DAI RETTILI AI MAMMIFERI

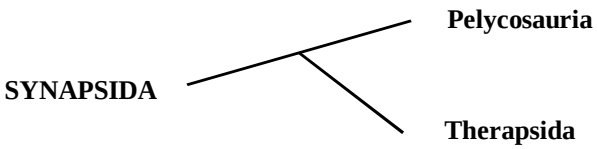
Da 65 milioni di anni i Mammiferi sono i Vertebrati dominanti sulla terraferma

Origini ben più antiche (Triassico Superiore?)

SINAPSIDI origini ancora più antiche

Mammiferi e **Sinapsidi** possono costituire un clade unico: problemi tassonomici

SYNAPSIDA

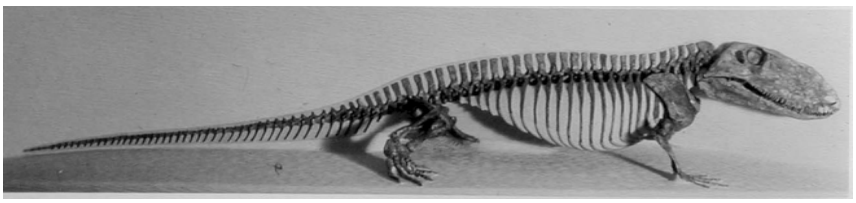


PELYCOSAURIA

Dimensioni doppie rispetto ad altri Amnioti primitivi

- ✓ Aumento allometrico delle dimensioni della testa.
- ✓Accorciamento porzione posteriore del cranio
- ✓Aumento di altezza della stessa regione

Divergenza dagli altri Amnioti in relazione a differenze nella dieta?



LA STORIA EVOLUTIVA DEI MAMMIFERI E' IL RISULTATO DI UNA COMPLESSA INTERAZIONE TRA METABOLISMO E MASTICAZIONE

ANATOMIA DEI PELYCOSAURIA

Caratteri primitivi

- ✓ Postura sprawling
- ✓ Coda lunga
- ✓ Due coracoidi per lato
- ✓ Tarso con grande centrale mediale
- ✓ Staffa grande ma non ha funzione di supporto

Caratteri derivati

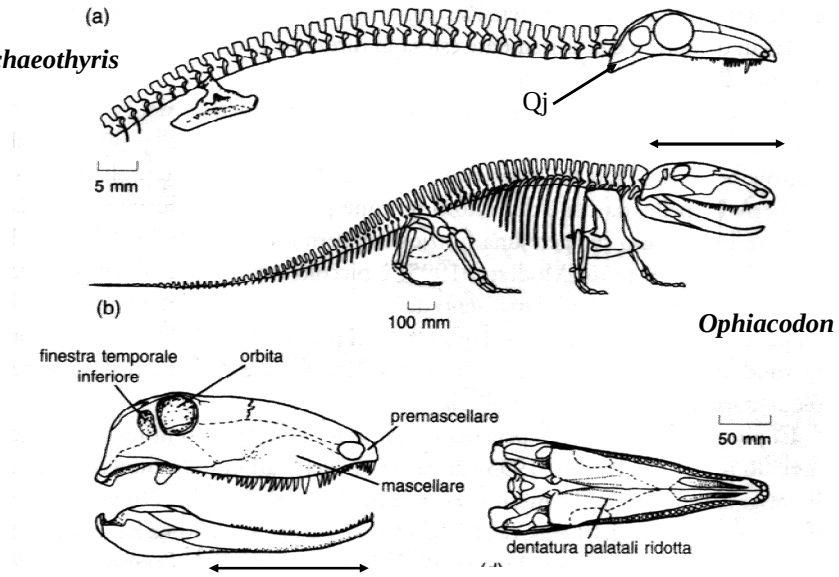
CRANIO

- ✓ Una sola finestra temporale inferiore
- ✓ Contatto tra **sopratemporale** e **postorbitale**
- ✓Regione occipitale inclinata posteriormente

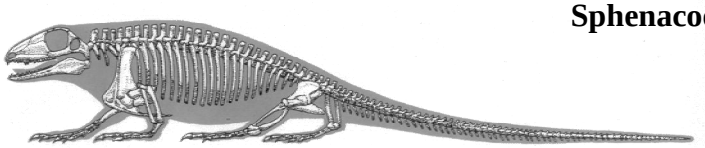
SCHELETRO POSTCRANIALE

- ✓Spine neurali più grandi
- ✓Processi trasversi espansi, zigapofisi ravvicinate
- ✓Ossa dei cinti e degli arti estremamente robuste
- ✓Perdita parziale della mobilità del tronco

