Supplementary Table S1.Infection parameters of the intestinal helminth species of 130 female lesser scaup (*Aythya affinis*) collected from 4 regions of the upper Midwest, USA, during spring 2014 and 2015, including the Upper Mississippi River Valley, Central Mississippi River Valley, Illinois River Valley, and Southern Illinois; *n* – number of hosts examined, P – prevalence (% infected scaup), MI – mean intensity (mean number of helminths from infected scaup), numbers in parentheses are the 95% confidence intervals, **\***species were unable to be identified to be differentiated between previously identified congeneric species, ⱡ*Sphaeridiotrema* spp could not be differentiated between *S. globulus* and *S. pseudoglobulus*, †Juvenile refers to a cestode specimen where all individuals were underdeveloped and unidentifiable.

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Taxon | | Southern Illinois  (*n* = 10) | |  | Illinois River Valley  (*n* = 60) | |  | Central Mississippi River Valley (*n* = 22) | |  | Upper Mississippi River Valley (*n* = 38) | |
| P | MI |  | P | MI |  | P | MI |  | P | MI |
| Trematoda | |  |  |  |  |  |  |  |  |  |  |  |
|  | *Apatemon gracilis* | 10.0 (0.5-44.6) | 10.0 |  | 20.0 (11.4-32.4) | 32.4 (21.3-44.4) |  | 22.7 (9.4-45.3) | 221.2 (32.6-457.8) |  | 39.5 (21.4-60.9) | 475.9 (88.3-914.3) |
|  | *Apatemon burti* | - | - |  | 5.0 (1.4-13.9) | 7.0 (1.0-10.0) |  | 4.5 (0.2-22.2) | 2.0 |  | 2.6 (0.1-14.0) | 60.0 |
|  | *Cotylurus cornutus* | - | - |  | 4.7 (0.1-8.9) | 10.0 |  | - | - |  | 5.3 (1.0-18.0) | 15.0 (10.0-15.0) |
|  | *Cotylurus flabelliformis* | 10.0 (0.5-44.6) | 20.0 |  | 6.7 (2.3-16.4) | 52.5 (20.0-65.0) |  | 9.1 (1.6-29.1) | 174.5 (97.0-174.5) |  | 7.9 (2.2-20.8) | 79.3 (40.0-114.3) |
|  | *Cotylurus gallinulae hebraicus* | 10.0 (0.5-44.6) | 20.0 |  | 25.0 (15.6-37.4) | 45.9 (25.9-82.9) |  | 18.2 (6.5-38.9) | 43.0 (11.5-102.5) |  | 34.2 (20.8-51.3) | 67.2 (41.2-99.1) |
|  | *Cotylurus* spp*.\** | 10.0 (0.5-44.6) | 10.0 |  | 31.7 (20.6-45.0) | 33.2 (22.6-55.0) |  | 22.7 (9.4-45.3) | 139.2 (30.0-336.0) |  | 39.5 (24.7-55.7) | 159.3 (39.9-620.6) |
|  | *Cyathocotyle bushiensis* | - | - |  | - | - |  | - | - |  | 36.8 (22.6-53.5) | 27.7 (10.0-92.0) |
|  | *Diplostomum phoxini* | - | - |  | 13.3 (6.3-24.8) | 44.4 (10.6-96.9) |  | 9.1 (1.6-29.1) | 20.0 (10.0-20.0) |  | 2.6 (0.1-14.0) | 30.0 |
|  | *Echinoparyphium recurvatum* | 20.0 (3.7-55.4) | 409.0 (10.0-409.0) |  | 85.0 (73.5-92.2) | 1831.3 (1200.3-3540.5) |  | 31.8 (15.2-54.7) | 57.1 (17.1-170.0) |  | 52.6 (36.7-68.7) | 262.6 (160.0-402.2) |
|  | *Echinostoma trivolvis* | 20.0 (3.7-55.4) | 32.5 (30.0-32.5) |  | 36.7 (24.8-50.0) | 436.0 (122.4-1557.4) |  | 13.6 (3.8-33.8) | 9.3 (1.0-14.0) |  | 36.8 (22.6-53.5) | 71.4 (33.1-181.9) |
|  | *Psilochasmus oxyurus* | 10.0 (0.5-44.6) | 31.0 |  | 40.0 (28.2-53.4) | 33.9 (21.5-58.5) |  | 40.9 (22.2-61.7) | 35.0 (18.0-80.1) |  | 23.7 (12.7-39.4) | 53.7 (21.3-110.6) |
