



Preliminary survey on Chiropterans in Dandeli and Anashi Tiger Reserve

A Survey Report

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Submitted to

Karnataka Forest Department

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BATS OF DANDELI AND ANASHI

Introduction:

The Order Chiroptera contains 1,001 species of bats, which are the only Volant mammals. This represents nearly a quarter of all known mammals. Such impressive diversity is certainly matched by the tremendous variation in ecology and behavior displayed by bats. Bats eat everything from insects and fruits to nectar, fish meat (small land invertebrates). Bats can be found in almost all habitats except extremely hot deserts and the cold Polar Regions. Species are more in the warmer latitudes.

Almost everywhere they are found, they are viewed with a mild disdain to revulsion due to a combination of fictitious information and their natural habits. They have found a place in almost all folklore-not for the right reasons-but to depict bad omen, evil, spirits of the night, vampires etc. even in recent time's farmers frown upon fruit bats for inflicting heavy loss on their crops. The common perception of bats is negative; this has led to many ignorant and shortsighted policies such as the Indian legislation, which has categorized the fruit bat as vermin for three decades. Slowly this is changing.

Evolutionary History

The fossil record for bats is far from complete. This partly because bats are small and have delicate bones that seldom becomes fossils. The bones are difficult to recognize even when they are fossilized. Thus, the origin and evolution of these mammals are poorly understood.

The oldest bat fossil, *Icaronycteris index*, became extinct about 60 million years ago. Early bats were insect eaters, as indicated by the teeth and by the fossilized insects found in the stomach of one the ancient bat. Megachiropteran bats first appear in the fossil record about 35 million years ago.

The ability to fly to catch insects in the dark was important developments in bat evolution. Many scientists believe that bat ancestors were small, shrew like

mammals that chased flying insects among the leaves of the trees and evolved limb membrane that enable them to glide from branch to branch. The transition from a fixed limb like that of a flying squirrel, to a movable wing was a critical step in the development of bat flight and evolution. It allowed bats to pursue prey above the trees. Scientist also suspects that the early bats were able to echolocate, which enhanced the capture of insects at night. However the exact origin of echolocation in bats is not known. The type of echolocation used by the *Microchiropteran* bats is not found among flying foxes.

Why Bats?

Bats play a tremendous role in the ecosystem, a simple example being the fruit bat, which play the role of flower pollinator and in seed dispersal, and that of insectivorous bats in controlling much of insect population. Although fruit bat damages a small amount of the agricultural crop, their role in forest regeneration more than compensates this loss in the long-term from the perspective of the greater good.

Research on insect consumption by bats in other parts of the world has shown that *Tadarida brasiliensis* of Mexico can consume more than half of its body weight in insects nightly with colonies estimated to consume 10 tones per million bats on a nightly basis. Similar estimates for other insectivorous species know from Borneo where one cave population consumes 7500 kg per night. Y.P. Sinha has described the Indian False Vampire *Megaderma lyra* as a good friend to farmers in the state of Bihar. Colonies of this ranging from 25 to 240 individuals consume rats and mice, which destroy grain, stored in bags and are rewarded with protection by farmers who call it goddess Laxmi (observation by Y.P. Sinha, 2002).

Chiroptera of the Indian subcontinent has not been studied systematically. Most of the available data based on sporadic publication by a few biologists, and many notes by wildlife researchers or species inventory keepers. In 1997 however a book brought out by bates and Harrison, bats of the Indian subcontinent, captured all information in historic and current publications on bats of the region and also provided a systematic key to resolving taxonomic and nomenclature problems. Much of the information is extracted from this well compiled book.

