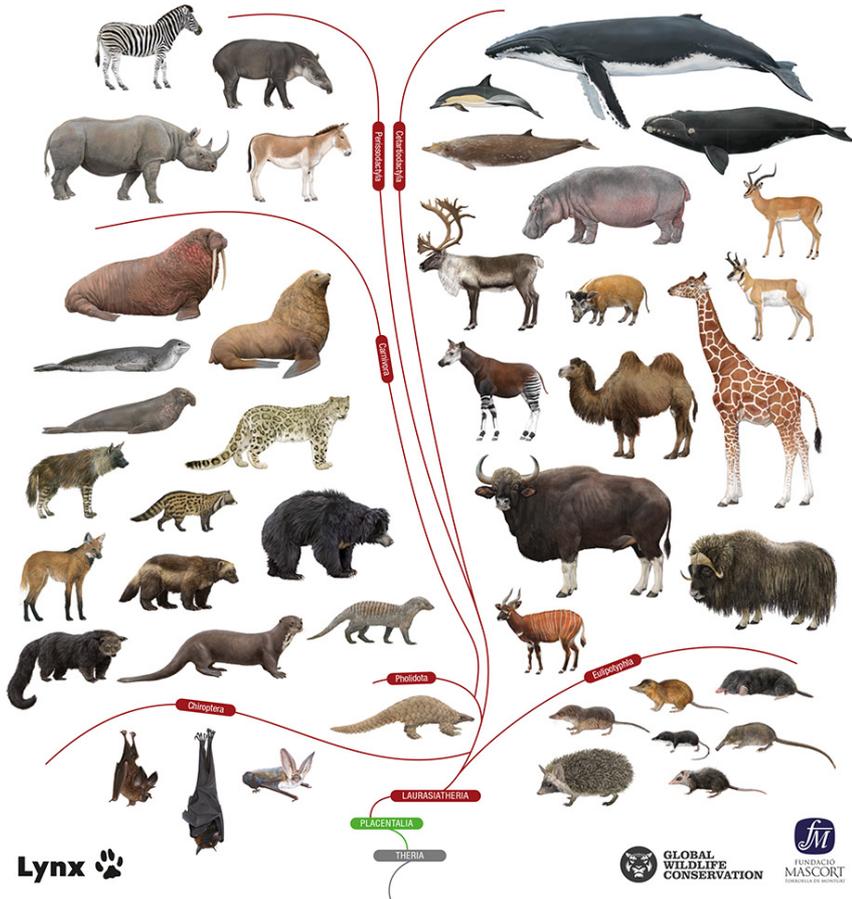


Illustrated Checklist of the Mammals of the World

Connor J. Burgin, Don E. Wilson, Russell A. Mittermeier, Anthony B. Rylands, Thomas E. Lacher & Wes Sechrest

VOLUME 2

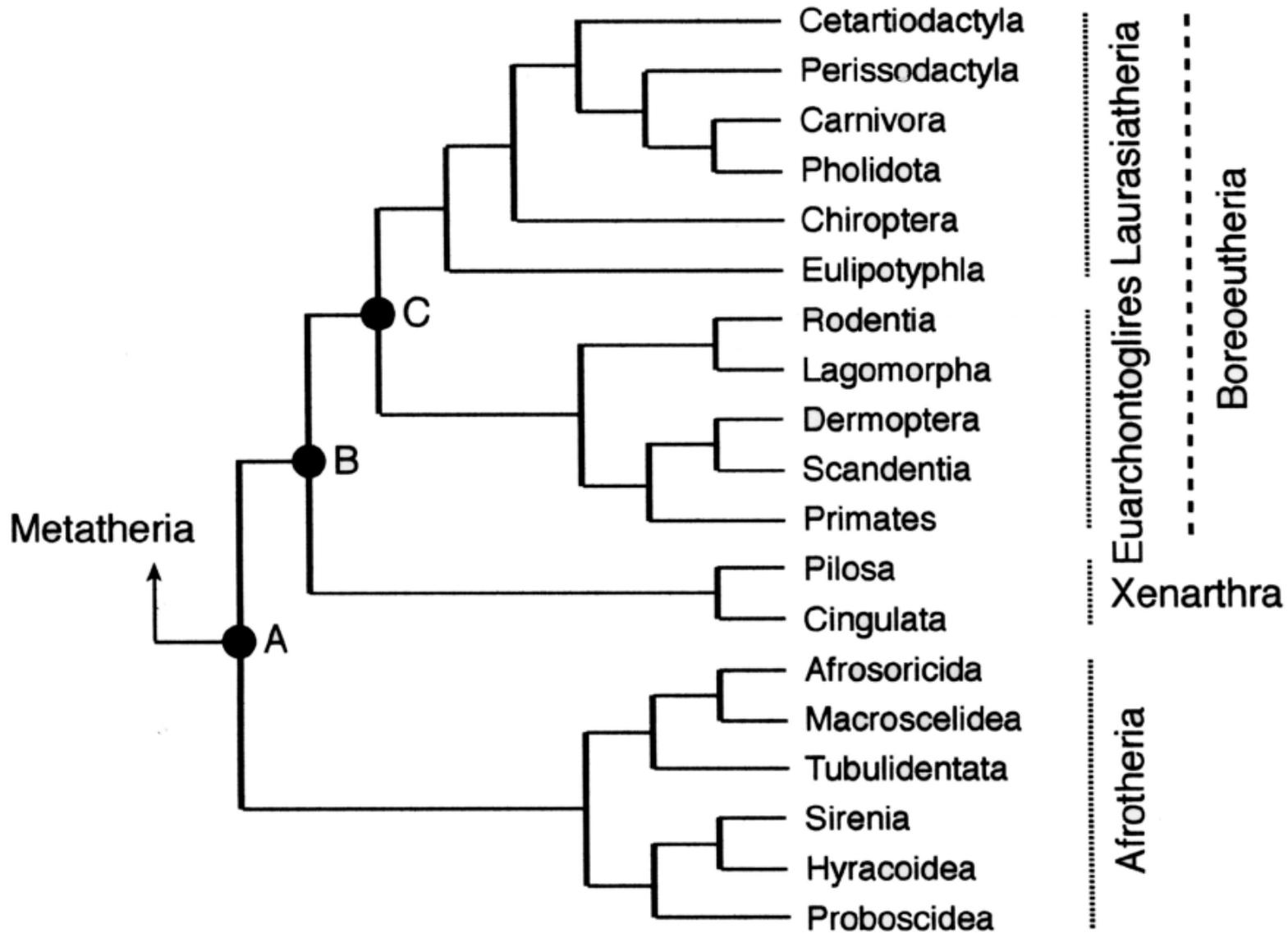


Lynx 

 GLOBAL WILDLIFE CONSERVATION

 MAMMAL SOCIETY

Diversidade e Classificação dos mamíferos recentes





Mammals

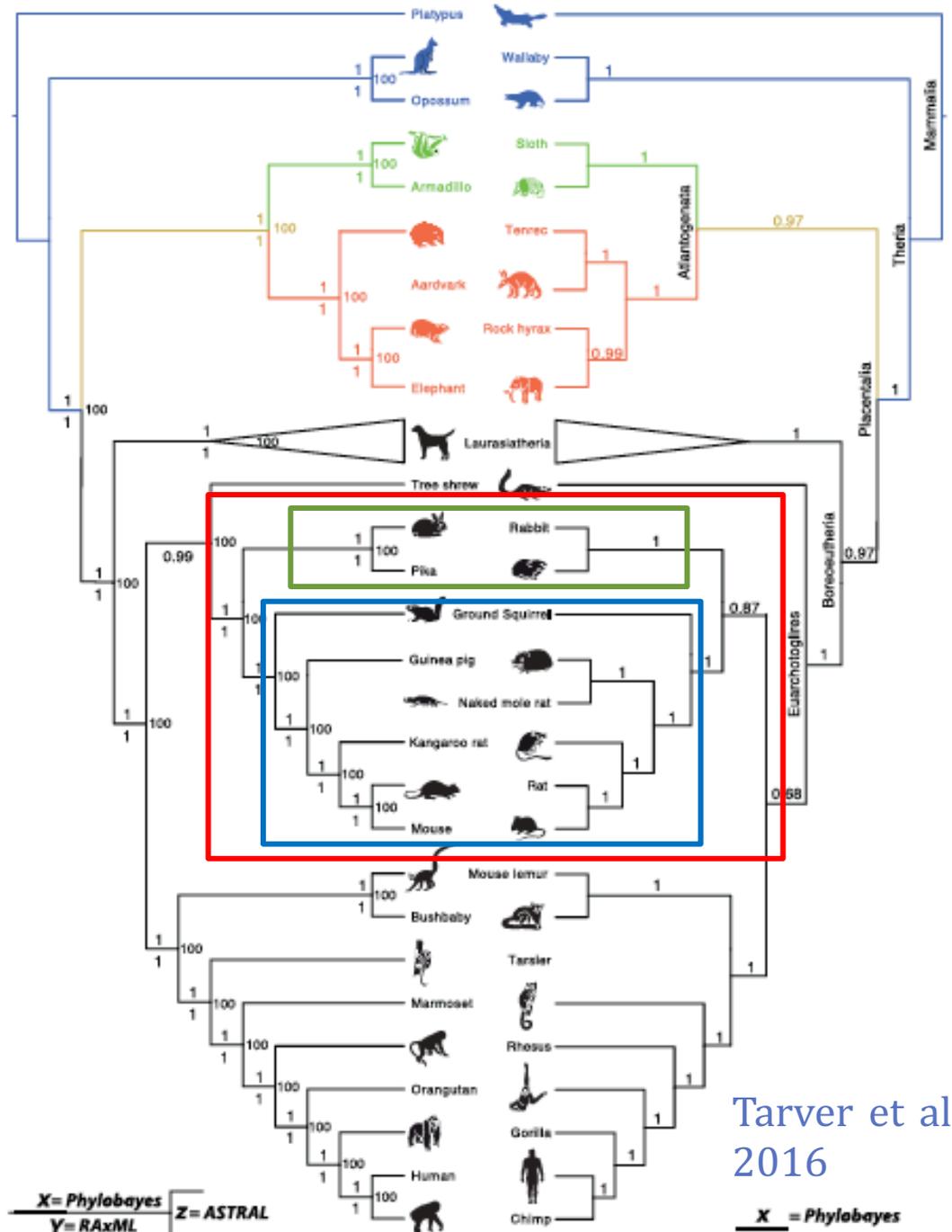
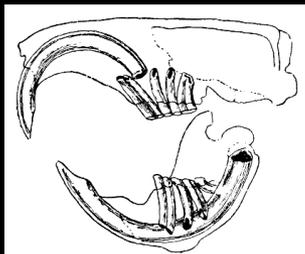
1,250 genera

5,900 species

Glires

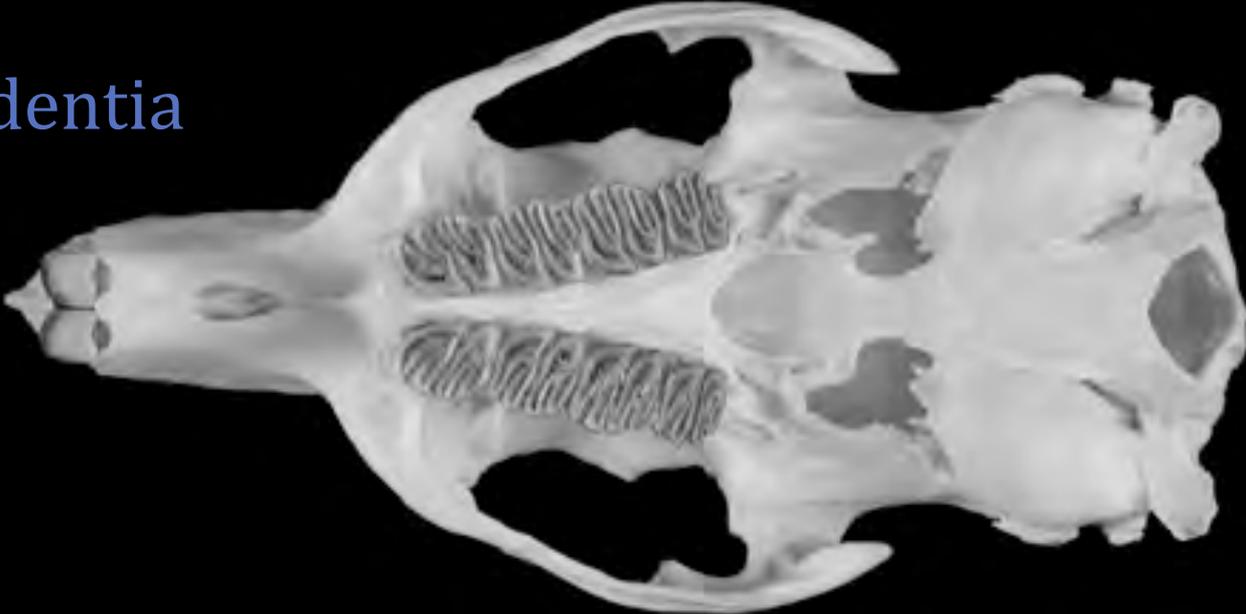
Rodentia + **Lagomopha**

Ever-growing incisors



Tarver et al.
2016

Rodentia



Lagomopha



ORDEM RODENTIA



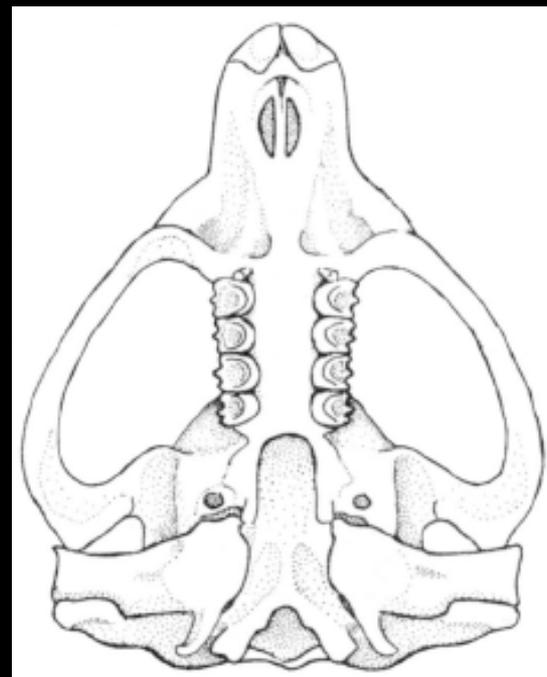
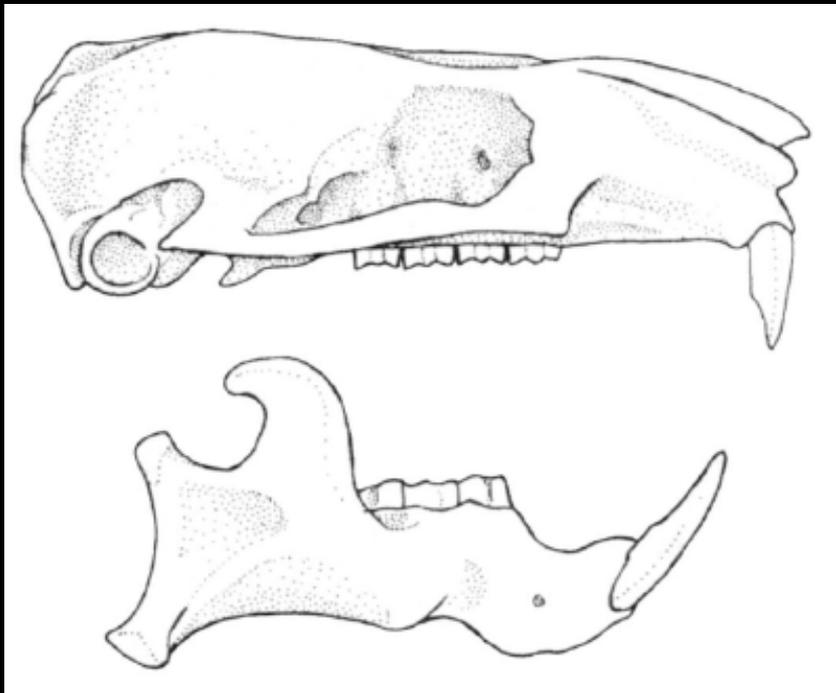
33 famílias

491 gêneros

2277 espécies

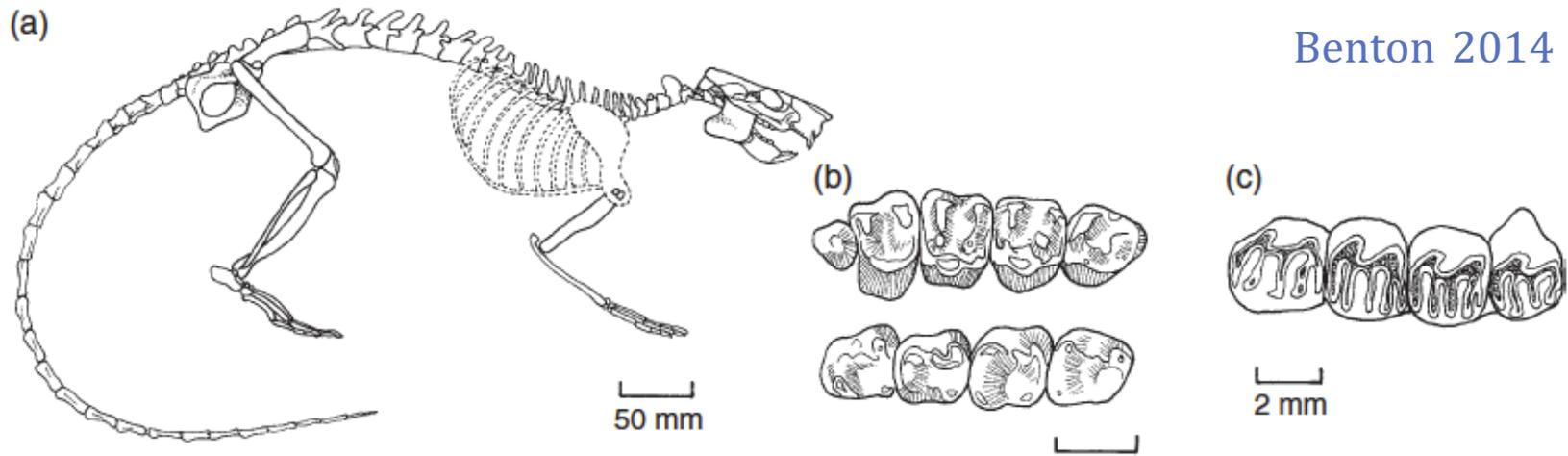
uniquely derived characters that diagnose a monophyletic Rodentia:

1. one pair of upper and lower incisors; each tooth enlarged, sharply beveled, and ever-growing
2. broad diastema between incisors and cheek teeth in both upper and lower jaws
3. incisor enamel restricted to anterior face only
4. paraconid lost on lower cheek teeth
5. orbital cavity lying just dorsal to cheek teeth
6. ramus of zygoma lies anterior to the first cheek tooth
7. mandibular (=glenoid) fossa is an anterior-posterior trough allowing fore and aft movement of the mandible



1 0 2 3
----- = 22
1 0 1 3

Benton 2014



Paramys

Palaeocene and
Eocene of Eurasia
and N America

740 extinct genera

490 extant genera

Rose 2006







Protrogomorphous
Aplodontia



Sciuriform
Marmota

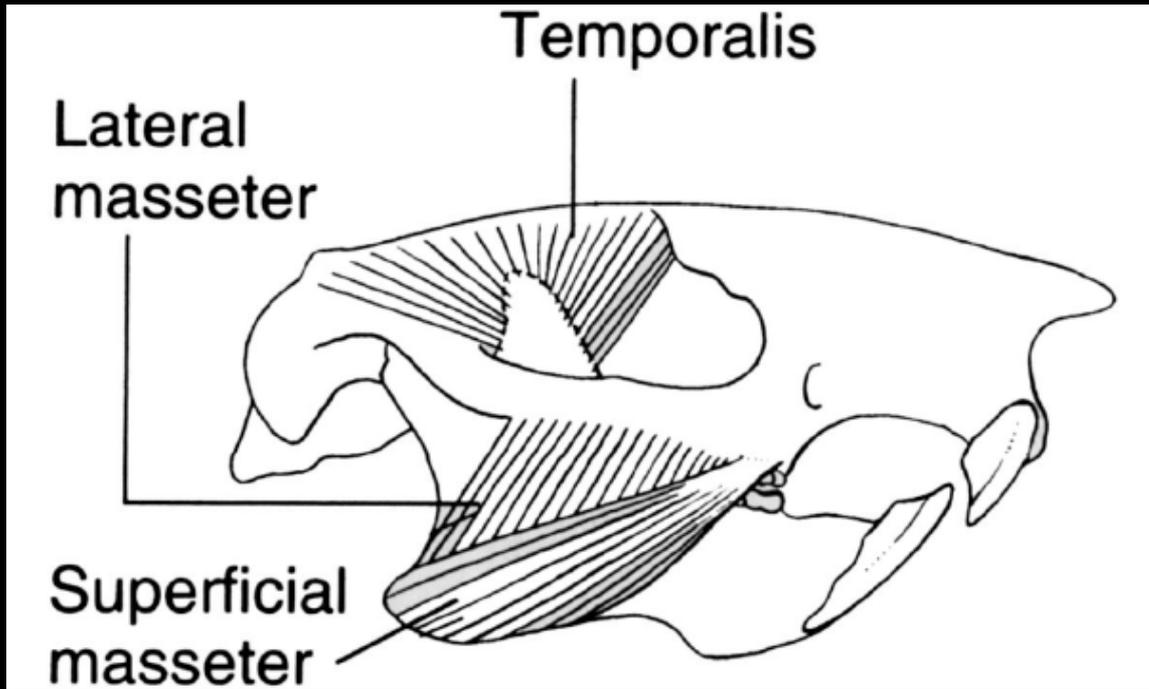


Myomorphous
Cricetomys



Hystricomorphous
Erethizon

Protrogomorpha



Aplodontidae

Aplodontia rufa

Protrogomorphous condition

infraorbital foramen



superficial masseter

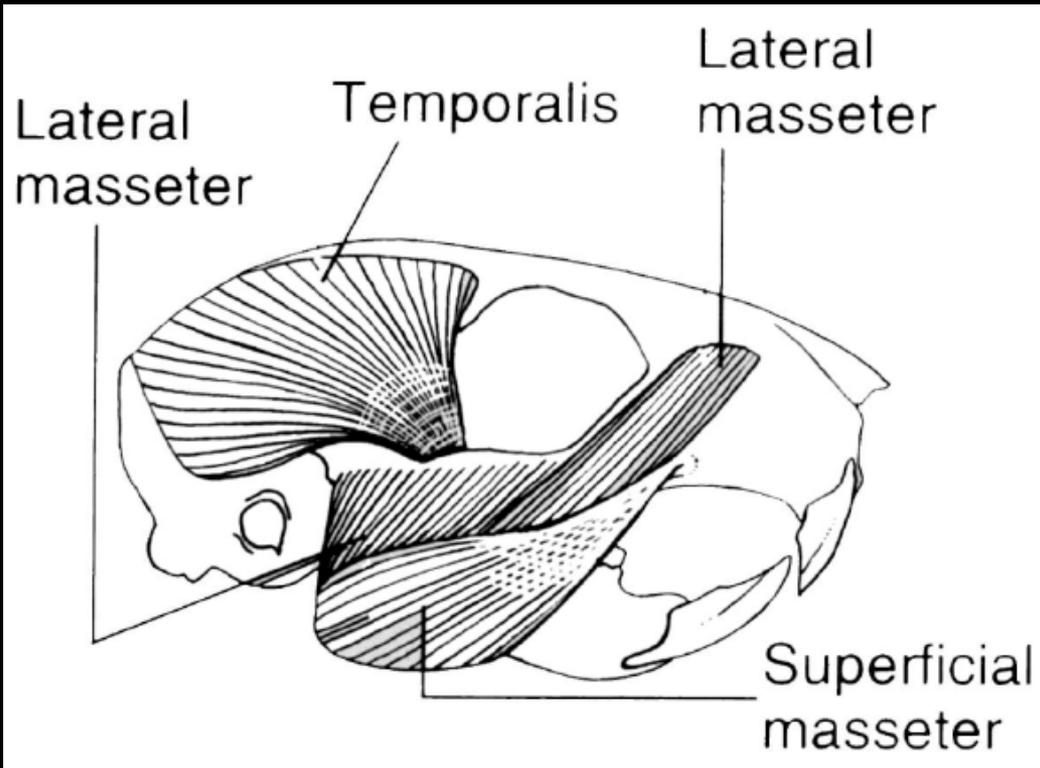


lateral masseter

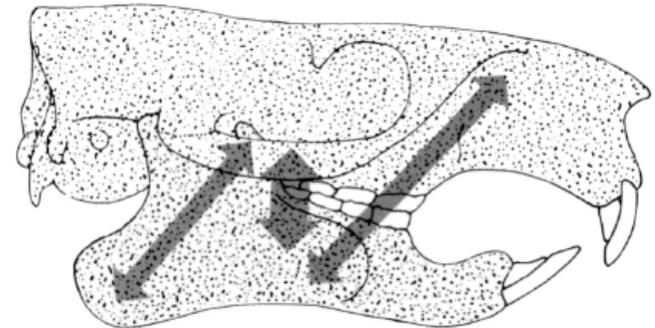


medial masseter

Sciuromorpha

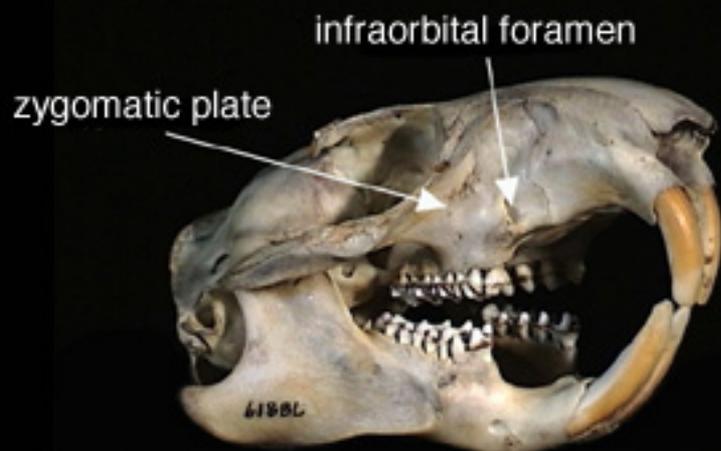


Esquillos, castores



major force of jaw action is upward (large arrow); secondary forces are up and forward (smaller arrows)

Sciurormorphous condition



superficial masseter

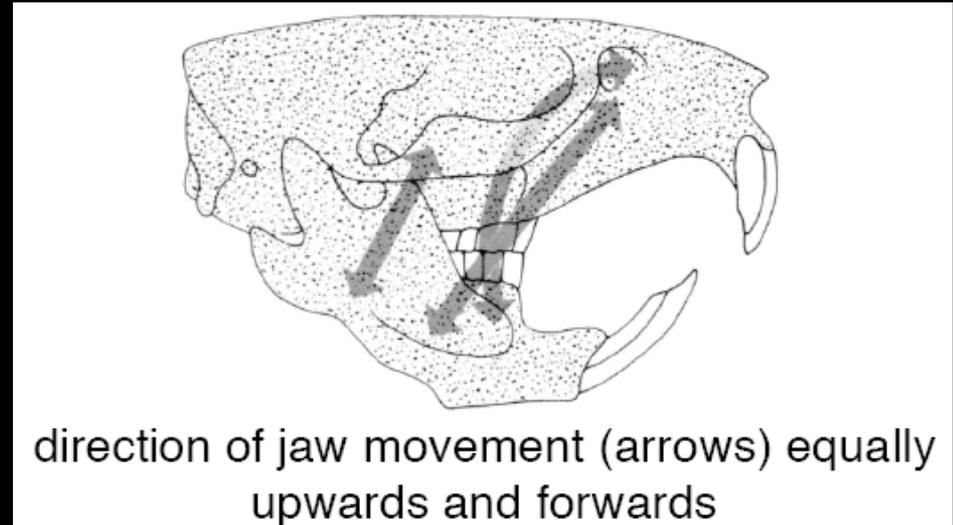
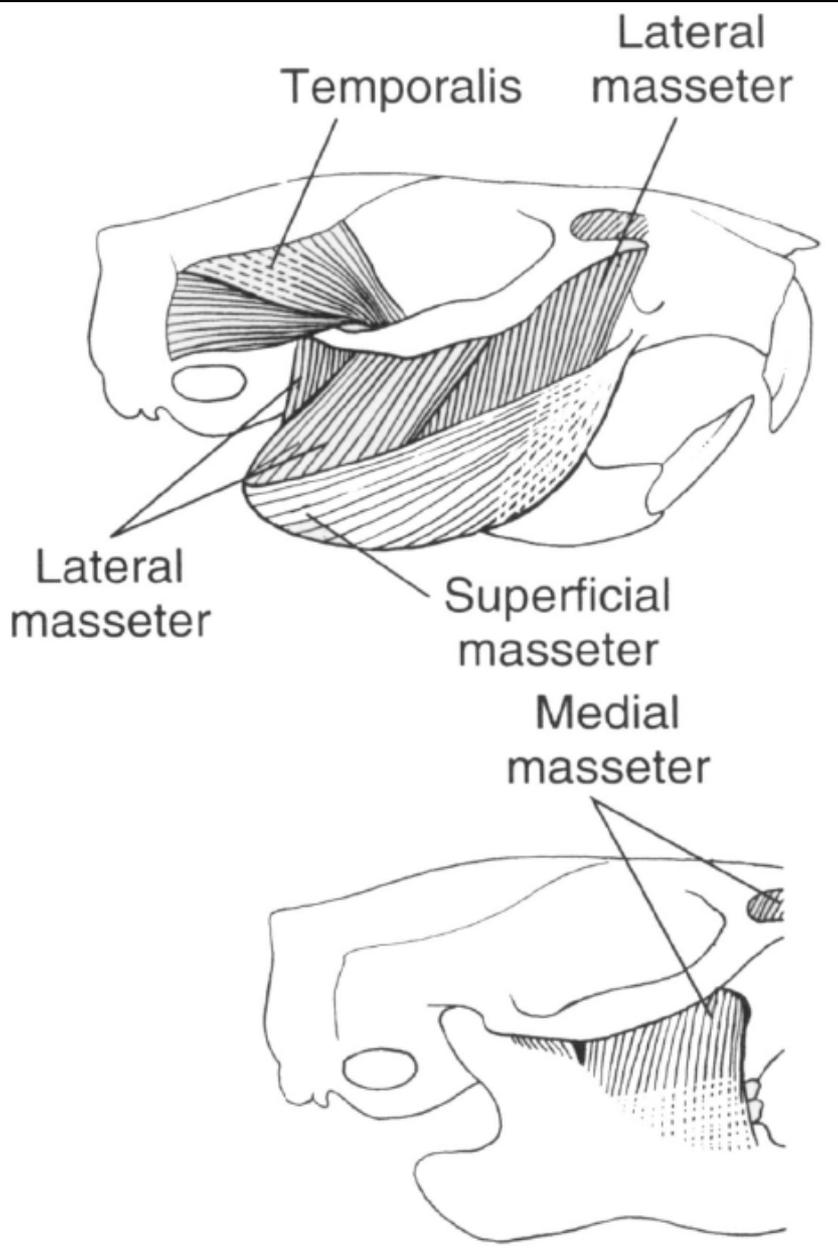


lateral masseter



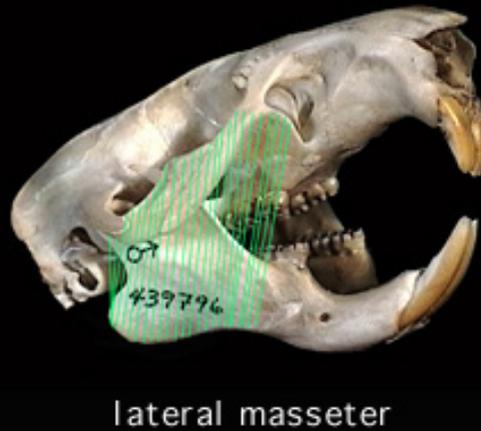
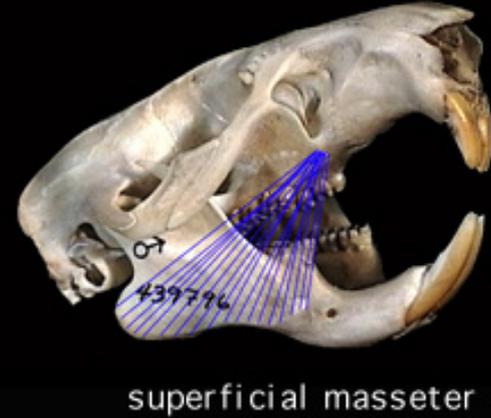
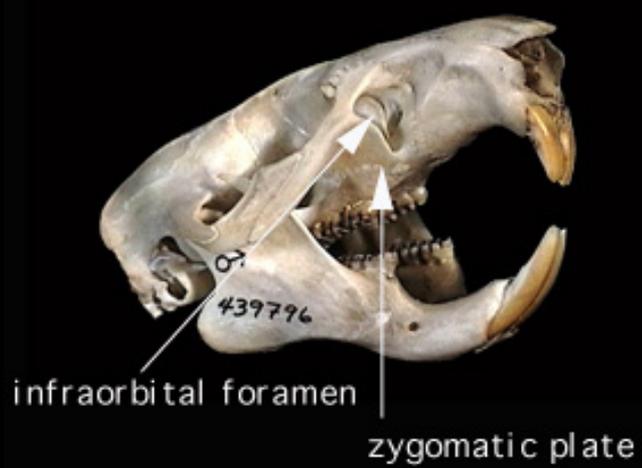
medial masseter

