

LAB 7: RODENTIA II

Sources: Martin et al. chapter 23 (pp. 138-161); this handout. Refer to previous handout for general comments

Suborder Sciurognathi (continued)**Family Castoridae (beavers)**

Diagnosis: skull massive; zygomaseteric structure as in Sciuridae; infraorbital foramen forming a narrow canal, anterior opening smaller than incisive foramen; bullae with neck that projects dorsolaterally; dental formula $1/1\ 0/0\ 1/1\ 3/3 = 20$; cheek teeth hypsodont, but not ever-growing; occlusional pattern characterized by narrow inner and outer folds of enamel; modified for aquatic life: hind feet enlarged, digits webbed, tail dorsoventrally flattened and scaly, fur very dense.

Habits: eat mostly bark and leaves; crepuscular and nocturnal; colonial; build dams of sticks, mud and rocks to impound water in northern parts of range; build dome-shaped lodges; 1-6 young born once per year.

Range: Holarctic

Genus: *Castor canadensis* (beaver)

Know: **Castoridae**

Family Myoxidae (formerly Gliridae; dormice)

Diagnosis: infraorbital canal moderate; mandible with angular process usually inflected; cheekteeth brachydont, nearly basin-shaped; palate broad; dental formula $1/1\ 0/0\ 2/2\ 3/3 = 20$; tail bushy; tympanic portion of bulla large and inflated; no postorbital process.

Habits: scansorial; nocturnal; mostly arboreal; hibernate; are squirrel-like in most habits; feed largely on fruits, nuts and some animal matter; bear 2-9 young after gestation of 28 days.

Range: Africa, Europe, and the Middle East

Genera: *Eliomys*
Glis
Graphirus
Dryomys

Know: **Myoxidae**

Family Heteromyidae (pocket mice, kangaroo mice, kangaroo rats)

Diagnosis: external fur-lined cheek pouches; orifice of interorbital canal countersunk in vacuity extending transversely through rostrum; skull thin, not strongly modified for fossorial life; zygomatic arch slender; jaws small; dental formula 1/1, 0/0, 1/1, 3/3 = 20; cheekteeth hypsodont, but not ever-growing, except in *Dipodomys*; trend toward saltatorial locomotion: hind foot long, tail long, bullae slightly inflated to highly inflated

Habits: nocturnal; typically burrow; feed on seeds which are stored in chamber in burrow; some quadrupedal, other bipedal; some hibernate and estivate; 1-8 young born after 24-33 day gestation; desert forms physiologically adapted to live without free water.

Range: Neotropica and Nearctic

Specimens: *Dipodomys*
Microdipidops
Perognathus
Liomys

Know: **Heteromyidae**

Family Dipodidae (jerboas)

Diagnosis: infraorbital foramen enlarged; zygomatic plate narrow and completely below the infraorbital canal; mandible weakly developed, angular process frequently perforated and never distorted outward; cheekteeth hypsodont, but rooted, having modified heptamerous enamel; P4 small or absent; vibrissae nearly as long as body; dental formula 1/1 0/0 0-1/0 3/3 = 16/18; tympanic and mastoid portions of bullae inflated; lateral toes reduced or absent; feet elongate; tail long and terminally tufted

Habits: saltatorial and bipedal; nocturnal and crepuscular; make burrows; feed on leafy vegetation and seeds; secretive; hibernate; average three young per litter with gestation of approx. 42 days

Range: central Palearctic, northern Ethiopia

Genera: *Dipus*
Jaculus
Allactaga
Allactagulus
Paradipus
Salpingotus

Know: **Dipodidae**

Family Zapodidae (jumping mice) (sometimes included within the Dipodidae)

Diagnosis: infraorbital foramen large; hind limbs elongated for saltation; cheekteeth brachydont or semihypsodont, having quadritubercular crown structure; auditory bullae not inflated; angular process of mandible not distorted outward; dental formula $1/1 \ 0/0 \ 0-1 \ 0 \ 3/3 = 16/18$

Habits: saltatorial; use tail for balance; feed on grass seeds, fleshy fruits

Range: Holarctic (except southern fringe and most of Europe)

Genera: *Zapus hudsonius* (meadow jumping mouse)
Napaeozapus insignis (woodland jumping mouse)
Sicista

Know: **Zapodidae**
Zapus

Family Muridae

Taxonomic note: Muridae is an extremely large and diverse family. Until recently most of the subfamilies within the family Muridae were considered separate, full families (notably Arvicolidae, Cricetidae, Sigmodontidae and Spalacidae; see classification). Some groups were previously included *within* some of these families, especially the Cricetidae, which has in the past itself been considered one, large and diverse family including the Gerbillinae and Sigmodontinae. Although we follow here a current, widely accepted taxonomy, bear in mind that the situation is contentious and volatile—it could change at any time, particularly as phylogenetic relationships among rodents are better resolved.

