

Appendix A The protein sequences of VvSCPL genes in *Vitis Vinifera* (TXT).

>VvSCPL1

MMQGSQKMNIQGYTVGNPITNHFSDFNRIAYTHQVIGILSYELYEVI IPLTHSGLILNRI

>VvSCPL2

MLVDTATLPIPI SHNSTSLLFLLLHGKPLLSLVEREQGTRRNWLACLIRKQTELLNLLRKAKMQGNSGIDTSLFEVNEIE
SEAESYKILPQKGMKEKDRIERLPGQPHVGFSSQYGGYVTIDESKGEALYYYFVEAPTSKEYLPLLLWLNNGPGCSSLGAG
AMAELGPFVRVHSDGKTLYRNRFANWKAANVLFLETSPGVGFSYSNISYNYRGDRKTAGANYAFLVNWLERFPEYKKRDFY
IAGESYAGHFVQLAHVILHHNKKANRTIINLKGITIGNAAIHDETDWLGMYQYFGSHALVSPRTTRQIEKHCDSPGVT
NQNKECNAAFEEDPNIANIGIYNIYGPVCLDTNLTAKPKKVTPLQFDPCSYDYVHAYLNRDPVQEAFFHANVTKLYDWE
ICNNVVYNWTDSAWSIITLLHEFMENGLRVVWVSGDVGDRVPVSTLASLAKMRLTVKTPWHPWFLHGEVGGYTEVYKGD
LTFATVRGAGHQVPSFQPRRALSFI IHFLAGTPLPN

>VvSCPL3

MKQIEALDILQKAKLHGNSGIDTNLFEVNEVENGAETESHKIHPQEGLKEKDRIDMLPGQPHVGFSSQYGGYVTIDESKGG
ALYYYFAEAPLSKKSPLLLWLNNGPGCSSLAYGAMQELGPFVRVHSEGKTLYRNQYAWNKVANVLFLESPAGVGFSSYSNT
TSDYRNGGDRKTAKDNYAFLVNWLERFPEYKKRDFYISGESYAGHYVPQLAHTILHHNKKADGPIINLKGIIIGNAVIND
ETDELGMYQYFGSHALVSEKTIHQMEKHCFSPGAASQSKECTKASDEVDDNIDVIDIYNIYAPLCFNTLTVKPKKVT
EFDPCSDYVVYAYLNRADVQKALHANVTKLYDWEPCSDVIQNWTDSPSTIIPLLHEFMENGLRVVWVSGDTDGRVPVTS
TMAIDTMKLSVKTPWHPWFVAGEVGGYTEVYKGD LTFATVRGAGHQVPSFRPKRALSISHFLSGTPLPRLFFLIFSS
FVEQSHGRVRKQTELLKLLQKAKMQGNSGIDTSLFEVNEIKSEAESYKILPQKGMKEKDRIERLPGQPHVGFSSQYGGYVT
IDESKGEAFYYYFVEAPTSRESPLLLWFNGPGCSSLAYGAMQELGPFVRVHSDGKTLYRNQYAWNKVANVLFLESPAGV
GFSSYSNTSDNQSGGDRKTANENYAFLVNWLERFPEYKKRDFYISGESYAGHYVPQLAHTILHHNKKANGPIINLKGII
IGNAVIDDEADDIGRYQLGSHALVSEKTIHQMEKHCFSPGATSQSKECTEAVDEVHNSIDVIDIYNIYSPLCFNTILTA
KPKKVTPEFDPCSDYVVSAYLNRADVQKALHANVTKLYEWRPCSDIDKNWTDSPSTIIPLLREFMANGLRVVWVSGDTD
GDVPVSTMASIGKMLSVKTPWHPWFVAGEVGGYTEVYKGD LTFATVRGAGHQVPSFRPKRALSIVHFLSGTPLPKPS
SKH

>VvSCPL4

MIVPFIILFIIITPPFQKLFQGYLLGNPATDSQFDNNPKIRFAHCIALISDELVEAIGVTAGNNRDMEKVQQGLTLHKRYP
NYCRL

>VvSCPL5

MLFSFVLTEAAPQTALVTKLPGFNGTFPSKHYSYVTIDENHGKCLFYVMVSENPNSEDPVVLWLNNGPGCSSFDGFVY
EHGPFNFEARTQGDLPQLHLNPYSWSKLSNIYLDSPAGVGFSSYSENLDYRTGDLKTASDSHAFILKWFELYPEFLSNP
FYIAGESYAGVYVPTLAYEVVKGKGGIKPILNFKGYMVGNGVTDEEFDGNALVPFAHGMGLISDELFDQISNLCCQGNYY
NSLDENCESKLSKVDKIDIEGLNIYDILEPCYHEKSPETSLGNIRLPSSFQKLGETDRPFAVRKRMFGRAWPLRAPVREG
VPTWPQLLNSGSPCTDDEVATSWLNNKAVREAIHAALESVAGKWELCTDRILYHHDAGSMIKYHKNLTSNGYRALIFSG
DHDMCVPYTGSAWTRSVGYKVVDWRPWFDEQVAGYVQGYENNLFTLTVKGSHTVPEYKPREALAFYSRWLTGRPI

