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MAMMALS OF THE ANDAMANS AND NICOBARS : THEIR ZOOGEOGRAPHY AND FAUNAL AFFINITY

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(With three Tables)

The islands of Andaman and Nicobar groups lie in the Bay of Bengal separated by a sea-space of 1190 km from the Coromandal coast of India, 515 km from the Tenasserim coast of Burma and 1255 km from Calcutta. The Andaman group of islands are situated between 13°41' and 10°30' N. latitudes and 92°11' and 93°07' E. longitudes while those of Nicobars lie between 6°40' and 9°30' N. latitudes and 92°30' and 94°10' E. longitudes. There are more than 200 large and small islands in Andaman group which stretch out in a North-South direction. The Nicobars comprise about 22 smaller islands lying in North to South-east direction. The ten degree channel separates the Andamans from Nicobars by a sea-space of 296 km. The land area of the Andamans is approximately 6332 sq. km. and that of the Nicobars 16.5 sq. km. The length of the Andamans is about 352 km and width at maximum 52 km. The Andamans form a compact chain of islands, whereas the Nicobars lie far separated from one another.

Geology

The Andaman islands form a part of lofty range of submarine mountains, 1125.6 km long, running from cape Negrais in the Arakan Yomah range of Burma, through Sumatra and Java to the lesser Sunda island and the Moluccas and contain much that is geologically characteristic of the Arakan Yomah. The older rocks are early Tertiary or late Cretaceous, but there are no fossils to indicate exact age. There is coral formation along the coast of the islands. There has been of late a comparative rising in parts of Andamans especially in the Ritchie's Archipelago, and sinking in others chiefly along the east coast. Narcondam and Barren islands are of volcanic origin. The Nicobar islands form a part of submarine chain known for its volcanic activity. The hilly islands consist partly of stratified deposits which occupied the bottom level of the sea before their appearance and partly of plutonic rocks which pierced the former and came to the surface through the old upheaval.

Climate

The climate in Andamans is just like those of tropical islands on

the same latitudes. It is warm, the mean temperature varying from 21°-30°C. The rainfall is irregular and amounts to an annual average of 34.8 cm. The islands are subjected to both the south-west and north-east monsoons. Cyclones occur at changes of monsoon and are rare. The Nicobars also are exposed to both the monsoons. Rain falls throughout the year, generally in sharp, heavy showers. The annual rainfall varies from 228.6 to 342.9 cm and the temperature from 17.8. to 33.3°C.

History of study of mammalian fauna

Alexander (1827) published an account of the landing of a party at Little Andaman in search of water. In this report mention was made of the skulls of Andaman pig and a drawing of the same was also given. Blyth (1846) gave a brief note on the fauna of the Nicobars ; besides other species, he mentioned a monkey and a large squirrel observed by Mr. Barbe and Capt. Lewis, but these could not be captured. Again, Blyth (1858, 1859, 1860) reported some mammals from the south Andamans. Bartlet (1860, in Miller, 1902) described a new monkey, *Macacus andamanensis* (= *Macacus leoninus* Blyth), Fitzinger (1861, in Miller, 1902) gave a list of eight mammals collected during the voyage of "Novara" In 1863, Blyth gave a complete account of the known mammals of the Andaman and Nicobars. Tytler (1864) gave the description of a new civet cat. Sclater (1869) reported the macaque described earlier by Bartlet. Dobson (1871, 1872, 1873) gave short accounts of bats occurring in Andaman and Nicobars, and more detailed ones lateron (1876, 1878). Hume (1874, in Miller, 1902) observed *Pteropus nicobaricus* on Little Jolly Boy Island. Anderson (1881) listed thirteen species of bats. Blanford (1888, 1891) recorded eighteen mammals, from these islands. Miller (1902) listed 39 mammals four of them doubtful. Mason (1908) reported flying foxes and described a new species, *Pteropus tytleri*. After a long gap, the Zoological Survey of India took initiative to study the fauna of these islands. As the result, Chaturvedi (1966a) described a new house rat and also recorded (1966b, 1969) the Northern Palm Squirrel, *Funambulus pennanti* Wroughton and a fruit bat, *Cynopterus sphinx* (Vahl). Soota & Chaturvedi (1971) reported *Pipistrellus camortae* from Car Nicobar. Nath & Chaturvedi (1975) published an account of 12 species of mammals and added much new information, including the first authentic record of cats from these islands. Bhattacharya (1976) recorded *Pipistrellus coromandra* (Gray) from the Car Nicobar. Hill (1967), based on a collection of Bombay Natural History Society published a paper on bats of these islands and listed 24 species and subspecies. Abdulali (1976) and Chana (1976) also dealt with wild life and its preservation.

