# Appendix 3. Alignments for selected genes for selected species from the comparative analyses

These images show the sequence alignments used to check for consistency of gene annotations within taxonomic groups. The images were produced by the MacClade v. 4.08 program.

In all cases, nucleotides and amino acids are represented by their 1-letter IUPAC-IUB codes, and they have unique colors. Where appropriate, overlapping genes are shown using numbers (e.g. "1.") at the top of the relevant aligned columns.

For the protein-coding genes, both the nucleotide sequence and the translated amino-acid sequence are show, in alternating rows.

For the tRNA-coding genes, the tRNA structure is shown as a separate line, with letters indicating the paired nucleotides in each stem (H = acceptor stem, D = D-arm stem, W = anticodon stem, V = T-arm stem) and also the anticodon (S).

For the rRNA-coding genes, the rRNA structure is shown as a separate line, with letters indicating the paired nucleotides in some of the stems (the portion of the alignment shown may not include all of each stem). Also, lower-case nucleotides are considered not to be part of the gene.

Figure 1. 3' end of the COX3 gene for *Oxya chinensis* (Arthropoda; Insecta), showing the annotated overlaps with the tRNA-gly gene.

Figure 2. 3' end of the COX3 gene for *Priapulus caudatus* (Priapulida), showing the annotated overlaps with the tRNA-gly gene.

Figure 3. 3' end of the COX3 gene for *Enterobius vermicularis* (Nematoda), showing the annotated overlaps with the tRNA-pro gene.

Figure 4. 3' end of the COX2 gene for *Cepaea nemoralis* and *Euhadra herklotsi* (Mollusca), showing the annotated overlap with the tRNA-tyr (1.) and tRNA-gly (2.) genes, respectively.

Figure 5. 3' end of the NAD5 gene for *Aphrocallistes vastus* (Porifera), showing the annotated overlap with the tRNA-phe (1.) and tRNA-cys (2.) genes.

Figure 6. 5' end of the NAD2 gene for *Aphrocallistes vastus* (Porifera), showing the annotated overlap with the COX3 gene.

Figure 7. The tRNA-ser(UCN) gene for *Steganacarus magnus* (Arthropoda; Chelicerata), showing the possible overlap with the l-rRNA gene.

Figure 8. The l-rRNA gene for *Varroa destructor* (Arthropoda; Chelicerata), showing the overlap with the tRNA-val gene.

Figure 9. The tRNA-ala gene for *Shinkaia crosnieri* (Arthropoda; Crustacea).

Figure 10. The tRNA-cys gene for *Shinkaia crosnieri* (Arthropoda; Crustacea).

Figure 11. The tRNA-gln gene for *Aleurochiton aceris* (Arthropoda; Insecta).

Figure 12. The tRNA-ile gene for *Aleurochiton aceris* (Arthropoda; Insecta).

Figure 13. The tRNA-ala gene for *Neomaskellia andropogonis* (Arthropoda; Insecta).

Figure 14. The tRNA-asn gene for *Neomaskellia andropogonis* (Arthropoda; Insecta).

Figure 15. The tRNA-cys gene for *Neomaskellia andropogonis* (Arthropoda; Insecta).

Figure 16. The tRNA-asn gene for *Xiphinema americanum* (Nematoda), showing the overlap with the COX2 gene.

Figure 17. Part of the COX2 gene for *Xiphinema americanum* (Nematoda), showing the overlap with the tRNA-asn gene.

Figure 18. The tRNA-trp gene for *Shinkaia crosnieri* (Arthropoda; Crustacea), showing the overlap with the COX1 (1.) and CYTB (2.) genes.

Figure 19. The 5' end of the CYTB and the 3' end of the COX1 genes for *Shinkaia crosnieri* (Arthropoda; Crustacea), showing the overlap with the tRNA-trp gene.

Figure 20. The tRNA-phe gene for *Epiperipatus biolleyi* (Onychophora), showing the overlap with the COX3 gene.

Figure 21. Part of the COX3 gene for *Epiperipatus biolleyi* (Onychophora), showing the overlap with the tRNA-phe gene.

Figure 22. The tRNA-leu(CUN) gene for *Epiperipatus biolleyi* (Onychophora), showing the overlap with the ATP6 gene.

Figure 23. Part of the ATP6 gene for *Epiperipatus biolleyi* (Onychophora), showing the overlap with the tRNA-leu(CUN) gene.

Figure 24. The tRNA-gln gene for *Aleurodicus dugesii* (Arthropoda; Insecta), showing the overlap with the NAD5 gene.

Figure 25. Part of the NAD5 gene for *Aleurodicus dugesii* (Arthropoda; Insecta), showing the overlap with the tRNA-gln gene.

OxyaCOX3.nex

| Taxa | Characters | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 | 101 | 102 | 103 | 104 | 105 | 106 | 107 | 108 | 109 | 110 | 111 | 112 | 113 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Gryllotalpa orientalis | g | t | a | g | a | t | g | t | a | g | t | a | t | g | a | c | t | a | t | t | c | c | t | t | t | t | t | a | t | t | t | c | c | a | t | c | t | a | c | t | g |
| | | V | | | D | | | V | | | V | | | W | | | L | | | F | | | L | | | F | | | I | | | S | | | I | | | Y | | | W | |
| 2 | Locusta migratoria | g | t | t | g | a | t | g | t | a | g | t | a | t | g | a | t | t | a | t | t | t | t | t | a | t | a | t | t | t | a | t | c | a | a | t | t | t | a | c | t | g |
| | | V | | | D | | | V | | | V | | | W | | | L | | | F | | | L | | | Y | | | L | | | S | | | I | | | Y | | | W | |
| 3 | Oxya chinensis | g | t | t | g | a | a | a | t | a | g | t | a | t | g | a | t | t | a | t | t | c | c | t | t | t | a | t | a | t | t | t | c | a | a | t | t | t | a | c | t | g |
| | | V | | | E | | | M | | | V | | | W | | | L | | | F | | | L | | | Y | | | I | | | S | | | I | | | Y | | | W | |
| 4 | Grylloblatta sculleni | g | t | a | g | a | t | g | t | a | a | t | t | t | g | a | t | t | a | t | t | t | c | t | a | t | a | c | a | t | t | t | c | a | a | t | t | t | a | t | t | g |
| | | V | | | D | | | V | | | I | | | W | | | L | | | F | | | L | | | Y | | | I | | | S | | | I | | | Y | | | W | |
| 5 | Sclerophasma paresisensis | g | t | t | g | a | t | a | t | t | g | t | a | t | g | a | t | t | a | t | t | c | t | t | g | t | a | t | g | t | a | t | c | t | a | t | t | t | a | c | t | g |
| | | V | | | D | | | I | | | V | | | W | | | L | | | F | | | L | | | Y | | | V | | | S | | | I | | | Y | | | W | |
| 6 | Timema californicum | g | t | a | g | a | t | g | t | a | g | t | a | t | g | a | t | t | a | t | t | t | t | t | a | t | a | t | a | t | c | t | c | a | c | t | a | t | a | t | t | g |
| | | V | | | D | | | V | | | V | | | W | | | L | | | F | | | L | | | Y | | | I | | | S | | | L | | | Y | | | W | |
| 7 | Periplaneta fuliginosa | g | t | a | g | a | t | g | t | t | g | t | g | t | g | a | t | t | a | t | t | t | t | t | a | t | a | c | a | t | t | t | c | t | a | t | t | t | a | t | t | g |
| | | V | | | D | | | V | | | V | | | W | | | L | | | F | | | L | | | Y | | | I | | | S | | | I | | | Y | | | W | |
| 8 | Tamolanica tamolana | g | t | t | g | a | t | g | t | t | g | t | a | t | g | a | t | t | a | t | t | t | t | t | a | t | a | t | g | t | t | t | c | c | a | t | t | t | a | c | t | g |
| | | V | | | D | | | V | | | V | | | W | | | L | | | F | | | L | | | Y | | | V | | | S | | | I | | | Y | | | W | |
| 9 | Pteronarcys princeps | g | t | t | g | a | t | g | t | a | g | t | t | t | g | a | t | t | a | t | t | t | t | t | a | t | a | t | a | t | c | t | c | a | a | t | t | t | a | c | t | g |
| | | V | | | D | | | V | | | V | | | W | | | L | | | F | | | L | | | Y | | | I | | | S | | | I | | | Y | | | W | |

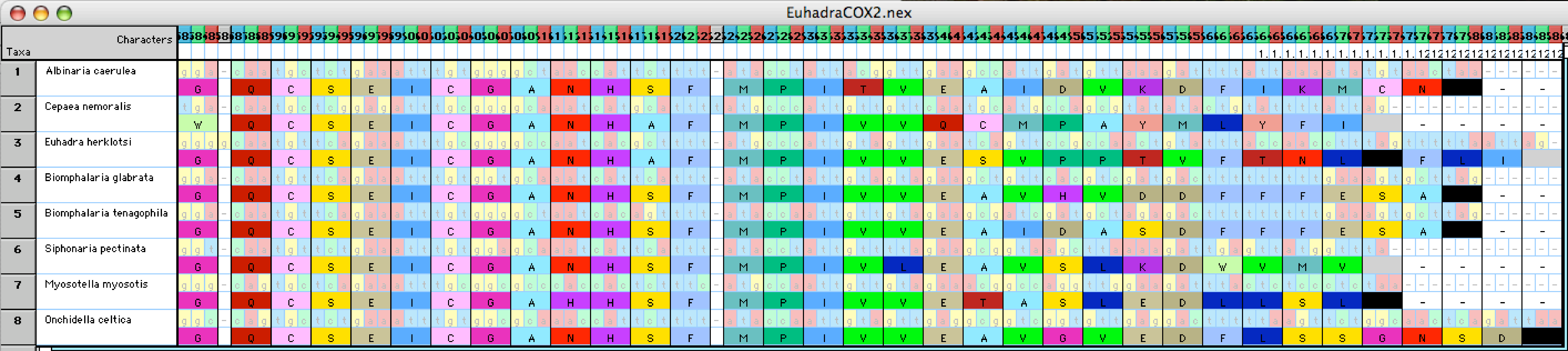
| Taxa | 114 | 115 | 116 | 117 | 118 | 119 | 120 | 121 | 122 | 123 | 124 | 125 | 126 | 127 | 128 | 129 | 130 | 131 | 132 | 133 | 134 | 135 | 136 | 137 | 138 | 139 | 140 | 141 | 142 | 143 | 144 | 145 | 146 | 147 | 148 | 149 | 150 | 151 | 152 | 153 | 154 | 155 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | a | a | a | t | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | | | | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | - | |
| 2 | a | a | a | t | a | a | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | | | | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | - | |
| 3 | a | g | a | t | a | t | t | t | g | t | t | t | t | t | c | c | a | g | t | a | t | a | a | a | t | a | g | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | | | | | L | | | F | | | F | | | Q | | | Y | | | K | | | | | | | | | | | | | | | | | | | | | |
| 4 | a | a | a | t | a | a | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | | | | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | - | |
| 5 | a | a | a | t | a | a | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | | | | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | - | |
| 6 | a | a | a | t | a | a | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | | | | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | - | |
| 7 | a | a | a | t | a | a | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | | | | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | - | |
| 8 | a | a | a | t | a | a | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | | | | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | - | |
| 9 | a | a | a | c | t | a | a | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | | | | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | - | |

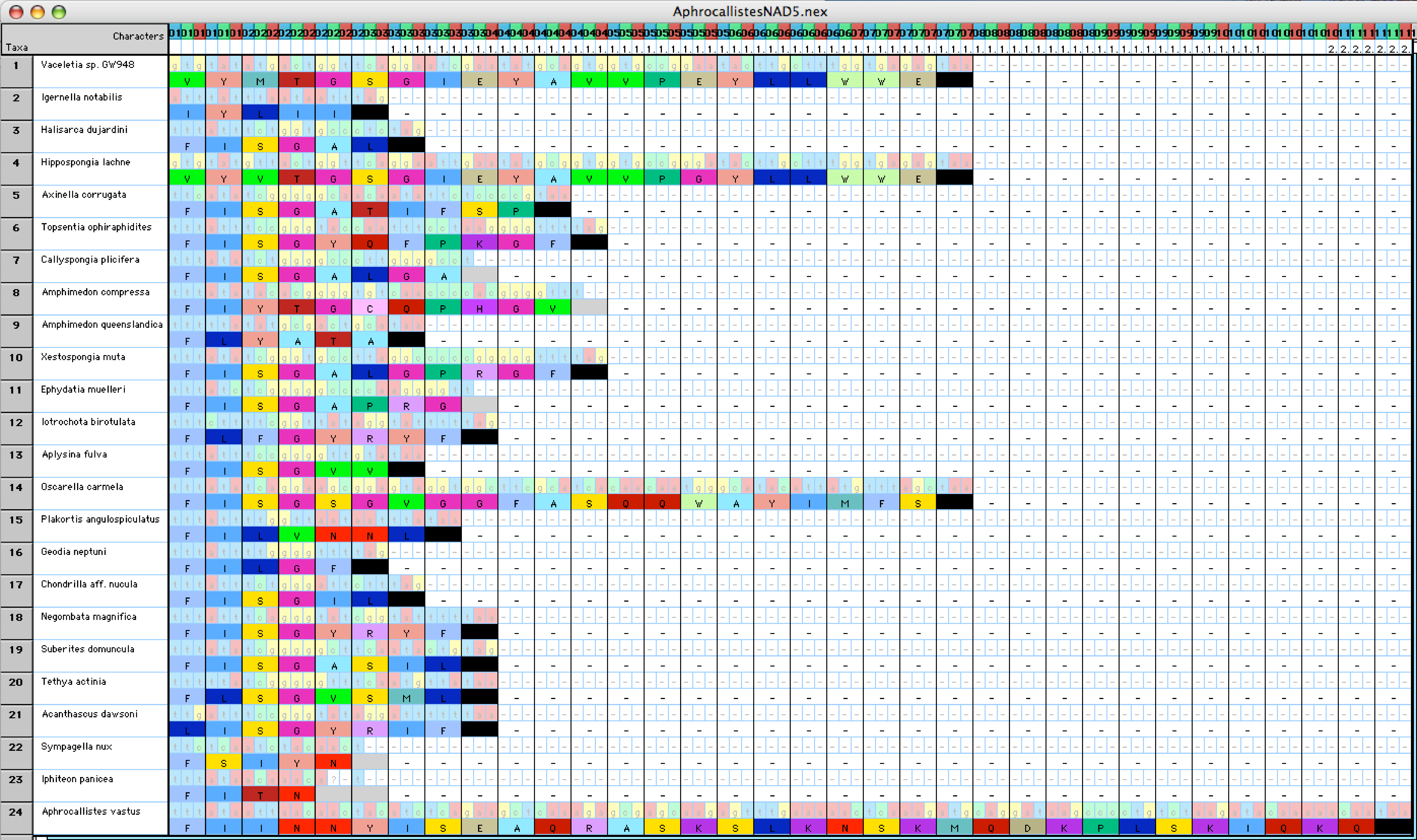
PriapulusCOX3.nex

| | Taxa | Characters (nucleotides) | Characters (amino acids) |
|---|---|---|---|
| 1 | Tricholepidion gertschi | ttt gta gat gta gtt tga tta ttc cta tat atc tca att tat tga tga ggt agt taa --- --- --- --- --- | F V D V V W L F L Y I S I Y W W G S   - - - - - |
| 2 | Petrobius brevistylis | ttt gta gat gta gtt tgg cta ttt ctt tac atc tcc atc tac tga tga gga agc tag --- --- --- --- --- | F V D V V W L F L Y I S I Y W W G S   - - - - - |
| 3 | Squilla empusa | ttc gta gat gta gtt tga cta ttc cta tat att tca atc tac tga tga gga ggt ta- --- --- --- --- --- | F V D V V W L F L Y I S I Y W W G G   - - - - - |
| 4 | Penaeus monodon | ttt gta gat gtt gta tga tta ttc ctc tat att tct att tat tga tga gga ggc t-- --- --- --- --- --- | F V D V V W L F L Y I S I Y W W G G   - - - - - |
| 5 | Triops cancriformis | ttt gta gat gtc gtt tga tta ttc ctt tac att tct att tat tga tga gga ggg t-- --- --- --- --- --- | F V D V V W L F L Y I S I Y W W G G   - - - - - |
| 6 | Daphnia pulex | ttt gtt gac gtt gtt tga cta ttt ctt ttt atc tct atc tac tgg tgg ggc aac taa --- --- --- --- --- | F V D V V W L F L F I S I Y W W G N   - - - - - |
| 7 | Pollicipes polymerus | ttt gta gat gta gtt tgg cta ttc ctt tat gtg tct atc tac tga tga gga gga t-- --- --- --- --- --- | F V D V V W L F L Y V S I Y W W G G   - - - - - |
| 8 | Scutigerella causeyae | ttt gta gat gta gtt tga tta ttt tta tat att tca att tac tga tga gga aga taa --- --- --- --- --- | F V D V V W L F L Y I S I Y W W G S   - - - - - |
| 9 | Lithobius forficatus | ttc gta gac gta gtt tga cta ttc cta ttt ctc tct att tac tga tga gga agt taa --- --- --- --- --- | F V D V V W L F L F L S I Y W W G S   - - - - - |
| 10 | Thyropygus sp. DVL-2001 | ttc gta gat gta gta tga tta ttt ctt tac att tca att tat tga tga gga ggc taa --- --- --- --- --- | F V D V V W L F L Y I S I Y W W G G   - - - - - |
| 11 | Narceus annularus | ttt gta gac gta gtc tga cta ttt ctt tat gtt tca att tac tga tga gga ata t-- --- --- --- --- --- | F V D V V W L F L Y V S I Y W W G M   - - - - - |
| 12 | Scutigera coleoptrata | ttc gta gat gtg gtg tga ctc ttc cta ttc aca tca att tac tga tga gga ggt t-- --- --- --- --- --- | F V D V V W L F L F T S I Y W W G G   - - - - - |
| 13 | Centruroides limpidus | ttt gtt gat gtg gtt tgg ttg ttt ttg ttt gtt tct att tat tgg tga ggt aag t-- --- --- --- --- --- | F V D V V W L F L F V S I Y W W G K   - - - - - |
| 14 | Limulus polyphemus | ttt gtt gat gta gtt tga ctc ttc ctc ttt atc tct att tac tga tgg gga tct ta- --- --- --- --- --- | F V D V V W L F L F I S I Y W W G S   - - - - - |
| 15 | Ixodes hexagonus | ttc gta gac gta gtt tgg cta ttc tta ttt aca ttc ata tac tga tga att ttc t-- --- --- --- --- --- | F V D V V W L F L F T F M Y W W I F   - - - - - |
| 16 | Heptathela hangzhouensis | ttc gtt gat gta gtt tgg cta ttt tta ttt acc ttt att tac tag --- --- --- --- --- --- --- --- --- | F V D V V W L F L F T F I Y   - - - - - - - - - |
| 17 | Nymphon gracile | ttt gtt gat gta gtt tga tta ttt tta tat tta act tat tac tga tga cct tca taa --- --- --- --- --- | F V D V V W L F L Y L T Y Y W W P S   - - - - - |
| 18 | Priapulus caudatus | ttt gtt gat gtt gta tga ctc ttt ctt ttc gtg aga atc tat tga tga gga tct tgt ctt ttt agt ata taa | F V D V V W L F L F V S I Y W W G S C L F S M   |
| 19 | Epiperipatus biolleyi | ttt gtt gat gtt gtt tgg ttg ttt tta ttt att aca att tat tga tga ggt tca taa --- --- --- --- --- | F V D V V W L F L F I T I Y W W G S   - - - - - |

EnterobiusCOX3.nex

| Taxa | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 Anisakis simplex | tat Y | tgg W | cat H | ttt F | gtg V | gat D | gtt V | gtc V | tgg W | ttg L | ttt F | ttg L | ttt F | gtt V | ttt F | gtt V | tat Y | tgg W | tgg W | tct S | --- - | tac Y | t-- | --- - | --- - |
| 2 Ascaris suum | tat Y | tgg W | cat H | ttt F | gta V | gat D | gta V | gtt V | tgg W | ttg L | ttt F | ttg L | ttt F | gtt V | ttt F | gtt V | tat Y | tga W | tga W | tct S | --- - | tat Y | taa | --- - | --- - |
| 3 Toxocara canis | tat Y | tgg W | cat H | ttt F | gtt V | gat D | gtt V | gtg V | tgg W | ctg L | ttt F | cta L | ttt F | gtt V | ttt F | gtg V | tat Y | tgg W | tga W | tcg S | --- - | tat Y | tag | --- - | --- - |
| 4 Toxocara malaysiensis | tat Y | tgg W | cat H | ttt F | gtt V | gat D | gtt V | gtg V | tga W | tta L | ttt F | ttg L | ttc F | gtt V | ttt F | gtg V | tat Y | tga W | tgg W | tca S | --- - | tat Y | tag | --- - | --- - |
| 5 Toxocara cati | tat Y | tgg W | cat H | ttt F | gtt V | gat D | gta V | gtg V | tgg W | tta L | ttt F | ttg L | ttt F | gtg V | ttt F | gtg V | tat Y | tgg W | tga W | tca S | --- - | tat Y | taa | --- - | --- - |
| 6 Necator americanus | tat Y | tga W | cat H | ttt F | gtt V | gat D | gtg V | gtt V | tga W | tta L | ttt F | tta L | ttt F | gtt V | ttt F | gtt V | tat Y | tga W | tga W | tca S | --- - | tat Y | t-- | --- - | --- - |
| 7 Ancylostoma duodenale | tat Y | tga W | cat H | ttt F | gtt V | gat D | gta V | gtt V | tgg W | ttg L | ttt F | tta L | ttt F | gtg V | ttt F | gtt V | tat Y | tga W | tga W | tct S | --- - | tat Y | t-- | --- - | --- - |
| 8 Cooperia oncophora | tat Y | tgg W | cat H | ttt F | gtY V | gac D | gta V | gtt V | tga W | ttg L | ttt F | tta L | ttt F | gtg V | ttt F | gtg V | tat Y | tga W | tgR W | tct S | --- - | tat Y | t-- | --- - | --- - |
| 9 Haemonchus contortus | tat Y | tga W | cat H | ttt F | gtt V | gat D | gta V | gtg V | tga W | ttg L | ttt F | tta L | ttt F | gtg V | ttt F | gtt V | tat Y | tga W | gga G | tct S | --- - | tat Y | --- - | --- - | --- - |
| 10 Caenorhabditis elegans | tat Y | tga W | cat H | ttt F | gtt V | gat D | gta V | gtg V | tga W | tta L | ttt F | tta L | ttt F | gtg V | ttt F | gtt V | tat Y | tga W | tga W | tct S | --- - | tac Y | taa | --- - | --- - |
| 11 Caenorhabditis briggsae | tat Y | tga W | cat H | ttt F | gtt V | gat D | gta V | gtt V | tga W | tta L | ttt F | tta L | ttt F | gta V | ttt F | gtt V | tat Y | tga W | tga W | tct S | --- - | tac Y | taa | --- - | --- - |
| 12 Heterorhabditis bacteriophora | tat Y | tga W | cat H | ttt F | gtt V | gat D | gtt V | gta V | tgg W | tta L | ttt F | tta L | ttt F | gtt V | ttt F | gtt V | tat Y | tga W | tga W | tct S | --- - | tat Y | taa | --- - | --- - |
| 13 Steinernema carpocapsae | tat Y | tga W | cat H | ttt F | gtt V | gat D | gta V | gtt V | tgg W | tta L | ttt F | tta L | ttt F | gtt V | ttt F | gtt V | tat Y | tga W | tga W | tct S | --- - | tat Y | taa | --- - | --- - |
| 14 Strongyloides stercoralis | tat Y | tgg W | cat H | ttt F | gta V | gat D | gta V | gtt V | tgg W | ttg L | ttt F | tta L | ttt F | gtt V | ttt F | gtt V | tac Y | tgg W | tga W | ggt G | --- - | tat Y | tag | --- - | --- - |
| 15 Enterobius vermicularis | tat Y | tgg W | cat H | ttt F | gta V | gat D | gta V | gtt V | tgg W | ttg L | ttt F | ttg L | ttt F | tta L | agg S | gtt V | tat Y | att I | tca S | agg S | --- - | ttg L | agt S | ttt F | tag |
| 16 Globodera pallida | tat Y | tgg W | cat H | ttt F | gtt V | gat D | gta V | att I | tgg W | ctt L | ttt F | ctt L | ttt F | gtt V | ttt F | gtt V | tat Y | tga W | tga W | gtt V | --- - | tat Y | taa | --- - | --- - |
| 17 Globodera rostochiensis | tat Y | tgg W | cat H | ttt F | gtg V | gat D | gtt V | gtt V | tgg W | ctt L | ttt F | ctt L | ttt F | att I | ttt F | gtt V | tat Y | tga W | tgg W | gtt V | --- - | ttt F | taa | --- - | --- - |
| 18 Onchocerca volvulus | tat Y | tgg W | cgt R | ttt F | tta L | gag E | tga W | atg M | tga W | ggt G | gtt V | atg M | ttt F | tgt C | tta L | tta L | tat Y | gtt V | tga W | ggt G | --- - | tct S | taa | --- - | --- - |
| 19 Dirofilaria immitis | tat Y | tga W | cgt R | ttt F | ttg L | gag E | tga W | atg M | tga W | ggg G | att I | atg M | ttt F | agt S | tta L | tta L | tat Y | gtt V | tga W | ggt G | --- - | tct S | taa | --- - | --- - |
| 20 Brugia malayi | tat Y | tga W | cgg R | ttc F | tta L | gaa E | tga W | atg M | tga W | ggt G | att I | ata M | ttt F | tgt C | tta L | tta L | tat Y | gtt V | tga W | ggt G | --- - | tct S | taa | --- - | --- - |
| 21 Trichinella spiralis | tat Y | tga W | cac H | ttt F | gta V | gac D | gca A | gta V | tga W | cta L | ata M | cta L | tat Y | aca T | acc T | ttc F | tac Y | tgc C | tga W | gga G | --- - | aga S | tag | --- - | --- - |
| 22 Xiphinema americanum | tat Y | tgg W | cac H | ttc F | gtg V | gac D | gtg V | gta V | tga W | ttg L | ttc F | cta L | ttt F | ttt F | tga W | gtt V | tat Y | gta V | tga W | aac N | aac N | ttt F | taa | --- - | --- - |


EuhadraCOX2.nex
Characters
Taxa
1 Albinaria caerulea
G Q C S E I C G A N H S F M P I T V E A I D V K D F I K M C N - -
2 Cepaea nemoralis
W Q C S E I C G A N H A F M P I V V Q C M P A Y M L Y F I - - -
3 Euhadra herklotsi
G Q C S E I C G A N H A F M P I V V E S V P P T V F T N L F L I
4 Biomphalaria glabrata
G Q C S E I C G A N H S F M P I V V E A V H V D D F F F E S A - -
5 Biomphalaria tenagophila
G Q C S E I C G A N H S F M P I V V E A I D A S D F F F E S A - -
6 Siphonaria pectinata
G Q C S E I C G A N H S F M P I V L E A V S L K D W V M V - -
7 Myosotella myosotis
G Q C S E I C G A H H S F M P I V V E T A S L E D L L S L - -
8 Onchidella celtica
G Q C S E I C G A N H S F M P I V V E A V G V E D F L S S G N S D



AphrocallistesNAD5.nex
Characters
Taxa
1 Vaceletia sp. GW948 V Y M T G S G I E Y A V V P E Y L L W W E
2 Igernella notabilis I Y L I I
3 Halisarca dujardini F I S G A L
4 Hippospongia lachne V Y V T G S G I E Y A V V P G Y L L W W E
5 Axinella corrugata F I S G A T I F S P
6 Topsentia ophiraphidites F I S G Y Q F P K G F
7 Callyspongia plicifera F I S G A L G A
8 Amphimedon compressa F I Y T G C Q P H G V
9 Amphimedon queenslandica F L Y A T A
10 Xestospongia muta F I S G A L G P R G F
11 Ephydatia muelleri F I S G A P R G
12 Iotrochota birotulata F L F G Y R Y F
13 Aplysina fulva F I S G V V
14 Oscarella carmela F I S G S G V G G F A S Q Q W A Y I M F S
15 Plakortis angulospiculatus F I L V N N L
16 Geodia neptuni F I L G F
17 Chondrilla aff. nucula F I S G I L
18 Negombata magnifica F I S G Y R Y F
19 Suberites domuncula F I S G A S I L
20 Tethya actinia F L S G V S M L
21 Acanthascus dawsoni L I S G Y R I F
22 Sympagella nux F S I Y N
23 Iphiteon panicea F I T N
24 Aphrocallistes vastus F I I N N Y I S E A Q R A S K S L K N S K M Q D K P L S K I Q K Q

NAD2porifera.nex

| Taxa | Characters 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. |
| 1 | Vaceletia sp. GW948 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | a | t | g | t | t | a | t | t | a | t | t | g | t | g | a | a | t | g | g | a | c | g | g | g | t | t | g | a | t | g | g | t | t |
| | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | M | | L | | L | | L | | W | | M | | D | | G | | L | | M | | V |
| 2 | Igernella notabilis | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | a | t | g | g | a | g | g | a | g | t | a | t | a | t | t | a | a | a | a | t | a | a | t | a | g | t | a | a | g | t | c | c | c | g | a | g | g | g | c | t | t | a | t | t | a | a | g | c |
| | | - | | - | | - | | - | | - | | - | | - | | - | | - | | M | | E | | E | | Y | | I | | K | | I | | I | | V | | S | | P | | E | | G | | L | | L | | S |
| 3 | Halisarca dujardini | - | - | - | - | - | - | - | - | - | - | - | - | - | - | a | t | g | t | a | t | g | a | a | g | t | t | c | c | t | c | t | c | a | a | t | a | t | t | t | t | t | t | a | t | a | t | a | a | t | a | t | a | t | a | t | c | c | a | g | a | a | a | t | a | c | t | c | t | t | a | a | g | t |
| | | - | | - | | - | | - | | - | | - | | M | | Y | | E | | V | | P | | L | | N | | I | | F | | Y | | I | | I | | I | | Y | | P | | E | | I | | L | | L | | S |
| 4 | Hippospongia lachne | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | a | t | g | t | t | a | t | t | a | t | t | g | t | g | a | g | t | g | g | a | c | g | g | g | c | t | g | a | t | g | g | t | t |
| | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | M | | L | | L | | L | | W | | V | | D | | G | | L | | M | | V |
| 5 | Axinella corrugata | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | a | t | g | g | t | t | a | t | a | a | t | g | a | g | t | c | c | a | g | a | a | g | t | t | t | t | a | t | t | a | a | g | t |
| | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | M | | V | | I | | M | | S | | P | | E | | V | | L | | L | | S |
| 6 | Topsentia ophiraphidites | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | a | t | g | t | a | t | g | a | a | a | t | a | t | t | a | a | a | t | a | t | a | a | t | a | a | c | t | a | c | a | c | c | a | g | a | g | g | t | a | t | t | a | t | t | a | a | g | t |
| | | - | | - | | - | | - | | - | | - | | - | | - | | - | | M | | Y | | E | | I | | L | | N | | I | | I | | T | | T | | P | | E | | V | | L | | L | | S |
| 7 | Callyspongia plicifera | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | a | t | g | t | t | a | a | a | a | t | a | a | t | a | a | t | g | a | a | t | c | c | a | g | a | g | g | t | a | g | t | a | t | t | a | a | g | t |
| | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | M | | L | | K | | I | | I | | M | | N | | P | | E | | V | | V | | L | | S |
| 8 | Amphimedon compressa | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | a | t | g | a | a | c | g | a | c | a | t | a | a | t | a | a | g | c | c | c | a | g | a | g | g | t | a | g | t | a | t | t | a | a | g | t |
| | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | M | | N | | D | | I | | I | | S | | P | | E | | V | | V | | L | | S |
| 9 | Amphimedon queenslandica | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | M | | Y | | S | | E | | M | | M | | L | | G |
| 10 | Xestospongia muta | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | a | t | g | g | a | a | a | t | g | t | a | t | g | a | a | a | t | t | t | t | t | a | a | t | a | t | a | a | t | a | t | a | a | a | t | c | c | a | g | a | g | g | t | a | t | t | a | t | t | g | a | g | t |
| | | - | | - | | - | | - | | - | | - | | - | | M | | E | | M | | Y | | E | | I | | F | | N | | I | | I | | I | | N | | P | | E | | V | | L | | L | | S |
| 11 | Ephydatia muelleri | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | t | t | g | t | a | t | g | a | a | a | c | t | t | t | t | a | a | c | a | t | a | a | t | a | t | a | a | a | t | c | c | a | g | a | g | g | t | a | t | t | a | t | t | a | a | g | t |
| | | - | | - | | - | | - | | - | | - | | - | | L | | Y | | E | | T | | F | | N | | I | | I | | I | | N | | P | | E | | V | | L | | L | | S | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | Iotrochota birotulata | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | a | t | g | t | t | a | g | a | t | t | t | a | t | t | t | c | g | a | g | a | a | t | t | a | t | t | a | t | t | g | a | g | t |
| | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | M | | L | | D | | L | | F | | R | | E | | L | | L | | L | | S |
| 13 | Aplysina fulva | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | a | t | g | t | t | t | g | a | g | a | t | a | t | a | c | a | a | t | a | t | a | a | t | t | t | a | t | a | t | c | c | a | g | a | a | a | t | t | t | t | a | t | t | a | a | g | c |
| | | - | | - | | - | | - | | - | | - | | - | | M | | F | | E | | I | | Y | | N | | I | | I | | L | | Y | | P | | E | | I | | L | | L | | S | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | Oscarella carmela | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | a | t | g | t | a | t | g | a | a | g | c | t | t | t | t | a | t | c | c | a | g | a | a | t | t | a | t | t | t | c | t | a | a | g | t |
| | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | M | | Y | | E | | A | | F | | Y | | P | | E | | L | | F | | L | | S | | | | | | | | | | | | | | | | | | | | | | |
| 15 | Plakortis angulospiculatus | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | g | t | g | t | a | t | g | a | g | g | g | a | t | a | t | t | a | t | t | c | a | g | a | g | t | g | g | t | t | a | g | c | c | a | g | t |
| | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | V | | Y | | E | | G | | Y | | Y | | S | | E | | W | | L | | A | | S |
| 16 | Geodia neptuni | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | a | t | g | t | a | t | g | a | a | a | t | t | t | t | a | a | a | t | a | t | a | g | t | a | a | t | g | a | a | t | t | c | t | g | a | g | g | t | a | t | t | a | t | t | a | a | g | t |
| | | - | | - | | - | | - | | - | | - | | - | | - | | - | | M | | Y | | E | | I | | L | | N | | I | | V | | M | | N | | S | | E | | V | | L | | L | | S | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 17 | Chondrilla aff. nucula | - | - | - | - | - | - | - | - | - | - | - | - | - | - | a | t | g | t | a | t | g | a | a | g | t | t | c | c | t | c | t | c | a | a | t | a | t | t | t | t | t | t | a | t | a | t | a | a | t | t | a | t | g | t | a | t | c | c | a | g | a | a | a | t | a | t | t | a | t | t | a | a | g | t |
| | | - | | - | | - | | - | | - | | - | | M | | Y | | E | | V | | P | | L | | N | | I | | F | | Y | | I | | I | | M | | Y | | P | | E | | I | | L | | L | | S | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 18 | Negombata magnifica | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | a | t | g | t | t | a | g | g | a | a | t | a | t | t | t | c | c | a | g | a | a | t | t | a | t | t | a | t | t | a | a | g | t |
| | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | M | | L | | G | | I | | F | | P | | E | | L | | L | | L | | S |
| 19 | Suberites domuncula | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | a | t | g | a | t | t | a | c | a | a | t | a | t | t | t | t | c | t | g | a | g | g | t | a | t | t | a | t | t | a | a | g | t |
| | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | M | | I | | T | | I | | F | | S | | E | | V | | L | | L | | S |
| 20 | Tethya actinia | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | a | t | g | g | g | t | t | t | a | a | t | g | g | g | a | t | a | a | t | a | a | g | c | c | c | g | a | g | a | t | g | t | t | a | t | t | a | a | g | t |
| | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | M | | G | | L | | M | | G | | I | | I | | S | | P | | E | | M | | L | | L | | S |
| 21 | Acanthascus dawsoni | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | g | t | g | t | t | a | g | g | a | a | t | a | t | t | t | c | c | a | g | a | g | t | t | a | g | t | a | t | t | a | a | g | t |
| | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | V | | L | | G | | I | | F | | P | | E | | L | | V | | L | | S |
| 22 | Sympagella nux | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | M | | T | | W | | T | | E | | L | | P | | L | | - |
| 23 | Iphiteon panicea | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | - | | M | | T | | W | | T | | E | | V | | I | | I | | I |
| 24 | Aphrocallistes vastus | a | t | g | a | c | t | a | t | t | t | c | t | t | t | a | c | a | t | a | t | g | t | a | t | a | t | a | c | t | g | a | t | g | a | g | g | a | t | g | c | t | a | a | a | a | c | a | a | a | t | g | a | t | a | c | t | a | a | c | a | g | a | a | a | t | a | a | t | t | c | t | c | - | - | - |
| | | M | | T | | I | | S | | L | | H | | M | | Y | | I | | L | | M | | R | | M | | L | | K | | Q | | M | | I | | L | | T | | E | | I | | I | | L | | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

