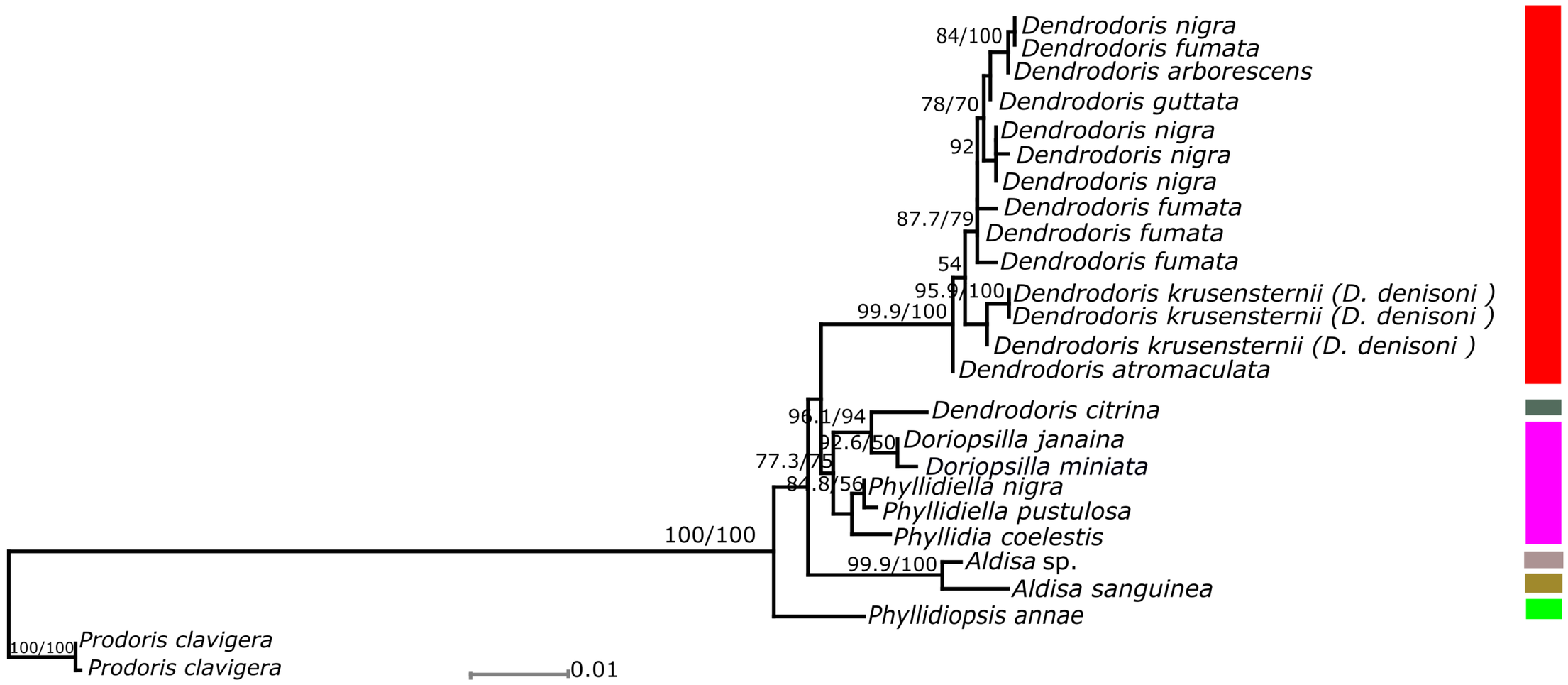


Fig. S1. Phylogenetic reconstruction of Dendrodorididae O'Donoghue, 1924 based on the 18S data set, with *Prodoris clavigera* (Thiele, 1912) as outgroup. Numbers before and after slash indicate approximate likelihood ratio test (SH-aLRT) and bootstrap values for maximum likelihood (ML) respectively. Numbers less than 50 are removed. Coloured bars indicate species delimitation resulting from ABGD test.

