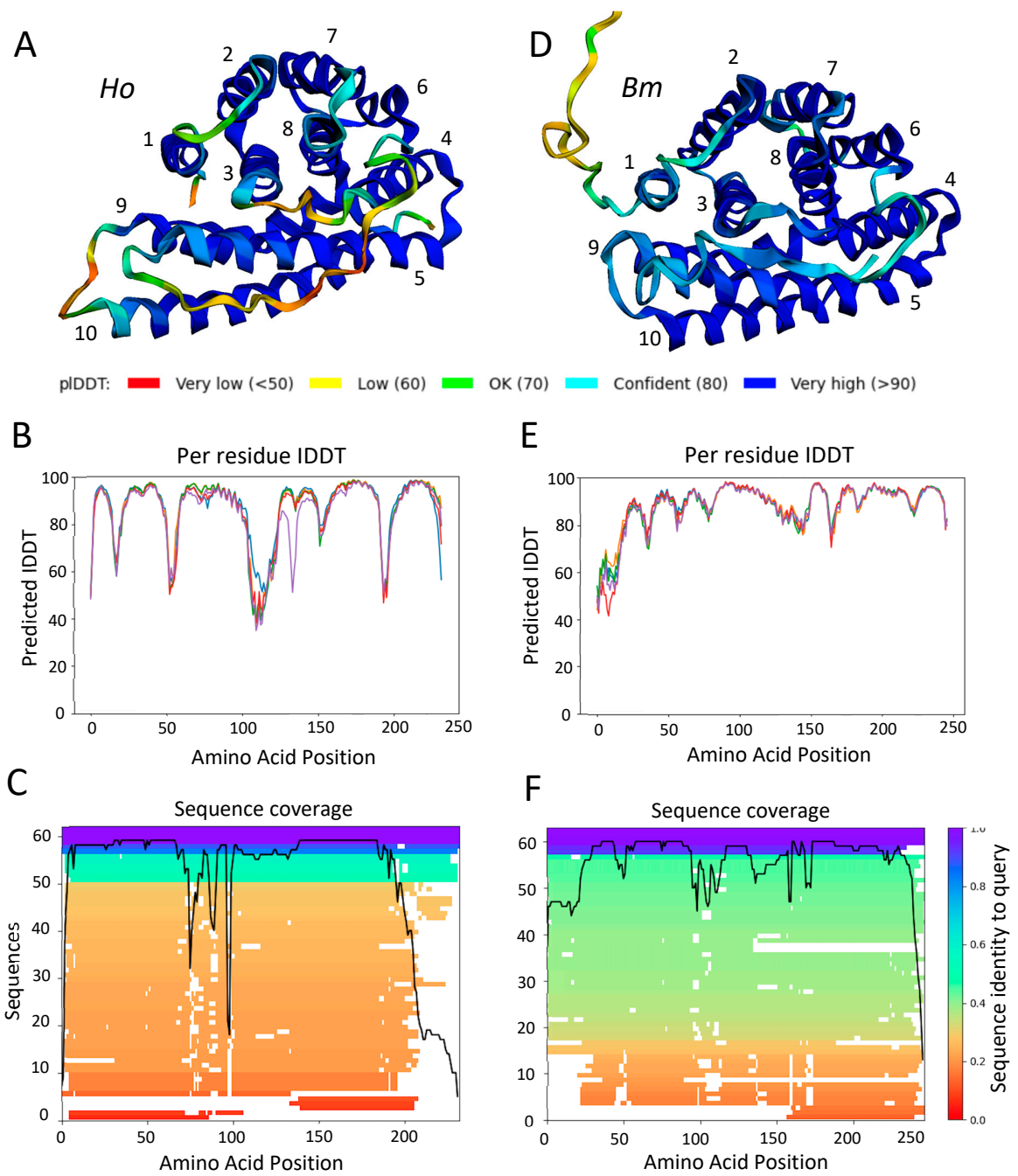


P21828	FIBL_BOMMO	1	----	MKPIFL	--VLVATSAYAAP-SVTINQYSDNEIPRDIDDGKAS--SVISRWD-YV	50
Q26427	FIBL_GALME	1	----	MLPFVL	--VLVATSALAAP-SVVISQDNINNIAPRVGNRPISALIDRAFE-IV	52
Q9BL15	Q9BL15_PAPXU	1	----	MLPITL	--ILLVVTSAFAAP-SVTVTQYNANDIPVPVDPNGKPSSSI--ENAFDVL	51
A0A6J2JLC8	A0A6J2JLC8_BOMMA	1	----	MKPIFL	--VLVATSAYAAP-SVTINQYSDNEIPRDIDDGKAS--SVISRWD-YV	50
A0A7I02NV9	A0A7I02NV9_DANPL	1	MTCT	MLPFVL	--VFLFAQSTFALPTA-LVNFVDVNEARVIDNGQLVSRALLDKVFE-LI	56
Q9BL17	Q9BL17_9NEOP	1	----	MMRPVL	--VLFVATSALAAP-SVLLKQYSENEVAPTKDNGKQVSSYLTDRTFD-LF	53
A0A891XIJ7	A0A891XIJ7_TINBI	1	----	MLRFAL	--VLFQAQCAFAAP-QVQIAQNIDEVPRPRDNGRQVNSYLTGTGLFELD	53
Q14UU5	Q14UU5_YPOEV	1	----	MLPLVL	--VLVQAQSALAP-SVSNQVAYNQAEGRDNGNLINSYVTDVAFG-LL	52
A0A0N1PIW2	A0A0N1PIW2_PAPMA	1	----	MLPITL	--ILLVVTSAFAAP-SVTVTQYNANDIPVPVDPNGKPSSSI--ENAFSVLN	51
A0A3S2NFE9	A0A3S2NFE9_CHISP	1	----	MLPLVL	--VSLVSGALAAVPTLTQYSINEIPLENENRIFISSALTRQAFD-NI	52
A0A2A4JXS4	A0A2A4JXS4_HELVI	1	----	MLPVL	--VLVATSALAAP-GVNLIRNVNEVPPRRHNGRAVSAFLTNQAFE-NI	52
A0A821XWV1	A0A821XWV1_9NEOP	1	----	MLPFVL	--VFLAQAQSAFAAPSNAATFYNTNEVGSVPDNGGLVNSYIVSGPVD-YL	53
A0A8B8HT70	A0A8B8HT70_9NEOP	1	----	MLPVL	--VLVQAQSAFAAPSNGVQGFKNFNEVAPVSDNGKLVSSYITDGSIA-YI	53
DOEW8D	DOEW8D_CORCP	1	----	MLPFVL	--VLVASSALAAP-SVSTIQDNINNIAPVASNGRAVSSYLTDRAFE-IV	52
J9XS21	J9XS21_HARDE	1	----	MLPFVL	--VSEFVSGALAVP-VVNUNQYSINEVAPVGDNGRLVSSFLTDRSFE-AV	52
V5UTC1	V5UTC1_OSTFU	1	----	MLPFVL	--VSLVSGAFALP-AVVSQYNYNEIAPVADNGKLVSSYLSNADF-LV	52
A0A7E5W904	A0A7E5W904_TRINI	1	----	MLFVVL	--LLLAASALANP-FGRVNRQYSYDDVG-----SNSVIEGLD-SV	42
A0A6J1NAW1	A0A6J1NAW1_BICAN	1	----	MLPLIL	--VFLAQNALSLPYT-NVNFYNIENAPSIPTNGQLINSVTTGALE-WI	52
A0A5B2VHG3	A0A5B2VHG3_9BACT	1	----	MKPIFL	--VLVATSAYAAP-SVTINQYSDNEIPRDIDDGKAS--SVISRWD-YV	50
A0A835GRS5	A0A835GRS5_SPOEX	1	----	MLFVVL	--VFLAATSALAAP-GAYLNIISIDEAIPPKDSGRAVSAFRIDQATE-IA	52
D7PBV9	D7PBV9_9NEOP	1	----	MLPIVL	--VLSVLSVLAQAQAYG---ASVNFVPIEDVPIRYEFGNTINRNLDAFQ-LV	51
A0A7U3TKS2	A0A7U3TKS2_PLUXY	1	----	MLPVL	--VLVQAQSAFAGP-AVQLSLANFNEVAPSKDNGRLVNRHVSDGAFD-LI	52
Limnephilus_decipiens		1	----	MALSLILGALLIAIQGASFVA-----SSHISASLLEGTWD-LV	36	
Limnephilus_lunatus		1	----	MALSLILGALLIAIQGASFVA-----SSHISASLLEGTWD-LV	36	
