

S13. Text Multi-species analysis of CCHa_R2s
Supporting Figure 16

Blastp search retrieved PA and PB isoforms from *D virilis*; however, not from several of the other species in the extended evolutionary analyses.

The lack of a PA in all species is significant because *D suzuki* included a BBS in the additional (PA-specific) sequence. Direct inspection of genomic DNA from each of the missing species (below) revealed them. Genbank references are included for each. First is shown the Clustal alignment of all 19 species

CLUSTAL Line-ups; Genbank Reference IDs below

Predicted TM domains in **YELLOW**

BBS sequences in **RED**

Here is the Clustal line up of PB isoforms:

Mojavensis	----MYAALMDMSQMLAASLAYAPAESSSAAA-----AAGVNLSQLSNSSQLDG---	45
Virilis	MPKNMLAALMDMSQTLAASLAYAPLESNAAATAAA-AAAAAVLVNVSQGLNSSLQDLG---	56
Grimshawi	----MYAALMDMSQTLAASLAYAPMESNSAAAAAALGMNVSQLSNSSQLDG---	53
Bipectinate	----MSALMDMSQTLALSLLYAPPDATGGVSPNIIISIGSGN-----GSDGGGNDSSLG	49
Anannassae	----MSAALMDMSQTLALSLLYAPLDATGGASPNIA-IGNGNDSN--GGGDGGANDSGLV	53
Serrata	----VDTDVMDIAQALVASLAHAPLDGSGG-----GGNGN---	32
Kikkawei	----VNTNKMDIAQALVASLAHAPLDGSGN-----G---S---	28
Fichsuphila	----MHAALMDVGQTLAGGS-----SAND-----TGLLATGGE	29
Rhopaloo	----MFAALMDVGQTLAGSL-----A-----E-GN	20
Elegans	----MFAALMDVGQTLAGSL-----A-----TEGN	21
Suzuki	----MYAALVDVGQTLVAGLVDR-----GANE-----SGLLASGQA	33
Biarmipes	----MYVALVDVGQTLAAGLADG---ANE-----SVLMATGHA	31
Takahashi	----MYAALMDVGQTLAASLAEGGGN---E-----SGLLATQ--	30
Erecta	----MYAALMDVGQTLAARLADGEGN---D-----SGLLATRQG	32
Melanogaster	----MYASLMDVGQTLAARLADSDGNGAND-----SGLLATGQG	35
Sechellia	----MYASLMDVGQTLAARLADGEGNGAND-----SGLLATGQG	35
Eugracilis	----MYASLMDVGQTLAARLADGEGNGAND-----SGLLATGQG	35
Simulans	----MYASLMDVGQTLAARLADGEGNGAND-----SGLLATGQG	35
Mauritania	----MYASLMDVGQTLAARLADGEGNGAND-----SGLLATGQG	35
	:*:* * *	
Mojavensis	-SSVVTVATAAT-----VGQHN-A-SIEESSYKVLDRPETYIVTVLYTLFIVGVVLGN	96
Virilis	-SLATAAATTTTAVTTSTSTHNAS-GEEYPQYKVLDRPETYIVTVLYTLFIVGVVLGN	114
Grimshawi	-STGATAAT-----SIPHNVS-AEEYPQYKVLDRPETYIVTVLYTLFIVGVVLGN	102
Bipectinate	LATG-QQGAATAVGGVGLGLGQHNASADGGGPPYVPVLERPETYIVTVLYTLFIVGVVLGN	108
Anannassae	LATG-QQGVATVGGVGLGLGQHNASADGGGIPYVPVLERPETYIVTVLYTLFIVGVVLGN	112
Serrata	-GSGANDSVLLATGTGAAAEQHNASIDGGMVPYVPVLDLPETYIVTVLYTLFIVGVVLGN	91
Kikkawei	-GSGGNDSVLLAT--GASAEQHNASIDGGMVPYVPVLDLPETYIVTVLYTLFIVGVVLGN	85
Fichsuphila	QEQQEGLGLGGMGMEMGQHNASADGGMVPYVPVLDLPETYIVTVLYTLFIVGVVLGN	89
Rhopaloo	GSGVQEGLELGPGMVEVQHNASADGGIVPYVPVLDLPETYIVTVLYTLFIVGVVLGN	80
Elegans	DSGLLATG-QYEGGVEVGMGQHNASADGGMVPYVPVLDLPETYIVTVLYTLFIVGVVLGN	80
Suzuki	AEQQEQG-----HG-VAHNASADGGMVPYVPVLDLPETYIVTVLYTLFIVGVVLGN	82
Biarmipes	AEQQEQG-----HW-VGQNASADGGVMPYVPVLDLPETYIVTVLYTLFIVGVVLGN	80
Takahashi	-----EGQ---GLDLE-TGHNASADGGIVPYVPVLDLPETYIVTVLYTLFIVGVVLGN	79
Erecta	LEQQEQEQQE---GLALG-MAHNASADGGMVPYVPVLDLPETYIVTVLYTLFIVGVVLGN	88
Melanogaster	LEQ-----EQE---GLALD-MGHNASADGGIVPYVPVLDLPETYIVTVLYTLFIVGVVLGN	87
Sechellia	LEQ-----EQE---GLALD-MGHNASADGGIVPYVPVLDLPETYIVTVLYTLFIVGVVLGN	87
Eugracilis	LEQ-----EQE---GLALD-MGHNASADGGIVPYVPVLDLPETYIVTVLYTLFIVGVVLGN	87
Simulans	LEQ-----EQE---GLALD-MGHNASADGGIVPYVPVLDLPETYIVTVLYTLFIVGVVLGN	87
Mauritania	LEQ-----EQE---GLALD-MGHNASADGGIVPYVPVLDLPETYIVTVLYTLFIVGVVLGN	87
	:* : ** ** :*****:*****	
Mojavensis	GTLVIFFRHRSRNIIPNTYILSLALADLLVILVCVPVATIVYQTQESWPFERNMCRISEF	156
Virilis	GTLVIFFRHRSRNIIPNTYILSLALADLLVILVCVPVATIVYQTQESWPFERNMCRITEF	174
Grimshawi	GTLVIFFRHRSRNIIPNTYILSLALADLLVILVCVPVATIVYQTQESWPFERNMCRISEF	162

