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A lucky find - 325 million year old teeth represents the oldest sharks of Austria

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The fossil record of Chondrichthyes, or cartilaginous fishes, is strongly biased throughout the Palaeozoic in Austria. However, three exceptionally well-preserved teeth from the Carboniferous succession of Nötsch were found and recently donated to the Natural History Museum Vienna and the Landesmuseum Klagenfurt in Carinthia. While one tooth, *Cladodus gailensis,* protrudes from the siliciclastic rock matrix, an adjacent tooth, which is assignable to an unidentified member of the family Heslerodidae, remained completely covered by matrix. The third tooth, which could be identified as *Saivodus* cf. *striatus*, was also covered partially by matrix, which temporarily hid its genus-typical tooth characters until a micro-CT scan was prepared. The visualization of the teeth thus not only enabled the morphological description but also allowed the recognition of a hitherto unknown species, *C. gailensis*, and the documentation of the first record of the genus *Saivodus* in Central Europe.

In addition, we present a synopsis of the distribution and diversity of Carboniferous sharks based on primary literature. This comprehensive study indicates a distinct relationship between shark diversity and both major glaciation events during the Serpukhovian and Kasimovian, respectively. Although both extinction peaks of the North American realm were linked and followed by high diversification rates, marine Eurasian sharks seemingly struggled to cope with these drastic climatic and sea-level fluctuations in addition to continental reconfigurations. The freshwater sharks (Xenacanthiformes), on the other hand, immediately occupied new niches (river systems and lakes), which were provided by the ongoing deglaciation.

References

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