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# RE-EVALUATION OF THE HOLOTYPE OF *MUS RUBER* JENTINK, 1880 (RODENTIA: MURIDAE) FROM WESTERN NEW GUINEA (IRIAN JAYA)

by

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With 1 plate

## INTRODUCTION

The first rodent from the New Guinea region, now included in the genus *Rattus*, to be formally named, was *Mus ruber* Jentink, 1880. The name *R. ruber* is currently in widespread use (Lidicker, 1968, 1973; Lidicker & Ziegler, 1968; Misonne, 1969; Ziegler, 1971; Bulmer & Menzies, 1972, 1973; Menzies, 1973; Dwyer, 1975), several subspecies from areas throughout New Guinea and adjacent islands have been placed under it (Tate, 1951; Laurie, 1952; Laurie & Hill, 1954), and some of these are among the most abundant and widespread endemic rats in the entire region. Furthermore, populations identified as nominate *ruber* and various other subspecies have on earlier occasions been shifted at the generic level or have been linked with other groups of *Rattus*. In fact the various forms currently placed in *R. ruber* represent a complex of species. A detailed analysis of the situation will be published at a future date (Taylor, Calaby and Van Deusen, ms).

Several assessments of species of *Rattus* endemic to New Guinea have been made, of which none has seriously questioned the endemicity or validity of *R. ruber* as a distinct taxon represented by Jentink's holotype. Jentink (1880) remarked that the holotype had very soft fur with no trace of spines, and that it resembled *Mus neglectus* (= *R. rattus*), a point not pursued by later investigators, some of whom (e.g. Ellerman) never even examined the specimen.

## THE TYPE SPECIMEN

The holotype consists of a mounted specimen (Rijksmuseum van Natuurlijke Historie, Cat. syst. a) and skull (RMNH Cat. ost. a), reg. nr. 26067. It is not known whether any field collecting label ever existed, but the specimen now bears a red type specimen label attached to the right hind leg identifying it as *Mus ruber* Jentink. On the underside of the white board upon which the specimen is mounted the locality (Doreh, now known as Manokwari), collector (Von Rosenberg) and date (January 1869) are noted. The skin is mounted in a more or less life-like pose, artificial eyes have been added, and presumably it was prepared for public display. The pelage has obviously faded from the rusty brown condition described by Jentink (1880) to a more oxidized reddish hue dorsally and a slightly more yellowish color ventrally. Rümmler (1938) suggested that the fading may have been caused by long storage in alcohol, but prolonged exposure to light in an exhibition case will produce a similar effect.

Jentink (1880) did not indicate the sex but later (1887, 1888, 1907) stated that it was an adult female. The mammary formula was determined by Tate (1951) as 2 + 2 = 8. We were able to locate two pectoral and two inguinal teats on the right side, and two pectoral ones on the left, but no left inguinal teats. Those that can be located are small and suggest a non-lactating condition. An asymmetrical count is not unusual when taken from a dry specimen, for teats can easily be destroyed in preparation. This seems to be the case in this instance, and thus, the mammary formula given by Tate (1951) cannot be confirmed and its validity is doubtful.

Body measurements were provided by Jentink (1880) and presumably they were taken on the preserved specimen prior to its preparation into a life mount, since they differ substantially from those we obtained from the mounted specimen. The body measurements given by Jentink are followed in brackets by those we obtained, and are as follow: head and body length 214 mm (180 mm); tail length 140 mm (150 mm); hind foot length s. u. 37 mm (35 mm); ear length 18 mm (16.5 mm).

The skull is intact, except for missing zygomata and a posterior segment of palate, and the ink labelling on the cranium (pl. 1a) associates it with the skin of *ruber* and identifies it as the holotype. The molars are worn almost to the point of obliteration of the occlusal patterns, and the supraorbital ridges rise about 0.8 mm above the smooth cranial surface. These features together support the assessment first made by Jentink (1907) that the holotype was an adult rather than, as suggested later by Rümmler (1938), a subadult.

## IDENTITY OF THE TYPE SPECIMEN

The holotype of *R. ruber* is actually a specimen of an earlier-named commensal species, *R. nitidus* (*Mus nitidus* Hodgson, 1845; Nepal). Musser (1973, 1977) has already added *R. nitidus* to the fauna of Irian Jaya (western New Guinea). He located specimens in museum collections that extended the known range considerably eastward, and recorded *Rattus vanheurni* Sody, 1933 (type locality, vicinity of Manokwari) as a junior synonym of *R. nitidus*.

