

Pc77	--MKLSTSVLSVLVIAVELTVCMEFD	---	FSEAIS	CSEQC	PWGAGV	PVCGQRSMEKKTFTS	55
Pc266	--MTLTSALSIVIIAVAYSVCMLDKQVYSKDID	---	CTASCLVEY	-	KPVCAOKDESEKPEFGN	57	
Kazal	MKMKLSTSTFSVVVIAVELTVCMEFD	---	FGEAGN	CPKTC	TVTN-QHVCQORVNEELRTENS	56	
Pc77	KCHFDYYNOCVSGGWVLLKYSSC	--					78
Pc266	IC	-----					59
Kazal	LCEMEKENLCSGGWTKLNKNGHCST						81

Pc60	MP--IALFFFFYSLLLGTSLGQQYGSN-----RTLNKVLGNVGNVVNQCIDLEHERVKL	51
Pc61	MKQSIATIEFSLGLLHYVAHCAPYIILNSLLSTSSDYLNKINKTAKAVGOVLSLTNGTTQL	60
hemolysin-like	MA--IALLEFFCSLLLATSLSG-QYGD-----RTLLNQMFGGVADVNNQCIDVAQDNVKL	50
Pc60	TTKLTNSGVEHGTNIGKMGVAAGATLSSOGLGGGTDLAKEGLELVGTVGEIIPGAG-VPV	110
Pc61	GTSLTSSGTYSMATSTAKACLSSATTFGKEAMSETVIYSDKGLDFVSNITGSIPVVG-EQI	119
hemolysin-like	TTQLTSSAVEHGTNLGKMGVAAGTILTSKGLGGVTDLGKQGLDLVGTIAEVIPGADLLPV	110
Pc60	NYVTEAKTGLTIVNNLCQKGIKVTTHLCNQALDNTKTIITKIASCTVENFSSARTGVAKK	170
Pc61	EQITGIGKLSLDLGQSTCKDVIDLTESYCKAGLTTINTGTQLTTGAIGGIAHGGAELGK-	178
hemolysin-like	RTVIDICKTGVSVLNNICQEGIKSASYLCNEVLDKTKLAKLTTCTVENLSSAGTAIAKG	170
Pc60	TVSTGLNALANVLNTGMDAGMALVPGTTTQPNSPENSQPVSEPAPESSNAVSSLIQRGWS	230
Pc61	---OGTQAAANLITSGITRGVQAITG-----TPEIA-----	207
hemolysin-like	AVSTGANAVANVLNTGMDALMAFVPGGSSKTNAIQDITKAITQPGIAKPNPENKIAKPES	230
Pc60	YFGGNQDNYYK-----	241
Pc61	-----	206
hemolysin-like	KSSGGLGSYLTSGLSFFGR	249