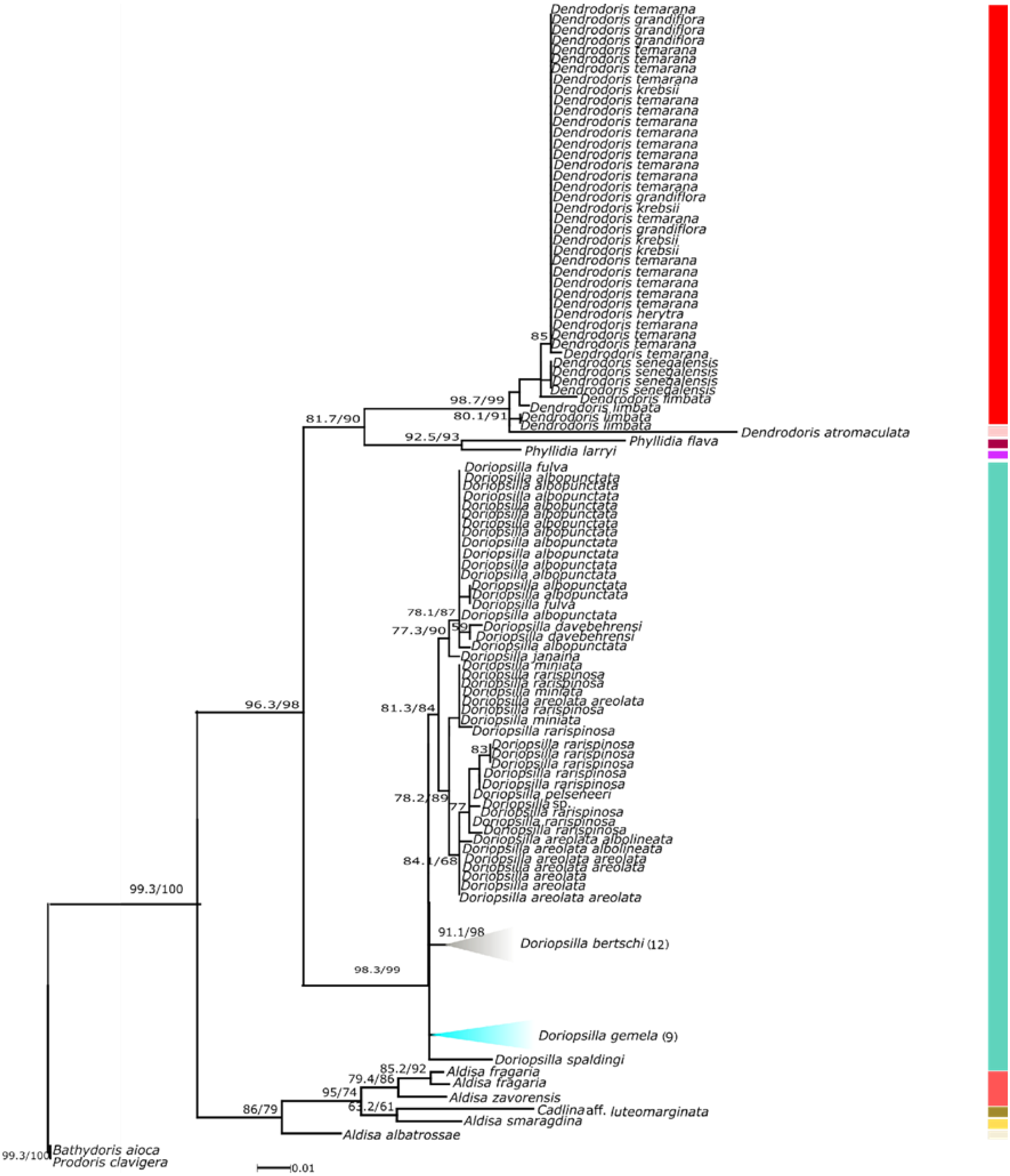


Fig. S2. Phylogenetic reconstruction of Dendrodorididae O'Donoghue, 1924 based on the H3 data set, with *Bathydoris aioca* Er. Marcus & Ev. Marcus, 1962 and *Prodoris clavigera* (Thiele, 1912) as outgroup. Terminal taxa on species level partly collapsed (triangles coloured for better clarity) and specimen numbers written in brackets. Numbers before and after slash indicate approximate likelihood ratio test (SH-aLRT) and bootstrap values for maximum likelihood (ML) respectively. Numbers less than 50 are removed. Coloured bars indicate species delimitation resulting from ABGD test. Note that the genera *Dendrodoris* Ehrenberg, 1831 and *Doriopsilla* Bergh, 1880 are monophyletic.