The next available name for the rats of New Guinea and nearby islands that are currently named *R. ruber* by authors, is *R. praetor* (*Mus praetor* Thomas, 1888; Aola, Guadalcanal, Solomon Islands). Thomas (1888, 1889) clearly distinguished *R. praetor* from another similar large native rat, *Rattus leucopus* (= *Mus terraereginae*); however some later investigators (i.e. Rümmler, 1938; Frechkop, 1948; Ellerman, 1949) did not recognize the two species as being separate, but rather merged them under *R. leucopus* or *R. ringens* or even relegated them to another genus, *Stenomys* (Rümmler, 1938; Frechkop, 1948). This has added considerably to the complexity in the current taxonomy of this group and will be discussed in detail later (Taylor, Calaby and Van Deusen, ms).

The basis of our determination of the holotype of *R. ruber* as a specimen of *R. nitidus* relies mainly upon our comparisons with the descriptions given by Hinton (1919) and Musser (1977) for the latter species, and upon our data for *R. praetor* and *R. rattus* from New Guinea. Our determination has been confirmed by Musser (pers. comm.) who is preparing a revision of *R. nitidus*.

The general morphology of the skull of the holotype (pl. 1a-c), with its well developed supraorbital ridges, generally wide palatal foramina, and small molars, provides the most conspicuous visual features that ally it to *R. nitidus*. The molars of the holotype are too worn to utilize the character of the anterior labial cusp that Musser (1977) finds reliable in distinguishing *R. nitidus* from *R. rattus*. Hinton (1919) used the ratio of the condylobasal length to the nasal length to distinguish *R. nitidus* from *R. rattus*. The latter species is similar in several morphological characters and, as *Mus neglectus*, was the rat to which Jentink (1880) recognized similarity in his description of *R. ruber*. Hinton (1919) stated that the nasal length of *R. nitidus* is typically 40% or more of the condylobasal length and is less than 40% in *R. rattus*. According to our measurements, this ratio in the holotype of *R. ruber* is 40.4% Among all the *R. rattus* specimens we have examined from New Guinea, this ratio is less than 40% by at least one percentage point and

usually by 2 or 3. *Rattus praetor* from the Vogelkop area of Irian Jaya (Manokwari, the type locality of *R. ruber* and *R. vanheurni*, is a port on the northern coast of the Vogelkop Peninsula), is not separable from *R. nitidus* on the basis of this ratio since in this species too, it exceeds 40%, but it is readily separable on a number of other features. *Rattus praetor* from this region of New Guinea is a larger rat, and those specimens of comparable skull length to the holotype of *R. ruber*, which has well-worn molars, have only light or moderate tooth wear. The skull of *R. praetor* is visually separable from that of the holotype (pl. 1d-f). Note particularly the distinct anterior taper of the palatal foramina in *R. praetor*, whereas that of the holotype of *R. ruber* is minimal. The molars are much more robust in *R. praetor* from the Vogelkop, each molar row being close to 1.0 mm larger both in width and in length (alveolar level) in individuals of skull size comparable to that of the holotype of *R. ruber*. The same magnitude of difference also occurs in *R. praetor* from the Solomon Islands near its type locality, and in New Britain.

It was not until fairly recently (Tate 1951) that the name *ruber* was linked in synonymy with *praetor*, solely on the basis of comparison of the holotype of *ruber* with the holotype and paratype of *praetor*. Since *R. ruber* was the first species of *Rattus* to be described from New Guinea, the name *ruber* would have priority over *praetor*, had its synonymy with *R. nitidus* not been clarified now. Already, Laurie & Hill (1960) and Misonne (1969) have followed Tate's unfortunate proposal. Now that we have located among museum collections unidentified or misidentified specimens of the large and spiny *R. praetor* from near the type locality of *R. ruber* in the Vogelkop area, the discovery of the correct identity of *R. ruber* as a specimen of the commensal Asian rat, *R. nitidus*, is both critical and timely. *R. praetor*, the second *Rattus* to be described from the New Guinea region, now regains the status of a full species, and its name is the valid one for a widespread group of large, spinous rates of the island of New Guinea, the Bismarck Archipelago, and the Solomon Islands.

