

Additional Table 1. Amino acid sequences deduced from the complete *Mcox2* extension nucleotide sequences of the 21 species used in this study (using the *Drosophila* mtDNA genetic code). Sites shaded in black are the 11 constant amino acid positions; the eight sites shaded with blue are those that may be under positive selection as inferred by the MG94xHKY85x3_4x2_Rates model in *HyPhy*; the six sites shaded with orange are those that may be under positive selection as inferred by the M8 model in the *codeml* algorithm in PAML. In the C-terminus tail regions, the N-glycosylation motifs are shaded in red, the casein kinase II phosphorylation motifs are shaded in green, and areas where these motifs overlap are shaded in blue.

Species	10	20	30	40	50
L. straminea	-NHNFMNASSGFGNRRNSCLVFIGDKIYWVFYSMFRGTYFVVELYFKWW				
L. hydiana	-NHNFMNASSGFGNRRNSCLVFIGDKIYWVFYSMFRGTYFVVELYFKWW				
A. ligamentina	-NHNFNVNASSGFGNRRNSCLVFIGDKIYWVFYSMFRGTYFVVGLEYFKWW				
L. ovata	---NHNSNMNASSGSGDRGCLMFIGDVIYWVLYSTYRGTCFMVGLYFKWW				
H. subangulata	-NHNSNTNASGSSKNLNRSYLMLIGDAVYWVFYSTYQGISFAVGLYFKWW				
V. ellipsifirmis	----NHNSNMNSGGSKNRGYFMIVGDVVYWVFSIIYEGVYISAKLYVLWW				
O. olivaria	----NHDSNMNSGGSKNRGYLMIVGDTFYWVFSIICEGIYISAKLYMLWW				
P. fasciolaris	NHDSNTNAGDGGVEKKSGLLGLTLVSAIKYVFVSIFKTTFLLGKVYFLAW				
L. rimosus	-NHDKNTNAGGGDVSKGGSLLGVLSSLIGYVFFGVLKATILLGKVYFLWW				
G. rotundata	---NHNMNTNSSGSSGGGSYCSGVWDIIRYVVC GIVKVAIFLGKMYGMWW				
C. tampicoensis	--NHNKNANACSGPGGGGSYCSVWWDVIRYVVC GILKAAIFIGKMYGLWW				
O. reflexa	---NHNKNISHGGDENNASFLSVVRDIIGYVLRKVLGGILILGKLYVLWW				
T. lividus	-----SHDKNMNAGDSGDGGRSVVWNAAVWVIRMILKVTIFCGKAYFLWW				
P. popeii	-NHDKNINANCADCSCDSGFMMAVWKAIMCALGAIWKLTKFLAWLYVVMWF				
A. plicata	-----NHNINVNASTGGGLCGSFWDYVVGFLGIWKCVKFLGKLYVMWF				
P. dombeyanus	--NHDMNLNANASYTCSNNLCAGAWGAIVCAKKIWGVTKFLGSCYVMWF				
F. flava	--NHDENMKNMVGASNSWSVAGYAWGLLTSAAKKLEFLKMAGTMYVMWF				
P. sintoxia	---NHDENMKNVKGANDWSVTAYAWALLTSAAKKLELLKMAGTMYVMWF				
Q. quadrula	----NHGKDVNNSGVVDSANGFSLRGFLMGVFKKIVKVLKMLGSLYVMWF				
Q. refulgens	----NHSKDVNNSGVVDGVGGFSLRGFLMGVFKKVVKVLKMLGSLYVMWF				
I. japonensis	-----NHNNVLKEMGGRPESWTWWGLLVAVVSGIGKGLYWLGS MYGMFL				

