

Appendix 1. GenBank sequence identifiers (GI numbers) for loci used in analysis listed alphabetically. Changes to the species name used in this manuscript are listed in bold. Checkmarks denote taxa used in primary analysis (188-taxa), shown in Fig 1.

| GenBank Name | Fig. 1 | 12S | 16S | 18S | 28S | COI | cytb | H3 | odh | opsin | pax |
|-----------------------------------|--------|------------|------------|-----------|-----------|------------|------------|-----------|-----------|-----------|-----------|
| Abdopus abaculus | | 0 | 0 | 0 | 0 | 226088442 | 0 | 0 | 0 | 0 | 0 |
| Abdopus aculeatus | | | | | | 226088444 | | | | | |
| Abralia sp. | | 0 | 0 | 0 | 0 | 4003399 | 0 | 0 | 0 | 0 | 0 |
| Abralia trigonura | | | 498929 | | | | | | | | |
| Abralia veranyi | ✓ | 0 | 209969975 | 209969995 | 209970067 | 209970147 | 0 | 209970192 | 0 | 0 | 0 |
| Abraliopsis pacificus | ✓ | 48994429 | 48994456 | | | | | | | 48994597 | 48994547 |
| Abraliopsis pfefferi | | 0 | 0 | 49482097 | 49482150 | 0 | 0 | 50347033 | 0 | 0 | 0 |
| Abraliopsis sp. | | | 498928 | 34369157 | | | | | | | |
| Abraliopsis sp. YJP 2002 | | 0 | 0 | 0 | 34369182 | 0 | 0 | 0 | 0 | 0 | 0 |
| Adelieledone piatkowski | ✓ | 161611169 | 161611151 | | | | | | 161611137 | 158828829 | 161611101 |
| Adelieledone polymorpha | ✓ | 129279685 | 18076692 | 0 | 0 | 15421837 | 161598182 | 0 | 45510967 | 45511068 | 45511020 |
| Pareledone sp. AP 2001 | | | 18027468 | | | | | | | | |
| = Adelieledone sp. AP 2001 | | | | | | | | | | | |
| Afrololigo mercatoris | | 0 | 93004770 | 0 | 0 | 194474586 | 0 | 0 | 0 | 194474656 | 0 |
| Alloteuthis africana | | | 194474470 | | | 194474508 | | | | 194474600 | |
| Alloteuthis media | | 0 | 194474490 | 0 | 0 | 194474550 | 0 | 0 | 0 | 194474634 | 0 |
| Alloteuthis subulata | | | 194474505 | | | 194474580 | | | | 194474650 | |
| Alluroteuthis antarcticus | | 0 | 0 | 0 | 0 | 4927135 | 0 | 0 | 0 | 0 | 0 |
| Ameloctopus litoralis | | | | | | | 76359246 | | | | |
| Amphioctopus aegina | | 0 | 0 | 0 | 0 | 226088446 | 0 | 0 | 0 | 0 | 0 |
| Octopus aegina | | 62005880 | 62005866 | | | | 76359260 | | | | |
| = Amphioctopus aegina | | | | | | | | | | | |
| Amphioctopus fangsiao | | 0 | 0 | 0 | 0 | 226088450 | 0 | 0 | 0 | 0 | 0 |
| Octopus areolatus | | 62005878 | 18076177 | | | | | | | | |
| = Amphioctopus fangsiao | | | | | | | | | | | |
| Amphioctopus kagoshimensis | | 0 | 0 | 0 | 0 | 226088456 | 0 | 0 | 0 | 0 | 0 |
| Amphioctopus marginatus | | | | | | 207107966 | | | | | |
| Octopus marginatus | | 0 | 18076181 | 0 | 0 | 0 | 76359294 | 0 | 0 | 0 | 0 |
| = Amphioctopus marginatus | | | | | | | | | | | |
| Amphioctopus cf neglectus | | | | | | 207107970 | | | | | |
| = Amphioctopus neglectus | | | | | | | | | | | |
| Amphioctopus cf ovulum | | 0 | 0 | 0 | 0 | 207107972 | 0 | 0 | 0 | 0 | 0 |
| = Amphioctopus ovulum | | | | | | | | | | | |
| Amphioctopus cf rex | | | | | | 207107968 | | | | | |
| = Amphioctopus rex | | | | | | | | | | | |
| Amphioctopus cf siamensis | | 0 | 0 | 0 | 0 | 226088448 | 0 | 0 | 0 | 0 | 0 |
| = Amphioctopus siamensis | | | | | | | | | | | |
| Amphitretus pelagicus | | | | | | 15421823 | | | | | |
| Ancistrocheirus lesueuri | | 0 | 0 | 0 | 49482149 | 4003401 | 0 | 0 | 0 | 0 | 0 |
| Ancistroteuthis lichtensteinii | ✓ | | 209969958 | 209970016 | 209970051 | 209970117 | | 209970243 | | | |
| Aphrodoctopus schultzei | | 0 | 18072925 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Aphrodoctopus sp. JMS 2004 | | 48994441 | 48994448 | | | | | | | | |
| Architeuthis dux | ✓ | 2127256204 | 2127256203 | 49482087 | 82622108 | 2127256201 | 2127256202 | 38607259 | 0 | 0 | 0 |
| Architeuthis sp. | | | 498927 | | 18072919 | 4003403 | | | | | |
| Architeuthis sp. ARL 2008 | ✓ | 0 | 209969956 | 209969985 | 209970061 | 209970109 | 0 | 209970171 | 0 | 0 | 0 |
| Architeuthis sp. JMS 2004 | ✓ | 48994443 | 48994455 | | | | | | 48994503 | 48994593 | |

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|--|--------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|----------|-----------|----------|
| Architeuthis sp. ML 2009 | | 0 | 0 | 0 | 0 | 255642897 | 0 | 0 | 0 | 0 | 0 |
| Argonauta argo | | 62005877 | 62005863 | | | 62084161 | | | | | |
| Argonauta nodosa | ✓ | 45510911 | 45510935 | 49482067 | 0 | 4003405 | 76359244 | 50346987 | 45510951 | 45511050 | 0 |
| Asperoteuthis nesis | ✓ | 167538900 | 167538899 | 209970022 | 209970068 | 167538892 | | | | | |
| Bathypolypus arcticus | | 0 | 82622208 | 49482070 | 0 | 4003407 | 0 | 0 | 0 | 0 | 0 |
| Bathypolypus sp. | | | 16944397 | | | | | | | | |
| Bathypolypus sp. JMS 2004 | ✓ | 48994418 | 48994446 | 0 | 0 | 0 | 0 | 0 | 48994469 | 48994571 | 48994525 |
| Bathypolypus sponsalis | | 116829864 | 18072838 | | | | 239735781 | | | | |
| Bathypolypus valdiviae | ✓ | 48994417 | 0 | 0 | 0 | 15421831 | 0 | 0 | 48994467 | 0 | 48994523 |
| Bathyteuthis abyssicola | ✓ | 48994432 | 209969915 | 49482088 | 49482142 | 4003409 | | 50347019 | 48994493 | 48994603 | 48994553 |
| Bathyteuthis berryi | ✓ | 48762894 | 48762909 | 0 | 0 | 48762876 | 0 | 0 | 48994318 | 48994356 | 48994386 |