>VvSCPL6

MSSLRWKAMIAVTLTLLCFSREVESSLSLSDKILELPGQPVGFQYSGYVAVDEKQQRALFYFFAEAEETDPAIKPLVL
WLNNGPGCSSLGVGAFSENGPFRPSGELLVRNEYSWNREANMLYLETPIGVGFSSYSTDSSSYAAVNDKITARDNLVFLQK
WLLKFPQYKNRDLFITGESYAGHYVPQLAELMLQFNKKEKLFNLKGIAGLGNPVLEFATDLNSRAEFFWVSHGLISDSTYKM
FTSFCNYSRYVSEYRGSVSSICSRVMSQVGRETSRFVDKYDVTLDVCISSVLSQSKVLSPPQVTETIDVCVEDETESYL
NRRDVQKALHARLVGNKWSVCSNILDYELLDLEIPTISIVGKLIKAGIPVLVYSGDQDSVIPLTGSRTL VHGLAEELGL
NTTVPYRVWFEGKQVGGWTQVYGNILSFATIRGASHEAPFSQPERSLVLFRAFLGGRPLPQAF

>VvSCPL7

MTSRVYRESRWSIGQYKVNLMVLCVMVFLTFLALVSFVSMPEVMADRHSRQWTNDKGLNSLGNEDLVTDLPQPVAVDFR
HYAGYVTVNEENGRALFYWFYEATTQPNKPLVLWLNNGGPGCSSVGYGATQEI GPFIVD TDGHGLKFNYPYSWNREANMLF
LESPVGVGFSYSNTTSDYEKLGDDFTANDNYAFLHKWFLKFPYSYRKRIFYIAGESYAGKYVPELAEVIYDKNKDPSLFD
LRGILLGNPETCDADDWRGLVDYAWSHAVVSDETHKI IRENCDFYSEDPWSNDNCSDAVGEVLDQYKRIDIYSLYTSVCT
KTSKRSDDNSMQVLFKRTSRMMPRIMGGYDPCDDYAKAFYNRADVQKALHVS DGHVKNWSICNADIFGNWSQSQPSVL
PIYRKLIAAGLRIWVYSGD TDGRVPV LSTRYCLSTLKLPI TRAWRPWYHQQVSGWVFEYKGLTFATFRGAGHAVPVFKP
SESLAFFSAFLQGESPPCQSQ

>VvSCPL8

MDSL TWKTI PMVSVVFLCFL LKAHPSLSHPDKI IQLPGQPQVGFQQFSGYVSLDDKKQRALFYFVEAESDPASKPLVL
WLNNGGPGCSSLGVGAFSENGPFRPNGEFLLRNEYSWNREANMLYLETPVGVGFSYSSDTPYVTVDDKITARDNLAF LQRW
FLKFPQYKHRDLFITGESYAGHYVPQLAELMIRFNKKEKLFNLKGIALGNPVLEFATDLNSRAEYFWSHGLISDSTYRLF
TSACNYSRYVSEYYRDSVSSVCSRMAQVSRETSKFDKYDVTLDVCLSSVLSQSKVISPQQVAETIDVCIDDKTVNYLN
RKDVQKALHARLVGIRSWTVCS DILDYELLNLEIPTISIVGSLIKAGIPVLVYSGDQDSVIPLTGSR TLVHNLAKELGLN
TTVPYRVWFEKGQVGGWTRVYGNILSFATIRGASHEAPFSQPERSLVLFKSFLEARPLPEFF

>VvSCPL9

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TGYYVGVGESEEVQLFYFVFKSENNPTEDPLLLWLTGGPGCSAFSALFYEIGPLYFESVPYHGSLPTLELNPHSWTQVSN
IFLDAPVGTGFSYATTSRASHSGDFQATHQAHEFLRKWLIDHPEFLSNPVYVGGDSYSGITVPVVVQHISNGNEDDTEPF
INLKGYLLGNPVTEQGTETTAQFRFAHGMALISDELYESLKTSCGDEYPFKYPINIQC IKDVQAFYKCSIGIQFGQILEP
VCGFGSLKPEDIFLSGRRYLIGKLRERRPEPSLSAFECRTDGYILAPYWANNATVQEALHIRKNTIREWQRCAMGLSYTP
EIESSFEYHVTLSKKGYRSLIYSGDHMIVPFFSTQAWIRSLNYSIVDDWRSWMVEGQVGGYTRTYSNQMTFATVKGGGH
TAPEYRPKECFGM YKRWVSGQPLQ