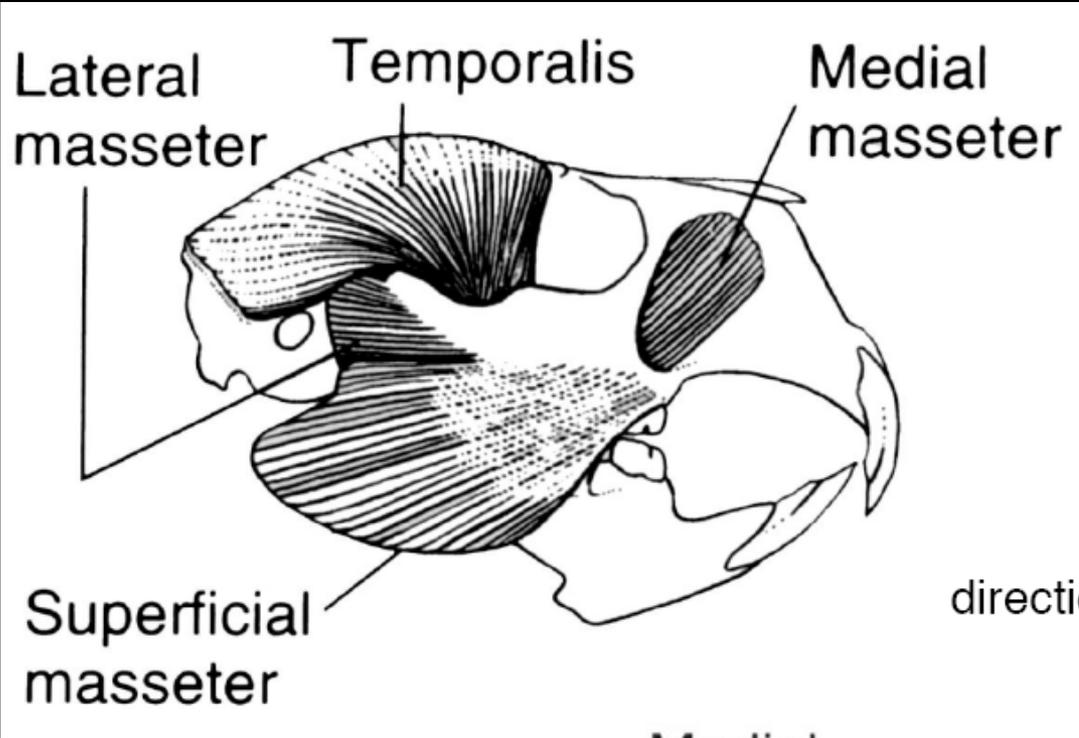
Myomorpha



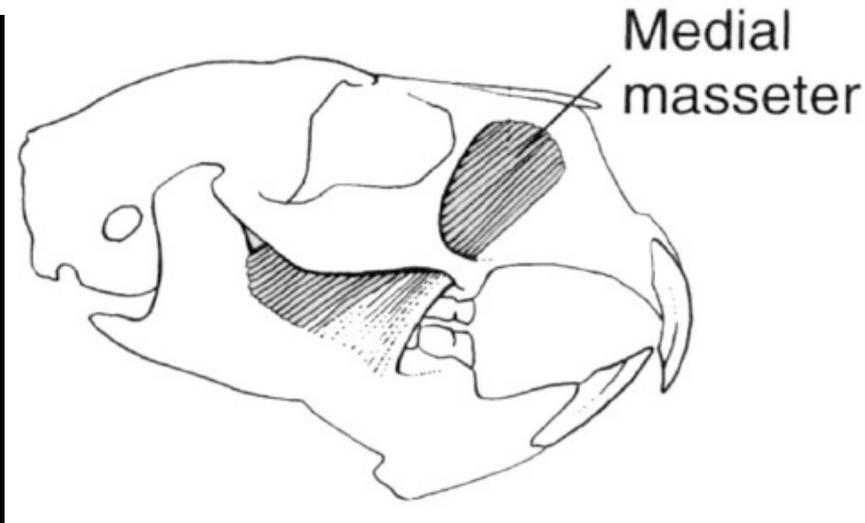
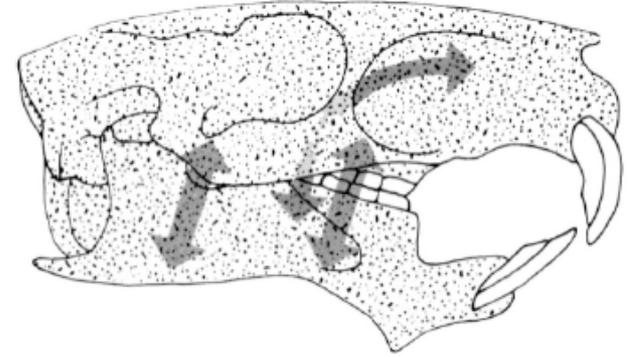
Ratos

Myomorphous condition





Hystricomorpha



Capivaras, Cutias, Pacas,
Ouriços...

Hystricomorphous condition



infraorbital foramen



superficial masseter

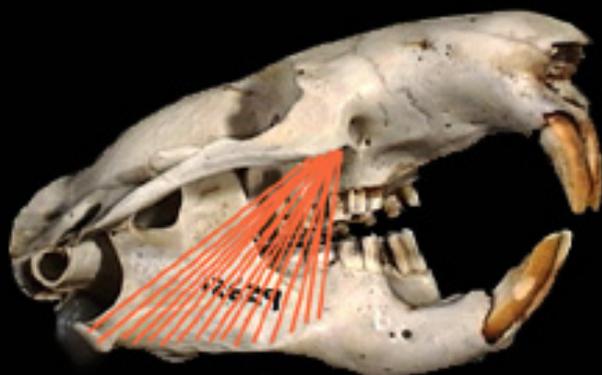


lateral masseter

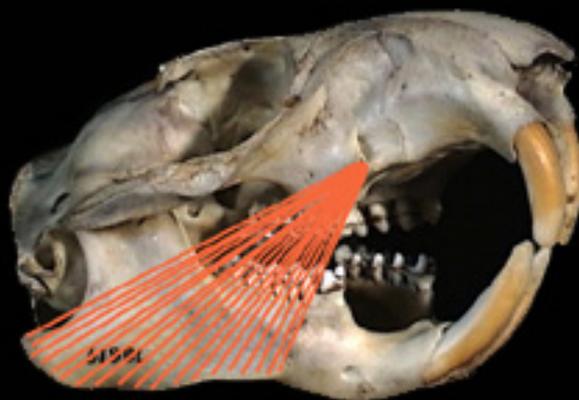


medial masseter

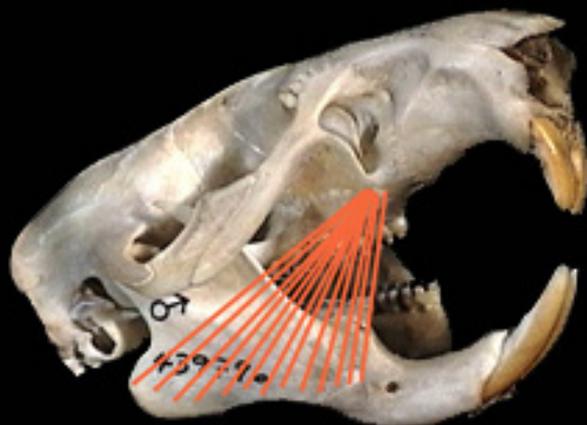
Superficial masseter



Protrogomorphous



Sciurumorphous



Myomorphous

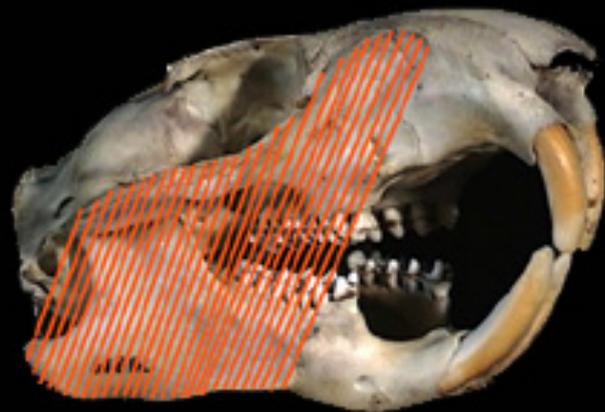


Hystricomorphous

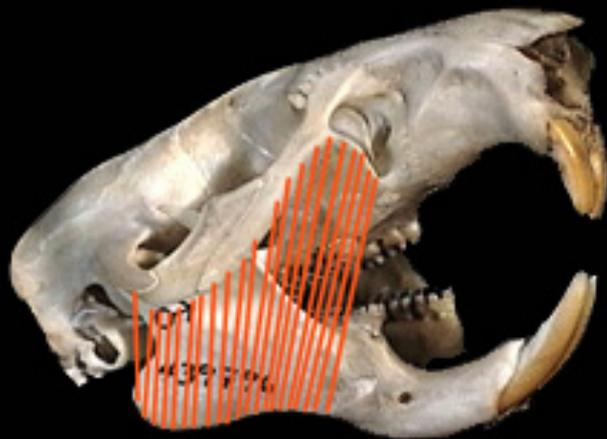
Lateral masseter



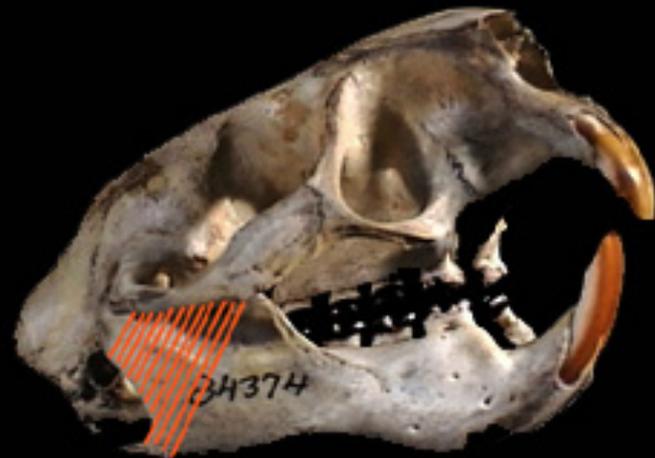
Protrogomorphous



Sciurormorphous

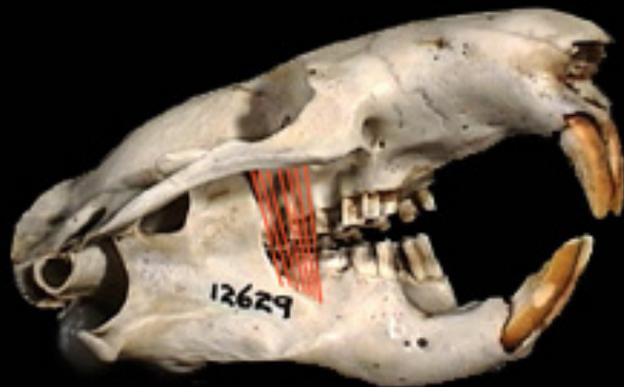


Myomorphous

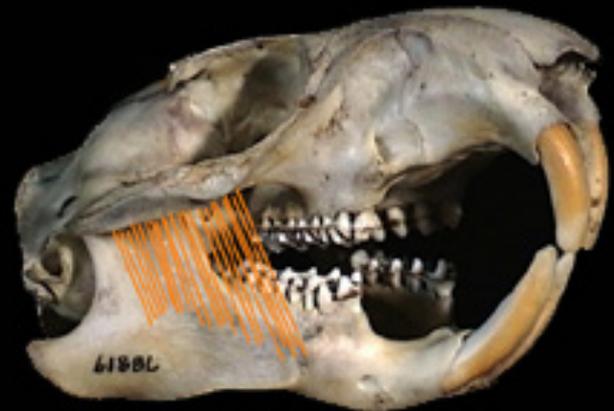


Hystricomorphous

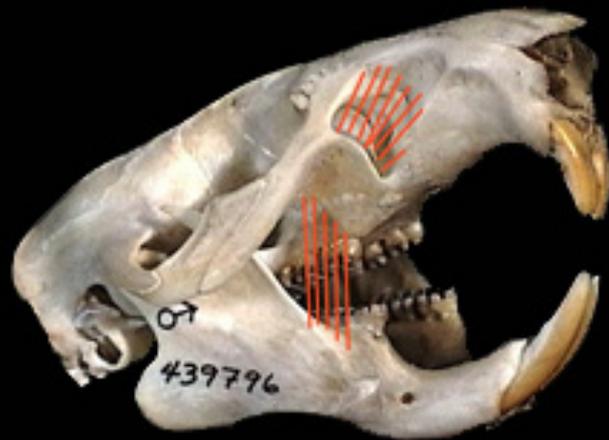
Medial masseter



Protrogomorphous



Sciurumorphous



Myomorphous



Hystricomorphous



Protrogomorphous
Aplodontia



Sciurumorphous
Marmota

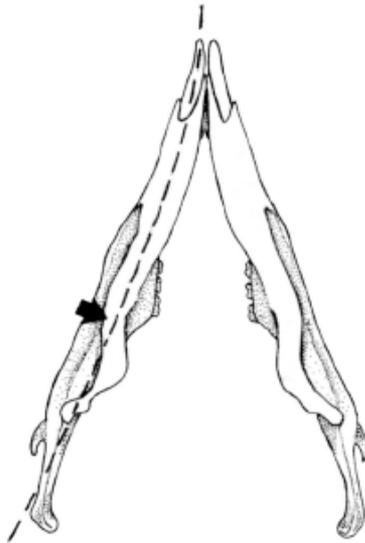


Myomorphous
Cricetomys

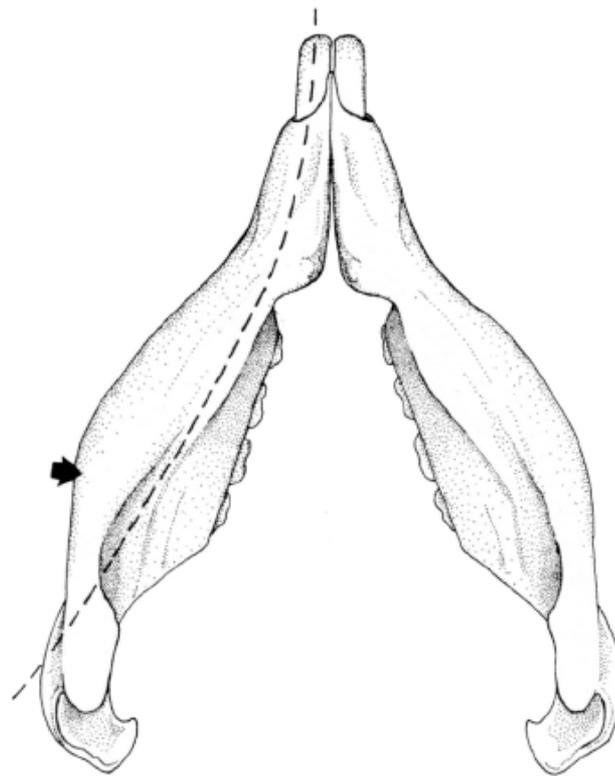


Hystricomorphous
Erethizon

Sciurognathia X Hystricognathia



sciurognathy: angular process (bold arrow) directly ventral to sheath of lower incisor (dotted line)



hystricognathy: root of angular process (bold arrow) deflected lateral to sheath of lower incisor (dotted line)

Sciurognathous jaws



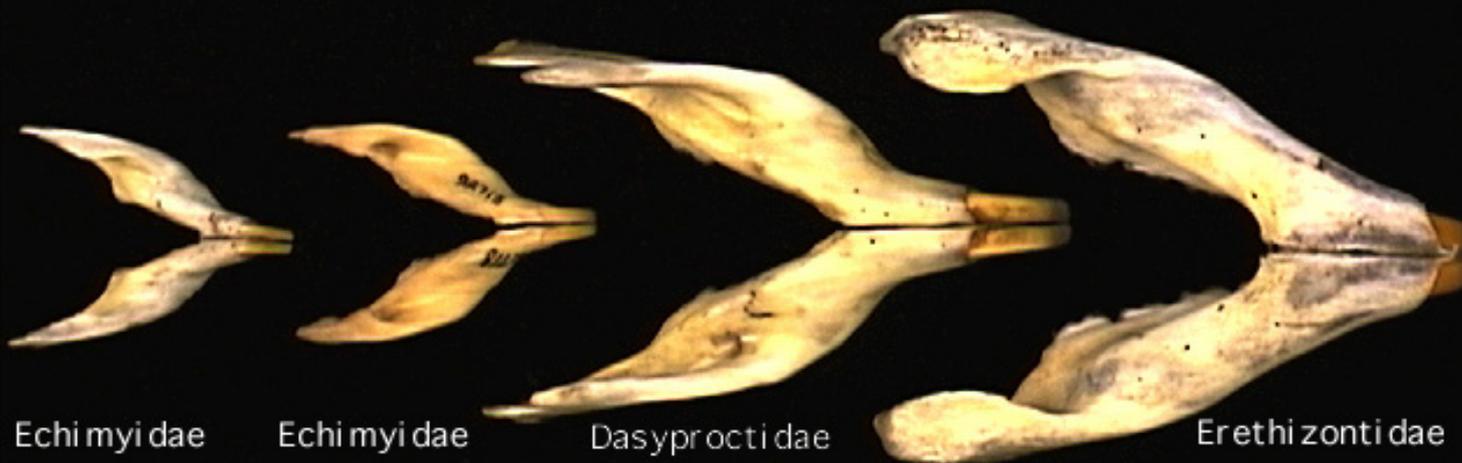
Sigmodontinae

Sigmodontinae

Rhizomyinae

Sciuridae

Hystriognathous jaws



Echimyidae

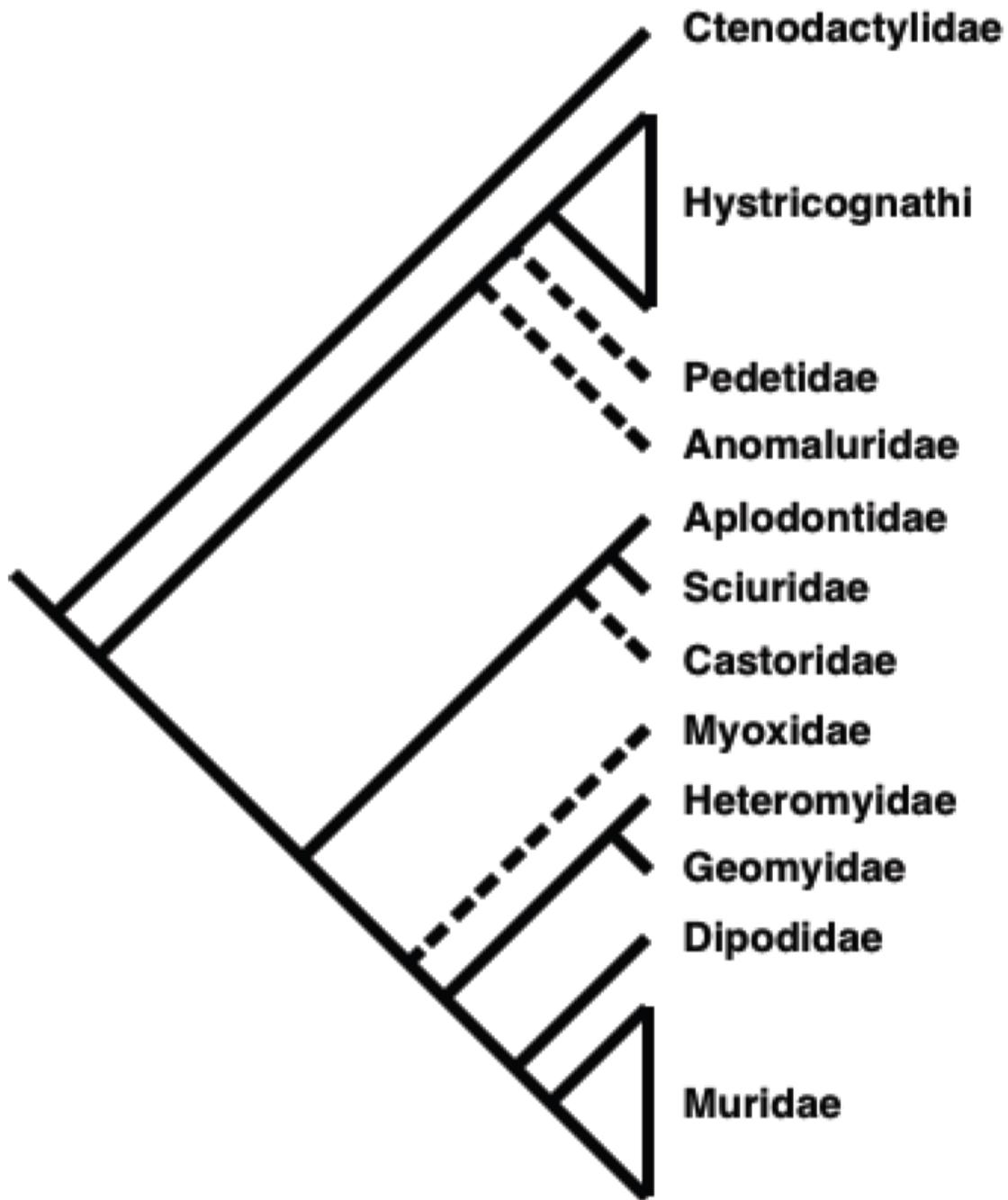
Echimyidae

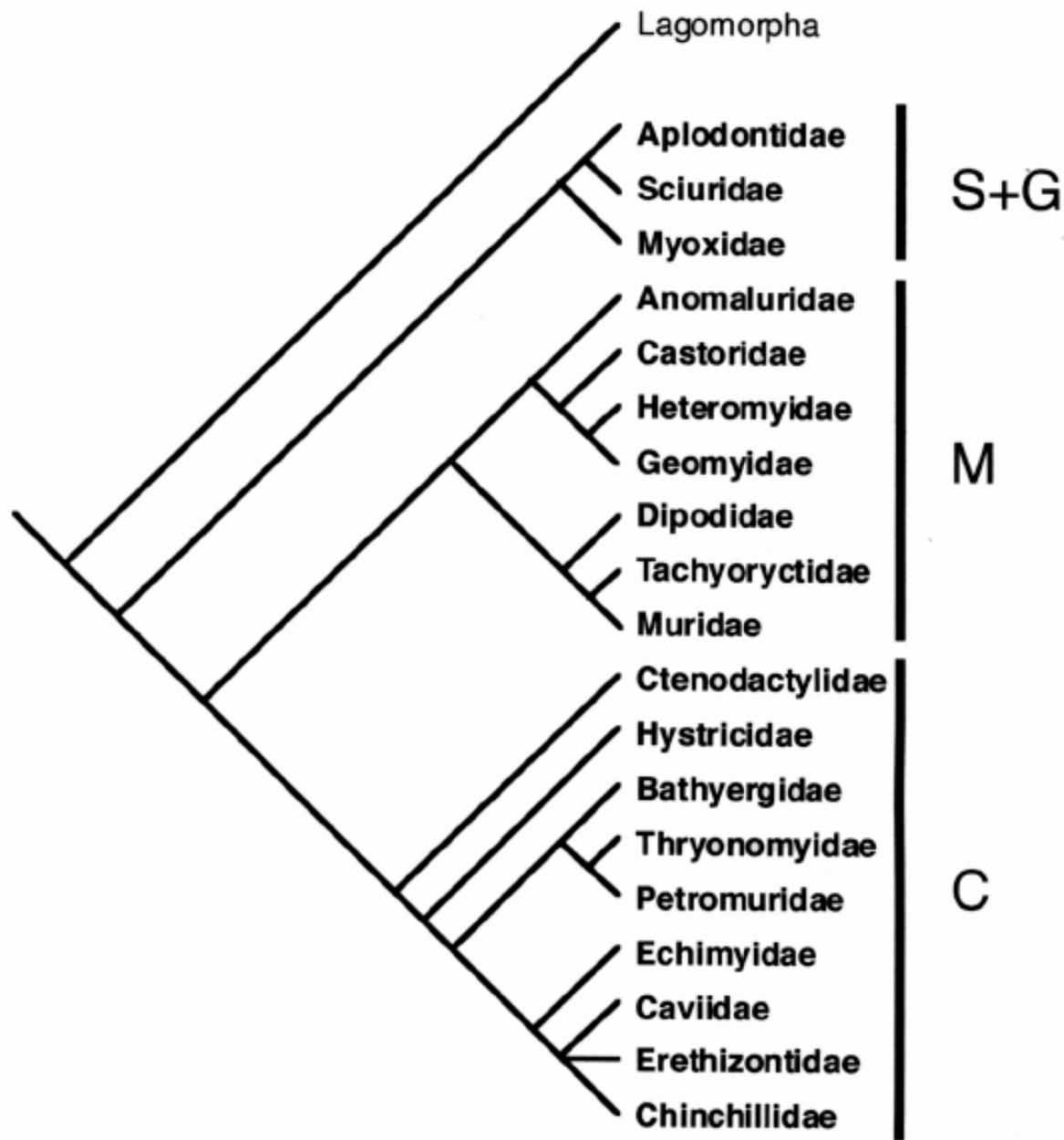
Dasyproctidae

Erethizontidae

	Sciurognathous	Hystricognathous
Protrogomorphous	Aplodontidae	
Sciuromorphic	Sciuridae Castoridae	Bathyergidae
Hystricomorphous	Anomaluridae Pedetidae Ctenodactylidae Dipodidae	Hystricidae Petromuridae Thryonomyidae Erethizontidae Chinchillidae Dinomyidae Caviidae Dasyproctidae Agoutidae Ctenomyidae Octodontidae Abrocomidae Echimyidae Capromyidae Myocastoridae
Myomorphic	Geomyidae* Heteromyidae* Muridae Gliridae	

*geomyoids (Geomyidae + Heteromyidae) are sometimes labeled as “pseudo-myomorphic”





Order **Rodentia**

Suborder **Sciuromorpha**

- Family Aplodontidae - mountain beavers
- Family Sciuridae - squirrels
- Family Gliridae - dormice

Suborder **Castorimorpha**

- Family Castoridae - beavers
- Family Heteromyidae - pocket mice, kangaroo rats, kangaroo mice
- Family Geomyidae - pocket gophers

Suborder Myomorpha

Superfamily Dipodoidea

- Family Dipodidae - jerboas, birch mice, jumping mice

Superfamily Muroidea

- Family Platacanthomyidae - tree mice
- Family Spalacidae - zokors, bamboo rats, mole rats
- Family Calomyscidae - no common name exc. "Calomyscus"
- Family Nesomyidae - pouche rats, climbing mice, fat mice, tufted-tailed rats
- Family Cricetidae - voles, New World mice and rats
- Family Muridae - gerbils, hamsters, Old World mice and rats

