

C GH18 chitinase-like superfamily protein (predicted Imaginal disc growth factor (Idgf)-like protein)

VLP
A.aegypti
C.inanitus
M.sexta
M.demolitor
N.vitripennis

1 1 1 1 1 1

MKLFIVSSLAIWLLLAHLNNEVSAVDPHEHNKVVICYWNSTSFERQGPGLKFIVEDLRPAL
 MWFFKVGALLFLAAL.....VSAANNATTGPKVICCYDGMQSLREGLGKITVTDIELPAL
 MKQFIQIIFLGLAIRLGG.....ISADQTSNPDKFCYWNSSSFIKSGPAKVNVMDLKLPAL
 MKILIALAGV.L.AV.....AVATPASVPRKVICCYDSKSYVRESQARMLPMDIDPAL
 MKVLLAVIA.ALTVSL.....GALDPHEHNKVVICYWNSTSFERPQGPGLKFIQIDDLKLPAL
 MKLLISTAVAVVLLVLCV..NSAFGVDPHEHSKVVICYWNAVTSFERAGPGLKFIQVDLDRPAL

1 5 10 15 20 25 30 35 40 45 50 55 60

VLP
A.aegypti
C.inanitus
M.sexta
M.demolitor
N.vitripennis

60 54 56 52 54 58

SLCTHLIYGFAGIDANSFDVVP LNPNLDTGAGYAFYRLVTQMKRNFPDLKVVYLGIGGNAD
 PFCCTHLIYGFAGVNPETYRLKALDESELDSDGKGQYRLATTLLKRRYPNLKVVLLSVGGYKD
 SLCTHLIYNSAGINSKNYEVVSLKPKIETDSSRGLYRDIVDLKKCFPTLKIYLGIGGGVD
 SFCCTHLIYGFAGIQPDTYKVP LNENLDVDRAHANYRAITNFKTKYYPGLKVVLLSVGGDAD
 PFCCTHLIYGFAGIDANSFEAIP LHPNLDTGAGYAFYRIVTQLRQTYPHLKVVYLSIGGNAD
 SLCTHLIYGFAGINAANFEVVP LNPNLDTGAGYGFYRLVTQLRQFPELKVYVLSIGGNAD

65 70 75 80 85 90 95 100 105 110 115 120

VLP
A.aegypti
C.inanitus
M.sexta
M.demolitor
N.vitripennis

120 114 116 112 114 118

PYE...THKYLTLTETSEARTKFINSVGRLLSDYEFDGDVLEWQFPEVKVKKERGTFGSFF
 LTEKPPFKYLTLLEESAGSRRTAFVNSVYSTLKTYYDFDGLDLAWQFPQTKPKIRGWTCKV
 PDSN..YEKYLSSLVEKSQTRNKFITSVVKFATDFNFDGDVLAWQFPVPESSKSENSLTS
 T.EEA..QKYNLLLESPOARTAFVNSGVLLAEQHGFDGIDLAWQFPRIKPKVRSSTWGS
 PDY...THKYLTLTETPETRTFRINSMRLVNEYDFDGDIDLAWQFPEVKVKKHRSTLGNV
 PYE...THKYLTVTETSEARNKFVRSVDRLLQDYDFDGDVLAWQFPVVKVKKNRGTFGSL

125 130 135 140 145 150 155 160 165 170 175 180

VLP
A.aegypti
C.inanitus
M.sexta
M.demolitor
N.vitripennis

178 174 174 169 172 176

.WHKVKKTFGYGKFKDEKKEEHRNGFTALVVRDLKNO LRA..NKALTLTVLPHVNSVYYD
 .WHGFKKLFITGDSVLDKPADEHRKEEFTALVVRDLKNA LVD..NFKALTLTVLPHVNESIFMD
 LVNYAKSWIGRGAFKDEKVAEHRKCFNSLVVDLNSLKKQK..NKALTLTVLPHVNV TAYD
 .WHGKKTTFGTTP.VDDKEAEHRKEEFTALVRELKQALNVKPNMQLA TVLPHVNA SIYYD
 .WHNKKAFGGGKFKDEKKEEHRNGFTINLVVRDLKVQLRSR..NKALTLTVLPHVNA TIYYD
 .WHGKKTTFGYGKFKDEKEEQHRDGF TIVVRDLKTQLRAK..NKALTLTVLPHINS SIYYD