Limnephilus_rhombicus		1	----	MALSLILGALLIAIQGASFVA-----SSHISASLLEGTWD-LV	36	
Limnephilus_marmoratus		1	----	MALSLILGALLIAIQGASFVA-----SSHVSSSLELATWD-LV	36	
Hesperophylax_occidentalis		1	----	MALSLILGALLIAIQGASFVA-----SSQISASLLEETWN-LV	36	
Hydropsyche_angustipennis		1	----	MAILVFLSALLFIQAA---S-----AHCNTAGLVQATWG-LI	33	
Parapsyche_elais		1	----	MAILVFLSALLFIQAA---A-----AHCNT-GLIEATWG-LI	32	
Stenopsyche_tienmushanensis		1	----	MAILVFLSALLFIQAA---T-----ACNVPGGLLQAAWG-LI	33	
Stenopsyche_marmorata		1	----	MAILVFLSALLFIQAA---T-----ACNVPGGLLQAAWG-LI	33	
Rhyacophila_oblitterata		1	----	MALLLLTAATLATQGI---A-----SAAIQPALIEATWR-LV	33	
Hydropsyche_tenuis		1	----	MAILVFLSALLFIQAA---S-----AHCNTAGLVQATWG-LI	33	
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P21828	FIBL_BOMMO	51	DDT	DKSIAILLNVQEILKDMASQGDYASQASAVAQTAGIIAHLISAGIPGDAIAAAANVINSY	110	
Q26427	FIBL_GALME	53	DGG	DTNIYILTIQOILNDLANQDPDGLSQSLAVTQAAALGELATGVPNGSCEAAAVIDAY	112	
Q9BL15	Q9BL15_PAPXU	52	DGG	DTNIYILTIQOILNDLANQDSDKSKQALAVGQAIILGELAYGNPDGACAAAEVLNAY	111	
A0A6J2JLC8	A0A6J2JLC8_BOMMA	51	DDT	DKSIAILLNVQEILKDMASQGDYASQASAVAQTAGIIAHLISAGIPGDAIAAAANVINSY	110	
A0A7I02NV9	A0A7I02NV9_DANPL	57	DGDI	PLYAQMIMQSVNDQANSQDASQASAVVLAIAINIAELANGIPGDAIESAALVNAY	116	
Q9BL17	Q9BL17_9NEOP	54	DGG	DNNIYILNAMQMLMDFANSQDYSQARALAQTIATAILDSSGIPGDAIASADVANAY	113	
A0A891XIJ7	A0A891XIJ7_TINBI	54	GGDK	KTVLTLSTEHVISDLLRQPDYSQAMGLSNAVALVGLAPAPGDAIGGSADMLVNAY	113	
Q14UU5	Q14UU5_YPOEV	53	DGAE	QNIYMLTNQOIVNDMANSQDPTQALALGQAINLVGEA-VGSTGDAIADMLVNAY	111	
A0A0N1PIW2	A0A0N1PIW2_PAPMA	52	DDG	DSNTYILTIQOILNDLANQADPKSRALAVGQAIILGELVYSGPDGACIAELINAY	111	
A0A3S2NFE9	A0A3S2NFE9_CHISP	54	DGG	DSNTYILTLLEGVHDLANQDDNSQSLAQTAIILGELATGVPNGSCEAAAVINAY	113	
A0A2A4JXS4	A0A2A4JXS4_HELVI	53	DGG	DTVPYVVLNQVQVDDLANQDGRSSQALAGQVIAILGSLSTGIPGDAIAPNFISY	112	
A0A821XWV1	A0A821XWV1_9NEOP	54	DGGS	IPLYAQMILLQILNDLANSPNPVSKATAVIQTIALGELSHGTSQSDSEARGLINAY	113	
A0A8B8HT70	A0A8B8HT70_9NEOP	54	DGG	DTPLYAQMIIQSDNDMADTSDTDHSWNAVIOITATVGLANGVPGDAIEAALINAY	113	
DOEW8D	DOEW8D_CORCP	53	DGG	DTNIYILTIQOILNDLANQPDLSQNLAVVQTVAAALGELATGAPGDSCEAAALVAY	112	
J9XS21	J9XS21_HARDE	53	DGG	QNIYILTIQOILNDLANQPDLSQNLAVGQTIIVLGLANGVPGDSCEAAALVAY	112	