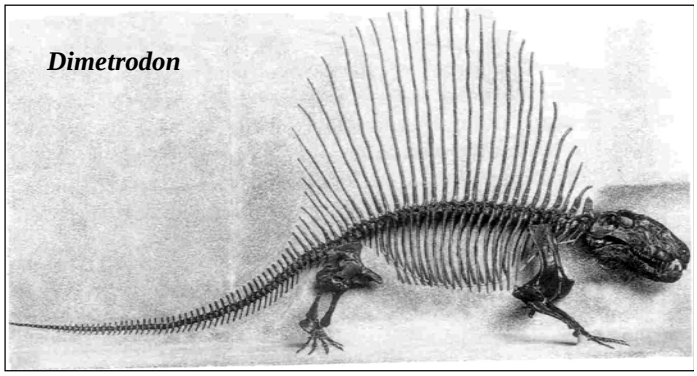
Ophiacodontidae

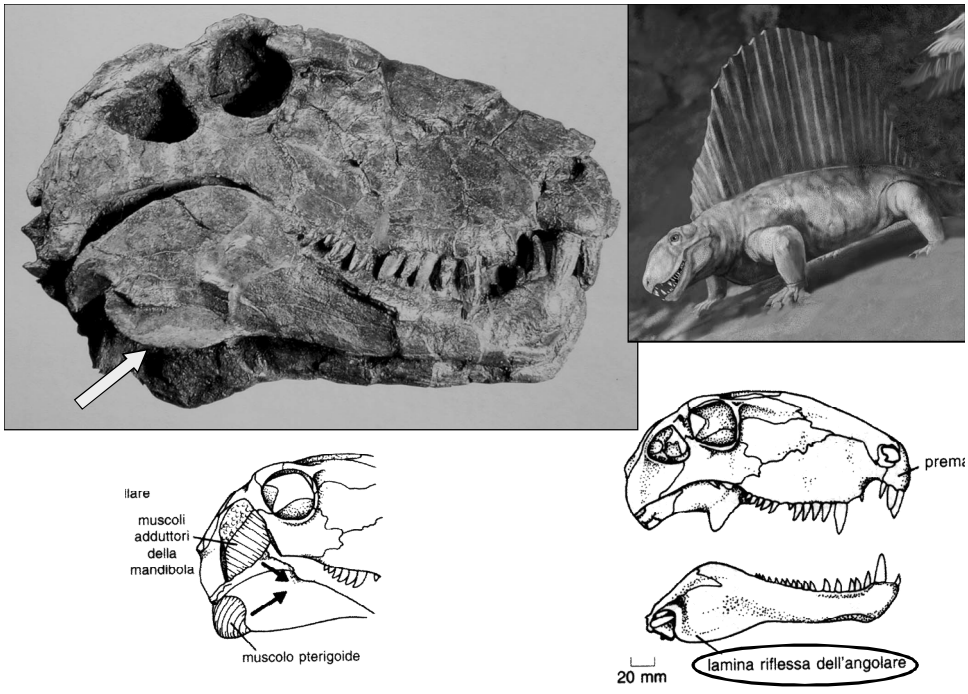


Sphenacodontidae

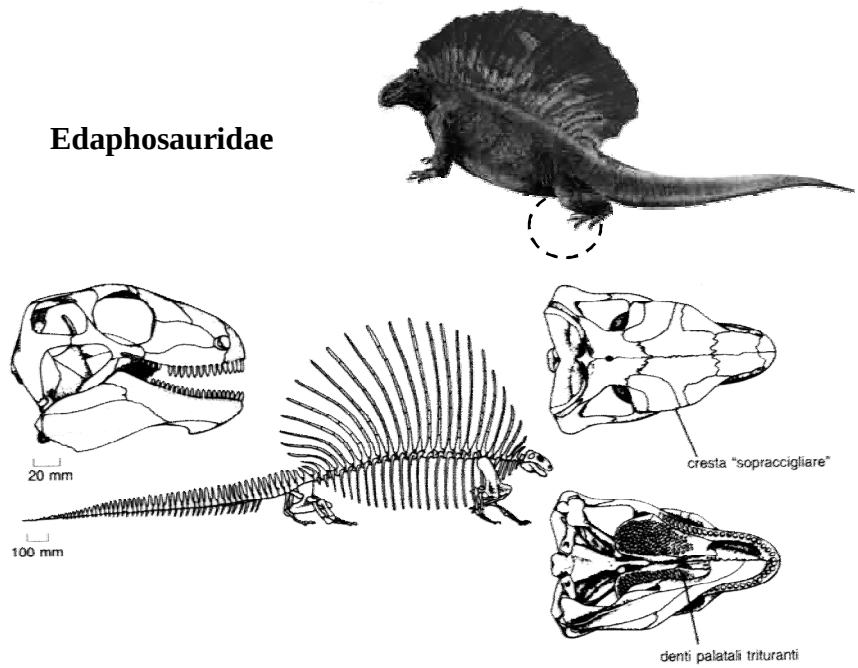


Haptodus

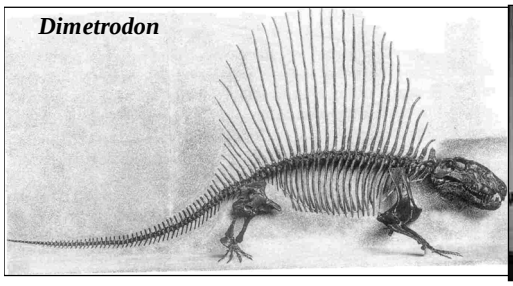


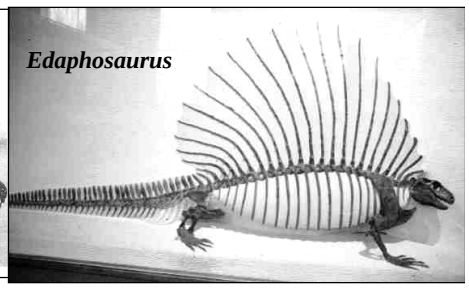


Edaphosauridae



Quale funzione per la vela?



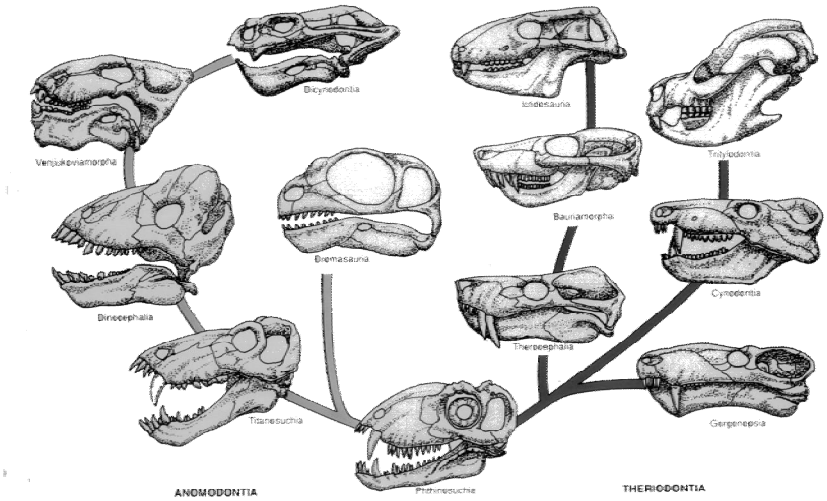


Riconoscimento?

