

CLUSTAL 2.1 MULTIPLE SEQUENCE ALIGNMENT

File: /media/morpheus/disk1/fst/pep_msa/PALM2A-KA-PE.ps 1 14:14:22 2022

Page 1 of 9

		: . . . : . . .	***:*. *:***:*.***:	
Pavo_muticus	--FQQA	KDKKGCCSGKSWGRRQKHQLYPVSLSLPPS	SNYLSKEKKRKRQTEIEGKRQ	LEDQ 58
Pavo_cristatus	--FQQA	KDKKGCCSGKSWGRRQKHQLYPVSLSLPPS	SNYLSKEKKRKRQTEIEGKRQ	LEDQ 58
Gallus_gallus	--MFKQA	KDKKGCCSGKSGGSCPGYKTI	INCTLGCTRPSTTTVEKKRKRQTEIEGKRQ	LEDQ 59
Anas_platyrhynchos	--MAEAELH	KERLQAIA	-----EKKRKRQTEIEGKRQ	LEDQ 34
Chelonia_mydas	--MAEAELH	KERLQAIA	-----AKRKRQTEIEGKRQ	LEDQ 34
Homo_sapiens	--MAEAELH	KERLQAIA	-----EKKRKRQTEIEGKRQ	LEDQ 34
Pan_troglodytes	MEMAEAELH	KERLQAIA	-----EKKRKRQTEIEGKRQ	LEDQ 36
Macaca_mulatta	MEMAEAELH	KERLQAIA	-----EKKRKRQTEIEGKRQ	LEDQ 36
Callithrix_jacchus	MEMAEAELH	KERLQAIA	-----EKKRKRQTEIEGKRQ	LEDQ 36
Mus_musculus	MEMAEAELH	KERLQAIA	-----EKKRKRQTEIEGKRQ	LEDQ 36
Bos_taurus	--MAEAELH	KERLQAIA	-----EKKRKRQTEIEGKRQ	LEDQ 34
Equus_caballus	--MAEAELH	KERLQAIA	-----EKKRKRQTEIEGKRQ	LEDQ 34
Canis_lupus_familiaris	--MAEAELH	KERLQAIA	-----EKKRKRQTEIEGKRQ	LEDQ 34
Ornithorhynchus_anatinus	--MAEAELH	KERLQAIA	-----EKKRKRQTEIEGKRQ	LEEQ 34
Latimeria_chalumnae	--MAEAELH	KERLQAIA	-----EKKRKRQAEIEDKRQ	LEDQ 34
Rhinatrema_bivittatum	--MAEAELH	KERLQAIA	-----EKKRKRQTEIDGKRQ	LEDQ 34
Xenopus_tropicalis	--MAEAELH	RERLQAIA	-----EKKRQQAIEDKRQ	LEDK 34
Xenopus_laevis	--MAEVDLH	RERLQAIA	-----EKKRQQAIEDKRQ	LEDK 34
	1.....10.....20.....30.....40.....50.....60			

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
Pavo_muticus	I	L	Q	L	Q	H	F	K	S	K	A	L	R	E	K	W	L	L	Q	G	I	P	A	G	S	A	E	E	E	E	E	A	R	R	K	Q	S	E	E	D	E	L	K	V	K	K	L	E	E	N	I	H	R	L	E	Q	E	I	Q	K	L	118																																																										
Pavo_cristatus	I	L	Q	L	Q	H	F	K	S	K	A	L	R	E	K	W	L	L	Q	G	I	P	A	G	S	A	E	E	E	E	E	A	R	R	K	Q	S	E	E	D	E	L	K	V	K	K	L	E	E	N	I	H	R	L	E	Q	E	I	Q	K	L	118																																																										
Gallus_gallus	I	L	Q	L	Q	H	F	K	S	K	A	L	R	E	K	W	L	L	Q	G	I	P	A	G	S	A	E	E	E	E	E	A	R	R	K	Q	S	E	E	D	E	L	K	V	K	K	L	E	E	N	I	H	R	L	E	Q	E	I	Q	K	L	119																																																										
Anas_platyrhynchos	I	L	Q	L	Q	H	F	K	S	K	A	L	R	E	K	W	L	L	Q	G	I	P	A	G	S	A	E	E	E	E	E	A	R	R	R	Q	S	E	E	D	E	L	K	V	K	K	L	E	E	N	I	H	R	L	E	Q	E	I	Q	K	L	94																																																										
Chelonia_mydas	I	L	Q	L	Q	H	F	K	S	K	A	L	R	E	K	W	L	L	Q	G	I	P	A	G	S	A	E	E	E	E	E	A	R	R	R	Q	S	E	E	D	E	L	K	V	K	R	L	E	D	N	I	H	R	L	E	Q	E	I	E	K	L	94																																																										
Homo_sapiens	I	L	L	L	Q	H	S	K	S	K	V	L	R	E	K	W	L	L	Q	G	I	P	A	G	T	A	E	E	E	E	E	A	R	R	R	Q	S	E	E	D	E	F	R	V	K	Q	L	E	D	N	I	Q	R	L	E	Q	E	I	Q	T	L	94																																																										
Pan_troglodytes	I	L	L	L	Q	H	S	K	S	K	V	L	R	E	K	W	L	L	Q	G	I	P	A	G	T	A	E	E	E	E	E	A	R	R	R	Q	S	E	E	D	E	F	R	V	K	Q	L	E	D	N	I	Q	R	L	E	Q	E	I	Q	T	L	96																																																										
Macaca_mulatta	I	L	L	L	Q	H	S	K	S	K	V	L	R	E	K	W	L	L	Q	G	I	P	A	G	T	A	E	E	E	E	E	A	R	R	R	Q	S	E	E	D	E	F	R	V	K	Q	L	E	D	N	I	Q	R	L	E	Q	E	I	Q	T	L	96																																																										
Callithrix_jacchus	I	L	L	L	Q	H	S	K	S	K	V	L	R	E	K	W	L	L	Q	G	I	P	A	G	T	T	E	E	E	E	E	A	R	R	R	Q	S	E	E	D	E	F	R	V	K	Q	L	E	D	N	I	Q	R	L	E	Q	E	I	Q	T	L	96																																																										
Mus_musculus	V	L	L	L	Q																																																																																																																			

	..*	***:::*	*:.*.*	*::.*.*	::	:
Pavo_muticus	ESEESQISAKEQIILEKLKETEKSF	DNLOKTF	SHODGDAVNYIC	SQIPELPTLYSR	TAEP	178
Pavo_cristatus	ESEESQISAKEQIILEKLKETEKSF	DNLOKTF	SHODGDAVNYIC	SQIPELPTLYSR	TAEP	178
Gallus_gallus	ESEESQISAKEQIILEKLKETEKSF	DNLOKTF	SHODGDAVNYIC	SQIPELPTLYSR	TAEP	179
Anas_platyrhynchos	ESEESQISAKEQIILEKLKETEKSF	DNLOKTF	FAHODGDAVNYIY	SQIPELPTLYSR	TAEP	154
Chelonia_mydas	ESEESQISAKEQIILEKLKETEKSF	EDFQKFS	SHODGDAVNYIY	SQIPELPTLYSR	TAEP	154
Homo_sapiens	ESEESQISAKEQIILEKLKETEKSF	KDFQKGS	SSTDGDAVNYIS	SQLPDL	PILCSRTAEP	154
Pan_troglodytes	ESEESQISAKEQIILEKLKETEKSF	KDFQKGS	SSTDGDAVNYIS	SQLPDL	PILCSRTAEP	156
Macaca_mulatta	ESEESQISAKEQIILEKLKETEKSF	KDFQKGS	SSTDGDAVNYIS	SQLPDL	PILCSRTAEP	156
Callithrix_jacchus	ESEESQISAKEQIILEKLKETEKSF	KDFQKGS	SSTDGDAVNYIS	SQLPDL	PILCSRTAEP	156
Mus_musculus	ESEESQISAKEQIILEKLKETEKSF	KDLQKSF	STADG-----	-----	-----	133
Bos_taurus	ESEESQISAKEQIILEKLKETEKSF	KDFQKFS	SADGDAVNHIS	SQLPDL	PILCSRTAEP	154
Equus_caballus	ESEESQISAKEQIILERLKETEKSF	KDLQKFS	SSTDGDAVNYIS	SQLPDL	PLLCSP	TAEP 154
Canis_lupus_familiaris	ESEESQISAKEQIILEKLKETEKSF	KDLQKFS	SNADGDAVNYIS	SQLPDL	PILCSRTAEP	154
Ornithorhynchus_anatinus	ESEESQISAKEKLILEKLKETEKSL	EDFQKFS	SNKDGDAVNHIC	SQLPDL	PKLYTR	TAEP 154
Latimeria_chalumnae	ENEELQISTRECI	LREKLRETEKSIEDLQKSL	SNODGDAVNYIY	SQIPDL	PALYSQRS	SQL 154
Rhinatrema_bivittatum	EKEESLISAKEQVIREKLKETEKSF	EELQKSF	ANODGDAVNYIY	SQIPDL	PALYTHR	SET 154
Xenopus_tropicalis	ESEESLISAKEQILREKLRETEIS	FEDLQKSL	SNQETDAVNYIY	SEIPDL	TTFNLQNT	ET 154
Xenopus_laevis	ESEESLISAKEQILREKLRETAIS	FEDVQKSL	SNQETDAVNYIY	SQIPDL	ASFNLQNT	ET 154
	.....130	.....140	.....150	.....160	.....170	.....180