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## References


BULMER, R. N. H. & J. I. MENZIES, 1972. Karam classification of marsupials and rodents. Pt. 1. — J. Polynesian Soc., 81 : 472-499.

——, 1973. Karam classification of marsupials and rodents. Pt. 2. — Ibidem : 82 : 86-107.

DWYER, P., 1975. Observations on the breeding biology of some New Guinea murid rodents. — Aust. Wildl. Res., 2 : 33-45.

ELLERMAN, J. R., 1949. The families and genera of living rodents. Vol. 3, Pt. 1. London, Brit. Mus. (Nat. Hist.) : 1-210.

FRECHKOP, S., 1948. Notes sur les mammifères. XXXI. — Sur une collection provenant de l'île de Bougainville. — Bull. Mus Roy. Hist. Nat. Belg., 24 : 1-12.

HILL, J. E., 1960. Renaming of Rattus ruber melanurus Laurie and Hill, 1954. — J. Mammal., 41 : 277.

HINTON, M. A. C., 1919. Scientific results from the mammals survey. No. XVIII (cont.). Report on the house rats of India, Burma, and Ceylon. Part II. — Bombay Nat. Hist. Soc. J., 26 : 384-416.

HODGSON, B. H., 1845. On the rats, mice, and shrews of the central region of Nepal. — Ann. Mag. Nat. Hist., 15 : 266-270.

JENTINK, F. A., 1880. On some hitherto undescribed species of Mus in the Leyden Museum. — Notes Leyden Mus., 2 : 13-19.

——, 1887. Catalogue ostéologique des mammifères. — Mus. Hist. Nat. Pays-Bas, 9 : 1-360.

——, 1888. Catalogue systématique des mammifères. — Ibidem, 12 : 1-280.

——, 1907. On the New-Guinea mammals. — Notes Leyden Mus., 28 : 161-212.

LAURIE, E. M. O., 1952. Mammals collected by Mr. Shaw Mayer in New Guinea 1932-1949. — Bull. Brit. Mus. (Nat. Hist.) Zool., 1 : 269-318.

LAURIE, E. M. O. & J. E. HILL, 1954. List of Land mammals of New Guinea, Celebes and adjacent islands 1758-1952. London, Brit. Mus. (Nat. Hist.) : 1-175.

LIDICKER JR., W. Z., 1968. A phylogeny of New Guinea rodent genera based on phallic morphology. — J. Mammal., 49 : 609-643.

——, 1973. A phenetic analysis of some New Guinea rodents. — Syst. Zool., 22 : 36-45.

LIDICKER JR., W. Z. & A. C. ZIEGLER, 1968. Report on a collection of mammals from eastern New Guinea. — Univ. Calif. Publ. Zool., 87 : 1-60.

MENZIES, J. I., 1973. A key to rats of the genera Rattus, Melomys and Pogonomelomys on the New Guinea mainland. — Dept. Biol. Occas. Pap., Univ. Papua New Guinea, 2 : 1-16.

MISONNE, X., 1969. African and Indo-Australian Muridae. Evolutionary Trends. — Mus. Roy. Afrique Cent. Tervuren, Ann., Sér. in 8°, Sci. Zool., 172 : 1-219.

MUSSER, G. G., 1973. Zoogeographical significance of the ricefield rat, Rattus argentiventer, on Celebes and New Guinea and the identity of Rattus pesticulus. — Amer. Mus. Novitat., 2511 : 1-30.

——, 1977. Epimys benquetensis, a composite, and one zoogeographic view of rat and mouse faunas in the Philippines and Celebes. — Amer. Mus. Novitat., 2624 : 1-15.

RÜMMLER, H., 1938. Die Systematik und Verbreitung der Muriden Neuguineas. — Mitt. Zool. Mus. Berlin, 23 : 1-298.

TATE, G. H. H., 1951. Results of the Archbold Expeditions. No. 65. The Rodents of Australia and New Guinea. — Bull. Amer. Mus. Nat. Hist., 97 : 183-430.

