

**S12. Text Multi-species analysis of PDF-R PA isoforms**  
**Supporting Figure 15**

CLUSTAL Line-ups; Genbank Reference IDs below  
 6<sup>th</sup> & 7<sup>th</sup> Predicted TM domain in **YELLOW**  
 BBS sequences in **RED**

Serrata	-----LQLQYAFGLDMTLLSSILDGSG-----GISAQRFTRLLRQSSTS	39
Kikkawei	-----MQLQYAFAGDMTLLSSILDGSG-----SISAQRFTRLLRQSSTS	39
Bipectinate	-----HYADTGNMTLLSSILDGSG-----SVSVQRLTRLLRQSSPS	36
Anannassae	-----MTLLSSILDGSG-----SVSVQRLTRLLRQSSSTS	29
Fichsuphila	-----MTLLASILDGCG-----GISAQRFTRLLAQSSLL	29
Rhopalao	-----MTLLSNILDGCG-----GISAQCLTRSLRESSSP	29
Elegans	MKVAFTSQMNNENNHFHNVDGEMTLLSNILDGCG-----GIPAQRILARLLRQSSSS	52
Eugracilis	-----MTLLSNILDGSG-----GISAQRFTRLLRQSSSS	29
Erecta	-----MTLLSNILDGCG-----CISAQRFTRLLRQSGSS	29
Melanogaster	-----MTLLSNILDGCG-----CISAQRFTRLLRQSGSS	29
Sechellia	-----MTLLSNILDGCG-----CISDQRFTHLLRQSGSS	29
Simulans	-----MTLLSNILDGCG-----CISAQRFTRLLRQSGSS	29
Mauritania	-----MTLLSNILDGCG-----CISAQRFTRLLRQSGSS	29
Takahashi	-----MTLLSNILDGCG-----GISAQRFARLLRQSSSS	29
Suzuki	-----MTLLSNILDGCG-----GISAQRFTRLLRQSSSS	29
Biarmipes	-----MTLLSNILDGCG-----GISAQRFTRLLRQSSSP	29
Mojavensis	-----MQLAGDSEAGSMPTIITTTSTSSNSFLQRIALKAVTA	36
Grimshawii	-----MMQLPGINKPGCIPTISTSSIIIPQ---RFARRAARV	34
Virilis	-----	0

Serrata	SSSSSS-----SSASGSMLEPTSSQLPINDVLGGGRIPLFHDNGTGESL-----	83
Kikkawei	SSS--S-----VSASASMLEPTSSQLPNNDVLGGGRIPLFGNATGESSSSSSSP	86
Bipectinate	ASASGT-----ALASESMVEPTASQM-LNEITDGGRVPSL---GQDLAT-----	76
Anannassae	SSASGP-----SLASDSISSMVE-----ATSLRVPSL---GHDLST-----	62
Fichsuphila	ASSASASASASASASGTFASESMLEPTSSHI-----LPTGRVPLVHGFDFSTT-----	77
Rhopalao	GS-PG-----SPESGAFESKSMLEPTSSHI-----LPTGRVPLVHDFNASS-----	69
Elegans	GSTPS-----GSASGPFESKSMLEPTSSHI-----LPTGRVPLVHDFGSSS-----	93
Eugracilis	GSSASASAS-----ASSYGTLESKSMLEPTSSHT-----LPGGRVPLVHDFDS-----	71
Erecta	VP---SPS---APAPGTFESISMLEPTSLHS-----LPTGRVPLVHDFDA-----	68
Melanogaster	GP---SPS---APTAGTFESKSMLEPTSSHS-----LATGRVPLVHDFDA-----	68
Sechellia	GP---SPS---APAPGTFESKSMLEPTSSHS-----LATGRVPLVHDFDA-----	68
Simulans	GP---SPS---APAPGTFESKSMLEPTSSHS-----LATGRVPLVHDFDA-----	68
Mauritania	GP---SPS---APAPGTFESKSMLEPTSSHS-----LATGRVPLVHDFDA-----	68
Takahashi	GSPSASASSASSSSGTTFESKSMLEPTSSQN-----LPTGRVPLVHDFDFDFDP-----	79
Suzuki	GSPSS-----SSGTTTFESKSMLEPTSSHI-----LPTGRVPLVHDFDFDS-----	70
Biarmipes	GFLSS-----SSLGTTTFESKSMLEPTSSHV-----LPTGRVPLVHDFDFDS-----	70
Mojavensis	ATTTKDRL-----ISIVETD---SPAGSH-M-----DP--STAMTTT--SITA	71
Grimshawii	ASTSTATV-----TTLSMSMTQSG--RSMLNRTM-----TSIATATTTSTSTSI	78
Virilis	-----MPT-A--APSSNRTV-----STHHSTMTSTSTTYGT	29

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Serrata	-----PLPDADALDPNFVLDGVTSAKMALEATVK-EVLRDPDPEQILANANATAFWNIT	137
Kikkawei	PLPSPSLPDADALDPNFVLDGVTSAKMALEATVK--VLRDPDPEQILANANASAFWNIT	144
Bipectinate	-----TTETTQGSNVIIDRVTVNAKMALEATVM-DVLPDPDPDQVLGAVNASAHWNMT	128
Anannassae	-----TT---ETNVIIDRVTVNAKMALEATVM-DVLPDPEPDQVLTGVNASSHWNMN	110
Fichsuphila	-----TESTTSTYVLDGVASVAQMPLESTVMDALPDSDPDQAFGNLNVTAFWNLT	128
Rhopalao	-----TDSP--GTFLLDGVVSAQMALEPTLTD-LLPDPDPDQVLSNLNASAFWNLT	118
Elegans	-----TESPLTGTYLLDGVASVAEMALEPTVRD-ILSDPDPDKVLSNLNASAFWNLT	144
Eugracilis	-----STTESPGAYLLDGVASVAKMALEPAVMD-VLPDPDTEQVLSNLNITAFWNLT	122
Erecta	-----STTESPGTYVLDGVARVAQLALEPTVMD-GLPDPDTEQVLSNLNNSAFWNLT	119
Melanogaster	-----STTESPGTYVLDGVARVAQLALEPTVMD-ALPDSDEQVLSNLNNSAFWNLT	119
Sechellia	-----STTESPGTYVLDGVARVAQLALEPTVMD-ALPDPDTEQVLSNLNNSAFWNLT	119
Simulans	-----STTESPGTYVLDGVARVAQLALEPTVMD-ALPDPDTEQVLSNLNNSAFWNLT	119
Mauritania	-----TTTESPGTHVLDGVARVAQLALEPTVMD-ALPDPDTEQVLSNLNNSAFWNLT	119
Takahashi	-----TTTESPGNYVLDGVASVAKMALEPTVMDTVLPDSDPDQVLSNLNVSAPWNLT	132
Suzuki	-----LTTESTGTHVLDGVASVAKMALEPTVMDAVLPDSDTDQVLSNLNISAFWNIT	122
Biarmipes	-----STTELPRILVLDGVAGVATMALEPTAMDAVLPDSDPDQVLSNFNISAFWNIT	122
Mojavensis	TATATPAATATAS--ELSRSDVLNASIEATVAVGMDTVKTATESGLPTVSGTTLPSWNSS	129
Grimshawii	HSTTSSTSKLPSQVISGLADVINGTELDMTAAATAV---GLDAAVP-DPSTTSSSWNST	134