| Bathyteuthis sp. A | ✓ | | 209969938 | 209969988 | 209970031 | 209970077 | | 209970177 | | | |
| Batoteuthis skolops | ✓ | 0 | 209969916 | 49482089 | 49482143 | 0 | 0 | 50347021 | 0 | 0 | 0 |
| Bentheledone sp. CYV 2001 | | | | | | 15421843 | | | | | |
| Bentheledone sp. HBH | | 0 | 18072926 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Benthoctopus eureka | | | | | | | 239735783 | | | | |
| Benthoctopus eureka 1 = Benthoctopus eureka | | 116829865 | 116829855 | 0 | 0 | 0 | 0 | 0 | 0 | 116829806 | 0 |
| Benthoctopus johnsonianus | ✓ | 116829867 | 116829858 | | | | 239735785 | | | 116829812 | |
| Benthoctopus cf levis = Benthoctopus levis | | 0 | 116829857 | 0 | 0 | 0 | 0 | 0 | 0 | 116829810 | 0 |
| Benthoctopus levis | | 226350502 | | | | | | | | | |
| Benthoctopus normani | | 0 | 0 | 0 | 0 | 0 | 239735803 | 0 | 0 | 116829814 | 0 |
| Benthoctopus normani 3 = Benthoctopus normani | | 116829868 | 116829859 | | | | | | | | |
| Benthoctopus oregonensis | | 239735813 | 239735811 | 0 | 0 | 0 | 239735787 | 0 | 0 | 0 | 0 |
| Benthoctopus cf profundorum = Benthoctopus profundorum | | 239735816 | 239735810 | | | | 239735797 | | | | |
| Benthoctopus rigbyae | | 226350505 | 226350509 | 0 | 0 | 0 | 239735805 | 0 | 0 | 0 | 0 |
| Benthoctopus sp. | | | 18072839 | | | | | | | | |
| Benthoctopus sp. A | | 239735814 | 239735808 | 0 | 0 | 0 | 239735791 | 0 | 0 | 0 | 0 |
| Benthoctopus sp. A JMS 2004 | | | | | | | | | 45510963 | 45511064 | 45511016 |
| Benthoctopus sp. B | | 239735820 | 0 | 0 | 0 | 0 | 239735801 | 0 | 0 | 0 | 0 |
| Benthoctopus sp. CYV 2001 | | | | | | 15421833 | | | | | |
| Benthoctopus sp. JMS 2004 | ✓ | 48994419 | 0 | 0 | 0 | 0 | 0 | 0 | 48994471 | 48994573 | 48994527 |
| Benthoctopus sp. MV | | 239735821 | | | | | | | | | |
| Benthoctopus thielei | | 226350504 | 226350508 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Benthoctopus yaquinae | ✓ | 239735818 | 239735807 | 34369159 | | | 239735789 | | | | |
| Berryteuthis anonychus | ✓ | 58202079 | 209969954 | 209970002 | 209970048 | 209970105 | 0 | 209970201 | 0 | 0 | 0 |
| Berryteuthis magister | ✓ | 62005902 | 209969979 | 209970026 | 209970070 | 58202168 | | 209970203 | | | |
| Bolitaena pygmaea | ✓ | 45510925 | 0 | 0 | 0 | 4003425 | 0 | 0 | 45510977 | 45511078 | 45511030 |
| Brachioeteuthis beanii | | | | | | 4003411 | | | | | |
| Brachioeteuthis sp. 1 | | 0 | 209969917 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Brachioeteuthis sp. 2 | ✓ | | 209969939 | 209969989 | 209970032 | 209970079 | | 209970179 | | | |
| Brachioeteuthis sp. 3 | ✓ | 0 | 209969940 | 209969990 | 209970033 | 209970081 | 0 | 209970181 | 0 | 0 | 0 |
| Brachioeteuthis sp. ARL 2004 | | | | 49482090 | 49482144 | | | 50347023 | | | |

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|--|--------|------------|------------|-----------|-----------|------------|------------|-----------|----------|----------|----------|
| Callistoctopus aspidosomatus | | 0 | 0 | 0 | 0 | 226088466 | 0 | 0 | 0 | 0 | 0 |
| Octopus aspidosomatus = Callistoctopus aspidosomatus | | | 18076683 | | | | 76359264 | | | | |
| Callistoctopus luteus | | 0 | 0 | 0 | 0 | 207107974 | 0 | 0 | 0 | 0 | 0 |
| Octopus macropus = Callistoctopus macropus | | | 83306180 | | | | | | | | |
| Callistoctopus minor | | 0 | 0 | 0 | 0 | 226088496 | 0 | 0 | 0 | 0 | 0 |
| Callistoctopus ornatus | | | | | | 226088472 | | | | | |
| Octopus ornatus = Callistoctopus ornatus | ✓ | 62005883 | 18076183 | 0 | 0 | 0 | 0 | 0 | 48994354 | 48994384 | 48994414 |
| Callistoctopus sp. NSMTMo74815 | | | | | | 207107980 | | | | | |
| Chiroteuthis calyx | ✓ | 0 | 209969953 | 209969999 | 209970047 | 209970103 | 0 | 209970211 | 0 | 0 | 0 |
| Chiroteuthis mega | ✓ | | 209969941 | 209969998 | 209970034 | 209970083 | | 209970215 | | | |
| Chiroteuthis veranyi | ✓ | 0 | 209969962 | 209970000 | 209970054 | 209970125 | 0 | 209970213 | 0 | 0 | 0 |
| Chtenopteryx sicula | ✓ | 34542039 | 34542069 | 209969986 | 209970043 | 209970097 | | 209970173 | | | |
| Chtenopteryx sp. ARL 2008 | ✓ | 0 | 209969967 | 209969987 | 209970060 | 209970135 | 0 | 209970175 | 0 | 0 | 0 |
| Cirroctopus glacialis | | | 28629084 | | | | | | | | |
| Grimpoteuthis glacialis = Cirroctopus glacialis | | 0 | 0 | 0 | 0 | 15421817 | 0 | 0 | 0 | 0 | 0 |
| Cirroctopus hochbergi | | | 21912808 | | | | | | | | |
| Cirroteuthis muelleri | | 0 | 28629064 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Cirrothauma murrayi | | | 28629062 | 49482061 | | 4003417 | | | | | |
| Cistopus cf indicus = Cistopus indicus | | 0 | 0 | 0 | 0 | 207107982 | 0 | 0 | 0 | 0 | 0 |
| Cistopus indicus | | | 18073263 | | | | 76359248 | | | | |
| Cistopus sp. JMS 2004 | | 48994421 | 0 | 0 | 0 | 0 | 0 | 48994475 | 48994577 | 48994531 | |
| Cranchia scabra | ✓ | 48994436 | 209969918 | 49482092 | 49482145 | 4003419 | | 50347025 | 48994519 | 48994611 | 48994561 |
| Cycloteuthis sirventyi | ✓ | 0 | 209969920 | 49482094 | 49482147 | 4003421 | 0 | 50347029 | 0 | 0 | 0 |
| Discoteuthis discus | ✓ | | 209969945 | 209969994 | 209970039 | 209970091 | | 209970227 | | | |
