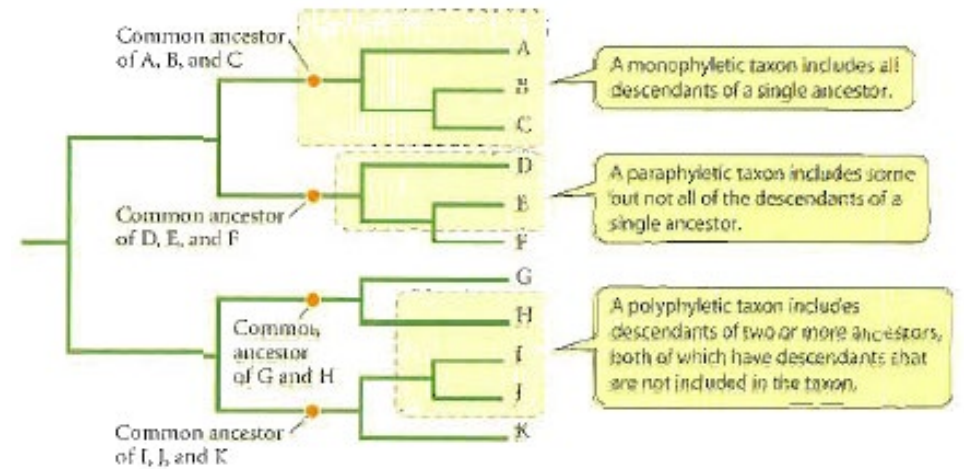
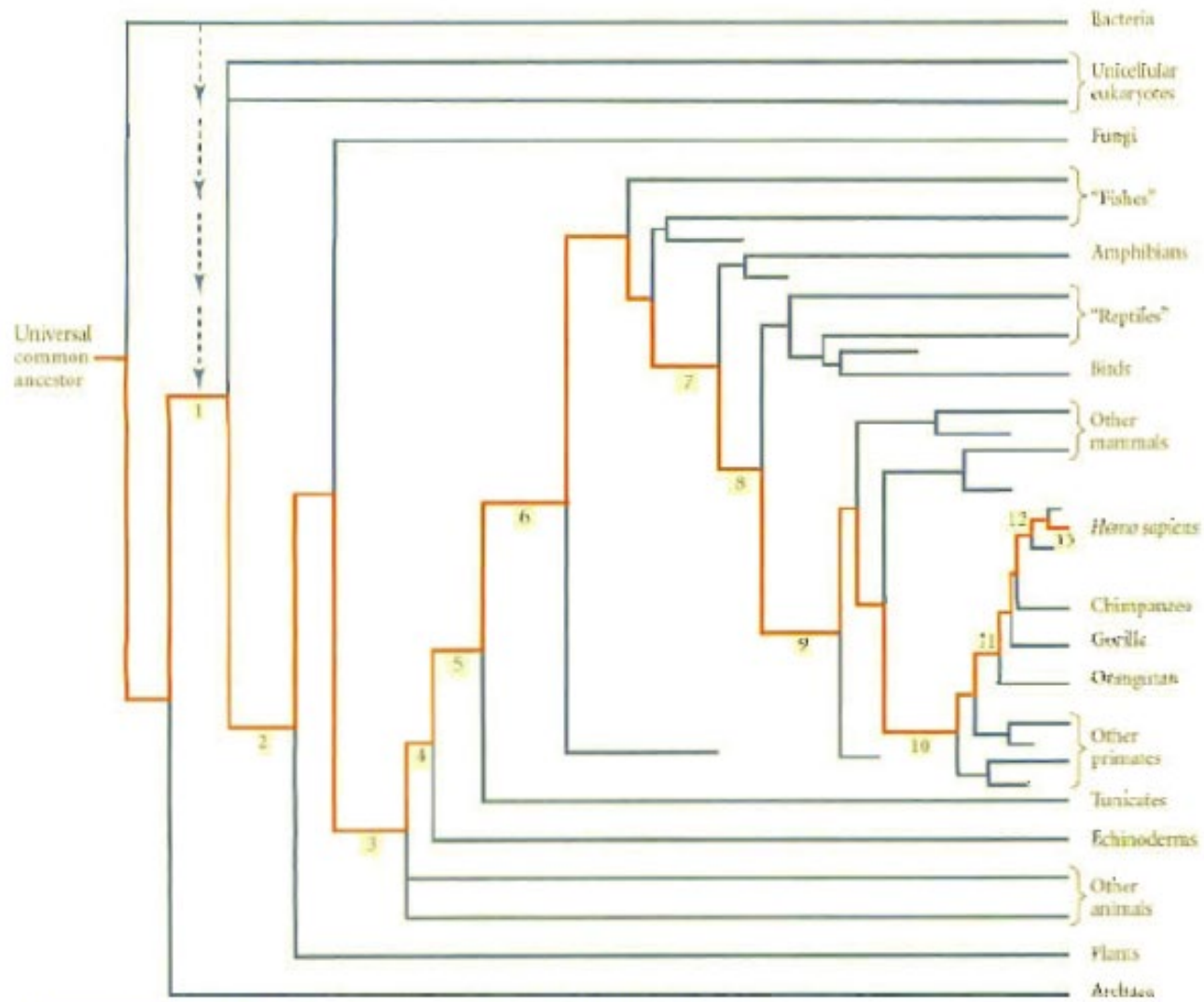