>VvSCPL10

MIMNWGKISLKVVSSEKMANIALNIWFSLCCLVGLVQCCGGRGFNPIGKLIREGLSKGRLSDEWTWTSFPLNTTSKFPLD
GLKESHKIESLPGQPNGVDFDQFSGYVTVDSL AGRALFYFVESPQNSTTKPLVLWLNNGGPGCSSFGIGAMMELGPFRVN
KDGETLYLNKHAWNKEANIIFLESPAGVGFYSYSDTASDYNSSGDYRTASDSYIFLLSWLEIFPEYKTRDFFIAGEGYAGH
YVPQLAQTILLFNSIPDLPIINLRGIAMGNPYVDRETA FKIVDYWYSHALISDEIYMELILNCNVSSEESASEECIAWL
LQADNAMGNINVDIYAPLCNSSADSNSVSAFDPCSGNYIHAYLNIPVQVEALHANVTGLPCPWEFCRQCHPTKCNIIYSS
NYAAQHSGADEQRNTSVDIQARDLNQNEFEVLWILTKSNLICSGD TDGVVPVTSRYPFKKGLVTRTPWHPWYTHGEVG
GYAVEYQNLTFVTVRSGGHFVPSYQPARSLQLFCSFLNGTLGASLPRPNMKVAPL TWLLPLLLCYQLALLLPYSGATE
NLYRLINSRRSANPPRSELWDEL DGRDGNASPLYIGPQDGLMQDDKIESLPGQPEGVNFQYAGYVTVDPKAGRALFYF
VESPEDSSTKPLVLWLNNGGPGCSSLGYGAMEELGPFRVNPDKTLFRNEYAWNVSNIIFLESPAGVGFYSYNTSSDYVN
VGDKKTAEDSYTFLINWLERFPQYKTRDFFITGESYSGHYVPQLAYTILSNNKTNQTVINLKGIAIGNAWIDDNTSLKG
IYDYI WTHALSSDESNAIQKYCDFTTGNFSTKCLDYTYQAEGEVGNIDIYNIYAPLCHSSGPTSRVSGVND FDCSDY
YVESYLNLAEVQKALHARNTTWGACSGVGTDSPTTILPTIKQLMASGISVWIYSGD TDGRVPVTSRYSINTFKLPVKT
AWRPWYYNKEVGGYVVEYKGVVFATVRGAGHLVPSYQPRALTMIA SFLQGTLP PPS

>VvSCPL11

MGRWWFALFGVVLVLSVNGYPEEDLVVRLPGQPEVGRFQFAGYVDVDVKAGRSLFYFVEAEEDDPDTKALTLWLNNGGPG
CSSMGGGAFTELGPFFPSGDGRGLRRNSKSWNKASNL FVESPAGVGSYSNTTSDYTCGDASTARDMRVFMKWKLEKFP
AFKSRALFLTGESYAGHYIPQLAVALLDYNSHSTGFKFNKGV AIGNPLRLDRSAATYEFFWSHGMI SDEIGLITITKE
CDFDDYVYASPHNVFSCNQALSEANSIVGEYINNDVILDVCYPAIVEQELRLRRMATKMSV GIDVCMYERSFYFNLP
EVQKALHANRTGLN YRWTMCSGVLNYSETDGNIDILPLLKRIVQNSIPVWVFSGDQDSV PLLGSRTLIRELAQEMKFKI
TVPFGAWFHKGQVGGWATEYGNLLTFATVRGAHMVPYAQPSRALHLFSSFVRGRRLPNTTRPSIDDQ

>VvSCPL12

MASGFILEVISLFLFFLYFKSFAELITSLPGQPANVSFKQYAGYIVTDARHGRALFYFVEAKTADPLSRPLTLWFNGGP
GCSSLGFGAFMENGPFQPGENGILVKNKHSWNLESNMLYVESPIGVGFSYSNTSSDYFWDTRTAEDNLRFINWLEEF
NYKSELFLTGESYAGHYIPQLAALIVEYNQKPNIRPIKLSIALGNPLLDLDSVLAADYLWAHGAISDHTLMLEKTV
NYSKFLREYIHGQLSEGCNNVYNRVNEIGNDVRQDLLLLPICLSSNSAQQFKLKGQRGTIHAARIARRTRETIPDPCLSD
RILTYLNNPQVQKALHANTHLPYHWGFCAGPLEYQIDNLDMNLIPLIEHLIKEGIPILLFSGDQDAIIPLTQTRIIANN
VAKDLKLVPFTEYGTWYDKKQVGGWTQSFGLREGKNVTLTFATVRGAAHEVPFTSPSQALTMFKSFLSGSPLPRPHE
>VvSCPL13

MIKETLLLINLHASSNSNIKDQYFINKDVVYIYIYKALFSRTRKVQKSSVFQQEPFYPYNTIKVTLILYLVMALGFLEA
ISFFLFQLYSKSFAELITALPGQPANVSFKQYSGYIATDDQHGRALFYFVEAETAHPLSRPLTLWLNGGPGCSSLGFGA
FMENGPFQPGENGILVKNKHSWNIESNMLYVESPIGVGFSYSNTSSNYFWDTRTAEDNLRFINVWFEEFPYKSELFL
TGESYAGHYIPQLAALLVEYNKRPNIRPIKKAIALGNPLLDLDSVLAGDYLWSHGAISDHTLLEKTVCNDSKYLREY
YHGQLSKECKDVFNRLDEISGDVEKGDLLMPKCLSSNSAQQFRLKGLQGIYAEIDRRTRGTIPDPCLPDRIFTYLN
NPQVQKALHANTHLPYVWDFCSGPLVYQVDNLDMDLLPLIAYLLEQNIIRILLYSGDQDAKVPLTQTRLITNNLAKDLK
LVPFKYGTWYDKEVGGWSQSFGLRDLGMNLTLLTFATVRGAAHEVPFTSPSQALTLFKSFLSGSPPRLPHE
>VvSCPL14

