Table S2: Cytochrome c subunit I (COI) seqences used to generate the global tree (Figure 7), their species identification, assigned geographic region, habitat (SW: saltwater; FW: freshwater), clade and haplotype assignment.

Genbank accession	Species ID	Assigned region	Habitat	Clade	Shared haplotype
KJ841677	adspersus	Mediterranean/NE Atlantic	SW	-	-
KJ841678	adspersus	Mediterranean/NE Atlantic	SW	-	-
KJ841679	adspersus	Mediterranean/NE Atlantic	SW	-	-
KJ841680	adspersus	Mediterranean/NE Atlantic	SW	-	-
KJ841681	adspersus	Mediterranean/NE Atlantic	SW	-	-
KJ841682	adspersus	Mediterranean/NE Atlantic	SW	-	-
KJ841683	adspersus	Mediterranean/NE Atlantic	SW	-	-
KJ841684	adspersus	Mediterranean/NE Atlantic	SW	-	-
KJ841685	adspersus	Mediterranean/NE Atlantic	SW	-	-
KJ841686	adspersus	Mediterranean/NE Atlantic	SW	-	-
MT517444	antennarius	Mediterranean/NE Atlantic	FW	-	-
MT517447	antennarius	Mediterranean/NE Atlantic	FW	-	-
MT517448	antennarius	Mediterranean/NE Atlantic	FW	-	-
MT517449	antennarius	Mediterranean/NE Atlantic	FW	-	-
MT517450	antennarius	Mediterranean/NE Atlantic	FW	-	-
MT517452	antennarius	Mediterranean/NE Atlantic	FW	-	-
KY660277	capensis	South Africa	FW	-	-
KY660278	capensis	South Africa	FW	-	-
KY660279	capensis	South Africa	FW	-	-
KY660280	capensis	South Africa	FW	-	-
KY660281	capensis	South Africa	FW	-	-
KY660282	capensis	South Africa	FW	-	-
KY660283	capensis	South Africa	FW	-	-
KY660284	capensis	South Africa	FW	-	-
KY660285	capensis	South Africa	FW	-	-
JF767303	carinicauda	Indo-Pacific	SW	-	-
JF767305	carinicauda	Indo-Pacific	SW	-	-
JF767306	carinicauda	Indo-Pacific	SW	-	-
JF767309	carinicauda	Indo-Pacific	SW	-	-
JF767312	carinicauda	Indo-Pacific	SW	-	-
KP179167	carteri	SW Atlantic	FW	-	-
KP179168	carteri	SW Atlantic	FW	-	-
KP759472	debilis	South Africa	SW	-	-
DQ882102	elegans	Mediterranean/NE Atlantic	SW	-	-
HE573175	elegans	Mediterranean/NE Atlantic	SW	-	-

HE573176	elegans	Mediterranean/NE Atlantic	SW	-	-
JQ306028	elegans	Mediterranean/NE Atlantic	SW	-	-
JQ306029	elegans	Mediterranean/NE Atlantic	SW	-	-
JQ306030	elegans	Mediterranean/NE Atlantic	SW	-	-
KC019174	floridanus	Caribbean/GoM/NW Atlantic	SW	-	-
KC019175	floridanus	Caribbean/GoM/NW Atlantic	SW	-	-
KC019176	floridanus	Caribbean/GoM/NW Atlantic	SW	-	-
KC019177	floridanus	Caribbean/GoM/NW Atlantic	SW	-	-
KC019178	floridanus	Caribbean/GoM/NW Atlantic	SW	-	-
KC019179	floridanus	Caribbean/GoM/NW Atlantic	SW	-	-
KC019180	floridanus	Caribbean/GoM/NW Atlantic	SW	-	-
KC019182	floridanus	Caribbean/GoM/NW Atlantic	SW	-	-
KC019183	floridanus	Caribbean/GoM/NW Atlantic	SW	-	-
KT282102	gravieri	Indo-Pacific	SW	-	-
KP179170	ivonicus	SW Atlantic	FW	-	-
KP179171	ivonicus	SW Atlantic	FW	-	-
KJ769063	kadiakensis	Caribbean/GoM/NW Atlantic	FW	Clade 1	-
KJ769064	kadiakensis	Caribbean/GoM/NW Atlantic	FW	Clade 1	-
KJ769066	kadiakensis	Caribbean/GoM/NW Atlantic	FW	-	-
PP989521	kadiakensis (50A)	Caribbean/GoM/NW Atlantic	FW	Clade 1	