Human interference leading to habitat loss is a major threat in almost all species of bats. Felling of roost trees widening of roads is a common threat to fruit bats deforestation for different reasons such as development, timber, local needs, forest policies etc. destroy many roost and fruit trees for fruit bats. The resulting loss of loss of habitat due to felling of trees reduces the quality of habitat for micro chiropterans- reduction in canopy insect population. Human interference such as lopping, fire, roost disturbance, anti-fruit bat measures etc, result in negative effect on bats in wild habitats. Bats that live in caves that are a major tourist attraction like the Cavala caves are prone to roost disturbance. Bats that live have colonized old or abandoned buildings; temples, disused wells and timber yards are under threat from change in policies of the concerned authorities. In addition, hunting accounts for threats to about 15% of the bat species. There are different types of hunting. Local hunt most species of bat for medicine and meat. Some species of fruit bat are considered a pest and therefore persecuted.

Indian subcontinent has got about 123 species in 37 genera, among them 112 species are found in India, and many of them are found in forests of North-East India, and Western Ghats. About 50 species of bats expected to occur in the forests of Western Ghats (Nameer et al. 2001), this included some of the endemic and endangered species.

Western Ghats and bats:

The Western Ghats mountain range lies parallel to the western coast of southern India through six states from 8° to 21° N (Pascal, 1988). Although human activity has been present in these hills since prehistoric times, organized state-sponsored forestry and non-forestry activities began c. 200 years ago (Chandran, 1997). Commercial crop plantations, tea and coffee cultivation, construction of hydroelectric dams and power generation brought millions of people to the area and, as a result, wildlife habitats, especially the rainforests, have undergone drastic changes, including extensive fragmentation. However, the Western Ghats still harbours a high diversity of flora and fauna, and is one of eight 'hottest hotspots' of global biodiversity (Myers *et al.*, 2000); it also has the highest human population density of all these eight hotspots (Cincotta *et al.*, 2000).

About 135 species of mammalian species are known from Western Ghats, the large proportion of them include small rodents and chiropterans. Bats contribute about 37 % to the total mammal diversity in the Western Ghats. However, yet the clear distribution of all the species are not properly addressed, and further local diversity and species richness is also equally important from the conservation point of view. However, since no attempt has been made for the proper exploration for the entire Western Ghats, each record of the species at different localities is very important. With this background the present exploration to visual record of the bats was carried out with the objective **“Preliminary survey on Chiropterans in Dandeli and Anashi Tiger Reserve”**

Method:

The survey for visual records was lasted more than 45 days, in which all the five forest ranges of Dandeli and Anashi were covered. We traveled 138 kilometers and walked about 75 kilometers while searching for bats roosts, caves, tree hollows, old buildings and abandoned quarters, Etc.

We collected secondary information from the forest department personnel and local people on possible roosting sits which require proper exploration. We enquired a total of 37 people including forest staff and the local villagers, out of which almost 80% of the information turned to be positive. We also photo documented the bats so as to identify the species.

Findings:

A total of ten species of bats were recorded in Dandeli and Anashi. Bats were found in all the vegetation types in the two parks including moist deciduous forest, dry deciduous forest and wet evergreen forest. Which practically means they are virtually present almost everywhere. Similar species we found in very similar type of location or habitat. For example the Black Bearded Tomb Bat (*Thophozous Melanapogan*) was found only in cave system, which had gaps between them, like the Cavala caves. Where as the Lesser False Vampire

(*Megaderma Spasma*) which were found in almost all kinds of locations from tree hollows, dead and fallen trees, and old buildings to caves seems to be like a more generalist species in choosing roosting sites.

Species account:

