

Tropical Topics

An interpretive newsletter for the tourism industry



Rodents of the Wet Tropics

No. 46 April 1998

Notes from the Editor

Rats have an image problem. Unfortunately just a few species, which carry disease and damage human property, have given the whole family a bad name. So what use are they?

Rodents play an important role in the environment. Primarily, they provide good snacks, featuring on the menus of owls, pythons, quolls and other animals. Also, although they eat large numbers of seeds (try to find an unopened and unrobbed candlenut seed on the forest floor!) they also serve to disperse seeds as well as fungal spores.

From the human point of view, although rats and mice do not appeal to everyone as pets, as laboratory animals they have played a very important role in everything from medical to cosmetic testing.

I would like to thank Steve Van Dyck (Queensland Museum), Nigel Tucker (DoE), Andrew Brody (BSES), Steve Comport (CSIRO) and Mike Trenerry (DoE) for their help with this issue.

Please note

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The cane, the rats, the trees and the owls

Cane growers do not like rats. Rodents destroy or damage up to \$9 million worth of sugarcane a year, while farmers spend a further \$600 000 on rat bait in an attempt to control them. Two native species, the canefield rat and the grassland melomys (also known as Burton's climbing rat) do most of the damage. Grassland dwellers and nibblers by nature, they have found the abundance of sugary cane which has replaced native forests on the Queensland coast very much to their liking.



A diet of cane alone, however, is not enough to sustain these rats. They prefer grassy and weedy areas that provide shelter as well as protein-rich grass seeds, essential for breeding. The average canefield, with its grassy margins, is ideal for these rats.

Traditionally, cane farmers have tackled their rat problems with poisons — bait in the canefields themselves and herbicides on the grasses which harbour the rats but where it is illegal to use the baits. This is costly, time consuming and environmentally undesirable — poisoned rats become easy prey for predators such as owls, pythons and goannas which in turn ingest the toxins. Herbicides near water can poison frogs and aquatic life.

In 1994, an alternative approach to the rat problem was trialled in the Tully and Miriwinni areas. A co-operative DoE and Bureau of Sugar Research Stations (BSES) project, it involved planting sections of creek banks, on the borders of canefields, with native trees. As the trees grew and spread their canopies, cutting out the light, the grasses below died away. The results were dramatic.

Within six months, the rats had disappeared

from one area and been reduced by 80 percent in another.

Enthusiasm for this rat control method is spreading. Instead of repeatedly spraying or slashing grasses and weeds, a one-off planting followed by short-term maintenance provides a long-term solution. The tree species are carefully selected so as not to shade the cane or interfere with equipment. Cabinet timbers and bush foods are being planted in some places for future economic reward.

Naturally, the environment also benefits. Stream health improves as erosion and choking weeds are reduced. Vegetated corridors, particularly along connecting creeks, provide important cover, food and safe travel routes for rainforest wildlife, such as the cassowary. The trees also attract owls. Able to eat four or five rats each night, an owl is a farmer's friend — but clearing and poisoning has drastically reduced their numbers. Now, they are being given a helping hand. New trees are still too young to provide perches and nesting hollows so, in the meantime, artificial ones are being installed.

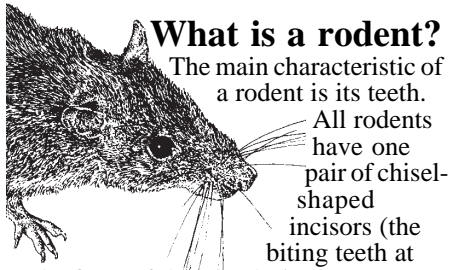
This approach to the rat problem — reducing their numbers by natural methods — results in all-round benefits, for the farmer and the environment.



WET TROPICS
MANAGEMENT AUTHORITY



Department
of Environment



What is a rodent?

The main characteristic of a rodent is its teeth. All rodents have one pair of chisel-shaped incisors (the biting teeth at the front of the mouth) in the upper and lower jaws. The front surface of each is covered with a very hard enamel while the back surface is softer dentine, so as the animal chews on hard nuts and other plant material the backs are worn down faster than the fronts, maintaining a constantly sharp surface. These teeth grow continually throughout the animal's life and must be continually worn down. If a rodent is unable to gnaw, the teeth may eventually grow around into its face and kill the animal.

At the back of a rodent's mouth, separated from the incisors by a gap, are pairs of molars which are used to grind food.

