**Supp. file 1.** Additional information.<https://doi.org/10.5852/ejt.2024.943.2585.11773>

Shape

Description automatically generated with medium confidence

**Fig. S1.** Maximum likelihood tree for Dorididae Rafinesque, 1815 based on the concatenated alignment of COI, 16S, and H3 markers (1449 bp). Bootstrap support values are shown on branches. The outgroup used to root the tree was *Aphelodoris* Bergh, 1879. Scale bar indicates substitutions per site.

Shape

Description automatically generated with medium confidence

**Fig. S2:** Maximum likelihood tree for Dorididae Rafinesque, 1815 based on the COI marker (659 bp). Bootstrap support values are shown on branches. The outgroup used to root the tree was *Aphelodoris* Bergh, 1879. Scale bar indicates substations per site.

Shape

Description automatically generated with medium confidence

**Fig. S3:** Maximum likelihood tree for Dorididae Rafinesque, 1815 based on the 16S marker (462 bp). Bootstrap support values are shown on branches. The outgroup used to root the tree was *Aphelodoris* Bergh, 1879. Scale bar indicates substations per site.

Shape

Description automatically generated with medium confidence

**Fig. S4:** Maximum likelihood tree for Dorididae Rafinesque, 1815 based on the H3 marker (328 bp). Bootstrap support values are shown on branches. The outgroup used to root the tree was *Doris verrucosa* Linnaeus, 1758. Scale bar indicates substations per site.