MWCYRIKSRNIDLLVGGYILFLLSLNYLKLNQGHRLRIVMAMESITSNLIKLLLLLLLYFLPCFHAKSPPTSTLPLPTKS
GYLPVNPTTNSAMFYTFYDAQNPISPLTQTPLVIWLQGGPGCSSMIGNFLELGPWRLNCDKHLQLEPNLGAWNRI
FGLLLFDNPIGTGFSIASSPKEIPTDQYSVAKHLFFAIRSFIELDPLFKRSRIYITGESYAGKYVPAIGYI
LKKNAQLQVATHAASAYFSGLINGKQKTQLEKAQLEAVNHVVVSGAGHLVPADQSVNSQIMIEDWVLERGLFANEQ
EANPSSSSTGNETKNLSERAQFEVIRLTEGNWREATNPRYRAMYSQAMIEVWVLERGLFANEQESNYSCFLFCFFGT
SSCMTNQ>VvSCPL15

MESTTNSNLIKLLLLLYFLPCFHTKSPASTLPLPTKSGYLPVNPTTNSAMFYTFYEAQNPISPLTQTPLVIWLQGGPGC
SSMIGNFLELGPWRLNRDKHLQLEPNLGAWNRIFGLLLFDNPVGTGFSVASSPKEIPTDQYSVAKHLFFAIRS
FIELDPLFKRSRIYITGESYAGKYVPAIGYHILKKSRLPESQRVNLRGVAIGNGLTDPVRQVATHAATLYDLTRK
VPYELELVGDHVVVSGAGHLVPADQPVNSQIMIEDWVLERGLFGNEQERNQ>VvSCPL16

MVSMASLNCNLLIFCLVLQAMAAAAASVAGAEELQQEKDRVKDLPGQPAVEFRHYAGYVKLRPQDEKALFYWFF
EAQGGVLEKPLVLWLNGGPGCSSIAYGAAQELGPFLVRSNGTQLILNDFSWNKVANILFLEAPVGVGFSYTNKST
DLLKLGDRIT AEDSHAFLVQWFKRFPFKSHDFYITGESYAGHYVPLAELIYERNRSTKDSYINLKGFMI
GNAVINDETTDDMGLIEFAWSHAIISDQLYHGIIKECDFIRDNPTNLCSNHIKGLLEAYSIDMYSIYTPVCL
SSSKETYRKFVTAPRLFTQHDLWHQLPSGYDPCTEDYAEKYFNREDVQKALHANVTKLPYPYTPCSNVIRK
WNSAETMLPTIQKLLKAGLRIWVYCGDTDGRVPTSTRYSINKMGLRIQKQWRAWFHRKQVAGVWV
TYEGGLTLATVRGAGHQVPI LAPAQSLALFSHFLSAANLPSSRAQ>VvSCPL17

MASSLCNWLIFCLVLQAMTAAASVAGAEELQQEKDRVKDLPGQPAVEFRHYAGYVKLRPQDEKALFYWFF
EAQGGVLEKPLVLWLNGGPGCSSIAYGAAQELGPFLVRSNGTKLILNDFSWNKVANILFLEAPVGVGFSYTNK
SSDLLKLGDRIT AEDSHAFLVQWFKRFPKSLKTHDFYITGESYAGHYVPLAELIYERNRSTKDFYINLKGF
MIGNAVINDETTDDMGLIEFAWSHAIISDQIYHGIMKNCDFKSGNLTNLCIKYVEGFFAYLDIDVYSIYTP
VCLSSSKETYRKLVTAPRLFAQHDLWHQLPSGYDPCTEDYAEKYFNREDVQKALHANVTKLPYPYTTCSK
VIRRWNDSPTVLPTIQKLLKAGLRIWVYSGDTDGRVPTSTRYSINKMGLRIQKQWRAWFDRKQVAGVWV
TYEGGLTLATVRGAGHQVPI LAPAQSLALFSHFLSDATLPSSRAQ>VvSCPL18

MENLVFLSLLLVLSPFSSANDILGFSSNPKFKPSQAEKLIRELNLFPKDAEPVNAVGRESKSLVETRLRFP
GIDYS DASVVEDLGHAGYKIKHSSAARMFYLFESRDNRKDPVVIWLTGGPGCSSELAVFYENGPF
TIAKNLSLLWNEFGWDKVSNLLYVDQPIGTGFSYSSDKHDIRHNEEGVSNLDYFLQAFEEHPQFADNDFYIT
GESYAGHYIPAFARVHRGNKAKEGIHILKGFAGNGLTDPQIQYKAYTDYALDMGI IQKPDYDRINKVLP
VCEMAIRLCGTDTGDISCMASYFVCNTIFSSI