Virilis TSTTQAALTS-----F-----EPMAVTAAGMDV---TMAGTEPLSSTSIPTFWNSS 72  
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Serrata --LASAAATNYENCALFANYTLPQTGLYCNWTWDTLLCWPPTPAGVLARMNCPGGYHGV 195  
 Kikkawai --LAAAATNYENCALFANYTLPQTGLYCNWTWDTLLCWPPTPAGVLARMNCPGGYHGV 202  
 Bipectinate --LSSSTATNYENCALFANYTLPQTGLYCNWTWDTLLCWPPTPAGVLARMHCPGGYHGV 186  
 Ananassae MTLSSASATNYENCALFANYTLPQTGLYCNWTWDTLLCWPPTPAGVLARMNCPGGYHGV 170  
 Fichsuphila --LASAAATNFENCALFANYTLPQTGLYCNWTWDTLLCWPPTPAGVLARMNCPGGFHGV 186  
 Rhopalao --LASAAATNFENCALFANYTLPQTGLYCNWTWDTLLCWPPTPAGVLARMNCPAGFHGV 176  
 Elegans --LASAAATNFENCALFANYTLPQTGLYCNWTWDTLLCWPPTPAGVLARMNCPGGFHGV 202  
 Eugracilis --LASAAATNFENCALFVNYTLPQTGLYCNWTWDTLLCWPPTPAGVLARMNCPGGFHGV 180  
 Erecta --LSSAAATNFENCALFVNYTLPQTGLYCNWTWDTLLCWPPTPAGVLARMNCPGGFHGV 177  
 Melanogaster --LASAAATNFENCALFVNYTLPQTGLYCNWTWDTLLCWPPTPAGVLARMNCPGGFHGV 177  
 Sechellia --LASAAATNFENCALFVNYTLPQTGLYCNWTWDTLLCWPPTPAGVLARMNCPGGFHGV 177  
 Simulans --LASAAATNFENCALFVNYTLPQTGLYCNWTWDTLLCWPPTPAGVLARMNCPGGFHGV 177  
 Mauritania --LASAAATNFENCALFVNYTLPQTGLYCNWTWDTLLCWPPTPAGVLARMNCPGGFHGV 177  
 Takahashi --LASAAATNFENCALFVNYTLPQTGLYCNWTWDTLLCWPPTPAGVLARMNCPAGFHGV 190  
 Suzuki --LASAAATNFENCSSLFVNYTLPQTGLYCNWTWDTLLCWPPTPAGVLARMNCPGGFHGV 180  
 Biarmipes --LASAAATNFENCSSLFVNYTLPQTGLYCNWTWDTLLCWPPTPAGVLARMNCPGGFHGV 180  
 Mojavensis --FNSALANNYDNCSAMFANYTHPQTGLYCNWTWDTLLCWPPTPAGNARMNCPAGYHGV 187  
 Grimshawii --FSTASANSYDNCSAMFANYTQPVTGLYCNWTWDTLLCWPPTPAGVMARMYCPAGYHGV 192  
 Virilis --INTASANSYDNCSALFANYTQPTTVIYCNWTWDTLLCWPPTPAGATAHMHCAGYHGV 130  
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Serrata DTRKFANRKCELDGRWGSRPNATEFNATGWTDYGPCKPEVIRLMQMGSRDLDLYIEI 255  
 Kikkawai DTRKFANRKCELDGRWGSRPNATEFNATGWTDYGPCKPEVIRLMQMGSRDLDLYIEI 262  
 Bipectinate DTRKFANRKCELDGRWGSRPNATEPSPAGWTDYGPCKPEVIRLMQSMGSK-DIDYIDI 245  
 Ananassae DTRKFANRKCELDGRWGSRPNATEPSPAGWTDYGPCKPEVIRLMQSMGSK-DIDYIDI 229  
 Fichsuphila DTRKFAIRKCELDGRWGSRPNATEVSPPGWTDYGPCKPEVIRLMQMGSK-DFDLYIDI 245  
 Rhopalao DTRKFAIRKCELDGRWGSRPNATEVSPPGWTDYGPCKPEVIRLMQMGSK-DFDLYIDI 235  
 Elegans DTRKFAIRKCELDGRWGSRPNATEVSPPGWTDYGPCKPEVIRLMQMGSK-DFDLYIDI 261  
 Eugracilis DTRKFAIRKCELDGRWGSRPNATEASPPGWTDYGPCKPEVIRLMQMGSK-DFDLYIDI 239  
 Erecta DTRKFAIRKCELDGRWGSRPNATEVSPPGWTDYGPCKPEVIRLMQMGSK-DFDAYIDI 236  
 Melanogaster DTRKFAIRKCELDGRWGSRPNATEVSPPGWTDYGPCKPEVIRLMQMGSK-DFDAYIDI 236  
 Sechellia DTRKFAIRKCELDGRWGSRPNATEVSPPGWTDYGPCKPEVIRLMQMGSK-DFDAYIDI 236  
 Simulans DTRKFAIRKCELDGRWGSRPNATEVSPPGWTDYGPCKPEVIRLMQMGSK-DFDAYIDI 236  
 Mauritania DTRKFAIRKCELDGRWGSRPNATEVSPPGWTDYGPCKPEVIRLMQMGSK-DFDAYIDI 236  
 Takahashi DTRKFAIRKCELDGRWGSRPNATEVSPPGWTDYGPCKPEVIRLMQMGSK-NFDLYIDI 249  
 Suzuki DTRKFAIRKCELDGRWGSRPNATEVSPPGWTDYGPCKPEVIRLMQMGSK-DFDLYIDI 239  
 Biarmipes DTRKFAIRKCELDGRWGSRPNATEVSPPGWTDYGPCKPEVIRLMQMGSK-DFDLYIDI 239  
 Mojavensis DTRKFANRKCELDGHWGRPNETEPNHAGWTDYGPCKPEVIRLMQEIK---DVNLYIDI 244  
 Grimshawii DTRKFAIRKCELDGHWGRPNDELNTGGWTDYAPCYKPEVIRLMQEIK---DVNVYMDI 249  
 Virilis DTRKFANRKCELDGHWAGRPNSTEQKPTGWTDYGPCKPEVIRLMQEIK---DVNLYMDI 187  
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Serrata ARRTRTLEIVGLCLSLFALIVSLLIFCTFRSLRNNRTKIHKNLVFAMVLQVIIRLTLYLD 315  
 Kikkawai AKRTRTLEIVGLCLSLFALIVSLLIFCTFRSLRNNRTKIHKNLFIAMVLQVIIRLTLYLD 322  
 Bipectinate ARRTRTLEIVGLWVSLFALIVSLLIFCTFRSLRNNRTKIHKNLFIAMVLQVIVRLTYLD 305  
 Ananassae ARRTRTLEIVGLWVSLFALIVSLLIFCTFRSLRNNRTKIHKNLVFAMVLQVIVRLTYLD 289  
 Fichsuphila ARKTRTLEIVGLCLSLFALIVSLLIFCTFRSLRNNRTKIHKNLVFAMVLQVIIRLTLYLD 305  
 Rhopalao AKKTRTLEIVGLCLSLFALIVSLLIFCTFRSLRNNRTKIHKNLVFAMVLQVIIRLTLYLD 295  
 Elegans ARKTRTLEIVGLCLSLFALIVSLLIFCTFRSLRNNRTKIHKNLVFAMVLQVIIRLTLYLD 321  
 Eugracilis ARKTRTLEIVGLCLSLFALIVSLLIFCTFRSLRNNRTKIHKNLVFAMVLQVIIRLTLYLD 299  
 Erecta ARRTRTLEIVGLCLSLFALIVSLLIFCTFRSLRNNRTKIHKNLVFAMVLQVIIRLTLYLD 296  
 Melanogaster ARRTRTLEIVGLCLSLFALIVSLLIFCTFRSLRNNRTKIHKNLVFAMVLQVIIRLTLYLD 296  
 Sechellia ARRTRTLEIVGLCLSLFALIVSLLIFCTFRSLRNNRTKIHKNLVFAMVLQVIIRLTLYLD 296  
 Simulans ARRTRTLEIVGLCLSLFALIVSLLIFCTFRSLRNNRTKIHKNLVFAMVLQVIIRLTLYLD 296  
 Mauritania ARRTRTLEIVGLCLSLFALIVSLLIFCTFRSLRNNRTKIHKNLVFAMVLQVIIRLTLYLD 296  
 Takahashi AWKTRTLEIVGLCLSLFALIVSLLIFCTFRSLRNNRTKIHKNLVFAMVLQVIIRLTLYLD 309  
 Suzuki ARKTRTLEIVGLCLSLFALIVSLLIFCTFRSLRNNRTKIHKNLVFAMVLQVIIRLTLYLD 299  
 Biarmipes ARKTRTLEIVGLCLSLFALIVSLLIFCTFRSLRNNRTKIHKNLVFAMVLQVIIRLTLYLD 299  
 Mojavensis AQRTRTLEIIGLCLSLALIISLVIFCAFRLRNNRTKIHKNLFIAMVLQVIVRLTYLD 304  
 Grimshawii AQRTRTLEIIGLCLSLALIISLVIFCAFRLRNNRTKIHKNLFIAMVLQVIVRLTYLD 309  
 Virilis AQRTRTLEIIGLCLSLFALISLMIFCAFRLRNNRTKIHKNLFIAMVLQVIVRLTYLD 247  
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Serrata QFRRSKEAATNTSLSVIENTPYLCEASYVLLAYARTAMFMWMEIEGLYLHNMVTVAVFQ 375  
 Kikkawai QFRRNKEAATNTSLSVIENTPYLCEASYVLLAYARTAMFMWMEIEGLYLHNMVTVAVFQ 382  
 Bipectinate QYRRGNKEAATNTSLSAIENTPYLCEASYVLLAYARTAMFMWMEIEGLYLHNMVTVAVFQ 365  
 Ananassae QYRRGNKEAATNTSLSAIENTPYLCEASYVLLAYARTAMFMWMEIEGLYLHNMVTVAVFQ 349  
 Fichsuphila QFRRNKEAATNTSLSVIENTPYLCEASYVLLAYARTAMFMWMEIEGLYLHNMVTVAVFQ 365

