

Supplementary material

Integrative taxonomy reveals an even greater diversity within the speciose genus *Phyllodistomum* (Platyhelminthes : Trematoda : Gorgoderidae), parasitic in the urinary bladder of Middle American freshwater fishes, with descriptions of five new species

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Table S1. Species used in molecular phylogenetic and species delimitation analyses, with information of their host, locality and GenBank accession numbers

Species	Host	Locality	GenBank <i>COI</i>	28S	References
<i>Phyllodistomum</i> spp.					
<i>P. romualdae</i> sp. nov.	<i>Archocentrus centrarchus</i>	Finca el Espavel, San Carlos, Nicaragua	MW804287- MW804288	MW804310- MW804311	This study
	<i>Cribroheros alfari</i>	Río Las Animas, Costa Rica	MW804289- MW804291	MW804312- MW804314	This study
<i>P. virmantasi</i> sp. nov.	<i>Gobiomorus dormitor</i>	Río La Palma, Veracruz, Mexico	MW804292- MW804293	MW804315- MW804316	This study
	<i>Eleotris</i> sp.	Río La Palma, Veracruz, Mexico	MW804294	MW804317	This study
<i>P. isabelae</i> sp. nov.	<i>Maskaheros regani</i>	Río Grande, Matías Romero, Oaxaca, Mexico	MW804295- MW804297	MW804318- MW804320	This study
	<i>Thorichthys maculipinnis</i>	Río Grande, Matías Romero, Oaxaca, Mexico	MW804298	MW804321	This study
<i>P. scotti</i> sp. nov.	<i>Rhamdia nicaraguensis</i>	Finca El Espavel, San Carlos, Nicaragua	MW804299	MW804322	This study
<i>P. simonae</i> sp. nov.	<i>Tlaloc labialis</i>	Palo de Arquito, Nicaragua	MW804300	MW804323	This study
		Río San Carlos, Chiapas, Mexico	MW804301	--	This study
		La Gloria, Chiapas, Mexico	MW804302- MW804303	MW804324- MW804325	This study
<i>P. angulatum</i>	<i>Sander lucioperca</i>	Rybinsk water reservoir on the Volga River, Russia	--	KJ729529- KJ729531	Stunžėnas <i>et al.</i> 2017
	<i>Lota lota</i>	Rybinsk water reservoir on the Volga River, Russia	--	KX957733	Stunžėnas <i>et al.</i> 2017
	<i>S. lucioperca</i>	Rybinsk water reservoir on the Volga river, Russia	--	KX957734- KX957735	Stunžėnas <i>et al.</i> 2017
<i>P. brevicecum</i>	<i>Umbra limi</i>	Brokenhead, Manitoba, Canada	KC760179- KC760183	KC760204- KC760208	Razo-Mendivil <i>et al.</i> 2013
			--	HQ325009, HQ325008	Rosas-Valdez <i>et al.</i> 2011
<i>P. centropomi</i>	<i>Centropomus parallelus</i>	Tlacotalpan, Veracruz, Mexico	KT376733	KM659384	Pérez-Ponce de León <i>et al.</i> 2015a, 2015b
<i>P. cribbi</i>	<i>Zoogoneticus quitzeoensis</i> ; <i>Allotoca zacapuensis</i> ; <i>Hubbsina turneri</i> ; <i>Z. purhepechus</i>	Zacapu Lake, Michoacan, Mexico; La Luz Spring, Michoacan, Mexico	KT376727- KT376731	KT376718- KT376722	Pérez-Ponce de León <i>et al.</i> 2015a
<i>P. folium</i>	<i>Gasterosteus aculeatus</i>	Lithuania	--	AY277707, AY277706	Petkevičiūtė <i>et al.</i> 2004
	<i>Esox lucius</i>	River Ild, Russia	--	KJ729542	Petkevičiūtė <i>et al.</i> 2015a
	<i>Rutilus rutilus</i>	Rybinsk water Reservoir on the Volga River, Russia	--	KJ729536	Petkevičiūtė <i>et al.</i> 2015a
	<i>Gymnocephalus cernuus</i>	River Chesnava near Rybinsk water Reservoir on the Volga River, Russia	--	KX957728	Stunžėnas <i>et al.</i> 2017
	<i>Cottus gobio</i>	River Nėris, Lithuania	--	KJ729550	Petkevičiūtė <i>et al.</i> 2015a

