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# How the Form and Function of Postcranial Skeleton in Mammals Reflect their Ecological Niche and Locomotory Habits?

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## Editorial

Current mammal's diversity is the result of several radiations related to the invasion of new ecological niches. The niche of a species is determined by the habitat in which it lives, its habitat requirements and its behavioral adaptations. All in all, allow a species to persist and produce offspring. The mammal diverse groups show great morphological differentiation of the postcranial anatomy. Postcranium is referred to the whole or a part of the skeleton except skull and mandible. It consists of four structural and functional subunits including vertebral column and thorax, pectoral girdle (scapula and clavicle) and forelimb, pelvic girdle (innominate bone and sacral bone) and hindlimb, and postcranial muscular system. Although the postcranial skeleton of mammals reflects their ecology and locomotory habits, but the interplay between postcranial diversity and ecological niche as well as phylogenetic influences has received relatively little attention. Most studies on the locomotory apparatus in mammals have been restricted to the study of the limb long bones for determination of morphological variations in skeletal system during growth [1-3].

Few studies have carried on for mammal's identification (especially small mammals including the members of the orders Chiroptera, Lagomorpha, Rodentia and Soricomorpha) at lower taxonomic levels based on their postcranial skeleton features. In this regard, difficult procedures of skeleton preparation for study, the effects of the adaptation factors on skeleton morphology and anatomy, as well as inter and intra-species polymorphism may be the reasons of ignoring these characters in taxonomic and phylogenetic inferences [4].

Nevertheless, in some literatures, notes on the form and function of mammalian postcranial skeleton which reflect their ecological niche and locomotory habits have been mentioned. For instance, fossoriality is strongly indicated by the greater robusticity in the long bones of the fore and hind limb whereas, elongation of metatarsals and femur are signs of cursoriality in many mammals. The laterally expansion of atlantal transverse processes suggests a developed rotational capability of the head. The transverse processes of caudal vertebrae with broad lateral wings, reflects the well-developed basal musculature of the tail [3,5].

In conclusion, functional and evolutionary importance of several morphological variations in postcranial skeleton is still unknown. Some species despite having different size in their skeletal components, show lots of morphological similarities. Growth and developmental rate and pattern in bones show great variation and diversification from one species to another. Furthermore, individual's variations in skeletal growth during sexual maturity are important. More studies on the skeletal features, the relation between postcranial skeleton morphology and the life style, locomotory habits, ecology and habitat structure are needed.

Hence, examination of various morphological and morphometric characters of the skeletal components under a stereomicroscope and/or a hand lens, drawing the diagnostic taxonomical characters using a drawing tube connecting to a stereomicroscope, discarding the polymorphic characters from the primary list of the osteological and myological characters and recognition of valuable characters, comprehensive evolutionary comparative study on different characters and finally preparing identification keys for specimens determination or reconstructing the life history of extinct mammals based on the postcranial features seem to be useful identification tools in paleozoology and archeozoology studies as well as in identifying skeletal remains in pellets of birds' of prey or for deposited specimens in museums.

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