Journal of Helminthology

*Gyrodactylus sprostonae* Ling, 1962 infects an indigenous cyprinid in southern Africa: An expanded description.

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**Supplementary Table S1**: List of *Gyrodactylus* species included in the phylogenetic analyses with their hosts, locality, GenBank accession numbers and references.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Gyrodactylus species** | **Host** | **Locality** | **Accession number** | **Reference** |
| Gyrodactylus banmae | *Danio rerio* (F. Hamilton. 1822) | China | MW353802 | Jin *et al.* (2021) |
| Gyrodactylus banmae | *Danio rerio* (F. Hamilton. 1822) | China | MW353803 | Jin *et al.* (2021) |
| Gyrodactylus cernuae | *Gymnocephalus cernuus* (Linnaeus, 1758) | Finland | AF484529 | Zietara & Lumme (2002) |
| Gyrodactylus derjavinoides | *Oncorhynchus* *mykiss* (Walbaum, 1792) | United Kingdom | AF484530 | Zietara & Lumme (2002) |
| Gyrodactylus derjavinoides | *Oncorhynchus* *mykiss* (Walbaum, 1792) | Scotland | AJ132259 | Cunningham *et al.* (2000) |
| Gyrodactylus derjavinoides | *Salmo trutta trutta* Walbaum, 1792 | Sweden | DQ357215 | Malmberg *et* *al*. (2007) |
| Gyrodactylus derjavinoides | *Salmo trutta* Linnaeus, 1758 | Poland | EF445939 | Rokicka *et al.* (2007) |
| Gyrodactylus derjavinoides | *Salmo trutta* Linnaeus, 1758 | Sweden | EF445940 | Zietara *et al.* (2010) |
| Gyrodactylus derjavinoides | *Salmo trutta* Linnaeus,1758 | Sweden | EF445941 | Zietara *et al.* (2010) |
| Gyrodactylus derjavinoides | *Salmo letnica* (Karaman, 1924) | Macedonia | EU304810 | Zietara *et al.* (2010) |
| Gyrodactylus derjavinoides | *Salmo salar* Linnaeus,1758 | United Kingdom | GQ368236 | Gilmore *et al.* (2010) |
| Gyrodactylus gurleyi | *Carassius auratus* Linnaeus,1758 | United Kingdom | AJ001842 | Cable *et al.* (1999) |
| Gyrodactylus gurleyi | *Carassius auratus* Linnaeus,1758 | China | KC922453 | Li *et al.* (2014) |
| Gyrodactylus gurleyi | *Carassius auratus* Linnaeus,1758 | China | ON117570 | Tu *et al.* 2015 |
| Gyrodactylus kobayashii | *Carassius auratus* Linnaeus,1758 | United Kingdom | AF484534 | Zietara & Lumme (2002) |
| Gyrodactylus kobayashii | *Carassius auratus* Linnaeus,1758 | Commercially imported | AJ132985 | Cable *et al.* (1999) |
| Gyrodactylus kobayashii | *Carassius carassius* (Linnaeus, 1758) | Poland | AY278042 | Zietara & Lumme (2004) |
| Gyrodactylus kobayashii | *Carassius auratus* Linnaeus,1758 | China | KC922452 | Li *et al.* (2014) |
| Gyrodactylus kobayashii | *Carassius auratus* Linnaeus,1758 | China | KJ524572 | Tu *et al.* 2015 |
| 1 | *Carassius auratus* Linnaeus,1758 | China | KJ755085 | Tu *et al.* 2015 |
| Gyrodactylus kobayashii | *Carassius auratus* Linnaeus,1758 | China | KJ755086 | Tu *et al.* 2015 |
| Gyrodactylus kobayashii | *Carassius auratus* Linnaeus,1758 | China | ON117569 | Unpublished |
| Gyrodactylus longiradix | *Gymnocephalus cernuus* (Linnaeus, 1758) | Finland | AF484538 | Zietara & Lumme (2002) |
| Gyrodactylus longoacuminatus | *Carassius carassius* (Linnaeus, 1758) | Poland | AY278043 | Zietara & Lumme (2004) |
| Gyrodactylus longoacuminatus | *Carassius auratus* Linnaeus,1758 | China | KC922451 | Li *et al.* (2014) |
| Gyrodactylus longoacuminatus | *Carassius auratus* Linnaeus,1758 | China | ON117571 | Unpublished |
| Gyrodactylus luciopercae | *Perca fluviatilis* Linnaeus, 1758 | Finland | AF484540 | Zietara & Lumme (2002) |
| Gyrodactylus luciopercae | *Perca fluviatilis* Linnaeus, 1758 | Finland | AF484541 | Zietara & Lumme (2002) |
| Gyrodactylus pomeraniae x Gyrodactylus lavareti | *Oncorhynchus* *mykiss* (Walbaum, 1792) | Finland | EF143067 | Kuusela *et al.* (2008) |
| Gyrodactylus pomeraniae x Gyrodactylus lavareti | *Oncorhynchus* *mykiss* (Walbaum, 1792) | Finland | EF143068 | Kuusela *et al.* (2008) |
| Gyrodactylus pomeraniae x Gyrodactylus lavareti | *Oncorhynchus* *mykiss* (Walbaum, 1792) | Finland | EF143069 | Kuusela *et al.* (2008) |
| Gyrodactylus salaris | *Oncorhynchus mykiss* (Walbaum, 1792) | Denmark | AJ515912 | Lindenstrøm *et al.* (2003) |
| Gyrodactylus salaris | *Oncorhynchus mykiss* (Walbaum, 1792) | Denmark | DQ823390 | Kania *et al.* (2007) |
| Gyrodactylus salaris | *Salvelinus alpinus* (Linnaeus, 1758) | Norway | DQ898302 | Robertson *et al.* (2007) |
| Gyrodactylus salaris | *Oncorhynchus mykiss* (Walbaum, 1792) | Poland | EF464677 | Zietara *et al.* (2010) |
| Gyrodactylus salaris | *Oncorhynchus mykiss* (Walbaum, 1792) | Russia | KM192262 | Ieshko *et al.* (2014) |
| Gyrodactylus salaris | *Oncorhynchus mykiss* (Walbaum, 1792) | Russia | MW819706 | Hansen *et al.* (2022) |
| Gyrodactylus salaris | *Salmo salar* Linnaeus,1758 | Norway | Z72477 | Cunningham *et al.* (1997) |
| Gyrodactylus salmonis | *Salvelinus alpinus* (Linnaeus, 1758) | Finland | EF113106 | Kuusela *et al.* (2008) |
| Gyrodactylus salmonis | *Oncorhynchus mykiss* (Walbaum, 1792) | United States of America | GQ368233 | Gilmore *et al.* (2010) |
| Gyrodactylus salmonis | *Oncorhynchus mykiss* (Walbaum, 1792) | Mexico | JN230351 | Rubio-Godoy *et al.* (2012) |
