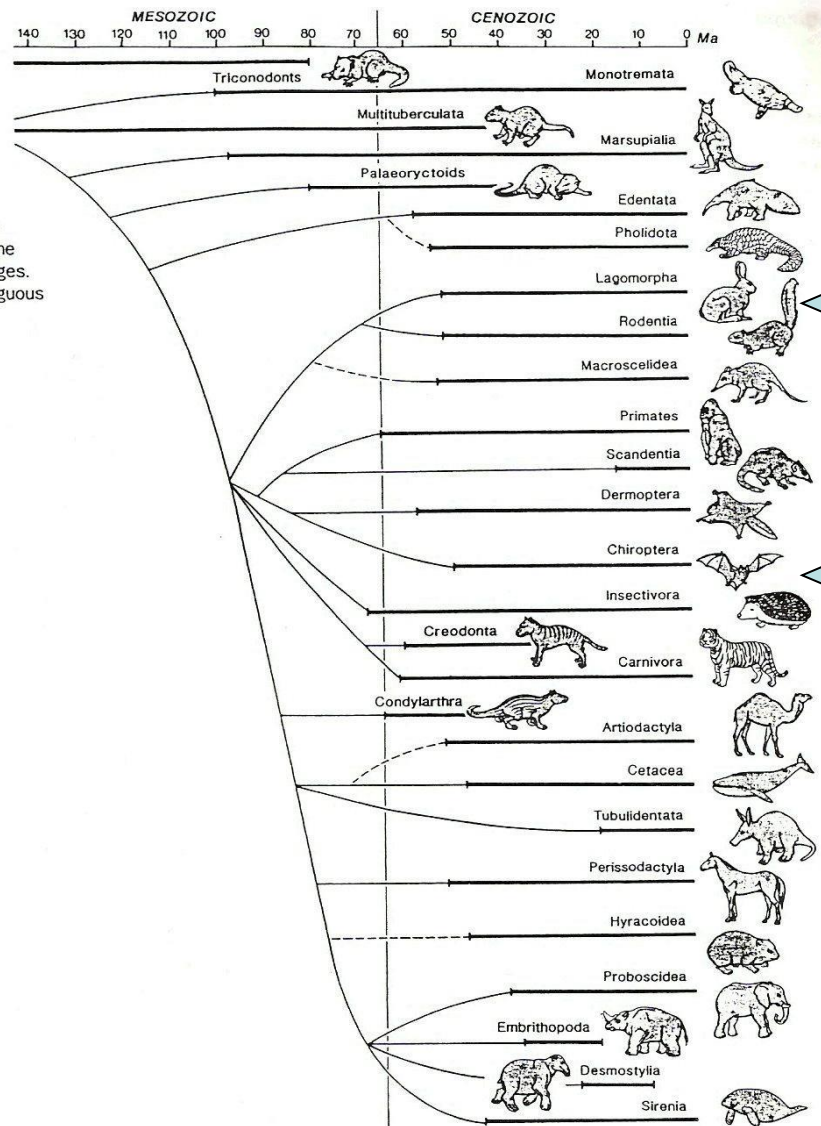


# RODENTIA & LAGOMORPHA (GLIRES) + CHIROPTERA

1. A phylogenetic tree showing relationships among the major mammalian clades. The solid horizontal bars indicate the age range of the clade on the basis of dated first appearance in the fossil record. Solid lines indicate the branching sequence, although the date of the actual splitting event can only be inferred from the relationships of the clades and their known ages. Dashed lines indicate relatively more ambiguous relationships.



Fonte: Novacek, 1992.

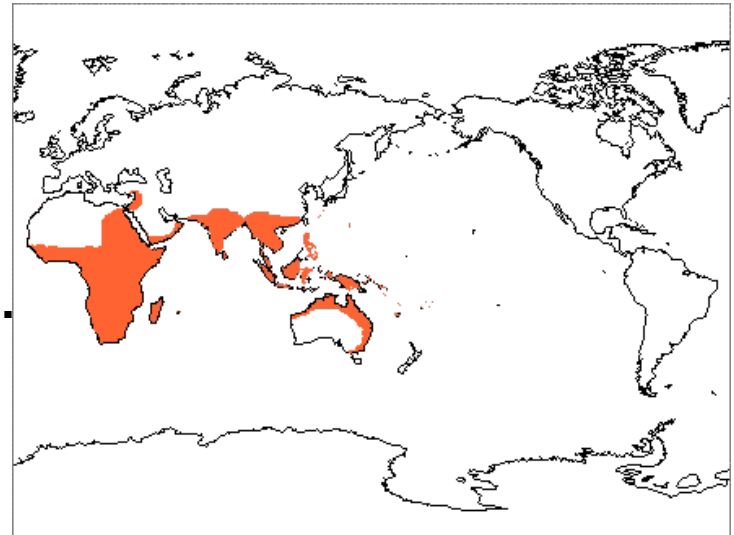
**CHIROPTERA – 1110 espécies em W & R , 2005; 20,49%  
do total de mamíferos. *Chiros* = mão**