	60	70	80	90	100
L. straminea	FYLLKFGIYW	PVKFVF	ESTFSLTTWAL	NNTSYSLV	VWVWFLSDPVDASTS
L. hydiana	FYLLKFGIYW	PVKFVF	ESTFSLTTWAL	NNTSYSLV	VWVWFLSDPVDASTS
A. ligamentina	FYLLKFGIYW	PVKFVF	ESTFSLTTWAL	NNTSYSLV	VWVWFLSDPVDASTS
L. ovata	FYFFKFGVYW	PLKFTLE	SAFNLTWAL	NNTSYSLV	SWFVWFLSDPVDASVS
H. subangulata	FYVLKVGIVP	PLSCTL	KAVFNLGQWT	FNVSVSLAK	KWFMWFLSDPVDASLS
V. ellipsifirmis	YYFFEYCVVF	PVKFALE	EGVYSLTSMF	FKTCVSLV	MWVGWFLSDPVGATVG
O. olivaria	YYFFKYGVVF	PVKCALE	EGAYSLTSMV	LKTCVSLV	VWVGWFLSDPVGATVG
P. fasciolaris	YYLGYYSIYV	PFSFVFL	LGAFDLIWWV	SYICVAVG	SWMSWFLTNPFDAVSF
L. rimosus	YYLGYYVVYV	PVSIVVF	IGTFDFVWVAV	STCVAFG	SWLSWFLVMDPIDATMF
G. rotundata	YCFGYYVVYL	PVKYTL	VGTFDLTCWV	ASTCLA	AVRWASWFLVSDPVDASVY
C. tampicoensis	YCLGYYVVYL	PIKYTL	VGTFDLTWWI	SSACIA	IGRWIGWFLVSPVDASVY
O. reflexa	YYFFYYAVYV	PVKYAI	FGTGFLTWLI	IETCCSV	GRWVWFLVSNPVDASIF
T. lividus	YYLAYYAIYV	PIKYTF	WGAFDLTWWT	VVTCFS	IGRWVWFLVLEPVDASVY
P. popeii	YNLFYYGLYV	PIKYSVL	GSIDLTTWWI	IMTCYAV	GEWALWFLVDPVNASLF
A. plicata	YYLGYYGVYL	PIKFTV	CSSDLVWWT	IMSCVAL	GEWMGWFLVTNPVDASVF
P. dombeyanus	YYLGYYGVYV	PIKVAV	VGSFDLVWWT	VSACL	SVGRWVWFLVAMD
F. flava	YYVFYYGLYV	PAKFAV	TTSDDLWWT	VESCAV	VKWVWFLTSPVDASVF
P. sintoxia	YYVFYYGLYV	PAKFAV	TTSDDLWWT	VESCAV	VKWVWFLTSPVDASVF
Q. quadrula	YYVIYYGLYV	PAKFAV	FGGCDLIQWT	LKSLAIA	EWMWFLVSPVDASIF
Q. refulgens	YYVLYYGLYV	PAKFAV	FGGCDLIQWAL	LKSLAIA	EWMWFLVSPVDASIF
I. japonensis	YYLFYYSFYV	PGKFVV	VGSWGFVWVW	ISSSVI	VVKWLWFLVGNPMEAVSY

	110	120	130	140	150
L. straminea	AIVWLGGKAF	SVIHFSVTSP	VMAFVWL	TKKVWSLTCL	VANLPFVVFDAMW
L. hydiana	AIVWLGGKAF	SVIHFSVTSP	VMAFVWL	TKKVWSLTCL	VANLPFVVFDAMW
A. ligamentina	AVVWLGGKVF	SVIRFSVTSP	VMAFVWL	TKKVWSLTCL	VANLPFVVFDPMW
L. ovata	AIVWLKGKIF	SAIYFSVTSP	LTAFFVWL	SKKVWSLTCL	FMANLPFVVFDAMW
H. subangulata	AVVWLGNKFF	SVIYFSVTSP	LTAFFVWL	SKKAWSTCF	IGNLPFIVFDAMW
V. ellipsifirmis	ALVFLGDKIF	SVVYFSVTSP	MKAFFVWL	VSKACKVA	WFFVNFPLFAFDAMI
O. olivaria	ALVFLVDEIF	SVVYFSVTSP	VKLFVWL	TKKAWSV	AWFMVNFPPVAFDAWI
P. fasciolaris	VFLYLVGWVW	SLVYFFVTSP	VSAVWL	AELVWKVI	YVMSNVPILSLDAWV
L. rimosus	ALFYLSSEIL	SLIYYCVTSP	IMASVWL	AKGVWVKV	CVLVSVPFMTFDFAM
G. rotundata	AFLYLGSKVW	SVFLFCVTSP	MMASVWL	AKGVWVSV	ICVSVSFPFVVFNWAV
C. tampicoensis	AFFYLGGKVW	SVFLFCVTSP	VSAVWL	VKSIWAVV	CAGVSFPFVVFDPMW
O. reflexa	AFFYLCGKFL	SGIWFVVSSP	VSAVWL	ITGIWKM	IGVVASLSFFVFDAMW
T. lividus	AFMYLGGKIC	SAVWFAVTSP	VKASVWL	VKGWVKV	ACAVVNFPPVFDAMW
P. popeii	ALNYLGAKIW	SIMVFAITSP	VSAVWL	GKGVWVKV	CVVASLPFLILDALW
A. plicata	AFFYLVDKVW	SAVFFVVTKP	VEASVWI	IKGIWKG	ACAVVNFPLVFDAMW
P. dombeyanus	AISYLGKGIW	SGVCFAVTSP	IAASVWV	VKGWVSGI	CAVVSFPYVAFNALV
F. flava	VCVYLVKKVG	SGIWFVVTS	PVAVKWII	ISGVWKG	ACAVNFPFLVFNAMW
P. sintoxia	ACVYLVKKVG	SGIWFVVTS	PVAVKWII	ISGVWKG	ACAVNFPFLVFNAMW
Q. quadrula	AFGYFVGKVS	SGLWFVVSSP	VTAVIWL	AKGVWKG	VCAIVWFPLTAFEAWF
Q. refulgens	AFGYLVGKVS	SGLWFVVTS	PVTAFVWL	VKGWVSGV	CAIVWFPLTAFEAWF
I. japonensis	AVGCLVANIW	SVVFFVTSP	VVAVWWL	VKGFCGVV	VGFWFSLYAFEAVL

