region, recent extension of the range of the Swamp Rat (*R. lutreolus imbil*)² to southern Queensland, and the coincident range of externally similar species in the north have added to the difficulties of final determination.

The rather bright greyish-brown, relatively small-footed and short-tailed rat, *R. culmorum*,³ originally described from the Inkerman district south of Townsville as probably "the commonest species of Central Queensland", would actually seem to be of decidedly restricted habitat throughout the wide coastal range accorded it. Specimens of the true *culmorum* have been identified only from the region of Mackay, amongst the extensive series of rats examined from the cane field area, from the Hamblenden Mill district near Cairns to Mackay.

¹ Thomas.—Ann. Mag. Nat. Hist., (9) xii, 1923, p. 159.

² Troughton.—Australian Zoologist, viii, 4, 1937, p. 283.

³ Thomas and Dollman.—Proc. Zool. Soc., 1908 (1909), p. 790.

According to Mr. W. A. McDougall, who has submitted varied series of rats from a wide range of localities on behalf of the Central Sugar Experiment Station at Mackay, the light brown field rat, or true *culmorum*, is quite distinct and, although living together with the dusky field rat (*conatus*), no intergradation of colour has been noted. In view of the much more universal distribution of *R. conatus*, originally described from the Annam River, just south of Cooktown, and recently identified from various cane field areas from Mossman, north of Cairns, to Mackay, it would seem that exceptionally attractive field conditions in the Mackay area have caused the apparently unusual association of the less plentiful *culmorum* with the prolific *conatus*.

Although the occurrence of *culmorum* appears normally restricted to somewhat isolated conditions of habitat, the range was vastly extended inland and to the south in 1921 by the description of the geographical races *R. culmorum vallesius* from the Upper Darling River region of New South Wales, and *R. culmorum austrinus* from Eyre's Peninsula, South Australia. In addition to these races of Oldfield Thomas may be added his *Rattus youngi*, described in 1926 from Moreton Island, off Brisbane, as "no doubt related to *assimilis*". The decidedly smaller foot, shorter tail, and more inflated tympanic bullae, however, definitely ally it sub-specifically with *culmorum*, as shown in the Check-list of Mammals,⁴ which may be consulted for general references. Examination of a specimen from the extremity of Cape York, received in exchange from the British Museum in 1923 as being quite representative of the typical Inkerman series, shows it to possess various differences to be expected from the marked disparity of habitat, warranting description as a distinct race.

Examination of the unique types of *Rattus sordidus* at the British Museum during 1930, and consideration of the extensive northern coastal range of *R. assimilis* and *culmorum*, leaves little doubt that the dusky brown *R. conatus* actually represents the northern race of the sombre "lost" *sordidus* of the Darling Downs. Topotypical specimens of Cooktown *conatus* are decidedly lighter, but there is a progressive darkening southward to Mackay which confirms the probable relationship, though personal measurements of the typical crania of *sordidus* would indicate subspecific distinction, on account of the larger molars, more slender nasals, and other proportions.

Pending re-discovery of the Darling Downs animal, or examination of intermediate specimens from south of Mackay, it appears desirable to retain the specific distinction of *conatus*, as simplifying field investigations and the tabulation of research. This view is further supported by the apparent discontinuance of the range of the Eastern Swamp Rat (*lutreolus*) beyond the Gympie-Maryborough region of S.E. Queensland, and also because the incompleteness of the typical *sordidus* crania prevents a comparison of the character of the bullae.

Further evidence of a general continuity of murine distribution, however, was provided by the recent submission of six specimens of a small pseudomyid rat from Mackay for identification on behalf of the Central Sugar Experiment Station of the Queensland Bureau. Identified as a new race of *Thetomys gracilicaudatus*, described from Oak Creek, "Darling Downs", by Gould in 1845, the specimens are of particular interest in extending the known range of one of the two larger pseudomyid genera some 500 miles to the north-east, apart from adding another species to the cane field list.

⁴ Iredale and Troughton.—Austr. Museum Memoir, vi, 1934.

Interesting comment forwarded by the Assistant Director of the Bureau of Sugar Experiment Stations, Mr. Arthur F. Bell, concerning the small series of what appeared to be another indigenous species of *Rattus*, stated that specimens were occasionally taken when collecting *R. conatus*, their native habitat being similar. So far, it was noted, "the largest male found (one with testes well down) weighed 66 gms. A male '*culmorum*' [= *conatus*] may weigh as high as 207 gms., although the usual weight of a well-fed old male is 175-195. The brown '*youngi*' [= *culmorum*] in weight, is more or less between the two". It is notable, therefore, that an average difference in weight supports the distinction between the light and dark short-tailed field rats occurring coincidentally in the Mackay region.