Table 1. Occurrence of bat species in different forest ranges of DATR

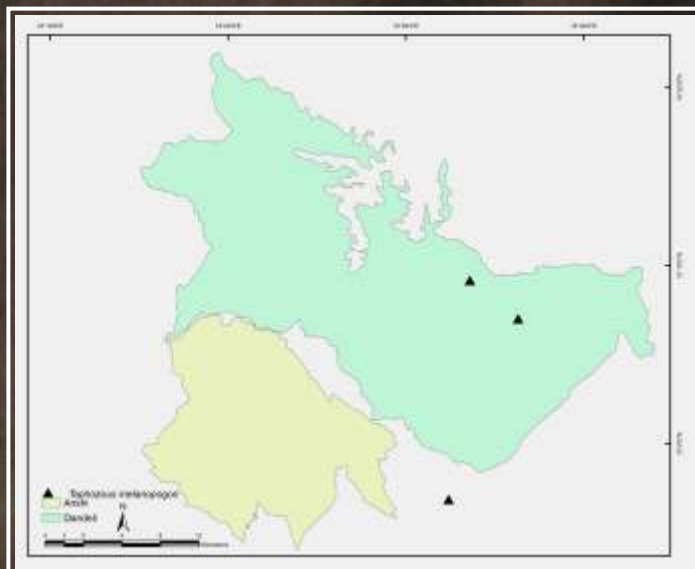
Species	Forest Ranges				
	Kulgi	Pansoli	Kumbharwada	Gundh	Anashi
Keelart's leaf nosed bat (<i>Hipposideros Lankadiva</i>)	P	P	P	N	N
Rofous Horseshoe bat (<i>Rhinolophus Rouxii</i>)	P	P	P	P	P
Sreiber's Long Fingered Bat (<i>Miniopeterus Shreibersii</i>)	N	N	N	N	P
Schinder's Leaf Nosed Bat (<i>Hipposideros Speoris</i>)	P	N	N	N	N
Fulvous Fruit Bat (<i>Rousettus Leschenaulti</i>)	P	N	N	N	P
Lesser False Vampire (<i>Megaderma Spasma</i>)	P	P	P	P	P
Black Bearded Tomb Bat (<i>Taphozous melanopogon</i>)	P	P	N	N	P
Naked Rumped Tomb Bat (<i>Taphozous nudiventris</i>)	N	N	N	N	P
Lesser Woolly Horseshoe Bat (<i>Rhinilophus Beddomei</i>)	P	P	N	N	N

P: Present; N: No information



a) **Black Bearded Tomb Bat** (*Taphozous melanopogon*)

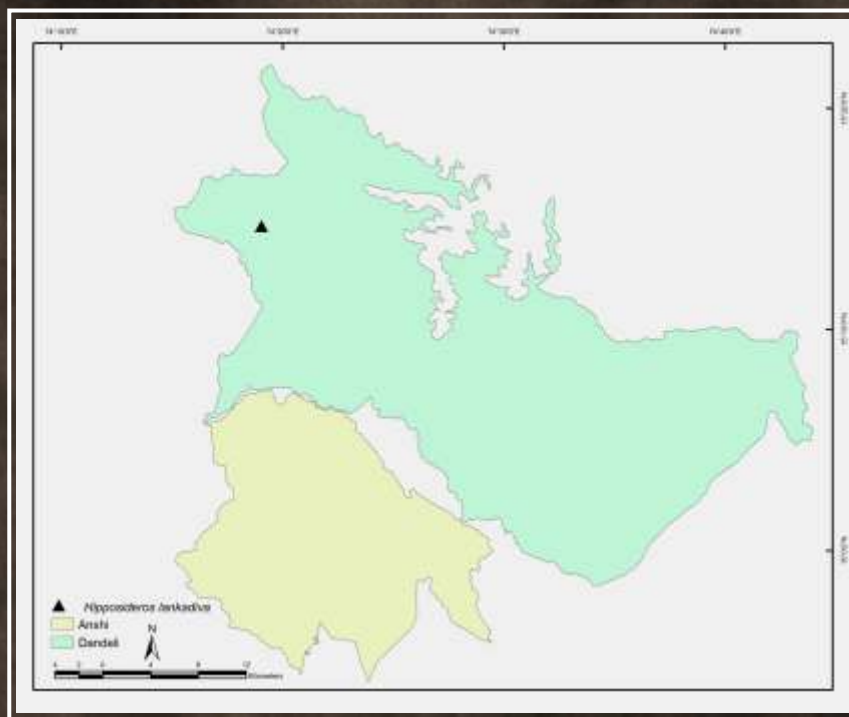
Even these bats are colonial, insectivorous and are found in places where there are natural caves, old temples and mines. They are quite shy in nature they tend to hide into crevices in the caves. Tourism is one of the major threats for this species.





b) Kelaart's Leaf Nosed Bat (*Hipposideros Lankadiva*)

