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**Supplementary material**

**Revision of Tasmanian viviparous velvet worms (Onychophora : Peripatopsidae) with descriptions of two new species**

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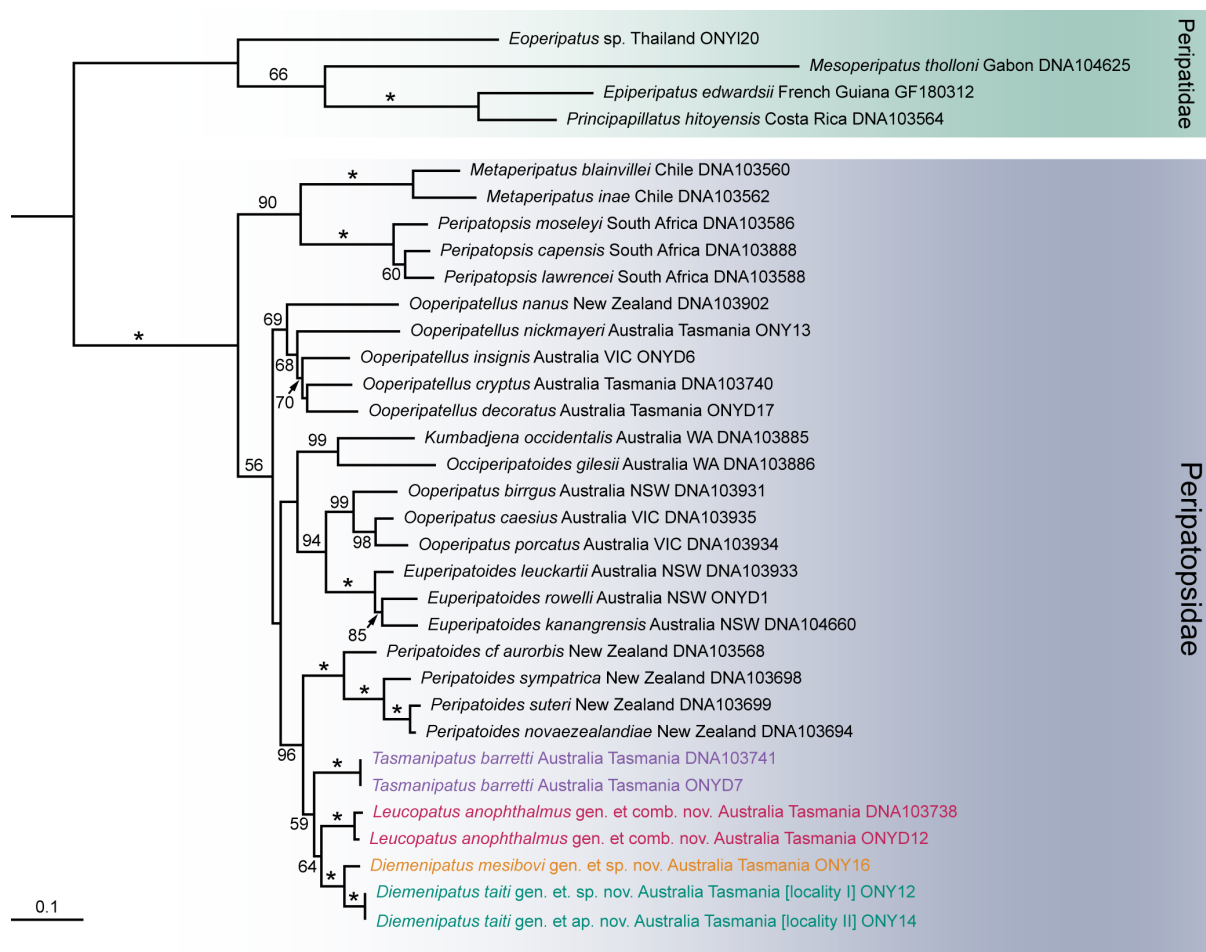