| Gyrodactylus salmonis | *Oncorhynchus mykiss* (Walbaum, 1792) | United States of America | MN850538 | Leis *et al.* (2021) |
| Gyrodactylus salmonis | *Oncorhynchus mykiss* (Walbaum, 1792) | United States of America | MN850539 | Leis *et al.* (2021) |
| Gyrodactylus salmonis | *Oncorhynchus mykiss* (Walbaum, 1792) | United States of America | MN850540 | Leis *et al.* (2021) |
| Gyrodactylus salmonis | *Oncorhynchus mykiss* (Walbaum, 1792) | United States of America | MN850541 | Leis *et al.* (2021) |
| Gyrodactylus salmonis | *Oncorhynchus mykiss* (Walbaum, 1792) | United States of America | MN850542 | Leis *et al.* (2021) |
| Gyrodactylus salmonis | *Oncorhynchus mykiss* (Walbaum, 1792) | United States of America | MN850543 | Leis *et al.* (2021) |
| Gyrodactylus salmonis | *Oncorhynchus mykiss* (Walbaum, 1792) | United States of America | MN850544 | Leis *et al.* (2021) |
| Gyrodactylus sp.\_1\_JWC-2022 | *Carassius auratus* Linnaeus,1758 | China | ON117567 | Unpublished |
| Gyrodactylus sp.\_2\_JWC-2022 | *Carassius auratus* Linnaeus,1758 | China | ON117568 | Unpublished |
| Gyrodactylus sprostonae | *Carassius* *gibelio* (Bloch, 1782) | Poland | AY278044 | Zietara & Lumme (2004) |
| Gyrodactylus sprostonae | *Carassius auratus* Linnaeus,1758 | China | KP295469 | Unpublished |
| Gyrodactylus sprostonae | *Hypophthalmichthys* *nobilis* (Richardson, 1845) | China | KT346368 | Unpublished |
| Gyrodactylus teuchis | *Oncorhynchus mykiss* (Walbaum, 1792) | France | AJ249350 | Cunningham *et al.* (2001) |
| Gyrodactylus teuchis | *Salmo trutta* Linnaeus,1758 | Austria | JN628863 | Hahn *et al.* (2011) |
| Gyrodactylus teuchis | *Salmo trutta* Linnaeus,1758 | Austria | JN628864 | Hahn *et al.* (2011) |
| Gyrodactylus teuchis | *Oncorhynchus mykiss* (Walbaum, 1792) | Portugal | MN853657 | Paladini *et al.* (2021) |

**Supplementary Table S2**: Genetic distance between *Gyrodactylus sprostonae* Ling, 1962 from the present study and other *Gyrodactylus* species from GenBank based on ITS rDNA. The number of base pair differences is above the diagonal and uncorrected *p-*distances (%) below. Intraspecific distances are shaded in blue.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **GenBank accession number** | **Gyrodactylus species** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** | **15** | **16** |
| **1** | XXXXXXXX | ***Gyrodactylus******sprostonae*** |  | **4** | **2** | **1** | **184** | **183** | **186** | **185** | **168** | **185** | **184** | **187** | **185** | **182** | **185** | **161** |
| **2** | KP295469 | *Gyrodactylus sprostonae* | **0.00** |  | **7** | 3 | 186 | 185 | 188 | 187 | 170 | 187 | 186 | 188 | 186 | 183 | 186 | 163 |
| **3** | KT346368 | *Gyrodactylus sprostonae* | **0.00** | **0.01** |  | 3 | 186 | 188 | 191 | 189 | 172 | 190 | 189 | 191 | 189 | 186 | 189 | 163 |
| **4** | AY278044 | *Gyrodactylus sprostonae* | **0.00** | **0.00** | **0.00** |  | 185 | 184 | 187 | 186 | 169 | 186 | 185 | 188 | 186 | 183 | 186 | 162 |
| **5** | MW819706 | *Gyrodactylus salaris* | **0.18** | 0.18 | 0.18 | 0.18 |  | 2 | 3 | 4 | 5 | 3 | 2 | 117 | 118 | 112 | 119 | 95 |
| **6** | AJ515912 | *Gyrodactylus salaris* | **0.17** | 0.17 | 0.17 | 0.17 | 0.00 |  | 1 | 2 | 0 | 1 | 0 | 113 | 114 | 108 | 115 | 93 |
| **7** | DQ823390 | *Gyrodactylus salaris* | **0.17** | 0.17 | 0.17 | 0.17 | 0.00 | 0.00 |  | 3 | 4 | 0 | 1 | 117 | 118 | 112 | 119 | 96 |
| **8** | KM192262 | *Gyrodactylus salaris* | **0.17** | 0.17 | 0.18 | 0.17 | 0.00 | 0.00 | 0.00 |  | 5 | 3 | 2 | 116 | 117 | 111 | 118 | 95 |
| **9** | EF464677 | *Gyrodactylus salaris* | **0.16** | 0.17 | 0.17 | 0.16 | 0.00 | 0.00 | 0.00 | 0.00 |  | 4 | 3 | 106 | 107 | 102 | 108 | 89 |
| **12** | DQ898302 | *Gyrodactylus salaris* | **0.17** | 0.17 | 0.17 | 0.17 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |  | 1 | 117 | 118 | 112 | 119 | 96 |
| **11** | Z72477 | *Gyrodactylus salaris* | **0.17** | 0.17 | 0.17 | 0.17 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |  | 116 | 117 | 111 | 118 | 95 |
| **12** | AF484538 | *Gyrodactylus longiradix* | **0.17** | 0.17 | 0.18 | 0.17 | 0.10 | 0.09 | 0.10 | 0.09 | 0.09 | 0.10 | 0.09 |  | 6 | 24 | 7 | 100 |
| **13** | AF484540 | *Gyrodactylus luciopercae* | **0.17** | 0.17 | 0.18 | 0.17 | 0.10 | 0.09 | 0.10 | 0.10 | 0.09 | 0.10 | 0.10 | 0.00 |  | 26 | 1 | 102 |
| **14** | AF484529 | *Gyrodactylus cernuae* | **0.17** | 0.17 | 0.17 | 0.17 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.02 | 0.02 |  | 27 | 96 |
| **15** | AF484541 | *Gyrodactylus luciopercae* | **0.17** | 0.17 | 0.18 | 0.17 | 0.10 | 0.09 | 0.10 | 0.10 | 0.09 | 0.10 | 0.10 | 0.01 | 0.00 | 0.02 |  | 103 |
| **16** | GQ368236 | *Gyrodactylus derjavinoides* | **0.16** | 0.16 | 0.16 | 0.16 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.09 | 0.09 | 0.08 | 0.09 |  |
| **17** | MN853657 | *Gyrodactylus teuchis* | **0.15** | 0.15 | 0.15 | 0.16 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 | 0.08 | 0.08 | 0.08 | 0.09 | 0.07 |
| **18** | AJ249350 | *Gyrodactylus teuchis* | **0.20** | 0.20 | 0.20 | 0.20 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.10 | 0.10 | 0.10 | 0.10 | 0.09 |