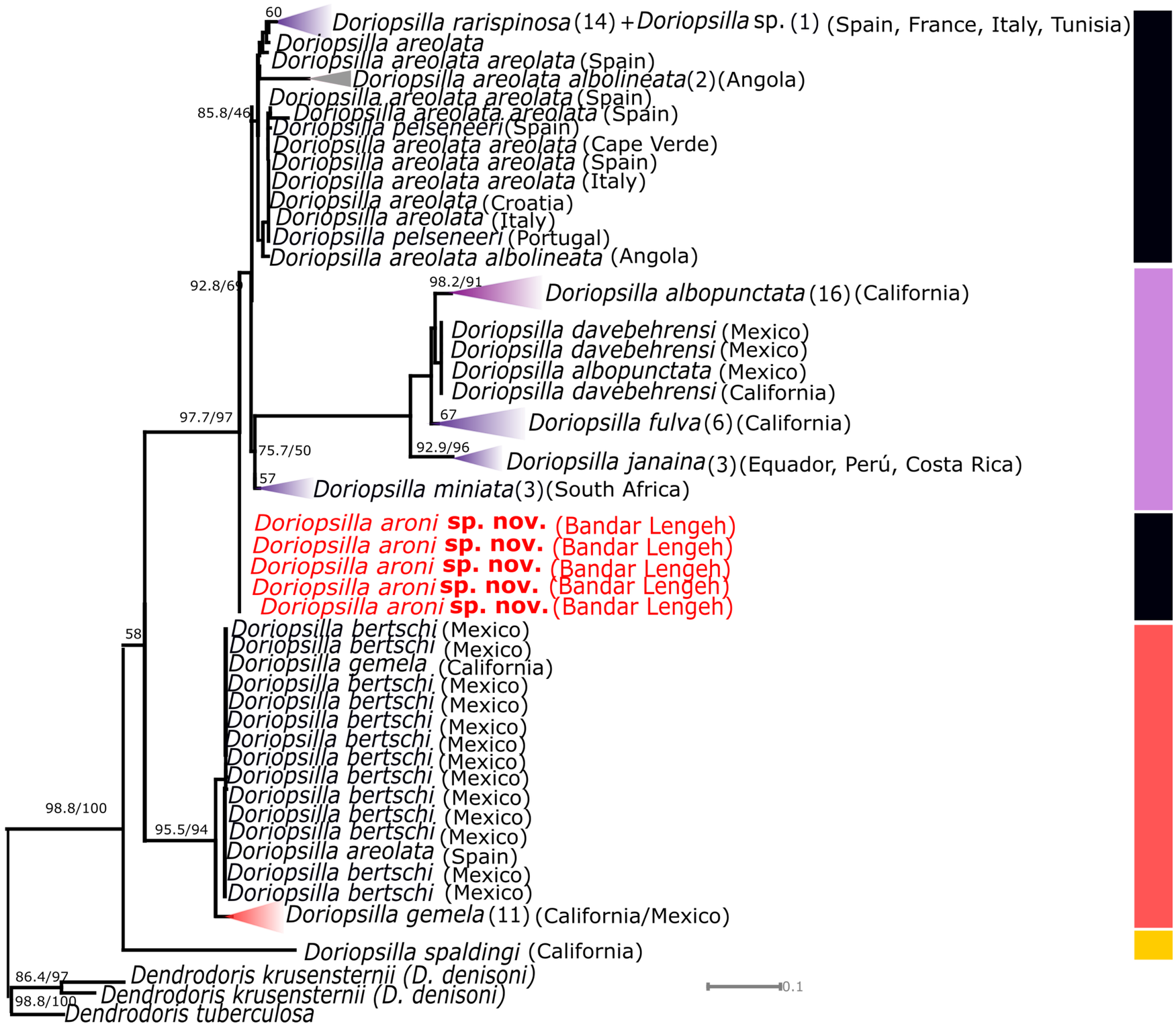


Fig. S3. Phylogenetic reconstruction of the genus *Doriopsilla* Bergh, 1880 based on the 16S data set, with *Dendrodoris* Ehrenberg, 1831 species (from short branch) as outgroup. Terminal taxa on species level partly collapsed (triangles coloured for better clarity) and specimen numbers written in brackets. Numbers before and after slash indicate approximate likelihood ratio test (SH-aLRT) and bootstrap values for maximum likelihood (ML) respectively. Numbers less than 50 are removed. Coloured bars indicate species delimitation resulting from ABGD test.