PP989520	kadiakensis (50B)	Caribbean/GoM/NW Atlantic	FW	Clade 1	
KJ769084	lindsayi	Caribbean/GoM/NW Atlantic	FW	-	-
KJ769085	lindsayi	Caribbean/GoM/NW Atlantic	FW	-	-
AJ640115	longirorostris	Mediterranean/NE Atlantic	SW	-	-
AJ640116	longirorostris	Mediterranean/NE Atlantic	SW	-	-
AJ640117	longirorostris	Mediterranean/NE Atlantic	SW	-	-
AJ640118	longirorostris	Mediterranean/NE Atlantic	SW	-	-
AJ640119	longirorostris	Mediterranean/NE Atlantic	SW	-	-
AJ640120	longirorostris	Mediterranean/NE Atlantic	SW	-	-
AJ640121	longirorostris	Mediterranean/NE Atlantic	SW	-	-
AJ640122	longirorostris	Mediterranean/NE Atlantic	SW	-	-
AJ640123	longirorostris	Mediterranean/NE Atlantic	SW	-	-
AJ640124	longirorostris	Mediterranean/NE Atlantic	SW	-	-
HG792276	macrodactylus	Indo-Pacific	SW	-	-
HG792278	macrodactylus	Indo-Pacific, Mediterranean/NE Atlantic, Caribbean/GoM/NW Atlantic	SW	-	-
HG792279	macrodactylus	Indo-Pacific, Mediterranean/NE Atlantic	SW	-	-
HG792280	macrodactylus	Indo-Pacific	SW	-	-
HG792281	macrodactylus	Indo-Pacific	SW	-	-
HG792313	macrodactylus	Indo-Pacific	SW	-	-
JX502980	macrodactylus	Indo-Pacific	SW	-	-

KP179172	mercedae	SW Atlantic	FW	-	-
KJ769086	mexicanus	North/Central America	FW	-	-
MT517459	minos	Mediterranean/NE Atlantic	FW	-	-
MK412768	modestus	Indo-Pacific	FW	-	-
MK412769	modestus	Indo-Pacific	FW	-	-
MW069518	modestus	Indo-Pacific	FW	-	-
MW069519	modestus	Indo-Pacific	FW	-	-
MW069520	modestus	Indo-Pacific	FW	-	-
MW069521	modestus	Indo-Pacific	FW	-	-
MW069523	modestus	Indo-Pacific	FW	-	-
KU905885	mundusnovus	Caribbean/GoM/NW Atlantic	SW	Clade 3	-
KU905899	mundusnovus	Caribbean/GoM/NW Atlantic	SW	Clade 3	-
MH087532	mundusnovus	Caribbean/GoM/NW Atlantic	SW	-	-
MH087698	mundusnovus	Caribbean/GoM/NW Atlantic	SW	-	-
PP989509	mundusnovus (55C)	Caribbean/GoM/NW Atlantic	SW	Clade 4	
PP989513	mundusnovus (55D)	Caribbean/GoM/NW Atlantic	SW	Clade 4	H7
PP989495	mundusnovus (55H)	Caribbean/GoM/NW Atlantic	SW	Clade 3	H3
PP989535	mundusnovus (66D)	Caribbean/GoM/NW Atlantic	SW	Clade 3	
KP179174	northropi	SW Atlantic	SW	-	-
KP179175	northropi	SW Atlantic	SW	-	-
KP179177	northropi	SW Atlantic	SW	-	-
KP179165	octaviae	SW Atlantic	SW	-	-
KP179166	octaviae	SW Atlantic	SW	-	-
JX502983	pacificus	Indo-Pacific	SW	-	-
JX502984	pacificus	Indo-Pacific	SW	-	-
KP179178	paivai	SW Atlantic	SW	-	-
MK308076	paludosus	Caribbean/GoM/NW Atlantic	FW	-	-
MK308144	paludosus	Caribbean/GoM/NW Atlantic	FW	-	-
MK308178	paludosus	Caribbean/GoM/NW Atlantic	FW	-	-
MK308191	paludosus	Caribbean/GoM/NW Atlantic	FW	-	-
MK308205	paludosus	Caribbean/GoM/NW Atlantic	FW	-	-
MK308228	paludosus	Caribbean/GoM/NW Atlantic	FW	-	-
MK308239	paludosus	Caribbean/GoM/NW Atlantic	FW	-	-
MK308259	paludosus	Caribbean/GoM/NW Atlantic	FW	-	-
MK308273	paludosus	Caribbean/GoM/NW Atlantic	FW	-	-
KP179180	pandaliformis	SW Atlantic	FW	-	-
KP179181	pandaliformis	SW Atlantic	FW	-	-
KP179182	pandaliformis	SW Atlantic	FW	-	-
