

Multi-locus phylogenetic analysis of Amphipoda indicates a single origin of the pelagic suborder Hyperiidea

Supplemental Material

S1.Data Curation	ii
S2.Multiple-Sequence Alignment	iii
S3.Supplemental Discussion	iii
S4.Taxon Selection Table	v
Supplemental References	xvii

S1. Data Curation

Updated Identifications Due to their placement in preliminary gene trees, certain sequences from Browne et al. (2007) and Hurt et al. (2013) were re-identified by examining morphological vouchers provided by Dr. William Browne at the University of Miami and using the dichotomous key in Zeidler (2004). The identifications of EF989686, KC428842, KC428893, and KC428944 were changed from *Hyperietta parviceps* to *Hyperioides sibaginis* and the identifications of EF989667, KC428897, KC428846, and KC428948 were changed from *Hyperoche medusarum* to *Hyperia* sp. Based on personal communication with Dr. William Browne, the identifications of KC428923, KC428872, KC428974, and EF989655 were changed from *Streetsia porcella* or *Glossocephalus* sp. 19 to *Glossocephalus rebecca*, a new species described by Zeidler and Browne (2015).

Excluded Sequence A number of selected sequences were removed after preliminary analyses for reasons described below. Whenever possible, these excluded sequences were replaced by selecting another available sequence for the same taxon.

An 18S sequence identified as *Hyperietta sibaginis* (GU358617) was excluded because this is not an accepted genus and species combination and does not appear to have been one in the past. The sequence is similar to *Hyperioides* 18S sequences and therefore may be *Hyperioides sibaginis* but this identification is speculative so the sequence was excluded. An 18S sequence identified as *Hyperietta stephensi* (DQ378051) may be miss-identified and was excluded. The sequence does not cluster with other *Hyperietta* or even hyperiid sequences and is not actually included in the doctoral dissertation cited for this sequence on GenBank (Englisch, 2001). It is, however, very similar to a non-hyperiid amphipod sequence citing the same dissertation, which is identified as *Epimeriella walkeri* (DQ378005). Another 18S sequence, identified as *Eupronoe minuta* (DQ378052) and also citing Englisch (2001), was excluded because it is much more similar to *Hyperietta* sequences than to *Eupronoe* sequences and does not match the sequence length listed for this taxon and accession number in the cited dissertation (Englisch, 2001).

28S sequences mapping to the short D9-D10 region of the gene were excluded. There was little to no overlap with sequences from other regions of 28S.

A COI sequence identified as *Hyperia galba* (DQ889153), representing the only hyperiid in a crustacean-wide barcoding study (Costa et al., 2007), was excluded because a BLAST search indicated greater similarity to *Hyperoche* COI sequences. Three additional COI sequences were excluded because a BLAST search suggested they are not amphipod sequences: *Primno* sp. (GU145052), *Eupronoe intermedia* (HM053493), and *Oxycephalus clausi* (GU145053). Five COI sequences were removed after the sequences were trimmed according to the GenBank annotation of COI because only 186–190 bp of the 3' end of COI remained. These sequences comprise AM749356, AM749332, AM749352, AM749345, and JQ319551.

Trimmed Sequences A COI sequence for *Platyscelus serratulus* (EF989662) was trimmed due to alignment issues. The sequence was not annotated with a reading frame or protein coding sequence. The reading frame was identified manually and 62 nucleotides were trimmed from the 5' end to remove a region that would not align and included two stop codons. An H3 sequence for *Asellus aquaticus* (AJ238321) was trimmed according to the GenBank annotation, retaining positions 2600–3000. The 3' half of a 16S sequence for *Lanceola* sp. (KP456062) was not alignable and was trimmed after position 119. 530 nucleotides at the 5' end of a 16S sequence for *Niphargus kochianus* (KC315548) fell outside the gene region covered by any other sequence and were removed.

Concatenated Sequences Some sequences, linked by a voucher or isolate number, were found to be different regions of the same gene, sequenced from the same individual. After the order and direction was determined, such sequences were concatenated and subsequently aligned as a single sequence, labeled with both accession numbers. Concatenated sequences are indicated by a dash between accession numbers in the Taxon Selection Table ().

S2. Multiple-Sequence Alignment

Multiple-sequence alignments were generated using MAFFT version 7 (Katoh and Standley, 2013). Alignment methods specific to individual genes are described here. The longest amphipod 18S sequences (>2000 bp) were aligned using the MAFFT Q-INS-i algorithm, a method recommended for the global alignment of divergent non-coding RNA sequences. This sequence-based, RNA alignment method incorporates structural information using an objective function derived from base-pairing probabilities (Katoh and Toh, 2008a). The longest amphipod and isopod 28S sequences (>1225 bp) were aligned using the MAFFT E-INS-i algorithm (Katoh and Toh, 2008b). The longest amphipod and isopod 16S sequences (>400 bp) were also aligned using the MAFFT E-INS-i algorithm. Before multiple sequence alignment, COI and H3 sequences were translated to amino acid sequences using the R package SeqinR (Charif and Lobry, 2007) with the invertebrate mitochondrial and standard genetic codes respectfully. For COI, the longest amphipod amino acid sequences (>220 aa) were aligned using the MAFFT L-INS-i algorithm (Katoh and Toh, 2008b). All H3 sequences were aligned together using the E-INS-i algorithm in MAFFT (Katoh and Toh, 2008b). The aligned COI and H3 sequences were then back-translated by supplying the original nucleotide sequences and amino acid alignments to RevTrans version 1.4 (Wernersson and Pedersen, 2003).

S3. Supplemental Discussion

Introduction - Amphipod Systematics Amphipoda [Crustacea; Malacostraca; Peracarida] is a highly speciose order consisting of 223 families, over 1,600 genera, and nearly 10,000 described species (Lowry and Myers, 2017). Amphipods are accepted as a monophyletic group defined by their unique arrangement of pereopods into two distinct forward and reverse-facing groups (Bousfield and Shih, 1994). The order is further distinguished from other peracarids by the presence of sessile eyes, coxal gills, and a differentiated pleosome and urosome, each with three segments (Lowry and Myers, 2017). The majority of amphipods are marine or estuarine; however, some species are found in freshwater, supralittoral, and terrestrial environments. The amphipod body is usually laterally compressed and always lacks a carapace. Until recently, Amphipoda was organized into four suborders: Hyperiidea, Caprellidea, Gammaridea and Ingolfiellidea. This classification was revised through a series of morphological phylogenetic analyses (Myers and Lowry, 2003; Lowry and Myers, 2013, 2017). The superfamily Corophioidea was removed from Gammaridea and joined with Caprellidea forming suborder Corophiidea (characterized by a thickened telson and robust setae on uropods) (Barnard and Karaman, 1984; Myers and Lowry, 2003). These robust setae were later deemed a synapomorphy of a much larger clade of amphipods including Corophioidea as well as most freshwater and some benthic marine species of Gammaridea (Lowry and Myers, 2013). These groups were combined to form the new suborder Senticaudata. Most recently, Lowry and Myers (2017) argued for splitting Gammaridea into three new suborders (Colomastigidea, Hyperiopsidea, Amphilochidea) and Ingolfiellidea into one new amphipod suborder (Pseudingolfiellidea) and a new peracarid order (Ingolfiellida). Amphipod suborders currently listed by the World Amphipod Database comprise Amphilochidea, Colomastigidea, Hyperiidea, Hyperiopsidea, Pseudingolfiellidea, and Senticaudata (Horton et al., 2018).

Ingolfiellida A single 18S sequence for *Ingolfiella tabularis* (the only available representative of Ingolfiellidea) is recovered as sister to all other amphipods in the concatenated analysis as well as the 18S gene tree. This result is consistent with the findings of a prior 18S analysis, which included the same *Ingolfiella tabularis* sequence (Verheyen et al., 2016), as well as a recent morphological analysis, which raised Ingolfiellidea from an amphipod suborder to a new peracarid order, Ingolfiellida (Lowry and Myers, 2017). Representatives of Ingolfiellida differ from those of Amphipoda in the presence of pedunculate eyes, a six-segmented pleosome, and reduced appendages (pleopods and uropods), but are considered sister to Amphipoda due to the shared presence of coxal gills and absence of a carapace (Lowry and Myers, 2017). Assessing whether molecular data support an Ingolfiellida-Amphipoda sister relationship requires additional sequence data, particularly for representatives of the six other genera within Ingolfiellida as well as representatives of Pseudingolfiellidea.