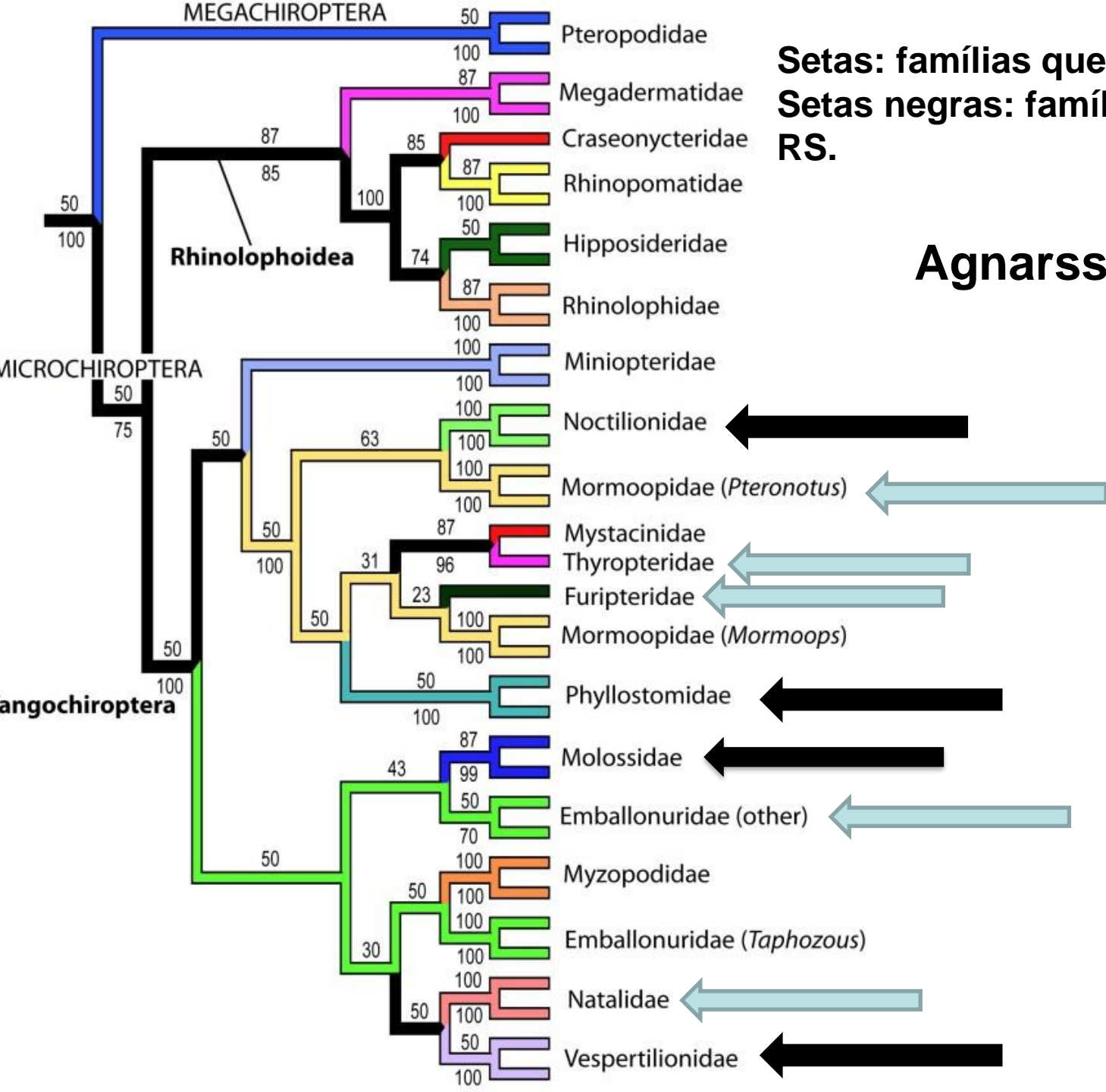
**Subordens Megachiroptera e Microchiroptera. Não aceitas em W & R,  
2005!!!!**

**Mega – não usam ecolocalização, excetto *Rousettus*; África, Ásia e  
Oceania; 2º dígito da mão com garra; frugivoria, nectarivoria e  
polinivoria. Família única Pteropodidae – raposas voadoras! 143 spp.**

**Micro – usam ecolocalização, cosmopolitas; 2º dígito da mão sem  
garra; mesmos hábitos alimentares de mega mais carnivoria,  
piscivoria, insetivoria e hematofagia. Dezesete (17) famílias.**