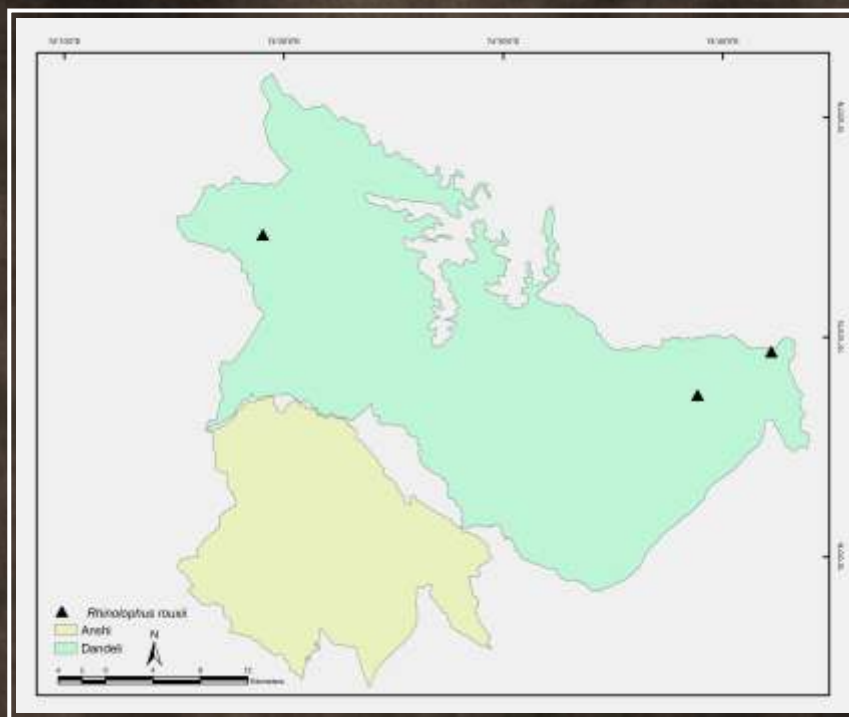
Keelart's leaf nosed bat or the large Ceylon leaf nosed bat is found usually in caves, ruins, old mines and temples. Its roosts are mostly formed of a colony of bats, they roosts along with *Hipposideros Speoris*, *Rhinolophus rouxii*, *H. fulvus*, *H. galeritus*, *Miniopterus schreibersii*, *Rousettus leishenaulti*. Being insectivorous in nature they fly out after dark to hunt on insects. In Karnataka they have been recorded from Gerasoppa, Kamalashile, Kolar, Talewadi and Yellapur areas by bates and Harrison in 1997. Though their status in India says least concerned, they have a lot of threat from human interferences due to loss in habitat, deforestation and hunting.





c) Rofous Horseshoe bat (*Rhinolophus Rouxii*)

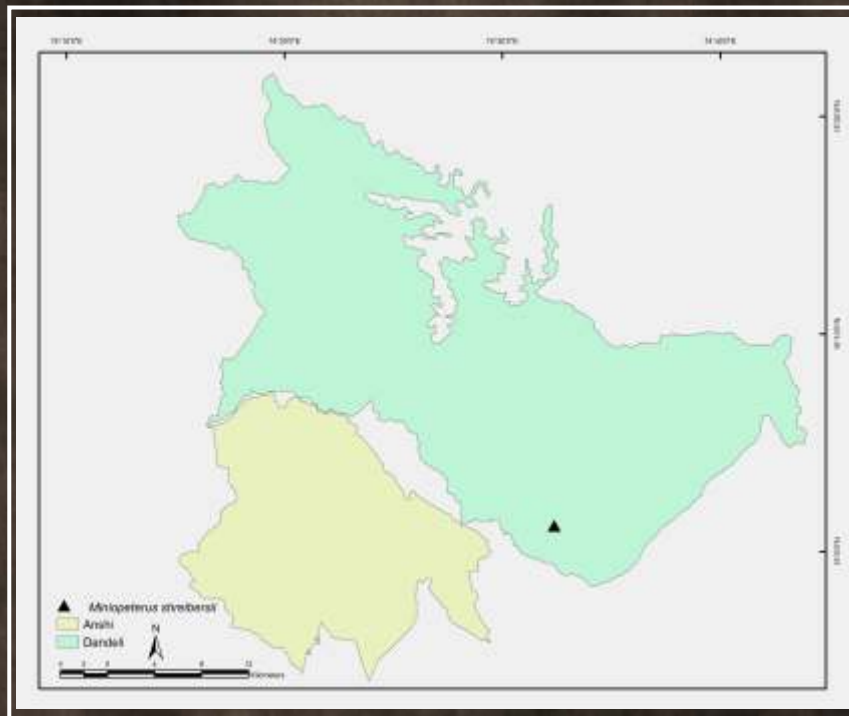
Though it was one of the most commonly found bat in Dandeli and Anashi, its status is near threatened. Even this bat roosts in caves, tree hollows and temples. It's mostly found in areas in relatively high rainfall. Insectivorous by nature, this bat flies out at dusk for hunting. Human interference, alien invasive species, competition from fruit bats to roosting places and habitat loss are the major threats to this bat species.