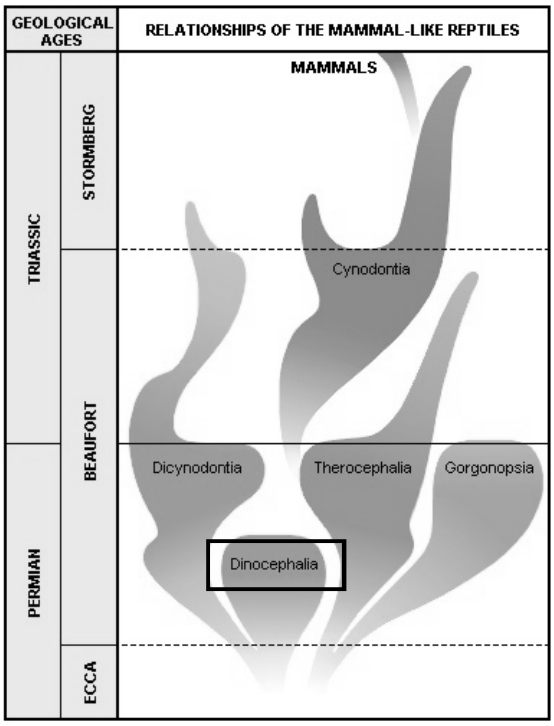
Esibizione?

Termoregolazione?

