

Mammalogy Laboratory 5 - Rodents II: Castorimorpha and Myomorpha

Suborder Castorimorpha

Family Castoridae (Beavers)

Diagnosis: Skull massive; sciurognathus jaw morphology; sciuiromorphous zygomaseteric condition; infraorbital foramen forming a narrow canal, anterior opening smaller than incisive foramen; bullae with a neck that projects dorsolaterally; cheek teeth high-crowned, but not ever-growing; modified for aquatic life: hind feet enlarged; digits webbed, tail dorsoventrally flattened and scaly, fur very dense.

Habits: Eat mostly bark and leaves; crepuscular to nocturnal; build dams of sticks, mud and rocks to impound water in the northern parts of range; build dome shaped lodges

Range: Holarctic

Genus: *Castor canadensis*

Family Geomyidae (Pocket gophers)

Diagnosis: External fur-lined cheek pouches; premolars figure 8-shaped, larger than any molar; molars ring shaped, except M3 which may have a posterior heel; cheek-teeth ever-growing; skull flattened dorsoventrally; bullae moderately large; strong temporal ridges, often forming a sagittal crest; deep pit on each side of palate at level of M3; palatine unites with pterygoids to form a pterygoid plate; incisive foramina small and enclosed by premaxilla; highly specialized for fossorial life: short neck; thick body; short hair; ears and eyes small; incisors procumbent and often grooved, forefoot with five digits bearing powerful claws.



Habits: Fossorial, eat succulent tubers; food carried in pouches to storage chambers in burrows; one or two active breeding periods per year.

Range: Nearctic and Neotropical

Representative Genera: *Thomomys*, *Geomys*, *Papogeomys*, *Heterogeomys*

Material in Lab: *Thomomys talpoides* (Northern pocket gopher)
T. townsendii (Townsend's pocket gopher)
*T. umbrinus** (Southern pocket gopher)

Idaho species not represented: *T. idahoensis* (Idaho pocket gopher)
*Not an Idaho species

Family Heteromyidae (Pocket mice, Kangaroo rats, Kangaroo mice)

Diagnosis: External fur-lined cheek pouches; infraorbital canal countersunk in rostrum and extending transversely through rostrum; skull thin, not strongly modified for fossorial life; zygomatic arch slender; jaws small; trend toward saltatorial locomotion: hind foot becoming long, tail long, bullae slightly to highly inflated.

Habits: Nocturnal; typically burrow; feed on seeds which are stored in chamber in burrows; some quadrupedal, others bipedal; some hibernate, others aestivate; desert forms physiologically adapted to not taking water for days.

Range: Nearctic and Neotropical

Genera: *Heteromys*, *Liomys*, *Perognathus*, *Cheotodipus*, *Dipodomys*, *Microdipodops*

Material in Lab: *Perognathus parvus* (Great Basin pocket mouse)
P. longimembris (Little pocket mouse)
*Chaetodipus penicillatus** (Desert pocket mouse)
Dipodomys ordii (Ord's kangaroo rat)
D. microps (Chisel-toothed kangaroo rat)
*D. heermani** (Heerman's kangaroo rat)
Microdipodops megacephalus (Dark kangaroo mouse)

*Not an Idaho species

Suborder Myomorpha

Family Muridae (Old World Mice and Rats)

Diagnosis: Upper molars with a functional row of tubercles on lingual side of crown internal to the hypocone and protocone; cheek-teeth laminate or cuspidate; when cuspidate, cusps arranged in three longitudinal rows, inner row may be vestigial; infraorbital canal generalized, usually wider above than below; zygomatic plate broadened and tilted upward; tail typically naked and scaly; soles of feet naked.

Habits: Climbing, terrestrial, arboreal, burrowing, or semi-aquatic. *Mus* and *Rattus* are commensal with humans; habits, food, etc. extremely varied.

Range: Cosmopolitan through introduction (accidental) by humans, but naturally, Australia, Eurasia, Africa, and Indonesia

Representative Genera: *Rattus*; *Mus*; *Apodemus*; *Acomys*; *Notomys*; *Hydromys*; *Bandicota*

Material in Lab: *Rattus norvegicus*⁺ (Norway rat)
Mus musculus⁺ (House mouse)

⁺ Introduced species

Family Cricetidae (New World Mice and Rats, Hamsters, Voles)

Subfamily Neotominae

Diagnosis: Upper molars with two functional rows of tubercles (i.e., none present on lingual side of crown internal to the hypocone and protocone); cheek-teeth prismatic or cuspidate; when cuspidate, cusps arranged in two longitudinal rows; infraorbital canal generalized, usually wider above than below; zygomatic plate broadened and tilted upward; tail often furred.

Habits: Climbing, terrestrial, arboreal, burrowing, or semi-aquatic.

Representative Genera: *Scotinomys*, *Peromyscus*, *Neotoma*, *Reithrodontomys*, *Onychomys*, *Ochrotomys*, *Habromys*.

Material in Lab: *Reithrodontomys megalotis* (Western harvest mouse)
Peromyscus maniculatus (Deer mouse)
P. crinitus (Canyon mouse)
*P. californicus** (California mouse)
*P. eremicus** (Cactus mouse)
Onychomys leucogaster (Northern grasshopper mouse)
Neotoma lepida (Desert woodrat)
N. cinerea (Bushy-tailed woodrat)

Idaho form not represented: *Peromyscus truei* (Pinion mouse)

*Not an Idaho species

Subfamily Sigmodontinae

Diagnosis: Infraorbital canal generalized with a rounded upper portion and a narrow lower portion; zygomatic plate broad and tilted upwards to a greater or lesser degree; skull varying in form, but always without postorbital processes on frontals; angular process of mandible not directed outwards; molars variable, but with a basic arrangement of two longitudinal rows of cusps.

Habits: Terrestrial to arboreal; occupy a wide variety of habitats, from near tundra (both boreal and alpine) to desert to rainforest.

Range: New World

Representative Genera: *Sigmodon*, *Phyllotis*, *Oryzomys*, *Andalgalomys*, *Calomys*,

Material in Lab: ***Oryzomys palustris*** (Marsh rice rat)*
 Sigmodon hispidus (Hispid cotton rat)*

Subfamily Arvicolinae (Voles and Lemmings)

Note: This group is sometimes called Microtinae (or microtines).

Diagnosis: Same as for Sigmodontinae with the following exceptions: molars prismatic; skull angular and sculptured, with temporal ridges often prominent.

Habits: Tend to have very high reproductive capacity; population cycles are characteristic; two genera (*Ondatra* and *Neofiber*) are semiaquatic; terrestrial forms often make runways; some are semifossorial, a few are arboreal; feed on grasses.

Range Holarctic, extending into the Neotropical highlands.

Representative Genera: *Microtus*, *Myodes*, *Synaptomys*, *Phenacomys*, *Dicrostonyx*, *Hyperacrius*, *Lemmus*, *Lemmingscus*, *Arvicola*.

Material in Lab: ***Myodes*** (formerly *Clethrionomys*) ***gapperi*** (Southern red-backed vole)
 Microtus pennsylvanicus (Meadow vole)
 M. montanus (Montane vole)
 M. richardsoni (Water vole)
 M. longicaudus (Long-tailed vole)
 Phenacomys intermedius (Heather vole)
 Lemmingscus curtatus (Sagebrush vole)
 Synaptomys borealis (Northern bog lemming)
 Ondatra zibethicus (Muskrat)

Myodes



Synaptomys



Phenacomys



Microtus



Family Dipodidae (Jerboas and Jumping mice)

Diagnosis: Infraorbital foramen large, hystricomorphous; hind limbs elongated for saltation; tail long; zygomatic arch narrow, entirely below infraorbital canal; auditory bullae may or may not be inflated; lateral toes may be reduced or absent; molars often having quadritubercular crown structure.

Habits: Saltatorial; use tail for balance; hibernate rather deeply; feed on grass, seeds, fleshy fruit.

Range: Holarctic (including northern Africa)

Representative Genera: *Dipus*, *Jaculus*, *Allactaga*, *Paradipus*, *Sicista*, *Napaeozapus*, *Zapus*.

Material in Lab: *Zapus princeps* (Western jumping mouse)
 *Napaeozapus insignis** (Woodland jumping mouse)

*Not an Idaho species