**DG dos Megach.**





**Setas: famílias que ocorrem no Brasil.  
Setas negras: famílias que ocorrem no RS.**

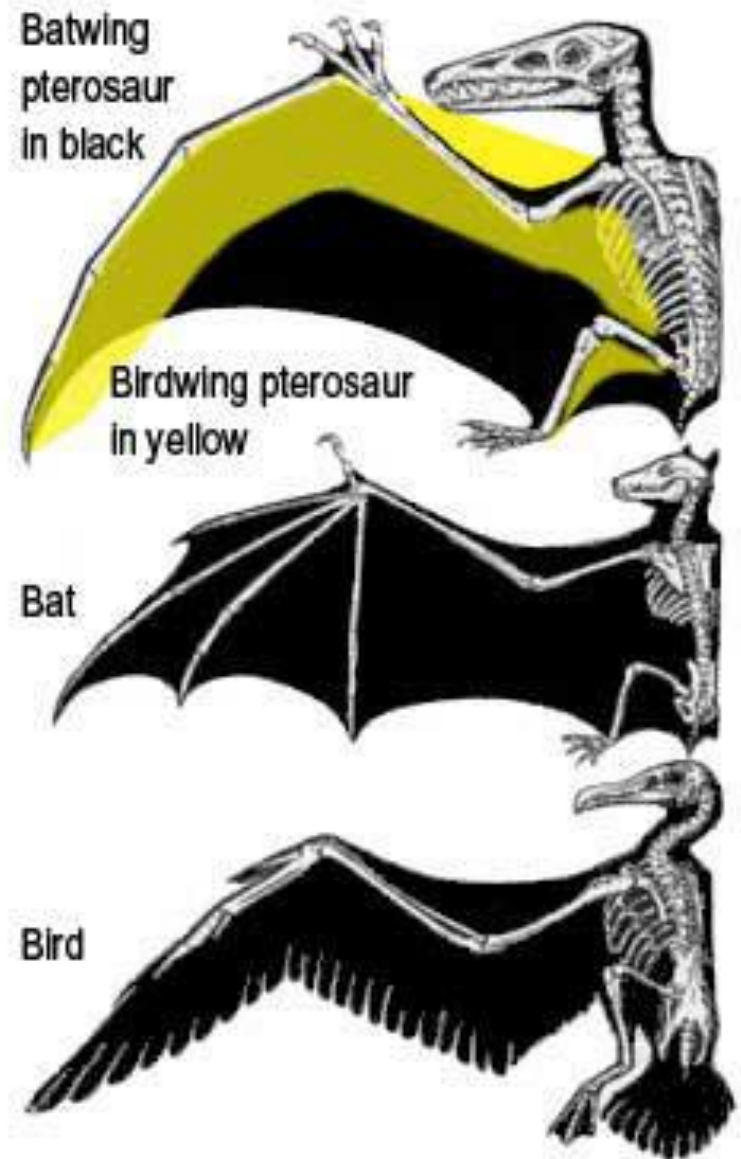
**Agnarsson et al., 2011.**

# Comparação das asas entre diferentes tipos de Tetrapoda:

**PTEROSAURIA †**

**CHIROPTERA**

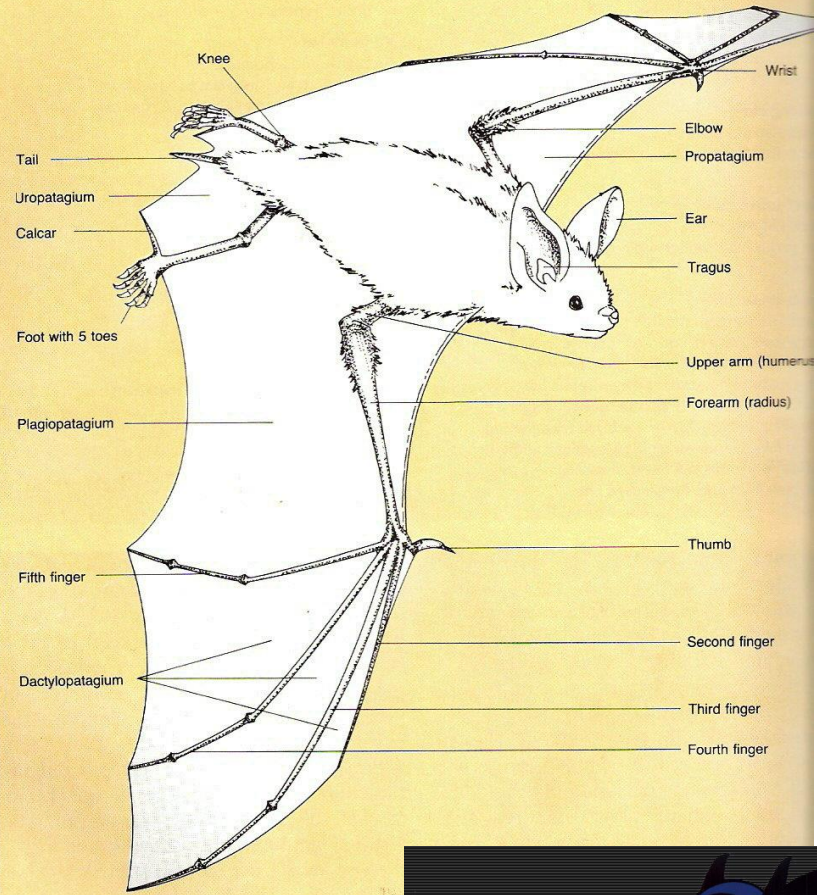
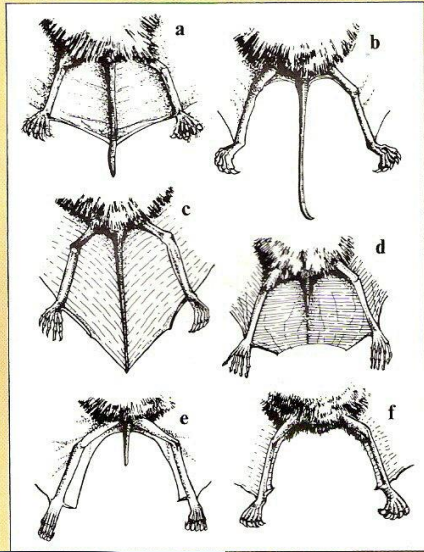
**AVES**



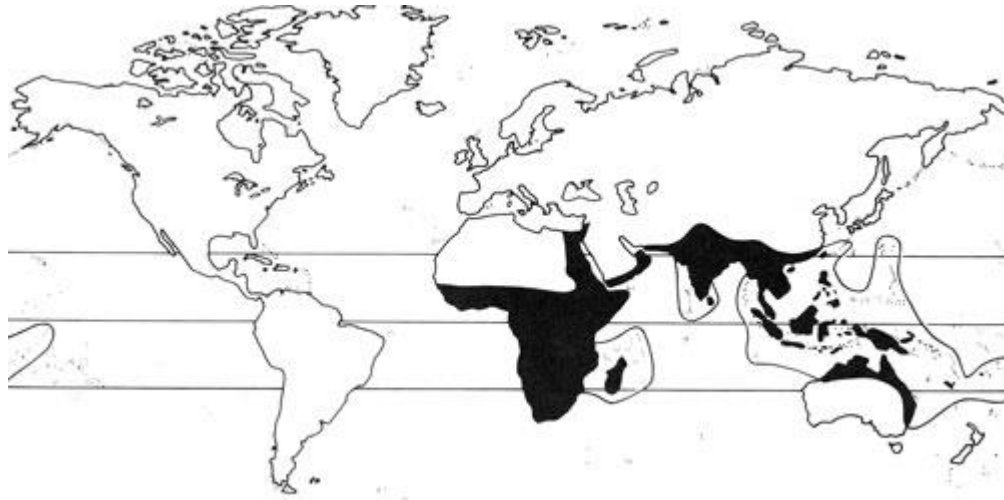
# THE BAT BODY PLAN

► **Body plan** of a typical bat with a simple nose.

▼ **Bat tails.** Major variations in tail shape of bats: (a) free tail (free-tailed bat—*Tadarida*); (b) mouse tail (mouse-tailed bat—*Rhinopoma*); (c) full membrane (mouse-eared bat—*Myotis*); (d) sheath tail (Old World sheath-tailed bat—*Emballonura*); (e) short tail (tube-nosed fruit bat—*Nyctimene*); (f) tail lacking (flying fox—*Pteropus*).



# Megachiroptera



**Microchiroptera – Famílias que ocorrem no RS!**

**Phyllostomidae – presença de folha nasal! Maioria frugívoros!**



**Trachops cirrhosus**

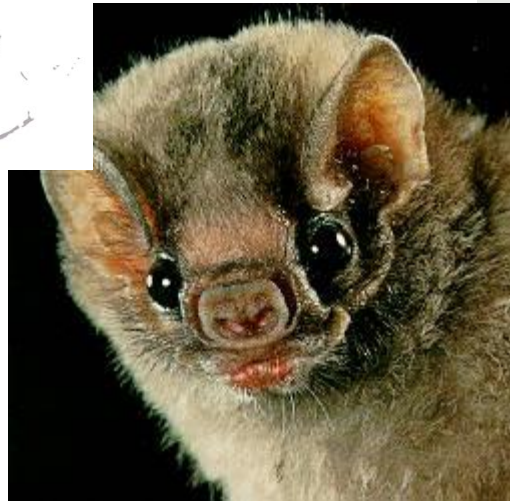


**Chrotopterus auritus**

30 3 2006

Foto: Tiago Borges

Subfamília Desmodontinae – vampiros , apenas 3 espécies, todas sul-americanas: *Desmodus rotundus*, *Diaemus youngii* e *Diphylla ecaudata*





**Gênero Anoura – nectarívoro!**



**Família Noctilionidae –  
morcego pescador –  
*Noctilio leporinus*.**



Família Molossidae – insetívoros de cauda livre.