MAIAGDANYYDIRKKCEGSLCYDFSNMERFLNQRSVRDALGVGDIDFVSCSPTVYQAMLMDWWRNLEVGIPALLEDEVKL
LVYAGEYDLICNWLGNRWWHAMKWSGQKDFQASLEIPFEVRDSHAGLVKSYGPLTFLKVHDAGHMVPMQPEASLEMLK
RWMEGKLVGGQDESEEPEKLV AQM

>VvSCPL19

MDWEGESTKKLVERRLRFPIDYSDASVKDLSQHAGYYKL R HSLAARMFYLF FESRDSRKDPVVIWLTGGPGCGSELALF
YENGPFTIAANMSLMWNDGWGDKISNLLYVDQPIGTGFSYSSDLRDIRHNEEAISNDLDFDLQAFEEHPLFTNNDFYIA
GESYAGHYIPALAARIHRGNKAKGGIHINLKGFAIGNGLTNPQIQYKAYTDYALEMGMIEKTDYDRINKVLPVCEMAIKL
CGTDGTISCMASYFVCNSIFSKIMALSGDTNYYDIRKTCEGSLCYDFSNMEKFLNQPVRALGVGDI EFVPCSPAVYQA
LLMDWWRNLEVGIPDLEDGIKLLVYAGEYDLICNWLGNRWWHAMEWGGQLEFQAAPVFPVIGDSKAGLMKIHGPLTF
LKVHDAGHMVPMQPRVALEMLKRWFENKLPENTPAESKEPEKRV AQM

>VvSCPL20

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ALFYWLEAPKSRGPASRPLILWLNNGPGCSSVAYGASEEVGPPFRVDPDGKTLHLNPNYAWNAEALLFLDSPAGVGFYSYS
NTSSDLPNVGDKRTAKDAYKFLINWLQRFPQYKHRPFYIAGESYAGHYIPELSQIVQRNKGMPNPAINFKGFLGNPLI
DDYYDNKGTHEFWWSHGLISDSTYEALKEACANDTFLFPKDKCNALTGAYKEFGDIDPYNISGPCREVA TLGNNSKLP
LPWTFRGNDECIVRYTRKYMNRGEVQKAFHANVTHLPYSWATCSSIVRRNWSDSPKSMLPIFKQLISAGIRIWLFSGD TD
AVLPLTATRYSIKALKLKITINWHAWYDDKQEVGGWSQVYEGLTFTTVRGAGHEVPLGQPRRALILLGHFLNNKMPAAP
TLFQ

>VvSCPL21

MGHYVSAVIFFFFLVGLCTSSYLEQERDRITELPGQPKNIGFAQYSGYVTVNKQAGRALFYWLQSPASRGAESRPLV
LWLNNGPGCSSVAYGAAEEIGPFRIRPDGKTLFINPYAWNLANLLFLESPAGVGFYSYSNTTSDLYTAGDQRTAEDAYTF
LINWFERFPQYKHRDFYIAGESYAGHYVPQLSQIVYRRNKGIQNPVVNFKGFLVGNVAVTDDYHDYIGTFEYWWTHGLISD
STYKILRVACDLGSSMHPSECTKALNLAEEQGNIDPYSIFTRPCNDTSSLRRNLRGHYPWMSRAYDPCTERYSEVYFN
LPEVQTALHANVTQVSYWPRTCSNIVGIYWADSPLSMLPIYQELIAAGLRIWVFSGD TDAVVPVTATRYSIDALKLPTIT
NWAYAYDNHKGWWSQVYKGLTFVTVTGAGHEVPLHRPRQAYILFRSFLNKPMPS

>VvSCPL22

MLFSFVVFTEAAPKGS LI THLPGFNGIFPSKHYSYVDIGGEPKLNLFYFVVSERNPAKDPLVLWLNNGPGCSSFDGFV
YEHGPFNF EAGKTPISLPTLHLNPYSWSKVSSMIYLDSP TGVGFSFSKNTWQYKTGDVQTASD THEFLLRWFKEPEFIT
NPFYVSGESYAGVYVPTLSAAIVKGIKSGAKPTINFKGYLVGNVTDMEFDANALVPFTHGMGLISSEMFEKARDNCGGN
YYSNESKSCIEELNKIYNAISGLNQYDILEPCYHRPTKKEETGNTTLPLSFKQLGATNRPLPVRTRMFGRAWPFRA PVK
DGIPLWTELKQNPICPTDDQVASAWLNDKGVRTAIIHAQQKDVIGEW EICTGRLHYSSDSGSM LQYHKNL TAKGYRALI
YSGDHDMCVPTGSEAWTRSLGYKIMDEWRWISNDQVAGYTQGYEHGLTFLT IKGAGHTVPEYKPREALDFFGRWLE GK
AIQ