MAMMALIAN FAUNA

A total of 46 species and subspecies of mammals are now known

from these islands. The reported occurrence of a few other needs confirmation. Two rats, *Rattus rattus alexandrianus* and *R. norvegicus*, are cosmopolitan and found on all sea-ports. *Rattus bowersi* was recorded by Blanford (1891) but Miller (1902) regarded it as *R. taciturnus*. The sea-cow, *Dugong dugon* (Miller) being a marine form has been kept out of consideration. Occurrence of the Jungle cat, *Felis chaus*, is very doubtful since there is no authentic record of the species from Andamans (no specimen available). The pig-tailed monkey, *Macaca nemestrina leonina*, considered indigenous by Bartlet (*loc. cit.*) proved to be an introduced one, and lack of a subsequent record arouses suspicion that the description of Bartlet was either based on pet specimens or introduced ones which failed to establish themselves in the Andamans. The barking deer, *Muntiacus muntjak* was seen by a party of the Zoological Survey of India in Middle Andaman (personal communication) but in absence of any specimen of this deer as well as sambhar in any collection, these are not included here. Two flying foxes, *Pteropus vampyrus* and *P. giganteus* have also been reported from Andamans but Mason (*loc. cit.*) considered the former as a seasonal migrant and the latter as an occasional and rare straggler. Seasonal migration of *P. vampyrus* (from Malaya) seems to be doubtful since no Worker has collected or seen these bats for decades in these islands. *Scotophilus kuhli* (= *S. temmincki*) was reported by Blyth (1863) but we do not find any subsequent record hence left out of consideration.

The goats introduced in Barren island have grown in large number, Surprisingly these goats can subsist upon sea water as there is no freshwater. Buffaloes left back on Kamorta by some early settlers have multiplied to good number. The elephants once brought to Andamans by some lumbering contractors are still used for the same purpose although on a smaller scale. Two types of feral cats also have been recorded (Nath, & Chaturvedi, 1975). During a visit in the year 1969 to Ross Island, author observed a few rhesus monkeys, a cheetal and some goats brought by some naval staff. Of course, horses and dogs go with human being and these islands are not exception to this. Including all above discussed forms total number of mammals becomes sixtyfour. Out of these the well recognised species (46) are dealt here in brief. Classification followed here is after Ellerman & Morrison-Scott (1951). Distribution of the species on islands is given within parentheses.

INSECTIVORA

Five species, all indigenous have been reported. Two tree shrews, *Tupaia nicobarica nicobarica* (Great Nicobar) and *T. n. surda* (Little Nicobar) and a terrestrial one, *Crocidura nicobarica* (Great Nicobar) are found in Nicobar group of islands. Tree shrews are absent in Andamans but two terrestrial forms, *Crocidura andamanensis* (South Andaman) and *C. hispida* (Middle Andaman) are found there.

CHIROPTERA

Twenty three species of bats are known, out of these, six species are endemic to Andamans and six to Nicobars. Among the remaining eleven species a few are common to Andaman and Nicobars while others are found also in adjacent countries. *Pteropus hypomelanus satyrus* (Narcondam), *Cynopterus brachyotis brachysoma* (South Andaman), *Rhinolophus andamanensis* (Port Cornwallis, South Andaman), *R. cognatus cognatus* (Port Blair), *R. c. famulus* (Narcondam & North central) and *Myotis adversus dryas* (Port Blair) are endemic forms of Andamans. Besides these, *Hesperoptenus tickelli* (Long Isl. & South Andaman), *Tylonycteris pachypus fulvida* (south Andaman), *Cynopterus sphinx* (Port Blair), *Taphozous melanopogan* (Landtall, Ross, Port Blair), *Megaderma spasma* (South Andaman), *Pteropus melanotus* (syn. *P. tytleri*) (South Andaman & Nicobars) and *Eonycteris spelaea* (South Andaman) are also found in Andamans.