Família Vespertilionidae – insetívoros de cauda inclusa no uropatágio.

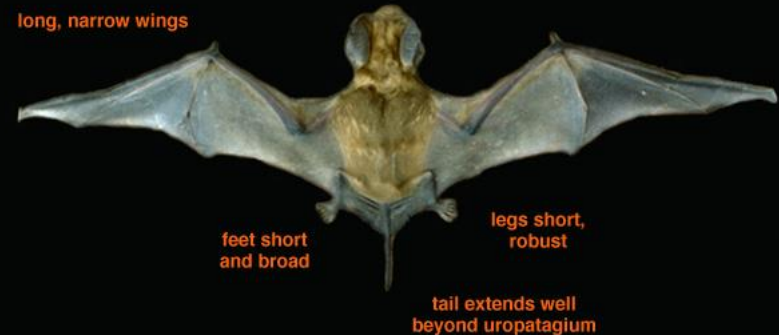


*Tadarida brasiliensis* –  
sinantropo, populações  
numerosas.



## Molossidae

long, narrow wings



feet short  
and broad

legs short,  
robust

tail extends well  
beyond uropatagium

**RODENTIA – 2277 espécies, das 5418 totais de mamíferos (W & R, 2005) = 42,03%!!!!!!!!!!!!!!**

### **Why so successful?**

- nearly cosmopolitan in distribution
- exploit a broad spectrum of foods
- important members of most terrestrial faunas
- often reach extremely high population densities
- small size to utilize shelters and escape predation
- high fecundity - large number of offspring, some survive
- rapid population turnover - natural selection operates quickly

## Sistemática de Rodentia:

Cinco (5) subordens – diferenças relacionadas à morfologia do forame infra-orbital e nível de desenvolvimento e local de origem e inserção do masseter.

Subordem Sciuromorpha – 4 famílias.

So. Castorimorpha – 2 famílias.

So. Myomorpha – 7 famílias.

So. Anomaluromorpha – 2 famílias

So. Hystricomorpha – 18 famílias.

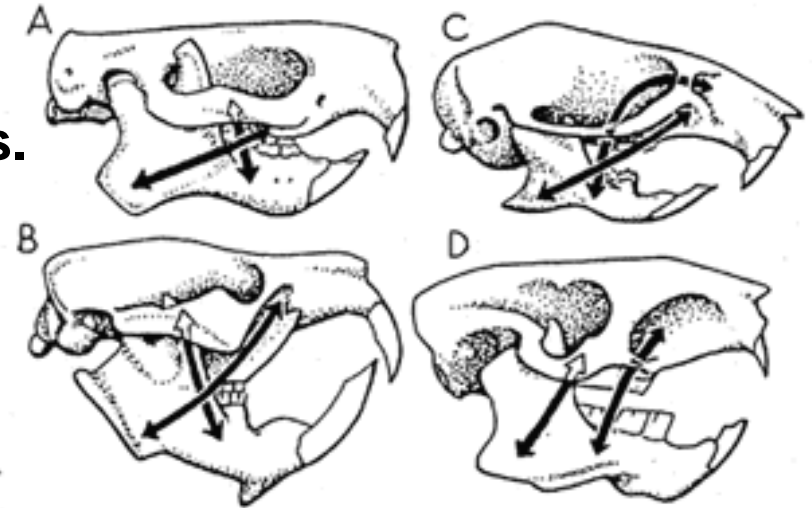
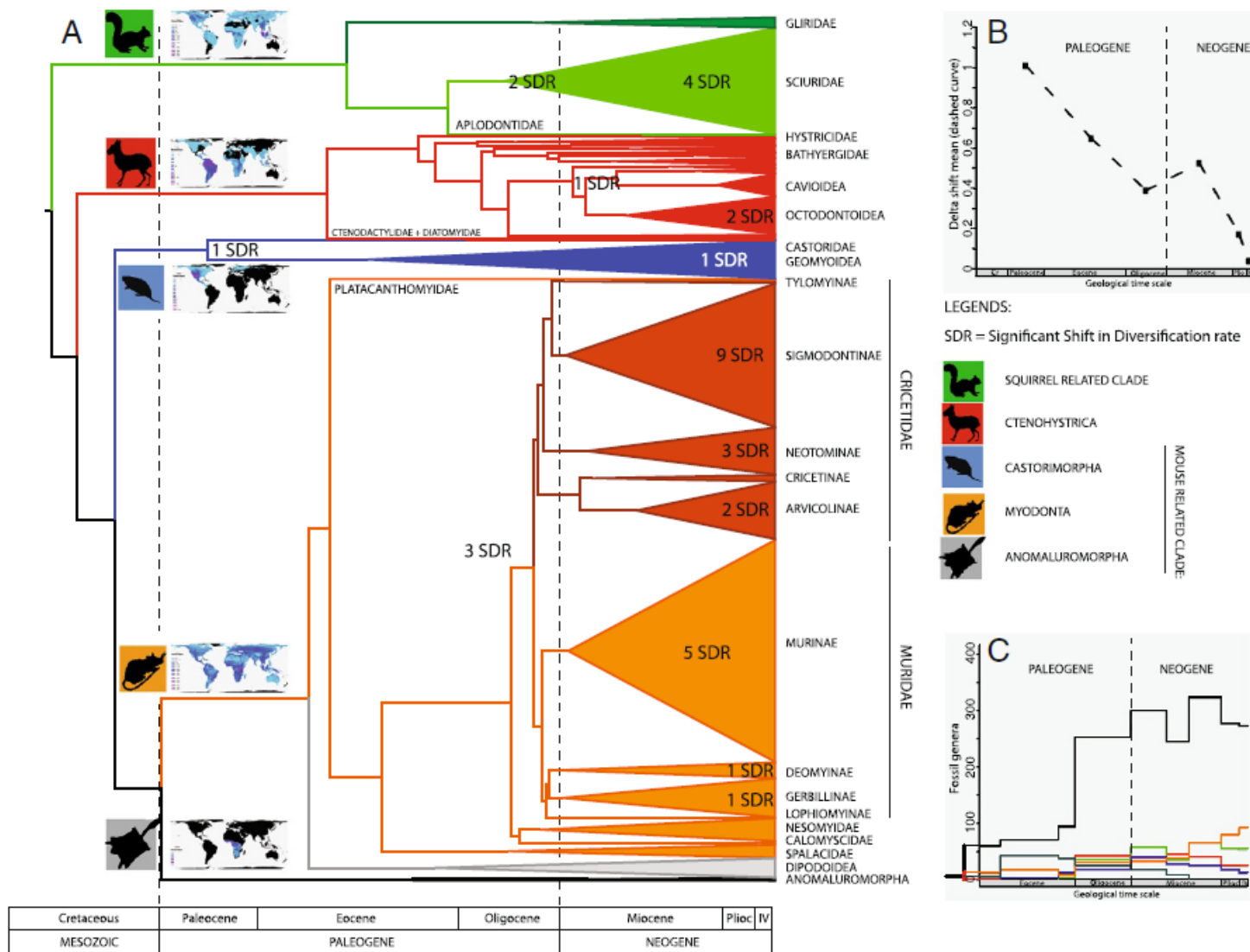


