**Table S2:** PCR primers and FISH probes. Thermal cycling conditions are given for all primer pairs.

| | Target gene | Primer/probe | Sequence (5'-3') | Thermal cycling | | | | Reference |
|---|---|---|---|---|---|---|---|---|
| PCR primers | Earthworm ND2-COI | Lum-ND2-322F or 370F | TGT CAT YTC TGA TAC CCR TCA GT<br>TGC CTD ATY YTA TCN WCM TG | Initial denaturation<br>Denaturation | 94˚C<br>94˚C | 03:00<br>00:30 | | This study |
| | | Lum-COI-723R | TAK ACT TCT GGG TGM CCA AAR AAT CA | Annealing<br>Elongation<br>Finalization | 48˚C<br>72˚C<br>72˚C | 00:30<br>01:30<br>03:00 | 35 ↺ | |
| | Earthworm ND2 | Lum-ND2-322F or 370F | TGT CAT YTC TGA TAC CCR TCA GT<br>TGC CTD ATY YTA TCN WCM TG | Initial denaturation<br>Denaturation | 94˚C<br>94˚C | 03:00<br>00:30 | | This study |
| | | Lum-COI-14R | CCA ATR TCT TTG TGG ATT WGT TGA GT | Annealing<br>Elongation<br>Finalization | 43˚C<br>72˚C<br>72˚C | 00:30<br>01:00<br>03:00 | 35 ↺ | |
| | *Verminephrobacter* VrpoB | VrpoB-43F<br>VrpoB-1430R | TTC GGC ASC CGC GAC AGC GYG C<br>GCC ARR CCG GTG CGG TAC TGG TT | Initial denaturation<br>Denaturation | 94˚C<br>94˚C | 03:00<br>00:30 | | This study |
| | | | | Annealing<br>Elongation<br>Finalization | 65˚C<br>72˚C<br>72˚C | 00:30<br>01:30<br>03:00 | 30 ↺ | |
| | *Flexibacter*-like FrpoB | FrpoB-1905F<br>FrpoB-3213R | TGC YAA CCG YGC CYT GAT GG<br>TGR CGW CCG GCC ATY TTA TC | Initial denaturation<br>Denaturation | 94˚C<br>94˚C | 03:00<br>00:30 | | This study |
| | | | | Annealing<br>Elongation<br>Finalization | 60˚C<br>72˚C<br>72˚C | 00:30<br>01:30<br>03:00 | 30 ↺ | |
| | *Flexibacter*-like 16S rRNA gene | Flexi-145F<br>CF319aR | GGY ATA GCT CGG GGA AAC<br>TGG TCC GTG TCT CAG TAC | Initial denaturation<br>Denaturation | 94˚C<br>94˚C | 03:00<br>00:30 | | Davidson et al., 2010<br>Manz et al., 1996 |
| | | | | Annealing<br>Elongation<br>Finalization | 55˚C<br>72˚C<br>72˚C | 00:30<br>00:30<br>03:00 | 30 ↺ | |
| | *Flexibacter*-like 16S rRNA gene | Flexi-145F<br>1492R | GGY ATA GCT CGG GGA AAC<br>GGT TAC CTT GTT ACG ACT T | Initial denaturation<br>Denaturation | 94˚C<br>94˚C | 03:00<br>00:30 | | Davidson et al., 2010<br>Turner et al., 1999 |
| | | | | Annealing<br>Elongation<br>Finalization | 57˚C<br>72˚C<br>72˚C | 00:30<br>01:30<br>03:00 | 30 ↺ | |
| FISH probes | Eubacterial 16S rRNA | EUB338-I-II-III MIX-FAM | GCT GCC TCC CGT AGG AGT<br>GCA GCC ACC CGT AGG TGT<br>GCT GCC ACC CGT AGG TGT | | | | | Daims et al., 1999 |
| | *Verminephrobacter* 16S rRNA | LSB145-CY5 | GGG ATA ACG GAG CGA AAG | | | | | Schweitzer et al., 2001 |
| | *Flexibacter*-like 16S rRNA | FLX226-CY3 | ATC AGG CGC ATG CTT ATC C | | | | | This study |