# Supplementary material

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| **Table 1:** Collecting data and GenBank Accession numbers for taxa included in the phylogenetic analyses. Newly added sequences written in bold. | | | | |
| **Species** | **18S** | **16S** | **COI** | **Locality** |
| **Outgroup** |  |  |  |  |
| *Eunice pennata* (Eunicidae) | AY040684 | AF321418 | - |  |
| *Harmothoe imbricata* (Polynoidae) | AY340434 | AY340463 | AY839580 |  |
| *Nereis pelagica* (Nereididae) | AY340438 | AY340470 | - |  |
| *Phyllodoce maculata* (Phyllodocidae) | AY176302 | - | AY839586 |  |
| *Nereimyra punctata* (Hesionidae) | DQ779661 | DQ442577 | DQ442566 | Bohuslän, Sweden |
| *Sigambra* sp. (Pilargidae) | AY340444 | AY340481 | - |  |
| **Syllidae** |  |  |  |  |
| *Astreptosyllis acrassiseta* (Anoplosyllinae) | - | JF913950 | - | Port Jackson, NSW, Australia |
| *Streptosyllis bidentata* (Anoplosyllinae) | GU357625 | EF123802 | EF123768 | Port de la Selva, Girona, Spain |
| *Eusyllis blomstrandi* (Eusyllinae) | EF123887 | EF123788 | EF123749 | Kaldbak, Faroe Islands |
| *Amblyosyllis clarae* (Eusyllinae) | x | MH431080 | MH431263 | Trondheim fjord, Rodberg, Norway |
| *Pionosyllis nidrosiensis* (Eusyllinae) | EF123826 | EF123795 | EF123758 | Tjärno, Sweden |
| *Exogone haswelli* (Exogoninae) | JF903601 | - | JF903770 | Botany Bay, NSW, Australia |
| *Sphaerosyllis austriaca* (Exogoninae) | EF123884 | EF123799 | EF123763 | Port de la Selva, Girona, Spain |
| *Prosphaerosyllis battiri* (Exogoninae) | JF903630 | JF903711 | JF903763 | Rottnest Is., WA, Australia |
| **Syllinae** |  |  |  |  |
| *Alcyonosyllis hinterkircheri* | KM277825 | KM277821 | - | Kimberley, WA, Australia |
| *Alcyonosyllis phili* | KM277824 | KM277822 | KM277827 | Kimberley, WA, Australia |
| *Branchiosyllis exilis* | JF903581 | JF903691 | JF903783 | Shark Bay, WA, Australia |
| *Branchiosyllis maculata* | JF903585 | JF903694 | - | Heron Island, QLD, Australia |
| *Branchiosyllis thylacine* | JF903586 | JF913951 | - | Port Jackson, NSW, Australia |
| *Eurysyllis tuberculata* | EF123833 | - | EF123748 | Banyuls-sur-mer, France |
| *Haplosyllis* sp.1 | JF903607 | JF903698 | - | Shark Bay, WA, Australia |
| *Haplosyllis spongicola* | EF123837 | EF123791 | EF123751 | Banyuls-sur-mer, France |
| *Megasyllis corruscans* | KM277826 | KM277823 | KM277828 | Sydney, NSW, Australia |
| *Megasyllis glandulosa* | JF903576 | JF903686 | - | Port Denison, WA, Australia |
| *Megasyllis inflata* | JF913966 | JF913954 | JF903776 | Port Jackson, NSW, Australia |
| *Megasyllis mariandreworum* | JF903613 | JF913962 | - | Botany Bay, NSW, Australia |
| *Megasyllis niponnica* | - | EF123813 | EF123782 | Manazuru, Japan |
| *Megasyllis* sp. 1 | JF903577 | JF903687 | - | Manazuru, Japan |
| *Megasyllis* sp.2 | JF903614 | - | - | Manazuru, Japan |
| *Megasyllis subantennata* | JF903578 | JF903688 | JF903775 | Kalbarry, WA, Australia |
| *Megasyllis tigrina* | JF903579 | JF903689 | - | Jervis Bay, NSW, Australia |
| *Opisthosyllis leslieharrisae* | EF123844 | - | EF123757 | California, USA |
| *Opisthosyllis longicirrata* | JF903622 | JF913959 | - | Heron Island, QLD, Australia |
| *Parahaplosyllis kumpol* | - | KX084922 | KX084966 | Cavalli Islands, New Zealand |
| *Paraopisthosyllis alternocirra* | JF903623 | JF903707 | JF903786 | Rottnest Is., WA, Australia |
| *Paraopisthosyllis* cf. *phyllocirra* | JF903624 | JF903708 | JF903777 | Lizard Island, QNLD, Australia |
| ***Paraopisthosyllis rufa* n. sp.** | **PV288371** | **PV275264** | **-** | **Misaki, Japan** |
| *Pseudosyllis brevipennis* | EF123878 | EF123816 | EF123785 | Port de la Selva, Girona, Spain |
| *Syllis adamantea* | - | GU362679 | GU362692 | Taipingjiao, China |
| *Syllis albae* | KX792201 | KX792205 | KX792209 | Las Cruces, Chile |
