Supplementary file 3. Family Gorgonocephalidae, pairwise distance values based on 608 bp mitochondrial COI sequences, calculated using the Kimura 2-parameter method with 1,000 bootstrap replicates (Values in blue represent Standard Error). Abbreviations: AN = Antarctica; NZ = New Zealand, SAO = Southern Ocean, SCS = South China Sea.

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Species** | **GenBank Accession No.** | **P-distance (%)** | | | | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 1 | *Gorgonocephalus chilensis novaezelandiae* (SCS) | MZ198761 |  | 0.27% | 0.62% | 0.52% | 0.79% | 0.91% | 1.50% | 1.57% | 1.47% | 1.48% | 1.85% | 1.76% | 1.79% | 1.89% | 1.80% |
| 2 | *Gorgonocephalus chilensis* (NZ) | KU895116 | 0.50% |  | 0.57% | 0.47% | 0.76% | 0.89% | 1.54% | 1.62% | 1.52% | 1.53% | 1.88% | 1.81% | 1.81% | 1.95% | 1.80% |
| 3 | *Gorgonocephalus chilensis* (SO) | MH671879 | 2.52% | 2.01% |  | 0.28% | 0.83% | 0.96% | 1.57% | 1.67% | 1.58% | 1.59% | 1.87% | 1.82% | 1.83% | 1.94% | 1.88% |
| 4 | *Gorgonocephalus chilensis* (AN) | AB758812 | 2.01% | 1.50% | 0.50% |  | 0.78% | 0.91% | 1.55% | 1.67% | 1.58% | 1.58% | 1.86% | 1.79% | 1.80% | 1.92% | 1.87% |
| 5 | *Gorgonocephalus eucnemis* | AB758809 | 4.07% | 3.90% | 4.60% | 4.07% |  | 0.89% | 1.57% | 1.60% | 1.54% | 1.55% | 1.80% | 1.82% | 1.77% | 1.88% | 1.87% |
| 6 | *Gorgonocephalus arcticus* | HM543017 | 5.47% | 5.29% | 6.36% | 5.83% | 5.64% |  | 1.47% | 1.57% | 1.49% | 1.46% | 1.83% | 1.81% | 1.83% | 1.95% | 1.75% |
| 7 | *Gorgonocephalus sundanus* | KU895115 | 13.49% | 14.08% | 14.89% | 14.69% | 14.09% | 12.33% |  | 0.83% | 0.88% | 0.87% | 1.70% | 1.63% | 1.73% | 1.95% | 1.85% |
| 8 | *Gorgonocephalus* cf. *dolichodsactylus* (SCS) | MZ198760 | 14.31% | 14.92% | 15.94% | 15.95% | 14.10% | 13.53% | 3.90% |  | 0.64% | 0.61% | 1.68% | 1.77% | 1.76% | 1.98% | 1.87% |
| 9 | *Gorgonocephalus pustulatum* | KU895114 | 13.31% | 13.90% | 14.91% | 14.92% | 13.90% | 12.92% | 4.42% | 2.51% |  | 0.43% | 1.68% | 1.78% | 1.76% | 1.89% | 1.83% |
| 10 | *Astrodendrum sagaminum* | AB758795 | 13.31% | 13.90% | 14.91% | 14.92% | 13.90% | 12.54% | 4.42% | 2.18% | 1.16% |  | 1.67% | 1.72% | 1.72% | 1.87% | 1.80% |
| 11 | *Asteroporpa australiensis* | KU895095 | 18.40% | 18.82% | 19.24% | 19.03% | 17.55% | 18.22% | 15.91% | 15.51% | 15.10% | 14.90% |  | 1.83% | 1.79% | 2.06% | 1.99% |
| 12 | *Astrocrius parens* | AB758794 | 17.13% | 17.76% | 18.60% | 18.18% | 18.62% | 17.36% | 15.48% | 17.14% | 16.95% | 16.31% | 19.01% |  | 1.49% | 1.79% | 1.83% |
| 13 | *Astrotoma agassizii* | KU895112 | 18.59% | 18.59% | 19.02% | 18.60% | 17.74% | 18.80% | 16.91% | 16.91% | 16.30% | 16.08% | 16.90% | 13.11% |  | 1.87% | 1.62% |
| 14 | *Astrodia abyssicola* | AB758828 | 20.09% | 20.74% | 20.95% | 20.96% | 19.86% | 20.95% | 19.43% | 19.02% | 18.16% | 17.94% | 21.16% | 17.53% | 17.96% |  | 1.80% |
| 15 | *Asteronyx loveni* | KU895062 | 20.30% | 20.31% | 21.40% | 21.41% | 21.17% | 18.81% | 18.80% | 18.58% | 17.97% | 18.16% | 21.17% | 19.04% | 16.10% | 17.87% |  |