Supplement 1. List of studied water bodies and their characteristics. Areas: NS – Northern seaside area; AH – Anadyr Highlands; KH – Koryak Highlands. Types of water bodies: SL – swamp lakes; OB – oxbows; TL – thermokarst lakes; TWB – temporary water bodies and small lakes of unclear genesis; ML – mountain lakes.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Area** | **N** | **E** | **Types of water bodies** |
| 1 | NS | 69.02199 | 169.38374 | SL |
| 2 | NS | 69.02322 | 169.38277 | SL |
| 3 | NS | 69.01984 | 169.41028 | SL |
| 4 | NS | 69.02012 | 169.41121 | SL |
| 5 | NS | 69.02025 | 169.41084 | SL |
| 6 | NS | 69.0203 | 169.41001 | SL |
| 7 | NS | 69.01999 | 169.40919 | SL |
| 8 | NS | 69.02039 | 169.40852 | SL |
| 9 | NS | 69.02038 | 169.40871 | SL |
| 10 | NS | 69.02032 | 169.40854 | SL |
| 11 | NS | 69.02083 | 169.40917 | SL |
| 12 | NS | 69.02109 | 169.40885 | SL |
| 13 | NS | 69.02105 | 169.40867 | SL |
| 14 | NS | 69.02152 | 169.40741 | SL |
| 15 | NS | 69.02155 | 169.40664 | SL |
| 16 | NS | 69.02171 | 169.40633 | SL |
| 17 | NS | 69.02195 | 169.40526 | SL |
| 18 | NS | 69.02208 | 169.405 | SL |
| 19 | NS | 69.02186 | 169.40489 | SL |
| 20 | NS | 69.00953 | 169.39257 | OB |
| 21 | NS | 69.01189 | 169.34355 | TL |
| 22 | NS | 69.0079 | 169.33451 | TL |
| 23 | NS | 69.007 | 169.33433 | TL |
| 24 | NS | 69.00693 | 169.33976 | TL |
| 25 | NS | 69.0076 | 169.34162 | SL |
| 26 | NS | 69.00727 | 169.34803 | SL |
| 27 | NS | 69.01006 | 169.39179 | OB |
| 28 | NS | 69.01084 | 169.40401 | OB |
| 29 | NS | 69.0122 | 169.40858 | OB |
| 30 | NS | 69.01481 | 169.41702 | OB |
| 31 | NS | 69.01613 | 169.42057 | OB |
| 32 | NS | 69.7595 | 170.605 | TWB |
| 33 | NS | 69.8131 | 170.6058 | TWB |
| 34 | NS | 69.7986 | 170.6414 | TWB |
| 35 | NS | 69.7594 | 170.6051 | TWB |
| 36 | NS | 69.7986 | 170.6361 | TWB |
| 37 | NS | 69.7986 | 170.6414 | TWB |
| 38 | NS | 69.7987 | 170.6415 | TWB |
| 39 | NS | 69.6414 | 170.6414 | TWB |
| 40 | NS | 69.7673 | 170.6072 | TWB |
| 41 | NS | 69.7986 | 170.6393 | TWB |
| 42 | NS | 69.7673 | 170.6072 | TWB |
| 43 | AH | 67.486 | 172.081 | ML |
| 44 | AH | 68.53687 | 176.8821 | ML |
| 45 | AH | 68.53687 | 176.8821 | ML |
| 46 | AH | 67.1316 | 178.6236 | ML |
| 47 | AH | 65.75292 | 176.3656 | ML |
| 48 | AH | 64.90233 | 174.4667 | ML |
| 49 | AH | 63.8842 | 164.6439 | ML |
| 50 | AH | 64.99332 | 164.2159 | ML |
| 51 | AH | 66.85387 | 175.2853 | ML |
| 52 | AH | 68.37219 | 178.0103 | ML |
| 53 | AH | 68.41203 | 175.9271 | ML |
| 54 | AH | 68.66689 | 176.9308 | ML |
| 55 | AH | 66.51902 | 175.9157 | ML |
| 56 | AH | 68.66689 | 176.9308 | ML |
| 57 | AH | 67.4554 | 168.5773 | ML |
| 58 | AH | 67.34752 | 169.4037 | ML |
| 59 | KH | 63.12199 | 172.6287 | ML |
| 60 | KH | 63.01151 | 172.1558 | ML |