CLUSTAL 2.1 MULTIPLE SEQUENCE ALIGNMENT

File: /media/morpheus/disk1/fst/pep_msa/PALM2A/PAPEps 1 14:14:22 2022

Page 2 of 9

Pavo_muticus	VPGRDGASRVAALCTMEINVEKDKQTGETKIVSASPVGPDEAHQRGFKVYDDGTVVYEV	238
Pavo_cristatus	VPGRDGASRVAALCTMEINVEKDKQTGETKIVSASPVGPDEAHQRGFKVYDDGTVVYEV	238
Gallus_gallus	VPGRDGASRVAALCTMEINVEKDKQTGETKIVSASPVGPDEAHQRGFKVYDDGTVVYEV	239
Anas_platyrhynchos	VPGRDGASRVAALCTMEINVEKDKQTGETKIVSASPIGPDEAHQRGFKVYDDGTVVYEV	214
Chelonia_mydas	VPQWDGSSR-----	163
Homo_sapiens	SPGQDGTSSRAA-----	165
Pan_troglodytes	SPGQDGTSSRAAAVYAMEINVEKDKQTGETKILSTSTIGPEGVHQGVKGYDDGTVVYEV	216
Macaca_mulatta	SPGQDGTSSRAA-----	167
Callithrix_jacchus	TPGQDRTSSRAAAVYAMEINVEKDKQTGETKILSTSTIGPEGVHQGVKGYDDGTVVYEV	216
Mus_musculus	-----	133
Bos_taurus	SPGQDGTSSRAA-----	165
Equus_caballus	SPGQDGTSSRAAAVYAMEINVEKDKQTGETKILSTSTIGPEGVHQGVKGYDDGTVVYEV	214
Canis_lupus_familiaris	SPGQDGTSSRAAAVYAMEINVEKDKQTGETKILSTSTIGPEGVHQGVKGYDDGTVVYEV	214
Ornithorhynchus_anatinus	SPGRDGTSSVAD-----	166
Latimeria_chalumnae	ISGQGMERVYALYAMEINVEKDKQTGETKILSSSAIGPEGVHHRGIKVYDDGSKVYEV	214
Rhinatrema_bivittatum	IPGRDGTSSRLAAYYAMEINVEKDRQTGETKILSASALGPEGVHQGVKGYDDGAKIVYEV	214
Xenopus_tropicalis	SLSGDGTTRVAALYAMEINVEKDRNTGETKIVSASALDPEGVHQGVKGYDDGNKVYEV	214
Xenopus_laevis	SLSGEGTAR-----	163
	.....190.....200.....210.....220.....230.....240	

Pavo_muticus	HSGGTVVENGVHKLSSKDVDELMQKAGQSNVKGGEYIMTVSDRNAVADGNLSHMKEQMLF	298
Pavo_cristatus	HSGGTVVENGVHKLSSKDVDELMQKAGQSNVKGGEYIMTVSDRNAVADGNLSHMKEQMLF	298
Gallus_gallus	HSGGTVVENGVHKLSSKDVDELMQKAGQSNVKGGEYIMTVSDRNAVADGNLSHMKEQMLF	299
Anas_platyrhynchos	HSGGTVVENGVHKLSSKDVDELMQKAGQSSVKGGFETMTVSDRNAVADGNLSQMKEQMLF	274
Chelonia_mydas	-----	163
Homo_sapiens	-----	165
Pan_troglodytes	RSGGTVVENGVHKLSTKDVEELIQKAGQSSLGGGH---VSERTVIADGSLSHPKHEMLC	272
Macaca_mulatta	-----	167
Callithrix_jacchus	HSGGTVVENGVHKLSSAKDVEELIQKAGQSSLGGRH---GSERTVIADGSLSHPKHEMLC	272
Mus_musculus	-----	133
Bos_taurus	-----	165
Equus_caballus	HSGGTIVENGVHKLSSKDVDEELIQKAGQSSLRGGH---VSERTVADGSVSHPKHEMLC	270
Canis_lupus_familiaris	HSGGTVVENGVHRLSSKDVDEELIQKAGQSSFRGGH---VSERTGIADGSLSHPKHEMLC	270
Ornithorhynchus_anatinus	-----	166
Latimeria_chalumnae	QSGG-----	218
Rhinatrema_bivittatum	HNNG-----	218
Xenopus_tropicalis	HRAGAVVENGIIHKLNTRDVELIQKSAQSNLIGGQEKELPERTVTIEGNPSHVKEHMHF	274
Xenopus_laevis	-----	163
	.....250.....260.....270.....280.....290.....300	

Pavo_muticus	KEAKLEMVHKPNKGHAV-NSQPQDKPRGGEVPEASADQPVMTIFMGYQSIDDEEETKKVL	357
Pavo_cristatus	KEAKLEMVHKPNKGHAV-NSQPQDKPRGGEVPEASADQPVMTIFMGYQSIDDEEETKKVL	357
Gallus_gallus	KEAKLEMVHKPNKGHAV-NSQPQDKPRGGEVPEASADQPVMTIFMGYQSIDDEEETKKVL	358
Anas_platyrhynchos	KEAKLEMVHKPSKGHAV-NPQPQDKPCGGDIPEASADQPVMTIFMGYQNIIDDEEETKKVL	333
Chelonia_mydas	-----	163
Homo_sapiens	-----	165
Pan_troglodytes	KEAKLEMVHKSRKDHSSGNPGQQAQAPSAAGPEANLDQPVMTIFMGYQNIIDDEEETKKVL	332
Macaca_mulatta	-----	167
Callithrix_jacchus	KEAKLEMVHKSRKDHSSGNPGQQAQAPSTAGPEANLDQPVMTIFMGYQNIIDDEEETKKVL	332
Mus_musculus	-----	133
Bos_taurus	-----	165
Equus_caballus	KEAKLEMVHKSRKDHSSGNPGQQTQAPSTEGPEAHLDPVMTIFMGYQNIIDDEEETKKVL	330
Canis_lupus_familiaris	KEAKLEMVHKSRKDHSSGTPGQQAQAPSTEGPEANLDQPVMTIFMGYQNIIDDEEETKKVL	330
Ornithorhynchus_anatinus	-----	166
Latimeria_chalumnae	-----	218
Rhinatrema_bivittatum	-----	218
Xenopus_tropicalis	KEAKLEMVHKQTKGAPV-KQGQHARSCENAGTDATLDQPVMTIFMGYQNIIDDEEETKKVL	333
Xenopus_laevis	-----	163
	.....310.....320.....330.....340.....350.....360	

CLUSTAL 2.1 MULTIPLE SEQUENCE ALIGNMENT

File: /media/morpheus/disk1/fst/pep_msa/PALM2A-KA-PE.ps 1 14:14:22 2022

Page 3 of 9

Pavo_muticus	GYDET	TIKAE	LVLI	DEDE	KS	SLRE	KT	VT	DI	ST	MD	GNAA	ELVS	GRPL	SD	TT	EP	SS	PE	GK	EE	417
Pavo_cristatus	GYDET	TIKAE	LVLI	DEDE	KS	SLRE	KT	VT	DI	ST	MD	GNAA	ELVS	GRPL	SD	TT	EP	SS	PE	GK	EE	417
Gallus_gallus	GYDET	TIKAE	LVLI	DEDE	KS	SLRE	KT	VT	DI	ST	MD	GNAA	ELVS	GRPL	SD	TT	EP	SS	PE	GK	EE	418
Anas_platyrhynchos	GYDET	TIKAE	LVLI	DEDE	KS	SLRE	KT	VT	DV	ST	MD	GNAA	ELVS	GRPL	SD	TT	EP	SS	PE	GK	EE	393
Chelonia_mydas	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	163
Homo_sapiens	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	165
Pan_troglodytes	GYDET	TIKAE	LVLI	DEDE	KS	SLRE	KT	VT	DV	ST	ID	GNAA	ELVS	GRPV	SD	TT	EP	SS	PE	GK	EE	392
Macaca_mulatta	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	167
Callithrix_jacchus	GYDET	TVKAE	LVLI	DEDE	KS	SLRE	KT	VT	DV	ST	ID	GNAA	ELVS	GRPI	SD	TT	EP	SS	PE	GK	EE	392
Mus_musculus	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	133
Bos_taurus	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	165
Equus_caballus	GYDET	TIKAE	LVLI	DEDE	KS	SLRE	KT	VT	DV	ST	ID	GNAA	ELVS	GRPV	SD	TT	EP	SS	PE	GK	EE	390
Canis_lupus_familiaris	GYDET	TIKAE	LVLI	DEDE	KS	SLRE	KT	VT	DV	ST	ID	GNAA	ELVS	GRLI	SD	TT	EP	SS	PE	GK	EE	390
Ornithorhynchus_anatinus	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	166
Latimeria_chalumnae	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	218
Rhinatrema_bivittatum	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	218
Xenopus_tropicalis	EYDD	TIKAE	LVLI	DEDE	KS	SLRE	KT	VT	DV	ST	MD	GNAA	ELVS	GKLL	TT	ET	EP	SS	PE	GK	EE	393
Xenopus_laevis	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	163
	.....	370	.....	380	.....	390	.....	400	.....	410	.....	420										