**Table S1:** Material used in molecular phylogenetic analyses and species delimitation tests, with GenBank accession numbers and relevant references.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Species** | **Voucher number** | **Locality** | **COI** | **16S** | **H3** | **Reference** |
| *Doris ocelligera* | X396 | Coves Cala Maset, Sant Feliu de Guíxols, Girona, Spain | OR286433 | OR286512 | OR340967 | This study |
| *Doris ocelligera* | X447 | Coves Cala Maset, Sant Feliu de Guíxols, Girona, Spain | OR286434 | OR286513 | OR340968 | This study |
| *Doris ocelligera* | MCZ395160 | Punta del Romaní, l'Escala, Girona, Spain | OR286432 | – | – | This study |
| *Doris berghi* | G04 | Playa viveiro, Galicia, Spain | OR286435 | OR286514 | OR340969 | This study |
| *Doris berghi* | GC40 | Piscinas de Agaete, Gran Canaria, Spain | OR286436 | OR286515 | OR340970 | This study |
| *Doris berghi* | ZSM20210024 | Coves Cala Maset, Sant Feliu de Guíxols, Girona, Spain | OR286438 | OR286516 | OR340971 | This study |
| *Doris berghi* | MCZ395161 | Aigua Freda, Begur, Girona, Spain | OR286437 | – | – | This study |
| *Doris marmorata* | B2 | Blanes, Girona, Spain | OR286430 | OR286510 | – | This study |
| *Doris marmorata* | ZSMMol20210023 | Coves Cala Maset, Sant Feliu de Guíxols, Girona, Spain | OR286431 | OR286511 | OR340966 | This study |
| *Doris bertheloti* | ZSMMol20210045 | Caleta Caballo, Lanzarote, Spain | OR286429 | OR286509 | OR340965 | This study |
| *Doris bertheloti* | B7 | La Herradura, Granada, Spain | OR286428 | – | – | This study |
| *Doris verrucosa* | ZSM20210044 | Étang de Thau, Sète, France | OR286439 | OR286517 | OR340972 | This study |
| *Doris verrucosa* |  | – | ON716048 | – | – | Mugnai & Costantini (unpubl.) |
| *Doris verrucosa* | DVCM1 | Capo Miseno, Naples, Italy | – | HE861892 | – | De Masi *et al*. 2015 |
| *Austrodoris kerguelenensis* | – | Burdwood Bank, Antarctica | EU823127 | EU823219 | – | Wilson *et al*. 2009 |
| *Austrodoris kerguelenensis* | ZSM200210482 | Elephant Is., Antarctica | EU823136 | EU823228 | – | Wilson *et al*. 2009 |
| *Austrodoris kerguelenensis* | ­ | Bransfield Strait, Antarctica | EU823146 | EU823238 | – | Wilson *et al*. 2009 |
| *Austrodoris kerguelenensis* | – | McMurdo Sound, Ross Sea, Antarctica | GU227115 | GU227000 | – | Heimeier *et al*. 2010 |
| *Doris odhneri* | CASIZ188014 | USA: Duxbury Reef, Marin Co., California | – | MF958295 | – | Hallas *et al*. 2017 |
| *Doris odhneri* | – | Munamjin-ri Gangwon-do, South Korea | OL800585 | OL800585 | – | Do *et al*. 2022 |
| *Conualevia alba* | – | California, La Jolla, Bird Rock, USA | KC153021 | KC153023 | – | Wilson, Maschek & Baker (unpubl.) |
| *Doris montereyensis* | BICSIOM12334 | USA: California, La Jolla, La Jolla Canyon | KC153022 | KC153024 | – | GenBank |
| *Doris montereyensis* | CASIZ174493 | USA: Battery Point, Cresceent City, Del Norte Co., California | MF958425 | MF958294 | – | Hallas *et al*. 2017 |
| *Archidoris pseudoargus* | – | Helgoland, North Sea | – | AF249224 | – | Wollscheid-Lengeling *et al.* 2001 |
| *Archidoris pseudoargus* |  | Plymouth, Devonshire, UK | AJ223256 | AJ225180 | – | Thollesson 2000 |
| *Archidoris wellingtonensis* | – | Ross Sea, Antarctica | GQ292034 | – | – | Shields, Marko, Woods & Moran (unpubl.) |
| *Archidoris pseudoargus* | – | Plymouth, Devonshire, UK | AJ223256 | AJ225180 | – | Thollesson 2000 |
| *Doriopsis pecten* | – | Australia: Queensland, Mooloolaba | KJ001311 | KJ018914 | – | Cheney *et al*. 2014 |
| *Homoiodoris japonica* | – | China | KP635442 | KP635442 | – | Liu *et al*. 2015 |
| *Homoiodoris japonica* |  | China | NC\_034006 | NC\_034006 | – | Liu & Shen (unpubl.) |
| *Doris* sp. | CASIZ192348 | Saudi Arabia: Red Sea | – | MF958306 | – | Hallas *et al*. 2017 |
| *Aphelodoris luctuosa* |  | Auckland, New Zealand | GQ292042 | – | – | Hallas *et al*. 2017 |
| *Aphelodoris* sp. | CCS-2010 | Ross Sea, Antarctica | GQ292033 | – | – | Shields, Marko, Woods & Moran (unpubl.) |
| *Aphelodoris* sp. | CASIZ176920 | Oudekraal, Cape Prov., South Africa | MF958424 | MF958293 | – | Hallas *et al*. 2017 |
| Dorididaesp. | 1467385 | Papua New Guinea | MZ560065 | – | – | Plaisance, Matterson, Drovetski, Fabricius, Meyer & Knowlton (unpubl.) |
| *Doriopsis granulosa* | – | Indo-Pacific region | AF249798 | AF249223 | – | Wollscheid-Lengeling *et al.* 2001 |
| *Doriopsis granulosa* | D. granulosa | Mauritius | MW815564 | – | – | Ah-Shee-Tee *et al*. 2022 |
| *Doris adrianae* | DOR01 | Vigo | MW518047 | – | – | Almón, Pérez & Pérez (unpubl.) |
| *Doris adrianae* | DOR02 | Vigo | MW518048 | – | – | Almón, Pérez & Pérez (unpubl.) |
| *Doris adrianae* | DOR03 | Vigo | MW518049 | – | – | Almón, Pérez & Pérez (unpubl.) |
| *Doris adrianae* | DOR04 | Vigo | MW518050 | – | – | Almón, Pérez & Pérez (unpubl.) |
| *Doris adrianae* | DOR05 | Vigo | MW518051 | – | – | Almón, Pérez & Pérez (unpubl.) |
| *Doris adrianae* | USCX10324 | Ría de Ferrol, Galicia, Spain | MW602531 | – | – | Urgorri *et al*. 2021 |
| *Doris nobilis* | Gastr 8481V | – | MG935354 | – | – | Lundin (unpubl.) |
| *Doris ocelligera* | DORA2 | Vigo | MW522603 | – | – | Almón, Pérez & Pérez (unpubl.) |
| *Doris ocelligera* | DORA4 | Vigo | MW522602 | – | – | Almón, Pérez & Pérez (unpubl.) |
| *Doris* sp. | CCS-2010 | Ross Sea, Antarctica | GQ292046 | – | – | Shields, Marko, Woods & Moran (unpubl.) |

