

## **Affinities of Monotremata:**

### **Reptilian Affinities:**

(1) Presence of ectopterygoid (Echidna pterygoid) in skull.

(2) Presence of prevomer.

(3) Zygomatic arch is perforated by a temporal canal, which is believed to be post-temporal fossa of reptiles.

(4) At the posterior end of palate, a pair of bones of doubtful nature are present. According to many they represent some reptilian skull bone.

(5) Ribs are single headed (excepting cervical ribs).

(6) Cervical ribs are present.

(7) Coracoid is well developed and plate like, and epicoracoid is present.

(8) 'V- shaped interclavicle.

(9) Epipubic bone is present.

(10) Acetabulum is perforated.

(11) Absence of epiphysis in the vertebrae except in the tail region of platypus.

(12) Corpus callosum is absent and anterior commissure is well-developed.

(13) Ventral abdominal vein is present.

(14) Body temperature is not constant.

(15) Cloaca is present and it is shallow.

(16) Testis is abdominal.

(17) The median penis is composed of a corpus spongiosum and a corpus fibrosum, and bears a groove that transmits spermatozoa but not urine like other mammals.

(18) Presence of different glands in the oviduct.

(19) Oviparous and meroblastic segmentation.

(20) No uterine gestation.

## **Remark:**

Presence of strong reptilian features in Monotremata speaks of its primitiveness. These primitive mammals have failed to cope up with many of the evolutionary transformations which culminated in the establishment of better characteristics in higher mammals.

## **Avian Affinities:**

(1) Shape of the beak in platypus resembles birds.

(2) Teeth are absent.

(3) Presence of webbed feet.

(4) Sutures of the skull are obliterated.

(5) Presence of spur in the tarsal region.

(6) Presence of oil glandy

## **Remark:**

The relationship between monotremes and birds does not stand on a solid ground. The converging characters noticed in them are due more to the fact that both possess common reptilian ancestry.

## **Mammalian Affinities:**

- (1) Presence of hair, mammary glands, oil gland and sweat glands.
- (2) Double occipital condyles.
- (3) Single jaw bone, dentary.
- (4) Presence of palate.
- (5) Jaw attachment is craniostylic.
- (6) Sternum is segmented.
- (7) Cervical vertebrae are seven.
- (8) Circulatory system is typically mammalian.
- (9) Diaphragm is present.

(10) Presence of proportionately large ear ossicles.

(11) Cochlea is slightly coiled.

(12) Cerebellum is well-developed.

(13) Presence of corpora quadrigemina.

(14) Fertilization is internal.

### **Remark:**

Though monotremes show affinity with non-mammalian groups, the above-mentioned characters unequivocally speak of close and firm affinity with mammals.

### **Affinities with Marsupials:**

(1) Structure of skull.

(2) Presence of Marsupial bone.

(3) Mandibular inflection.

(4) General contour of brain.

(5) Bulbourethral gland.

(6) Resemblance between foetal monotreme and marsupial.

(7) Mode of milk secretion.

**Remark:**

Considering the similarities, Gregory (1947) has proposed that monotremes originated from some pre-marsupial stock and their present features are due to degeneration, neoteny and specialization. He has included both monotremes and marsupials in a subclass 'Marsupiontia'. But the most accepted view is that monotremes originated from the principal line of evolution of mammals.