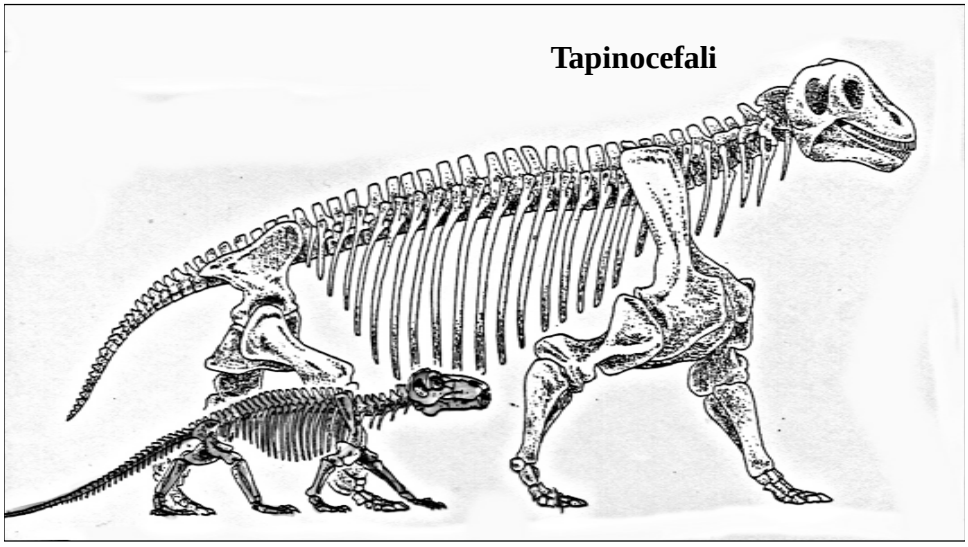
THERAPSIDA



Dinocefali

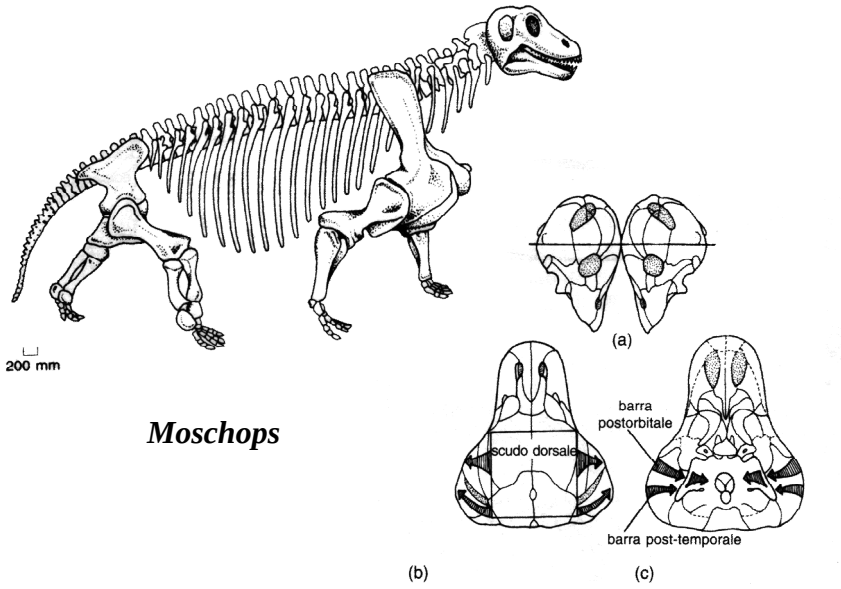


Tapinocefali



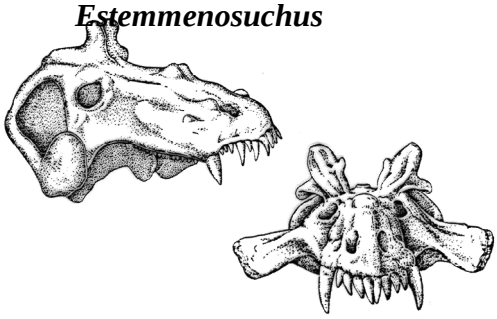
Titanosuchi

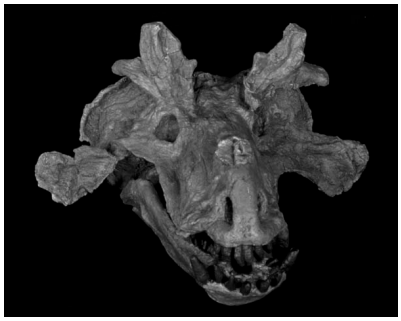
Tapinocephalidae



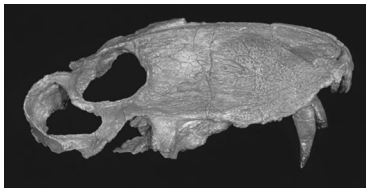
Moschops

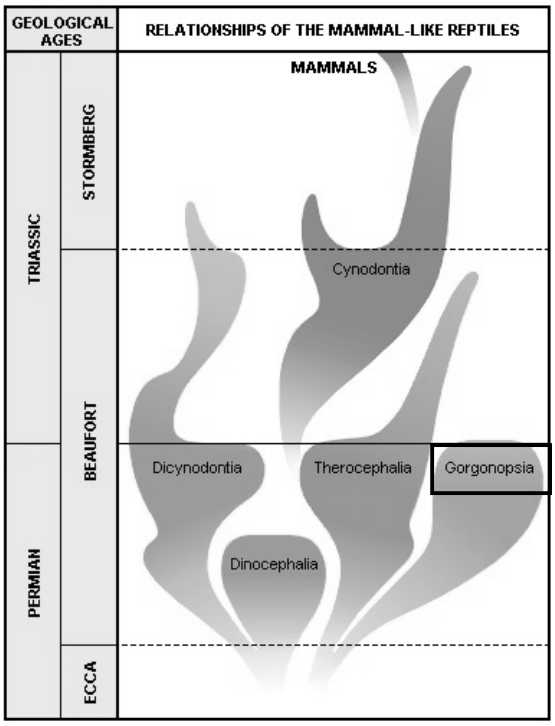
Estemmenosuchus



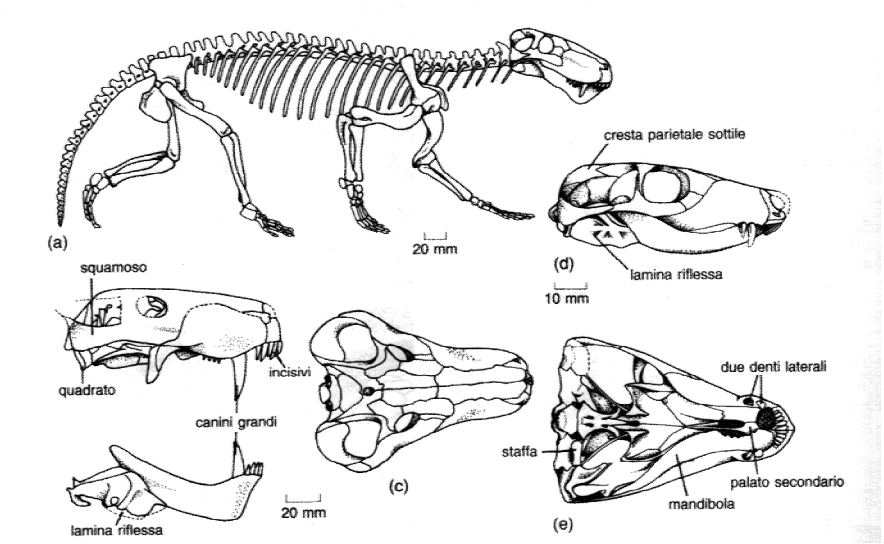


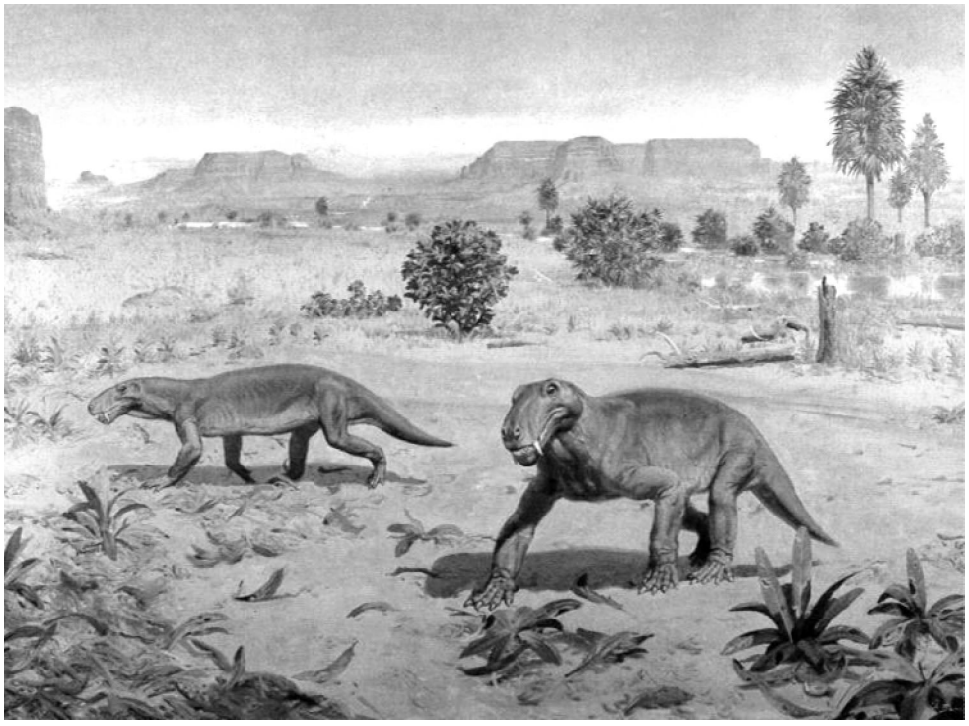
Gorgonopsia



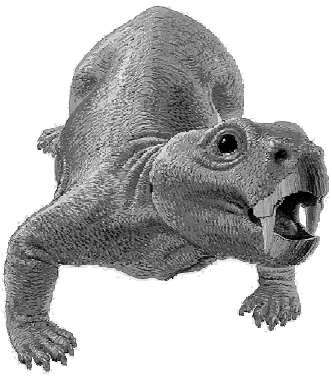


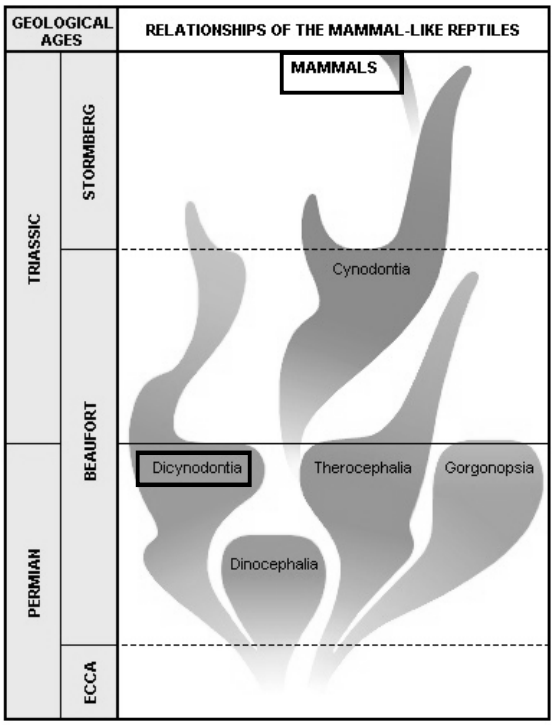