Biarmipes	ARNMPGEQQSMQSRQTQARARRHVARMVVAFFVVVFFICFFPYHVFE	WYHFYPTAEEDFDD	320
Takahashi	ARNMPGEQQSMQSRQTQARARRHVARMVVAFFVVVFFICFFPYHVFE	WYHFYPTAEEDFDD	319
Erecta	ARNMPGEQQSMQSRQTQARARLHVARMVVAFFVVVFFICFFPYHVFE	WYHFYPTAEEDFDE	328
Melanogaster	ARNMPGEQQSMQSRQTQARARLHVARMVVAFFVVVFFICFFPYHVFE	WYHFYPTAEEDFDE	327
Sechellia	ARNMPGEQQSMQSRQTQARARLHVARMVVAFFVVVFFICFFPYHVFE	WYHFYPTAEEDFDE	327
Eugracilis	ARNMPGEQQSMQSRQTQARARLHVARMVVAFFVVVFFICFFPYHVFE	WYHFYPTAEEDFDE	327
Simulans	ARNMPGEQQSMQSRQTQARARLHVARMVVAFFVVVFFICFFPYHVFE	WYHFYPTAEEDFDE	327
Mauritania	ARNMPGEQQSMQSRQTQARARLHVARMVVAFFVVVFFICFFPYHVFE	WYHFYPTAEEDFDE	327

:* *:***:***** :*****:****:*****:****:***:

Mojavensis	FWNVVRIVGFCTSFVNSCVNPVALYCVS	GVFRQHFNRYLCCICVKRQPHLRQHSSTATGIM	396
Virilis	FWHVVRIVGFCTSFVNSCVNPVALYCVS	GVFRQHFNRYLCCICVKRQPHLRQHSSTATGVM	414
Grimshawi	FWHVVRIVGFCTSFVNSCVNPVALYCVS	GVFRQHFNRYLCCICVKRQPHLRQHSSTATGVM	402
Bipectinate	FWNVLRIVGFCTSFVNSCVNPVALYCVS	GVFRQHFNRYLCCICVKRQPHLRQHSSTATGIM	408
Ananassae	FWNVLRIVGFCTSFVNSCVNPVALYCVS	GVFRQHFNRYLCCICVKRQPHLRQHSSTATGIM	412
Serrata	FWNVLRIVGFCTSFVNSCVNPVALYCVS	GVFRQHFNRYLCCICVKRQPHLRQHSSTATGMM	391
Kikkawei	FWNVLRIVGFCTSFVNSCVNPVALYCVS	GVFRQHFNRYLCCICVKRQPHLRQHSSTATGMM	385
Fichsuphila	FWNVLRIVGFCTSFVNSCVNPVALYCVS	GVFRQHFNRYLCCICVKRQPHLRQHSSTATGMM	389
Rhopaloo	FWNVLRIVGFCTSFVNSCVNPVALYCVS	GVFRQHFNRYLCCICVKRQPHLRQHSSTATGMM	380
Elegans	FWNVLRIVGFCTSFVNSCVNPVALYCVS	GVFRQHFNRYLCCICVKRQPHLRQHSSTATGMM	380
Suzuki	FWNVLRIVGFCTSFVNSCVNPVALYCVS	GVFRQHFNRYLCCICVKRQPHLRQHSSTATGMM	379
Biarmipes	FWNVLRIVGFCTSFVNSCVNPVALYCVS	GVFRQHFNRYLCCICVKRQPHLRQHSSTATGMM	380
Takahashi	FWNVLRIVGFCTSFVNSCVNPVALYCVS	GVFRQHFNRYLCCICVKRQPHLRQHSSTATGMM	379
Erecta	FWNVLRIVGFCTSFVNSCVNPVALYCVS	GVFRQHFNRYLCCICVKRQPHLRQHSSTATGMM	388
Melanogaster	FWNVLRIVGFCTSFVNSCVNPVALYCVS	GVFRQHFNRYLCCICVKRQPHLRQHSSTATGMM	387
Sechellia	FWNVLRIVGFCTSFVNSCVNPVALYCVS	GVFRQHFNRYLCCICVKRQPHLRQHSSTATGMM	387
Eugracilis	FWNVLRIVGFCTSFVNSCVNPVALYCVS	GVFRQHFNRYLCCICVKRQPHLRQHSSTATGMM	387
Simulans	FWNVLRIVGFCTSFVNSCVNPVALYCVS	GVFRQHFNRYLCCICVKRQPHLRQHSSTATGMM	387
Mauritania	FWNVLRIVGFCTSFVNSCVNPVALYCVS	GVFRQHFNRYLCCICVKRQPHLRQHSSTATGMM	387

