**Supplementary Data**

of the manuscript entitled

**The Paris Biota decapod (Arthropoda) fauna and the diversity of Triassic decapods**

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**Abstract of the manuscript**—We describe here the early Spathian (Early Triassic) Paris Biota decapod fauna from the western USA basin. This fauna contains two taxa of Aegeridae (Dendobranchiata), namely *Anisaeger longirostrus* n. sp. and *Aeger* sp. that are the oldest known representatives of their family, thus extending its temporal range by 5 Myr back into the Early Triassic. This fauna also includes two representatives of Glypheida (Pleocyemata) with *Litogaster turnbullensis* Schram, 1971 and *Pemphix krumenackeri* n. sp., comforting for the former, and extending for the latter, the temporal range of their respective superfamily back to the Early Triassic. Overall, the Paris Biota decapods are some of the oldest known representatives of Decapoda, filling in an important gap in the evolutionary history of this group, especially during the Triassic that marks the early diversification of this clade. Additionally, we overview and compile all known Triassic decapods, which leads to the revision of four species of Middle and Late Triassic Aegeridae, and to a revised family assignment of a Middle Triassic Glypheida. Based on this refined dataset, we also investigate decapod diversity throughout the Triassic. We show that the apparent increase in decapod taxonomic richness is probably driven by the heterogeneity of the fossil record and/or sampling effort, and that the decapod alpha diversity is actually relatively high as soon as the Early Triassic and remains rather stable throughout the Triassic.

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**[There are no specific requirements to open and exploit the following files. Supplementary file 1 & 2 are .TIF documents. Supplementary file 3, 4, 5 & 6 are .xlsx documents]**

**Files:**

**Supplementary file 1:** *Distaeger prodigiosus* Schweitzer et al., 2014. (**1**) Right lateral view of holotype, LPI-41666A. (**2**) Clos-up view of holotype first pereiopod. (**3**) Line drawing of holotype first pereiopod. Abbreviations: c - carpus; da - dactilus; m - merus; P - pereiopod; pr - propodus. Scale is 1 cm.

 **Supplementary file 2:** *Anisaeger atavus* (Bill, 1914) illustrated in Gall (1971). (**1**) Reconstitution by Gall (1971). (**2**) Ventral view of the neotype designated by Gall (1971), Grès à meules, Vilsberg, PEN 1. (**2**) Dorsal view of the specimen PEN 3 from the Grès à meules, Vilsberg. (**3**) Dorsal view of the specimen PEN 2 from the Grès à meules, Bust.

**Supplementary file 3:** Compiled dataset of all known Triassic decapods.

**Supplementary file 4:** Paleobiology Database (PBDB) raw data downloaded on June 18th, 2021 using as search words: “Decapoda” and “Triassic”.

***Supplementary file 4 document information:***

*Data Provider: The Paleobiology Database*

*Data Source: The Paleobiology Database*

*Data License: Creative Commons CC-BY*

*License URL: http://creativecommons.org/licenses/by/4.0/*

*Documentation URL: http://paleobiodb.org/data1.2/occs/list\_doc.html*

*Data URL: http://paleobiodb.org/data1.2/occs/list.csv?&interval\_id=16&base\_id=22304&show=coords,attr,loc,prot,time,strat,stratext,lith,lithext,geo,rem,ent,entname,crmod,paleoloc&datainfo*

*Access Time: Fri 2021-06-18 07:21:48 GMT*

*Title: PBDB Data Service*

*Parameters: base\_id: 22304; interval\_id: 16 ; timerule: majortaxon\_status: all; show: coords, attr, loc, prot, time, strat, stratext, lith, lithext, geo, rem, ent, entname, crmod, paleoloc.*

*Empty cells signify the information was not provided in the database*

**Supplementary file 5:** List of Triassic decapods according to the Paleobiology Database (PBDB; search “Decapoda, Triassic”, downloaded on June 18th, 2021) and associated summary of the accuracy of each reported taxon. Duplicate of taxa reported from the same age and site were dismissed. For each taxon, the epoch and/or stage, as well as the number of distinct formations from which it was reported in the PBDB are also specified. When the misreport is only minor (*i.e.*, it does not impact diversity estimates), the report is considered as valid.

***Supplementary file 5 document information:***

*Cells were left empty when nothing wass to be reported*

**Supplementary file 6**: Summary of the Triassic decapods from the newly compiled dataset that are also reported in the PBDB dataset. The taxa for which a new combination is proposed in this work are indicated by a "\*".