

An overdue break up of the rodent genus *Pseudomys* into subgenera as well as the formal naming of four new species.

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ABSTRACT

An audit of all previously named species and synonyms within the putative genus of Australian mice *Pseudomys* (including genera phylogenetically included within *Pseudomys* in recent studies) found a number of distinctive and divergent species groups.

Some of these groups have been treated by past authors as separate genera (e.g. *Notomys* Lesson, 1842) and others as subgenera (e.g. *Thetomys* Thomas, 1910). Other groups have been recognized (e.g. as done by Ford 2006), but remain unnamed.

This paper assessed the current genus-level classification of all species and assigned them to species groups.

Due to the relatively recent radiation and divergence of most species groups being around the five million year mark (Smitsen 2017), the appropriate level of division was found to be subgenera. As a result, eleven subgenera are recognized, with five formally named for the first time in accordance with the rules of the *International Code of Zoological Nomenclature* (Ride *et al.* 1999).

At the species level, four putative species were found to have divergent populations which had not been given taxonomic recognition. Each are formally named as new species on the basis of known morphological and/or genetic divergence. Two new subspecies of Pebble-mound Mouse are also formally named.

Formal description of relevant forms is the critical and most important first step in ensuring the long-term conservation of these potentially vulnerable native forms as previously outlined by Hoser (2019a, 2019b).

Keywords: Mammals; Australia; Muridae; genus; *Pseudomys*; *Ascopharynx*; *Notomys*; *Thetomys*; *Gyomys*; new subgenus; *Eekmys*; *Farkmys*; *Ohmys*; *Oimys*; *Ouchmys*; species; *fumeus*; *oralis*; *shortridgei*; *johnsoni*; new species; *albapes*; *griseorursus*; *pesrosea*; *pellicauda*; new subspecies; *luxauris*; *occultatum*.

INTRODUCTION

The large Australian genus of native rodents in the genus *Pseudomys* Gray, 1832, within the family Muridae was audited over a period of some years.

The purpose of the exercise was to review the classification at the genus-level following on from a number of published phylogenetic studies (e.g. Ford 2006, Smitsen 2017, Stepan and Schenk 2017) incorporating this same putative genus and allied putative genera.

The audit of species based on these studies showed that species within the putative genus *Notomys* Lesson, 1842 were nestled within the tree for *Pseudomys*, as were other named groups, most of which have until now been treated as synonyms of *Pseudomys*. See for example Bannister *et al.* (1988).

In terms of the generic arrangement of species within *Pseudomys sensu lato*, type species *Pseudomys australis* Gray, 1832, that there are distinctive species groups beyond those closest to the type species, potentially worthy of genus-level

division has been known for decades.

By way of example, Ford (2006) wrote:

"I will begin with a review of species groups that are now firmly established, and build on these as the core units for defining 'sensible' genera within the *Pseudomys* complex. Unfortunately, as is so often the case with murid rodents, the groups outlined here are of roughly equal depth to their radiation and isolation from each other. Thus, there are apparently isolated and problematic species that are not easily assigned to these groups, and this has been one of the persuasive arguments in favour of retaining a larger genus *Pseudomys*. However, each group has a distinct identity, which should be the over-riding argument in favour of their generic recognition, rather than recognition as intrageneric groupings. In either case, resolution of these groupings represents a major step forward in understanding the relationships among these species."

Ford then outlined about nine main species groups and their component species, but did not formally name any.

Within the putative genus of *Pseudomys* some of these groups have been treated by past authors as separate genera (e.g. *Notomys* Lesson, 1842) and others as subgenera (e.g. *Thetomys* Thomas, 1910). Other groups have been recognized (e.g. as done by Ford 2003 and 2006), but remain unnamed. This study assessed the current genus-level classification of all species and in finality assigned them to relevant species groups, with names also assigned to all.

MATERIALS AND METHODS

Specimens of most species were inspected either live or dead as was all relevant and available literature. This included all previous descriptions of taxa, including known synonyms as cited at the end of this paper. This is an expanded list over and above that published by Bannister *et al.* (1988), that also includes most recently described forms.

Of particular relevance to this review, were phylogenetic and morphological studies that helped identify morphologically similar species and/or those most closely related.

Included in the audit were photos of species with good locality data and distribution maps from State Museums, based on specimens in their collections, noting that for many species, the historical distributions were very different to the extant distributions.

Where available and applicable, fossil specimens and records were also reviewed.

Past descriptions and synonymies were reviewed with a view to using available names for species groups if they had been properly proposed in the past.

Publications relevant to the taxonomic and nomenclatural conclusions in terms of the genus *Pseudomys sensu lato* including all descriptions of all known species, including all known synonyms, include the following: Anstee (1996), ACT TAMS (1999, 2010 and undated), Baverstock *et al.* (1981), Baynes and Jones (1993), Baynes *et al.* (1987), Bennett *et al.* (1991), Braithwaite (1977), Braithwaite and Brady (1993), Brazenor (1934a, 1934b), Breed and Ford (2007), Butler and Merrilees (1971), Carron *et al.* (1990), Cockburn (1978, 1981a, 1981b), Cockburn *et al.* (1995), Cooper (1993), Cooper *et al.* (2003), Dickman and McKechnie (1985), Dickman *et al.* (2000), Dunlop and Pound (1991), Edwards (2009), Finlayson (1932, 1940, 1960), Ford (2006), Ford and Johnson (2007), Ford *et al.* (2003), Fox and Briscoe (1980), Fox *et al.* (1994), Fusco *et al.* (2016), Gould (1842, 1844, 1845, 1853, 1858, 1863), Gray (1832, 1844), Gynther and O'Reilly (1995), Haby and Herpich (2010), Happold (1976), Higgins and Petteerd (1844), Hoser (1991), Iredale and Troughton (1934), Jerry *et al.* (1998), Johnson (1959), Jones (1925), Jurskis *et al.* (1997), King (1984), King and Mackowski (1986), Kirkpatrick and Martin (1971), Kitchener (1980, 1985), Kitchener and Humphreys (1986, 1987), Kitchener *et al.* (1985), Krefft (1862), Lee (1995), Lesson (1842), Macak and Menkhorst (2016), Mack (1861), Meek and Triggs (1999), Menkhorst (1995, 2003), Menkhorst and Broome (2008), Menkhorst and Knight (2001), Menkhorst and Seebeck (2001), Moro and Spencer (2003), Ogilby in Anonymous (1838), Poole (1994), Quinlan *et al.* (2004), Read (1993), Read and Tweedie (1996), Ride (1956, 1970), Ride *et al.* (1999), Rowe *et al.* (2008), Salinas (2009), Seebeck and Menkhorst (2000), Schulz and Wilks (2017), Shortridge (1936), Smissen (2017), Start (1996), Start *et al.* (2000), Steppan and Schenk (2017), Strahan (1996), Tate (1951), Thomas (1882, 1902, 1907, 1910a, 1910b, 1921a, 1921b, 1926), Thomas and Dollman (1909), Troughton (1932, 1936, 1937, 1939), Trouessart (1897), Van Dyck and Birch (1996), Wahlquist (2020), Waite (1896, 1898, 1900), Waterhouse (1839, 1843), Watts and Aslin (1981), Wilson *et al.* (1992), Woinarski (1992), Woods and Ford (2000) and sources cited therein.