|  | *Maritrema* sp. 1 | - | - |  | 3.3 (0.6-11.4) | 296.0 (174.0-296.0) |  | 4.5 (0.2-22.2) | 20.0 |  | 13.2 (5.3-27.4) | 172.4 (50.0-434.0) |
|  | *Maritrema* sp. 2 | 10.0 (0.5-44.6) | 10.0 |  | - | - |  | 18.2 (6.5-38.9) | 14.6 (4.3-25.0) |  | - | - |
|  | *Microphallus oblonga* | - | - |  | 18.3 (10.1-29.9) | 121.4 (60.9-190.2) |  | 36.4 (18.7-58.2) | 1951.5 (827.1-3937.5) |  | 28.9 (16.7-45.3) | 85.8 (49.8-136.3) |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| Table S1. Continued | | | | | | | | | | | | |
|  | Taxon | Southern Illinois  (*n* = 10) | |  | Illinois River Valley  (*n* = 60) | |  | Central Mississippi River Valley (*n* = 22) | |  | Upper Mississippi River Valley (*n* = 38) | |
|  | P | MI |  | P | MI |  | P | MI |  | P | MI |
|  | *Microphallus pygmaeus* | - | - |  | - | - |  | 27.3 (12.6-50.0) | 9916.0 (2946.7-16885.3) |  | 7.9 (2.2-20.8) | 1433.7 (161.0-2576.7) |
|  | *Microphallus* spp.\* | - | - |  | 11.7 (5.6-22.3) | 147.7 (29.6-340.1) |  | 18.2 (6.5-38.9) | 3617.5 (235.0-9121.5) |  | 15.8 (7.1-31.3) | 1624.2 (404.7-4029.7) |
|  | *Notocotylus* sp. | 30.0 (8.7-61.9) | 3.0 (2.0-4.0) |  | 6.7 (2.3-16.4) | 10.8 (1.0-20.5) |  | 13.6 (3.8-33.8) | 14.7 (1.0-28.3) |  | 2.6 (0.1-14.0) | 1.0 |
|  | *Paramonostomum* sp. | - | - |  | 5.0 (1.4-13.9) | 8.7 (7.0-10.0) |  | 4.5 (0.2-22.2) | 1.0 |  | - | - |
|  | *Plenosoma minimum* | - | - |  | 1.7 (0.1-8.9) | 10.0 |  | 9.1 (1.6-29.1) | 55.5 (1.0-55.5) |  | 52.6 (36.7-68.7) | 1816.2 (943.2-3100.1) |
|  | *Prosthogonimus anatinus* | - | - |  | 3.3 (0.6-11.4) | 6.0 (1.0-6.0) |  | - | - |  | 2.6 (0.1-14.0) | 10.0 |
|  | *Sphaeridiotrema* spp. ⱡ | - | - |  | - | - |  | 54.5 (33.8-74.0) | 258.4 (107.5-577.6) |  | 71.1 (54.7-93.3) | 454.3 (236.7-909.5) |
|  | *Zygocotyle lunata* | 20.0 (3.7-55.4) | 1.0 |  | 41.7 (29.9-55.0) | 9.4 (5.0-24.4) |  | 31.8 (15.2-54.7) | 8.6 (2.3-24.9) |  | 18.4 (8.8-34.0) | 2.3 (1.4-3.1) |
| Cestoda | |  |  |  |  |  |  |  |  |  |  |  |
|  | *Anatinella* sp. | - | - |  | 1.7 (0.1-8.9) | 10.0 |  | 4.5 (0.2-22.2) | 170.0 |  | - | - |
|  | *Dicranotaenia coronula* | 50.0 (22.3-77.8) | 6.0 (2.6-10.8) |  | 40.0 (28.2-53.4) | 103.3 (51.3-210.3) |  | 45.5 (21.1-66.2) | 9.9 (5.2-17.4) |  | 39.5 (24.7-55.7) | 42.1 (17.7-122.5) |
|  | *Diorchis* sp. 1 | 30.0 (8.7-61.9) | 4.3 (1.0-7.3) |  | 40.0 (28.2-53.4) | 113.2 (58.9-289.5) |  | 40.9 (22.2-61.7) | 514.1 (93.1-1730.9) |  | 28.9 (16.7-45.3) | 118.8 (40.6-355.7) |
|  | *Diorchis* sp. 2 | 10.0 (0.5-44.4) | 10.0 |  | 28.3 (18.2-40.8) | 47.6 (25.1-101.1) |  | 40.9 (22.2-61.7) | 157.8 (17.3-702.2) |  | 28.9 (16.7-45.3) | 104.9 (26.2-383.4) |
|  | *Echinocotyle rosseteri* | - | - |  | 20.0 (11.4-32.4) | 413.9 (185.3-796.3) |  | 9.1 (1.6-29.1) | 75.0 (65.0-75.0) |  | 15.8 (7.1-32.3) | 1539.5 (81.7-5352.8) |
|  | *Fimbriaria fasciolaris* | 10.0 (0.5-44.6) | 10.0 |  | 45.0 (32.4-57.8) | 845.1 (231.2-3155.1) |  | 45.5 (26.1-66.2) | 73.4 (31.8-135.9) |  | 28.9 (16.7-45.3) | 33.9 (17.6-59.7) |