V5UTC1	V5UTC1_OSTFU	53	DGG	DTNIYILTIQOILNDLANQPDPSQALAVQAIAVVGELASGIPGDAIDASAFAVNAY	112	
A0A7E5W904	A0A7E5W904_TRINI	43	DGG	DLTFNLTLEFQIILKDLVSLPDRSQALGFGQAIALVGLSATGIPGDAIAAAIDINY	102	
A0A6J1NAW1	A0A6J1NAW1_BICAN	53	DGG	DVPLYLQILMETSVDNIDAAV---NQAAAAIQTIIVLGETAPGIPGDAIEAALINAS	108	
A0A5B2VHG3	A0A5B2VHG3_9BACT	51	DDT	DKSIAILLNVQEILKDMASQGDYASQASAVAQTAGIIAHLISAGIPGDAIAAAANVINSY	110	
A0A835GRS5	A0A835GRS5_SPOEX	53	NQGE	ASAYLLTFEQIILKLDGNSKNVQSQAALAAQAIQYGLVAVSSGVPNGSCEAADLINAY	112	
D7PBV9	D7PBV9_9NEOP	52	DGAS	VPILHALTHQATLDLADQPDGVSSQSIAGQTLGILGELTSVAGDTCYGSQOLVDSY	111	
A0A7U3TKS2	A0A7U3TKS2_PLUXY	53	DRGE	LVNVTTLTAVNVGLDLAGAPDYSQALAVGQTIINLLAEL-TGPAISDGEYTNINAE	111	
Limnephilus_decipiens		37	EQGE	VEPYVLLLKDEVVSTG-----GVYGLGATLTGVGELAWPRPASGGHKLINAN	89	
Limnephilus_lunatus		37	EQGE	VEPYVLLLKDEVVSTG-----GVYGLGATLTGVGELAWPRPASGGHKLINAN	89	
Limnephilus_rhombicus		37	EQGE	VEPYVLLLKDEVVSTG-----GVYGLGATLTGVGELAWPRPASGGHKLINAN	89	
Limnephilus_marmoratus		37	EQGE	VEPYVLLLKDEVVSTA-----GVYGLGATLTGVGELAWPRPASGGHKLINAN	89	
Hesperophylax_occidentalis		37	DQGE	VEPFTLLLKDEVVATG-----GVYGLGATLTGVGELAWPRPASGGHKLINAN	89	
Hydropsyche_angustipennis		34	EDGE	IEPFSLVLRNLSILAENDNXPTSQLYALGATLTAVSELVSWRPSACAYANLINAN	93	
Parapsyche_elais		33	EDGE	IEPFLVLRNLLLETANT-GRSGEYIYALGATFSAVSELSWVRPASACAYANLINAN	91	
Stenopsyche_tienmushanensis		34	EDGE	IEPFALVLRNLDILSN---SGLDGGLYALGATFSAVSELSWVRPASACAHANLINAN	90	
Stenopsyche_marmorata		34	EDGE	IEPFALVLRNLDILSN---SGSDGGLYALGATFSAVSELSWVRPASACAHANLINAN	90	
Rhyacophila_oblitterata		34	EDGE	IEPFALLRDLIELAEAGPSXSTXELYALGATFSAVSELSWVRPASGGHKLINAC	93	
Hydropsyche_tenuis		34	EDGE	IEPFLVLRNDSIVAGENENXNSQLYALGATFSAVSELSWVRPSACAYANLINAN	93	
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P21828	FIBL_BOMMO	111	TDG	VVR-SGNFAGFROSLGPFEGHVGQNLNLINQLVINPQGLRYSVGPALGAGGGRYDF	169	
Q26427	FIBL_GALME	113	ANS	VR-TGDNALSITAVANYINRLNSIGLISQLASNPDSLRYSYSGPAGNAGGGRYDF	171	
Q9BL15	Q9BL15_PAPXU	112	T----	SGNKAATRAALGNFIQSIVANIDSLVQLILNPNVSRYSYSGRGNVGGGRSYNF	166	
A0A6J2JLC8	A0A6J2JLC8_BOMMA	111	TDG	VVR-SGNFAGFROSLGPFEGHVGQNLNLINQLVINPQGLRYSVGPALGAGGGRYDF	169	
A0A7I02NV9	A0A7I02NV9_DANPL	117	AYAV	S-TGNSAGLRSAIVKYVQRINANIDAVRLVNSPDSVRYSSGPRGNIGGGRSYDF	175	