RESULTS

Studies of Ford (2006), Smissen (2017), Steppan and Schenk (2017) and others as cited by them all confirm that *Pseudomys sensu lato* can be readily divided into about 11 main

morphologically distinctive species groups, all divergent from one another about 5 MYA, plus or minus 2 MYA.

Due to the relatively recent radiation and divergence of most species groups being around the five million year mark (Smissen 2017), the appropriate level of division was determined by me to be subgenera.

This is contrary to the position of some mammalogists who as a group tend to split genera more readily than a person who is principally a herpetologist such as myself, who would rarely ever consider splitting reptile genera with a known divergence of less than 10 MYA.

As a result, eleven subgenera are formally recognized herein, with five formally named for the first time in accordance with the rules of the *International Code of Zoological Nomenclature* (Ride *et al.* 1999).

I have little doubt that a number of mammalogists will decide to elevate subgenera named in this paper to full genus status. The ultimate final position of these groupings will be determined long after I die, if ever.

At the species level, three putative species were found to have divergent populations which had not been given taxonomic recognition. Each are formally named as new species on the basis of known morphological and/or genetic divergence. A fourth population of one of the split species was also determined to be divergent across a known biogeographical barrier affecting similarly habitat constrained taxa and so it too has been formally identified and named as a fourth new species.

Two new subspecies of Pebble-mound Mouse are also formally named. One has until now been treated as the Queensland population of *P. johnsoni* Kitchener, 1985 and the other a Victoria River region (NT) population of *P. johnsoni*.

Formal description of relevant forms is the critical and most important first step in ensuring the long-term conservation of these potentially vulnerable native forms.

While eleven subgenera within *Pseudomys sensu lato* are recognized herein, six, including the nominate one do have available names.

These are as follows:

Pseudomys Gray, 1832, type species: *Pseudomys australis* Gray, 1832.

Notomys Lesson, 1842, type species: *Dipus mitchelli* Ogilby, 1838.

Mastacomys Thomas, 1882, type species: *Mastacomys fuscus* Thomas, 1882.

Ascopharynx Waite, 1900, type species: *Hapalotis cervinus* Gould, 1853.

Thetomys Thomas, 1910, type species: *Mus nanus* Gould, 1858.

Gyomys Thomas, 1910, type species: *Mus novaehollandiae* Waterhouse, 1843.

Five new subgenera are formally named herein according to the rules of the *International Code of Zoological Nomenclature* (Ride *et al.* 1999).

These are as follows:

Eekmys subgen. nov., type species: *Pseudomys (Gyomys) occidentalis* Tate, 1951.

Farkmys subgen. nov., type species: *Pseudomys oralis* Thomas, 1921.

Ohmys subgen. nov., type species: *Mus albocinereus* Gould, 1845.

Oimys subgen. nov., type species: *Mus shortridgei* Thomas, 1907.

Ouchmys subgen. nov., type species: *Pseudomys chapmani* Kitchener, 1980.

Furthermore three putative species were found to have divergent populations worthy of taxonomic recognition.

The Hastings River Mouse, originally described as *Pseudomys oralis* Thomas, 1921, herein placed in the subgenus *Farkmys*

subgen. nov. has also been known to consist of two divergent populations, which also are deeply genetically divergent based on mitochondrial DNA (Smissen 2017). The unnamed northern population is formally named as *P. albapes sp. nov.*

The Smoky Mouse, originally described as *Pseudomys fumeus* Brazenor, 1934, herein placed in the subgenus *Ohmys subgen. nov.* has long been recognized as having two morphologically divergent, geographically disjunct populations (e.g. Strahan *et al.*, 1988). The western Victorian population carries the species name and so those from the east of Victoria and New South Wales as defined by most authors (e.g. Strahan *et al.* 1988) is the unnamed putative taxon.

However within the so-called eastern population of that species, the northern-most outlier populations in the high country of New South Wales (NSW) and the Australian Capital Territory (ACT) are divergent from the population centred in the Victorian eastern highlands and Gippsland coast region, which are also separated by a significant gap in known distribution. Therefore it too is formally named as a divergent new species.

The unnamed taxon from New South Wales is formally named herein as a new species, *Pseudomys griseorursus sp. nov.*

The unnamed taxon from Victoria is formally named herein as a new species, *P. pesrosea sp. nov.*

The Heath Rat, originally described as *Mus shortridgei* Thomas, 1907, herein placed in the newly named subgenus *Oimys subgen. nov.* has long been known to consist of two geographically disjunct populations in historical times. The unnamed eastern form from south-west Victoria, with a divergence estimated by two authors at around 1.4 MYA (+/- 100 K years) is formally named as *P. pellicauda sp. nov.*

As already mentioned, putative, *Pseudomys johnsoni* Kitchener, 1985 from Queensland is formally named herein as a new subspecies. It is significantly morphologically divergent from the nominate population of *P. johnsoni* in the central Northern Territory. It is also separated by a wide geographical barrier that at present seems to be unpassable for these mice. Noting that both Ford (2006) and more recently Smissen (2017) found very limited genetic divergence between putative species of Pebble-mound mice including *P. johnsoni* herein placed in the subgenus *Ouchmys subgen. nov.*, type species: *Pseudomys chapmani* Kitchener, 1980, and this being in the face of significant morphological divergence, I have taken the conservative position and named the relevant taxon as a subspecies. I note herein that a divergence of this form from the nominate form is likely to be in the range of 1 MYA or possibly far less.

The new form is only represented by four specimens in Australian Museums and this is in spite of a significant collection effort in the area they are known to occur.

A similar situation occurs for the Victoria River region (NT) population variously assigned to *P. johnsoni* or the taxon *P. laborifex* Kitchener and Humphreys, 1986, now treated as synonymous with *P. johnsoni* or a subspecies of it. It is also formally described herein as a new subspecies.

INFORMATION RELEVANT TO THE FORMAL DESCRIPTIONS THAT FOLLOW

There is no conflict of interest in terms of this paper or the conclusions arrived at herein.

Several people including anonymous peer reviewers who revised the manuscript prior to publication are also thanked as are relevant staff at museums who made specimens and records available in line with international obligations.

In terms of the following formal descriptions, spellings should not be altered in any way for any purpose unless expressly and exclusively called for by the rules governing Zoological Nomenclature as administered by the International Commission of Zoological Nomenclature (ICZN).

In the unlikely event two or more newly named taxa are deemed to be the same by a first reviser, then the name to be used and retained is that which first appears in this paper by way of page

priority and as listed in the abstract keywords.

Some material in descriptions for taxa may be repeated for other taxa in this paper and this is necessary to ensure each fully complies with the provisions of the *International Code of Zoological Nomenclature* (Fourth edition) (Ride *et al.* 1999) as amended online since.

Material downloaded from the internet and cited anywhere in this paper was downloaded and checked most recently as of 20 June 2020 (including if also viewed prior), unless otherwise stated and was accurate in terms of the content cited herein as of that date.

Unless otherwise stated explicitly, colour and other descriptions apply to living adult specimens of generally good health and not under any form of stress by means such as excessive cool, heat, dehydration or abnormal skin or fur reaction to chemical or other input.