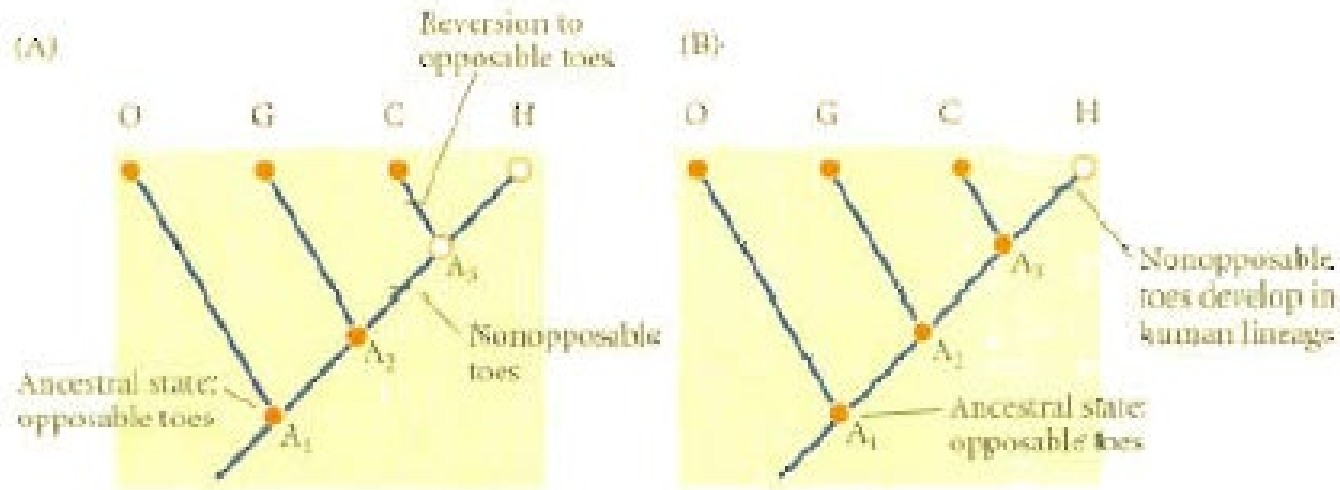