Pavo_muticus	LPLEAAPGTREMDMLPK-DQQGLCSFEKPEETEEKTEKSSRIPEDDIRLKKNRDQNCANFL	476
Pavo_cristatus	LPLEAAPGTREMDMLPK-DQQGLCSFEKPEETEEKTEKSSRIPEDDIRLKKNRDQNCANFL	476
Gallus_gallus	LPLEAAPGTREMDMLPK-DLQGLCSFENPETEERTEKSSRIPEDDIRLKKNRDQNCANFL	477
Anas_platyrhynchos	LPLEAAPGARGMDPPS-NPQGLSCSCEPEAEERAGKSSSRNPEDDIRLKKNRDQNCANFL	452
Chelonia_mydas	-----VPGVKGMVLPK-DGRGSCSCESPETAVTGMKSSSRIPEDDIRLRKDKDRNCAKFF	217
Homo_sapiens	-----GVGWENVLLKEGESASNATETSGPDMTIKKPPQLSEDDIWLKSEGDNYSATLL	218
Pan_troglodytes	LATEPAPGVGWENVLLKESESASNATETSGPDMTIKKPPQLSEDDIWLKSEGDNYSATLL	452
Macaca_mulatta	-----GVIWENVLLKGGESALNAKETSGPDMTIKKPPQLSEDDIRLKSEGDDYSATLL	220
Callithrix_jacchus	LATEPAPGVGWENVLLKESESASNVKETSDPDMAIKKTPQLSEDDIQLKSEGDNYSANLL	452
Mus_musculus	-----ASGWSTVLLQGDELTADEPIGTN-ADMAIQKPPQLSEANQLRSKQDNCGDSRL	185
Bos_taurus	-----GVGWESVLLTRDDITSEAIASSSADMTVKKPPELSEDDIRLKHHERDNCSAKAL	218
Equus_caballus	LATEPAPGVGWENVLLKGDDTTSDATEISADMTIKKPPQLSEDDIRLKRERDSCSANPL	450
Canis_lupus_familiaris	LATEPAPGVGWETMLLKGEAIVSDATEISADMTIKKPPQLSEDDIRLEGQADGSADEPL	450
Ornithorhynchus_anatinus	-----EKRDDELCSGSRPFQYRFSEISNDVMTLTKTPKPLEHDVRLKKNRIOQYSANFL	219
Latimeria_chalumnae	---TVVENGVHQLSSNDVDELIIQVRVQSNLKGGSERTTAFQRTVRIEGNPEHKMEQTLF	274
Rhinatrema_bivittatum	---AVVENGVHKLSSRDVDELIIKAGQSNIRGGFETKIVSERTVIIDGKPSHMKEQMLF	274
Xenopus_tropicalis	LATEPIADVKKKTQFKDPNDY-----EPGGSLSQLDKPQTPEDDLNLK-EKDPNSANFS	447
Xenopus_laevis	----VADVKKKTQVQFKGPDY-----ETIESLLQLNKPQVPEDDLNLK-EKDQTSDFNS	212
	.....430.....440.....450.....460.....470.....480	

Pavo_muticus	EPAT-VLSTKEEKMEIEVPVSEHKS---	ITTVASPHPIDNPHTHFFSSAASHNG-LKDRHE	531
Pavo_cristatus	EPAT-VLSTKEEKMEIEVPVSEHKS---	ITTVASPHPIDNPHTHFFSSAASHNG-LKDRHE	531
Gallus_gallus	EPAT-ALSTKEEKMEIEVPVSEHKS---	ITTVASPHPIDNPHTHFFSSAASHNG-LKDRHE	532
Anas_platyrhynchos	EPAT-VLAAKEEKMIEVPVSEHKS---	ITTVASPNPVDNPTTHFFSPAASHNG-LKDRHE	507
Chelonia_mydas	EPVS-VLATKEEKMEIEVPVSEHKNN--	ITVVASTQSDNPHTHFFSPVASHNG-LEDRHE	272
Homo_sapiens	EPAASSLSPDHKNMEIEVSVAECKS--	VPGITSTPHPMDHPSAFYS--PPHNGLLTDHHE	274
Pan_troglodytes	EPAASSLSPDHKNMEIEVSVAECKS--	VPGITSTPHPMDHPSAFYS--PPHNGLLTDHHE	508
Macaca_mulatta	EPVTSSLSPDHKNMEIEVSVAECKS--	VPGITSTPHPMDHPSPFYS--PPHNGLLTDHHE	276
Callithrix_jacchus	EPATSALSPPDHKNMEIEVSVAECKS--	VPGITSTPHPMDHPSPFYS--SPHNGLLTDHHE	508
Mus_musculus	EPAASSLSPDHKNMEIGVSVAECKS--	VPGVTSTPHSKDHSSPFYS--PSHNGLLADHHE	241
Bos_taurus	ESITSSLPPDHKNMEIEVSVAECKS--	VTGITSTPHSMDHPSPFYS--TPHNGLLADHHE	274
Equus caballus	QPAPSSLPPDHKNMEIEVSAAECKG--	VPGITSTLHSIDHPSPFYS--PPHNGLLADHHE	506
Canis_lupus_familiaris	EPAPSALLPPDHAMEIEVSLAECKSKSV	GPDISCAPHSMDRSPFYS--PPHNGLPADRPE	508
Ornithorhynchus_anatinus	EPAASILPSSSEKMEIEVPIAECKSAT	GADPASASHPMDHPPPFPYSPMPSHNGLLPDSHE	279
Latimeria_chalumnae	KEAKLEMVHNPSKKDARSPGHGLGETSTE	EIPEASADQPVMTIFMGYQNIDDEETTKML	334
Rhinatrema_bivittatum	KEAKLEMVEKSSKGLSGNPQHQQSKIIT	GEEIPEATVDQPVMTIFMGYQNIDDEETKRVL	334
Xenopus_tropicalis	DPAKFVISK--ETMEIEVPVSEHKG---	IILINQDDSAADDQSVFLAAVANQG-LKNRHE	501
Xenopus_laevis	DPARLVISK--ETMEIDVPVSEHKG---	IILINQDGSAHDQSVFLAVANQNG-IKNRHE	266
.....490.....500.....510.....520.....530.....540			

CLUSTAL 2.1 MULTIPLE SEQUENCE ALIGNMENT

File: /media/morpheus/disk1/fst/pep_msa/PALM2A-KA-PE.ps 1 14:14:22 2022

Page 4 of 9

	.. : * : * : * . : . * . . : : :		
Pavo_muticus	SLDSEVAKEIRYLDEVLEANCCDS-SADNTIFNGTSSPQLS-----AVTIMDGS	GASVNVS	585
Pavo_cristatus	SLDSEVAKEIRYLDEVLEANCCDS-SADNTIFNGTSSPQLS-----AVTIMDGS	GASVNVS	585
Gallus_gallus	SLESEVAKEIRYLDEVLEANCCDS-SADNTIFNGTSSPQLS-----AVTIMDGS	GASVNVS	586
Anas_platyrhynchos	SLDSEVAKEIRYLDEVLEANCCDS-ATDNTIFNGTSSPEPS-----AVTIMDGS	GASVNVP	561
Chelonia_mydas	SLDSEVAKEIRYLDEVLEANCCDS-AADNPFNGTCSPEPS-----AI-IVDAS	GPSVHIN	325
Homo_sapiens	SLDNDVAREIRYLDEVLEANCCDS-AVDGTYNGTSSPEPG-----AVVLVGG	LSPPVHEA	328
Pan_troglodytes	SLDNDVAREIRYLDEVLEANCCDS-AVDGTYNGTSSPEPG-----AVVLVGG	LSPPVHEA	562
Macaca_mulatta	SLDNDVAREIRYLDEVLEANCCDS-AVDGTFNGTSSPEPG-----AVVLVGG	LSPPAVHET	330
Callithrix_jacchus	SLDNDVAREIRYLDEVLEANCCDS-AVDGTCNGTSSPEPG-----AVVLVGG	LSPPVQET	562
Mus_musculus	SLDNDVAREIQYLDEVLEANCCDS-SVDGTYNGISSPEPG-----AAILVSS	LSPPAHSV	295
Bos_taurus	SLDNDVAREIRYLDEVLEANCCDS-AVDGTYNGTSSPEPG-----AAILAGS	PSPTTAA	328
Equus_caballus	SLDNDVAREIRYLDEVLEANCCDS-AVDGTYNGTSSPEPG-----AAILVGS	LSPPAHAA	560
Canis_lupus_familiaris	VLDNDVAREIRYLDEVLEASGCDAAPAADGAYNGTWSPEPLESPEPEPPEPGLSP	PPARAA	568
Ornithorhynchus_anatinus	SLDSEVAKEIRYLDEVLEANCCDS-SADAAAYNGTSSPEPS-----VTIAKGESS	PSIPTS	333
Latimeria_chalumnae	GYDGSIKAELVLIDEDEKSLREKTVTDVSIIDGNAAELVSGRPLSETTEPSSS	DEKDES	394
Rhinatrema_bivittatum	GYDDTIKAELVLIDEDEKSLREKTVTDVSTMDGNAAELVSGKLLTDTTEPSS	PEGKEES	394
Xenopus_tropicalis	SIDSVAKEIQYLLDDVLEANCCDT-STDNTLNGSPSPELCTT-----VGDSS	YVCVTAS	555
Xenopus_laevis	SIDSVAEQIQYLLDDVLEANCCDT-SADNTMNGSPTEPLCT-----VGESS	YVIVTAP	319
	.....550.....560.....570.....580.....590.....600		