d) Scriber's Long Fingered Bat (*Miniopeterus Shreibersii*)

This is relatively a small sized bat. This roosts in large colonies of more than 5000-6000 individuals. These bats are found in hilly and forested areas. They roost in caves, caverns and crevices in rocks. This is also an insectivorous bat.

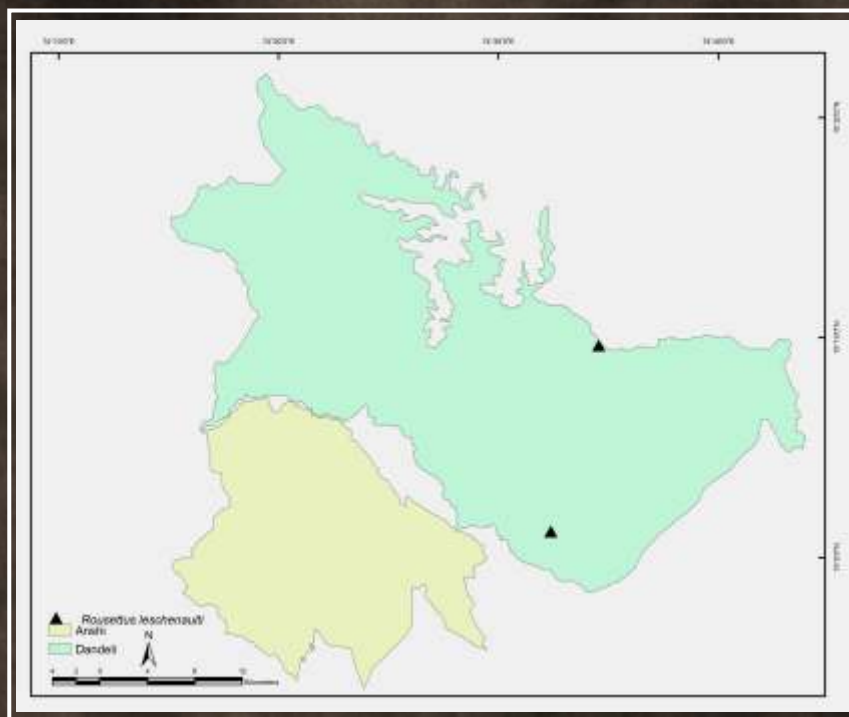




e) Fulvous Fruit Bat (*Rousettus Leschenaulti*)

The bat gets its name because of the term Fulvous that means orange. This is the most widely spread and distributed fruit bat in this area.