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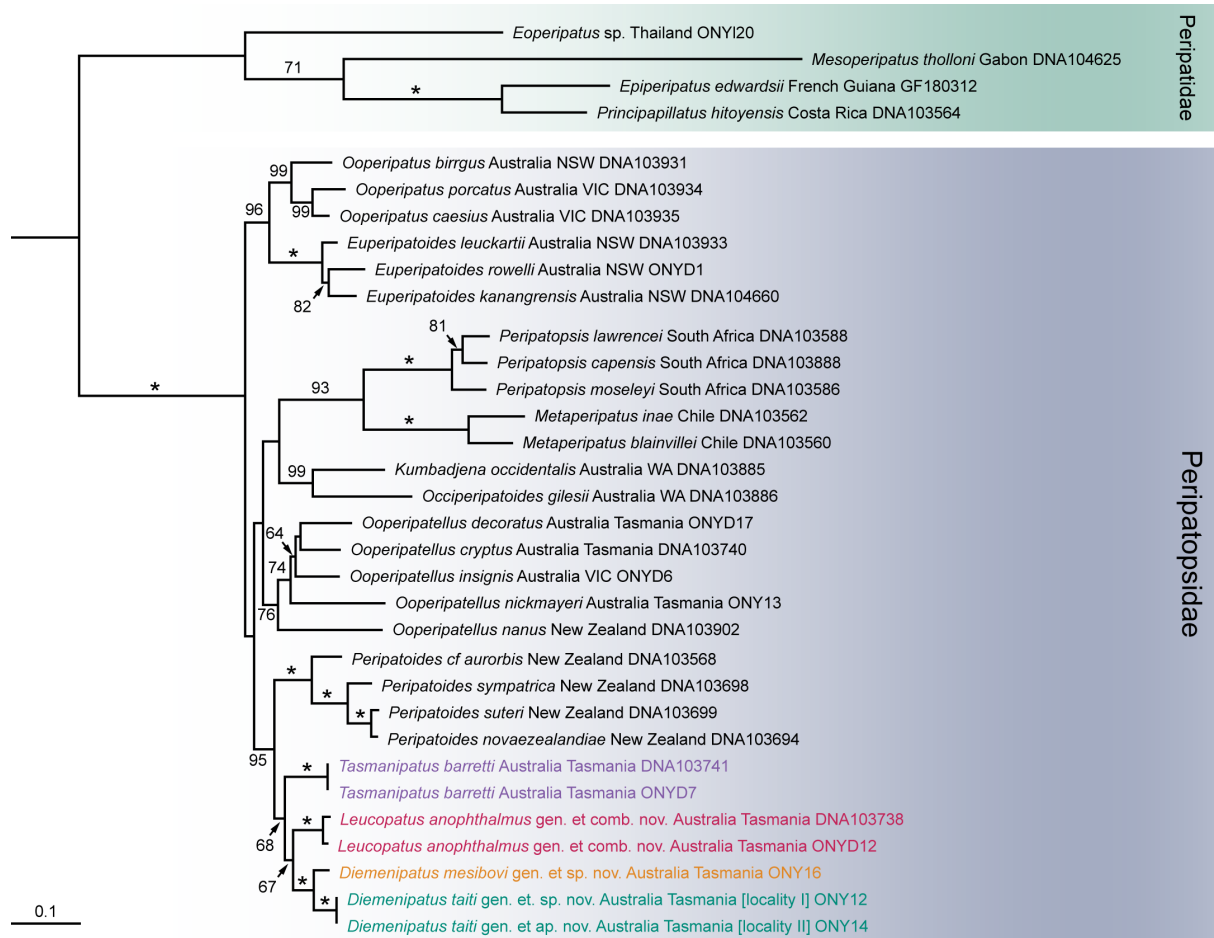
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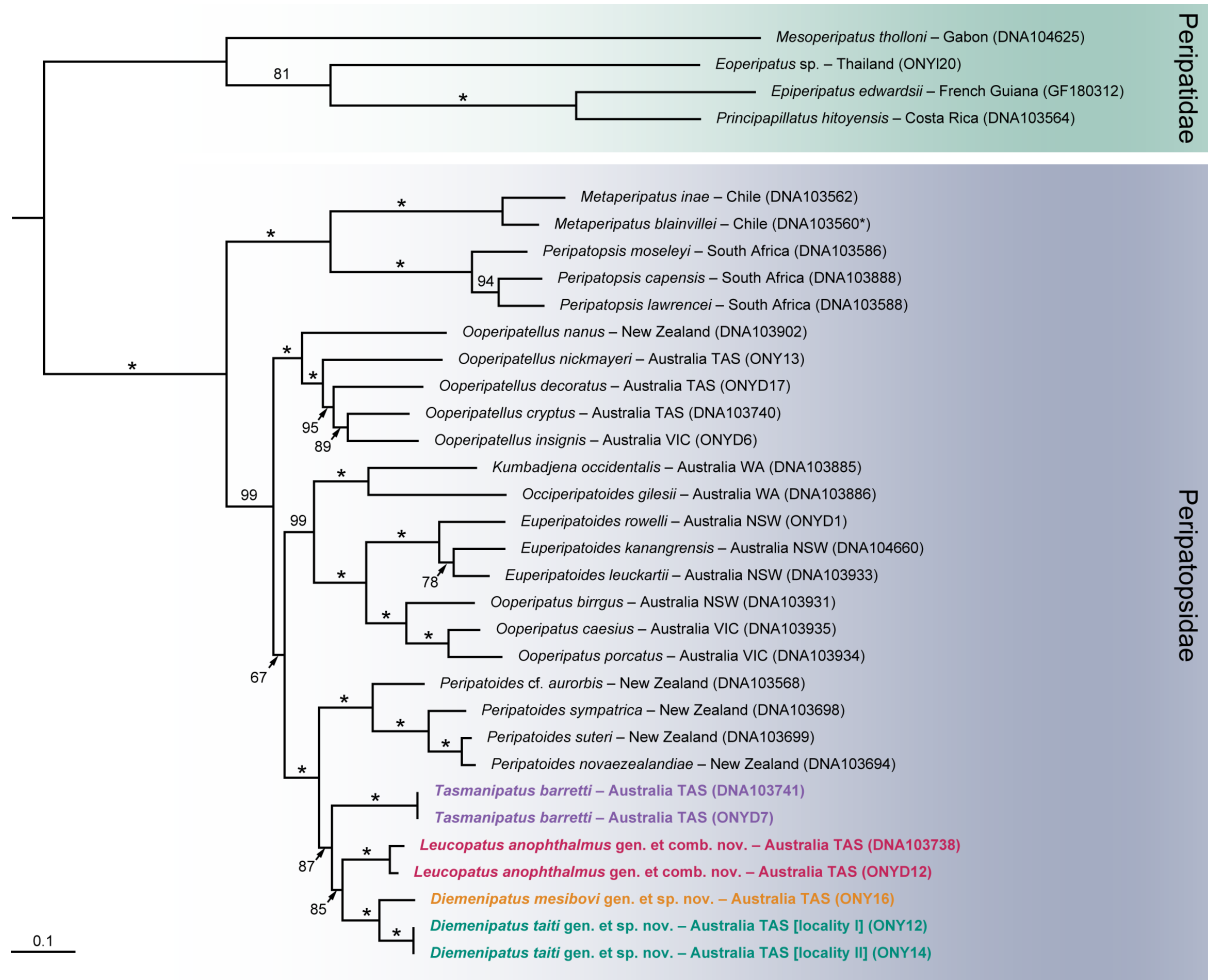
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