Q9BL17	Q9BL17_9NEOP	114	SAAV	R-SGNPSGFRSALNRYIKYIASNLDSIVRIANNPNVSRYSVGPSSGGSGGGRSYDF	172	
A0A891XIJ7	A0A891XIJ7_TINBI	114	A----	SGNQGAIRQAVSNYSVINTNIDTIAKLAVNPSSLRYSVGPSSGCPGGGRSYDF	168	
Q14UU5	Q14UU5_YPOEV	112	A----	SGNAAAVSQALSGYVNRINANINAVARLAVDPTAAGSIYVSSGGGAGGGRSYQF	166	
A0A0N1PIW2	A0A0N1PIW2_PAPMA	112	T----	SGNKAATSAAVLNFIQSIVANIDSLVQLILNPNVSRYSYSGRGNVGGGRSYNF	166	
A0A3S2NFE9	A0A3S2NFE9_CHISP	114	AGSV	R-TGNKSLRPVAMNVLARLANNIDILVGLVNNPDSLRSAVGPGRNAGGGRYEF	172	
A0A2A4JXS4	A0A2A4JXS4_HELVI	113	VASL	R-NGNS---VAPALGKFGVATKQHIDQIVQYLVNPNQLKNAVGPGRNNGGGRYQF	169	
A0A821XWV1	A0A821XWV1_9NEOP	114	AYS	AK-SGNKSLRQAIANFVNRNNDITIAQLVNVNAVRYSVGPGRSGGGGRYQF	172	
A0A8B8HT70	A0A8B8HT70_9NEOP	114	AYS	V-SGNSAGLRALPNFYVQIAGYVDTIVQLVNNPNVGRYSSGPRKLLGGGRSYQF	172	
DOEW8D	DOEW8D_CORCP	113	ASAV	R-TGNSAGLAAAGNYINRLSSVNNIVQLANNPNAVRYTSGPSGSGNGGRSYQF	171	
J9XS21	J9XS21_HARDE	113	ANG	VVR-SGNFAGVRGLNNFLGRLAADIDRLAQLAVNPALRSVGPGRNAGGGRYQF	171	
V5UTC1	V5UTC1_OSTFU	113	ANAV	R-SGNNAGLRAALNRYLGRLAADIDRLAQLAVNPALRSVGPGRNAGGGRYQF	171	
A0A7E5W904	A0A7E5W904_TRINI	103	VNG	VVR-DQ-----SVFNVNSLASQIDLVAQISSDSNALRFATGPRGNNGGGRYQF	155	
A0A6J1NAW1	A0A6J1NAW1_BICAN	109	-----	ANNAGLRPSLVSEFIQRIAGYIDTIVRLVNNPNVSRYSYSGRGNLGGGRSYQF	161	
A0A5B2VHG3	A0A5B2VHG3_9BACT	111	TDG	VVR-SGNFAGFROSLGPFEGHVGQNLNLINQLVINPQGLRYSVGPALGAGGGRYDF	169	
A0A835GRS5	A0A835GRS5_SPOEX	113	VAAS	R-SGNNAQVRSATAKFSYSSSLIDNIVELSVNSESMTFVAGPRGNFAGGRYQF	171	
D7PBV9	D7PBV9_9NEOP	112	NNYH	T-TGNRADLNNAIDSYVGSINRAVDQVLVLRNPAALRNQAAVHSSGGGRSYGH	170	
A0A7U3TKS2	A0A7U3TKS2_PLUXY	112	V----	SGNSGA---AQRAYANRLARNIDTIVKFAQNPNAAARLASRNGSGAGGARGFNL	163	
Limnephilus_decipiens		90	VALN	DGTALWGELEDAVDSYAVVLAQAVDNILRILGLNCIIPAPWPPTLENSCGDWGRIYDF	149	
Limnephilus_lunatus		90	VALN	DGTALWGELEDAVDSYAVVLAQAVDNILRILGLNCIIPAPWPPTLENSCGDWGRIYDF	149	
Limnephilus_rhombicus		90	VALN	DGTALWGELEDAVDSYAVVLAQAVDNILRILGLNCIIPAPWPPTLENSCGDWGRIYDF	149	
Limnephilus_marmoratus		90	VALN	DGTALWGELEDAVDSYAVVLAQAVDNILRILGLNCIIPAPWPPTLENSCGDWGRIYDF	149	
Hesperophylax_occidentalis		90	VALN	DGTALWGELEDAVDSYAVVLAQAVDNILRILGLNCIIPAPWPPTLENSCGDWGRIYDF	149	
Hydropsyche_angustipennis		94	VGL	ANHNLRGAAALSSAIDGYAQVLAQAANERILGQCCVLPSPWPVLDNCCGDYGRYDF	153	
Parapsyche_elais		92	VHL	GGSLSRASLSSAIDGYAVSLAQAANERILGRCCVLPSPWPVLDNCCGDYGRYDF	151	