| **19** | JN628864 | *Gyrodactylus teuchis* | **0.21** | 0.21 | 0.21 | 0.21 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.10 | 0.10 | 0.10 | 0.10 | 0.09 |
| **20** | JN628863 | *Gyrodactylus teuchis* | **0.21** | 0.21 | 0.21 | 0.21 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.10 | 0.10 | 0.10 | 0.10 | 0.09 |
| **21** | AF484530 | *Gyrodactylus derjavinoides* | **0.16** | 0.16 | 0.17 | 0.16 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.09 | 0.09 | 0.08 | 0.09 | 0.00 |
| **22** | EF445940 | *Gyrodactylus derjavinoides* | **0.16** | 0.16 | 0.17 | 0.16 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.09 | 0.09 | 0.08 | 0.09 | 0.00 |
| **23** | DQ357215 | *Gyrodactylus derjavinoides* | **0.16** | 0.16 | 0.16 | 0.16 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.09 | 0.09 | 0.08 | 0.09 | 0.00 |
| **24** | EF445941 | *Gyrodactylus derjavinoides* | **0.16** | 0.16 | 0.17 | 0.16 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.09 | 0.09 | 0.08 | 0.09 | 0.00 |
| **25** | EU304810 | *Gyrodactylus derjavinoides* | **0.16** | 0.16 | 0.16 | 0.16 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.09 | 0.08 | 0.09 | 0.00 |
| **26** | EF445939 | *Gyrodactylus derjavinoides* | **0.16** | 0.16 | 0.17 | 0.16 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.09 | 0.09 | 0.08 | 0.09 | 0.00 |
| **27** | AJ132259 | *Gyrodactylus derjavinoides* | **0.16** | 0.16 | 0.16 | 0.16 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.09 | 0.09 | 0.08 | 0.09 | 0.00 |
| **28** | MN850538 | *Gyrodactylus salmonis* | **0.20** | 0.20 | 0.20 | 0.20 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.10 | 0.10 | 0.10 | 0.10 | 0.08 |
| **29** | EF113106 | *Gyrodactylus salmonis* | **0.20** | 0.20 | 0.20 | 0.20 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.10 | 0.10 | 0.10 | 0.10 | 0.08 |
| **30** | MN850539 | *Gyrodactylus salmonis* | **0.20** | 0.20 | 0.20 | 0.20 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.10 | 0.10 | 0.10 | 0.10 | 0.08 |
| **31** | MN850540 | *Gyrodactylus salmonis* | **0.20** | 0.20 | 0.20 | 0.20 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.10 | 0.10 | 0.10 | 0.10 | 0.08 |
| **32** | MN850541 | *Gyrodactylus salmonis* | **0.20** | 0.20 | 0.20 | 0.20 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.10 | 0.10 | 0.10 | 0.10 | 0.08 |
| **33** | MN850542 | *Gyrodactylus salmonis* | **0.20** | 0.20 | 0.20 | 0.20 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.10 | 0.10 | 0.10 | 0.10 | 0.08 |
| **34** | JN230351 | *Gyrodactylus salmonis* | **0.20** | 0.20 | 0.20 | 0.20 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.11 | 0.11 | 0.10 | 0.11 | 0.08 |
| **35** | EF143069 | *Gyrodactylus pomeraniae x Gyrodactylus lavareti* | **0.20** | 0.20 | 0.21 | 0.20 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.11 | 0.11 | 0.11 | 0.11 | 0.08 |
| **36** | EF143068 | *Gyrodactylus pomeraniae x Gyrodactylus lavareti* | **0.20** | 0.20 | 0.20 | 0.20 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.10 | 0.10 | 0.10 | 0.10 | 0.08 |
| **37** | EF143067 | *Gyrodactylus pomeraniae x Gyrodactylus lavareti* | **0.19** | 0.19 | 0.19 | 0.19 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.09 | 0.10 | 0.09 | 0.10 | 0.07 |
| **38** | MN850544 | *Gyrodactylus salmonis* | **0.20** | 0.20 | 0.20 | 0.20 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.10 | 0.10 | 0.10 | 0.10 | 0.08 |
| **39** | MN850543 | *Gyrodactylus salmonis* | **0.20** | 0.20 | 0.20 | 0.20 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.10 | 0.10 | 0.10 | 0.10 | 0.08 |
| **40** | GQ368233 | *Gyrodactylus salmonis* | **0.20** | 0.19 | 0.20 | 0.20 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.10 | 0.10 | 0.10 | 0.10 | 0.08 |
| **41** | MW353802 | *Gyrodactylus banmae* | **0.17** | 0.17 | 0.17 | 0.17 | 0.18 | 0.18 | 0.18 | 0.18 | 0.17 | 0.18 | 0.18 | 0.19 | 0.19 | 0.19 | 0.19 | 0.18 |
| **42** | MW353803 | *Gyrodactylus banmae* | **0.17** | 0.17 | 0.17 | 0.17 | 0.18 | 0.18 | 0.18 | 0.18 | 0.17 | 0.18 | 0.18 | 0.19 | 0.19 | 0.19 | 0.19 | 0.18 |
| **43** | ON117567 | *Gyrodactylus*\_sp.\_1\_JWC-2022 | **0.17** | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.16 | 0.17 | 0.17 | 0.18 | 0.18 | 0.18 | 0.18 | 0.17 |
| **44** | AY278043 | *Gyrodactylus* *longoacuminatus* | **0.17** | 0.17 | 0.17 | 0.17 | 0.19 | 0.19 | 0.19 | 0.19 | 0.17 | 0.19 | 0.19 | 0.19 | 0.19 | 0.19 | 0.19 | 0.18 |
| **45** | KC922451 | *Gyrodactylus* *longoacuminatus* | **0.17** | 0.17 | 0.17 | 0.17 | 0.19 | 0.18 | 0.19 | 0.19 | 0.18 | 0.19 | 0.18 | 0.19 | 0.19 | 0.19 | 0.19 | 0.18 |
| **46** | ON117571 | *Gyrodactylus* *longoacuminatus* | **0.17** | 0.17 | 0.17 | 0.17 | 0.18 | 0.18 | 0.18 | 0.18 | 0.16 | 0.18 | 0.18 | 0.18 | 0.18 | 0.18 | 0.18 | 0.17 |
| **47** | AY278042 | *Gyrodactylus kobayashii* | **0.16** | 0.17 | 0.17 | 0.16 | 0.21 | 0.20 | 0.21 | 0.21 | 0.19 | 0.21 | 0.21 | 0.20 | 0.20 | 0.20 | 0.20 | 0.21 |
| **48** | AF484534 | *Gyrodactylus kobayashii* | **0.16** | 0.17 | 0.17 | 0.16 | 0.21 | 0.20 | 0.21 | 0.21 | 0.19 | 0.21 | 0.21 | 0.20 | 0.20 | 0.20 | 0.20 | 0.21 |