Pavo_muticus	NDSV	PNAREE	-----	NVADQ	QAPLVVKPHE	610						
Pavo_cristatus	NDSV	PDAREE	-----	NVADQ	QAPLVVKPHE	610						
Gallus_gallus	NDSV	PNAREE	-----	NAADQ	QVPLVVKPHD	611						
Anas_platyrhynchos	NDSV	PNEGEG	-----	NVADK	QAPLVVEPHE	586						
Chelonia_mydas	SES	VPNEKDI	-----	IIAGR	QASPVIEPNE	350						
Homo_sapiens	TQ	PEPTERT	-----	ASRQ	APPHIELSN	350						
Pan_troglodytes	TQ	PEPTERT	-----	ASRQ	APPHIELSN	584						
Macaca_mulatta	AQ	PEPTERT	-----	ASQ	APPHIELSN	352						
Callithrix_jacchus	TQ	PEPTERT	-----	ASRQ	ALPHIELSN	584						
Mus_musculus	TEA	EPTEKA	-----	SGR	VPPHIELSR	317						
Bos_taurus	VQ	PEVTETA	-----	AGRQ	APPHIELHQ	350						
Equus_caballus	SQ	LEPTERA	-----	ASRQ	ALPHIELSK	582						
Canis_lupus_familiaris	GLP	QAGSA	-----	AAGR	VPPPTEATT	590						
Ornithorhynchus_anatinus	SCP	KSTESR	-----	ETAV	VLPLTELNK	355						
Latimeria_chalumnae	AEKL	PAAGTE	-----	KKRR	-----	408						
Rhinatrema_bivittatum	LVTD	PMPGLNGLML	SE	EDGRDF	CASEATPADFPTAKS	PEICEDDSK	LKKDRDRNS	ASLQD	454			
Xenopus_tropicalis	SAS	IVTEVIA	-----	EE	PKQTP	LVEITE	578					
Xenopus_laevis	SAS	IVETIA	-----	EE	PKQAP	VVEITE	342					
	610	620	630	640	650	660

Pavo_muticus	-----	610
Pavo_cristatus	-----	610
Gallus_gallus	-----	611
Anas_platyrhynchos	-----	586
Chelonia_mydas	-----	350
Homo_sapiens	-----	350
Pan_troglodytes	-----	584
Macaca_mulatta	-----	352
Callithrix_jacchus	-----	584
Mus_musculus	-----	317
Bos_taurus	-----	350
Equus_caballus	-----	582
Canis_lupus_familiaris	G-----	591
Ornithorhynchus_anatinus	-----	355
Latimeria_chalumnae	-----	408
Rhinatrema_bivittatum	PASMLCANKGTMEIESPVSEHKGIILVTSTNPLDSKTNFFSPITCHNGLKDRHESLDSDV	514
Xenopus_tropicalis	-----	578
Xenopus_laevis	-----	342
	.....670.....680.....690.....700.....710.....720	

CLUSTAL 2.1 MULTIPLE SEQUENCE ALIGNMENT

File: /media/morpheus/disk1/fst/pep_msa/PALM2A-KA-PEs 1 14:14:22 2022

Page 5 of 9

Pavo_muticus	-----GSTAGESLNSNGHSLG-----	626
Pavo_cristatus	-----GSTAGESLNSNGHSLG-----	626
Gallus_gallus	-----VSTTGESLNSNGHSLG-----	627
Anas_platyrhynchos	-----ASITDENLNSNGHSL-----	601
Chelonia_mydas	-----TNVMSEKLKPNHGSSD-----	366
Homo_sapiens	-----SSPDPMAEAERTNGHSP-----	367
Pan_troglodytes	-----SSPDPMAEAERTNGHSP-----	601
Macaca_mulatta	-----SSPDPMAEAERTNGHSP-----	369
Callithrix_jacchus	-----SLDPMAEAERANGHSP-----	601
Mus_musculus	-----SPSDRMAEGERANGHST-----	334
Bos_taurus	-----SDSDTMAEGRRANGHPP-----	367
Equus_caballus	-----SNSATMAEGGRANGHSP-----	599
Canis_lupus_familiaris	-----SPGGAQAEATEANGRAPAL-----	610
Ornithorhynchus_anatinus	-----ASPMAEALKPNGHPP-----	370
Latimeria_chalumnae	-----CQCCTVM-----	415
Rhinatrema_bivittatum	AKETIRYLDDEVLEANCCDLSVDNTCTNGTSSPQPSAILLDYSGPSVNIADNAMLSEEEIIIA	574
Xenopus_tropicalis	-----PSEVLDPIKINGHSQS-----	594
Xenopus_laevis	-----ASEVMDPVKMNGHSQN-----	358
	.....730.....740.....750.....760.....770.....780	

Pavo_muticus	-----GLKEDTGESLKMPGSP	TSSNSSRRSSKDGETTL	659	
Pavo_cristatus	-----GLKEDTGESLKMPGSP	TSSNSSRRSSKDGETTL	659	
Gallus_gallus	-----GLKEDIGESLKIPGSP	TSSNSSRRSSKDGETTL	660	
Anas_platyrhynchos	-----KEDIRESLKMPGSP	TSSNSSRRSSKDGEATF	632	
Chelonia_mydas	-----GQKEELCGNLKMPAS	SPSSSTSSRRSSKDGETTL	399	
Homo_sapiens	-----SQPRDALGDSLQVPVSP	SSTTSSRCSSRDGEFTL	401	
Pan_troglodytes	-----SQPRDALGDSLQAPVSP	SSTTSSRCSSRDGEFTL	635	
Macaca_mulatta	-----SQPRDALGDSLQAPVSP	SSSTSSWCSSRDGEFTL	403	
Callithrix_jacchus	-----GQPRDVLGDGLQAPVSP	SSSTSSRCSSRDGEFTL	635	
Mus_musculus	-----DQPQDLLGNLSLQAPAS	SPSSSTSSHCCSSRDGEFTL	368	
Bos_taurus	-----EQPRDVLGDSLQVPVSP	SSSTSSRCSSRDGEVTL	401	
Equus_caballus	-----DQPRDLLGDSLQAPVSP	SSSTSSRCSSRDGEFTL	633	
Canis_lupus_familiaris	-----DQPRDALAG-----	RGGSGVRAPGGAGREGEPTL	639	
Ornithorhynchus_anatinus	-----DGQREALGESWPAPVSP	SSSTSSRGSSRDGEITH	404	
Latimeria_chalumnae	-----		415	
Rhinatrema_bivittatum	DSKQPVFVEQSEPNVVEEQFKTNGHPQT	QLKEETCDNVKYPAS	SPSSSNSSRRSSKDGEITV	634
Xenopus_tropicalis	-----ENKDELVDGYTYPAS	PNSSSNSSRRSSKDGEILP	627	
Xenopus_laevis	-----GNKDEPFEGYTYPAS	PNSSSNSSRRSSKDGDILP	391	
	.....790.....800.....810.....820.....830.....840		