| Discoteuthis laciniosa | ✓ | 0 | 209969921 | 49482095 | 49482148 | 4003423 | 0 | 50347031 | 0 | 0 | 0 |
| Doratosepiion sp. LB 2005 | | 77157303 | | | | | | | | | |
| Loligo gahi = Doryteuthis gahi | ✓ | 0 | 93004761 | 0 | 0 | 5678658 | 0 | 0 | 0 | 0 | 0 |
| Loligo opalescens = Doryteuthis opalescens | ✓ | 2402666124 | 2402666123 | | | 2402666121 | 2402666122 | | 12055096 | | 1778016 |
| Loligo pealei = Doryteuthis pealeii | ✓ | 0 | 56567271 | 34369176 | 34369209 | 18026439 | 0 | 38607257 | 0 | 0 | 0 |
| Loligo plei = Doryteuthis plei | ✓ | | 93004765 | | | 14120087 | | | | | |
| Dosidicus gigas | ✓ | 1548161314 | 1548161313 | 209970009 | 209970049 | 1548161311 | 1548161312 | 209970229 | 0 | 0 | 0 |
| Eledone cirrhosa | ✓ | 48994420 | 18073265 | 49482072 | | | | | 48994473 | 48994575 | 48994529 |
| Eledone massyae | | 0 | 18073266 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Eledone moschata | | | 18073267 | | | | | | | | |
| Enoplateuthis galaxias | | 0 | 3175997 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Enoplateuthis higginsii | ✓ | 48994430 | 3175998 | | | | | | 48994495 | 48994599 | 48994549 |
| Enoplateuthis leptura | ✓ | 0 | 209969922 | 49482098 | 49482151 | 0 | 0 | 50347035 | 0 | 0 | 0 |

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|--------------------------------------|--------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Enoplateuthis reticulata | | | 498933 | | | 4003427 | | | | | |
| Enoplateuthis sp. BL 2001 | | 0 | 0 | 0 | 18375783 | 0 | 0 | 0 | 0 | 0 | 0 |
| Enteroteuthis dofleini | ✓ | 62005876 | 45510940 | | | 62084159 | 239735795 | | 45510965 | 45510966 | 45511018 |
| Octopus magnificus | | 0 | 18076180 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| = Enteroteuthis magnificus | | | | | | | | | | | |
| Eucleoteuthis luminosa | ✓ | | 209969960 | 209970010 | | 209970119 | | 209970225 | | | |
| Euprymna berryi | ✓ | 34542045 | 14161379 | 0 | 34542098 | 13195587 | 0 | 0 | 0 | 0 | 0 |
| Euprymna hyllebergi | ✓ | 34542048 | 34542074 | | 34542099 | 34542132 | | | | | |
| Euprymna morsei | | 62005906 | 34542070 | 0 | 34542100 | 0 | 0 | 0 | 0 | 0 | 0 |
| Euprymna scolopes | ✓ | 34542046 | 34542072 | | 34542097 | 34542128 | | | 48994346 | 48994378 | 21667880 |
| Euprymna sp. | | 0 | 498935 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Euprymna tasmanica | ✓ | 34542047 | 34542073 | | 34542108 | 34542130 | | | | 48994587 | 48994541 |
| Galiteuthis armata | ✓ | 0 | 0 | 209970023 | 209970053 | 209970151 | 0 | 209970188 | 0 | 0 | 0 |
| Galiteuthis sp. JMS 2004 | ✓ | 48994433 | 48994461 | | | | | | 48994483 | 48994605 | 48994555 |
| Gonatopsis borealis | | 58202061 | 58202086 | 0 | 0 | 4927137 | 0 | 0 | 0 | 0 | 0 |
| Gonatopsis japonicus | | 58202058 | 58202080 | | | 58202112 | | | | | |
| Gonatopsis octopedatus | ✓ | 58202060 | 58202085 | 209970027 | 209970071 | 58202122 | 0 | 0 | 0 | 0 | 0 |
| Gonatopsis cf okutanii | | | 209969981 | 209970028 | | 209970161 | | | | | |
| = Gonatopsis okutanii | | | | | | | | | | | |
| Gonatopsis sp. 01 | | 58202066 | 58202092 | 0 | 0 | 58202136 | 0 | 0 | 0 | 0 | 0 |
| Gonatopsis sp. ARL 2008 | ✓ | | 209969951 | 209970003 | 209970045 | | | 209970199 | | | |
| Gonatus antarcticus | ✓ | 0 | 58202093 | 49482102 | 49482155 | 58202138 | 0 | 50347043 | 0 | 0 | 0 |
| Gonatus berryi | | | 58202095 | | | 4003429 | | | | | |
| Gonatus californiensis | | 0 | 0 | 0 | 0 | 5052409 | 0 | 0 | 0 | 0 | 0 |
| Gonatus fabricii | ✓ | 58202067 | 58202094 | 49482103 | 49482156 | 4927139 | | 50347045 | | | |
| Gonatus kamtschaticus | | 58202071 | 58202099 | 0 | 0 | 58202148 | 0 | 0 | 0 | 0 | 0 |
| Gonatus madokai | | 58202075 | 58202106 | | | 58202162 | | | | | |
| Gonatus cf onyx | | 58202074 | 58202104 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Gonatus onyx | | | | | | 4003431 | | | | | |
| Gonatus pyros | | 0 | 58202105 | 0 | 0 | 58202160 | 0 | 0 | 0 | 0 | 0 |
| Gonatus tinro | | 58202068 | 58202097 | | | 58202142 | | | | | |
| Graneledone antarctica | ✓ | 161611174 | 161611156 | 0 | 0 | 15421839 | 0 | 0 | 0 | 158828843 | 161611135 |
| Graneledone pacifica | | | | 34369169 | | | | | | | |
| = Graneledone borealopacifica | | | | | | | | | | | |
| Graneledone boreopacifica | ✓ | 161611173 | 161611155 | 0 | 0 | 15421841 | 0 | 0 | 161611149 | 158828839 | 161611131 |
| Graneledone verrucosa | ✓ | 45510922 | 82561543 | 49482073 | | 4003433 | | 50346991 | 45510973 | 158828841 | 45511024 |
| Grimalditeuthis bonplandi | ✓ | 0 | 209969942 | 209970001 | 209970035 | 209970085 | 0 | 209970217 | 0 | 0 | 0 |
| Grimpella thaumastocheir | | | | | | | 76359250 | | | | |
| Grimpoteuthis sp. | | 0 | 93004785 | 0 | 0 | 5678678 | 0 | 0 | 0 | 0 | 0 |
| Grimpoteuthis sp. Challenger | | | 28629089 | | | | | | | | |
| Grimpoteuthis sp. CYV 2001 | | 0 | 0 | 0 | 0 | 15421819 | 0 | 0 | 0 | 0 | 0 |
| Grimpoteuthis sp. Discovery | | | 28629088 | | | | | | | | |
| Haliphron atlanticus | ✓ | 48994416 | 48994445 | 49482065 | 0 | 15421821 | 0 | 0 | 48994352 | 48994569 | 48994521 |
| Haliphron sp. ARL 2004 | | | | | | | | 50346986 | | | |
| = Haliphron atlanticus | | | | | | | | | | | |