Suborder **Anomaluromorpha**

- Family Anomaluridae - scaly-tailed squirrels
- Family Pedetidae - spring hares

Suborder **Hystricomorpha**

Infraorder **Ctenodactylomorphi**

Family Ctenodactylidae - gundis

Infraorder **Hystricognathi**

- Family Bathyergidae - mole rats
- Family Hystricidae - Old World porcupines
- Family Petromuridae - dassie or rock rats
- Family Thryonomyidae - cane rats
- Family Erethizontidae - New World porcupines
- Family Chinchillidae - chinchillas, viscachas
- Family Dinomyidae - pacarana
- Family Caviidae - guinea pigs, Patagonian “hare”, capybara
- Family Dasyproctidae - agoutis, acouchis
- Family Cuniculidae - pacas
- Family Ctenomyidae - tuco-tucos
- Family Octodontidae - octodonts, degu
- Family Abrocomidae - chinchilla rats
- Family Echimyidae - tree rats, spiny rats
- Family Myocastoridae - nutria
- Family Capromyidae - hutias
- Family Heptaxodontidae[†] - key mouse, giant hutias

MOUSE RELATED CLADE:



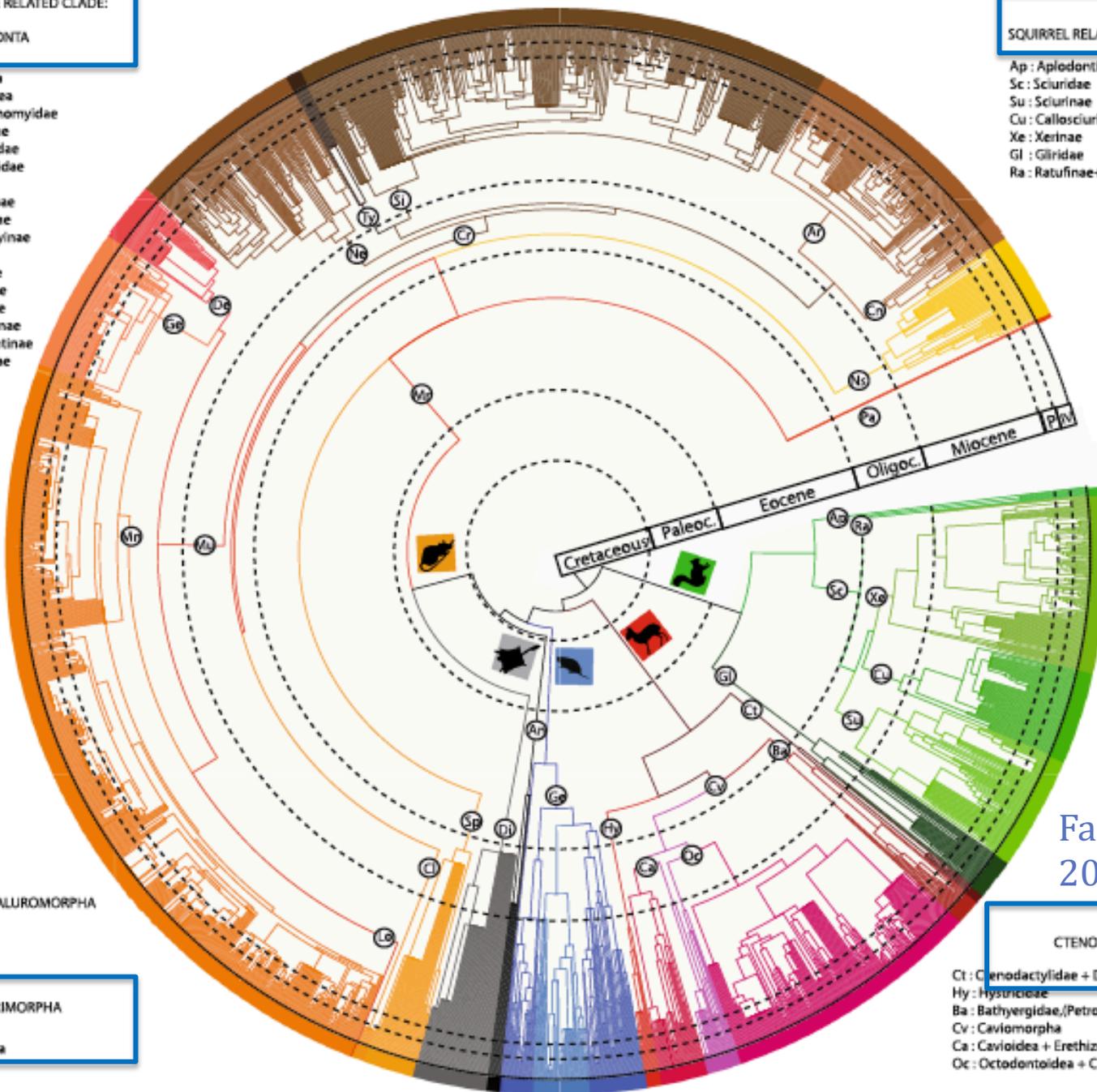
MYODONTA

- Mr: Muroidea
- Di: Dipodoidea
- Pa: Platacanthomyidae
- Sp: Spalacidae
- Ns: Nesomyidae
- Cl: Calomyscidae
- Mu: Muridae
- De: Deomyinae
- Ge: Gerbillinae
- Lo: Lophomyinae
- Mr: Murinae
- Cr: Cricetidae
- Ar: Arvicolinae
- Cn: Cricetinae
- Ne: Neotominae
- Si: Sigmodontinae
- Ty: Tylomyinae

SQUIRREL RELATED CLADE



- Ap: Apodontidae
- Sc: Sciuridae
- Su: Sciurinae
- Cu: Callosciurinae
- Xe: Xerinae
- Gl: Gliridae
- Ra: Ratufinae+Sciurillinae



ANOMALUROMORPHA



CASTORIMORPHA

- Ge: Geomyoidea

Fabre et al.
2012

CTENOHYSTRICA



- Ct: Ctenodactylidae + Diatomyidae
- Hy: Hystriidae
- Ba: Bathyergidae, (Petrouridae, Thryonomidae)
- Cv: Caviomorpha
- Ca: Cavioidae + Erethizontidae
- Oc: Octodontoidea + Chinchillidae

SUBORDEM SCIUROMOPHA

Família Sciuridae

general characters:

1. body form slender (7-100 cm)
2. tail may be relatively short to long, often bushy
3. digits 4-5, not webbed
4. pinna may be small to relatively large, without a tragus
5. gliding membrane usually absent; if present, arising from wrist, with calcar also present
6. postorbital process large
7. auditory bulla moderately inflated, not flask-shaped and without tympanic tube
8. zygomatic plate well developed
9. infraorbital foramen very small, slit-like
10. angular process of lower jaw usually slightly inflected
11. crowns of cheekteeth usually not flat, with distinct cusps or ridges and valleys

dental formula:

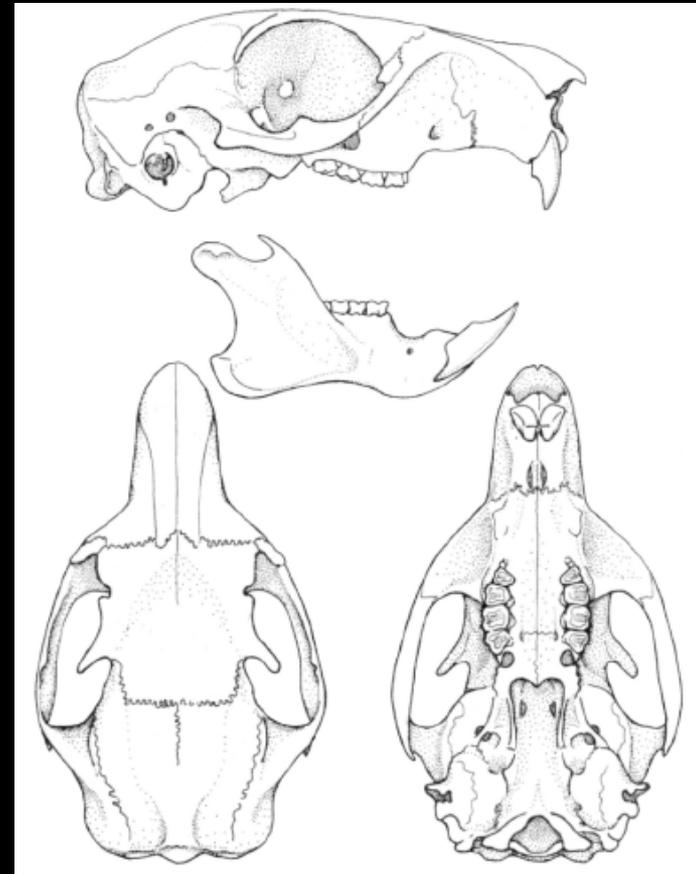
$$\frac{1 \ 0 \ 1-2 \ 3}{1 \ 0 \ 1 \ 3} = 20-22$$



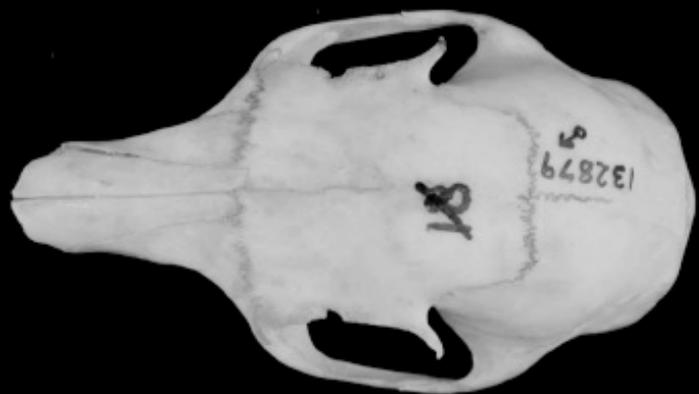
1 família

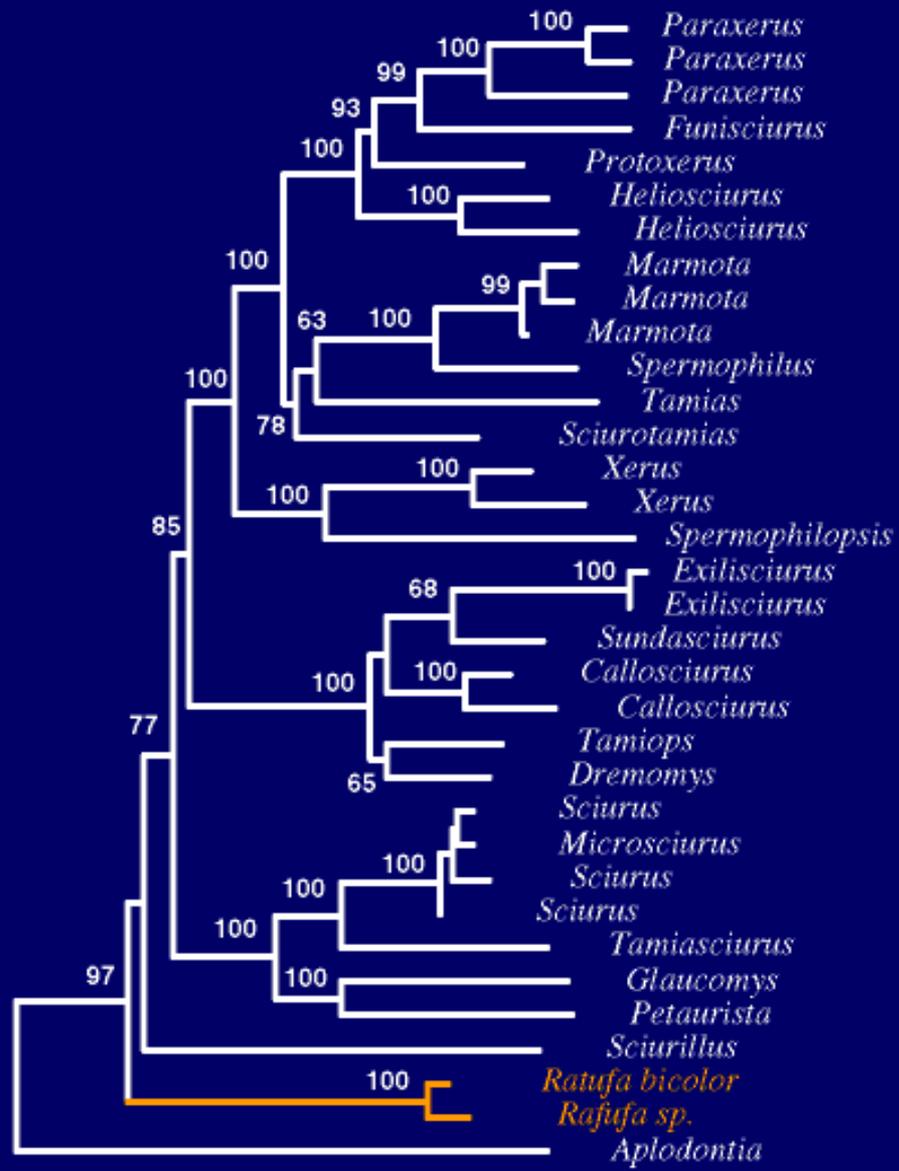
~ 3 gêneros (51)

~ 16 espécies (278)



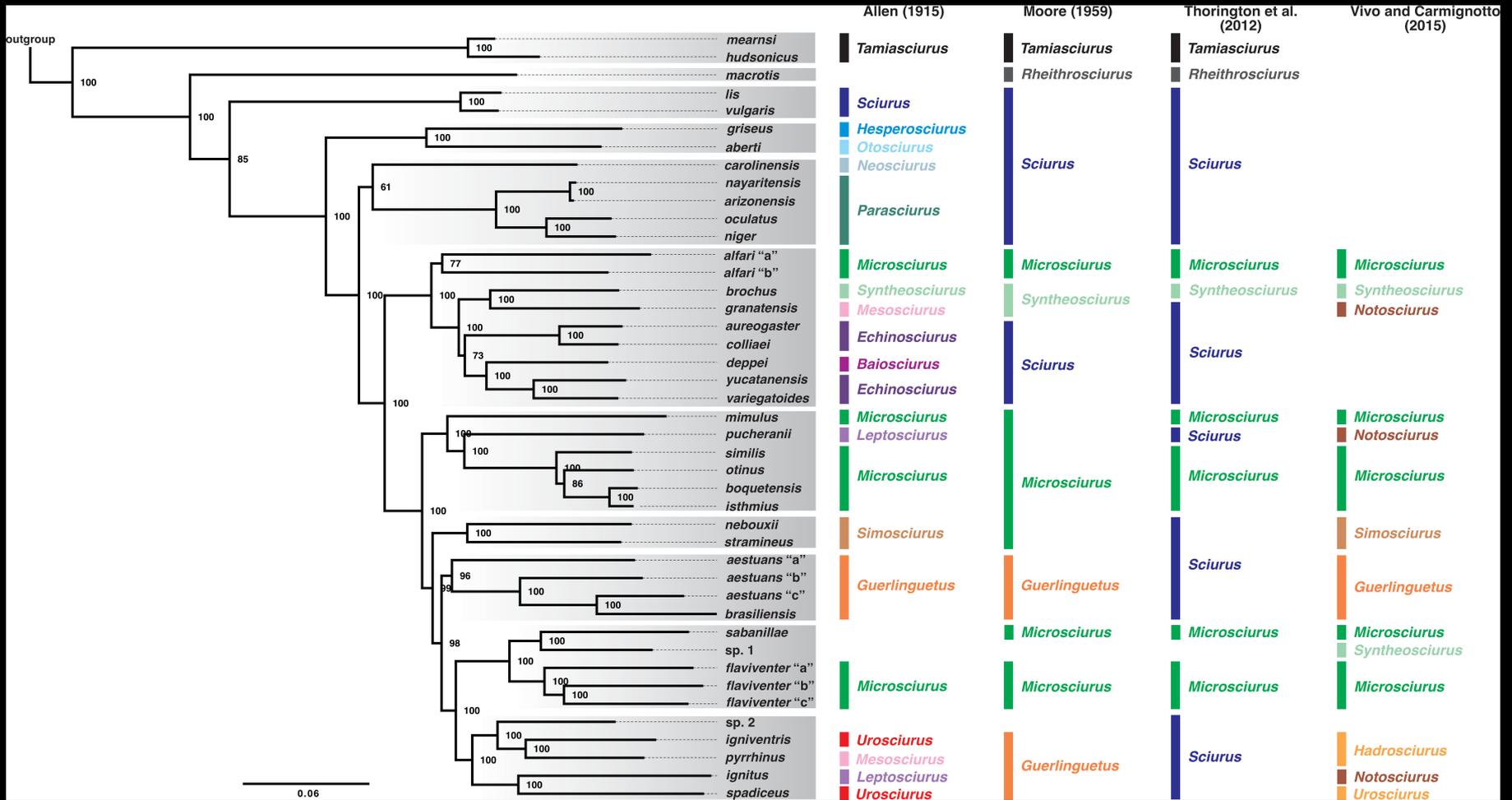






Museomics of tree squirrels: a dense taxon sampling of mitogenomes reveals hidden diversity, phenotypic convergence, and the need of a taxonomic overhaul

Edson Fiedler de Abreu-Jr.^{1,2*†}, Silvia E. Pavan^{2,3*†}, Mirian T. N. Tsuchiya^{2,4}, Don E. Wilson⁵, Alexandre R. Percequillo¹ and Jesús E. Maldonado^{2,6}

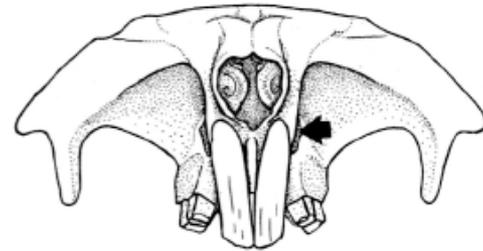
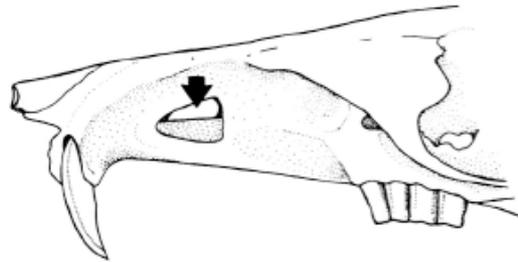


SUBORDEM CASTORIMORPHA

Família Heteromyidae

diagnostic characters:

1. external fur-lined cheek pouches
2. limbs modified for quadrupedal bounding or bi-pedal saltation
3. infraorbital canal compressed against and entirely piercing the rostrum, opening laterally



dental formula:

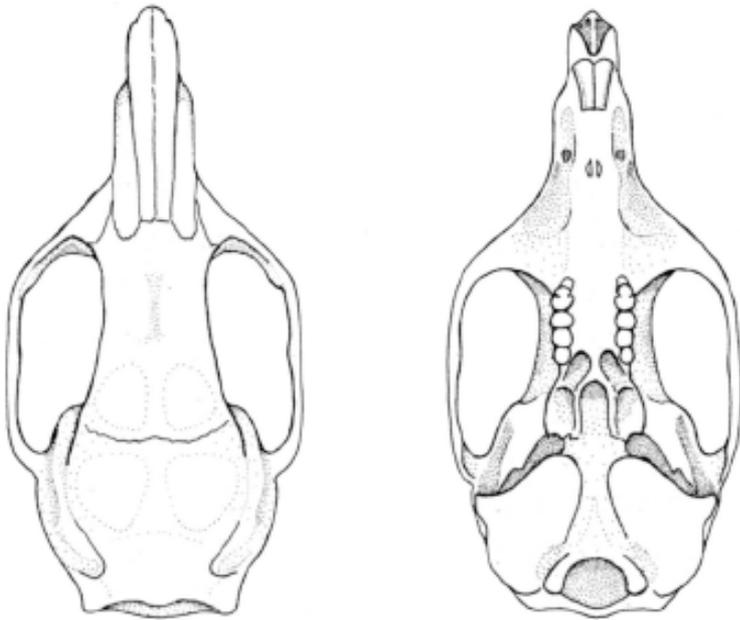
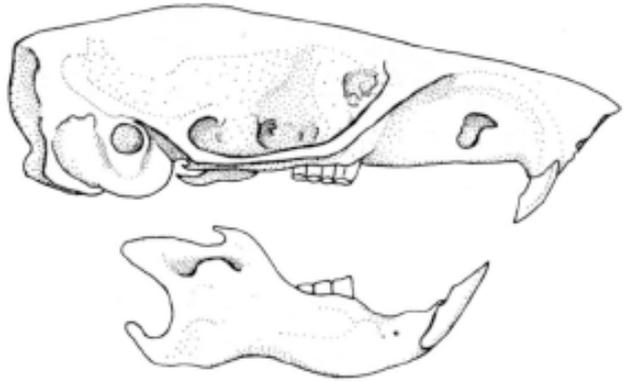
$$\begin{array}{cccc} 1 & 0 & 1 & 3 \\ \hline 1 & 0 & 1 & 3 \end{array} = 20$$

1 gênero (6)

5 espécies (60)

additional characters:

1. body mouse- to rat-like (10-50 cm)
2. hindlimbs relatively long (all pocket mice) to very long (kangaroo rats and kangaroo mice)
3. tail long to very long, well haired, often strongly tufted at end
4. eyes relatively large and visible
5. pinna relatively small
6. cranium somewhat rounded in profile
7. zygomatic plate broad and tilted upward
8. nasals extending anteriorly, well beyond level of upper incisors
9. auditory bulla slightly inflated (*Liomys*, *Heteromys*), moderately inflated (*Chaetodipus*, *Perognathus*), or greatly inflated (*Dipodomys*, *Microdipodops*)
10. no foramen in the angular process of the lower jaw
11. crowns of molars simple, bi-lophodont, brachydont (all pocket mice and kangaroo mice) to simple ovals and hypsodont (kangaroo rats)

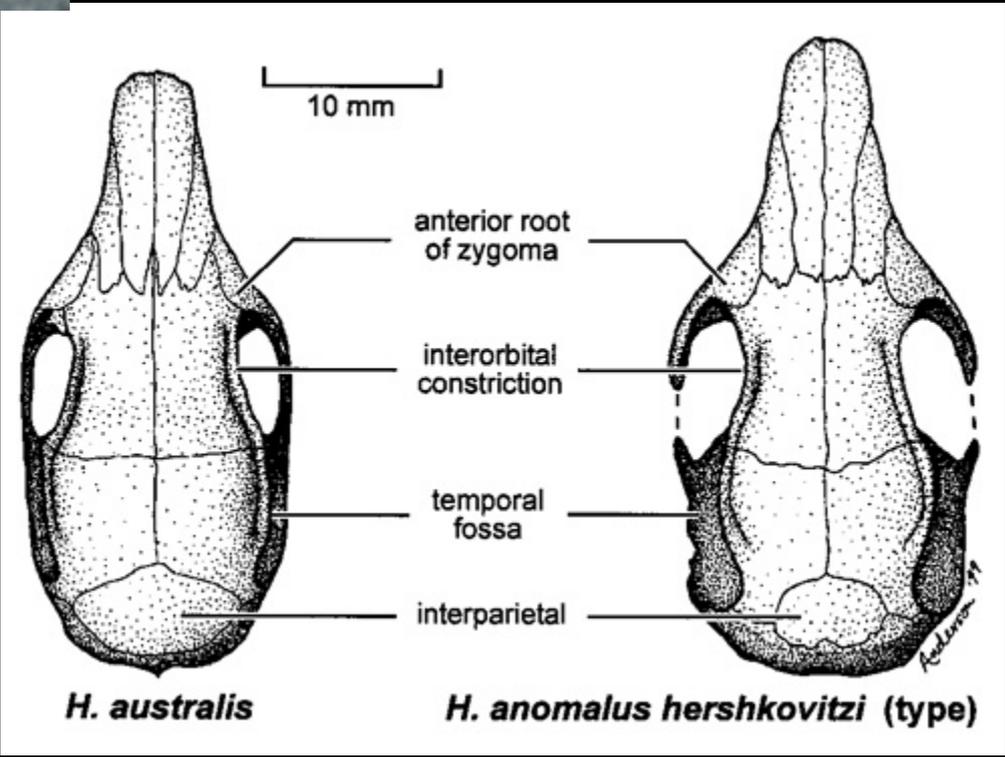


skull of *Heteromys* (spiny pocket mouse)



Gaumer's spiny pocket mouse, *Heteromys gaumeri*

Family Heteromyidae
Heteromys anomalus
P.V. August
ASNM-MH



H. australis

H. anomalus hershkovitzi (type)

SUBORDEM MYOMORPHA

Superfamília Muroidea

1993 – 2 nd edition	2005 – 3 rd edition
Family Muridae	Suborder Muroidea
Subfamily Platacanthomyinae	Family Platacanthomyidae
	Family Spalacidae
Subfamily Myospalacinae	Subfamily Myospalacinae
Subfamily Rhizomyinae	Subfamily Rhizomyinae
	Subfamily Tachyoryctinae
Subfamily Spalacinae	Subfamily Spalacinae
Subfamily Calomyscinae	Family Calomyscidae
	Family Nesomyidae
Subfamily Cricetomyinae	Subfamily Cricetomyinae
Subfamily Dendromurinae	Subfamily Dendromurinae
Subfamily Mystromyinae	Subfamily Mystromyinae
Subfamily Nesomyinae	Subfamily Nesomyinae
Subfamily Petromyscinae	Subfamily Petromyscinae
	Subfamily Delanymyinae
	Family Cricetidae
Subfamily Arvicolinae	Subfamily Arvicolinae
Subfamily Cricetinae	Subfamily Cricetinae
Subfamily Lophiomyinae	Subfamily Lophiomyinae
Subfamily Sigmodontinae	Subfamily Sigmodontinae
	Subfamily Neotominae
	Subfamily Tylomyinae
	Family Muridae
	Subfamily Leimacomyinae (from Dendromurinae)
	Subfamily Deomyinae (from Dendromurinae)
Subfamily Gerbillinae	Subfamily Gerbillinae
Subfamily Murinae	Subfamily Murinae
Subfamily Otomyinae	Subfamily Otomyinae

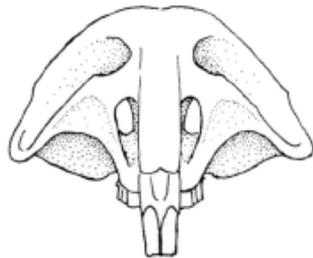
Diversity and distribution of muroid taxa (from G. G. Musser and M. D. Carleton. 2005. Muroidea, in [D. E. Wilson and D. M. Reeder, eds.], Mammal Species of the World, 3rd ed. Johns Hopkins University Press, Baltimore, MD)

subfamily	approx. diversity (genera / species)	common names	range
Suborder Muroidea	310 / 1517		
Family Platacanthomyidae	2 / 2	spiny mouse, blind tree mouse	India, SE Asia
Family Spalacidae	6 / 36		
Subfamily Myospalacinae	2 / 6	zokors	Siberia, northern China
Subfamily Rhizomyinae	2 / 4	mole rats, bamboo rats	East Africa, south Asia
Subfamily Tachyoryctinae	1 / 13		
Subfamily Spalacinae	1 / 13	blind mole rats	North Africa, eastern Mediterranean
Family Calomyscidae	1 / 8	mouse hamsters	Middle East and SW Asia
Family Nesomyidae	21 / 61		
Subfamily Cricetomyinae	3 / 8	pouched rats and mice	subSaharan Africa
Subfamily Dendromurinae	6 / 24	climbing rats, forest mice	subSaharan Africa
Subfamily Mystromyinae	1 / 1	white-tailed rats	South Africa
Subfamily Nesomyinae	9 / 23	Malagasy rats and mice	Madagascar
Subfamily Petromyscinae	1 / 4	rock mice, swamp mouse	Africa
Subfamily Delanymyinae	1 / 1	Swamp mouse	Tropical Africa

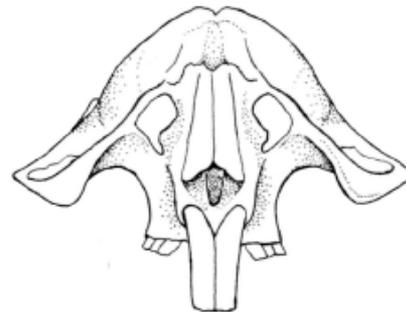
Family Cricetidae	130 / 681		
Subfamily Arvicolinae	28 / 151	voles, lemmings, muskrat	Holarctic
Subfamily Cricetinae	7 / 18	hamsters	Palaearctic
Subfamily Lophiomyinae	1 / 1	maned rat	eastern Africa
Subfamily Sigmodontinae	74 / 377	New World rats and mice	Central and South America
Subfamily Neotominae	16 / 124	New World rats and mice	North and Central America
Subfamily Tylomyinae	4 / 10	vesper rats, climbing rats	Central and South America
Family Muridae	150 / 730		
Subfamily Leimacomyinae	1 / 1	forest mouse	Africa (Togo)
Subfamily Deomyinae	4 / 42	spiny mice, brush- tailed mice	Africa
Subfamily Gerbillinae	16 / 103	gerbils, jirds, sand rats	Africa, southern Asia
Subfamily Murinae	126 / 561	Old World rats and mice	Old World (worldwide with introductions)
Subfamily Otomyinae	3 / 23	Vlei rats, Karroo rats	Africa

general characters:

1. body mouse- to rat-sized (10-90 cm), unspecialized or adapted for swimming, climbing, digging, or hopping
2. limbs usually unspecialized (except for some that are modified for the above habits)
3. tail short to very long, scaly to well-haired
4. eyes relatively large, visible
5. pinna small to large
6. cheek pouches, if present, opening internally
7. cranium variable in shape, rounded in profile (most genera) or flat and triangular (subterranean arvicoline *Ellobius*, rhizomyines, myospalacines, spalacines)
8. infraorbital canal medium-sized, usually v-shaped (wider dorsally than ventrally), opening anteriorly (oval in shape in rhizomyines)



infraorbital foramina of *Rattus*,
subfamily Murinae



infraorbital foramina of *Rhizomys*,
subfamily Rhizomyinae

9. zygomatic plate broad (rarely narrow), tilted upward
10. nasals usually extending anteriorly to or beyond level of upper incisors (not extending beyond incisors in rhizomyines)
11. auditory bulla usually not greatly inflated (except in most genera of gerbillines)
12. no foramen in angular process of lower jaw
13. crowns of molars cuspidate or flat, with angular (prismatic) or rounded lateral folds of enamel

dental formula:

$$\frac{1 \ 0 \ 0 \ 2-3}{1 \ 0 \ 0 \ 2-3} = 12-16$$

SUBORDEM MYOMORPHA

Superfamília Muroidea

Família Cricetidae

Subfamília Sigmodontinae

general characters: Mouse- to rat-like in body form, including climbing, sub-fossorial, semi-saltatorial, and aquatic specialized body forms and teeth and jaws designed for granivory, herbivory, insectivory, carnivory, and fungus feeding. The molar teeth are typically cuspidate, with two parallel rows of cusps, although many genera have planed, flattened occlusal surfaces for grass eating.