# 3. Evrim Modelleri





**Ancestral condition**

H	Humerus
U	Ulna
R	Radius
C	Carpals
M	Metacarpals
S	Sesamoid (cartilage bone)
1-5	Digits

Early amphibian

**Adapted for swimming**

Ichthyosaur (extinct)  
(additional segments in digits which were enclosed in flipper)

Porpoise  
(flipper convergent with ichthyosaurs)

**Adapted for flying**

Bird  
(digits lost and fused)

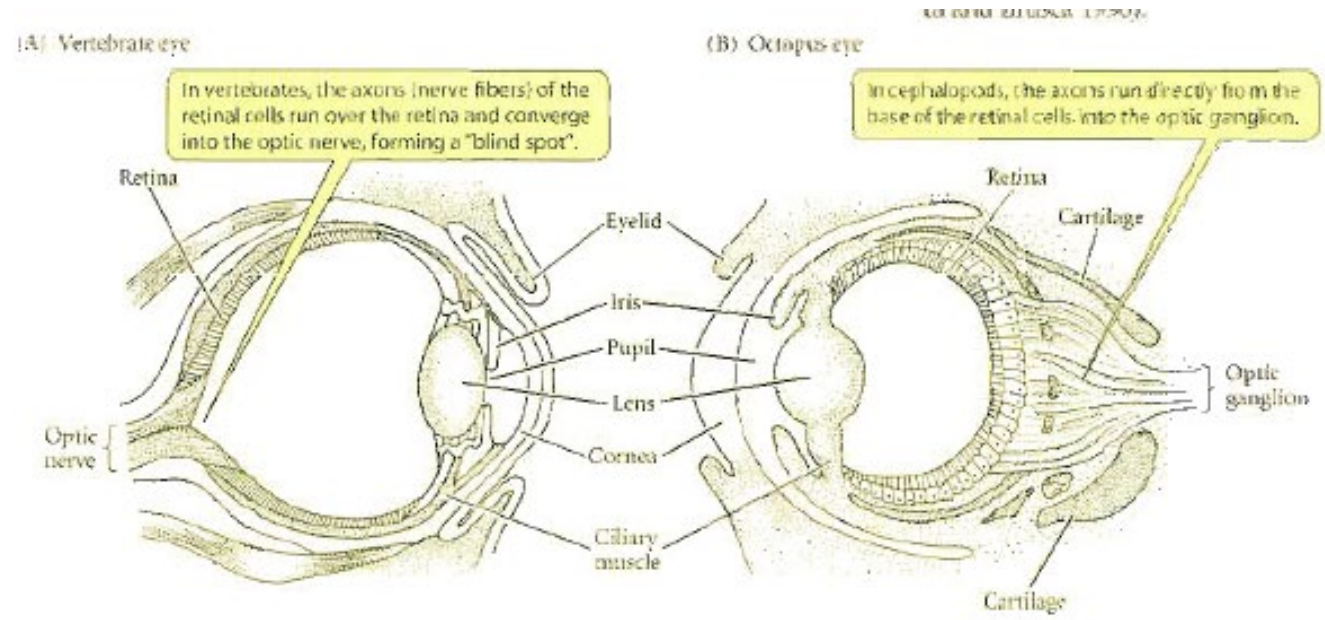
Bat  
(long digits support flight membrane)

