

# THE INSECTIVORES

## *Order Insectivora*

### ORDER INSECTIVORA

The name Insectivora refers to the diet of most members of this order. Although a diet of insects and other small invertebrates is common among the diverse mammals included in Insectivora, the ordinal name does not indicate a diagnostic character. Some members of the order Insectivora are quite omnivorous or carnivorous, whereas various species in several other orders have diets that are almost exclusively insectivorous. Insectivores are generally small, rather primitive mammals. The order has been used as a "wastebasket taxon" into which many kinds of living and fossil mammals of dubious relationships have been placed. Most species are terrestrial, but fossorial and/or semi-aquatic forms are not uncommon, and semiarboreal forms exist.

Some insectivores (e.g., some moles) are considered pests in some parts of their range, but none are of major economic importance. The Russian desman, *Desmana moschata*, and several other species in Talpidae, were once commercially important for their fur. One species of shrew, *Suncus murinus*, is a commensal with humans through much of the Orient.

#### DISTINGUISHING CHARACTERS

No single character or simple combination of characters can be given that will distinguish all insectivores from all other mammals. They are small animals ranging in size from some of the smallest known mammals, the shrews *Suncus etruscus* and *Sorex hoyi*, to species

the size of a rabbit. The pelage usually consists of only one kind of hair other than vibrissae, though some forms have spines as well. The feet are usually plantigrade and with five toes. The dentition is generally simple, and the cheek teeth are zalambdodont in some groups.

The olfactory capsules are longer than the brain and largely interorbital. The maxillae extend into the orbital walls and separate the lacrimal bones from the palatines. The jugals are reduced or absent, and the zygomatic arches are sometimes incomplete. Postorbital bars are never present. A baculum has been reported in some insectivores and may exist in others.

#### LIVING FAMILIES OF INSECTIVORA

For a list of families and their contents see Table 12.1.

Insectivores range over most of the world's land surface except for the Australian and southern Neotropical Regions, Antarctica, and most oceanic islands. The European hedgehog, *Erinaceus europaeus*, has been introduced into New Zealand; a tenrec, *Tenrec eacaudatus*, has been introduced onto Réunion, Mauritius, and islands in the Comoro and Seychelles groups in the Indian Ocean; and one commensal shrew, *Suncus murinus*, has followed modern humans into New Guinea, Guam, Madagascar, and various Old World continental seaports.

**TABLE 12.1 Living Families of Insectivora\***

Family	Common Name	Number of		Distribution
		Genera	Species	
Solenodontidae	Solenodons	1	2	Cuba, Hispaniola
Tenrecidae	Tenrecs, otter shrews	10	24	Madagascar (tenrecs) and westcentral Africa (otter shrews)
Chrysochloridae	Golden moles	7	18	Central and southern Africa
Erinaceidae	Hedgehogs, gymnures	7	21	Ethiopian, Palearctic, Oriental
Soricidae	Shrews	23	312	Holarctic, Ethiopian, Oriental, northern Neotropical
Talpidae	moles and desmans	17	42	Holarctic, Oriental

\*The families listed here, and the numbers of genera and species, follow Hutterer (1993), except that the completely extinct family Nesophontidae and one extinct species of Solenodontidae are omitted from this table and from discussion in this chapter.

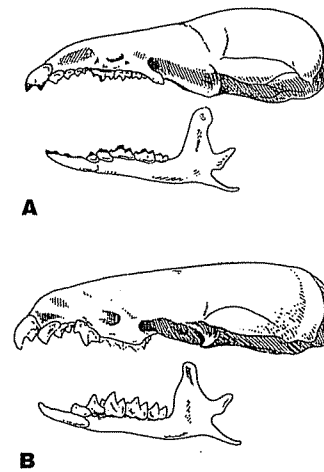
**KEY TO LIVING FAMILIES OF INSECTIVORA**

- 1 I<sup>1</sup> large, protruding forward and hooked, small cusp present behind main cusp (Fig. 12.2); teeth may or may not be pigmented; small animals with short dense fur (Fig. 12.1) ..... **Soricidae** shrews
- 1' I<sup>1</sup> may be large, but if hooked, no accessory cusp present; teeth never pigmented; size and pelage various, frequently spiny ..... 2
- 2 (1') Zygomatic arch incomplete ..... 3
- 2' Zygomatic arch complete ..... 4
- 3 (2) Dental formula 3/3 1/1 3/3 3/3 = 40; I<sup>1</sup> large (Fig. 12.3); I<sub>2</sub> large with longitudinal, lingual groove (Fig. 12.4); pelage long and lax; tail long and scaly (Fig 12.5) ..... **Solenodontidae** solenodons
- 3' Dental formula various; I<sup>1</sup> small or large; I<sub>2</sub> may be large but never grooved (Fig. 12.6); pelage various, usually very short or with spines (Fig. 12.7); tail various ..... **Tenrecidae** tenrecs and otter shrews