Pavo_muticus	TTLKKEAKFELRAFHEDKKPSKLFEDED-EKEKYRVRKVRPSEEMIELEKERRELIKSQA	718
Pavo_cristatus	TTLKKEAKFELRAFHEDKKPSKLFEDED-EKEKYRVRKVRPSEEMIELEKERRELIKSQA	718
Gallus_gallus	TTLKKEAKFELRAFHEDKKPSKLFEDED-EKEKYRVRKVRPSEEMIELEKERRELIKSQA	719
Anas_platyrhynchos	TTLKKEAKFELRAFHEDKKPSKLFEEED-EKEKYKVRKVRPSEEMMELEKERRELIKSQA	691
Chelonia_mydas	TTIKKEAKFELRAFQEEKKPSKLFDDDN-EKEKYSVRKVRPSEEIIELEKERRELIKSQA	458
Homo_sapiens	TTLKKEAKFELRAFHEDKKPSKLFEDDEHEKEQYCIKRVRPSEEMLELEKERRELIRSQA	461
Pan_troglodytes	TTLKKEAKFELRAFHEDKKPSKLFEDDEHEKEQYCIKRVRPSEEMLELEKERRELIRSQA	695
Macaca_mulatta	TTLKKEAKFELRAFHEDKKPSKLFEDDEREKEQYCVRKVRPSEEMLELEKERRELIRSQA	463
Callithrix_jacchus	TTLKKEAKFELRAFHEDKKPSKLFEDDEHEKEQYCIKRVRPSEEMLELEKERRELIRSQA	695
Mus_musculus	TTLKKEAKFELRAFHEDKKPSKLFEEDEREKEQFCVRKVRPSEEMIELEKERRELIRSQA	428
Bos_taurus	TTLKKEAKFELRAFHEDKKPSKLFEDDESEKEQYRVRKVRPSEEMLELEKERRELIRSQA	461
Equus_caballus	TTLKKEAKFELRAFHEDKKPSKLFEDDESEKEQYCVRKVRPSEEMLELEKERRELIRSQA	693
Canis_lupus_familiaris	TTLKKEAKFELRAFHEDKKPSRLFEDDEGEREQYCVRKVRPSEEMLELEKERRELIRSQA	699
Ornithorhynchus_anatinus	TTLKKEAKFELRAFHEDKKPSKLFDDDCGEKDKYRVRKVRPSEEMLELEKERRELIRSQA	464
Latimeria_chalumnae	-----	415
Rhinatrema_bivittatum	TTIKKEAKFELRAFHEDKKPSKLF-DDEGEKEKIRVRKVRPSEEVIELEKERKELIKNQA	693
Xenopus_tropicalis	KVIKKEAKFELRTFHEEKKPSKLFDDFN-EKEHIRVRKIRPSEEVQELEKERLELIKSQA	686
Xenopus_laevis	KIIKKEAKFELRTFHEEKKPSKLFDDFN-EKEHIRVRKVRPSEEVQELEKERLELIKSQA	450
	.....850.....860.....870.....880.....890.....900	

CLUSTAL 2.1 MULTIPLE SEQUENCE ALIGNMENT

File: /media/morpheus/disk1/fst/pep_msa/PALM2A-KA-PE.p 1 14:14:22 2022

Page 6 of 9

Pavo_muticus	VKKNP	STIAAKWWNP	PEKTLEE	Q	LDEEHLE	SHKKYKERKERQ	Q	Q	Q	SA	-----	765
Pavo_cristatus	VKKNP	NIAAKWWNP	PEKTLEE	Q	LDEEHLE	SHKKYKERKERQ	Q	Q	Q	SA	-----	765
Gallus_gallus	VKKNP	NIAAKWWNP	PEKTLEE	Q	LDEEHLE	SHKKYKERKERL	Q	Q	Q	ST	-----	766
Anas_platyrhynchos	VKKNP	NIAAKWWNP	PEKTLEE	Q	LDEEHLE	SHKKYKERKERQ	Q	Q	Q	GA	-----	738
Chelonia_mydas	VKKNP	GIAAKWWNP	PEKTLEE	Q	LDEEHLE	SHKKYKERKERQ	Q	Q	Q	ST	-----	505
Homo_sapiens	VKKNP	GIAAKWWNP	PEKTIEE	Q	LDEEHLE	SHKKYKERKERRA	Q	Q	E	Q	--LLLLKQL	519
Pan_troglodytes	VKKNP	GIAAKWWNP	PEKTIEE	Q	LDEEHLE	SHKKYKERKERRA	Q	Q	E	Q	--LLLLQQL	753
Macaca_mulatta	VKKNP	GIAAKWWNP	PEKTIEE	Q	LDEEHLE	SHKKYKERKEKRA	Q	Q	E	Q	--LLLLQQL	521
Callithrix_jacchus	VKKNP	GIAAKWWNP	PEKTIEE	Q	LDEEHLE	SHKKYKERKERRA	Q	Q	E	Q	--LLLLQQL	753
Mus_musculus	VKKNP	GIAAKWWNP	PEKTIEE	Q	LDEEHLE	SHRKYKERKEKRA	Q	Q	E	Q	--LQL	486
Bos_taurus	VKKNP	GIAAKWWNP	PEKTIEE	Q	LDEEHLE	SHKKYKERKERRA	Q	Q	E	Q	--LLMQ	517
Equus_caballus	VKKNP	GIAAKWWNP	PEKTIEE	Q	LDEEHLE	SHKKYKERKERRA	Q	Q	E	Q	--LLMQ	751
Canis_lupus_familiaris	VKKNP	GIAAKWWNP	PEKTIEE	Q	LDEEHLE	SHKKYKERKERRA	Q	Q	E	Q	--LLMQ	757
Ornithorhynchus_anatinus	VKKNP	GIAAKWWNP	PEKTLEE	Q	LDEEHLE	SHKKYKERKERR	Q	Q	E	Q	Q	524
Latimeria_chalumnae												415
Rhinatrema_bivittatum	VKKNP	SIATKWWNP	PEKTLEE	Q	LDEEHLE	SHKKYIERKRKQ	Q	V	M	L	P	740
Xenopus_tropicalis	MKKNP	GITTKWWNP	PEKTIEE	Q	L	D	L	Q	L	E	S	733
Xenopus_laevis	VKKNS	GITTKWWNP	PEKTIEE	Q	L	S	D	Q	L	E	S	497
	.....	910.....	920.....	930.....	940.....	950.....	960					

Species	Sequence	Position
Pavo_muticus	-----TPTSPKQISCSFVPPEPVNIKKEDIVTEQ	794
Pavo_cristatus	-----TPTSPKQISCSFVPPEPVNIKKEDIVTEQ	794
Gallus_gallus	-----TPTSPKQVSCSFVPPEPVNIKKEDIVTEQ	795
Anas_platyrhynchos	-----TPPSPKQVSCSFVPPEPMNIKKEDIVTEQ	767
Chelonia_mydas	-----TPTSPKQVAYSFVPPEPGCVKKEDIVTEQ	534
Homo_sapiens	QQ-----PPSQLCTAPASSHERASMDKA-----KEDIVTEQ	551
Pan_troglodytes	QQ-----PPSQLCTAPASSHERASMDKA-----KEDIVTEQ	785
Macaca_mulatta	QQQQQ-----PPSQLCTAPASSHECASMIDKA-----KEDIVTEQ	556
Callithrix_jacchus	QQQ-----PPSQLCTAPHSSHEPTSMIDRA-----KEDIVTEQ	786
Mus_musculus	QQQQQLQQQLQQQQQLQQQLQQQLSTSQPCTAPAA-HKHLGDGIEHT-----KEDVVTEQ	539
Bos_taurus	-----PPPQLCTAPAPSRHPSVTDHP-----KEDIVTEQ	547
Equus_caballus	QQQQQQ-----PPPQLCPAPASSRERSMSTENT-----KEDIVTEQ	787
Canis_lupus_familiaris	QQQQQPPLPQ-----POPQPCAAPAPRPDAGTTEHA-----KEDIVTEQ	797
Ornithorhynchus_anatinus	QKQQ-----PLNQPVCVSPASPNSHCAFELPDASISQKKDIVTEQ	564
Latimeria_chalumnae	-----	415
Rhinatrema_bivittatum	-----PSPIQKSFSFVPPEPVTVNKKEDIVTEQ	767
Xenopus_tropicalis	-----SPPAVKVHHFPPILSEPTAVKKEDIVTEQ	762
Xenopus_laevis	-----SPPAVKANHLPPVLSETTAVKKEDIVTEQ	526

Pavo_muticus	IDFSAARKQFOLMEHSGPSQGOVPPRRSGTPKMFSVKPFYKSLNPSNADRPLSTITRPVS	854
Pavo_cristatus	IDFSAARKQFOLMEHSGPSQGOVPPRRSGTPKMFSVKPFYKSLNPSNADRPLSTITRPVS	854
Gallus_gallus	IDFSAARKQFOLMEHSGPSQGOVPPRRSGTPKMFSVKPFYKSLNPSNADRPLSTITRPVS	855
Anas_platyrhynchos	IDFSAARKQFOLMEHSGPSQGOVPPRRSGTPKMFVSIKPFYKSLNPSPADRPLSTVTRPVS	827
Chelonia_mydas	IDFSAARKQFOLMENSQANSIAPKRSVAPKMFVSIKPFYRPIGSPHVDRTVSMTRPAS	594
Homo_sapiens	IDFSAARKQFOLMENSRIQAVAKQSTPRLFSIKPFYRPLGVSNSDKPL-TNPRPPS	606
Pan_troglodytes	IDFSAARKQFOLMENSRIQAVAKQSTPRLFSIKPFYRPLGVSNSDKPL-TNPRPPS	840
Macaca_mulatta	IDFSAARKQFOLMENSRIQAVAKQSTPRLFSIKPFYRPLGVSNSDKPL-TNPRPPS	611
Callithrix_jacchus	IDFSAARKQFOLMENSRIQAVAKQSTPRLFSIKPFYRPLGVSNSDKPL-TNPRPPS	841
Mus_musculus	IDFSAARKQFOLMENSRIQTLAKQSTPRLFSIKPYYKPLGSIHSDKPP-TILRPAT	594
Bos_taurus	IDFSAARKQFOLMENSRIQTVARGQSTPRLFSIKPFYKPLGVSNSDKTL-TISRPAS	602
Equus_caballus	IDFSAARKQFOLMENSRIQTVAKQSTPRLFSVSKPFYRPLGVSNSDRPL-TLSRPAS	842
Canis_lupus_familiaris	IDFSAARKQFOLMENSRIQTVAKQSTPRLFSVSKPFYKPLGVSNSDKPL-TISRPAS	852
Ornithorhynchus_anatinus	IDFSSARKQFOLMENSRIQAAARGPAPKLFVSIKPFYRPLGSSLSSEKAL-TITRPAS	619
Latimeria_chalumnae	-----	415
Rhinatrema_bivittatum	IDFSAARKQFLVMENITQPNHIIQPKRSVTPKLFVSVKPFYKSLGATQTERPFAPVTAIRP	827
Xenopus_tropicalis	IDFLAARKQFLNMENITQPNFKIIPPKRSVSIANLFTVKPFYKSSSEAKSYSCITVINSVP	822
Xenopus_laevis	IDFLAARKQFLNMENITQPNYKPPPKRSVSIANLFTVVPFYKSSSEAKSYSCITVINSVP	586
	.....1030.....1040.....1050.....1060.....1070.....1080	