Species	Host	Locality	GenBank <i>COI</i>	28S	References
	<i>Scardinius erythrophthalmus</i>	Rybinsk water reservoir on the Volga river, Russia	--	MT872646	Petkevičiūtė <i>et al.</i> 2020
	<i>Rutilus rutilus</i>	River Sunoga, Russia	--	MT872645	Petkevičiūtė <i>et al.</i> 2020
	<i>Sphaerium corneum</i>	River Shumorovka, Russia	--	KJ729546	Petkevičiūtė <i>et al.</i> 2015a
	<i>S. corneum</i>	River Hegga, Norway	--	KJ729551	Petkevičiūtė <i>et al.</i> 2015a
	<i>Pisidium supinum</i>	River Ūla, Lithuania	--	KJ729544	Petkevičiūtė <i>et al.</i> 2015a
	<i>Pisidium amnicum</i>	River Ild, Russia	--	KJ729535	Petkevičiūtė <i>et al.</i> 2015a
<i>P. hoggettae</i>	<i>Plectropomus leopardus</i>	Lizard Island, Queensland, Australia	--	KF013191	Cutmore <i>et al.</i> 2013
<i>P. hyporhamphi</i>	<i>Hyporhamphus australis</i>	Moreton Bay, Queensland, Australia	--	KF013190	Cutmore <i>et al.</i> 2013
<i>P. inecoli</i>	<i>Pseudoxiphophorus bimaculatus</i>	Creek at Agua Bendita, Xico, Veracruz, Mexico	KC760169– KC760183	KC760199– KC760203	Razo-Mendivil <i>et al.</i> 2013
		Axtla de Terrazas, San Luis Potosí, Mexico	--	MW804326– MW804327	This study
		Río Grande, Matías Romero, Oaxaca, Mexico	--	MW804328– MW804329	This study
		Río Los Perros, Oaxaca, Mexico	--	MW804330	This study
	<i>Poecilia</i> sp.	Quebrada El Paraíso, Honduras	--	MW804331	This study
	<i>Profundulus oaxacae</i>	Río Cuilapam, Oaxaca, Mexico	--	MW804332– MW804333	This study
	<i>Xiphophorus hellerii</i>	Río Grande, Matías Romero, Oaxaca, Mexico	--	MW804334	This study
	<i>Poeciliopsis gracilis</i>	Río Grande, Matías Romero, Oaxaca, Mexico	--	MW804335	This study
		Río San Juan, Cristóbal Obregón, Chiapas, Mexico	--	KM659386	Pérez-Ponce de León <i>et al.</i> 2015b; this study
		Río Los Perros, Oaxaca, Mexico	--	MW804336	This study
	<i>Profundulus</i> sp.	San Juan del Río, Oaxaca, Mexico	--	KM659389	Pérez-Ponce de León <i>et al.</i> 2015b; this study
	<i>Poecilia sphenops</i>	Santa María Coyotepec, Oaxaca, Mexico	--	KM659380, KM659383	Pérez-Ponce de León <i>et al.</i> 2015b; this study
		Río Los Perros, Oaxaca, Mexico	--	MW804337	This study
		Río San Juan, Cristóbal Obregón, Chiapas, Mexico	--	KM659385	Pérez-Ponce de León <i>et al.</i> 2015b; this study