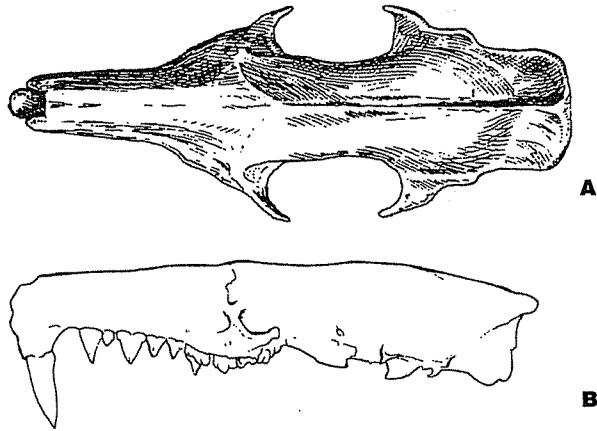
- 4 (2') Crowns of upper molars quadrate (Fig. 12.8); eyes and pinnae large, pelage may include spines (Fig. 12.9) ..... **Erinaceidae** hedgehogs and gymnures
- 4' Crowns of upper molars triangular (zalambdodont) or with cusps in a W-shaped pattern (dilambdodont) (Fig. 12.10A); eyes and pinnae small or absent, pelage never spiny ..... 5



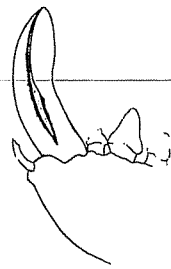
**Figure 12.1** Representatives of the three most widespread genera of Soricidae. (A) *Sorex araneus*, (B) *Suncus murinus*, and (C) *Crocidura suaveolens*. Not all to same scale. (Hsia et al. 1964)



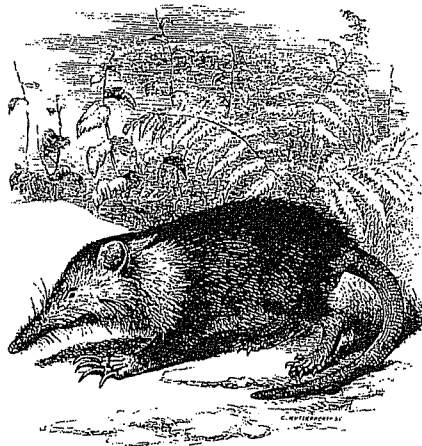
**Figure 12.2** Skulls of a pigmented-toothed shrew. (A) *Sorex araneus*, and (B) an unpigmented-toothed shrew, *Crocidura suaveolens*. Both Soricidae. (Stroganov 1957)



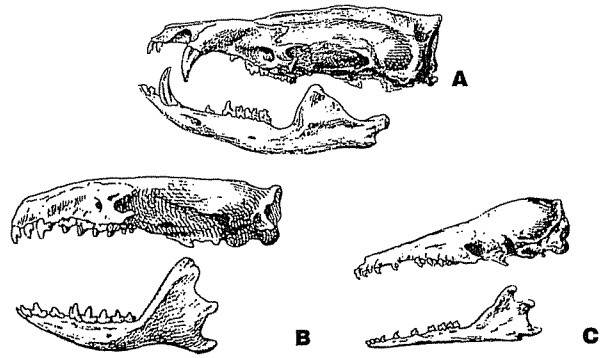
**Figure 12.3** Dorsal (A) and lateral (B) views of the skull of a solenodon, *Solenodon paradoxus*, Solenodontidae. (A, Cabrera 1925; B, John D. Whitesell)



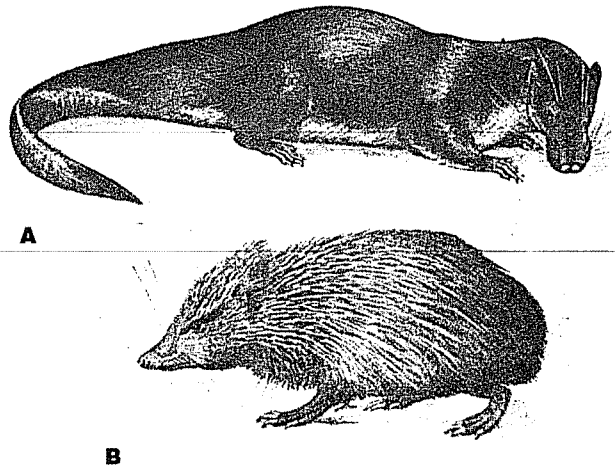
**Figure 12.4** A lingual view of the anterior portion of the mandible of a solenodon. (John D. Whitesell)