Rats from outside the ranks (the introduced ones)

The **black rat** (*Rattus rattus*) probably arrived with the First Fleet and is the species which carries plague (at least its fleas do), Weil's disease* and salmonella. It is the one running rave parties in the rafters, eating holes in your walls, raiding your fruit basket, scuttling from your compost, sneaking in under the door and sliding down your banisters. Phenomenally successful at reproducing, a female can give birth to 60-100 young in one year. Fortunately this rat, which originated in South-East Asia and was introduced to Europe in the 13th century, does not seem to have displaced native rat species. Instead, it has moved in where they are not present, particularly around human habitation.

Black rats differ from brown rats (*R. norvegicus*) which are found mainly around urban centres in Australia and not in the Wet Tropics. Black rats are sleeker, with larger ears and longer tails, and are less aggressive and better climbers. *Other rats, notably the canefield rat, also carry Weil's disease.

The **house mouse** (*Mus musculus*) occurs in every part of Australia. In fact, next to humans, it is the most widespread mammal species on the planet, having even hitched a ride and set up home in Antarctic bases. Mice can live, and breed, in refrigerators at -10deg. as well as in metal containers in 40deg. heat.

Every four years or so, plagues of mice occur in grain-growing areas. In northern Australia, however, where there is more native competition and the wet humid climate is not especially to their liking, they are found mainly around human habitation.



The water-rat and the delicate mouse.

Biggest and smallest

Vying for top position, the giant white-tailed rat, water-rat and black-footed tree-rat can all weigh up to 1kg with some male water-rats tipping the scales above that. By contrast, an adult delicate mouse can weigh as little as 6g. The black rat generally weighs under 300g.

What's in a name?

Perhaps our native rats would be more acceptable if they were known by other names. Melomys, which is commonly used, sounds much more attractive than 'climbing rat' so perhaps a tourist encountering a giant white-tailed rat for the first time is more likely to appreciate the unique nature of this animal if introduced to it as a 'uromys'.

Recent migrants

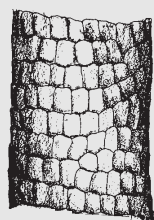
In this, the land of marsupials, it is perhaps surprising that about one-quarter of all native mammal species are rodents. Nevertheless, Australian rodent species comprise only about four percent of the world's total. This lack of diversity in Australia is undoubtedly due to their relatively recent arrival (and a measure of how very successful this group has been elsewhere in the world). Of the 24 rodent families in the world only one (Muridae) is found in Australia and of the 16 subfamilies found in this family only two (Hydromyinae and Murinae) are Australian.

Although the finding of a 115 million-year-old placental fossil in Victoria threatens theories about the spread

of non-marsupials into Australia, rodents have long been considered newcomers. They are believed to have reached first New Guinea and then Australia, from Indonesia, on rafts of vegetation or as falling sea levels during Ice Ages presented them with land bridges. Fossil evidence indicates that one group arrived in Australia about four million years ago. Most native rats and mice belong to this group, known as the 'old endemics'. The 'true' rats — the 'new endemics' — arrived along the same route less than one million years ago. Apart from bats, marine mammals and humans, rodents were the only placental representatives in Australia until the dingo made its appearance 3500-5000 years ago.

The old endemic group (Hydromyinae), with over 50 members in Australia, is the largest of the two subfamilies. Most common representatives in the Wet Tropics are the melomys, white-tailed rats, prehensile-tailed rat and water-rat.

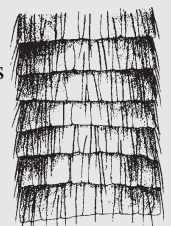
The new endemic group (Murinae), the 'true' rats, is considered the most successful rodent group with over 400 representatives worldwide. However, in Australia, where they are such recent arrivals, there are only 11 species, seven of them native. Of these seven, five are found in the Wet Tropics. The four introduced species also belong to this group; two of these now inhabit the Wet Tropics (see above).



Tail of giant white-tailed rat (*Uromys caudimaculatus*)

Tails tell tales

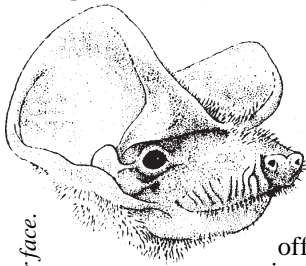
In the Wet Tropics, most common rats are either new endemic 'true' rats (*Rattus* spp) or belong to just one of the old endemic groups (Uromyini) which includes the white-tailed rats (*Uromys*) and melomys. These are known as the mosaic-tailed rats. This is because the individual scales on their tails are arranged in an interlocking pattern, with very little overlap, rather like tiles in a mosaic. By contrast, the scales on the tails of other rats overlap, giving a less smooth appearance, and are arranged in a more ring-like pattern. The tails of mosaic-tailed rats appear naked, while those of *Rattus* have visible hairs.