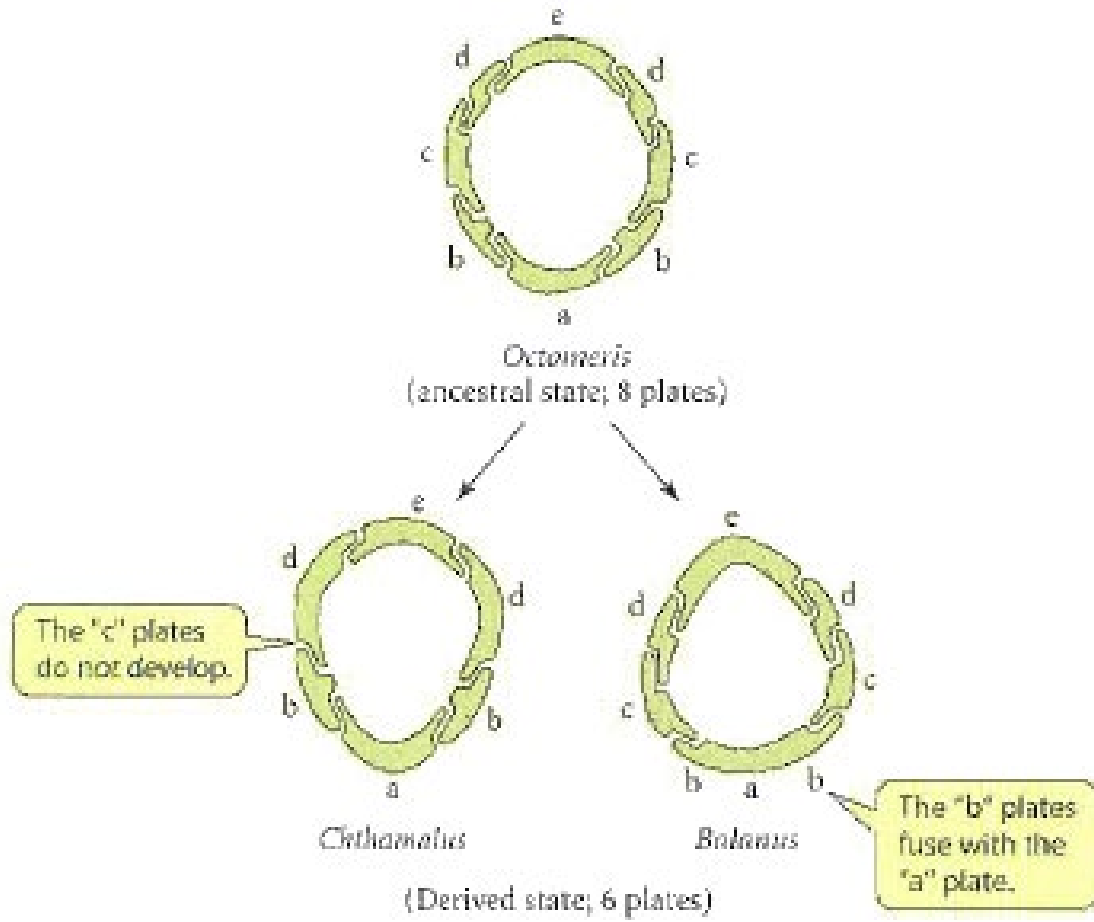
Pterodactyl  
(fourth finger supported flight membrane)

**Horse**  
(four digits lost; other bones fused)

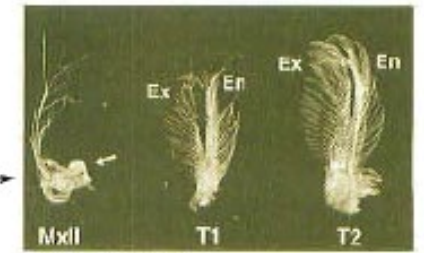
**Mole**  
(stout, broad bones and claws adapted for digging)