dental formula:

$$\frac{1 \ 0 \ 0 \ 2-3}{1 \ 0 \ 0 \ 2-3} = 12-16$$

~ 84 gêneros

~ 394 espécies



Family Muridae
Oryzomys nitidus
S. Reith and M. V. Dellapenna
ASM - MHL

Family Muridae

Oryzomys alfaroi

S. Anderson
ASM - MIL



Family Muridae

Oryzomys capito

E.V. Cargill
ASM-MIL



Family Muridae

Akodon longipilis

P. L. Meserve
ASM - MIL



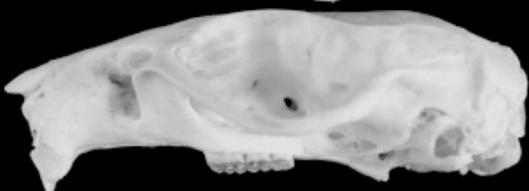
Family Muridae

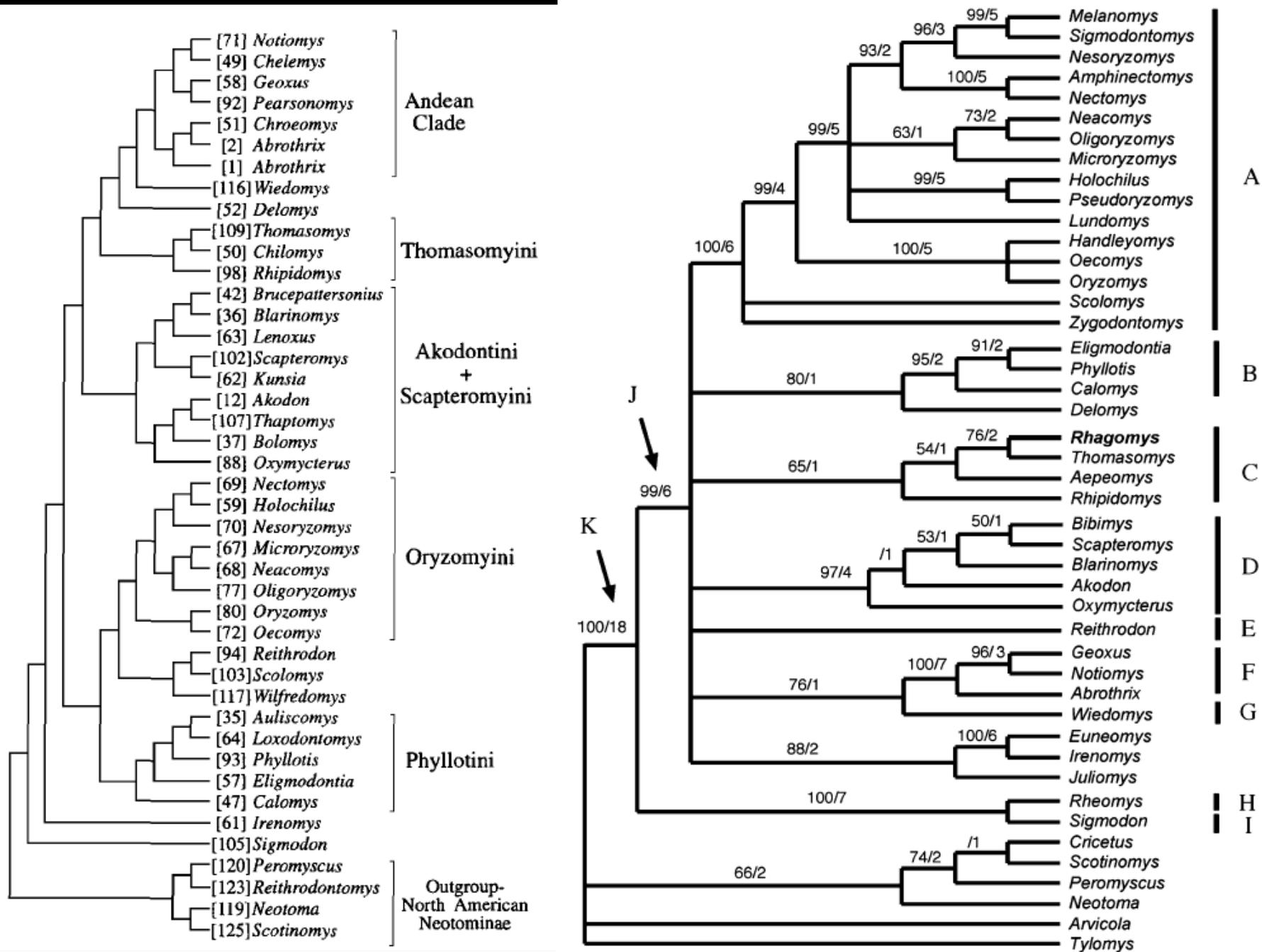
Holochilus sciureus

R.D. Lord
ASM-MIL







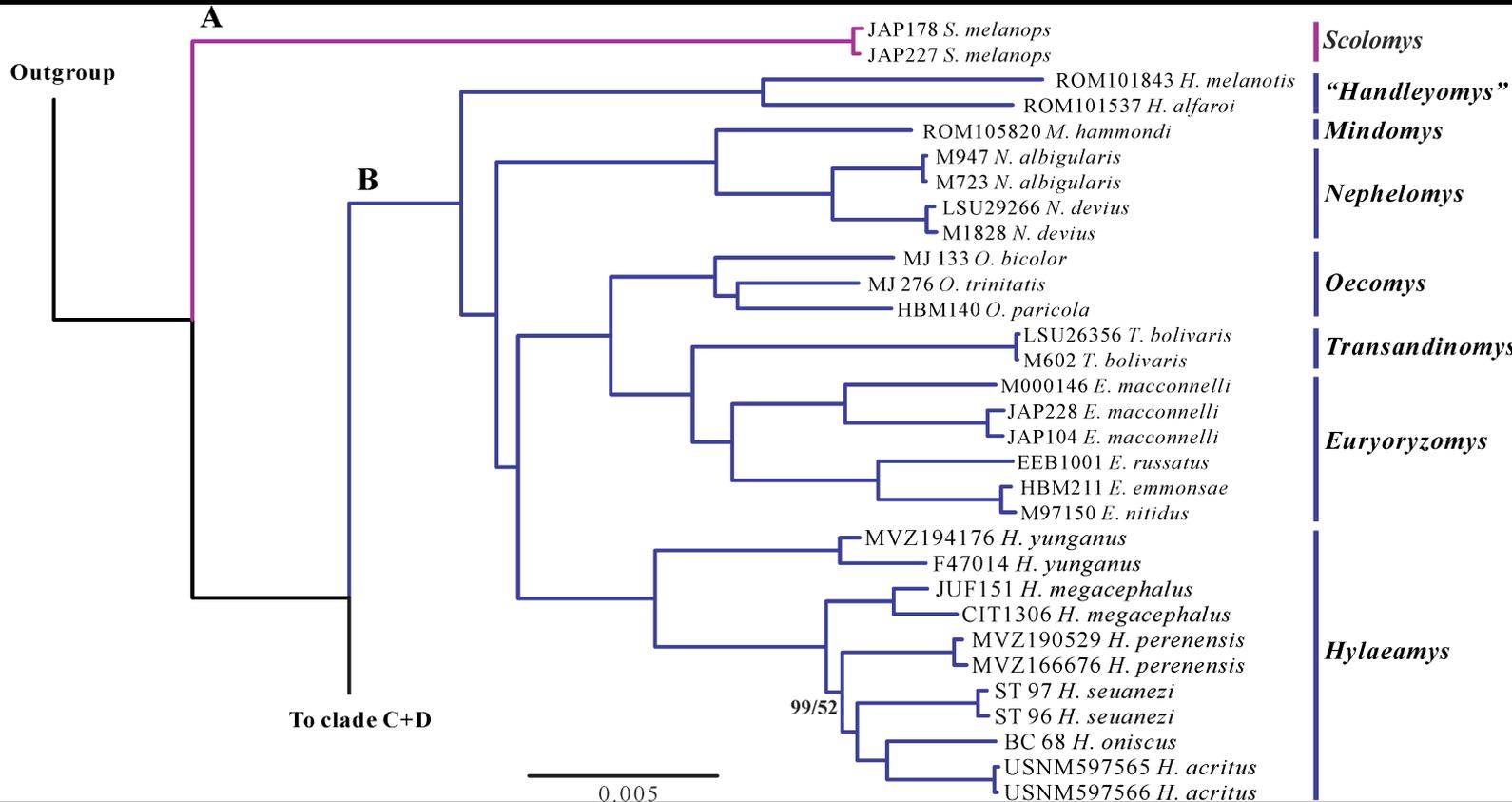
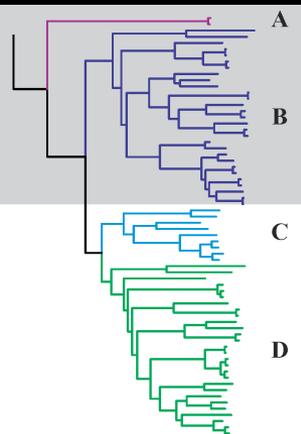




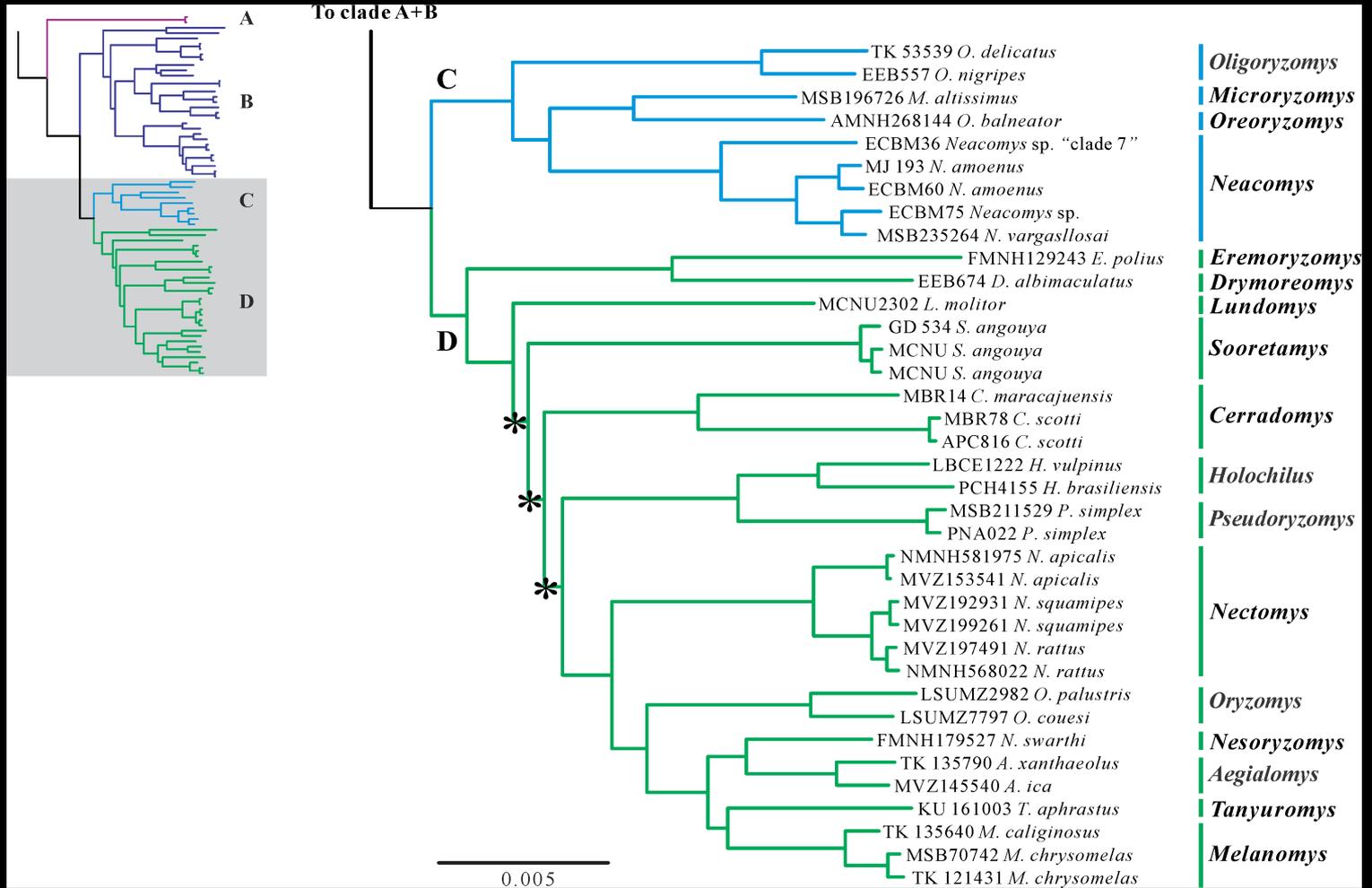
RAxML

Tempo and mode of evolution of oryzomyine rodents (Rodentia, Cricetidae, Sigmodontinae): A phylogenomic approach[☆]

Alexandre Reis Percequillo^{a,b,*}, Joyce Rodrigues do Prado^a, Edson Fiedler Abreu^a, Jeronimo Dalapicolla^{a,c}, Ana Carolina Pavan^a, Elisandra de Almeida Chiquito^{a,d}, Pamela Brennan^a, Scott J. Steppan^e, Alan R. Lemmon^f, Emily Moriarty Lemmon^f, Mark Wilkinson^b

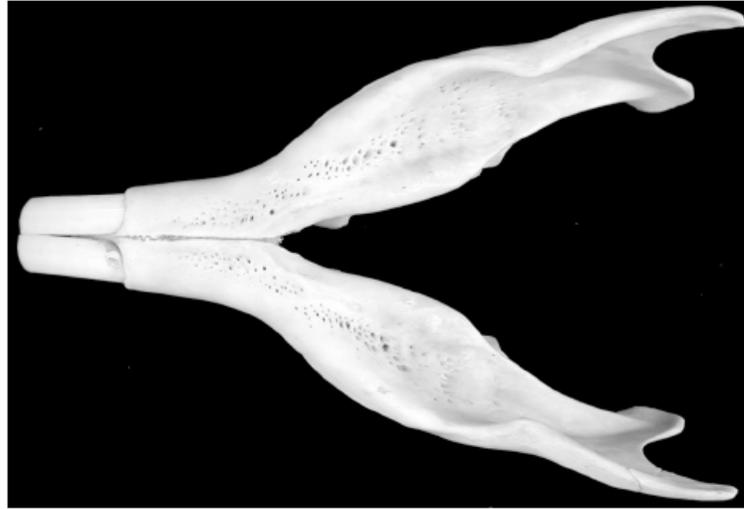


RAxML



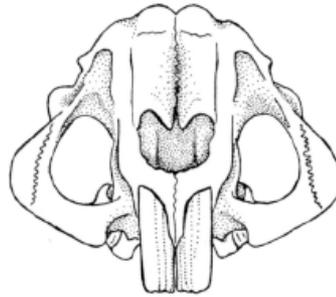
SUBORDEM HYSTRICOMORPHA

diagnostic character: lower jaw hystricognathous

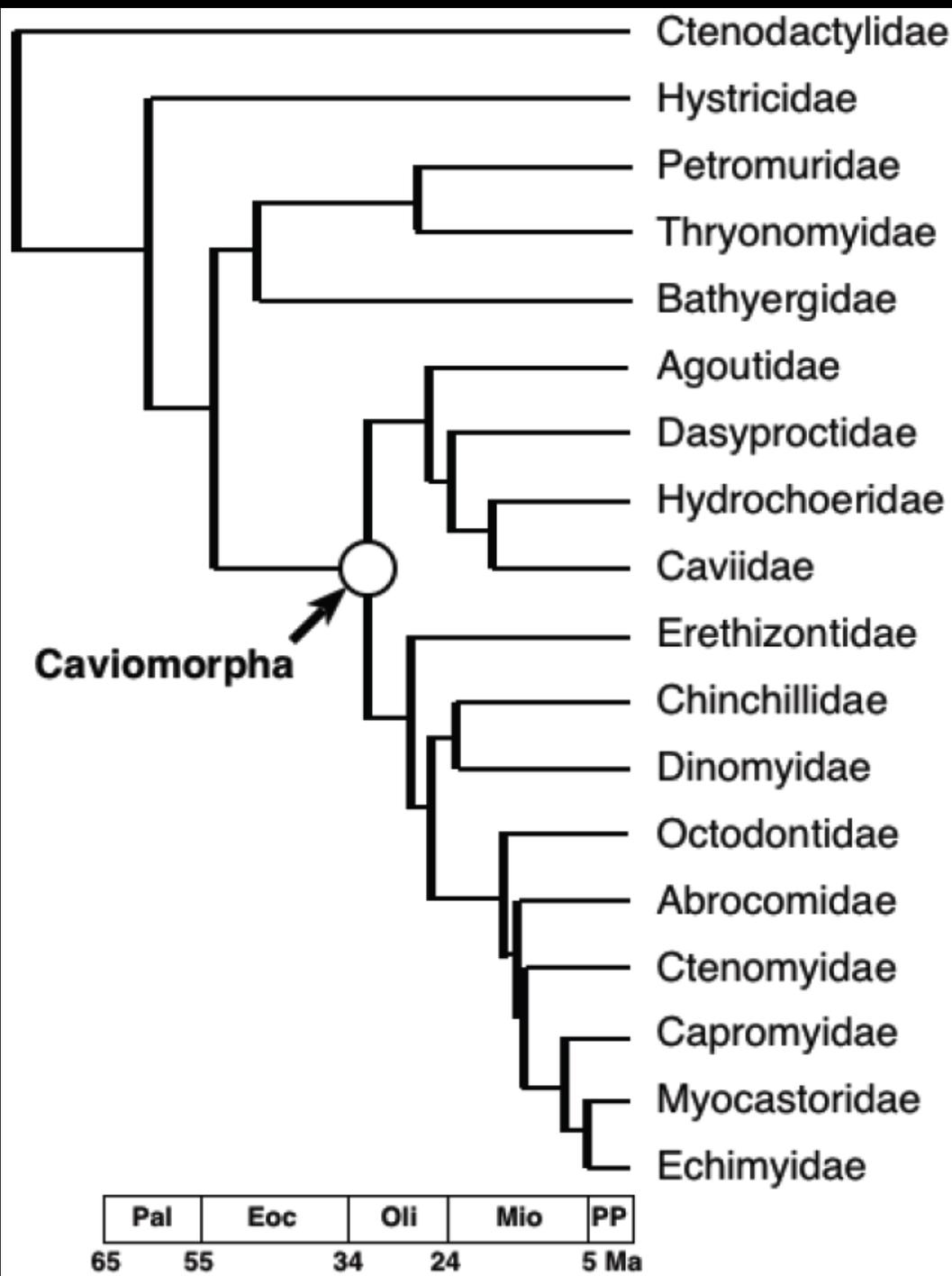


additional characters:

1. infraorbital foramen very large (except in Bathyergidae), accommodating much of the medial masseter muscle (hystricomorphous)



2. cheekteeth usually 4/4 (one premolar, three molars), with four or five transverse crests primitively, or reduction to a minimum of two crests



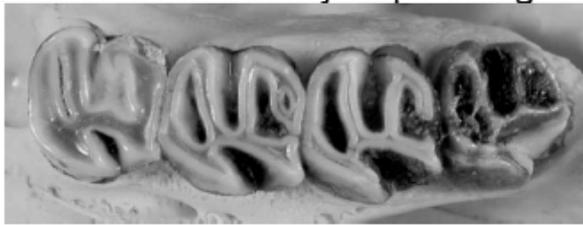
SUBORDEM HYSTRICOMORPHA

Caviomorpha

Família Erethizontidae

general characters:

1. body moderately large, heavy-set (50-115 cm)
2. pelage conspicuously spiny, spines not modified into hollow quills, each spine with proximally directed barbs
3. tail short (*Erethizon*, *Echinoprocta*), or long and prehensile, curling dorsally (*Coendou*, *Chaetomys*)
4. limbs relatively short
5. digits functionally 4-4 (pollex and hallux reduced) or 4-5; not webbed; claws long, curved
6. skull usually blocky, moderately ridged
7. infraorbital foramen very large and without distinct groove for nerve passage
8. lacrimal canal not opening on side of rostrum
9. auditory bulla relatively large
10. paroccipital process short
11. jugal not approaching lacrimal
12. lower jaw without ridge or groove on lateral surface; coronoid process prominent
13. upper toothrows slightly convergent anteriorly
14. occlusal surface of cheekteeth flat, with narrow (*Chaetomys*) or wide enamel folds not usually separating from each other to form islands with wear



right upper toothrow of the North American porcupine, *Erethizon dorsatum*



right upper toothrow of the South American prehensile tailed porcupine, *Coendou bicolor*

dental formula:

$$\frac{1 \ 0 \ 1 \ 3}{1 \ 0 \ 1 \ 3} = 20$$

range: temperate North American forests (*Erethizon*); tropical forests of Central and South America (*Chaetomys*, *Coendou*, *Echinoprocta*, *Sphiggurus*)

2 subfamílias

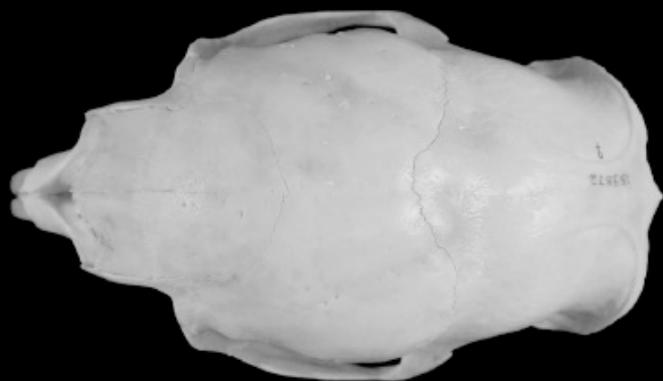
5 gêneros

16 espécies









SUBORDEM HYSTRICOMORPHA

Caviomorpha

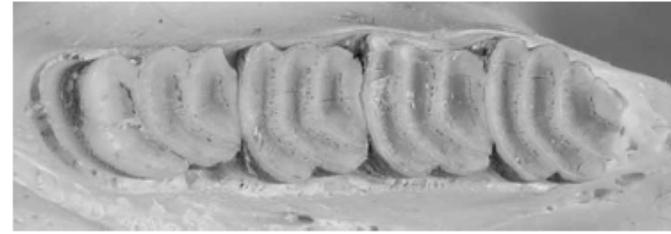
Família Chinchillidae

general characters:

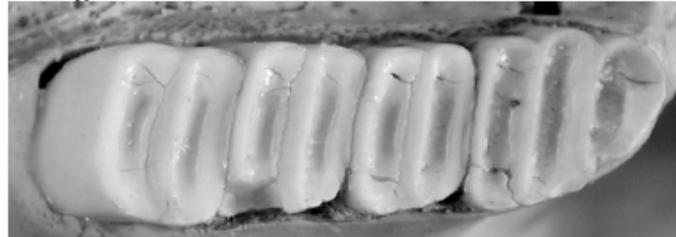
1. moderate to large size (30-85 cm)
2. pelage long, soft, dense
3. tail long, bushy
4. forelimbs short, hind limbs long
5. digits 4-3 or 4-4, not webbed; claws unspecialized
6. skull elongate and ridged (*Lagostomus*) or relatively broad and with little or no ridging
7. infraorbital foramen very large, with (*Lagostomus*) or without distinct groove for nerve passage
8. auditory bulla small (*Lagostomus*) to very large
9. paroccipital process long (*Lagostomus*) or short and bound to bulla
10. jugal approaching (*Chinchilla*) or in contact with lacrimal
11. lower jaw without ridge or groove on lateral surface; angular process elongate and not deflected; coronoid process prominent
12. upper toothrows convergent anteriorly
13. occlusal surface of cheekteeth flat, consisting of a series of transverse plates



right upper tooththrow of the chinchilla,
Chinchilla laniger



right upper tooththrow of the mountain
viscacha, *Lagidium*



left upper tooththrow of the plains viscacha, *Lagostomus*

dental formula:

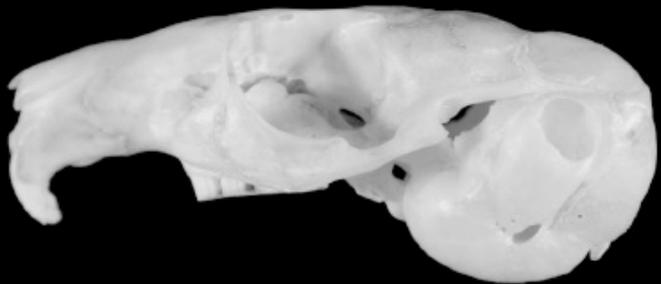
$$\begin{array}{r} 1 \ 0 \ 1 \ 3 \\ \hline 1 \ 0 \ 1 \ 3 \end{array} = 20$$

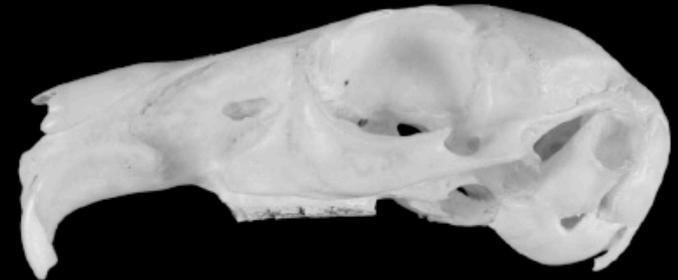
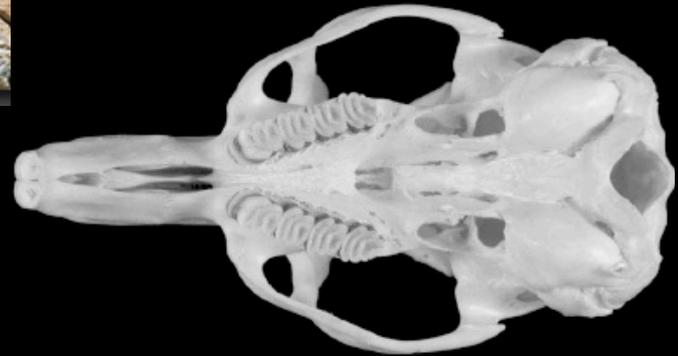
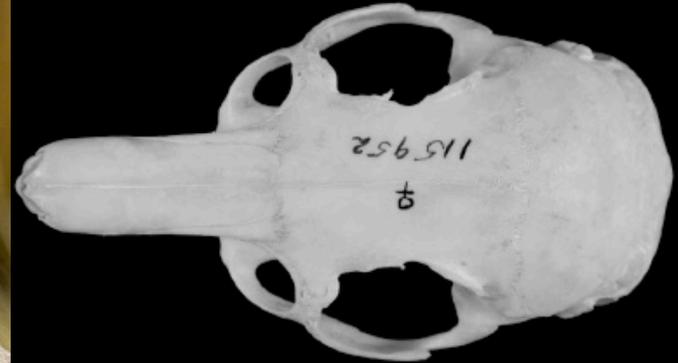
range: South America, high Andes (from central Peru to northern Chile and Argentina) and lowland plains of Argentina

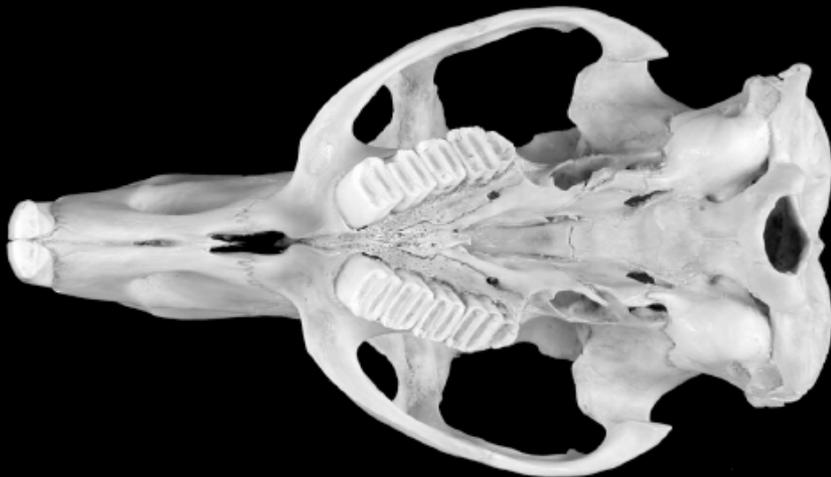
3 gêneros

7 espécies









SUBORDEM HYSTRICOMORPHA

Caviomorpha

Família Dinomyidae

general characters:

1. body relatively large, heavy-set (90-100 cm)
2. pelage thick, soft, with a pair of white stripes or series of white spots along back
3. tail short, well haired, thick
4. limbs short
5. digits 4-4, not webbed; claws large, strong
6. skull blocky, not heavily ridged
7. infraorbital foramen very large, without distinct groove for nerve passage
8. lacrimal canal not opening on side of rostrum
9. auditory bulla moderately large
10. paroccipital process short
11. jugal not approaching lacrimal
12. lower jaw without ridge or groove on lateral surface; angular process strongly deflected; coronoid process very small or absent