CLUSTAL 2.1 MULTIPLE SEQUENCE ALIGNMENT

File: /media/morpheus/disk1/fst/pep_msa/PALM2A/PAPEps 1 14:14:22 2022

Page 7 of 9

Pavo_muticus	MYGQTGOHEGNDITVVKAQKVSCSSE-DDTNAQ--NNSADPIRELPCSDSSRAGQASKLW	911
Pavo_cristatus	MYGQTGOHEGNDITVVKAQKVSCSSE-DDTNAQ--NNSADPIRELPCSDSSRAGQASKLW	911
Gallus_gallus	MYGQTGOHEGNDITVVKAQKVSCSSE-DDANAQ--NNSADPIRELPCSDSSRAGQASKLW	912
Anas_platyrhynchos	MYGQTGOLEGSDVTVVKAQKVSCASE-DDTNTQ--SNTADPMRESPCSDSTRAGQASKLW	884
Chelonia_mydas	VP-----LENNDITIVKAQKVSCVSEGHPRNIQ--SSPADPVRELSYSDTSKTGQTTKLW	647
Homo_sapiens	VGGP---PEDSGASAAKGQKSPGALETPSAAGS-OGNTASQGKEGYPYSEPSKRGPLSKLW	662
Pan_troglodytes	VGGP---PEDSGASAAKGQKSPSALETPSAAGS-OGNTAPQGKEGYPYSEPSKRGPLSKLW	896
Macaca_mulatta	VGGP---PEDSGASATKGQKSPGALETPSAAGS-OGNTAPQGKEGYPYSEPAKRGPLSKLW	667
Callithrix_jacchus	VGGP---PEDSGASAAKGQKSPGALETSAAAS-OGSTAPQGKEGYPYSEPSKRGPLSKLW	897
Mus_musculus	VGGT---LEDGGTQAAKEQKAPCVSESQSAGAG-PANAATQGKEGYPYSEPSKRGPLSKLW	650
Bos_taurus	VGAP---PED--SSAAKGQKAHCAPESQSSGGGGOGSTAPQGKEGYPYSEPSKRGPLSKLW	657
Equus_caballus	ARGP---SEDNGTSAAKGQKASCAMETQSSGGG-OGSSTPQGKEGYPYSEPSKRGPLSKLW	898
Canis_lupus_familiaris	IGAP---REDPGASAAKGQKASCAPESQSSGGG-OGSAAPPQGKEGYPYSEPSKRGPLSKLW	908
Ornithorhynchus_anatinus	IGVP---PEEDGISSPKPEKSPCGPGTQNSPTN-----PGEASKHGPTAKLW	663
Latimeria_chalumnae	-----	415
Rhinatrema_bivittatum	PPPVVS-EQMVQVKDNQTTQKFSVCPPEQHIGTA--ITPTEPVREYSGGDNSSQIGQPIKSW	884
Xenopus_tropicalis	CVQS---VQDETPTFVKAERVNCISEDSVINQ--RLMAEVSAEPSADIDLONEKVKRS	876
Xenopus_laevis	CVQS---VQGETPLVKAERVNCISEDPTMNQ--RLMADASPEPSADIDLDEKVKRS	640
	.....1090.....1100.....1110.....1120.....1130.....1140	

Pavo_muticus	SEDFEFMSARAVFTVVKDDVQGVLDQLPKSASASSPPEELDSGLDDLVSRSQDTTVLETL	971
Pavo_cristatus	SEDFEFMSARAVFTVVKDDVQGVLDQLPKSASASSPPEELDSGLDDLVSRSQDTTVLETL	971
Gallus_gallus	SEDFEFMSARAVFTVVKDDVQGVLDQLPKSASASSPPEELDSGLDDLVSRSQDTTVLETL	972
Anas_platyrhynchos	AEDGEFMSARAVFTVVKDDGQGVLDQLPKSSASSPPEELDSGLDDLVSRSQDTTVLETL	944
Chelonia_mydas	ADDSEFMSARAVFMVVKDDDPGILDQFSRSVNVSSPPEELDSGLDELVSRSQDTTVLETL	707
Homo_sapiens	AEDGEFTSARAVLTVVKDDDHGILDQFSRSVNVSLTQEELDSGLDELVSRSQDTTVLETL	722
Pan_troglodytes	AEDGEFTSARAVLTVVKDDDHGILDQFSRSVNVSLTQEELDSGLDELVSRSQDTTVLETL	956
Macaca_mulatta	AEDGEFTSARAVLTVVKDDDHGILDHFSKSVNVSLTQEELDSGLDELVSRSQDTTVLETL	727
Callithrix_jacchus	AEDGEFTSARAVLTVVKDDDHGILDQFSKSVNVSLTQEELDSGLDELVSRSQDTTVLETL	957
Mus_musculus	AEDGEFTSARAVLTVVKDEDHGILDQFSRSVNVSLTQEELDSGLDELVSRSQDTTVLETL	710
Bos_taurus	AEDGEFTSARAVLTVVKDDDPGILDQFSRSVNVSLTQEELDSGLDELVSRSQDTTVLETL	717
Equus_caballus	AEDGEFTSARAILTVVKDDDHGILDQFSRSVNVSLTQEELDSGLDELVSRSQDTTVLETL	958
Canis_lupus_familiaris	AEDGEFTSARAVLTVVKDDDPGILDQFSRSVNVSLTQEELDSGLDELVSRSQDTTVLETL	968
Ornithorhynchus_anatinus	AEEGEFMSARAVFTVVKDDDHGILDQFSRSVNVSSPPEELDSGLDELVSRSQDTTVLETL	723
Latimeria_chalumnae	-----	415
Rhinatrema_bivittatum	TDDGEFMSARAIFTEIKEYDNDISDHFSKCVNISSPPEELDSGLDELVSRSQDTTILETL	944
Xenopus_tropicalis	AE--EFVCATANFTVLKDDNDLSDRFKSVSVSFLPEEQDSGLDDLVSRSQDTTVMETL	934
Xenopus_laevis	AE--EFVSATASFTVLKDDSDLSDRFVKS SVSFLPEEQDSGLDDLVSRSQDTTVMETL	698
	.....1150.....1160.....1170.....1180.....1190.....1200	

Pavo_muticus	SNDFSMDNISDSGASNETMSALQESSLADFSLPQTPQADTPAECRGEKMSKSFSDPGCDS	1031
Pavo_cristatus	SNDFSMDNISDSGASNETMSALQESSLADFSLPQTPQADTPAECRGEKMSKSFSDPGCDS	1031
Gallus_gallus	SNDFSMDNISDSGASNETMSALQESSLADFSLPQTPQADTPAECRGEKMSKSFSDPGCDS	1032
Anas_platyrhynchos	SNDFSMDNISDSGASNETMSALQESSLADFSLPQTPQADTPAECRDEGISKSFSDPGCDS	1004
Chelonia_mydas	SNDFSMDNISDSGASNETMNPLOENSLADFSLPQTPQADTPSECR-VGVSKSFSDHGFYS	766
Homo_sapiens	SNDFSMDNISDSGASNETTNALQENSLADFSLPQTPQTDNPSEGRGEGVSKSFSDHGFYS	782
Pan_troglodytes	SNDFSMDNISDSGASNETTNALQENSLADFSLPQTPQTDNPSEGRGEGVSKSFSDHGFYS	1016
Macaca_mulatta	SNDFSMDNISDSGASNETTNALQENSLADFSLPQTPQTDNPSEGRGEGVSKSFSDHGFYS	787
Callithrix_jacchus	SNDFSMDNISDSGASNETTNALQENSLADFSLPQTPQTDNPSEGRGEGVSKSFSDHGFYS	1017
Mus_musculus	SNDFSMDNISDSGASNETPSALQENSLADFSLPQTPQTDNPSEGR-EGVSKSFSDHGFYS	769
Bos_taurus	SNDFSMDNISDSGASNETTNALQENSLADFSLPQTPQTDNPSEGRGEGVSKSFSDHGFYS	777
Equus_caballus	SNDFSMDNISDSGASNETTNALQENSLADFSLPQTPQTDNPSEGRGEGVSKSFSDHGFYS	1018
Canis_lupus_familiaris	SNDFSMDNISDSGASNETTNALQENSLADFSLPQTPQTDNPSEGRGEGVSKSFSDHGFYS	1028
Ornithorhynchus_anatinus	SNDFSMDNISDSGASNETMNPLOENSLADFSLPQTPQTEIPLESRPEGVSKSFSDHGFYS	783
Latimeria_chalumnae	-----	415
Rhinatrema_bivittatum	SNDFSMDNISDSGASNETINAFQENSFGDFSQPQTPMSDNLADYSLERVSESYSPAFYS	1004
Xenopus_tropicalis	SNDFSMDNISDSGASNETMSVQHDYSLGDLSPQTPVNDTVTEYTLEEGSK--SDQGFYS	992
Xenopus_laevis	SNYFSMDNISDSGASNETMSAQHDYSLGDLSPQTPVNDTVTEYTLEEGSK--YDQGFYS	756
	.....1210.....1220.....1230.....1240.....1250.....1260	

