

MADAGASCAR GIANT JUMPING RAT

Scientific name – *Hypogeomys antimena*



Background

This large nocturnal, forest-dwelling rodent is threatened with extinction in the near future because of its limited distribution and loss of habitat. Giant jumping rats had never been kept in captivity before Gerald Durrell brought 5 to Jersey from Madagascar in 1990. The carefully managed captive breeding programme for these critically endangered rats has successfully established a 'safety net' population, which provides a safeguard against its disappearance in the wild. Durrell was the first conservation organisation to breed these mammals and has also coordinated an international effort with 16 other institutions currently caring for this species. So far 12 of these have been able to breed it: a major success!

Species classification

The 2050 or so species of the world's rodents comprise one of the largest mammal groups or 'orders', the Rodentia, which is divided into 29 smaller groups or 'families'. Rats and mice are grouped together in the largest family, the Muridae, which contains 16 distinct sub-families. One of these, the Nesomyinae, is comprised of the 20 currently recognised species of native Madagascan rodent. These are all rat-like, and are believed by some to have evolved in Madagascar from a common rodent ancestor, like the lemurs. However, others think that the island was colonised at different times by ancestral forms that arrived from Africa. Until genetic studies answer the question of how closely related different species are, the classification of Madagascan rodents will remain uncertain. There are 8 smaller groups or 'genera' within the Nesomyinae sub-family, and the giant jumping rat *Hypogeomys antimena* is the only living species in the 'jumping rat' genus *Hypogeomys*. A second much larger, and now extinct, species, *H. australis*, has been described from subfossil remains found in the southeast of the island. Incidentally, three species of non-native rodent have been introduced to Madagascar by humans, to the detriment of endemic wildlife: the black rat *Rattus rattus*, brown rat *Rattus norvegicus* and house mouse *Mus musculus*.

Description

The giant jumping rat is the largest rodent in Madagascar – it is about the size of a rabbit. It has long, narrow pointed ears, which are not covered in fur, and a thick, muscular, sparsely furred tail. The short, dense, fur on its body varies in colour from grey-brown to reddish-brown on its upperparts and is creamy-white on its feet and underparts. Young rats have paler fur than adults. The back feet of giant jumping

rats, as their name suggests, are adapted for jumping – they are large in comparison to the front feet, like those of a kangaroo. Amazingly, they can jump up almost a metre into the air, which is a good evasive tactic when faced with a predator. Ordinarily, giant jumping rats move about on all fours or hop on their hindlegs. Adult male and females are similar in size, with body and tail and lengths of about 30-35cm (12-14in) and 21-24cm (8-9½in) respectively. Wild rats weigh 1.1-1.3kg (2½-3lb), but in captivity they may be up to 1.5kg (3.3lb).

Distribution and habitat

The only place in the world where these huge rodents are found is in the region of Menabe on the west coast of Madagascar, where they live in tiny forest fragments to the north of the town of Morondava. They only inhabit mature, dry deciduous forest, which is dwindling all over the island. They are strictly nocturnal and sleep during the day in burrows, which are vacated at dusk. These refuges provide protection to both young and adults against the elements and predators. Jumping rat burrows may be up to 1m (3.3ft) deep, 5m (16½ft) across and consist of a complex of tunnels, each around 45cm (18in) diameter. Between 1 and 6 exit holes give access to a burrow, although only 1-3 of these are in use at any one time, the others are blocked with soil and leaves. Even those in use are plugged with soil at a depth of around 50cm (20in), and must be excavated and resealed each time an animal passes in or out.

Feeding habits

The diet of the giant jumping rat in the wild consists largely of fruit and seeds, which have fallen to the forest floor. They have also been observed stripping bark from saplings, which may be for tooth sharpening, but is more likely to be feeding behaviour. Food is held in the

forepaws and manipulated in the mouth while the rat is semi-upright on its haunches.