| **49** | KJ524572 | *Gyrodactylus kobayashii* | **0.17** | 0.18 | 0.17 | 0.17 | 0.21 | 0.21 | 0.22 | 0.21 | 0.20 | 0.22 | 0.21 | 0.21 | 0.21 | 0.21 | 0.21 | 0.21 |
| **50** | AJ132985 | *Gyrodactylus kobayashii* | **0.16** | 0.16 | 0.17 | 0.17 | 0.21 | 0.20 | 0.20 | 0.21 | 0.20 | 0.20 | 0.20 | 0.20 | 0.21 | 0.20 | 0.21 | 0.21 |
| **51** | KC922452 | *Gyrodactylus kobayashii* | **0.16** | 0.16 | 0.16 | 0.16 | 0.21 | 0.20 | 0.20 | 0.20 | 0.19 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.21 |
| **52** | ON117569 | *Gyrodactylus kobayashii* | **0.17** | 0.17 | 0.17 | 0.17 | 0.21 | 0.21 | 0.21 | 0.21 | 0.19 | 0.21 | 0.21 | 0.20 | 0.20 | 0.20 | 0.20 | 0.21 |
| **53** | KJ755086 | *Gyrodactylus kobayashii* | **0.17** | 0.18 | 0.18 | 0.17 | 0.22 | 0.23 | 0.23 | 0.22 | 0.21 | 0.23 | 0.23 | 0.22 | 0.22 | 0.22 | 0.22 | 0.21 |
| **54** | ON755086 | *Gyrodactylus*\_sp.\_2\_JWC-2022 | **0.18** | 0.18 | 0.18 | 0.18 | 0.22 | 0.22 | 0.22 | 0.22 | 0.20 | 0.22 | 0.22 | 0.21 | 0.22 | 0.22 | 0.22 | 0.21 |
| **55** | ON117570 | *Gyrodactylus gurleyi* | **0.18** | 0.19 | 0.18 | 0.18 | 0.22 | 0.22 | 0.22 | 0.22 | 0.21 | 0.22 | 0.22 | 0.22 | 0.22 | 0.22 | 0.22 | 0.22 |
| **56** | KC922452 | *Gyrodactylus gurleyi* | **0.18** | 0.18 | 0.18 | 0.18 | 0.22 | 0.21 | 0.21 | 0.22 | 0.20 | 0.21 | 0.21 | 0.21 | 0.22 | 0.21 | 0.22 | 0.22 |
| **57** | AJ001842 | *Gyrodactylus gurleyi* | **0.18** | 0.18 | 0.18 | 0.19 | 0.23 | 0.22 | 0.22 | 0.22 | 0.21 | 0.22 | 0.22 | 0.22 | 0.22 | 0.22 | 0.22 | 0.22 |
| **58** | KJ755085 | *Gyrodactylus kobayashii* | **0.18** | 0.20 | 0.19 | 0.19 | 0.23 | 0.24 | 0.24 | 0.23 | 0.22 | 0.24 | 0.24 | 0.23 | 0.23 | 0.23 | 0.23 | 0.22 |

**Supplementary table S2** continued:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **GenBank accession number** | **Gyrodactylus species** | **17** | **18** | **19** | **20** | **21** | **22** | **23** | **24** | **25** | **26** | **27** | **28** | **29** | **30** | **31** | **32** |
| **1** | **XXXXXXXX** | ***Gyrodactylus sprostonae*** | **152** | **229** | **228** | **229** | **169** | **169** | **169** | **169** | **168** | **169** | **169** | **221** | **221** | **221** | **221** | **221** |
| **2** | KP295469 | *Gyrodactylus sprostonae* | 155 | 231 | 230 | 231 | 171 | 171 | 171 | 171 | 170 | 171 | 171 | 222 | 222 | 222 | 222 | 222 |
| **3** | KT346368 | *Gyrodactylus sprostonae* | 155 | 234 | 230 | 231 | 173 | 173 | 172 | 173 | 172 | 173 | 174 | 225 | 225 | 225 | 225 | 225 |
| **4** | AY278044 | *Gyrodactylus sprostonae* | 153 | 230 | 229 | 230 | 170 | 170 | 170 | 170 | 169 | 170 | 170 | 222 | 222 | 222 | 222 | 222 |
| **5** | MW819706 | *Gyrodactylus salaris* | 74 | 230 | 229 | 230 | 170 | 170 | 170 | 170 | 169 | 170 | 170 | 222 | 222 | 222 | 222 | 222 |
| **6** | AJ515912 | *Gyrodactylus salaris* | 73 | 110 | 109 | 109 | 93 | 93 | 93 | 93 | 92 | 92 | 93 | 105 | 105 | 105 | 105 | 105 |
| **7** | DQ823390 | *Gyrodactylus salaris* | 75 | 113 | 112 | 112 | 96 | 96 | 96 | 96 | 95 | 95 | 96 | 107 | 107 | 107 | 107 | 107 |
| **8** | KM192262 | *Gyrodactylus salaris* | 75 | 113 | 112 | 112 | 95 | 95 | 95 | 95 | 94 | 94 | 95 | 107 | 107 | 107 | 107 | 107 |
| **9** | EF464677 | *Gyrodactylus salaris* | 70 | 107 | 106 | 106 | 89 | 89 | 89 | 89 | 88 | 88 | 89 | 102 | 102 | 102 | 102 | 102 |
| **12** | DQ898302 | *Gyrodactylus salaris* | 75 | 113 | 112 | 112 | 96 | 96 | 96 | 96 | 95 | 95 | 96 | 107 | 107 | 107 | 107 | 107 |
| **11** | Z72477 | *Gyrodactylus salaris* | 74 | 112 | 111 | 111 | 95 | 95 | 95 | 95 | 94 | 94 | 95 | 106 | 106 | 106 | 106 | 106 |
| **12** | AF484538 | *Gyrodactylus longiradix* | 91 | 126 | 123 | 124 | 102 | 102 | 102 | 102 | 101 | 102 | 102 | 125 | 125 | 125 | 125 | 125 |
| **13** | AF484540 | *Gyrodactylus luciopercae* | 92 | 126 | 123 | 124 | 105 | 105 | 105 | 105 | 104 | 104 | 105 | 125 | 125 | 125 | 125 | 125 |
| **14** | AF484529 | *Gyrodactylus cernuae* | 85 | 119 | 116 | 117 | 99 | 99 | 99 | 99 | 98 | 99 | 99 | 123 | 123 | 123 | 123 | 123 |
| **15** | AF484541 | *Gyrodactylus luciopercae* | 93 | 127 | 124 | 125 | 106 | 106 | 106 | 106 | 105 | 105 | 126 | 126 | 126 | 126 | 126 | 126 |
| **16** | GQ368236 | *Gyrodactylus derjavinoides* | 79 | 105 | 103 | 103 | 2 | 2 | 2 | 2 | 1 | 1 | 2 | 93 | 93 | 93 | 93 | 93 |
| **17** | MN853657 | *Gyrodactylus teuchis* |  | 5 | 4 | 4 | 82 | 82 | 82 | 82 | 81 | 81 | 82 | 78 | 78 | 78 | 78 | 78 |
| **18** | AJ249350 | *Gyrodactylus teuchis* | 0.00 |  | 2 | 2 | 109 | 109 | 109 | 109 | 108 | 108 | 109 | 122 | 122 | 122 | 122 | 122 |
| **19** | JN628864 | *Gyrodactylus teuchis* | 0.00 | 0.00 |  | 0 | 107 | 107 | 107 | 107 | 106 | 106 | 107 | 123 | 123 | 123 | 123 | 123 |
| **20** | JN628863 | *Gyrodactylus teuchis* | 0.00 | 0.00 | 0.00 |  | 107 | 107 | 107 | 107 | 106 | 106 | 107 | 123 | 123 | 123 | 123 | 123 |
| **21** | AF484530 | *Gyrodactylus derjavinoides* | 0.08 | 0.09 | 0.09 | 0.09 |  | 0 | 0 | 0 | 0 | 1 | 0 | 95 | 95 | 95 | 95 | 95 |
| **22** | EF445940 | *Gyrodactylus derjavinoides* | 0.08 | 0.09 | 0.09 | 0.09 | 0.00 |  | 0 | 0 | 0 | 1 | 0 | 95 | 95 | 95 | 95 | 95 |