Tail of bush rat (*Rattus fuscipes*)

Illustrations courtesy Queensland Museum

Out and about



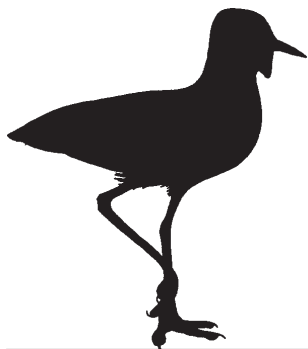
The northern freetail bat has a similar face.

When wildlife officers in the Department of Environment office in Cairns received a call about an injured 'white bat', they were sceptical. However, when they arrived to rescue the animal they were astonished to find an insectivorous bat with pure white fur, white skin and pink eyes (looking not unlike a winged white mouse).



Normally this type of bat, a **little northern freetail** (*Mormopterus loriae*) has dark brown fur and skin but this animal appeared to be a pure albino. The greatest surprise is that it was not picked off by predators long ago, although it seemed to have received some unwelcome attention, since it was found with a scratch under its wing. However, it was still young — about two months old. Whether it will live its full five years or so is doubtful. Albino bats are not unknown, but very rarely seen.

The next day another wildlife officer spotted an **albino masked lapwing** on the Yorkey's Knob road, north of Cairns. The bird was almost completely white except for a black cap and black primary and secondary flight feathers which were only visible when it took to the wing. Its legs were bright red, in contrast to the duller (reddish purple) legs of more normal birds and it had the usual yellow wattles around the face. The bird appeared to be paired with another, quite normal, lapwing.



Shell vine (*Connarus conchocarpus*) is one of the woody lianes of wet tropics rainforests. Its bright pink to red fruit have started dropping, and will continue to appear on the forest floor over the next couple of months. When mature they split open showing a dark seed with a small fleshy yellow aril. However, they are sometimes opened beforehand by sulphur-crested cockatoos, presumably because of competition from other birds.

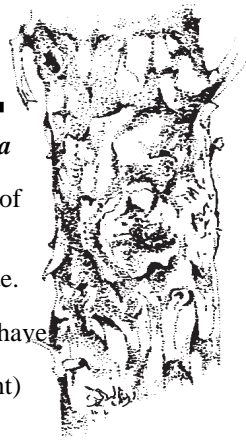
You can now visit the **EPA web site**, located on <http://www.epa.qld.gov.au>.



www.epa.qld.gov.au

A variety of headings can be found on the Home page, including *national parks, protecting the environment, recreation, cultural heritage, plants and animals, for schools, science and research, coasts and oceans and business and industry*. There are special features called *Things that go bump in the night* (on nocturnal creatures in Queensland), *Something in the air* (on air quality monitoring in Brisbane) and the *Naturally Queensland Information Centre*. The site is constantly being added to and has links within the site and to relevant outside organisations.

The name *Melaleuca* has an interesting origin. It is made up of the Greek *melanos* meaning black and *leucos* meaning white. The first species described is said to have had white branches against a black (burnt) trunk.



On a wormy note (a follow-up from *Tropical Topics 45*), scientists studying the Pompeii worm from deep sea hydrothermal vents in the eastern Pacific have found that it regularly experiences temperatures above 80deg.

In February a tour operator in the Daintree area, noticing an animal hobbling along the side of the road, stopped to pick it up. It turned out to be a baby **Bennett's tree-kangaroo**, about seven months old. Injured and fly-blown, covered in mites and suffering from pneumonia and dehydration, the little animal was sent to a Far North Queensland Wildlife Rescue Association carer in Cairns. With devoted 24-hours-a-day attention the little tree-kangaroo, a male, recovered from its injuries and is now doing well. His weight has increased from 800g to over 1350g and he is climbing trees and eating leaves. Because baby tree-roos generally stay with their mothers for two years, it will be over a year before he is introduced back to the wild.



The little tree-roo with his carer, Joy Underwood. Notice his very long tail.

If you find injured or orphaned wildlife please call the Association on 4053 4467

Rodents of the Wet Tropics

Mosaic-tailed rats

Apart from their mosaic tails, members of this group are also equipped with broad hind feet and are good climbers, using their partially prehensile (grasping) tails to assist them. They are often found in trees. *Uromys* have 46 main chromosomes whereas *melomys* have 48.



Giant white-tailed rat

(*Uromys caudimaculatus*)

The giant white-tailed rat is well named. Weighing up to a kilo (about the same as a lemuroid possum or small cat) it is one of the largest rodents in Australia — and the end of its tail, at least a third, is pure white. It sometimes looks as if it has been dipped in toothpaste.

This rat is the Wet Tropics rainforest rat. It is found only in the tropics (at all altitudes) from just south of Townsville to the tip of Cape York (and in New Guinea). It is found mainly in rainforests but also in nearby woodland, melaleuca swamps and mangrove forests.