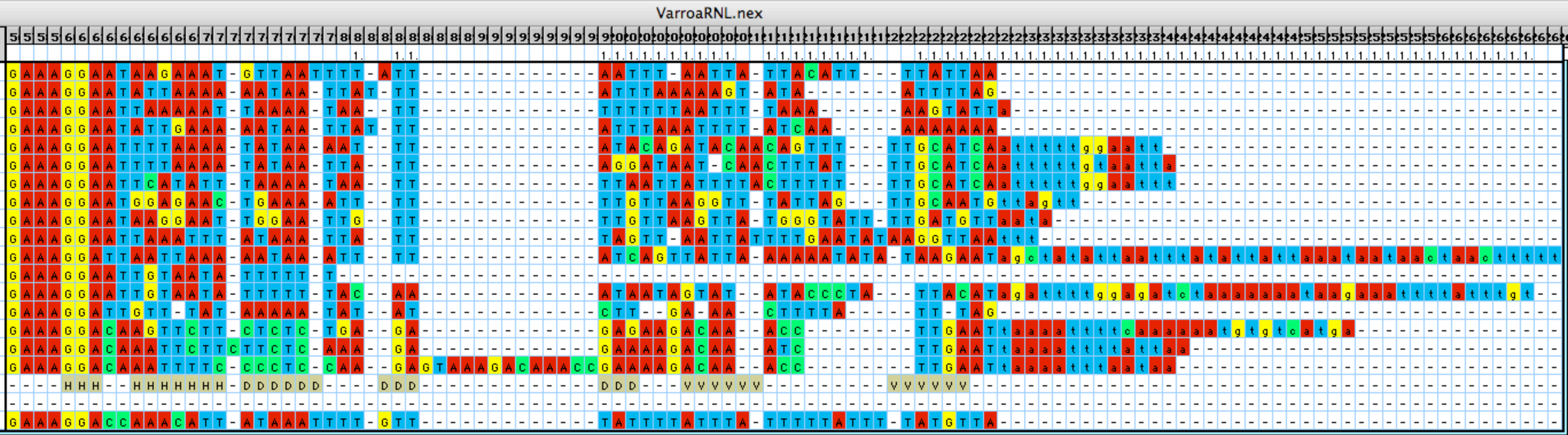
SteganacarusSer.nex

| Taxa \ Characters | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | | | | | | | | | 1. | 1. | 1. | 1. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 Ixodes hexagonus | G | A | C | T | T | T | T | T | A | A | C | T | A | T | G | C | A | T | T | A | - | - | - | A | G | T | A | T | G | T | A | T | T | T | T | G | A | A | A | A | T | A | C | A | A | A | A | A | A | G | A | A | - | C | A | T | T | T | A | - | - | T | T | C | T | A | A | A | A | G | T | C | T |
| 2 Ixodes holocyclus | G | A | T | T | A | T | T | T | A | A | C | T | A | T | A | T | A | - | - | - | - | - | - | A | G | T | A | T | A | T | A | T | T | T | T | G | A | A | A | A | T | A | T | A | A | A | A | A | A | G | A | A | A | G | G | A | A | T | - | - | T | T | T | C | T | A | A | T | A | A | T | C | T |
| 3 Ixodes persulcatus | G | A | C | T | T | T | T | T | A | A | C | T | A | T | A | C | C | T | A | - | - | - | - | A | G | T | A | T | A | T | A | T | T | T | T | G | A | A | A | A | T | A | T | A | A | A | A | A | A | G | A | A | - | T | C | T | T | T | - | - | - | T | T | C | T | A | A | A | A | G | T | C | T |
| 4 Ixodes uriae | G | A | T | T | A | T | T | T | A | A | C | T | A | T | A | A | C | A | - | - | - | - | - | A | G | T | A | T | A | T | A | T | T | T | T | G | A | A | A | A | T | A | T | A | A | A | A | A | A | G | A | A | T | T | C | T | T | A | - | - | A | T | T | C | T | A | A | T | A | A | T | C | T |
| 5 Haemaphysalis flava | G | A | C | T | T | T | T | T | A | A | C | T | A | T | A | T | A | - | - | - | - | - | - | A | G | T | A | T | A | T | A | T | T | T | T | G | A | A | A | A | T | A | T | A | A | A | A | A | A | G | A | G | - | T | T | T | - | - | - | - | - | C | T | C | T | A | T | T | A | G | T | C | T |
| 6 Rhipicephalus sanguineus | G | A | C | T | T | T | T | T | A | A | C | T | A | T | A | T | A | A | T | T | A | - | - | A | G | T | A | T | G | T | A | T | T | T | T | G | A | A | A | A | T | A | T | A | A | A | A | A | A | G | A | A | - | T | T | T | - | - | - | - | - | T | T | C | T | A | A | A | A | G | T | C | T |
| 7 Amblyomma triguttatum | G | A | C | T | T | T | T | T | A | A | C | T | A | T | T | A | T | T | A | - | - | - | - | A | G | T | A | T | A | T | A | T | T | T | T | G | A | A | A | A | T | A | T | A | A | A | A | A | A | G | A | A | - | T | T | T | A | T | - | - | - | T | T | C | T | A | A | A | A | G | T | C | T |
| 8 Ornithodoros moubata | G | A | C | A | T | T | T | T | A | A | C | T | A | T | T | T | A | - | - | - | - | - | - | A | G | T | A | T | A | T | A | T | T | T | T | G | A | A | A | A | T | A | T | A | A | A | A | A | A | G | A | A | - | T | T | C | A | - | - | - | - | - | T | C | T | A | A | A | T | G | T | C | T |
| 9 Ornithodoros porcinus | G | A | C | A | T | T | T | T | A | A | C | T | A | T | A | T | A | - | - | - | - | - | - | A | G | T | A | T | A | T | A | T | T | T | T | G | A | A | A | A | T | A | T | A | A | A | A | A | A | G | A | A | - | T | A | T | C | - | - | - | - | - | T | C | T | A | A | A | T | G | T | C | T |
| 10 Carios capensis | G | A | C | A | T | T | T | T | A | A | C | T | A | T | A | A | A | - | - | - | - | - | - | A | G | T | A | T | A | T | A | T | T | T | T | G | A | A | A | A | T | A | T | A | A | A | A | A | A | G | A | T | - | T | C | T | T | G | - | - | - | A | T | C | T | A | A | A | T | G | T | C | T |
| 11 Metaseiulus occidentalis | A | A | T | T | A | G | T | T | A | G | C | T | A | T | G | T | A | T | A | - | - | - | - | A | G | C | G | T | T | T | A | T | T | T | T | G | A | A | A | A | T | A | A | A | A | G | A | A | A | G | A | A | - | T | T | T | - | - | - | - | - | - | T | C | T | A | C | T | A | G | T | T | T |
| 12 Varroa destructor | G | A | T | T | A | T | T | T | A | A | C | T | A | A | T | A | A | A | - | - | - | - | - | A | G | T | A | T | T | T | A | T | T | T | T | G | A | A | A | A | T | A | A | A | A | A | A | T | A | G | A | A | - | G | T | A | T | C | - | - | - | T | T | C | T | A | A | T | A | A | T | C | T |
| 13 Steganacarus magnus | t | a | T | C | T | T | G | A | A | A | C | T | T | T | T | - | - | - | - | - | - | - | - | A | T | T | T | A | G | T | G | T | T | T | T | G | A | A | G | A | C | A | C | T | A | G | G | A | A | G | A | C | - | C | T | G | A | A | - | - | - | G | T | T | T | C | G | A | G | A | G | t | a |
| 14 Leptotrombidium pallidum | A | C | T | T | C | C | T | T | T | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | A | T | T | T | G | T | C | T | T | G | A | A | A | A | C | A | G | A | A | A | A | A | A | G | A | A | - | A | T | T | G | T | - | - | - | T | T | C | T | A | G | G | A | A | G | T | T |
| 15 Leptotrombidium akamushi | A | T | T | T | C | C | T | C | T | - | - | - | A | A | C | - | - | - | - | - | - | - | - | - | - | - | T | C | C | C | G | T | C | T | T | G | A | A | A | A | C | A | G | G | A | T | C | T | A | G | A | T | - | C | A | T | T | - | - | - | - | - | T | C | T | A | G | G | A | A | A | T | T |
| 16 Leptotrombidium deliense | A | T | T | T | C | C | T | C | T | - | - | - | C | - | - | - | - | - | - | - | - | - | - | - | - | - | T | C | C | T | G | T | C | T | T | G | A | A | A | A | C | A | G | G | G | A | A | T | A | G | A | T | - | G | A | T | - | - | - | - | - | A | T | C | T | A | G | G | G | A | A | T | T |
| 17 Pseudocellus pearsei | G | T | C | T | A | T | T | T | A | T | C | T | A | A | A | C | A | A | A | - | - | - | - | A | G | A | A | T | A | T | A | T | C | T | T | G | A | A | A | A | T | A | T | A | A | A | A | T | A | G | G | T | - | C | A | T | C | C | - | - | - | G | C | C | T | A | A | T | A | G | T | C | T |
| 18 Limulus polyphemus | G | A | C | T | A | T | T | T | A | G | C | T | A | T | A | T | A | T | T | A | C | T | A | A | G | C | T | T | T | T | G | T | T | T | T | G | A | A | A | A | C | A | A | A | A | G | A | A | A | G | A | A | G | C | T | A | A | T | T | A | C | T | T | C | T | A | A | T | A | G | T | C | T |
| 19 tRNA STRUCTURE | H | H | H | H | H | H | H | - | - | D | D | D | - | - | - | - | - | - | - | - | - | - | - | D | D | D | - | W | W | W | W | W | - | - | S | S | S | - | - | W | W | W | W | W | - | - | - | - | V | V | V | V | V | - | - | - | - | - | - | - | V | V | V | V | V | H | H | H | H | H | H | H | - |

Taxa 1 Ixodes hexagonus
Taxa 2 Ixodes holocyclus
Taxa 3 Ixodes persulcatus
Taxa 4 Ixodes uriae
Taxa 5 Haemaphysalis flava
Taxa 6 Rhipicephalus sanguineus
Taxa 7 Amblyomma triguttatum
Taxa 8 Ornithodoros moubata
Taxa 9 Ornithodoros porcinus
Taxa 10 Carios capensis
Taxa 11 Metaseiulus occidentalis
Taxa 12 Varroa destructor
Taxa 13 Steganacarus magnus
Taxa 14 Leptotrombidium pallidum
Taxa 15 Leptotrombidium akamushi
Taxa 16 Leptotrombidium deliense
Taxa 17 Pseudocellus pearsei
Taxa 18 Limulus polyphemus
Taxa 19 tRNA STRUCTURE

VarroaRNL.nex

| Taxa | Characters |
|---|---|
| 1 | Ixodes hexagonus |
| 2 | Ixodes holocyclus |
| 3 | Ixodes persulcatus |
| 4 | Ixodes uriae |
| 5 | Haemaphysalis flava |
| 6 | Rhipicephalus sanguineus |
| 7 | Amblyomma triguttatum |
| 8 | Ornithodoros moubata |
| 9 | Ornithodoros porcinus |
| 10 | Carios capensis |
| 11 | Metaseiulus occidentalis |
| 12 | Varroa destructor AJ493124 |
| 13 | Varroa destructor AY163547 |
| 14 | Steganacarus magnus |
| 15 | Leptotrombidium akamushi |
| 16 | Leptotrombidium pallidum |
| 17 | Leptotrombidium deliense |
| 18 | rRNA structure |
| 19 | Pseudocellus pearsei |
| 20 | Limulus polyphemus |