185 190 195 200 205 210 215 220 225 230 235 240

VLP
A.aegypti
C.inanitus
M.sexta
M.demolitor
N.vitripennis

236 232 233 227 230 234

VRL LAP NLD AV H L M T F D Q K T P E R N P K E A D F P A P I Y E S Y G R V T D D N V D Y Q T R A W L E N G M P F G
 V P L L K D N I D Y N L A S F D Q Q T P E R N P K E G D Y T A P I Y E P S E R V E G N N V D A E A S Y W . . Q G T P A
 P E I L A Q S L D A I H L M A F N K A T P D V N P E T A D Y P A P I Y G R D N . F K T Q C H N D V R Y W T N O K T P K
 V P A I I N L V D I V N I E A Y D Y F T P E R N P K E A D Y V S P I Y T P Q N R N P L Q N V A A I N Y W L Q S N A P S
 A R L L A P N I E A V H L M A F D Q V T P E R N P K E A D Y P A P I Y E S Y N R V P Q D N I D A A V R Y W L E H G T P G
 A R L L T P N L E A I H V F A F D Q S N P E R T P K A D Y P A P I Y E S Y G R E D T D N V D S Q T R Y W L E N G T P G

245 250 255 260 265 270 275 280 285 290 295 300

VLP
A.aegypti
C.inanitus
M.sexta
M.demolitor
N.vitripennis

296 290 292 287 290 294

S K I V I G I E T F G R T W K L T K E S . . E V S G V P P I H A E G P G T E G P H S H I P G V L G Y A E T C S R I L E S
 G K I V I G I E T Y G R G W K L V E K S . . G I T G V P P I P A D G P S I P G P H S G I N G F Y S W A E V C A K L I P N P
 E K N V I G I E T H A F T W K L G K S D L R F N S G V P P I A A N G P G A E G V V S S I P G F L S Y A E V C N R L N D K
 N K L V L G I A S Y S R T W K L D S E S . . E I S G V P P I H T D G A G E A G P Y T K I E G L L S Y P E V C A K L I N P
 G K I V I G I E A F A R T W K L T S E S . . Q I S G V P P I V A D G P G A E G P H T A T P G I L A Y G E V C T R L T E S
 G K I V V G I E A F A R T W K L T A D S . . E A A G V P P V T A D G P G A E G P H T G I A G L L S Y A E V C S R L T E H

305 310 315 320 325 330 335 340 345 350 355 360

VLP
A.aegypti
C.inanitus
M.sexta
M.demolitor
N.vitripennis

354 348 352 345 348 352

A.....VDR LRRVGD...PSKKYGSYAYKKYNDQTSEEGIWVGYEDVDTAGNKALYAK
 GNANLQGADQP LKKIGD...PTRRFYAFRIP.DENEEHGIWVGYEDVDTAGNKAAVYK
 S.....SSLIKVVDYLNKNSYGSYAYRLYNPKTQEDGIWVGYESYISAEKALYAK
 NHQ...KGM RPH LRRVTD...PSKRFCTYAFRLP.DDSEGGMVSYEDPDTAGQKASYVT
 H.....VGR LRRVGD...PSKKYGSYAYQSYNPE TGV DGIWVGYEDRDTAGNKASYK
 A.....VGR LRRVND...PSKKYGAAYQPYNSGTGT DGIWVGFEDPETAGNKALYAK

365 370 375 380 385 390 395 400 405 410 415 420

VLP
A.aegypti
C.inanitus
M.sexta
M.demolitor
N.vitripennis

404 404 404 399 398 402

A KGLGGVAIFELSLDDFRGICNDGDKFPIVRAAKFKL.
 A KGLGGISTFDLGNDDVARGACAGDKFPIVRAAKYRL.
 NNGLGGVAIWDLSNDDVHGTC DGNRFPITSAAKFKLA
 SKN LGGI SINDLSMDDFRGLCTGDKYPIVRAAKYRL.
 A KGLGGVAIWDLS TDDFRGICAGDKFPIVHAAKDKL.
 A KGLGGVAIYDLSLDDFRGVCNDGDKFPIVKGAKFKL.

425 430 435 440 445 450 455

E *Lh* VLP Bap31-like protein

VLP	1	MSLQWTLIASFLYTEIFIVLLLVLPVASEPRWQKLFKSRFLQSLSNQASMYFLVLLAIVL
<i>M. demolitor</i>	1	MSLQWTLIASFLYAEIFIVLLLVLPVASEKRWQSLFKSRFLQSLSNQASFYFVLLAIVL
<i>C. floridans</i>	1	MSIQWTLIAGFLYAEIAVLLLVLPPIASEPTRWQKLFKSRFLQSLSNQASIFYVLLGTLV
<i>S. invicta</i>	1	MSLQWTLIAGFLYTEIAIVLLLVLPVASEPTRWQKLFKSRFLQSLINQASIFYVLLGVL
<i>N. vitripennis</i>	1	MSLQWTLIATFLYAEIAVLLLVLPPIASEQRWQRFFKSRFLQSLSAQASMYFLVLLAIVL
<i>D. mojavensis</i>	1	MSLVWTLIAGFLYTEIAVLLLVLPVGLISEYKWNRFKSKFLAMLAQAQAHLYFLLIMGLV

