Lab 4 – Order Rodentia, Families Muridae and Dipodidae

Need to know:

Subfamilies Arvicolinae, Neotominae, Murinae

Clethrionomys (Myodes) gapperi—ID based on skin or skull, n. history

Lemmiscus curtatus—ID based on skin, n. history

Microtus spp—ID based on skull

M. longicaudus—ID based on skin, n. history

M. ochrogaster—ID based on skin, n. history

M. pennsylvanicus—ID based on skin, n. history

Ondatra zibethicus—ID based on skin or skull, n. history

Neotoma cinerea—ID based on skin or skull, n. history

Onychomys leucogaster—ID based on skin, n. history

Peromyscus—ID based on skull

P. maniculatus—ID based on skin, n. history

P. truei—ID based on skin, n. history

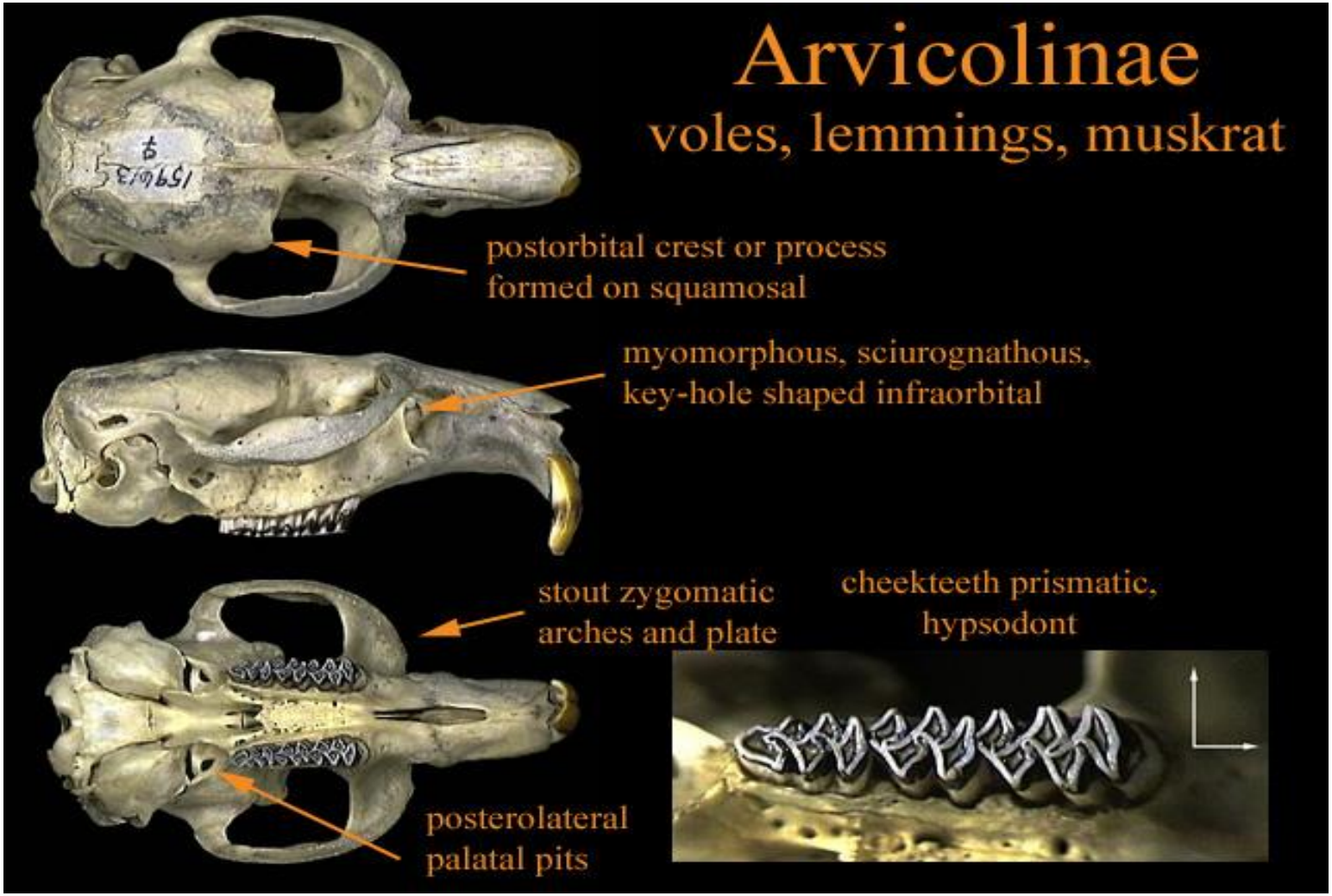
Reithrodontomys megalotis—ID based on skin or skull, n. history

Mus musculus—ID based on skin or skull, n. history

Rattus norvegicus—ID based on skull or skin, n. history

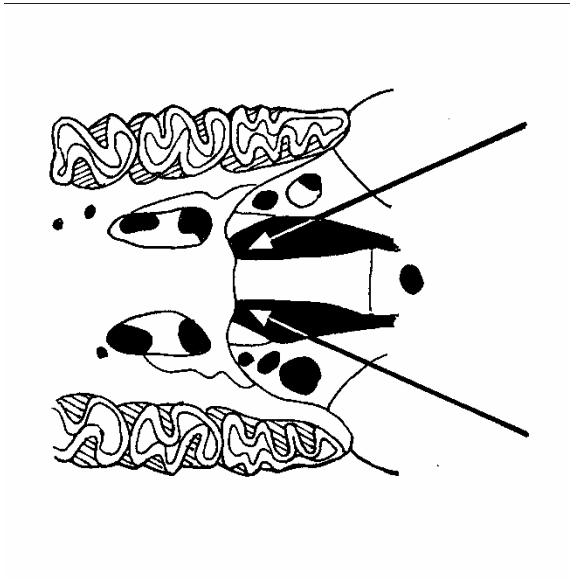
Zapus princeps—ID based on skin, n. history

