

Docodonta: The Non-Mammal Mammals

GEOL 204 The Fossil Record

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Geological Range

The Docodonta were a group of mammals that lived during the Mesozoic Era as seen in **Figure D**. Docodonts were first found in the Mid Jurassic in the Bathonian of the UK and Russia. During the Late Jurassic many fossils were found across Laurasia. It would further increase into the Cretaceous when another taxon was found in Russia. (Panciroli et al., 2)

Distinctive Characteristics and Phylogeny

Figure B: Docodonts were distinctive from other mammalian forms due to their unique molar structure. This figure depicts multiple diagrams of upper and lower molars of the Docodon. These molars were unique from other mammaliaform, in that they were capable of both shearing and grinding their food.

Phylogenetic relationships have been able to be made to Docodon solely based on the structure of the molars. - Docodonta also had very unique living conditions as well, fossils indicate they were aboreal as well as semi aquatic creatures. (Panciroli et al., 2)

Geographic Range

Docodonta was one of the first forms of mammals to appear throughout Eurasia. One of the oldest fossil sites was discovered in the U.K and one of the most recent sites was discovered in China. (Panciroli et al., 2-3)

Ancestral Relations

Figure E. The phylogenetic tree demonstrates that the clade of Docodonta is most closely related to *Tikitherium*, *Woutersia*, and *Delsatia*. (Panciroli et al., 16)

Speciation

Figure G. The *Castorocauda* is a species of Docodonta that was semi-aquatic and burrowed. The holotype is the first fossil found of this species and is used to identify other fossils as this specimen. This species was very similar to that of the modern-day beaver.

Figure H. The *Agilodocodon* is a species of Docodonta that is a little more unique. Rather than being semi-aquatic, it is thought to have been a tree climber. This has been hypothesized by comparing the phalanges, specifically the humerus bone located in the forearm, of the *Agilodocodon* with it's swimming relative the *Castorocauda*. This comparison between the two skeletal figures can be seen in **Figure I**. *Agilodocodon* also had different diets than that of other Docodonta species. An analysis of its dental structure leads scientists to believe that it was strictly a herbivore, rather than an omnivore. However, it has not been agreed upon what exactly they ate.

Habits

Figure F. Docodonta had semi aquatic habits, that resemble the modern platypus. Their teeth were crucial in being omnivores and not just solely a herbivore. They could also be burrowers like Docofossor in **Figure A**.

Resources

Figure A. Tamura, Nobu. “Docofossor brachydactylus.” 2020. 3D Model. Wikipedia. https://en.wikipedia.org/wiki/Docofossor#/media/File:Docofossor_NT.jpg. Accessed 24 April, 2020.

Figure B.

Figure C. “Laurasia-Godwana”. 2 June, 2009. New World Encyclopedia. <https://www.newworldencyclopedia.org/entry/Laurasia>. Accessed 24 April, 2020.

Figure D. Ji, Q., Di Liu, Y.-G. Z., & Neander, I. (2015, February 13). Evolutionary development in basal mammaliaforms as revealed by a docodontan. Retrieved from <https://science.sciencemag.org/content/347/6223/760>

Figure E.

Panciroli, Elsa, et al. “The Mandible and Dentition of Borealestes Serendipitus (Docodonta) from the Middle Jurassic of Skye, Scotland.” *Journal of Vertebrate Paleontology*, vol. 39, no. 3, 2019.

Geographic range: Panciroli, Elsa, et al. “The Mandible and Dentition of Borealestes Serendipitus (Docodonta) from the Middle Jurassic of Skye, Scotland.” *Journal of Vertebrate Paleontology*, vol. 39, no. 3, 2019.

Figure F.

Docodonta. (2020, February 26). Retrieved from <https://en.wikipedia.org/wiki/Docodonta>

Figure G

Qiang, Ji, et al. “A Swimming Mammaliaform from the Middle Jurassic and Ecomorphological Diversification of Early Mammals.” *Science*, vol. 311, no. 5764, 2006

https://www.researchgate.net/publication/255821612_A_Swimming_Mammaliaform_from_the_Middle_Jurassic_and_Ecomorphological_Diversification_of_Early_Mammals

Figure H and Figure I

Qiang, Ji, et al. “An arboreal docodont from the Jurassic and mammaliaform ecological diversification.” *Science*, vol. 347, no. 6223, p. 764-768, 2015

<https://science.sciencemag.org/content/347/6223/764>