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FOSSIL CALIBRATIONS FOR THE ARTHROPOD TREE OF LIFE

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ABSTRACT

Fossil age data and molecular sequences are increasingly combined to establish a timescale for the Tree of Life. Arthropods, as the most species-rich and morphologically disparate animal phylum, have received substantial attention, particularly with regard to questions such as the timing of habitat shifts (e.g. terrestrialisation), genome evolution (e.g. gene family duplication and functional evolution), origins of novel characters and behaviours (e.g. wings and flight, venom, silk), biogeography, rate of diversification (e.g. Cambrian explosion, insect coevolution with angiosperms, evolution of crab body plans), and the evolution of arthropod microbiomes. We present herein a series of rigorously vetted calibration fossils for arthropod evolutionary history, taking into account recently published guidelines for best practice in fossil calibration. These are restricted to Palaeozoic and Mesozoic fossils, no deeper than ordinal taxonomic level, nonetheless resulting in 80 fossil calibrations for 102 clades. This work is especially timely owing to the rapid growth of molecular sequence data and the fact that many included fossils have been described within the last five years. This contribution provides a resource