13. upper toothrows strongly convergent anteriorly

14. occlusal surface of cheekteeth flat, consisting of a series of four transverse plates



dental formula:

$$\frac{1 \ 0 \ 1 \ 3}{1 \ 0 \ 1 \ 3} = 20$$

range: eastern Andean slopes of tropical South America

1 gênero

1 espécie



Leszek Solski



SUBORDEM HYSTRICOMORPHA

Caviomorpha

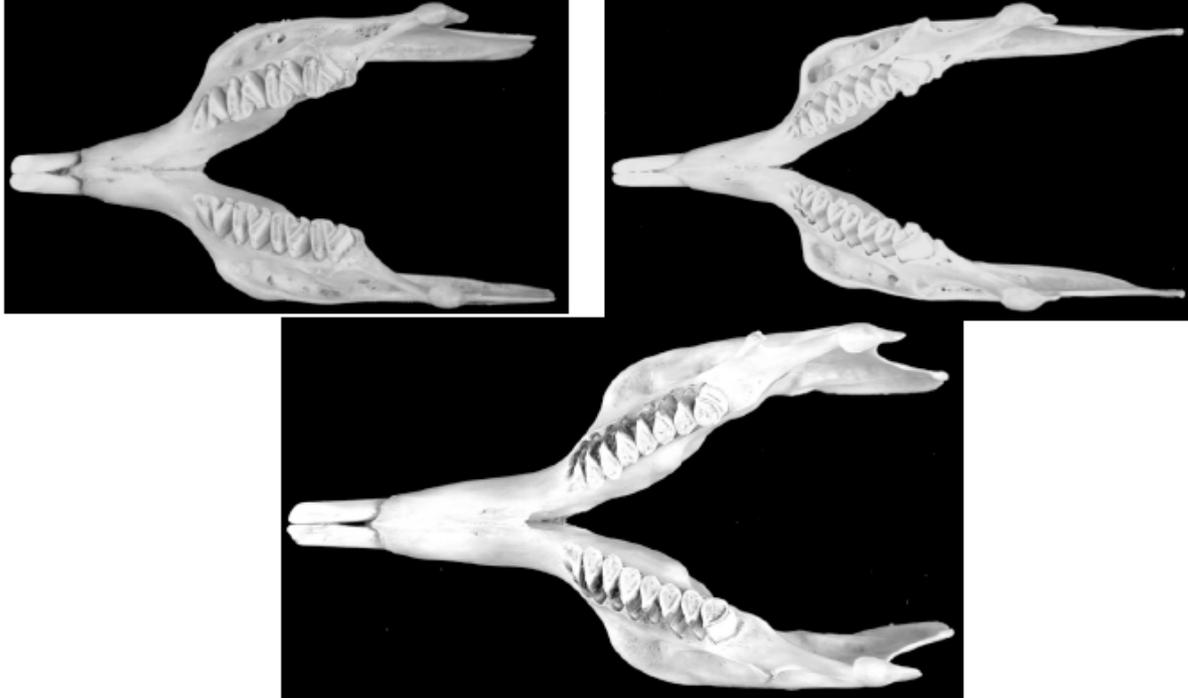
Família Caviidae

Subfamílias Caviinae e Dolichotinae

general characters:

1. body hare-like (*Dolichotus*) or small and stocky (15-80 cm)
2. pelage short to long; hairs soft or stiff, not spiny
3. tail very short
4. limbs long (*Dolichotus*) or short
5. digits 4-3, not webbed; claws unspecialized or hoof-like (*Dolichotus*)
6. skull elongate (*Dolichotus*) or relatively short and broad, with moderate to no ridging
7. infraorbital foramen very large, without distinct groove for nerve passage
8. lacrimal canal with small opening on side of rostrum at from edge of infraorbital canal (no opening in *Dolichotus*)
9. auditory bulla relatively large
10. paroccipital process prominent, slightly curved
11. jugal not approaching lacrimal

12. lower jaw with prominent ridge and groove on lateral surface; angular process elongated but not deflected; coronoid process prominent



dorsal views of lower jaws of *Cavia* (upper left), *Galea* (upper right), and *Dolichotis* (lower middle); note deep groove on lateral side of cheekteeth and elongated angular process

13. upper toothrows strongly convergent anteriorly (see pg. 249)

14. occlusal surface of cheekteeth flat and prismatic with single, major, sharp angular fold of enamel



upper right cheekteeth of the common guinea pig, *Cavia aperea*



upper right cheekteeth of the cavy, *Galea musteloides*



upper left cheekteeth of the Patagonian hare, *Dolichotis patagonum*

dental formula:

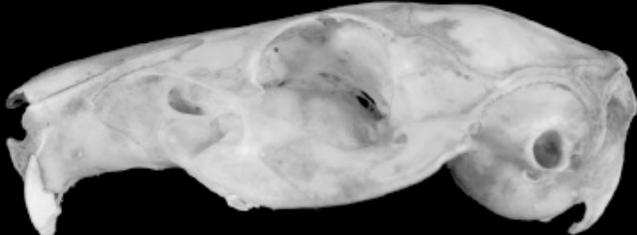
$$\begin{array}{r} 1 \ 0 \ 1 \ 3 \\ \hline 1 \ 0 \ 1 \ 3 \end{array} = 20$$

2 subfamílias

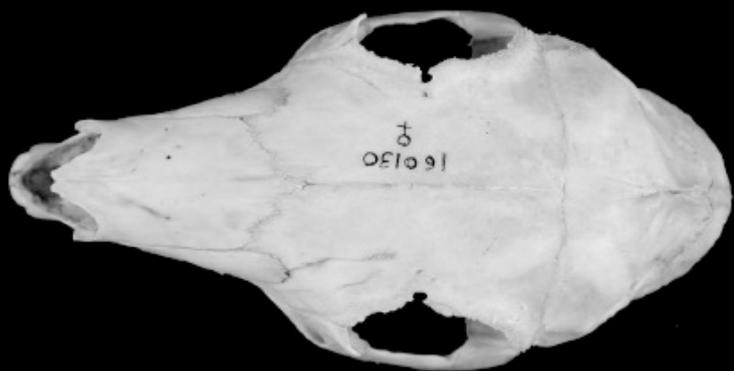
5 gêneros

17 espécies









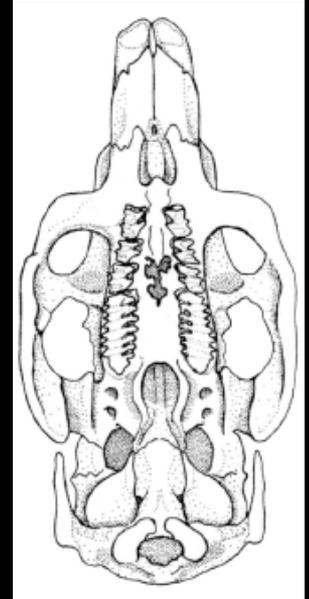
SUBORDEM HYSTRICOMORPHA

Caviomorpha

Família Caviidae

Subfamílias Hydrochoerinae

diagnostic character: third upper and lower molars huge, with the third upper molar longer than other three cheekteeth combined

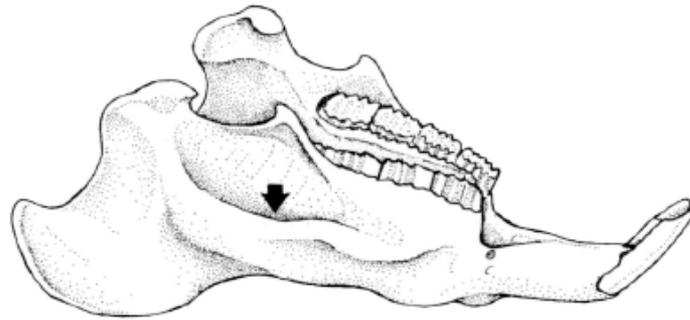


additional characters:

1. body large (up to 125 cm, 50 kg in weight), pig-like
2. pelage long, coarse, sparse
3. tail very short
4. limbs relatively short
5. digits 4-3, partially webbed; claws unspecialized
6. skull massive, elongate, not ridged
7. infraorbital foramen very large, without distinct groove for nerve passage
8. lacrimal canal with small opening on side of rostrum at front edge of infraorbital foramen
9. auditory bulla relatively large
10. paroccipital process very long (longest of all rodents), curved anteriorly

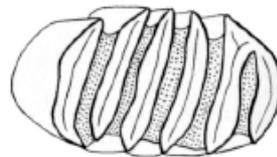
11. jugal not approaching lacrimal

12. lower jaw with prominent ridge and groove on lateral surface; coronoid process prominent



13. upper toothrows slightly convergent anteriorly

14. occlusal surface of cheekteeth flat and prismatic, with sharp angular folds of enamel, the latter forming numerous transverse ridges on the large third molar



lower third molar

dental formula:

$$\frac{1 \ 0 \ 1 \ 3}{1 \ 0 \ 1 \ 3} = 20$$

1 gêneros

1 espécie



SUBORDEM HYSTRICOMORPHA

Caviomorpha

Família Dasyproctidae

general characters:

1. body relatively large (35-65 cm)
2. pelage moderately long, coarse
3. tail short (*Myoprocta*) or very short (*Dasyprocta*)
4. limbs, especially hind limbs, relatively long, slender
5. digits 4-3, not webbed; claws hoof-like
6. skull elongate, not heavily ridged
7. infraorbital foramen very large, without a distinct groove for nerve passage
8. lacrimal canal with large opening on side of rostrum at front edge of infraorbital foramen
9. auditory bulla relatively large
10. paroccipital process relatively short
11. jugal not approaching lacrimal
12. lower jaw without ridge or groove on lateral surface; angular process deflected; coronoid process prominent

13. upper toothrows more or less parallel

14. occlusal surface of cheekteeth flat, consisting of transverse folds of enamel separating from each other to form islands in adults



right upper toothrow of an agouti, *Dasyprocta*



right upper toothrow of an acouchy,
Myoprocta

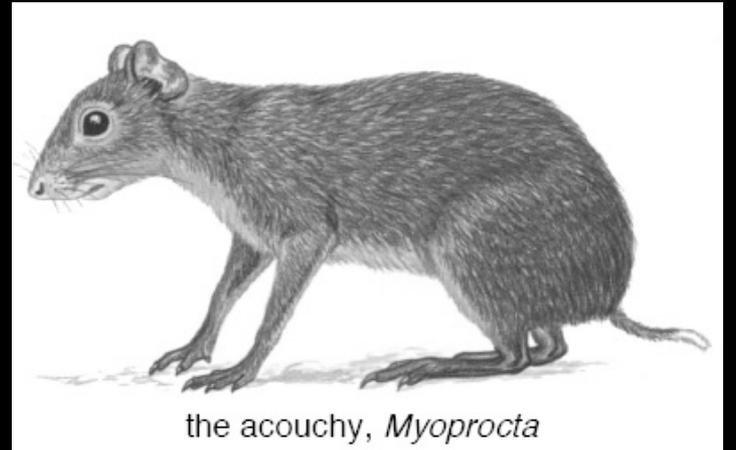
dental formula:

$$\frac{1 \ 0 \ 1 \ 3}{1 \ 0 \ 1 \ 3} = 20$$

2 gêneros

~ 13 espécies





the acouchy, *Myoprocta*



SUBORDEM HYSTRICOMORPHA

Caviomorpha

Família Cuniculidae

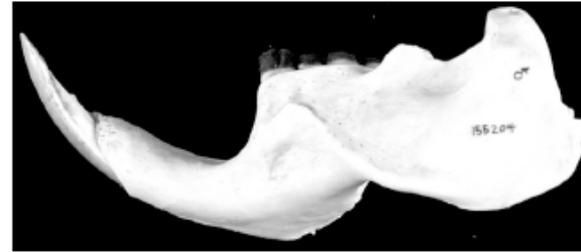
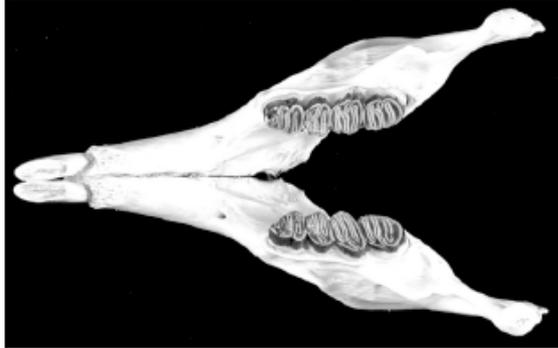
diagnostic character: hypertrophied zygomatic arch with corrugated jugal and maxilla; skull extremely robust

additional characters:

1. body relatively large (60-85 cm)
2. pelage relatively short and coarse, with a series of conspicuous white spots along sides
3. tail absent
4. limbs relatively short
5. digits 4-5, not webbed; claws hoof-like
6. skull extremely robust, with expanded zygomatic arches
7. infraorbital foramen very large, with a distinct groove for nerve passage at inner base
8. lacrimal canal not opening on side of rostrum
9. auditory bulla relatively small
10. paroccipital process relatively long

11. jugal not approaching lacrimal

12. lower jaw without ridge or groove on lateral surface; angular process deflected; coronoid process moderately prominent



13. upper toothrows more or less parallel

14. occlusal surface of cheekteeth flat, consisting of transverse folds of enamel separating from each other to form islands in adults



dental formula:

$$\begin{array}{r} 1 \ 0 \ 1 \ 3 \\ \hline 1 \ 0 \ 1 \ 3 \end{array} = 20$$

1 gênero

2 espécies



© 2006 mongabay.com





SUBORDEM HYSTRICOMORPHA

Caviomorpha

Família Ctenomyidae

general characters:

1. body relatively small (15-35 cm), and gopher-like
2. pinna small
3. eyes small
4. tail short, well furred
5. pelage generally long and soft
6. limbs short
7. digits functionally 4-5, not webbed, with row of bristles extending beyond claw on each; claws on forefeet large, curved; stiff hairs extend from sides of hind feet
8. skull blocky with strong zygomatic arches
9. infraorbital canal very large, with distinct groove for nerve passage at inner base
10. lacrimal canal not opening on side of rostrum

1 gênero

60 espécies

- 11. auditory bulla relatively large
- 12. paroccipital process short, bound to bulla
- 13. jugal not approaching lacrimal
- 14. lower jaw without ridge or groove on lateral surface; angular process deflected; coronoid process prominent



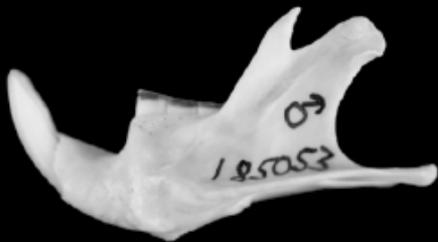
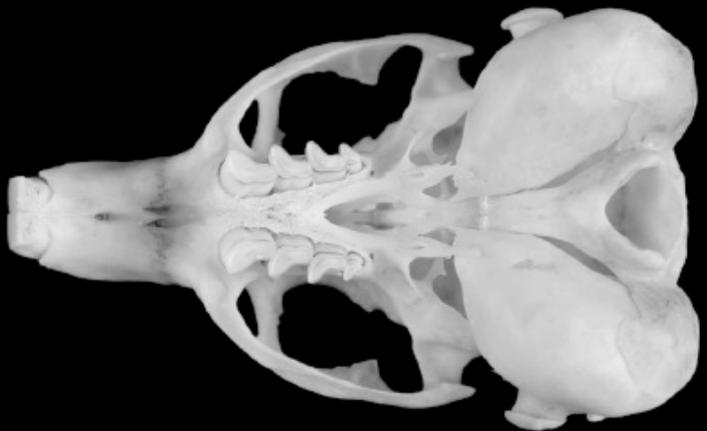
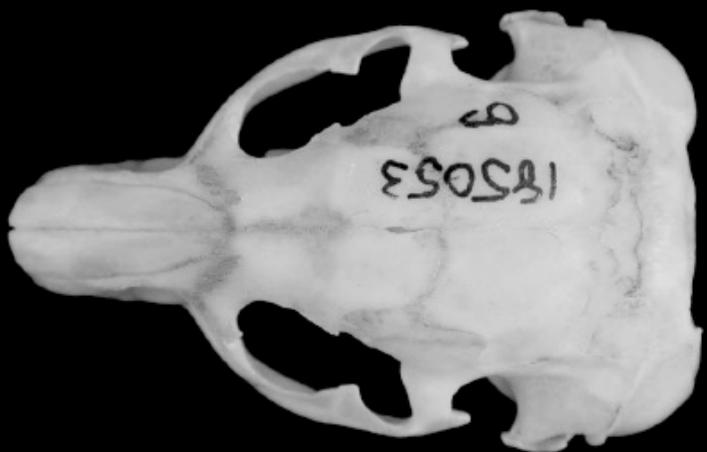
- 15. upper toothrows slightly convergent anteriorly
- 16. occlusal surface of cheekteeth simple, kidney-shaped



dental formula:

$$\frac{1 \ 0 \ 1 \ 3}{1 \ 0 \ 1 \ 3} = 20$$





SUBORDEM HYSTRICOMORPHA

Caviomorpha

Família Echimyidae

general characters:

1. body small to medium-sized, rat-like (15-80 cm)
2. pelage usually coarse or spiny
3. tail short (e.g., *Euryzomatomys*) to long (e.g., *Dactylomys*), sparsely to well haired
4. limbs moderately long
5. digits 4-5, not webbed; claws unspecialized in most, nail-like in bamboo rats (*Dactylomys*, *Kannabateomys*, *Olallamys*)
6. skull elongate, slightly to heavily ridged
7. infraorbital foramen very large, with or without distinct groove on floor for nerve passage
8. lacrimal canal not opening on side of rostrum
9. auditory bulla moderately large
10. paroccipital process elongate, curving under bulla

4 subfamílias (1 extinta)

21 gêneros (3 extintos)

~ 90 espécies (6 extintas)

11. jugal not approaching lacrimal
 12. lower jaw without ridge or groove on lateral surface; angular process slender and deflected; coronoid process relatively small (e.g., *Dactylomys*) to moderately large (e.g., *Proechimys*)

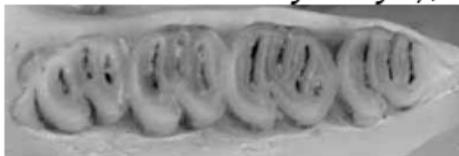


bamboo rat, *Dactylomys*

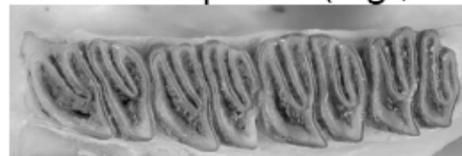


spiny rat, *Proechimys*

13. upper toothrows more or less parallel
 14. occlusal surface of cheekteeth flat, variable in pattern, having rounded enamel folds separating from each other to form islands with wear (e.g., *Proechimys*), sharply angular enamel folds forming prisms (e.g., *Dactylomys*), or transverse plates (e.g., *Makalata*)



spiny rat, *Proechimys*



bamboo rat, *Dactylomys*



tree rat, *Makalata*

dental formula:

$$\frac{1 \ 0 \ 1 \ 3}{1 \ 0 \ 1 \ 3} = 20$$



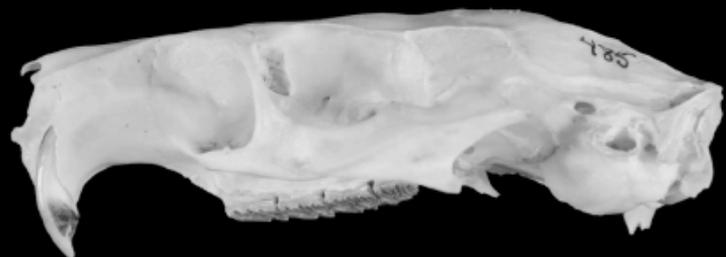
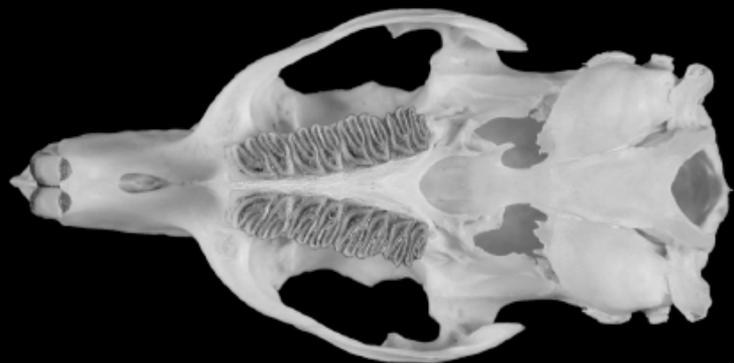
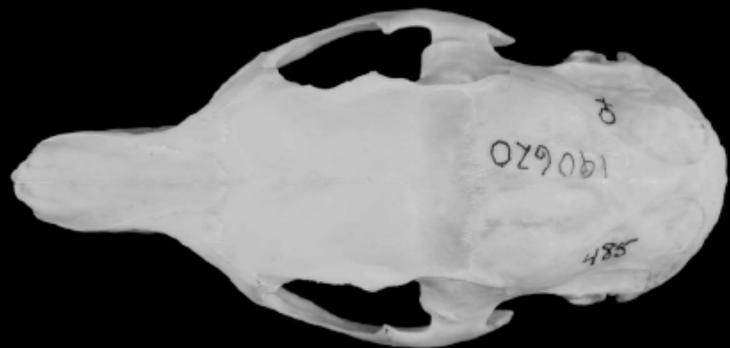
Family Muridae
Proechimys guairae
R.D. Lord
ASNM-MIL



Rodentia - Echimyidae
Mesomys hispidus
Ferreira's Spiny Tree-rat
T.B. Fernandes
ASNM-MIL



Copyright Smithsonian Institution, 1997



SUBORDEM HYSTRICOMORPHA

Caviomorpha

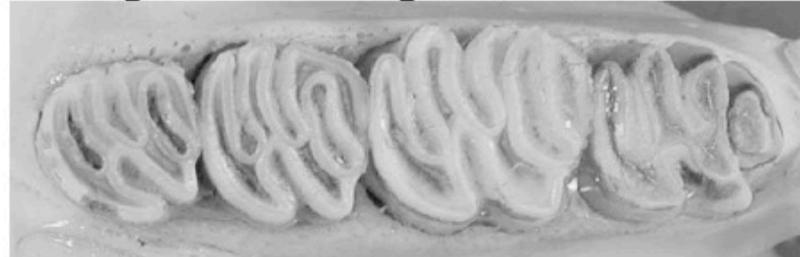
Família Echimyidae

Myocastor coypus

general characters:

1. moderate body size (43-65 cm; up to 10 kg in weight)
2. semi-aquatic, musk-rat like
3. pelage with dense, velvety underfur with long guard hairs
4. tail long, nearly naked, and cylindrical, not laterally compressed
5. hind feet webbed, with 5 digits, hallux is free but remaining four toes are connected by skin
6. fore feet with vestigial pollex and four long, unwebbed digits
7. claws sharp and strong
8. skull rectangular in shape, with broad and long rostrum, square supraorbital region, and well-developed lambdoidal ridge
9. infraorbital foramen very large, without distinct groove for nerve passage
10. lacrimal canal not opening on side of rostrum
11. auditory bulla medium in size
12. paroccipital process relatively long, well separated from bulla
13. lower jaw without ridge or groove on lateral surface; angular process strongly deflected; coronoid process very small
14. upper toothrows strongly convergent anteriorly

15. occlusal surface of cheekteeth flat, with one lingual and three labial deep enamel folds, forming islands with age



dental formula:

$$\begin{array}{r} 1 \ 0 \ 1 \ 3 \\ \hline 1 \ 0 \ 1 \ 3 \end{array} = 20$$

1 gênero

1 espécie

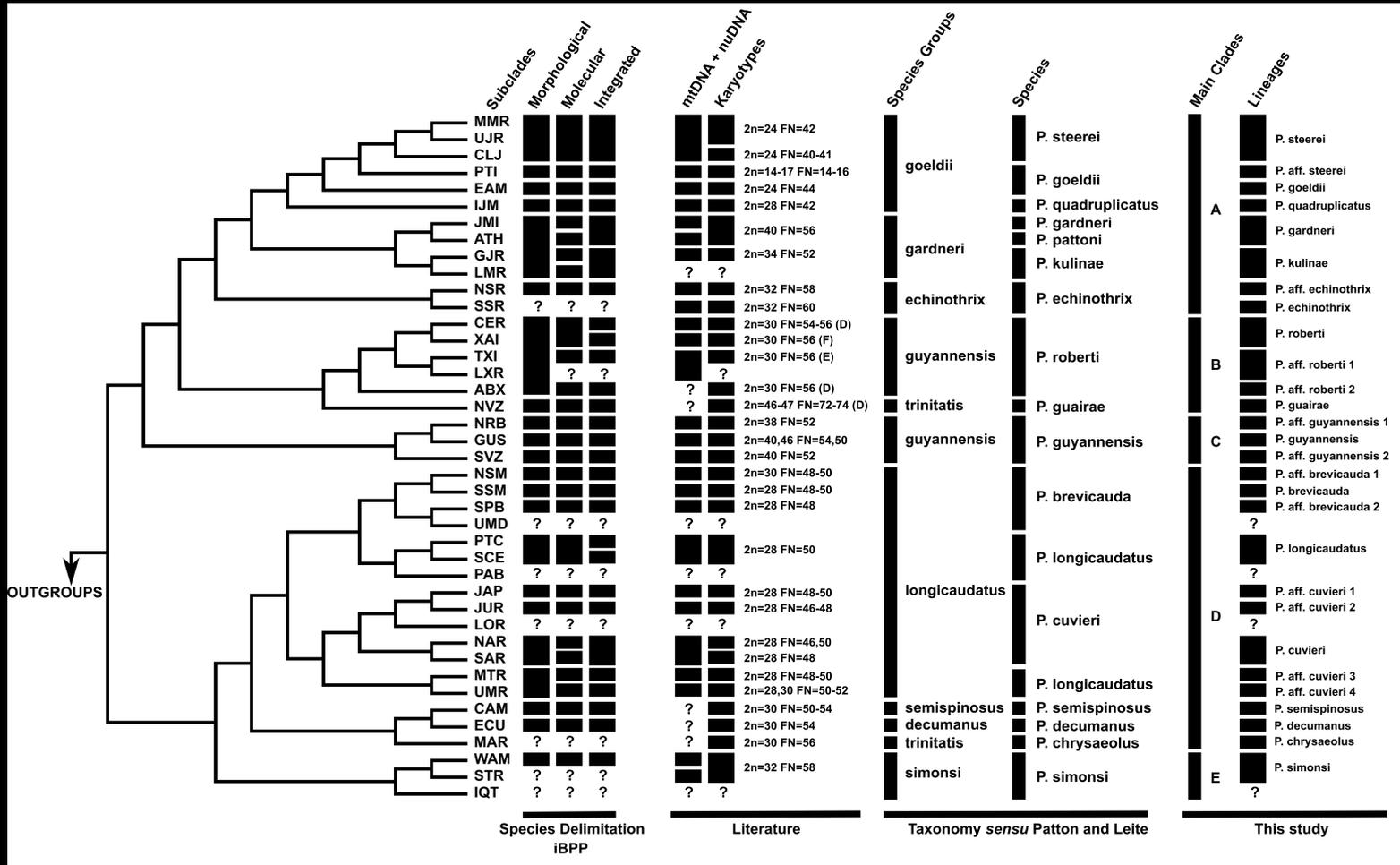






Revisões: gênero *Proechimys*

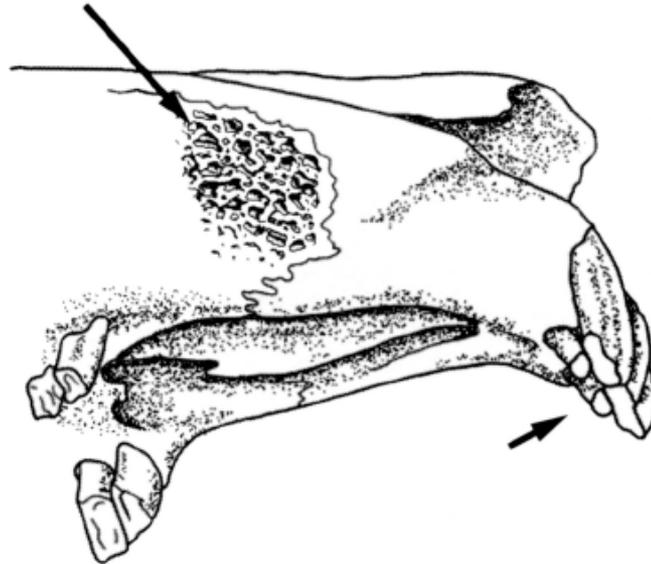
Jeronymo Dalapicolla



ORDEM LAGOMORPHA

diagnostic characters:

1. two pairs of upper incisors, the second pair small and peg-like and located directly behind the enlarged anterior pair
2. fenestrated maxilla



note peg-like 2nd incisors located behind the enlarged anterior pair (right arrow) and the fenestration of the lateral side of the rostrum (upper left arrow)

additional characters:

1. size small to medium
2. foot posture digitigrade
3. tail indistinct or small
4. soles of feet largely or entirely covered with fur
5. incisors and cheekteeth separated by large diastema
6. testes anterior to penis during breeding season

3 famílias

13 gêneros

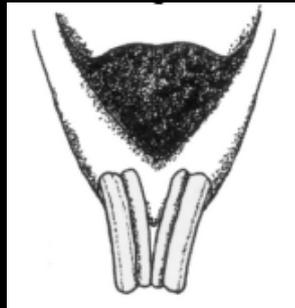
92 espécies

ORDEM LAGOMORPHA

Família Leporidae

general characters:

1. pinna long, pointed
2. tail short but distinct
3. hindlimbs longer than forelimbs, modified for hopping or running
4. digits 4-4, but first digit reduced on forefoot and hindfoot
5. pads on digits present but covered with hair
6. supraorbital process present, fan-shaped (often fused to varying degrees with frontal bones)
7. maxilla with numerous perforations
8. nasal widest posteriorly
9. jugal contained wholly within zygomatic arch
10. cutting edge of first upper incisor straight