| *Syllis alternata* | JF903649 | JF903726 | - | Port de la Selva, Girona, Spain |
| *Syllis amica* | KX084858 | - | KX084927 | Puerto Colera, Girona, Spain |
| *Syllis armillaris* | JF913969 | JF903727 | - | Cala Ratjada, Mallorca, Spain |
| *Syllis augeneri* | JF913970 | - | JF903788 | Port Jackson, NSW, Australia |
| *Syllis broomensis* | JF903650 | JF903728 | KU182897 |  |
| *Syllis cerina* | JF903653 | JF903729 | - | Prince of Wales Is., QLD, Australia |
| *Syllis columbretensis* | JF903656 | EF123805 | EF123771 | Port de la Selva, Girona, Spain |
| *Syllis compacta* | EF123846 | EF123806 | EF123772 | Altea, Alicante, Spain |
| *Syllis edensis* | - | JF903732 | JF903789 | New Port, NSW, Australia |
| *Syllis ehlersioides* | EF123841 | EF123808 | EF123773 | Manazuru Peninsula, Japan |
| *Syllis ferrani* | EF123874 | EF123809 | EF123775 | Port de la Selva, Girona, Spain |
| *Syllis gerlachi* | JF903659 | EF123810 | EF123777 | Port de la Selva, Girona, Spain |
| *Syllis gerundensis* | KX084847 | KX084861 | KX084929 | El Toro Island, Mallorca, Spain |
| *Syllis gracilis* complex lineage 1 | KX281030 | KX280966 | KX281007 | “Koala point”, Balayan Bay, Luzon Island, Philippines |
| *Syllis gracilis* complex lineage 2 | KX281039 | KX280936 | KX280979 | “Mainif point”, between Balayan Bay and Batan-gas Bay, Luzon Island, Philippines |
| *Syllis gracilis* complex lineage 3 | KX281013 | KX280948 | KX281002 | Western coast of Sicily |
| *Syllis gracilis* complex lineage 4 | KX281011 | KX280954 | KX280998 | Cap Falcó, Gi-rona, Spain |
| *Syllis lutea* | JF903663 | JF903736 | JF903785 | Shark Bay, WA, Australia |
| *Syllis magellanica* | KX281025 | KX280960 | KX281003 | El Queso, Ica, Peru |
| *Syllis malaquini* | MN533981 | MN533980 | MN533982 | Aquarium Madrid, Spain |
| *Syllis marugani* | EF123863 | EF123812 | EF123780 | Manazuru Peninsula, Japan |
| *Syllis monilaris* | EF123860 | EF123819 | EF123781 | Manazuru Peninsula, Japan |
| *Syllis okadai* | EF123858 | EF123814 | EF123783 | Manazuru Peninsula, Japan |
| ***Syllis okadai*** Misaki | **PV288373** | **PV275266** | **PV285285** | **Misaki, Japan** |
| *Syllis patriciae* | JF903665 | JF903738 | JF903781 | Shark Bay, WA, Australia |
| *Syllis picta* | KX281028 | KX280968 | KX281009 | ”Twin Rocks”, El Nido, Palawan Island, Philippines |
| *Syllis pigmentata* | EF155921 | - | EF123774 | Manazuru Peninsula, Japan |
| *Syllis pulvinata* | KX281050 | KX280969 | KX280976 | Puerto Colera, Girona, Spain |
| *Syllis tamarae* | KX792203 | KX792208 | KX792213 | Chile |
| *Syllis variegata* | KX281049 | KX280974 | KX281010 | “Polpollcan”, El Nido, Palawan Island, Philippines |
| *Syllis vittata* | JF903671 | JF903743 | GU362691 | San Esteban Asturias, Spain |
| *Trypanedenta gigantea* | KX084842 | KX084919 | KX084947 | Elephant Island, Antarctica |
| *Trypanobia cryptica* | KR604717 | KR534503:NC:  12516..13522 | KR534503:NC:  9653..10444 | Lizard Island, Australia |
| *Trypanobia depressa* | KR364795 | KR364797 | KR364801 | Lizard Island, Australia |
| *Trypanospina martini* | MG053194 | MG053191 | MG053200 | Mainif point”, between Balayan Bay and Batangas Bay, Luzon Island, Philippines |
| *Trypanosyllis aeolis* | KX084817 | KX084913 | KX084968 | El Toro Island, Mallorca, Spain |
| *Trypanosyllis californiensis* | KX084821 | KX084869 | KX084938 | La Jolla, San Diego, California |
| *Trypanosyllis luzonensis* | KX084838 | KX084892 | KX084963 | Hong Kong University of Science and Technology, Hong Kong, China |
| *Typosyllis antoni* | MN545360 | NC\_031404 :2927-3927 | NC\_031404 :14914-16503 | Aquarium Leipzig, Germany |
| *Xenosyllis scrabroides* | JF913974 | JF903753 |  |  |
| **Autolytinae** |  |  |  |  |
| *Cryptochaetosyllis imitatio* | PP545379 | PP545378 | PP545372 | Japan; Vietnam |