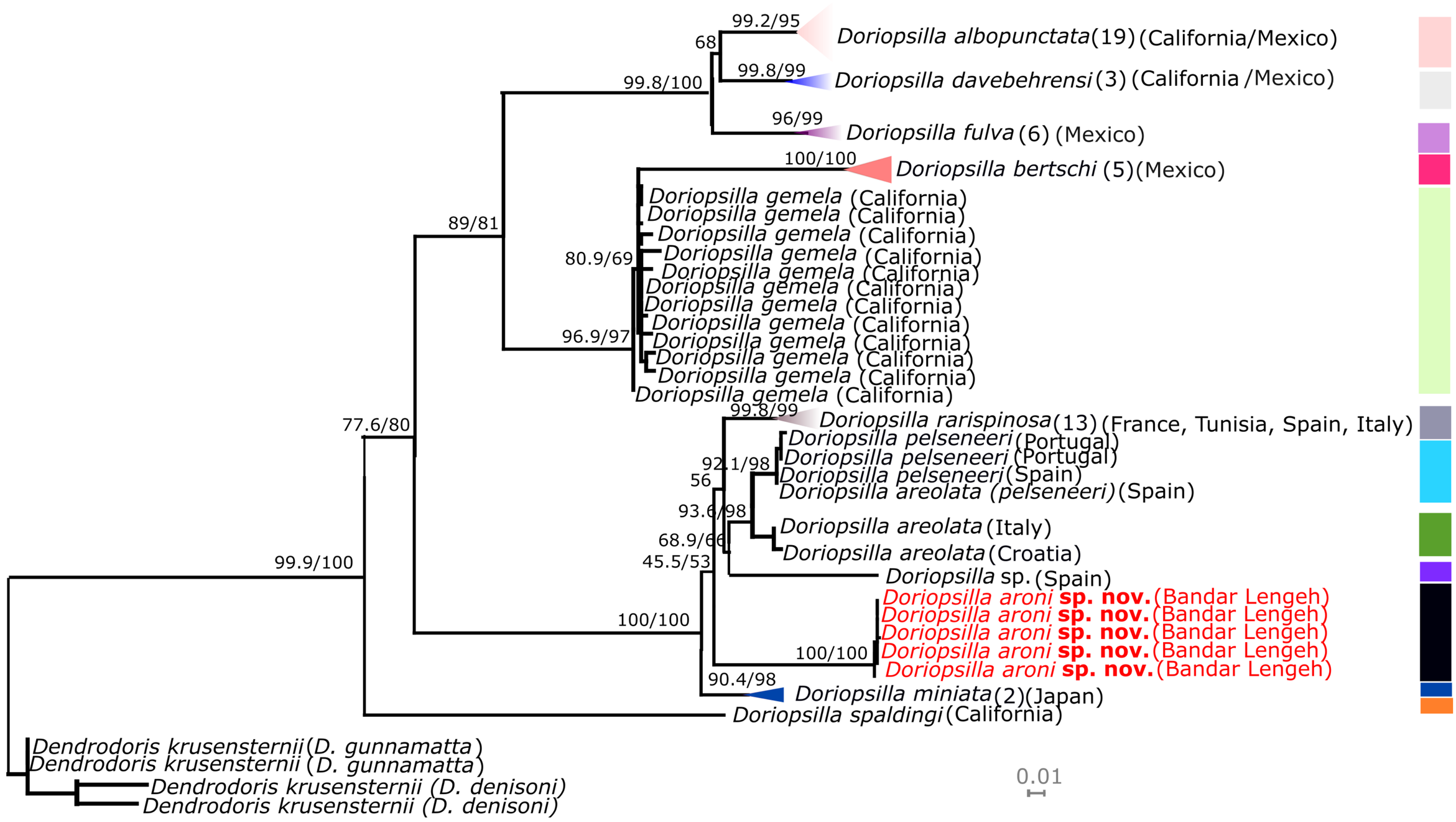