Senticaudata and Amphilochidea Our results show no evidence of monophyly for either of the amphipod suborders Senticaudata and Amphilochidea. Although we are unable to resolve relationships along

the backbone of Amphipoda, we recover four small clades that each include at least one representative of each of Senticaudata and Amphilochidea (Figure 1). Furthermore, the single representative of the suborder Colomastigidea (*Colomastix fissilingua*), as well as all representatives of the suborder Hyperidei, fall within a highly supported clade that also includes many representative of Amphilochidea (Figure 2). The suborder Amphilochidea is characterized by the presence of brush setae in adult males and was erected to unite two infraorders (Amphilochida and Lysianassida), comprising most of the families formally belonging to the now vacant suborder, Gammaridea (Lowry and Myers, 2017). Both Amphilochida and Lysianassida are polyphyletic in all of our analyses. The suborder Senticaudata is defined by the presence of spines (robust apical setae) at the tips of the rami of the first and second uropods (Lowry and Myers, 2013), a characteristic which exhibits homoplasy when mapped onto molecular analyses (Verhey et al., 2016) and appears to be present at intermediate states in multiple dissimilar amphipods (d’Udekem d’Acoz and Verhey, 2017). Myers and Lowry (2018) reassert these spines are a strong synapomorphy for Senticaudata, secondarily gained in only a few species outside the suborder. Our ability to use molecular data to resolve the deeper relationships within Amphipoda is currently limited by taxon sampling and possible loss of phylogenetic signal due to substitution saturation in the five genes we analyzed.

Senticaudata Analysis of the concatenated dataset recovers, with at least 70% bootstrap support, 13 clades containing only representatives of the amphipod suborder Senticaudata. These clades range in size from two to 57 taxa. The placement of 19 representatives of Senticaudata could not be resolved and are shown as individual taxa branching from the Amphipoda polytomy (Figure S1). We recover monophyly of the superfamily Talitroidea (100% bss) with 30 taxa representing 29 genera and five families. A clade comprising 26 of the 27 taxa of infraorder Corophiida (representing 25 genera and 11 families) was recovered with 86% bss (placement of *Neohela monstrosa* was not resolved). A clade comprising all five taxa of the family Niphargidae as well as both taxa of the family Pseudoniphargidae was recovered with 86% bss. A clade comprising 57 of the 67 representatives of superfamily Gammaroidea is recovered with 70% bss. Five of the remaining taxa form a clade (86% bss) comprising the monophyletic family Anisogammaridae (99% bss) and the only representative of the family Bathyporeiidae. Placement of the remaining five representatives of Gammaroidea was not resolved.

Amphilochidea Analysis of the concatenated dataset recovers (with at least 70% bootstrap support) 12 clades containing only representatives of the amphipod suborder Amphilochidea. These clades range in size from two to 23 taxa. The placement of 15 representatives of Amphilochidea could not be resolved and are shown as individual taxa branching from the Amphipoda polytomy (Figure S1). We recover monophyly of the families Ampeliscaidae (three taxa, 100% bss), Oedicerotoidea (four taxa, 100% bss), and Stegocephalidae (three taxa, 100% bss). A clade comprising five of the six taxa of the family Iphimediidae was recovered with 100% bss (placement of *Pariphimedia integricauda* was not resolved). The family Leucothoidea appears polyphyletic with representatives split among two clades. All representatives of the genus *Leucothoe* form one clade (100% bss). The other includes all representatives of the genera *Paranamixis* and *Anamixis* (100% bss) and is nested within a clade containing the single representatives of the family Amphilochidae and the suborder Colomastigidea (90% bss).

S4. Taxon Selection Table

Selected taxa are shown with GenBank accession numbers. Nucleotide sequence length (bp) is shown in parentheses. Concatenated sequences are indicated by a dash. The link column indicates if/how sequences for the same taxon are associated (submitted by the same author, same isolate number, same voucher number, or not associated).

Genus & species	COI	18S	28S	H3	16S	Link
AMPHIPODA						
Suborder Hyperiidea						
Family Cystisomatidae						
<i>Cystisoma gershwinae</i>	EF989675 (815)	KC428889 (2193)	KC428838 (2813)	KC428940 (328)		author
<i>Cystisoma pellucida</i>	EF989676 (815)	KC428890 (2184)	KC428839 (2789)	KC428941 (328)		author
Family Hyperiidae						
<i>Hyperia macrocephala</i>	EF989666 (815)	KC428892 (1624) DQ378047 (2363)	KC428841 (3162)	KC428943 (328)		author none
<i>Hyperia galba</i>	KT209327 (658)	KJ193819 (500) DQ378046 (2437)				author none
<i>Hyperia sp.</i>	EF989667 (815)	KC428897 (1675)	KC428846 (3129)	KC428948 (328)		author
<i>Hyperietta antarctica</i>	KC754382 (996)					none
<i>Hyperoche capucinus</i>	EF989665 (815)	KC428895 (1790)	KC428844 (2836)	KC428946 (328)		author
<i>Hyperoche martinezi</i>	EF989668 (757)	KC428896 (1589)	KC428845 (3062)	KC428947 (328)		author
<i>Themisto gaudichaudii</i>	HM053514 (985)	AY743940 (980) KP010865 (580)	EU375506 (1323) KP010898 (711)			none author
			AF244091–AF244092 (1958)			author
<i>Themisto sp.</i>	KF430249 (242)	KF430234 (926)	KF430306 (336)	KF484705 (354)	KF430276 (317)	author
<i>Themisto compressa</i>		DQ378049 (2315)				none
<i>Themisto libellula</i>	FJ581916 (658)	JN039368 (2150)				none
<i>Themisto japonica</i>	EF989663 (815)	KC428924 (1772)		KC428975 (328)		author
<i>Themisto pacifica</i>	EF989664 (812)	KC428925 (1585)	KC428874 (2926)	KC428976 (328)		author
<i>Themisto abyssorum</i>		KF609371 (2307)				none
Family Iulopididae						
<i>Iulopis loveni</i>	EF989669 (815)	KC428899 (1564)	KC428848 (1283)	KC428950 (328)		author
Family Lestrigonidae						
<i>Hyperietta vosseleri</i>	HM053495 (980)	GU358616 (2231)				author
<i>Hyperioides longipes</i>	EF989685 (809)	KC428894 (1529)	KC428843 (1094)	KC428945 (328)		author
<i>Hyperioides sibaginis</i>	EF989686 (796)	KC428893 (1547)	KC428842 (2638)	KC428944 (328)		author
	HM053496 (1001)	GU969172 (2168)				author
<i>Lestrigonus schizogeneios</i>	EF989684 (814)	KC428904 (1592)	KC428853 (2340)	KC428955 (328)		author
Family Phronimidae						
<i>Phronima bucephala</i>	EF989680 (775)	KC428911 (1549)	KC428860 (3085)	KC428962 (328)		author
<i>Phronima sp.</i>		DQ378053 (2284)				none
<i>Phronima cf. stebbingii</i>	GU145054 (631)					none
<i>Phronimella elongata PAC</i>	EF989678 (812)	KC428913 (1550)	KC428862 (3138)	KC428964 (328)		author
<i>Phronimella elongata ATL</i>	EF989677 (815)	KC428912 (1551)	KC428861 (3137)	KC428963 (328)		author
<i>Phronimella elongata</i>	HM053502 (681)	GU358621 (2211)				author
Family Phrosinidae						
<i>Phrosina semilunata ATL</i>	EF989670 (813)	KC428914 (1536)	KC428863 (2740)	KC428965 (328)		author
<i>Phrosina semilunata PAC</i>	EF989671 (815)	KC428915 (1535)	KC428864 (2776)	KC428966 (328)		author
<i>Phrosina semilunata</i>	HM053503 (916)	GU358622 (2151)				author
<i>Primno macropa</i>		DQ378050 (2264)	EU375505 (1172)			none
<i>Primno brevidens</i>	EF989672 (812)	KC428916 (1522)	KC428865 (2713)	KC428967 (328)		author
<i>Primno evansi</i>	EF989673 (812)	KC428917 (1521)	KC428866 (2589)	KC428968 (328)		author
Family Amphithyridae						
<i>Amphithyrus bispinosus</i>	HM053489 (821)	GU358611 (2291)				author
<i>Amphithyrus muratus</i>	HM053491 (803)	GU358612 (2221)				author

Continued on next page.