| *Epigamia alexandri* | AF474308 | AF474262 | GQ856183 | Kaldbak, Faroe Islands |
| *Epigamia macrophthalma* | AF474293 | - | - | Banyuls, France |
| *Epigamia magna* | AF474309 | AF474263 | - | FHL, Washington, USA |
| *Epigamia noroi* | AF474310 | AF474264 | - | SCI, California, USA |
| *Erseia oligochaeta* | GU722644 | GU722635 | GU722612 | Rovinj, Croatia |
| *Imajimaea draculai* | GQ856205 | GQ856208 | GQ856173 | Bratten area, Sweden |
| *Myrianida australiensis* | EF661838 | EF661834 | GQ856187 | Kaikora, New Zealand |
| *Myrianida brachycephala* | AF474296 | AF474250 | GQ856188 | Kristineberg, Sweden |
| *Myrianida convoluta* | AF474303 | AF474257 | GQ856189 | SCI, California, USA |
| *Myrianida dentalia* | AF474301 | AF474255 | GQ856190 | FHL, Washington, USA |
| *Myrianida edwarsi* | AF474294 | AF474248 | GQ856191 | Kristineberg, Sweden |
| *Myrianida flava* | AF474300 | AF474254 | GQ856192 | FHL, Washington, USA |
| *Myrianida gidholmi* | EF661839 | EF661835 | GQ856193 | Carrie Bow Cay, Belize |
| *Myrianida hesperidium* | AF474305 | AF474259 | - | Banyuls, France |
| *Myrianida inermis* | AF474302 | AF474256 | - | La Jolla, California, USA |
| *Myrianida irregularis* | AF474307 | AF474261 | GQ856196 | Friday Harbour, Washington, USA |
| *Myrianida langerhansi* | AF474297 | AF474251 | GQ856197 | Banyuls, France |
| *Myrianida longoprimicirrata* | GU722643 | GU722629 | GU722619 | Banyuls, France |
| *Myrianida pachycera* | AF474304 | AF474258 | GQ856198 | LA, California, USA |
| *Myrianida paradesi* | KY986867 | - | KY986868 | Pampa, Melchorita, Peru |
| *Myrianida pentadentata* | AF474299 | AF474253 | GQ856199 | La Jolla, California, USA |
| *Myrianida pinnigera* | AF474298 | AF474252 | GQ856200 | Cádiz, Spain |
| *Myrianida prolifera* | AF474295 | AF474249 | GQ856201 | Kristineberg, Sweden |
| *Myrianida puladilaw* | - | KJ534507 | KJ534506 | Luzon, Philippine Islands |
| *Myrianida quindecimdentata* | AF474306 | AF474260 | GQ856202 | Banyuls, France |
| *Proceraea albocephala* | GU722646 | GU722640 | GU722607 | Porto Moniz, Madeira |
| *Proceraea aurantiaca* | AF474324 | AF474278 | GQ856160 | Banyuls, France |
| *Proceraea cornuta* | AF474312 | AF474266 | - | Koster Area, Sweden |
| *Proceraea fasciata* | GQ856204 | GQ856206 | GQ856161 | North Carolina, USA |
| *Proceraea gigantea* | AF474313 | AF474267 | - | Santa Cruz Island, USA |
| *Proceraea hanssoni* | AF474321 | AF474275 | GQ856162 | FHL, Washington, USA |
| *Proceraea madeirensis* | GU722645 | GU722627 | GU722617 | Funchal, Madeira |
| *Proceraea nigropunctata* | AF474320 | AF474274 | GQ856163 | SCI, California, USA |
| *Proceraea okadai* | AF474319 | AF474273 | GQ856164 | FHL, Washington, USA |
| *Proceraea paraurantiaca* | AF474323 | AF474277 | GQ856165 | Banyuls, France |
| *Proceraea picta* | AF474317 | AF474271 | GQ856166 | Banyuls, France |
| *Proceraea pleijeli* | - | - | GQ856167 | Cádiz, Spain |
| *Proceraea prismatica* | AF474311 | AF474265 | GQ856168 | Kaldbak, Faroe Islands |
| *Proceraea pseudopicta* | AF474318 | AF474272 | - | Cádiz, Spain |
| *Proceraea rubroproventriculata* | AF474322 | AF474276 | GQ856169 | Baía de Paranagua, Brazil |
| *Proceraea scapularis* | AF474316 | AF474270 | GQ856170 | Banyuls, France |
| *Procerastea nematodes* | - | - | GQ856172 | Santa Catalina, Cal.,USA |
| *Virchowia clavata* | AF474314 | AF474268 | GQ856171 | Banyuls, France |
| ***Virchowia christophi* n. sp.** | **PV288372** | **PV275265** | **PV285284** | **Misaki, Japan** |
| ***Myrianida* sp.** | [**PV357201**](https://www.ncbi.nlm.nih.gov/nuccore/PV357201) | [**PV357200**](https://www.ncbi.nlm.nih.gov/nuccore/PV357200) | [**PV357176**](https://www.ncbi.nlm.nih.gov/nuccore/PV357176) | **Sado Island, Japan** |