| **23** | DQ357215 | *Gyrodactylus derjavinoides* | 0.08 | 0.09 | 0.09 | 0.09 | 0.00 | 0.00 |  | 0 | 0 | 1 | 0 | 95 | 95 | 95 | 95 | 95 |
| **24** | EF445941 | *Gyrodactylus derjavinoides* | 0.08 | 0.09 | 0.09 | 0.09 | 0.00 | 0.00 | 0.00 |  | 0 | 1 | 0 | 95 | 95 | 95 | 95 | 95 |
| **25** | EU304810 | *Gyrodactylus derjavinoides* | 0.08 | 0.09 | 0.09 | 0.09 | 0.00 | 0.00 | 0.00 | 0.00 |  | 0 | 0 | 94 | 94 | 94 | 94 | 94 |
| **26** | EF445939 | *Gyrodactylus derjavinoides* | 0.08 | 0.09 | 0.09 | 0.09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |  | 1 | 95 | 95 | 95 | 95 | 95 |
| **27** | AJ132259 | *Gyrodactylus derjavinoides* | 0.07 | 0.09 | 0.09 | 0.09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |  | 95 | 95 | 95 | 95 | 95 |
| **28** | MN850538 | *Gyrodactylus salmonis* | 0.07 | 0.10 | 0.10 | 0.10 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 |  | 0 | 0 | 0 | 0 |
| **29** | EF113106 | *Gyrodactylus salmonis* | 0.07 | 0.10 | 0.10 | 0.10 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.00 |  | 0 | 0 | 0 |
| **30** | MN850539 | *Gyrodactylus salmonis* | 0.07 | 0.10 | 0.10 | 0.10 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.00 | 0.00 |  | 0 | 0 |
| **31** | MN850540 | *Gyrodactylus salmonis* | 0.07 | 0.10 | 0.10 | 0.10 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.00 | 0.00 | 0.00 |  | 0 |
| **32** | MN850541 | *Gyrodactylus salmonis* | 0.07 | 0.10 | 0.10 | 0.10 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 |  |
| **33** | MN850542 | *Gyrodactylus salmonis* | 0.07 | 0.10 | 0.10 | 0.10 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **34** | JN230351 | *Gyrodactylus salmonis* | 0.07 | 0.10 | 0.10 | 0.10 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **35** | EF143069 | *Gyrodactylus pomeraniae x Gyrodactylus lavareti* | 0.08 | 0.10 | 0.10 | 0.10 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| **36** | EF143068 | *Gyrodactylus pomeraniae x Gyrodactylus lavareti* | 0.07 | 0.09 | 0.09 | 0.09 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| **37** | EF143067 | *Gyrodactylus pomeraniae x Gyrodactylus lavareti* | 0.07 | 0.08 | 0.09 | 0.09 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **38** | MN850544 | *Gyrodactylus salmonis* | 0.07 | 0.10 | 0.10 | 0.10 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **39** | MN850543 | *Gyrodactylus salmonis* | 0.07 | 0.10 | 0.10 | 0.10 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **40** | GQ368233 | *Gyrodactylus salmonis* | 0.07 | 0.09 | 0.10 | 0.10 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **41** | MW353802 | *Gyrodactylus banmae* | 0.15 | 0.19 | 0.19 | 0.19 | 0.18 | 0.18 | 0.18 | 0.18 | 0.18 | 0.18 | 0.18 | 0.18 | 0.18 | 0.18 | 0.18 | 0.18 |
| **42** | MW353803 | *Gyrodactylus banmae* | 0.15 | 0.19 | 0.19 | 0.19 | 0.18 | 0.18 | 0.18 | 0.18 | 0.18 | 0.18 | 0.18 | 0.18 | 0.18 | 0.18 | 0.18 | 0.18 |
| **43** | ON117567 | *Gyrodactylus*\_sp.\_1\_JWC-2022 | 0.15 | 0.18 | 0.18 | 0.19 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 |
| **44** | AY278043 | *Gyrodactylus* *longoacuminatus* | 0.17 | 0.22 | 0.22 | 0.22 | 0.18 | 0.18 | 0.18 | 0.18 | 0.18 | 0.18 | 0.18 | 0.19 | 0.19 | 0.19 | 0.19 | 0.19 |
| **45** | KC922451 | *Gyrodactylus* *longoacuminatus* | 0.17 | 0.22 | 0.23 | 0.23 | 0.18 | 0.18 | 0.18 | 0.18 | 0.18 | 0.18 | 0.18 | 0.19 | 0.19 | 0.19 | 0.19 | 0.19 |
| **46** | ON117571 | *Gyrodactylus* *longoacuminatus* | 0.16 | 0.21 | 0.21 | 0.21 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.18 | 0.18 | 0.18 | 0.18 | 0.18 |
| **47** | AY278042 | *Gyrodactylus kobayashii* | 0.19 | 0.23 | 0.24 | 0.24 | 0.21 | 0.21 | 0.21 | 0.21 | 0.21 | 0.21 | 0.21 | 0.22 | 0.22 | 0.22 | 0.22 | 0.22 |
| **48** | AF484534 | *Gyrodactylus kobayashii* | 0.19 | 0.23 | 0.24 | 0.24 | 0.21 | 0.21 | 0.21 | 0.21 | 0.21 | 0.21 | 0.21 | 0.22 | 0.22 | 0.22 | 0.22 | 0.22 |
| **49** | KJ524572 | *Gyrodactylus kobayashii* | 0.19 | 0.24 | 0.24 | 0.24 | 0.21 | 0.21 | 0.21 | 0.21 | 0.21 | 0.21 | 0.22 | 0.23 | 0.23 | 0.23 | 0.23 | 0.23 |
| **50** | AJ132985 | *Gyrodactylus kobayashii* | 0.18 | 0.23 | 0.24 | 0.24 | 0.21 | 0.21 | 0.21 | 0.21 | 0.21 | 0.21 | 0.20 | 0.23 | 0.23 | 0.23 | 0.23 | 0.23 |
| **51** | KC922452 | *Gyrodactylus kobayashii* | 0.18 | 0.23 | 0.24 | 0.24 | 0.21 | 0.21 | 0.20 | 0.21 | 0.21 | 0.21 | 0.20 | 0.22 | 0.22 | 0.22 | 0.22 | 0.22 |
| **52** | ON117569 | *Gyrodactylus kobayashii* | 0.19 | 0.24 | 0.24 | 0.24 | 0.21 | 0.21 | 0.21 | 0.21 | 0.20 | 0.21 | 0.21 | 0.23 | 0.23 | 0.23 | 0.23 | 0.23 |
| **53** | KJ755086 | *Gyrodactylus kobayashii* | 0.19 | 0.25 | 0.25 | 0.25 | 0.22 | 0.22 | 0.22 | 0.22 | 0.22 | 0.22 | 0.23 | 0.24 | 0.24 | 0.24 | 0.24 | 0.24 |
| **54** | ON755086 | *Gyrodactylus*\_sp.\_2\_JWC-2022 | 0.20 | 0.25 | 0.25 | 0.26 | 0.21 | 0.21 | 0.21 | 0.21 | 0.21 | 0.21 | 0.21 | 0.23 | 0.23 | 0.23 | 0.23 | 0.23 |
| **55** | ON117570 | *Gyrodactylus gurleyi* | 0.21 | 0.26 | 0.26 | 0.26 | 0.21 | 0.21 | 0.21 | 0.21 | 0.21 | 0.21 | 0.21 | 0.23 | 0.23 | 0.23 | 0.23 | 0.23 |
| **56** | KC922452 | *Gyrodactylus gurleyi* | 0.20 | 0.25 | 0.26 | 0.26 | 0.21 | 0.21 | 0.21 | 0.21 | 0.21 | 0.21 | 0.21 | 0.23 | 0.23 | 0.23 | 0.23 | 0.23 |