If you hear loud cracking, gnawing and chewing noises in the forest at night, the source is likely to be this rat. Its formidably strong teeth and jaws (all too familiar to unwary researchers) are capable of breaking into even the hardest-shelled rainforest fruit such as yellow walnut, (*Beilschmiedia bancroftii*) and the stone-like Kuranda quandong (*Elaeocarpus bancroftii*). Coconuts are another favourite as are mud crabs. Nothing is safe once it has attracted the

attention of a giant white-tailed rat; it can gnaw its way into tin cans and has a reputation for being able to 'read' the labels, showing a preference for condensed milk, beer and baked beans. It can also, apparently, unscrew the lid of a jam jar to reach the contents.

Placing attractive items at a height is no guarantee of safety. This rat is a good climber and spends much of its time clambering around in trees helping itself to nuts and fruits before they fall and attract competition from other foragers on the rainforest floor. To climb it hangs on with its forefeet and propels itself with very powerful hindlegs, a manner reminiscent of tree-kangaroos.

Apart from fruits, the giant white-tailed rat is fond of small reptiles, frogs, crustaceans, birds' eggs and insects; it tears open rotten logs, in the manner of a striped possum, in search of passalid beetles. It also eats large amounts of fungi and truffles and because of this may play an important part in forest ecology. Some trees depend on certain underground fungi. Attaching themselves to the tree roots, the fungi transfer nutrients and water from the soil to the trees, taking, in return, sugars from their hosts. Both benefit, some trees unable to survive without the fungi, so dispersal of their

spores is essential for a healthy forest. Large amounts of spores have been found in the guts of giant white-tailed rats and are known to remain there for up to 50 hours. Since radio-tracking of rats has shown that they can move up to 1000m in one night, across a variety of habitats, these animals, therefore, have the potential to be very important fungal dispersers.

Giant white-tailed rats also disperse fruit and seeds, carrying them up to 60m from the parent tree, burying them and covering them with leaves (sometimes weighed down with a stick). Although the rats have a good sense of smell and usually eat the hidden seeds eventually, it is likely that some escape detection and proceed to germinate. There are, after all, plenty of candlenut trees in the forest in spite of the rats' liking for the seeds.

During the day, giant white-tailed rats sleep in tree hollows or burrows under logs, in stream banks and so on. They breed during the wet season with newly-independent youngsters appearing at about this time of year.

When alarmed, the giant white-tailed rat produces an intense and harsh call. Its low pitch is said to be lower, by about an octave, in those rats from the Townsville area than those from Cairns!

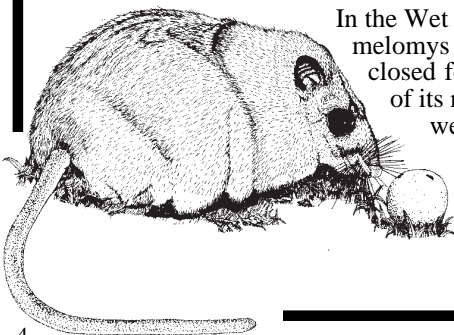
Melomys means 'Melanesian mouse' because many species are found in New Guinea and nearby islands. Apart from their mosaic tails and broad feet, they are characterised by very large eyes, thick necks and heads which are less pointed than those of true rats.

There are three species of melomys on mainland Australia. All three are very similar, but live separately. Although the Cape York melomys is externally identical to the fawn-footed melomys, and distinguished by differences only in the skull and blood proteins, it lives only on Cape York, north of Princess Charlotte Bay (and offshore islands). The fawn-footed melomys is found only south from Princess Charlotte Bay, its range extending into NSW. The grassland melomys (which is slightly smaller and has different molars to the other two species) is found in both regions but, as its name suggests, it prefers grassland to closed forest.

Fawn-footed melomys (*Melomys cervinipes*)

Next to the giant white-tailed rat, the fawn-footed melomys is the most common rodent in Wet Tropics rainforests. It is generally dull reddish brown, although it varies considerably between light orange to dark grey-brown on the back, with a paler underside and a long, brown tail. Like the white-tailed rat, it is a good climber, using vines when moving up tree trunks and scampering along branches to find the leaves and fruits on which it feeds. It also nests in trees and shrubs, at least two metres from the ground. The young melomys cling on to their mother's teats and are dragged along in this way, particularly if the mother has to flee from a predator. Presumably, for an animal which nests in trees, this is essential to prevent the young from falling.

In the Wet Tropics, the fawn-footed melomys is seldom found outside closed forest, (towards the south of its range it is also found in wetter open forests and even in coastal mangrove forests). It sometimes ventures into canefields which are close to forest.