Figure 1. Position of lateral and medial divisions of masseter muscle in rodents (superficial layer omitted). A, a protrogomorph; the entire masseter originates mainly from the lower edge of the zygomatic arch. B, an advanced sciuromorph; the lateral division of the masseter originates from the side of the rostrum, the medial division from the medial side of the zygomatic arch. C, a myomorph; the lateral division of the masseter is similar, but the medial division has pushed up through the orbit and passes through the infraorbital foramen onto the rostrum. D, a hystricomorph; the lateral division of the masseter arises on the zygomatic arch, but the medial division passes through the infraorbital foramen onto the rostrum (after Romer, 1966, fig. 437).



**Figure 2 Diversification of rodents through time.** Left part **(A)**: Simplified family-level phylogenetic dated tree of rodents. Stratigraphic scale is in the lower part. Significant shifts in diversification rate (SDR) are indicated (see also Table 1 and Additional file 2: Figure S2, Additional file 3: Figure S3, Additional file 4: Figure S4, Additional file 5: Figure S5, Additional file 6: Figure S6, Additional file 7: Figure S7, Additional file 8: Figure S8, Additional file 9: Figure S9, Additional file 10: Figure S10, Additional file 11: Figure S11, Additional file 12: Figure S12 to Additional file 13: Figure S13). Upper right part **(B)**: Variation through each epoch bin of the mean of absolute nodal  $\Delta$  shift statistics values calculated from the overall 2,263-taxon topology. Lower right part **(C)**: Histogram of the number of rodents genera through Tertiary (McKenna and Bell, 1997). This illustrates the evolution of genus diversity for all rodents (black), extinct stem rodents (darkgreen), Muroidea+Anomaluroidea (orange), Castorimorpha (blue), Sciuroidea (green) and Ctenohystrica (red).