Gorgonopsia

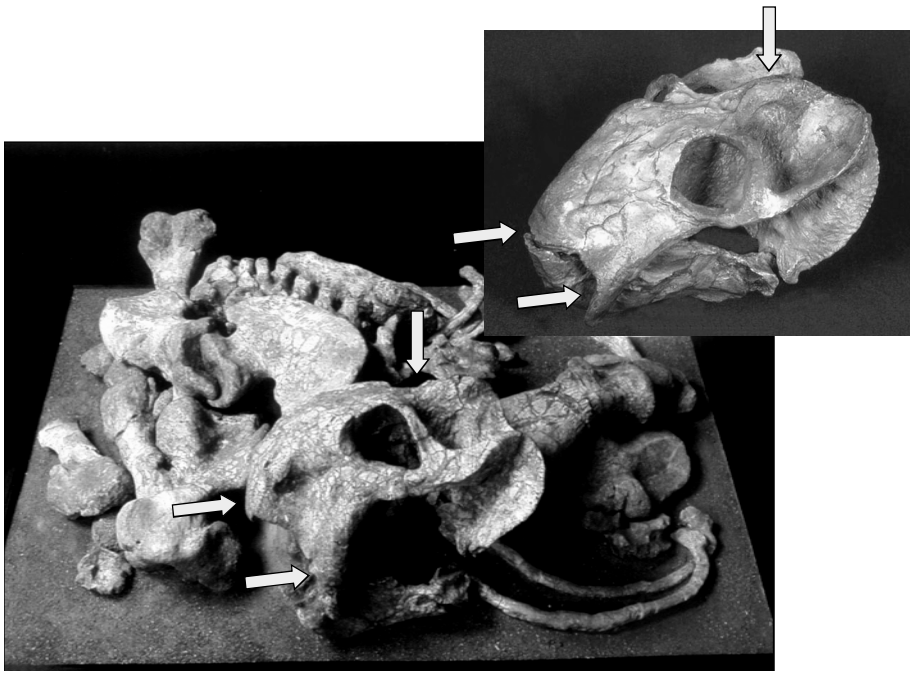


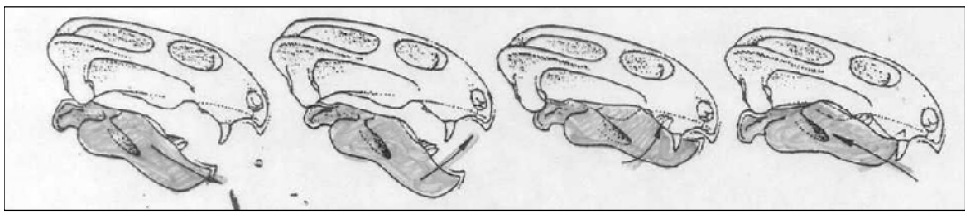


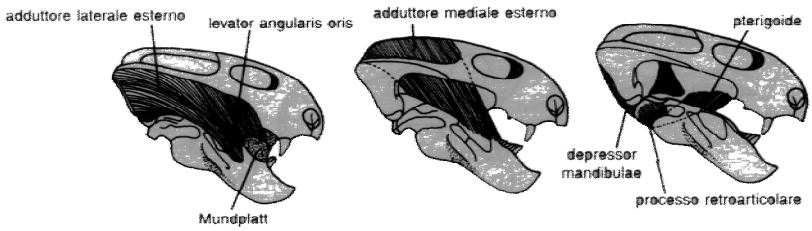
Dicinodonti



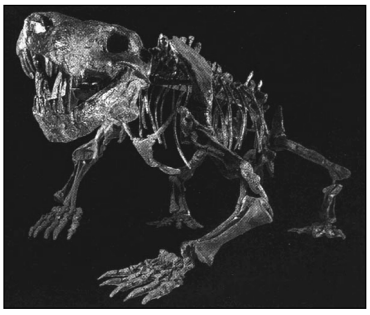


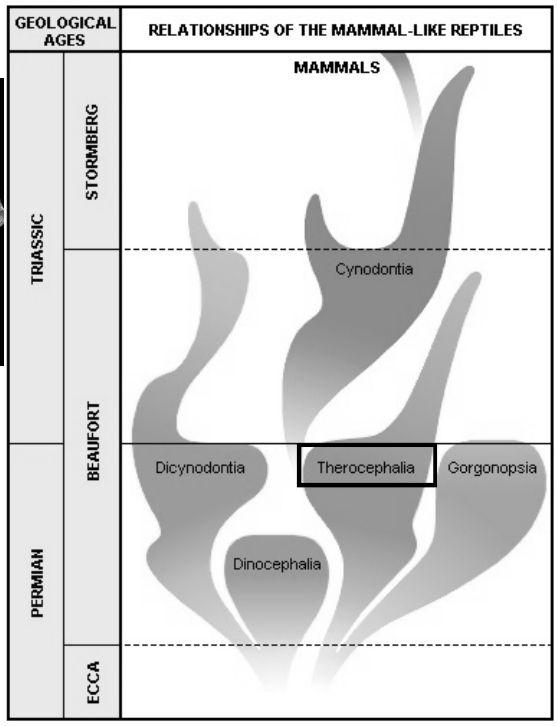




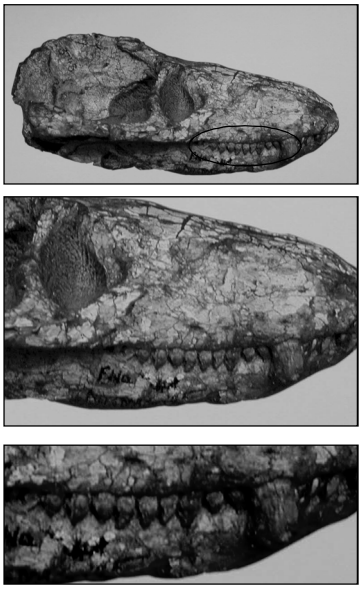

adduttore laterale esterno
levator angularis oris
adduttore mediale esterno
pterigoide
depressor mandibulae
processo retroarticolare
Mundplatt

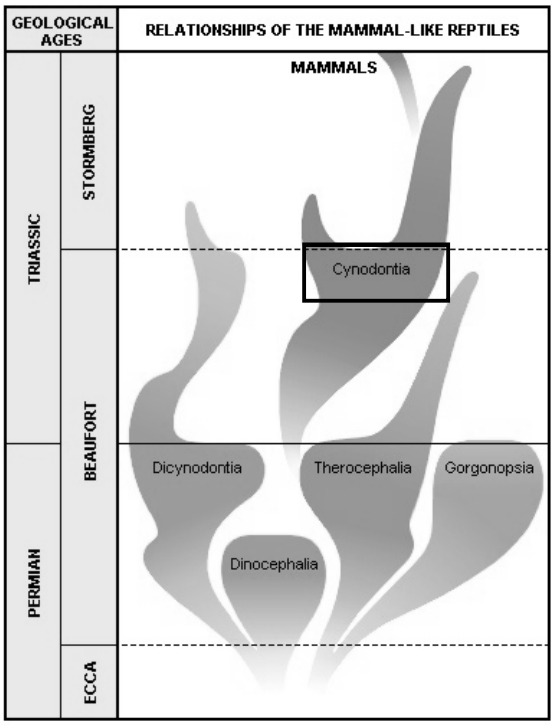
Terocefali




GEOLOGICAL AGES