**References**

Ah-Shee-Tee L., Puchooa D., Appadoo C., Bhoyroo V., Kerovec D. 2022. Occurrence and distribution of opisthobranch sea slugs in environment-impacted areas of Mauritius. *Regional Studies in Marine Science* 52: 102249. https://doi.org/10.1016/j.rsma.2022.102249

Cheney K.L., Cortesi F., How M.J., Wilson N.G., Blomberg S.P., Winters A.E., Umanzör S. & Marshall N.J. 2014. Conspicuous visual signals do not coevolve with increased body size in marine sea slugs. *Journal of Evolutionary Biology* 27: 676–687. https://doi.org/10.1111/jeb.12348

Do T.D., Jung D.-W. & Kim C.-B. 2022. Molecular phylogeny of selected dorid nudibranchs based on complete mitochondrial genome. *Scientific Reports* 12: 18797. https://doi.org/10.1038/s41598-022-23400-9

Hallas J.M., Chichvarkhin A. & Gosliner T.M. 2017. Aligning evidence: concerns regarding multiple sequence alignments in estimating the phylogeny of the Nudibranchia suborder Doridina. *Royal Society Open Science* 4: 171095. https://doi.org/10.1098/rsos.171095

Heimeier D., Lavery S. & Sewell M.A. 2010. Using DNA barcoding and phylogenetics to identify Antarctic invertebrate larvae: lessons from a large scale study. *Marine Genomics* 3: 165–177. https://doi.org/10.1016/j.margen.2010.09.004

De Masi L., Adelfi M.G., Pignone D. & Laratta B. 2015. Identification of *Doris verrucosa* mollusc via mitochondrial 16S rDNA. *Biochemical Systematics and Ecology* 58: 21–29. https://doi.org/10.1016/j.bse.2014.10.009

Liu C., Wu X. & Shen H.D. 2015. Complete mitochondrial genome of *Vaginulus alte* and *Homoiodoris japonica*. *Mitochondrial DNA Part A* 27: 3454–3457. https://doi.org/10.3109/19401736.2015.1066345

Thollesson M. 2000. Increasing fidelity in parsimony analysis of dorid nudibranchs by differential weighting, or a tale of two genes. *Molecular Phylogenetics and Evolution* (16): 161–172. https://doi.org/10.1006/mpev.2000.0789

Urgorri V., Pérez Señarís M., Díaz Agras G., Candás Romero M., Gómez Rodríguez C. 2021. *Doris adrianae* sp. nov. (Heterobranchia; Nudibranchia; Doridina) from the Galician coasts (NW Iberian Peninsula). *Nova Acta Científica Compostelana* 28: 1–33. https://doi.org/10.15304/nacc.id7500

Wilson N.G., Schrödl M. & Halanych K.M. 2009. Ocean barriers and glaciation: evidence for explosive radiation of mitochondrial lineages in the Antarctic sea slug *Doris kerguelenensis* (Mollusca, Nudibranchia). *Molecular Ecology* 18: 965–984. https://doi.org/10.1111/j.1365-294X.2008.04071.x

Wollscheid-Lengeling E., Boore J., Brown W. & Wägele H. 2001. The phylogeny of Nudibranchia (Opisthobranchia, Gastropoda, Mollusca) reconstructed by three molecular markers. *Organisms Diversity & Evolution* 1: 241–256. https://doi.org/10.1078/1439-6092-00022