| Hapalochlaena fasciata | | 0 | 0 | 0 | 0 | 226088474 | 76359252 | 0 | 0 | 0 | 0 |

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|--|--------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|----------|----------|----------|
| Hapalochlaena lunulata | | 62005882 | 18073264 | | | 226088476 | | | | | |
| Hapalochlaena maculosa | ✓ | 45510916 | 45510938 | 0 | 0 | 226088478 | 76359256 | 0 | 45510959 | 45511060 | 45511012 |
| Hapalochlaena sp. 1 MG 2004 | | | | | | | 76359254 | | | | |
| Helicocranchia pfefferi | | 0 | 93004784 | 0 | 0 | 5678671 | 0 | 0 | 0 | 0 | 0 |
| Heterololigo bleekeri | ✓ | 97906254 | 97906253 | | | 979062511 | 97906252 | | | | |
| Heteroteuthis hawaiiensis | ✓ | 34542063 | 34542089 | 49482077 | 82622107 | 34542160 | 0 | 50346997 | 48994344 | 48994376 | 48994406 |
| Histioteuthis bonellii | ✓ | | 209969964 | 209970005 | 209970056 | 209970129 | | 209970209 | | | |
| Histioteuthis corona | ✓ | 0 | 209969927 | 49482104 | 49482157 | 0 | 0 | 50347047 | 0 | 0 | 0 |
| Histioteuthis hoylei | ✓ | | 209969928 | 49482105 | 49482158 | 4003439 | | 50347049 | | | |
| Histioteuthis miranda | ✓ | 0 | 209969971 | 209970006 | 209970064 | 209970141 | 0 | 209970207 | 0 | 0 | 0 |
| Histioteuthis oceani | ✓ | 48994428 | 48994460 | | | | | | 48994487 | 48994595 | 48994545 |
| Histioteuthis reversa | ✓ | 0 | 209969947 | 49482106 | 209970041 | 209970143 | 0 | 209970205 | 0 | 0 | 0 |
| Histioteuthis sp. | | | 498936 | | | | | | | | |
| Histioteuthis sp. YJP 2002 | | 0 | 0 | 34369171 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Idiosepius biserialis | | 157932131 | 157863593 | | | | | | | | |
| Idiosepius macrocheir | | 157932166 | 157863628 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Idiosepius notoides | ✓ | 157932168 | 3618170 | | | | | | 45510979 | 45511080 | 45511032 |
| Idiosepius paradoxus | | 62005903 | 62005892 | 0 | 0 | 62084191 | 0 | 0 | 0 | 0 | 0 |
| Idiosepius picteti | | 157932192 | 157863661 | | | | | | | | |
| Idiosepius pygmaeus | ✓ | 34542043 | 209969911 | 49482082 | 0 | 4003441 | 0 | 50347007 | 0 | 0 | 0 |
| Illex argentinus | | | 498937 | | | 87042902 | | | | | |
| Illex coindetii | ✓ | 48994437 | 209969934 | 49482114 | 49482167 | 48762892 | 0 | 50347065 | 48994505 | 48994613 | 48994563 |
| Illex cf illecebrosus = Illex illecebrosus | | | 18253970 | | | | | | | | |
| Illex illecebrosus | | 0 | 0 | 0 | 0 | 87042834 | 0 | 0 | 0 | 0 | 0 |
| Japatella heathi = Japetella diaphana | | | | | | 15421825 | | | | | |
| Japetella diaphana | ✓ | 45510924 | 18073269 | 49482068 | 0 | 0 | 0 | 0 | 45510975 | 45511076 | 45511028 |
| Joubiniteuthis portieri | ✓ | 165868244 | 165868255 | 49482107 | 49482160 | 4003445 | | 50347053 | | | |
| Joubiniteuthis sp. JMS 2004 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 48994326 | 48994360 | 48994390 |
| Kondakovia sp. ARL 2008 | ✓ | | 209969983 | 209970030 | | 209970165 | | 209970247 | | | |
| Leachia atlantica | ✓ | 0 | 209969919 | 49482093 | 49482146 | 0 | 0 | 50347027 | 0 | 0 | 0 |
| Leachia lemur | ✓ | | 209969968 | 209969991 | 209970063 | 209970137 | | 209970186 | | | |
| Leachia pacifica | | 0 | 496355 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lepidoteuthis grimaldii | ✓ | | 209969930 | 49482108 | 49482161 | 4003447 | | 50347055 | | | |
| Liocranchia valdiviae | | 0 | 498940 | 0 | 0 | 4003449 | 0 | 0 | 0 | 0 | 0 |
| Loligo forbesi | ✓ | 45510930 | 498938 | | | 5678661 | | | 45510987 | 45511086 | 45511040 |
| Loligo reynaudii | | 0 | 93004766 | 0 | 0 | 5678665 | 0 | 0 | 0 | 0 | 0 |
| Loligo sp. AL9407 Loligo 1K | | | 18253969 | | | | | | | | |
| Loligo vulgaris | ✓ | 77157317 | 498939 | 0 | 0 | 5678656 | 0 | 0 | 13561066 | 0 | 0 |
| Loliolus japonica | | | 93004768 | | | 5678666 | 145244494 | | | | |
| Loliolus sp. JMS 2004 | ✓ | 48762902 | 48762913 | 0 | 0 | 48762884 | 0 | 0 | 48994340 | 48994372 | 48994402 |
| Lolliguncula brevis | | 48762898 | 93004769 | | | 5678655 | | | 48994332 | 48994364 | 48994394 |
| Lolliguncula diomedaeae | ✓ | 0 | 209969959 | 209969984 | 209970062 | 209970073 | 0 | 209970169 | 0 | 0 | 0 |
| Luteuthis dentatus | | | 21912935 | | | | | | | | |
| Lycoteuthis lorigera | ✓ | 0 | 209969973 | 209970020 | 209970065 | 209970145 | 0 | 209970198 | 0 | 0 | 0 |

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| GenBank Name | Fig. 1 | 12S | 16S | 18S | 28S | COI | cytb | H3 | odh | opsin | pax |
|---|--------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Octopus maorum = Macroctopus maorum | | | 18076684 | | | | 76359292 | | | | |
| Magnapinna sp. ARL 2008 | ✓ | 0 | 209969943 | 209970018 | 209970036 | 209970087 | 0 | 209970237 | 0 | 0 | 0 |
| Mastigoteuthis agassizii | ✓ | 165868248 | 165868260 | 49482109 | 49482162 | 169930488 | | 50347057 | | | |
| Mastigoteuthis latipinna = Mastigoteuthis cordiformis | | 0 | 0 | 0 | 0 | 5678673 | 0 | 0 | 0 | 0 | 0 |
| Mastigoteuthis hjorti | ✓ | 165868251 | 165868261 | 209970007 | 209970037 | 209970089 | | 209970221 | | | |
| Mastigoteuthis magna | ✓ | 165868246 | 165868258 | 49482110 | 49482163 | 4003455 | 0 | 50347059 | 0 | 0 | 0 |