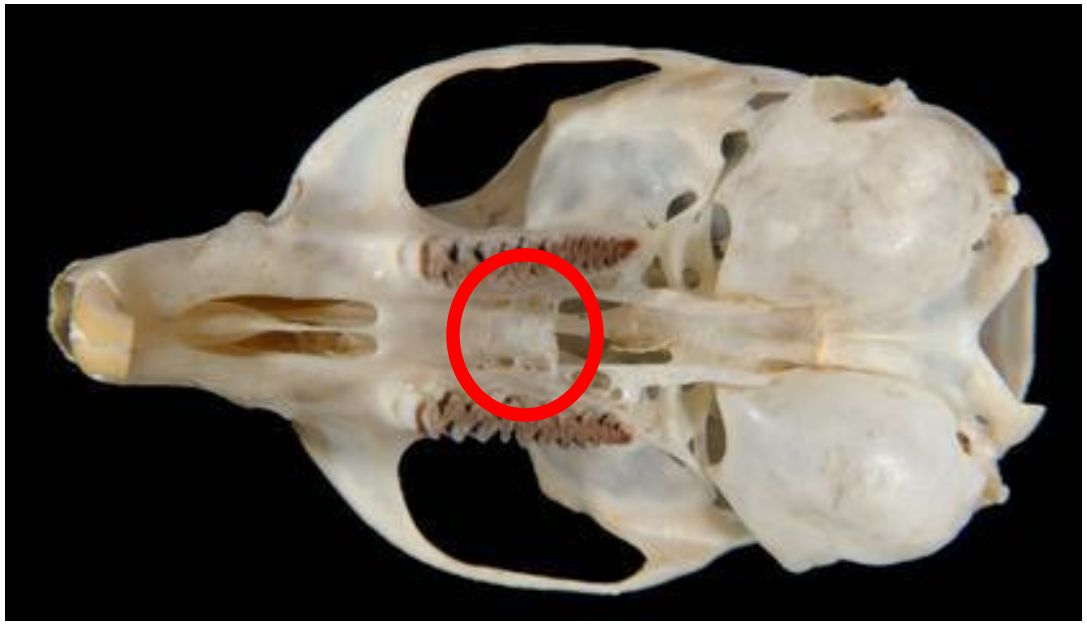
Order Rodentia, Subfamily Arvicolinae—voles and allies



1) molars with triangles of dentine surrounded by enamel
2) zygomatic arches parallel or nearly so

Clethrionomys (Myodes) gapperi— southern red-backed vole





1) bony palate terminates as a shelf between the last molars

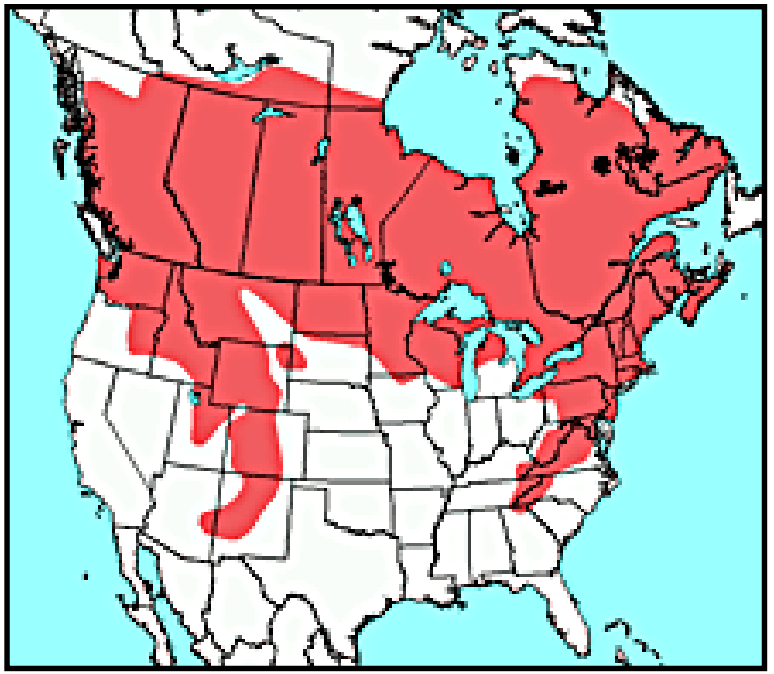
Clethrionomys gapperi
(southern red-backed vole)



1) **reddish stripe on dorsal pelage**
2) **short tail relative to other voles**

Natural history
--typically occurs in high-elevation, coniferous woodlands
--responds negatively to timber harvests (arboreal)



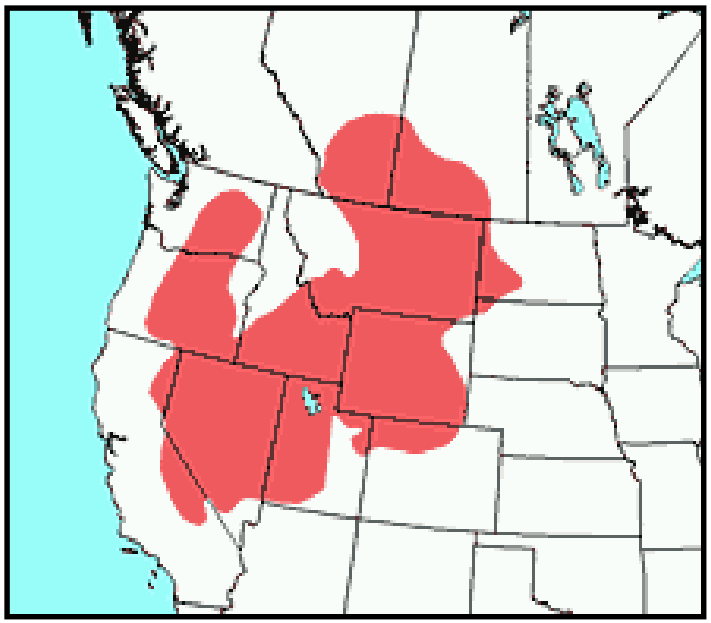


Lemmiscus curtatus
(sagebrush vole)



1) **light gray or grayish-yellow pelage**
2) **short tail relative to other voles**

Natural history
--occurs in sagebrush steppe intermixed with bunchgrasses and rabbitbrush
--live in colonies of up to 80 individuals with extensive burrows and trails (runways)



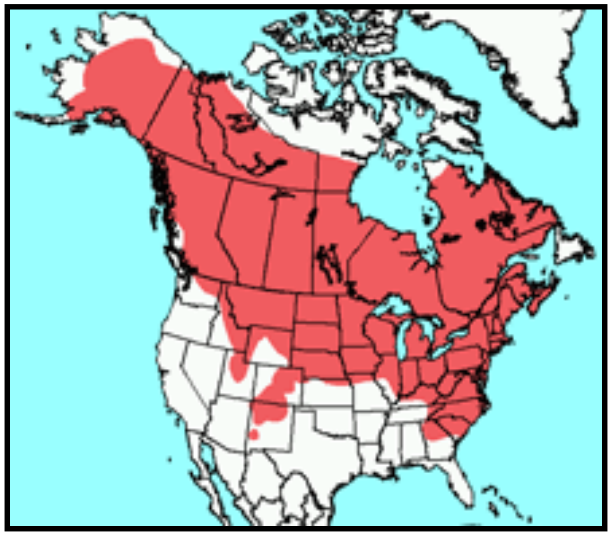


Microtus pennsylvanicus
(meadow vole)



1) **brownish-gray pelage**
2) **tail short relative to <u>M. longicaudus</u>**

Natural history
--generalist species, occurring in most types of grassland (including cropland)
--undergoes complex population cycles resulting from interactions between food and predators
-- forms runways