THOMAS, O., 1888. Diagnoses of six new mammals from the Solomon Islands. — Ann. Mag. Nat. Hist., 1 : 155-158.

——, 1889. The mammals of the Solomon Islands, based on the collections made by Mr. C. M. Woodford during his second expedition to the archipelago. — Proc. Zool. Soc. London 1888 : 470-484.

ZIEGLER, A. C., 1971. Suggested vernacular names for New Guinea recent land mammals. — Occas. Pap. B. P. Bishop Mus., 24 : 139-153.

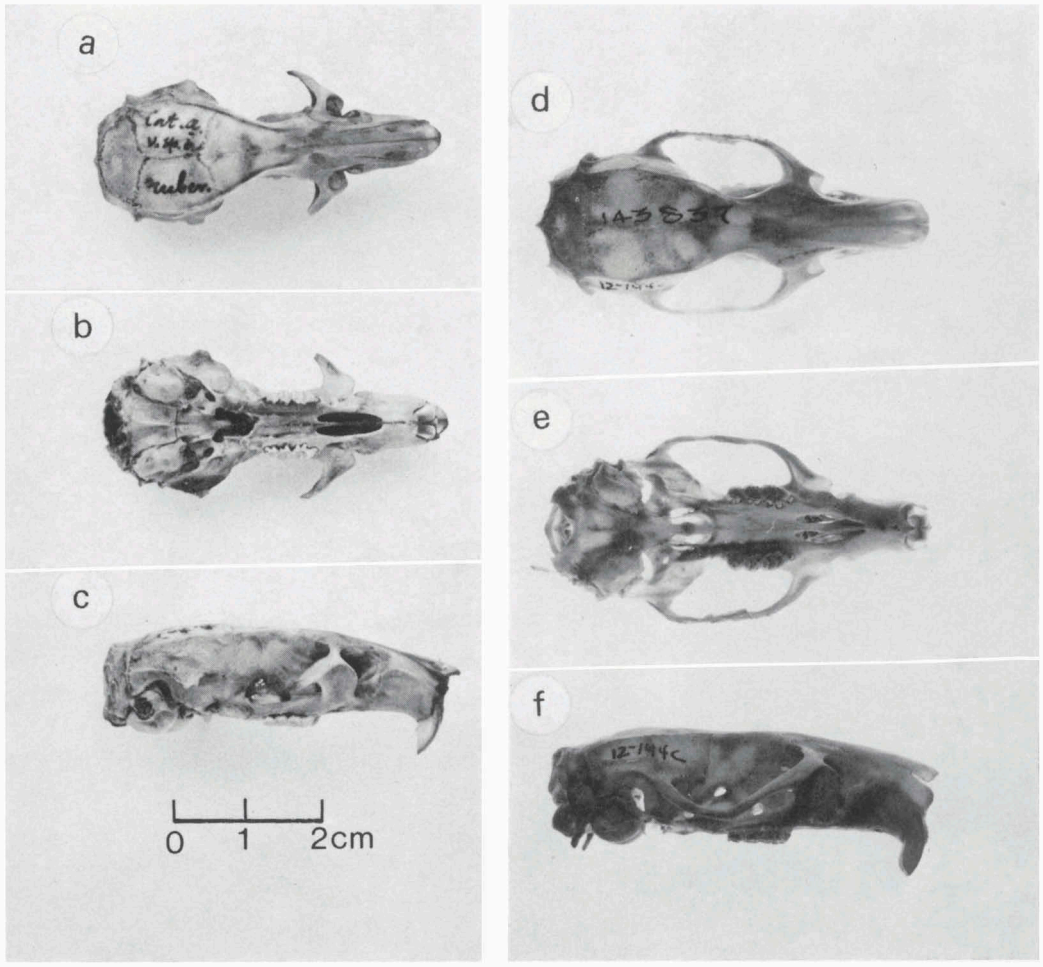


Fig. a-c. Dorsal, ventral and lateral view of the skull of the holotype of *Mus ruber* Jentink, RMNH 26067; Doreh (= Manokwari); occipitonasal length 46.5 mm. Fig. d-f. *Rattus praetor*, AMNH 143837; Sansapor, 225 km west of Doreh; occipitonasal length 51.6 mm. Both localities are coastal settlements in the Vogelkop region, New Guinea. Photographs approximately life-size.