A

Pc24	MEMFMILLVSYLSVHSGKINECNMKNITMHVVTWNVNGERPT-CLLKLLGQFQEKDEDE	59
Pc29	MKLKILLLLFLFVS-LYAK---EAPENPRTVYVVVTWNVGEEENPPGSVKELLGQISSKDELN	56
Pc31	MKLKILLLLFLFVS-LYAK---EAPENPRTVYVVVTWNVGEEENPPGSVKELLGQISSKDELN	56
Pc32	MKLKILLLLFLFVS-LYAK---EAPENPRTVYVVVTWNVGEEENPPGSVKELLGQISSKDELN	56
IP5P	MNLKILLLLFSFAS-LYAKYSKAAEDNPRSVYVVVTWNVAAEKDPPGSVKELLGQVSDSSEVN	59
Pc24	PDMVIVGLQEVTKSIDTALKDYFLGNRWEASTGDILES-NDYVKVETASLFGMFLNVYVK	118
Pc29	PDIIIVGLQEVTMNPIKALKKNKLVGDKWSEIDDDILKSNNNYAKIYSESLGMLLKVYVR	116
Pc31	PDIIIVGLQEVTMNPIKALKKNKLVGDKWSEIDDDILKSNNNYAKIYSESLGMLLKVYVR	116
Pc32	PDIIIVGLQEVTMNPIKALKKNKLVGDKWSEIDDDILKSNNNYAKIYSESLGMLLKVYVR	116
IP5P	PDIVIIIGLQELTMNEVQAVVNNIFDKWSDDEFNEILKSRNNYHKVYSESLGILLKGVK	119
Pc24	IQHSWSVADVN-IRHIDTEYFRYDNGGGVIMKFRLYGRLECLVHAHL--HGONKTARIE	175
Pc29	IKYKVTLSKEKDATTVKTGKGFSGNKGAVIIKFKLNELSYCVVNSHLP AHDEKLEERID	176
Pc31	IKYKV--SKEKDATTVKTGKGFSGNKGAVIIKFKLNEQSYCVVNSHLP AHDEKLENERIE	174
Pc32	IKYKVTLSKEKDATTVKTGKGFSGNKGAVIIKFKLNEQSYCVVNSHLP AHDEKLEKERID	176
IP5P	IKYKDSINKKADATTVKTGLGGM SGNKGAVIIKFKOLNNRWFCIVNSHLP AAHDEKLEQERIE	179
Pc24	DYKEIEQIRTVFCENP SDYVFFLGDNLNFHIRKVIENLKTPEETHALIKDEKYDELLKEDEL	235
Pc29	DYKTINRERGKFCGN-SDYVFWLGDNLNFRLD--ESLKD-EKIRELVKQKFNELLQKDQL	232
Pc31	DYKTINRERGKFCGN-SDYVFWLGDNLNFRLD--ESLKD-EKIRELVNOKKFNELLQKDQL	230
Pc32	DYKTINRERGKFCGN-SDYVFWLGDNLNFRLD--ESLKD-EKIRELVKQKFNELLQKDQL	232
IP5P	DYKTINNRVDFCNKPSDFIFWLGDNLNFRLO--EDVED-EKIRNWVQQRKYADLLKIDQL	236
Pc24	LYYKNANKIFRNYTEQPIKFPPTYKFL LKRNKSEYNLKRPAWTDRIILYKTESEREITPTI	295
Pc29	KVNHETKEIFGTENEQEIKFAPTFK--LEKKGGEYSKORRPAWTDREVLYKSDTSKIIKPT	290
Pc31	KVNHKTKEIFSTEKEQEIKFAPTFK--LEKKGGEYSKORRPAWTDREVLYKSGTSKIIKPT	288
Pc32	KVNHETKEIFGTENEQEIKFAPTFK--LEKKGGEYSKORRPAWTDREVLYKSDTSKIIKPT	290
IP5P	KINKQTKEIFTDFENEKEITFAPTFK--LEKGTCTYSTKRRPAWTDRIILYKSDTKKNIKPT	294
Pc24	SYNSMEDHRKSDHYPV EAI-----	314
Pc29	LYQSITSYIQSDHYPVQAQFFIANK	315
Pc31	LYQSITSYKQSDHYPVQAQFFIANK	313
Pc32	LYQSITSYIQSDHYPVQAQFFIANK	315
IP5P	LYKSIESYKHS DHYPVQAQFDIKY-	318