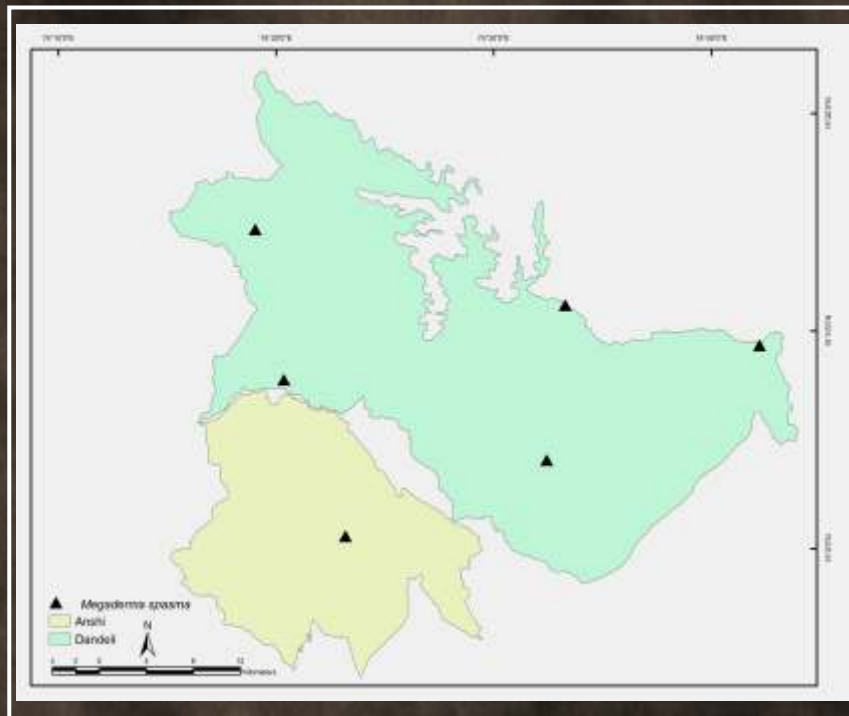
Even these roosts in caves, temples and man made constructions like tunnels etc. exploitation, hunting and tourism are some of the know threats to this species. These bats roost in numbers like 4000-5000 in a single colony, we have seen some of the caves have numbers more than 8000-10000.





f) Lesser False Vampire (*Megaderma Spasma*)

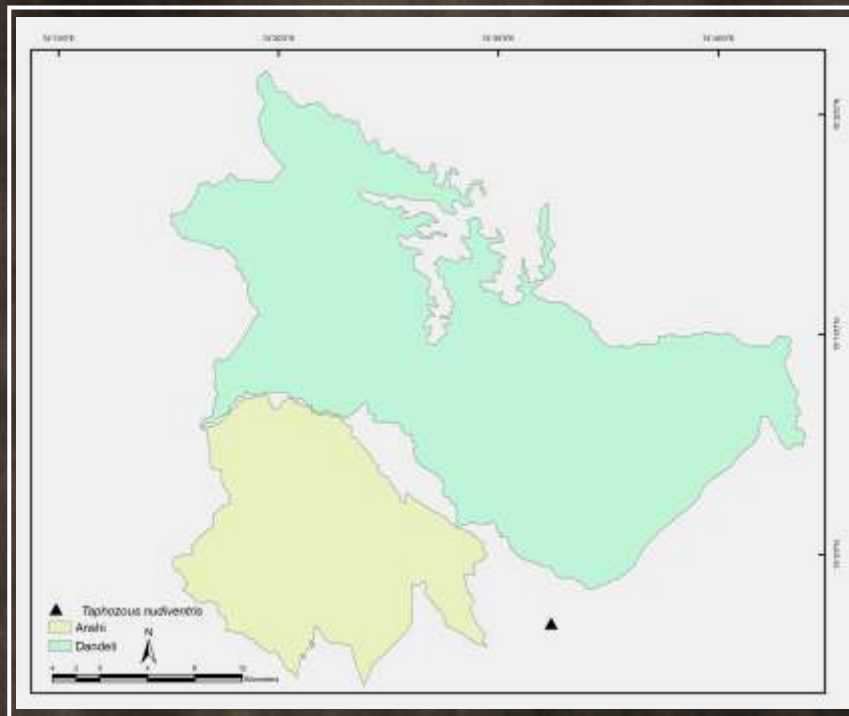
The only other species of false vampires, which are found in good numbers, are the lesser false vampires; these false vampires are found in a huge range of habitats from caves, temples, tree hollows, and abandoned buildings to mines. These bats easily adapt them self to any give type of habitat, or to changes in their habitat. They are insectivorous, but sometime they do eat geckos, small frogs and other smaller reptiles.