RELATIONSHIPS OF THE MAMMAL-LIKE REPTILES
TRIASSIC
PERMIAN
STORMBERG
BEAUFORT
ECCA
MAMMALS
Cynodontia
Dicynodontia
Therocephalia
Gorgonopsia
Dinocephalia

Cinodonti





CYNODONTIA

Il gruppo più evoluto

Rettili	Mammiferi
1. Basso **TM** (**T**asso **M**etabolico)	Alto **TM**
2. Cervello *piccolo*	Cervello *grande*
3. Senza placenta	Placenta, marsupio, ecc.

2 e **3** acquisiti probabilmente dal Cretacico (Superiore);
1 dal Triassico.

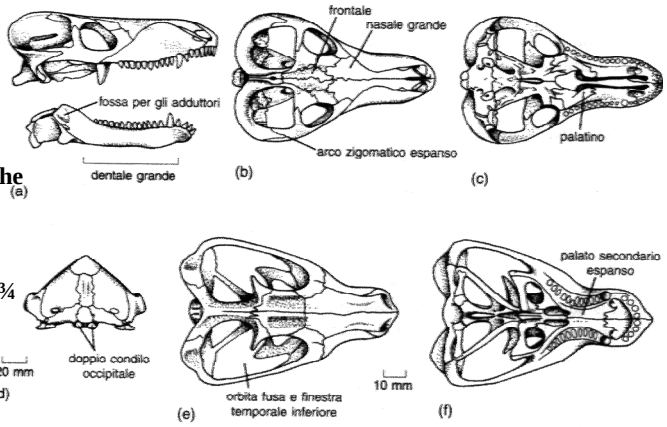
TM Mammiferi = 8 volte **TM** di un Rettile di pari dimensioni