:*.**:***** *****.***:*.****.*

Mojavensis	D-TSVTSMRSTYVGGGIAAG--GAREGGPRASVHMNNHGV	-----GAAGGRGGS	445
Virilis	D-TSVTSMRSTYVGGGGG-GAVGGSAAHRASLHMNNHGV	AVGGG---GGGGGRGGS	468
Grimshawi	D-TSVTSMRSTYVGGGGVGGATGSLAAHRASLHMNNHGS	---A---GGPGGRTGS	454
Bipectinate	DNTSVMRSTYVGGAG-----GNLRASMRNSNHGGGG	-----SGLSAGRGAS	454
Ananassae	DNTSVMRSTYVGGAG-----GNLRASMRNSNHGGGG	-----AGLPAGRGAS	458
Serrata	DNTSVMRSTYVGGCGTG-----GNLRASLHRNSNQ	---GGG---GLGGGAGRGGS	439
Kikkawei	DNTSVMRSTYVGGCGAG-----GNLRASLHRNSNQ	GVGGG---ALGGGTGRVGS	435
Fichsuphila	DNTSVMRSTYVGV-GG-----GNLRASLHRNSNHG	VGA-----AGGGPGRXGS	434
Rhopaloo	DNTSVMRSTYVGGATA-----GNLRASLHRNSNHG	GGGGGGVGGAGGLGSGRVGS	432
Elegans	DNTSVMRSTYVGGAAA-----GQLRASLHRNSNHG	GGG-----VGFSGSRVGS	426
Suzuki	DNTTVMRSTYIGSAGGG-----VANLRASQHRD	SCHGVG-----GGGGTGHADS	426
Biarmipes	DNTSVMRSTYVGGAGGV---GA---NLRASQHRN	-----SS	413
Takahashi	DNTSVMRSTYVGGAVGC---GPAGNLRASQHRNSNHG	-----GGGGSGRVGS	426
Erecta	DNTSVMRSTYVGGT-----AGNLRASLHRNSNHG	VGGAAAGGG---GGGGSGRVGS	438
Melanogaster	DNTSVMRSTYVGGT-----AGNLRASLHRNSNHG	VGGAGGGVGGVGS	438
Sechellia	DNTSVMRSTYVGGT-----AGNLRASLHRNSNHG	VAGAGGGVGGG---SGRVGS	436
Eugracilis	DNTSVMRSTYVGGT-----AGNLRASLHRNSNHG	VAGAGGGVGGG---SGRVGS	436
Simulans	DNTSVMRSTYVGGT-----AGNLRASLHRNSNHG	VGGAGGGVGGG---SGRVGS	436
Mauritania	DNTSVMRSTYVGGT-----AGNLRASLHRNSNHG	VGGAGGGVGGG---SGRVGS	436

* *: * *****: * * * * *

Mojavensis	FHRQDSMALQHAGSVNGHSH----	NANVGAGAGIGRASI INEKR	485
Virilis	FHRQDSMPLQHAGSGNGHAH----	NV-GGPGAGIGRASI INEKS	518
Grimshawi	FHRQDSMPLQHAGSGNGHAH----	NV-GG----IGRASI INEKS	500
Bipectinate	FHGGDSMPMQHSNGHGAAGGTGGAGVATGGPSSG	RAAAVGEKR	499
Ananassae	FHGGDSMPLQHSNGHGATGNSGGAGASATGGP	PSLGRATAVGEKR	503
Serrata	FHRQDSMPLQHNGHGAA--GGGAA--SGPSCGP	PAGR-AVAVGEKR	479
Kikkawei	FHRQDSMPLQHNGHGAAAGGGTA--SGPSCGS	AGR-AVAVGEKR	476
Fichsuphila	FHRQDSMPLQHNGHGAVASAAG-----C--	GSGGR-AAAGGEKR	471
Rhopaloo	FHRQDSMPLQHNGHGVSAGGAA-----	SGSGR-ATAVGEKR	481
Elegans	FHRQDSMALQHNGHGAAATGGAS-----	CAPGSGGR-GPAGGEKR	465
Suzuki	LHRQESMPLQHNGCVSG-----	GR-AASVGEKS	466
Biarmipes	LHRQASTPLQHNGHGTGGDETGH---	GPGWVSGGAAA-VGEKR	454
Takahashi	FHRQDSMPLQHNGHGTGIGAVG---	GAACGSGGRASAAVGEKR	468
Erecta	FHRQDSMPLQHNGHAGAGGGGSC---	GL--GSGGRTAP-VCEKS	489
Melanogaster	FHRQDSMPLQHNGHAGGGGAGGGSS---	GL--GAGGRTAA-VSEKS	489
Sechellia	FYRQDSMPLQHNGHAGTGAAGVSS---	GL--GAGGRTAS-VSEKR	475
Eugracilis	FYRQDSMPLQHNGHAGTGAAGVSS---	GL--GAGGRTAS-VSEKR	475
Simulans	FHRQDSMPLQHNGHAGAGGGGSS---	GL--GAGGRTAS-VSEKS	487
Mauritania	FHRQDSMPLQHNGHAGAGGGGSS---	GL--GAGGRTAP-VSEKS	487