Rhopaloo	QYRRGNKEAATNTSLSVIENTPYLCEASYVLELEYARTAMFMWMEIEGLYLHNMVTVAVFQ	355
Elegans	QYRRGNKEAATNTSLSVIENTPYLCEASYVLELEYARTAMFMWMEIEGLYLHNMVTVAVFQ	381
Eugracilis	QFRRGNKEAATNTSLSVIENTPYLCEASYVLELEYARTAMFMWMEIEGLYLHNMVTVAVFQ	359
Erecta	QFRRGNKEAATNTSLSAIENTPYLCEASYVLELEYARTAMFMWMEIEGLYLHNMVTVAVFQ	356
Melanogaster	QFRRGNKEAATNTSLSVIENTPYLCEASYVLELEYARTAMFMWMEIEGLYLHNMVTVAVFQ	356
Sechellia	QFRRGNKEAATNTSLSVIENTPYLCEASYVLELEYARTAMFMWMEIEGLYLHNMVTVAVFQ	356
Simulans	QFRRGNKEAATNTSLSVIENTPYLCEASYVLELEYARTAMFMWMEIEGLYLHNMVTVAVFQ	356
Mauritania	QFRRGNKEAATNTSLSVIENTPYLCEASYVLELEYARTAMFMWMEIEGLYLHNMVTVAVFQ	356
Takahashi	QYRRGNKEAATNTSLSVIENTPYLCEASYVLELEYARTAMFMWMEIEGLYLHNMVTVAVFQ	369
Suzuki	QFRRGNKEAATNTSLSVIENTPYLCEASYVLELEYARTAMFMWMEIEGLYLHNMVTVAVFQ	359
Biarmipes	QFRRGNKEAATNTSLSVIENTPYLCEASYVLELEYARTAMFMWMEIEGLYLHNMVTVAVFQ	359
Mojavensis	QFRRGIQ---YNSSLSAIENTPYLCEASYVLELEYARTAMFMWMEIEGLYLHNMVTVAVFQ	361
Grimshawii	QFRRGRPETATNASVSIIENTPYLCEASYVLELEYARTAMFMWMEIEGLYLHNMVTVAVFQ	369
Virilis	QFRRGKSDSANNTSLSVIENTPYLCEASYVLELEYARTAMFMWMEIEGLYLHNMVTVAVFQ	307

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Serrata	GSFPLKFFSRLGWCVFILMTTVWARCTVIYMDTSLGDCLWNYNLTPLYWILEGPRRLAVIL	435
Kikkawai	GSFPLKFFSRLGWCVFILMTTVWARCTVIYMDTSLGDCLWNYNLTPLYWILEGPRRLAVIL	442
Bipectinate	GSFPLKFFSRLGWCVFILMTFVWARCTVMYMDTSMGECLWNYNLTPLYWILEGPRRLAVIL	425
Ananassae	GSFPLKFFSRLGWCVFILMTFVWARCTVMYMDTSMGECLWNYNLTPLYWILEGPRRLAVIL	409
Fichsuphila	GSFPLKFFSRLGWCVFILMTTVWARCTVMYMDTSLGECLWNYNLTPLYWILEGPRRLAVIL	425
Rhopaloo	GSFPLKFFSRLGWCVFILMTTVWARCTVMYMDTSLGDCLWNYNLTPLYWILEGPRRLAVIL	415
Elegans	GSFPLKFFSRLGWCVFILMTTVWARCTVMYMDTSLGECLWNYNLTPLYWILEGPRRLAVIL	441
Eugracilis	GSFPLKFFSRLGWCVFILMTTVWARCTVMYMDTSLGECLWNYNLTPLYWILEGPRRLAVIL	419
Erecta	GSFPLKFFSRLGWCVFILMTTVWARCTVMYMDTSLGECLWNYNLTPLYWILEGPRRLAVIL	416
Melanogaster	GSFPLKFFSRLGWCVFILMTTVWARCTVMYMDTSLGECLWNYNLTPLYWILEGPRRLAVIL	416
Sechellia	GSFPLKFFSRLGWCVFILMTTVWARCTVMYMDTSLGECLWNYNLTPLYWILEGPRRLAVIL	416
Simulans	GSFPLKFFSRLGWCVFILMTTVWARCTVMYMDTSLGECLWNYNLTPLYWILEGPRRLAVIL	416
Mauritania	GSFPLKFFSRLGWCVFILMTTVWARCTVMYMDTSLGECLWNYNLTPLYWILEGPRRLAVIL	416
Takahashi	GSFPLKFFSRLGWGFPILMTTVWARCTVMYMDTSLGECLWNYNLTPLYWILEGPRRLAVIL	429
Suzuki	GSFPLKFFSRLGWGFPILMTTVWARCTVMYMDTSLGECLWNYNLTPLYWILEGPRRLAVIL	419
Biarmipes	GSFPLKFFSRLGWGFPILMTTVWARCTVMYMDTSLGECLWNYNLTPLYWILEGPRRLAVIL	419
Mojavensis	GSFPLIFFSLLGWGMPVMTFVWVQCTAIFMDTALGDCMWNYNLTPLYWILEGPRRLAVIL	421
Grimshawii	GNFPLKLFALLGWGLPVLMTFVWVQCTAIFMDTTVGECMWNYNLTPLYWILEGPRRLAVIL	429
Virilis	GNFPLVFFSLLGWGMPVMTFVWVQCTAIFMDTSLGDCLWNYNLTPLYWILEGPRRLTVM	367