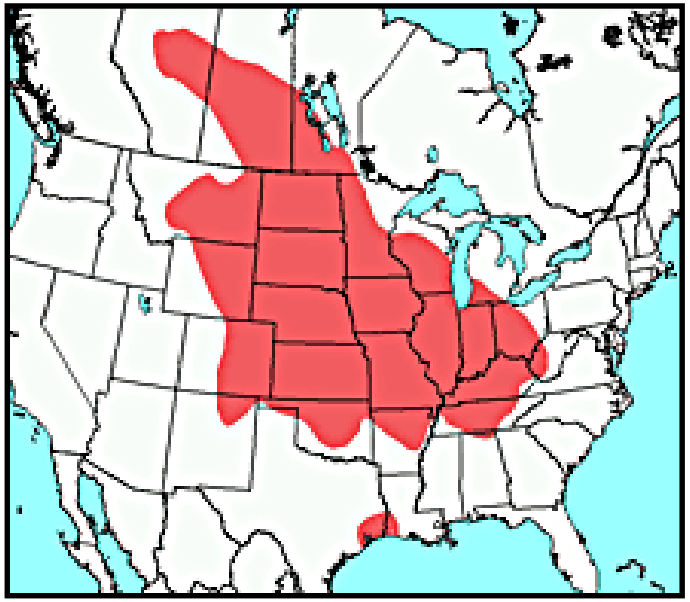


Microtus ochrogaster
(prairie vole)

1) **brownish pelage with orange wash, particularly on ventral pelage**
2) **tail of intermediate length, between 10-25% of body length**

Natural history
-- monogamous (rare in mammals, especially rodents)
-- typically occurs in less-disturbed grasslands than M. pennsylvanicus
-- forms runways



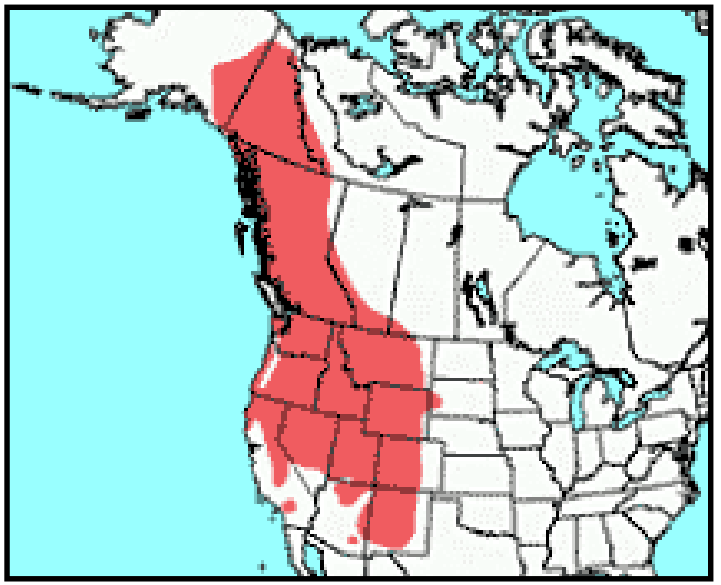


Microtus longicaudus
(long-tailed vole)

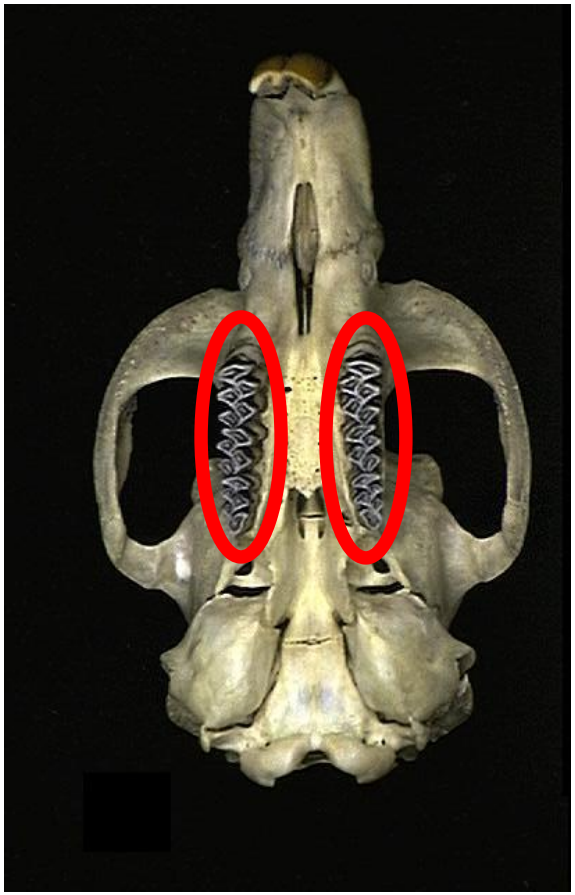
1) **brownish-gray pelage**
2) **long tail relative to other voles, 33-50% of body length**

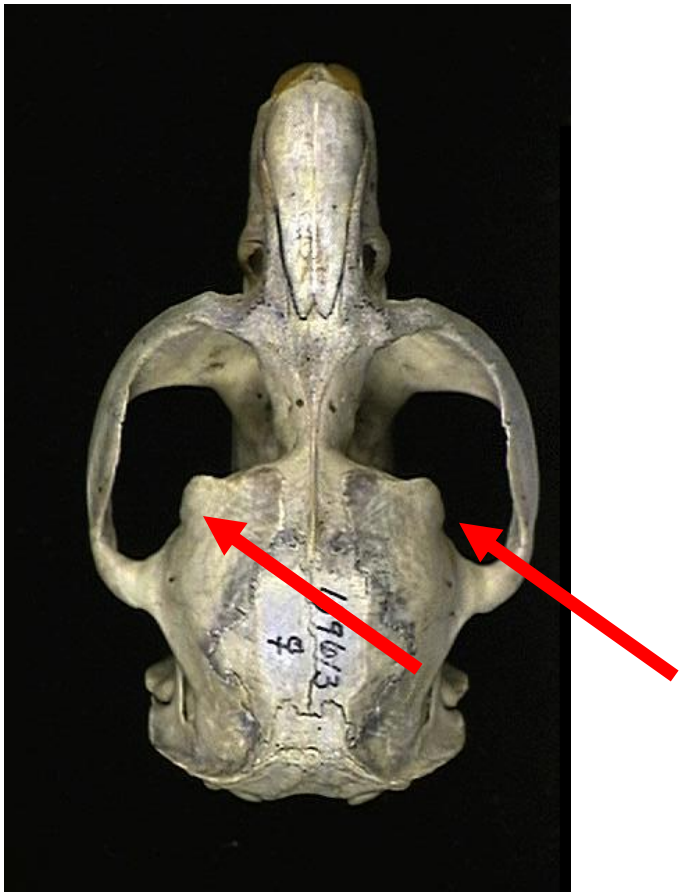
Natural history
-- doesn't form runways
-- prolific: 2-3 litters of 5-6 young/year