Grassland melomys

(*Melomys burtoni*)

Like the very similar fawn-footed melomys, the grassland melomys varies a great deal in colour and has actually been identified at various times as eight different species. Unsurprisingly, it lives in open grassland as well as in open woodland with a grassy understorey. It can be found on the edge of rainforest and in grassy clearings and tracks within it. The fawn-footed melomys may be living a short distance away, in the forest, but the two would rarely encounter each other.

Although this rodent is one of the most common of the tropical coast, it was not recorded from Queensland until 1916. Now it is well-known, not least in the canefields where it is considered a pest. It tends to chew the cane both at ground level and also, because it is a good climber, higher up. This allows entry to bacteria and fungi, which reduce the sugar content, and causes the canes to snap — which does not endear it to the cane farmer. Apart from plant stems and grass seeds, this melomys also eats fruit (including, sometimes, bananas) as well as insects, notably grasshoppers.

Rounded nests, which are built above the ground in grass, tree hollows or even on the forest floor, are built from grasses, leaves, pandanus fronds or bark.



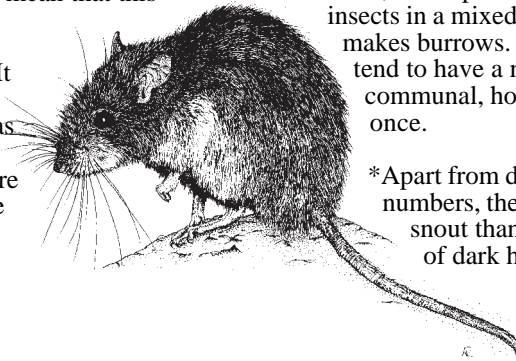
'True' rats

Comparative newcomers to Australia, 'true' rats of the *Rattus* tribe are generally ground dwelling. A few species are common in the Wet Tropics.

Bush rat (*Rattus fuscipes*)

There are four subspecies of this rat in Australia, each separated from the other by large distances. Some are able to inhabit relatively dry areas, with one subspecies even burrowing under the snow of subalpine areas of Victoria in winter. The Wet Tropics one (*Rattus fuscipes coracius*), however, sticks to dense rainforest where it depends on undergrowth, ground leaf litter, decaying logs and friable soil for cover. Although it is fairly common, its liking for dense cover, its habit of burrowing into the soil, its tendency to avoid human habitation and nocturnal habits mean that this rat is not often seen.

The bush rat has a varied diet. It eats a large quantity of insects, particularly in summer, as well as fruit, seeds, fibrous plants and fungi. Bush rats in captivity were observed to kill and eat a house mouse which had the bad judgement to wander into their cage.



Cape York rat (*Rattus leucopus*)

In Australia, the Cape York rat lives in two areas, from the tip of Cape York to the McIlwraith Range and in the Wet Tropics. Here it crosses paths with the bush rat which it closely resembles in both appearance* and requirements. The Cape York rat seems to prefer warmer temperatures and is not found at high altitudes in the south whereas the bush rat, which is more cool-adapted, is not found in the warm lowlands north of the Daintree River. However, even in the large areas where they two species' habitats overlap, such as on the Atherton Tablelands, researchers trapping for small mammals rarely find them together. One or other seems to dominate a patch of forest, possibly excluding the other when it has become established.

Like the bush rat, the Cape York rat includes large amounts of insects in a mixed diet, forages on the forest floor and makes burrows. With interconnecting chambers, these tend to have a number of entrances and may be communal, housing several adults and juveniles at once.

*Apart from differences in the skull and teat numbers, the Cape York rat has a more pointed snout than the bush rat and, sometimes, a ring of dark hairs around the eyes.

Canefield rat (*Rattus sordidus*)

This rat has a dark coat with a grey belly, a dark tail and a short-limbed appearance. Like the grassland melomys, it inhabits tropical grasslands, feeding on the stems and seed, as well as insects. It can be found in forests wherever an open canopy allows grass to grow. Although never found in rainforest, it is abundant in the grassy margins.

To create its grass-lined nest chamber this rat tunnels into moist soil. A colonial species, as many as 23 individuals may share one chamber and large populations can produce networks of interconnecting burrows over extensive areas; in an area 16x130 metres a total of 1,051 functioning burrow openings and 2,300 unused openings were counted. Sometimes the entire area of top soil is turned over.

This is one of the most prolific native rats; a young female is able to produce a litter of six when only 12 weeks old. As a result it is abundant throughout the Wet Tropics.