ShinkaiaALA.nex

| # | Taxa | Characters 1–77 |
|---|---|---|
| 1 | Fenneropenaeus chinensis | GGAGTTATAGTCA-AAA--------A-TGACATCTGATTTGCACTCAGAAAGTGCTCCATTA--GGAGCTAACTTCA |
| 2 | Litopenaeus vannamei | GGAGTTATAGTCA-ACA--------A-TGACATTTGATTTGCACTCAAAAAGTGCTCCATTA--GGAGCTAACTTCA |
| 3 | Marsupenaeus japonicus | GGAGTTATAGTCA-AAA--------A-TGACATTTGATTTGCACTCAAAAGGTGCTTCACTA--GAAGCTAACTTCA |
| 4 | Penaeus monodon | GGAGTTATATTCA-AAA--------A-TGATATCTGATTTGCACTCAGAAGGTGCTCTATTA--AGAGCTAACTTCA |
| 5 | Panulirus japonicus | AGGATTATAGTCA-ATT--------A-TGATATGTAACTTGCACTTACAAGGTGTTAAACT---TTAACTGATCTTA |
| 6 | Shinkaia crosnieri | AAAACTATAGTTT-AATT-------A-AAATTTATGATTTGCACTCATAAGCTGTTT-GTCAA--AAACTAGTTTTA |
| 7 | Pagurus longicarpus | TAAGCTATAATTT-AAATT------A-AAATATATGATTTGCACTCATATTACGTTCTATC---AGAACTAGCTTAG |
| 8 | Cherax destructor | GGAATTGTAGTCA-ACT--------A-TGACATATGATTTGCACTCATAAAGTGTTT-T------AAACCTTTTTCA |
| 9 | Callinectes sapidus | AAGGCTATAGTCA-AAATT------A-TGACACATGAGTTGCATTCATGAGGTGTTT-TCT----AAACTAGCTTTA |
| 10 | Portunus trituberculatus | AAGGCTATAGTCA-AATTT------A-TGACATATGAGTTGCATTCATAAAGTGTTT-TTA----AAACTAGCTTTA |
| 11 | Geothelphusa dehaani | GAAACTATAGTCATATTACAAACATAATGATATATAATTTGCACTTATAAGGAGTTT-AA-----AAACTAGTTTCA |
| 12 | Pseudocarcinus gigas | TAGACCATAGTCA-ATATCT-----A-TGACATATGAGTTGCATTCATAAAGAGTTC-AAAA---GAACTGGTTTAC |
| 13 | Eriocheir sinensis | AAGACCATAGTCA-ATAT-------A-TGACGTATGAGTTGCATTCATAAAGAGTTT-TCT----AAACTGGTTTTA |
| 14 | Halocaridina rubra | AAAGTTATAGTCA-AAT--------A-TGACATCTGGGTTGCATTCAGAAAGTACTTAACTC--TAAGTTAACTTTG |
| 15 | Macrobrachium rosenbergii | GAGATCATAGTCA-ACC--------A-TGATATTTGATTTGCACTCATAAGGTGCTC-CAAG---GAGCTGACCTTA |
| 16 | Gonodactylus chiragra | AGGATAGTAGTCA-AAA--------A-TGATATCTGATTTGCATTTAGAAGGTGTTA-CAAGGT-TAACCTATCTTA |
| 17 | Lysiosquillina maculata | AGGATAGTAGTCA-ACC--------A-TGATATCTGATTTGCATTTAGAAGGTATTACATTAA-GTAATCTATCTTA |
| 18 | Harpiosquilla harpax | AGGATAGTAGTCA-AAC--------A-TGATATTTGATTTGCATTCAGAAGGTGTTA-CAAAGT-TAACCTATCTTA |
| 19 | Squilla empusa | AGGATAGTAGTCA-AAT--------A-TGATATCTGATTTGCATTTAGAAGGTGTTA-CAAAGT-TAACCTATCTTA |
| 20 | Squilla mantis | AGGATAATAGTCA-AAA--------A-TGATACCTGATTTGCATTTAGGAGGTGTTA-CTAAGT-TAACTTATCTTA |
| 21 | Ligia oceanica | AAAGCTGTAGTTT-ATTA-------A-AAACGTTTGATTTGCATTCATAAGATAC---TCTT-----GTTAGCTTTG |
| 22 | tRNA STRUCTURE | HHHHHHH--HHHHH------------HHHHH-HHHHH--SSS--HHHHH----VVVVV------VVVVVHHHHHHH- |

ShinkaiaCYS.nex

| Taxa | Characters 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 |
|---|---|
| 1 | Fenneropenaeus chinensis |
| 2 | Litopenaeus vannamei |
| 3 | Marsupenaeus japonicus |
| 4 | Penaeus monodon |
| 5 | Panulirus japonicus |
| 6 | Shinkaia crosnieri |
| 7 | Pagurus longicarpus |
| 8 | Cherax destructor |
| 9 | Callinectes sapidus |
| 10 | Portunus trituberculatus |
| 11 | Geothelphusa dehaani |
| 12 | Pseudocarcinus gigas |
| 13 | Eriocheir sinensis |
| 14 | Halocaridina rubra |
| 15 | Macrobrachium rosenbergii |
| 16 | Gonodactylus chiragra |
| 17 | Lysiosquillina maculata |
| 18 | Harpiosquilla harpax |
| 19 | Squilla empusa |
| 20 | Squilla mantis |
| 21 | Ligia oceanica |
| 22 | tRNA STRUCTURE |

AleurochitonGLN.nex

| Taxa \ Characters | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 Philaenus spumarius | T | A | T | A | A | T | G | T | A | G | T | T | T | A | A | G | A | T | - | G | A | A | C | C | T | T | A | A | T | T | T | T | T | G | A | A | A | T | T | A | A | T | A | G | A | T | T | T | A | G | T | T | T | A | A | T | T | C | T | A | A | A | T | A | T | T | A | T | A | A |
| 2 Homalodisca coagulata | T | G | T | A | A | A | T | T | A | G | T | G | T | A | T | G | A | T | - | G | C | A | C | A | T | A | A | A | T | T | T | T | T | G | A | T | A | T | T | T | A | A | A | G | A | T | A | A | G | T | T | T | A | A | T | T | - | C | T | T | A | A | A | T | T | T | A | C | A | A |
| 3 Triatoma dimidiata | T | A | T | A | T | T | T | T | G | G | T | G | T | A | G | G | A | C | - | G | C | A | C | A | A | A | G | A | G | T | T | T | T | G | A | T | T | T | C | T | T | A | G | G | A | T | T | T | A | G | T | T | T | A | A | A | T | C | T | A | A | A | A | A | A | T | A | T | A | A |
| 4 Aleurodicus dugesii | G | T | A | A | T | T | A | T | A | G | T | T | T | C | C | T | A | T | - | A | A | A | T | T | T | A | A | T | A | T | T | T | T | G | A | T | T | G | T | T | A | T | A | A | A | - | - | - | - | - | T | A | - | - | - | - | - | - | - | - | - | T | T | A | A | T | A | T | A |
| 5 Aleurochiton aceris | T | T | A | A | T | T | T | A | A | G | T | G | A | T | A | A | T | - | - | T | C | A | C | T | T | T | A | A | T | C | T | T | T | G | A | T | A | T | T | A | A | C | A | A | A | A | T | T | A | A | T | T | A | A | A | T | - | T | T | A | A | T | A | A | A | A | T | T | A | A |
| 6 Bemisia tabaci | T | T | A | A | T | T | T | A | A | C | T | T | G | A | G | T | T | T | A | A | A | A | C | A | G | T | A | A | C | C | T | T | T | G | A | A | G | T | T | A | A | A | T | A | G | A | T | T | A | A | T | T | A | A | T | T | - | T | T | A | G | T | A | A | G | T | T | C | A | T |
| 7 Neomaskellia andropogonis | T | T | A | A | T | T | T | A | A | G | T | T | - | A | A | A | T | - | - | - | A | A | C | A | A | T | A | A | C | T | T | T | T | G | A | A | G | T | T | A | T | A | G | A | A | A | C | T | A | A | T | T | A | A | A | T | - | T | T | A | G | T | A | A | A | T | T | A | A | A |
| 8 Tetraleurodes acaciae | T | T | A | A | T | T | T | A | A | G | T | A | - | T | A | A | T | - | - | - | T | A | C | A | T | T | A | A | T | T | T | T | T | G | A | T | A | T | T | A | A | A | A | A | C | A | C | T | A | A | T | T | A | A | A | T | - | T | T | A | G | T | A | A | A | T | T | A | A | A |
| 9 Trialeurodes vaporariorum | T | T | A | A | G | T | T | A | A | G | T | A | A | T | A | A | A | - | - | A | T | G | C | A | C | A | A | G | C | T | T | T | T | G | A | T | G | C | T | T | G | T | T | T | G | G | T | T | A | A | T | T | A | A | A | T | - | T | T | A | A | C | A | A | C | T | T | A | A | A |
| 10 Schizaphis graminum | T | A | T | A | C | T | T | A | A | G | T | G | T | T | T | A | T | - | - | G | C | A | T | A | T | A | A | A | T | T | T | T | T | G | A | A | A | T | T | T | A | T | G | G | A | - | T | T | A | G | T | T | T | A | A | T | T | C | T | T | A | - | A | A | G | T | A | T | A | A |
| 11 Pachypsylla venusta | T | A | T | A | T | T | T | A | A | G | T | G | T | C | T | A | - | - | - | G | C | A | T | A | A | A | A | A | A | T | T | T | T | G | A | A | T | T | T | T | T | T | G | G | G | T | T | T | A | A | T | T | T | A | T | A | - | T | T | A | A | A | A | A | A | T | A | T | A | A |
| 12 tRNA STRUCTURE | H | H | H | H | H | H | H | - | - | D | D | D | D | - | - | - | - | - | - | D | D | D | D | - | W | W | W | W | W | - | - | S | S | S | - | - | W | W | W | W | W | - | - | - | - | V | V | V | V | V | - | - | - | - | - | - | V | V | V | V | V | H | H | H | H | H | H | H | - |

AleurochitonILE.nex

| Taxa \ Characters | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 Philaenus spumarius | A | A | T | A | A | G | A | T | G | C | C | T | G | A | A | A | A | - | - | A | G | G | A | T | T | A | T | T | T | T | G | A | T | G | T | A | A | T | A | A | A | T | T | A | T | G | T | A | A | - | - | C | T | G | T | - | - | - | - | T | T | A | C | T | C | T | T | A | T | T | A |
| 2 Homalodisca coagulata | A | G | T | A | A | A | G | T | G | C | C | T | G | A | A | T | A | A | - | A | G | G | A | T | T | A | T | T | T | T | G | A | T | A | G | A | A | T | A | A | A | T | T | A | T | G | T | A | A | T | - | T | T | A | - | - | - | - | A | T | T | A | C | C | T | T | T | A | T | T | G |
| 3 Triatoma dimidiata | A | A | T | A | A | G | G | T | G | C | C | T | G | A | T | A | A | A | - | A | G | G | G | C | T | A | T | C | T | T | G | A | T | A | G | G | A | T | A | G | A | T | A | A | T | G | T | A | T | - | - | T | T | A | T | - | - | - | - | T | T | A | C | C | C | T | T | A | T | T | A |
| 4 Aleurodicus dugesii | T | T | T | A | A | A | A | T | G | C | C | T | G | A | T | T | A | A | A | A | G | G | A | T | T | A | T | T | A | T | G | A | T | A | T | A | A | T | A | A | A | T | T | A | T | A | C | A | T | A | - | T | A | T | A | - | - | - | T | A | T | G | T | T | T | T | T | A | A | A | A |
| 5 Aleurochiton aceris | T | T | A | A | T | T | T | A | T | T | A | A | - | A | T | T | T | A | A | T | T | A | A | T | T | T | T | G | T | T | A | A | T | A | T | C | A | A | A | G | A | T | T | A | - | A | A | G | T | G | A | A | T | T | A | - | - | T | C | A | C | T | T | A | A | A | T | T | A | A | T |
| 6 Bemisia tabaci | T | T | T | A | G | A | A | T | G | C | C | T | G | A | T | A | A | A | - | A | G | G | G | T | T | A | T | T | A | T | G | A | T | A | T | A | A | T | A | G | T | T | A | A | T | G | T | A | G | C | T | T | T | A | A | - | - | A | G | T | T | A | C | T | T | C | T | A | G | A | G |
| 7 Neomaskellia andropogonis | T | T | T | A | G | G | G | T | G | C | C | T | G | A | A | A | A | - | - | A | G | G | A | T | C | A | C | T | G | T | G | A | T | A | C | A | G | T | G | A | A | T | T | A | T | A | C | A | - | - | - | T | A | A | T | T | - | - | - | - | T | G | T | C | T | C | T | A | A | G | A |
| 8 Tetraleurodes acaciae | T | T | T | A | G | A | G | T | G | C | C | T | G | A | T | T | A | A | - | A | G | G | G | T | T | G | C | T | G | T | G | A | T | A | C | A | G | C | A | G | T | T | A | A | - | G | C | A | A | - | - | T | T | A | A | A | C | - | - | T | T | G | C | C | T | T | T | G | A | A | A |
| 9 Trialeurodes vaporariorum | T | T | T | G | A | A | A | T | G | C | C | C | G | A | A | A | A | - | - | A | G | G | A | T | T | A | T | T | G | T | G | A | T | A | C | A | A | T | A | A | A | A | C | A | T | G | C | A | T | G | T | A | A | G | T | T | A | A | T | G | T | G | C | T | T | T | C | G | A | A | G |
| 10 Schizaphis graminum | A | A | T | A | A | A | A | T | G | C | C | T | G | A | A | A | A | - | - | A | G | G | G | G | T | A | C | T | T | T | G | A | T | A | G | A | G | T | A | A | A | T | C | A | T | G | G | A | T | - | - | T | A | T | A | T | - | - | - | A | T | A | C | T | T | T | T | A | T | T | A |
| 11 Pachypsylla venusta | A | G | A | A | A | G | A | T | G | C | C | T | G | A | A | A | A | - | - | A | G | G | A | T | T | A | T | T | T | T | G | A | T | G | T | A | A | T | A | A | A | T | T | A | T | G | T | T | T | - | - | A | G | T | A | - | - | - | - | A | A | A | C | T | C | T | T | T | C | T | A |
| 12 tRNA STRUCTURE | H | H | H | H | H | H | H | - | - | D | D | D | - | - | - | - | - | - | - | D | D | D | - | W | W | W | W | W | - | - | S | S | S | - | - | W | W | W | W | W | - | - | - | - | - | V | V | V | V | V | V | - | - | - | - | - | V | V | V | V | V | V | H | H | H | H | H | H | H | - |

L

NeomaskelliaALA.nex

| | Taxa / Characters | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Philaenus spumarius | A | G | G | A | T | T | A | T | A | G | T | T | A | - | - | A | T | T | - | - | - | - | A | - | - | T | A | A | T | A | A | T | T | G | A | T | T | T | G | C | A | T | T | C | A | A | T | A | G | G | T | - | A | T | C | T | T | T | G | A | A | - | - | A | G | A | T | T | A | A | T | C | T | T | A |
| 2 | Homalodisca coagulata | A | G | G | A | T | T | A | T | A | T | T | T | A | - | - | A | T | T | - | - | - | - | A | - | - | T | A | A | T | A | T | T | T | G | A | T | T | T | G | C | A | T | T | C | A | A | A | A | G | G | T | - | G | C | T | T | A | A | T | - | - | - | - | A | A | G | C | T | A | A | T | C | T | T | A |
| 3 | Triatoma dimidiata | G | G | G | G | A | T | G | T | A | G | T | T | A | - | - | A | A | A | - | - | - | - | A | - | - | T | A | A | C | A | T | C | T | A | A | T | T | T | G | C | A | A | T | T | A | G | A | A | A | G | T | - | A | C | T | T | A | C | T | T | A | C | - | A | A | G | T | C | T | T | C | C | T | C | A |
| 4 | Aleurodicus dugesii | A | A | A | A | T | A | A | T | A | G | T | T | T | - | - | A | T | T | T | - | - | - | A | - | - | A | A | A | T | T | T | T | T | A | A | T | T | T | G | C | A | A | T | T | A | A | A | A | G | A | A | - | T | A | - | - | T | T | T | T | T | - | - | - | - | T | A | T | T | A | T | T | T | T | A |
| 5 | Aleurochiton aceris | A | G | A | G | C | A | A | T | A | G | T | T | T | - | - | A | T | A | - | - | - | - | A | - | - | A | A | A | C | A | C | T | T | A | A | T | T | T | G | C | A | A | T | T | A | A | G | A | A | T | T | - | G | A | T | - | G | A | A | A | - | - | - | - | A | T | C | T | T | G | T | T | T | T | A |
| 6 | Bemisia tabaci | A | G | G | A | T | A | A | G | A | G | T | T | T | - | - | A | A | C | - | - | - | - | A | - | - | A | A | A | C | A | T | A | T | A | A | G | T | T | G | C | A | A | T | T | A | T | A | A | A | A | A | - | A | A | A | C | T | A | C | A | C | T | - | G | T | T | T | T | T | A | T | C | T | T | A |
| 7 | Neomaskellia andropogonis | T | C | T | A | T | T | C | A | G | A | T | T | - | - | - | A | A | T | T | T | C | - | - | - | - | - | A | A | T | T | T | T | A | A | A | A | T | T | G | C | A | A | T | T | T | A | A | T | G | T | T | A | T | T | A | A | T | T | T | A | A | - | - | C | T | A | C | G | A | A | T | A | A | G | T |
| 8 | Tetraleurodes acaciae | T | G | G | A | C | A | A | T | A | G | T | T | T | T | A | A | A | A | T | T | A | T | G | T | A | A | A | A | T | T | T | G | C | A | G | C | T | T | G | C | A | T | C | T | G | C | A | A | G | G | T | - | G | C | C | - | T | T | A | G | T | G | C | - | G | G | C | T | T | G | T | C | T | A | A |
| 9 | Trialeurodes vaporariorum | G | G | G | G | T | A | A | T | A | G | T | T | T | - | - | A | A | T | T | A | - | - | A | - | - | A | A | A | T | T | T | T | T | A | A | T | T | T | G | C | A | G | T | T | A | A | T | A | G | A | T | - | G | T | - | - | A | A | G | G | - | - | - | - | - | G | C | T | T | A | C | C | T | T | T |
| 10 | Schizaphis graminum | A | G | G | A | T | A | A | T | A | G | T | T | A | - | - | A | A | A | T | T | T | - | A | - | - | T | A | A | C | A | T | T | T | A | A | T | T | T | G | C | T | T | T | T | A | A | A | A | A | T | T | - | A | T | T | - | T | A | A | T | - | - | - | - | A | A | T | T | T | A | T | C | T | T | A |
| 11 | Pachypsylla venusta | A | G | G | G | C | T | A | A | A | G | T | T | T | - | - | A | A | T | T | - | - | - | - | - | - | A | A | A | C | A | T | T | T | A | A | T | T | T | G | C | A | T | T | T | A | G | A | A | A | A | A | - | A | C | - | - | T | T | A | T | T | - | - | - | - | G | T | T | A | G | C | C | T | A | A |
| 12 | tRNA STRUCTURE | H | H | H | H | H | H | H | - | - | D | D | D | D | D | D | - | - | - | - | - | - | - | - | D | D | D | D | D | D | - | W | W | W | W | W | - | - | S | S | S | - | - | W | W | W | W | W | - | - | - | - | - | V | V | V | V | - | - | - | - | - | - | - | V | V | V | V | H | H | H | H | H | H | H | - |