Taxon Selection Table – continued from previous page

Genus & species	COI	18S	28S	H3	16S	Link
Family Brachyscelidae						
<i>Brachyscelus cruscolum</i>	EF989658 (835)	KC428881 (1574)	KC428830 (2841)	KC428932 (328)		author
<i>Brachyscelus globiceps</i>	EF989660 (836)	KC428882 (1574)	KC428831 (2819)	KC428933 (328)		author
<i>Brachyscelus rapax</i>	EF989659 (814)	KC428883 (1576)	KC428832 (2833)	KC428934 (328)		author
Family Eupronoidae						
<i>Eupronoe intermedia</i>	HM053492 (1003)	GU358613 (2296)				author
<i>Parapronoe campbelli</i>	EF989657 (839)	KC428910 (1595)	KC428859 (2886)	KC428961 (328)		author
Family Lycaeidae						
<i>Lycaea nasuta</i>	EF989647 (833)	KC428905 (1551)	KC428854 (2754)	KC428956 (328)		author
<i>Lycaea pulex</i>		GU358624 (2197)				none
<i>Simorhynchotus antennarius</i>	HM053505 (700)	GU358623 (2216)				author
Family Oxycephalidae						
<i>Calamorrhynchus pellucidus</i>	EF989649 (833)	KC428884 (1594)	KC428833 (2855)	KC428935 (328)		author
<i>Craniocephalus scleroticus</i>	EF989648 (833)	KC428885 (1618)	KC428834 (2838)	KC428936 (328)		author
<i>Glossocephalus milneedwardsi</i>	EF989654 (773)	KC428891 (1597)	KC428840 (2854)	KC428942 (328)		author
<i>Glossocephalus rebecca</i>	EF989655 (812)	KC428923 (1594)	KC428872 (2870)	KC428974 (328)		author
<i>Leptocotis tenuirostris</i>	EF989653 (833)	KC428903 (1230)	KC428852 (1226)	KC428954 (328)		author
<i>Oxycephalus clausi</i>	EF989652 (832)	KC428908 (1598)	KC428857 (2860)	KC428959 (328)		author
		GU358618 (2291)				none
<i>Rhabdosoma whitei</i>	EF989650 (836)	KC428918 (1594)	KC428867 (2919)	KC428969 (328)		author
<i>Streetsia challengerii</i>	EF989651 (833)	KC428922 (1597)	KC428871 (2868)	KC428973 (328)		author
<i>Streetsia mindanaonis</i>		GU358625 (2246)				none
<i>Streetsia porcella</i>	HM053507 (1002)	GU358626 (2291)				author
Family Parascelidae						
<i>Parascelus typhoides</i>	HM053509 (837)	GU358628 (2286)				author
<i>Thyropus sphaeroma</i>	EF989661 (833)	KC428926 (1591)	KC428875 (2791)	KC428977 (328)		author
Family Platyscelidae						
<i>Hemityphis tenuimanus</i>	HM053494 (1011)	GU358615 (2296)				author
<i>Tetrathyrus forcipatus</i>	HM053508 (881)	GU358627 (2276)				author
Family Tryphanidae						
<i>Tryphana malmi</i>	EF989656 (776)	KC428927 (1842)	KC428876 (2902)	KC428978 (328)		author
Family Cylopodidae						
<i>Cyllopus magellanicus</i>	EF989690 (812)	KC428888 (1617)	KC428837 (2983)	KC428939 (328)		author
		DQ378043 (2365)				none
<i>Cyllopus lucasii</i>	EF989691 (812)	KC428887 (1617)	KC428836 (2827)	KC428938 (328)		author
		DQ378042 (2368)				none
Family Paraphronimidae						
<i>Paraphronima gracilis</i>	EF989674 (814)	KC428909 (2142)	KC428858 (2836)	KC428960 (328)		author
<i>Paraphronima sp.</i>	HM053501 (681)	GU358620 (2176)				author
Family Vibiliidae						
<i>Vibilia antarctica</i>	EF989689 (812)	KC428928 (1795)	KC428877 (2807)	KC428979 (328)		author
		DQ378044 (2353)				none
<i>Vibilia propinqua</i>	EF989687 (812)	KC428929 (1599)	KC428878 (2888)	KC428980 (328)		author
<i>Vibilia viatrix</i>	EF989688 (812)	KC428930 (1610)	KC428879 (2811)	KC428981 (328)		author
<i>Vibilia armata</i>	HM053511 (821)	GU358629 (2331)				author
<i>Vibilia cultripes</i>		KF430235 (945)	KF430307 (340)	KF484706 (354)	KF430277 (317)	author
Family Lanceolidae						
<i>Lanceola loveni</i>	EF989693 (806)	KC428900 (2254)	KC428849 (3085)	KC428951 (328)		author
<i>Lanceola pacifica</i>	EF989697 (804)	KC428901 (2278)	KC428850 (2957)	KC428952 (328)		author
<i>Lanceola sayana</i>	EF989696 (810)	KC428902 (2238)	KC428851 (3032)	KC428953 (328)		author
<i>Lanceola sp.</i>	KP713953 (639)	KT372894 (569)			KP456062 (238)	author
<i>Scypholanceola aestiva</i>	EF989694 (807)	KC428920 (2248)	KC428869 (3015)	KC428971 (328)		author
<i>Scypholanceola sp.</i>	EF989695 (793)	KC428921 (2264)	KC428870 (3114)	KC428972 (328)		author

Continued on next page.

Taxon Selection Table – continued from previous page

Genus & species	COI	18S	28S	H3	16S	Link
Family Microphasmidae						
<i>Microphasma agassizi</i>	EF989692 (815)	KC428906 (2278)	KC428855 (3044)	KC428957 (328)		author
Family Mimonectidae						
<i>Mimonectes loveni</i>	EF989698 (814)	KC428907 (2500)	KC428856 (3142)	KC428958 (328)		author
Family Scinidae						
<i>Acanthoscina acanthodes</i>	EF989700 (815)	KC428880 (2273)	KC428829 (1328)	KC428931 (328)		author
<i>Scina borealis</i>	EF989699 (811)	KC428919 (2269)	KC428868 (3010)	KC428970 (328)		author
Suborder Gammaridea						
Family Acanthonotozomatidae						
<i>Acanthonotozoma serratum</i>		KT808777 (2245)	KT808683 (1165)			voucher
Family Acanthonotozomellidae						
<i>genus nov.</i>	KY907651 (564)		KY907502 (1382)			voucher
<i>Acanthonotozomella trispinosa</i>	KY907618 (570)	KT808770 (2310)	KT808684 (1202)			voucher
<i>Acanthonotozomoides oatesi</i>	KY907616 (561)	KT808782 (2340)	KT808686 (1191)			voucher
Family Alicellidae						
<i>Alicella gigantea</i>	JX436324 (652)	JX436325–JX436326 (1620)			JX436323 (266)	author
<i>Paralicella caperesca</i>	KF430243 (242)	KF430228 (918)	KF430300 (308)	KF484699 (354)	KF430270 (301)	author
<i>Tectoalopsis wegeneri</i>	KP713946 (641)	KP347457 (1591)			KP456086 (259)	isolate
Family Amathillopsidae						
<i>Amathillopsis charlottae</i>		KT808742 (2347)	KT808689 (1194)			voucher
<i>Parepimeria crenulata</i>		KT808760 (2155)	KT808732 (1175)			voucher
Family Ampeliscidae						
<i>Ampelisca eschrichtii</i>		AY826963 (2325)				none
<i>Byblis gaimardi</i>	DQ889084 (644)	AY826964 (2296)				none
<i>Haploops tubicola</i>		AY826960 (2303)				none
Family Amphilochidae						
<i>Amphilochus tenuimanus</i>		DQ378029 (2399)				none
<i>Gitana sarsi</i>	KT208690 (658)					none
Family Colomastigidae						
<i>Colomastix fissilingua</i>		DQ378032 (2606)				none
Family Cressidae						
Family Dexaminidae						
Family Dikwidae						
<i>Dikwa andresi</i>	KY907615 (536)	KT808771 (2472)	KT808704 (1206)			voucher
Family Epimeriidae						
<i>Epimeria grandirostris</i>	FM955307–KU870832 (1213)	DQ378007 (2444)	KU759605 (1491)			none
	KF430254 (242)		KF430313 (305)	KF484712 (354)	KF430283 (309)	author
<i>Paramphithoe hystrix</i>	AY271845 (632)		AY271830 (702)			author
			KT808730 (1188)			none
Family Haustoriidae						
<i>Haustorius arenarius</i>	KT209440 (658)	AY826950 (2388)				none
Family Iphimediidae						
<i>Anchiphimedia dorsalis</i>	KY907612 (478)	KT808747 (2116)	KT808690 (1175)			voucher
<i>Echiniphimedia echinata</i>	AF451352 (625)					none
		KT808743 (1948)	KT808705 (1181)			voucher
<i>Gnathiphimedia sexdentata</i>	AF451354–KU870835 (1139)	KT808746 (2111)	KU759609 (1331)			author
<i>Iphimediella cyclogena</i>	AF451348–KY907611 (1108)	KT808745 (2060)	KT808722 (1183)			none
<i>Maxilliphimedia longipes</i>		AF356547 (2391)	KT808724 (1180)			none
<i>Pariphimedia integricauda</i>		DQ378001 (2448)				none

Continued on next page.