| Mastigoteuthis microlucens | | 165868241 | 165868252 | | | 169930486 | | | | | |
| Mastigoteuthis sp. M1 | | 165868245 | 165868256 | 0 | 0 | 169930494 | 0 | 0 | 0 | 0 | 0 |
| Megaleledone senoi = Megaleledone setebos | | | | | | 15421847 | | | | | |
| Megaleledone setebos | ✓ | 129279686 | 129279664 | 0 | 0 | 0 | 0 | 0 | 161611139 | 154813166 | 161611129 |
| Megalocranchia fisheri | ✓ | 48994434 | | | | | | | 48994491 | 48994607 | 48994557 |
| Megalocranchia sp. ARL 2008 | | 0 | 209969944 | 209969993 | 209970038 | 209970123 | 0 | 209970183 | 0 | 0 | 0 |
| Mesonychoteuthis hamiltoni | ✓ | | 209969977 | 209970024 | | 209970153 | | 209970190 | | | |
| Metasepia pfefferi | | 77157304 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Metasepia tullbergi | ✓ | 62241210 | 62241202 | | | 62241222 | 242117741 | | 48994350 | 48994382 | 48994412 |
| Onykia knipovitchi = Moroteuthis knipovitchi | ✓ | 0 | 209969936 | 49482117 | 49482170 | 4927143 | 0 | 50347071 | 0 | 0 | 0 |
| Nautilus belauensis | | | 571356 | | | | | | | | |
| Nautilus macromphalus | ✓ | 944906654 | 944906653 | 17385427 | 0 | 911773921 | 944906652 | 0 | 0 | 0 | 0 |
| Nautilus pompilius | ✓ | 48994439 | 38607021 | 34369177 | | 18026437 | | | | | 48994567 |
| Nautilus repertus | | 0 | 571355 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nautilus scrobiculatus | | | 571333 | 18026322 | | | | | | | |
| Nautilus stenomphalus | | 0 | 571332 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Neorossia caroli | | | 117960047 | | | | | | | | |
| Neoteuthis thielei | ✓ | 0 | 209969931 | 49482111 | 49482164 | 0 | 0 | 50347061 | 0 | 0 | 0 |
| Notonykia sp. ARL 2008 | ✓ | | 209969948 | 209970014 | 209970042 | 209970115 | | 209970245 | | | |
| Nototodarus gouldi | | 0 | 38641271 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nototodarus hawaiiensis | | | 498942 | | | | | | | | |
| Nototodarus sp. GD 2007 | | 0 | 148337316 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Octopoteuthis megaptera | ✓ | | 209969974 | 209970008 | 209970066 | 209970075 | | 209970235 | | | |
| Octopoteuthis nielseni | ✓ | 48994431 | 48994457 | 49482112 | 49482165 | 4003459 | 0 | 209970231 | 48994515 | 48994601 | 48994551 |
| Octopoteuthis sicula | ✓ | | 209969933 | 49482113 | 49482166 | | | 50347063 | | | |
| Octopus aculeatus | | 0 | 0 | 0 | 0 | 0 | 76359258 | 0 | 0 | 0 | 0 |
| Octopus alpeus | | | | | | | 76359262 | | | | |
| Octopus australis | | 0 | 0 | 0 | 0 | 0 | 76359266 | 0 | 0 | 0 | 0 |
| Octopus berrima | ✓ | 45510913 | 45510936 | | | | 76359268 | | 45510953 | 45511054 | 45511006 |
| Octopus bimaculoides | ✓ | 45510917 | 18076178 | 0 | 0 | 15421827 | 0 | 0 | 45510961 | 45511062 | 45511014 |
| Octopus bocki | | | 18076686 | | | | | | | | |
| Octopus bunurong | | 0 | 0 | 0 | 0 | 0 | 76359270 | 0 | 0 | 0 | 0 |
| Octopus californicus | | | 16944718 | | | 15421829 | | | | | |
| Octopus conispadiceus | | 62005885 | 62005871 | 0 | 0 | 226088482 | 0 | 0 | 0 | 0 | 0 |
| Octopus cyanea | ✓ | 62005884 | 18076207 | | | 226088484 | 76359272 | | | | |
| Octopus dierythraeus | | 0 | 0 | 0 | 0 | 0 | 76359276 | 0 | 0 | 0 | 0 |

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|--------------------------------|--------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|----------|-----------|----------|
| Octopus exannulatus | | | | | | | 76359278 | | | | |
| Octopus graptus | | 0 | 0 | 0 | 0 | 0 | 76359280 | 0 | 0 | 0 | 0 |
| Octopus hongkongensis | | 186704370 | 186704369 | | | 226088490 | | | | | |
| Octopus incella | | 0 | 0 | 0 | 0 | 226088500 | 0 | 0 | 0 | 0 | 0 |
| Octopus joubini | | | | | | 38607157 | | 38607255 | | | |
| Octopus kagoshimensis | | 0 | 18076682 | 0 | 0 | 0 | 76359284 | 0 | 0 | 0 | 0 |
| Octopus kaurina | ✓ | 45510914 | 45510937 | | | | | | 45510955 | 45511056 | 45511008 |
| Octopus laqueus | | 186704374 | 186704373 | 0 | 0 | 226088502 | 0 | 0 | 0 | 0 | 0 |
| Octopus longispadiceus | | | | | | 226088494 | | | | | |
| Octopus luteus | | 0 | 18076179 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Octopus maya | | | 226424604 | | | | | | | | |
| Octopus mimus | | 0 | 16944714 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Octopus minor | | 62005879 | 62005865 | | | 62084165 | | | | | |
| Octopus mototi | | 0 | 18076182 | 0 | 0 | 0 | 76359296 | 0 | 0 | 0 | 0 |
| Octopus ocellate sp | | | | | | | 76359298 | | | | |
| Octopus ocellatus | ✓ | 893374134 | 893374133 | 0 | 0 | 893374131 | 893374132 | 0 | 0 | 0 | 0 |
| Octopus oculifer | | | | | | | 76359300 | | | | |
| Octopus oliveri | | 0 | 0 | 0 | 0 | 226088480 | 0 | 0 | 0 | 0 | 0 |
| Octopus pallidus | | | 18076184 | | | | 76359302 | | | | |
| Octopus parvus | | 62005875 | 62005861 | 0 | 0 | 226088504 | 0 | 0 | 0 | 0 | 0 |
| Octopus rubescens | ✓ | 45510915 | 18076185 | | | | | | 45510957 | 45511058 | 45511010 |
| Octopus salutii | | 0 | 16944719 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Octopus sasakii | | 62005881 | 62005867 | | | 62084169 | | | | | |
| Octopus sp. | | 0 | 18076186 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Octopus sp. 10 MG 2004 | | | | | | | 76359288 | | | | |
| Octopus sp. 5 MG 2004 | | 0 | 0 | 0 | 0 | 0 | 76359282 | 0 | 0 | 0 | 0 |
| Octopus sp. 8 MG 2004 | | | | | | | 76359286 | | | | |
| Octopus sp. hakutoensis | | 186704366 | 186704365 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Octopus sp. HBH 6 | | | 18076687 | | | | | | | | |
| Octopus sp. NSMT Mo75218 | | 0 | 0 | 0 | 0 | 207107984 | 0 | 0 | 0 | 0 | 0 |
| Octopus sp. OM853 | | 62086208 | 62086207 | | | 62086209 | | | | | |
| Octopus sp. OM870 | | 62086204 | 62086203 | 0 | 0 | 62086205 | 0 | 0 | 0 | 0 | 0 |
| Octopus sp. OM949 | | 62086212 | 62086211 | | | 62086213 | | | | | |
| Octopus sp. TL 2006 | | 0 | 118430808 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Octopus sp. xSA MG 2004 | | | | | | | 76359290 | | | | |
| Octopus tehuelchus | | 0 | 18076191 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Octopus tetricus | | | | | | 4003461 | 76359304 | | | | |
| Octopus variabilis | | 0 | 161016099 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Octopus vulgaris | ✓ | 537938874 | 537938873 | | | 537938871 | 537938872 | | | 116829804 | |
| Octopus wolfi | | 0 | 18076685 | 0 | 0 | 226088506 | 0 | 0 | 0 | 0 | 0 |
| Ocythoe tuberculata | | | | 49482069 | | | | | | | |
| Ommastrephes bartramii | ✓ | 62005898 | 209969935 | 49482115 | 49482168 | 4003463 | 0 | 50347067 | 48994330 | 48994362 | 48994392 |
| Onychoteuthis banksii | | | | | | 154347379 | | | | | |
| Onychoteuthis cf banksii | ✓ | 0 | 209969966 | 209970012 | 209970058 | 0 | 0 | 209970249 | 0 | 0 | 0 |
| = Onychoteuthis banksii | | | | | | | | | | | |
| Onychoteuthis borealijaponica | | | | | | 154347377 | | | | | |

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|---|--------|-----------|-----------|-----------|-----------|-----------|------|-----------|-----------|-----------|-----------|
| Onychoteuthis compacta | | 0 | 3176101 | 0 | 0 | 4003465 | 0 | 0 | 0 | 0 | 0 |
| Onychoteuthis sp. | | | 3176102 | | | | | | | | |
| Onychoteuthis sp. B3 JMS 200 | ✓ | 48994442 | 48994454 | 0 | 0 | 0 | 0 | 0 | 48994485 | 48994591 | 0 |
| Onychoteuthis sp. BC | | | 3176100 | | | | | | | | |
| Onykia carriboea | ✓ | 0 | 209969950 | 209970015 | 209970044 | 209970099 | 0 | 209970239 | 0 | 0 | 0 |
| Onykia ingens | | | 498941 | | | 154347375 | | | | | |
| Onykia lonnbergii | | 0 | 0 | 0 | 0 | 154347373 | 0 | 0 | 0 | 0 | 0 |
| Onykia robsoni | | | 3176080 | | | 154347371 | | | | | |
| Onykia robusta | ✓ | 0 | 3176079 | 209970013 | 209970050 | 154347369 | 0 | 209970241 | 0 | 0 | 0 |
| Onykia sp | | | 3176096 | | | | | | | | |
| Onykia sp. Moroteuthis | | 0 | 0 | 0 | 18076659 | 0 | 0 | 0 | 0 | 0 | 0 |
| Onykia sp. A | | | | | | 154347381 | | | | | |
| Opisthoteuthis californiana | | 0 | 21912932 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Opisthoteuthis sp. ARL 2004 = Opisthoteuthis californiana | | | | | | | | 50346980 | | | |
| Opisthoteuthis depressa | | 62005886 | 62005872 | 0 | 0 | 62084179 | 0 | 0 | 0 | 0 | 0 |
| Opisthoteuthis hardyi | | | 28629082 | | | | | | | | |
| Opisthoteuthis massyae | ✓ | 45510910 | 21912931 | 0 | 0 | 0 | 0 | 0 | 45510949 | 45511048 | 45511000 |
| Opisthoteuthis sp | | | 18076193 | | | | | | | | |
| Opisthoteuthis sp. B PCHH2001 | | 0 | 21912933 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Opisthoteuthis sp. CYV 2001 | | | | | | 15421815 | | | | | |
| Opisthoteuthis sp. JMS 2004 | | 48994440 | 48994444 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Opisthoteuthis sp. Thallassa | | | 28629083 | | | | | | | | |
| Ornithoteuthis antillarum | ✓ | 0 | 209969923 | 49482099 | 49482152 | 0 | 0 | 50347037 | 0 | 0 | 0 |
| Pareledone aequipapillae | ✓ | 129279691 | 129279669 | | | | | | 129279547 | 154813169 | 161611107 |
| Pareledone albimaculata | ✓ | 129279693 | 129279671 | 0 | 0 | 0 | 0 | 0 | 129279551 | 154813170 | 161611109 |
| Pareledone aurata | ✓ | 129279689 | 129279667 | | | | | | 129279543 | 154813168 | 161611103 |
| Pareledone charcoti | ✓ | 129279687 | 129279665 | 0 | 0 | 15421835 | 0 | 0 | 129279541 | 154813167 | 161611105 |
| Pareledone cornuta | ✓ | 129279697 | 129279675 | | | | | | 129279559 | 154813171 | 161611111 |
| Pareledone felix | ✓ | 129279695 | 129279673 | 0 | 0 | 0 | 0 | 0 | 129279557 | 129279528 | 0 |
| Pareledone panchroma | ✓ | 129279705 | 129279683 | | | | | | 129279575 | 154813175 | 161611115 |
| Pareledone serperastrata | ✓ | 129279699 | 129279677 | 0 | 0 | 0 | 0 | 0 | 129279563 | 154813172 | 161611113 |
| Pareledone subtilis | ✓ | 129279701 | 129279679 | | | | | | 129279567 | 154813173 | 161611117 |
| Pareledone turqueti | ✓ | 129279703 | 129279681 | 0 | 0 | 0 | 0 | 0 | 45510969 | 45511070 | 45511022 |
| Pholidoteuthis adami | ✓ | | 209969970 | 209970021 | | 209970139 | | 209970253 | | | |
| Planctoteuthis danae | | 0 | 0 | 0 | 0 | 5678669 | 0 | 0 | 0 | 0 | 0 |
| Planctoteuthis levimana | ✓ | | 209969963 | 209969997 | 209970055 | 209970127 | | 209970219 | | | |
| Psychroteuthis glacialis | | 0 | 0 | 0 | 0 | 4927145 | 0 | 0 | 0 | 0 | 0 |
| Psychroteuthis sp. ARL 2004 = Psychroteuthis glacialis | ✓ | | 209969937 | 49482118 | 49482171 | | | 50347073 | | | |
| Pterygioteuthis gemmata | ✓ | 0 | 209969924 | 49482100 | 49482153 | 0 | 0 | 50347039 | 0 | 0 | 0 |
| Pterygioteuthis giardi hoylei | ✓ | | 209969978 | 209970025 | 209970069 | 209970155 | | 209970196 | | | |
| Pterygioteuthis microlampas | ✓ | 48762895 | 209969969 | 209969996 | 209970059 | 209970133 | 0 | 209970194 | 48994322 | 48994358 | 48994388 |
| Pyroteuthis addolux | | | | | | 4003469 | | | | | |
| Pyroteuthis margaritifera | | 0 | 0 | 49482101 | 49482154 | 0 | 0 | 50347041 | 0 | 0 | 0 |
| Rondeletiola minor | ✓ | 34542060 | 34542086 | | 34542095 | 34542154 | | | | | |

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| GenBank Name | Fig. 1 | 12S | 16S | 18S | 28S | COI | cytb | H3 | odh | opsin | pax |
|---------------------------|--------|------------|------------|-----------|-----------|------------|------------|----------|----------|----------|-----------|
| Rossia bipapillata | | 34542059 | 34542085 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Rossia macrosoma | | | 498944 | | | | | | | | 48994543 |
| Rossia pacifica | ✓ | 62005904 | 62005893 | 0 | 0 | 5353806 | 0 | 0 | 48994342 | 48994374 | 48994404 |
| Rossia palpebrosa | ✓ | | 209969908 | 49482078 | 49482135 | 4003471 | | 50346999 | | | |
| Rossia sp. | | 0 | 93004781 | 0 | 0 | 5678677 | 0 | 0 | 0 | 0 | 0 |
| Scaurgus unicolor | | | 16944720 | | | | | | | | |
| Selenoteuthis scintillans | ✓ | 0 | 209969946 | 209970019 | 209970040 | 209970093 | 0 | 0 | 0 | 0 | 0 |
| Semirossia tenera | | 38374163 | 38374164 | | | 38374165 | | | | | |
| Sepia aculeata | | 77157322 | 14161382 | 0 | 0 | 13195589 | 0 | 0 | 0 | 0 | 0 |
| Sepia andreana | | | | | | 242117663 | 242117693 | | | | |
| Sepia apama | ✓ | 48994424 | 48994451 | 0 | 0 | 0 | 0 | 0 | 0 | 48994583 | 48994537 |
| Sepia aureomaculata | | | | | | 242117665 | 242117695 | | | | |
| Sepia bertheloti | | 0 | 34559533 | 0 | 0 | 242117667 | 242117697 | 0 | 0 | 0 | 0 |
| Sepia elegans | ✓ | 34542042 | 34542066 | | 18026376 | 242117669 | 242117701 | 38607261 | | | |
| Sepia elliptica | | 77157305 | 77157331 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sepia esculenta | ✓ | 1531239214 | 1531239213 | | | 1531239211 | 1531239212 | | | | |
| Sepia filibrachia | | 77157318 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sepia furcata | | | | | | 46947386 | | | | | |
| Sepia gibba | | 0 | 0 | 0 | 0 | 242117671 | 242117703 | 0 | 0 | 0 | 0 |
| Sepia hierredda | | | 34559531 | | | 34996415 | | | | | |
| Sepia hirunda | | 0 | 0 | 0 | 0 | 46947384 | 0 | 0 | 0 | 0 | 0 |
| Sepia kobeensis | ✓ | 62241208 | 62241200 | | | 62909952 | 242117705 | | | | |
| Sepia latimanus | ✓ | 62241207 | 62241199 | 0 | 0 | 62241218 | 242117707 | 0 | 0 | 0 | 0 |
| Sepia lorigera | ✓ | 62909941 | 62909937 | | | 62909946 | 242117711 | | | | |
| Sepia lycidas | ✓ | 62241206 | 62241198 | 0 | 0 | 62241216 | 242117713 | 0 | 0 | 0 | 0 |
| Sepia madokai | | | 77157330 | | | 242117675 | 242117715 | | | | |
| Sepia officinalis | ✓ | 892552844 | 892552843 | 49482076 | 49482134 | 892552841 | 892552842 | 50346995 | 13561068 | 0 | 121495688 |
| Sepia opipara | | 77157308 | | | | 4003475 | | | | | |
| Sepia orbignyana | | 77157309 | 498950 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sepia papuensis | | 77157310 | 498951 | | | | | | | | |
| Sepia pardex | ✓ | 62909940 | 62909936 | 0 | 0 | 62909944 | 242117717 | 0 | 0 | 0 | 0 |
| Sepia peterseni | ✓ | 62241209 | 62241201 | | | 62241220 | 242117719 | | | | |
| Sepia pharaonis | ✓ | 77157311 | 116041621 | 0 | 0 | 14028758 | 242117721 | 0 | 48994348 | 48994380 | 48994410 |
| Sepia plangon | | 77157312 | | | | | | | | | |
| Sepia prashadi | | 0 | 0 | 0 | 0 | 242117679 | 242117723 | 0 | 0 | 0 | 0 |
| Sepia recurvirostra | ✓ | 77157321 | 77157329 | | | 242117681 | 242117725 | | | | |
| Sepia rex | | 77157314 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sepia robsoni | | | 14150654 | | | 13195591 | | | | | |
| Sepia smithi | | 77157313 | 77157333 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sepia sp. SI0604 | ✓ | 62909942 | 62909938 | | | 62909948 | 242117733 | | | | |
| Sepia subtenuipes | | 0 | 0 | 0 | 0 | 0 | 242117735 | 0 | 0 | 0 | 0 |
| Sepia tenuipes | ✓ | | | | | 242117683 | 242117727 | | | | |
| Sepia tokioensis | ✓ | 0 | 0 | 0 | 0 | 242117685 | 242117729 | 0 | 0 | 0 | 0 |
| Sepia whitleyana | | 77157315 | | | | | | | | | |
| Sepiadarium austrinum | ✓ | 48994423 | 48994450 | 0 | 0 | 0 | 0 | 0 | 48994479 | 48994581 | 48994535 |
| Sepiadarium kochi | ✓ | 62005907 | 34542087 | | 34542111 | 38154317 | | | | | |

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|----------------------------|--------|------------|------------|-----------|-----------|------------|------------|-----------|-----------|-----------|-----------|
| Sepiella inermis | ✓ | 0 | 209969906 | 49482075 | 49482133 | 0 | 0 | 209970167 | 0 | 0 | 0 |
| Sepiella japonica | ✓ | 77157302 | 48994452 | | | 242117691 | 242117737 | | 48994481 | 48994585 | 48994539 |
| Sepiella maindroni | | 62241211 | 62241203 | 0 | 0 | 13195581 | 0 | 0 | 0 | 0 | 0 |