**Human**  
(opposable thumb; flexible fingers for grasping)

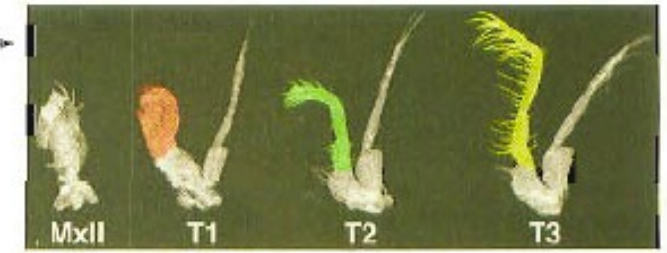




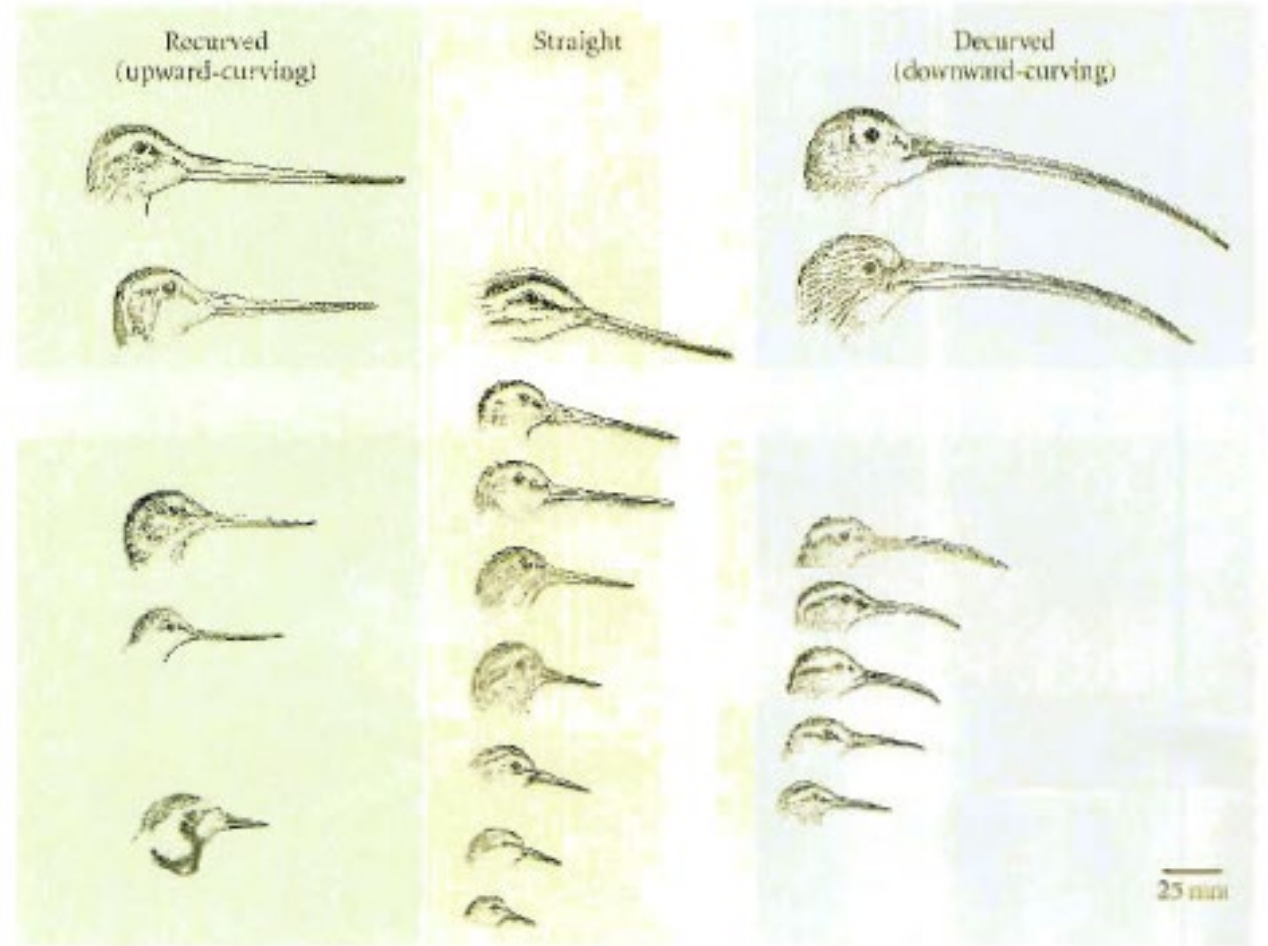
Order	Number of maxillipeds	Head	Thorax
		H1 H2 H3	T1 T2 T3 T4
Branchiopoda			
Anostraca	0	[ ][ ] [ ]	[ ][ ][ ][ ]
Leptostaca	0	[ ][ ] [ ]	[ ][ ][ ][ ]
Mysida	1	[ ][ ] [ ]	[ ][ ][ ][ ]
Maxillopoda			
Copepoda	1	[ ][ ] [ ]	[ ][ ][ ][ ]
		Mesocyclops	



*Paramekalia* (legs)



*Mysidium* (maxillipeds)



In Passifloraceae, stipules are modified into tendrils.



In Bignoniaceae, terminal nodules of the tripartite leaves are modified into tendrils and suckers.



In Ranunculaceae, leaves are modified into tendrils.



In Rubiaceae, inflorescence petioles are modified into hooks.



*Kuchinosaurus*



Most "reptiles," such as this extinct lizard, have homodont (uniform) teeth that are not individualized.