| **57** | AJ001842 | *Gyrodactylus gurleyi* | 0.20 | 0.26 | 0.26 | 0.26 | 0.22 | 0.22 | 0.22 | 0.22 | 0.22 | 0.22 | 0.21 | 0.23 | 0.23 | 0.23 | 0.23 | 0.23 |
| **58** | KJ755085 | *Gyrodactylus kobayashii* | 0.20 | 0.27 | 0.26 | 0.26 | 0.23 | 0.23 | 0.23 | 0.23 | 0.23 | 0.23 | 0.24 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 |

**Supplementary table S2** continued:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | GenBank accession number | *Gyrodactylus* species | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 |
| 1 |  | ***Gyrodactylus sprostonae*** | **220** | **219** | **228** | **218** | **207** | **220** | **220** | **221** | **175** | **174** | **169** | **189** | **134** | **171** | **181** | **181** |
| 2 | KP295469 | *Gyrodactylus sprostonae* | 221 | 220 | 229 | 219 | 208 | 221 | 221 | 222 | 175 | 174 | 169 | 189 | 195 | 171 | 185 | 185 |
| 3 | KT346368 | *Gyrodactylus sprostonae* | 224 | 221 | 232 | 222 | 211 | 224 | 224 | 226 | 176 | 175 | 170 | 190 | 176 | 170 | 185 | 185 |
| 4 | AY278044 | *Gyrodactylus sprostonae* | 221 | 220 | 229 | 219 | 208 | 221 | 221 | 222 | 175 | 174 | 169 | 188 | 193 | 170 | 182 | 182 |
| 5 | MW819706 | *Gyrodactylus salaris* | 106 | 106 | 108 | 105 | 91 | 106 | 106 | 106 | 184 | 189 | 165 | 195 | 198 | 171 | 233 | 233 |
| 6 | AJ515912 | *Gyrodactylus salaris* | 105 | 105 | 107 | 104 | 90 | 105 | 105 | 105 | 186 | 187 | 166 | 198 | 202 | 171 | 230 | 230 |
| 7 | DQ823390 | *Gyrodactylus salaris* | 107 | 107 | 109 | 106 | 92 | 107 | 107 | 107 | 188 | 189 | 168 | 201 | 205 | 174 | 233 | 233 |
| 8 | KM192262 | *Gyrodactylus salaris* | 107 | 107 | 109 | 106 | 92 | 107 | 107 | 107 | 187 | 188 | 167 | 199 | 202 | 172 | 232 | 232 |
| 9 | EF464677 | *Gyrodactylus salaris* | 102 | 102 | 104 | 100 | 87 | 102 | 102 | 102 | 173 | 174 | 152 | 177 | 180 | 150 | 210 | 210 |
| 10 | DQ898302 | *Gyrodactylus salaris* | 107 | 107 | 109 | 105 | 92 | 107 | 107 | 107 | 188 | 189 | 168 | 201 | 205 | 174 | 233 | 233 |
| 11 | Z72477 | *Gyrodactylus salaris* | 106 | 106 | 108 | 104 | 91 | 106 | 106 | 106 | 187 | 188 | 167 | 200 | 204 | 173 | 232 | 232 |
| 12 | AF484538 | *Gyrodactylus longiradix* | 124 | 124 | 130 | 123 | 112 | 124 | 124 | 125 | 200 | 200 | 178 | 202 | 205 | 176 | 228 | 228 |
| 13 | AF484540 | *Gyrodactylus luciopercae* | 124 | 124 | 131 | 125 | 113 | 124 | 124 | 125 | 200 | 200 | 178 | 201 | 204 | 175 | 230 | 230 |
| 14 | AF484529 | *Gyrodactylus cernuae* | 122 | 122 | 128 | 121 | 110 | 122 | 122 | 123 | 197 | 197 | 176 | 201 | 204 | 146 | 228 | 228 |
| 15 | AF484541 | *Gyrodactylus luciopercae* | 125 | 125 | 132 | 126 | 114 | 125 | 125 | 126 | 200 | 200 | 178 | 202 | 205 | 176 | 230 | 230 |
| 16 | GQ368236 | *Gyrodactylus derjavinoides* | 93 | 93 | 95 | 90 | 83 | 93 | 93 | 93 | 184 | 184 | 170 | 181 | 183 | 164 | 227 | 227 |
| 17 | MN853657 | *Gyrodactylus teuchis* | 78 | 76 | 81 | 77 | 68 | 78 | 78 | 78 | 143 | 142 | 135 | 165 | 167 | 150 | 188 | 188 |
| 18 | AJ249350 | *Gyrodactylus teuchis* | 121 | 120 | 124 | 115 | 103 | 121 | 121 | 122 | 206 | 205 | 188 | 245 | 249 | 218 | 277 | 277 |
| 19 | JN628864 | *Gyrodactylus teuchis* | 122 | 121 | 125 | 116 | 104 | 122 | 122 | 123 | 201 | 205 | 188 | 245 | 248 | 218 | 277 | 277 |
| 20 | JN628863 | *Gyrodactylus teuchis* | 122 | 121 | 125 | 116 | 104 | 122 | 122 | 123 | 207 | 206 | 189 | 246 | 249 | 219 | 278 | 278 |
| 21 | AF484530 | *Gyrodactylus derjavinoides* | 95 | 95 | 97 | 92 | 84 | 95 | 95 | 95 | 191 | 191 | 170 | 192 | 194 | 166 | 232 | 232 |
| 22 | EF445940 | *Gyrodactylus derjavinoides* | 95 | 95 | 97 | 92 | 84 | 95 | 95 | 95 | 191 | 191 | 170 | 192 | 194 | 166 | 232 | 232 |
| 23 | DQ357215 | *Gyrodactylus derjavinoides* | 95 | 95 | 97 | 92 | 84 | 95 | 95 | 95 | 191 | 191 | 170 | 192 | 194 | 166 | 232 | 232 |
| 24 | EF445941 | *Gyrodactylus derjavinoides* | 95 | 95 | 97 | 92 | 84 | 95 | 95 | 95 | 191 | 191 | 170 | 192 | 194 | 166 | 232 | 232 |
| 25 | EU304810 | *Gyrodactylus derjavinoides* | 94 | 94 | 96 | 91 | 84 | 94 | 94 | 94 | 190 | 190 | 169 | 191 | 193 | 165 | 231 | 231 |
| 26 | EF445939 | *Gyrodactylus derjavinoides* | 95 | 95 | 97 | 92 | 84 | 95 | 95 | 95 | 191 | 191 | 170 | 192 | 194 | 166 | 232 | 232 |
| 27 | AJ132259 | *Gyrodactylus derjavinoides* | 95 | 95 | 97 | 92 | 84 | 95 | 95 | 95 | 191 | 191 | 170 | 192 | 194 | 165 | 232 | 232 |
| 28 | MN850538 | *Gyrodactylus salmonis* | 0 | 0 | 31 | 10 | 6 | 0 | 0 | 0 | 198 | 197 | 178 | 207 | 208 | 181 | 265 | 265 |
| 29 | EF113106 | *Gyrodactylus salmonis* | 0 | 0 | 31 | 10 | 6 | 0 | 0 | 0 | 198 | 197 | 178 | 207 | 208 | 181 | 265 | 265 |
| 30 | MN850539 | *Gyrodactylus salmonis* | 0 | 0 | 31 | 10 | 6 | 0 | 0 | 0 | 198 | 197 | 178 | 207 | 208 | 181 | 265 | 265 |
| 31 | MN850540 | *Gyrodactylus salmonis* | 0 | 0 | 31 | 10 | 6 | 0 | 0 | 0 | 198 | 197 | 178 | 207 | 208 | 181 | 265 | 265 |
| 32 | MN850541 | *Gyrodactylus salmonis* | 0 | 0 | 31 | 10 | 6 | 0 | 0 | 0 | 198 | 197 | 178 | 207 | 208 | 181 | 265 | 265 |
| 33 | MN850542 | *Gyrodactylus salmonis* |  | 0 | 31 | 10 | 6 | 0 | 0 | 0 | 196 | 195 | 177 | 206 | 207 | 180 | 263 | 263 |