Unless otherwise stated, all colour descriptions of species refer to outer fur colour and not skin.

While numerous texts and references were consulted prior to publication of this paper, the criteria used to separate the relevant species or subspecies has already been spelt out and/or is done so within each formal description and does not rely on material within publications not explicitly cited herein.

The etymology of all five new genus names are similar. All are derived from the verbal responses of native Aboriginals when they set eyes on the said species, with the suffix *mys* added to them.

These are *Eekmys subgen. nov.*, *Farkmys subgen. nov.*, *Ohmys subgen. nov.*, *Oimys subgen. nov.*, and *Ouchmys subgen. nov.*

All four species named herein are named based on Latin words used to describe a character state of each as outlined in each of the formal descriptions.

Due to the taxonomic rearrangement of the genus *Pseudomys* in this paper, being made to reflect the phylogenetic reality of the group, the taxon name *Ascopharynx fuscus* Jones, 1925, becomes a junior homonym of *Mastacomys fuscus* Thomas, 1882 and is therefore unavailable to be used in the ongoing genus level arrangement. The next available name for the relevant taxon is *Notomys fuscus eyreius* Finlayson, 1960 and so the relevant taxon is identified elsewhere in this paper as either *Pseudomys eyreius* (Finlayson, 1960) or *P. (Notomys) eyreius* (Finlayson, 1960).

The name *P. subrufus* (Krefft, 1862) is the correct nomen for the taxon widely known as *P. desertor* Troughton, 1932, which based on current (and accepted herein) taxonomic concepts is a junior synonym of the earlier name. There is no reasonable basis to reverse priority of names as it goes against all published versions of the *International Code of Zoological Nomenclature* and predecessors.

Reversing priority of scientific names is a recipe for nomenclatural anarchy and is something that should only be considered in extreme and unusual cases. This has been the position of the *International Commission of Zoological Nomenclature* (ICZN) since its inception. This is not the case for *P. subrufus* (Krefft, 1862).

CONSERVATION

In terms of conservation of each population of each subgenus or species as described below, the relevant comments in Hoser (1989, 1991, 1993, 1996, 2019a and 2019b) apply.

Wildlife laws as currently enforced in Australia, are not in a materially significant way enhancing the long-term survival prospects of any of the relevant species.

Over breeding of humans and the environmental problems associated with this overpopulation are by far the greatest long term threat to each and every relevant species, noting that already liberated feral pest species continue to cause ongoing stress and decline of some relevant species as explicitly detailed in Hoser (1991).

In line with the Australian Federal Government's "Big Australia"

policy, that being to increase the human population of 25 million (2020), from 13 million in around 1970, to over 100 million within 100 years "so that we can tell China what to do", as stated by the former Prime Minister, Kevin Rudd in 2019 (Zaczek 2019), the human pressure on the relevant ecosystems has increased in line with the human populations nearby and will clearly continue to do so.

EKMYS SUBGEN. NOV.

LSIDURN:LSID:ZOOBANK.ORG:ACT:FBBB6615-C09E-4735-B024-08DE041A7D07

Type species: *Pseudomys (Gyomys) occidentalis* Tate, 1951.

Diagnosis: The subgenus *Eekmys subgen. nov.* is monotypic for the Western Mouse *Pseudomys (Gyomys) occidentalis* Tate, 1951.

The subgenus *Gyomys* Thomas, 1910, type species: *Mus novaehollandiae* Waterhouse, 1843 is of a different and divergent lineage within *Pseudomys sensu lato*.

Eekmys subgen. nov. are readily separated from all other *Pseudomys* Gray, 1832 *sensu lato* by the following suite of characters: White paws, dorsum and sides with a mixture of dark grey and yellowish buff fur with black guard hairs. Venter is greyish-white. Head-body length is 90-110 mm (average of 97 mm), tail length is 120-140 (average 129) mm, weight 33-53 (average 34) grams, (derived from Strahan *et al.* 1988).

Distribution: Known only from small remnant bushland reserves in the Western Australian wheat belt.

Etymology: In 1980 I spent time with some local western Australian Aboriginals of the Noongar tribe, from the West Australian wheat belt.

When the women see this species they yell out the word "eek!" Hence the nomen "*Eekmys*".

Content: *Pseudomys (Eekmys) occidentalis* Tate, 1951.

FARKMYS SUBGEN. NOV.

LSIDURN:LSID:ZOOBANK.ORG:ACT:747DA097-195D-4530-882B-F2E303B25A8B

Type species: *Pseudomys australis oralis* Thomas, 1921.

Diagnosis: Rodents in the subgenus *Farkmys subgen. nov.* are separated from other species within *Pseudomys* Gray, 1832 *sensu lato* by the following suite of characters: Brownish-grey above and buff to greyish-white below. Separated from other rodents of similar size in eastern New South Wales and southern Queensland (where they are found) by having large protruberant eyes, a rounded snout with a "Roman Nose", distinctively white feet, with a slight pinkish tinge on the toes and a tail that is dark above and distinctively separate from the white furred underside. Palatal foramina 7-5. Upper molar series 6-7. Separated from species in the nominate subgenus *Pseudomys* Gray, 1832 by having a proportionately long skull as well as a long and narrow interorbital region that is sharply square edged. Palatal foramina is proportionately short, not or scarcely penetrating between the molars, versus reaching the middle of molar one in subgenus *Pseudomys*.

Further separated from *Pseudomys* and the other subgenera by having longer and softer hair and lacking a brownish tone to the underside.

Distribution: In recent geological times, the subgenus occurred from north-east Victoria, along the coast of New South Wales to the Sunshine Coast about 100 km north of Brisbane in Queensland, Australia. Molecular evidence suggests more than one identifiable lineage (Smitsen 2017), with one of these formally named in this paper.

Etymology: The putative species *P. oralis* was thought to be rare and so when I enlisted Birpai Aboriginal people to assist in finding the taxon near the Hastings River in New South Wales in the winter of 2019 the hunter yelled "fark" when he grabbed for one and it bit him. Hence the derived name "*Farkmys*".

Content: *Pseudomys (Farkmys) oralis* Thomas, 1921. (type species); *P. (Farkmys) albapes sp. nov.*

OHMYS SUBGEN. NOV.

LSIDURN:LSID:ZOOBANK.ORG:ACT:32ABDD3C-D0D0-4B15-8604-196EFA69463B

Type species: *Mus albocinereus* Gould, 1845.

Diagnosis: Members of the subgenus *Ohmys subgen. nov.* are readily separated from other members of *Pseudomys* Gray, 1832 *sensu lato* by the following suite of characters, being one or other of:

1/ Hairs soft and fine and 11-12 mm long on back. General colour is blue-grey, under surface is paler grey, the bases of the hairs slaty, the tips greyish-white. Ears are of medium length and greyish. Hands and feet are silvery white. The last hind sole pad is small and round. Tail is longer than head and body, pale brown above, white on the sides and below. Feet, ears and teeth of moderate size (*P. albocinereus* (Gould, 1845), *P. apodemoides* (Finlayson, 1932), *P. glaucus* (Thomas, 1910)), or:

2/ As above, except as follows: Hairs soft and fine and 14-15 mm long on back. Body pale silvery grey, grey, blue-grey or blackish, tail is similar to body in colour on top but with white lateral stripes. Belly is grey to white. Feet are pink with white fur. Feet, ears and teeth are of large size (*P. fumeus* (Brazenor, 1934), *P. griseorursus sp. nov.*, *P. pesrosea sp. nov.*).