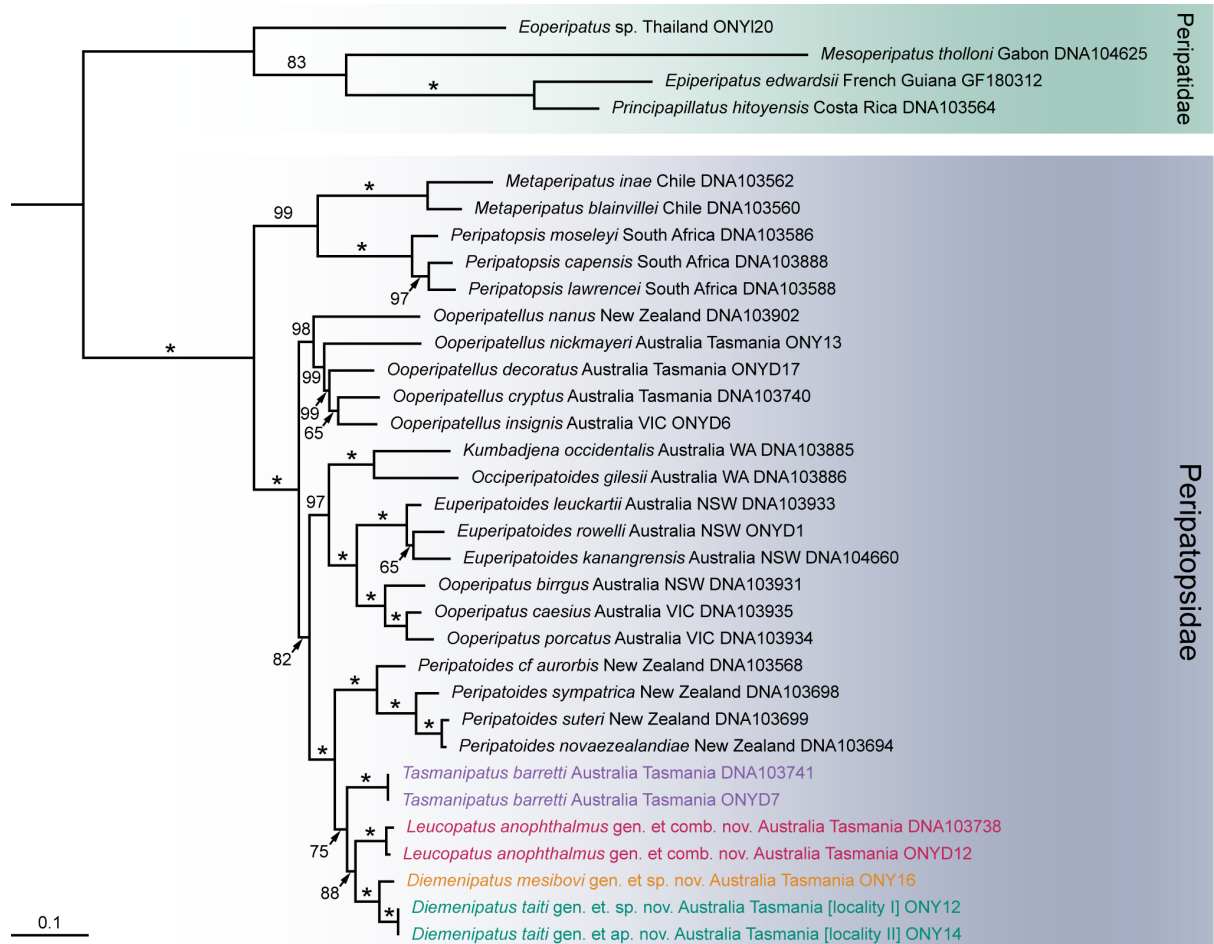
**Figure S1. Phylogenetic relationship of the species studied to other onychophorans.** Maximum likelihood topology combining nucleotide sequences of the *12S rRNA*, *16S rRNA*, *18S rRNA* and *28S rRNA* genes with translated amino acids from *COI* sequences. Four species of Peripatidae were used as outgroup taxa. Bootstrap values are provided above/under the branches. Asterisks indicate maximum bootstrap support values (=100). Bootstrap values below 50 are not indicated.