B

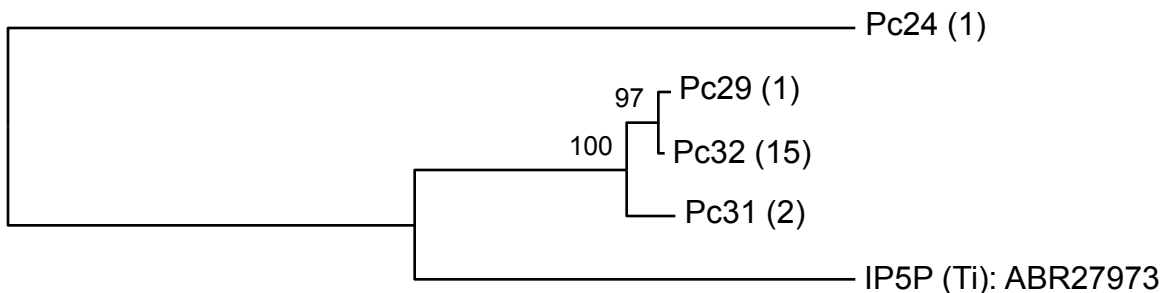


Fig. S3

A

Pc80	MAKHCSLVFSLLA-FALIYS-----LLSSANTCSN-----SNQFLG---	36
Pc294	MANTHYSLVFSLLT-LALIDSL-----VASTQLACKN-----SNILLG---	37
<i>Triatoma infestans</i>	MAKAHSSLVFCLLA-LALVR-----FAQAKCTN-----GYTFLG---	33
<i>Triatoma dimidiata</i>	MAKTQCPLVFSLLA-LALIGN-----LPSSAAQCKN-----ESNTFIA---	37
<i>Rhodnius prolixus</i>	MVQYCSLEV-GLLASIVLLSSMVLVRPGRPVPG---SDPLRKRVRSSCVDPLKKVIG---	53
<i>Phlebotomus argentipes</i>	MWHIKHFLFFVALFVVVHTQTN-YCQPKLCTFGPGLPARPHIGCKNSGQFDRKTCPK-DA	58
<i>Phlebotomus duboscqi</i>	MLQIKNLLVIVVLFVTVQSQNEKYCDQNLCTSNN--VVKPHIGCKNDGQFK-KSCPG-DA	56
<i>Lutzomyia longipalpis</i>	MLQIKHLLIFVGLLVVNAQSN-YCKQESCSGG--VERPHIGCKNSGDFS-ETCSG-DA	55
<i>Drosophila melanogaster</i>	MQPSAVLLTTIMII-----SCE-----VAFACNG-KI	27
<i>Anopheles sinensis</i>	MARWIFVLGVLGGLLSLQARSNYCTTSYCR----AGVKNVGCNPPFFSGGWLKAGKNP	55
<i>Aedes aegypti</i>	MFTVN-----	5
<i>Apis mellifera</i>	MAREGIIRLTLIFIF-----VSTGSADVSCI-----GKALL	32
<i>Vespula vulgaris</i>	MEISGLVYLIIIVTIIIDLPYGKANNYCKIKCLKG---GVHTACKY--GSLKPNCGNKVV	54
<i>Solenopsis invicta</i>	MELI-VSILWLAITAENLANTLATNYCNLQCKR--NNAIHTMCOY--TSPTPGMCMLEY	55
Pc80	-MKEIRKKEKQKLLDAHNKYREVTASCKALG-----YOPPAENMLETGWDNYAAQ	86
Pc294	-LKTITTKDKQKLLDAHNRYRNLVASKSP-----ROPPAQNMRVLV-----	78
<i>Triatoma infestans</i>	-IKELSEKDKQKLLDFHNKFRLETAAGEAPAPKGEDGRERROPPAANMLETWHHKAQKQ	92
<i>Triatoma dimidiata</i>	-ELQLTEEEKQALLDAHNRYRETAAGNAHGK-----ROPPAQNMLELTDWDEHAAQ	88
<i>Rhodnius prolixus</i>	-LKNFDEKDKKLLLHEHNQYREKVAAGLAP-----NOPGAENMILLTWNSDAALQ	102
<i>Phlebotomus argentipes</i>	QLMPTITEDTKKFLFHINRRLRDRFARGSMSPE-----FQSAAKPMLKWNDELAKL	108
<i>Phlebotomus duboscqi</i>	EVVNLKSKQKNLFLKIHNRRLRDLAHGSVTP-----FQPAAKPMLKWNDELAKL	106
<i>Lutzomyia longipalpis</i>	EIVKMDKKKQNLVVMHNRLRDRFARGAVPG-----FAPAAPKMLKWNDELAKL	105
<i>Drosophila melanogaster</i>	IASGITAEERSIILQEHNRRLQIVATGRYPG-----QPGAENMREIVWDELAAR	77
<i>Anopheles sinensis</i>	AVIEITPARQTLILNEHNTRRSQALALQQLWP-----FAPAKRMPITLAWDSELAQ	105
<i>Aedes aegypti</i>	-ESLIGSTDKYDILEHNKLRQAVAQGLIPG-----QPGAENMLEMOWDDELARK	54
<i>Apis mellifera</i>	KSDQVSCQDKQLILDEHNSLREKISFGEIQG-----MPSAANMRELTWDELAAM	82
<i>Vespula vulgaris</i>	VSYGLTKQEKQDILKEHNDEROKIARGLETRGN----PGPOPPAKMKNLVWDELAVV	109
<i>Solenopsis invicta</i>	SNVGFDAEKDAIVNKHNLRLRQVAVSCKEMRGT----NGPOPPAVKMPNLTWDELATI	110
Pc80	ASSWANGCQFMHNDPKD-KKNKPMGQNLVYKMSKEEDVNTTFFNIWVD-YMVEGWYNESA	144
