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How not to disappear completely: new Stereospondyli fossils from the Rhaetian, Upper Triassic of Bonenburg, North Rhine-Westphalia and their implications for the Late Triassic extinction of Stereospondyli

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Temnospondyli appeared in the early Carboniferous, became extinct in the Early Cretaceous and reached high diversity especially during the Permian and Triassic. After the end-Permian mass extinction, almost only Stereospondyli survived (with the exception of the dissorophoid *Micropholis*). This clade radiated and gave rise to several successful groups: Plagiosauroidea, Trematosauroidea, Metoposauroidea, Capitosauria, and Brachyopoidea. While Brachyopoidea survived into the Early Cretaceous, the other groups were thought to have gradually disappeared during the Late Triassic, going extinct before the Rhaetian. This hypothesis was supported by the lack of unambiguously dated Rhaetian localities with Stereospondyli fossils. This gap was filled by the discovery of the Bonenburg clay pit in North Rhine-Westphalia (Germany). This locality has been unequivocally dated to the late middle Rhaetian and had yielded a temnospondyl fossil assigned to Capitosauria. Here we describe further Stereospondyli fossils from Bonenburg, including diagnostic bones such as a dentary, a pterygoid, a parietal, and eight other bones in different states of preservation. These fossils belong to at least two taxa of Capitosauria and one taxon of Plagiosauridae and represent the geologically youngest remains of both clades. The specimens are described morphologically, and for the long bones, a clavicle fragment, and an unidentified dermal bone, histological analysis was used to further confirm the morphological analysis. These results shed light on the extinction of two major groups of Stereospondyli, documenting that some non-brachyopoid temnospondyls survived until the end of the Triassic.

Key words: Temnospondyli, Capitosauroidea, Plagiosaurinae, bone histology, end-Triassic extinction, Rhaetian, Bonenburg.

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