

Supplementary file 1: Tables comprising metadata and sequence accession numbers for each host species and monogean species included in phylogenetic analyses.

Supplementary Table 1. List of host species with the respective GenBank accession number for a representative cytochrome *b* sequence per each population.

Fish species	Locality	Accession number cyt b
<i>Acanthobrama marmid</i>	Du Choman, Aw-e Shiler River	OQ797988
<i>Alburnus sellal</i>	wadi Kalat Shirah, tributary of Tabin River	OQ797989
	Zahrzi, Tabin River	OQ797989
	Grdi Go, Zalm Stream	OQ797991
<i>Alburnus</i> sp.	Grdi Go, Zalm Stream	OQ797992
<i>Barbus lacerta</i>	Kani Shok, tributary of Tabin River	OQ797993
<i>Carasobarbus luteus</i>	Zahrzi, Tabin River	KU524920
<i>Carasobarbus luteus</i>	Grdi Go, Zalm Stream	AF145944
<i>Paracapoeta trutta</i>	Kani Shok, tributary of Tabin River	JF798333
<i>Capoeta umbla</i>	wadi Kalat Shirah, tributary of Tabin River	KY065268
<i>Cyprinion macrostomum</i>	wadi Kalat Shirah, tributary of Tabin River	OQ797995
<i>Garra rufa</i>	by the road Suleymania-Dukan, Little Zab	OQ797996
<i>Chondrostoma regium</i>	Du Choman, Aw-e Shiler River	OQ797997
<i>Luciobarbus barbulus</i>	Du Choman, Aw-e Shiler River	OQ797998
<i>Squalius berak</i>	Kani Shok, tributary of Tabin River	OQ797999
<i>Squalius lepidus</i>	Du Choman, Aw-e Shiler River	OP728025

Newly generated sequences are marked by asterisks (*).

Supplementary Table 2. List of *Dactylogyrus* and *Ancyrocephalus* species used in the phylogenetic analyses with GenBank accession numbers for the sequences of two ribosomal regions.