Pc294	-----NHVIR-LSG-----FP-----DFIL-----EGK	95
<i>Triatoma infestans</i>	AYKWARTCEWKHNNATD-KAGNSMGQNLGRKMSTEKTDVDDTFDKWSY-DLVRGWDFEAK	150
<i>Triatoma dimidiata</i>	ASSWARTCEFEHNLPTD-KQKQKLGQNLALRRSTRPSKAKVSFGYWMKNYMKVGFDFEAK	147
<i>Rhodnius prolixus</i>	AKAWASGCDFMHNNPESKNTKKPMGQNIYKMSIEKETLEKTFQRYIP-EMVKGWYDEVE	161
<i>Phlebotomus argentipes</i>	AEYNVRTCEFKHDQCRSANICPYAGQNLGQMTSYPDYLDLNYVIKNI TREWFLEYKLAQ	168
<i>Phlebotomus duboscqi</i>	AEYNVRTCKFAHDQCRATKICRYAGQNLGQMSFPEFLNTNIAIKNI TREWFREYKDATQ	166
<i>Lutzomyia longipalpis</i>	AEYNVRTCKFAHDKCRADIVCPYAGQNLGQMSYPTHRDLNLYKLNLTREWFREYRWAKQ	165
<i>Drosophila melanogaster</i>	AQKWADNCQFRHDPRT-INRFTMGQNLAIWSTAPLHAD-DGDFPSR---IQSWFNEVQ	132
<i>Anopheles sinensis</i>	AANNARSCDFEKHDKCRNTAMYKYAGQNLAI SYFYGMSKSVEALIQEGIAGWNEFKD TTQ	165
<i>Aedes aegypti</i>	AQDWADQCIKFKHPKKK-LGRFTMGQNLALIWSSASLDDDRSDFPGR---IRKWFDEVK	110
<i>Apis mellifera</i>	AQNWATKCAEIRDPRH-IRGFYVEQNLKTISSSTQFNDL--PDWRQT---IYNWFNEVQ	136
<i>Vespula vulgaris</i>	AQVWANQCQYGHDTCRD-VAKYQVQNLVALTGSTAAYKDDPVKLVKMWEDVKDYNPK--	166
<i>Solenopsis invicta</i>	AQRWANQCTFEHDACRN-VERFAVGQNLAAATSSSGKNKSTPNEMILLWYNEVKDFDNRWI	169
Pc80	LYIFGSN-FS-----GKTAHYTQLVWATTARTICCGYSYYK-----NNWHVGYLVCNYSP	193
Pc294	LF-----WI-----	99
<i>Triatoma infestans</i>	LYKYGSG-FS-----MSTGHYTOVWVWANTSQVCGYSYYMQIDEYNQKWTGYLVCNYSP	204
<i>Triatoma dimidiata</i>	LYTFGSG-FS-----TATGHYTOVWVWAKSSKLCGYSYYTTYING-RKWYVGYLVCNYNP	200
<i>Rhodnius prolixus</i>	LYNFGDS-FS-----AATGHYTOVWVWNTTKVGCVYSYFKVDN-----GWYSGYLVCNYSP	211
<i>Phlebotomus argentipes</i>	SHTDMFTTSGKNG-KATGHFTAFIHEKSDKVGCAISKVFVNKYK----FKEYLVACNYCY	223
<i>Phlebotomus duboscqi</i>	DNTDMFTSG--RNGRQKIGHFTAFIHEKSDKVGCAVAKFTNNNK----FKEYLIACNYCY	220
<i>Lutzomyia longipalpis</i>	SQLDNYVGGPGKDN-KQIGHFTAFVHEKTDKVGCAIARFTNEHN----FKETLLACNYCY	220
<i>Drosophila melanogaster</i>	KYSFGDA-WS-----PKTGHYSQLVWGETSLVCCGYAEYKDTSK----YNKLYVCNYGP	181
<i>Anopheles sinensis</i>	AQLDKYPNG--YTG-PAIGHFTOMASDQTNRTGCAMQYWKKDYK----WETYLYVCDYAL	218
<i>Aedes aegypti</i>	KYSFGAK-FS-----LATGHYMLIWDATYLVCCGYSYHYSGNK----YNKLYVCNYGP	159
<i>Apis mellifera</i>	YKGG-----ISHYNOIFWANSYLI CGGFTYYFDAGH-----YVKNYVCNYAP	179
<i>Vespula vulgaris</i>	KKFGGND--F-----LKTGHYTOVWVWANTKEVCGGSIKVIQ-----EKWHKHLYVCNYGP	214
<i>Solenopsis invicta</i>	SSFPSDDNIL----MKVGHYTOVWVWAKTTKICCGRIMFKEP----DNWTKHLYVCNYGP	220