The endemic bats of Nicobar group are : *Pteropus Faunulus* (Car Nicobar), *Cynopterus brachyotis scherzeri* (Car Nicobar & Nancowry), *Hipposideros diadema nicobarensis* (Trinkat & Little Nicobar), *H. ater nicobarulae* (Car Nicobar, Camorta, Nancowry & Little Nicobar), *Pipistrellus camortae* (Car Nicobar & Camorta) and *Miniopterus pusillus* (Nicobars). The other species which are also distributed in adjacent countries include *Hipposideros fulvus fulvus* (Nicobars), *Pipistrellus coromandra* (Car Nicobar), *Pipistrellus tenuis* (Nicobars), *Taphozous sacolaimus crassus*, (Great Nicobar), *Pteropus melanotus* (Nicobars & South Andaman).

PRIMATES

Only one species, the crab eating monkey, *Macaca fascicularis umbrosa* Miller is found, that too is confined to Nicobars only.

ARTIODACTYLA

Only three species of artiodactyles are known from these islands. A pig, *Sus scrofa andamanensis* (South Andaman, Baratang, Little Andaman) and a deer, *Axis axis* (Port Cornwallis, North Andaman, Middle Andaman, S. Andaman, Baratang) are found in Andamans. *Sus scrofa nicobaricus* (Great Nicobar) is found only in Nicobars.

CARNIVORA

Carnivores are completely absent from Nicobars while only one species of civet cat, *Paguma larvata tytleri* (South Andaman, Baratang)

is found in Andamans. Two kinds of feral cats are also known from Andamans (Nath & Chaturvedi, 1975).

RODENTIA

Five rats, *Rattus r. andamanensis* (Middle Andaman, South Andaman, Barren, Narcondam), *R. rattus flebilis* (Henry-lawrence), *R. r. atridorsum* (Barren), *R. stoicus* (Henrylawrence) and *R. taciturnus* (South Andaman) are endemic species of Andamans. Two rats *R. rattus holchu* (Interview, Long, Baratang, Port Blair, Car Nicobar) and *R. palmarum* (Great Nicobar, Trinkat, Henrylawrence, South Andaman) have distribution in Andamans as well as Nicobars. A house mouse, *Mus musculus castaneus* (Middle Andaman & Port Blair) widely distributed in India, Burma, Thailand, Malaya etc. is also found in Andamans. The Northern Palm Squirrel, *F. pennanti* (Port Blair & Middle Andaman) although a recent introduction is well established in Andamans. As regards Nicobars, four species *Rattus pulliventer* (Great Nicobar), *R. burrus* (Trinkat), *R. burrulus* (Car Nicobar) and *R. burrescens* (Great Nicobar) are endemic. *R. rattus holchu* and *R. palmarum* are found in Nicobar as well as Andamans.

Fauna Composition.—The results of faunistic analysis have been summarised in table 1. Of the fourteen orders of living mammals only six are represented in Andamans and Nicobars (Cetaceans excluded). Among these 10.8% are insectivores, 50% bats, 2.2% primates, 6.6% artiodactyles, 2.2% carnivores and 28.2% rodents. It is obvious that bats are predominant followed by rats. The primates and carnivores are represented very poorly. It is rather surprising to note that both bats and rats are represented by almost equal number of species/

Table—1. Composition of mammal fauna of Andaman and Nicobars.

Order	Number of Genera	Number of species & subspecies	%. of fauna
Insectivora	2	5	10.8
Chiroptera	12	23	50
Primates	1	1	2.2
Artiodactyla	2	3	6.6
Rodentia	3	13	28.2

subspecies (bats-12, rats-11). Distribution of endemic species in two island group *i. e.* Andamans and Nicobars is exactly equal (15 species in each). Even if we make groupwise consideration, they are found to be in almost equal numbers of species/subspecies in two groups of islands *e. g.* bats six species in each island group, rats five in Andamans

and four species in Nicobars, insectivores two in former and three in latter. The mammal fauna comprises 69.6% (32 species) endemic elements and only 30.4% (14 species) exotic.

ZOOGEOGRAPHY

(Tables 2 & 3)

Andamans.—Of the 27 species and subspecies found here, 15 (55.5%) are native of Andamans. Among insectivores both the shrews are confined to Andamans. Besides six endemic bats there are at least seven species of bats which are also distributed in adjacent countries. *Hesperoptenus tickelli*, *Tylonycteris pachypus fulvida* known from Andamans have got distribution in India, Thailand, Burma and Malaya. *Cynopterus sphinx*, *Taphozous melanopogon* and *Megaderma spasma* are found in India, Burma, Thailand, Malaya and Java-Sumatra. *Pteropus melanotus* in addition to Andamans is found in Nicobars and Java-Sumatra. Another bat, *Eonycteris spelaea* has got very wide distributional range including Andamans, India, Burma, Malaya, Java-Sumatra etc.

A subspecies of civet cat occurring in Andamans is endemic. Among ungulates, Andaman pig is endemic but the cheetal, *Axis axis* is found in India and Sri Lanka. Among rodents *Mus musculus castaneus* is widely distributed in South east Asia while *F. pennanti* is found in India.

Nicobars.—Besides six species of endemic bats mentioned above there are five exotic forms also. *Hipposideros fulvus fulvus* and *Pipistrellus coromandra* are found in Nicobars as well as India. *Taphozous saccolaimus crassus* is also found in India and Java-Sumatra. *Pteropus melanotus* occurs in Andamans and Java-Sumatra besides Nicobars. Another species, *Pipistrellus tenuis* is found in Java-Sumatra also.

Faunal affinity (Table 3).—As discussed above 69.6% of the mammal fauna of Andamans and Nicobars is composed of endemic elements and only 30.4% (less than one third) is exotic. Among the exotic species most of them belong to order Chiroptera and a few to other orders. It is difficult to trace back the arrival of mammals to these islands. However, it can be presumed that most of the terrestrial mammals reached these islands or were already present there long before separation of these islands from the main continental mass. Under changed ecological conditions they evolved as separate distinct species/subspecies. These lately evolved species constitute endemic fauna. The same phenomenon can be applied to bats also. However, higher number of alien species of bats indicate that either they reached these island much later and they have not undergone complete change in the course of speciation. Another possibility, which cannot be ruled

Table—2 Distribution of Andamans and Nicobars mammals in relation to adjacent countries.

Sl. No.	Name	Andamans	Nicobars	Indian Mainland	Malaya	Thailand	Burma	Java	Sumatra	Sri Lanka
INSECTIVORA										
1.	<i>Tupaia nicobarica nicobarica</i> (Zelebor)	+	+							
2.	<i>Tupaia nicobarica surda</i> Miller		+							
3.	<i>Crocidure hispida</i> Thomas	+								
4.	<i>Crocidura nicobarica</i> Miller		+							
5.	<i>Crocidura andamanensis</i> Miller	+								
CHIROPTERA										
6.	<i>Pteropus hypomelanus satyrus</i> Andersen	+								
7.	<i>Pteropus faunulus</i> Miller		+							
8.	<i>Pteropus melanotus</i> Blyth	+	+					+	+	
9.	<i>Cynopterus sphinx</i> (Vahl)	+		+	+	+	+	+	+	+
10.	<i>Cynopterus brachyotis scherzeri</i> Zelebor		+							
11.	<i>Cynopterus brachyotis brachysoma</i> Dobson	+								
12.	<i>Eonycteris spelaea</i> (Dobson)	+		+	+	+	+	+	+	
13.	<i>Taphozous melanopogon</i> Temminck	+		+	+		+	+	+	
14.	<i>Taphozous saccolaimus crassus</i> Blyth		+	+					+	
15.	<i>Megaderma spasma</i> (Linnaeus)	+		+	+	+	+	+	+	+

Table—2 (Conted)

Sl. No.	Name	Andamans	Nicobars	Indian Mainland	Malaya	Thailand	Burma	Java	Sumatra	Sri Lanka
32.	<i>Sus scrofa nicobaricus</i> Miller		+							
33.	<i>Axis axis axis</i> (Erleben)	+		+						+
RODENTIA										
34.	<i>Funumbulus pennanti</i> Wroughton	+		+						
35.	<i>Rattus v. andamanensis</i> (Blyth)	+								
36.	<i>Rattus (?) rattus flebilis</i> (Miller)	+								
37.	<i>Rattus (?) rattus at ridorsum</i> (Miller)	+								
38.	<i>Rattus rattus holchu</i> Chaturvedi	+	+							
39.	<i>Rattus palmarum</i> (Zelebor)	+	+							
40.	<i>Rattus stoicus</i> (Miller)	+								
41.	<i>Rattus taciturnus</i> (Miller)	+								
42.	<i>Rattus pulliventer</i> (Miller)		+							
43.	<i>Rattus burrus</i> (Miller)		+							
44.	<i>Rattus burrus</i> (Miller)		+							
45.	<i>Rattus burrescens</i> (Miller)		+							
46.	<i>Mus musculus castaneus</i> Waterhouse	+		+	+	+	+			+

out, is that bats being good flyers they can easily negotiate the expanse of sea between these islands and adjacent countries and they continue to do so even now as indicated by a good number of exotic species occurring in these islands. However, it is worth to note that even among bats more than 50% are endemic.

Table—3. Faunal affinity of mammals of Andaman & Nicobar Islands with adjacent countries.

Areas	Number of species	%. Fauna
1. Andamans	15	32.6
2. Nicobars	15	32.6
3. Andaman+Nicobars	2	4.3
4. Andaman+India	2	4.3
5. Nicobar+India	2	4.3
6. Nicobar+India+Sumatra	1	2.2
7. Nicobar+Java	1	2.2
8. Andaman+India+Thailand+Burma+Malaya	3	6.6
9. Andaman+India+Thailand+Burma+Malaya+Java & Sumatra	3	6.6
10. Andaman+Nicobar+Java & Sumatra	1	2.2
11. Andaman+Nicobar+India+Thailand+Burma+Malaya+Java & Sumatra	1	2.2

On the basis of geographical distribution of the mammals of these islands the maximum faunal affinity is found with India (Table-3). Among the alien species, nine mammals of Andaman and four of Nicobars are found on Indian main land, of course some of these also occur in Burma, Malaya, Java and Sumatra. There are only two species, *F. pennanti* and *Axis axis* which are found only in India. Likewise, only one species, *Pteropus melanotus* is found only in Java-Sumatra after these islands. We do not find any species of these islands confined to Burma or Malaya only. Out of nine Indian species occurring in Andamans seven are also represented in Burma and Malaya, four of which are known from Java and Sumatra. Among the Nicobar mammals, two species *H. fulvus* and *P. coromandra* are found on Indian main land. Another species, *T. saccolaimus crassus* is found in India as well as Sumatra.

From the facts discussed above it is clear that major part of mammal fauna of Andaman and Nicobar Islands is endemic, each group comprising 32.6% separately and 4.3% sharing with each other.

Likewise 4.3% fauna is distributed between Andaman and India and another 4.3% between Nicobar and India. Presumption that Nicobars are more akin to Malaya or Java and Sumatra is not supported as far mammal fauna is concerned.

SUMMARY

The present paper provides a brief history of work on mammal fauna of Andaman and Nicobar Islands. The doubtful records of several mammals have also been discussed. Forty six species of mammals are recognised as representing the mammal fauna, these are dealt group-wise. The fauna composition, zoogeography and affinity of fauna with those of adjacent countries is also discussed.

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