Stenopsyche_tienmushanensis		91	VNL	ARHSLGRDALSSAIDGYAVVLAQAANERLLGQPCVLPSPWPVLDNCCGDYGRYQF	150	
Stenopsyche_marmorata		91	VNL	ARHSLGRDALSSAIDGYAVVLAQAANERLLGQTCVLPSPWPVLDNCCGDYGRYQF	150	
Rhyacophila_oblitterata		94	VGL	NDGSTSYSELSAIDGYAVVLAQAVDNILRILGCCVLPSPWPVLDNCCGDYGRYQF	153	
Hydropsyche_tenuis		94	VDL	GNHNLGRALSSAIDGYAQVLAQAANERILGQCCVLPSPWPVLDNCCGDYGRYQF	153	
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P21828	FIBL_BOMMO	170	EA	AWDAILASS----	DSSFLNEEY	CIVKRL	YNSRNSQSNNIA	AYIT	AHLLPPVAQV	FHQHS	225			
Q26427	FIBL_GALME	172	EA	AWDAVLNNAN--	PYQIGLINEEY	CAARRLY	NAFNRSRNNV	GAAIT	TAGAVVAQT	QAAQII	230			
Q9BL5	Q9BL5_PAPXU	167	EA	AWDSVLSEAD--	PFLSSLYNEEY	CAAKRL	YNFNRNSNV	GAAVTA	ASLSVPVTK	VVQRA	225			
AOA6J2JLC8	AOA6J2JLC8_BOMMA	170	EA	AWDAILASS----	DSGFLNEEY	CIVKRL	YNSRNSQSNNIA	AYIT	AHLLPPVAQV	FHQHS	225			
AOA7I0ZNV9	AOA7I0ZNV9_DANPL	176	EA	AWDDILNNAN--	PFQIGLINEEY	CAAKRL	YNAPSVRNSN	LAAIT	VTASLSRVN	QIGNA	234			
Q9BL7	Q9BL7_9NEOP	173	ES	VQSVLAGS----	SSSLDYEEY	CVAKRL	YAFNVRNSN	IGAAIT	TATSIPOVIN	VFEAV	228			
AOA891XIJ7	AOA891XIJ7_TINBI	169	EA	AWDRILESSN--	PYQIGLINEEY	CAARRLY	TANSVQSN	NNVGA	ATISASST	APITQV	FQHS	227		
Q14UU5	Q14UU5_YPOEV	167	EQ	WDSVLNAN--	AYTIGLINEEY	CAARRLY	AFNPNQNN	VAAAL	SASAI	PEVRQIL	SSV	225		
AOA0N1PIW2	AOA0N1PIW2_PAPMA	167	EA	AWDSVLSEAD--	PFLSSLYNEEY	CAAKRL	YNFNRNSNV	GAAVTA	ASLSVPVTE	VVQKA	225			
AOA3S2NFE9	AOA3S2NFE9_CHISP	173	EA	WDAVLNSAN--	INTVGLLNEEY	CSSKRL	YAFNRTNN	VGAAAT	AAAVPQV	TRAVGQA	231			
AOA2A4JXS4	AOA2A4JXS4_HELVI	170	EA	AWDAILSNAS--	GASAGLVNEEY	CAAKRL	YSAFGLQSS	SLGAYV	TAVSLP	PNRVLQDA	228			
AOA821XWV1	AOA821XWV1_9NEOP	173	ES	WDAILSSAA--	PAQSALLNEEY	CVARRLY	NAFNIRSN	NVAA	GVSA	AAIPQVI	KVAQYA	231		
AOA8B8HT70	AOA8B8HT70_9NEOP	173	EA	WDGILDKAN--	AYQIGLINEEY	CAAKRL	YNFNRNSNV	AA	GVTA	VTTRPVN	QLVQLA	231		
D0EWD8	D0EWD8_CORCP	172	EA	WDAVLSSAN--	AYQIGLINEEY	CAAKRL	YAFNTRSN	NNVGA	ATISASST	APITQV	ADHL	230		
J9XS21	J9XS21_HARDE	172	EA	WDAVLSSAN--	AYQIGLINEEY	CAAKRL	YAVNIRSN	NNVGA	AVSAA	VAPVTV	QAVQGA	230		
V5UTC1	V5UTC1_OSTFU	172	EA	AAAINNG----	SNGLINEEY	CAAKRL	YAFNARS	NNVGA	AVSAAAA	PPVARAV	QQA	226		
AOA7E5W904	AOA7E5W904_TRINI	156	EA	WDLIFDSAT--	PSQFNYINEEY	CTAKRL	KSSVNVNS	NNAA	AVITAV	SLPVVNN	ILLNS	214		