Fig. S4

Pc80	AGNIFKENP <small>Y</small> VQGNQN--*CSGYGLDRS-TRYDHL <small>C</small> VKKNKKSQS	235
Pc294	-----	99
<i>Triatoma infestans</i>	AGNFNNREPEI--SKEKCTDPKLESS-KNYKHL <small>C</small> VLKKKKKN	244
<i>Triatoma dimidiata</i>	GGNVKGEVPYKKCKVN--CGAHMLGRS-HNYTNLCIENQGNH	239
<i>Rhodnius prolixus</i>	AGNWyGEAPYKEGSGT--CPGKFLEVASKQYPHLCCKKKKK	250
<i>Phlebotomus argentipes</i>	T-NMMKEKVYTKCQPCSQCQS---KKCDsvYKHLCDASEVIEPIPDILKN-PRNGK	274
<i>Phlebotomus duboscqi</i>	T-NMMKEPIYTKCPPCSQCKN---KKCGTVYKNLCPADEKVDPTPEILKNQPRRG	271
<i>Lutzomyia longipalpis</i>	T-NMMKERIYTGKPCSQCQS---KKCGPVYKNLCPDSEKVDPTPDVLKQ-WKHGK	271
<i>Drosophila melanogaster</i>	GGNVVGYNPYEVGK--PSCSTYGMKPS-SRYQGLCAAPGSSPAANSVYGANTIETYEGY	238
<i>Anopheles sinensis</i>	T-NMIGTAVYKKCPVGSQCTT-GINTS-AGLDGLCNPMEFINPVPN	261
<i>Aedes aegypti</i>	AGNVQGVPIYITC--HPSCEQHGLQKS-STYPGLCAAGAGAGEVDPYHHDNVIPONYYSY	216
<i>Apis mellifera</i>	GDNVDGHLPEYQC--QPA <small>C</small> SNYKMTSS-SRFRGL <small>C</small> SAG	214
<i>Vespula vulgaris</i>	SGNFMNEELYQTK	227
<i>Solenopsis invicta</i>	AGNVLGAPIY <small>E</small> IKK	234
Pc80	-----	235
Pc294	-----	99
<i>Triatoma infestans</i>	-----	244
<i>Triatoma dimidiata</i>	-----	239
<i>Rhodnius prolixus</i>	-----	250
<i>Phlebotomus argentipes</i>	-----	274
<i>Phlebotomus duboscqi</i>	-----	271
<i>Lutzomyia longipalpis</i>	-----	271
<i>Drosophila melanogaster</i>	NSSPSSQTANNNPPTNNINKSQFSYNQPRPKPVQITINPNPSPFNPQA <small>AA</small> VP <small>S</small> ASTFGGSSF	298
<i>Anopheles sinensis</i>	-----	261
<i>Aedes aegypti</i>	QAS-----SNNHENQHYTS---APVRPAYTAP--NHQOSYDNHILYN	253
<i>Apis mellifera</i>	-----TNNYLGTRC	223
<i>Vespula vulgaris</i>	-----	227
<i>Solenopsis invicta</i>	-----	234
Pc80	-----	235
Pc294	-----	99
<i>Triatoma infestans</i>	-----	244
<i>Triatoma dimidiata</i>	-----	239
<i>Rhodnius prolixus</i>	-----	250
<i>Phlebotomus argentipes</i>	-----	274
<i>Phlebotomus duboscqi</i>	-----	271
<i>Lutzomyia longipalpis</i>	-----	271
<i>Drosophila melanogaster</i>	GSASRGGSHAYTTDPSQSAGRYKHKLEAYRPSAAEFESVHKHTILRTYIEQNQQRQDQ	358
<i>Anopheles sinensis</i>	-----	261
<i>Aedes aegypti</i>	-----LVFDQHKQSQQQQQQHHYQPSHPQYP-SSHQOTYHHLPSPASVVTATTN	302
<i>Apis mellifera</i>	-----	223
<i>Vespula vulgaris</i>	-----	227
<i>Solenopsis invicta</i>	-----	234
Pc80	-----	235
Pc294	-----	99
<i>Triatoma infestans</i>	-----	244
<i>Triatoma dimidiata</i>	-----	239
<i>Rhodnius prolixus</i>	-----	250
<i>Phlebotomus argentipes</i>	-----	274
<i>Phlebotomus duboscqi</i>	-----	271
<i>Lutzomyia longipalpis</i>	-----	271
<i>Drosophila melanogaster</i>	QQQQQKEQDQQQQPEPSSTKKPSRGWSLLT-WRG	392
<i>Anopheles sinensis</i>	-----	261
<i>Aedes aegypti</i>	AAANLLKPGNILKSPFLSYR-----WDLLENFLH	331
<i>Apis mellifera</i>	-----	223
<i>Vespula vulgaris</i>	-----	227
<i>Solenopsis invicta</i>	-----	234