>VvSCPL23

MHIYSVFLITRPFKIFFIFSKINP INLIFLKKKNHFAMAMASFYLTSSLICILFSFVVFTEAAPKGS LI THLPGFNGTF
PSKHYSYVDIGGEPKLNLFYFVVSERNPGKDPLVLWLNNGPGCSSFDGFVYEHGPFNF EAGKTPNSLPTLHLNPYSWS
KVSSMIYLDSPAGVGF SFSKNTWQYNTGDLQTASD THEFLLRWFKEPEFITNPFYVSGESYAGVYVPTLSAAIVKGIK S
GAKPTINFKGYLVGNVTDMEFDANALVPFTHGMGLISSEMFEKARDNCGGNYSNESKSCIEELNKIYNAISGLNKYNI
LEPCYHRPAKKEETGNTTLPLSFKQLGATNRPLPVRTRMFGRAWPFHAPVKDGIPLWPELMK KKTIPCTDDQVASVWL
NDKGVRTAIIHAQQKDVIGEW EICTGRLYSSDSGSM LQYHKSLTAEGYQAL IYSGDHDMCVPTGSEAWTRSLGYKI VDE
WRWISNDQVAGYTQGYEHGLTFLT IKGAGHTVPEYKPEALDFFSRWLDGKAIQ

>VvSCPL24

MFYLFELQDSRKDLVVIWLI GGLGHSSELAVFYENRFTIAKNLPLLWIEFSWDKAFEEHSQFVDNDFYVTGESYARH
YILAFVARVHRGNKANEGIHMKLGFGIGNGLTNPQIQYKAYTG YALDMGII EISDYDRVYTVFPVCEMAIRLCGTFGTH

SLFLAWHTWPPLVGHSQ

>VvSCPL25

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KPLVLWLNNGGPGCSSVAYGASEEIGPFRLYRTGSSLYLNKYSWNRVANILFLESPAGVGFSTNTSSDLKNSGDRRTAQD
ALIFLVRWMSRFPKYKHFYIAGESYAGHYVPQLAKKIHDYNKASSHPIINLKGMVGNVTDNYYDSIGTVAFWWSHS
MISDRSYRSIMDHCDFIAERTSEKCEAVSYAINHEFGDIDQYSIYTPSCMALPNSSTIRSPRFKNSLVRRRVSGYDPC
ENYAKEYYRNPVQKAMHANSTGIPYKWTACSGVLKYWNDSEASMLPIYKELIEAGLRIWVFSGDTDAVVPVTATRFSL
NHLNLTVKTPWPYWSGGQVGGWTEVEYGLTFATVRGAGHEVPLFQPMRAFLFRSFLGGKQLPSSSENQ

>VvSCPL26

MLSLKWFVLQILFTLIYLNTPASSDPLVQQRLDKVQHLPGQAFNISFAHYSGYVTVNENSGRALFYWFIEAAEDPSSK
PLVLWLNNGGPGCSSIAYGQSEEIGPFHIKEDGKTLYLNYPYSWNVANILFLDSPVGVGFSTNTSSDVSTNGDIRTAKDS
LAFLLKWFERFPQYKGRDFYITGESYAGHYVPLSQAIVRHNSATKAESINLKGYMVGNAITDDFHDHLGVFQFMWSAGM
ISDQTYKLLNVFCDFQPFHSSASCDKIMDIASEEMGNVDPYSIFTPPCSVKGFNSQLMKRLIRVGRISERYDPCTEQH
SVVYYNLPVQQALHVVYTDNAPSKWATCSDEVSAWKDSPKTVLDVYRELHAGLRIWIFSGDTDAIPVTSTRYSVDAL
KLPTVGPWRAYDDGQVGGWSQEYAGLTFVTVRGAGHEVPLHKPKQALTLINAFKGTSMPSLEQLADS

>VvSCPL27

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PKWAFVVQILLTLINLNATSSSSDPLVQQELDKVLQLPGQTFNISFAHYAGYVTVNEYTGRALFYWFIEAAEDPSSK
LVLWLNNGRLLPNTLYRETKMVNTIYEAASKNRLSMASDVKECTMVFLSFLSSLYIYIYILTSILTEKEEGTIEKES
DFLEESGRAGKGRNFGIKKEGTRGHYVPLSQITVRYNFTTAKASISICDEDSQSFILSSELCDKIMDIAREEIGNIDL
YNIFTPPCIQNLQTKSSKKKIMAGGISRKYDPCTQQHSVVYYNLPVQQALHVVYVDNSTFKWATCRYSSF

>VvSCPL28

MALSPKWFVVQILLTLINLNATSSSDPLVQQELDKVLQLPGQTFNISFAHYAGYVTVNEYTGRALFYWFIEAAEDPSS
KPLVLWLNNGGPGCSSIAYGQSEEIGPFHIKEDGKTLYLNYPYSWNQAANILFLDFPVGVGFSTNTSSDIFSSNGDLRTAKD
SLKFLEWFERFPQYKGRDFYITGESYAGHYVPLSQAIVRYNFATKAKSINLKGYMVGNAITDDFHDHLGLFQFMWSVG
MISDQTYKLLNVFCDSQSFILSSELCDKIMDIAREEIGNIDLYSIFTPPCSVKIGFSNQLMKKLIMASGISRKYDPCTEQ
HSAVYYNLPVQQALHVVYVDNATFKWATCSDEVSTTWKDSRPSVNLNRYRELHARLRIWIFSGDTDAIPVTSTRYSIDA
LKLPTVSPWRAYDDGQVGGWTDYAGLTFVTVRGAGHEVPLHKPKQAFTLFAFLSGAPMPYMEQVSY