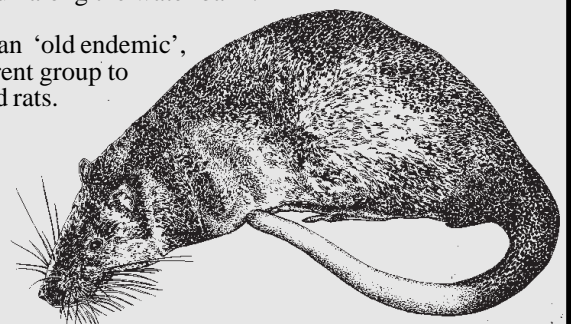
Water-rat (*Hydromys chrysogaster*)

This is a very unusual rat. Apart from the platypus, it is the only semi-aquatic mammal in Australia and behaves more like an otter or a mink than a rat. It is possible that most marsupials are not found in water because their pouches would get flooded. Therefore, when water rats first arrived in Australia, from Asia and New Guinea, they found an almost empty niche. They now inhabit most of Queensland as well as other states, using fresh as well as brackish water and often appearing on marine beaches.

With luxuriant, thick, water-repellent fur and large partially-webbed hindfeet which act as paddles, this very large rat is well-adapted to a life in or next to water. It dives to catch yabbies and other crustaceans, fish and mussels. It also eats frogs, birds' eggs, snails, turtles and even fully-grown water-birds, bats and house mice. It can even survive a feast of cane toads whose disembowelled corpses sometimes litter the side of ponds frequented by this lively predator. Interestingly, a water-rat's molar teeth are smoother than those of other rats. Like the grinding pads of the platypus mouth these are useful for crushing hard bodies of aquatic invertebrates, such as yabbies.

Unusually for an Australian rodent the water-rat is not entirely nocturnal and can be seen in the morning and evening, surfacing and diving in a manner similar to that of a platypus. The white tip to its thickly furred tail (and lack of beak) distinguish the water-rat as well as its unplatypus-like tendency to emerge from the water to eat its food and to run along the water bank.

The water-rat is an 'old endemic', but from a different group to the mosaic-tailed rats.



Questions & Answers

Q Following the wonderful rains, I've noticed masses of small brown toads hopping around. If I knew, for certain, they were cane toads, I'd be annihilating them! Do we have toads native to North Queensland? If not, may I presume that all brown toads are cane toads and kill them?

A There are no native toads in Australia. Some frogs look like toads but none of them can be seen in daylight and none swarm like toads (and toadpoles). The red-groined toadlet (*Uperoleia mimula*) (actually a frog) does not grow to more than 2cm in length and has red groins. The ornate burrowing frog (*Limnodynastes ornatus*), which is brown and superficially toad-like has moist smooth skin, never dry skin like a toad, and a white belly. Toads have grey marks on their bellies.

Although annihilating the toads may make you feel better, it is unlikely to make much difference. Very few of those thousands of toadlets are going to survive to adulthood but with females laying up to 90 000 eggs a year there are still plenty to carry on the name!

Q How many types of native bees live in the rainforests and what is known about them?

A Very few native bees have been studied in Queensland's Wet Tropics, mainly because of problems associated with identification, and information is limited. However, there are thought to be at least 141 species (34 genera, 6 families) of native bees within the Wet Tropics World Heritage Area — about 9 percent of the estimated 1,500 species occurring in Australia. About 19 percent of these species apparently only occur in rainforest, 40 percent in both rainforest and open sclerophyll forest, 32 percent in open forest and woodlands and 9 percent in all habitats.

Native bees rely on pollen, nectar and, in a few groups, oils, from the flowers they visit. Most species appear to gather food from a wide range of plants while others are restricted to a few species of related flowers. Some plants rely on individual species of native bees for pollination.

Only the stingless bee *Trigona carbonaria* has been studied in any detail. This bee forms large colonies of up to 10,000 individuals. It is able to identify the best available food sources and to communicate the direction of a preferred food source to nestmates. This native bee is also an important pollinator of native plants.

The fossil record indicates that all major bee families existed 40 million years ago, with the oldest an 80-million-year-old stingless social bee. Bees probably originated at least 120 million years ago - fossil flowers from the time show features associated with pollination by bees.

Bees and flowering plants probably evolved together. Therefore, when we observe interactions between native bees and their environment today, we can compare it with looking through a window at an event which occurred millions of years ago. The original participants may have long ago disappeared, but some of the major interactions they participated in still occur.

Acknowledgements to Tad Bartreau who is currently studying native bee biology and ecology with a focus on the stingless social bees of the genus *Austroplebia* and *Trigona*.

For more information on native bees: Cardale, J.C. (1993). Hymenoptera: Apoidea. In Houston, W.W.K. & Maynard, G.V. (eds) Zoological Catalogue of Australia. Canberra: AGPS Volume 10.

Facts and stats on rodents

Over half of all mammal species are rodents — worldwide about 2000 species have been described. The group includes squirrels, porcupines, beavers, agoutis and, at 50kg the largest of all, the capybara of Central America.