	160	170	180
L. straminea	SCMS <u>SFSDNETK</u> QWVVMQVARSSSEVFYKAMVEYYSKK		
L. hydiana	NCMS <u>SFSDNETK</u> QWVVMQVARSSSEVFYKAMVEYYSKK		
A. ligamentina	DCMS <u>SFSDNETK</u> QWVVIQIARSSEVFYKAMVEYYSKK		
L. ovata	N <u>MS</u> <u>SFSDNETK</u> SWVVAQIARNSEVFYSAMMEYYSKK		
H. subangulata	DTMSTF <u>SGNESKR</u> WVVTQIARNSEVFYKVMMDYYSKK		
V. ellipsifirmis	DVMSSF <u>SNNETK</u> QWIVTHIARNTSEFYRAMVEYYSKK		
O. olivaria	DVMSSF <u>SNNETK</u> QWIVAHIAIARNTSEFYRTMVEYYSKK		
P. fasciolaris	SFINYY <u>SSSETQ</u> KYIVRQIANNTKEFFDVLCLKHYVKK		
L. rimosus	DCMSSF <u>SSNETK</u> EYVRRISKNTKEFFDVLLSYYSKK		
G. rotundata	DVMSSF <u>SYNETK</u> EYVVRHITRNTKEFYWIMMGYYGKK		
C. tampicoensis	DVMGSF <u>SYNETK</u> EYVVWQITRNTKEFYWIMMGYYGKK		
O. reflexa	DAMS <u>SFSDNETK</u> EWVIWHITRNTKEFYWVVMSSYYAEK		
T. lividus	NVMS <u>SFSDNETK</u> ECVFWHITRNTKEFYWIMMGYYGKK		
P. popeii	ESMS <u>SFSDNETK</u> SWIVWQINRNTKEFILILMGYYSKK		
A. plicata	EQMSSF <u>SSNDTK</u> GFVVWHIYRNTKEFYWALLDRYSGK		
P. dombeyanus	DSVSS <u>FN</u> ENGVOELIAWQVYRSTKRFYWALLNRYSGK		
F. flava	ESMSTF <u>TQNETK</u> DLVIWHVYRNTKEFIWALAERYKGD		
P. sintoxia	ESMSTF <u>TQNETK</u> DLVVWHVYRNTKEFIWALAERYKTG		
Q. quadrula	DSMS <u>SFTDNDTK</u> NLVVWHIYRNTKEFVWALMERYKD-		
Q. refulgens	DSMS <u>SFTDNDTK</u> NMVVWHIYRNTKEFVWALMERYKD-		
I. japonensis	NSLSSTGDGFQEFVVD <u>NVSW</u> NTKKFLWILSNRYKGG		