

EXERCISE 34 MAMMALS : OBSERVATION AND CLASSIFICATION OF SPECIMENS

Structure

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34.1 INTRODUCTION

Mammals are one of the most familiar groups of animals that we see around us. These belong to class **Mammalia** of back-boned animals (**vertebrates**). Mammals as you will recall from Unit 4, Block I LSE-10 course are a group of more than 4000 species which share intricate adaptations, extraordinary behavioral patterns **and** very complex societies i.e. they exhibit a vast range of complexity and diversity. Technically you can describe a mammal as:

'A group of animals with backbone whose bodies are covered with hair and who nurse the infants with milk secreted by special glands'.

Mammals are found all over the world and in almost all types of habitat. They have a big range of size from the largest blue whale to the very small hog-nosed bat. They can be found on the cold frozen arctic upto the hot equator, in snow clad mountains rising high on land to the very deep bottom of the ocean. This indeed is a remarkable group of animals. All these varying habitat that these animals inhabit call for a very large range of adaptations. These include besides the terrestrial life, adaptations for a life under water, for flying in the air, and for living in the trees. These diverse habitats have brought about many changes in the body form and function during evolution. In the present exercise you will study some important representatives of class **Mammalia**.

Objectives

After completing this exercise, you should be able to:

- identify and give the scientific as well as common names of specimens of **Duck bill platypus, Mole, Hedge hog, Shrew, Bat, Squirrel, Mongoose, Slender loris,**
- classify the identified genera upto the level of order
- list characters justifying the classification of identified specimen and mention special features, if any
- mention habitat and geographical distribution of each genus
- draw a labelled diagram of each identified mammal.

34.2 MATERIALS REQUIRED

- 1.. Museum specimens of the following mammals:
 - Ornithorhynchus* (Duck bill platypus)
 - Talpa* (Mole)

Geographical Distribution

East Australia, Tasmania.

Classification and its Justification

Kingdom	Animalia	Animals, multi-cellular organisms with cells that lack a cell wall, many capable of movement or movement of some of their body parts or capable of movement at some time of their life cycle; heterotrophic nutrition.
Phylum	Chordata	Dorsal tubular nerve cord, notochord and paired gill-slits are present.
Subphylum	Vertebrata (Craniata)	Notochord is replaced by vertebral column; two pairs of appendages; circulatory system closed; hepatic portal system present; blood containing R.B.C.
Superclass	Gnathostomata	Jaws and paired appendages are present.
Class	Mammalia	Hairy skin, milk gland.
Subclass	Theria	Monotremata, egg-laying mammal .
Genus	<i>Ornithorhynchus</i>	
Common name	Duck bill platypus	

34.5.2 Talpa

Examine the specimen of Talpa (Mole) and note the following features with help of Fig. 34.2.

- i) Head wedge-shaped with pre-nasal bone in the snout which extends beyond the lower lip.
- ii) Eyes are rudimentary and **pinnac** are absent.
- iii) Body covered with thick velvety **fur**.
- iv) Tail sensory and devoid of hair.
- v) **Forelimbs characterised** by short humerus embedded in the body.
- vi) Extra sickle-shaped bone of carpus called radial **seasamoid** or falciform bone.
- vii) Muzzle endowed with projections called '**Eimer's** organs' which are probably sensory in nature.

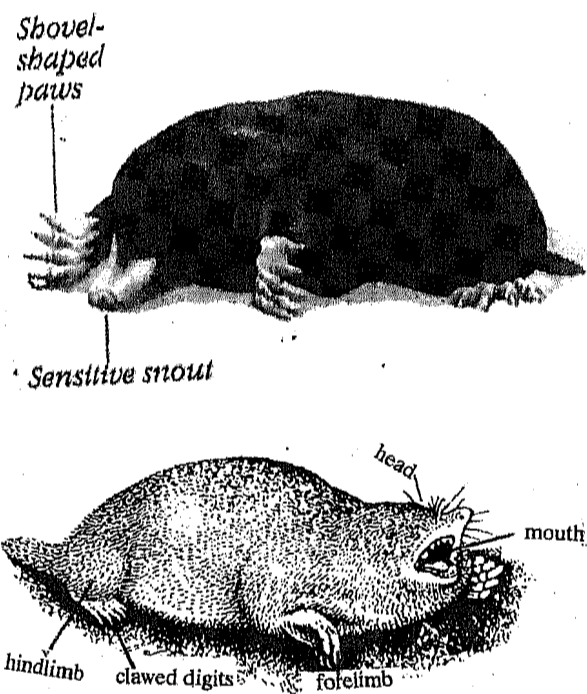


Fig. 34.2: *Talpa* (Mole)

Habit and Habitat

It lives in tunnels and is adapted for living under the ground.