Distribution: Hilly parts of Victoria and New South Wales.

Etymology: While hunting a rodent of this genus in the Grampian Ranges in Western Victoria, in late 2014 a member of the Jardwadjali Aboriginal tribe yelled "Oh" as he nearly trod on one by his foot. Hence the name "*Ohmys*".

Content: *P. (Ohmys) albocinereus* (Gould, 1845) (type species); *P. (Ohmys) apodemoides* (Finlayson, 1932); *P. (Ohmys) fumeus* (Brazenor, 1934); *P. (Ohmys) glaucus* (Thomas, 1910); *P. griseorursus sp. nov.*; *P. (Ohmys) pesrosea sp. nov.*

OIMYS SUBGEN. NOV.

LSIDURN:LSID:ZOOBANK.ORG:ACT:E99947D5-E8FE-4962-ACC7-D4228C165E45

Type species: *Mus shortridgei* Thomas, 1907.

Diagnosis: Members of the subgenus *Oimys subgen. nov.* are readily separated from other members of *Pseudomys* Gray, 1832 *sensu lato* by one or other of the following suites of characters:

Chestnut brown or reddish-grey brown above, greyish-white underneath. White upper lip and chin, pale orange eye ring. Tail is brown above and white on lower sides and below. The tail looks scaly with length equal to or shorter than the animal's head-body length. Feet and toes brown, except for toe tips that are whitish. Ears are covered with fine hairs (*P. subrufus* (Kreff, 1862)), or:

Larger species of *Pseudomys*, with a body mass in a range from 55 to 90 grams for an average weight of 70 grams. The head and body length of 95 to 120 millimeters and the tail length of 85 to 100 mm is always proportionally shorter than the body. The pelage is densely furred, grey-brown above and flecked with buff and black and the body is comparatively stocky. The tail is well covered in dark grey or brown hair at the upper side, being a whitish colour below and not annulated as seen in *Rattus Fischer*, 1803 species. There is a broad face and short muzzle, with bulging eyes. Rounded ears are 14 to 16 mm from the notch at the head. Ears are covered with fine hairs (*P. shortridgei* (Thomas, 1907), *P. pellicauda sp. nov.*).

Distribution: The historical (pre European settlement) range of the subgenus was probably drier parts of most of the southern two thirds of Australia, including much of Western Australia and all other mainland states with the possible exception of Queensland. Now, as far as is known the subgenus has an extant and very patchy distribution including south-west Victoria and central Australia, including northern South Australia and the south of the Northern Territory, south-west Western Australia and is not known to exist elsewhere.

Etymology: In 1996, I engaged an Aboriginal from the Bunganditj tribe to assist me in locating a species in this

subgenus in heath country in far south-west Victoria. We failed to find any. However I was advised that when they see these rodents they yell out "oi" to alert their friends. Hence the subgenus name "*Oimys*".

Content: *P. (Oimys) shortridgei* (Thomas, 1907) (type species); *P. (Oimys) subrufus* (Krefft, 1862); *P. (Oimys) pellicauda sp. nov.*

OUCHMYS SUBGEN. NOV.

LSIDURN:LSID:ZOOBANK.ORG:ACT:DE2A0C64-A0F4-4745-B2B8-C4A715C807DE

Type species: *Pseudomys chapmani* Kitchener, 1980.

Diagnosis: Mice in the subgenus *Ouchmys subgen. nov.*, type species: *Pseudomys chapmani* Kitchener, 1980 are commonly known as the Pebble-mound Mice in reflection of the nesting habits of the known species. Those species carry small stones and pebbles up to half their own weight in their mouths and arrange them in piles, shuffling them into position with their forelimbs. These are at the entrance of shallow burrows, which are sometimes plugged with the stones.

While similar in most respects to mice in the subgenus *Pseudomys* Gray, 1832 *sensu stricto*, species within the subgenus *Ouchmys subgen. nov.* are readily separated from those species (and the other subgenera) by their short tail, ears and feet, with the feet being no longer than 16 mm. Eye is of medium size. Within the subgenus *Gyomys* Thomas, 1910, the species *P. delicatulus* (Gould, 1842) is unusual in that it has similarly short feet.

Ouchmys subgen. nov. are further defined by being yellow-grey, brown or orange above and on the sides, head blackish-brown, paws brown overlain with white, white below, including the throat and upper rear edge of the mouth. Outer inner ear is grey or pink, depending on species and central inner ear is dark greyish pink or light pink. Long hairs are on the outer ear and minimal hair or none inside.

Distribution: Scattered hilly and rocky locations across the top third of Australia, with relevant known species separated by well-established known biogeographical barriers.

Etymology; When in the Pilbara of Western Australia in 1980, searching for Pilbara Death Adders *Acanthophis wellsii* Hoser, 1998, I painfully stubbed my toe on a pile of stones at the edge of a burrow of *P. chapmani* Kitchener, 1980, and screamed "Ouch". Hence the name "*Ouchmys*". The local Aboriginals and their heritage had been erased by European invaders, so I was not able to ascertain any Aboriginal name for the species. In 2020 a cave in the Juukan Gorge, was blown up by the Transnational Tax Avoiding Mining Corporation Rio Tinto. The cave contained 40,000 year old Aboriginal paintings (Wahlquist 2020).

Content: *P. (Ouchmys) chapmani* (Kitchener, 1980) (type species); *P. (Ouchmys) calabayi* (Kitchener and Humphreys, 1987); *P. (Ouchmys) johnsoni* (Kitchener, 1985); *P. (Ouchmys) patrius* (Thomas and Dollman, 1909).

PSEUDOMYS (FARKMYS) ALBAPES SP. NOV.

LSIDURN:LSID:ZOOBANK.ORG:ACT:18D94630-B4C4-4F0B-890C-F2D2A15C0EC1

Holotype: A preserved female specimen in the Queensland Museum, Brisbane, Queensland, Australia, specimen number JM10958 collected from Gambubal State Forest in south-east Queensland, Australia, Latitude -28.2297 S., Longitude 152.4272 E. This government-owned facility allows access to its holdings.

Paratype: A preserved female specimen in the Queensland Museum, Brisbane, Queensland, Australia, specimen number JM9994 collected from Gambubal State Forest in south-east Queensland, Australia, Latitude -28.25 S., Longitude 152.35 E.

Diagnosis: Until now, *P. albapes sp. nov.* has been treated as a northern population of the Hastings River Mouse, *P. oralis* Thomas, 1921 from northern New South Wales, generally north of the Hunter Valley in wetter areas. *P. albapes sp. nov.* occurs

from Washpool National Park in northern New South Wales, north along the coast and nearby highlands to the Sunshine Coast, roughly 100 km north of Brisbane in South-east Queensland.

Genetic studies have shown *P. albapes sp. nov.* to have species-level divergence from *P. oralis*.

The two species form the entirety of the subgenus *Farkmys subgen. nov.* and are morphologically similar.

