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Permian scorpions from the Petrified Forest of Chemnitz, Germany

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Abstract

© 2016 Dunlop et al.Background: Paleozoic scorpions (Arachnida: Scorpiones) have been widely documented from the Carboniferous Period; which hosts a remarkable assemblage of more than sixty species including both putative stem- and crown-group fossils. By contrast the succeeding Permian Period is almost completely devoid of records, which are currently restricted to a trace fossil from the early Permian of New Mexico, USA and some limb fragments from the late Permian of the Vologda Region, Russia. Results: ?Opsieobuthus tungeri sp. nov. from the Petrified Forest of Chemnitz, Germany represents the first complete body fossils of scorpions from the Permian. Explosive volcanism preserved these remarkable specimens in situ as part of the palaeosol horizon and bedrock of the Petrified Forest, immediately beneath the Zeisigwald tuff horizon. This dates to the early Permian (Sakmarian) or ca. 291 Ma. Intriguingly, the specimens were obtained from a palaeosol horizon with a compacted network of different-sized woody roots and thus have been preserved in situ in their likely life position, even within their original burrows. Differences in the structure of the comb-like pectines in the two fossils offer evidence for sexual dimorphism, and permit further inferences about the ecology and perhaps even the reproductive biology of these animals. Conclusions: As putative members of a Coal Measures genus, these fossils suggest that at least some Carboniferous scorpion lineages extended their range further into the Permian. This contributes towards a picture of scorpion evolution in which both basal and derived (orthostern) forms coexisted for quite some time; probably from the end of the Carboniferous through to at least the mid Triassic.

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Keywords

Arachnida, Burrows, Chemnitz, Early Permian, Germany, Petrified Forest, Scorpiones, Volcanism