The above are all PB isoforms; which are listed individual below.
 Here are the three isoforms predicted from *D melanogaster*:

PA (ALTERNATIVE SPLICE AT FINAL AA)

MYASLMDVGQ TLAARLADSD GNGANDSGLL ATGQGLEQEQ EGLALDMGHN ASADGGIVPY
 VPVLD RPETY IVTVLYTLIF IVGVLGNGTL VIIFFRHRSM RNIPNTYILS LALADLLVIL
 VCVPVATIVY TQESWPFERN MCRISEFFKD ISIGVSVFTL TALSGERYCA IVNPLRKLQT
 KPLTVFTAVM IWILAILLGM PSVLFSDIKS YPVFTATGNM TIEVCSPPFRD PEYAKFMVAG
 KALVYYLLPL SIIGALYIMM AKRLHMSARN MPGEQQSMQS RTQARARLHV ARMVVAFVVV
 FFICFFPYHV FELWYHFYPT AEEDFDEFWN VLRIVGFCTS FLNSCVNPVA LYCVSGVFRQ
 HFNRYLCCIC VKRQPHLRQH STATGMDNT SVMSMRSTY VGGTAGNLRA SLHRNSNHGV
 GGAGGGVGGG VSGRVSFSH RQDSMPLQHG NAHGGGAGGG SSSLGAGGRT AAVSEKSFIN
 RYESGVMRY

PB (SHORTEST)

MYASLMDVGQ TLAARLADSD GNGANDSGLL ATGQGLEQEQ EGLALDMGHN ASADGGIVPY
 VPVLD RPETY IVTVLYTLIF IVGVLGNGTL VIIFFRHRSM RNIPNTYILS LALADLLVIL
 VCVPVATIVY TQESWPFERN MCRISEFFKD ISIGVSVFTL TALSGERYCA IVNPLRKLQT
 KPLTVFTAVM IWILAILLGM PSVLFSDIKS YPVFTATGNM TIEVCSPPFRD PEYAKFMVAG
 KALVYYLLPL SIIGALYIMM AKRLHMSARN MPGEQQSMQS RTQARARLHV ARMVVAFVVV
 FFICFFPYHV FELWYHFYPT AEEDFDEFWN VLRIVGFCTS FLNSCVNPVA LYCVSGVFRQ
 HFNRYLCCIC VKRQPHLRQH STATGMDNT SVMSMRSTY VGGTAGNLRA SLHRNSNHGV
 GGAGGGVGGG VSGRVSFSH RQDSMPLQHG NAHGGGAGGG SSSLGAGGRT AAVSEKR

PC Stop suppressed PB

1 MYASLMDVGQ TLAARLADSD GNGANDSGLL ATGQGLEQEQ EGLALDMGHN ASADGGIVPY
 61 VPVLD RPETY IVTVLYTLIF IVGVLGNGTL VIIFFRHRSM RNIPNTYILS LALADLLVIL
 121 VCVPVATIVY TQESWPFERN MCRISEFFKD ISIGVSVFTL TALSGERYCA IVNPLRKLQT
 181 KPLTVFTAVM IWILAILLGM PSVLFSDIKS YPVFTATGNM TIEVCSPPFRD PEYAKFMVAG
 241 KALVYYLLPL SIIGALYIMM AKRLHMSARN MPGEQQSMQS RTQARARLHV ARMVVAFVVV
 301 FFICFFPYHV FELWYHFYPT AEEDFDEFWN VLRIVGFCTS FLNSCVNPVA LYCVSGVFRQ
 361 HFNRYLCCIC VKRQPHLRQH STATGMDNT SVMSMRSTY VGGTAGNLRA SLHRNSNHGV
 421 GGAGGGVGGG VSGRVSFSH RQDSMPLQHG NAHGGGAGGG SSSLGAGGRT AAVSEKR~~XT~~
 481 LIVELLGEEE VVSLQADEQ L

Some but not all PA isoforms were recovered in the original blastp search using *melanogaster* PA, and the Suzuki PA form contained a BBS in the added 12 AA. So I searched for the missing PA isoforms (*sechelia*, *biarmipes*, *anannassae*, *mojavensis*, *serrata*, *kikkawae*, *ficusphelia*, *bipectinate*, *Takahashi*, *eugracilis*). Found all - the documentation and data analysis are at the bottom of this file in section called:

“CCHa2-R PA isoform – data capture”

Here is the 1 conserved BBS in *biarmipes* and Suzuki PA proteins:

Mojavensis	FHRQDSMALQHAGSVNGHSH-----NANVGAGAGIGRASIINEKR----YDER-TRY	492
Virilis	FHRQDSMPLQHAGSNGHHAH-----NV-GGPGAGIGRASIINEKSLIKRYDER-TRY	529
Grimshawi	FHRQDSMPLQHAGSNGHHAH-----NV-GG----IGRASIINEKSLIKRYEER-ARY	511
Bipectinate	FHGGDSMPMQHSNGHGAAGGTLGGAGVGATGGPSSGRAAAVGEKSIINRFESNR-LRY	510
Anannassae	FHGGDSMPLQHSNGHGATGGNSGGAGASATGGPSLGRATAAVGEKRINRFESNR-MRY	514
Serrata	FHRQDSMPLQHNGHGAA-GGGAA--SGPSCGPAGR-AVAVGEKSLMGRYVSDRLRY	491
Kikkawei	FHRQDSMPLQHNGHGAAAGGGTA--SGPSCGSAGR-AVAVGEKSLMGRYVSDRLRY	482
Fichsuphila	FHRQDSMPLQHNGHGAVASAAG-----C--GSGGR-AAAGGEKSIINHYENDRLRY	482
Rhopaloea	FHRQDSMPLQHNGHGSVAGGAA-----SGSGGR-ATAVGEKSLINRYESDRIRY	481
Elegans	FHRQDSMALQHNGHGAATGGAS-----CAPGSGGR-GPAGGEKSLINRYESERIRY	477
Suzuki	LHRQESMPLQHNGCVSG-----GR-AASVGEK SLLSRYE NDRIRY	478
Biarmipes	LHRQASTPLQHNGHGTGGDETGH---GPGWVSGGAAA-VGEK SFISRYE NDRIRF	466
Takahashi	FHRQDSMPLQHNGHGTGIGAGVG---GAACGSGGRASAAVGEKSFINRYESGVMRY	470
Erecta	FHRQDSMPLQHNAHGAGAGGGSC---GL--GSGGRTAP-VCEKSFINRYESGRMRY	501
Melanogaster	FHRQDSMPLQHNAHGAGGGGSS---GL--GAGGRTAA-VSEKSFINRYESGVMRY	501
Sechellia	FYRQDSMPLQHNAHGAGAGGGSS---GL--GAGGRTAS-VSEKSFINRYESGVMRY	489
Eugracilis	FYRQDSMPLQHNAHGAGAGGGSS---GL--GAGGRTAS-VSEKSLINKR--DRIRY	485
Simulans	FHRQDSMPLQHNAHGAGAGGGSS---GL--GAGGRTAS-VSEKSFINRYESGVMRY	499
Mauritania	FHRQDSMPLQHNAHGAGAGGGSS---GL--GAGGRTAP-VSEKSFINRYESGVMRY	499

Melanogaster [NP_610199.2](#)

1 myaslmdvqg tlaarladsd gngandsgll atgggleqeq eglaldmghn asadggivpy
61 vpvldrpety ivtvlytlif ivgvlngntl viiffrhrsm rnipntyils laladllvil
121 vcvpvativy tqeswpfern mcriseffkd isigvsvftl talsgeryca ivnplrklqt
181 kpltvftavm iwilaillgm psvlfsdiks ypvftatgmn tievcspfrd peyakfmvag
241 kalvyyllpl siigalyimm akrhlmsarn mpgeqqsmqs rtqararlhv armvvafvfv
301 fficffpyhv felwyhfpyt aeedfdefwn vlrivgfcts flnscvnpva lycvsgvfrq
361 hfnrylccic vkrqphlrqh statgmmdnt svmsmrrsty vggtaglra slhrnsnhgv
421 ggagggvqgg vsgrvgsfh rqdsmlqhg nahgggaggg ssglgaggrt aavseksfin
481 ryesgvmy

Simulans [XP_016026076.2](#)

1 myaslmdvqg tlaarladge gngandsgll atgggleqeq eglaldmghn asadggivpy
61 vpvldrpety ivtvlytlif ivgvlngntl viiffrhrsm rnipntyils laladllvil
121 vcvpvativy tqeswpfern mcriseffkd isigvsvftl talsgeryca ivnplrklqt
181 kpltvftavm iwilaillgm psvlfsdiks ypvftatgmn tievcspfrd peyakfmvag
241 kalvyyllpl siigalyimm akrhlmsarn mpgeqqsmqs rtqararlhv armvvafvfv
301 fficffpyhv felwyhfpyt aeedfdefwn vlrivgfcts flnscvnpva lycvsgvfrq
361 hfnrylccic vkrqphlrqh statgmmdnt svmsmrrsty vggtaglra slhrnsnhgv
421 ggagggvqgg sgrvgsfhrq dsmlqhgna hgagagggss glgaggrtas vseksfinry
481 esgvmy

Suzuki [XP_036669887.1](#)

1 myaalvdvqg tlvaglvdra ganegsllas gqaeeqeqgh gvahnasadd gmvpyvpvld
61 rpetyivtvly tlifivgvl ngntlviiff rhrsmrnipn tyilslalad llvilvcvpv
121 ativyqtqesw pfdmncris effkdisigv svftltalsg erycaivnpl rklqtkpltv
181 ftaviiwila illgmpsvlf sdiksyvft amgnitiev spfrdpeyak fmvaakaliy
241 yllplsiiga lyimmanrlh msarnmpgeq qsmqsrqtqar arrhvarmvv afvvvfficf
301 fpyhvfelwy hfpytaeedf ddfwnvlriv gfctsflnsc vnpvalycvs gvfrlhfny
361 lccvcvkrhp hlrqstgmd nttvsmrrs tyigsagggv anlrasqhrd schgvqgggg
421 tghadslhrq esmplqhgng cvsggraasv gekslsrye ndriry

Mauritania [XP_033155286.1](#)

