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) |