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The oldest fossil record of the megamouth shark from the late Eocene of Denmark and comments on the enigmatic megachasmid origin

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The megamouth shark (Lamniformes: Megachasmidae) has sporadic occurrences both in the present-day oceans and in the fossil record. In this paper, we describe a new megachasmid, *Megachasma alisonae* sp. nov., on the basis of a morphologically distinct tooth collected from the Pyt Member of the late Eocene Søvind Marl Formation at Moesgård Strand in Denmark, that represents the geologically oldest known *Megachasma*. The tooth likely came from an individual that measured somewhere between 1.3 and 3.5 m long, and its morphology and chipped cusp tips suggest that it possibly fed on macro-zooplankton and small fishes that had hard skeletal components. Its occurrence in the mid-Priabonian Pyt Member at least suggests that the shark inhabited a relatively deep, open marine environment about 36 Ma ago. This Eocene specimen is significant because it illustrates the dental condition of early megachasmids, which is distinctively odontaspidid-like morphologically.

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