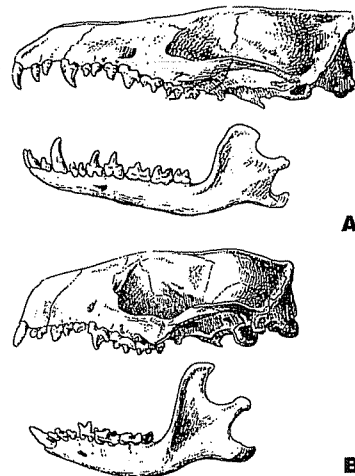
**Figure 12.5** The Cuban solenodon, *Solenodon cubanus*, Solenodontidae. (Flower and Lydekker 1891)



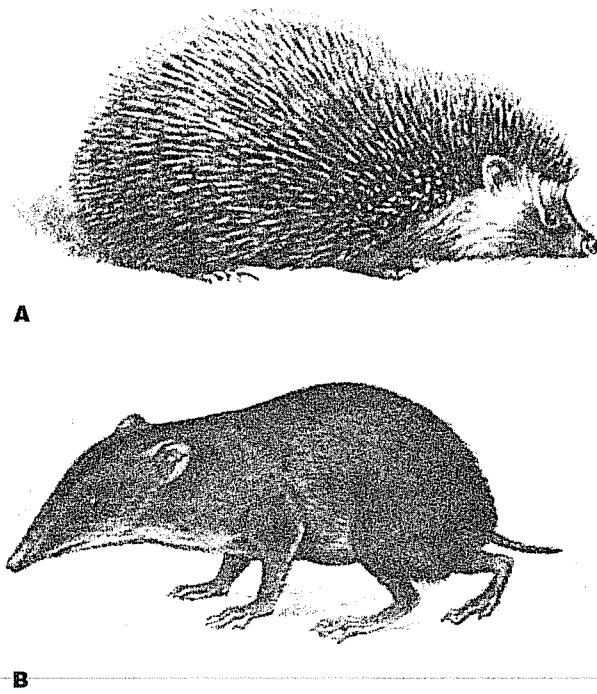
**Figure 12.6** Skulls of three tenrecids illustrating some of the diversity that occurs in this family. (A) *Tenrec ecaudatus*, (B) *Setifer setosus*, and (C) *Hemicentetes semispinosus*. (Cabrera 1925)



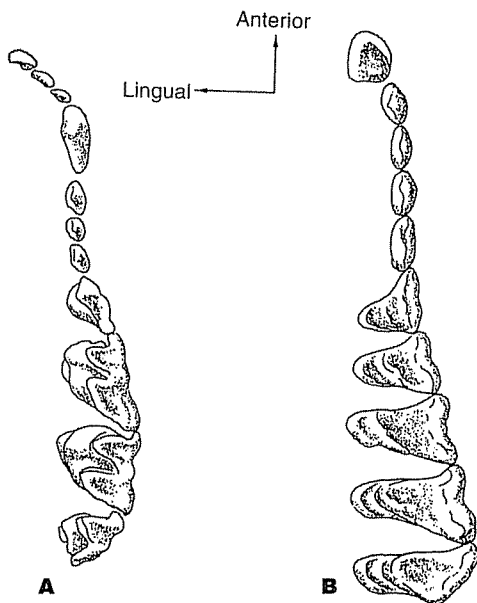
**Figure 12.7** Representative tenrecids. (A) An otter shrew, *Potamogale velox*, and (B) a tenrec, *Tenrec ecaudatus*. (Cabrera 1925)



**Figure 12.8** Skulls of representative Erinaceidae. (A) A gymnure, the moon "rat," *Echinorex gymnura*, and (B) a hedgehog, *Atelerix algirus*. (Cabrera 1925)



**Figure 12.9** Representative Erinaceidae, (A) A hedgehog, *Atelerix algirus*, and (B) a gymnure, *Hylomys suillus*. (Cabrera 1925)

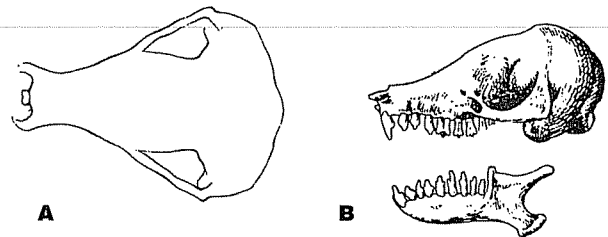


**Figure 12.10** Representative occlusal surfaces of the teeth of Insectivora. (A) Occlusal surfaces of the left upper tooth row from a European mole, *Talpa europaea*, Talpidae, with a dilambdodont (W-shaped) cusp pattern on the molars. (B) Left upper tooth-row from a giant otter shrew, *Potamogale velox*, Tenrecidae, with a zalambdodont (V-shaped) cusp pattern on the molars. (Feldhamer et al. 1999)

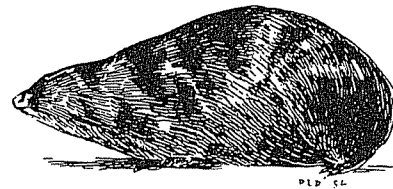
5 (4') Upper molars zalambdodont (V-shaped) (Fig. 12.10B); dental formula  $3/3 \ 1/1 \ 3/3 \ 2/2$  or  $3/3 = 36$  or  $40$ ;  $I^1$  enlarged; skull a short cone, zygomatic arches broad (Fig. 12.11); forefoot with four digits and with two central claws much larger than others; tail rudimentary (Fig. 12.12)

..... **Chrysochloridae**  
golden moles

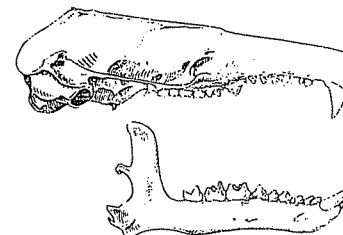
5' Upper molars dilambdodont (Fig 12.10A); dental formula various;  $I^1$  may (Fig. 12.13) or may not (Fig. 12.14) be enlarged; skull generally long and conical, zygomatic arches generally weak; forefoot with five digits; claws on digits two and three not particularly larger than others (Fig. 12.15), tail length various ..... **Talpidae**  
moles and desmans



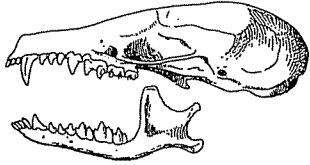
**Figure 12.11** Skull of a golden mole, *Chrysochloris asiatica* Chrysochloridae. (A) Diagrammatic dorsal view and (B) lateral view. (A, John D. Whitesell; B, Cabrera 1925)



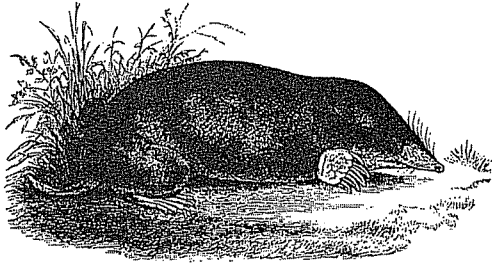
**Figure 12.12** A golden mole, *Chlorotalpa leucorhina*, Chrysochloridae. (Dekeyser 1955)



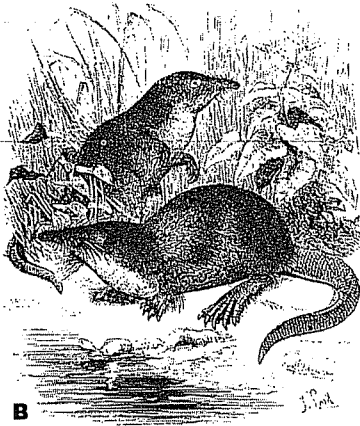
**Figure 12.13** Skull of a Russian desman, *Desmana moschata*, Talpidae. (Gromov et al. 1963)



**Figure 12.14** Skull of the European mole, *Talpa europaea*, Talpidae.  
(Cabrera 1925)



**A**



**B**

**Figure 12.15** Representative species of Talpidae. (A) A mole, *Scalopus aquaticus*, and (B) a Russian desman, *Desmana moschata*.

(A, Kingsley 1884; B, Flower and Lydekker 1891)

## COMMENTS AND SUGGESTIONS ON IDENTIFICATION

Unfortunately, there is no single good characteristic distinguishing all insectivores from all other mammals. Familiarize yourself with the general appearance of each family and the other groups with which it might be confused. Only the Tenrecidae has great diversity within the family, and except for the subfamily Potamogalinae, the otter shrews, tenrecids are confined to Madagascar. Also keep in mind that:

1. Moles, golden moles, and marsupial "moles" resemble each other. Check and compare forefeet, skulls, and localities collected.
2. Hedgehogs, tenrecs, and echidnas resemble each other. Check skulls and localities. There are no hedgehogs in Madagascar, and spiny tenrecids are confined to that island.
3. Certain shrews and certain moles resemble each other. Check the skulls for the distinctive first upper incisor of shrews.