Subfamily Murinae (Old World rats and mice)

Diagnosis: upper molars with a functional row of tubercles on lingual side of crown internal to the protocone and hypocone; cheekteeth laminate or cuspidate; when cuspidate, cusps arranged in three longitudinal rows, inner row may be vestigial; laminae of molars not separated by wide folds or valleys, but pressed tightly together; dental formula $1/1 \ 0/0 \ 0/0 \ 3/3 = 16$; infraorbital canal generalized, not conspicuously wider below than above; zygomatic plate broadened and tilted upward; tail typically naked and scaly; pollex rudimentary, claw reduced; 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 via human introduction; ancestrally Australia, Eurasia, Africa, and Indonesia

Genera: *Rattus rattus* (black rat)
Rattus norvegicus (Norway rat)
Mus musculus (house mouse)
Apodemus
Cricetomys
Acomys

Notomys
Hydromys
Bandicota

Know: **Muridae/Murinae**
 Rattus
 Mus

Subfamily Sigmodontinae (New World rats and mice)

Diagnosis: infraorbital canal generalized with a rounded upper portion and a narrower lower portion; zygomatic plate broad and tilted upward to a greater or lesser degree; skull varying in form, but always without postorbital process on frontal; angular portion of mandible not distorted outward; molar pattern based on five crests in upper and lower teeth; cheekteeth cuspidate or laminate; cusps arranged in two longitudinal rows; the lamina bearing cusps separated by wide reentrant folds; molars hypsodont or brachydont; dental formula $1/1\ 0/0\ 0/0\ 3/3 = 16$

Habits: primarily terrestrial, but ubiquitous; scamper, scansorial, saltatorial; occupy a variety of habitats; feed on seeds, leaves, fruits, and insects

Range: Nearctic, Neotropical and Ethiopian

Genera: ***Neotoma***
 Oryzomys
 Sigmodon
 Ochrotomys
 Onychomys
 Peromyscus leucopus (white-footed mouse)
 P. maniculatus (deer mouse)
 Reithrodontomys

Know: **Muridae/Sigmodontinae**
 Peromyscus

Subfamily Cricetinae (hamsters)

Diagnosis: as for Sigmodontinae

Range: Asia, Middle East, Mediterranean Europe

Genera: ***Cricetus***
 Mesocricetus

Know: **Muridae/Cricetinae**

Subfamily Gerbillinae (gerbils)

Diagnosis: as for Sigmodontinae

Range: Asia, Africa, Middle East

Genera: ***Gerbillus***
 Meriones

Know: **Muridae/Gerbillinae**

Subfamily Arvicolinae (voles, lemmings, muskrats)

Diagnosis: as for Sigmodontinae with following exceptions: molars prismatic, not cusped or laminate; skull angular and sculptured with temporal ridges often prominent

Habits: tend to be very 'r-selected'; two general (*Ondatra* and *Neofiber*) semiaquatic; terrestrial forms often make runways; feed on grasses, clippings of which can often be found along runways

Range: Holarctic (NA, northern Eurasia, Greenland)

Genera: ***Ondatra zibethicus*** (muskrat)
 Microtus pennsylvanicus (meadow vole)
 M. pinetorum (woodland or pine vole)
 Synaptomys cooperi (southern bog lemming)
 Clethrionomys gapperi (southern red-backed vole)
 Lemmus
 Phenacomys
 Dicristonyx
 Arvicola
 Lagurus

Know: **Muridae/Arvicolinae**
 Ondatra
 Microtus
 Synaptomys
 Clethrionomys

Subfamily Spalacinae (mole rats)

Diagnosis: zygomatic plate narrowed and turned downward to a near horizontal position; skull highly modified for fossorial life; occiput high and broad, sloping anteriorly; frontals constricted; molars rooted, but somewhat high-crowned; lower incisors forming powerful process on mandible beside the condyle; dental formula 1/1 0/0 0/0 3/3 = 16; molars peg-like; body mole-like; limbs short; eyes reduced, present beneath the skin, but having no external opening; ears vestigial; tail not externally present

Habits: feed primarily on roots; extremely fossorial; dig by means of strong incisors; solitary, inhabiting individual tunnel systems

Range: eastern Mediterranean region

Genera: ***Spalax***

Know: **Spalacinae**