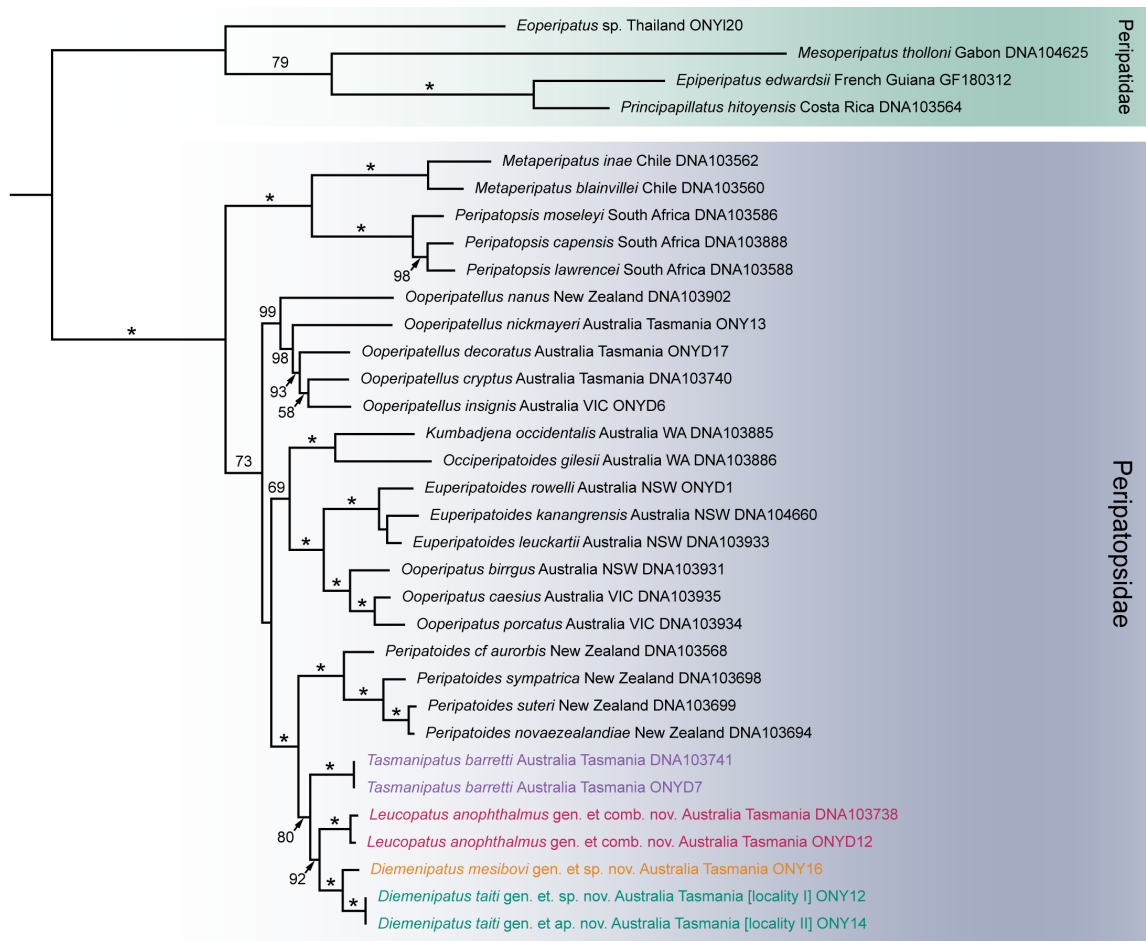
**Figure S2. Phylogenetic relationship of the species studied to other onychophorans.** Maximum likelihood topology combining nucleotide sequences of the *12S rRNA*, *16S rRNA*, *18S rRNA* and *28S rRNA* genes with *COI* nucleotide sequences excluding the third codon position. Four species of Peripatidae were used as outgroup taxa. Bootstrap values are provided above/under the branches. Asterisks indicate maximum bootstrap support values (=100). Bootstrap values below 50 are not indicated.