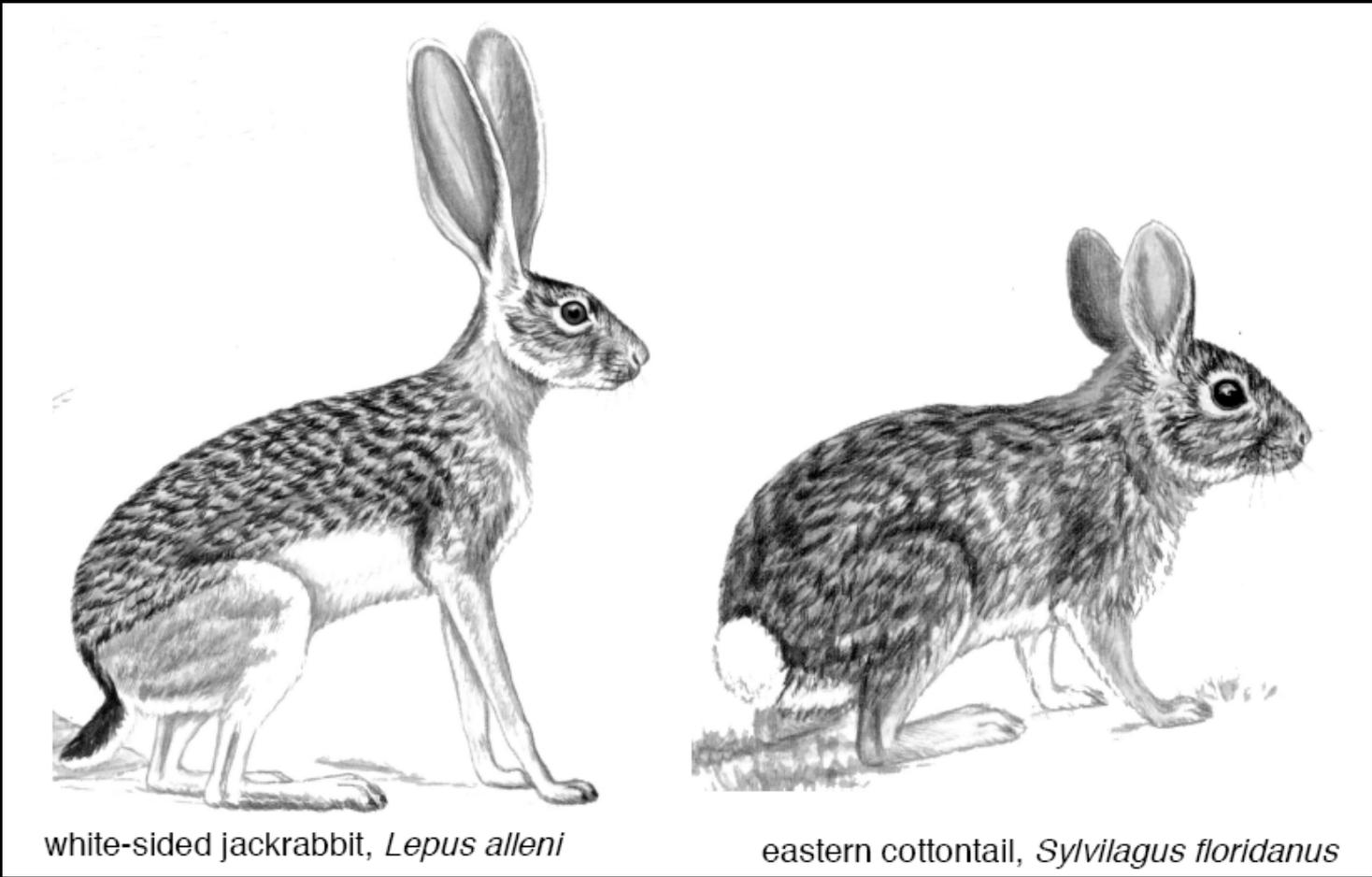
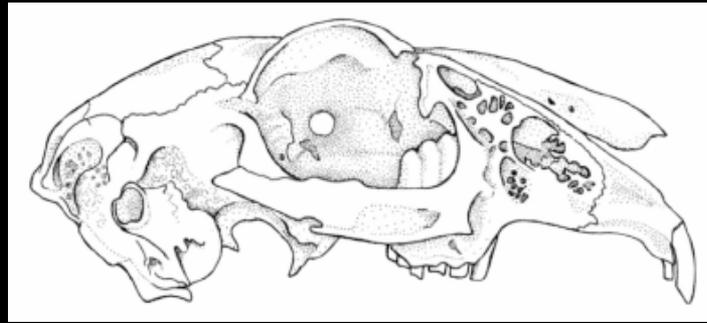
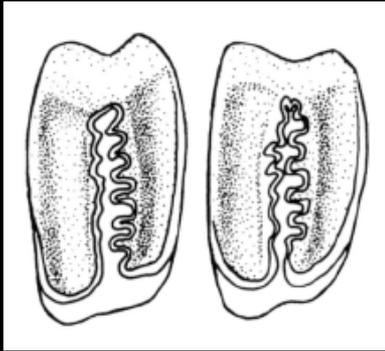


dental formula:

$$\frac{2 \ 0 \ 3 \ 2-3}{1 \ 0 \ 2 \ 3} = 26-28$$

11 gêneros

61 espécies



white-sided jackrabbit, *Lepus alleni*

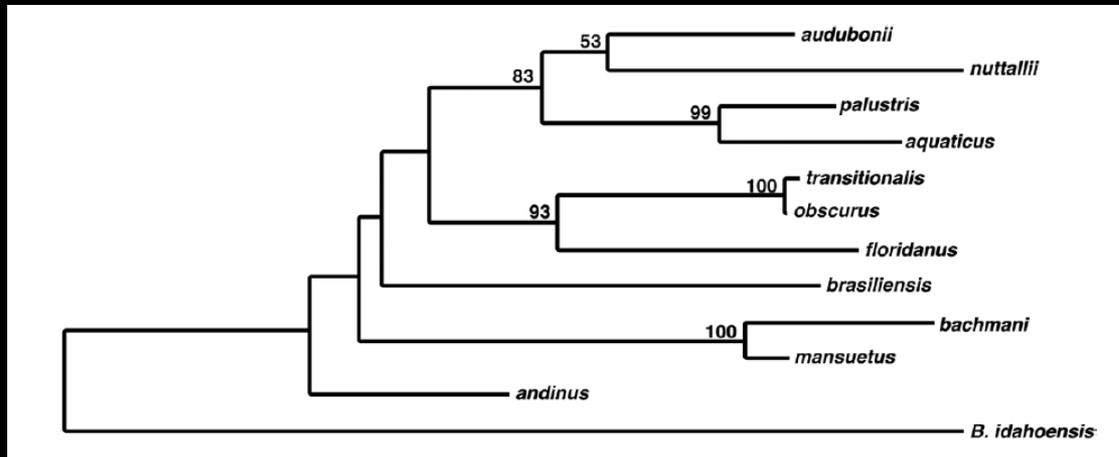
eastern cottontail, *Sylvilagus floridanus*

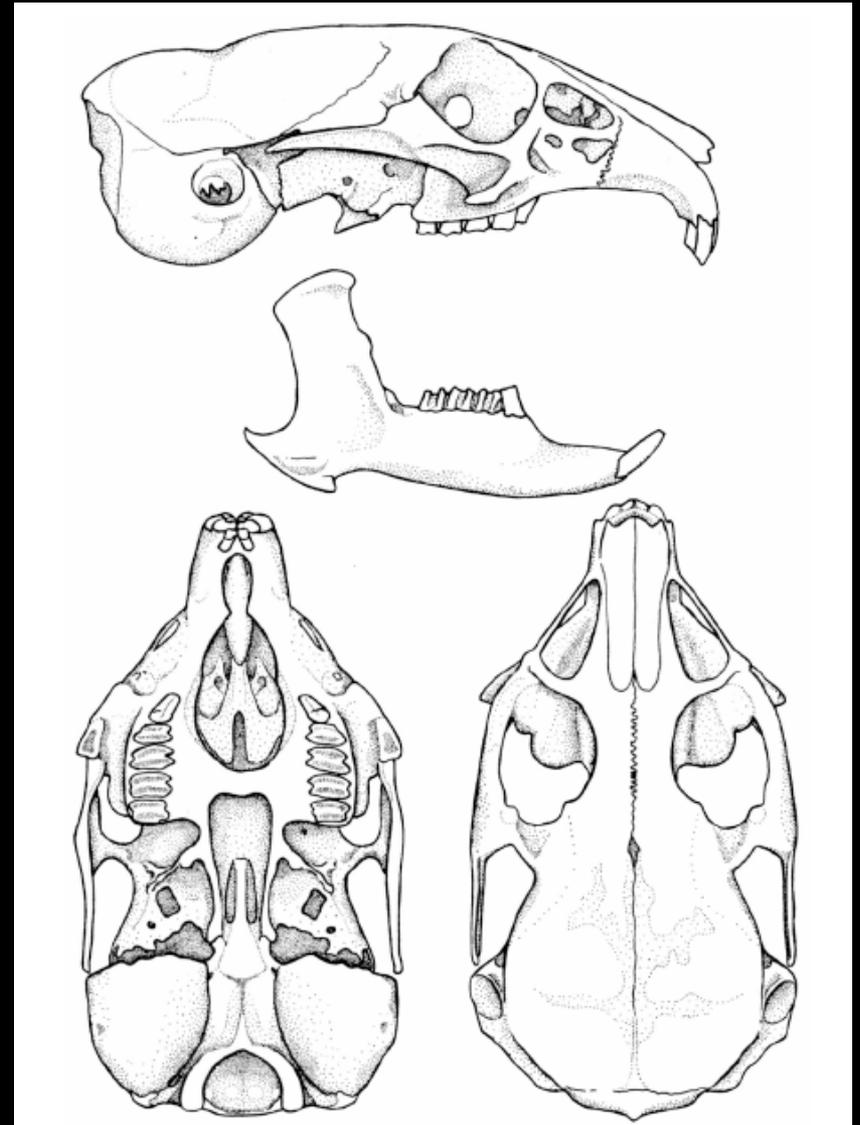
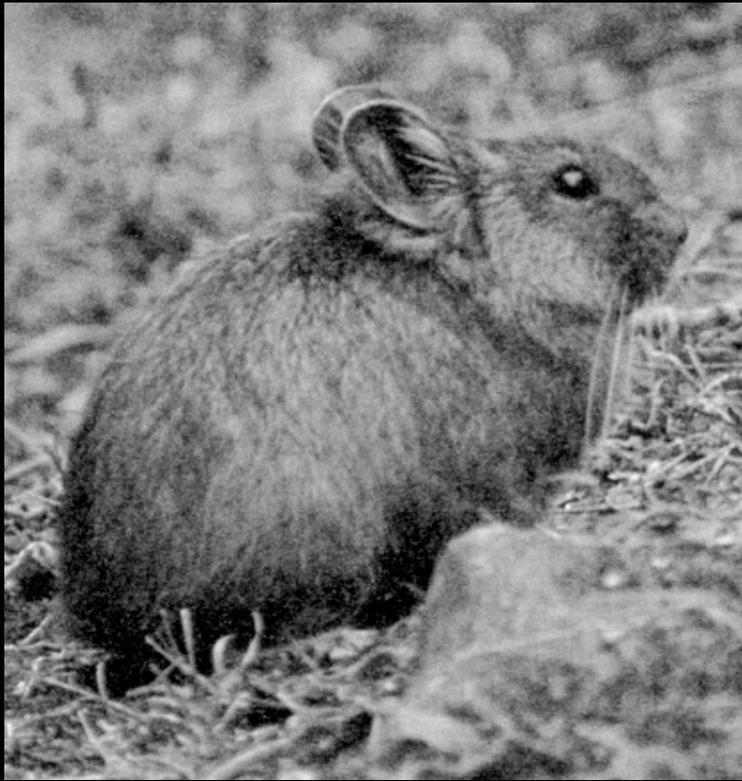




Taxonomy of the *Sylvilagus brasiliensis* complex in Central and South America (Lagomorpha: Leporidae)

Luis A. Ruedas,* Sofia Marques Silva, Johnnie H. French, Roy Nelson Platt II, Jorge Salazar-Bravo, José M. Mora, AND Cody W. Thompson





ORDEM CHIROPTERA

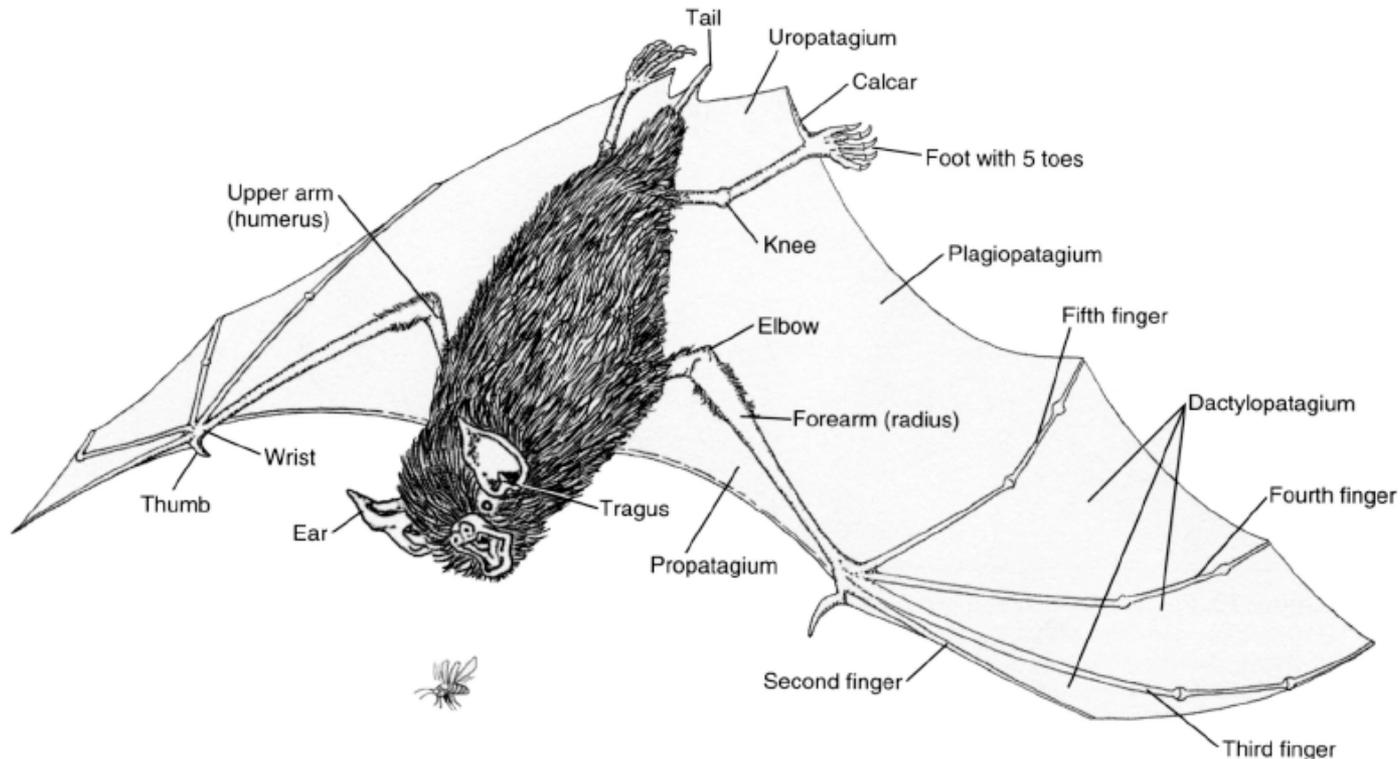
18 famílias

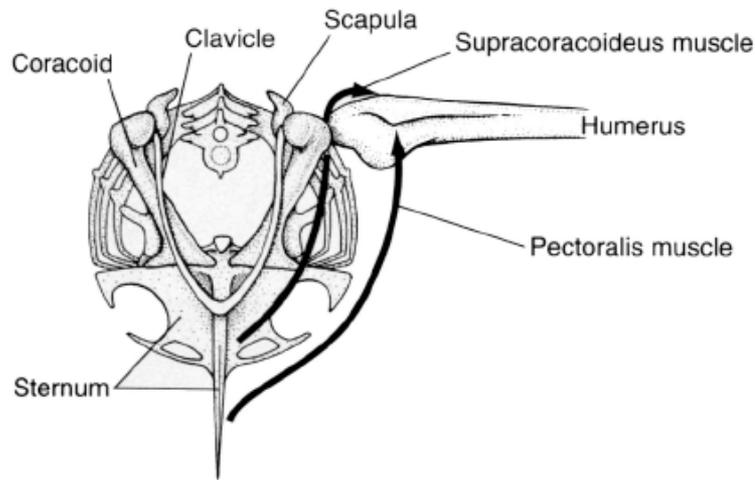
202 gêneros

1116 espécies

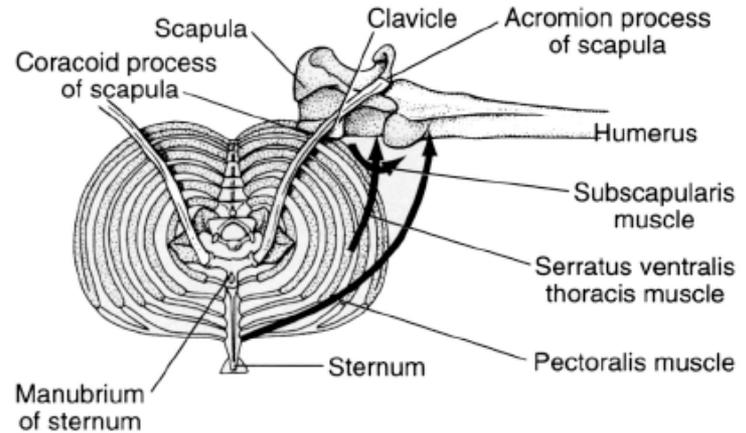
Caracteres Diagnósticos

forelimb modified for flight, with digits elongate and joined together by a membrane extending to side of body and hindlimb



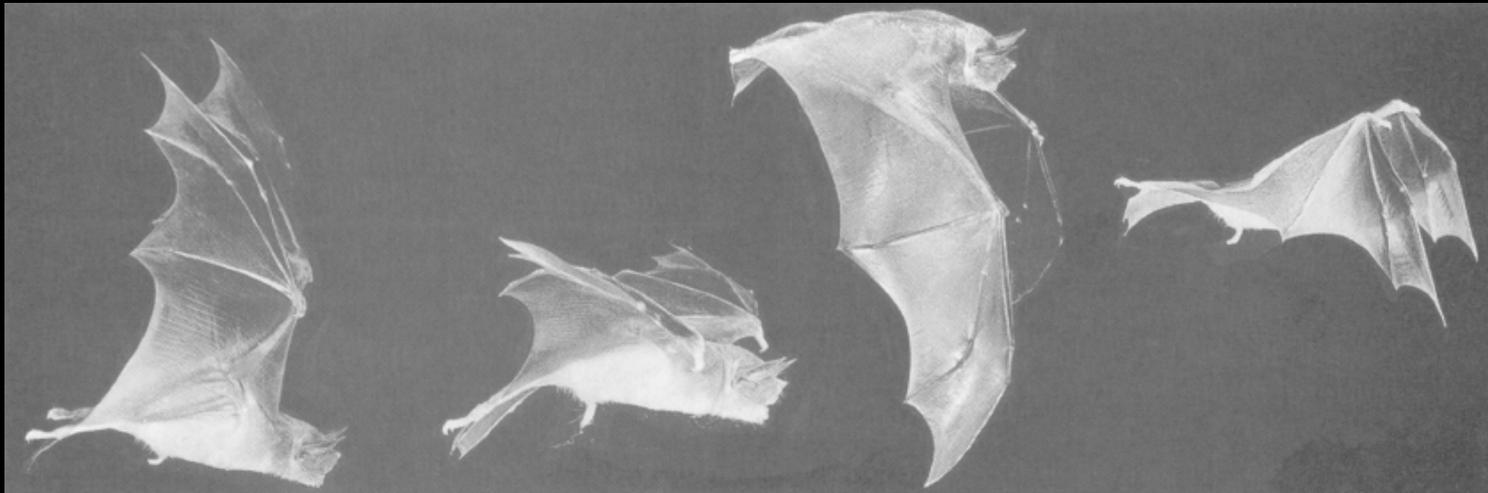


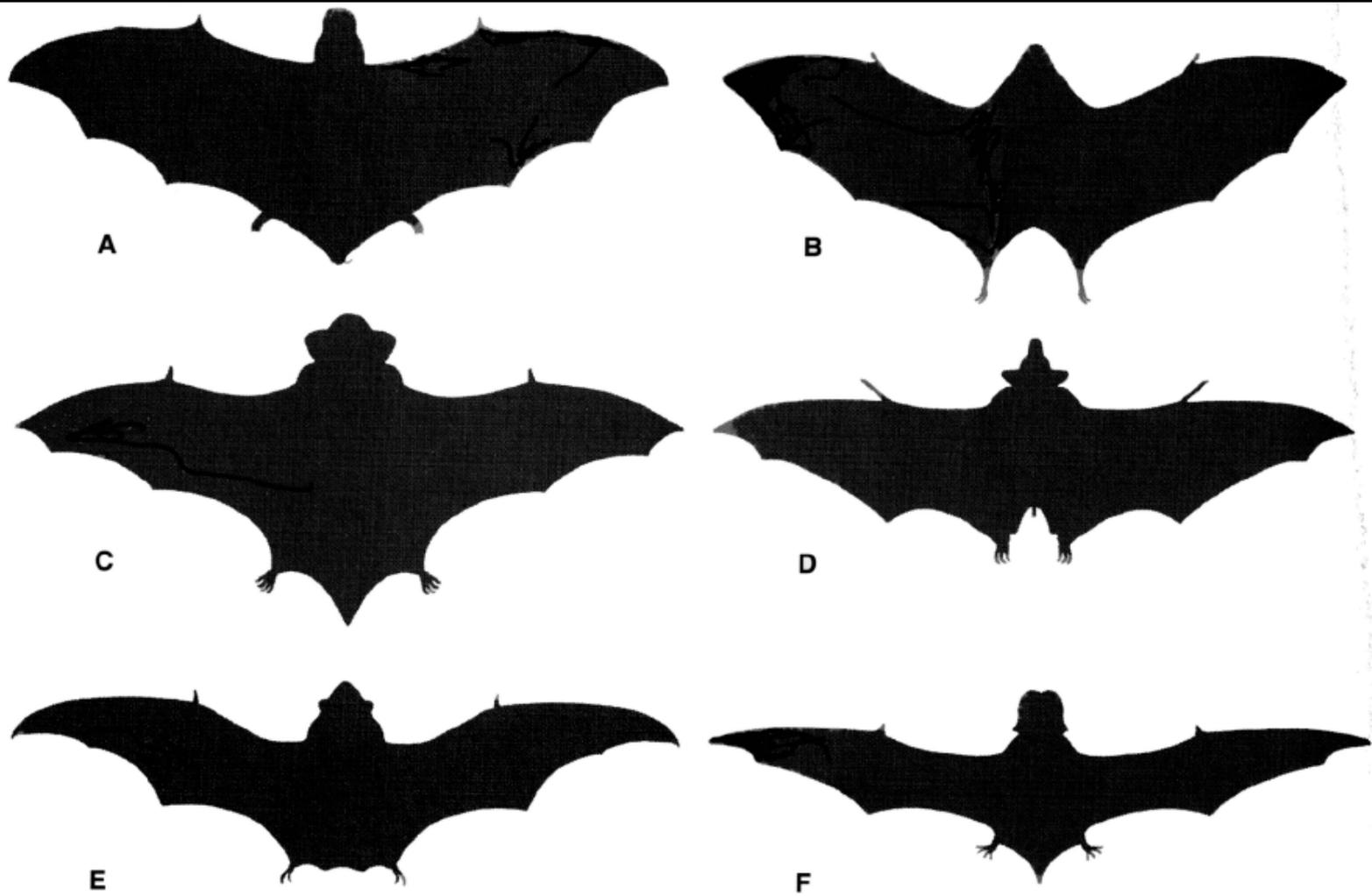
Bird



Bat

anterior views of the thorax and part of the left forelimb of a bird (left) and a bat (right), with some of the major muscles controlling the wing-beat cycle shown diagrammatically. Two muscles (supracoracoideus and pectoralis) power the downstroke in birds, but three (subscapularis, serratus ventralis thoracis, and pectoralis) do so in bats.





Variation in aspect ratio of wings (wingspan² divided by wing area, approximated by length divided by depth): Short, deep wings (low aspect ratio) occur in species with slow, highly maneuverable flight that glean insects in obstructed habitats (have low stalling speeds). Long, narrow wings (high aspect ratio) occur in bats that are rapid fliers, which are also less maneuverable (have high stalling speeds) and that fly in open areas, often well above the canopy. A – *Nycteris* (Nycteridae); B – *Cardioderma* (Megadermatidae); C – *Mimetillus* (Vespertilionidae); D – *Eidolon* (Pteropodidae), E – *Saccolaimus* (Emballonuridae); and F – *Mops* (Molossidae)

other characters

1. ulna reduced and non-functional; radius relatively large
2. sternum usually keeled
3. clavicle present
4. glenoid fossa of scapula directed dorsally
5. bones light, tubular
6. cervical and thoracic vertebrae without neural spines
7. cranium domed, often inflated in region of braincase and concave in frontal region
8. cheekteeth variable, but usually tritubercular
9. incisors relatively small
10. knee directed posteriorly owing to rotation of hindlimb for support of wing and tail membrane
11. rhinarium and lips often with fleshy appendages (nose-leaves, etc.)



simple muzzle
(Vespertilionidae)



ridged muzzle
(Molossidae)



chin leaf
(Mormoopidae)

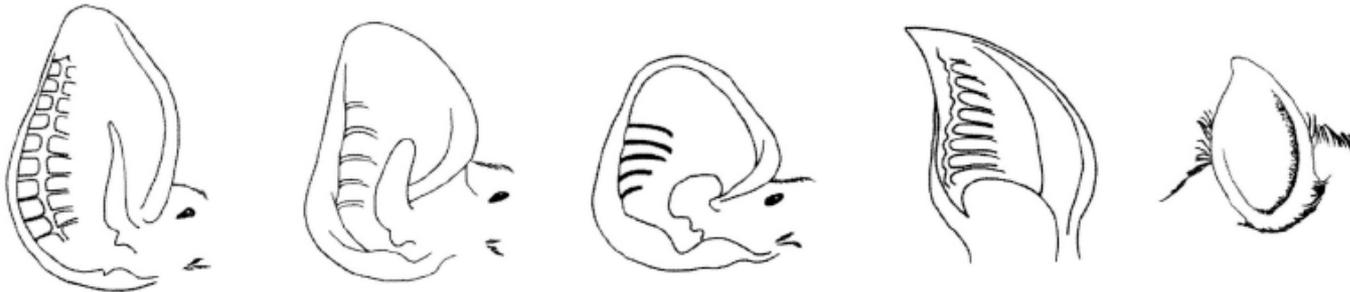


nose leaf
(Rhinolophidae)



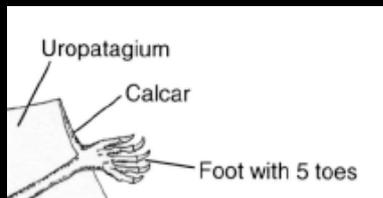
nose leaf
(Phyllostomidae)

12. tragus of ear usually well developed

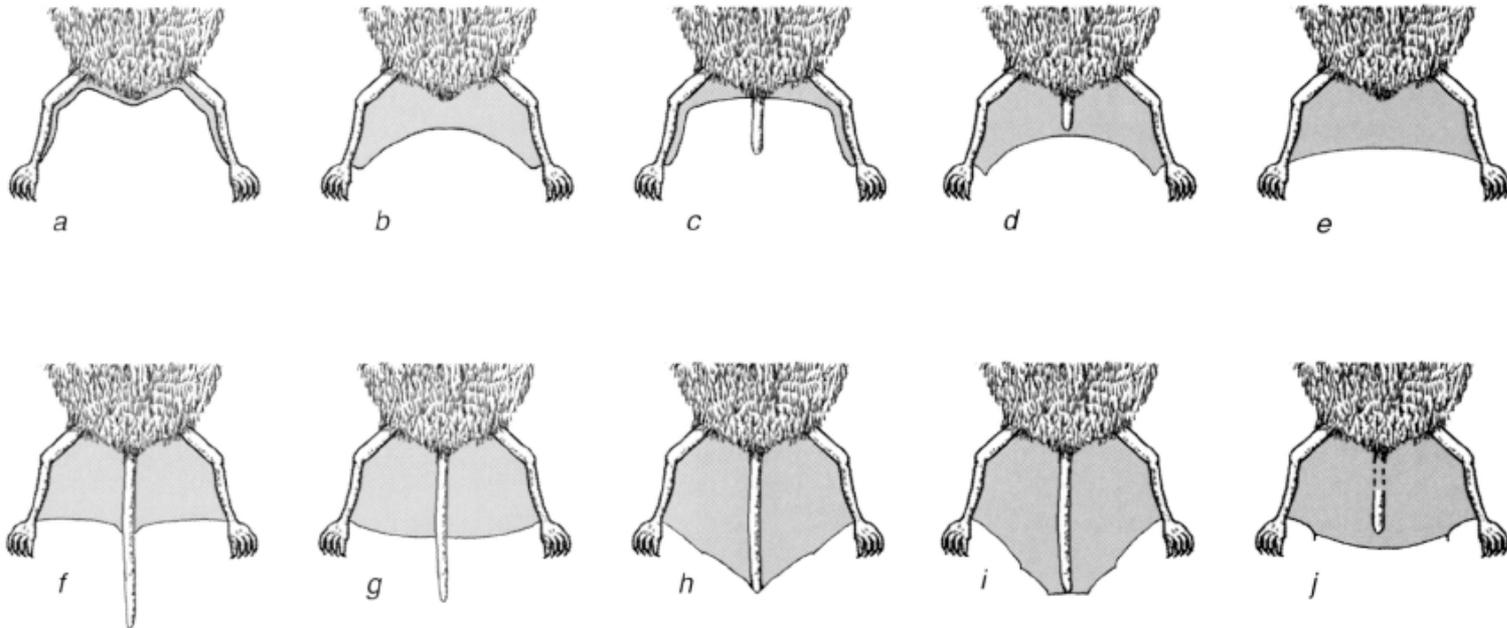


tragus present (1st, 2nd, and 3rd, from left – all Vespertilionidae), antitragus present (2nd from right – Rhinolophidae), inner ear margin continuous, without tragus or antitragus (extreme right – Pteropodidae)

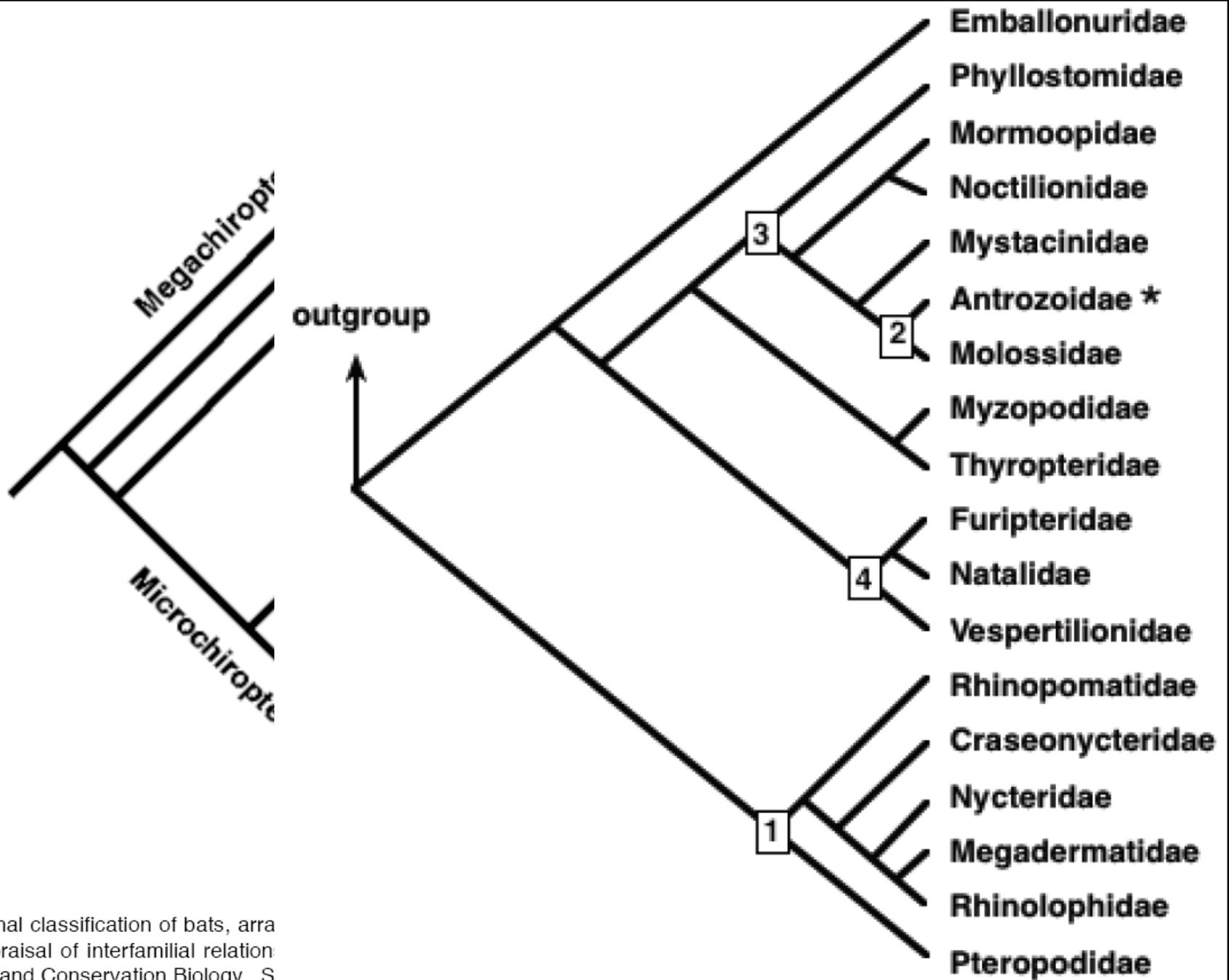
13. cartilaginous rod (calcar) arising from inner side of ankle joint, supporting tail (interfemoral) membrane (=uropatagium) – occasionally absent



14. tail membrane (uropatagium) usually present



variation in uropatagium and tail: A – lack of tail and membrane (some Pteropodidae and Phyllostomidae); B – narrow membrane but no tail (some Phyllostomidae); C – very narrow membrane and short, free tail (tube-nosed bats, Pteropodidae); D – narrow membrane with tail contained within membrane (some Phyllostomidae); E – extensive membrane but no tail (Crasseonycteridae); F – large membrane with long, thin tail free of membrane (mouse-tailed bats, Rhinopomatidae); G – large membrane with about one-half of tail extending freely beyond edge (free-tailed bats, Molossidae); H – extensive membrane with tail contained within and extending to edge (Vespertilionidae, Rhinolophidae, and Megadermatidae); I – extensive membrane and long tail, distinctive “T”-shaped distal edge (Nycteridae); J – extensive membrane with short tail extending through dorsal surface (Emballonuridae, Noctilionidae, Mormoopidae).