Ondatra zibethicus—muskrat





1) largest skull in WY exhibiting microtine teeth
2) conspicuous postorbital processes squarish

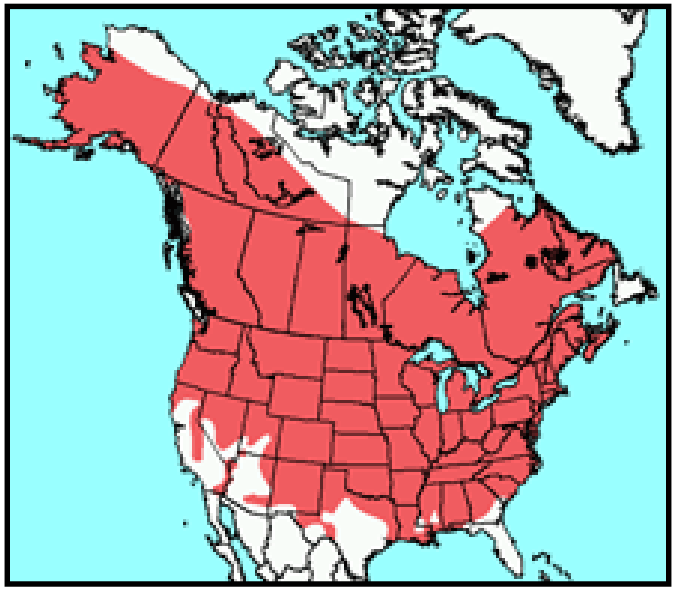
Ondatra zibethicus
(muskrat)

1) chocolate brown dorsum
2) two coats: thick undercoat and outer guard hairs
3) flattened, nearly hairless tail

Natural history
--semi-aquatic, occurring in inland waters
--introduced to Europe as a furbearer
--most harvested furbearer in WY







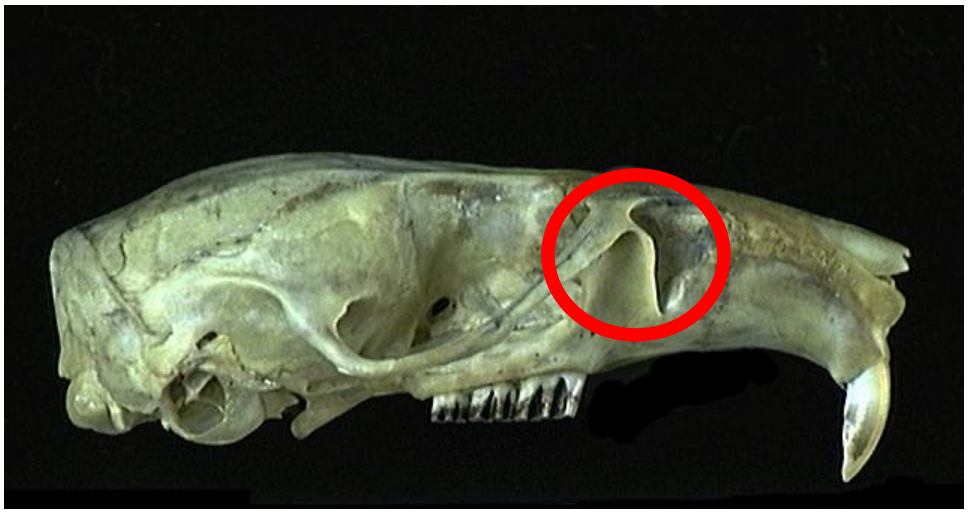
Order Rodentia, Subfamily Neotominae—North American mice and rats

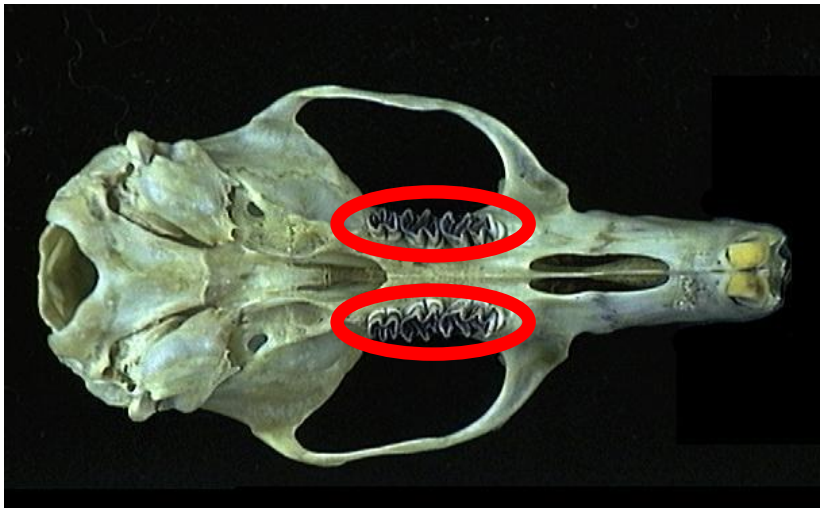




1) molars with 2 rows of cusps without triangles
2) postorbital processes absent or inconspicuous

Neotoma cinerea—bushy-tailed woodrat







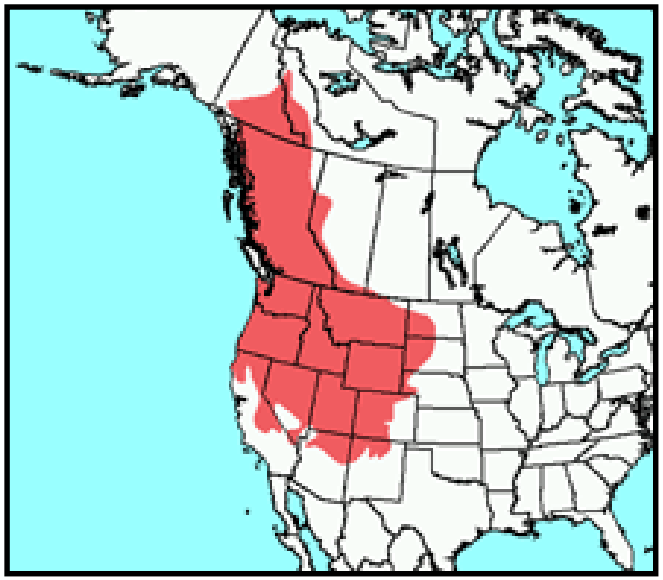
1) microtine-like teeth, but without conspicuous triangles
2) zygomatic plate extends anteriorly from zygomatic process

Neotoma cinerea
(bushy-tailed woodrat)

1) **white feet**
2) **bushy, squirrel-like tail**

Natural history
--herbivorous
--strong sexual dimorphism
--display Bergmann's Rule