Fig. S4 (continued)

B

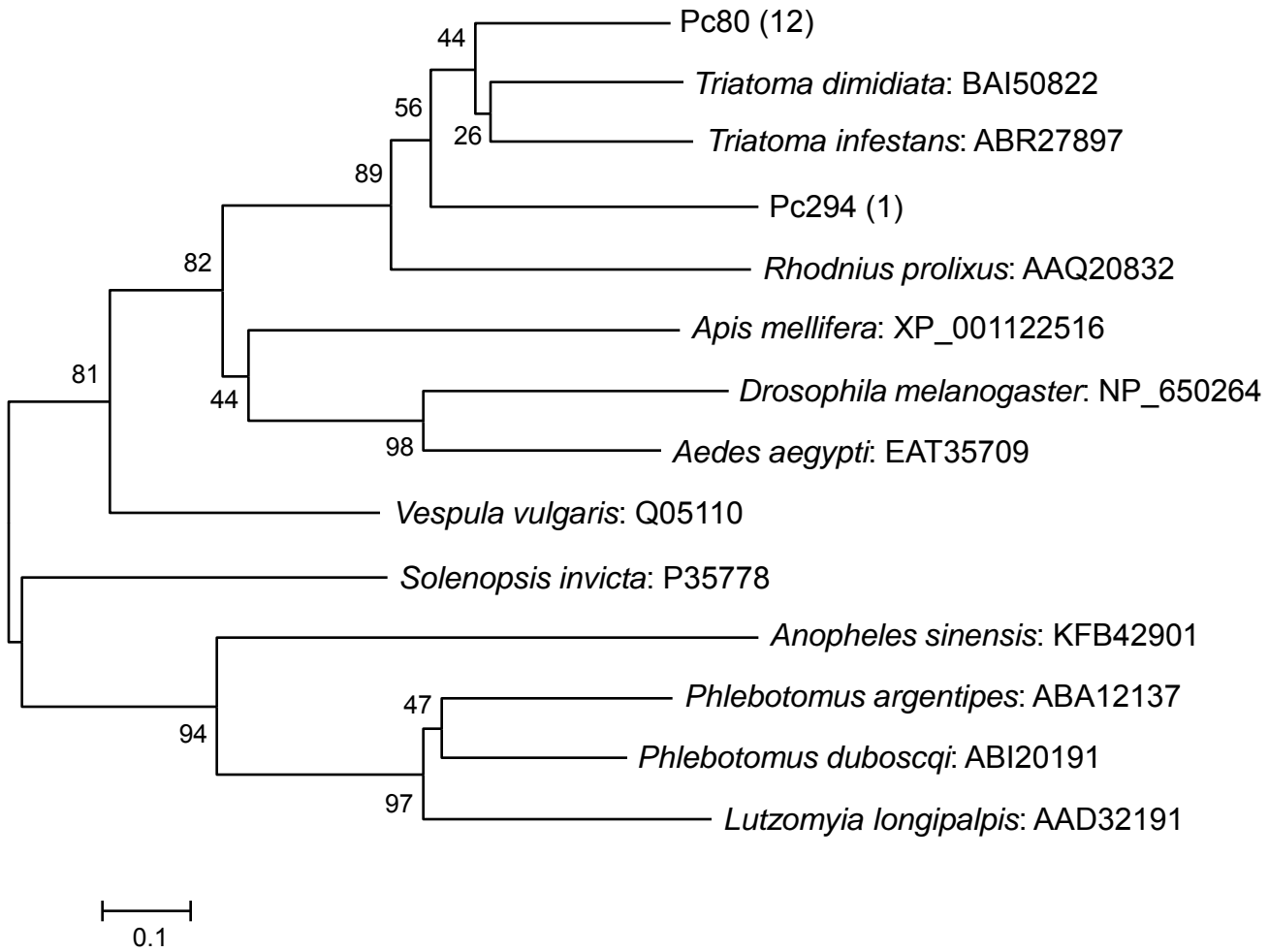


Fig. S4

Pc97	MLTVFLWRIILAFVAAVYQEEKDLLDFSNITSKISLYPHRDVEPTSVEASPEIDSSSEHG	60
Ti trypsin	MNYLYLLIGLVVVVEVP-----HAHTQEGEDDDEDSSEYG	35
Cd protease	MMKWFIL---LVAVVAL-----VQA---DSSEHG	22
* * *		
Pc97	--VTPGKMETNCTCGRANR-GGARIIGGRQFQPFYYPFLALIS-LSTDPERPHCGSTIIS	116
Ti trypsin	NRNVPGDKTINCD CGWANK-EDKRIIGGEETNVNEYPMAGLFYKPK-----LLFCGGSIIIT	92
Cd protease	--VSPGSKGTTACCGWANRSGGSRIVGGTYKANEYPFIVGIATVVGARGYAPFCGGSIIIT	80
* * *		
Pc97	DRHLLTAAHCTS-KAGGNIGLLVTVAVHEIGN---SPKSYTVEVERLIQHENYNERNLLN	172
Ti trypsin	QYHLLTAAHCTQPFEEVDRIQIVSGEHDQDKVDESSSTVYIDVLNFPHEGYYLIGHRRH	152
Cd protease	ANHVI TAAHCTDDI IKARTRTAVLLGSHDRSRP--SSTAVTINVERINQHEKYNANTIAN	138
* * *		
Pc97	DISLLYLKNPLQLTEVVS PACMPLPGMSVIGKYVRVIGWGATEAYGPMTVLPQKVDLEVI	232
Ti trypsin	DIAIILLKDKIVYTNIVGPACMPTEPIDMIGHKIKVLGWGKLSANGPSSKVLMKVYLNVV	212
Cd protease	DISILTLASSINFNKLIGPVCLPLPGLDVSQOTVRVIGWGAERFOCAMTMRPKKLDTTAV	198