KP179183	pandaliformis	SW Atlantic	FW	-	-
KP179184	pandaliformis	SW Atlantic	FW	-	-
KP179185	pandaliformis	SW Atlantic	FW	-	-
KP179186	pandaliformis	SW Atlantic	FW	-	-

KP179187	pandaliformis	SW Atlantic	FW	-	-
MT888370	pandaliformis	SW Atlantic	FW	-	-
EF595551	peringueyi	South Africa	SW	-	-
EF595552	peringueyi	South Africa	SW	-	-
EF595553	peringueyi	South Africa	SW	-	-
EF595554	peringueyi	South Africa	SW	-	-
EF595555	peringueyi	South Africa	SW	-	-
EF595556	peringueyi	South Africa	SW	-	-
EF595557	peringueyi	South Africa	SW	-	-
EF595558	peringueyi	South Africa	SW	-	-
EF595560	peringueyi	South Africa	SW	-	-
KT959457	pugio	Caribbean/GoM/NW Atlantic	SW	-	H5
MH235857	pugio	Caribbean/GoM/NW Atlantic	SW	-	H6
MH235862	pugio	Caribbean/GoM/NW Atlantic	SW	-	H5
MH235911	pugio	Caribbean/GoM/NW Atlantic	SW	-	H6
MK308074	pugio	Caribbean/GoM/NW Atlantic	SW	-	H5
MK308102	pugio	Caribbean/GoM/NW Atlantic	SW	-	H5
MK308240	pugio	Caribbean/GoM/NW Atlantic	SW	-	H5
PP989499	pugio (03K)	Caribbean/GoM/NW Atlantic	SW	Clade 3	H4
PP989494	pugio (04A)	Caribbean/GoM/NW Atlantic	SW	Clade 3	H1
PP989501	pugio (46H)	Caribbean/GoM/NW Atlantic	SW	Clade 3	H4
PP989498	pugio (47D)	Caribbean/GoM/NW Atlantic	SW	Clade 3	H1
PP989496	pugio (52A)	Caribbean/GoM/NW Atlantic	SW	Clade 3	H2
PP989511	pugio (52B)	Caribbean/GoM/NW Atlantic	SW	Clade 3	H4
PP989497	pugio (55F)	Caribbean/GoM/NW Atlantic	SW	Clade 3	H1
PP989512	pugio (55G)	Caribbean/GoM/NW Atlantic	SW	Clade 3	H2
PP989510	pugio (55I)	Caribbean/GoM/NW Atlantic	SW	Clade 3	H3
PP989527	pugio (58C)	Caribbean/GoM/NW Atlantic	SW	Clade 4	
PP989538	pugio (59A)	Caribbean/GoM/NW Atlantic	SW	Clade 3	
PP989532	pugio (66G)	Caribbean/GoM/NW Atlantic	SW	Clade 3	H1
PP989522	pugio (66H)	Caribbean/GoM/NW Atlantic	SW	Clade 3	
KP179188	ritteri	NE Pacific	SW	-	-
PP989526	schmitti (66F)	Mediterranean/NE Atlantic	SW	Clade 3	H1
PP989523	schmitti (66I)	Mediterranean/NE Atlantic	SW	Clade 3	
JQ306032	serratus	Mediterranean/NE Atlantic	SW	-	-
JQ306033	serratus	Mediterranean/NE Atlantic	SW	-	-
JQ306034	serratus	Mediterranean/NE Atlantic	SW	-	-
JQ306258	serratus	Mediterranean/NE Atlantic	SW	-	-
JQ306259	serratus	Mediterranean/NE Atlantic	SW	-	-
KJ841700	serratus	Mediterranean/NE Atlantic	SW	-	-
KP759473	serratus	Mediterranean/NE Atlantic	SW	-	-
JX502985	serrifer	Indo-Pacific	SW	-	-
MK994929	sinensis	Indo-Pacific	FW	-	-
MT884019	sinensis	Indo-Pacific	FW	-	-

MT884020	sinensis	Indo-Pacific	FW	-	-
MT884021	sinensis	Indo-Pacific	FW	-	-
MT884023	sinensis	Indo-Pacific	FW	-	-
JX100453	styliferus	Indo-Pacific	SW	-	-
MF621340	styliferus	Indo-Pacific	SW	-	-
MH429354	styliferus	Indo-Pacific	SW	-	-
MH884754	styliferus	Indo-Pacific	SW	-	-
MN200407	styliferus	Indo-Pacific	SW	-	-
MN200408	styliferus	Indo-Pacific	SW	-	-
HQ324441	suttkusi	Caribbean/GoM/NW Atlantic	FW	-	-
HQ324442	suttkusi	Caribbean/GoM/NW Atlantic	FW	-	-
HQ324462	suttkusi	Caribbean/GoM/NW Atlantic	FW	-	-
HQ324464	suttkusi	Caribbean/GoM/NW Atlantic	FW	-	-