TM è alla base dei cambiamenti scheletrici

TM legato a:
- Alimentazione
- Respirazione
- Circolazione

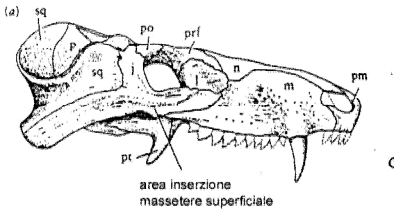
IL TREND E' DOCUMENTATO NEI CYNODONTIA

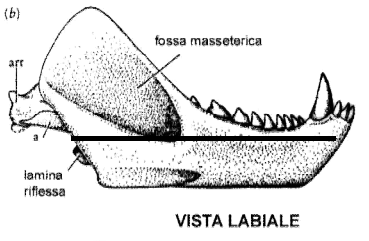
Cynodontia

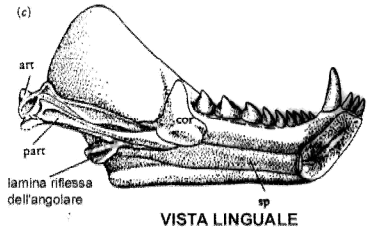


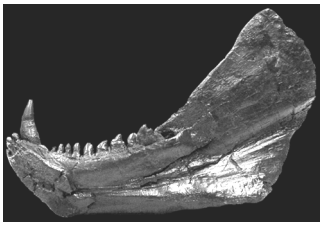
- ✓**Aumento arcate zigomatiche**
- ✓**Fossa per adduttori**
- ✓**Sviluppo del dentale oltre ¾ della mandibola**
- ✓**Sviluppo osso nasale**
- ✓**Palato secondario quasi completo costituito da mascellare e palatini**

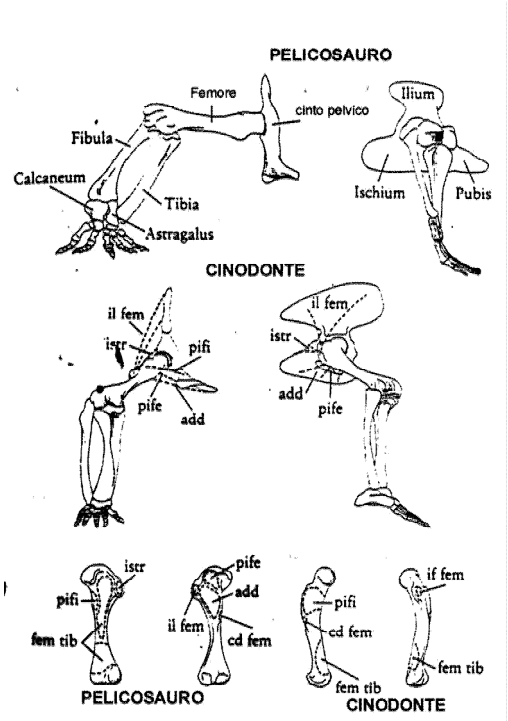
Cynognathus

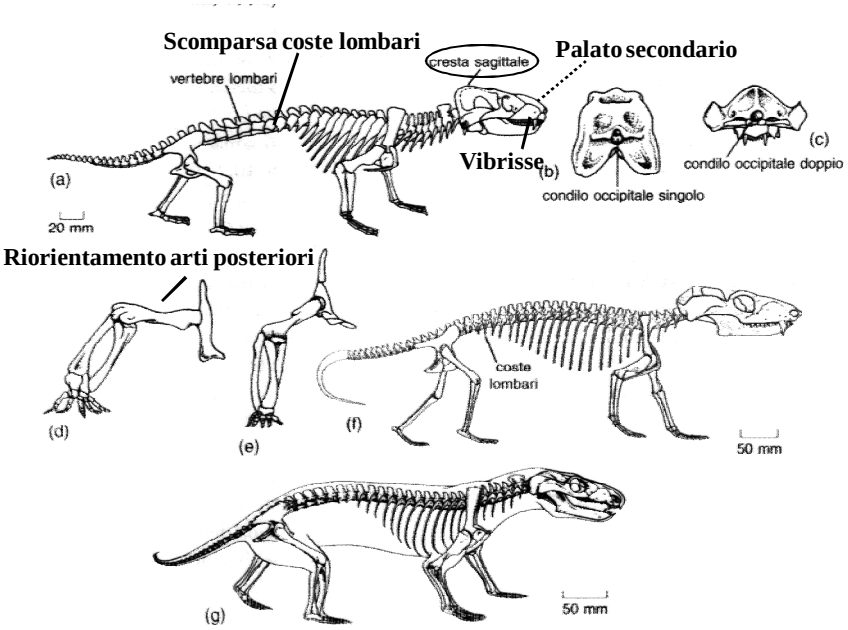


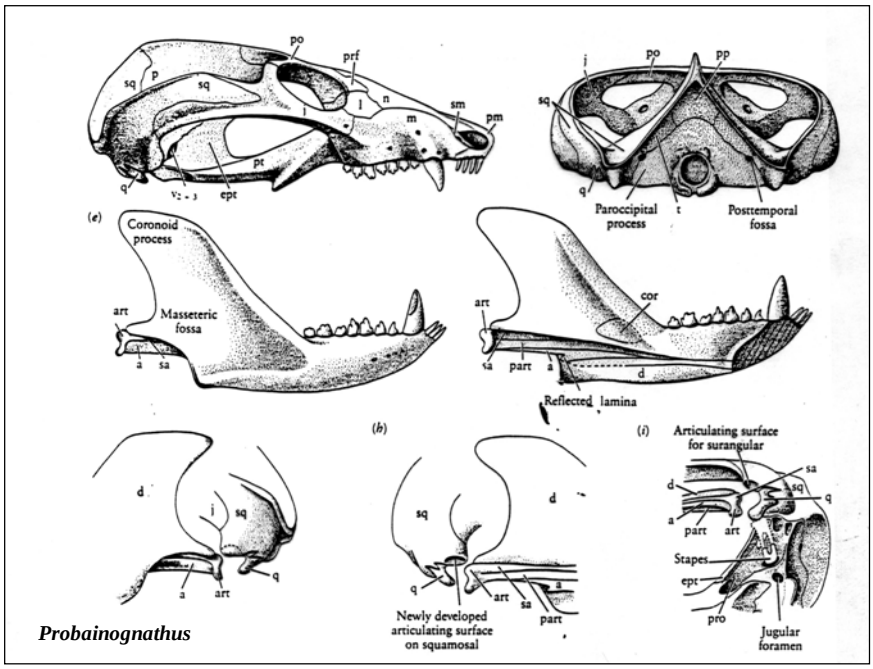







PELICOSAURO
Femore
cinto pelvico
Ilium
Fibula
Calcaneum
Tibia
Astragalus
Ischium
Pubis
CINODONTE
il fem
istr
pifi
pife
add
il fem
istr
add
pife
istr
pifi
fem tib
pife
add
il fem
cd fem
pifi
cd fem
fem tib
if fem
fem tib
PELICOSAURO
CINODONTE