CLUSTAL 2.1 MULTIPLE SEQUENCE ALIGNMENT

File: /media/morpheus/disk1/fst/pep_msa/PALM2A/PAPEps 1 14:14:22 2022

Page 8 of 9

Pavo_muticus	LSSALADSMILIDNQLEYHAGLLVQNAIQQAIAEQADKTN-----GKE	1073
Pavo_cristatus	LSSALADSMILIDNQLEYHAGLLVQNAIQQAIAEQADKTN-----GKE	1073
Gallus_gallus	LSSALAE SMII DNQLEYHAGLLVQNAIQQAIAEQADKTN-----GKE	1074
Anas_platyrhynchos	LSSTLADSMVIDDQLEYHAGLLVQNAIQQAIAEQADKAN-----CKE	1046
Chelonia_mydas	PSSTLLDSMLVDDQLDYHAGLLVQNAIQQAIAEQADKTG-----SKP	808
Homo_sapiens	PSSTLGDSPLVDDPLEYQAGLLVQNAIQQAIAEQVDKAV-----SKT	824
Pan_troglodytes	PSSTLGDSPLVDDPLEYQAGLLVQNAIQQAIAEQVDKAV-----SKT	1058
Macaca_mulatta	PSSTLGDSPLVDDPLEYQAGLLVQNAIQQAIAEQVDKAV-----SKT	829
Callithrix_jacchus	PSSMLGDSL SVDDPLEYQAGLLVQNAIQQAIAEQVDKAV-----SKT	1059
Mus_musculus	PSSTLGDSPLVDDPLEYQAGLLVQNAIQQAIAEQVDKAE-----AHT	811
Bos_taurus	PLSTLGDSASVDDPLEYQAGLLVQNAIQQAIAEQIDRAG-----SET	819
Equus_caballus	LSSTLGDSPLVDDPLEYQAGLLVQNAIQQAIAEQVDRAA-----SEI	1060
Canis_lupus_familiaris	PSSTLGDSPLVDDPLEYQAGLLVQNAIQQAIAERADRAA-----SEA	1070
Ornithorhynchus_anatinus	PSSTQGDSLLMEEHLEYQAGLLVQNAIQQAIAEQADKAG-----CRP	825
Latimeria_chalumnae	-----	415
Rhinatrema_bivittatum	PSATFSESLLISDQLEYQAGLLVQNAIQQAIAEQVERTGPTKLKDSAEHVNPTKQES TE	1064
Xenopus_tropicalis	PSSMLHDIDDHLDPLDYHAGILVQNVIIQALAEKAGFKDCTHSDNL-----DKSH	1042
Xenopus_laevis	PSSMLQDIDDQLD---YHAGVLVQNVIIQALAEKAGFKDSTHSEDS-----DKSN	803
.....1270.....1280.....1290.....1300.....1310.....1320		

Pavo_muticus	EKIPAEQDISAKEQPATTRLSPASKQQNPVFKPPQVSSPVQEKRD--TIPKTSKEDDSG	1131
Pavo_cristatus	EKIPAEQDISAKEQPATTRLSPASKQQNPVFKPPQVSSPVQEKRD--TIPKTSKEDDSG	1131
Gallus_gallus	EKIPAEQDISAKEQPATTRLSPASKQQNPVFKPPQVSSPVQEKRD--TIPKTSKEDDSG	1132
Anas_platyrhynchos	EKIPAEQDISAKEQPATTRLSPASKQQNPVFKPPQVSSPVQEKRD--TIPKTSKEDDSG	1104
Chelonia_mydas	ATDKVEQKNSVKDQEEVS-TAPCSEKEQSTTFEPPQVSSPVQEKRD--TIPKTSRNEEDSG	865
Homo_sapiens	SRDGAEQGGPEATVEEAE-AAAFGSEKPPQMFEPPOVSSPVQEKRD--VLPKILPAEDRA	881
Pan_troglodytes	SRDGAEQGGPEATVEEAE-AGAFGSEKPPQMFEPPOVSSPVQEKRD--VLPKILPAEDRA	1115
Macaca_mulatta	SRDGAEQGGPEATVEEAE-AGAFGSEKPPQMFEPPOVSSPVQEKRD--VLPKILPAEDRA	886
Callithrix_jacchus	SRDGAEQGGPEATVEEAE-AGAFGSEKPPQMFEPPOVSSPVQEKRD--VLPKILPAEDRV	1116
Mus_musculus	SKEGSEQQEPEATVEEAG-SQTPGSEKPPQMFEPPOVSSPVQEKRD--ILPKNLPAEDRA	868
Bos_taurus	TKGGAEQGGPQVSQEKAG-PRAPSSEKPPQMFEPPOVSSPVQEKRD--VLPKILSTEDRV	876
Equus_caballus	N-GGAEQGGPEATVEEAE-SGASSSEKPPQMFEPPOVSSPVQEKRD--VLPKILPAEDRA	1116
Canis_lupus_familiaris	SQRGPEAQGPRESLEEVEGAGAPGSEKPPQMFEPPOVSSPVQEKRE--VLPKILATEDRA	1128
Ornithorhynchus_anatinus	AEDPVVPKSPVKEEEVEVS-SPAACSGKPRNTEFEPPOVSSPVQEKRD--VLPKTLAEDAE	882
Latimeria_chalumnae	-----	415
Rhinatrema_bivittatum	QESAKEQLCPLQEQEKMGTLPACPENQSIFKEPPQVSSPVREKRDVIVIPKTSADQDFE	1124
Xenopus_tropicalis	FLDDSEHLTEKSEILSYSSPPVSPRRDTEVFEPPOVSSPVQKTKP-LTIPKTFESEDFO	1101
Xenopus_laevis	YFDNEPLTEKSEIISCSPPVSPGRDQREVFEPPOVSSPVQVTKA-ITIPKTFEGENFO	862
.....1330.....1340.....1350.....1360.....1370.....1380		

Pavo_muticus	LREGKSLQOSPVSASQPFLVEENRHEVSYFSKYSEAAELRSTASILATQEAETVGPFFK	1191
Pavo_cristatus	LREGKSLQOSPVSASQPFLVEENRHEVSYFSKYSEAAELRSTASILATQEAETVGPFFK	1191
Gallus_gallus	LREGKSLQOSPVSASQPFLVEENRHEVSYFSKYSEAAELRSTASILATQEAETVGPFFK	1192
Anas_platyrhynchos	LREGKSLQOTPAYSATQPFLVEENRHEVSYFSKYSEAAELRSTASILATQEAETVGPFFK	1164
Chelonia_mydas	LREGKTSQSSVSPTSQPFFIVEENRQEVSYFSKYSEAAELRSTASILATQEAETVGPFFK	925
Homo_sapiens	LRERGPPOPLPAVQPSGPIINMEETRPEGSYFSKYSEAAELRSTASLLATQESDVMVGPFK	941
Pan_troglodytes	LRERGPPOPLPAVQPSGPIINMEETRPEGSYFSKYSEAAELRSTASLLATQESDVMVGPFK	1175
Macaca_mulatta	LRERGPPOPLPAVQPSGPIINMEETRPEGSYFSKYSEAAELRSTASLLATQESDVMVGPFK	946
Callithrix_jacchus	LRERGPPOPLPAVQPSGPIINMEETRPEGSYFSKYSEAAELRSTASLLATQESDVMVGPFK	1176
Mus_musculus	LREGKSPPTAAQPSGPIINMEETRPEGGYFSKYSEAAELRSTASLLATQESDVMVGPFK	928
Bos_taurus	LRERGPSQPLPAVQPSGPIINMEETRPEGSYFSKYSEAAELRSTASLLATQESDVMVGPFK	936
Equus_caballus	LRERGPSQPLPVVQPSGPIINMEETRPEGSYFSKYSEAAELRSTASLLATQESDVMVGPFK	1176
Canis_lupus_familiaris	LRDTGPSQPPPTLQPRGPVSMEEARPEGSYFSKYSEAAELRSTASLLATQEAETVGPFFK	1188
Ornithorhynchus_anatinus	LREKMTSRQPPEAHTIHPVHSESRPEVSYFSKYSEAAELRSTASILASQESSEMTVGPYK	942
Latimeria_chalumnae	-----	415
Rhinatrema_bivittatum	LREEKNLQSPVPYGSQVIEEENRQEVSYFSKYSEAAELRSTASILASQEAETVGPFFK	1184
Xenopus_tropicalis	PKQDNPLPPKS-LSLTEQNSTEENKQE-SYFSKYSAELRSTASILATQETEISVGPFFK	1159
Xenopus_laevis	LKQDNPLSTKS-LSPTQONCTEEHKQE-SYFSKYSAELRSTASILATQETEISVGPFFK	920
.....1390.....1400.....1410.....1420.....1430.....1440		

