

A Prehistoric Mammal with Blood Red Teeth

Our colleague and palaeontologist Thierry Smith has discovered a 70 million year old mammal with red teeth in Transylvania, Romania. Iron strengthened *Barbatodon transylvanicus*' incisors and molars and gave them their red colour. *Barbatodon* is the oldest known fossil mammal with iron in its teeth and its skull is the most complete mammal fossil from the Upper Cretaceous period in Europe.

Thierry Smith, a palaeontologist from the Royal Belgian Institute of Natural Sciences (RBINS) and Vlad Codrea, his Romanian counterpart from the University of Babeş-Bolyai in Cluj-Napoca, have just described a primitive mammal that lived amongst dinosaurs 70 million years ago and had blood red patches on its tooth enamel.

Barbatodon transylvanicus 'the tooth from the Barbat in Transylvania', was unearthed in 2004 in Pui, Romania, beside the river Barbat, about 200km from Vlad Dracula's medieval castle. The comparisons with the legendary bloodthirsty prince stop there. The rat-sized animal didn't drink blood. "This rodent-like mammal had long incisors and ate very hard food, like grain," explains Smith. "Thanks to the spectrometric analyses carried out using an electron microscope, we observed that the red enamel was composed of 6.88% iron, which provides teeth with protection from wear and tear. This was particularly important for the animal as it couldn't grow another set of teeth". *Barbatodon* is the oldest known animal with iron in its teeth to date. This adaptation against abrasion is only observed today in rodents and shrews.

An Island Animal

During the upper Cretaceous period, southern Europe was an archipelago. Hateg, in the Carpathian Mountains was one of the islands in the group. 70 million years ago Hateg was home to *Barbatodon* and primitive dwarf dinosaurs. "Islands are often a refuge for primitive species," says Smith, "They survive longer on them than on the continent, and often natural selection on islands favours smaller species, like the Flores Man or Sicilian pigmy elephants."

A Successful Group

This red-toothed mammal was part of the *Multituberculates* family, whose name comes from the bumpy surface of their molars. This very primitive, successful group survived the mass extinction that took place at the end of the Cretaceous period 65 million years ago, as well as major global warming 10 million years later, which saw the emergence of modern mammals (including horses, cats and monkeys). However, 35 million years ago the *Multituberculates* died out after surviving for an impressive 150 million years.

Barbatodon transylvanicus is described in the open access journal *PLOS ONE* (<http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0132550>).

Credits

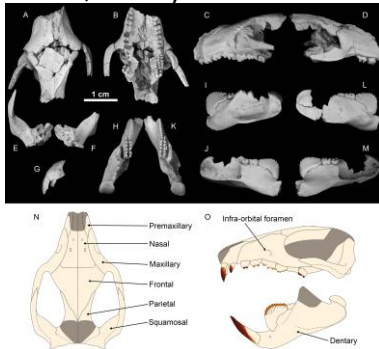
- *Barbatodon_transylvanicus.jpg* : ***Barbatodon transylvanicus*, the oldest fossil mammal with red teeth. (photo: Thierry Smith, RBINS)**



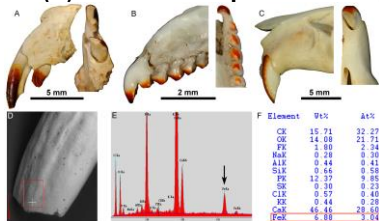
- *Barbatodon_transylvanicus_1.jpg* : The 'bumps' on the molars which *Multituberculates* are named after, and the clearly-visible blood-red areas that indicate the presence of iron in the enamel. (photo: Eric De Bast, RBINS)



- *Barbatodon_transylvanicus_2.jpg* : The reconstructed skull with the missing zones in grey. (illustration: Freya Vlerick, RBINS)



- *Barbatodon_transylvanicus_3.jpg* : A comparison of *Barbatodon's* red teeth (A) with those of a shrew (B) and a rat (C). Enamel composition analysis reveals a significant proportion of iron in *Barbatodon's* incisors (D-F).



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