**Table S5.** Sampling information of species used for phylogenetic analysis in this study

|  |  |  |
| --- | --- | --- |
| Species | Accession no. | Reference |
| *Branchipolynoe* sp. | KY753826 | (Zhang et al. 2018) |
| *Branchipolynoe pettiboneae* | KY753825 | (Zhang et al. 2018) |
| *Branchipolynoe onnuriensis* sp. nov. | MZ457523 | This Research |
| *Branchinotogluma japonicus* | KY753824 | (Zhang et al. 2018) |
| *Lepidonotopodium* sp. | KY753828 | (Zhang et al. 2018) |
| *Levensteiniella iris* | KY753827 | (Zhang et al. 2018) |
| *Halosydna* sp. | KY753830 | (Zhang et al. 2018) |
| *Pelagomacellicephala iliffei* | MW794261 | (Gonzalez et al. 2021) |
| *Melaenis* sp. | KY753829 | (Zhang et al. 2018) |
| *Eunoe nodosa* | MW557378 |  |
| *Arctonoe vittata* | MZ131647 |  |
| *Aphrodita australis* | MN334532 | (Wang et al. 2019) |