**Características dentárias:**

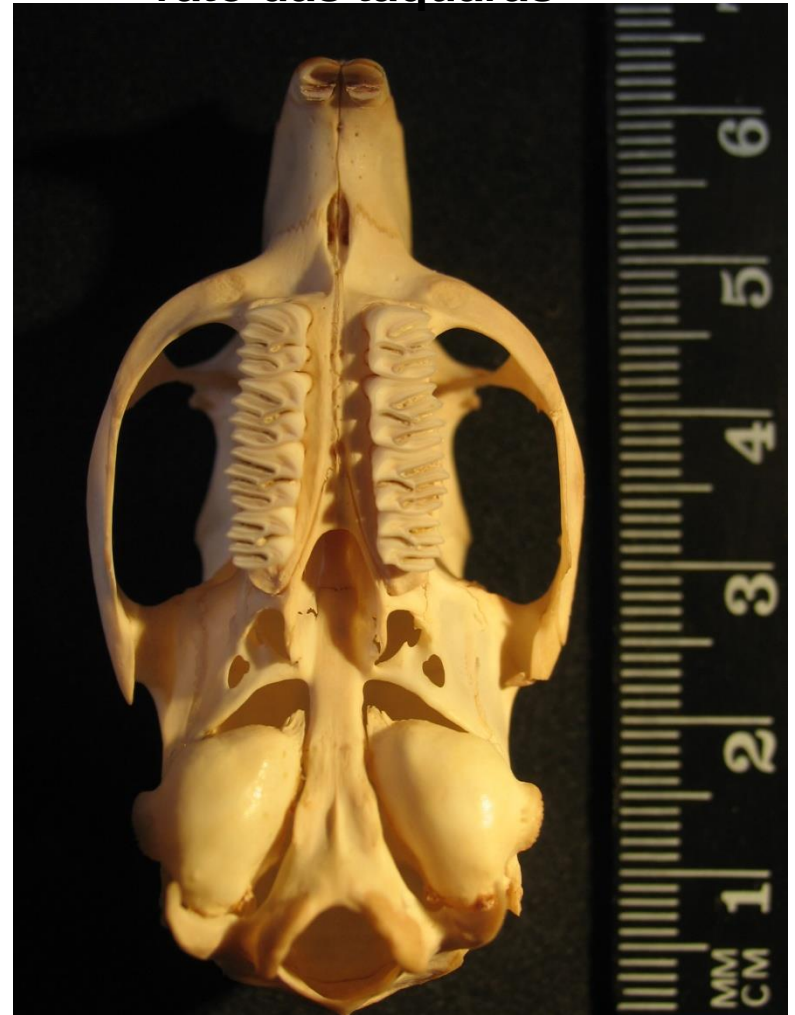
**Ausência de caninos - diastema;**

**Incisivos de crescimento contínuo (hipsodonte);**

**Pré-molares e molares com coroas amplas aptas à mastigação de alimentos rígidos.**

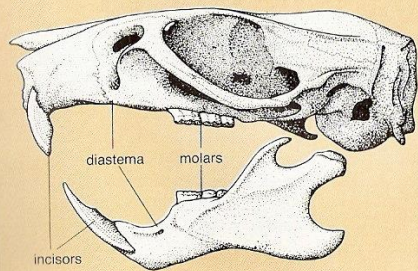
*Kannabateomys amblyonyx*

– rato das taquaras

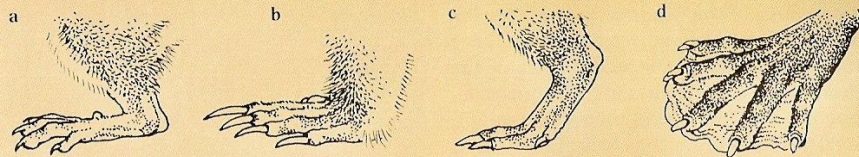
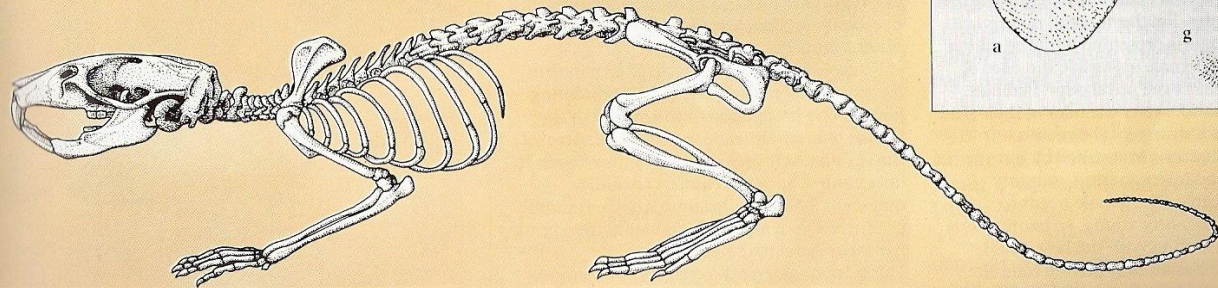


## THE RODENT BODY PLAN

▼ **Skull of the Roof rat.** Clearly shown are the continuously growing, gnawing incisors and the chewing molars, with the gap (diastema) left by the absence of the canine and premolar teeth. All mouse-like rodents lack premolar teeth. All squirrel-like rodents lack premolars but the squirrel- and cavy-like rodents have one or two on each side of the jaw.

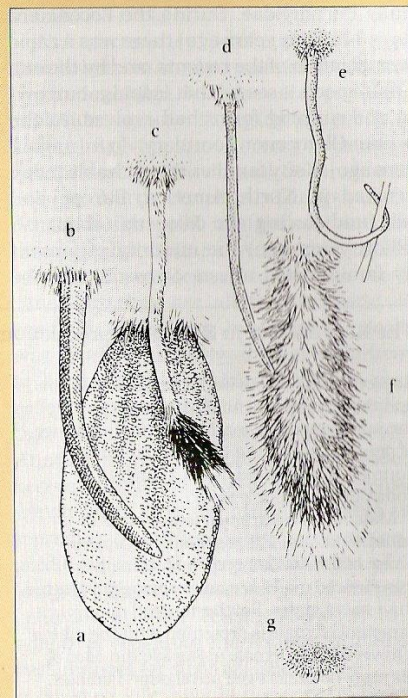


► **Skeleton of the Roof rat.** This is typical of rodents with its squat form, short limbs, plantigrade gait (ie it walks on the soles of its feet) and long tail.



▲ **Rodent feet.** Most rodent species, for example mice (a), are plantigrade, ie they walk on their palms and soles. Their nails are generally claw-like and may be elongate in some burrowing species, such as the Cape mole-rat (b). A few South American antelope-like species, such as the agouti (c), are adapted for running and are digitigrade, ie they run on just their fingers and toes. Their nails are hoof-like. Other rodents are adapted for aquatic life, eg the beaver (d), which has webbed hind feet. Generally, however, rodents are not fleet of foot, though the desert-living kangaroo mice and jerboas can bound across sand at speeds of 48 kilometers per hour (30mph).

► **Rodent tails.** The rodent tail is a very variable anatomical feature. (a) In the beaver it is flattened dorso-ventrally and aids in rapid underwater swimming; (b) in the muskrat the flattening is lateral and the tail is used as a rudder. Hopping mice, (c) jerboas, and (d) kangaroo mice have very long tails, usually with a tuft of hair at the end to act as a balancing organ. (e) In a few species, such as the European harvest mouse, the tail is truly prehensile and functions as a fifth limb, allowing incredible gymnastics to be performed among the grass heads. (f) In arboreal and gliding species, such as the Southern flying squirrel, it is bushy so as to provide both counterbalance and drag anchor. (g) Some hamsters have only a tiny visible tail. Most cavy-like rodents have no visible tail at all.



**Sciuromorpha – 4 fams.:**

**Aplodontidae – castor da montanha**

**Sciuridae – esquilos em geral; serelepes, caxinguelês, marmotas, etc.**



***Sciurus vulgaris***



***Cynomys sp.* – “prairie dog”**





# METADE

**Finalmente! Hoje é a  
minha aula!!!!!!!!!!!!!!**



**Gliridae – planadores e  
Geomyidae – fossoriais.**



**Castorimorpha: 2 fams.:  
Castoridae, gênero único *Castor*, 2 espécies.  
Heteromyidae – ratos-cangurus – 6 gêneros.**