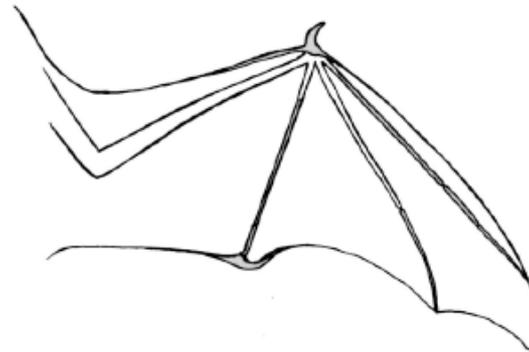
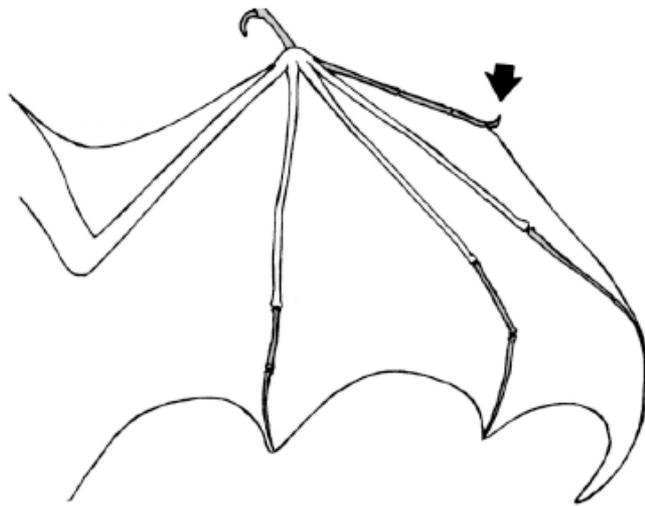
Traditional classification of bats, arranged according to a reappraisal of interfamilial relationships. *Biology and Conservation Biology*. S

ORDEM CHIROPTERA

Subordem Megachiroptera

diagnostic characters:

1. pinna simple, completely surrounding ear opening
2. no tragus or antitragus present
3. eyes well developed
4. 2nd digit of forelimb relatively free of 3rd digit and usually with claw



dental formula:

$$\begin{array}{r} 1-2 \quad 1 \quad 3 \quad 1-2 \\ \hline 0-2 \quad 1 \quad 3 \quad 2-3 \quad = 24-34 \end{array}$$

megachiropteran wing on left (arrow points to clawed 2nd digit); microchiropteran wing on right

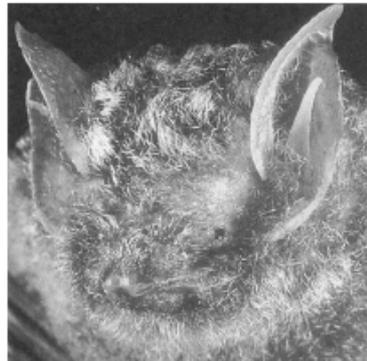
5. humerus with small trochiter (greater tuberosity) and trochin (lesser tuberosity) that do not articulate with scapula
6. postorbital process large, forming a complete postorbital bar in some taxa
7. angular process of lower jaw absent or broad and low

ORDEM CHIROPTERA

Subordem Microchiroptera

diagnostic characters:

1. pinna often complicated, not completely surrounding ear opening
2. tragus usually present; antitragus sometimes present
3. eyes small, appearing poorly developed



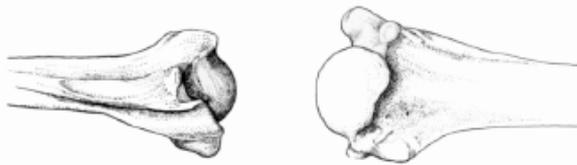
grooved-tooth bat, *Kerivoula*
(Vespertilionidae)



Old World leaf-nosed bat,
Rhinolophus (Rhinolophidae)

4. 2nd digit of forelimb fully enclosed in wing membrane, without claw

5. humerus with trochiter (greater tuberosity) and trochin (lesser tuberosity) large, often articulating with scapula



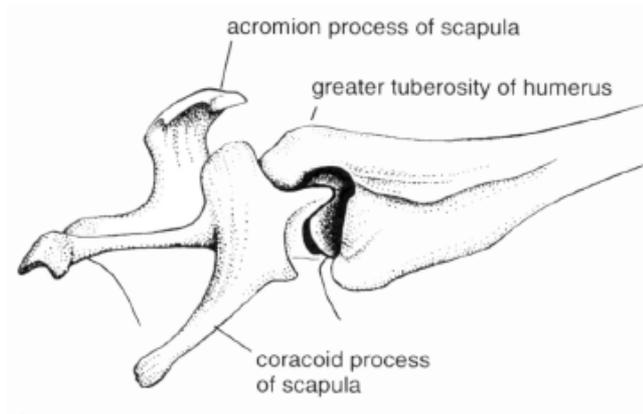
Pteropus (Pteropodidae)

proximal end of the humerus of a
megachiropteran bat



Molossus (Molossidae)

proximal end of the humerus of a
microchiropteran bat



6. postorbital processes usually absent (present in Emballonuridae, Megadermatidae, and Nycteridae)
7. angular process of lower jaw well developed

ORDEM CHIROPTERA

Subordem Microchiroptera

Família Emballonuridae

general characters:

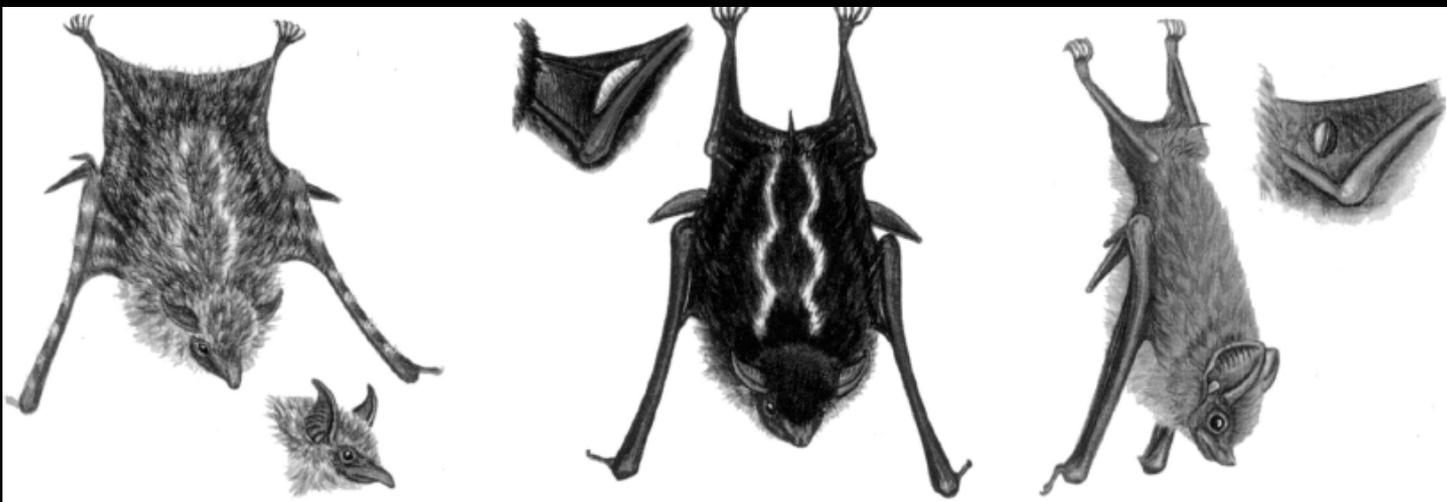
1. glandular sac present in wing membrane anterior to elbow joint in most genera (absent in all other microchiropterans)
2. size small to medium (forearm 35-66 mm)
3. muzzle smooth, no special skin outgrowths on face
4. pinnae moderately large, rounded, often united at bases, without ventral extension under eye
5. tragus present, small
6. 2nd digit of forelimb absent (a well-developed metacarpal remains); 3rd digit with two phalanges
7. thumb relatively large
8. hindlimb and hindfoot slender, with relatively large claws
9. tail emerging from dorsal surface of large uropatagium
10. humerus with trochiter smaller than trochin, not articulating with scapula
11. premaxillae small, separated, not fused to surrounding bones; only nasal branches present
12. postorbital process present, prominent but long and thin
13. cheekteeth tritubercular

dental formula:

$$\begin{array}{cccc} 1-2 & 1 & 2 & 3 \\ \hline 2-3 & 1 & 2 & 3 \end{array} = 30-34$$

13 gêneros (8)

51 espécies (21)

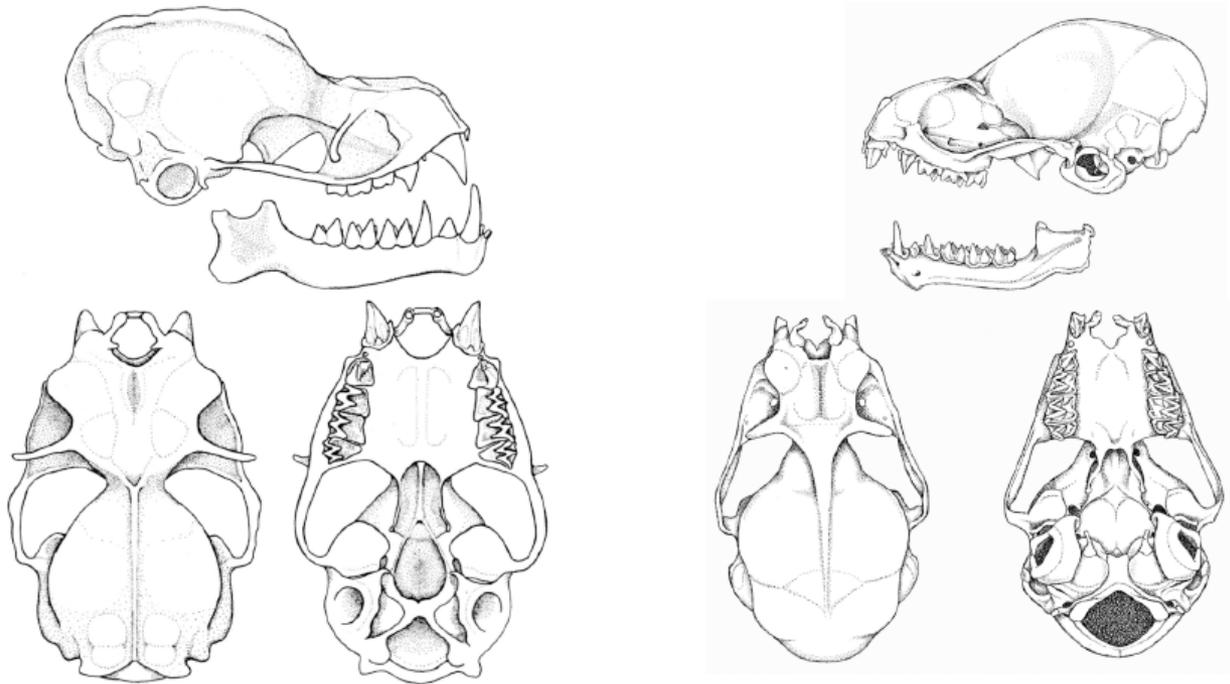


Rhynchonycteris
(proboscis bat)

Saccopteryx
(white-lined bats)

Balantiopteryx
(gray sac-winged bat)

[note sacs in wing (along forearm in *Saccopteryx*) and near upper arm in *Balantiopteryx*]



Peropteryx (dog-like bats)

Saccopteryx (sac-winged bats)

ORDEM CHIROPTERA

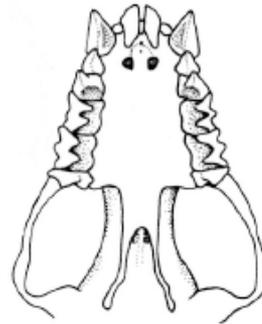
Subordem Microchiroptera

Família Phyllostomidae

general characters:

1. size variable, small to relatively large (forearm 25 - 110 mm)
2. conspicuous erect nose-leaf present on muzzle (rudimentary in a few genera)
3. pinnae small to large, variable in form, usually separate, without ventral extension under eye
4. tragus present, small
5. no disc on wrist or ankle
6. 2nd digit of forelimb with one small bony phalanx; 3rd digit with three
7. thumb relatively large
8. hindlimbs and hindfoot slender, with relatively large claws
9. calcar absent, small, or well developed (in different subfamilies)
10. tail variable; if present, may be shorter, longer, or equal in length to uropatagium
11. humerus with trochiter smaller than trochin, articulating with scapula

12. premaxillae with nasal and palatal branches, fused to each other and to maxillae



13. no postorbital process

14. cheekteeth variable, simple crushing type to tritubercular

dental formula:

$$\frac{2 \quad 1 \quad 2-3 \quad 2-3}{0-2 \quad 1 \quad 2-3 \quad 2-3} = 26-34$$

8 subfamílias

55 gêneros

160 espécies

ORDEM CHIROPTERA

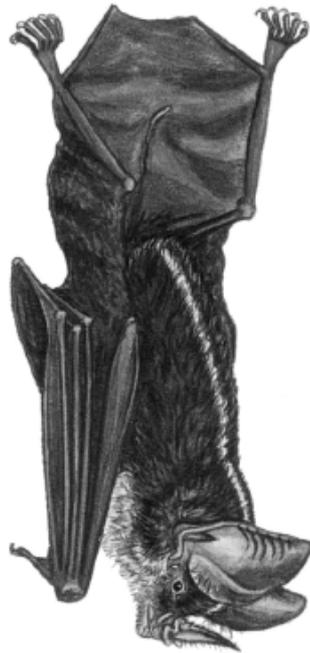
Subordem Microchiroptera

Família Phyllostomidae

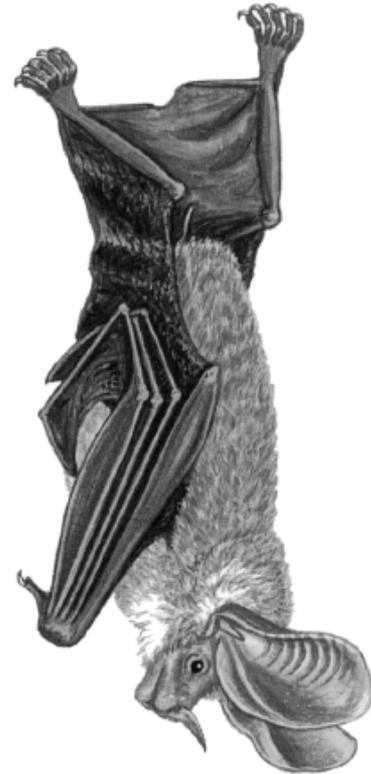
Subfamília Phyllostominae



little big-eared bat,
Micronycteris



hairy-nosed bat, *Mimon*



fringe-lipped bat, *Trachops*

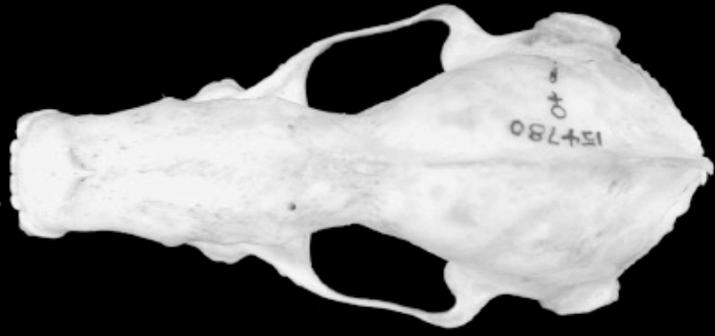


greater spear-nosed bat,
Phyllostomus



false vampire bat, *Vampyrum*





ORDEM CHIROPTERA

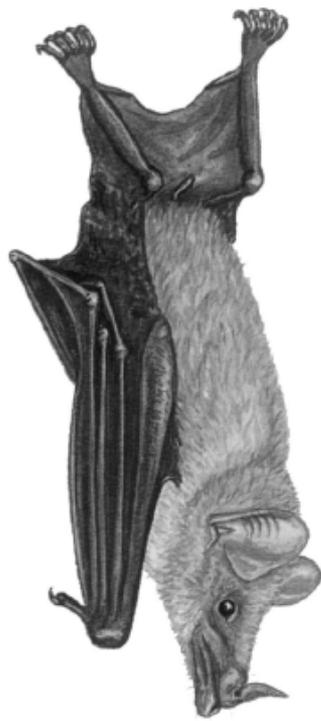
Subordem Microchiroptera

Família Phyllostomidae

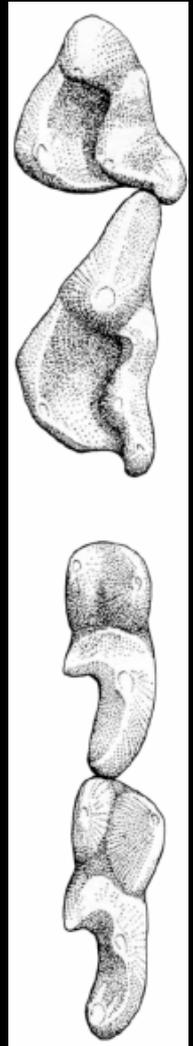
Subfamília Glossophaginae



hairy-legged long-tongued bat, *Anoura*



spear-nosed long-tongued bat, *Lonchophylla*



ORDEM CHIROPTERA

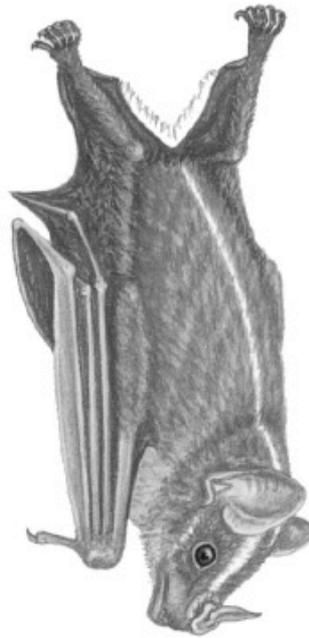
Subordem Microchiroptera

Família Phyllostomidae

Subfamília Stenodermatinae



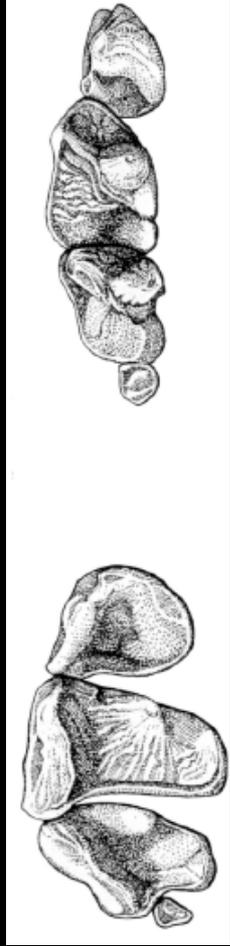
large fruit bat, *Artibeus*



white-lined fruit bats,
Platyrrhinus



hairy-legged fruit bats, *Sturnira*

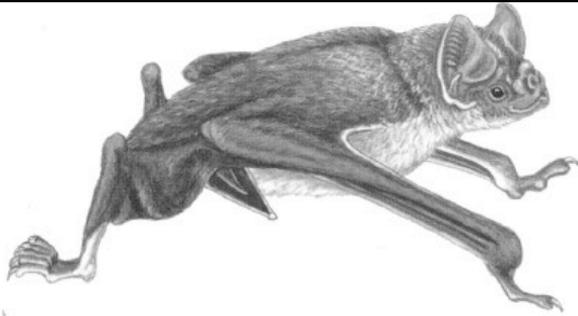


ORDEM CHIROPTERA

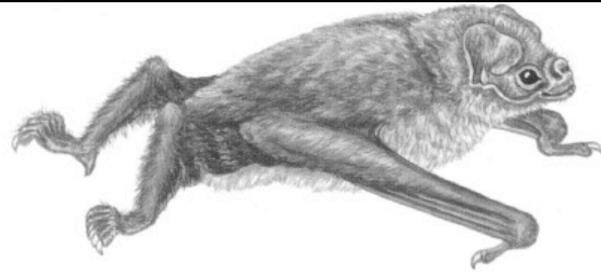
Subordem Microchiroptera

Família Phyllostomidae

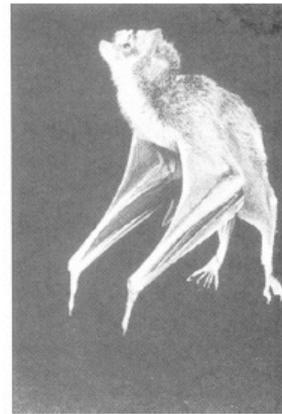
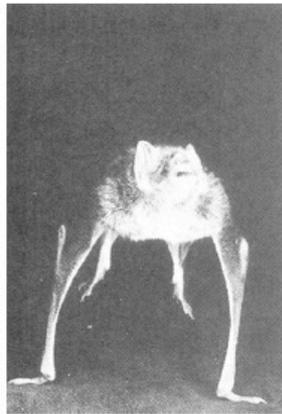
Subfamília Desmodontinae



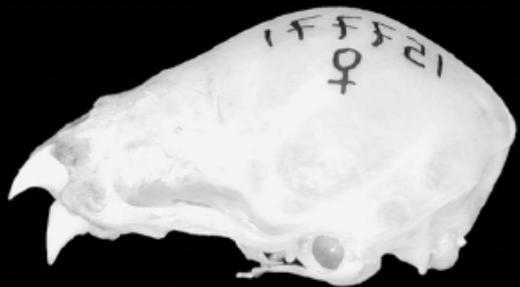
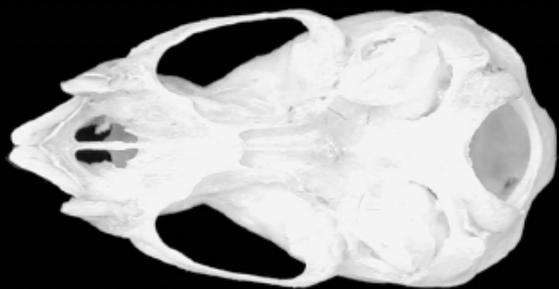
common vampire, *Desmodus*



hairy-legged vampire, *Diphylla*



quadrupedal locomotion in the common vampire, *Desmodus*
[note use of the long, robust thumbs]



ORDEM CHIROPTERA

Subordem Microchiroptera

Família Mormoopidae

general characters:

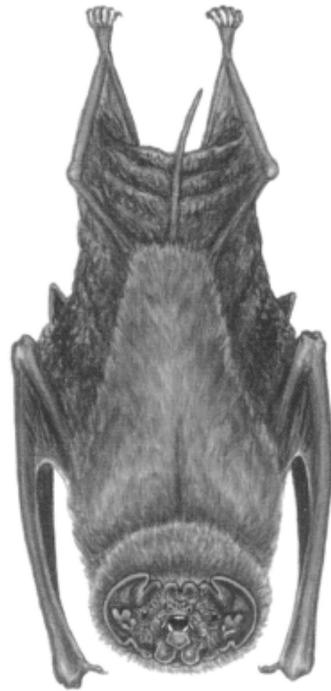
1. size small to medium (forearm 37-63 mm)
2. nose-leaf on muzzle rudimentary
3. conspicuous flap of skin on chin
4. tragus present, with secondary flap of skin on leading edge
5. pinnae large, often united at bases, with ventral extension under eye
6. no disc on wrist or ankle
7. 2nd digit of forelimb with one small bony phalanx; 3rd digit with three
8. thumb relatively large
9. hindlimb and hindfoot slender, with relatively large claws
10. calcar present, well developed
11. tail short, protruding from dorsal surface of large uroptagium
12. trochiter much smaller than trochin, not articulating with scapula
13. premaxillae with nasal and palatal branches, fused to each other and to maxillae
14. no postorbital process
15. cheekteeth tritubercular

dental formula:

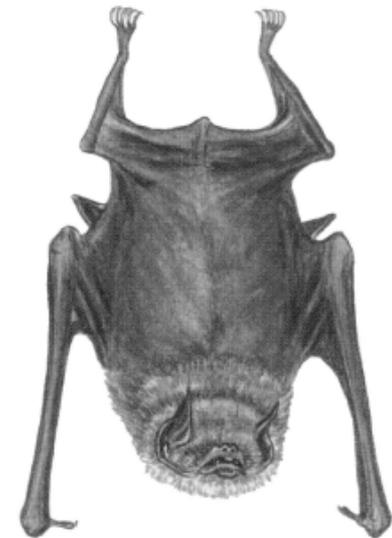
$$\begin{array}{cccc} 2 & 1 & 2 & 3 \\ \hline 2 & 1 & 3 & 3 \end{array} = 34$$

