

Affinities of Prototheria

DEGREE-I

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Prototheria are a group of mammals that lays egg and share most characters with Sauropsida (reptiles and birds). Though they show a little advancement over them, which rings them nearer to the mammalian kin. Prototherians show following chief affinities with other group of animals.

1. Reptilian affinity:

No definite connecting link is known between reptile and mammal, but enough evidences are available to show that mammals had originated from reptilis. Monotremes and living reptiles have following common characters:

1. Presence of cloaca
2. Pterygoïds, epipterygoïds, dumb-bell shaped prevomers and ring-like tympanic bones —large
3. No alisphenoids and tympanic bullae
4. Vertebrae without epiphyses and
5. Cervical ribs present
6. Thoracic -ribs — single -headed
7. T-shaped interclavicle present
8. Large coracoïds and plate-like precoracoïds
9. Acetabulum of echidna perforated
10. Anterior abdominal vein or its mesentery present
11. No corpus callosum
12. Body temperature variable
13. Cochlea with lagina
14. Ureters open into a urinogenital sinus
15. Testes abdominal

16. Penis simple conducts only sperms
17. Oviducts separately open into cloaca
18. No uterus and vagina
19. Females oviparous
20. Eggs large, cleidoic
21. Newly hatched young provided with a caruncle and an egg-tooth

II. Avian affinity:

The relationship between prototherian and birds does not have solid proofs. Similarity of characters between aves and prototheria are chiefly due to common ancestry. The important resemblances are:

1. Beak shape of Platypus resembles with birds
2. No Teeth
3. webbed feet
4. Presence of obliterated sutures of skull
5. spur in tarsal region
6. Oil gland present

III. Mammalian affinity

Prototherians are essentially mammals, since they possess the following typical mammalian characters:

1. Hairs on body
2. Pinnae present
3. Glandular skin with sweat and sebaceous glands
4. Diaphragm dividing body cavity
5. Chondrocranium is typically mammalian

6. Dicondylic skull
7. Middle ear cavity has 3 ear ossicles
8. cervical vertebrae - 7
9. Sternum is segmented
10. Caecum present between two intestines
11. 4-chambered heart
12. Only left aortic arch present
13. RBC small, circular and non-nucleated
14. Presence of corpora quadrigemina
15. Presence of milk glands

IV. Peculiar characters of Prototheria:

1. Presence of tarsal spurs in males
2. Milk glands modified sudorific glands and devoid of teats
3. Temporary abdominal mammary pouch in female during breeding season
4. Teeth replaced by horny plates in adults
5. Jaws elongated into a beak
6. Marsupial or epipubic bones present
7. Body temperature varies from 25° to 28°C
8. Right ovary smaller and non-functional

V. Conclusions:

Blending of reptilian and mammalian characters suggests an intermediate stage between the two groups. Prototherians Possess primitive, degenerate and highly specialized characters indicating an early separate side-line from the main mammalian stock. This validates their placement in a separate subclass

Prototheria from the rest of the mammals. Prototherians show that reptiles, birds and mammals together constitute a more homogeneous natural group than Ichthyopsida (fishes + amphibians) or even the superclass Pisces.

Finally, it is concluded that monotremes originated as an offshoot from the main line of mammalian evolution and retained all those characters through out their evolution.