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Serrata	LNFCFLVNIIRVLVMKLRQSQASDIEQTRKAVRAAIVLLPLLGITNLIHQVAPLKTATNF	495
Kikkawai	LNFCFLVNIIRVLVMKLRQSQASDIEQTRKAVRAAIVLLPLLGITNLIHQVAPLKTATNF	502
Bipectinate	LNFCFLVNIIRVLVVKLRQSQASDIEQTRKAVRAAIVLLPLLGITNLLHQVAPLKTATNF	485
Ananassae	LNFCFLVNIIRVLVVKLRQSQASDIEQTRKAVRAAIVLLPLLGITNLLHQVAPLKTATNF	469
Fichsuphila	LNFCFLVNIIRVLVMKLRQSQASDIEQTRKAVRAAIVLLPLLGITNLLHQVAPLKTATNF	485
Rhopaloo	LNFCFLVNIIRVLVMKLRQSQASDIEQTRKAVRAAIVLLPLLGITNLIHQVAPLKTATNF	475
Elegans	LNFCFLVNIIRVLVMKLRQSQASDIEQTRKAVRAAIVLLPLLGITNLLHQVAPLKTATNF	501
Eugracilis	LNFCFLVNIIRVLVMKLRQSQASDIEQTRKAVRAAIVLLPLLGITNLLHQVAPLKTATNF	479
Erecta	LNFCFLVNIIRVLVMKLRQSQASDIEQTRKAVRAAIVLLPLLGITNLIHQVAPLKTATNF	476
Melanogaster	LNFCFLVNIIRVLVMKLRQSQASDIEQTRKAVRAAIVLLPLLGITNLLHQVAPLKTATNF	476
Sechellia	LNFCFLVNIIRVLVMKLRQSQASDIEQTRKAVRAAIVLLPLLGITNLLHQVAPLKTATNF	476
Simulans	LNFCFLVNIIRVLVMKLRQSQASDIEQTRKAVRAAIVLLPLLGITNLLHQVAPLKTATNF	476
Mauritania	LNFCFLVNIIRVLVMKLRQSQASDIEQTRKAVRAAIVLLPLLGITNLLHQVAPLKTATNF	476
Takahashi	LNFCFLVNIIRVLVMKLRQSQASDIEQTRKAVRAAIVLLPLLGITNLIHQVAPLKTATNF	489
Suzuki	LNFCFLVNIIRVLVMKLRQSQASDIEQTRKAVRAAIVLLPLLGITNLLHQVAPLKTATNF	479
Biarmipes	LNFCFLVNIIRVLVMKLRQSQASDIEQTRKAVRAAIVLLPLLGITNLLHQVAPLKTATNF	479
Mojavensis	LNFFFLVNIIRVLVVKLRQSQASDIEQTRKAVRAAIVLLPLLGITNLLHLVPALKTAWKF	481
Grimshawii	LNFFFLVNIIRVLVVKLRQSQASDIEQTRKAVRAAIVLLPLLGITNLLHLVPALKTAWKF	489
Virilis	LNFFFLVNIIRVLVMKLRQSQASEIEQTRKAVRAAIVLLPLLGITNLLHLVPALKTAWKF	427

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Serrata	AVWSYSTYFLTSFQGFIALIYCFNLNFCFLVNIIRVLVMKLRQSQASDIEQTRKAVRAAIVLLPLLGITNLIHQVAPLKTATNF	555
Kikkawai	AVWSYSTYFLTSFQGFIALIYCFNLNFCFLVNIIRVLVMKLRQSQASDIEQTRKAVRAAIVLLPLLGITNLIHQVAPLKTATNF	562
Bipectinate	AVWSYGFHFLTSFQGFIALIYCFNLNFCFLVNIIRVLVVKLRQSQASDIEQTRKAVRAAIVLLPLLGITNLLHQVAPLKTATNF	545
Ananassae	AVWSYGFHFLTSFQGFIALIYCFNLNFCFLVNIIRVLVVKLRQSQASDIEQTRKAVRAAIVLLPLLGITNLLHQVAPLKTATNF	529
Fichsuphila	AVWSYGFHFLTSFQGFIALIYCFNLNFCFLVNIIRVLVMKLRQSQASDIEQTRKAVRAAIVLLPLLGITNLIHQVAPLKTATNF	545
Rhopaloo	AVWSYGFHFLTSFQGFIALIYCFNLNFCFLVNIIRVLVMKLRQSQASDIEQTRKAVRAAIVLLPLLGITNLIHQVAPLKTATNF	535
Elegans	AVWSYGFHFLTSFQGFIALIYCFNLNFCFLVNIIRVLVMKLRQSQASDIEQTRKAVRAAIVLLPLLGITNLLHQVAPLKTATNF	561
Eugracilis	AVWSYGFHFLTSFQGFIALIYCFNLNFCFLVNIIRVLVMKLRQSQASDIEQTRKAVRAAIVLLPLLGITNLIHQVAPLKTATNF	539
Erecta	AVWSYGFHFLTSFQGFIALIYCFNLNFCFLVNIIRVLVMKLRQSQASDIEQTRKAVRAAIVLLPLLGITNLIHQVAPLKTATNF	536
Melanogaster	AVWSYGFHFLTSFQGFIALIYCFNLNFCFLVNIIRVLVMKLRQSQASDIEQTRKAVRAAIVLLPLLGITNLIHQVAPLKTATNF	536
Sechellia	AVWSYGFHFLTSFQGFIALIYCFNLNFCFLVNIIRVLVMKLRQSQASDIEQTRKAVRAAIVLLPLLGITNLIHQVAPLKTATNF	536
Simulans	AVWSYGFHFLTSFQGFIALIYCFNLNFCFLVNIIRVLVMKLRQSQASDIEQTRKAVRAAIVLLPLLGITNLIHQVAPLKTATNF	536
Mauritania	AVWSYGFHFLTSFQGFIALIYCFNLNFCFLVNIIRVLVMKLRQSQASDIEQTRKAVRAAIVLLPLLGITNLIHQVAPLKTATNF	536

Takahashi AVWSYVTHFLTSFQGF FIALIYCFLN GEVRAVLLKSLATQLS VRGHP EWAPKRAMYSGA 549  
 Suzuki AVWSYGTHTFLTSFQGF FIALIYCFLN GEVRAVLLKSLATQLS VRGHP EWAPKRAMYSGA 539  
 Biarmipes AVWSYGTHTFLTSFQGF FIALIYCFLN GEVRAVLLKSLATQLS VRGHP EWAPKRAMYSGA 539  
 Mojavensis AIWSYVTHFLTSFQGF FIALIYCFLN GEVRAVLLKSLAVWMSVRGHP EWAPKRAMYSGA 541  
 Grimshawii AVWSYVTHFLTSFQGF FIALIYCFLN GEVRAVLLKSLAVWMSVRGHP EWAPKRAMYSGA 549  
 Virilis AIWSYVTHFLTSFQGF FIALIYCFLN GEVRAVLLKSI AVWLSVRGHP EWAPKRAMYSGA 487  
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Serrata YNTAPDPTDAVQ-QHQQTGENPATGKRISPPNKRLNGRKASSASIVLIHEPQQRQLRIPRL 614  
 Kikkawai YNTAPDPTDAVLQQQQQPGENPATGKRISPPNKRLNGRKASSASIVMIHEPQQRQLRIPRL 622  
 Bipectinate YNTAPDPTDAVI---QPGDNPATGKRISPPNKRLNGRKASSASIVMIHEPQQRHRLRIPRL 602  
 Anannassae YNTAPDPTDAVI---QPGENPATGKRISPPNKRLNGRKASSASIVMIHEPQQRNRLRIPRL 586  
 Fichsuphila YNTAPDPTDAV----HPAGDPSAPGKRISPPNKRLNGRKASSASIVMIHEPQQRHRLRIPRL 601  
 Rhopaloa YNTAPDPTDAV----QFAGDPLATGKRISPPNKRLNGRKASSASIVMIHEPQQRQLRIPRL 591  
 Elegans YNTAPDPTDAV----QFAGDPSATGKRISPPHKRLNGRKASSASIVMIHEPQQRQLRIPRL 617  
 Eugracilis YNTAPDPTDAV----QFAGDPSATGKRISPPNKRLNGRKASSASIVMIHEPQQRQLRIPRL 595  
 Erecta YNTAPDPTDAV----QFAGDPSATGKRISPPNKRLNGRKASSASIVMIHEPQQRQLRIPRL 592  
 Melanogaster YNTAPDPTDAV----QFAGDPSATGKRISPPNKRLNGRKASSASIVMIHEPQQRQLRIPRL 592  
 Sechellia YNTAPDPTDAV----QFVGDPSATGKRISPPNKRLNGRKASSASIVMIHEPQQRQLRIPRL 592  
 Simulans YNTAPDPTDAV----QFAGDPSATGKRISPPNKRLNGRKASSASIVMIHEPQQRQLRIPRL 592  
 Mauritania YNTAPDPTDAV----QFAGDPSATGKRISPPNKRLNGRKASSASIVMIHEPQQRQLRIPRL 592  
 Takahashi YNTAPDPTDAV----QFAGDPSATGKRISPPHKRLNGRKASSASIVMIHEPQQRQLRIPRL 605  
 Suzuki YNTAPDPTDAV----QFAGDPSATGKRISPPHKRLNGRKASSASIVMIHEPQQRHRLRIPRL 595  
 Biarmipes YNTAPDPTDAV----QFAGDPLATGKRISPPNKRLNGRKASSASIVMIHEPQQRHRLRIPRL 595  
 Mojavensis YNTAPDTEPPA---QQSVEALSSNIRISPSQRRLNCRKASSVIVIANEPQRQRAAQ-- 596  
 Grimshawii YNTAPDPTDVVQ---QP-GEAISTSRVPPPIKRLKSRKANNVTIVISNEPQQQQQHQML 605  
 Virilis YNTAPDPTDQPL---KQ-GDPQQSGKRLSQSTRKNSRKASSVTIVISTEPQIHR---YV 539  
 \*\*\*\*\*: : : . \*: : \* : \*\* ... \*\*: \*\* :.