NeomaskelliaASN.nex

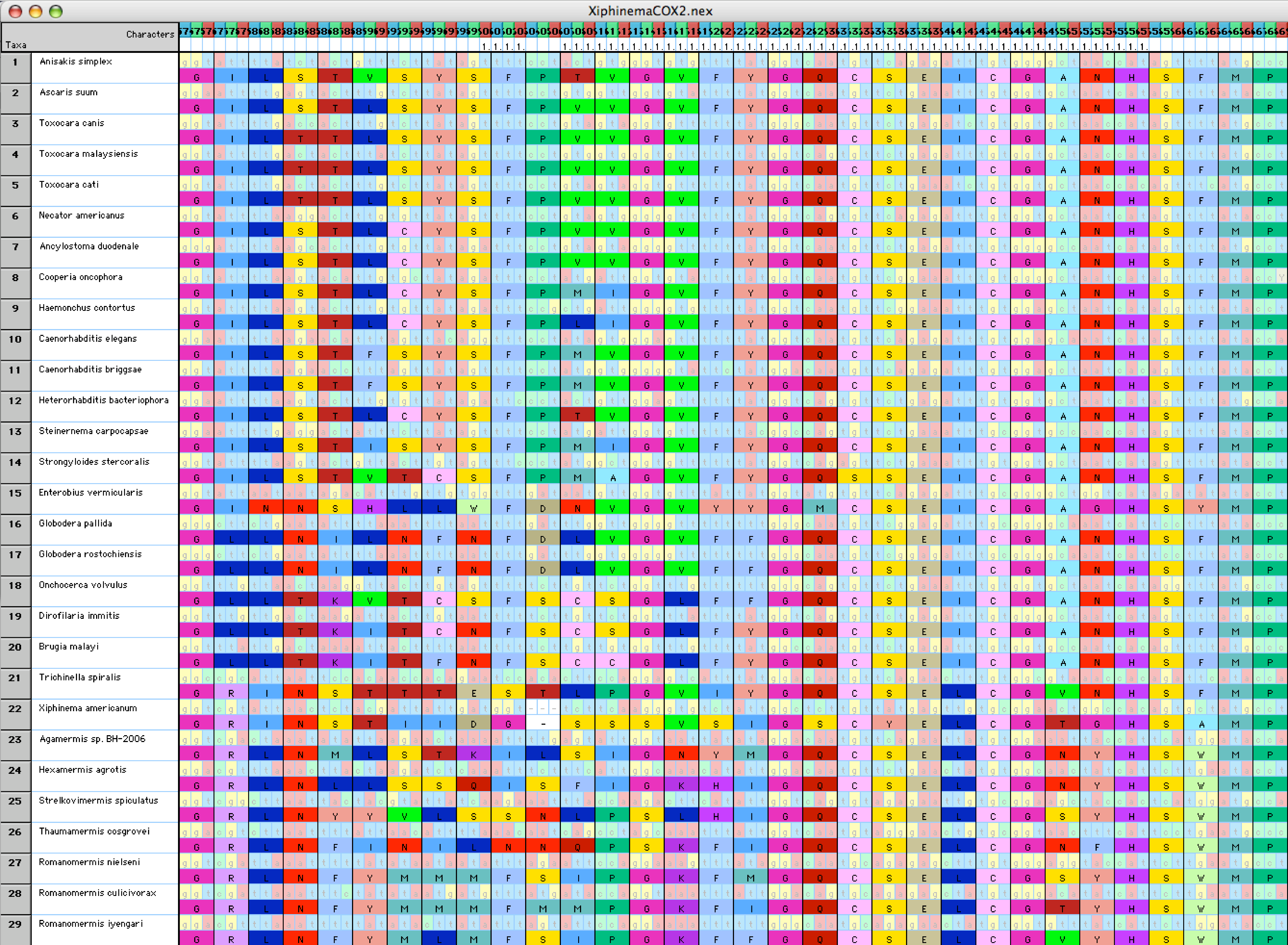
| Taxa \ Characters | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 Philaenus spumarius | T | T | A | A | C | T | A | A | A | G | C | C | A | A | A | A | T | - | A | G | A | G | G | C | A | A | T | T | T | A | T | T | G | T | T | A | A | T | A | A | A | A | A | A | A | T | T | G | A | A | - | - | T | T | A | A | T | - | - | - | - | T | T | C | T | A | G | T | T | A | A | A |
| 2 Homalodisca coagulata | T | T | A | G | T | T | A | A | A | G | C | C | A | A | A | A | T | T | A | G | A | G | G | C | A | T | C | T | T | A | T | T | G | T | T | A | A | T | A | A | G | A | A | T | A | A | T | G | A | A | - | - | T | T | T | T | - | - | - | - | - | T | T | C | T | A | A | C | T | A | A | A |
| 3 Triatoma dimidiata | T | T | A | A | T | T | G | A | A | G | C | C | A | A | A | A | - | - | A | G | A | G | G | C | C | T | T | T | C | A | T | T | G | T | T | A | A | T | G | A | A | A | A | A | A | A | T | G | A | T | - | - | T | A | A | T | A | - | - | - | - | A | T | C | C | A | A | T | T | A | A | A |
| 4 Aleurodicus dugesii | T | T | A | A | T | T | A | A | A | A | C | C | A | A | A | A | T | T | - | G | A | G | G | T | A | T | A | T | T | A | T | T | G | T | T | A | A | T | A | A | T | A | T | T | A | T | T | G | A | T | T | A | A | A | A | T | A | - | - | T | A | A | T | C | T | A | G | T | T | A | A | G |
| 5 Aleurochiton aceris | T | T | A | A | T | T | A | A | A | A | C | C | A | A | A | - | T | - | A | G | A | G | G | T | A | T | G | A | T | A | T | T | G | T | T | A | A | T | A | T | C | A | A | A | A | T | T | G | T | T | - | - | T | T | T | A | A | - | - | - | - | A | A | C | T | A | A | T | T | A | A | A |
| 6 Bemisia tabaci | T | T | A | G | T | T | A | A | A | A | C | C | A | A | A | A | A | - | A | G | A | G | G | T | A | T | A | T | T | A | T | T | G | T | T | A | A | T | A | A | T | A | G | A | A | A | T | G | A | A | - | - | A | T | T | T | T | - | - | - | - | T | T | C | T | A | A | C | T | A | A | A |
| 7 Neomaskellia andropogonis | T | T | A | T | T | C | G | T | A | G | T | T | A | A | A | - | T | T | - | - | - | A | A | T | A | A | C | A | T | T | A | A | A | T | T | G | C | A | A | T | T | T | T | A | A | - | - | A | A | T | T | G | A | A | A | A | T | - | - | - | T | A | A | T | C | T | G | A | A | T | A | G | A |
| 8 Tetraleurodes acaciae | T | T | A | G | T | T | A | A | A | A | C | C | A | A | A | - | T | T | A | G | A | G | G | T | C | T | A | C | T | A | T | T | G | T | T | A | A | T | A | G | T | A | T | A | A | T | T | G | A | A | - | - | A | A | T | T | A | - | - | - | - | T | T | C | T | A | A | C | T | A | A | A |
| 9 Trialeurodes vaporariorum | T | T | A | A | T | T | A | A | A | G | C | C | A | A | A | G | - | - | A | G | C | G | G | C | C | T | A | C | T | G | T | T | G | T | T | A | A | C | A | G | T | A | T | T | A | T | T | G | A | T | - | - | T | T | T | C | T | A | - | - | - | G | T | C | T | A | G | T | T | A | A | A |
| 10 Schizaphis graminum | T | T | A | A | T | T | G | A | A | A | C | C | A | A | A | A | T | - | A | G | A | G | G | T | T | T | A | T | T | A | C | T | G | T | T | A | A | T | A | A | T | A | A | T | A | T | T | G | A | A | - | - | A | A | A | A | A | A | A | - | - | T | T | C | C | A | A | T | T | A | A | A |
| 11 Pachypsylla venusta | T | G | A | G | T | A | A | A | A | G | T | C | A | A | A | A | - | - | A | G | A | G | A | C | A | A | A | T | T | A | T | T | G | T | T | A | A | T | A | A | T | T | T | T | A | A | T | G | A | A | - | - | A | C | C | A | - | - | - | - | - | T | T | C | T | T | A | C | T | C | A | A |
| 12 tRNA STRUCTURE | H | H | H | H | H | H | H | - | - | D | D | D | - | - | - | - | - | - | - | - | - | D | D | D | - | W | W | W | W | W | - | - | S | S | S | - | - | W | W | W | W | W | - | - | - | - | - | V | V | V | V | V | - | - | - | - | - | - | - | V | V | V | V | V | H | H | H | H | H | H | H | - |

NeomaskelliaCYS.nex

| Taxa \ Characters | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 Philaenus spumarius | A | G | C | C | T | T | A | T | A | G | T | C | A | A | T | A | A | A | - | - | - | - | A | T | G | A | T | T | T | T | A | G | A | C | T | G | C | A | A | T | T | C | T | A | A | A | G | G | A | G | T | A | - | - | A | A | A | A | T | T | A | A | - | - | T | A | C | T | A | A | G | G | C | T | T |
| 2 Homalodisca coagulata | A | G | T | C | T | T | A | T | A | G | T | T | T | A | A | G | A | - | - | - | - | - | A | A | A | A | C | G | T | T | A | A | A | T | T | G | C | A | A | A | T | T | T | A | A | A | A | T | T | A | A | - | - | - | A | T | T | A | A | - | - | - | - | - | - | T | T | T | A | A | G | A | C | T | T |
| 3 Triatoma dimidiata | G | G | C | T | T | T | A | T | A | G | T | C | A | A | T | A | T | - | - | - | - | - | A | T | G | A | T | A | T | C | A | G | A | C | T | G | C | A | A | T | T | C | T | G | A | A | G | T | A | G | T | - | - | - | A | G | T | C | A | - | - | - | - | - | T | A | C | T | A | A | A | G | C | T | T |
| 4 Aleurodicus dugesii | T | A | T | A | T | T | T | T | A | G | T | T | A | A | A | A | T | A | - | - | - | - | A | T | A | A | C | A | T | T | A | A | A | A | T | G | C | A | A | T | T | T | T | A | A | A | A | T | T | A | A | - | - | - | T | A | A | - | - | - | - | - | - | - | T | T | A | A | A | T | A | T | A | A |
| 5 Aleurochiton aceris | A | T | A | T | T | T | A | T | A | G | T | T | A | A | T | A | T | - | - | - | - | - | A | T | A | A | C | A | T | T | A | A | A | A | T | G | C | A | A | T | T | C | T | A | A | A | G | T | A | A | A | A | - | - | A | A | A | A | T | T | - | - | - | - | T | T | T | T | A | A | A | T | A | T | A |
| 6 Bemisia tabaci | T | T | A | T | T | A | A | T | A | G | T | T | A | A | A | T | A | A | - | - | - | - | A | T | A | A | C | A | C | T | A | A | A | A | T | G | C | A | A | T | T | T | T | A | G | A | A | T | T | G | A | - | - | - | A | A | T | T | A | A | - | - | - | - | - | T | C | T | T | G | A | T | A | A | A |
| 7 Neomaskellia andropogonis | T | T | A | T | T | C | G | T | A | G | T | T | A | A | A | T | T | A | - | - | - | - | A | T | A | A | C | A | T | T | A | A | A | T | T | G | C | A | A | T | T | T | T | A | A | A | A | T | T | G | A | - | - | - | A | A | T | T | A | A | - | - | - | - | - | T | C | T | G | A | A | T | A | G | A |
| 8 Tetraleurodes acaciae | A | T | A | T | T | A | A | T | A | G | T | T | A | A | T | A | A | - | - | - | - | - | A | T | A | A | C | T | T | T | A | A | A | A | T | G | C | A | A | T | T | T | T | A | A | A | A | T | A | A | A | C | - | - | A | A | G | A | A | A | A | - | - | - | G | T | T | T | T | A | A | T | A | T | A |
| 9 Trialeurodes vaporariorum | A | C | A | C | C | T | A | T | A | G | T | T | A | A | T | A | T | T | A | T | T | A | A | T | A | A | T | T | T | A | A | A | A | G | T | G | C | A | A | A | T | T | T | T | A | A | G | T | A | G | C | - | - | - | C | A | G | G | A | A | - | - | - | - | - | G | C | T | A | A | G | T | G | T | A |
| 10 Schizaphis graminum | A | A | C | T | T | T | A | T | A | T | T | C | A | A | A | T | T | A | T | - | - | - | A | T | G | A | T | A | T | T | A | A | A | T | T | G | C | A | A | A | T | T | T | A | A | A | G | G | T | A | T | T | A | A | T | T | A | T | T | - | - | - | T | T | A | A | T | T | A | A | G | G | T | T | T |
| 11 Pachypsylla venusta | A | A | T | T | C | T | T | T | A | T | T | C | A | A | T | A | - | - | - | - | - | - | A | T | G | A | T | A | C | T | A | A | A | T | T | G | C | A | A | A | T | T | T | G | G | A | G | G | T | G | A | - | - | - | G | T | T | T | - | - | - | - | - | - | T | C | A | A | G | A | G | T | T | T |
| 12 tRNA STRUCTURE | H | H | H | H | H | H | H | - | - | D | D | D | D | - | - | - | - | - | - | - | - | - | - | D | D | D | D | - | W | W | W | W | W | - | - | S | S | S | - | - | W | W | W | W | W | - | - | - | - | V | V | V | V | V | - | - | - | - | - | - | - | V | V | V | V | V | H | H | H | H | H | H | H | - |