P. oralis is separated from *P. albapes sp. nov.* by having strongly russet outer hairs in swathes across the upper body, versus not so in *P. albapes sp. nov.*. Under the eye of *P. oralis* is a semi-distinct patch of whitish hair. This patch is yellowish in *P. albapes sp. nov.*.

Rodents in the subgenus *Farkmys subgen. nov.* are separated from other species within *Pseudomys* Gray, 1832 *sensu lato* by the following suite of characters: Brownish-grey above and buff to greyish-white below. Separated from other rodents of similar size in eastern New South Wales and southern Queensland (where they are found) by having large protruberant eyes, a rounded snout with a "Roman Nose", distinctively white feet, with a slight pinkish tinge on the toes and a tail that is dark above and distinctively separate from the white furred underside. Palatal foramina 7-5, Upper molar series 6-7. Separated from species in the nominate subgenus *Pseudomys* Gray, 1832 by having a proportionately long skull, long and narrow interorbital region that is sharply square edged.

Palatal foramina is proportionately short, not or scarcely penetrating between the molars, versus reaching the middle of molar one in subgenus *Pseudomys*.

Further separated from *Pseudomys* and the other subgenera by having longer and softer hair and lacking a brownish tone to the underside.

P. albapes sp. nov. in life is depicted online at:

<https://www.bigvolcano.com.au/stories/mouse/index.html>

The type form of *P. oralis* from Mount Royal, NSW in life is depicted online at:

<https://www.flickr.com/photos/dougbeckers/3461154326/>

and at:

<https://www.flickr.com/photos/dougbeckers/3460327815/>

Distribution: *P. albapes sp. nov.* is known from Washpool National Park in northern New South Wales, north along the coast and nearby highlands to the Sunshine Coast, roughly 100 km north of Brisbane in South-east Queensland. The species *P. oralis* Thomas, 1921 is known from live specimens south of Washpool National Park in New South Wales, south to the Hunter Valley, with finds of subfossil remains attributed to this species extending south to north-east Victoria.

Etymology: The Latin words "*albapes*" refers to the pale or white feet in this species.

PSEUDOMYS (OHMYS) GRISEORURSUS SP. NOV.

LSIDURN:LSID:ZOOBANK.ORG:ACT:C49B3034-E109-4781-9421-9B07EF839157

Holotype: A preserved specimen at the Australian National Wildlife Collection, Canberra, ACT, Australia, specimen number: M13231 collected from the Brindabella Ranges, ACT, Australia, Latitude -35.32 S., Longitude 148.83 E. This government-owned facility allows access to its holdings.

Paratypes: Three preserved specimens at the Australian National Wildlife Collection, Canberra, ACT, Australia, specimen numbers: M28451, M28452 and M28453, all collected from Yarrangobilly Caves, Kosciuszko National Park River Walk, NSW, Australia, Latitude -35.7167 S., Longitude 148.5 E.

Diagnosis: Until now, *P. griseorursus sp. nov.* known from the Alpine regions of the Snowy Mountains in New South Wales with a second population in the Brindabella Ranges, west of the City of Canberra in the ACT and *P. pesrosea* from the central eastern Highlands of Victoria and the nearby east Gippsland coast as well as immediately adjacent areas of coastal New South Wales have been treated as eastern populations of the Smoky Mouse

P. fumeus (Brazenor, 1934) with a type locality of the Otway Ranges in south-west Victoria.

That more than one taxon has been lumped in this assemblage has been known for many years. For example Andrew Cockburn in Strahan *et al.* (1988) wrote:

"No formal subspecies have been described but the following types will ultimately warrant distinction on size, cranial and pelage characters: *Pseudomys fumeus* (Western form), west of Melbourne, now only known from the Grampian Ranges. Large more darkly coloured. *Pseudomys fumeus* (Eastern form) east of Melbourne, in sub-fossil deposits in New South Wales. Small, pale, grey."

The eastern populations also appear to be separated from one another by distribution and morphology and so are also split into two.

The three species *P. fumeus*, *P. griseorursus sp. nov.* and *P. pesrosea* are readily separated from one another as follows:

P. fumeus has dark brownish-grey fur and a light bluish-grey iris. Lightening of the jowls is not obvious. The entirety of the inner ear is orange. Average adult size is 90-100 mm, 120-145 mm tail length and 60-90 grams in weight.

P. griseorursus sp. nov. has silver grey fur and a dark iris. Lightening of the jowls is obvious and is not heavily peppered with black. The inner ear is brownish-grey at the outer edges and orange in the interior. Average adult size is 80-90 mm, 100-120 mm tail length and 40-70 grams in weight.

P. pesrosea has grey fur and a dark iris. On the snout between the eyes and the nose are numerous well-defined black tipped hairs. Lightening of the jowls is obvious and heavily peppered with black. The inner ear is brown at the outer edges and orange in the interior. Average adult size is 80-90 mm, 100-120 mm tail length and 40-70 grams in weight.

A photo of *P. fumeus* in life can be found online at:

<https://collections.museumsvictoria.com.au/species/8434>

A photo of *P. griseorursus sp. nov.* in life can be found at:

<https://www.environment.nsw.gov.au/news/endangered-kosciuszko-mouse-survives-fires>

A photo of *P. pesrosea sp. nov.* in life can be found at:

https://www.researchgate.net/figure/Smoky-Mouse-Pseudomys-fumeus-trapped-at-Mt-Terrible-May-2010-P-Menkhorst_fig1_323866907

and:

<https://www.ari.vic.gov.au/research/threatened-plants-and-animals/smoky-mice-movement-across-a-strategic-fuel-break>

Members of the subgenus *Ohmys subgen. nov.* are readily separated from other members of *Pseudomys* Gray, 1832 *sensu lato* by the following suite of characters, being one or other of:

1/ Hairs soft and fine and 11-12 mm long on back. General colour is blue-grey, under surface is paler grey, the bases of the hairs slaty, the tips greyish-white. Ears are of medium length and greyish. Hands and feet are silvery white. The last hind sole pad is small and round. Tail is longer than head and body, pale brown above, white on the sides and below. Feet, ears and teeth of moderate size (*P. albocinereus* (Gould, 1845), *P. apodemoides* (Finlayson, 1932), *P. glaucus* (Thomas, 1910)), or:

2/ As above, except as follows: Hairs soft and fine and 14-15 mm long on back. Body pale silvery grey, grey, blue-grey or blackish, tail is similar to body in colour on top but with white lateral stripes. Belly is grey to white. Feet are pink with white fur. Feet, ears and teeth are of large size (*P. fumeus* (Brazenor, 1934), *P. griseorursus sp. nov.*, *P. pesrosea sp. nov.*).

Distribution: *P. griseorursus sp. nov.* is known from the Alpine regions of the Snowy Mountains in New South Wales with a second population in the Brindabella Ranges, west of the City of Canberra in the ACT.

Etymology: The species name "*griseorursus*" is taken from the Latin meaning "grey back", which is a feature separating this taxon from the western form known as *P. fumeus* (Brazenor, 1934).

PSEUDOMYS (OHMYS) PESROSEA SP. NOV.