HQ324466	suttkusi	Caribbean/GoM/NW Atlantic	FW	-	-
HQ324468	suttkusi	Caribbean/GoM/NW Atlantic	FW	-	-
HQ324469	suttkusi	Caribbean/GoM/NW Atlantic	FW	-	-
HQ324478	suttkusi	Caribbean/GoM/NW Atlantic	FW	-	-
HQ324482	suttkusi	Caribbean/GoM/NW Atlantic	FW	-	-
HQ324496	suttkusi	Caribbean/GoM/NW Atlantic	FW	-	-
HQ324503	suttkusi	Caribbean/GoM/NW Atlantic	FW	-	-
HQ324504	suttkusi	Caribbean/GoM/NW Atlantic	FW	-	-
HQ324505	suttkusi	Caribbean/GoM/NW Atlantic	FW	-	-
HQ324509	suttkusi	Caribbean/GoM/NW Atlantic	FW	-	-
HQ324510	suttkusi	Caribbean/GoM/NW Atlantic	FW	-	-
HQ324525	suttkusi	Caribbean/GoM/NW Atlantic	FW	-	-
HQ324527	suttkusi	Caribbean/GoM/NW Atlantic	FW	-	-
HQ324529	suttkusi	Caribbean/GoM/NW Atlantic	FW	-	-
HQ324538	suttkusi	Caribbean/GoM/NW Atlantic	FW	-	-
KJ769047	suttkusi	Caribbean/GoM/NW Atlantic	FW	-	-
KJ769051	suttkusi	Caribbean/GoM/NW Atlantic	FW	-	-
KJ769052	suttkusi	Caribbean/GoM/NW Atlantic	FW	-	-
KJ769053	suttkusi	Caribbean/GoM/NW Atlantic	FW	-	-
KJ769054	suttkusi	Caribbean/GoM/NW Atlantic	FW	-	-
KJ769055	suttkusi	Caribbean/GoM/NW Atlantic	FW	-	-
KJ769072	suttkusi	Caribbean/GoM/NW Atlantic	FW	-	-
KJ769073	suttkusi	Caribbean/GoM/NW Atlantic	FW	-	-
KJ769077	suttkusi	Caribbean/GoM/NW Atlantic	FW	-	-
KJ769078	suttkusi	Caribbean/GoM/NW Atlantic	FW	-	-
KJ769079	suttkusi	Caribbean/GoM/NW Atlantic	FW	-	-
KJ769080	suttkusi	Caribbean/GoM/NW Atlantic	FW	-	-
PP989516	texanus (53B)	Caribbean/GoM/NW Atlantic	FW	Clade 2	
PP989515	texanus (54A)	Caribbean/GoM/NW Atlantic	FW	Clade 2	
PP989515	texanus (54A)	Caribbean/GoM/NW Atlantic	FW	Clade 2	
DQ882101	unknown sp.	?	?	-	-

KJ769035	unknown sp.	Caribbean/GoM/NW Atlantic	FW	-	-
KJ769036	unknown sp.	Caribbean/GoM/NW Atlantic	FW	-	-
KJ769038	unknown sp.	Caribbean/GoM/NW Atlantic	FW	-	-
KJ769045	unknown sp.	Caribbean/GoM/NW Atlantic	FW	-	-
KJ769049	unknown sp.	Caribbean/GoM/NW Atlantic	FW	-	-
KJ769059	unknown sp.	Caribbean/GoM/NW Atlantic	FW	-	-
KJ769074	unknown sp.	Caribbean/GoM/NW Atlantic	FW	-	-
KJ769081	unknown sp.	Caribbean/GoM/NW Atlantic	FW	-	-
KP179189	unknown sp.	SW Atlantic	FW	-	-
KP179190	unknown sp.	SW Atlantic	FW	-	-
MF401424	unknown sp.	Caribbean/GoM/NW Atlantic	SW	-	-
MK308088	unknown sp.	Caribbean/GoM/NW Atlantic	SW	-	-
OQ322994	unknown sp.	Caribbean/GoM/NW Atlantic	SW	-	-
KT208418	varians	Mediterranean/NE Atlantic	SW	-	-
KT209444	varians	Mediterranean/NE Atlantic	SW	-	-
FJ581830	vulgaris	Caribbean/GoM/NW Atlantic	SW	-	-
FJ581832	vulgaris	Caribbean/GoM/NW Atlantic	SW	-	-
FJ581833	vulgaris	Caribbean/GoM/NW Atlantic	SW	-	H9
KP254034	vulgaris	Caribbean/GoM/NW Atlantic	SW	-	H10
KP254631	vulgaris	Caribbean/GoM/NW Atlantic	SW	-	H11
KP254930	vulgaris	Caribbean/GoM/NW Atlantic	SW	-	H9
KT959369	vulgaris	Caribbean/GoM/NW Atlantic	SW	-	-
KT959459	vulgaris	Caribbean/GoM/NW Atlantic	SW	-	-
KU906070	vulgaris	Caribbean/GoM/NW Atlantic	SW	-	H11
PP989524	vulgaris (66C)	Caribbean/GoM/NW Atlantic	SW	Clade 4	H8