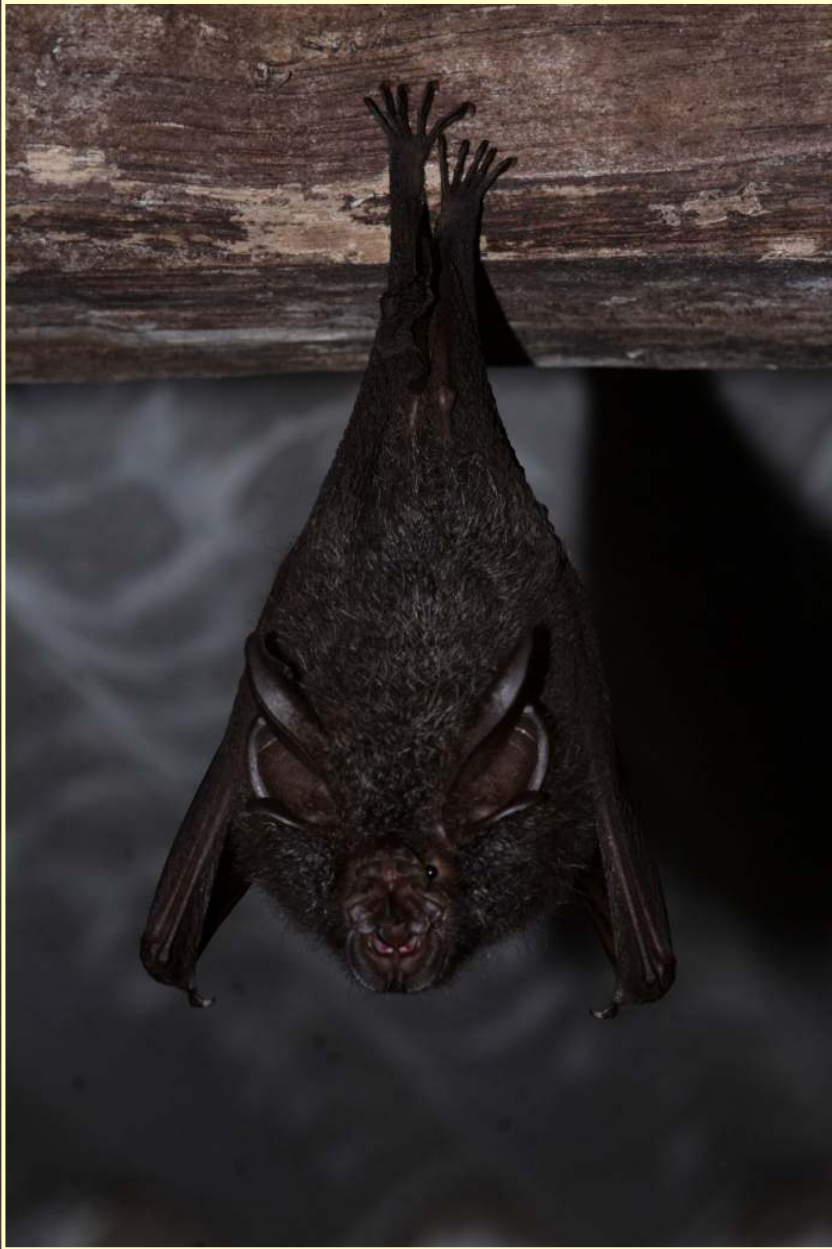




g) Naked Rumped Tomb Bat (*Taphozous nudiventris*)