LSIDurn:lsid:zoobank.org:act:92514510-1789-437C-A9FD-8DE165556C7B

Holotype: A preserved male specimen at the National Museum of Victoria, Melbourne, Australia, specimen number C26821 collected from 22.7km east of Sheep Yard Flat on Howqua Track, at the Howqua River, in the highlands region of eastern Victoria, Australia, Latitude -37.17 S., Longitude 146.53 E. This government-owned facility allows access to its holdings.

Paratype: A preserved male specimen at the National Museum of Victoria, Melbourne, Australia, specimen number C19176 collected from 13 km south of Mount Howitt on Butcher Country Spur Track, in the highlands region of eastern Victoria, Australia, Latitude -37.3 S., Longitude 146.65 E.

Diagnosis: Until now, *P. griseorursus sp. nov.* known from the Alpine regions of the Snowy Mountains in New South Wales with a second population in the Brindabella Ranges, west of the City of Canberra in the ACT and *P. pesrosea* from the central eastern Highlands of Victoria and the nearby east Gippsland coast as well as immediately adjacent areas of coastal New South Wales have been treated as eastern populations of the Smoky Mouse *P. fumeus* (Brazenor, 1934) with a type locality of the Otway Ranges in south-west Victoria.

That more than one taxon has been lumped in this assemblage has been known for many years. For example Andrew Cockburn in Strahan *et al.* (1988) wrote:

"No formal subspecies have been described but the following types will ultimately warrant distinction on size, cranial and pelage characters: *Pseudomys fumeus* (Western form), west of Melbourne, now only known from the Grampian Ranges. Large more darkly coloured. *Pseudomys fumeus* (Eastern form) east of Melbourne, in sub-fossil deposits in New South Wales. Small, pale, grey."

The eastern populations also appear to be separated from one another by distribution and morphology and so are also split into two.

The three species *P. fumeus*, *P. griseorursus sp. nov.* and *P. pesrosea* are readily separated from one another as follows:

P. fumeus has dark brownish-grey fur and a light bluish-grey iris. Lightening of the jowls is not obvious. The entirety of the inner ear is orange. Average adult size is 90-100 mm, 120-145 mm tail length and 60-90 grams in weight.

P. griseorursus sp. nov. has silver grey fur and a dark iris. Lightening of the jowls is obvious and is not heavily peppered with black. The inner ear is brownish-grey at the outer edges and orange in the interior. Average adult size is 80-90 mm, 100-120 mm tail length and 40-70 grams in weight.

P. pesrosea has grey fur and a dark iris. On the snout between the eyes and the nose are numerous well-defined black tipped hairs. Lightening of the jowls is obvious and heavily peppered with black. The inner ear is brown at the outer edges and orange in the interior. Average adult size is 80-90 mm, 100-120 mm tail length and 40-70 grams in weight.

A photo of *P. fumeus* in life can be found online at:

<https://collections.museumsvictoria.com.au/species/8434>

A photo of *P. griseorursus sp. nov.* in life can be found at:

<https://www.environment.nsw.gov.au/news/endangered-kosciuszko-mouse-survives-fires>

A photo of *P. pesrosea sp. nov.* in life can be found at:

https://www.researchgate.net/figure/Smoky-Mouse-Pseudomys-fumeus-trapped-at-Mt-Terrible-May-2010-P-Menkhorst_fig1_323866907

and:

<https://www.ari.vic.gov.au/research/threatened-plants-and-animals/smoky-mice-movement-across-a-strategic-fuel-break>

Members of the subgenus *Ohmys subgen. nov.* are readily separated from other members of *Pseudomys* Gray, 1832 *sensu lato* by the following suite of characters, being one or other of:

1/ Hairs soft and fine and 11-12 mm long on back. General

colour is blue-grey, under surface is paler grey, the bases of the hairs slaty, the tips greyish-white. Ears are of medium length and greyish. Hands and feet are silvery white. The last hind sole pad is small and round. Tail is longer than head and body, pale brown above, white on the sides and below. Feet, ears and teeth of moderate size (*P. albocinereus* (Gould, 1845), *P. apodemoides* (Finlayson, 1932), *P. glaucus* (Thomas, 1910)), or: 2/ As above, except as follows: Hairs soft and fine and 14-15 mm long on back. Body pale silvery grey, grey, blue-grey or blackish, tail is similar to body in colour on top but with white lateral stripes. Belly is grey to white. Feet are pink with white fur. Feet, ears and teeth are of large size (*P. fumeus* (Brazenor, 1934), *P. griseorursus* sp. nov., *P. pesrosea* sp. nov.).

Distribution: *P. pesrosea* appears to be restricted to the central eastern Highlands of Victoria and the nearby east Gippsland coast as well as immediately adjacent areas of coastal New South Wales.

Etymology: The new species name “*pesrosea*” comes from the Latin meaning foot is pink.

PSEUDOMYS (OIMYS) PELLICAUDA SP. NOV.

LSIDURN:LSID:ZOOBANK.ORG:ACT:4681F91D-EC3F-4612-89A8-1BFC3F614681

Holotype: A preserved female specimen at the National Museum of Victoria, Melbourne, Australia, specimen number C24361 collected from 13.3 km north east of Dartmoor, Victoria, Australia, Latitude -37.83 S., Longitude 141.37 E.

This government-owned facility allows access to its holdings.

Paratype: A preserved female specimen (skin and skeleton) at the National Museum of Victoria, Melbourne, Australia, specimen number C16137 collected from 17 km west of Casterton, Victoria, Australia, Latitude -37.6 S., Longitude 141.2 E.

Diagnosis: Until now the species *P. pellicauda* known only from heathlands in far south-west Victoria and potentially immediately adjacent parts of far south-east South Australia, has been treated as an east Australian population of the Heath Rat *P. shortridgei* (Thomas, 1907) from south-west Australia.

Cooper *et al.* (2013) asserted eastern and western populations of putative *P. shortridgei* separated “following the last glacial just a few thousand years ago”.

However they also cited a mtDNA sequence divergence of about 2.6 per cent which contradicts their assertion.

Such divergence implies a separation of populations of about 1.3 MYA which for small rapidly evolving species such as mice is a species-level divergence.

Salinas *et al.* (2009) also wrote:

“As a result of these findings, we suggest that the heath mouse comprises two highly divergent (but genetically diverse) lineages and the aridity of the Nullarbor Plain has clearly been a barrier for dispersals since the early Pleistocene (~1.43 million years ago). The populations either side of the Nullarbor Plain are genetically differentiated and should be defined as separate Evolutionary Significant Units (ESUs).”

In other words they clearly need taxonomic recognition as done herein.

The two species are readily separated as follows: *P. shortridgei* has light brown fur on top, with dark grey peppering underneath, becoming greyish on the flanks and anterior snout. Outer inner ear is yellow.

By contrast *P. pellicauda* has dark brown fur on top, with darker brown peppering underneath and overall with a strong russet tinge. It also has noticeably darker brown fur on the head and snout (versus the body). Outer inner ear is brown.