Serrata QSKAREKDKSLDKDRGKRIQLQQSQAEAMVADPTTITANRIRSKDDDDGGNGGGGGGGGS 674  
 Kikkawai RSRTREKDKSLDKDREKRTQHEAVS---EPINNVTTKANRIRSKDEDSNNGRGG---G 675  
 Bipectinate HSQRDRDKIKDRDKDNRDRQR-DD-RQLEETEADPATRIHSEKETA-----RTGRNR 654  
 Anannassae HSQRKGRDKAKDRDMENDKDRKRSDD-RQLEETEADPGTIRIHSKDE-----RASRNR 639  
 Fichsuphila QNKNQEKKGK--DRVEKADID-----TELDPAITRIQSKESTG----STGSRSR 643  
 Rhopaloa QNKAREKGR--DRVEKADA-----ETEPEPDAITRIHSEK--AG-S-TASRNSR 635  
 Elegans QSKAREKGR--DRAERADADAD-AET-NTKTEPEPDAITRIHSEKTAG-S-TGSRNSR 671  
 Eugracilis QNKAREKSK--DRVEKAEPE-----TEPDAISRIHSEKTEG-V-GGGTGSRT 639  
 Erecta QNKAREKKGK--ERVEKTDE-----AEPEPDAISRIHSEKAD----RARSRTR 635  
 Melanogaster QNKAREKKGK--DRVEKTDAE-----A--EPDPTISHIHSKEAG----SARSRTR 633  
 Sechellia QNKAREKKGK--DRVEKTDAE-----A--EPDPAISRIHSEKAG----SARSRTR 633  
 Simulans QNKAREKKGK--DRVEKTDAE-----A--EPDPAIARIHSEKAG----SARSRTR 633  
 Mauritania QNKAREKKGK--DRVEKTDAE-----A--EPDPAISRIHSEKAG----SARSRTR 633  
 Takahashi QNKAREKSR--DRVDKADA-----ETDPQADPAISRIHSEKSSGG-GGSTGSRNR 652  
 Suzuki QNKAREKSK--DRVEKADAA-----ETDANPDAISRIHSEKES-GI-AGSTGSRTR 642  
 Biarmipes QNKAREKSR--DRVDKADAA-----ETDPNQDPAISRIHSEKES-GI-AGGTGSRTR 642  
 Mojavensis --RNNNN-TANGNGNGNGNSR--NQGKDEPASGSARSQIRIRSKETP-E-----QGRS 644  
 Grimshawii QQRNTNNNSTNGS-----SPRTVEDDTGSA-MATRIRSKES-----SAG 643  
 Virilis PRNNNNRSTGARSARVGI-----LKATEEPASGSA-VGQIRSTDDGAS-----TTGR 587  
 : . : \* : \*

Serrata GSKWMMG-ICFRGQKVLRVPSASSVPPESVVFELSEQ 710  
 Kikkawai GSKWMMG-ICFRGQKVLRVPSASSVPPESVVFELSEQ 711  
 Bipectinate GSKWMMDIICFRGQKVLRVPSASSVPPESVVFELSEQ 691  
 Anannassae GSKWMMDIICFRGQKVLRVPSASSVPPESVVFELSEQ 676  
 Fichsuphila GSKWIMG-ICFRGQKVLRVPSASSVPPETNV----- 673  
 Rhopaloa GSKWIMG-ICFRGQKVLRVPSASSVPPESVVFELSEQ 671  
 Elegans GSKWIMG-ICFRGQKVLRVPSASSVPPESVVFELSEQ 707  
 Eugracilis GSKWIMG-ICFRGQKVLRVPSASSVPPESVVFELSEQ 675  
 Erecta GSKWIMG-ICFRGQKVLRVPSASSVPPETNV----- 665  
 Melanogaster GSKWIMG-ICFRGQKVLRVPSASSVPPESVVFELSEQ 669  
 Sechellia GSKWIMG-ICFRGQKVLRVPSASSVPPETNV----- 663  
 Simulans GSKWIMG-ICFRGQKVLRVPSASSVPPETNV----- 663  
 Mauritania GSKWIMG-ICFRGQKVLRVPSASSVPPESVVFELSEQ 669  
 Takahashi GSKWIMG-ICFRGQKVLRVPSASSVPPESVVFELSEQ 687  
 Suzuki GSKWIMG-ICFRGQKVLRVPSASSVPPETNV----- 672  
 Biarmipes GSKWIMG-ICFRGQKVLRVPSASSVPPETNV----- 672  
 Mojavensis TGNWMTN-LCFHGQKVLRVPPASSVPPETNV----- 674  
 Grimshawii RSNWMTN-LCFRGKVLRVPPASSVPPESVVFELSEL 679  
 Virilis NSNWMFG-LCFRGQKVLRVPPASSVPPESVVFELSEQ 623

Melanogaster NP\_570007.2

```
1 mtllsnildc ggcisaqrft rllrqsgssg ppsaptagt fesksmlept sshslatgrv
  61 pllhdffast tespgtyvld gvarvaqlal eptvmdalpd sdteqvlgnl nssapwnltl
 121 asaaatnfen csalfvnytl pqtglycnwt wdtllcwppt pagvlarmnc pggfhgvdtr
 181 kfairkceld grwgsrpnat evnppgwdty gpcykpeiir lmqqmgskdf dayidiarrt
 241 rtleviglcl slfalivsll ifctfrslrn nrtkihknlf vamvlqviir ltlyldqfrr
 301 gnkeaatnts lsvientpyl ceasyvllay artamfmwfm ieglylhnmv tvavfqqgsfp
 361 lkffsrlgwc vpilmttwa rctvmymdts lgeclwnynl tpyywilegp rlavillnfc
 421 flvniirvlv mklrqsqasd ieqtrkavra aivllplllgi tnlhqlapl kcatnfavws
 481 ygthfltsfq gffialiycf lngevravll kslatqlsvr ghpewapkra smysgaynta
 541 pdtdavqpag dpsatgkris ppnkrlngrk pssasivmih epqqrqlmp rlqnkarekg
 601 kdrvektdae aepdptishi hskeagsars rtrgskwimg icfrgqkvlr vpsassvppe
 661 svvfelseq
```

Simulans XP\_039153334

```
1 mtllsnildc ggcisaqrft rllrqsgssg ppsapapgt fesksmlept sshslatgrv
  61 pllhdffast tespgtyvld gvarvaqlal eptvmdalpd pdteqvlgnl nssapwnltl
 121 asaaatnfen csalfvnytl pqtglycnwt wdtllcwppt pagvlarmnc pggfhgvdtr
 181 kfairkceld grwgsrpnat evsppgwdty gpcykpeiir lmqqmgskdf dayidiarrt
 241 rtleviglcl slfalivsll ifctfrslrn nrtkihknlf vamvlqviir ltlyldqfrr
 301 gnkeaatnts lsvientpyl ceasyvllay artamfmwfm ieglylhnmv tvavfqqgsfp
 361 lkffsrlgwc vpilmttwa rctvmymdts lgeclwnynl tpyywilegp rlavillnfc
 421 flvniirvlv mklrqsqasd ieqtrkavra aivllplllgi tnlhqlapl kcatnfavws
 481 ygthfltsfq gffialiycf lngevravll kslatqlsvr ghpewapkra smysgaynta
 541 pdtdavqpag dpsatgkris ppnkrlngrk pssasivmih epqqrqlmp rmqnkarekg
 601 kdrvektdae aepdpaiari hskeagsars rtrgskwimg icfrgqkvlr vpsassvppe
 661 tnv
```