Species	Host	Locality	GenBank <i>COI</i>	28S	References
	<i>Profundulus punctatus</i>	Río Los Perros, Oaxaca, Mexico	--	MW804338	This study
		Nueva Francia, Chiapas, Mexico	--	KM659387	Pérez-Ponce de León <i>et al.</i> 2015b;
<i>P. kanae</i>	<i>Hynobius retardatus</i>	Pippu, Hokkaido, Japan	--	AB979868	This study Nakao 2015
<i>P. kupermani</i>	<i>P. fluviatilis</i>	Rybinsk water reservoir on the Volga river, Russia	--	MT875008, MT875009	Petkevičiūtė <i>et al.</i> 2020
	<i>Perca fluviatilis</i>	Rybinsk water reservoir on the Volga river, Russia	--	KY307869	Stunžėnas <i>et al.</i> 2017
<i>P. lacustri</i>	<i>Noturus flavus</i>	Assiniboine River, Manitoba, Canada	HQ325034– HQ325037	HQ325011– HQ325013	Rosas-Valdez <i>et al.</i> 2011
	<i>Ictalurus punctatus</i>	Río Bravo at Presa Falcón, Tamaulipas, Mexico	HQ325038– HQ325039	HQ325022– HQ325024	Rosas-Valdez <i>et al.</i> 2011
		Nemaha River, Nebraska, USA	HQ325047– HQ325050	HQ325014– HQ325015	Rosas-Valdez <i>et al.</i> 2011
		Assiniboine River, Manitoba, Canada	HQ325033	HQ325010	Rosas-Valdez <i>et al.</i> 2011
<i>P. lacustri</i> Clade 3	<i>Ictalurus punctatus</i>	Río Pantepc, Veracruz, Mexico	HQ325051– HQ325054	HQ325019– HQ325021	Rosas-Valdez <i>et al.</i> 2011
<i>P. lacustri</i> Clade 2	<i>Ictalurus punctatus</i>	Río Lerma at Presa San Juanico, Michoacán, Mexico	HQ325044	--	Rosas-Valdez <i>et al.</i> 2011
	<i>Ictalurus dugesii</i>	Lerma at Presa San Juanico, Michoacán, Mexico	HQ325040-43	HQ325025, HQ325026	Rosas-Valdez <i>et al.</i> 2011
<i>P. lacustri</i> Clade 1	<i>Ictalurus pricei</i>	Río Nazas at El Olote, Durango, Mexico	HQ325045, HQ325046	HQ325016 HQ325018	Rosas-Valdez <i>et al.</i> 2011
<i>P. magnificum</i>	<i>Tandanus tandanus</i>	Moggill Creek, Queensland, Australia	--	KF013186, KF013189	Cutmore <i>et al.</i> 2013
<i>P. macrocotyle</i>	<i>Dreissena polymorpha</i>	Lukomskoe Lake, Belarus	--	AY288823, AY281127	Stunžėnas <i>et al.</i> 2004
	<i>D. polymorpha</i>	Lake Lepelskoe, Belarus	--	AY288828	Stunžėnas <i>et al.</i> 2004
	<i>D. polymorpha</i>	Lake Vilkokšnis, Lithuania	--	KJ729518	Petkevičiūtė <i>et al.</i> 2015a
	<i>Scardinius erythrophthalmus</i>	Rybinsk water reservoir on the Volga river, Russia	--	MT872664	Petkevičiūtė <i>et al.</i> 2020
	<i>Leuciscus idus</i>	Rybinsk water reservoir on the Volga river, Russia	--	MT872663	Petkevičiūtė <i>et al.</i> 2020
<i>P. parasiluri</i>	<i>Silurus asotus</i>	Chinai, Lake Biwa, Takashima City, Shiga, Japan	LC002524	LC002522	Urabe <i>et al.</i> 2015
<i>P. pacificum</i>	<i>Pantolabus radiatus</i>	Moreton Bay, Queensland, Australia	--	MG845599	Cutmore <i>et al.</i> 2018
<i>P. pseudofolium</i>	<i>Pisidium amnicum</i>	A pond near Rybinsk water reservoir on the Volga River, Russia	--	KX957730	Stunžėnas <i>et al.</i> 2017
	<i>P. amnicum</i>	Lithuania	--	AY281126	Petkevičiūtė <i>et al.</i> 2004
	<i>G. cernuus</i>	River Chesnava near Rybinsk water reservoir on the Volga river, Russia	--	KX957732	Stunžėnas <i>et al.</i> 2017