Bergmann's Rule

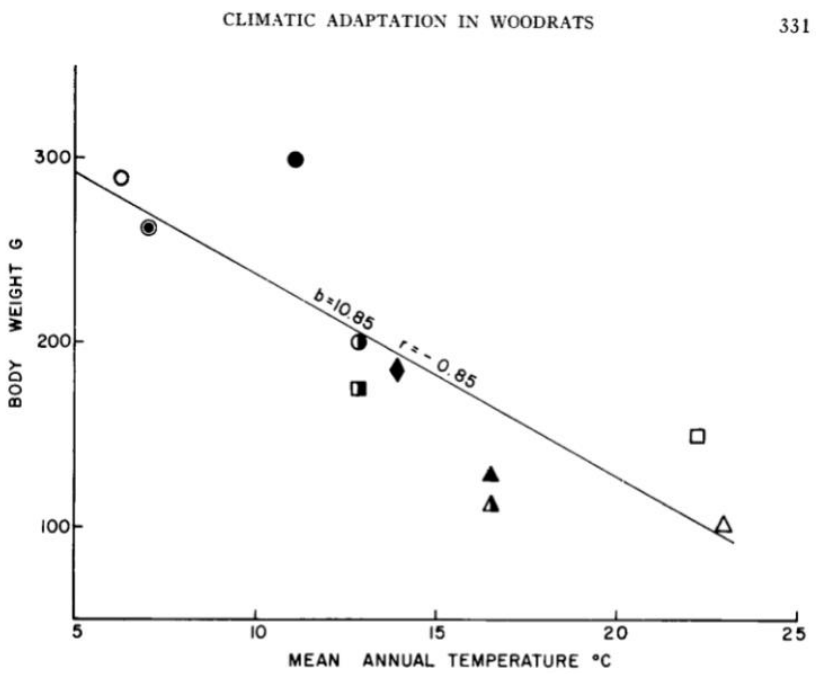


FIG. 1.—The relationship between the means of the body weights of freshly captured woodrats from ten populations and the mean annual temperature where they occur. The least squares regression line is plotted and its slope (b) and correlation coefficient (r) are given. Symbols for the populations are as follows: coastal *Neotoma cinerea*, shaded circle; highland (Colorado) *N. cinerea*, unshaded circle; highland (California) *N. cinerea*, circle with dot; high desert *N. cinerea*, half-shaded circle; high desert *N. albigula*, half-shaded square; low desert *N. albigula*, unshaded square; coastal *N. lepida*, shaded triangle; intermediate desert *N. lepida*, half-shaded triangle; low desert *N. lepida*, unshaded triangle; coastal *N. fuscipes*, shaded diamond.

Brown and Lee 1968

- Species of larger body size are found in cooler environments
- Species of smaller body size are found in warmer environments

Peromyscus spp.

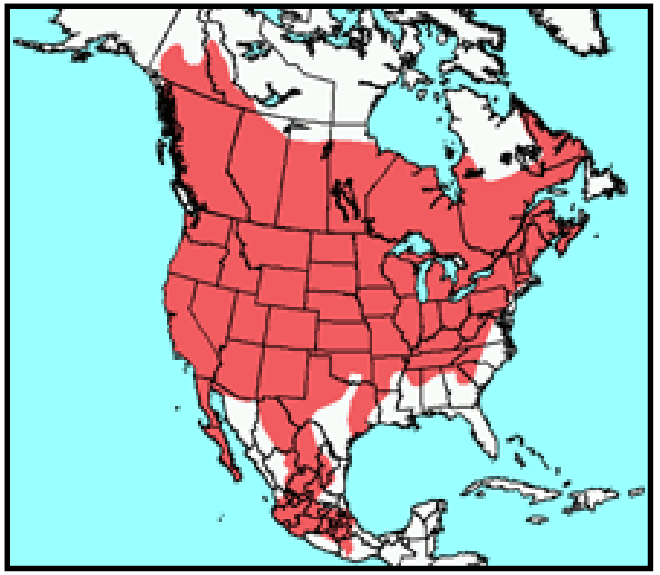




1) cusps of molars rounded and arranged in 2 rows
2) upper incisors not grooved or notched

Peromyscus maniculatus
(deer mouse)

1) sharply bicolored pelage and tail

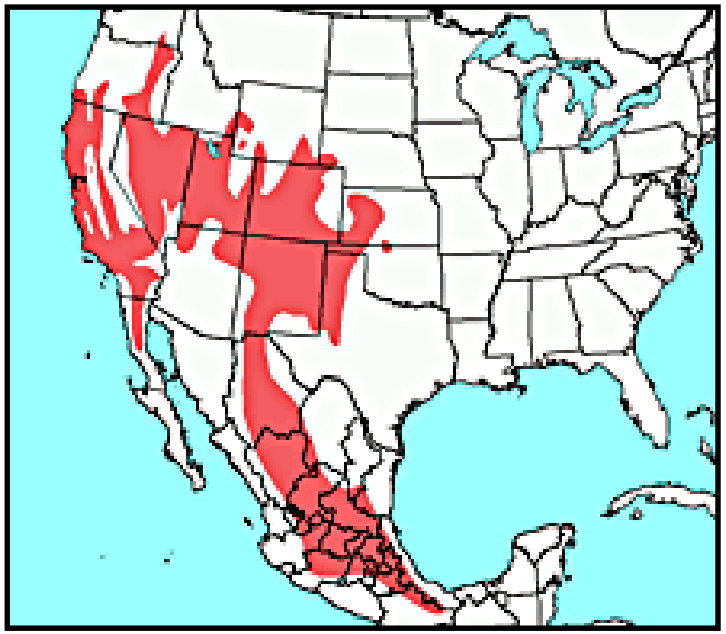


Natural history
--omnivorous
--habitat generalist
--widespread and abundant throughout the Nearctic



P. truei
(pinyon mouse)

1) **sharply bicolored pelage and tail**
2) **lateral orange streaks or wash**
3) **much larger ears than <u>P. maniculatus</u>**