1 myaslmdvqg tlaarladge gngandsgll atgggleqeq eglaldmghn asadggivpy
61 vpvldrpety ivtvlytlif ivgvlngntl viiffrhrsm rnipntyils laladllvil
121 vcvpvativy tqeswpfern mcriseffkd isigvsvftl talsgeryca ivnplrklqt
181 kpltvftavm iwilaillgm psvlfsdiks ypvftatgmn tievcspfrd peyakfmvag
241 kalvyyllpl siigalyimm akrhlmsarn mpgeqqsmqs rtqararlhv armvvafvfv
301 fficffpyhv felwyhfpyt aeedfdefwn vlrivgfcts flnscvnpva lycvsgvfrq
361 hfnrylccic vkrqphlrqh statgmmdnt svmsmrrsty vggtaglra slhrnsnhgv
421 ggagggvqgg sgrvgsfhrq dsmlqhgna hgagagggss glgaggrtap vseksfinry
481 esgvmy

Sehellia [XP_002043393.1](#)

1 myaslmdvqg tlaarladge gngandsgll atgggleqeq eglaldmghn asadggivpy
61 vpvldrpety ivtvlytlif ivgvlngntl viiffrhrsm rnipntyils laladllvil
121 vcvpvativy tqeswpfern mcriseffkd isigvsvftl talsgeryca ivnplrklqt
181 kpltvftavm iwilaillgm psvlfsdiks ypvftatgmn tievcspfrd peyakfmvag
241 kalvyyllpl siigalyimm akrhlmsarn mpgeqqsmqs rtqararlhv armvvafvfv
301 fficffpyhv felwyhfpyt aeedfdefwn vlrivgfcts flnscvnpva lycvsgvfrq
361 hfnrylccic vkrqphlrqh statgmmdnt svmsmrrsty vggtaglra slhrnsnhgv
421 agagggvqgg sgrvgsfyrq dsmlqhgna hgtgagvgss glgaggrtas vsekr

Serrata [KAH8390260.1](#)

1 vtdvmdiaq alvaslahap ldgsgggggn gngsgandsv llatgtgaaa eqhnasidgg
61 mvpvypvldr petyivtvly tlifivgvl ngntlviiff rhrsmrnipn tyilslaladl
121 lvilvcvpva tivytqesw fernmcrise ffdkdisigv vftltalsge rycaivnplr
181 klqtkpltvf tavmiwilai llgmpsvlvs diksyvltat tgnmtievcs pfrdpeyaqy
241 mvaakafiy lplsiigal yimmakrlhi sardmpgeq smqsrqtqara rrvhvarmvv
301 fvvvfficff pyhvfelwy fytaeedfd dfwnvlriv fctsflnscv npvalycvsg
361 vfrqhfnyrl ccicvkrqph lrqstatgm mdntsvmsmr rstyvggcgt ggnlraslhr
421 nsnqgggggl gggagrsgsf hrqdsmlqhg gngngaaggg aasgpscga gravavgek

Erecta [XP_001970784.2](#)

1 myaalmdvqg tlaarladge gndsgllatr ggleqegeqe qeglalmah nasadggmvp
61 yvpvldrpet yivtvlytli fvvglnggt lviiffrhrs mrnipntyil slaladllvi
121 lvcvpvativ ytqeswpfer nmcriseffk disigvsvft ltalsgeryc aivnplrkklq
181 tkpltvftav miwilaillg mpsvlfsdik sypvftatgn mtievcspfr dpeyakfmva
241 gkalvyyllp lsiigalyim makrlhmsar nmpgeqqsmq srtqararlh varmvvafvv
301 vfficffpyh vfelwyhfyf taeedfdefw nvlrivgfc sflnscvnpv alycvsgvfr
361 qhfnrylcci cvkrqphlrq hstatgmmdn tsvmsmrrst yvgtagnlr aslhrssnhg
421 vggagggggg gsgrvgsfsh rqdsmplqhg nahgagaggg scglsgsggrt apvceksfin
481 ryesgrmry

Takahashi [XP_017003388.2](#)

1 myaalmdvqg tlaaslaegg gnesgllatq egqgldletg hnasadggiv pyvpvldrpe
61 tyivtvlytl ifivglnggt tlviiffrhr smrnipntyil lslaladllv ilvcvpvati
121 vytqeswpfe rnmcriseff kdisigvsvf tltalsgeryc caivnplrkkl qtkpltvfta
181 viiwilail gmpsvlfsdi ksypvatpmg nitievcspfr rdreyakfmv aakaliyyll
241 plsiigalyi mmakrlhmsa rnmmpgeqqsm qsrtqararr hvarmvvafv vfficffpy
301 hvfelwyhfy ptaeedfddf wnlrivgfc tsflnscvnp valycvsgvf rqhfnrylcc
361 icvkrqphlr qhstatgmmd ntsvmsmrrs tyvggavgcg pagnlrasqh rnsnhggggg
421 sgrvgsfhrq dsmplqhgng hgtgigagvg gaacgsggra saavgekr

Biarmipes [XP_016966623.1](#)

1 myvalvdvqg tlaagladga nesvlmatgh aaeqegghwv gqnasgdgvm vpyvpvldrpe
61 etyivtvlyt lifivglng gtlviiffrh rsmrnipnty ilslaladll vilvcvpvat
121 ivytqeswpf ernmcrisef kdisigvsv ftltalsger ycaivnplrk lqtkpltvft
181 aaiiwilail lgmpsvlfsd ksypvltam gnmtievcsp frdaeyakfm vaakaliyyll
241 lplsiigaly immakrlhms arnmpgeqqs mqsrtqarar rhvarmvvaf vvvfficffp
301 yhvfelwyhf yptaeeedfdd fwnvlrivgf ctsflnscvnp pvalycvsgv frqhfnylcc
361 cfcvkrqphv rqhstatgmm dntsvmsmrr styvggagvg ganlrasqhr nsslhrqast
421 plqhgngngt ggdetghgpg wvsgraaaav gekr