<i>Dactylogyrus</i> species	Host species	Country	Accession number 18S+ITS1	Accession number 28S
<i>Dactylogyrus acinacus</i>	<i>Garra rufa</i>	Iraq	OR817711*	OR817696*
<i>Dactylogyrus affinis</i>	<i>Barbus cyri</i>	Iran	MZ031066	MZ031054
<i>Dactylogyrus alatus</i>	<i>Alburnus neretvae</i>	Bosnia and Herzegovina	MG792842	MG792956
<i>Dactylogyrus andalousiensis</i>	<i>Luciobarbus comizo</i>	Spain	MN365672	MN338207
<i>Dactylogyrus anchoratus</i>	<i>Carassius gibelio</i>	Croatia	KY859795	KY863555
<i>Dactylogyrus anoigeus</i> n. sp.	<i>Acanthobrama marmid</i>	Iraq	OR817699*	OR817682*
<i>Dactylogyrus arcus</i>	<i>Luxilus chrysocephalus</i>	Arkansas	OM108553	OM108517
<i>Dactylogyrus atlasensis</i>	<i>Luciobarbus lepinyei</i>	Morocco	KY629337	KY629356
<i>Dactylogyrus atromaculatus</i>	<i>Semotilus atromaculatus</i>	New York	OM108555	OM108519
<i>Dactylogyrus attenuatus</i>	<i>Semotilus atromaculatus</i>	Wisconsin	OM108556	OM108520
<i>Dactylogyrus auriculatus</i>	<i>Abramis brama</i>	Czech Republic	MG792838	MG792952
<i>Dactylogyrus aviunguis</i>	<i>Nocomis biguttatus</i>	Wisconsin	OM108557	OM108521
<i>Dactylogyrus balistae</i>	<i>Luciobarbus bocageii</i>	Portugal	KY629344	MN338205
<i>Dactylogyrus balkanicus</i>	<i>Barbus prespensis</i>	Greece	KY201093	KY201107
<i>Dactylogyrus barbuli</i>	<i>Luciobarbus barbulus</i>	Iraq	OR817712*	OR817692*
<i>Dactylogyrus barbuli</i>	<i>Luciobarbus xanthopterus</i>	Iraq	MZ031076	MZ031065
<i>Dactylogyrus behoussai</i>	<i>Luciobarbus moulouyensis</i>	Morocco	KX578025	KX553862
<i>Dactylogyrus bifurcatus</i>	<i>Pimephales notatus</i>	Arkansas	OM108558	OM108522
<i>Dactylogyrus bocageii</i>	<i>Luciobarbus bocageii</i>	Portugal	MN365671	KY629347
<i>Dactylogyrus borealis</i>	<i>Phoxinus</i> sp.	Bosnia and Herzegovina	KY629343	KY629372
<i>Dactylogyrus borjensis</i>	<i>Luciobarbus zayanensis</i>	Morocco	MN974257	MN973819
<i>Dactylogyrus carassobarbi</i>	<i>Carasobarbus luteus</i>	Iraq	MZ031071	MZ031060
<i>Dactylogyrus caucasicus</i>	<i>Alburnus devolii</i>	Albania	MG792840	MG792954
<i>Dactylogyrus cf. boopsi</i>	<i>Pimephales notatus</i>	Arkansas	OM108561	OM108525
<i>Dactylogyrus cf. chrosomi</i>	<i>Chrosomus neogaeus</i>	Wisconsin	OM108562	OM108526
<i>Dactylogyrus cf. parvicirrus</i>	<i>Notemigonus crysoleucas</i>	New York	OM108563	OM108527
<i>Dactylogyrus confusus</i>	<i>Clinostomus elongatus</i>	Wisconsin	OM108565	OM108529
<i>Dactylogyrus conchatus</i>	<i>Telestes muticellus</i>	Italy	MW443036	MW443033
<i>Dactylogyrus cornu</i>	<i>Vimba vimba</i>	Czech Republic	KY629342	KY629371
<i>Dactylogyrus crivellius</i>	<i>Barbus prespensis</i>	Greece	KY201094	KY201108
<i>Dactylogyrus deziensioides</i>	<i>Luciobarbus barbulus</i>	Iraq	OR817709*	OR817694*
<i>Dactylogyrus deziensis</i>	<i>Luciobarbus barbulus</i>	Iraq	OR817713*	OR817695*
<i>Dactylogyrus dirigerus</i>	<i>Chondrostoma vardareense</i>	Greece	MG792876	MG792992
<i>Dactylogyrus draeensis</i>	<i>Luciobarbus lepinyei</i>	Morocco	MN974258	MN973816
<i>Dactylogyrus dyki</i>	<i>Barbus cyclolepis</i>	Greece	MG792856	MG792971
<i>Dactylogyrus ergensi</i>	<i>Chondrostoma vardareense</i>	Greece	MG792878	MG792993
<i>Dactylogyrus fallax</i>	<i>Vimba vimba</i>	Czech Republic	KY629341	KY629370
<i>Dactylogyrus falsiphallus</i>	<i>Luciobarbus massaensis</i>	Morocco	KX578024	KX553861
<i>Dactylogyrus fimbriphallus</i>	<i>Luciobarbus lepinyei</i>	Morocco	KY629332	KY629357
<i>Dactylogyrus flagristylus</i>	<i>Nocomis biguttatus</i>	Wisconsin	OM108566	OM108530
<i>Dactylogyrus folkmanovae</i>	<i>Squalius cephalus</i>	Croatia	MG792911	MG793028