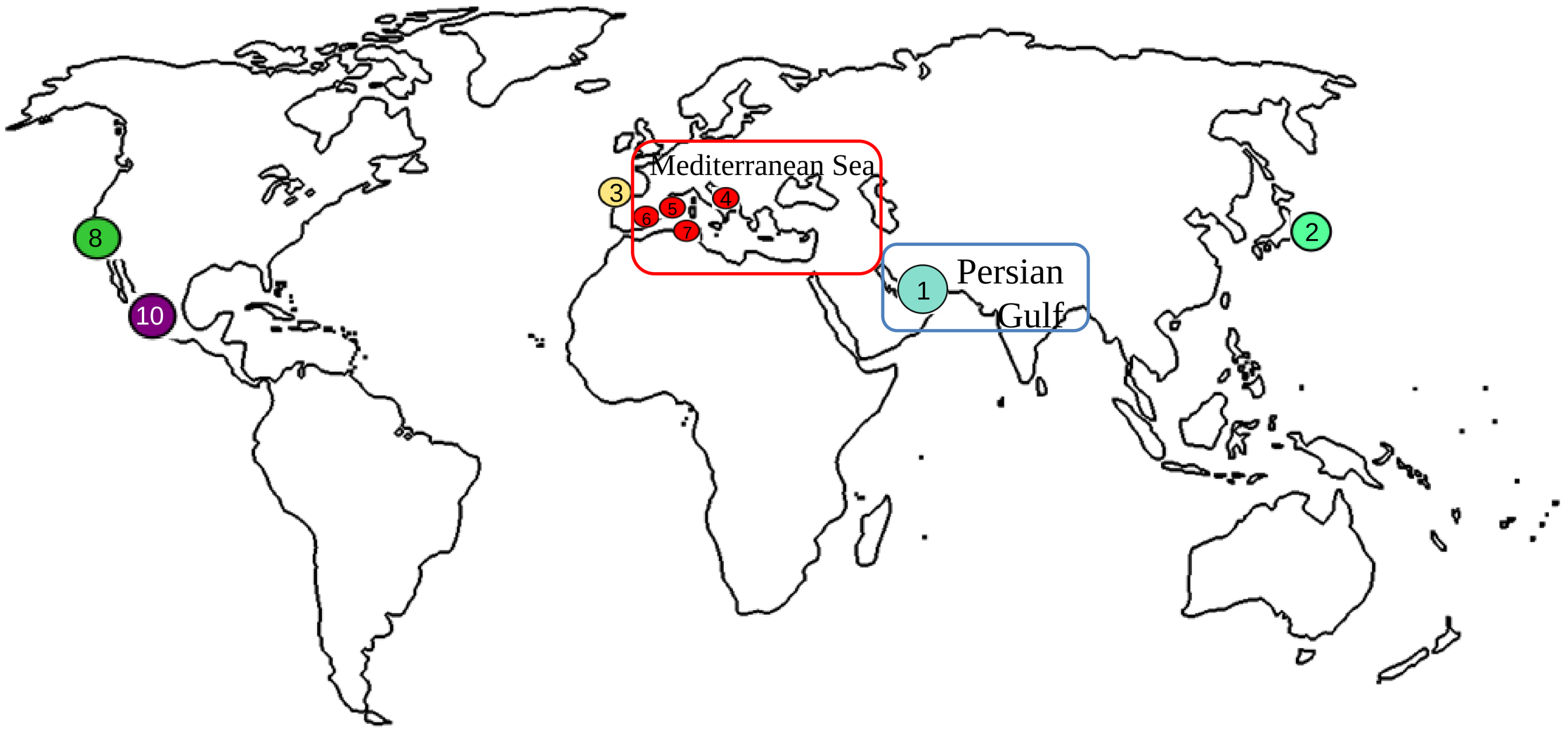


