Table S1. Sequences of the primers used to amplify nuclear and mitochondrial markers from the studied *Contracaecum* specimens.

|  |  |  |  |
| --- | --- | --- | --- |
| Marker | Name of primer | Sequence | Reference |
| ITS | NC5 | TAGGTGAACCTGCGGAAGGATCATT | Zhu et al. 1998 |
| NC2 | TTAGTTTCTTTTCCTCCGCT |
| cox1 | JB3 | TTTTTTGGGCATCCTGAGGTTTAT | Bowels et al. 1992 |
| JB4 | TAAAGAAAGAACATAATGAAAATG |
| cox2 | 211F | TTT TCT AGT TAT ATA GAT TGR TTY AT | Nadler & Hudspeth 2000 |
| 210R | CAC CAA CTC TTA AAA TTA TC |
| nad1 | nad1-F | TTCTTATGAGATTGCTTTT | Li et al. 2008 |
| nad1-R | TATCATAACGAAAACGAGG |
| rrnS | ZYSF | TGTTCCAGAATAATCGGCTA | Lin et al. 2013 |
| ZYSR | TTACTACAACTTACTCCCCT |

Table S2. Specimen information including their origins, hosts and GenBank accession numbers of the sequences used in the analysis.

|  |  |  |  |
| --- | --- | --- | --- |
| Species | origin | Host | GenBank accession number |
| ITS1 | ITS2 | cox1 | cox2 | nad1 | rrnS |
| *C. rudolphii* A | Italy | *Phalacrocorax carbo sinensis* | AJ634782 | AJ634785 | FJ416641-3,FJ866814-5 | EF122201-2, EF513501-2 | FJ426211-3 | FJ426237-8 |
| Poland | *Phalacrocorax carbo sinensis* | JQ071414 | JQ071437 |   |   |   |   |
| *C. rudolphii* A x *C. rudolphii* B | Poland | *Phalacrocorax carbo sinensis* | JQ071415 | JQ071438 |   |   |   |   |
| *C. rudolphii* B | Italy | *Phalacrocorax carbo sinensis* | AJ634783 | AJ634786 | FJ416644-5 | EF122203-4, EF513509, EF558894, EU852349 | FJ426214 | FJ426240-1 |
|
| Poland | *Phalacrocorax carbo sinensis* | JQ071409 | JQ071435 |   |   |   |   |
|
| China | *Phalacrocorax carbo sinensis* | AJ783845 |   | FJ416646-7, FJ416649,FJ905109 | FJ905109 | FJ426215-8, FJ905109 | FJ426242-4, FJ905109 |
| *C. rudolphii* C | USA | *Phalacrocorax carbosinensis* | FJ589790 | FJ589790 | FJ416650, FJ866816 |   | FJ426220 | FJ4216246-8 |
|
| *C. rudolphii* D | Australia | *Phalacrocorax carbo* | FM210251 | FM210268 |   |   |   |   |
| *C. rudolphii* E | Australia | *Phalacrocorax varius* | FM210257 | FM210271 |   |   |   |   |
| *C. rudolphii* F | USA | *Pelecanus occidentalis* | JF424597 | JF424597 |   | JF727879 |   | JF423899 |
|
| *C. septentrionale* | Spain | *Alca torda* | AJ634784 |  AJ634787 | FJ416653 |   | FJ426221 | FJ4262450 |
|
| Iceland | *Phalacrocorax carbo carbo* |   |   |   | EF558898 |   |   |
| *C. microcephalum* | Montenegro | *Phalacrocorax pygmaeus* | FM177523 | FM177527 |   | EF122208, EF513519 |   | EF014282 |
|
| *C. micropapillatum* | Greece | *Pelecanus onocrotalus* |   |   |   | EF122207 |   |   |
| Egypt | *Pelecanus onocrotalus* |   |   |   | EF122206, EU852350 |   |   |
| *C. multipapillatum* | Greece | *Pelecanus crispus* |   |   |   | EU852348 |   | EF014280 |
| Australia | *Pelecanus conspicillatus* | AM940056 | AM940061 |   | AF179910  |   |   |
| Australia | *Chelon auratus* | KC437337-8 | KC437346-8 |   |   |   |   |
| Black Sea | *Chelon auratus* | MH400190 | MH400190 |   |   |   |   |
|
| Guatemala | *Rhamdia sp.* |   |   |   | MH044685 |   |   |
|
| *C pyripapillatum* | Australia | *Pelecanus conspicillatus* | AM940062 | AM940069 |   |   |   | EF030717 |
| *C. ogmorhini* | South Africa | *Arctocephalus pusillus pusillus* |   |   | KU558726 | KU558726 | KU558726 | KU558726 |
|
| Canada | *Zalophus californianus* |   |   | KU558727, AJ616895 |   | KU558727,  | KU558727,  |
|
|   | *Arctocephalus pusillus doriferus* |   |   | NC\_031647-9 | NC\_031649 | NC\_031649 | NC\_031649 |
|
| Argentina | *Arctocephalus australis* |   |   |   | EU477211 |   |   |
|
| Australia | *Zalophus californianus* | AJ291468 | AJ291471 |   |   |   |   |
| *C. osculatum* | Canada | *Erignathus barbatus* | AJ250410-1 | AJ250419-20 |   |   |   |   |
|
| Baltic Sea | *Halichoerus grypus* | AJ250412 | AJ250421 |   |   |   |   |
|
| Antarctic | *Leptonychotes weddelli* | AJ250413 | AJ250418 |   |   |   |   |
| Lake Baikal | *Phoca sibirica* | AJ250415 | AJ250417 |   |   |   |   |
| Australia |  |   |   | AJ405314, AJ405317-8 |   |   |   |
| Greenland | *Gadus ogac* |   |   | JN786330 | JN786330 | JN786330 | JN786330 |
|
| *C bancrofti* |   |  | EU839572.1 |   |   |   |   |   |
| *C. overstreeti* | Turkey | *Mugil cephalus* | MG515224 | MG515224 |   | MG495095 |   |   |
| *C. chubutensis* | Argentina | *Phalacrocorax atriceps* | HQ389546 | HQ389548 |   | HQ328504 |   | HQ333521 |
| *C.* variegatum |   |  | FM177531 | FM177537 |   |   |   |   |
| *C.* bioccai | USA | *Pelecanus occidentalis* | JF424598 | JF424598 |   | EF558900 |   |   |
| *C\_margolisi* | USA | *Zalophus californianus* |   |   |   | EU477212 |   |   |
| *C. mirounga* | Antarctica | *Mirounga leonina* |   |   |   | EU477213  |   |   |
| *C\_radiatum* | Antarctica | *Leptonychotes weddellii* |   |   |   | EU477210 |   |   |
| *C\_eudyptulae* | Australia |  | FM177550 | FM177565 |   |   |   |   |
| *Hysterothylacium auctum* |   | *Zoarces viviparus* | AF115571 |  AF115571 |   |   |   |   |
| *Toxocara cati* | China |   | KY003086 | KY003086 | AM411622 | AM411622 | AM411622 | AM411622 |