Breeding

Giant jumping rats live in monogamous social units, which consist of a breeding pair and their offspring from previous years. Pair bonds between adult males and females last more than one breeding season and are maintained throughout the year. Pairs will normally remain together until a predator kills one mate, which is unfortunately a frequent occurrence, the main culprits being the fossa (a large Madagascan member of the civet family) and the Madagascan ground boa (a large snake) and dogs (introduced by people). When this happens, the remaining rat normally bonds with a new mate within a few days or weeks. The family unit occupies a minimum territory or 'home range' of 3-4 hectares (7½-10 acres), which increases in the dry season when food is scarcer. Within a territory, usually on a slightly raised area of bare soil, is the family burrow, and dotted around it are latrine sites, where the scent from urine and faeces is important for marking territorial boundaries. Other burrows within a territory may be used as temporary refuges during nocturnal activities, or by young males that have recently left their parents.

In the wild, births begin at the start of the hot rainy season, usually in late November, but in captivity they have occurred throughout the year. A litter of one or two young is born in a crude nest within a burrow. Newborns have a body length of 5-8cm (2-3in), and their eyes are closed for the first couple of weeks. They appear pink, but their bodies are covered with a coat of very fine grey fur. Infants remain in the burrow for the first 3-4 weeks, until they are steady on their feet and ready to be weaned. They then emerge, but stay very close to the entrance. From observing the rats in captivity, it has been found that of the female's 4 nipples, infants prefer to suckle from the 2 in her groin rather than those in her armpits, and they usually lie on their backs to feed. It has also been found that females may give birth to several (certainly over 2) litters per year in captivity, because there is always plenty of food available, whereas this is not usually the case in the wild. Female offspring remain with their parents for between 2 and 3 years, and then leave to begin breeding themselves. Males tend to leave after about a year, and are sometimes able to find a mate and a territory soon after, but most stay single until they are at least 2 years old.

Conservation status

The World Conservation Union (IUCN) currently classifies the Madagascar giant jumping rat as Endangered on the Red Data List, which means that it faces a very high risk of extinction in the near future. The current size of the giant jumping rat population is unknown, but the species only occurs at low densities and appears to be rare throughout its limited range. Based on recent research in Madagascar by local Durrell staff, the giant jumping rat is now considered to be one of the country's most endangered native² mammals. Their limited distribution, just 200km² is very fragmented and numbers are estimated at around 8,000, split into 2 populations that are isolated from each other.

The uncontrolled destruction and fragmentation of their forest habitat continues to be the main threat to the species survival. Oil extraction, logging and increased agriculture have been largely responsible for this loss of habitat. Feral dogs are now thought to be causing additional pressure to the population by killing and eating the giant jumping rats. In May 2001 a computer modeling technique, called a Population Habitat Viability Analysis or PHVA, was carried out. This predicted that at the current rates of habitat loss and predation, the giant jumping rat would be extinct in the wild within about 24 years. An action plan was subsequently formulated to try and stop this happening.

The future

Essential ongoing fieldwork will hopefully reveal the best way to save this species from extinction in the wild. Work already carried out has shown that the rats have very specific habitat requirements – they are only found in undisturbed, dry, dense forest with sparse undergrowth. Durrell successfully helped to establish a new officially protected area in Menabe in early 2006, which covers the entire distribution of the giant jumping rat, giving hope for the species' future in the wild.

A community education project, partially funded by grants from the States of Jersey Overseas Aid Committee, has been initiated focusing mainly on protecting the forest as a resource, rather than specifically helping the giant jumping rats. Villages that are seen to be protecting their surrounding environment, for example by limiting hunting, receive funding for community improvement projects such as digging wells for safe drinking water and building schools, therefore providing an incentive to the villagers to protect the habitat and animals Durrell is working with.

Locals currently see the species just as rats, and have a similar attitude to them as the majority of western people have about brown and black rats, and they certainly do not eat them. Future work will hopefully establish just what impact predation by dogs is having on the giant jumping rat population, and take steps towards controlling them. It is already recognised that forest use has to be regulated and that the extensive network of roads built by oil prospectors needs to be closed, to limit access by farmers and loggers. However, the education programme has to prove effective before this can happen, and ideally the giant jumping rat should be understood and appreciated by its human neighbours as a unique and fascinating part of Madagascar's natural heritage.

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