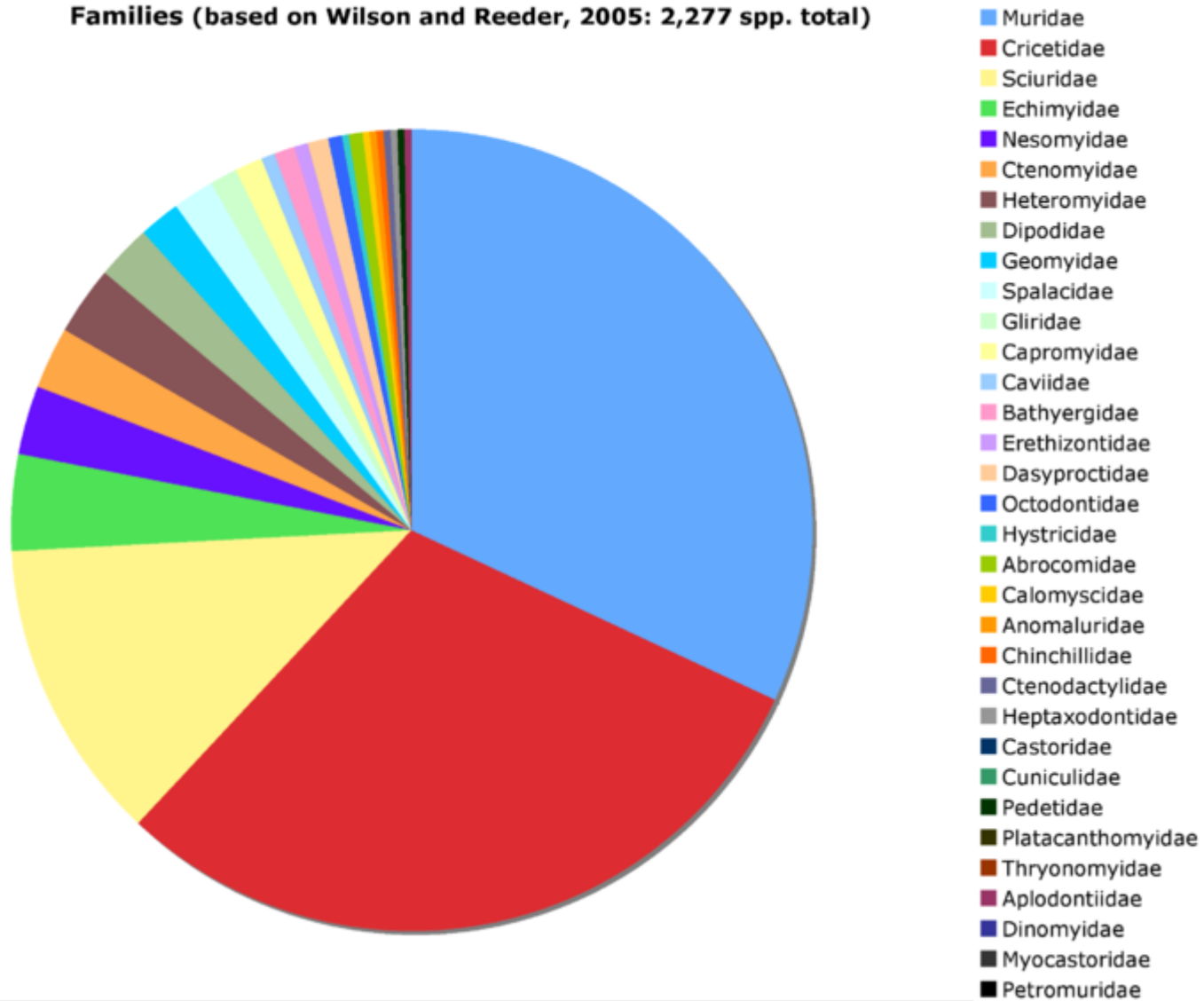
*Dipodomys sp.*



*Castor canadensis*



**Distribution of Extant and Recently Extinct Rodent Species across Families (based on Wilson and Reeder, 2005: 2,277 spp. total)**



**Muridae: 730 spp.**  
**Cricetidae: 681 spp.**

## Myomorpha – 7 fams., destaque:

**Cricetidae – ratos e camundongos do “novo mundo” 681 espécies!!!!!!!!!!!!**

**Muridae – ratos e camundongos do “velho mundo”; 730 espécies!!!!!!!!!!!!**

**Nestas duas famílias está 61,97% da diversidade de Rodentia!!!!!!**





**Ratos como divindades em algumas culturas, por ex., na Índia!**



***Sigmodon hispidus***



***Akodon sp.***

***Oryzomys palustris***



**Spalacidae – ratos-toupeira.**

**Dipodoidae**





**Northern Grasshopper Mouse**  
**(*Onychomys leucogaster*) –**  
**América do Norte.**

***Hydromys chrysogaster* –**  
**Australian water rat**



**Exemplos de**  
**Cricetidae de hábitos**  
**alimentares variados!**



**Anomaluromorpha – 2 fams., Anomaluridae – 7 espécies e Pedetidae, 2 espécies, restritos á África sub-saariana. Morfologia craniana semelhante aos Hystricomorpha.**



► **A scaly-tailed squirrel in flight.** The gliding membrane extends between the tail base and the hindlegs and from the hindlegs to the front limbs where it is attached to the upper arm and a gristle rod strung from the elbows to the neck. At sunset animals leave their roost trees and glide between trees in search of food for distances of up to 200m (approx 650ft). Pygmy scaly-tails have been reported moving as far as 6.5km (4mi) from their roost trees to eat the flesh of palm nuts.

