This supplementary file summarises the methodology used to make a phylogenetic tree of the copepod species included in the paper “Host specificity and the reproductive strategies of parasites” by Doherty, J.‐F., Milotic, M., Filion, A., and Eriksson, A. in *Parasitology*.

**Copepod phylogeny**

In order to verify if the copepod trait values depend on their phylogenetic relationships (i.e., if there is a phylogenetic signal), we attempted to reconstruct an evolutionary tree. Since not all copepod species have nucleotide sequences deposited in GenBank, a phylogenetic backbone was first created following the methods described in Khodami et al. (2017), henceforth named the reference paper. The parasitic copepod species used in the current study belong to three orders traditionally classified as Cyclopoida, Harpacticoida, and Siphonostomatoida. According to the reference paper, these belong to a monophyletic clade comprised of the following seven orders: Canuelloida (formerly part of Harpacticoida), Cyclopoida, Gelyelloida, Harpacticoida, Monstrilloida, Mormonilloida, and Siphonostomatoida (see reference paper for details). The species used in this study are found across multiple orders within this more recent copepod phylogeny. Therefore, in order to generate a backbone tree that is representative of the monophyly detailed in the reference paper, sequences from all seven orders were obtained. To do so, the genera used in the current study and all relevant taxa from the reference paper were combined into a comprehensive search list (see below). Nucleotide sequences from GenBank were then acquired using Geneious Prime 2020.1.1 (https://www.geneious.com) for the nuclear 18S ribosomal RNA gene. One representative species from each resulting genus was selected to reconstruct the tree. The species *Busquilla plantei*, from the closely related Hoplocarida, was used as an outgroup for the backbone tree.

All obtained sequences were then aligned, manually edited, and conserved blocks were selected using Gblocks (Castresana, 2000). The phylogenetic backbone was reconstructed using Bayesian analysis in MrBayes version 3.2.7a (Huelsenbeck & Ronquist, 2001) with weighted substitution models. Posterior probabilities were estimated using the same conditions as in the reference paper. MCMC trace files, generated by MrBayes, were analysed in Tracer version 1.7.1 (Rambaut *et al.*, 2018) to verify the marginal distribution of model parameters. The consensus tree was subsequently visualised in FigTree version 1.4.4 (http://tree.bio.ed.ac.uk/software/figtree/). In an attempt to create the final tree that included all copepod species used in the current study, a post-MrBayes assessment of the backbone tree was performed in the R package “PASTIS” (Thomas *et al.*, 2013). This package enables the inclusion of any species lacking genetic data through taxonomic placement constraints imposed on the initial consensus tree produced by MrBayes. With these constraints, a new posterior distribution of ultrametric trees containing all copepod species used in this study was generated in MrBayes.

**References**

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**Copepod genera search list for nucleotide sequences**

Abasia OR Acanthochondria OR Acanthochondrites OR Acanthocyclops OR Acantholochus OR Acanthomolgus OR Aegisthidae OR Albionella OR Alella OR Alteuthellopsis OR Amardopsis OR Amphiascoides OR Anchimolgidae OR Anchimolgus OR Anchistrotos OR Anisomolgus OR Anthessius OR Anthosoma OR Aphotopontius OR Apocyclops OR Archinotodelphys OR Argestidae OR Arrama OR Asellopsis OR Aspidomulgus OR Astericola OR Asterocheridae OR Asteropontius OR Bomolochus OR Brachiella OR Bradya OR Caligus OR Calonastes OR Canthocamptus OR Catiniidae OR Cerioxynus OR Cerviniella OR Cerviniopsis OR Ceuthoecetes OR Cholomyzon OR Chondracanthus OR Clausidium OR Clavella OR Clavellisa OR Clavellopsis OR Clavisodalis OR Cletodidae OR Colobomatus OR Congericola OR Contomolgus OR Copilia OR Coregonicola OR Corycaeus OR Critomolgus OR Cyclopicina OR Cyclopina OR Cyclopinella OR Cyclopinodes OR Cyclops OR Cymbasoma OR Dermoergasilus OR Diallagomolgus OR Diarthrodes OR Ditrichocorycaeus OR Doridicola OR Ecbathyrion OR Echetus OR Ectocyclops OR Elytrophora OR Entomolepididae OR Ergasilus OR Eucyclops OR Eudactylina OR Eudactylinodes OR Euryte OR Gelyelloida OR Gloiopotes OR Halicyclops OR Haplomolgus OR Harpacticus OR Hatschekia OR Hemicyclops OR Hermilius OR Holobomolochus OR Idyanthidae OR Indoclausia OR Irodes OR Jusheyus OR Kroyeria OR Laophontina OR Laophontodes OR Lepeophtheirus OR Leptopontia OR Lernaea OR Lernaeenicus OR Lernanthropus OR Lernentoma OR Lichomolgus OR Lophoura OR Macrocyclops OR Malacopsyllus OR Mecomerinx OR Meringomolgus OR Mesochra OR Mesocletodes OR Metacyclopina OR Metataeniacanthus OR Metaxymolgus OR Miraciidae OR Mixtio OR Monomolgus OR Monstrilla OR Monstrillopsis OR Mormonilla OR Mytilicola OR Naobranchia OR Nemesis OR Neobrachiella OR Neocervinia OR Norion OR Norkus OR Normanellidae OR Nothobomolochus OR Notodelphys OR Odontomolgus OR Oithonidae OR Oncaea OR Orbitacolax OR Orecturus OR Pachos OR Paeon OR Pandarus OR Panjakus OR Parabrachiella OR Parabradya OR Paracyclopina OR Paralebion OR Parameiropsis OR Paramolgus OR Paranannopus OR Parastenocaridae OR Paredromolgus OR Pectinophilus OR Peltidium OR Pennatulicola OR Perissopus OR Pharodes OR Pontoeciella OR Pontostratiotes OR Prionomolgus OR Pseudanthessius OR Pseudocycnus OR Pseudonychocamptus OR Pseudopetalus OR Pseudotachidius OR Pseudotaeniacanthus OR Pterinopsyllus OR Pumiliopsis OR Rhogobius OR Sabelliphilus OR Salmincola OR Sapphirina OR Sarsameira OR Scambicornus OR Schedomolgus OR Scyphuliger OR Sentiropsis OR Sewelliapusia OR Sinergasilus OR Siphonostomatoida OR Smirnovipinidae OR Speleoithona OR Sphyrion OR Stellicola OR Stenocaris OR Stenocaropsis OR Stenocopiinae OR Stenopontius OR Styracothorax OR Superornatiremidae OR Taeniacanthodes OR Taeniacanthus OR Tegastes OR Telson OR Tetragonicepsidae OR Thalestridae OR Thompsonula OR Tigriopus OR Tisbe OR Tracheliastes OR Trochicola OR Unicolax OR Vahinius OR Volkmannia OR Wynnowenia OR Xarifia OR Xylora OR Zosime