Table S3. Tests of neutrality for four mitochondrial markers, cox1 (450bp), cox2 (560bp), nad1 (400bp) and rrnS (530bp), within *C. rudolphii* A (n=158) and *C. rudolphii* B (n=22).

|  |  |  |  |
| --- | --- | --- | --- |
| Marker | Species | Fu’s FS (p-value) | Tajima’s D (p-value) |
| cox1 | *C. rudolphii* A | -2.45924 (P< 0.01) | -1.84557 (P < 0.05) |
| *C. rudolphii* B | -2.916 (P > 0.10) | -0.81528 (P > 0.10) |
| cox2 | *C. rudolphii* A | -2.32427 (P< 0.02) |  -1.65857 (P < 0.05) |
| *C. rudolphii* B | -1.13338 (P > 0.10) | -1.08819 (P > 0.10) |
| nad1 | *C. rudolphii* A | -1.62073 (P< 0.01) |  -1.22840 (P < 0.05) |
| *C. rudolphii* B | 1.15728 (P > 0.10) | 1.22474 (P > 0.10) |
| rrnS | *C. rudolphii* A | -3.97169 (P< 0.02) | -2.11594 (P < 0.05) |
| *C. rudolphii* B | 0.54841 (P > 0.10) | -0.46110 (P > 0.10) |