<i>Dactylogyrus formosus</i>	<i>Carassius gibelio</i>	Croatia	MG792869	MG792984
<i>Dactylogyrus globulatus</i>	<i>Chondrostoma soetta</i>	Italy	MW443035	MW443032
<i>Dactylogyrus goktschaicus</i>	<i>Barbus cyri</i>	Iran	MZ031067	MZ031055
<i>Dactylogyrus goktschaicus</i>	<i>Barbus lacerta</i>	Iraq	OR817701*	OR817684*
<i>Dactylogyrus gracilis</i>	<i>Capoeta buhsei</i>	Iran	MZ031068	MZ031056
<i>Dactylogyrus guadianensis</i>	<i>Luciobarbus comizo</i>	Spain	MN365674	MN338209
<i>Dactylogyrus holciki</i>	<i>Alburnus</i> sp.	Iraq	OR817700*	OR817683*
<i>Dactylogyrus cheloides</i>	<i>Rhinichthys atratulus</i>	Wisconsin	OM108567	OM108531
<i>Dactylogyrus inutilis</i>	<i>Capoeta trutta</i>	Iraq	OR817704*	OR817687*
<i>Dactylogyrus ksibii</i>	<i>Luciobarbus ksibi</i>	Morocco	MN974252	MN973812
<i>Dactylogyrus kulindrii</i>	<i>Carasobarbus fritschii</i>	Morocco	KY629336	KY629354
<i>Dactylogyrus kulwieci</i>	<i>Luciobarbus xanthopterus</i>	Iraq	MZ031075	MZ031064
<i>Dactylogyrus lachneri</i>	<i>Nocomis biguttatus</i>	Wisconsin	OM108568	OM108532
<i>Dactylogyrus legionensis</i>	<i>Luciobarbus graellsii</i>	Spain	MN365678	MN338210
<i>Dactylogyrus lenkorani</i>	<i>Capoeta buhsei</i>	Iran	MZ031069	MZ031057
<i>Dactylogyrus lenkorani</i>	<i>Capoeta umbla</i>	Iraq	OR817706*	OR817689*
<i>Dactylogyrus lenkoranoïdes</i>	<i>Luciobarbus graellsii</i>	Spain	MN365676	MN338211
<i>Dactylogyrus leptus</i>	<i>Chondrostoma knerii</i>	Croatia	MG792871	MG792986
<i>Dactylogyrus linstowi</i>	<i>Luciobarbus capito</i>	Iran	MZ031073	MZ031062
<i>Dactylogyrus linstowoïdes</i>	<i>Luciobarbus guiraonis</i>	Spain	KY629329	KY629349
<i>Dactylogyrus macrostomi</i>	<i>Cyprinion macrostomum</i>	Iraq	OR817708*	OR817690*
<i>Dactylogyrus marocanus</i>	<i>Carasobarbus fritschii</i>	Morocco	KY629333	KY629355
<i>Dactylogyrus martinovici</i>	<i>Pachychilon pictum</i>	Greece	MG792885	MG793001
<i>Dactylogyrus mascomai</i>	<i>Luciobarbus graellsii</i>	Spain	MN365680	MN338215
<i>Dactylogyrus medicus</i> n. sp.	<i>Garra rufa</i>	Iraq	OR817710*	OR817691*
<i>Dactylogyrus microcirrus</i>	<i>Paracapoeta trutta</i>	Iraq	OR817705*	OR817688*
<i>Dactylogyrus nanoides</i>	<i>Squalius prespensis</i>	Greece	MG792923	MG793045
<i>Dactylogyrus nanus</i>	<i>Rutilus rubilio</i>	Italy	MK434933	MK434953
<i>Dactylogyrus octopus</i>	<i>Tropidophoxinellus spartiaticus</i>	Greece	MG792950	MG793065
<i>Dactylogyrus omenti</i>	<i>Aulopyge huegeli</i>	Bosnia and Herzegovina	KY201091	KY201105
<i>Dactylogyrus opertus</i>	<i>Telestes muticellus</i>	Italy	MK434944	MK434964
<i>Dactylogyrus opsopoeodi</i>	<i>Opsopoeodus emiliae</i>	Mississippi	OM108569	OM108533
<i>Dactylogyrus pectenatus</i>	<i>Pimephales promelas</i>	Wisconsin	OM108571	OM108535
<i>Dactylogyrus perlus</i>	<i>Luxilus chrysocephalus</i>	Arkansas	OM108572	OM108536
<i>Dactylogyrus persis</i>	<i>Carasobarbus luteus</i>	Iraq	OR817702*	OR817685*