* * *		
Pc97	STEKCHEYWQLQVATDPVTQICRMWENKSACHGDSGGPVVWLDPDTNRYTSVGI VSFGLP	292
Ti trypsin	PLEECNNTHEYIGLVE-RRQICTYHPTKDS COGDSGGPLLWLDREINRYVLAAVTSYGLS	271
Cd protease	SPAQCAA IWRGLVSATNPTQVCTLSKKETACOGDSGGPVVWRDPQTNRYTLIGLVSF GAA	258
* * *		
Pc97	CKSSVFNMDTSVVSYPWIMKGI EATTPGRKLC TKIVN	330
Ti trypsin	CATDVEGVNTNISYYPWIKVVAETRPEAPICTKQN-	308
Cd protease	CTDEKPTVNT RVAAYLPWIKQOIAATKPAG-VCTKA--	258

Pc237	MK F VT V IA V VC Y LF V AT N SL T TP S SR S DS L EV L E K CS N EN N IS L LI A DK L V K H T K P V S N	60
Td76	MR I VT V IA V VC Y LF V V N NC L TP S SP G T A S L EV L E K CS E NN V Q P LI A DK L V K H T Q A V S N	60
Pc237	R D E K CL L SC F L K ER G Y Y V N GE I D T E K IL O Y L K T IL S D E K Y K R LE G T F K T CV S K V D K N K D T	120
Td76	K N E K CL L SC F LE G ME F Y V N G E I K T D K IL O Y L K T IL S D E K Y K N FE G T F K T CV S K V N K T -D E	119
Pc237	CE I AN D V H L C A E PS --	134
Td76	CK L AN E V H SC V D V E Q S	135