| Sepietta neglecta | ✓ | 34542056 | 34542082 | | 34542105 | 34542148 | | | | | |
| Sepietta obscura | ✓ | 34542057 | 34542083 | 0 | 34542104 | 34542150 | 0 | 0 | 0 | 0 | 0 |
| Sepietta oweniana | | 34542058 | 34542084 | | | 34542152 | | | | | |
| Sepietta sp. | | 0 | 498954 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sepiola affinis | ✓ | 34542050 | 209969909 | 49482079 | 34542106 | 34542136 | | 50347001 | | | |
| Sepiola atlantica | ✓ | 34542055 | 34542081 | 0 | 34542102 | 34542146 | 0 | 0 | 0 | 0 | 0 |
| Sepiola birostrata | ✓ | 34542049 | 34542075 | | 34542103 | 34542134 | | | | | |
| Sepiola intermedia | ✓ | 34542052 | 34542078 | 0 | 34542109 | 34542140 | 0 | 0 | 0 | 0 | 0 |
| Sepiola ligulata | ✓ | 34542051 | 34542077 | | 34542101 | 34542138 | | | | | |
| Sepiola robusta | ✓ | 34542053 | 34542079 | 0 | 34542110 | 34542142 | 0 | 0 | 0 | 0 | 0 |
| Sepiola rondeleti | | 34542054 | 34542080 | | | 34542144 | | | | | |
| Sepiola sp | | 0 | 498952 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sepiolina nipponensis | ✓ | 34542062 | 34542088 | | 34542091 | 34542158 | | | | | |
| Sepioloidea lineolata | ✓ | 48994422 | 48994449 | 0 | | 4003477 | 0 | 0 | 48994477 | 48994579 | 48994533 |
| Sepioteuthis australis | ✓ | 48762899 | 93004772 | | | 4003479 | | | 48994334 | 48994366 | 48994396 |
| Sepioteuthis lessoniana | ✓ | 892554074 | 892554073 | 49482085 | 49482140 | 890008521 | 892554072 | 50347013 | 48994336 | 48994368 | 48994398 |
| Sepioteuthis sepioidea | | | 93004775 | | | 5678651 | | | | | |
| Spirula spirula | ✓ | 34542040 | 498953 | 49482081 | 18076661 | 34542122 | 0 | 50347005 | 45510983 | 45511084 | 45511036 |
| Stauroteuthis gilchristi | ✓ | 45510909 | 45510933 | | | | | | 45510947 | 45511046 | 45510998 |
| Stauroteuthis sp. Bahia | | 0 | 28629076 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Stauroteuthis syrtensis | ✓ | | 82622206 | 49482062 | | 4003483 | | 50346978 | | | |
| Sthenoteuthis oualaniensis | ✓ | 1869200834 | 1869200833 | 49482116 | 209970057 | 1869200831 | 1869200832 | 209970223 | 45510989 | 45511088 | 45511042 |
| Stoloteuthis leucoptera | ✓ | 34542064 | 209969910 | 49482080 | 34542113 | 4003485 | | 50347003 | | | |
| Octopoteuthis danae | ✓ | 0 | 209969982 | 209970029 | 209970072 | 209970163 | 0 | 209970233 | | 0 | 0 |
| = Taningia danae | | | | | | | | | | | |
| Taonius borealis | | | | | | 5678674 | | | | | |
| Taonius pavo | ✓ | 0 | 209969961 | 209969992 | 209970052 | 209970121 | 0 | 209970184 | 0 | 0 | 0 |
| Teuthowenia megalops | ✓ | 48994435 | 48994458 | | | 48762890 | | | 48994509 | 48994609 | 48994559 |
| Thaumeledone brevis | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 161611121 |
| Thaumeledone gunteri | ✓ | 161611175 | 18027462 | 49482074 | | | 161598196 | 50346993 | 161611143 | 158828833 | 161611123 |
| Thaumeledone peninsulae | ✓ | 161611171 | 162956983 | 0 | 0 | 0 | 161598190 | 0 | 161611145 | 158828835 | 161611125 |
| Thaumeledone rotunda | ✓ | 161611170 | 161611152 | | | | 161598186 | | 161611141 | 158828831 | |
| Thaumeledone sp. CYV 2001 | | 0 | 0 | 0 | 0 | 15421845 | 0 | 0 | 0 | 0 | 0 |
| Thysanoteuthis rhombus | ✓ | 62005901 | 209969952 | 209970017 | 209970046 | 209970101 | | 209970251 | | | |
| Todarodes filippovae | | 0 | 498955 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Todarodes pacificus | ✓ | 537939954 | 537939953 | | 18076665 | 537939951 | 537939952 | | | | |
| Todaropsis eblanae | ✓ | 48994438 | 48994462 | 0 | 0 | 0 | 0 | 0 | 48994489 | 48994615 | 48994565 |
| Tremoctopus violaceus | ✓ | 45510912 | 18076192 | | | 15421849 | | | 45510992 | 45511052 | 45511004 |
| Uroteuthis chinensis | ✓ | 0 | 209969912 | 23450949 | 49482138 | 28207579 | 0 | 50347009 | 0 | 0 | 0 |
| Uroteuthis duvauceli | | | 3618168 | | | 5678659 | | | | | |
| Uroteuthis edulis | | 0 | 3618173 | 0 | 0 | 169247791 | 0 | 0 | 0 | 0 | 0 |
| Uroteuthis noctiluca | ✓ | 34542041 | 34542065 | | 34542094 | 34542116 | | | | | |
| Uroteuthis sp. JMS 2004 | ✓ | 48762901 | 48762912 | 0 | 0 | 0 | 0 | 0 | 48994338 | 48994370 | 48994400 |

Appendix 1. GenBank sequence identifiers (GI numbers) for loci used in analysis listed alphabetically. Changes to the species name used in this manuscript are listed in bold. Checkmarks denote taxa used in primary analysis (188-taxa), shown in Fig 1.

| GenBank Name | Fig. 1 | 12S | 16S | 18S | 28S | COI | cytb | H3 | odh | opsin | pax |
|------------------------------|---------------|------------|------------|------------|------------|------------|-------------|-----------|------------|--------------|------------|
| Vampyroteuthis infernalis | ✓ | 1531248574 | 1531248573 | 34369180 | | 1531248571 | 1531248572 | 50346982 | 45510945 | 45511044 | 45510996 |
| Velodona togata | ✓ | 161611172 | 161611154 | 0 | 0 | 0 | 161598184 | 0 | 161611147 | 158828837 | 161611127 |
| Vitreledonella richardi | ✓ | 45510923 | 45510943 | | | 13249500 | | | 45510971 | 45511074 | 45511026 |
| Vulcanoctopus hydrothermalis | | 239735815 | 239735812 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Watasenia scintillans | ✓ | 893373944 | 893373943 | | | 893373941 | 893373942 | | | | |