| 34 | JN230351 | *Gyrodactylus salmonis* | 0.00 |  | 31 | 10 | 6 | 0 | 0 | 0 | 198 | 197 | 178 | 203 | 204 | 181 | 261 | 261 |
| 35 | EF143069 | *Gyrodactylus pomeraniae x Gyrodactylus lavareti* | 0.02 | 0.03 |  | 28 | 0 | 31 | 31 | 31 | 198 | 196 | 182 | 209 | 211 | 184 | 266 | 266 |
| 36 | EF143068 | *Gyrodactylus pomeraniae x Gyrodactylus lavareti* | 0.01 | 0.01 | 0.02 |  | 0 | 10 | 10 | 10 | 194 | 193 | 175 | 207 | 208 | 181 | 260 | 260 |
| 37 | EF143067 | *Gyrodactylus pomeraniae x Gyrodactylus lavareti* | 0.00 | 0.01 | 0.00 | 0.00 |  | 6 | 6 | 6 | 183 | 181 | 165 | 192 | 194 | 167 | 245 | 245 |
| 38 | MN850544 | *Gyrodactylus salmonis* | 0.00 | 0.00 | 0.02 | 0.01 | 0.00 |  | 0 | 0 | 196 | 195 | 177 | 204 | 207 | 180 | 263 | 263 |
| 39 | MN850543 | *Gyrodactylus salmonis* | 0.00 | 0.00 | 0.02 | 0.01 | 0.00 | 0.00 |  | 0 | 196 | 195 | 177 | 204 | 207 | 180 | 263 | 263 |
| 40 | GQ368233 | *Gyrodactylus salmonis* | 0.00 | 0.00 | 0.02 | 0.01 | 0.00 | 0.00 | 0.00 |  | 198 | 197 | 178 | 207 | 209 | 181 | 265 | 265 |
| 41 | MW353802 | *Gyrodactylus banmae* | 0.18 | 0.18 | 0.18 | 0.18 | 0.17 | 0.18 | 0.18 | 0.18 |  | 6 | 21 | 154 | 159 | 141 | 182 | 182 |
| 42 | MW353803 | *Gyrodactylus banmae* | 0.18 | 0.18 | 0.18 | 0.18 | 0.17 | 0.18 | 0.18 | 0.18 | 0.01 |  | 27 | 159 | 164 | 145 | 180 | 180 |
| 43 | ON117567 | *Gyrodactylus*\_sp.\_1\_JWC-2022 | 0.17 | 0.17 | 0.18 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.02 | 0.03 |  | 145 | 150 | 142 | 171 | 171 |
| 44 | AY278043 | *Gyrodactylus* *longoacuminatus* | 0.18 | 0.19 | 0.19 | 0.19 | 0.18 | 0.18 | 0.18 | 0.19 | 0.14 | 0.15 | 0.14 |  | 8 | 2 | 198 | 198 |
| 45 | KC922451 | *Gyrodactylus* *longoacuminatus* | 0.19 | 0.19 | 0.19 | 0.19 | 0.18 | 0.19 | 0.19 | 0.18 | 0.15 | 0.15 | 0.15 | 0.01 |  | 6 | 203 | 203 |
| 46 | ON117571 | *Gyrodactylus* *longoacuminatus* | 0.18 | 0.18 | 0.18 | 0.18 | 0.17 | 0.18 | 0.18 | 0.18 | 0.14 | 0.15 | 0.14 | 0.00 | 0.01 |  | 179 | 179 |
| 47 | AY278042 | *Gyrodactylus kobayashii* | 0.22 | 0.23 | 0.23 | 0.22 | 0.21 | 0.22 | 0.22 | 0.22 | 0.17 | 0.17 | 0.17 | 0.18 | 0.18 | 0.18 |  | 0 |
| 48 | AF484534 | *Gyrodactylus kobayashii* | 0.22 | 0.23 | 0.23 | 0.22 | 0.21 | 0.22 | 0.22 | 0.22 | 0.17 | 0.17 | 0.17 | 0.18 | 0.18 | 0.18 | 0.00 |  |
| 49 | KJ524572 | *Gyrodactylus kobayashii* | 0.23 | 0.23 | 0.23 | 0.23 | 0.22 | 0.23 | 0.23 | 0.23 | 0.17 | 0.17 | 0.17 | 0.18 | 0.19 | 0.17 | 0.01 | 0.01 |
| 50 | AJ132985 | *Gyrodactylus kobayashii* | 0.23 | 0.23 | 0.23 | 0.23 | 0.22 | 0.23 | 0.23 | 0.22 | 0.17 | 0.17 | 0.17 | 0.18 | 0.18 | 0.18 | 0.00 | 0.00 |
| 51 | KC922452 | *Gyrodactylus kobayashii* | 0.22 | 0.23 | 0.23 | 0.22 | 0.21 | 0.22 | 0.22 | 0.22 | 0.17 | 0.17 | 0.17 | 0.18 | 0.18 | 0.18 | 0.00 | 0.00 |
| 52 | ON117569 | *Gyrodactylus kobayashii* | 0.23 | 0.23 | 0.23 | 0.22 | 0.22 | 0.23 | 0.23 | 0.23 | 0.17 | 0.16 | 0.16 | 0.18 | 0.18 | 0.18 | 0.00 | 0.00 |
| 53 | KJ755086 | *Gyrodactylus kobayashii* | 0.24 | 0.24 | 0.24 | 0.24 | 0.23 | 0.24 | 0.24 | 0.24 | 0.18 | 0.18 | 0.18 | 0.19 | 0.20 | 0.18 | 0.04 | 0.04 |
| 54 | ON755086 | *Gyrodactylus*\_sp.\_2\_JWC-2022 | 0.23 | 0.23 | 0.24 | 0.23 | 0.22 | 0.23 | 0.23 | 0.23 | 0.18 | 0.18 | 0.18 | 0.19 | 0.19 | 0.18 | 0.15 | 0.15 |
| 55 | ON117570 | *Gyrodactylus gurleyi* | 0.23 | 0.23 | 0.24 | 0.23 | 0.23 | 0.23 | 0.23 | 0.23 | 0.18 | 0.18 | 0.19 | 0.19 | 0.19 | 0.19 | 0.16 | 0.16 |
| 56 | KC922452 | *Gyrodactylus gurleyi* | 0.23 | 0.23 | 0.24 | 0.23 | 0.22 | 0.23 | 0.23 | 0.22 | 0.18 | 0.18 | 0.19 | 0.18 | 0.18 | 0.19 | 0.15 | 0.15 |
| 57 | AJ001842 | *Gyrodactylus gurleyi* | 0.23 | 0.24 | 0.24 | 0.23 | 0.23 | 0.23 | 0.23 | 0.23 | 0.18 | 0.18 | 0.19 | 0.19 | 0.19 | 0.19 | 0.16 | 0.16 |
| 58 | KJ755085 | *Gyrodactylus kobayashii* | 0.25 | 0.24 | 0.25 | 0.25 | 0.24 | 0.25 | 0.25 | 0.26 | 0.19 | 0.19 | 0.17 | 0.20 | 0.21 | 0.17 | 0.05 | 0.05 |

**Supplementary table S2** continued:

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | GenBank accession number | *Gyrodactylus* species | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 |
| 1 | XXXXXXXX | ***Gyrodactylus******sprostonae*** | **188** | **182** | **181** | **171** | **190** | **190** | **189** | **201** | **205** | **204** |
| 2 | KP295469 | *Gyrodactylus sprostonae* | 202 | 186 | 185 | 175 | 209 | 194 | 193 | 205 | 209 | 224 |
| 3 | KT346368 | *Gyrodactylus sprostonae* | 196 | 185 | 186 | 173 | 199 | 191 | 190 | 205 | 207 | 214 |
| 4 | AY278044 | *Gyrodactylus sprostonae* | 190 | 183 | 182 | 172 | 194 | 191 | 190 | 202 | 206 | 208 |
| 5 | MW819706 | *Gyrodactylus salaris* | 232 | 234 | 233 | 215 | 240 | 231 | 228 | 245 | 248 | 249 |
| 6 | AJ515912 | *Gyrodactylus salaris* | 246 | 231 | 230 | 211 | 258 | 228 | 225 | 243 | 245 | 273 |
| 7 | DQ823390 | *Gyrodactylus salaris* | 249 | 234 | 233 | 214 | 261 | 231 | 228 | 246 | 248 | 276 |
| 8 | KM192262 | *Gyrodactylus salaris* | 239 | 233 | 232 | 213 | 248 | 229 | 226 | 244 | 246 | 262 |
| 9 | EF464677 | *Gyrodactylus salaris* | 217 | 211 | 210 | 191 | 226 | 203 | 201 | 219 | 221 | 240 |
| 12 | DQ898302 | *Gyrodactylus salaris* | 249 | 234 | 233 | 214 | 261 | 230 | 227 | 245 | 249 | 276 |