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	<i>G. ceruus</i>	Rybinsk water reservoir on the Volga River, Russia	--	KX957731	Stunžėnas <i>et al.</i> 2017
<i>P. spinopapillatum</i>	<i>Profundulus balsanus</i>	San Gabriel Mixtepec, Oaxaca, México	KT376732, MW804304- MW804305 MW804306	KM659382, KM659381, KM659379 KM659388	Pérez-Ponce de León <i>et al.</i> 2015 <i>b</i> , This study Pérez-Ponce de León <i>et al.</i> 2015 <i>b</i> This study
	<i>Profundulus oaxacae</i>	Flores Magon, Oaxaca, México			
<i>P. staffordi</i>	<i>Ameiurus melas</i>	Río Los Sabinos, Oaxaca, México	MW804307	MW804339	This study
		La Salle River, Winnipeg, Manitoba, Canada	HQ325055- HQ325056	EF032692, HQ325027- HQ325028	Rosas-Valdez <i>et al.</i> 2011
<i>P. umblae</i>	<i>Pisidium hibernicum</i>	Lake Nordersjoen, Norway	--	KP284109, KP284110 KJ729528	Petkevičiūtė <i>et al.</i> 2015 <i>b</i> Petkevičiūtė <i>et al.</i> 2015 <i>a</i>
	<i>Coregonus albula</i>	Lake Syamozero, Karelia, Russia	--		
<i>P. cf. symmetrorchis</i>	<i>Clarias gariepinus</i>	Lake Victoria, Kenya	--	KF013171, KF013174	Cutmore <i>et al.</i> 2013
<i>P. vaili</i>	<i>Mulloidichthys vanicolensis</i>	Lizard Island, Queensland, Australia	--	KF013187, KF013173	Cutmore <i>et al.</i> 2013
<i>P. wallacei</i>	<i>Xenotaenia resolanae</i> ; <i>Allodontichthys tamazulae</i> ; <i>Ilyodon furcidens</i>	Arroyo Durazno, Cuзалapa River, Jalisco, Mexico; Tamazula River, Jalisco, Mexico; Ayuquila River, Jalisco, Mexico	KT376723- KT376726	KT376714- KT376717	Pérez-Ponce de León <i>et al.</i> 2015 <i>a</i>
<i>Phyllodistomum</i> sp. 4	<i>Cephalopholis urodeta</i>	Gambier Islands, French Polynesia	--	KF013183	Cutmore <i>et al.</i> 2013
	<i>Epibulus insidiator</i>	Gambier Islands, French Polynesia	--	KF013179	Cutmore <i>et al.</i> 2013
<i>Phyllodistomum</i> sp. 5	<i>Epibulus insidiator</i>	Heron Island, Queensland, Australia	--	KF013181	Cutmore <i>et al.</i> 2013
	<i>Cephalopholis boenak</i>	Heron Island, Queensland, Australia	--	KF013175	Cutmore <i>et al.</i> 2013
<i>Phyllodistomum</i> sp.	<i>Cyprinus carpio</i>	Main canal on the left bank of the Yodo River, Koyamotomachi, Neyagawa City, Osaka, Japan	AB987943- AB987944	--	Urabe <i>et al.</i> 2015
		Torikai bridge, Yodo River, Settsu City, Osaka, Japan	AB987945	--	Urabe <i>et al.</i> 2015
<i>Cercaria duplicata</i>	<i>Anodonta anatina</i>	Kaunas water Reservoir, Lithuania	--	KJ729515	Petkevičiūtė <i>et al.</i> 2015 <i>a</i>
	<i>A. anatina</i>	Lake Saravesi, Finland	--	KJ729516	Petkevičiūtė <i>et al.</i> 2015 <i>a</i>
	<i>A. anatina</i>	River Sluch, Ukraine	--	KJ729517	Petkevičiūtė <i>et al.</i> 2015 <i>a</i>
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***Pseudophyllodistomum* spp.**