>VvSCPL29

MATISAFLIQICLTVESPPSADKIVSLPGQPQVGFQQFAGYITVDEKQQRHLFYFVEAETDPASKPLVLWLNNGGPGCSS
IGAGAFCEHGFKPSGELVNNDYSWNKVANMLYLESPAGVGFSTNTSANTSFYAFVNDEMTARDNLKFLQRWFLKFPYKN
RDLFLTGESYAGHYVPLAQLIVQSKVKFNKGVAINPLLEFNDFNSRAEYMWSHGLISDITYEFTV ICNYSQVRR
IVMGLSPACSGVISQVSRELGKHIDSYDVTLDVCLPSVVSQSERLNQPRGTEKIDVCVEDET IKYLNKRDVQKALHAHL
KGVSRWSICSEVLKYEYRNLEIPTIHVVGAVLKSIRVLVYSGDQSVVPLTGTRTLVNGLAKDLGLNTVPYRNWFQGR
QVGGWTQVYGDKLSFATIRGASHEAPFSQPERSLVLFNTFLQGKPLPEATVVL

>VvSCPL30

MMILAACAALVHFCSSAVESHSAQADQISSLPQQPRVSFQQFSGYITIDEKQDRSFFYFVEAENDTTLKPLVVWFSG
GPGCSSVGGGAFAGHGFPRPSGDILLTNKYSWNREANMLYPESPAGTGFSTNTSANTSFYTNLNDIETARDNLVFLKNWIK
FPQYKNSELIAGESYAGHFVPLAQLILES RVKFNKGVILMGDPLMDFDTNYSVPHFYWSHGLISDSTYNLFSSKCN
SRMNREQTSGSLPACLAVRSQYSQEVGDSVDRFDVTLNSCLPSVDPQPVNTENVDCIGDEVNKYLNREDVQKSLHARL
VGVANWSMCSGALRYNIKDEKITMIPVMGSLVKSGIRTFVYSGDQSVIPLFGTRTLVDGLAKELRLNTVPYRNWFE
QVGGWTQVYGDILSFATVRGGSHTVPGTQPARALVLFATFLKGGPPPAE

>VvSCPL31

MKLHCSWVVLATLCVAPLCFAMEPVSESDKLGSLPGQPHVSFQQFGGYVITIDEKQGRALFYFVEAVTDPATASKPLVLW

LTGGPGCSSLGGGAFMEHGPFPRPGNTLFRNKHSWNREANMLYVESPAGVGFYSRNKSFYDDINDEVTARDNLAFLEGW
FMKFPKYRNRELFITGESYAGHYVPQLAQLVINSKGNFNKLGILIGNPFFEFTDINAQGDFFWSHGLISDSTHALLTST
CNYSQIMRWVYNISESLSPECYEVYNKSAGEIGGSVDPFDVLDGKCLSSEEVCLTDEVDVYLNKRDVQKSLHAQLVGT
PNWTLCPDPSAHFLKDAVIPSINVVEWLWVSGIRASVYSGDQDSRISLIGTRSLLEGLAKKLLKTTVPYRNWFEKKQVGGW
TQVYGDILSFATIRGGSHTAPISQPTRSLALFTAFLGKPLPDA

>VvSCPL32

MQTQSWMMILAAVCAALVHFCSSAVESHSAQADQISSLPGQPRVTRDNLVFLKNWFIKFPQYKNSSELF IAGESYAGHFVP
QLAQLILESrvKFNKLGILMGNPLMDFDTNYSNVPHFYWSHGLISDSTYNLFSSKCNYSRMNREQTSGSLSPACLAVRSQ
YSQEVGDSVDRFDVTLNSCLPSVDPQPQVTENVVDCIGDEVNKYFNREDVQKSLHARLVGVANWSMCSGALRYNIKDEI
TMIPVMGSLVKSGIRTFVYSGDQDSV IPLFGTRTLVDGLAKELRLNTTVPYRNWFEQVGGWTQVYGDILSFATVRGGS
HTVPGTQPARALVLFTAFLKQPPPAE

>VvSCPL33

MEPVSESDKLGSLPGQPHVSFQQFGGYVTIDEKQGRALFYFVEAVTDPTASKPLVLWLTGGPGCSSLGGGAFMEHGPFPR
PRGNTLLRNKHSWNREANMLYVESPAGVGFYSRNKSFYDDINDEVTARDNLAFLEGWFMKFPKYRNRELFITGESYAGH
YVPQLAQLVINSKGNFNKLGILIGNPFFEFTDMNAQGDFFWSHGLISDSTHALLTSTCNYSQIMRWVYNISESLSPECY
EVYNKSAGEIGGSVDPFDVLDGKCLSSEEVCLTDEVDVYLNKRDVQKSLHAQLVGTPNWTLCPDPSAHFLKDAVIPSINV
VEWLVRSGIRASVYSGDQDSRMSLFGTRSLLEGLAKKLLKTTVPYRNWFEKKQVGGWTQVYGDILSFATIRGGSHTAPI
SQPARSLALFTAFLGKPLPDA

