

Reproductive Biology of the Mice and Rats (Family Muridae) in New Guinea—Diversity and Evolution

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ABSTRACT. In New Guinea there are around 100 species of native rodents in the family Muridae that are members of two tribes, the Hydromyini and Rattini, and five divisions—the Hydromys, Uromys, Mallomys, Pogonomys, and Rattus divisions. Here we review their basic reproductive biology so far as it can be determined from the material available. We find that females of most species in the Hydromys and Uromys divisions have 4 nipples, most species in the Pogonomys division have 6, whereas in the Mallomys division nipple number across species ranges from 2 to 6, and in the Rattus division from 4 up to 12. The number of fetuses observed in pregnant individuals in species of all of the hydromyine divisions was generally between 1 and 3 but in three species in the Rattus division up to 6, or even occasionally more, occurs. In males, the relative testes mass (RTM) of most species in the Hydromys, Uromys, Mallomys, and Rattus divisions was usually between 1 and 3% of body mass, whereas in the Pogonomys division it varied markedly from only around 0.4% in *Hyomys goliath* up to 5% in two species of *Pogonomys*. The spermatozoa of species in the Hydromys and Uromys divisions, like in the Australian species of these divisions, contained a head with an apical hook together and two ventral processes, whereas in the Pogonomys and Mallomys divisions marked interspecific differences occurred with some having a sperm head with an apical hook and ventral processes but in others there were no ventral processes but a long apical hook. Sperm tail length of most species was generally between 90 and 130 μm but *Chiruromys* and *Xenuromys* had sperm tail lengths of 150–153 μm . Male accessory sex glands were generally similar across the species except for that of the preputial glands which appeared to be absent in species of *Pogonomys* and *Chiruromys* but very large in *Hyomys*. The findings of large relative testes mass in *Pogonomys* and long sperm tails in *Chiruromys* and *Xenuromys* suggest selection for high levels of intermale sperm competition and hence multimale breeding systems in these species, whereas the variation in preputial gland size suggest interspecific differences in social organization.

Introduction

Australia, New Guinea and its adjacent land-bridge islands, Sahul, have a unique diversity of mammals with the original mammalian fauna being composed of marsupials and monotremes. However various groups of eutherian

mammals also occur with murid rodents first arriving around 6 million years ago in the late Miocene or early Pliocene. Whereas there are, in Australia, around 60 species of native rodents in the family Muridae that make up around 20% of the current extant mammalian fauna, the number of species of mice and rats in New Guinea is still not known in detail

Keywords: pregnancy; sperm form; New Guinea rodents; evolution

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Received: 18 October 2020 **Accepted:** 18 October 2020 **Published:** 25 November 2020 (in print and online simultaneously)

Publisher: The Australian Museum, Sydney, Australia (a statutory authority of, and principally funded by, the NSW State Government)

Citation: Breed, William G., Chris M. Leigh, and Eleanor J. Peirce. 2020. Reproductive biology of the mice and rats (family Muridae) in New Guinea—diversity and evolution. In *Papers in Honour of Ken Aplin*, ed. Julien Louys, Sue O'Connor, and Kristofer M. Helgen. *Records of the Australian Museum* 72(5): 303–316. <https://doi.org/10.3853/j.2201-4349.72.2020.1733>

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