Supplement 2. Amplification and sequencing primers and PCR conditions for Anostraca DNA.

|  |  |  |  |
| --- | --- | --- | --- |
| **Reagents for PCR (final volume 25 µL)** | | | |
| 5 µL of 5× HotTaq Red buffer  0.5 µL of HotTaq polymerase  0,5 µL of dNTP (50 µM stock)  0.3 µL of a mix of both primers (10 µM stock)  17.7 µL of sterile water  1 µL of genomic DNA | | | |
| **Marker** | **Primers** | **PCR conditions** | **References** |
| Cytochrome *c* oxidase subunit I | **ZplanktR1\_t1**  CAGGAAACAGCTATGACTTCAGGRTGRCCRAARAATCA  **ZplanktF1\_t1**  TGTAAAACGACGGCCAGTTCTASWAATCATAARGATATTGG | 5 min – 95 °C, 10x [30 s – 95 °C, 1 min – 52 °C, -0.5 °C per cycle 1 min –  72 °C], 30x [30 s – 95 °C, 1 mib – 48 °C, 1 min –  72 °C],  7 min – 72 °C | Prosser et al., 2013 |
| 18S rRNA | **1F**  TACCTGGTTGATCCTGCCAGTAG  **5R**  CTTGGCAAATGCTTTCGC  **3F**  GTTCGATTCCGGAGAGGGA  **18Sbi**  GAGTCTCGTTCGTTATCGGA  **18Sa2.0**  ATGGTTGCAAAGCTGAAAC  **9R**  GATCCTTCCGCAGGTTCACCTAC | 5 min – 95 °C, 35x [30 s – 95 °C, 30 s – 50 °C, 1 min –  72 °C], 7 min – 72 °C | Giribet et al., 1996;  Whiting et al., 1997 |

Supplement 4. Analysed 18S sequences of specimens from genus *Branchinecta* from GenBank and BOLD.

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| --- | --- | --- |
| Species | Geography | 18S |
| *Branchinecta tolli* | Russia: Chukotka | PQ046213 |
| *B. tolli* | Russia: Chukotka | PQ046214 |
| *B. tolli* | Russia: Chukotka | PQ046215 |
| *Branchinecta orientalis* | Austria | OK037204 |
| *B. orientalis* | Mongolia | OK037210 |
| *B. orientalis* | Mongolia | OK037211 |
| *Branchinecta papillata* | Chile | ON426172 |
| *Branchinecta lindahli* | USA | AJ238063 |
| *Branchinecta mesovallensis* | USA | AJ238064 |
| *Branchinecta ferox* | Austria | OK037197 |
| *B. ferox* | Morocco | OK037209 |
| *Branchinecta packardi* | USA: central Texas | AF144206 |
| *B. packardi* | USA: central Texas | L26512 |
| **OUTGROUPS** | | |
| *Lepidurus apus* | Germany: Berlin, Spandauer Forst | EF189623 |

Supplement 6. Pairwise R-test of samples groups from different water bodies: 1 – oxbows; 2 – swamp lakes; 3 – thermokarst lakes; 4 – mountain lakes; 5 – temporary water bodies and small lakes of unclear genesis.

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| --- | --- | --- | --- | --- |
| **Types of water bodies** | **1** | **2** | **3** | **4** |
| **2** | 0.875 |  |  |  |
| **3** | 0.647 | 0.971 |  |  |
| **4** | 0.394 | 0.728 | 0.525 |  |
| **5** | 0.333 | 0.655 | 0.252 | 0.543 |