AOA6J1NAW1	AOA6J1NAW1_BICAN	162	EA	WDRILLRESS--	PYDFGLLNEEY	CAAKRL	STAWNLR	SNNV	ATAIT	ATIP	EVREVRLG	220		
AOA5B2VHG3	AOA5B2VHG3_9BACT	170	EA	WDAILASS----	DSSFLNEEY	CIVKRL	YNSRNSQSNNIA	AYIT	AHLLPPVAQV	FHQHS	225			
AOA835GRS5	AOA835GRS5_SPOEX	172	EA	WDSILASAP--	ASSVHLVNEEY	CAAKRL	YKGF	SVVSN	AGAIL	TA	VSLPSVNL	AFQNV	230	
D7PBV9	D7PBV9_9NEOP	171	DK	WDLALSNAGS	AAHADLINEQC	SSRRLY	GAWDRRS	NSV	AAAA	AVTSP	PGHVQV	RGA	230	
AOA7U3TKS2	AOA7U3TKS2_PLUXY	164	EA	WDSILSNA--	SQIGLINEEY	CTVAKRL	YGAT	SASSN	AAAA	ALT	TA	SLAPSA	VN	220
Limnephilus decipiens		150	ESS	WSLSKVN-----	KG	VVCAARRLY	TSFGARANN	VGAAAT	SAATDA	ATSI	ISEI			199
Limnephilus lunatus		150	ESS	WSLSNVN-----	NG	VVCAARRLY	TSFGARANN	VGAAAT	SAATDA	ATSI	ISEI			199
Limnephilus rhombicus		150	ESS	WGLSKVN-----	KG	VVCAARRLY	TSFGARANN	VGAAAT	SAATDA	AVSI	ISEI			199
Limnephilus marmoratus		150	ESS	WGLSKVN-----	KG	VVCAARRLY	TSFGARANN	VGAAAT	SAATDA	AAIS	ITTEI			199
Hesperophylax occidentalis		150	ENS	WLSNVN-----	NG	VVCAARRLY	TAFGARANN	VGAAAT	SAATDA	ATSI	ITSDV			199
Hydropsyche angustipennis		154	ENS	WSLATGCNS-----	EG	PRCAARDLY	LALNARS	NNVGA	AAAT	SAATPA	ISIFKRI			205
Parapsyche elsis		152	ED	WSLATSFSS-----	SK	ARCAARDLY	TALNARS	NNVGA	AAAT	SAATTP	PALSILKCI			203
Stenopsyche tienmushanensis		151	ES	WDLANSA-S-----	SG	ARCAARDLY	TSFGARANN	VGAAAT	SAAT	SPALAI	IFKGI			201
Stenopsyche marmorata		151	ES	WDLANSA-S-----	SV	ARCAARDLY	TSFGARANN	VGAAAT	SAAT	SPALAI	IFKGI			201
Rhyacophila oblitterata		154	ED	WDLAKGA-G-----	SK	ARCAARDLY	TSFGARLNNI	GAAAT	SAAT	TAARE	ILBQI			204
Hydropsyche tenuis		154	ENS	WGLVKGFSS-----	NG	PSCAARDLY	LALNARS	NNVGA	AAAT	SAAT	SPAIGI	IKRI		205
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P21828	FIBL_BOMMO	226	AG	SI--	TDLLRGVNG-----	ND	ATGLVANAQRY	IAQAASQVHV-----			262			
Q26427	FIBL_GALME	231	LP	SL--	VNVLSAVAAG-----	GN	VAGAAQAQQA	LANAAANVL-----			267			
Q9BL5	Q9BL5_PAPXU	226	Y	STL--	ANLLRAIGNN-----	GN	VIGAAAAKVEL	LRSL-----			257			
AOA6J2JLC8	AOA6J2JLC8_BOMMA	226	AG	SI--	TDLLRGVNG-----	ND	ATGLVANAQRY	IAQAASQVHV-----			262			
AOA7I0ZNV9	AOA7I0ZNV9_DANPL	235	L	GPL--	AEFLRAAIG-----	GN	LVNVSAGNAKAL	SRALASVQY-----			271			
Q9BL7	Q9BL7_9NEOP	229	L	GPA--	STFLRTIANG-----	GN	AAQAAGKLRSAL	VNAASRT-----			263			