A photo of *P. pellicauda* in life can be found online at: <https://www.flickr.com/photos/160417453>

A photo of *P. shortridgei* in life can be found online at: <https://www.agefotostock.com/age/en/Stock-Images/Rights-Managed/UIG-961-24-hrd00332>

Members of the subgenus *Oimys* subgen. nov. are readily separated from other members of *Pseudomys* Gray, 1832 *sensu lato* by one or other of the following suites of characters:

Chestnut brown or reddish-grey brown above, greyish-white underneath. White upper lip and chin, pale orange eye ring. Tail is brown above and white on lower sides and below. The tail looks scaly with length equal to or shorter than the animal's head-body length. Feet and toes brown, except for toe tips that are whitish. Ears are covered with fine hairs (*P. subrufus* (Kreff, 1862)), or:

Larger species of *Pseudomys*, with a body mass in a range from 55 to 90 grams for an average weight of 70 grams. The head and body length of 95 to 120 millimeters and the tail length of 85 to 100 mm is always proportionally shorter than the body. The pelage is densely furred, grey-brown above and flecked with buff and black and the body is comparatively stocky. The tail is well covered in dark grey or brown hair at the upper side, and a whitish colour below and not annulated as seen in *Rattus* Fischer, 1803 species. There is a broad face and short muzzle, with bulging eyes. Rounded ears are 14 to 16 mm from the notch at the head. Ears are covered with fine hairs (*P. shortridgei* (Thomas, 1907), *P. pellicauda* sp. nov.).

Distribution: The species *P. pellicauda* is known only from heathlands in far south-west Victoria and potentially immediately adjacent parts of far south-east South Australia.

In the recent geological past, both *P. pellicauda* and *P. shortridgei* had a wider distribution, straddling either side of the Nullarbor as detailed in Cooper *et al.* (2003).

Etymology: The new species name “*pellicauda*” literally means hairy tail.

PSEUDOMYS (OUCHMYS) JOHNSONI LUXAURIS SUBSP. NOV.

LSIDURN:LSID:ZOOBANK.ORG:ACT:39CE3A41-D0DF-46C9-BBF7-E910C8A13024

Holotype: A preserved female specimen in the Queensland Museum, Brisbane, Queensland, Australia, specimen number: JM10866 collected from Maronan Station, via Cloncurry, north-west Queensland, Latitude -21.1728 S., Longitude 140.9141 E. This government-owned facility allows access to its holdings.

Paratypes: Two preserved specimens in the Queensland Museum, Brisbane, Queensland, Australia, specimen numbers: JM10867 and JM10868 collected from Maronan Station, via Cloncurry, north-west Queensland, Latitude -21.1728 S., Longitude 140.9141 E, and one preserved specimen in the Queensland Museum, Brisbane, Queensland, Australia, specimen number: JM14557 collected from 7 km west of Cloncurry on the Barkley Highway, north-west Queensland, Latitude -20.7 S., Longitude 140.5 E.

Diagnosis: The taxon herein named as *Pseudomys johnsoni luxauris* subsp. nov. has been treated by mammalogists as either an eastern population of *P. johnsoni* Kitchener, 1985 (e.g. the type material records in the Qld Museum) or as an undescribed form (e.g. Start 1996).

Start (1996), wrote:

“An undescribed *Pseudomys* species builds pebble mounds in the Cloncurry - Mt Isa area of north-western Queensland. It is not *P. johnsoni*, as stated in van Dyck (1996) (van Dyck and Birch 1996, van Dyck personal communication).”

Ford (2003), similarly wrote:

“Populations of mice from the Mt Isa-Cloncurry region of western Queensland were initially thought to be *P. johnsoni* by Van Dyck (pers comm), but he later (van Dyck and Birch, 1996, Van Dyck 1997) regarded them as an undescribed species.”

It is clearly morphologically divergent from nominate *P. johnsoni* to be worthy of taxonomic recognition, especially in light of wide geographical discordance between the two populations.

Nominate *P. johnsoni* is a north-central Australian form, extending to Western Australia, while *P. johnsoni luxauris* subsp.

nov. is apparently confined to the elevated rocky region between Camooweal in the west and near Cloncurry in the East, all in Queensland. Between these areas is a large expanse of relatively flat black soil plains, which no doubt forms a barrier between movement between these areas for the relevant species.

P. johnsoni luxauris subsp. nov. is readily separated from all of nominate *P. johnsoni johnsoni*, treated herein as including *Pseudomys laborifex* Kitchener and Humphreys, 1986, from the Kimberley district of Western Australia), *P. chapmani* Kitchener, 1980 from the Pilbara in Western Australia as well as south of there, *P. calabayi* Kitchener and Humphreys, 1987 from near Darwin in the NT and hilly areas east of there, including the Arnhem Land Escarpment and *P. patrius* (Thomas and Dollman, 1909) from north-east Queensland by the following unique suite of characters: Orange fur, versus brown, grey or yellow in all other species, a dark beetroot brown iris and an inner ear that is light pink in colour, including the outer edges, versus not so in all other species except in putative *P. laborifex*.

Dark blackish grey peppering on the dorsum is prominent in *P. johnsoni luxauris subsp. nov.* due to the relatively light colour of the fur.

Hair on the forefeet of *P. johnsoni luxauris subsp. nov.* is whitish orange versus whitish or whitish grey in all other species.

Photos of *P. johnsoni luxauris subsp. nov.* in life can be found online at:

<https://www.flickr.com/photos/ryanfrancis/16974339001/>

and at:

<https://www.flickr.com/photos/ryanfrancis/16787825660/>

P. johnsoni occultatum subsp. nov. formally described below is a subspecies from the Victoria River District of the Northern Territory. It is separated from *P. johnsoni* and *P. laborifex* (as originally identified by the describers), as well as *P. johnsoni luxauris subsp. nov.* by the following suite of characters: Brownish fur on the dorsum versus yellowish brown in *P. laborifex* and brownish grey in nominate *P. johnsoni*. Inner ear is light orange with the outer areas having scattered grey peppering, versus absent in *P. laborifex* and an area of thick charcoal grey in the outer region of the inner ear in *P. johnsoni*.

Mice in the subgenus *Ouchmys subgen. nov.*, type species: *Pseudomys chapmani* Kitchener, 1980 (including all species mentioned previously in this description) are commonly known as the Pebble-mound Mice in reflection of the nesting habits of the known species. Those species carry small stones and pebbles up to half their own weight in their mouths and arrange them in piles, shuffling them into position with their forelimbs. These are at the entrance of shallow burrows, which are sometimes plugged with the stones.

While similar in most respects to mice in the subgenus *Pseudomys* Gray, 1832 *sensu stricto*, species within the subgenus *Ouchmys subgen. nov.* are readily separated from those species (and the other subgenera) by their short tail, ears and feet, with the feet being no longer than 16 mm. Eye is of medium size. Within the subgenus *Gyomys* Thomas, 1910, the species *P. delicatulus* (Gould, 1842) is unusual in that it has similarly short feet. *Ouchmys subgen. nov.* are further defined by being yellow-grey, brown or orange above and on the sides, head blackish-brown, paws brown overlain with white, white below, including the throat and upper rear edge of the mouth. Outer inner ear is grey or pink, depending on species and central inner ear is dark greyish pink or light pink. Long hairs are on the outer ear and minimal hair or none inside.

Distribution: *P. johnsoni luxauris* is apparently confined to the elevated rocky region between Camooweal in the west and near Cloncurry in the East, all in Queensland.

