

HERBIVORY IN LATE PALEOZOIC AND EARLY MESOZOIC AMNIOTE TETRAPODS

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The rich faunas of Late Carboniferous and Early Permian tetrapods from Euramerica mark the first appearance of terrestrial herbivorous vertebrates. The oldest known herbivores are the non-mammalian synapsids of the genus Edaphosaurus. Evidence for their herbivory is not restricted to the structure of the dentition, but also includes non-dental features such as the structure of the skull and the large, barrel-shaped rib cage. Using dental and non-dental attributes, it is possible to identify other herbivores of Late Carboniferous and Early Permian age. These include the medium-sized to large caseid synapsids and the large captorhinids with multiple tooth rows. Other potential consumers of plants such as omnivores and opportunistic herbivores cannot be definitely identified on the basis of craniodental features. It is not possible to determine precisely the feeding preferences of such forms as bolosaurids and the enigmatic diadectids, which have crushing dentitions and show some tooth wear.

Three major groups of Late Permian amniotes, pareiasaurian parareptiles and dicynodont and some dinocephalian synapsids, were probably herbivorous. As common, geographically widespread, and taxonomically diverse primary consumers, these herbivores, especially dicynodonts, became an integral part of the emerging continental ecosystems of "modern" aspect.

Triassic continental tetrapods show a diversity of taxa with different craniodental features indicative of herbivory. There exists evidence for six major types of food processing in Triassic herbivores. One particularly diverse clade of non-mammalian synapsids, the gomphodont cynodonts, is characterized by complex, mammal-like tooth-to-tooth occlusion. Most herbivorous tetrapods of Triassic age were presumably generalized browsers that fed within one meter above the ground. During the Late Triassic, the first high-browsing herbivores appeared in the form of sauropodomorph dinosaurs. They apparently employed gastric mills for food processing whereas contemporaneous ornithischian dinosaurs mainly relied on mastication.