Suzuki XP\_016939142.1

```
1 mtllsnildc ggcisaqrft rllrqsssg spsssssgtt fesksmlept sshilptgrv
  61 pilhdffdfs lttestgthv ldgvasvakm aleptvmdav lpdstdtdqvl snlnisapwn
 121 itlasaaatn fencsslfnv ytlpqsglyc nwtwdtllcw pptpagvlar mncpggfhgv
 181 dtrkfairkc eldgrwgsrpnatevppgwdty gpcykpeiir iirlmqmgs kdfdlyidia
 241 rkttrtleivg lclslfaliv slifctfrs lrnrnrkikh nlfvamvlqv iirtlyldqf
 301 frrgnkeaat ntslsvient pylceasyvl leyartamfm wmfieglylh nmvtvavfqq
 361 sfplkffsrl gwgfplmtt vwarctvmym dtslgeclwn ynltpyywil egprlavill
 421 nfcflvniir vlvmlrqsq asdieqtrka vraaivllpl lgitnllhql aplkcatnfa
 481 wsygthflts fqgffiali ycfllngevra vllkslatql svrghpewap krasmysgay
 541 ntapdtdavq pagdpsatgk rispphkrln grkpssasiv mihepqqrrh liprlqnrker
 601 ekskdrveka daetdanpd paisrihske sgiagstgstr trgskwimgi cfrgqkvlr
 661 psassvppet nv
```

Mauritania NC\_046672.1

```
1 mtllsnildc ggcisaqrft rllrqsgssg ppsapapgt fesksmlept sshslatgrv
  61 pllhdffatt tespgthvld gvarvaqlal eptvmdalpd pdteqvlgnl nsnapwnltl
 121 asaaatnfen csalfvnytl pqtglycnwt wdtllcwppt pagvlarmnc pggfhgvdtr
 181 kfairkceld grwgsrpnat evsppgwdty gpcykpeiir lmqqmgskdf dayidiarrt
 241 rtleviglcl slfalivsll ifctfrslrn nrtkihknlf vamvlqviir ltlyldqfrr
 301 gnkeaatnts lsvientpyl ceasyvllay artamfmwfm ieglylhnmv tvavfqqgsfp
 361 lkffsrlgwc vpilmttwa rctvmymdts lgeclwnynl tpyywilegp rlavillnfc
 421 flvniirvlv mklrqsqasd ieqtrkavra aivllplllgi tnlhqlapl kcatnfavws
 481 ygthfltsfq gffialiycf lngevravll kslatqlsvr ghpewapkra smysgaynta
 541 pdtdavqpag dpsatgkris ppnkrlngrk pssasivmih epqqrqlmp rmqnkarekg
 601 kdrvektdae aepdpaisri hskeagsars rtrgskwimg icfrgqkvLRVPSASSVPPESVVFELSEQ
```

Sehelia XP\_032581354.1

```
1 mtllsnildc ggcisdqrft hllrqsgssg ppsapapgt fesksmlept sphslatgrv
  61 pllhdffast tespgtyvld gvarvaqlal eptvmdalpd pdteqvlgnl nssapwnltl
 121 asaaatnfen csalfvnytl pqtglycnwt wdtllcwppt pagvlarmnc pggfhgvdtr
 181 kfanrkceled grwgsrpnat evsppgwdty gpcykpeiir lmqqmgskdf dayidiarrt
 241 rtleviglcl slfalivsll ifctfrslrn nrtkihknlf vamvlqviir ltlyldqfrr
 301 gnkeaatnts lsvientpyl ceasyvllay artamfmwfm ieglylhnmv tvavfqqgsfp
 361 lkffsrlgwc vpilmttwa rctvmymdts lgeclwnynl tpyywilegp rlavillnfc
```

421 flvniirvlv mklrqsqasd ieqtrkavra aivllpllgi tnlhqlapl ktatnfavws  
481 ygthfltsfq gffialiyfc lngevravll kslatqlsvr ghpewapkra smysgaynta  
541 pdtdavqpvq dpsatgkris ppnkrlngrk pssasivmih epqqrqlmp rmqnkarekg  
601 kdrvektdae aepdpaisri hskeagsars rtrgskwimg icfrgqkvlr vpsassvppe  
661 tnv

Serrata [KAH8373163.1](#)

1 lqlqyaflgd mtllssilds gggisaqrft rllrqsstss sssssssasg smleptssql  
61 pindvlgggr ipflhdngtg eslplpdada ldpnfvlldgv tsvakmalea tvkevlrdpd  
121 peqilanana tapwnitlas aaatnyencs alfanytlpq tglycnwtwd tllcwpppta  
181 gvlarmncpg gyhgvdtrkf anrkceldgr wgsrpnatet natgwtdygp cykpevirml  
241 qmgsredld lyieiartrr tleivglcls lfalivslly fctfrslrnn rtkihknlfv  
301 amvlqviirl tlyldqfrrg skeaatntsl svientpylc easyvllaya rtamfmwmmfi  
361 eglylhnmtv vavfqqsfpl kffsrlgwcv pilmttvar ctviymdtsl gdcflwnynlt  
421 pyywilgepr lavillnfcf lvniirvlvm klrqsqasdi eqtrkavraa ivllpllgit  
481 nilhqvaplk tatnfavwsy styfltsfqg ffialiyfcf lngevravllk slatqlsvrg  
541 hpewapkras msgayntap dtdavqqhqq tgenpatgkr isppnkrlng rkassasivl  
601 ihpqqqrql iprlqskare kdkslkdrq kriqlqqsqa eamvadptti ttanrirskd  
661 ddggnggggg gggsgskwmm gicfrgqkvlr rvpsassvpp esvvfelseq

Erecta [XP\\_026838097.1](#)

1 mtllsnildc ggcisaqrft rllrqsqssv ppsapapgt fesismlept slhslptgrv  
61 pllhdfdast tespgtyvld gvarvaqlal eptvmdglpd pdteqvlsl nssapwnltl  
121 ssaatnfen csalfvnytl pqtglycnwt wdtllcwpppt pagvlarmnc pggfhgvdtr  
181 kfairkceld grwgsrpnat evsppgwtdy gpcykpeiir lmqqmgsxdf dayidiarrt  
241 rtleivglci slfalivslly ifctfrslrn nrtkihknlf vamvlqviir ltlyldqfrr  
301 gnkeaatnts lsaiientpyl ceasyvllay artamfmwmmf ieglylhnmv tvavfqqsfp  
361 lkffsrlgwc vpilmttvwa rctvmymdts lgeclwnynl tpyywilgepr rlavillnfc  
421 flvniirvlv mklrqsqasd ieqtrkavra aivllpllgi tnlhqlapl ktatnfavws  
481 ygthfltsfq gffialiyfc lngevravll kslatqlsvr ghpewapkra smysgaynta  
541 pdtdavqpag dpsatgkris ppnkrlngrk pssasivmih epqqrqlmp rlqnkarekg  
601 kervektke aepepdpais rihskeadra rsrtgskwi mgicfrgqkv lrpsassvpp  
661 petnv

Takahashi [NW\\_025323455.1](#)