In Australia, there are over 60 species of native rodents. Only four species have been introduced.

Mice are simply small rats. There is no other distinction.

Of Australian rodents, seven species are regarded as extinct, another five are classified as endangered and seven as vulnerable.

There are two races of giant white-tailed rats in Australia, one in the Iron and McIlwraith Ranges and the other in the Wet Tropics between Cooktown and Townsville. The differences lie in their chromosomes but they can interbreed.

When the ship HMS Bramble landed on the cay named after it, in 1845, it was recorded that, "on capsizing (over 60 empty turtle shells which had been left at the end of the cay) numbers of large rats made their escape from beneath them, and our people, who (being Sunday) had an afternoon's leave on shore to collect eggs for their messes, amused themselves with shooting them with the bows and arrows they had obtained from the natives of Erub!"

Of 10 000 small mammals trapped in sites in the Wet Tropics over a period of 10 years, 98 percent were rats. In terms of biomass — mass of living material — they probably outweigh all other groups of rainforest vertebrates, including birds, bats, marsupials and reptiles.

Rodents are among the few animals which seem to benefit from clearing, 25 percent more being found in forest fragments than in large forest areas. Possibly there are fewer predators and possibly the rats find more food as they move between forest and pasture.

Although we regard some of our rats as giants, in New Guinea the black-eared giant rat (*Mallomys rothschildi*) can have a body and head longer than 400mm and weigh up to 2kg.

The last outbreak of plague in Australia was in 1923.

Tourist talk

ENGLISH	GERMAN	JAPANESE
rodent	Nagetier	齧齒目の
rat	Ratte	鼠
mouse	Maus	小鼠
incisor	Schneidezahn	門齒
owl	Eule	ふくろう
sugarcane	Zuckerrohr	砂糖きび
grassland	Grasland	草原
native (adj)	einheimisch	自生
tail	Schwanz	尻尾
to climb	klettern	登る

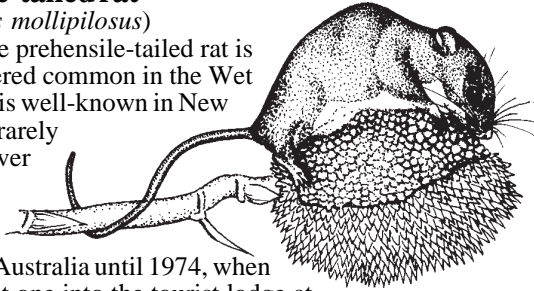
The rare, the marginal and the secretive

Some rodents in the Wet Tropics are not often seen — but are of great interest nonetheless.

Prehensile-tailed rat

(*Pogonomys mollipilosus*)

Although the prehensile-tailed rat is now considered common in the Wet Tropics and is well-known in New Guinea, it is rarely seen and never enters traps. In fact, it was not recorded in Australia until 1974, when a cat brought one into the tourist lodge at Lake Barrine on the Atherton Tablelands. Since then many more have been seen, sadly, all too often in the possession of cats, but some have also been observed in the wild. Their remains are also frequently found in owl pellets.



This rat is roughly the same size as the fawn-footed melomys, which shares the same habitat. The prehensile-tailed rat is distinguished by its pure white belly which is sharply divided from its grey-brown upperparts and its dark eye-rings. It also has soft fur and a long tail which has an unusual area of tough naked skin on the upper surface of the tip. The tail is more rectangular than round in cross-section and can bend so that the *upper* surface is twirled around a support. Most animals with prehensile tails use the *lower* surface for grip.

This rat, although it lives in colonial burrows in the ground, spends its nights in understorey and trees, climbing with the aid of its tail and feeding on leaves and fruits. Included among the latter are pandanus, figs and bananas. It is a rainforest-dweller, and apart from the Wet Tropics, is found also in Iron Range.

The masked white-tailed rat (*Uromys hadrourus*)

Following its discovery in 1973, this animal was known as the Thornton Peak melomys, after the mountain on which it was found. Only recently were its similarities to the *Uromys* side of the mosaic-tailed tribe recognised and both its common and scientific names changed accordingly.

Although more like a large melomys in size, it actually resembles a small giant white-tailed rat in appearance and can be confused with the young of that species. Little is known about this animal but it seems to spend at least part of its time foraging on the rainforest floor. Like its larger cousin, it can break into hard-shelled forest fruits and has a liking for passalid beetles, found in rotting logs.

In recent years, more masked white-tailed rats have been found on Mt Carbine, Mt Lewis and the Lamins Hill area of the Atherton Tablelands. Since it is found nowhere else in the world, this species is therefore endemic to the Wet Tropics — the only rodent with that status.