Elephant shrew



Typical mammals, such as the elephant shrew, have heterodont, individualized teeth, differentiated into incisors, canines, premolars, and molars.

*Prozeuglodon*



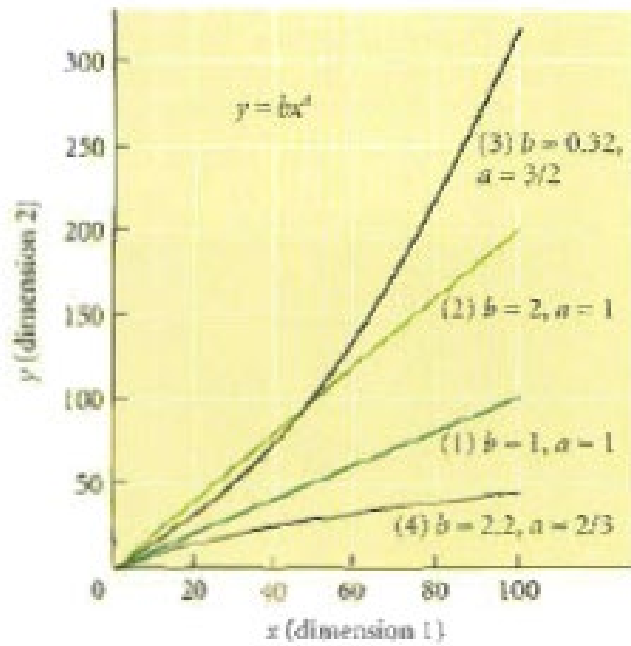
In this primitive whale from the Eocene, differentiation of the teeth has been reduced.

Dolphin

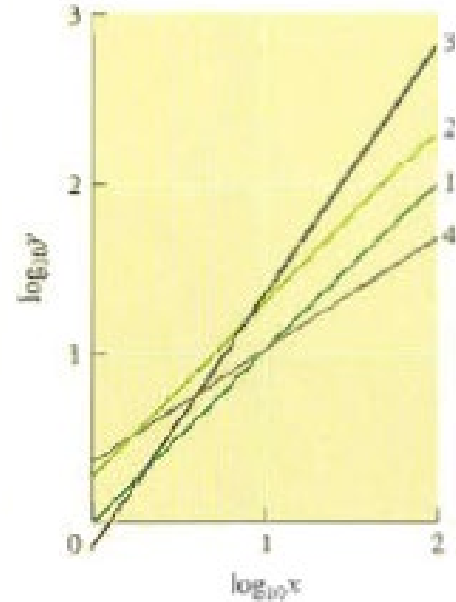


In modern toothed cetaceans such as dolphins, the teeth are again homodont and no longer individualized.