| 11 | Z72477 | *Gyrodactylus salaris* | 248 | 233 | 232 | 213 | 260 | 229 | 226 | 244 | 246 | 275 |
| 12 | AF484538 | *Gyrodactylus longiradix* | 236 | 229 | 228 | 209 | 245 | 226 | 225 | 241 | 244 | 261 |
| 13 | AF484540 | *Gyrodactylus luciopercae* | 238 | 231 | 230 | 211 | 248 | 229 | 228 | 244 | 247 | 264 |
| 14 | AF484529 | *Gyrodactylus cernuae* | 236 | 229 | 228 | 209 | 245 | 228 | 226 | 242 | 245 | 262 |
| 15 | AF484541 | *Gyrodactylus luciopercae* | 238 | 231 | 230 | 211 | 248 | 229 | 228 | 244 | 247 | 264 |
| 16 | GQ368236 | *Gyrodactylus derjavinoides* | 227 | 228 | 227 | 213 | 230 | 220 | 217 | 229 | 233 | 217 |
| 17 | MN853657 | *Gyrodactylus teuchis* | 197 | 188 | 188 | 180 | 200 | 200 | 197 | 207 | 209 | 202 |
| 18 | AJ249350 | *Gyrodactylus teuchis* | 294 | 277 | 277 | 259 | 303 | 279 | 281 | 300 | 303 | 327 |
| 19 | JN628864 | *Gyrodactylus teuchis* | 278 | 277 | 277 | 259 | 284 | 280 | 282 | 301 | 304 | 305 |
| 20 | JN628863 | *Gyrodactylus teuchis* | 279 | 278 | 278 | 260 | 285 | 281 | 283 | 302 | 305 | 306 |
| 21 | AF484530 | *Gyrodactylus derjavinoides* | 240 | 233 | 232 | 211 | 247 | 220 | 216 | 235 | 239 | 260 |
| 22 | EF445940 | *Gyrodactylus derjavinoides* | 240 | 233 | 232 | 211 | 247 | 220 | 216 | 235 | 239 | 260 |
| 23 | DQ357215 | *Gyrodactylus derjavinoides* | 242 | 233 | 232 | 211 | 247 | 220 | 216 | 235 | 239 | 262 |
| 24 | EF445941 | *Gyrodactylus derjavinoides* | 240 | 233 | 232 | 211 | 247 | 220 | 216 | 235 | 239 | 260 |
| 25 | EU304810 | *Gyrodactylus derjavinoides* | 239 | 233 | 231 | 210 | 246 | 219 | 215 | 234 | 238 | 259 |
| 26 | EF445939 | *Gyrodactylus derjavinoides* | 240 | 233 | 232 | 211 | 247 | 220 | 216 | 235 | 239 | 260 |
| 27 | AJ132259 | *Gyrodactylus derjavinoides* | 249 | 233 | 232 | 211 | 259 | 220 | 216 | 235 | 239 | 273 |
| 28 | MN850538 | *Gyrodactylus salmonis* | 272 | 266 | 265 | 246 | 281 | 248 | 249 | 263 | 268 | 296 |
| 29 | EF113106 | *Gyrodactylus salmonis* | 272 | 266 | 265 | 246 | 281 | 248 | 249 | 263 | 268 | 296 |
| 30 | MN850539 | *Gyrodactylus salmonis* | 272 | 266 | 265 | 246 | 281 | 248 | 249 | 263 | 268 | 296 |
| 31 | MN850540 | *Gyrodactylus salmonis* | 272 | 266 | 265 | 246 | 281 | 248 | 249 | 263 | 268 | 296 |
| 32 | MN850541 | *Gyrodactylus salmonis* | 272 | 266 | 265 | 246 | 281 | 248 | 249 | 263 | 268 | 296 |
| 33 | MN850542 | *Gyrodactylus salmonis* | 270 | 264 | 263 | 245 | 279 | 247 | 248 | 261 | 266 | 295 |
| 34 | JN230351 | *Gyrodactylus salmonis* | 260 | 262 | 261 | 246 | 269 | 248 | 249 | 262 | 267 | 280 |
| 35 | EF143069 | *Gyrodactylus pomeraniae x Gyrodactylus lavareti* | 273 | 267 | 266 | 247 | 281 | 258 | 258 | 273 | 277 | 296 |
| 36 | EF143068 | *Gyrodactylus pomeraniae x Gyrodactylus lavareti* | 267 | 261 | 260 | 241 | 276 | 247 | 247 | 262 | 266 | 291 |
| 37 | EF143067 | *Gyrodactylus pomeraniae x Gyrodactylus lavareti* | 252 | 246 | 245 | 226 | 261 | 236 | 236 | 251 | 255 | 276 |
| 38 | MN850544 | *Gyrodactylus salmonis* | 270 | 264 | 263 | 245 | 279 | 247 | 248 | 261 | 266 | 295 |
| 39 | MN850543 | *Gyrodactylus salmonis* | 270 | 264 | 263 | 245 | 279 | 247 | 248 | 261 | 266 | 295 |
| 40 | GQ368233 | *Gyrodactylus salmonis* | 281 | 266 | 265 | 245 | 293 | 248 | 249 | 263 | 268 | 309 |
| 41 | MW353802 | *Gyrodactylus banmae* | 182 | 181 | 182 | 169 | 197 | 183 | 182 | 191 | 195 | 211 |
| 42 | MW353803 | *Gyrodactylus banmae* | 180 | 179 | 180 | 167 | 195 | 183 | 182 | 191 | 195 | 209 |
| 43 | ON117567 | *Gyrodactylus*\_sp.\_1\_JWC-2022 | 170 | 172 | 171 | 164 | 179 | 181 | 188 | 191 | 195 | 176 |
| 44 | AY278043 | *Gyrodactylus* *longoacuminatus* | 205 | 199 | 198 | 182 | 213 | 202 | 196 | 211 | 214 | 221 |
| 45 | KC922451 | *Gyrodactylus* *longoacuminatus* | 219 | 205 | 204 | 187 | 230 | 204 | 198 | 214 | 217 | 239 |
| 46 | ON117571 | *Gyrodactylus* *longoacuminatus* | 178 | 180 | 178 | 178 | 181 | 190 | 195 | 195 | 197 | 176 |
| 47 | AY278042 | *Gyrodactylus kobayashii* | 10 | 2 | 0 | 0 | 43 | 166 | 168 | 179 | 186 | 57 |
| 48 | AF484534 | *Gyrodactylus kobayashii* | 10 | 2 | 0 | 0 | 43 | 166 | 168 | 178 | 186 | 57 |
| 49 | KJ524572 | *Gyrodactylus kobayashii* |  | 15 | 19 | 2 | 61 | 167 | 170 | 198 | 197 | 69 |
| 50 | AJ132985 | *Gyrodactylus kobayashii* | 0.01 |  | 2 | 2 | 47 | 168 | 168 | 179 | 186 | 65 |
| 51 | KC922452 | *Gyrodactylus kobayashii* | 0.02 | 0.00 |  | 0 | 55 | 166 | 168 | 179 | 186 | 70 |
| 52 | ON117569 | *Gyrodactylus kobayashii* | 0.00 | 0.00 | 0.00 |  | 24 | 158 | 163 | 165 | 171 | 18 |
| 53 | KJ755086 | *Gyrodactylus kobayashii* | 0.05 | 0.04 | 0.04 | 0.02 |  | 168 | 167 | 204 | 203 | 84 |
| 54 | ON755086 | *Gyrodactylus*\_sp.\_2\_JWC-2022 | 0.15 | 0.16 | 0.15 | 0.15 | 0.15 |  | 7 | 9 | 24 | 177 |
| 55 | ON117570 | *Gyrodactylus gurleyi* | 0.16 | 0.16 | 0.16 | 0.15 | 0.16 | 0.01 |  | 1 | 16 | 179 |
| 56 | KC922452 | *Gyrodactylus gurleyi* | 0.17 | 0.15 | 0.15 | 0.15 | 0.17 | 0.01 | 0.00 |  | 16 | 235 |
| 57 | AJ001842 | *Gyrodactylus gurleyi* | 0.17 | 0.16 | 0.16 | 0.16 | 0.17 | 0.02 | 0.01 | 0.01 |  | 228 |
| 58 | KJ755085 | *Gyrodactylus kobayashii* | 0.06 | 0.05 | 0.06 | 0.02 | 0.07 | 0.16 | 0.17 | 0.20 | 0.20 |  |