

ADAPTIVE RADIATION IN MAMMALS WITH REFERENCE TO LOCOMOTORY APPENDAGES

[Adaptation to environment is one of the most obvious and at the same time remarkable qualities of living organism. It sums up nearly the whole result of evolution]

Q.What do you mean by adaptive radiation?

In evolutionary biology, adaptive radiation is a process in which organisms diversify rapidly from an ancestral species into a multitude of new forms, particularly when a change in the environment makes new resources available, creates new challenges, or opens new environmental niches. Starting with a recent single ancestor, this process results in the speciation and phenotypic adaptation of an array of species exhibiting different morphological and physiological traits.

Q.State the law of adaptive radiation with special reference to mammals.

According to Osborn (1902)—

- i) Each isolated region, if large and sufficiently varied in its topography, soil, climate and vegetation will give rise to it a diversified fauna.
- ii) The larger the region and the more diverse the conditions, the greater the variety of mammals which will result.
- iii) From a primitive stem form radii go out in four diverse directions, the adaptations being mainly those of limbs and feet- also teeth, but that of the teeth and feet do not necessarily parallel.
- iv) Adaptive branching more accurately expresses what takes place in the orders and families, which do not radiate in all directions, nor always in straight lines, but in branches that often turn and change their direction.

The impelling cause of adaptive radiation are the need of food and the need of safety . They all lead to 4 general directions—cursorial (speed wld becom, fossorial, scansorial and volant mode adaptations.

Q.Adaptive radiation in mammals in respect of locomotory appendages.

(a)Arboreal descent—

- i) The marsupials are either all arboreal today or give evidence in their anatomy of arboreal descent. Striking arboreal feature grasping toe or hallux on the hind feet. This being offset, oppose usually the 4th digit, thus forming an admirable prehensile organ whose grasp of a branch it is difficult to loosen.
- ii) The terrestrial kangaroos have become adapted in a wonderful way for speed over the earth's surface and among other things have entirely lost this grasping hallux, as reduction of the lateral digits, much or little , invariably accompanies *evolution for speed*.

The atrophied organ therefore is lost forever, its old time function may be secondarily required by other organs should the need arise.

(b)Cursorial descent—

- i) The propelling organs in cursorial forms are the limbs exclusively, so that aside from the resistance-lessening contour, this adaptation concerns itself chiefly with their modification of which the first is the loss of general utility.
- ii) The extended hands pull the body forward in running.

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During **Mesozoic era**, the age of reptiles (dinosaurs), mammals were small, generalised and rare. By the **end of Mesozoic** or beginning of Coenozoic, the dinosaurs vanished and mammals suddenly expanded into varied evolutionary patterns. Early in **Cretaceous period**, placental mammals became distinct from marsupials.