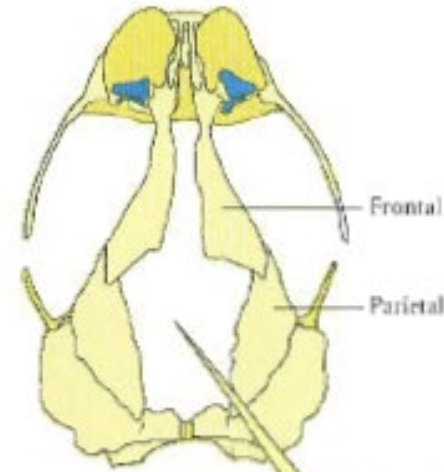
(A) Arithmetic plots



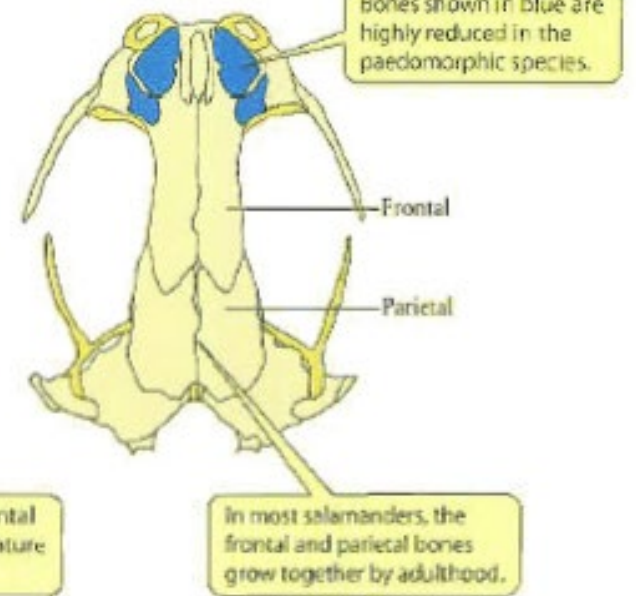
(B) Logarithmic plots



(A) Paedomorphic (*Thorius*)

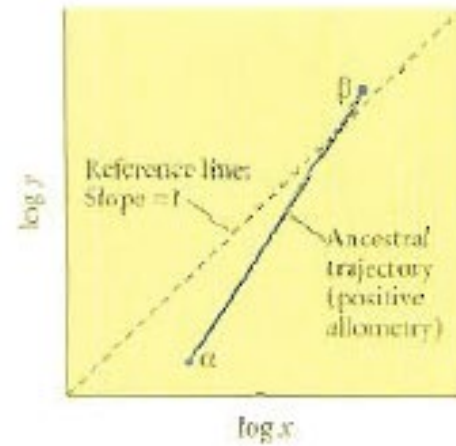


(B) Nonpaedomorphic

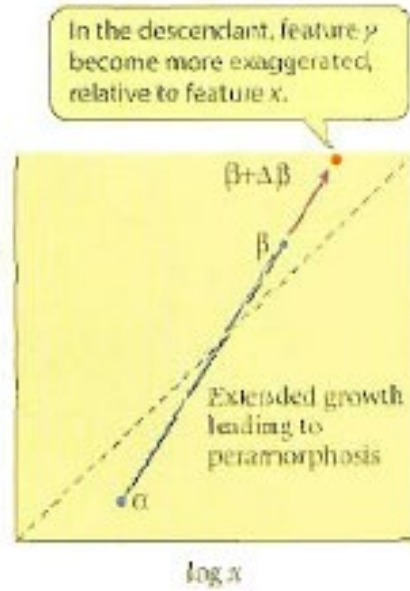




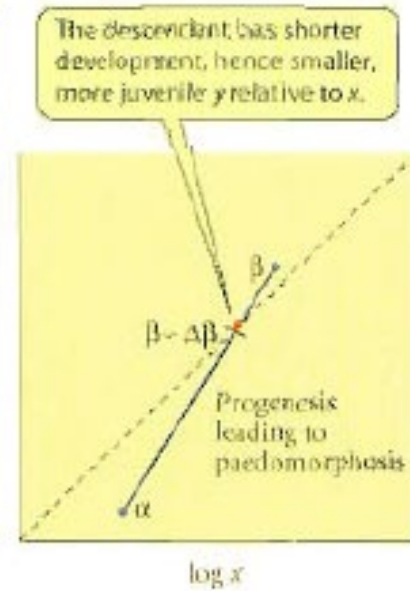
(A)



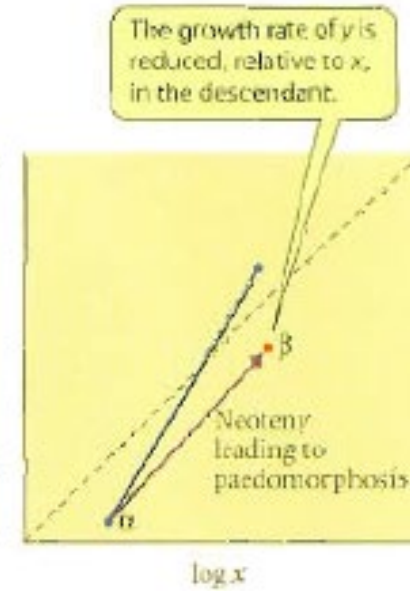
(B)