AOA891XIJ7	AOA891XIJ7_TINBI	228	I	GPV--	SNFLRAAISG-----	QN	VQGAQAQAKAAT	ISNAARI-----			262			
Q14UU5	Q14UU5_YPOEV	226	A	APL--	ANLMRVVSG-----	GN	PAQAAASQAQAL	IAQAARA-----			260			
AOA0N1PIW2	AOA0N1PIW2_PAPMA	226	Y	GSL--	TNLLRAIGNN-----	GN	VIGAAAAKVEL	LRSV-----			257			
AOA3S2NFE9	AOA3S2NFE9_CHISP	232	L	NAV--	VPFLKVANG-----	GN	PAGLAAGAKQAL	LRAGSSVPL-----			268			
AOA2A4JXS4	AOA2A4JXS4_HELVI	229	L	EPV--	AKFVASLSSG-----	NY	AAAAAGAKNAL	DNALRY-----			261			
AOA821XWV1	AOA821XWV1_9NEOP	232	L	QPL--	AQFLRAVAG-----	EN	PLQPAAAKAGLN	QAVNKKL-----			268			
AOA8B8HT70	AOA8B8HT70_9NEOP	232	L	PQLAQV	SFLRVVANG-----	GN	PAQAGANAKNAL	QLSLPKIQY-----			270			
D0EWD8	D0EWD8_CORCP	231	I	PSL--	TSLLSSVAG-----	GN	VASAAQVRTAV	SSGATKIRL-----			267			
J9XS21	J9XS21_HARDE	231	L	GPL--	ANFLRAVAG-----	AN	ASVAGAKSAL	LQAGGRVQL-----			267			
V5UTC1	V5UTC1_OSTFU	227	L	NPL--	SNFLRVVAG-----	AN	SSQAAAKAAL	LRAGASIQ-----			263			
AOA7E5W904	AOA7E5W904_TRINI	215	L	NEI--	TAFAGAVGQG-----	NA	RAAGAAKQAL	LRAGSSY-----			248			
AOA6J1NAW1	AOA6J1NAW1_BICAN	221	L	PEV--	GEFLRVLSYG-----	GN	PGPAGQAQAKAAL	LQVRSQVKC-----			257			
AOA5B2VHG3	AOA5B2VHG3_9BACT	226	AG	SI--	TDLLRGVNG-----	ND	ATGLVANAQRY	IAQAASQVHV-----			262			
AOA835GRS5	AOA835GRS5_SPOEX	231	L	PQA--	ANFLAALPSG-----	NA	GSAAALKQAL	YNSV-----			261			
D7PBV9	D7PBV9_9NEOP	231	L	PQI--	ASFLNTAVAG-----	GN	TAAAGQALKQAL	TQSSALVKSKY-----			269			
AOA7U3TKS2	AOA7U3TKS2_PLUXY	221	L	GPL--	ANFLRSVAG-----	AN	PAQAGLAQA	IRSAV-----			252			
Limnephilus decipiens		200	E	DEL--	VSYLEAVVSKSAGPK----	QK	LRTL	LAGSLKASTFRASGNAKSGLRSRCH			249			
Limnephilus lunatus		200	E	DEL--	VSYLEAVVSKSAGPK----	QK	LRTL	LAGSLKASTFRASGNAKSGLRSRCH			249			
Limnephilus rhombicus		200	E	DEL--	VSYLEAVVSKSAGPK----	QK	LRTL	LAGSLKASTFRASGNAKGGLRSRCH			249			
Limnephilus marmoratus		200	D	DEL--	VSYLEAVVSKSAGPK----	DK	LRTL	LAGSLKASTFRASANAKGGLRSRCH			249			
Hesperophylax occidentalis		200	E	DEL--	VSYLEAVLSKSAGPGXCKSKQKQLRTL	LAGSLKASTFRASGIAKNGLSRCH					254			
Hydropsyche angustipennis		206	K	GEI--	SSLLSLATAP--	KSSGCATRK	KDLRTAAGVLKQATYNAAD	DDVKS	SSLYSCV		258			
Parapsyche elsis		204	E	GD--	IKFLEVA--	T--	SKSGCASRSKQLRTL	GGLKSSIFSAAD	EAKSSLYHSCA		254			
Stenopsyche tienmushanensis		202	E	GE--	VSVLKAATSK-----	DCSRNLR	TETGILKAAIFRAADEAKNSLYCRVC				248			