Etymology: The new subspecies name "*luxauris*" literally means "light ear" in reflection of that fact that this newly named subspecies is separated from the nominate species and other closely related species in the subgenus by the lighter colour of the inner ear.

PSEUDOMYS (OUCHMYS) JOHNSONI OCCULTATUM SUBSP. NOV.

LSIDURN:LSID:ZOOBANK.ORG:ACT:67791393-03E2-4ECB-B62B-36FB02698667

Holotype: A preserved specimen at the Museum and Art Gallery of the Northern Territory, Darwin. Northern Territory, Australia, specimen number: U4897 collected from the Wickham River in the Gregory National Park, Northern Territory, Latitude -16.6 S., Longitude 130.45 E. This government-owned facility allows access to its holdings.

Paratypes: Six preserved specimens at the Museum and Art Gallery of the Northern Territory, Darwin. Northern Territory, Australia, specimen numbers: U4898, U4899, U4900, U4901, U4902 and U4903 collected from the Wickham River in the Gregory National Park, Northern Territory, Latitude -16.6 S., Longitude 130.45 E.

Diagnosis: *P. johnsoni occultatum subsp. nov.* has until now been treated as a population of *P. johnsoni* Kitchener, 1985 or alternatively of *P. laborifex* Kitchener and Humphreys, 1986, a taxon since synonymised at the species level with *P. johnsoni* Kitchener, 1985 based on the findings of Ford (2003 and 2006). However all three of *P. johnsoni occultatum subsp. nov.*, nominate *P. johnsoni* and *P. laborifex* were shown by Ford to be three recently divergent lineages worthy of taxonomic recognition, leading to the formal description herein.

P. johnsoni occultatum subsp. nov. is separated from *P. johnsoni* and *P. laborifex* (as originally identified by the describers) by the following suite of characters: Brownish fur on the dorsum versus yellowish brown in *P. laborifex* and brownish grey in nominate *P. johnsoni*. Inner ear is light orange with the outer areas having scattered grey peppering, versus absent in *P. laborifex* and an area of thick charcoal grey in the outer region of the inner ear in *P. johnsoni*.

P. johnsoni luxauris subsp. nov. from the Cloncurry/Mount Isa area of Queensland is readily separated from all of nominate *P. johnsoni johnsoni*, treated herein as including *Pseudomys laborifex* Kitchener and Humphreys, 1986, from the Kimberley district of Western Australia and *P. johnsoni occultatum subsp. nov.* from north-west Northern Territory, *P. chapmani* Kitchener, 1980 from the Pilbara in Western Australia as well as south of there, *P. calabayi* Kitchener and Humphreys, 1987 from near Darwin in the NT and hilly areas east of there, including the Arnhem Land Escarpment and *P. patrius* (Thomas and Dollman, 1909) from north-east Queensland by the following unique suite of characters: Orange fur, versus brown, grey or yellow in all other species, a dark beetroot brown iris and an inner ear that is light pink in colour, including the outer edges, versus not so in all other species except in putative *P. laborifex*.

Dark blackish grey peppering on the dorsum is prominent in *P. johnsoni luxauris subsp. nov.* due to the relatively light colour of the fur.

Hair on the forefeet of *P. johnsoni luxauris subsp. nov.* is whitish orange versus whitish or whitish grey in all other species.

Photos of *P. johnsoni luxauris subsp. nov.* in life can be found online at:

<https://www.flickr.com/photos/ryanfrancis/16974339001/>

and at:

<https://www.flickr.com/photos/ryanfrancis/16787825660/>

Mice in the subgenus *Ouchmys subgen. nov.*, type species: *Pseudomys chapmani* Kitchener, 1980 (including all species mentioned previously in this description) are commonly known as the Pebble-mound Mice in reflection of the nesting habits of the known species. Those species carry small stones and pebbles up to half their own weight in their mouths and arrange them in piles, shuffling them into position with their forelimbs. These are at the entrance of shallow burrows, which are sometimes plugged with the stones.

While similar in most respects to mice in the subgenus *Pseudomys* Gray, 1832 *sensu stricto*, species within the

subgenus *Ouchmys subgen. nov.* are readily separated from those species (and the other subgenera) by their short tail, ears and feet, with the feet being no longer than 16 mm. Eye is of medium size. Within the subgenus *Gyomys* Thomas, 1910, the species *P. delicatulus* (Gould, 1842) is unusual in that it has similarly short feet.

Ouchmys subgen. nov. are further defined by being yellow-grey, brown or orange above and on the sides, head blackish-brown, paws brown overlain with white, white below, including the throat and upper rear edge of the mouth. Outer inner ear is grey or pink, depending on species and central inner ear is dark greyish pink or light pink. Long hairs are on the outer ear and minimal hair or none inside.

Distribution: *P. johnsoni occultatum subsp. nov.* are apparently confined to the Victoria River District of the Northern Territory.

Etymology: The new subspecies name "*occultatum*" comes from the Latin word meaning hidden. This taxon has been largely hidden from science until now, save for its initial identification as a separate and genetically distinctive lineage by Ford (2003).

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CONFLICTS OF INTEREST

None.

SPECIES LIST GENUS *PSEUDOMYS* GRAY, 1832 (BY SUBGENERA)

Pseudomys Gray, 1832.

P. australis Gray, 1832 (monotypic).

Notomys Lesson, 1842.

P. mitchelli (Ogilby, 1838) (type species).

P. alexis (Thomas, 1922)

P. aquilo (Thomas, 1921)

P. eyreius (Finlayson, 1960)

P. mordax (Thomas, 1922)

Mastacomys Thomas, 1882.

P. fuscus (Thomas, 1882) (monotypic).

Ascopharynx Waite, 1900.

P. cervinus (Gould, 1853) (type species).

P. amplus (Brazenor, 1936)

P. macrotis (Thomas, 1921)

P. longicaudatus (Gould, 1844)

Thetomys Thomas, 1910.

P. nanus (Gould, 1858) (type species).

P. gracilicaudatus (Gould, 1845)

Gyomys Thomas, 1910.

P. novaehollandiae (Waterhouse, 1843) (type species).

P. bolami (Troughton, 1932)

P. delicatulus (Gould, 1842)

P. fieldi (Waite, 1896)

P. hermannsburgensis (Waite, 1896)

P. higginsi (Trouessart, 1897)

P. pilligaensis Fox and Briscoe, 1980

P. praeconis (Thomas, 1910).

Eekmys subgen. nov.

P. occidentalis (Tate, 1951) (monotypic).

Farkmys subgen. nov.

P. oralis (Thomas, 1921) (type species)

P. albapes sp. nov.

Ohmys subgen. nov.

P. albocinereus (Gould, 1845) (type species)

P. apodemoides (Finlayson, 1932)

P. fumeus (Brazenor, 1934)

P. glaucus (Thomas, 1910)

P. griseorursus sp. nov.

P. pesrosea sp. nov.

Oimys subgen. nov.

P. shortridgei (Thomas, 1907) (type species).

P. subrufus (Kreff, 1862)

P. pellicauda sp. nov.

Ouchmys subgen. nov.

P. chapmani (Kitchener, 1980) (type species).

P. calabayi (Kitchener and Humphreys, 1987)

P. johnsoni (Kitchener, 1985)

P. patrius (Thomas and Dollman, 1909)

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