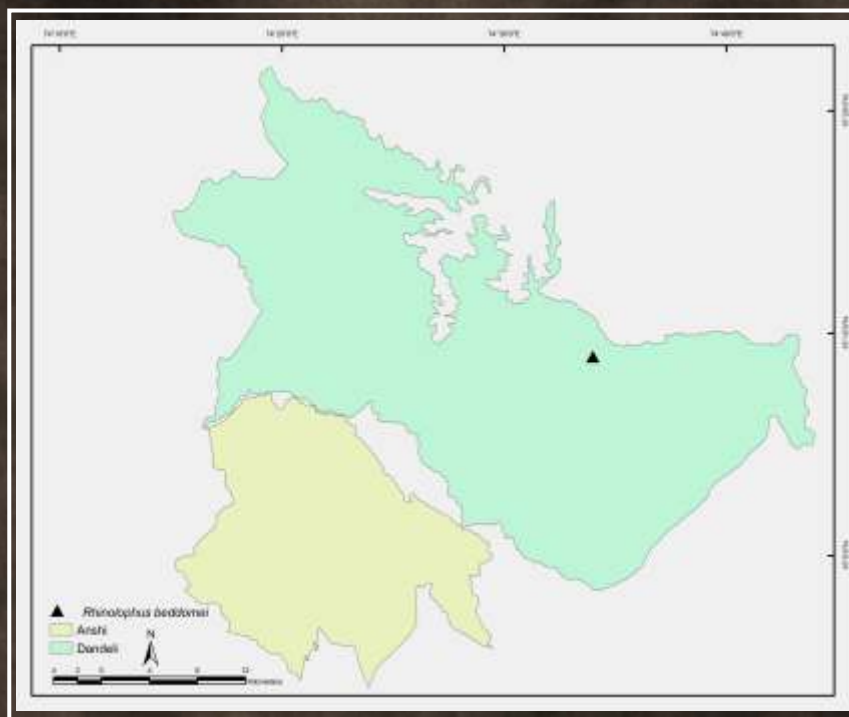
Though this bat too shares the same kind of behaviour as of the melanopogon, these bats are pretty rare and not very common in this area. They get their name due to the naked patch on the rump, which is quite prominently visible. A little bigger in size than the black bearded they sometimes share the same roost.





h) Lesser Woolly Horseshoe Bat (*Rhinilophus Beddomei*)

Found mostly solitary or pairs, sometimes they are found in small groups. Even these bats roosts in caves, trees hollows, old buildings etc., although widely distributed, low-density and forest dependency suggests that this species is vulnerable to habitat destruction.





i) Schinder's Leaf Nosed Bat (*Hipposideros Speoris*)

This is a very commonly found bat, which is nocturnal and roosts in colonies or even mixed colonies with other bats. They are found in dry and forested areas, caves, temples and abandoned old buildings. Habitat loss is one of the major threats to this species

Conclusion

Though there has not been much work done on bats, especially in the Western Ghats, Bates and Harrison (1997) reported six species from this region of the Western Ghats including Tickell's bat *Nycticejus tickellii blyth*, Keelart's Pipistrellie *Pipistrellus cylonicus*, Indian Pygmy Bat *Pipistrellus tenuis*, Rufus horseshoe bat *Rhinolophus rouxii*, Asiatic lesser yellow hose bat *Scotophilus kuhlii* and Bamboo bat *Tyloncteris pachypus*. This was the only occurrence report available from DATR. However the present exploration documented nine species, out of nine species only one species earlier documented by Bates and Harrison (1997). That indicates presence of more than 15 species of bats in the DATR. We have used indirect method to locate the roosting sites and photographing the bats and identifying them. Hence, we feel if a proper scientific survey is conducted using mist nets, echo locators and proper morph metrics there is a more numbers to be recorded.

Some of the bats are habitat specific and some are generalists. In the long run the generalists like the lesser false vampire will adapt and survive the changes made by man, but on the other hand the habitat specialists always suffer, as they cannot adapt to the changes to their surrounding. So as to protect them it is necessary to understand the habitat requirement and habitat management may require to be adopted. Awareness camps have to be taken up to root out misbelieves about bats. Last but not the least their feeding grounds have to be identified and well protected as the bats come to the same feeding grounds regularly,

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