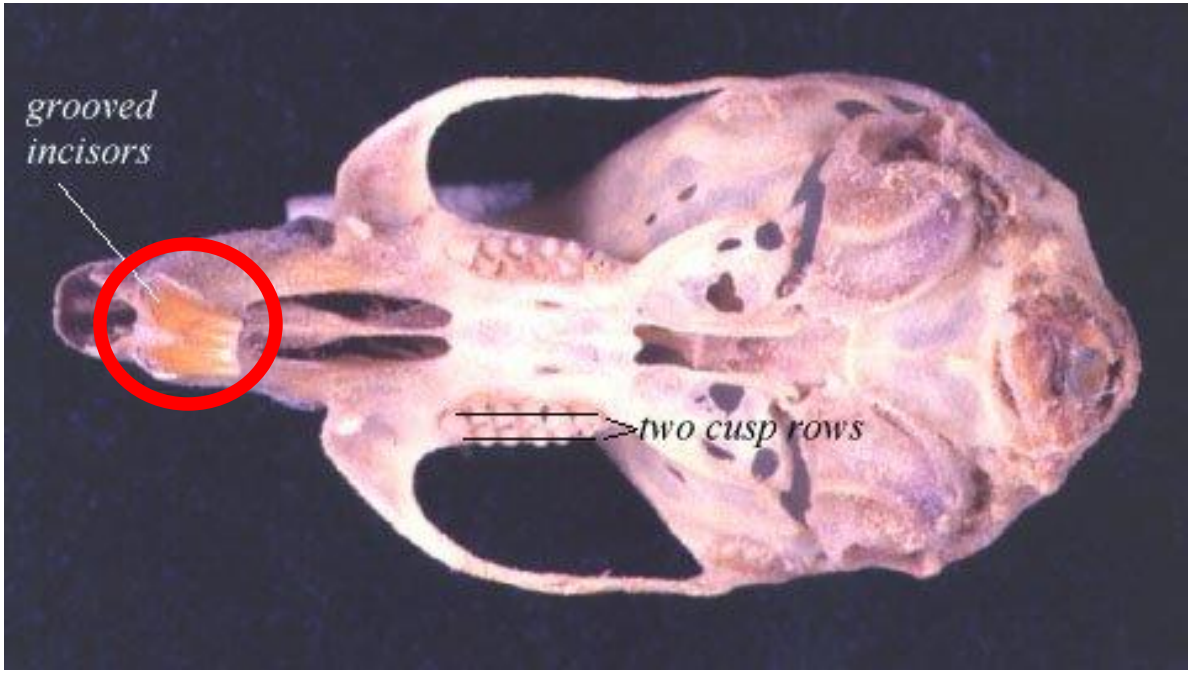


Natural history
--omnivorous
-- in WY, found in sagebrush and pinyon-juniper woodlands





Reithrodontomys megalotis—western harvest mouse



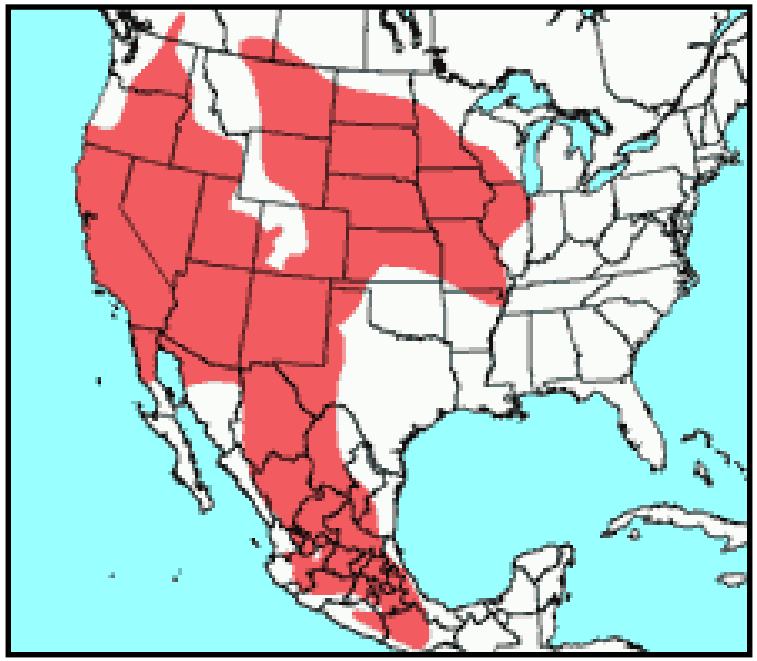
1) cusps of molars rounded and arranged in 2 rows
2) upper incisors grooved

Reithrodontomys megalotis
(western harvest mouse)

1) **bicolored pelage, but not as distinct distinct as <u>Peromyscus</u>**

Natural history
--granivorous
--in WY, found in weedy areas with high amounts of cover
--semi-arboreal





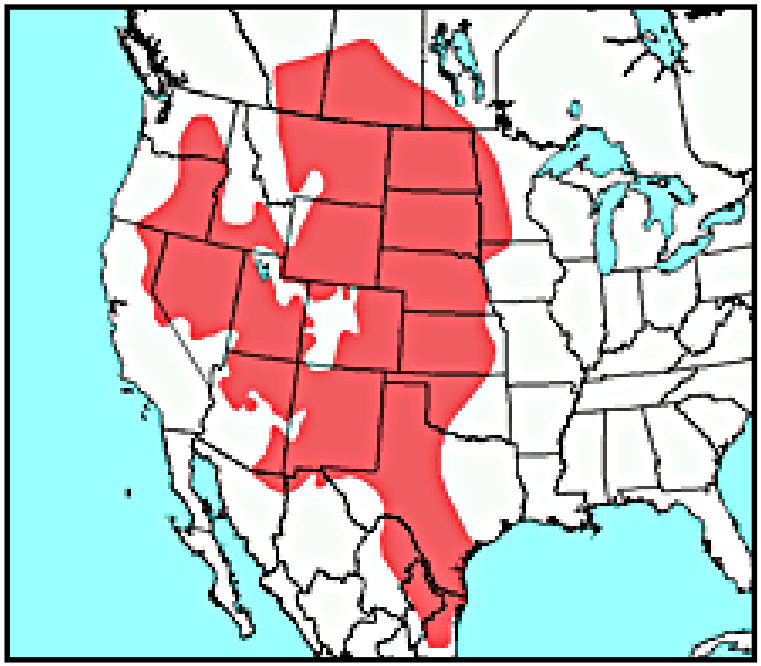


Onychomys leucogaster
(northern grasshopper mouse)

1) **gray or grayish-brown dorsum with light ventral pelage**
2) **Short, light-colored tail**