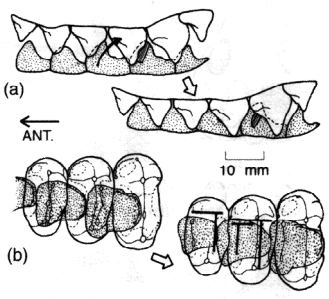

Scomparsa coste lombari
Palato secondario
cresta sagittale
vertebre lombari
Vibrisse
(a)
20 mm
(b)
condilo occipitale singolo
(c)
condilo occipitale doppio
Riorientamento arti posteriori
(d)
(e)
(f)
coste lombari
50 mm
(g)
50 mm



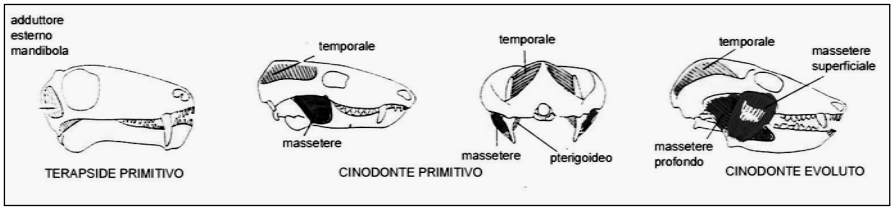
Probainognathus

Occlusione dentale

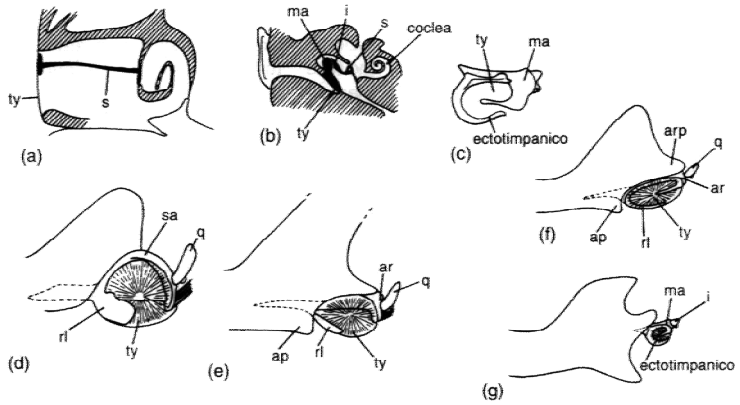
a) Chiusura delle mandibole e occlusione
b) Vista occlusale delle stesse due posizioni



Evoluzione della muscolatura mandibolare

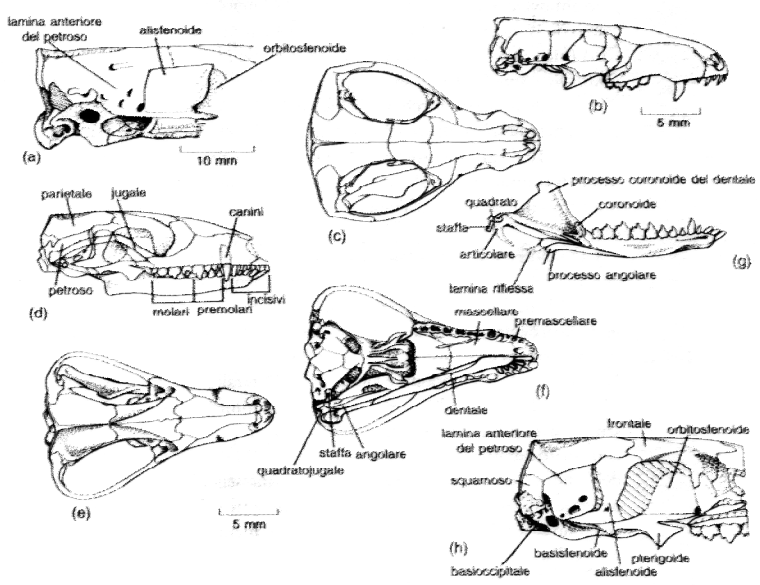


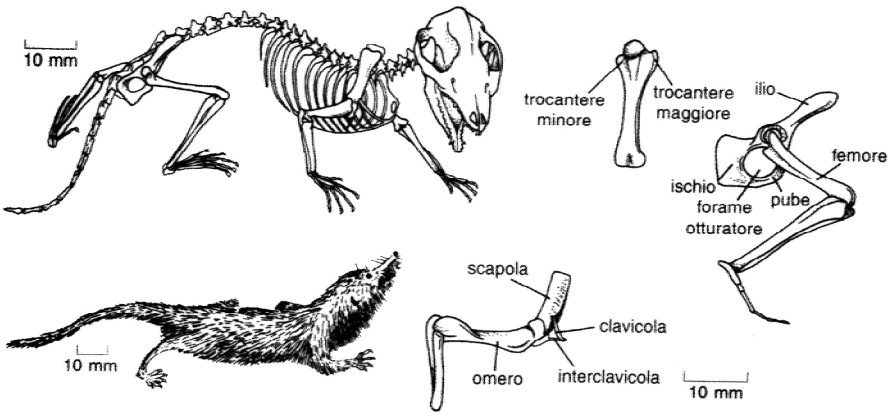
Struttura dell'orecchio



a) rettile, **b)** e **c)** mammifero, **d)** cinodonte primitivo, **e)** cinodonte evoluto, **f)** mammifero primitivo, **g)** mammifero terio attuale

Mammiferi primitivi





Megazostrodon ***Morganucodon***