1 5 10 15 20 25 30 35 40 45 50 55 60

VLP	61	LFLLDAIREMRKYSN.MEGGEHAHAHLDAEMQGNMRTFRAQRNFYISGFATFLSLVIRRL
<i>M. demolitor</i>	61	LFLLDAIREMRKYSK.LEHTE..HGHLD AEMQGNMRTFRAQRNFYISGFATFLSLVIRRL
<i>C. floridans</i>	61	LFLLDAIREMRKYSK.TDHTD.VHPSLNLELQENMRTFRAQRNFYISGFATFLSLVIRRL
<i>S. invicta</i>	61	LFLLDAIREMRKYS.SLDHTD.R.HQLNLELQENMRTFRAQRNFYISGFATFLSLVIRRL
<i>N. vitripennis</i>	61	LFLLDAIREMRKYS.S.HEVTEHAHSHLDTEMQGNMRTFRAQRNFYISGFATFLSLVIRRL
<i>D. mojavensis</i>	61	LFLLDAIREMRKYSN.TDNSG..EVHLNVEMQHSMRTFRAQRNFYISGFATFLVIVIRKL

65 70 75 80 85 90 95 100 105 110 115 120

VLP	120	VL LIS TOASLLAQSEAA MRQAESATT TARTLLSQQTT GESAQNESNEAYDKAVSELK TQT
<i>M. demolitor</i>	118	VI LIS TOATLLAQSEAA LRQAQSATT TAKSLLSQQK..GETAQNDSNEAHDKLVTDLKSQV
<i>C. floridans</i>	119	VI LIS TOATLLAQNEAAMRQAQSATT TARSLLSQQRTI GESAQNDSNEAHDKQVSELKQKI
<i>S. invicta</i>	119	VN LIS AQASLLAQNEAAMRQAQSATT TARSLLSQQRTI GESLQNDSNEAHDKAVSELKSQI
<i>N. vitripennis</i>	120	VT LIS AQATLLAQSEAS MKQAQSATS AARNLLQKS..GESAQNDTNEVHDKAVTELKAKL
<i>D. mojavensis</i>	118	VQ LIS TOANLLAQSEAS MKQAQSATAA ARSLMTEK..TDKAKEATEDSTLNE LNKLIKER.

125 130 135 140 145 150 155 160 165 170 175 180

VLP	180	KELEIKNT ELES E L T REKKDK SAVKSQADSLAKEYDRLTNEHESKLLQQT.....GSDK
<i>M. demolitor</i>	176	SELSQKNT ELEN E L K REKKDK DALKSQAESLAKEYDRLTNEHAKLVKA.....EGGDK
<i>C. floridans</i>	179	KELQVKNL ELEN L V K REKKDK EAIKSQADSLAKEYDRLTNEHAKLIQS.....SSDK
<i>S. invicta</i>	179	KELQAKNQ DLES N L T REKKDK EAIKSQAESLTKEYDRLTNEHAKLLQS.....SDK
<i>N. vitripennis</i>	178	K..... ELES E L E KEKKDK AAVKSQAESLAKEYDRLTNEHESKLLSA.....GGDK
<i>D. mojavensis</i>	175VQ ELTS E I N REKKDK EAVKSQAESLN REYDRLTNEEY SKLQKQITIGGGAKGAS I

185 190 195 200 205 210 215 220 225 230 235 240

VLP	232	KSD
<i>M. demolitor</i>	229	KSD
<i>C. floridans</i>	231	KSD
<i>S. invicta</i>	230	KTD
<i>N. vitripennis</i>	223	KSD
<i>D. mojavensis</i>	229	KDD

F *Lh* VLP knottin-like protein

VLP	1	MASLKV.LP.LL L A T I I M F . L . A P A I . N A R C S P N G T P C Q P D G R T . P C C T G F C Y . . K Q V G W
<i>N. lecontei</i>	1	MAISMRKILMS L F V . V A V I L A . F I G . T A D A C I R N R D G C Q P D G S Q G N C C S G Y C H . . K E P G W
<i>T. pretiosum</i>	1	MASFKSCIIIFV L F A L V A V I M M . M A P . S A M A C I G N G H C Q P D G S M G N C C S G N C Y . . K Q Q G W
<i>B. tabaci</i>	1	MHKYLAWF... I F A . V A T L W M I A G S M A Q G N C I P D G A P C Q A D G S M G N C C T T F C L Q H E Q P G G
<i>B. hygida</i>	1	MRMSIKCFA.V I F V A F A F F . L . G Q I S R A E A C I P D G R C H E S D P G P G C C S G F C Y . . R E R N W
<i>M. crystallinum</i>	1	MAKVSSLLKFA I V L I I V L S M . S A I I . S A K C I K N G K G C R E D Q G P B F C C S G F C Y . . R Q V G W

1 5 10 15 20 25 30 35 40 45 50 55 60

VLP	53	RRGVCSI R.
<i>N. lecontei</i>	56	VAGYCRS R.
<i>T. pretiosum</i>	57	AMGDCR... .
<i>B. tabaci</i>	57	TPGHCTTR S
<i>B. hygida</i>	56	KDGD CRKR P
<i>M. crystallinum</i>	57	AR EY CKN R.

65