CLUSTAL 2.1 MULTIPLE SEQUENCE ALIGNMENT

File: /media/morpheus/disk1/fst/pep_msa/PALM2A_KA_PEPs 1 14:14:22 2022

Page 9 of 9

Pavo_muticus	LRSRKQRTLSMIEEEEIRAAQEREELKRQR--OGLQMAPSPVTKSAPPLPRTTVSYKTAP	1249
Pavo_cristatus	LRSRKQRTLSMIEEEEIRAAQEREELKRQR--OGLQMAPSPVTKSAPPLPRTTVSYKTAP	1249
Gallus_gallus	LRSRKQRTLSMIEEEEIRAAQEREELKRQR--OGLQMAPSPVTKSAPPLPRTTVSYKTAP	1250
Anas_platyrhynchos	LRSRKQRTLSMIEEEEIRAAQEREELKRQR--OGLQVAPSPVMKSAPALPRTTVSYKTAP	1222
Chelonia_mydas	LRSRKQRTLSMIEEEEIRAAQEREELKRQR--OGLQMTQSPIAKSAPPLPRTTVAYKTAP	983
Homo_sapiens	LRSRKQRTLSMIEEEEIRAAQEREELKRQR--QVLOSTQSPRTKNAPSLPSR-TCYKTAP	998
Pan_troglodytes	LRSRKQRTLSMIEEEEIRAAQEREELKRQR--QVLOSTQSPRTKNAPSLPSR-TCYKTAP	1232
Macaca_mulatta	LRSRKQRTLSMIEEEEIRAAQEREELKRQR--QVLOSTQSPRTKNAPSLPSR-TCYKTAP	1003
Callithrix_jacchus	LRSRKQRTLSMIEEEEIRAAQEREELKRQR--QVLOSTQSPRTKNAPSLPSR-TCYKTAP	1233
Mus_musculus	LRSRKQRTLSMIEEEEIRAAQEREELKRQR--QVROSTQSPRAKNAPSLPSRTTCYKTAP	986
Bos_taurus	LRSRKQRTLSMIEEEEIRAAQEREELKRQR--QVLOSTQSPKAKNAPSLPSRASCYKTAP	994
Equus_caballus	LRSRKQRTLSMIEEEEIRAAQEREELKRQR--QVLOSTQSPRAKNAPSLPSRTPCYKTAP	1234
Canis_lupus_familiaris	LRSRKQRTLSMIEEEEIRAAQEREELKRQR--QVLOSTQSPRAKSAPSLPSRASSCKTAP	1246
Ornithorhynchus_anatinus	LRSKKQRTLSMIEEEEIRAAQEREELKRQR--QVRQIAQSPPTTKNAPPLPSRTVCYKTAP	1000
Latimeria_chalumnae	-----	415
Rhinatrema_bivittatum	LRSKKQRTLSMIEEEEIRAAQEREELKRQR--ONLQNPQSPSSKAAPALPRTTVCYKTAP	1242
Xenopus_tropicalis	LRSKKQRTLSMIEEEEIRAAQEREELKRQR--SFQSQHSPSNKSAPVLPRTTVSYKTAP	1219
Xenopus_laevis	LRSKKQRTLSMIEEEEIRAAQEREELKRQR--SIQSQHSPSNKSAPVLPRTTVSYKTAP	980
	.....1450.....1460.....1470.....1480.....1490.....1500	

Pavo_muticus	GKIEKIKPPPSPTTEGPASHSDLQAEPPAGAQRPKNLMETLMEDYETHKTKRRERMDDSS	1309
Pavo_cristatus	GKIEKIKPPPSPTTEGPASHSDLQAEPPAGAQRPKNLMETLMEDYETHKTKRRERMDDSS	1309
Gallus_gallus	GKIEKIKPPPSPTTEGPASHSDLQAEPPAGAQRPKNLMETLMEDYETHKTKRRERMDDSS	1310
Anas_platyrhynchos	GKIEKIKPPPSPTTEGPASHSDLQAEPPAGAQRPKNLMETLMEDYETHKTKRRERMDDSS	1282
Chelonia_mydas	GKIEKIRPPPSPTTEGPPLSOSDLLPDEAAGSQRPKNLMQTLMEDYETHKTKRRERMDDSS	1043
Homo_sapiens	GKIEKVKPPPSPTTEGPPLSOPDLAPEEAAGTQRPKNLMQTLMEDYETHKTKRRERMDDSS	1058
Pan_troglodytes	GKIEKVKPPPSPTTEGPPLSOPDLAPEEAAGTQRPKNLMQTLMEDYETHKTKRRERMDDSS	1292
Macaca_mulatta	GKIEKVKPPPSPTTEGPPLSOPDLAPEEAAGTQRPKNLMQTLMEDYETHKTKRRERMDDSS	1063
Callithrix_jacchus	GKIEKVKPPPSPTTEGPPLSOPDLAPEEAAGTQRPKNLMQTLMEDYETHKTKRRERMDDSS	1293
Mus_musculus	GKIEKVKPPPSPTTEGPPLSOPDLAPEEAAGTQRPKNLMQTLMEDYETHKTKRRERMDDSS	1046
Bos_taurus	GKIEKVRPPPSPTTEGPPLSOPDLAPEEAAGSQRPKNLMQTLMEDYETHKTKRRERMDDSS	1054
Equus_caballus	GKIEKVKPPPSPTTEGPPLSOPDLAPEEAAGSQRPKNLMQTLMEDYETHKTKRRERMDDSS	1294
Canis_lupus_familiaris	GTIEKVKPPPSPTTEGPSSOPDLAPEEAAGTQRPKNLMQTLMEDYETHKTKRRERMDDSS	1306
Ornithorhynchus_anatinus	GKIEKVRPPPSPTTEGPSSOPDLLLEEAGSQRPKNLMQTLMEDYETHKTKRRERMDDSS	1060
Latimeria_chalumnae	-----	415
Rhinatrema_bivittatum	GKIEKIRPPPSPTTEGPSSOPDLLLEEAGSQRPKNLMETLLEDYETHKTKRRERMDDSS	1302
Xenopus_tropicalis	GKIEKLRNPPSPRGESFPVQPDLLLEEEAGSQRPKNLMETLMDDYEAHKTTRDRMDDSS	1279
Xenopus_laevis	GKIEKIRNPPSPRGESFPVQPDLLLEEEAGSQRPKNLMETLMDDYFESHKTTRDRMDDAT	1040
	.....1510.....1520.....1530.....1540.....1550.....1560	

Pavo_muticus	YTCKLLSSKVTSEVLEATRVNRRKSALALRWEAGIYANREEDNE--	1352
Pavo_cristatus	YTCKLLSSKVTSEVLEATRVNRRKSALALRWEAGIYANREEDNE--	1352
Gallus_gallus	YTCKLLSSKVTSEVLEATRVNRRKSALALRWEAGIYANREEDNE--	1353
Anas_platyrhynchos	YTCKLLSSKVTSEVLEATRVNRRKSALALRWEAGIYANREEDNE--	1325
Chelonia_mydas	YTCKLLSSKVTSEVLEATRVNRRKSALALRWEAGIYANREEDNE--	1086
Homo_sapiens	-----VLEATRVNRRKSALALRWEAGIYANREEDNE--	1090
Pan_troglodytes	YTCKLLSSKVTSEVLEATRVNRRKSALALRWEAGIYANREEDNE--	1337
Macaca_mulatta	-----VLEATRVNRRKSALALRWEAGIYANREEDNE--	1095
Callithrix_jacchus	YTCKLLSSKVTSEVLEATRVNRRKSALALRWEAGIYANREEDNE--	1338
Mus_musculus	YTCKLLSSKVTSEVLEATRVNRRKSALALRWEAGIYANREEDNE--	1091
Bos_taurus	-----VLEATRVNRRKSALALRWEAGIYANREEDNE--	1086
Equus_caballus	YTCKLLSSKVTSEVLEATRVNRRKSALALRWEAGIYANREEDNE--	1339
Canis_lupus_familiaris	YTCKLLSSKVTSEVLEATRVNRRKSALALRWEAGIYANREEDNE--	1351
Ornithorhynchus_anatinus	-----VLEATRVNRRKSALALRWEAGIYANREEDNE--	1090
Latimeria_chalumnae	-----	415
Rhinatrema_bivittatum	-----VLEATRVNRRKSALALRWEAGIYANREEDNE--	1332
Xenopus_tropicalis	YTCKLLSNRITYEVLDAVRVNRRKSALALKWEAGIYANREDDE--	1322
Xenopus_laevis	-----VLDVRVNRRKSALALKWEAGIYANREDDE--	1071
	.....1570.....1580.....1590.....1600.....	