Apart from providing assistance to the various Departments investigating cane field problems, and also the Colonial Sugar Refining Company, examination of material submitted by the various research officers has resulted in most important additions to the Australian Museum collection. The most interesting acquisition resulted from the identification of the second known specimen of the "False Water Rat", *Xeromys myoides*, from a swamp in the Mackay district. The peculiar annectant form was originally described from a single specimen in the Godeffroy (Hamburg) Museum in 1889, from the same region, and the discovery of the second specimen should provide interesting data for future publication.

It is hoped to conserve sufficient material to complete study series for the various research departments and museum, and in this regard due acknowledgment is tendered Mr. W. A. McDougall, M.Sc., Assistant Entomologist, Queensland Bureau of Sugar Experiment Stations, for his activities in providing varied and adequate series of cane field Murinae. Sincere appreciation is also expressed for the loan of toponymical specimens by the British and Queensland Museum authorities, and especially to Mr. T. C. S. Morrison-Scott, B.Sc., A.R.C.S., Assistant Keeper of Zoology at the British Museum, for kindly providing notes upon the type specimen of *Thetomys gracilicaudatus*.

***Rattus culmorum apex*, subsp. nov.**

Diagnosis.—A much more coarsely spinous race, with generally similar external dimensions, but with a proportionately shorter tail and longer ear. The skull of the aged female holotype is relatively larger, and definitely distinguished by the decidedly wider palatal foramina and shorter molar row, while the bullae exceed the maximum recorded for the typical race.

General coloration more olivaceous owing to the dense admixture of coarsely spinous hairs, which are of a greenish-yellow tinge nearest colonial buff (Ridgway); more strongly speckled dorsally owing to the mixture of pale spines with the darker bistre brown and usual cinnamon tipping. Underfur greyish-olive above and below, instead of the slate-greyish of the typical form, and combining with the spinous hairs in imparting the more olivaceous general tone. The coarser nature of the pelage is indicated by the more spinous hairing of the belly, which is cream colour tinged with colonial buff.

Dimensions of Holotype.—Old female, field measurements: Head and body 159; tail 122; pes 29; ear 20.5 mm.

Skull.—Greatest length 38.5; zygomatic breadth 19.2; interorbital breadth 4.9; braincase breadth 15.5; nasals 14 × 4; palatilar length 17.5; palatal foramina 7.6 × 2.7; bulla length 9.2; upper molar row, crowns, 6.2; width of m¹ 2.1 mm.

Holotype.—Old female skin and skull, No. M.3371 in the Australian Museum collection, from Skull Creek in the extreme north-west of Cape York Peninsula, collected by Robin Kemp in 1913 and received by exchange from the British Museum.

Thetomys gracilicaudatus ultra, subsp. nov.

Diagnosis.—A warmly grizzled yellowish-brown race, lacking the greyish tone of the less tropical typical form. External and cranial dimensions generally similar, but the tail relatively much shorter, according to Gould's description, and the skull somewhat smaller but with larger palatal foramina.

General coloration above speckled yellowish-brown, composed of the clay and dark mummy brown tipping, the light tips becoming paler on the head, rump, and sides where an ochraceous-buffy wash is indicated. Basal fur about deep neutral grey, contrasting with the yellowish-brown tipping of the back, and not providing the paler greyish tone described for the typical race. Belly darkish buffy-grey, without sharp demarcation in adults owing to a continuation of the wash of ochraceous-buff from the sides.

Dimensions of Holotype.—From spirit: Head and body 110; tail 105; pes 26; ear 16 mm.

Skull.—Greatest length 31.4; zygomatic breadth 16.8; interorbital breadth 3.8; braincase breadth 13.4; nasals 12.3 × 3.6; palate length 16.3; palatal foramina 7.3 × 2.1; bulla length 5; upper molar row, crowns, 5.8; width of m^1 2.1 mm.

Holotype.—Adult female skin and skull, No. M.6407 in the Australian Museum collection from the cane field area at Mackay, north coastal Queensland. Part of a series of six specimens presented by the Bureau of Sugar Experiment Stations of the Queensland Department of Agriculture.

Remarks.—Apparently a more yellowish tropic coastal relative of the greyish-brown typical form of the Darling Downs. It appears to be distinguished also by the longer tail, and minor cranial features, though the lack of the basal part of the skull of Gould's original specimen prevents complete comparison, notably of the bulla size. Apart from racial distinction, discovery of the northern colony of the apparently "lost" species is of much interest in extending the north-eastern range of the pseudomyid genus.