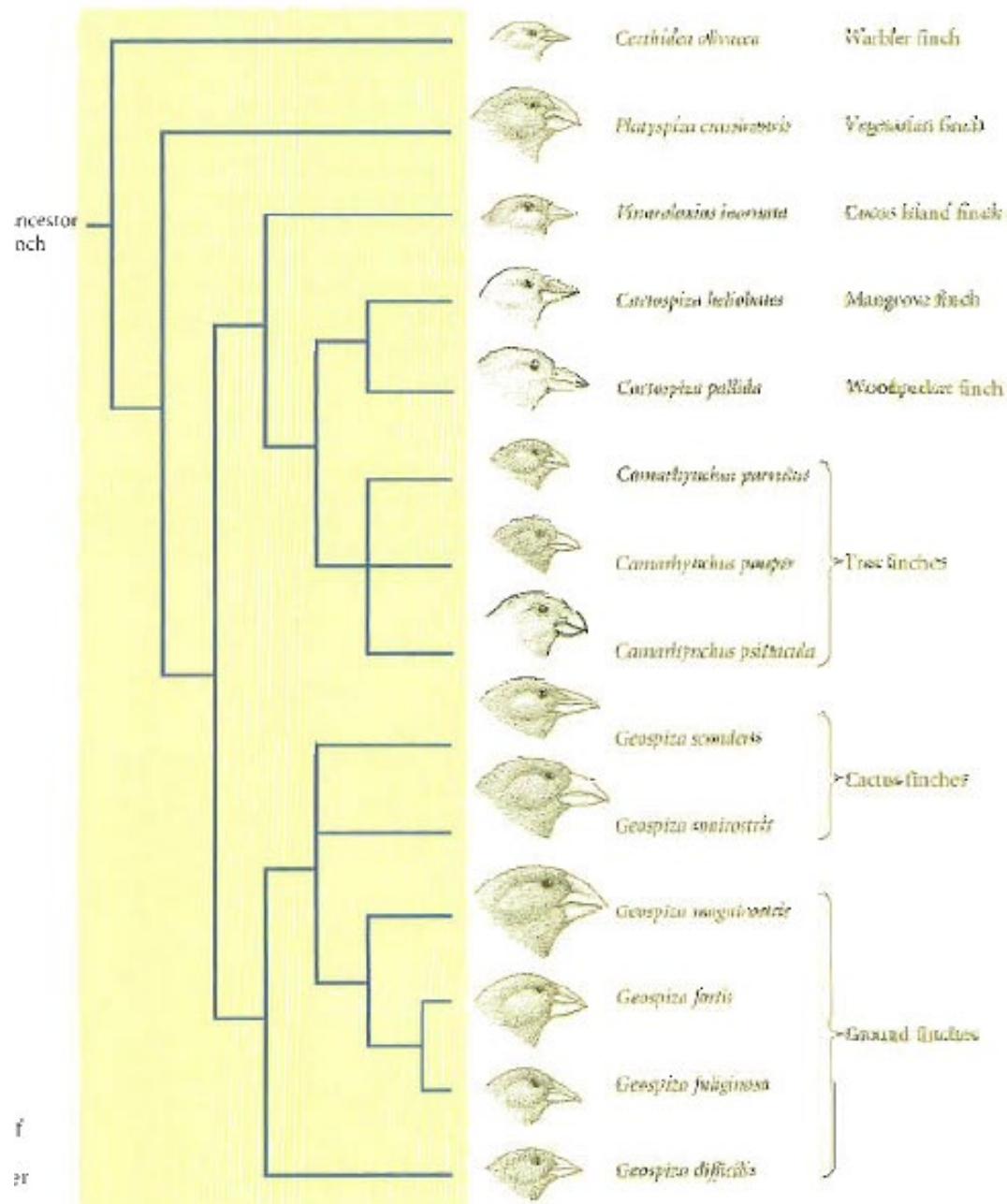


(C)



(D)





Reference: Futuyma, D. J. (2005). Evolution. Sinauer & Associates. Inc., Sunderland, Massachusetts, 226-243.

(A) *Argyroxiphium sandwicense*



(B) *Wilkesia hobsdyi*



(C) *Dabaotia meuziesii*

