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Masticatory musculature of Asian taeniolabidoid multituberculate mammals

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The backward chewing stroke in multituberculates (unique for mammals) resulted in a more anterior insertion of the masticatory muscles than in any other mammal group, including rodents. Multituberculates differ from tritylodontids in details of the masticatory musculature, but share with them the backward masticatory power stroke and retractory horizontal components of the resultant force of all the masticatory muscles (protractory in Theria). The Taeniolabididae differ from the Eucosmodontidae in having a more powerful masticatory musculature, expressed
by the higher zygomatic arch with relatively larger anterior and middle zygomatic ridges and higher coronoid process. It is speculated that the bicuspid, or pointed upper incisors, and semi-procumbent, pointed lower ones, characteristic of nontaeniolabidoid mdtitliberculates were used for picking-up and killing insects or other prey. In relation to the backward power stroke the low position of the condylar process was advantageous for most multituberculates. In extreme cases (Sloanbaataridae and Taeniolabididae), the adaptation for crushing hard seeds,
worked against the benefit of the low position of the condylar process and a high condylar process developed. Five new multituberculate autapomorphies are recognized: anterior and intermediate zygomatic ridges: glenoid fossa large, flat and sloping backwards (forwards in rodents), arranged anterolateral and standing out from the braincase; semicircular posterior margin of the dentary with condylar process forming at least a part of it; anterior position of the coronoid process; and anterior position of the masseteric fossa. The postorbital process in those ultituberculates
studied is situated on the parietal and the orbit is very large.

Key words: Multituberculata, Mammalia, Cretaceous, masticatory musculature.

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