Species	Host	Locality	GenBank COI	28S	References
<i>P. macrobrachicola</i>	<i>Anguilla japonica</i>	Uji River, Uji City, Kyoto, Japan	LC002523	--	Urabe <i>et al.</i> 2015
<i>P. johnstoni</i>	<i>Macrobrachium australiense</i>	Warrill Creek, Queensland, Australia	--	KF013177, KF013182	Cutmore <i>et al.</i> 2013
Gorgoderina spp.					
<i>G. lufengensis</i>	<i>Nanorana yunnanensis</i>	China	--	MH277507	J. Ding, unpubl. data
<i>Gorgoderina</i> sp.	<i>Rana</i> sp.	La Victoria, Veracruz, Mexico	HQ325032	HQ325007	Rosas-Valdez <i>et al.</i> 2011
Gorgodera spp.					
<i>G. cygnoides</i>	<i>Rana ridibunda</i>	--	--	AF151938	Tkach <i>et al.</i> 2000
<i>Gorgoderidae</i> sp.	<i>Rana ridibunda</i>	Bulgaria	--	AY222264	Olson <i>et al.</i> 2003
	<i>Lioconcha castrensis</i>	Heron Island, Queensland, Australia		KF013172	Cutmore <i>et al.</i> 2013
Xystretrum spp.					
<i>X. caballeroi</i>	<i>Balistes polylepis</i>	Mexico	--	HQ325030	Rosas-Valdez <i>et al.</i> 2011
	<i>Sufflamen verres</i>	Mexico	--	HQ325031	Rosas-Valdez <i>et al.</i> 2011
<i>X. solidum</i>	<i>Sphoeroides testudineus</i>	USA	--	KF013188	Cutmore <i>et al.</i> 2013
<i>Xystretrum</i> sp.	<i>Sufflamen fraenatum</i>	Australia	--	KF013176, AY222263	Cutmore <i>et al.</i> 2013
<i>Xystretrum</i> sp. 2	<i>Sufflamen chrysopterum</i>	Australia	--	KF013185	Cutmore <i>et al.</i> 2013
	<i>Rhinecanthus aculeatus</i>	Australia	--	KF013178	Cutmore <i>et al.</i> 2013
Outgroup					
<i>Staphylorhynchus cymatodes</i>	<i>Carcharhinus sorrah</i>	Australia	--	HM486320	Cutmore <i>et al.</i> 2010
<i>Nagmia floridensis</i>	<i>Dasyatis sabina</i>	USA	--	EF032691	Curran <i>et al.</i> 2006
<i>Allocreadium lobatum</i>	<i>Semotilus atromaculatus</i>	Tobacco Creek, Manitoba, Canada	KC899847	--	Martínez-Aquino <i>et al.</i> 2013
<i>Margotrema bravoae</i>	<i>Allodontichthys zonistius</i>	Mexico	KC899864	--	Martínez-Aquino <i>et al.</i> 2013
<i>Margotrema resolanae</i>	<i>Xenotaenia resolanae</i>	Mexico	KC899854	--	Martínez-Aquino <i>et al.</i> 2013
<i>Wallinia chavarriae</i>	<i>Gephyrocharax</i> sp.	Panama	KC899851	--	Martínez-Aquino <i>et al.</i> 2013
<i>Prosthenhystera</i> sp.	<i>Gephyrocharax</i> sp.	Panama	KC899848– KC899850	--	Martínez-Aquino <i>et al.</i> 2013
<i>Prosthenhystera obesa</i>	<i>Astyanax aeneus</i>	Quebrada Puercos, Guanacaste, Costa Rica	HQ325057	--	Rosas-Valdez <i>et al.</i> 2011
	<i>Hoplías</i> sp.	Peru	--	AY222206	Olson <i>et al.</i> 2003

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