1 mtllsnildc gggisaqrfa rllrqsstss spsasassa ssssgtsfes ksmleptssq  
61 nlptgrvpil hdfdffdpt ttespgnyv ldgvasvakm aleptvmdtv lpsdspdqlv  
121 snlnvsapwn ltlasaaatn fencsalfvn ytlpqtglyc nwtwdtllcw pptpagvlar  
181 mncpagfhgv dtrkfairkc eldgrwgsrp natevspggw tdygpcykpe iirlmeqmg  
241 knfdlyidia wktrtleivg lclslfaliv sllifctfrs lrnrtrtkihk nlfvamvlqv  
301 iirltlyldq yrrgnkeaat ntslsvient pylceasyvl leyartamfm wmfieglylh  
361 nmvtvavfqq sfplkffsrl gwgfplmtt vwarctvmym dtslgeclwn ynltpyywil  
421 egprlavill nfcflvniir vlvmklrqsq asdieqtrka vraaivllpl lgitnilhqm  
481 aplktatnfa vwsyvthflt sfqgffiali ycfllngevra vllkslatql svrghpewap  
541 krasmysgay ntapdtdavq pagdpsatgk rispphkrln grkpssasiv mihepqqqr  
601 liprlqkar eksrdrvka daetdpqadp aisrihskes sgggstgsr nrgskwimgi  
661 cfrgqkdkcvVLRVPSASSVPPESVVFELSEQ

Biarmipes [XP\\_016948718.1](#)

1 mtllsnildc gggisaqrft rllrqsstss flssslgtt fesksmlept sshvlptgrv  
61 pvlhdffdfs sttelprilv ldgvagvatm aleptamdav lpsdspdqlv snfnisapwn  
121 itlasaaatn fencsalfvn ytlpqtglyc nwtwdtllcw pptpagvlar mncpggfhgv  
181 dtrkfairkc eldgrwgsrp natevspggw tdygpcykpe iirlmqqmgs kfdlyidia  
241 rktrtleivg lclslfaliv sllifctfrs lrnrtrtkihk nlfvamvlqv iirltlyldq  
301 frgnkeaat ntslsvient pylceasyvl leyartamfm wmfieglylh nmvtvavfqq  
361 sfplkffsrl gwgfplmtt vwarctvmym dtslgeclwn ynltpyywil egprlavill  
421 nfcflvniir vlvmklrqsq asdieqtrka vraaivllpl lgitnllhql aplktatnfa  
481 vwsyvthflt sfqgffiali ycfllngevra vllkslatql svrghpewap krasmysgay  
541 ntapdtdavq pagdplatgk rispphkrln grkpssasiv mihepqqqr liprlqkar  
601 eksrdrvka daetdpnqd paisrihske tgiaggtgsr trgskwimgi cfrgqkvlr  
661 psassvppet nv

Eugracilis XP\_017067611.1

```
1 mtllsnilds gggisaqrft rllrqssssg sssasasass ygtlesksml eptsshtlpg
  61 grvpilhdhfd ssttespgay lldgvasvak malepavmdv lpdpdtdqvl snlnitapwn
 121 ltlasaaatn fencsalfvn ytlpqtglyc nwtwdtllcw pptpagvlar mncpggfhgv
 181 dtrkfairkc eldgrwgsrp nateasppgw tdygpcykpe iirlmqqmgn kdfdlyidia
 241 rkrtrtleivg lclslfaliv slllifctfrs lrnnrtkikh nlfvamvlqv iirltlyldq
 301 frrgnkeaat ntslsvient pylceasyvl leyartamfm wmfieglylh nmvtvavfqq
 361 sfpkffsrl gwcvpilmtt vwarctvmym dttlgeclwn ynltppywil egprlavill
 421 nfcflvniir vlvmlkrqsq asdieqtrka vraaivllpl lgitnllhql aplkatnfa
 481 vwsygthflt sfqgffiali ycfllngevra vllkslatql svrghpewap krasmysgay
 541 ntapdtdavq pagdpsatgk risppnkrln grkpssasiv mihepqqqr liprlqnkar
 601 ekskdrveka epetepdai srihsketgv gggtsrtrg skwimgicfr gqkvlrvpsa
 661 ssvpesvfvf elseq
```

Rhopaloea XP\_044317065.1

```
1 mtllsnildc gggisaqclt rslresspg spgspesgaf esksmlepts shilptgrvp
  61 vlhdfnasst dspgtflldg vvsvaqmale ptltdllpdp dpdqvlslnln asapwnltla
 121 saaatnfenc salfanypql qtglycnwtw dtllcwpppt agvlarmncp agfhgvdtrk
 181 fairkcelldg rwgsrpnate vsppgwdygy pcykpeiirl mqmgssrdfd tfidiaktr
 241 tleivglcls lfalivslili fctfslrlnn rtkihknlfv amvlqviirl tlyldqyrrg
 301 nkeaatntsl svientpylc easyvllaya rtamfmwmfi eglylhnmtv vavfqqsfpl
 361 kffsrlgwcv pilmttvarw ctvmymdtsl gdclwnynlt pyywillegpr lavillnfcf
 421 lvniirvlvm klrqsqasdi eqtrkavraa ivllppllgit nilhqmaplk tatnfavwsy
 481 gthfltsfqq ffialiyfcfl ngevraavlkk slatqlsvrg hpewapkras msgayntap
 541 dtdavqpagd platgkrisp pnkrlngrkp ssasivmihe pqqqrliplr lqnkarekgr
 601 drvekadaet epepdairt ihskeagsta srnsrgskwi mgicfrgqkv lrvpsassvp
 661 pesvfvfelse q
```

Fichsuphila XP\_017048319.1

```
1 mtllasildc gggisaqrft rllaqsslla sssasasasa sasasgtfas esmleptssh
  61 ilptgrvpvl hgfdstttes ttstyvldgv asvaqmplle stvmdalpds dpdqafgnln
 121 vtapwnltla saaatnfenc salfanypql qsglycnwtw dtllcwpppt agvlarmncp
 181 ggfhgvdtrk fairkcelldg rwgsrpnate vsppgwdygy pcykpeiirl mqmggnkdfd
 241 lyidiarktr tleivglcls lfalivslili fctfslrlnn rtkihknlfv amvlqviirl
 301 tlyldqfrrg nkeaatntsl svientpylc easyvllaya rtamfmwmfi eglylhnmtv
 361 vavfqqsfpl kffsrlgwcv pilmttvarw ctvmymdtsl geclwnynlt pyywillegpr
 421 lavillnfcf lvniirvlvm klrqsqasdi eqtrkavraa ivllppllgit nllhqlapl
 481 tatnfavwsy gthfltsfqq ffialiyfcfl ngevraavlkk slatqlsvrg hpewapkras
 541 msgayntap dtdavhpagd psapgkrisp pnkrlngrkp ssasivmihe pqqqrliplr
 601 lqnknqekgk drvekaidt eldpatriq skestgstgs rrsrgskwimg icfrgqkvlr
 661 vpsassvppe tnv
```

Elegans [NW\\_024545513.1](#))

```
1 mkvaftsqmn nennhfhnv dgemtllsni ldcgggipaq rlarllrqss ssgstpsgsa
  61 sgpfesksml epttshilpt grvpilhdhfd ssttespltg tyllldgvasv aemaleptvr
 121 dilsdpdpdk vlsnl nasap wnllassaa tfencsalf anytlpqtgl ycnwtwdtll
 181 cwpptpagvl armncpggfh gvdtrkfair kcelldgrwgs rpnatevspp gwdygygpcyk
 241 peiirlmqqm gskdfdyid iarktrtlei vglclslfal ivsllifctf rslrnnrtki
 301 hknlfvamvl qviirltlyl dqyrrgnkea atntslsvie ntpylceasy vllayartam
 361 fmwmfiegly lhnmtvavf qgsfplkffs rlgwcapilm ttvarctvm ymdtslgecl
 421 wnyntppyw ilegprlavi llncflvni irvlvmlkrq sqasdieqtr kavraaivll
 481 pllgitnllh qlaplktatn favwsygthf ltsfqqffia liycflngev ravllkslat
 541 qlsvrghpew apkrasmysg ayntaptda vqpagdpsat gkrispphkr lngkpsas
 601 ivmiheppqr qlriprlqsk arekgrdrae radadadaet ntktepepdp atrihskes
 661 tagstgsrsn rgskwimgic frgqkVLRVPSASSVPPESVVFELSEQ
```