Bramble Cay melomys (*Melomys rubicola*)

The only known home of this melomys measures just 340m by 150m — a sand cay at the northern end of the Great Barrier Reef, 50km from New Guinea. Bramble Cay is home for nesting colonies of seabirds, turtles and the only mammal endemic to a coral cay on the GBR. Several hundred melomys forage for food in the dense vegetation but do not seem to eat bird or turtle eggs or young.

This animal is closely related to the Cape York melomys but has a much rougher tail (the scales stand out) and different blood proteins. It seems to be a unique species but sand

cays are quite recent and Bramble Cay cannot have existed for longer than a few thousand years. Either this melomys is a very rapidly evolving species or it has relatives — somewhere. Researchers are currently investigating melomys species in New Guinea where it is thought genetic studies may discover another population. Otherwise, as Bramble Cay is being gradually eroded away, this unique animal is doomed to extinction.

Black-footed tree rat (*Mesembriomys gouldii*)

The black-footed tree rat inhabits tropical woodlands and open forests. Squirrel-like, but nocturnal, it spends much of its time in trees feeding on fruits but also eats insects such as termites. Although spectacular, with long dark fur, large ears and a long black hairy tail with a white tip, this animal is not often seen. Several, however, have turned up in roof spaces.

Common rock rat (*Zyzomys argurus*)

Two years ago some specimens of this rat were found in the Wet Tropics for the first time, on the western side of the Lamb Range, west of Cairns. This rat is characterised by a tail which is very thick, especially towards the base where fat is stored. It lives among rocks, feeding on plant material and some insects.

Eastern pebble-mound mouse (*Pseudomys patrius*)

Until 1991, pebble-mound mice were known only from W.A. and the Northern Territory. Then one was found near Charters Towers, in Queensland, and others subsequently discovered in several other areas, including Paluma (near Townsville), within the Wet Tropics. It turned out to be a species last seen in 1907 and since considered extinct. This mouse generally inhabits dry areas where it piles small stones around the entrance to its burrow. Possible functions for these pebbles are protection and insulation, collection of dew (for drinking), or transmission of information, in the form of scent, to potential mates.

Delicate mouse (*Pseudomys delicatulus*)

One of Australia's smallest rodents, this mouse prefers open areas with sparse vegetation such as coastal sand-dunes. Populations fluctuate, with most seen around June/July. It is common around Mount Molloy.

Eastern chestnut mouse (*Pseudomys gracilicaudatus*)

Found, patchily, in open woodland, with a grass understorey, numbers of this mouse seem to increase after fire.

Lakelands Downs mouse (*Leggadina lakedownensis*)

Normally secretive and rare, this mouse occasionally occurs in plague proportions. It prefers open grassland and savanna woodland.

Swamp rat (*Rattus lutreolus*)

Despite its name, this rat is not very fond of swimming but lives close to water, feeding largely on sedge and grass and moving around by day. In the Wet Tropics, it inhabits the uplands.

Pale field rat (*Rattus tunneyi*)

Sometimes called Tunney's rat, this animal was once more widespread. It is thought that destruction of the creeklines it inhabits, particularly by rabbits and stock, have led to its decline.

Bookshelf

The Mammals of Australia

Ronald Strahan (ed)
Reed Books (1995)

This has entries on all the rodents.

The Rodents of Australia

C.H.S. Watts & H.J. Aslin
Australian Natural Science Library
Angus and Robertson Publishers,
Australia (1981)

Unfortunately out of print now, this is the rat bible.

Rats and Mice in Queensland

Queensland Museum Booklet
Number 9 (1974)

Photos and a brief description of each species plus an identification key.

Wildlife Australia Summer 1996
Sympathy for the Devil's lapdog
Greg Czechura

A general look at Australian rodents.

Nature Australia Vol25 No3 Summer 1995-96
Killer Rats of the Queensland Rainforest
William F. Laurance

Nature Australia Vol25 No10 Spring 1997

Queensland Pebble-mound mice .. up from the tailings
Steve Van Dyck

Is there a rat in your hip pocket?
Rat control... and 19 other good reasons to revegetate
Canegrowers and LWRRDC
Brochure available free from BSES

Repairing the Rainforest

Dr Steve Goosem & Nigel I.J. Tucker
Cassowary Publication (1995)

Practical aspects of rainforest rehabilitation with species lists.

Australian Geographic No49 Jan-Mar 1998
Owls sweeten the natural order
Frank Povah

Natural rat control in canefields.

Nature Australia Vol25 No6 Spring 1996

Ratbags of the Rafters (Black rats)
Steve Van Dyck

Nature Australia Vol25 No9 Winter 1997

House Mouse Rouse
Steve Van Dyck



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