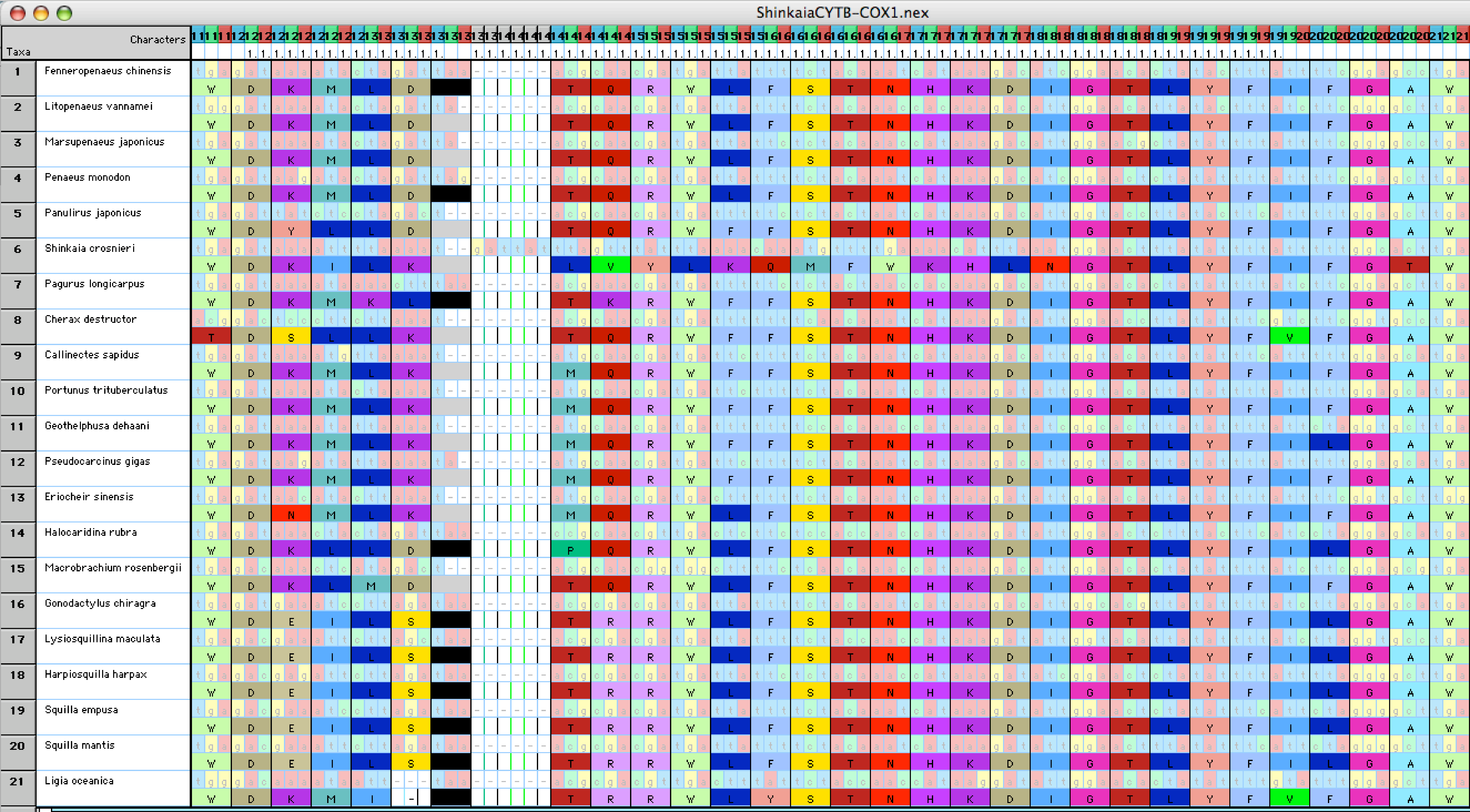
XiphinemaASN.nex

| Taxa \ Characters | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 Anisakis simplex | T | A | A | G | G | T | T | T | A | G | T | T | T | - | - | A | A | T | T | T | T | - | - | - | A | - | - | G | A | A | T | T | G | T | C | G | A | C | T | G | T | T | G | A | T | C | G | G | A | A | G | G | T | - | T | T | T | - | - | - | T | A | C | C | T | T | A | G |
| 2 Ascaris suum | T | A | A | G | A | G | T | T | A | G | T | T | T | - | - | A | A | T | A | T | T | - | - | - | A | - | - | G | A | A | T | T | G | T | T | G | A | C | T | G | T | T | G | A | T | C | A | A | T | G | G | G | T | - | G | A | T | - | - | - | T | C | T | C | T | T | A | G |
| 3 Toxocara canis | T | A | G | A | A | G | T | T | A | G | T | T | T | - | - | A | A | T | A | A | - | - | - | - | A | - | - | A | A | A | T | G | T | T | T | G | A | C | T | G | T | T | A | A | T | C | A | A | G | A | G | A | C | - | A | T | A | - | - | - | T | C | T | T | C | T | A | G |
| 4 Toxocara malaysiensis | T | A | G | A | A | G | T | T | A | G | T | T | T | - | - | A | A | T | A | A | G | - | - | - | A | - | - | A | A | A | T | G | T | T | T | G | A | C | T | G | T | T | A | A | T | C | A | A | A | A | G | A | C | - | A | T | G | - | - | - | T | C | T | T | C | T | A | G |
| 5 Toxocara cati | T | A | G | A | A | G | T | T | A | G | T | T | T | - | - | A | A | T | A | A | G | - | - | - | A | - | - | A | A | A | T | G | T | T | T | G | A | C | T | G | T | T | A | A | T | C | A | A | A | A | G | A | C | - | A | T | A | - | - | - | T | C | T | T | C | T | A | G |
| 6 Necator americanus | T | A | A | G | A | G | T | T | A | G | T | T | T | - | - | A | A | T | A | - | - | - | - | - | A | - | - | G | A | A | T | T | G | T | T | G | A | C | T | G | T | T | A | A | T | C | A | A | A | A | G | G | T | - | T | T | - | - | - | - | A | C | T | C | T | T | A | A |
| 7 Ancylostoma duodenale | T | A | A | G | A | G | T | T | A | G | T | T | T | - | - | A | A | G | T | G | T | G | T | T | A | - | - | G | A | A | T | T | G | T | T | G | A | C | T | G | T | T | A | A | T | C | A | A | A | A | G | G | T | - | T | T | - | - | - | - | A | C | T | C | T | T | A | A |
| 8 Cooperia oncophora | T | A | A | G | G | G | T | T | A | G | T | T | T | - | - | A | A | G | T | - | - | - | - | - | A | - | - | A | A | A | T | T | G | T | T | G | A | T | T | G | T | T | G | A | T | C | A | A | A | A | G | A | T | - | T | A | - | - | - | - | T | C | T | C | T | T | A | A |
| 9 Haemonchus contortus | T | A | A | G | A | A | T | T | A | G | T | T | T | - | - | A | A | T | T | T | A | - | - | - | A | - | - | G | A | A | T | T | G | T | T | G | A | C | T | G | T | T | A | A | T | C | A | A | A | A | G | G | T | - | G | A | - | - | - | - | T | T | T | C | T | T | A | A |
| 10 Caenorhabditis elegans | T | A | A | G | A | G | T | T | A | G | T | T | T | - | - | A | A | T | A | T | - | - | - | - | A | - | - | G | A | A | T | T | G | T | T | G | A | C | T | G | T | T | A | A | T | C | A | A | A | A | G | G | T | - | G | T | A | - | - | - | C | C | T | C | T | T | A | A |
| 11 Caenorhabditis briggsae | T | A | A | G | A | G | T | T | A | G | T | T | T | - | - | A | A | T | T | A | A | - | - | - | A | - | - | G | A | A | T | T | G | T | T | G | A | C | T | G | T | T | A | A | T | C | A | A | A | A | G | G | T | - | A | T | A | - | - | - | C | C | T | C | T | T | A | A |
| 12 Heterorhabditis bacteriophora | T | A | A | G | A | G | T | T | A | G | T | T | T | - | - | A | A | T | T | - | - | - | - | - | A | - | - | G | A | A | T | T | G | T | T | G | A | C | T | G | T | T | G | A | T | C | A | A | A | A | G | G | T | - | T | A | - | - | - | - | A | C | T | C | T | T | A | A |
| 13 Steinernema carpocapsae | T | A | A | G | A | G | T | T | A | G | T | T | T | - | - | A | A | T | T | T | - | - | - | - | A | - | - | G | A | A | T | A | A | T | T | G | A | C | T | G | T | T | A | A | T | C | A | A | T | A | G | G | T | - | T | T | T | - | - | - | T | C | T | C | T | T | A | A |
| 14 Strongyloides stercoralis | T | G | A | G | G | A | T | T | A | T | T | T | T | - | - | A | A | T | T | T | - | - | - | - | A | - | - | G | A | A | T | A | T | T | T | A | G | C | T | G | T | T | A | A | C | T | A | A | A | A | G | G | T | - | T | - | - | - | - | - | A | T | C | T | T | C | A | T |
| 15 Enterobius vermicularis | T | A | G | G | C | T | G | T | A | G | T | T | T | - | - | G | A | T | A | G | A | - | - | - | A | - | - | A | A | A | T | G | G | T | G | G | A | T | T | G | T | T | G | C | T | C | C | G | A | C | G | A | A | - | A | A | - | - | - | - | T | G | G | C | C | T | A | G |
| 16 Globodera pallida | A | A | A | G | A | T | T | T | A | T | T | T | A | - | - | A | A | A | A | - | - | - | - | - | A | - | - | T | A | A | T | A | T | T | T | T | A | T | T | G | T | T | A | A | T | A | A | A | A | A | G | T | T | - | T | T | T | - | - | - | T | C | T | T | T | T | T | T |
| 17 Globodera rostochiensis | A | A | A | G | A | T | T | T | A | T | T | T | A | - | - | A | A | A | A | - | - | - | - | - | A | - | - | T | A | A | T | A | T | T | T | T | A | T | T | G | T | T | A | A | T | A | A | A | A | A | G | T | T | - | T | T | T | - | - | - | T | C | T | T | T | T | T | T |
| 18 Onchocerca volvulus | G | A | A | T | T | T | T | T | A | G | T | A | T | - | - | A | A | T | T | T | T | T | - | - | G | - | - | G | T | A | C | G | G | T | T | A | A | T | T | G | T | T | G | A | T | T | A | G | C | A | G | G | T | - | T | T | T | - | - | - | G | A | A | G | T | T | C | T |
| 19 Dirofilaria immitis | G | A | A | T | T | T | T | G | A | G | T | A | T | G | - | G | T | T | T | - | - | - | - | - | T | - | T | G | T | A | T | A | A | C | T | A | A | T | T | G | T | T | G | A | T | T | A | G | T | A | G | G | G | - | T | A | - | - | - | - | A | A | G | G | T | T | C | T |
| 20 Brugia malayi | G | A | A | T | T | T | T | A | A | G | T | A | T | A | A | T | T | T | T | T | - | - | - | - | T | T | T | G | T | A | T | A | A | C | T | A | A | T | T | G | T | T | G | A | T | T | A | G | T | A | G | G | T | - | T | A | - | - | - | - | A | A | G | A | T | T | C | T |
| 21 Trichinella spiralis | T | A | G | A | G | T | C | A | A | G | C | A | T | - | - | A | T | C | A | G | A | T | - | - | G | - | - | A | T | G | C | A | T | A | A | A | A | C | T | G | T | T | A | T | T | T | T | T | A | A | G | A | A | - | T | A | C | A | - | - | A | A | C | T | C | T | A | G |
| 22 Xiphinema americanum | T | G | G | T | T | C | T | T | C | A | A | G | G | - | - | G | T | G | - | - | - | - | - | - | T | - | - | C | T | A | T | T | G | G | C | T | C | T | T | G | T | T | A | T | G | A | G | T | T | G | T | G | C | - | G | G | A | A | - | - | C | T | G | G | C | C | A | C |
| 23 Agamermis sp. BH-2006 | T | T | T | A | G | G | T | T | A | - | - | - | - | - | - | A | - | - | - | - | - | - | - | - | A | - | - | - | - | - | - | T | G | A | A | A | A | T | T | G | T | T | A | A | T | T | T | T | C | T | A | C | A | - | A | A | A | T | T | - | A | C | C | T | A | G | A | T |
| 24 Hexamermis agrotis | A | T | T | A | A | G | T | G | T | - | - | - | - | - | - | T | A | A | - | - | - | - | - | - | T | - | - | - | - | - | - | G | T | G | A | A | A | T | T | G | T | T | A | A | T | T | T | C | A | T | G | T | A | - | A | T | T | T | - | - | A | C | T | T | A | G | A | G |
| 25 Strelkovimermis spiculatus | T | T | T | A | A | G | C | A | T | - | - | - | - | - | - | T | A | T | - | - | - | - | - | - | G | - | - | - | - | - | - | A | T | A | A | A | A | C | T | G | T | T | A | A | T | T | T | T | A | T | T | G | A | - | A | A | A | A | A | - | G | C | T | T | A | A | G | A |
| 26 Thaumamermis cosgrovei | C | A | T | A | A | G | T | T | C | - | - | - | - | - | - | A | A | A | - | - | - | - | - | - | C | - | - | - | - | - | - | A | T | A | A | A | A | T | T | G | T | T | A | C | T | T | T | T | A | T | T | A | G | - | A | A | T | A | - | - | G | C | T | T | A | A | G | T |
| 27 Romanomermis nielseni | T | T | T | A | A | A | C | A | T | - | - | - | - | - | - | C | T | A | T | A | - | - | - | - | A | - | - | - | - | - | - | A | T | A | A | A | A | T | T | G | T | T | A | A | T | T | T | T | A | T | T | C | A | - | A | A | A | - | - | - | G | T | T | T | A | A | A | A |
| 28 Romanomermis culicivorax | A | T | T | A | A | A | C | G | T | - | - | - | - | - | - | A | C | A | A | - | - | - | - | - | T | - | - | - | - | - | - | A | T | A | A | A | A | T | T | G | T | T | A | A | T | T | T | T | A | T | T | T | A | - | A | A | A | - | - | - | G | T | T | T | A | A | A | A |
| 29 Romanomermis iyengari | T | T | T | A | A | A | C | A | A | - | - | - | - | - | - | A | G | A | A | - | - | - | - | - | T | - | - | - | - | - | - | A | T | A | A | A | A | T | T | G | T | T | A | A | T | T | T | T | A | T | T | A | A | - | A | A | A | - | - | - | G | T | T | T | A | A | A | A |
| 30 tRNA STRUCTURE | H | H | H | H | H | H | H | - | - | D | D | D | D | D | D | - | - | - | - | - | - | - | - | - | - | D | D | D | D | D | D | - | W | W | W | W | W | - | - | S | S | S | - | - | W | W | W | W | W | - | - | - | - | V | - | - | - | - | - | V | H | H | H | H | H | H | H | - |


XiphinemaCOX2.nex
Characters
Taxa
1 Anisakis simplex G I L S T V S Y S F P T V G V F Y G Q C S E I C G A N H S F M P
2 Ascaris suum G I L S T L S Y S F P V V G V F Y G Q C S E I C G A N H S F M P
3 Toxocara canis G I L T T L S Y S F P V V G V F Y G Q C S E I C G A N H S F M P
4 Toxocara malaysiensis G I L T T L S Y S F P V V G V F Y G Q C S E I C G A N H S F M P
5 Toxocara cati G I L T T L S Y S F P V V G V F Y G Q C S E I C G A N H S F M P
6 Necator americanus G I L S T L C Y S F P V V G V F Y G Q C S E I C G A N H S F M P
7 Ancylostoma duodenale G I L S T L C Y S F P V V G V F Y G Q C S E I C G A N H S F M P
8 Cooperia oncophora G I L S T L C Y S F P M I G V F Y G Q C S E I C G A N H S F M P
9 Haemonchus contortus G I L S T L C Y S F P L I G V F Y G Q C S E I C G A N H S F M P
10 Caenorhabditis elegans G I L S T F S Y S F P M V G V F Y G Q C S E I C G A N H S F M P
11 Caenorhabditis briggsae G I L S T F S Y S F P M V G V F Y G Q C S E I C G A N H S F M P
12 Heterorhabditis bacteriophora G I L S T L C Y S F P T V G V F Y G Q C S E I C G A N H S F M P
13 Steinernema carpocapsae G I L S T I S Y S F P M I G V F Y G Q C S E I C G A N H S F M P
14 Strongyloides stercoralis G I L S T V T C S F P M A G V F Y G Q S S E I C G A N H S F M P
15 Enterobius vermicularis G I N N S H L L W F D N V G V Y Y G M C S E I C G A G H S Y M P
16 Globodera pallida G L L N I L N F N F D L V G V F F G Q C S E I C G A N H S F M P
17 Globodera rostochiensis G L L N I L N F N F D L V G V F F G Q C S E I C G A N H S F M P
18 Onchocerca volvulus G L L T K V T C S F S C S G L F F G Q C S E I C G A N H S F M P
19 Dirofilaria immitis G L L T K I T C N F S C S G L F Y G Q C S E I C G A N H S F M P
20 Brugia malayi G L L T K I T F N F S C C G L F Y G Q C S E I C G A N H S F M P
21 Trichinella spiralis G R I N S T T T E S T L P G V I Y G Q C S E L C G V N H S F M P
22 Xiphinema americanum G R I N S T I I D G - S S S V S I G S C Y E L C G T G H S A M P
23 Agamermis sp. BH-2006 G R L N M L S T K I L S I G N Y M G Q C S E L C G N Y H S W M P
24 Hexamermis agrotis G R L N L L S S Q I S F I G K H I G Q C S E L C G N Y H S W M P
25 Strelkovimermis spiculatus G R L N Y Y V L S S N L P S L H I G Q C S E L C G S Y H S W M P
26 Thaumamermis cosgrovei G R L N F I N I L N N Q P S K F I G Q C S E L C G N F H S W M P
27 Romanomermis nielseni G R L N F Y M M M F S I P G K F M G Q C S E L C G S Y H S W M P
28 Romanomermis culicivorax G R L N F Y M M M F M M P G K F I G Q C S E L C G T Y H S W M P
29 Romanomermis iyengari G R L N F Y M L M F S I P G K F F G Q C S E L C G V Y H S W M P

