

Diversity of diapsid fifth metatarsals from the Lower Triassic karst deposits of Czatkowice, southern Poland—functional and phylogenetic implications

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Three morphotypes of the fifth metatarsal (MttV), one of the most informative bones of the postcranium, have been described herein from the Early Triassic karst deposits of the Czatkowice locality (Southern Poland). Two of them have been assigned to a basal archosauriform *Osmolskina czatkowicensis* and a basal lepidosauromorph, *Sophineta cracoviensis*, respectively, while one is undetermined saurian. Two morphological categories of the hooked fifth metatarsals recognized from this assemblage account for two different solutions to the problem of improvement of locomotion. A strongly inflected (sensu Robinson 1975) MttV shaft consists of two parts, a distal one lying on the ground in a plantigrade manner and a proximal one bent at an angle to get align with the ventral surface of the crus and proximal tarsus. In contrast, a straight shaft of the hooked MttV, suggests its subvertical life position and thus a digitigrade foot stance. The hooking of the fifth metatarsal, that is currently accepted saurian synapomorphy, appeared in phylogeny in a primitive state referred to herein as a neckless type: with neither a neck-shaped articular protrusion for the fourth distal tarsal nor a directly medial orientation of the articular facet. A derived long-necked type with protruding articular part and more directly medial orientation of the articular facet appeared, at various stages of further phylogeny. A strong plantar–dorsal inflexion of the fifth metatarsal associated with a protrusion of lateral plantar tubercle, dates from a directly pre-lepidosaurian stage of evolution.

Key words: Reptilia, Diapsida, fifth metatarsal, functional morphology, Triassic, Poland.

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