<i>Dactylogyrus petenyi</i>	<i>Barbus cyclolepis</i>	Greece	MG792857	MG792972
<i>Dactylogyrus petkovici</i>	<i>Pachychilon pictum</i>	Greece	MG792887	MG793003
<i>Dactylogyrus polylepidis</i>	<i>Achondrostoma arcasii</i>	Spain	MN365664	MN338198
<i>Dactylogyrus pulcher</i>	<i>Capoeta razii</i>	Iran	MZ031070	MZ031058
<i>Dactylogyrus recisus</i>	<i>Pachychilon macedonicum</i>	Greece	MG792882	MG792998
<i>Dactylogyrus regius</i> n. sp.	<i>Chondrostoma regium</i>	Iraq	OR817707*	OR817693*
<i>Dactylogyrus rhinichthius</i>	<i>Rhinichthys atratulus</i>	Wisconsin	OM108573	OM108537
<i>Dactylogyrus rivalis</i> n. sp.	<i>Squalius lepidus</i>	Iraq	OR817714*	OR817697*
<i>Dactylogyrus rosickyi</i>	<i>Pachychilon pictum</i>	Greece	MG792888	MG793004
<i>Dactylogyrus rutili</i>	<i>Rutilus lacustris</i>	Greece	MG792900	MG793016
<i>Dactylogyrus rysavyi</i>	<i>Alburnoides oeconomui</i>	Greece	MG792851	MG792965
<i>Dactylogyrus sagittarius</i>	<i>Telestes muticellus</i>	Italy	MW443037	MW443034
<i>Dactylogyrus sandai</i>	<i>Telestes kaedicus</i>	Croatia	MG792942	MG793057
<i>Dactylogyrus scorpius</i>	<i>Luciobarbus rifensis</i>	Morocco	KX578023	KX553860
<i>Dactylogyrus sekulovici</i>	<i>Pachychilon pictum</i>	Greece	MG792889	MG793005
<i>Dactylogyrus semotilus</i>	<i>Luxilus chrysocephalus</i>	Arkansas	OM108574	OM108538
<i>Dactylogyrus sp.</i>	<i>Luciobarbus xanthopterus</i>	Iraq	MZ031074	MZ031063
<i>Dactylogyrus sphyrna</i>	<i>Vimba vimba</i>	Czech Republic	MG792951	MG793066
<i>Dactylogyrus suecicus</i>	<i>Rutilus lacustris</i>	Greece	MG792901	MG793017
<i>Dactylogyrus tapienensis</i>	<i>Barbonymus schwanefeldii</i>	South African Republic	OR081826	OR077124
<i>Dactylogyrus tissensis</i>	<i>Alburnoides oeconomui</i>	Greece	MG792852	MG792966
<i>Dactylogyrus varius</i>	<i>Luciobarbus massaensis</i>	Morocco	KX578026	KX553863
<i>Dactylogyrus vastator</i>	<i>Carassius gibelio</i>	Croatia	KY207446	KY629366
<i>Dactylogyrus venusti</i>	<i>Cyprinella venusta</i>	Mississippi	OM108588	OM108552
<i>Dactylogyrus vistulae</i>	<i>Squalius lepidus</i>	Iraq	OR817715*	OR817698*
<i>Dactylogyrus vistulae</i>	<i>Squalius prespensis</i>	Greece	MG792925	MG793043
<i>Dactylogyrus viticulus</i>	<i>Barbonymus schwanefeldii</i>	South African Republic	OR081827	OR077125
<i>Dactylogyrus volutus</i>	<i>Carasobarbus fritschii</i>	Morocco	KY629334	KY629353
<i>Dactylogyrus vranoviensis</i>	<i>Squalius squalus</i>	Croatia	MG792931	MG793048
<i>Dactylogyrus vukicae</i>	<i>Delminichthys adspersus</i>	Bosnia and Herzegovina	MG792881	MG792995
<i>Dactylogyrus yinwenyingae</i>	<i>Squalius lucumonis</i>	Italy	MK434939	MK434959
<i>Dactylogyrus zandti</i>	<i>Abramis brama</i>	Czech Republic	MG792839	MG792953
<i>Dactylogyrus zatensis</i>	<i>Carasobarbus fritschii</i>	Morocco	KY629335	KY629352
<i>Ancyrocephalus percae</i>	<i>Perca fluviatilis</i>	Finland	AJ490166	KF499080