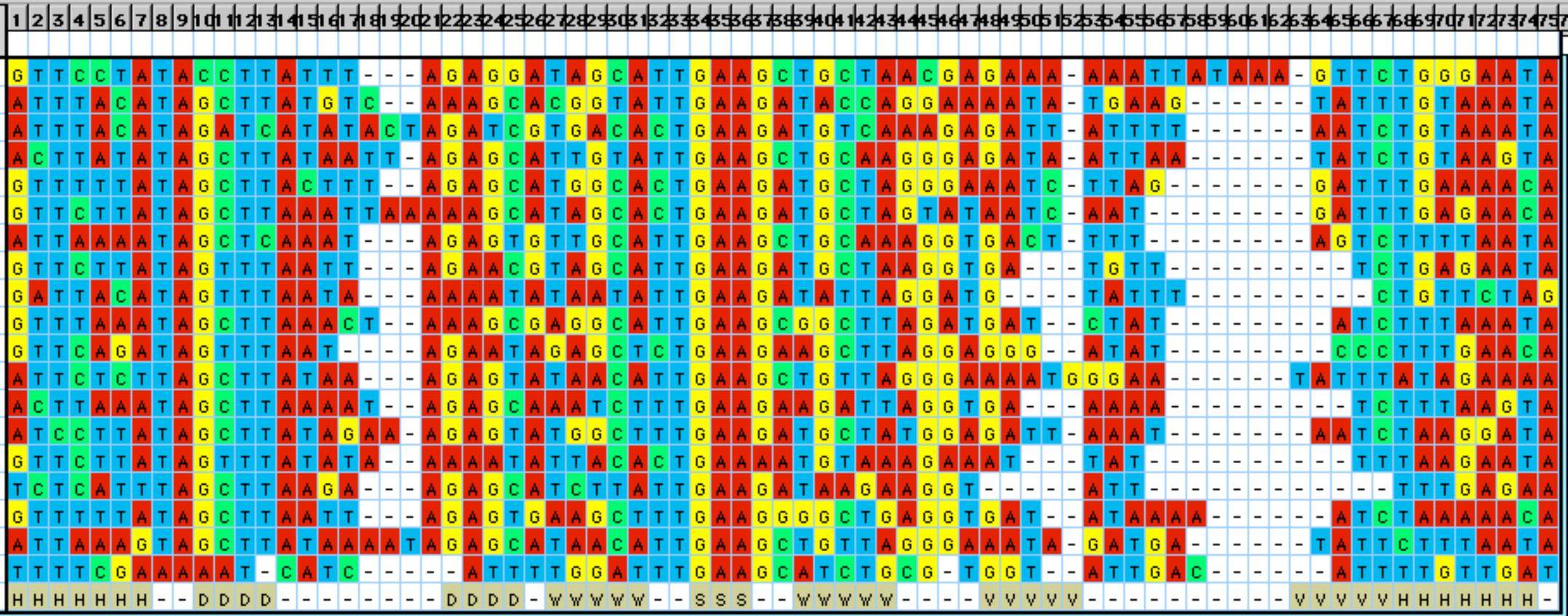
ShinkaiaTRP.nex

| Taxa | | Characters 1–80 |
|---|---|---|
| 1 | Fenneropenaeus chinensis | AAAGCTTTAAGTTATCT--AAACTTATAGCCTTCAAAGCTATCAAAAGGAGTAAAAA---------TCTCCTAAGCTTTA |
| 2 | Litopenaeus vannamei | AAAGCTTTAAGTTATCT--AAACTAATAGCCTTCAAAGTTATCAAAAAGAGTAAAAA---------TCTCTTAAGCTTTA |
| 3 | Marsupenaeus japonicus | AAAGCTTTAAGTTATTT--AAACTAGCAGCCTTCAAAGCTGCCAAAAGGAGTAAAT----------TCTCTTAAGCTTTA |
| 4 | Penaeus monodon | AAAGCTTTAAGTTATCA--AAACTTATAGCCTTCAAAGCTGTCAAGAGGAGTAGAA----------TCTCCTAAGCTTTA |
| 5 | Panulirus japonicus | AAGATTTTAAGTTATTTT-AAACTGTTGCCCTTCAAAGGCGAAAAAAAAAGACGT-----------GCTTTTAAATCTTA |
| 6 | Shinkaia crosnieri | TAAAATATAAAGT-TCC---ATTTAAATGTTTTCAAAACATTTGTTTTAAATAAACTAAATAATCATTTTAAAATTTTAT |
| 7 | Pagurus longicarpus | GAGATTTTAAGTTATAT--AAACTAATAGCCTTCAAAGCTATAAAAATAAGTAAAC----------TCTTTTAAATCTTA |
| 8 | Cherax destructor | AAGATTTTAAGTTAATTT-AAACTAACATCCTTCAAAGCTGTCAATAAAAGTTGAA----------CCTTTTAAATCTTG |
| 9 | Callinectes sapidus | AGGATTTTAAGTTATTT--AAACTAAAGGCCTTCAAAGCCTAAAAAAAAAGATCA-----------TCTTTTAAATCCTA |
| 10 | Portunus trituberculatus | AGGATTTTAAGTTATAT--AAACTAAAGGCCTTCAAAGTCTAAAAAAAAAGAATTC----------TCTTTTAAATCCTA |
| 11 | Geothelphusa dehaani | AAGATTTTAAGTTAAAT--AAACTAGAAGCCTTCAAAGCTTAAAAT--AA-TTTTT----------T-TT--AAATCTTA |
| 12 | Pseudocarcinus gigas | AGAATTTTAAGTTATTT--AAACTAAAAGCCTTCAAAGCTTAAAAAAAAAGTAAAC----------ACTTTTAAATTCTA |
| 13 | Eriocheir sinensis | AGAATTTTAAGTTATTT--AAACTAAAAGCCTTCAAAGCTTTCTAAAAAAGTATTAA---------CCTTTTAAATTCTA |
| 14 | Halocaridina rubra | AAGGTTTTAAGTTAAAA--AAACTAGTAACCTTCAAAGTTTCTAATAGGAGAAAGC----------ACTCTTAAACCTTA |
| 15 | Macrobrachium rosenbergii | AAGGTTTTAAGTTAACT--AAACTAGTAACCTTCAAAGTTCCCAACAAGAGTATAAA---------TCTCTTAAACCTTA |
| 16 | Gonodactylus chiragra | AAGACCTTAAGTTAATA--AAACTAAAAGACTTCAAACCTTTCAATATGAGTCAAA----------TCTCTTAGGTCTTA |
| 17 | Lysiosquillina maculata | AAGATCTTAAGTTAACT--AAACTAGAAGCCTTCAAACCTTTCAATATGAGTTCAAA---------CCTCTTAGGTCTTA |
| 18 | Harpiosquilla harpax | AAGATCTTAAGTTAAACG-AAACTAGAAGACTTCAAACCTTCCTATATGAGTATAAA---------TCTCTTAGGTCTTA |
| 19 | Squilla empusa | AAGATCTTAAGTTAAAC--AAACTAGAAGACTTCAAACCTTCCAATATGAGTACAAA---------CCTCCTAGGTCTTA |
| 20 | Squilla mantis | AAGATCTTAAGTTAAAT--AAACTAGAAGACTTCAAACCTTCCAATATGAGTTTAA----------TCTCTTAGGTCTTA |
| 21 | Ligia oceanica | TAAACTTTAAGTTAACTAAAAACTATTATCCTTCAAAGATAAAATT--GA-TCATCTT--------T-TC--AAGTTTAA |
| 22 | tRNA STRUCTURE | HHHHHHH--DDDD-------DDDD-WWWWW--SSS--WWWWW----VVVVV----------------VVVVVHHHHHHH- |


ShinkaiaCYTB-COX1.nex
Characters
Taxa
1 Fenneropenaeus chinensis
2 Litopenaeus vannamei
3 Marsupenaeus japonicus
4 Penaeus monodon
5 Panulirus japonicus
6 Shinkaia crosnieri
7 Pagurus longicarpus
8 Cherax destructor
9 Callinectes sapidus
10 Portunus trituberculatus
11 Geothelphusa dehaani
12 Pseudocarcinus gigas
13 Eriocheir sinensis
14 Halocaridina rubra
15 Macrobrachium rosenbergii
16 Gonodactylus chiragra
17 Lysiosquillina maculata
18 Harpiosquilla harpax
19 Squilla empusa
20 Squilla mantis
21 Ligia oceanica

EpiperipatusPHE.nex

| Taxa | Characters |
|---|---|
| 1 | Tricholepidion gertschi |
| 2 | Petrobius brevistylis |
| 3 | Squilla empusa |
| 4 | Penaeus monodon |
| 5 | Triops cancriformis |
| 6 | Daphnia pulex |
| 7 | Pollicipes polymerus |
| 8 | Scutigera coleoptrata |
| 9 | Lithobius forficatus |
| 10 | Thyropygus sp. DVL-2001 |
| 11 | Narceus annularus |
| 12 | Scutigerella causeyae |
| 13 | Centruroides limpidus |
| 14 | Limulus polyphemus |
| 15 | Ixodes hexagonus |
| 16 | Heptathela hangzhouensis |
| 17 | Nymphon gracile |
| 18 | Priapulus caudatus |
| 19 | Epiperipatus biolleyi |
| 20 | tRNA STRUCTURE |



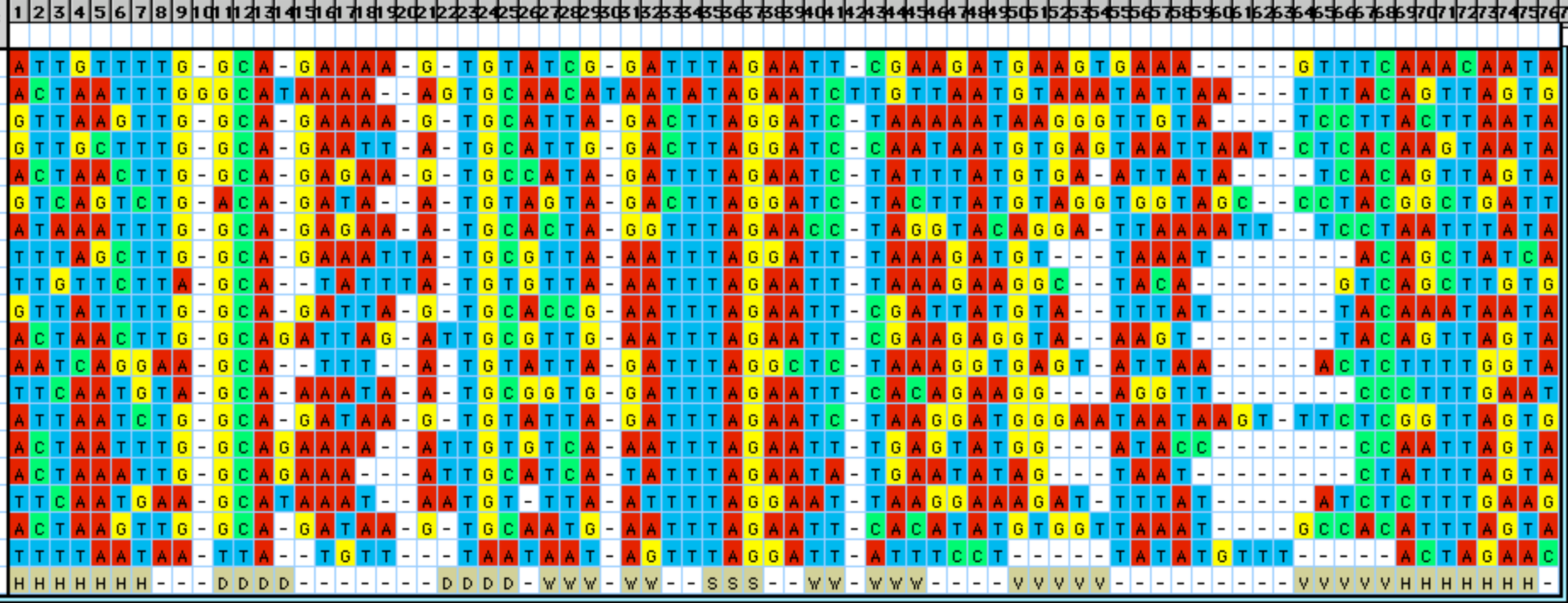
EpiperipatusCOX3.nex

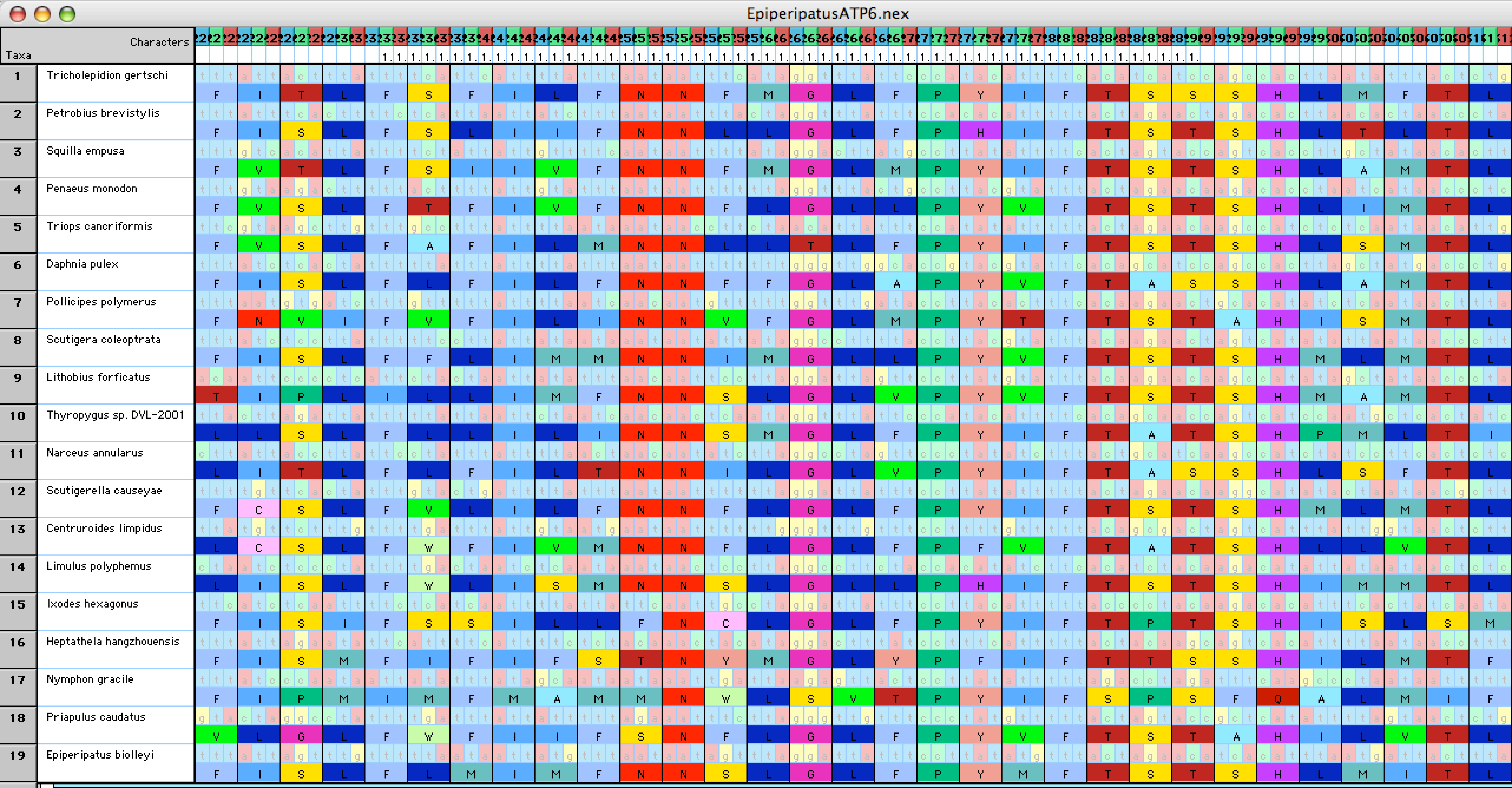
| Taxa | Characters | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Tricholepidion gertschi | R | H | I | K | Y | H | F | S | S | N | H | H | F | G | F | E | A | A | A |
| 2 | Petrobius brevistylis | R | H | S | S | C | H | F | S | A | Q | H | H | F | G | F | E | A | A | A |
| 3 | Squilla empusa | R | L | Y | M | C | H | F | S | S | H | H | H | F | G | F | E | A | A | A |
| 4 | Penaeus monodon | R | L | Y | K | C | H | F | S | A | M | H | H | F | G | F | E | A | A | A |
| 5 | Triops cancriformis | R | H | L | A | H | H | F | S | S | E | H | H | F | G | F | E | A | A | A |
| 6 | Daphnia pulex | R | H | T | L | H | H | F | S | F | T | H | H | F | G | F | E | A | A | A |
| 7 | Pollicipes polymerus | R | M | I | K | F | H | F | S | P | S | H | H | F | G | F | E | A | A | A |
| 8 | Scutigera coleoptrata | R | H | N | L | K | H | L | S | P | I | H | H | F | G | F | E | A | A | A |
| 9 | Lithobius forficatus | R | H | N | V | N | H | F | S | S | T | H | H | M | G | F | E | A | A | T |
| 10 | Thyropygus sp. DVL-2001 | R | H | I | L | F | H | Y | S | P | H | H | H | F | G | F | E | A | A | A |
| 11 | Narceus annularus | R | L | S | T | H | H | F | S | S | H | H | H | F | G | F | E | A | A | A |
| 12 | Scutigerella causeyae | R | H | N | M | T | H | F | S | A | S | H | H | F | G | F | E | A | A | A |
| 13 | Centruroides limpidus | R | S | C | R | F | H | F | S | G | W | H | H | F | G | F | E | A | A | A |
| 14 | Limulus polyphemus | R | L | M | F | F | H | F | S | P | N | H | H | F | G | F | E | A | A | A |
| 15 | Ixodes hexagonus | R | I | N | M | N | L | I | S | S | S | H | H | F | G | F | E | A | A | A |
| 16 | Heptathela hangzhouensis | R | I | K | L | S | H | L | S | S | T | H | H | F | G | F | E | A | A | A |
| 17 | Nymphon gracile | R | V | K | M | N | H | F | T | K | S | H | H | T | G | M | E | L | M | I |
| 18 | Priapulus caudatus | R | H | T | L | N | H | F | S | S | N | H | H | F | G | F | E | A | A | A |
| 19 | Epiperipatus biolleyi | R | Q | F | Y | W | H | F | S | K | N | H | H | F | G | F | E | A | S | A |