Eugracilis [XP_017074910.2](#)

1 myaslmdvqg tlaarladge gngandsqll atgggleqeq eglaldmghn asadggivpy
61 vpvldrpety ivtvlytlif ivglnggtl viiffrhrsm rnipntyils laladllvil
121 vcvpviativ tqeswpfern mcriseffkd isigvsvftl talsgeryc aivnplrkklqt
181 kpltvftavm iwilaillgm psvlfsdiks ypvftatgnm tievcspfrd peyakfmvag
241 kalvyyllpl siigalyimm akrhlmsarn mpgeqqsmqs rtqararlvh armvvafvvv
301 ffficffpyh vfelwyhfyf aeefdefwn vlrivgfcfs flnscvnpva lycvsgvfrq
361 hfnrylccic vkrqphlrq statgmmdnt svmsmrrsty vgtagnlra slhrnsnhgv
421 agagggvggg sgrvgsfyrq dsmplqhgna hgtgagvgss glgaggrtas vsekr

Rhopaloea [XP_044315908.1](#)

1 mfaalmdvqg tlagslaegn gsgvqgegle lpgmgvevgv qhnasadggi vpyvpvldrpe
61 etyivtvlyt lifivglng gtlviiffrh rsmrnipnty ilslaladll vilvcvpvat
121 ivytqeswpf ernmcrisef kdisigvsv ftltalsger ycaivnplrk lqtkpltvft
181 aviiwilail lgmpsvlfsd ksypvvtvk gnitievcsp ysdpeyakym vaakatiyyll
241 lplsiigaly immakrlhms arnmpgeqqs mqsrtqarar rhvarmvvaf vvvfficffp
301 yhvfelwyhf yptaeeedfdd fwnvlrivgf ctsflnscvnp pvalycvsgv frqhfnylcc
361 cicvkrqphl rqhstatgmm dntsvmsmrr styvggatag hlraslhrns nhggggggvg
421 gagglsgsgrv gsfhrqdsmp lqhgngngsv aggaasgsgg ratavgeksl inryesdrir
481 y

Fichsuphila [XP_017051484.2](#)

1 mhaalmdvqg tlaggssand tgllatggee eqeqqpglgl gmngmvmemqg hnasadggmv
61 pyvpvldrpe tyivtvlytl ifivglnggt tlviiffrhr smrnipntyil lslaladllv
121 ilvcvpvati vytqeswpfe rnmcriseff kdisigvsvf tltalsgeryc caivnplrkkl
181 qtkpltvfta viiwilail gmpsvlfsdi ksypvltak nmtievcspfr rdpeyakcmv
241 aakafiyyll plsiigalyi mmakrlhmsa rnmmpgeqqsm qsrtqararr hvarmvvafv
301 vfficffpyh hvfelwyhfy ptaeedfddf wnlrivgfc tsflnscvnp valycvsgvf
361 rqhfnrylcc icvkrqphlr qhstatgmmd ntsvmsmrrs tyvgvgggnl raslhrnsnh
421 vgaagggpg rxgsfhrqds mplqhgngng avasaagcgs ggaaaggekr

Elegans [XP_041565851.1](#)

1 mfaalmdvqg tlagslateg ndsgllatqg yeggvevgmg qhnssadggm vpyvpvldrpe

61 etyivtvlyt lifivgvlgn gtlviiffrh rsmrnipty ilslaladll vilvcvpvat
121 ivytqeswpf ernmcrisef fkdisigvsv ftltalsger ycaivnplrk lqtkpltvft
181 aviiwilail lgmpsfvlsv ikscopytan gnmteievcs frdpeyakcm vaakafiyyl
241 lplsiigaly immakrlhms arnmpgeqqs mqsrtqarar rhvarmvvaf vvvfficffp
301 yhvfelwyhf yptaeeedfdd fwnvlrivgf ctsflnscvn pvalycvsgv frqhfnyrlc
361 cicvkrqphl rghstatgmm dntsvmsmrr styvggaaag qlraslhrns shngggvgfg
421 sgrvgsfhrq dsmalqhgng hgaatggasc apgsggrgpa ggekr

Kikkawei [KAH8308790.1](#)

1 vntnkmdiaq alvaslahap ldgsgngsgs ggndsvllat gasaeqhnas idggmvpyvp
61 vldrpetyiv tvlytlifiv gvlngntlvi iffrhrsmrn ipntyilsla ladllvilvc
121 vpvativytq eswpfernmc riseffkdis igvsvftlta lsgerycaiv nplrklqtkp
181 ltvftavmiw ilaillgmps flvsdiksyv vltangnmti evcspyrde yaqcmvaaka
241 fiyylpllsi igalyimmak rlhisardmp geqqsmsqsr qararrhvar mvvafvvvff
301 icffpyhvf lwyhfypta eddfdfwnvl rivgfctsf nscvnpvaly cvsgvfrqhf
361 nrylccicvk rqphlrqst atgmdntsv msrrstyvg gcgaggnlra slhrnsngq
421 ggggalgggt grvgsfhrqd smplqhgng gaaaggtas gpscgsagra vavgek