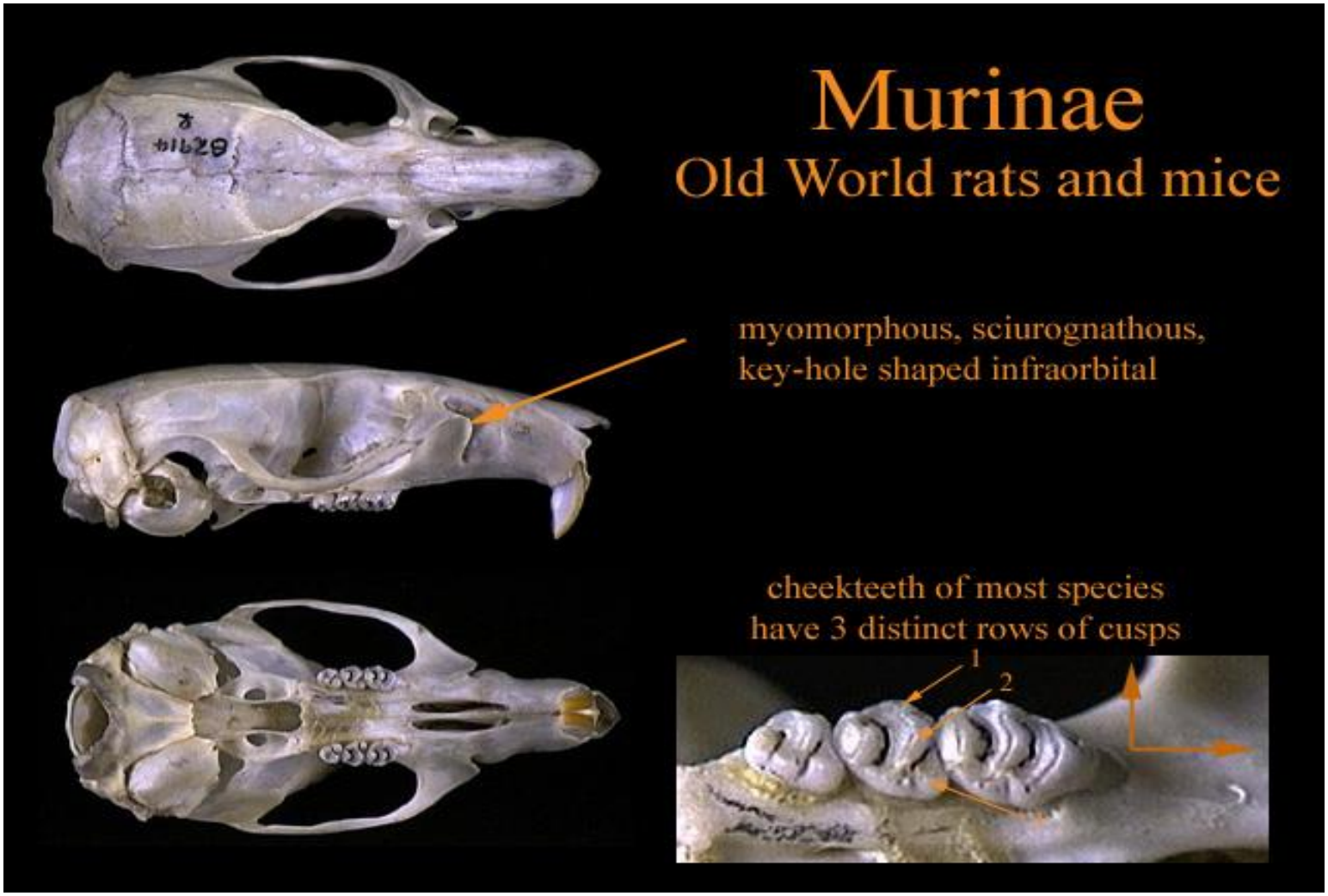


Natural history
--insectivorous and carnivorous
--monogamous
--prefer sandy soils





Order Rodentia, Subfamily Murinae—Old World mice and rats



1) molars with 3 rows of cusps without triangles
2) postorbital processes absent or inconspicuous

Mus musculus—house mouse



1) upper incisors notched

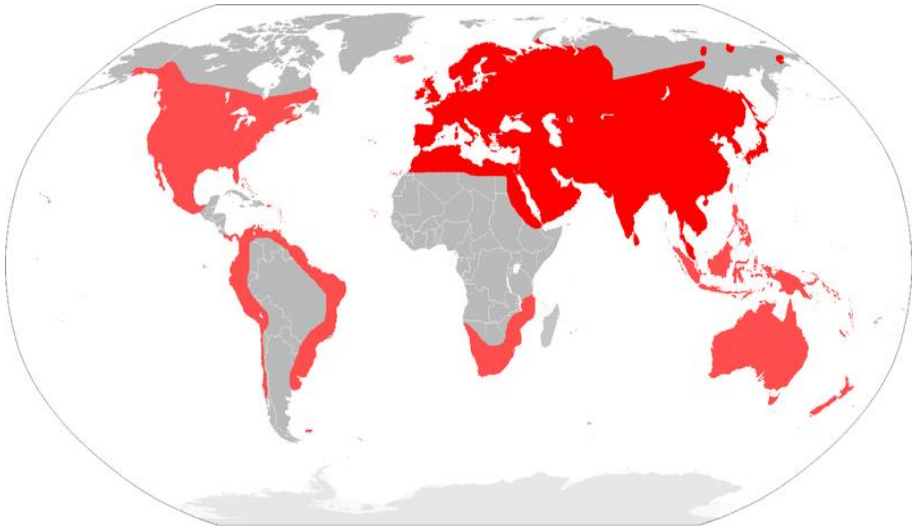
Mus musculus
(house mouse)

1) **dull, grayish-brown**
2) **not sharply bicolored**

Natural history
--introduced from India
--nearly cosmopolitan distribution
--major economic damage (est $60 million/yr in Australia)