| Taxa | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | W | Y | W | H | F | V | D | V | V | W | L | F | L | L | L | L | L | L | L | L |
| 2 | W | Y | W | H | F | V | D | V | V | W | L | F | L | L | L | L | L | L | L | L |
| 3 | W | Y | W | H | F | V | D | V | V | W | L | F | L | L | L | L | L | L | L | L |
| 4 | W | Y | W | H | F | V | D | V | V | W | L | F | L | L | L | L | L | L | L | L |
| 5 | W | Y | W | H | F | V | D | V | V | W | L | F | L | L | L | L | L | L | L | L |
| 6 | W | Y | W | H | F | V | D | V | V | W | L | F | L | L | L | L | L | L | L | L |
| 7 | W | Y | W | H | F | V | D | V | V | W | L | F | L | L | L | L | L | L | L | L |
| 8 | W | Y | W | H | F | V | D | V | V | W | L | F | L | L | L | L | L | L | L | L |
| 9 | W | Y | W | H | F | V | D | V | V | W | L | F | L | L | L | L | L | L | L | L |
| 10 | W | Y | W | H | F | V | D | V | V | W | L | F | L | L | L | L | L | L | L | L |
| 11 | W | Y | W | H | F | V | D | V | V | W | L | F | L | L | L | L | L | L | L | L |
| 12 | W | Y | W | H | F | V | D | V | V | W | L | F | L | L | L | L | L | L | L | L |
| 13 | W | Y | W | H | F | V | D | V | V | W | L | F | L | L | L | L | L | L | L | L |
| 14 | W | Y | W | H | F | V | D | V | V | W | L | F | L | L | L | L | L | L | L | L |
| 15 | W | Y | W | H | F | V | D | V | V | W | L | F | L | L | L | L | L | L | L | L |
| 16 | W | Y | W | H | F | V | D | V | V | W | L | F | L | L | L | L | L | L | L | L |
| 17 | W | Y | W | H | F | V | D | V | V | W | L | F | L | L | L | L | L | L | L | L |
| 18 | W | Y | W | H | F | V | D | V | V | W | L | F | L | L | L | L | L | L | L | L |
| 19 | W | Y | W | H | F | V | D | V | V | W | L | F | L | L | L | L | L | L | L | L |

EpiperipatusLeu.nex

| Taxa | Characters |
|---|---|
| 1 | Tricholepidion gertschi |
| 2 | Petrobius brevistylis |
| 3 | Squilla empusa |
| 4 | Penaeus monodon |
| 5 | Triops cancriformis |
| 6 | Daphnia pulex |
| 7 | Pollicipes polymerus |
| 8 | Scutigera coleoptrata |
| 9 | Lithobius forficatus |
| 10 | Thyropygus sp. DVL-2001 |
| 11 | Narceus annularus |
| 12 | Scutigerella causeyae |
| 13 | Centruroides limpidus |
| 14 | Limulus polyphemus |
| 15 | Ixodes hexagonus |
| 16 | Heptathela hangzhouensis |
| 17 | Nymphon gracile |
| 18 | Priapulus caudatus |
| 19 | Epiperipatus biolleyi |
| 20 | tRNA STRUCTURE |




EpiperipatusATP6.nex
Characters
Taxa
1 Tricholepidion gertschi F I T L F S F I L F N N F M G L F P Y I F T S S S H L M F T L
2 Petrobius brevistylis F I S L F S L I I F N N L L G L F P H I F T S T S H L T L T L
3 Squilla empusa F V T L F S I I V F N N F M G L M P Y I F T S T S H L A M T L
4 Penaeus monodon F V S L F T F I V F N N F L G L L P Y V F T S T S H L I M T L
5 Triops cancriformis F V S L F A F I L M N N L L T L F P Y I F T S T S H L S M T L
6 Daphnia pulex F I S L F L F I L F N N F F G L A P Y V F T A S S H L A M T L
7 Pollicipes polymerus F N V I F V F I L I N N V F G L M P Y T F T S T A H I S M T L
8 Scutigera coleoptrata F I S L F F L I M M N N I M G L L P Y V F T S T S H M L M T L
9 Lithobius forficatus T I P L I L L I M F N N S L G L V P Y V F T S T S H M A M T L
10 Thyropygus sp. DVL-2001 L L S L F L L I L I N N S M G L F P Y I F T A T S H P M L T I
11 Narceus annularus L I T L F L F I L T N N I L G L V P Y I F T A S S H L S F T L
12 Scutigerella causeyae F C S L F V L I L F N N F L G L F P Y I F T S T S H M L M T L
13 Centruroides limpidus L C S L F W F I V M N N F L G L F P F V F T A T S H L L V T L
14 Limulus polyphemus L I S L F W L I S M N N S L G L L P H I F T S T S H I M M T L
15 Ixodes hexagonus F I S I F S S I L L F N C L G L F P Y I F T P T S H I S L S M
16 Heptathela hangzhouensis F I S M F I F I F S T N Y M G L Y P F I F T T S S H I L M T F
17 Nymphon gracile F I P M I M F M A M M N W L S V T P Y I F S P S F Q A L M I F
18 Priapulus caudatus V L G L F W F I I F S N F L G L F P Y V F T S T A H I L V T L
19 Epiperipatus biolleyi F I S L F L M I M F N N S L G L F P Y M F T S T S H L M I T L

AleurodicusGLN.nex

| Taxa \ Characters | 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 |
|---|---|
| 1 Philaenus spumarius | T A T A A T G T A G T T T A A G A T - G A A C C T T A A T T T T T G A A A T T A A T A G A T T T A G T T T A A T T C T A A A T A T T A T A A |
| 2 Homalodisca coagulata | T G T A A A T T A G T G T A T G A T - G C A C A T A A A T T T T T G A T A T T T A A A G A T A A G T T T A A T T - C T T A A A T T T A C A A |
| 3 Triatoma dimidiata | T A T A T T T T G G T G T A G G A C - G C A C A A A A G A G T T T T G A T T T C T T A G G A T T T A G T T T A A A T C T A A A A A A T A T A A |
| 4 Aleurodicus dugesii | G T A A T T A T A G T T T C C T A T - A A A T T T A A T A T T T T G A T T G T T A T A A A - - - - - T A - - - - - - - - - - T T A A T A T A |
| 5 Aleurochiton aceris | T T A A T T T A A G T G A T A A T - - T C A C T T T A A T C T T T G A T A T T A A C A A A A T T A A T T A A A T - T T A A T A A A T T A A A |
| 6 Bemisia tabaci | T T A A T T T A A C T T G A G T T T A A A A C A G T A A C C T T T G A A G T T A A A T A G A T T A A T T A A T T - T T A G T A A G T T C A T |
| 7 Neomaskellia andropogonis | T T A A T T T A A G T T - A A A T - - - A A C A A T A A C T T T T G A A G T T A T A G A A A C T A A T T A A A T - T T A G T A A A T T A A A |
| 8 Tetraleurodes acaciae | T T A A T T T A A G T A - T A A T - - - T A C A T T A A T T T T T G A T A T T A A A A A C A C T A A T T A A A T - T T A G T A A A T T A A A |
| 9 Trialeurodes vaporariorum | T T A A G T T A A G T A A T A A A - - A T G C A C A A G C T T T T G A T G C T T G T T T G G T T A A T T A A A T - T T A A C A A C T T A A A |
| 10 Schizaphis graminum | T A T A C T T A A G T G T T T A T - - G C A T A T A A A T T T T T G A A A T T T A T G G A - T T A G T T T A A T T C T T T A - A A G T A T A A |
| 11 Pachypsylla venusta | T A T A T T T A A G T G T C T A - - - G C A T A A A A A A T T T T G A A T T T T T T G G G T T T A A T T T A T A - T T A A A A A A A T A T A A |
| 12 tRNA STRUCTURE | H H H H H H H - - D D D D - - - - - - D D D D - W W W W W - - S S S - - W W W W W - - - - V V V V V - - - - - - V V V V V H H H H H H H - |

AleurodicusNAD5.nex

| Taxa \ Characters | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. |
| 1 Philaenus spumarius | t | g | t | g | c | a | g | g | t | g | t | t | g | t | t | a | t | t | c | a | t | t | c | a | a | t | a | t | g | a | g | g | g | a | a | t | c | a | g | g | a | t | a | t | t | c | g | t | t | t | t | a | t | a | g | g | a | g | g | t | t | t | a | a | t | t |
| | C | | A | | G | | V | | V | | I | | H | | S | | M | | W | | G | | N | | Q | | D | | I | | R | | F | | M | | G | | G | | L | | I | | N | | Q | | L | | P | | I | | I | | T | | S | | C | | | |
| 2 Homalodisca coagulata | t | g | t | t | c | a | g | g | t | a | t | t | t | t | t | a | t | t | t | t | t | a | t | a | t | a | a | a | t | g | a | t | a | a | t | c | a | g | a | t | a | t | t | c | g | a | t | t | a | a | t | a | g | g | a | t | c | a | g | t | a | t | g | t | a | t | a | t | t | a | a | t | a | c | c | t | t | t | t | a | c | a | a | c | t | t | c | t | t | g | t |
| | C | | S | | G | | I | | F | | I | | F | | Y | | M | | N | | D | | N | | Q | | D | | I | | R | | L | | M | | G | | S | | V | | C | | M | | L | | M | | P | | F | | T | | T | | S | | C | | | |
| 3 Triatoma dimidiata | t | g | t | g | c | a | g | g | t | c | t | t | a | t | g | a | t | t | c | a | t | t | g | t | a | t | a | g | a | g | a | g | a | t | t | c | c | c | a | a | g | a | t | a | t | t | c | g | t | c | a | t | a | t | g | g | g | a | t | t | g | a | t | g | g | t | t | a | a | t | c | a | t | t | t | g | c | c | t | t | t | t | a | c | t | t | g | t | a | c | t | t | g | t |
| | C | | A | | G | | L | | M | | I | | H | | C | | M | | S | | D | | S | | Q | | D | | I | | R | | H | | M | | G | | L | | M | | V | | N | | H | | L | | P | | F | | T | | C | | T | | C | | | |
| 4 Aleurodicus dugesii | t | g | t | g | c | t | g | g | a | t | c | t | t | a | t | a | t | t | a | a | t | a | t | t | t | a | t | a | a | c | - | - | - | a | a | t | c | a | a | a | a | t | a | t | a | t | t | t | a | t | a | g | g | a | a | c | t | a | t | a | a | t | t | a | c | a | a | c | g | t | a | a | c | t | t | t | a | a | t | a | a | t | a | g | a | g | a | t | t | g | a |
| | C | | A | | S | | S | | Y | | I | | N | | I | | Y | | N | | - | | N | | Q | | N | | I | | K | | F | | M | | G | | N | | Y | | N | | Y | | N | | M | | N | | F | | N | | N | | I | | S | | | |
| 5 Aleurochiton aceris | t | g | c | a | g | a | a | g | a | a | c | a | t | t | t | a | t | t | g | c | g | t | g | t | a | a | c | a | a | c | - | - | - | a | c | a | c | a | a | g | a | t | a | t | a | c | g | a | a | a | a | t | a | a | a | a | a | c | c | - | - | - | a | a | c | g | a | a | a | t | g | c | t | a | c | c | a | g | t | t | a | c | c | a | c | a | a | t | a | a | g | t |
| | C | | S | | S | | T | | F | | I | | A | | C | | N | | N | | - | | T | | Q | | D | | M | | R | | K | | M | | K | | T | | - | | N | | E | | M | | L | | P | | V | | T | | T | | M | | S | | | |
| 6 Bemisia tabaci | t | g | t | a | g | a | a | g | t | a | c | t | t | t | t | a | t | t | t | a | t | g | t | a | a | g | t | a | a | t | - | - | - | a | c | a | c | a | a | g | a | t | c | t | a | c | g | a | a | a | a | c | t | a | t | c | t | t | c | a | a | c | t | a | g | a | t | c | a | t | a | t | a | t | a | a | t | g | g | t | a | a | c | a | a | a | a | t | a | t | t | c | t |
| | C | | S | | S | | T | | F | | I | | Y | | V | | S | | N | | - | | T | | Q | | D | | L | | R | | K | | L | | S | | S | | T | | S | | S | | Y | | M | | M | | V | | T | | N | | I | | S | | | |
| 7 Neomaskellia andropogonis | t | g | t | g | c | a | a | g | a | t | c | a | t | a | t | a | t | t | t | c | t | a | t | a | t | t | t | a | a | t | - | - | - | a | c | c | c | a | a | g | a | t | a | t | a | a | c | g | t | t | t | a | a | t | a | a | a | a | t | a | t | t | - | - | - | a | a | t | a | a | a | a | c | t | t | t | a | c | c | a | t | t | a | a | c | t | a | a | a | c | a | g | c | t |
| | C | | A | | S | | S | | Y | | I | | S | | M | | F | | N | | - | | T | | Q | | D | | M | | R | | L | | M | | N | | I | | - | | N | | K | | T | | L | | P | | L | | T | | K | | T | | A | | | |
| 8 Tetraleurodes acaciae | t | g | c | a | g | a | a | g | a | a | c | a | a | t | a | a | t | c | t | c | a | a | t | a | g | c | a | a | a | t | - | - | - | t | c | t | c | a | g | g | a | c | a | t | t | c | g | a | a | a | a | t | c | t | c | a | a | c | t | c | a | a | t | c | a | g | c | c | c | a | g | a | a | t | c | g | t | a | c | a | a | t | a | t | a | a | g | c |
| | C | | S | | S | | T | | M | | I | | S | | M | | A | | N | | - | | S | | Q | | D | | I | | R | | K | | I | | S | | N | | S | | N | | Q | | P | | S | | I | | V | | T | | M | | M | | S | | | |
| 9 Trialeurodes vaporariorum | t | g | t | g | c | c | a | g | a | a | c | a | t | t | t | a | t | t | a | a | t | a | c | c | t | t | c | a | a | t | - | - | - | a | c | a | c | a | a | g | a | t | a | t | a | c | g | t | a | a | a | a | t | a | t | c | a | a | c | a | g | c | a | g | g | t | c | a | c | c | a | c | a | t | a | t | c | g | t | c | t | a | c | g | c | a | a | a | c | a | g | c | a |
| | C | | A | | S | | T | | F | | I | | N | | T | | F | | N | | - | | T | | Q | | D | | M | | R | | K | | M | | S | | T | | A | | G | | H | | H | | M | | S | | S | | T | | Q | | T | | A | | | |
| 10 Schizaphis graminum | a | g | a | g | c | t | g | g | t | a | t | t | t | t | a | a | t | t | t | t | a | a | a | t | a | t | a | a | a | t | a | a | t | a | a | t | c | a | a | g | a | t | a | t | t | c | g | t | a | a | a | a | t | a | g | g | t | g | g | a | t | t | a | a | t | t | g | a | t | t | a | t | t | t | a | c | c | t | t | t | t | g | t | g | g | a | t | t | a | a | t | t |
| | S | | A | | G | | I | | L | | I | | L | | N | | M | | N | | N | | N | | Q | | D | | I | | R | | K | | M | | G | | G | | L | | I | | D | | Y | | L | | P | | F | | C | | G | | L | | I | | | |
| 11 Pachypsylla venusta | t | g | t | g | c | t | g | g | a | t | g | t | t | t | a | a | t | t | c | a | t | a | g | a | g | g | a | g | g | a | t | c | a | a | t | t | c | a | a | g | a | t | t | t | a | c | g | t | a | a | a | a | t | a | g | g | a | a | a | t | t | g | t | c | a | c | a | t | t | g | a | t | t | t | a | t | g | a | a | t | t | a | a | a | g | c | t | a | g | a | a | t | t |
| | C | | A | | G | | C | | L | | I | | H | | S | | G | | G | | S | | I | | Q | | D | | L | | R | | K | | M | | G | | N | | C | | H | | I | | D | | L | | W | | I | | K | | A | | S | | I | | | |