Bipectinate [XP_017092331.2](#)

1 msalmdmsqt lalsllyapp datggvspni isigsgngsd ggndsslg1 atgqqaata
61 vggvlglgqh nasadggggy yvpvlerpet yivtvlytli fivgvlngt lviiffrhrs
121 mrnipnyic slaladllvi lvcvpvativ ytqeswpfer nmcriseffk disigsvft
181 ltalsgeryc aivnplrkq tkpltvftaa miwvllaillg mpsflvsnik sytvltpngn
241 lsievcdpfr dpeyakymva akasiyylp lsiigalyim makrlhisar dmpgeqqsq
301 srsqararrh varmvvafvv vfficffpyh vfelwyhfyf taeeedfdefw nvlrivgfct
361 sflnscvnpv alycvsgvfr qhfnyrlccf cvkrqphlrq hstatgimdn tsvmsmrrst
421 yvggaggnlr asmhrnsnhg gggsglsag rgasfhggds mpmqhsngq aaggtlggag
481 vgatggpssg raaavgekr

Anannasae [XP_001961345.2](#)

1 msaalmdmsq tlalslvyapp ldatggaspn iaigngndsn gggdggands glvlatgqqg
61 vatvvvgvlg lgqhngsadg gigpyvpvle rpetyivtvlytli fivgvlngt gngtlviiff
121 rhrsmrnipt tyilslalad llvilvcvpv ativyqtqesw pfernmcris effkdisigv
181 svftltalsg erycaivnpl rklqtkpltv ftaamiwvla illgmpsfll snksyvtlt
241 pngnmsievc dpyrdpeyak ymvaakasiy ylvplsiiga lyimmakrlh isardmpgeq
301 qsmqsrqar aryvvarmv afvvvfficl fpyyvfelwy hfyptaeeed defwnvlriv
361 gfctsflnsc vnpvalycvs gvfrqhfnyrlccf cvkrqphlrq hlrqstgimdn tsvmsmrrst
421 rrstyvggag nlrssmhrn shngggggag lpagrgasfh ggdsmlqhs nghgatggn
481 ggagasatgg psigrtaavgekr

Mojavensis [XP_002006847.2](#)

1 myaalmdmsq mlaaslayap aesssaaaaa gvnlsqlsns sqldgssvvt vataatvgqh
61 nasieessyv kvldrpetyi tvlytlifiv vgvngntlv iiffrhrsmr nipntyilsl
121 aladllvilv cvpvativyt qeswpfernm criseffkdi sigvsvftlt alsgeryci
181 vnplrklqtk pltvftavii wvfaimlgmp sfvvsdiqsy nittpngnit igvcspfrsk
241 iyakymvvak asiyylvpls iigvlyimma krlhisardm pgeqlsiqsr sqararrhva
301 rmvavfvvfv ficffpyhvf elwyhfypta eddfdfwnv vrvivgfctsf lncvnpval
361 ycvsgvfrqh fnrylccicv krqphlrqhs tatgimdtv tsmrrstyvg ggaaaggare
421 ggprsvhmn nnhgvsaga grggsfhrqd smalqhagsv nghshnanvg agagigrasi
481 inekr

Virilis [XP_002049178.2](#)

1 mpknmlaalm dmsqtlasla ayaplesnaa ataaaaaaaa vlnvsqgn sqldgslat
61 aaatttttav ttststhnas geeppqyvk ldrpetyivt vlytlifivg vlgngtlvii
121 ffrhrsmrni pntyilslal adllvilvcv pvativytqesw pfernmcris iteffkdisi
181 gsvvftltal sgeryciavn plrklqtkpl tvftaviiwv faimlgmpsf vvsdiqgytl
241 ptpngnitie vcsprfrskiy akymvvakas iyylvplsi gvllyimmakrl hisardmpg
301 eqlsiqsrq ararrhvarmv vavfvvfficv ffpyhvfel wyhfyptaee ddfdfwhvvr
361 ivgfctsfln scvnpvalyc vsgvfrqhfnyrlccicvkr qphlrqhsta tgvmtdsvts
421 mrrstyvggg gggavggsla ahraslhmn nhgvavggg ggggrggsfh rqdsmlqha
481 gsgngahnv gpggagigra siinekslik rydertry

Grimshawi [XP_001985716.1](#)

1 myaalmdmsq tlaaslayap mesnsaaaaa aaaaaalgm nvsqslsnssq ldgstgataa

61 tsiphnvsae eyppyvkvld rpetyivtvl ytlifivgvl gngtlviiff rhsmrnipn
121 tyilslalad llvilvcvqv ativyqtqesw pfermncris effkdisigv svftltalsg
181 erycaivnpl rklqtkpltv ftaviiwvla imlgmprsfv sdlqgytlpt nkgnitiev
241 spfrskiyak ymvvakasiy yfvplsiigv lyimmakrlh isardmpgeq lsiqrsqar
301 arrhvarmvv afvvvfficf fpyhvfelwy hfyptaeddf ddfwhvrviv gfctsflnsc
361 vnpvalycvs gvfrqhfny lccfcvkrqp hlrqhstatg vmdtsvtsmr rstyvvgggg
421 vggatgslaa hraslhmnnt hgsgagppgg rtgsfhrqds mplqhagsgn ghahnvggig
481 rasiineksl ikryeerary

“CCHa2-R PA isoform – data capture”: