

## Mammalogy Laboratory 3 – Chiroptera

### Order Chiroptera

General Comments: The Order Chiroptera has received a great deal of attention from systematists because an Australian neurobiologist has discovered that one group, the Pteropodidea (the megabats), has neuronal pathways that are very similar to those found in primates, and not at all similar to those of Microchiroptera. A flurry of molecular papers followed that examined the hypothesis of non-monophyly of Chiroptera, and most could reject it. The data therefore indicate that the classical hypothesis of a monophyletic Chiroptera is supported. Furthermore, some recent papers have indicated that the megabats have evolved from within microbats, making the latter a paraphyletic group. Some difficult names have resulted; **Yangochiroptera**, which includes most of the microbats, and **Yinpterochiroptera**, which includes the megabats (Pteropodidae) and a few microbat families (e.g., Craseonycteridae, Hipposideridae, Megadermatidae, Rhinolophidae, etc.).

This is a very diverse group. Chiroptera is the second largest order of mammals, containing approximately 925 species; ca. 20% of all mammals are bats. The biology of bats and their morphological diversity are fascinating. In general, the northern latitudes have a relatively depauperate bat fauna; all our local bats belong to a single family.

Diagnosis: flying mammals with well-developed wings; hand and forefingers greatly elongated (except for the thumb); never > 2 pairs of upper incisors; never > 22 milk teeth; baculum present; manubrium often keeled.

Range: Cosmopolitan (worldwide)

#### **Family Pteropodidae** (fruit bats or flying foxes)

Diagnosis: foredigit 2 retains some degree of independence and is often clawed; mandible with angular process broad and low or practically absent; post-orbital process well-developed; bony palate extends posteriorly beyond last molar; tragus absent; no nose leaf; eyes well developed.

Habits: Frugivores or nectivores; crepuscular/nocturnal; usually locate food by smell; have excellent vision; don't echolocate (except *Rousettus*); do not hibernate; long life span with low reproductive potential (usually one young per year).

Range: Old World tropics:

Representative Genera: *Pteropus*, *Rousettus*, *Dobsonia*, *Micropteropus*, *Cynopterus*.

Material in Lab: ***Pteropus*** (skeleton)

## Yangochiropteran families

Diagnosis: foredigit 2 scarcely, if at all independent, closely appressed against third digit, and lacking a claw; mandible with angular process well developed, usually long and narrow; post-orbital process usually absent or rudimentary, occasionally well-developed; bony palate usually not extended posteriorly beyond last molars; tragus often present; eyes relatively small; effective echolocation in all groups.

Range: cosmopolitan, including New Zealand.

Families:

Phyllostomidae	Emballonuridae
Natalidae	Noctilionidae
Furipteridae	<b>Vespertilionidae</b>
Thyropteridae	Mystacinidae
Myzopodidae	Nycteridae
Mormoopidae	<b>Molossidae</b>

### Family Vespertilionidae (vespertilionid or common bats)

Diagnosis: foredigit 3 with three phalanges, foredigit two with metacarpal and one small phalanx; nose-leaf absent or rudimentary; tragus present and well-developed; premaxillae separate; no post-orbital process; tail long, extending to end of wide interfemoral membrane; molars always 3/3, with well-developed W-shaped ectolophs (Dilambdodont).

Habits: usually insectivorous, a few species piscivorous; migration and hibernation common; usually one young per year, but a few species have up to four; some tropical species polyestrous; may live as long as 30 years or more.

**Range: Cosmopolitan**

Representative Genera: 36 genera, 314 species.

Material in Lab: *Corynorhinus (Plecotus) townsendii* (Townsend's big-eared bat)  
*Lasiurus blossevillii* (red bat)\*  
*Lasiurus cinereus* (hoary bat)  
*Eptesicus fuscus* (big brown bat)  
*Lasionycterus noctivagans* (silver-haired bat)  
*Myotis lucifugus* (little brown bat)  
*M. thysanodes* (fringed myotis)  
*M. evotis* (long-eared myotis)  
*M. volans* (long-legged myotis)  
*M. yumanensis* (Yuma myotis)  
*Parastrellus* (formerly *Pipistrellus*) *hesperus* (canyon bat)  
*Antrozous pallidus* (pallid bat)

\*Likely to occur in Idaho, but not documented.

Idaho Forms not represented:

- Euderma maculatum* (spotted bat)
- Myotis californicus* (California myotis)
- M. ciliolabrum (leibii)* (western small-footed myotis)

Key to *Myotis* species occurring in Idaho:

1. Uropatagium fringed with well-developed stiff hairs.....*M. thysanodes*  
Uropatagium not visibly fringed.....2
2. Ears extending past rostrum when laid forward.....3  
Ears not extending past rostrum when laid forward.....5
3. Ears > 16 mm, extending > 2 mm beyond rostrum.....*M. evotis*  
Ears < 16 mm.....4
4. Black facial marking present.....*M. ciliolabrum*  
Black facial marking absent; sparse hair extending onto uropatagium.....*M. californicus*
5. Uropatagium furred .....*M. volans*  
Uropatagium not furred; calcar not keeled.....6
6. Pelage glossy, with distinct sheen; greatest length of skull usually > 14 mm.....*M. lucifugus*  
Pelage dull, often pale, without sheen; greatest length of skull < 14 mm..... *M. yumanensis*

**Family Molossidae (free-tailed bats and mastiff bats)**

Diagnosis: muzzle broad and obtuse; foredigit 3 with three phalanges; lips large, upper lip often furrowed by vertical wrinkles; ears usually large and broad, often united across forehead; tragus present but small; interfemoral membrane narrow, with tail extending far beyond distal edge; no postorbital process.

Habits: insectivorous; inhabit caves, buildings or other similar structures; fast fliers (recorded up to 95 km/hr); some species migratory; some species hibernate but generally not as deeply as vespertilionids; most species colonial, with colonies of 20,000,000 known for *Tadarida brasiliensis*; typically one young per year.

Range: widespread in tropical and subtropical forests; occur in the southern half of US

Representative Genera: *Tadarida*, *Otomops*, *Meoplatymops*, *Platymops*, *Sauromys*, *Eumops*, *Molossus*.

Martial in Lab: *Tadarida brasiliensis*\*

\*Not an Idaho species