

CONSERVATION STRATEGIES OF INDIAN MOUSE DEER
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Abstract:

Mouse deer are graceful and look somewhat like large rodents also known as chevrotains. Mouse deer (*Tragulus* spp. An *Hyemoschus aquaticus*) are among the smallest ruminants known. The lesser mouse deer of Southeast Asia is probably the smallest an adult stands only 20cm high and weighs a mere 1-2.5 kg.

Within India, the Indian chevrotain is commonly encountered in a number of forest areas along the Western Ghats, in the Eastern Ghats up to Orissa, and in the forests of central India. The Kalakad-Mundanthurai Tiger Reserve at the extreme south of the Western Ghats appears to be one of the best localities for the species and may represent a major population stronghold.

The species may also be frequently met with in most other protected areas along the Western Ghats such as the Periyar Tiger Reserve, Indira Gandhi Wildlife Sanctuary, Silent Valley, Mudumalai-Bandipur-Nagarahole, Bhadra, and Kudremukh. Krishnan (1972) noted that the species is seen almost commonly around Karwar and in some forests of the Simlipal hills of Orissa in the east. Along the Eastern Ghats populations of mouse deer occur in the forest tracts along the Nallamal hills and Srisailam Nagarjuna Sagar and also in in Kanha National Park in Madhya Pradesh.

Twenty-five million years ago, early forms of mouse deer existed throughout Asia, Africa and Europe. Today's species are restricted to tropical forests and mangrove thickets of Southeast Asia and Central Africa.

Introduction:

Of the three Asian species, the Indian mouse deer occurs in southern India and Sri Lanka, the larger Malayan mouse deer occurs on the mainland of Southeast Asia and the lesser Malayan mouse deer occurs on Java as well.

The water chevrotain, a related African animal is found from eastern Zaire to the Atlantic coast.

Habitat:

These animals inhabit equatorial forests and mixed secondary tropical forest. They generally live among undergrowth on the edges of dense lowland rainforests.

Taxonomical status

Kingdom	:	Animalia
Phylum	:	Chordata
Class	:	Mammalia
Order	:	Artiodactyla
Family	:	Tragulidae
Genus	:	<i>Tragulus</i>
Species	:	<i>T. meminna</i>

Binomial name

Tragulus meminna

Etymology:

Tragos is Greek for "goat" and *-ulus* in Latin means "tiny". *Napu* is a local name. The name "mouse deer" refers to its small size and does not imply that it is a true deer. It is called "greater" because it is larger than other *Tragulid* species.

The word 'chevrotain' itself is French, and can be translated as 'little goat'. The single African species is consistently known as chevrotain (Wilson *et al.*, 2005). The names chevrotain and mouse-deer have been used interchangeably among the Asian species (Nowak, 1999) though recent authorities typically have preferred chevrotain for the species in the genus *Moschiola* and mouse-deer for the species in the genus *Tragulid*. Consequently, all species with pale-spotted or -striped upperparts are known as chevrotains, and all the species without are known as mouse-deer.

The Indian Mouse Deer:

India's smallest deer, the Mouse deer, also known as Indian Chevrotain (*Tragulid meminna*), is a very timid and nocturnal animal difficult to spot in the wild. This species was widespread and successful from the Oligocene (34 million years ago) to the Miocene (about 5 million years ago), but has remained almost unchanged over that time and remains as an example of primitive ruminant form.

Chevrotains have a four-chambered stomach to ferment tough plant foods, but the third chamber is poorly developed. Like other ruminants, they lack upper incisors, and give birth to only a single young, rather than having pig-like litters.

The dental formula of chevrotains is the same as that of some smaller deer.

**Indian Mouse Deer (also known as Indian Chevrotain)**

"Chevrotain" is a French word "chevre," which means "goat," and it is then made diminutive to denote a "kid." It is not closely related to a goat. "Deer" comes from the German word "Tier," which simply means "animal." The brown coat is speckled with white markings. The body is stocky, with rounded hindquarters. The legs are slender and the feet are four-toed, but the outer toes are small. It has 34 teeth. The upper canines in the male are longer and more pointed than those of the female.

This animal grows to about twenty inches long, thirteen inches at the shoulder, and they weigh about six pounds. This nocturnal animal is very timid and disappears in dense vegetation at the least hint of danger. It is thus very difficult to observe in the wild. It is solitary, except for the mating period. Its diet is quite varied, and includes both plants and small animals.

The chevrotains have primitive features, closer to non-ruminants such as pigs. They do not have horns or antlers, but both sexes possess enlarged upper canines. The male's are prominent and sharp, projecting either side of the lower jaw.

Chevrotains have short, thin legs which leave them lacking in agility but also helps to maintain a smaller profile which aids in running through the dense foliage of their environment.

Other pig-like features include the presence of four toes on each foot, the absence of facial scent glands, premolars with sharp crowns, and the form of their sexual behaviour and copulation.

Chevrotains are solitary animals, and usually interact only to mate. The young are weaned at three months of age, and reach sexual maturity at between five and ten months, depending on species. Parental care is relatively limited. Although they lack the types of scent glands found in most other ruminants, they do possess a chin gland for marking each other as mates or antagonists, and, in the case of the water chevrotain, anal and preputial glands for marking territory.

Their territories are relatively small, on the order of 13-24 hectares, but neighbors generally ignore each other, rather than competing aggressively.

Morphology:

Although very small for an ungulate, the greater mouse-deer is one of the largest members of its genus. It is rivaled in size by Williamson's Mouse-deer. It weighs 5 to 8 kg (11 to 18 lb). Its head-and-body length is 70 to 75 cm (2.3 to 2.46 ft) and its tail length is 8 to 10 cm (3.1 to 3.9 in). Its shoulder height is about 30 to 35 cm (12 to 14 in).

It has a small triangular head with a small pointed black nose and large eyes. It has long legs that are as thin as a pencil. The hind legs are visibly longer than the front legs.

The body is rounded. The fur on the upper part of its body is grey-buff to orange-buff. On the sides, the fur is quite pale, but darker along the midline. It is white underneath, especially on the neck, stomach, chest and chin. The male has neither horns nor antlers, but has small "tusks" – elongated canines in the upper jaws.

How to Recognize a Mouse Deer:

Adult mouse deer has a height of about 10-12 inches or 20-30 cms.

The brown coat is speckled with white markings.

The legs are slender and the feet are four-toed, but the outer toes are small.

Mating period is in the rainy season and in all other seasons males are solitary creatures.

Give birth to only one offspring at a time.

Hides in tree crevices or behind large rocks.

Usually can be sighted during daybreak or dusk when the animal looks for food.

Biology:

Little about these animals is recorded. Essentially vegetarians they feed chiefly on fruits, supplemented by leaves. They also eat insects (for instance, ants) if available. They do not seem to eat grass.

The premolars of the mouse deer are designed for piercing and chopping food rather than for chewing. As noted the stomach consists of three functional compartments: the rumen, the reticulum and the abomasum. (The omasum of ruminants is represented only by a rudimentary area).

The stomach occupies almost the whole of the abdominal cavity, extending from the diaphragm to the pelvic inlet, which provides this small animal with large food-storage capacity. The blood has a very high erythrocyte (red blood corpuscle) count as well as the smallest erythrocyte size of any mammal. The flesh is 'white' and the muscles contain little myoglobin.

The gestation period is about 5-6 months depending on the species. There is only one young per birth. Weaning normally occurs at 2-3 months, but can occur as early as 3 weeks with sexual maturity achieved at 4-5 months (Asian species) and 10 months (African species). The young stay alone, hidden in vegetation during the first month or two.

Behavior:

Mouse deer are shy, keeping to dense jungle and depending on concealment for protection. Although often present in large numbers they are seldom seen. Preferring to be near lakes, rivers or streams they can nevertheless wander 1 km or more from water. They feed mostly at dusk or at night, sheltering in undisturbed areas or under shady bushes during the day. They utter weak, bleating sounds and when frightened, jump a meter or more in the air.

Communication is by scent and calls. The African species possess anal and preputial glands with which along with urine and feces they mark their home ranges. Males of both Asian and African species possess a chin gland to mark either the vegetation or their mates.

Mouse deer are among the most excitable, nervous and jumpy animals. One must tread softly in their presence for fear of causing absolute pandemonium and mishap. The greater mouse-deer is solitary and nocturnal. It uses small trails through thick brush in the forest. When the male is ready to mate, he rubs a large gland on his lower jaw against the female to determine whether she is ready to mate.

The male is very territorial, marking his territory with feces, urine and secretions from the intermandibular gland under the chin. When angry, the male will beat the ground with his hooves at a rate of four times per second. They are rather trusting but delicate animals. They feed on fallen fruits, aquatic plants, buds, leaves, shrubs and grasses.

Reproduction:

They are solitary or live in pairs. The young are weaned at three months of age, and reach sexual maturity between five and ten months, depending on species. Parental care is relatively limited.

Although they lack the types of scent glands found in most other ruminants, they do possess a chin gland for marking each other as mates or antagonists, and, in the case of the water chevrotain, anal and preputial glands for marking territory. Their territories are relatively small, on the order of 13-24 hectares, but neighbors generally ignore each other, rather than competing aggressively (Dubost, 1984).

Some of the species show a remarkable affinity with water, often remaining submerged for prolonged periods to evade predators or other unwelcome intrusion. This has also lent support to the idea that whales evolved from water-loving creatures that looked like small deer.