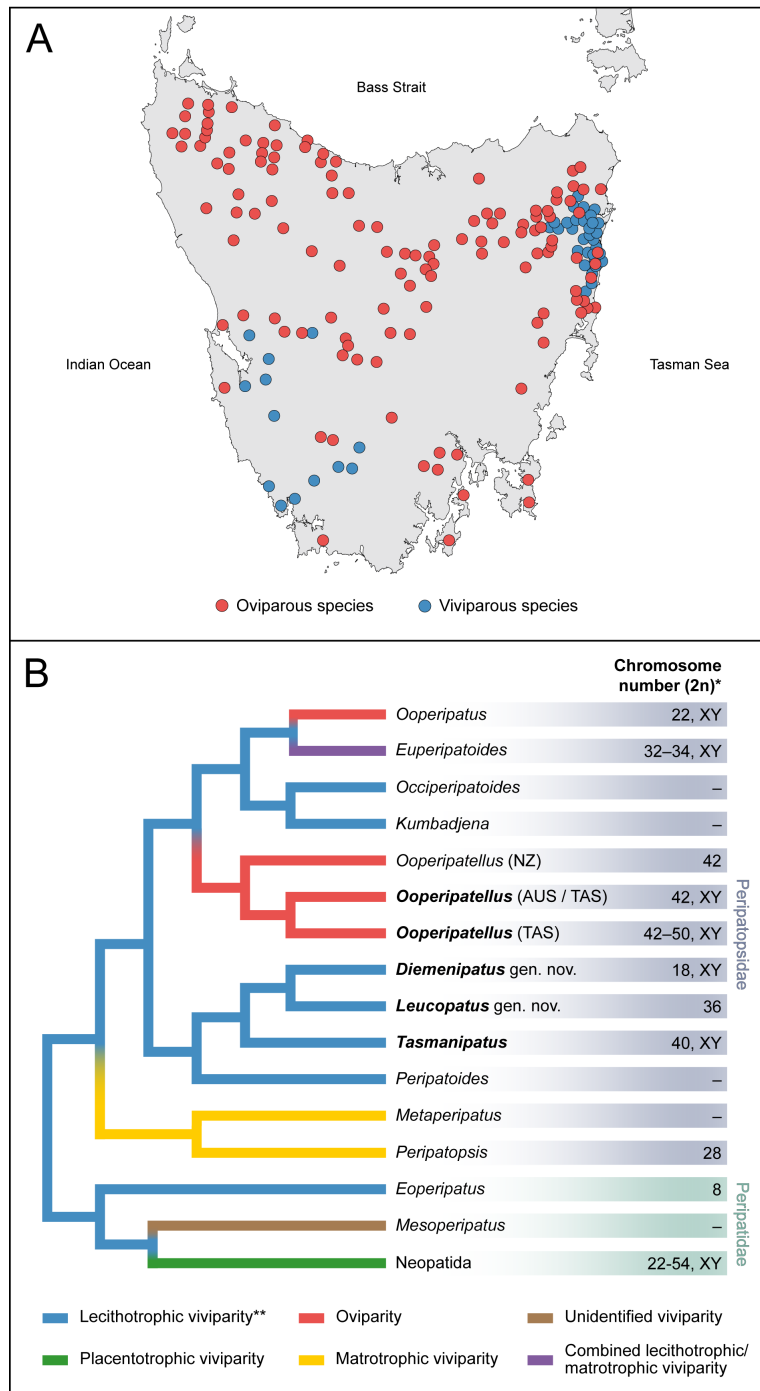
**Figure S3. Phylogenetic relationship of the species studied to other onychophorans.** Bayesian inference topology combining nucleotide sequences of the *12S rRNA*, *16S rRNA*, *18S rRNA*, *28S rRNA* and *COI* genes. Four species of Peripatidae were used as outgroup taxa. Posterior probability values are provided above/under the branches. Asterisks indicate maximum probability value (=100%). Probabilities below 50 are not indicated.



**Figure S4. Phylogenetic relationship of the species studied to other onychophorans.** Bayesian inference topology combining nucleotide sequences of the *12S rRNA*, *16S rRNA*, *18S rRNA* and *28S rRNA* genes with translated amino acids from *COI* sequences. Four species of Peripatidae were used as outgroup taxa. Posterior probability values are provided above/under the branches. Asterisks indicate maximum probability value (=100%). Probabilities below 50 are not indicated.



**Figure S5. Phylogenetic relationship of the species studied to other onychophorans.** Bayesian inference topology combining nucleotide sequences of the *12S rRNA*, *16S rRNA*, *18S rRNA* and *28S rRNA* genes with *COI* nucleotide sequences excluding the third codon position. Four species of Peripatidae were used as outgroup taxa. Posterior probability values are provided above/under the branches. Asterisks indicate maximum probability value (=100%). Probabilities below 50 are not indicated.



**Figure S6. Reproduction mode and chromosome number in different onychophoran taxa.** (A) Tasmanian map showing the known distribution of oviparous (red circles) and viviparous (blue circles) onychophorans in the island. Note that the latter are only known from northeastern and southwestern parts of Tasmania. Distribution pattern reconstructed after Mesibov & Ruhberg (1991), Briscoe & Tait (1993), Reid (1996), Brockmann (2007), Oliveira & Mayer (2017) and data from the present study. (B) Reproduction mode and chromosome number in different onychophoran taxa. Phylogenetic tree modified from Mayer *et al.* (2015) to match the topology presented in this study (Figs. 12, S1, S2). \*Chromosome number available for at least one species of the taxon (Jeffery *et al.* 2012; Montgomery 1900; Oliveira *et al.* 2012b, 2013; Rowell *et al.* 1995, 2002; present study). \*\* This mode may be in fact a combination of lecithotrophic and matrotrophic viviparity, as demonstrated for *Euperipatoides rowelli* Reid, 1996 (Sunnucks *et al.* 2000).