2 gêneros

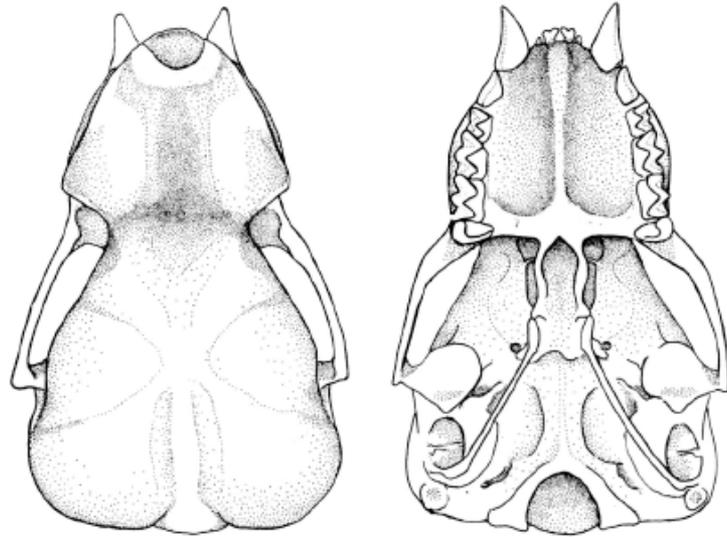
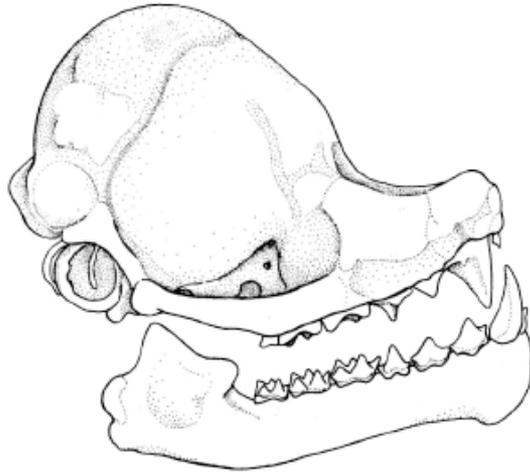
10 espécies



ghost-faced bat, *Mormoops*



naked-backed bat, *Pteronotus davyi*

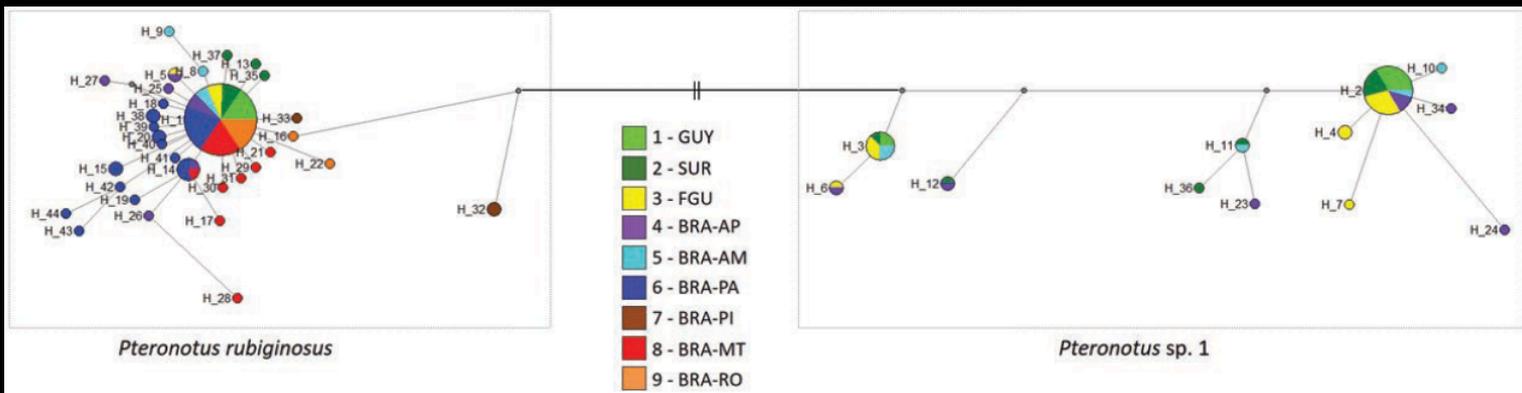
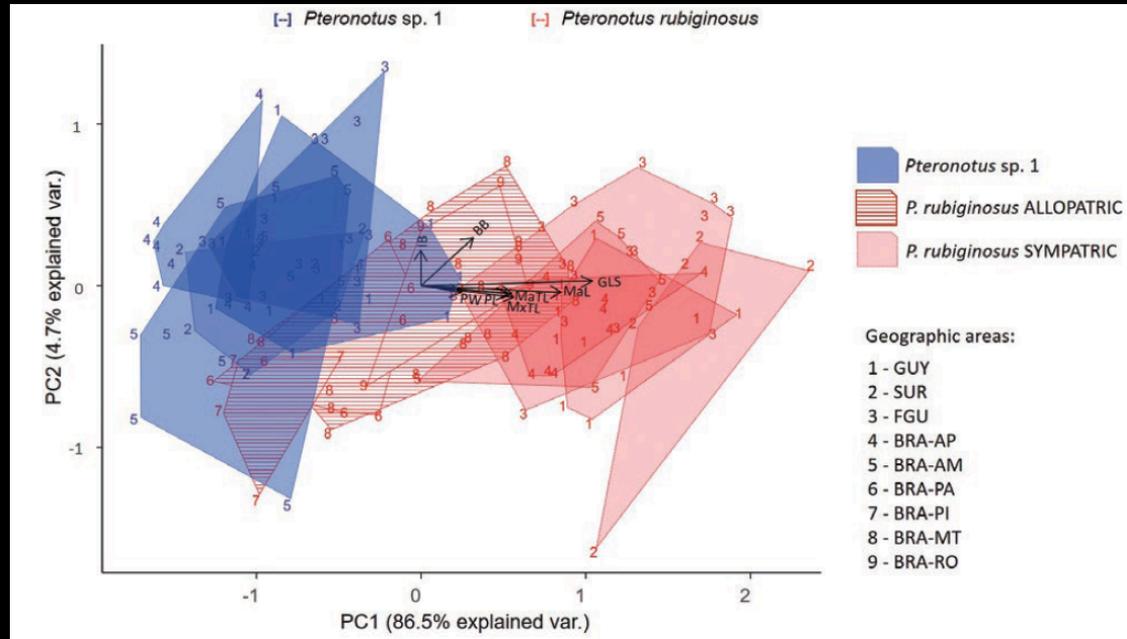
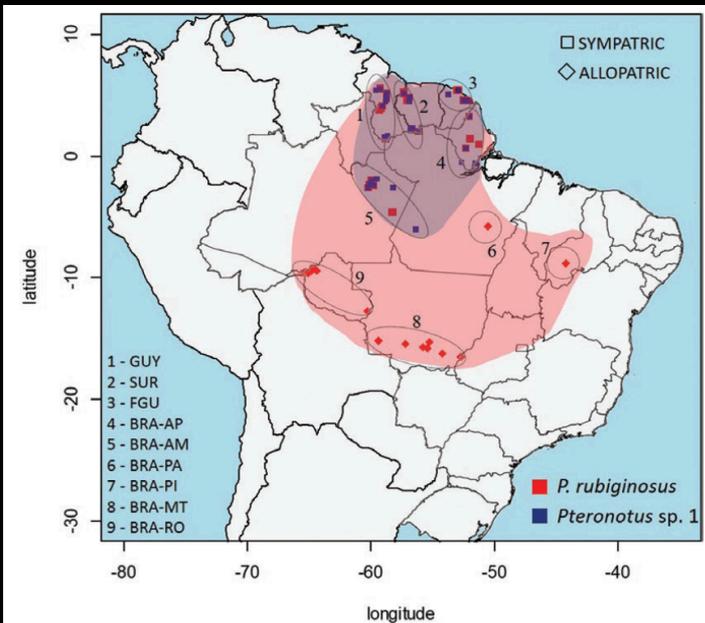


ghost-faced bat, *Mormoops megalophylla*



Geographic variation in a South American clade of mormoopid bats, *Pteronotus* (*Phyllodia*), with description of a new species

ANA C. PAVAN,* PAULO E. D. BOBROWIEC, AND ALEXANDRE R. PERCEQUILLO



ORDEM CHIROPTERA

Subordem Microchiroptera

Família Noctilionidae

general characters:

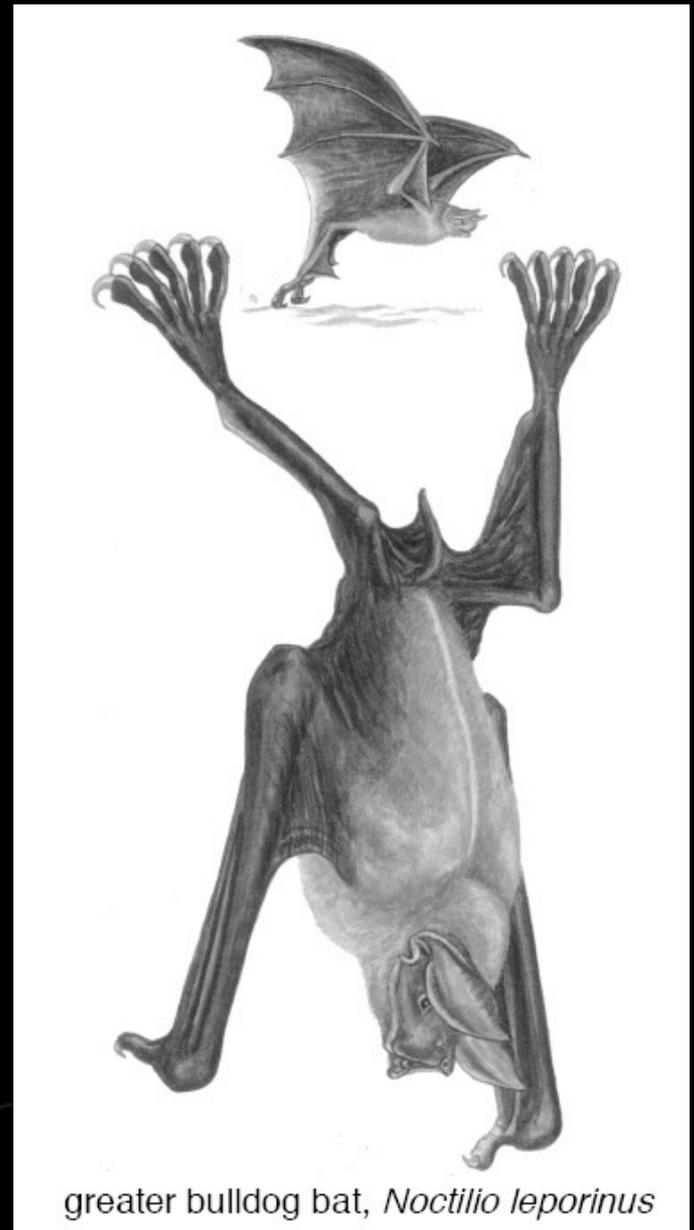
1. size medium (forearm 55-90 mm)
2. muzzle pointed, plain (no skin out-growths)
3. lips thick, folded, with median cleft, and forming distinct cheek pouches
4. pinnae large, pointed, separate, without ventral extension under eye
5. tragus present, small
6. no disc on wrist or ankle
7. 2nd digit of forelimb with one vestigial bony phalanx; 3rd digit with two
8. thumb large
9. hindlimb large; hindfoot with large, strongly curved claws
10. calcar present, well developed
11. tail extending to middle of large uropatagium
12. humerus with trochiter much smaller than trochin, only slightly articulating with scapula
13. premaxillae with palatal and nasal branches, fused to each other and to maxillae
14. no postorbital process
15. cheekteeth tritubercular

dental formula:

$$\begin{array}{r} 2 \ 1 \ 1 \ 3 \\ \hline 1 \ 1 \ 2 \ 3 \end{array} = 28$$

1 gênero

2 espécies





ORDEM CHIROPTERA

Subordem Microchiroptera

Família Molossidae

general characters:

1. size medium (forearm 29 – 80 mm)
2. muzzle plain, broad, with short hairs bearing spoon-shaped tips; muzzle often with tiny bumps or vertical wrinkles on upper surface
3. pinnae usually large, pointed or rounded, often united across forehead, and usually projecting forward rather than vertically above head
4. tragus very small or absent
5. no disc on wrist or ankle
6. 2nd digit of forelimb with one bony phalanx; 3rd digit with two
7. 1st phalanx of 3rd finger folding to outer (rather than the usual inner) side of metacarpal when wing is folded
8. thumb relatively large
9. hindlimb and hindfoot short, broad
10. 1st and 5th digits of hindfoot with fringe of stiff bristles
11. calcar present, well developed
12. tail extending well beyond margin of relatively small uropatagium
13. humerus with trochiter much larger than trochin, broadly articulating with scapula
14. premaxillae separated or united, fused to maxillae, with or without palatal branches
15. cheekteeth tritubercular

dental formula:

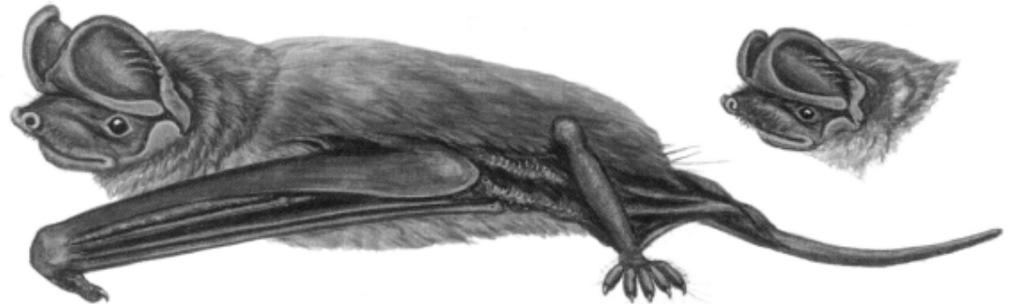
$$\begin{array}{cccc} 1 & 1 & 1-2 & 3 \\ \hline 1-3 & 1 & 2 & 3 \end{array} = 26-32$$

16 gêneros

100 espécies



Mexican free-tailed bat, *Tadarida brasiliensis*



bonneted bat, *Eumops hansae*



Marco A. R. Mello



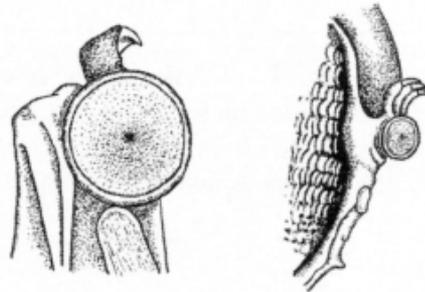
ORDEM CHIROPTERA

Subordem Microchiroptera

Família Thyropteridae

general characters:

1. size small (forearm 30-38 mm)
2. muzzle plain; no skin out-growths
3. pinnae large, funnel-shaped, separate, without ventral extension under eye
4. tragus present, small
5. prominent stalked adhesive disc present at wrist and ankle



6. 2nd digit of forelimb absent (vestigial metacarpal remaining); 3rd digit with three phalanges
7. thumb much reduced, but with well developed claw
8. hindlimb slender, hindfoot small; only two unfused phalanges per digit; claws reduced
9. 3rd and 4th digits of hindfoot syndactylous (including claws)

10. calcar present, well developed
11. tail extending slightly beyond relatively large uropatagium
12. humerus with trochiter distinctly larger than trochin, articulating with scapula
13. premaxillae with palatal and nasal branches, fused to each other and to maxillae
14. no postorbital process
15. cheekteeth tritubercular

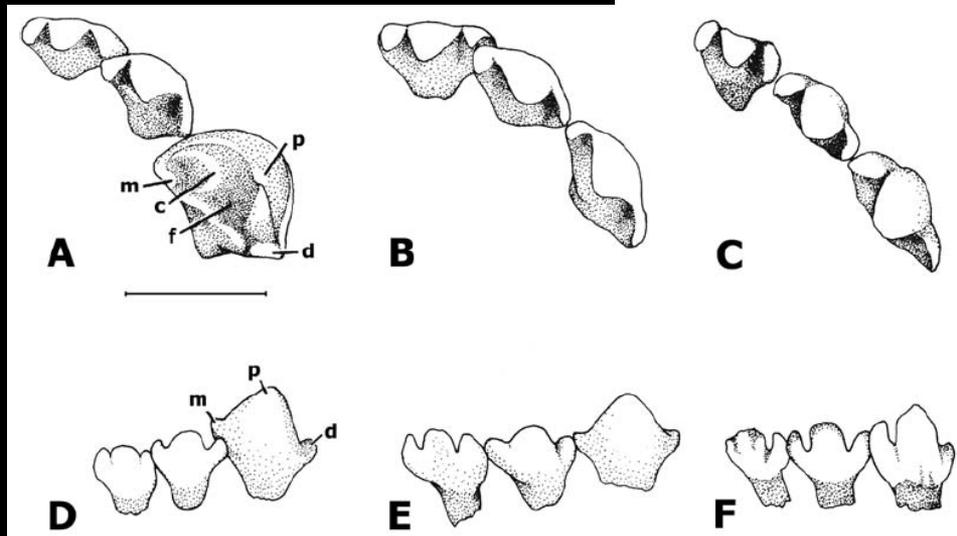
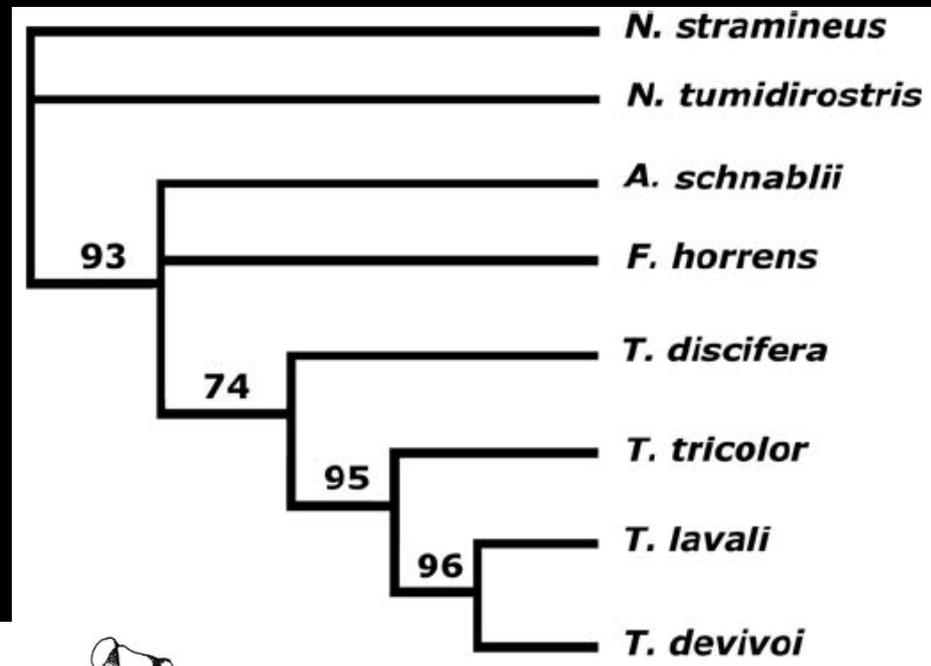
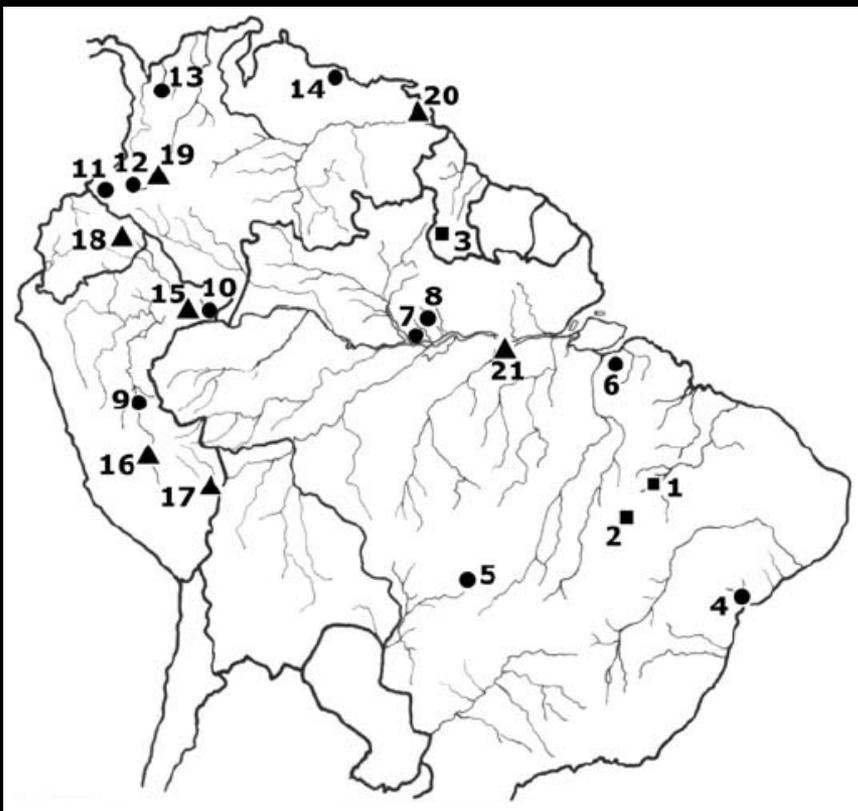


dental formula:

$$\begin{array}{cccc} 2 & 1 & 3 & 3 \\ \hline 3 & 1 & 3 & 3 \end{array} = 38$$

1 gênero

4 espécies





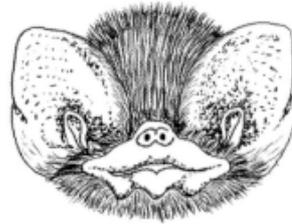
ORDEM CHIROPTERA

Subordem Microchiroptera

Família Furipteridae

general characters:

1. size small (forearm 30-40 mm)
2. muzzle plain; no skin out-growths
3. pinnae large, funnel-shaped, separate, without ventral extension under eye
4. tragus present, small, triangular



5. no disc on wrist or ankle
6. 2nd digit of forelimb absent (metacarpal remaining); 3rd digit with two phalanges
7. thumb much reduced, function-less, mostly enclosed in wing membrane
8. hindlimb and hindfoot slender, small, with relatively small claws
9. calcar present, well developed

10. tail long, fully enclosed in large uropatagium
11. humerus with trochiter scarcely longer than trochin, articulating slightly with scapula
12. premaxillae with reduced and unossified palatal branches, fused to each other and to maxillae
13. no postorbital process
14. cheekteeth tritubercular

dental formula:

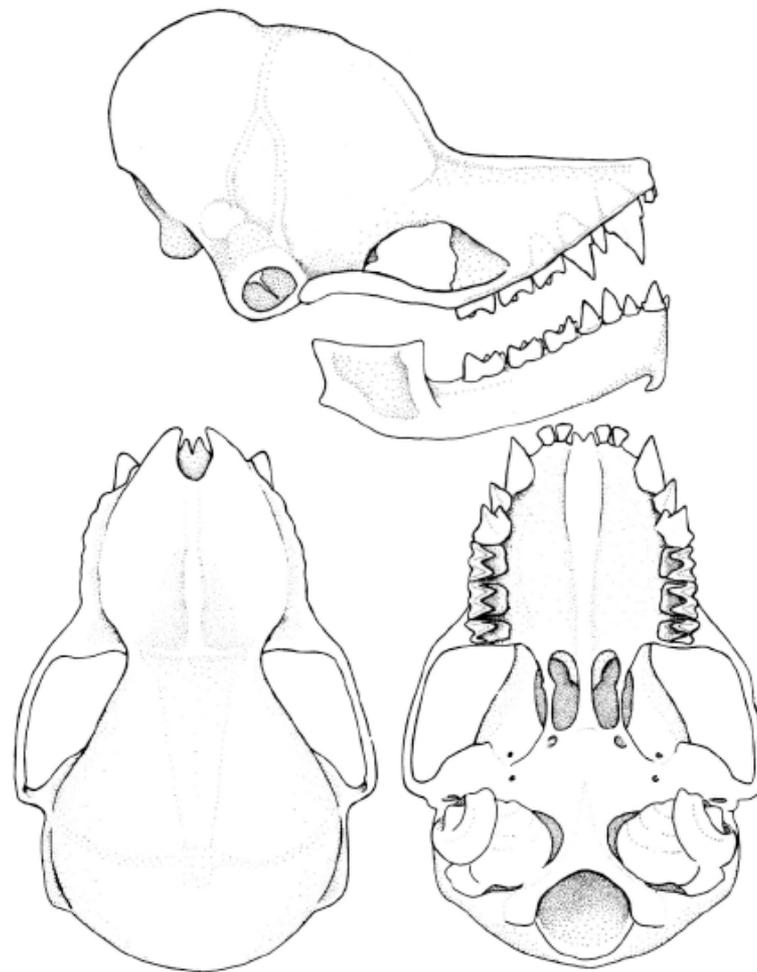
$$\frac{2 \ 1 \ 2 \ 3}{3 \ 1 \ 3 \ 3} = 36$$

2 gêneros

2 espécies



thumbless bat, *Furipterus*



skull of the smoky bat, *Amorphochilus*

ORDEM CHIROPTERA

Subordem Microchiroptera

Família Natalidae

general characters:

1. size small (forearm 27-42 mm)
2. muzzle plain; no skin out-growths
3. pinnae large, funnel-shaped, separate, without ventral extension under eye
4. tragus present, small, triangular
5. no disc on wrist or ankle
6. 2nd digit of forelimb absent (metacarpal remaining); third digit with two phalanges
7. thumb relatively small
8. hindlimb and hindfoot very slender, small, with relatively small claws
9. calcar present, well developed
10. tail long, fully enclosed in large uroptagium
11. humerus with trochiter nearly as large as trochin, articulating with scapula
12. premaxillae with nasal and palatal branches, fused to each other and to maxilla
13. no postorbital process
14. cheekteeth tritubercular

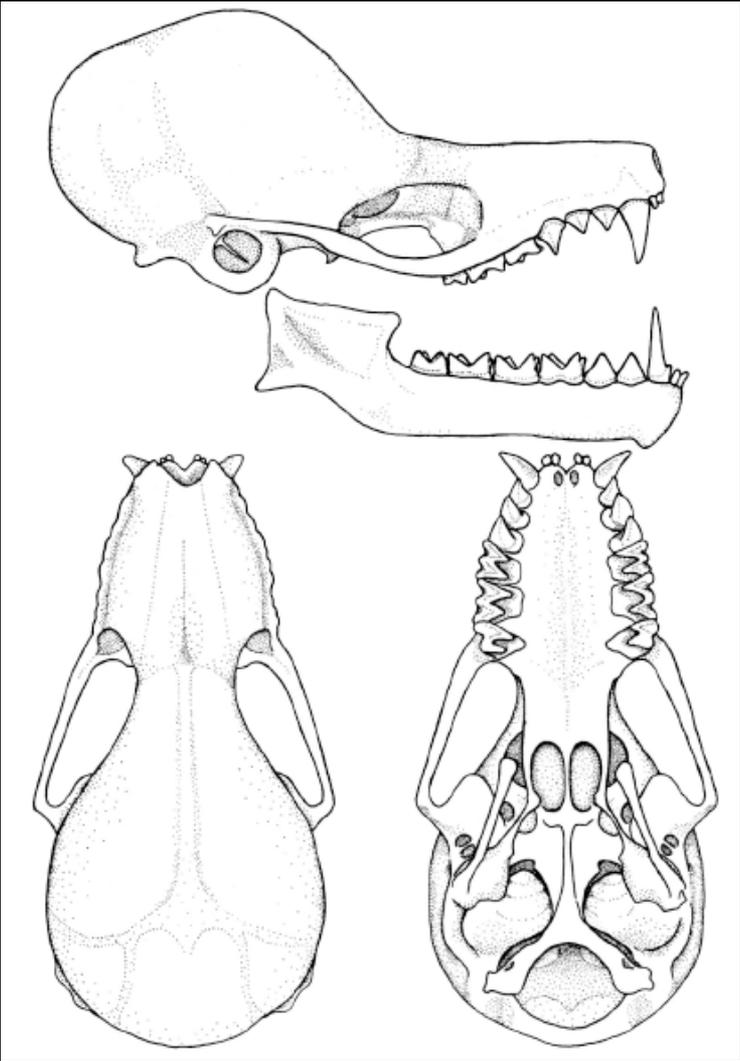
dental formula:

$$\begin{array}{cccc} 2 & 1 & 3 & 3 \\ \hline 3 & 1 & 3 & 3 \end{array} = 38$$

3 gêneros

8 espécies





ORDEM CHIROPTERA

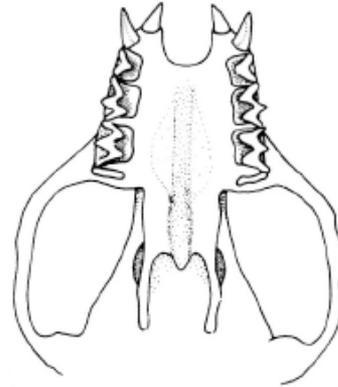
Subordem Microchiroptera

Família Vespertilionidae

general characters:

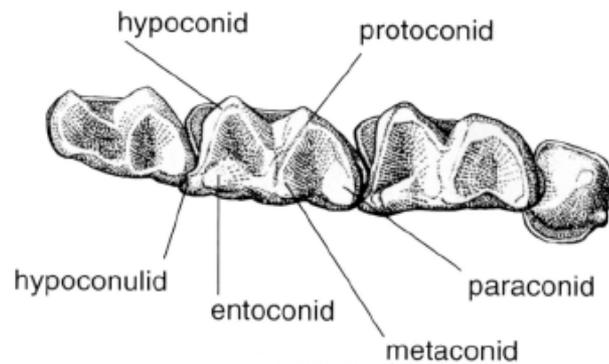
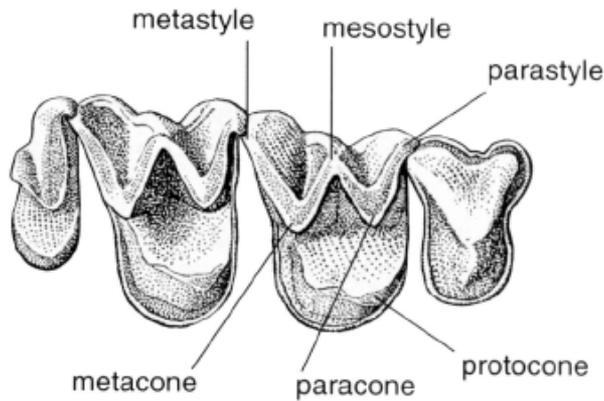
1. size small to medium (forearm 24-90 mm)
2. muzzle plain; no skin out-growths
3. pinnae variable, small to very large, pointed or rounded, usually separate without ventral extension under eye
4. tragus present, prominent
5. small sucker-like pad on wrist or ankle (or both) in some (*Eudiscopus*, *Glischropus*, *Tylonycteris*, *Hesperoptenus*, some *Pipistrellus*)
6. 2nd digit of forelimb with one small bony phalanx; 3rd digit with two bony phalanges and a third cartilaginous one
7. thumb relatively large
8. hindlimb and hindfoot slender, usually with moderately large claws (very large in fish-eating bat, *Myotis vivesi*)
9. calcar present, well developed
10. tail long, enclosed in large uropatagium
11. humerus with trochiter much larger than trochin, broadly articulating with scapula

12. premaxillae separated, but fused to maxillae; only nasal branches present



13. no postorbital process

14. cheekteeth tritubercular

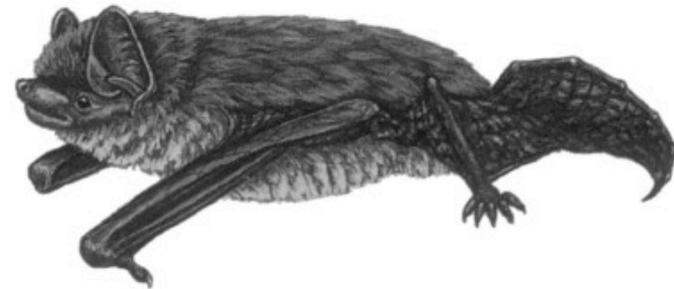


dental formula:

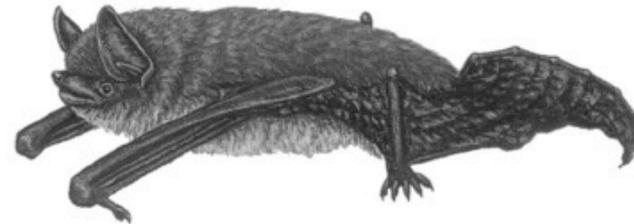
$$\begin{array}{cccc} 1-2 & 1 & 1-3 & 3 \\ \hline 2-3 & 1 & 2-3 & 3 \end{array} = 28-34$$

48 gêneros (5)

407 espécies (22)



big brown bat, *Eptesicus*



little brown bat, *Myotis*



South American big-eared brown bat, *Histioglossus*



such



little brown bat, *Myotis*



house, or yellow bat, *Scotophilus*