Geographical Distribution

It is found in western Himalayas and eastern part of India.

Classification and its Justification

Kingdom	Animalia	Animals, multi-cellular organisms with cells that lack a cell wall, many capable of movement or movement of some of their body parts or capable of movement at some time of their life cycle; heterotrophic nutrition.
Phylum	Chordata	Dorsal tubular nerve cord, notochord and paired gill-slits are present.
Subphylum	Vertebrata (Craniata)	Notochord is replaced by vertebral column; two pairs of appendages; circulatory system closed; hepatic portal system present; blood containing R.B.C.
Superclass	Gnathostomata	Jaws and paired appendages are present.
Class	Mammalia	Hairy skin, milk gland
Subclass	Eutheria	Viviparous mammals
Order	Insectivora	Small cranial cavity and low grade brain
Genus	Talpa	
Common name	Mole	

34.5.3 Erinaceus

Examine the specimen of Erinaceus (Hedge hog) and **note** the following features with help of Fig. 34.3.

- i) Body is covered with spines.
- ii) Ventral side has fur.
- iii) Band of muscle passes along the side and over the neck and base of tail for moving the spiny area in order to cover the whole body in a defensive posture.
- iv) Head is small with a pointed snout and the tail is **small**.
- v) Eyes are small and pinnae are short.
- vi) **There** are five toes on each foot.
- vii) Number of teeth varies from 36 to 44.
- viii) Upper and lower first incisors larger than others. Lower incisors fit in the gap between upper incisors.

[The most special feature of hedgehog is that it curls into a ball of spine when threatened thus succeeding in thwarting efforts of predators.]

Habit and Habitat

It is a nocturnal (active during the night) animals and is found hiding in bushes and dark holes during the day. It is omnivorous. Food consists of insects, fruits, worms, slugs and other small animals. **When** disturbed it rolls into a **tight** ball covered with spines. It lives in burrows. Each individual hedgehog has its own burrow. It hibernates in winters. Hibernation is dictated by climatic conditions and food availability. Young ones are born naked with the spines being under the skin.

Geographical Distribution

Found widely in northern hemisphere, Africa, India and West Indies.

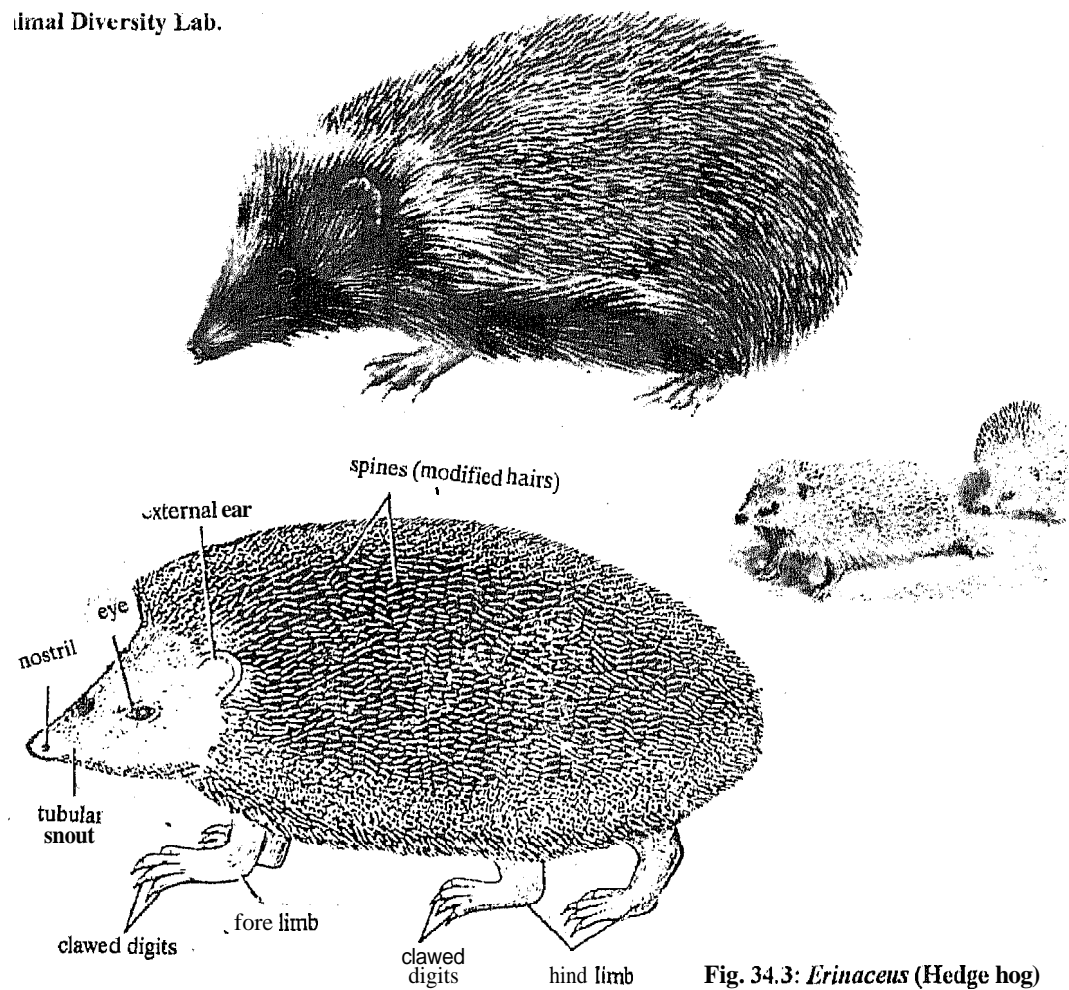


Fig. 34.3: *Erinaceus* (Hedge hog)

Classification and its Justification

Kingdom	Animalia	Animals, multi-cellular organisms with cells that lack a cell wall, many capable of movement or movement of some of their body parts or capable of movement at some time of their life cycle; heterotrophic nutrition.
Phylum	Chordata	Dorsal tubular nerve cord, notochord and paired gill-slits are present.
Subphylum	Vertebrata (Craniata)	Notochord is replaced by vertebral column; two pairs of appendages; circulatory system closed; hepatic portal system present; blood containing R.B.C.
Superclass	Gnathostomata	Jaws and paired appendages are present.
Class	Mammalia	Hairy skin, milk gland
Subclass	Eutheria	Viviparous mammals
Order	Insectivora	Small cranial cavity & low grade brain
Genus	<i>Erinaceus</i>	
Common name	Hedge hog	

34.5.4 *Sunchus murinus*

Examine the specimen of *Sunchus murinus* (Shrew) and note the following features with help of figure 34.4.

- i) Body is covered with fur and has an elongated snout and tail.
- ii) Small eyes and ears.
- iii) First pair of incisor teeth is very long.
- iv) Limbs with five claws.

- v) Teeth are not replaced and hence wearing down of teeth leads to starvation and even death in some shrews.
- vi) Most of the shrews show refection i.e. licking the anus. By this they are supposed to obtain trace elements and vitamin B & K.
- vii) They show territorial behaviour.

[Pigmy shrew is the smallest mammal.]

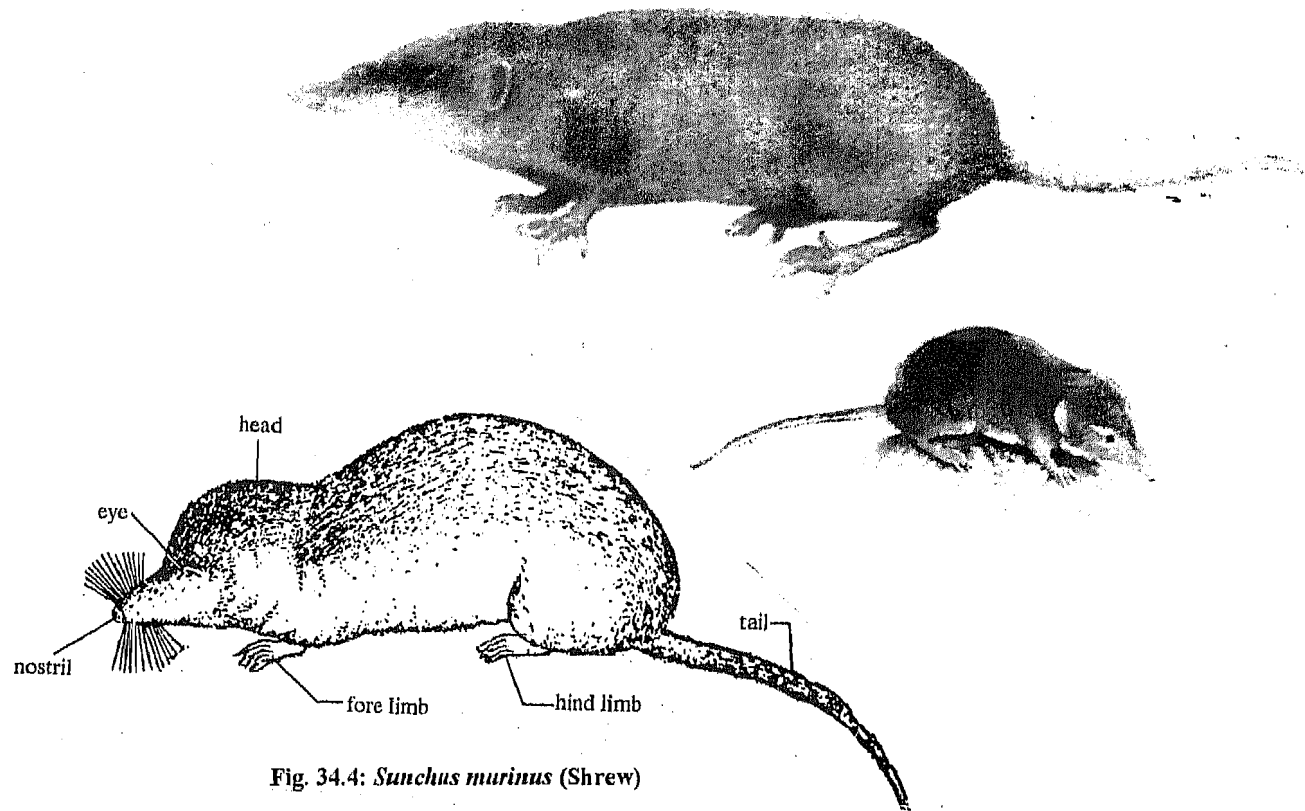


Fig. 34.4: *Sunchus murinus* (Shrew)

Habit & Habiat

It lives in burrows in gardens. It is found in places with human settlements. It is a carnivore and is active during night time. Feeds on insects and worms.

Geographical Distribution

Widely distributed common in Indian subcontinent but absent from Australia and parts of USA.

Classification and its Justification

Kingdom	Animalia	Animals, multi-cellular organisms with cells that lack a cell wall, many capable of movement or movement of some of their body parts or capable of movement at some time of their life cycle; heterotrophic nutrition.
Phylum	Chordata	Dorsal tubular nerve cord, notochord and paired gill-slits are present.
Subphylum	Vertebrata (Craniata)	Notochord is replaced by vertebral column; two pairs of appendages; circulatory system closed; hepatic portal system present; blood containing R.B.C.
Superclass	Gnathostomata	Jaws and paired appendages are present.
Class	Mammalia	Hairy skin, milk gland
Subclass	Eutheria	Viviparous mammals
Order	Insectivora	Small cranial cavity & low grade brain
Genus	<i>Sunchus</i>	

Species *murinus*
 Common name Shrew

Malayan flying fox
Pteropus vampyrus, or
 large fruit bat is the
 world's largest bat which
 can attain a wing span of
 over 6 feet (1.8m) and
 weigh well over two and a
 half pounds (1000 g).
 There are 7 subspecies of
 large fruit bat, and the
 most threatened being
Pteropus vampyrus
lanensis of philippines.
 The large fruit bat has a
 gestation period of
 approximately 180 days
 and gives birth to a single
 pup (two on rare occasion).

34.5.5 Pteropus

Examine the specimen of *Pteropus* (Bat) and note the following features with help of figure 34.5.

- (i) Large sized animals. May have a wing span as large as 5 feet.
- (ii) Body covered with soft fur.
- (iii) Snout long and without nose leaf.
- (iv) Ears are oval and widely separated.
- (v) Tail absent.
- (vi) Thumb and second digit clawed.
- (vii) Tail membrane (Uropatagium) absent.

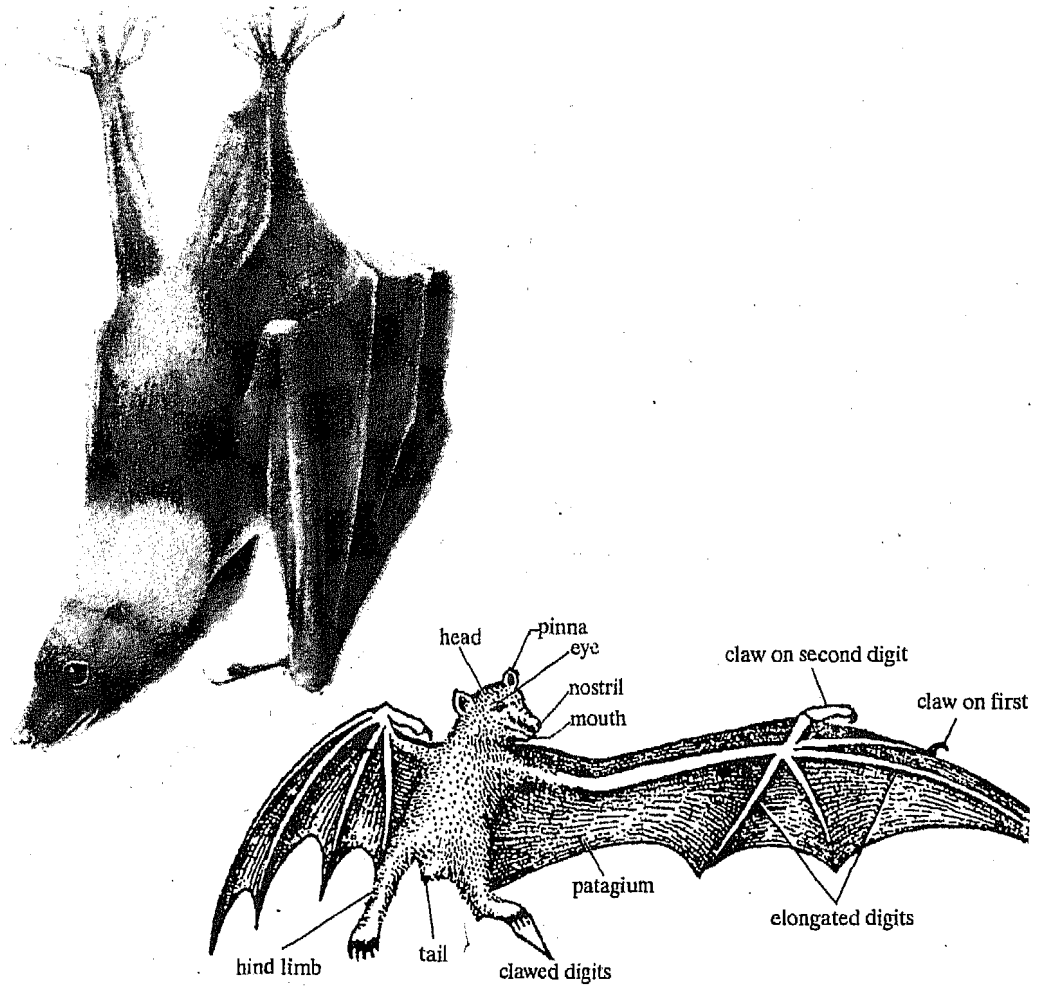


Fig. 34.5: *Pteropus* (Fruit bat)

[Bats exhibit the unique feature of echolocation in which they use high frequency waves emitted by them to find food and avoid obstacles in the dark. This system works like a sonar.]

Habit and Habitat

This animal is adapted to an arboreal mode of life. It is found hanging upside down on large trees during daytime and becomes active at night. Lives in groups.

Geographical Distribution

It is found in tropics and subtropics, Africa to East Asia and Australia,

Classification and its justification

Kingdom	Animalia	Animals, multi-cellular organisms with cells that lack a cell wall, many capable of movement or movement of some of their body parts or capable of movement at some time of their life cycle; heterotrophic nutrition .
Phylum	Chordata	Dorsal tubular nerve cord, notochord and paired gill-slits are present.
Subphylum	Vertebrata (Craniata)	Notochord is replaced by vertebral column; two pairs of appendages; circulatory system closed ; hepatic portal system present; blood containing R.B.C.
Superclass	Gnathostomata	Jaws and paired appendages are present.
Class	Mammalia	Hairy skin, milk gland
Subclass	Eutheria	Viviparous mammals
Order	Chiroptera	Large fruit-eating bats; fore-limbs modified for flight; second and fifth digits greatly elongated, supporting the wing or flight membrane; hind-limbs weak, have five clawed digits; eyes small and vision weak; ears with large pinnae, teeth sharp; sternum has a keel; nocturnal.
Genus	<i>Pteropus</i>	
Common name	Bat	

34.5.6 *Funambulus*

Examine the specimen of *Funambulus* (Squirrel) and note the following features with the help of figure 34.6.

- (i) Body bears three stripes of white and grey coat on dorsal side.
- (ii) The ventral side and limbs have grey coat.
- (iii) Eyes large and pinnae well developed.
- (iv) Large chisel-like exposed incisors, canines absent.
- (v) Limbs have five claws on digits and the elbow joint is capable of rotating.
- (vi) Tail elongated and bushy.

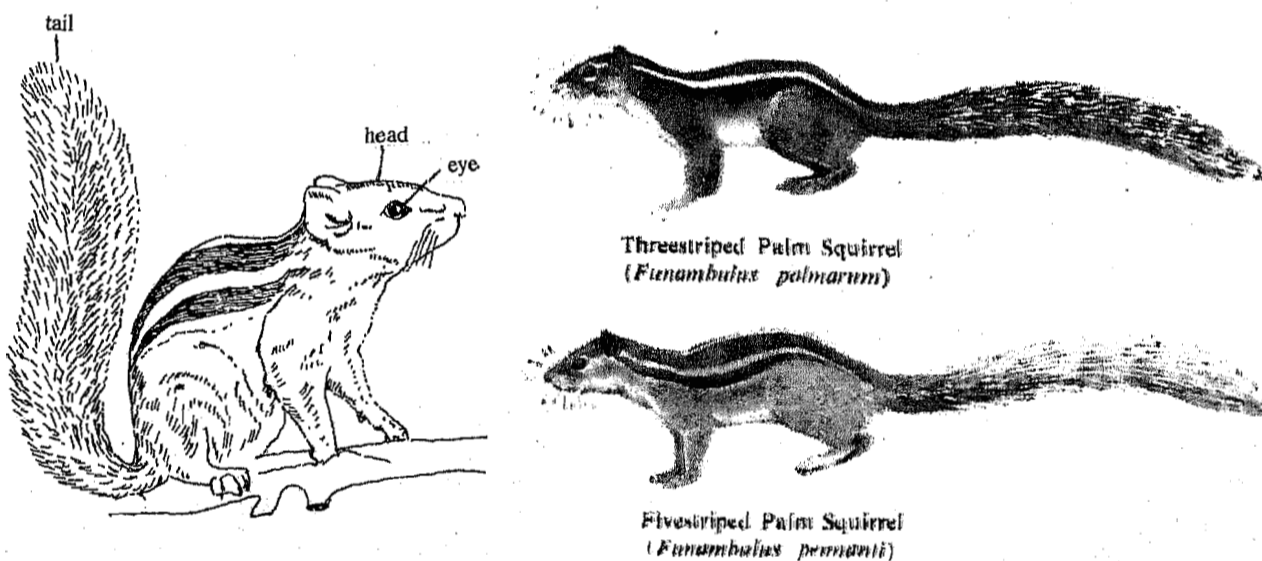


Fig. 34.6: *Funambulus* (Squirrel)

Habit & Habitat

It lives in trees and on ground. It is a diurnal animal feeding on fruits and seeds.

Geographical Distribution

Worldwide.

Classification and its justification

Kingdom	Animalia	Animals, multi-cellular organisms with cells that lack a cell wall, many capable of movement or movement of some of their body parts or capable of movement at some time of their life cycle; heterotrophic nutrition.
Phylum	Chordata	Dorsal tubular nerve cord, notochord and paired gill-slits are present.
Subphylum	Vertebrata (Craniata)	Notochord is replaced by vertebral column; two pairs of appendages; circulatory system closed; hepatic portal system present; blood containing R.B.C.
Superclass	Gnathostomata	Jaws and paired appendages are present.
Class	Mammalia	Hairy skin, milk gland
Subclass	Eutheria	Viviparous mammals
Order	Rodentia	<i>Chisel</i> like incisors, canines absent
Genus	<i>Funambulus</i>	
Common name	Squirrel	

34.5.7 *Herpestes*

Examine the specimen of *Herpestes* (Mongoose) and note the following features with help of figure 34.7.

- (i) Body covered with short fur, blackish brown to gray in colour.
- (ii) Feet darker than head and body.
- (iii) Carnivore, feeds on snakes, small vertebrates, insects and occasionally fruits.
- (iv) Teeth 34 to 40 in number.
- (v) Well developed carnassial teeth to shear flesh.
- (vi) Digits tipped by long non retractable claws adopted for digging.
- (vii) Large anal sac with two glandular openings used for scent marking.

[In India, mongoose has long been associated with the folklore involving snakes as it is known to often attack and kill snakes. Some species stand in a group when threatened by snakes who due to their poor eyesight interpret them as one single large animal and thus avoid them.]

Habit and Habitat

It lives in burrows and is mainly nocturnal. It is mainly carnivorous and feeds on snakes, small vertebrates, insects and occasionally fruits.

Geographical Distribution

Africa, Arabia, India and Sri Lanka

Classification and its justification

Kingdom	Animalia	Animals, multi-cellular organisms with cells that lack a cell wall, many capable of movement or movement of some of their body parts or capable of movement at some time of their life cycle; heterotrophic nutrition.
Phylum	Chordata	Dorsal tubular nerve cord, notochord and paired gill-slits are present.
Subphylum	Vertebrata (Craniata)	Notochord is replaced by vertebral column; two pairs of appendages; circulatory system closed;

		hepatic portal system present; blood containing R.B.C.
Superclass	Gnathostomata	Jaws and paired appendages are present.
Class	Mammalia	Hairy skin, milk gland
Subclass	Eutheria	Viviparous mammals
Order	Carnivora	Powerful canines, carnassial both to shear flesh
Genus	<i>Herpestes</i>	
Common name	Mongoose	

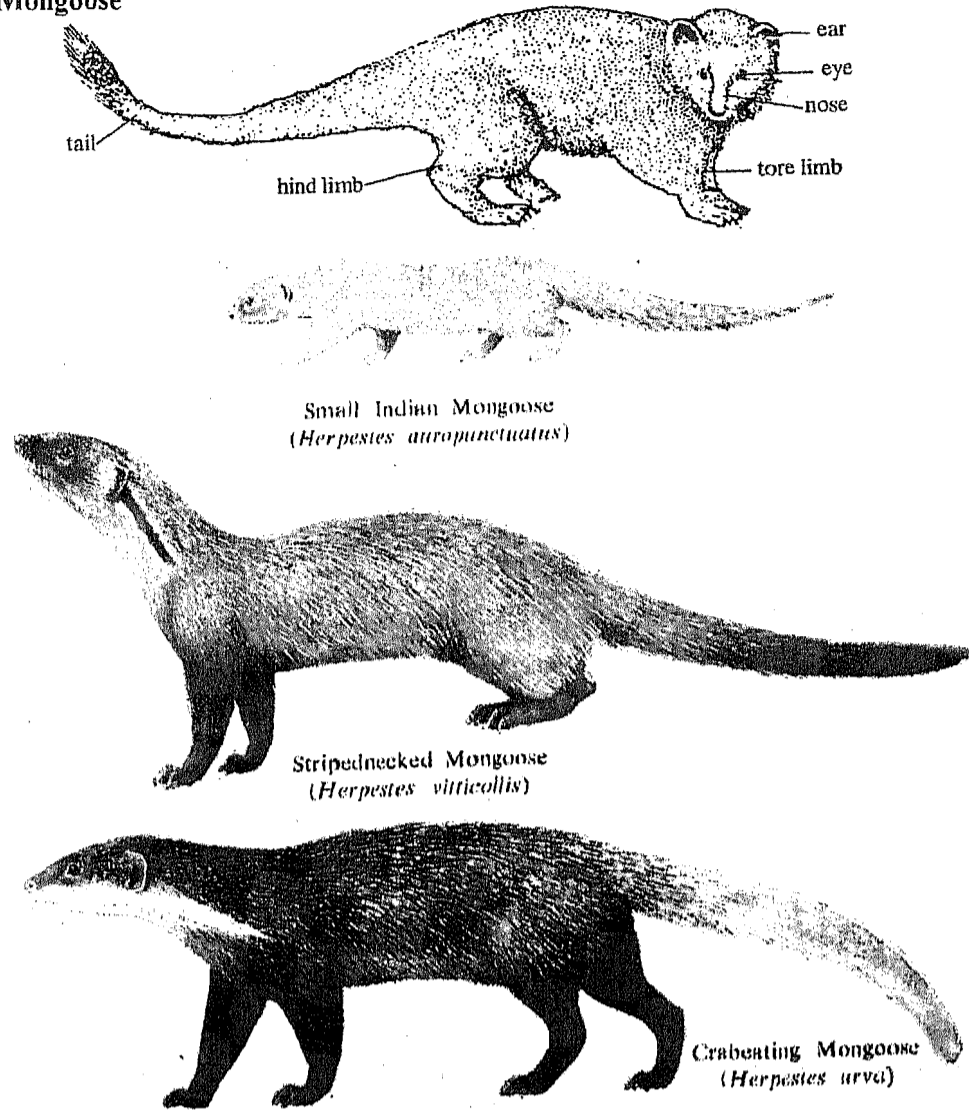


Fig. 34.7: *Herpestes* (Mongoose)

34.5.8 *Loris*

Examine the specimen of *Loris* (Slender loris) and note the following features with help of figure 24.8.

- (i) Body is covered with grey reddish coat of hair.
- (ii) Moist snout (as different from higher primates).
- (iii) Face covered with hair.
- (iv) Dental formula; I 2/2, C 1/1, Pm 3/3, M 3/3 = 36,
- (v) External sexual organs visible.
- (vi) Much reduced tail.
- (vii) Short fingers having soft pads on the tips.
- (viii) Eyes surrounded by black spots separated by narrow white line down to nose.

[These animals have some of the features which may be considered primitive like a transverse fold of skin on the abdomen of the female that might be a representation of marsupium.]

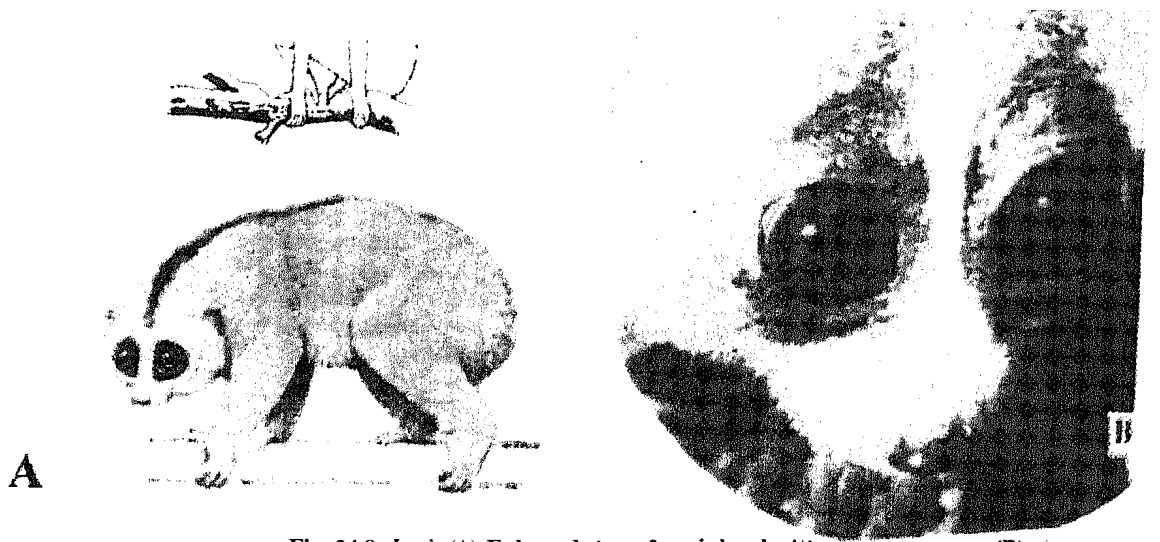


Fig. 34.8: *Loris* (A) Enlarged view of *Loris* head with prominent eyes (B).

Habit and Habitat

These animals are nocturnal and live on the trees.

Geographical Distribution

Found in Africa and Asia.

Classification and its justification

Kingdom	Animalia	Animals, multi-cellular organisms with cells that lack a cell wall, many capable of movement or movement of some of their body parts or capable of movement at some time of their life cycle; heterotrophic nutrition.
Phylum	Chordata	Dorsal tubular nerve cord, notochord and paired gill-slits are present.
Subphylum	Vertebrata (Craniata)	Notochord is replaced by vertebral column; two pairs of appendages; circulatory system closed ; hepatic portal system present; blood containing R.B.C.
Superclass	Gnathostomata	Jaws and paired appendages are present.
Class	Mammalia	Hairy skin, milk gland
Subclass	Eutheria	Viviparous mammals
Order	Primates	Opposable thumb
Genus	<i>Loris</i>	
Common name	Slender loris	

34.6 TERMINAL QUESTION

1. Match animals given in column-I with their respective orders (given in column-II)

	Column-I	Column-II
	Animal	Order
(i)	<i>Erinaceus</i>	<i>Chiroptera</i>
(ii)	<i>Herpestes</i>	<i>Insectivora</i>
(iii)	<i>Pteropus</i>	<i>Rodentia</i>
(iv)	<i>Funambulus</i>	<i>Carnivora</i>

2. Give two salient features of the following mammals.

(i) <i>Ornithorhynchus</i>	(iii) <i>Loris</i>
(ii) <i>Talpa</i>	(iv) <i>Pteropus</i>