Kikkawei KAH8343197.1

1 mqlqyafagd mtlssilds ggsisaqrft rllrqsstss sssvsasasm leptssqlpn  
61 ndvlgggrip flpgnatges ssssspplps pslpdadald pnfvldgvts vakmaleatv  
121 kvlrpdpeq ilananasap wnitlaaaaa tnyencsalf anytlpqtgl ycnwtwdtll  
181 cwpptpagvl armncpggyh gvdtrkfanr kceldgrwgs rpnatetnat gwt dygpcyk  
241 pevirlmqm gsredldyi eiakrtrtle ivglclslfa livsllifct frslrnnrtk  
301 ihknlfiamv lqviiirtly ldqfrrgnke aatntslsvi entpylceas yvllayarta  
361 mfmwmfieg l ylhnmvtvav fggfplkff srlgwcvpil mttvwarctv iymdtslgdc  
421 lwnynltpyy wilegprlav illnfcflvn iirvlvmklr qsqasdieqt rkavraaivl  
481 lpllgitnil hqlaplktat nfavwsysty fltsfqqffi aliycflnge vravllksla  
541 tqslsvrghpe wapkrasmys gayntaptd avlqqqqqg enpatgkris ppnkrlngrk  
601 assasivmih epqqrqlip rlrstrtrek ksldkdrekr tqheavsepi nvtttkanr  
661 irskdedssn grgggskwm ngicfrgqkv lrvpsassvp pesvfvfelse q

**Bipectinate KAH8261948.1**

1 hyadtgnmtl lssildsggs vsvqrtrll rqspsasas gталasesmv eptasqmlne  
61 itdggvrpsl gqdlatttet tgqsnviidr vtnvakmale atvmdvlpdp dpdqvlagvn  
121 asahwnmtls sstatnyenc salfanytlp qtglycnwtw dtllcwpptp agvlarmhpc  
181 ggyhgvdtrk fanrkceldg rwgsrpnate pspagwtdyg pcykpevir l mqsmgskdid  
241 iyidiartrr tleivglwvs lfalvislli fctfrslrnn rtkihknlf i amvlqvivrl  
301 tlyldqyrrg nkeaatntsl saientpylc easyvllaya rtamfmwmfi eglylhnmvt  
361 vavfqqsfpl kffsrlgwc v pilmtfvwar ctvmymdtsm geclwnynlt pyywilegpr  
421 lavillnfcfl vniiirvlv klrqsqasdi eqtrkavraa ivllpllgit nllhqlapl k  
481 tatnfavwsy gthfltsfqq ffialiycfl ngevrvllk slatqmsvrg hpewvpkras  
541 mysgayntap dtdaviqqpg dnpatgkris ppnkrlngrk assasivmih epqqrhllp  
601 rlhsqrkdrd kikdrkdnd rdrqrdrql eetegdpatt rihsketart grnrgskwmm  
661 diicfrgqkv lrvpsassvp pesvfvfelse q

**Ananassae XP\_044573162.1**

1 mtlssilds ggsvsqrll rllrqsstss sasgplasad sissmveats lrvpslghdl  
61 sttetnvii drvtnvakma leatvmdvlp dpepdqvlgt vnasshwnm mtlssasatn  
121 yencsalfan ytlpqtglyc nwtwdtllcw pptpagvlar mncpggyhgv dtrkfanrkc  
181 eldgrwvdrp natpfpagw tdygpcykpe virmlqsmgs kdidiyidia rtrtleivg  
241 lwslfalvi sllifctfrs lrnnrtkihk nlfvamlvq ivrltlyldq yrrgnkeaat  
301 ntslsaient pylceasyvl leyartamfm wmfieglylh nmvtvavfqq sfplkffsrl  
361 gwcvpilmtf vwarctvmym dtsmgeclwn ynltppywil egprlavill nfcflvniir  
421 vlvvklrqsq asdieqtrka vraaivllpl lgitnllhl aplktatnfa vwsyghflt  
481 sfqgffiali ycflngevra vllkslatqm svrghpewvp krasmysgay ntapdtdavi  
541 qqgpenpatg krisppnkrl ngrkasgasi vmihepqqrn rllprlrsqr kgrdkakdrd  
601 mendkdrkrs ddrqleetea dpgtirihsk dterasrnrg skwmmdiicf rgqkvlrvps  
661 assvppesvv felseq

**Grimshawii EDW00227.1**

1 nmqlpginkp gcipststss iipqrfarr aarvaststa tvttlmsmt sqsrmlnrt  
61 mtsiatatst ststsisths ttssstsklp sqvisgladv ingteldmta aatavglmaa  
121 vdpststss wnstfstasa nsydncaamf anytqpvtgl ycnwtwdsll cwpptpagvm  
181 armycpagyh gvdtrkfair kceldghwgr rpnatetntg gwt dyapcyk pevirlmqei  
241 kdvnvymdia qrtrtleiig lclslalali slvifcafrrs lrnnrtkihk nlfvamlvq  
301 ivrltlyldq frgrpetat nasvsiient pylceasyvl leyartamfm wmfieglylh  
361 nmvtvavfqq nfpklfall gwglpvlmtf vvwqctaim dttvgecmwn ynltppywil  
421 egprlavill nffflvniir vlvvklrqsq asdieqtrka vraaivllpl lgitnllhlv  
481 palktawkfa vwsyvhflt sfqgffiali ycflngevrt vllkslavwm svrghpewap  
541 krasmysgay ntapdtdvq qpgeaistsr rvppikrlk srkannvtiv isnepqqqqq  
601 qhqmllqqrnt nnnstngssp rtveddtgsa matrirskes sagsrnwmtn lcfrgkklvr  
661 vppassvppe svvfelsel

**Mojavensis XP\_002010381.2**

1 mqlagdeag smptiitst ssnslqria lkavtaatt kdrilivet dspagshmdp  
61 stamtttsit atatatpaat ataselsrsd vlnasieatt avgmdtvkta tesglptvsg  
121 tlpwswnsf nsalannydn csamfanyth pqtglycnwt wdsllcwppt pagnlarmnc  
181 payghvdr kfanrkceld ghwgrpnet ephagwtdy gpcykpevir lmqeiadvnl  
241 yidiaqrtrt leiiglclsl laliislvif cafrrlrrn rtkihknlfia mvlqvivrlt  
301 lyldqfrrgi qynsslsaie ntpylceasy vlleyartam fmwmfiegly lhnmtvavf  
361 qgsfpliffs llgwmpvwm tfvwvqctai fmdtalgdcm wnyltpyyw ilegprlavi  
421 llnffflvni irvlvklrqsq sqasdieqtr kavraaivll pllgitnllh lvpalktawk



481 faiwsyvthf ltsfqgffia liycflngev ravllkslav wmsvrghpew vpkramysa  
541 ayntapdtep paqqsveals snirispqsr rlnckrassv iivianepqr qraaqqrnnn  
601 ntangngngn gngsrnqgkd epasgsarsg qrirsketpe qgrstgnwmf slcfhgqkvl  
661 rvppassvpp etnv

Virilis XP\_032288784.1

1 mptaapssnr tvsthhsttm tststtygtt sttqaaltsf epmavtaagm dvtmagtepl  
61 sstsiptfwn ssintasans ydnscalfan ytqpttviyc nwtwdsllcw pptpagatah  
121 mhcpagyhgv dtrkfankc eldghwagrp nsteqkptgw tdygpcykpe virlmgeikd  
181 vnlymdiaqr trtleiiglc lslfaliisl mifcafrslr nnrtkihkn1 fvamvlqviv  
241 rltlyldqfr rgksdsannt slsvientpy lceasyvllle yartamfmwm fieglylhn1  
301 itvavfqgnf plvffsllgw gmpvlmtfvw vqctafmdt slgdclwnyn ltpyywileg  
361 prltvimlnf fflvniirvl vmklrqsqas eieqtrkavr aaivllpllg itnllhlvpa  
421 lktawkfaiw syvthfltsf qgffialiyc flngevram lksiavwlsv rghpewapkr  
481 psmysgaynt apdtdpqlkq gdpqqsgkrl sqstkrnsr kassvtivis tepqihryvp  
541 rrrnnnrast gsarvrgilk ateeapasgsa vgqrirstdd gasttgrnsn wmfglcfrgq  
601 kvlrvppass vppesvvel seq