The list includes also host species and countries of collection for each *Dactylogyrus* species. Newly-generated sequences are marked by asterisks (*).

Supplementary Table 3. List of *Gyrodactylus* and *Macrogyrodactylus* species used in the phylogenetic analyses with GenBank accession numbers for the sequences of one ribosomal region.

Gyrodactylus species	Host species	Country	Accession number
<i>Gyrodactylus alekosi</i>	<i>Clarias gariepinus</i>	Mozambique	FR850682
<i>Gyrodactylus arcuatus</i>	N/A	N/A	AF156668
<i>Gyrodactylus azeezsaedi</i> n. sp.	<i>Squalius berak</i>	Iraq	OR773093*
<i>Gyrodactylus blazeki</i> n. sp.	<i>Alburnus</i> sp.	Iraq	OR773085*
<i>Gyrodactylus botnicus</i>	<i>Phoxinus phoxinus</i>	Finland	AF484542
<i>Gyrodactylus branchicus</i>	<i>Gasterosteus aculeatus</i>	Belgium	AF156669
<i>Gyrodactylus bubyri</i>	<i>Pomatoschistus microps</i>	Belgium	AF328868
<i>Gyrodactylus danastriae</i>	<i>Phoxinus phoxinus</i>	Poland	HM192925
<i>Gyrodactylus derjavini</i>	N/A	Great Britain	AJ001840
<i>Gyrodactylus derjavinoides</i>	N/A	N/A	AJ132259
<i>Gyrodactylus ergensi</i>	<i>Sarotherodon galilaeus</i>	Senegal	FN394985
<i>Gyrodactylus gobbii</i>	N/A	Czech Republic	AJ407922
<i>Gyrodactylus hildae</i>	<i>Oreochromis niloticus</i>	Ethiopia	FJ231869
<i>Gyrodactylus iraqemembranatus</i> n. sp.	<i>Paracapoeta trutta</i>	Iraq	OR773087*
<i>Gyrodactylus jiroveci</i>	<i>Barbatula barbatula</i>	Czech Republic	AM502860
<i>Gyrodactylus jurajdai</i> n. sp.	<i>Chondrostoma regium</i>	Iraq	OR773088*
<i>Gyrodactylus kobayashii</i>	<i>Carassius auratus</i>	China	KJ524572
<i>Gyrodactylus laevis</i>	<i>Phoxinus phoxinus</i>	Finland	AY278036
<i>Gyrodactylus laevisoides</i>	<i>Chrosomus eos</i>	Canada	KF263527
<i>Gyrodactylus lomi</i>	<i>Squalius cephalus</i>	Czech Republic	AJ407929
<i>Gyrodactylus luciopercae</i>	<i>Perca fluviatilis</i>	Czech Republic	AJ407931
<i>Gyrodactylus macronychus</i>	<i>Phoxinus phoxinus</i>	Czech Republic	AJ407893
<i>Gyrodactylus malalai</i>	<i>Oreochromis niloticus</i>	Sudan	FR695484
<i>Gyrodactylus mediatoris</i>	<i>Notropis hudsonius</i>	Canada	KF178301
<i>Gyrodactylus mhaiseni</i> n. sp.	<i>Alburnus sellal</i>	Iraq	OR773082*
<i>Gyrodactylus mhaiseni</i> n. sp.	<i>Alburnus sellal</i>	Iraq	OR773083*
<i>Gyrodactylus nigritae</i>	<i>Synodontis nigrita</i>	Senegal	FR850686
<i>Gyrodactylus nipponensis</i>	<i>Anguilla japonica</i>	Japan	AB063295
<i>Gyrodactylus nyanzae</i>	<i>Oreochromis niloticus</i>	Zimbabwe	LN849939
<i>Gyrodactylus occupatus</i>	<i>Tilapia</i> sp.	Zimbabwe	LN849940
<i>Gyrodactylus pannonicus</i>	<i>Phoxinus phoxinus</i>	Slovak Republic	HM192915
<i>Gyrodactylus parisellei</i>	<i>Oreochromis niloticus</i>	Zimbabwe	LN849941
<i>Gyrodactylus poeciliae</i>	<i>Poecilia caucana</i>	Venezuela	AJ001844
<i>Gyrodactylus prostae</i>	<i>Rutilus rutilus</i>	Czech Republic	AJ567673
<i>Gyrodactylus pterygialis</i>	N/A	N/A	AJ581657
<i>Gyrodactylus pungitii</i>	<i>Poecilia caucana</i>	Venezuela	AJ001845
<i>Gyrodactylus rhodei</i>	<i>Rhodeus sericeus</i>	Czech Republic	AJ407933
<i>Gyrodactylus rivularae</i>	<i>Abbottina rivularis</i>	China	HM185818
<i>Gyrodactylus rysavyi</i>	<i>Clarias anguillaris</i>	Senegal	FR850679
<i>Gyrodactylus salaris</i>	N/A	N/A	AJ001847
<i>Gyrodactylus sandai</i> n. sp.	<i>Capoeta umbla</i>	Iraq	OR773089*
<i>Gyrodactylus satanicus</i> n. sp.	<i>Garra rufa</i>	Iraq	OR773091*
<i>Gyrodactylus</i> sp. 3	<i>Luciobarbus barbulus</i>	Iraq	OR773092*
<i>Gyrodactylus</i> sp. 3	<i>Alburnus sellal</i>	Iraq	OR773084*
<i>Gyrodactylus</i> sp. 4	<i>Barbus lacerta</i>	Iraq	OR773086*
<i>Gyrodactylus sturmbaueri</i>	<i>Pseudocrenilabrus philander</i>	Zimbabwe	LN849938
<i>Gyrodactylus synodonti</i>	<i>Synodontis nigrita</i>	Senegal	FR850684
<i>Gyrodactylus ulinganisus</i>	<i>Oreochromis mossambicus</i>	South African Republic	FJ231870
<i>Gyrodactylus vimbi</i>	<i>Squalius cephalus</i>	Czech Republic	AJ407936
<i>Gyrodactylus vukicae</i> n. sp.	<i>Garra rufa</i>	Iraq	OR773090*
<i>Gyrodactylus vukicae</i> n. sp.	<i>Garra rufa</i>	Iraq	OR773094*
<i>Macrogyrodactylus karibae</i>	<i>Clarias gariepinus</i>	Zimbabwe	GU252715

The list includes also host species and countries of collection for each *Gyrodactylus* species. Newly-generated sequences are marked by asterisks (*). N/A = data were not available in GenBank database.