Greater mouse-deer breed throughout the year; The female spends most of her adult life pregnant. They usually produce one young per birth, after a gestation of 152–155 days. Newborn animals are well-developed and immediately able to stand; they are fully active after 30 minutes. The young stand on three legs while nursing. Both male and female become mature at age 4½ months. Their life span is up to 14 years.

Economic importance for humans

The greater mouse-deer is used as a source of food for local people.

Uses

Mouse deer are widely sought by native people for food and their meat is highly regarded. Dressed carcasses have a high proportion of muscle (84 percent in Asian species), low proportion of bone (15 percent), and an insignificant of fat.

The ratio of muscle to bone is large-5.6:1. The mean dressing percentage of 62.1 percent is greater than that reported for cattle, water buffalo or goat. The mouse deer is traditionally hunted for its meat.

Advantages:

As noted, these are small, seemingly tractable creatures that are at home in the heat, humidity and diseases of tropical lowlands. They might play a particularly important role as livestock for tropical rainforests; the forests could be left standing while the animal still produces meat.

Today in a widely condemned process, tropical rainforests are being felled in order to raise cattle for meat.

Conservation status:

In recent years human encroachment into the forest has caused the destruction of the mouse deer habitats and has put various mouse deer species under a pressure that is causing their populations to decline.

The major threats to *T. meminna* are over-hunting by humans and loss of their habitat through rapid deforestation activity.

Conservation needs:

The survival of these four “living fossils” depends on conserving their rainforest habitat and restricting hunting especially night hunting. But studies of their propagation and management are also imperative.

In particular research is warranted on various aspects of their husbandry, such as enclosure design, space requirements and health.

A special research need is to understand the animal’s nutritional requirements and to develop diets for use in captivity.

Conservation Actions:

Mouse deer are surprisingly well-known within the Philippines and constitute a potentially ideal vehicle for promoting increased future conservation, research and education activities in this region (Grubb and Gardiner, 1998), though little or no effective action has been taken to date.

The species is fully protected under both Philippine national law and various local (provincial and municipal) ordinances (NRMCA, 1985), but these are mostly ineffectively enforced at the present time.

The species would undoubtedly also benefit from the establishment of effectively protected areas (it is not currently known from any), and the enhanced enforcement of laws on hunting and trade.

Research is needed on its habitat requirements, threats and conservation needs throughout its extremely limited range; the latter therefore also including Bugsuc Island, much of which is privately-owned and inaccessible to researchers without prior permission.

Existing captive populations of this species could be more usefully utilized as the basis for a properly structured conservation breeding programme; though any such initiative should be linked to related *in-situ* conservation management and applied research requirements.

Preservation of bloodline of mouse deer:

Wildlife experts are working towards preserving the bloodline of the mouse deer. Three zoological parks, two in the state and one in Andhra Pradesh, are involved in the project to prevent this shy animal from falling prey to inbreeding.

Sri Chamarajendra Zoological park Mysore, Nehru Zoological Park Hyderabad and Dr Shivarama Karanth Zoological enclosure at Pilikula Nisarga Dhama at Mangalore have become the mouse deer triangle of India.

The initiative came about after the Pilikula Nisarga Dhama’s drive to increase their numbers bore fruit “The mouse deer had problems mating in a typical zoo enclosure. But during the last two years, we shifted them to a specially designed enclosure, quite similar to their habitat in the wild.

The males have to move from one facility to another to fertilize with the females and the male offsprings should be shunted from one zoo to another to maintain the bloodline,” he added.

“Breeding was also happening in Mysore Zoo and sooner or later we will also have males in plenty, so we need to have regular exchange programmes of mouse deer,”

Why this sudden interest in mouse deer in captive facilities? “The numbers in the wild were dwindling, though it has not endangered yet, but since they are cute to look at and harmless, people keep them as pets. The programme can have international impact as many captive facilities globally want this species to be in their repertoire.”

Mouse deer breeding centre in Andhra Pradesh:

As part of the Central Zoo Authority (CZA) initiative towards conservation of endangered wild animal species, a Mouse Deer Breeding Centre has been set up at the Nehru Zoological Park, Hyderabad here and the new building is scheduled to be inaugurated shortly.

The zoo presently has two male and five female mouse deer, known as 'Jarini Pandi' in Telugu and literally meaning a deer and a mouse. Figuring in the endangered species list, the species also referred to as 'Spotted Indian Chevrotain' are small secretive ones with primitive features now found only in parts of Africa and South-East Asia, apart from India.

With short thin legs, they are known to lack agility, but disappear fast into foliage when faced with a threat. The breeding centre has been part of CZA's plans for conservation breeding of endangered wild animal species of the Deccan Plateau.

Wildlife officials are all set to start breeding of the endangered species Mouse Deer, also known as 'Spotted Indian Chevrotain', at Nehru Zoological Park, Hyderabad which is fast becoming a major centre for breeding of endangered species using technology. Already the zoo officials have taken up the onus of reviving the dwindling species of White Backed Vultures.

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