Stenopsyche marmorata		202	E	GE--	ISLLKAATSK-----	DCSRNLR	TETGILKAAIFRAADEAKNSLYCRVC				248			
Rhyacophila oblitterata		205	E	NDL--	ITYLNTVVK	SASGSWQCAQKKKNMLTLGGYLKSA	WKAASVT	KRNL	S----		255			
Hydropsyche tenuis		206	R	GE--	SSLLSLATAP--	KSSGCATRK	KDLRTAAGVLKQATYNAAD	DDVKNIP-----			253			

Supplemental Figure S1. Multiple sequence alignment of 22 lepidopteran (blue) and 11 trichopteran (black) L-fibroin sequences. * identical, : strongly conserved, . less strongly conserved.



Supplemental Figure S2. Colabfold confidence metric scores and sequence coverage for *Ho* (A-C) and *Bm* (D-F) L-fibroin predicted structures.

Supplementary Methods:

Five of the Trichoptera L-fibroin sequences SFig. 1 were retrieved UniProtKB: (*Stenopsyche marmorata* LC057252.1,[1] *Rhyacophila oblitterata* AB354690.1,[2] *Limnephilus decipiens* AB214510.1, [3] *Hydropsyche angustipennis* AB354593.1,[3] and *Hesperophylax occidentalis*: KM384738.1.[6] Two other sequences were obtained from previous publications (*Stenopsyche tienmushanensis* [4], *Hydropsyche tenuis* [5]). L-Fibroin sequences of four additional species are newly reported in this study and were mined from published genomes (*Parapsyche elsis*: GCA_022651745.1 [7], *Limnephilus marmoratus*: GCA_917880885.1, *Limnephilus rhombicus*: GCA_929108145.1, *Limnephilus lunatus*: GCA_917563855.2 [8]). L-fibroins were extracted from the assemblies by using tBLASTn to identify conserved N- and C-terminal amino acids of closely related *Limnephilus decipiens* AB214509 [3] or *Hydropsyche angustipennis* [3] in Geneious Prime 2022.1.1. Hits were extracted with 10,000 bps of flanking sequence using the sequence view “extract” in Geneious. For *Parapsyche elsis*, we annotated this region using Augustus v.3.3.2. [9]. The three *Limnephilus* species were annotated manually using the annotation of previous published *Limnephilus decipiens* AB214510.1 [3]. Protein coding nucleotide sequences were translated in Geneious. Newly reported L-fibroin sequences can be found on figshare: <https://doi.org/10.6084/m9.figshare.20240847.v1>

Supplementary Material References:

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