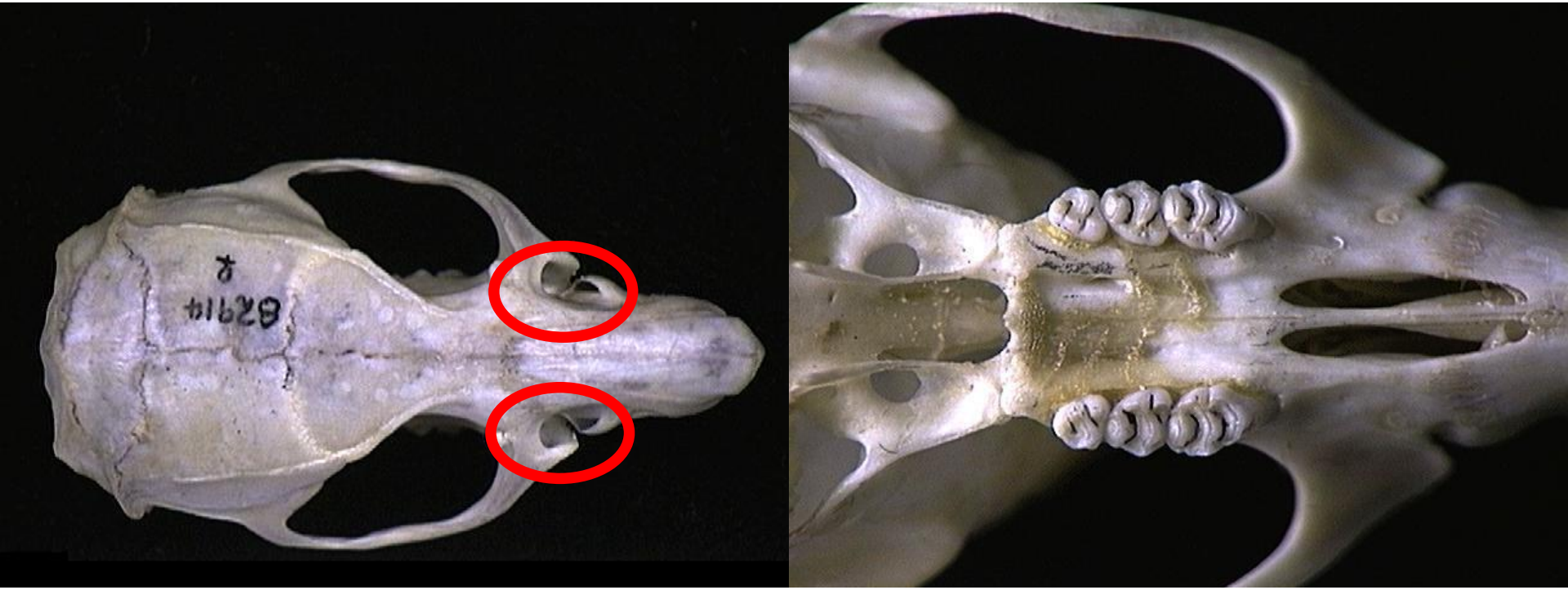








Rattus norvegicus—Norway rat



1) zygomatic plate extends anteriorly from zygomatic process

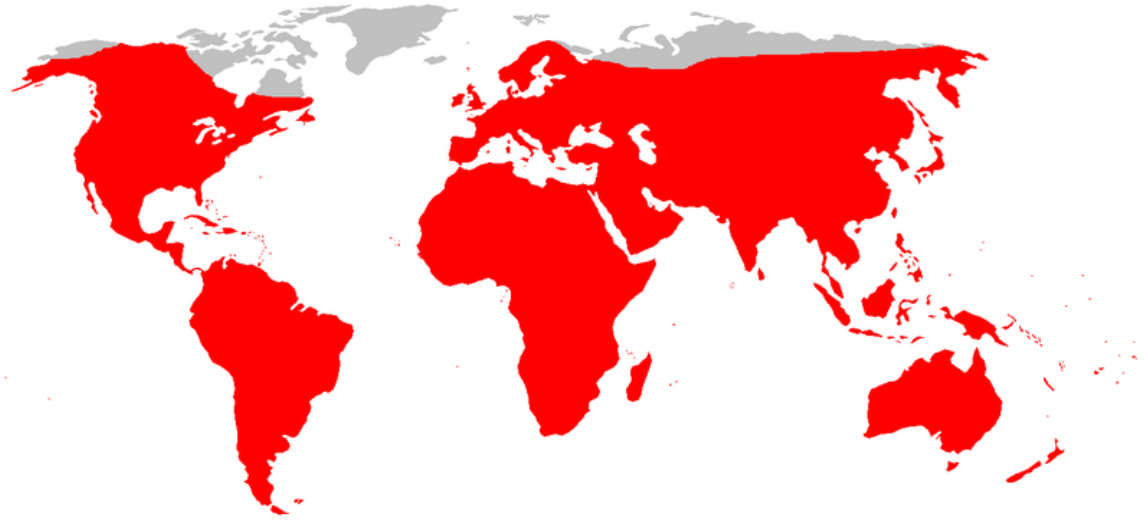
2) lophodont molars

Rattus norvegicus
(Norway or brown rat)

1) **dull, grayish-brown**
2) **tail length < body length**
3) **stout rump**



Natural history
--introduced from Eurasia
--nearly cosmopolitan distribution
--average $225,000 damage in US/year



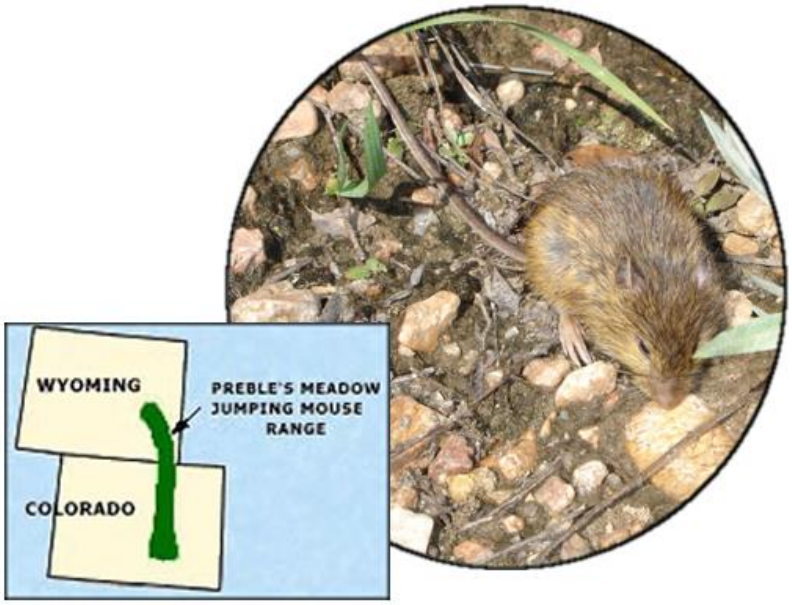


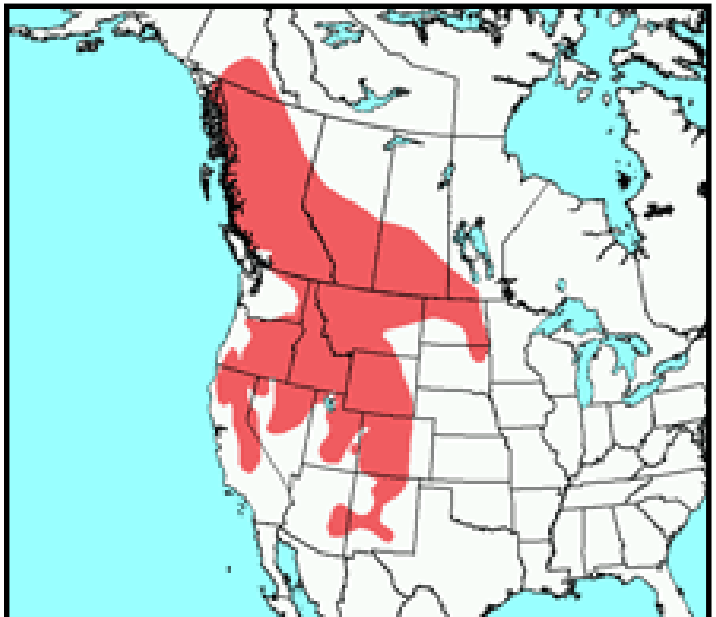


Family Dipodidae
Zapus princeps
(western jumping mouse)

1) **Dorsal pelage with lateral orange wash**
2) **Sparsely furred or naked tail twice as long as body**
3) **Massive hind feet**

Natural history
--adapted for saltatorial lifestyle
--prefer riparian areas
--closely related to old-world gerbils
--Preble's meadow jumping mouse has been relisted under the ESA





For Quiz:

- Know what family and subfamily each species belongs
- Identify species based on skins and skulls
- Know natural history facts for each species
- Spelling counts!!! Capitalize family and order names. Underline Latin binomials
- Next week’s quiz covers Lab 3 and 4!