|  | *Fimbriariodes intermedia* | - | - |  | 5.0 (1.4-13.9) | 34.3 (1.0-67.3) |  | 18.2 (6.5-38.9) | 42.5 (5.5-93.8) |  | 7.9 (2.2-20.8) | 36.3 (21.0-48.3) |
|  | *Hymenolepis megalops* | - | - |  | 5.0 (1.4-13.9) | 195.0 (2.0-385.3) |  | 4.5 (0.2-22.2) | 10.0 |  | 2.6 (0.1-14.0) | 1.0 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| Table S1. Continued | | | | | | | | | | | | |
|  | Taxon | Southern Illinois  (*n* = 10) | |  | Illinois River Valley  (*n* = 60) | |  | Central Mississippi River Valley (*n* = 22) | |  | Upper Mississippi River Valley (*n* = 38) | |
|  | P | MI |  | P | MI |  | P | MI |  | P | MI |
|  | *Hymenolepis pusilla* | 90.0 (55.4-99.5) | 309.9 (140.8-757.4) |  | 78.3 (65.9-87.3) | 1343.6 (740.0-2446.8) |  | 72.7 (50.0-87.4) | 1467.8 (587.3-3326.4) |  | 71.1 (54.7-83.3) | 1618.9 (838.2-3586.9) |
|  | *Hymenolepis spinocirrosa* | 70.0 (38.1-91.3) | 576.7 (229.7-1064.0) |  | 91.7 (81.9-96.7) | 1449.1 (897.4-2430.5) |  | 77.3 (54.7-90.6) | 1211.2 (589.1-2175.6) |  | 71.1 (54.7-83.3) | 829.7 (396.9-1771.4) |
|  | *Hymenolepis tuvensis* | 20.0 (3.7-55.4) | 102.0 (100.0-102.0) |  | 23.3 (13.9-35.7) | 630.0 (209.9-1552.9) |  | 22.7 (9.4-45.3) | 556.2 (34.2-1982.4) |  | 31.6 (18.0-48.7) | 89.8 (48.8-202.7) |
|  | *Hymenolepis* spp.\* | - | - |  | 33.3 (22.3-46.6) | 248.9 (126.3-549.5) |  | 27.3 (12.6-50.0) | 232.5 (53.2-536.2) |  | 34.2 (20.8-51.3) | 113.9 (65.6-217.1) |
|  | *Retinometra macrocanthos* | 20.0 (3.7-55.4) | 20.0 |  | 40.0 (28.2-53.4) | 301.6 (155.6-640.8) |  | 36.4 (18.7-58.2) | 136.8 (45.9-281.4) |  | 21.1 (10.0-36.7) | 137.1 (55.3-314.1) |
|  | *Sobolevicanthus* sp. | 10.0 (0.5-44.6) | 7.0 |  | 23.3 (13.9-35.7) | 150.4 (42.8-548.0) |  | 18.2 (6.5-38.9) | 163.3 (8.3-465.0) |  | 26.3 (14.0-42.1) | 25.0 (8.2-53.0) |
|  | Juvenile† | - | - |  | 3.3 (0.6-11.4) | 495.5 (10.0-495.5) |  | - | - |  | - | - |
| Nematoda | |  |  |  |  |  |  |  |  |  |  |  |
|  | *Baruscapillaria obsignata* | 60.0 (29.1-85.0) | 7.7 (4.0-12.8) |  | 30.0 (19.6-42.9) | 15.0 (10.2-20.9) |  | 59.1 (38.3-77.8) | 6.8 (4.9-9.6) |  | 47.4 (31.4-63.3) | 8.6 (6.4-12.7) |
|  | *Capillaria anatis* | 50.0 (22.3-77.8) | 4.8 (2.4-7.2) |  | 66.7 (53.4-77.7) | 15.2 (11.8-21.1) |  | 40.9 (22.2-61.7) | 13.9 (7.8-20.4) |  | 57.9 (42.0-72.6) | 11.1 (7.5-17.5) |
|  | *Capillaria spinulosa* | - | - |  | 3.3 (0.6-11.4) | 3.0 (1.0-3.0) |  | - | - |  | - | - |
|  | *Capillaria* spp.\* | 10.0 (0.5-44.6) | 2.0 |  | 25.0 (15.6-37.4) | 3.9 (2.5-6.5) |  | 22.7 (9.4-45.3) | 5.2 (1.2-12.8) |  | 34.2 (20.8-51.3) | 9.4 (6.0-18.6) |
|  | *Strongyloides* sp. | 60.0 (29.1-85.0) | 19.0 (5.7-45.0) |  | 30.0 (19.6-42.9) | 42.3 (21.4-88.6) |  | 31.8 (15.2-54.7) | 62.7 (27.1-103.9) |  | 55.3 (39.4-70.4) | 294.6 (16.2-1383.0) |
| Acanthocephala | |  |  |  |  |  |  |  |  |  |  |  |
|  | *Corynosoma constrictum* | - | - |  | 6.7 (2.3-16.4) | 21.5 (5.5-37.8) |  | 4.5 (0.2-22.2) | 11.0 |  | - | - |
|  | *Polymorphus marilis* | 10.0 (0.5-44.6) | 2.0 |  | 8.3 (3.4-18.1) | 8.8 (3.2-14.6) |  | 9.1 (1.6-29.1) | 59.0 (2.0-59.0) |  | - | - |