**SUPPORTING INFORMATION**

Captions for the additional supporting information for “Stranger than a scorpion: a reassessment of *Parioscorpio venator*, a problematic arthropod from the Llandoverian Waukesha Lagerstätte” found at the Dryad Digital Repository.

Table S1. Measurement information on the whole body and head of specimens of *Parioscorpio venator* on which the rediagnosis and redescription were primarily based.

Table S2. Measurement information for the trunk of the specimens of *Parioscorpio venator* on which the rediagnosis and redescription were primarily based. Body length and width are included from Table S1 for reference.

Fig. S1. Phylogenetic analyses of the character matrix of Aria and Caron (2017a) including *Parioscorpio venator*. Presented trees are those where alternative states are consistently coded for each analysis. Each alternative state scheme is analyzed for two interpretations: one where the anteriormost (as preserved in the fossils) main trunk leg ramus is interpreted as an exopod and the subsequent ramus an endopodal exite (exopod/endopodal exite interpretation), and one where the anteriormost ramus is interpreted as an epipod and the subsequent ramus an exopod (epipod/exopod interpretation). All alternative state analysis trees are strict consensus trees; any pertinent information that can be gleaned from the 50% majority rule trees is included in the Main Text or Appendix S2. *Parioscorpio venator* is highlighted in yellow in all cladograms, and bold numbers to the left of nodes are Bremer support values. A–B, the “uncertain” analyses where alternative states are coded as ‘?’ when ‘?’ was an optional alternative state; A, exopod/endopodal exite interpretation; B, epipod/exopod interpretation; C–D, the “negative certainty” analyses where alternative states are coded as absent or the smallest possible number of a repeating morphology when such optional states were available; C, exopod/endopodal exite interpretation; D, epipod/exopod interpretation; E–F, the “positive certainty” analyses where alternative states are coded as present or the largest possible number of a repeating morphology when such optional states were available; E, exopod/endopodal exite interpretation; F, epipod/exopod interpretation.

Appendix S1. Character table which serves as the basis for the phylogenetic analyses in this study. Based on the table of Aria and Caron (2017a), it includes *Parioscorpio venator* and the various alternative interpretations of its morphological character states described in the Main Text and Appendix S2.

Appendix S2. Additional considerations of the phylogenetic affinities of *Parioscorpio venator* with the stem-group comparison taxa and their implications on arthropod phylogeny.