**Table S1.** Occurrence of modified head structures and mode of nourishment supply to the embryo in described taxa of Peripatopsidae\* .

Peripatopsidae		
Taxon name	Head structure present (+) or absent (-)	Mode of nourishment supply
<sup>1</sup> <i>Acanthokara</i>	+	“ovoviviparity”
<sup>1</sup> <i>Aethrikos</i>	+	“ovoviviparity”
<sup>1</sup> <i>Aktinothele</i>	+	oviparity
<i>Anoplokaros</i>	-	“ovoviviparity”
<sup>1</sup> <i>Austroperipatus</i>	+	oviparity
<sup>1</sup> <i>Baeothele</i>	-	oviparity
<sup>1</sup> <i>Centorumis</i>	+	“ovoviviparity”
<sup>1</sup> <i>Cephalofovea</i>	+	“ovoviviparity”
<sup>1</sup> <i>Critolaus</i>	+	oviparity
<sup>1</sup> <i>Dactylothele</i>	+	“ovoviviparity”
<i>Diemenipatus gen. nov.</i>	-	“ovoviviparity”
<sup>1</sup> <i>Dystactotylos</i>	+	oviparity
<sup>1</sup> <i>Euperipatoides</i>	-	combined lecithotrophic/ matrotrophic viviparity
<sup>1</sup> <i>Florelliceps</i>	+	“ovoviviparity”
<sup>1</sup> <i>Hylonomoipos</i>	+	oviparity
<sup>1</sup> <i>Konothele</i>	+	oviparity
<i>Kumbadjena</i>	-	“ovoviviparity”
<i>Lathropatus</i>	-	“ovoviviparity”
<i>Leucopatus gen. nov.</i>	-	“ovoviviparity”
<sup>1</sup> <i>Leuropezos</i>	+	oviparity
<i>Mantonipatus</i>	-	“ovoviviparity”
<sup>1</sup> <i>Metaperipatus</i>	-	matrotrophic viviparity
<sup>1</sup> <i>Minyplanetes</i>	+	“ovoviviparity”
<sup>1</sup> <i>Nodocapitus</i>	+	“ovoviviparity”
<i>Occiperipatoides</i>	-	“ovoviviparity”
<sup>1</sup> <i>Ooperipatellus</i>	-	oviparity
<sup>1</sup> <i>Ooperipatus</i>	+	oviparity
<sup>1</sup> <i>Opisthopatus</i>	-	matrotrophic viviparity
<sup>1</sup> <i>Paraperipatus</i>	+	matrotrophic viviparity
<i>Paropisthopatus</i>	-	“ovoviviparity”
<i>Peripatoides</i>	-	“ovoviviparity”
<sup>1</sup> <i>Peripatopsis</i>	-	matrotrophic viviparity
<sup>1</sup> <i>Phallocephale</i>	+	“ovoviviparity”
<sup>1</sup> <i>Planipapillus</i>	+	oviparity
<sup>1</sup> <i>Regimitra</i>	+	“ovoviviparity”
<sup>1</sup> <i>Ruhbergia</i>	+	“ovoviviparity”
<sup>1</sup> <i>Sphenoparme</i>	+	“ovoviviparity”
<i>Tasmanipatus</i>	-	“ovoviviparity”
<sup>1</sup> <i>Tetrameraden</i>	+	“ovoviviparity”
<sup>1</sup> <i>Vescerro</i>	+	oviparity
<sup>1</sup> <i>Wambalana</i>	+	“ovoviviparity”

\*Information obtained from Ruhberg (1985), Reid (1996, 2000a,b, 2002), Mayer *et al.* (2015) and the present study.

<sup>1</sup> Taxon differs from the species studied in at least one of the features.



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