# Hystricomorpha – maior diversidade em número de famílias – total de 18!

**Hystricidae – ouriços do velho mundo, “porcupines”.**



**Erethizontidae – ouriços do novo mundo – ouriços cacheiros ou “porco-espinho”.**



# Ctenomyidae – tuco-tucos, fossoriais, 4 espécies na planície costeira do RS!

<http://www.ufrgs.br/projetotucotuco/projetotucotuco.html>



***Ctenomys flamarioni***



***Ctenomys minutus***

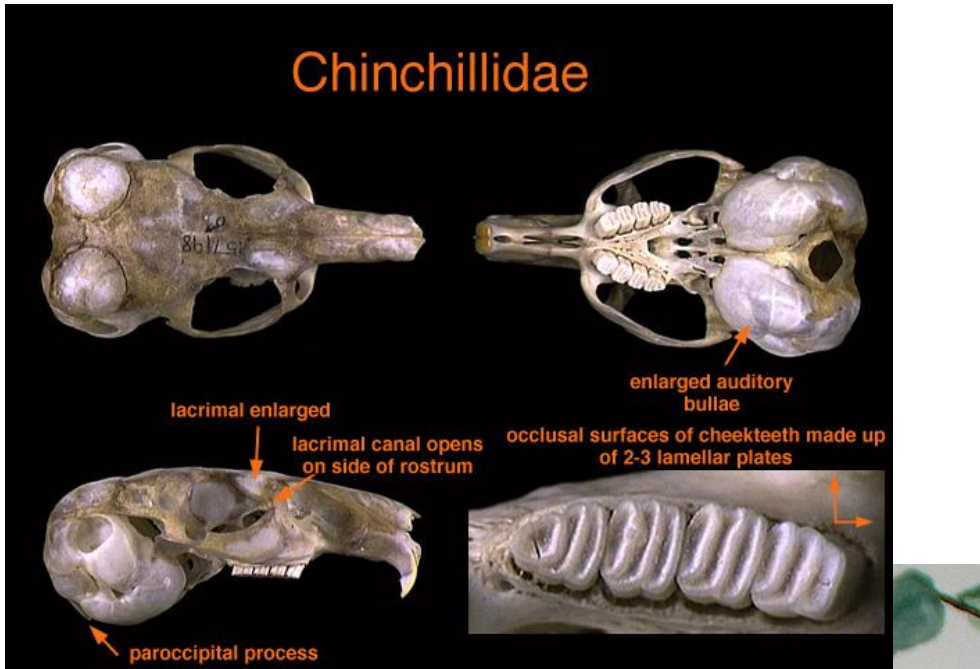


***Ctenomys torquatus***



***Ctenomys lami***

**Echimyidae – ratos arborícolas, caudas muito longas; rato das taquaras – *Kannabateomys amblyonyx*, 20 gêneros.**



**Chinchilidae –  
chinchilas; altiplanos da  
América do Sul; pele de  
alto valor comercial; 3  
gêneros, 7 espécies.**

**Caviidae – preás, porcos da Índia, cobaias em geral; subfamília Hydrochoerinae para a capivara, *Hydrochoerus hydrochaeris* mais a da América Central *H. isthmus* e mais o gênero *Kerodon*.**



**Dasyproctidae – cutias, *Dasyprocta*, 11 espécies e *Myoprocta*, 2 espécies.**



**Cuniculidae – pacas, *Cuniculus*, 2 espécies.**

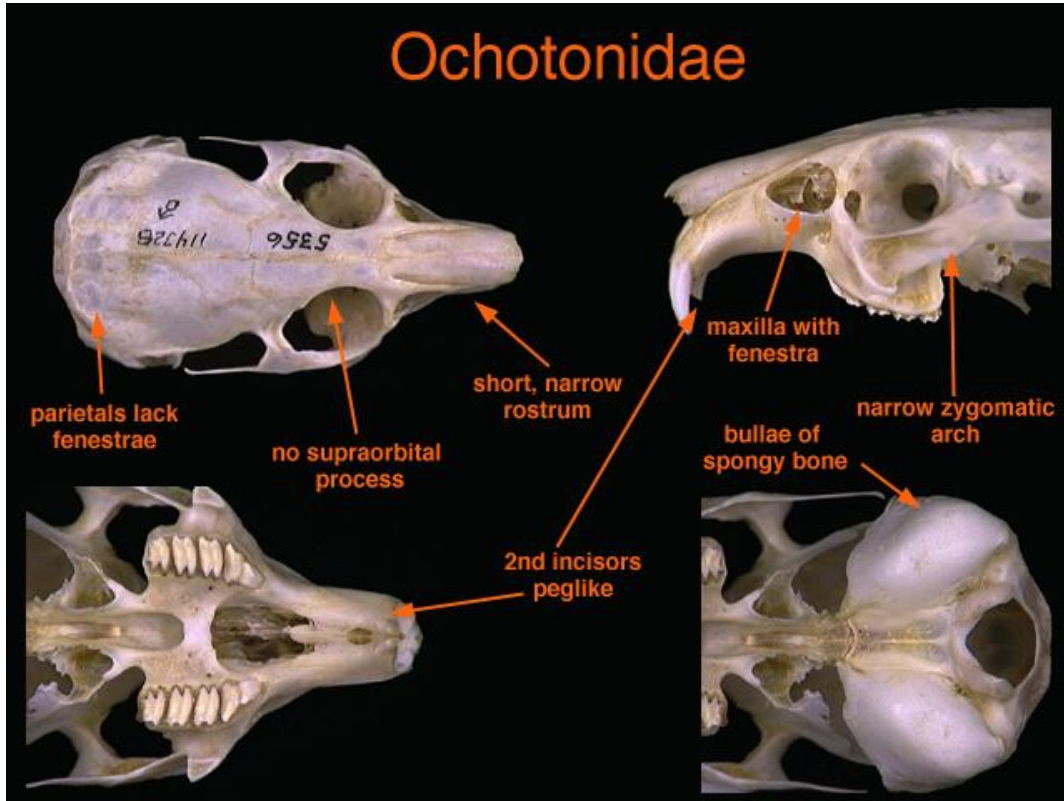
**Myocastoridae, gênero e espécie única, *Myocastor coypus*, ratão do banhado ou nútria.**



P. Dubeis - 2001  
*Myocastor coypus*

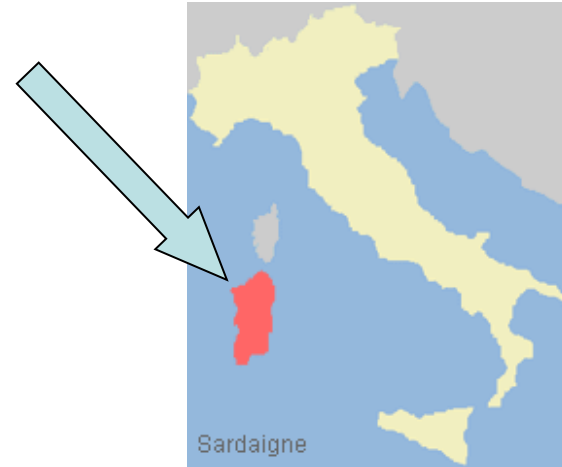


**LAGOMORPHA – 85 espécies em 3 famílias, uma extinta.**  
**Características diagnósticas da ordem – principal: presença de dois pares de incisivos superiores!!! Herbivoria/onivoria.**



**Hipertrofia dos pavilhões auditivos NÃO é diagnóstica para a ordem!!!!!!!!!!!!**

**Prolagidae (extinta) – gênero único, *Prolagus* com 16 espécies fósseis, sendo uma, *Prolagus sardus*, extinta no século XVII, endêmica da Sardenha.**



**Ochotonidae – “pikas” ou “rock rabbits”; gênero único *Ochotona*, 30 espécies, América do Norte e Eurásia.**





**Leporidae – lebres e coelhos, 54 espécies, cosmopolitas, lebre europeia introduzida em praticamente o mundo todo.**

***Oryctolagus cuniculus***



***Lepus californicus***



***Sylvilagus brasiliensis*, tapeti.**



