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Mastication in the most primitive eusuchian crocodylian

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New cranial material of the peculiar heterodont crocodylian were discovered from the Upper Cretaceous of Hungary (Iharkút, Bakony Mountains). On the basis of the newer skull and mandible remains the Hungarian crocodile is the closest relative of *Hylaeochampsa vectiana* OWEN, 1874 from the Barremian of the Isle of Wight and the two taxa are the most primitive crocodyliforms with an eusuchian palate. The morphology of the bones of the temporal region, moreover the insertion surfaces of cranial adductor tendons and muscles and the details of the dentition support the hypothesis that the Iharkút eusuchian possessed a special masticatory apparatus. The large protuberance on the ventral surface of the quadrate indicates relatively large masses of *M. adductor mandibulae posterior* (MAMP) and that of *M. adductor mandibulae externus medialis* (MAMEM). The extremely long posterior process of the pterygoid suggests that the *M. pterygoideus posterior* (MPTP) was well developed. The closed supratemporal fenestrae show that the *M. adductor mandibulae externus profundus* (MAMEP) responsible for fast jaw closing was small. Compared the muscular system of the Hungarian eusuchian with that of herbivorous mammals (Smith 1993), the Iharkút crocodile had a high capacity for slow jaw closing and mastication (MPTP, MAMP of crocodiles correspond to the Masseter muscle of mammals, Iordansky 1964), and had a low capacity for fast closing. The large and flat, multi-cusped teeth in the maxilla with transverse microwear lines on their occlusal surfaces and the thin lateral flanges of the pterygoid indicate that during food processing this crocodile was able to move its lower jaws exceptionally slightly mediolaterally.