Taxon Selection Table – continued from previous page

Genus & species	COI	18S	28S	H3	16S	Link
Family Leucothoidae						
<i>Anamixis bananarama</i>		KC527601 (928)				none
<i>Anamixis cavatura</i>		JF506085 (477)				none
<i>Anamixis sentan</i>		JX145117 (803)				none
<i>Anamixis vanga</i>	JF900757 (305)	JF506091 (493)				isolate
<i>Leucothoe akaisen</i>		JX145113 (790)				none
<i>Leucothoe akaoni</i>	KP896389 (502)	KP896366 (720)				author
<i>Leucothoe akuma</i>	KP896390 (502)	KP896367 (747)				author
<i>Leucothoe amamiensis</i>		JX145086 (775)				none
<i>Leucothoe ashleyae</i>	JF900755 (305)	JF506073 (405)				isolate
<i>Leucothoe bise</i>		JX145083 (706)				none
<i>Leucothoe daisukei</i>		JX145091 (723)				none
<i>Leucothoe elegans</i>		JX145099 (823)				none
<i>Leucothoe enko</i>		JX145106 (790)				none
<i>Leucothoe hashi</i>		JX145101 (843)				none
<i>Leucothoe kebukai</i>		JX145107 (799)				none
<i>Leucothoe lecroyae</i>		JX145081 (754)				none
<i>Leucothoe nurunuru</i>		JX145093 (728)				none
<i>Leucothoe obuchii</i>		JX145103 (851)				none
<i>Leucothoe ouraensis</i>		JX145108 (772)				none
<i>Leucothoe spinicarpa</i>		DQ378025 (2637)				none
<i>Leucothoe togatta</i>		JX145115 (810)				none
<i>Leucothoe toribe</i>		JX145102 (849)				none
<i>Leucothoe trulla</i>		JX145080 (697)				none
<i>Leucothoe urospinosa</i>		JF506069 (478)				none
<i>Leucothoe vulgaris</i>	KP896446 (502)	KP896375 (776)				author
<i>Leucothoe zanpa</i>		JX145100 (834)				none
<i>Paranamixis fijiensis</i>	KC706705 (313)	KC527600 (826)				none
<i>Paranamixis misakiensis</i>		KC527598 (845)				none
<i>Paranamixis thomasi</i>		JX145121 (803)				none
Family Megaluropidae						
<i>Megaluropus longimerus</i>		DQ378035 (2521)				none
Family Melphidippidae						
<i>Melphidippa antarctica</i>		DQ377998 (2130)				none
			KF430319 (311)	KF484719 (354)	KF430289 (299)	author
Family Ochlesidae						
<i>Odius carinatus</i>			KT808726 (1077)			none
Family Oedicerotidae						
<i>Arrhis phyllonyx</i>		AF419235 (2718)				none
<i>Bathymedon obtusifrons</i>		AF419236 (2613)				none
<i>Monoculodes packardi</i>		DQ378015 (2708)				none
<i>Paroediceros propinquus</i>		AF419231 (2770)				none
Family Pardaliscidae						
<i>Nicippe recticaudata</i>	LC214958 (658)		LC214961 (1336)	LC214963 (328)	LC214956 (407)	isolate
Family Phoxocephalidae						
<i>Fuegophoxus abjectus</i>		AY826972 (2432)	EU693290 (847)			none
Family Pleustidae						
<i>Atylopsis sp.</i>		KT808772 (2096)	KT808695 (1144)			voucher
<i>Austropleustes cuspidatus</i>		KT808750 (2109)	KT808698 (1188)			voucher
<i>Neopleustes pulchellus</i>		KT808755 (2056)	KT808725 (1164)			voucher
<i>Incisocalloipe aestuarius</i>		KT808759 (2059)	KT808721 (1175)			voucher
<i>Pleustes panoplus</i>	FJ581859 (658)	DQ378034 (2347)				none
		KT808754 (2072)	KT808734 (1172)			voucher

Continued on next page.

Taxon Selection Table – continued from previous page

Genus & species	COI	18S	28S	H3	16S	Link
Family Stegocephalidae						
<i>Andanieixis lupus</i>		AY826969 (2267)				none
<i>Andaniopsis nordlandica</i>		AY826971 (2282)				none
<i>Stegocephalus inflatus</i>		AY826970 (2244)				none
Family Stenothoidae						
<i>Stenothoe brevicornis</i>		AY826962 (2232)				none
<i>Antatelson walkeri</i>		AY826961 (2375)				none
Family Stilipedidae						
<i>Alexandrella dentata</i>	KY907621 (568)	KT808769 (2297)	KT808688 (1199)			author
<i>Bathypanoploea schellenbergi</i>	KY907613 (568)	KT808768 (2306)	KT808699 (1203)			voucher
<i>Astyra antarctica</i>	KF430258 (242)	DQ377999 (2830)	KF430317 (310)	KF484717 (344)	KF430288 (305)	none
Family Synopiidae						
<i>Syrrhoe psychrophila</i>	KF430259 (242)		KF430318 (317)	KF484718 (354)		author
		DQ378030 (2340)				none
Family Thurstonellidae						
<i>Thurstonella sp.</i>		KT808785 (2057)				none
Family Urothoidae						
<i>Urothoe brevicornis</i>		AY826973 (2341)	EU693331 (851)			none
Family Valettiopsidae						
<i>Valettietta anacantha</i>	KP713949 (638)	KT372893 (591)			KP456096 (255)	author
Family Vicmusiidae						
<i>Acanthonotozomopsis pushkini</i>	KY907620 (556)	KT808783 (2385)	KT808687 (1233)			voucher
Family Eusiridae						
<i>Eusirus giganteus</i>		KT808766 (2217)	KT808714 (1202)			voucher
<i>Rhachotropis antarctica</i>		KT808757 (2244)	KT808738 (1088)			voucher
Family Liljeborgiidae						
<i>Idunella picta</i>		KT808786 (2054)				none
<i>Liljeborgia quadridentata</i>	KF430260 (242)		KF430320 (310)	KF484720 (354)	KF430290 (310)	author
<i>Liljeborgia fissicornis</i>		AY826959 (2350)				none
Family Lysianassoidea						
<i>Lysianassoidea sp.</i>	KP713916 (642)	KP347466 (1539)			KP456100 (257)	voucher
Family Cyclocaridae						
<i>Cyclocaris sp. n.</i>	KF430245 (242)	KF430230 (990)	KF430302 (308)	KF484701 (354)	KF430272 (297)	author
Family Eurytheneidae						
<i>Eurythenes gryllus</i>	KF430246 (242)	KF430231 (918)	KF430303 (308)	KF484702 (354)	KF430273 (301)	author
Family Hirondeilleidae						
<i>Hirondeillea namarensis</i>	KF430248 (242)	KF430233 (956)	KF430305 (308)	KF484704 (354)	KF430275 (289)	author
Family Lysianassidae						
<i>Cheirimedon femoratus</i>	MF124090 (658)					none
<i>Falklandia reducta</i>	GU109256 (658)		GU109193 (1223)			voucher
<i>Lepidepecreum umbo</i>		AY826968 (2524)				none
<i>Onesimoides sp.</i>	JQ246436 (561)	JQ246437 (554)				author
<i>Orchomene aff. pectinatus</i>	KF430241 (242)	KF430226 (942)	KF430298 (308)	KF484697 (354)	KF430268 (292)	author
<i>Orchomenella gerulicorbis</i>	KF430240 (242)	KF430225 (538)	KF430297 (308)	KF484696 (354)	KF430267 (293)	author
<i>Orchomenyx macronyx</i>	GU109231 (658)		GU109200 (1226)			voucher
<i>Pseudorchomene plebs</i>	GU109255 (658)		GU109209 (1239)			voucher
<i>Tryphosella murrayi</i>	GU109268 (635)	AY826965 (2469)				none
Family Opisidae						
<i>Opisa takafuminakanoi</i>	LC190497 (639)		LC186947 (1313)	LC186948 (328)	LC186946 (395)	voucher
Family Scopelocheiridae						
<i>Paracallisoma sp. n.</i>	KF430244 (242)	KF430229 (1031)	KF430301 (307)	KF484700 (354)	KF430271 (296)	author
<i>Scopelocheirus schellenbergi</i>	KP713897 (641)	KP347453 (1518)			KP456128 (236)	isolate

Continued on next page.

Taxon Selection Table – continued from previous page

Genus & species	COI	18S	28S	H3	16S	Link
Family Uristidae						
<i>Abyssorchomene abyssorum</i>	KF430239 (242)	KF430224 (929)	KF430296 (308)	KF484695 (354)	KF430266 (293)	author
<i>Centromedon zoe</i>	KF430236 (242)	KF430221 (936)	KF430293 (307)	KF484692 (354)	KF430263 (299)	author
<i>Menigrates obtusifrons</i>		AY826966 (2371)				none
<i>Stephonyx biscayensis</i>	KF430237 (242)	KF430222 (967)	KF430294 (308)	KF484693 (354)	KF430264 (295)	author
<i>Tmetonyx sp. n.</i>	KF430247 (242)	KF430232 (933)	KF430304 (308)	KF484703 (354)	KF430274 (290)	author
<i>Uristes sp.</i>	KP713947 (652)	KP347458 (1616)			KP456063 (231)	isolate
Family Lysianassoidea (temp.)						
<i>Ambasiopsis sp.</i>	GU109246 (658)		GU109214 (1247)			voucher
Family Pontoporeiidae						
<i>Monoporeia affinis</i>	KM068102 (630)	AY926800–AY926861 (1257)			AY926738 (454)	author
Suborder Senticaudata						
Family Bogidiellidae						
<i>Bogidiella veneris</i>	JF278089 (446)		JF278090 (1392)			author
Family Salentinellidae						
<i>Salentinella denticulata</i>		DQ378037 (2470)				none
Family Caprellidae						
<i>Caprella californica</i>	JX545461 (710)	JX545395–JX545359 (1357)			JX545431 (425)	author
	KF743426 (659)	KF743484 (912)				voucher
<i>Caprella danilevskii</i>	KX224002 (562)	AB295398 (2194)				none
<i>Monoliropus tener</i>		AB295395 (2278)				none
<i>Protella gracilis</i>		AB295396 (2523)				none
<i>Pseudoprotella phasma</i>	KF430255 (242)		KF430314 (302)	KF484713 (354)	KF430284 (302)	author
		DQ378041 (2245)				none
<i>Perotripus sp.</i>		AB295401 (2256)				none
<i>Phtisica marina</i>	KT209123 (658)	DQ378040 (2165)				none
<i>Protogeton sp.</i>		AB295400 (2286)				none
<i>Protomima imitatrix</i>		AB295399 (2339)				none
Family Caprogammaridae						
<i>Caprogammarus gurbanovae</i>		AB520634 (2266)				none
Family Cyamidae						
<i>Cyamus balaenopterae</i>		AB520635 (2315)				none
<i>Isocyamus globicipitis</i>	FJ751181 (750)					none
Family Dulichiidae						
<i>Dulichia porrecta</i>		DQ378020 (2336)				none
Family Podoceridae						
<i>Podocerus variegatus</i>		DQ378022 (2354)				none
			KF430321 (304)	KF484721 (354)		author
Family Priscoimilitaridae						
<i>Priscoimilitaris heike</i>	LC155259 (658)		LC155260 (1274)	LC155261 (328)		voucher
Family Ischyroceridae						
<i>Ischyrocerus anguipes</i>	JX545466 (710)	JX545402–JX545366 (1328)			JX545438 (434)	author
<i>Jassa slatteryi</i>	EF989682 (812)	AB295408 (2161)				none
<i>Bubocorphium sp.</i>		AB295405 (2398)				none
<i>Erichthonius brasiliensis</i>	JX545462 (710)	JX545398–JX545362 (1463)			JX545434 (442)	none
		DQ378016 (2404)				none
Family Photidae						
<i>Gammaropsis utinomii</i>		AB295406 (2273)				none
<i>Photis longicaudata</i>	KT208497 (658)					none

Continued on next page.

Taxon Selection Table – continued from previous page

Genus & species	COI	18S	28S	H3	16S	Link
Family Aoridae						
<i>Aora gracilis</i>	KT208392 (658)	DQ378019 (2235)				none
<i>Aoroides columbiae</i>	JX545451 (710)	JX545385–JX545349 (1326)			JX545421 (435)	author
<i>Grandidierella japonica</i>	JX545464 (710)	JX545400–JX545364 (1450)			JX545436 (441)	author
		AB295403 (2326)				none
	LC331672 (126)		LC331664 (1316)			author
<i>Paraoroides sp.</i>	EF989711 (815)					none
Family Unciolidae						
<i>Neohela monstrosa</i>		DQ378018 (2505)				none
<i>Unciolella lunata</i>	KT307706 (594)					none
Family Ampithoidae						
<i>Amphitholina cuniculus</i>	KP316295 (539)				KP316253 (358)	author
<i>Ampithoe ramondi</i>	KF430251 (242)		KF430310 (307)	KF484709 (354)	KF430280 (287)	author
		DQ378024 (2229)				none
<i>Paragrubia latipoda</i>	KP316322 (539)				KP316284 (377)	author
<i>Pseudopleonexes lessoniae</i>	KP316318 (539)				KP316280 (367)	author
<i>Exampithoe kutti</i>	KP316314 (539)				KP316274 (362)	author
Family Corophiidae						
<i>Chelicorophium robustum</i>	KM009058 (611)	HG322470 (182)				none
<i>Corophium volutator</i>	KT208717 (658)	DQ378027 (2587)				none
<i>Monocorophium insidiosum</i>	KT208626 (649)	KJ193732 (927)				author
<i>Paracorophium excavatum</i>	HQ858008 (530)					none
Family Crymostygidae						
<i>Crymostygius thingvallensis</i>	HQ286032 (582)	HQ286012 (2393)	HQ286019 (1395)		HQ286009 (368)	author
Family Pseudoniphargidae						
<i>Pseudoniphargus daviui</i>	KY441038 (546)			KY441072 (258)		voucher
		HE967300 (1863)				none
<i>Pseudoniphargus gorbeanus</i>	KY441043 (618)		KY441101 (508)	KY441075 (231)		voucher
Family Crangonyctidae						
<i>Amurocrangonyx arsenjevi</i>	HQ286025 (582)	HQ286015 (2278)			HQ286007 (401)	author
<i>Bactrurus mucronatus</i>	KF430261 (242)		KF430322 (310)	KF484722 (354)	KF430291 (293)	author
		AF202978 (2329)				none
<i>Crangonyx forbesi</i>	KF430256 (242)			KF484714 (354)	KF430285 (298)	author
		AF202980 (2331)	EU693287 (819)			none
<i>Stygobromus mackini</i>	KF430257 (242)		KF430316 (304)	KF484716 (354)	KF430287 (306)	author
		DQ377995 (2322)				none
<i>Stygobromus gracilipes</i>	HQ286034 (582)	HQ286016 (2299)	HQ286022 (1218)		HQ286002 (405)	author
<i>Synurella ambulans</i>	HQ286037 (560)	HQ286018 (2327)			HQ286000 (396)	author
			EF617236 (853)			none
Family Niphargidae						
<i>Haploginglymus morenoi</i>	KY441021 (272)		KY441080 (882)	KY441054 (330)		voucher
<i>Microniphargus leruthi</i>			KX379004 (769)	KX379049 (331)		none
<i>Niphargobates orophobata</i>			JQ815552–JQ815548 (1627)	JQ815518 (313)		none
<i>Niphargus kochianus</i>	KC315687 (845)		KC315610 (1035)		KC315548 (994)	author
		AF419221 (2227)				none
			EU693308 (852)	JQ815492 (330)		voucher
<i>Pontoniphargus racovitzai</i>	KF290216 (658)		KF290023 (988)			none

Continued on next page.

Taxon Selection Table – continued from previous page

Genus & species	COI	18S	28S	H3	16S	Link
Family Paramelitidae						
<i>Chydaekata acuminata</i>	DQ256001 (657)	EU302474 (424)				author
	DQ255998 (657)				DQ838003 (460)	author
<i>Hurleya kalamundae</i>		GU563376 (402)				none
<i>Kruptus linnaei</i>	GU111906 (521)	GU111908 (433)			GU111907 (453)	author
<i>Maarrka sp.</i>	DQ838033 (646)	EU302475 (424)			DQ838010 (471)	author
<i>Molina pleobranchos</i>	DQ255962 (651)	EU302470 (424)			DQ838015 (389)	author
<i>Pilbarus millsii</i>	DQ490126 (589)	EU302471 (424)			EU309472 (326)	author
Family Pseudocrangonyctidae						
<i>Pseudocrangonyx gudariensis</i>	LC171499 (658)		LC171498 (1308)	LC171500 (328)	LC171497 (412)	voucher
Family Acanthogammaridae						
<i>Acanthogammarus lappaceus</i>	FJ756297 (621)	FJ752383–FJ756218 (1170)			FJ756244 (338)	voucher
<i>Boeckazelia carpenterii</i>		Z98995 (608)				none
<i>Brachyuropus grewingkii</i>	FJ756300 (627)	FJ752386–FJ756221 (1185)			FJ756247 (339)	voucher
<i>Brandtia latissima lata</i>	AY926654 (650)	AY926758–AY926820 (1472)			AY926698 (395)	author
<i>Cornugammarus maximus</i>	FJ756304 (624)	FJ752389–FJ756224 (991)			FJ756255 (339)	voucher
<i>Diplacanthus brevispinus</i>	AY926651 (639)	AY926754–AY926816 (1408)			AY926694 (407)	author
<i>Dorogostaikia parasitica</i>	FJ756317 (627)	FJ752392–FJ756227 (1183)			FJ756267 (339)	voucher
<i>Garjajewia sarsi</i>	FJ756330 (627)	FJ752399–FJ756234 (1183)			FJ756282 (339)	voucher
<i>Paragarjajewia petersi</i>		Z98990 (609)				none
<i>Ceratogammarus cornutus</i>		Z98987 (609)				none
<i>Parapallasea borowskii</i>		AY926807–AY926868 (1371)			AY926745 (390)	author
<i>Plesiogammarus brevis</i>	AY926689 (668)	AY926808–AY926869 (1365)			AY926746 (451)	author
<i>Poekilogammarus pictoides</i>	AY926690 (500)	AY926809–AY926870 (1231)			AY926747 (418)	author
Family Anisogammaridae						
<i>Eogammarus confervicolus</i>	AY926659 (547)	AY926767–AY926829 (1421)			AY926707 (522)	author
<i>Jesogammarus hebeiensis</i>	EF570352 (639)	EF582935 (2045)	EF582998 (1276)		EF582847 (415)	voucher
<i>Ramellogammarus vancouverensis</i>		AY926813–AY926874 (1461)			AY926751 (435)	author
<i>Spasskogammarus spasskii</i>	LC052234 (371)		LC214764 (708)		LC052255 (446)	author
Family Baikalogammaridae						
<i>Baikalogammarus pullus</i>	FJ756303 (627)	FJ752388–FJ756223 (1142)			FJ756254 (340)	voucher
Family Bathyporeiidae						
<i>Bathyporeia pilosa</i>	KT208483 (658)	AY826951 (2216)				none
Family Carinogammaridae						
<i>Carinogammarus sp.</i>		AY926759–AY926821 (1467)			AY926699 (257)	author
Family Crypturopodidae						
<i>Asprogammarus seidlitzii</i>	FJ756299 (591)	FJ752385–FJ756220 (1180)			FJ756246 (267)	voucher
<i>Crypturopus pachytus</i>		AY926764–AY926826 (902)			AY926704 (420)	author
<i>Pseudomicruropus rotundatulus</i>		AY926812–AY926873 (1401)			AY926750 (413)	author
Family Eulimnogammaridae						
<i>Abyssogammarus gracilis</i>		AY926753–AY926815 (1406)			AY926693 (443)	author
<i>Sluginella kietlinskii</i>		Z98983 (589)				none
<i>Odontogammarus calcaratus</i>	AY926685 (450)	AY926801–AY926862 (1411)			AY926739 (438)	author
Family Gammaracanthidae						
<i>Gammaracanthus lacustris</i>	JF965997 (653)	JF966191 (1982)	JF965829 (1312)			voucher
Family Gammarellidae						
<i>Austroregia regis</i>		KT808775 (2021)				none
<i>Gammarellus homari</i>	KT208652 (658)	DQ378033 (2338)		KP113588 (344)		none
<i>Gammarellus angulosus</i>	KT208518 (648)					none
		KT808778 (2045)	KT808715 (1109)			voucher

Continued on next page.

Taxon Selection Table – continued from previous page

Genus & species	COI	18S	28S	H3	16S	Link
Family Gammaridae						
<i>Amathillina pusilla</i>		AY926756–AY926818 (1116)			AY926696 (391)	author
<i>Anopogammarus revazi</i>	KF478522 (649)	KF478608 (1951)	KF478431 (1299)			voucher
<i>Chaetogammarus ischnus</i>	KF478532 (653)	KF478612 (1922)	KF478441 (1277)			voucher
<i>Comatogammarus ferghanensis</i>	JF965996 (653)	JF966190 (2009)	JF965828 (1284)			voucher
<i>Dikerogammarus villosus</i>	EF570297 (651)	EF582898 (2159)	EF582941 (1257)			voucher
<i>Echinogammarus stammeri</i>	KF478544 (310)	KF478618 (1951)	KF478454 (1284)			voucher
<i>Fontogammarus dalmatinus</i>	KF478520 (656)	KF478606 (1962)	KF478429 (1269)			voucher
<i>Gammarus pulex</i>	EF570334 (632)	EF582923 (1964)	EF582978 (1272)			voucher
<i>Gmelina costata</i>		KF478625 (1927)	KF478468 (1274)			voucher
<i>Jugogammarus kusceri</i>	KF478552 (655)	KF478622 (1921)	KF478462 (1274)			voucher
<i>Laurogammarus scutarensis</i>	KF478543 (656)	KF478617 (1937)	KF478453 (1282)			voucher
<i>Marinogammarus stoerensis</i>	KF478601 (653)	KF478651 (2056)	KF478515 (1269)			voucher
<i>Neogammarus nudus</i>	KF478564 (656)	KF478630 (2011)	KF478477 (1278)			voucher
<i>Rhipidogammarus rhipidiophorus</i>	JF965991 (656)	JF966186 (2124)	JF965823 (1286)			voucher
<i>Sarthrogammarus sp.</i>	KF478602 (653)	KF478652 (2001)	KF478516 (1268)			voucher
<i>Sinogammarus chuanhui</i>	EF570355 (644)	EF582937 (2028)	EF583000 (1254)			voucher
<i>Barnardiorum shadini</i>	JF965994 (653)	JF966188 (1964)	JF965826 (1274)			voucher
Family Macrohectopidae						
<i>Macrohectopus branickii</i>	AY926677 (519)	AY926793–AY926854 (1366)			AY926732 (418)	author
Family Mesogammaridae						
<i>Mesogammarus melitoides</i>					AB432964 (418)	none
Family Micrurupodidae						
<i>Gmelinoides fasciatus</i>	KF478573 (625)	AY926791–AY926852 (1446)			AY926730 (417)	author
<i>Linevichella vortex</i>	FJ756331 (627)	FJ752400–FJ756235 (1179)			FJ756283 (303)	voucher
<i>Micruropus glaber</i>	AY926682 (697)	AY926798–AY926859 (1476)			AY926736 (362)	author
Family Ommatogammaridae						
<i>Ommatogammarus flavus</i>	FJ756342 (626)	FJ752406–FJ756241 (1185)			FJ756294 (339)	voucher
Family Pachyschesidae						
<i>Pachyschesis sp.</i>		Z98989 (565)				none
Family Pallaseidae						
<i>Hakonboekia strauchii</i>	AY926676 (708)	AY926792–AY926853 (1389)			AY926731 (439)	author
<i>Pallasea grubei</i>	AY926688 (550)	AY926805–AY926866 (1396)			AY926743 (344)	author
<i>Pallaseopsis kessleri</i>	FJ756344 (627)	FJ752408–FJ756243 (1183)			FJ756296 (339)	voucher
Family Phreatogammaridae						
<i>Phreatogammarus sp.</i>		DQ378036 (2559)				none
Family Pontogammaridae						
<i>Niphargogammarus aequimanus</i>	KF478576 (656)	KF478636 (1899)	KF478489 (688)			voucher
<i>Obesogammarus acuminatus</i>	KF478574 (652)	KF478634 (1938)	KF478487 (1275)			voucher
<i>Paraniphargoides motasi</i>	KF478571 (656)	KF478633 (1926)	KF478485 (1280)			voucher
<i>Pontogammarus maeoticus</i>	KF478575 (656)	KF478635 (1930)	KF478488 (1266)			voucher
<i>Stenogammarus similis</i>	KF478570 (656)	KF478632 (1928)	KF478484 (1264)			voucher
<i>Turcogammarus aralensis</i>	KF478568 (656)	KF478631 (1936)	KF478482 (1266)			voucher
Family Typhlogammaridae						
<i>Accubogammarus sp.</i>	KF478592 (428)	KF478647 (2011)	KF478506 (1274)			voucher
<i>Metohia carinata</i>	KF478584 (573)	KF478640 (2043)	KF478498 (1282)			voucher
<i>Typhlogammarus sp.</i>	KF478591 (612)	KF478646 (1461)	KF478505 (1268)			voucher
<i>Zenkevitchia admirabilis</i>	KF478599 (624)		KF478514 (1285)			voucher

Continued on next page.

Taxon Selection Table – continued from previous page

Genus & species	COI	18S	28S	H3	16S	Link
Family Calliopiidae						
<i>Apherusa bispinosa</i>	KT208700 (641)	DQ378009 (2287)	KT808691 (1313)			none
<i>Calliopijs laeviusculus</i>	FJ581531 (658)	DQ378008 (2562)	KT808701 (1192)			none
<i>Cleippides quadricuspis</i>		KT808779 (2032)	KT808703 (1123)			voucher
<i>Halirages fulvocinctus</i>	FJ581692 (658)		KT808720 (1183)			none
<i>Oligochinus lighti</i>		JX545408–JX545372 (1387)				author
<i>Oradarea megalops</i>		KT808773 (2208)	KT808696 (1144)			voucher
<i>Weyprechtia pinguis</i>	DQ889174 (644)		KT808741 (1111)			none
Family Pontogeneiidae						
<i>Atyloella tribinicuspidata</i>		KT808751 (2137)	KT808697 (1184)			voucher
<i>Awacaris kawasawai</i>			LC146875 (793)			none
<i>Bovallia gigantea</i>			KT808700 (1235)			none
<i>Eurymera monticulosa</i>		KT808776 (2051)	KT808712 (1185)			voucher
<i>Gondogeneia</i> sp.			KT808718 (1254)			none
<i>Liouvillea</i> sp.		KT808765 (2152)	KT808723 (1190)			voucher
<i>Paramoera</i> sp.		KT808752 (2202)	KT808729 (1187)			voucher
<i>Prostebbingia gracilis</i>		KT808781 (2181)	KT808735 (1167)			voucher
<i>Schraderia gracilis</i>		KT808756 (2148)	KT808740 (1185)			voucher
<i>Sternomoera yezoensis</i>	LC146809 (640)		LC145840 (800)			author
Family Eriopisidae						
<i>Eriopisa elongata</i>			EU693289 (873)			none
<i>Nedsia</i> sp.	EU304458 (521)	EU302461 (397)			EU309473 (432)	author
Family Hadziidae						
<i>Hadzia</i> sp.			KF719276 (852)			none
<i>Tuluweckelia cernua</i>	MF589982 (638)					none
Family Maeridae						
<i>Glossomaera lindsae</i>	KC706703 (312)					none
<i>Maera inaequipes</i>	KF369148 (658)	AF419229 (2487)				none
<i>Paraceradocus gibber</i>		AF419232 (2328)				none
Family Melitidae						
<i>Exitomelita lignicola</i>	JQ775392 (682)					none
<i>Megamoera subtener</i>	AY926678 (708)	AY926794–AY926855 (1561)				author
<i>Melita nitida</i>	AY926679 (660)	AY926795–AY926856 (1476)			AY926733 (461)	author
Family Metacrangonyctidae						
<i>Longipodacrangonyx</i> sp.	HE967100 (657)	HE967282–HE967283 (1547)			HE967238 (418)	none
<i>Metacrangonyx longipes</i>	FR729731 (639)	HE967285 (2200)		FR846126 (324)	HE970662 (390)	author
Family Nuuanuidae						
<i>Gammarella fucicola</i>	KX224034 (658)	KJ182992 (454)				none
Family Chiltoniidae						
<i>Arabunnachiltonia murphyi</i>	KT958091 (888)		KT957994 (573)			author
<i>Austrochiltonia cooperi</i>	JN009914 (1504)		KT957987 (571)			isolate
<i>Kartachiltonia moodyi</i>	KJ661125 (1486)		KT957970 (568)			isolate
<i>Phreatochiltonia anophthalma</i>	KT958045 (1198)		KT957971 (575)			author
<i>Scutachiltonia axfordi</i>	KT958075 (639)		KT958022 (588)			author
<i>Stygochiltonia bradfordae</i>	KT958077 (639)		KT958024 (571)			author
<i>Wangiannachiltonia guzikae</i>	KT958093 (1135)		KT957995 (577)			author
<i>Yilgarniella sturtensis</i>	KT958073 (639)		KT958021 (398)			author
Family Dogielinotidae						
<i>Allorchestes angusta</i>	JX545449 (710)	JX545382–JX545346 (1395)			JX545418 (439)	author
<i>Exhyalella natalensis</i>	AF520436 (706)					none

Continued on next page.

Taxon Selection Table – continued from previous page

Genus & species	COI	18S	28S	H3	16S	Link
Family Hyalellidae						
<i>Hyalella azteca</i>	DQ464604 (637)		DQ464742 (1415)			author
	GU066812 (658)	GU066808 (419)				author
<i>Hyalella</i> sp.	AJ968917 (626)	AJ966715 (1138)				author
Family Hyalidae						
<i>Hyale nilssoni</i>	AF520435 (703)	AY826958 (2318)				none
<i>Parallorchestes cowani</i>	JX545470 (710)	JX545412–JX545376 (1308)			JX545443 (441)	author
<i>Parhyale hawaiiensis</i>	KF430250 (242)		KF430309 (315)	KF484708 (354)	KF430279 (312)	author
		AY826957 (2550)				none
<i>Protohyale frequens</i>	JX545472 (710)	JX545414–JX545378 (1396)			JX545445 (439)	author
Family Talitridae						
<i>Africorchestia spinifera</i>	JX094869 (500)	KP010861 (457)	KP010895 (756)			author
	KY379015 (336)			KY378979 (330)		author
<i>Arcitalitrus dorrieni</i>	JX094872 (500)	KP010833 (563)				author
<i>Bellorchestia pravidactyla</i>	KX812472 (658)					none
<i>Brevitalitrus</i> sp.	AB741707 (658)					none
<i>Britorchestia uolinii</i>	JX094874 (500)	KP010862 (594)				author
<i>Cryptorchestia cavimana</i>	JX094880 (500)	KP010839 (594)	KP010871 (757)			author
		AY744893 (2217)		AY744907 (327)	AY744911 (489)	author
<i>Deshayesorchestia deshayesii</i>	JX094865 (500)	KP010834 (598)	KP010866 (755)			author
		AY826956 (2292)				none
	AY185153 (336)			KY378965 (330)		author
<i>Macarorchestia remyi</i>	HQ679929 (582)	KP010835 (594)	KP010867 (726)			author
				KY378983 (330)		none
<i>Mexorchestia carpenteri</i>	KX360531 (658)					none
<i>Mysticotalitrus cryptus</i>	KY379028 (363)			KY378998 (330)		author
<i>Neotenorchestia kenwildishi</i>		KP010864 (594)	KP010897 (753)			author
<i>Orchestia gammarellus</i>	KT208598 (658)	AY826954 (2286)		AM748665 (368)		none
	EU276190 (532)	KP010845 (594)	KP010877 (753)			author
<i>Palmorchestia epigaea</i>	KY379020 (363)			KY378985 (330)		author
	JX094883 (500)	KP010855 (594)	KP010888 (753)			author
<i>Platorchestia japonica</i>	EF570353 (643)	EF582936 (2045)	EF582999 (1240)		EF582844 (419)	voucher
	KC578472 (864)		KC578342 (1332)	KC578406.1	KC578276 (406)	voucher
<i>Pseudorchestoidea brito</i>	JX094881 (500)	KP010856 (594)	KP010890 (753)			author
<i>Sinorchestia taiwanensis</i>	KC578516 (864)		KC578386 (1332)	KC578449 (327)	KC578320 (337)	voucher
<i>Solitroides motokawai</i>	LC223812 (658)		LC223811 (1250)	LC223813 (328)	LC223810 (421)	voucher
<i>Talitroides topitotum</i>	AB741766 (658)				MF072683 (492)	none
<i>Talitrus saltator</i>	JX094867 (500)	KP010859 (594)	KP010893 (757)			author
	KY379010 (363)			KY378974 (330)		author
		AY826955 (2285)				none
<i>Talorchestia martensii</i>	KC578515 (864)		KC578385 (1338)	KC578448 (327)	KC578319 (380)	voucher
<i>Waemataua kaitaia</i>	KU896886 (658)			KU896898 (329)	KU896879 (429)	author
Amphipoda incertae sedis						
Family Sanchoidae						
<i>Chosroes</i> aff. <i>decoratus</i>		KT808774 (2205)	KT808702 (1206)			voucher
INGOLFIELLIDA						
Suborder Ingolfiellidae						
Family Ingolfiellidae						
<i>Ingolfiella tabularis</i>		DQ378054 (2053)				none

Continued on next page.

Taxon Selection Table – continued from previous page

Genus & species	COI	18S	28S	H3	16S	Link
ISOPODA						
Suborder Asellota						
Family Asellidae						
<i>Proasellus slavus</i>	JQ921400 (626)		JQ921987 (720)		JQ921807 (452)	isolate
		AF496662 (2115)				none
Family Stenasellidae						
<i>Stenasellus racovitzai</i>	JQ921620 (973)		JQ922010 (814)		JQ921835 (385)	isolate
		AF496663 (2216)				none
Family Janiridae						
<i>Ianiropsis epilittoralis</i>	EF682303 (647)	EF682260 (1888)	EF682305 (901)			isolate
					AF260859 (510)	none
Family Munnopsidae						
<i>Betamorphia fusiformis</i>	EF682291 (623)	EF682247 (2212)	EF682332 (1162)			isolate
					EF116526 (514)	none
Suborder Oniscidea						
Family Armadillidae						
<i>Cubaris murina</i>	AB861534 (663)	AB861893 (662)	AB861892 (658)		AB861889 (449)	isolate
<i>Spherillo dorsalis</i>	AB861897 (615)	AB861917 (651)	AB861924 (629)		AB861910 (388)	isolate
Family Philosciidae						
<i>Burmoniscus meeusei</i>	AB889794 (653)	AB889803 (675)	AB889806 (635)		AB889800 (453)	isolate
Family Platyarthridae						
<i>Platyarthrus hoffmannseggii</i>	KR424594 (561)	KR424631 (594)	KR424712 (805)			voucher
					AJ388092 (347)	none
<i>Trichorhina tomentosa</i>	KR424599 (612)	KR424633 (614)	KR424715 (760)			voucher
		AY048186 (2851)			JF309314 (338)	none
Family Porcellionidae						
<i>Porcellio scaber</i>	LC126629 (663)	LC126633 (693)	LC126635 (552)			isolate
		AJ287062 (3192)	AY744901 (2713)		DQ305104 (450)	none
<i>Porcellionides pruinosus</i>	KR424606 (672)	KR424622 (653)	KR424723 (768)			voucher
		AY048181 (2370)			AJ275210 (428)	none
Suborder Valvifera						
Family Idoteidae						
<i>Idotea sp.</i>	KC428828 (758)	KC428898 (2831)	KC428847 (2464)	KC428949 (328)		isolate

Nucleotide sequence length (bp) shown in parentheses. Concatenated sequences indicated by a dash.

Supplemental References

- Barnard, J. L. and Karaman, G. S. (1984). Australia as a major evolutionary centre for Amphipoda (Crustacea). In Lowry, J. K., editor, *Papers from the Conference on the Biology and Evolution of Crustacea*, volume 18, pages 45–61. Australian Museum, Sydney.
- Bousfield, E. L. and Shih, C. (1994). The phyletic classification of amphipod crustaceans: problems in resolution. *Amphipacifica*, 1(3):76–134.
- Browne, W. E., Haddock, S. H. D., and Martindale, M. Q. (2007). Phylogenetic analysis of lineage relationships among hyperiid amphipods as revealed by examination of the mitochondrial gene, cytochrome oxidase i (COI). *Integrative and Comparative Biology*, 47(6):815–830.
- Charif, D. and Lobry, J. R. (2007). SeqinR 1.0-2: a contributed package to the R project for statistical computing devoted to biological sequences retrieval and analysis. Biological and Medical Physics, Biomedical Engineering, pages 207–232.
- Costa, F. O., deWaard, J. R., Boutillier, J., Ratnasingham, S., Dooh, R. T., Hajibabaei, M., and Hebert, P. D. N. (2007). Biological identifications through dna barcodes: the case of the crustacea. *Canadian Journal of Fisheries and Aquatic Sciences*, 64:272–295.
- d’Udekem d’Acoz, C. and Verheye, M. L. (2017). *Epimeria* of the Southern Ocean with notes on their relatives (Crustacea, Amphipoda, Eusiroidea). *European Journal of Taxonomy*, 359:1–553.
- Englisch, U. (2001). *Analyse der Phylogenie der Amphipoda (Crustacea, Malacostraca) mit Hilfe von Sequenzen des Gens der RNA der kleinen ribosomalen*. PhD thesis, der Ruhr-Universität Bochum.
- Horton, T., Lowry, J., De Broyer, C., Bellan-Santini, D., coleman, C. O., Corbari, L., Daneliya, M., Dauvin, J.-C., Fišer, C., Gasca, R., Grabowske, M., Guarra-García, J. M., Hendrycks, E., Hughes, L., Jaume, D., Jazdzewski, K., Kim, T.-H., King, R., Krapp-Schickel, T., LeCroy, S., Lörz, A.-N., Mamos, T., Senna, A. R., Serejo, C., Sket, B., Souza-Filho, J. F., Tandberg, A. H., Thomas, J., Thurston, M., Vader, W., Väinölä, R., Vonk, R., White, K., and Zeidler, W. (2018). World amphipod database. Amphipoda. <http://www.marinespecies.org/aphia.php?p=taxdetails&id=1135>.
- Hurt, C., Haddock, S. H. D., and Browne, W. E. (2013). Molecular phylogenetic evidence for the reorganization of the hyperiid amphipods, a diverse group of pelagic crustaceans. *Molecular Phylogenetics and Evolution*, 67(1):28–37.
- Katoh, K. and Standley, D. (2013). MAFFT multiple sequence alignment software version 7: improvements in performance and usability. *Molecular Biology and Evolution*, 30(4):772–780.
- Katoh, K. and Toh, H. (2008a). Improved accuracy of multiple ncRNA alignment by incorporating structural information into a MAFFT-based framework. *BMC Bioinformatics*, 9:212.
- Katoh, K. and Toh, H. (2008b). Recent developments in the MAFFT multiple sequence alignment program. *Briefings in Bioinformatics*, 9(4):286–298.
- Lowry, J. K. and Myers, A. A. (2013). A phylogeny and classification of the Senticaudata subord. nov. (Crustacea: Amphipoda). *Zootaxa*, 3610(1):1–80.
- Lowry, J. K. and Myers, A. A. (2017). A phylogeny and classification of the Amphipoda with the establishment of the new order Ingolfiellida (Crustacea: Peracarida). *Zootaxa*, 4265(1):1–89.
- Myers, A. A. and Lowry, J. K. (2003). A phylogeny and a new classification of the Corophiidea Leach, 1814 (Amphipoda). *Journal of Crustacean Biology*, 23(2):443–485.
- Myers, A. A. and Lowry, J. K. (2018). The Senticaudata, a suborder of the Amphipoda—a commentary on d’Udekem d’Acoz and Verheye (2017). *ZooKeys*, 730:151–155.

- Verheye, M. L., Martin, P., Backeljau, T., and d'Udekem d'Acoz, C. (2016). DNA analyses reveal abundant homoplasy in taxonomically important morphological characters of Eusiroidea (Crustacea, Amphipoda). *Zoologica Scripta*, 45(3):300–321.
- Wernersson, R. and Pedersen, A. G. (2003). RevTrans: multiple alignment of coding DNA from aligned amino acid sequences. *Nucleic Acids Research*, 31(13):3537–3539.
- Zeidler, W. (2004). A review of the families and genera of the hyperiidean amphipod superfamily Phronimoidea Bowman and Gruner, 1973 (Crustacea: Amphipoda: Hyperiidea). *Zootaxa*, 567:1–66.
- Zeidler, W. and Browne, W. E. (2015). A new *Glossocephalus* (Crustacea: Amphipoda: Hyperiidea: Oxycephalidae) from deep-water in the Monterey Bay region, California, USA, with an overview of the genus. *Zootaxa*, 4027(3):408–424.