Fig. S4. Phylogenetic reconstruction of the genus *Doriopsilla* Bergh, 1880 based on the CO1 data set, with *Dendrodoris* Ehrenberg, 1831 species (from short branch) as outgroup. Terminal taxa on species level partly collapsed (triangles coloured for better clarity) and specimen numbers written in brackets. Numbers before and after slash indicate approximate likelihood ratio test (SH-aLRT) and bootstrap values for maximum likelihood (ML) respectively. Numbers less than 50 are removed. Coloured bars indicate species delimitation resulting from ABGD test.



1 *D. aroni* **sp. nov.**

2 *D. miniata*

3 *D. pelseneeri*

4 *D. areolata*,*D. rarispinosa*

5 *D. rarispinosa*

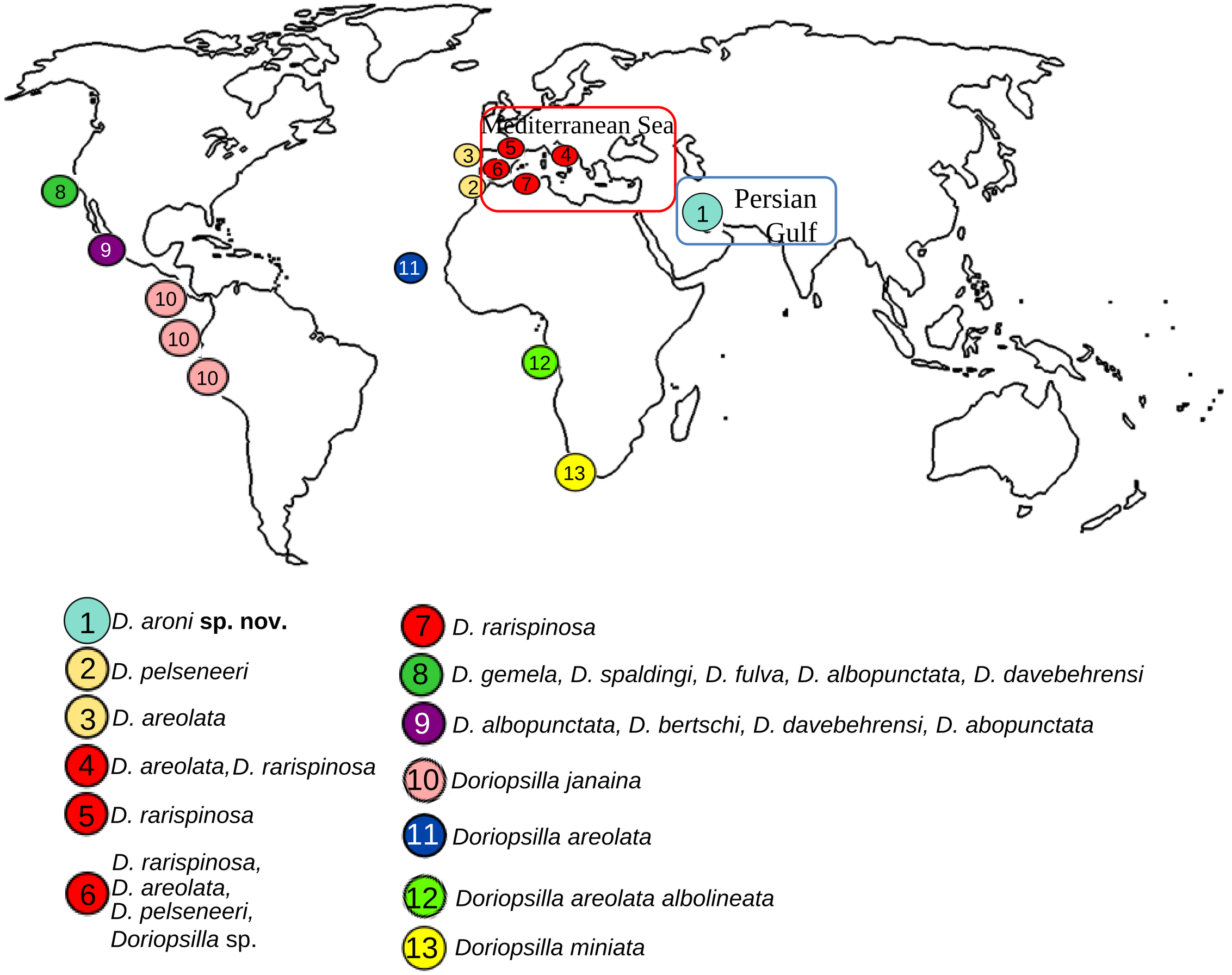
6 *D. rarispinosa, Doriopsilla* sp., *D. pelseneeri, D. areolata*

7 *D. rarispinosa*

8 *D. gemela, D. spaldingi, D. fulva, D. albopunctata, D. davebehrensi*

9 *D. bertschi, D. davebehrensi*

Fig. S5. Distribution map of *Doriopsilla* Bergh, 1880 species (CO1 sequences) included in our study. Species and their respective localities highlighted in the same colour as in Fig.13. Outline world map downloaded from https://www.outline-world-map.com/blank-thick-white-world-map-b3c.



1 *D. aroni* **sp. nov.**

2 *D. pelseneeri*

3 *D. areolata*

4 *D. areolata*, *D. rarispinosa*

5 *D. rarispinosa*

6 *D. rarispinosa*, *D. areolata*, *D. pelseneeri*, *Doriopsilla* sp.

7 *D. rarispinosa*

8 *D. gemela*, *D. spaldingi*, *D. fulva*, *D. albopunctata*, *D. davebehrensi*

9 *D. albopunctata*, *D. bertschi*, *D. davebehrensi*, *D. abopunctata*

10 *Doriopsilla janaina*

11 *Doriopsilla areolata*

12 *Doriopsilla areolata albolineata*

13 *Doriopsilla miniata*

Fig. S6. Distribution map of *Doriopsilla* Bergh, 1880 species (16S sequences) included in our study . Species and their respective localities highlighted in the same colour as in Fig. 14. Outline world map downloaded from https://www.outline-world-map.com/blank-thick-white-world-map-b3c.