>VvSCPL34

MKLHCSWVVLATLCVAPLCFAMEPVSESDKLGSLPGQPHVSFQQFGGYVTIDEKQGRALFYFVEAVTDPTASKPLVLW
LTGGPGCSSLGGGAFMEHGPFPRPGNTLLRNKHSWNREANMLYVESPAGVGFYSRNKSFYDDINDEVTARDNLAFLEGW
FMKFPKYRNRELFITGESYAGHYVPQLAQLVINSKGNFNKLGILIGNPFFEFTDMNAQGDFFWSHGLISDSTHALLTST
CNYSQIMRWVYNISESLSPECYEVYNKSAGEIGGSVDPFDVLDGKCLS SVRNTTPNISAFIQGTFNAWKLCPSYNKLEN
QAVS IASLSL SVTMTQTSWMMILAAVCAALVHFCSSAVESHSAQADQISSLPGQPRVSFQQFSGYITIDEKQDRSFFYYF
VEAENDTTALKPLVWVWFGGPGCSSVGAQHGPFRPSGDILLTNKYSWNREANMLYPESPAGTGFSYSANTSFYTNLNDI
TARDNLVFLKNWFIKFPQYKNSSELF IAGESYAGHFVPQLAQLILESSVKFNKLGILMGNPLMDFDTNYSNVPHFYWSHGL
ISDSTYNLFSSKCNYSRMNREQTSGSLSPACLAVRSQYSQEVGDSVDRFDVTLNSCLPSVDPQPQVTENVVDCIGDEVNK
YFNREDVQKSLHARLVGVANWSMCSGALRYNIKDEI TMIPVMGSLVKSGIRTFVYSGDQDSV IPLFGTRTLVDGLAKK
RLNTTVPYRNWFEQVGGWTQVYGDILSFATVRGGSHTVPGTQPARALVLFTAFLKQPPPAE

>VvSCPL35

MASSLYVYLLVLVLGGALQASVDGHLSEILARQKADRvKPLPGQPEVGFQRQYAGYVTVNESHGRALFYWFFEATQNPHQ
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YAFLIHWFKRFPQFKPHDFYIAGESYAGHYVPQLAEVIYDHNKHVSKKHLINLKGFMIGNALLDDDDTDQRGMVSYAWDHA
VISDRVFFDIKKACNFSAPVTEECNIALGKYFEVYEI IDMYSLYAPT CEDDATSSTTSFVARQLPLIRGNVAPKTF SKF
PAWHKRPTGYDPCASDYTTVYLNREPVQAALHANVTNIPYPTWTHCSNNISFVNDAPASILPIIKKLVGGGLRIWVFGDT
DGRIPVSSRTLRLKLGKTIQEWTPWYTSHEVGGWTIEYDGLTFVTVRGAGHEVPTFAPKQAFQLIRHFLDNEKLPSTP
IQ

>VvSCPL36

MIKIFKIYYGNFFSFERKHLKATKYFQLCFQSAYSANSLTPSFFCFFFIGMAEAAAQHQLLLACTGLLLLLLVSSSSVA
TARSI IKTLPFGPGELEPFYLETGYVGVGENESVQLFYFVKSQRNPVLDPLVLWLTGGPGCSTLSAFFYESGPVSFNLT
YNGGLPTLELKEYTWTETLNI IYLDAPVGTGFSYSTTQEGYTTDDYKSAQIYEFLKKWL IQHPEFLKNNLYIGGDSYSGI
PVP MIVQDIYDSEGGSPRLNLNLQGYVLGNPVTDAYIDKNSRVPFARLTLISDGLYESAKANCNGDYVNANASSEQC
ESDVQEIEELLRDINIQQILDPCDCTFSSP IPNEEKNLQRSLAENPTDFLSQLGEETMYFCHDYMYILSETWANNRDVRE
ALHVREGTKGYWKRCNISGLAYTEDV ISSVAYHRNLSKTGLRALIYSGDHDMSVPHIGTQQWIDSLNLTLADTWRAWYTE

GQVAGYTKRYTNDFFALTYATVKGAGHVAPEYKPPQCCYAMLKRWFAYYQLQ

>VvSCPL37

MQVLKPKYRTNVSSIVTLLGFPEELSFYLETGFVCRYVGVGKNEEVQLLYLFFRLERNPSVNPLMFWLTGGPSCSTFS
SFFYSNGSPSSFSFVWRVLPPTMAAAEHQHRFLSVMLLLLVSFGIANGRSV IKTLPGFSGELPFYLETGYVGVGENEEV
QLFYFVKSRNPVFDPLMLWLSGGPGCSTLTAFFYENGLTFNIQEYEGGLPNLYLKENTWTKTLNI IFVDAPVSGSFS
YSKTQEGYIMEDLKAAQTYEFLKKWLVDPHEFLKNELYVGGDSYSGIPVPMVQEIYYGSPSLNLQGYVLGNPLTDTDN
DVNSRIPFAHRLTLISDELYESAKTSCNGDYVTNASNEQCVADMEAI SKLIDQIYIMQVLEPNCGISSRKPKEGELNHT
HFLTQLGEKSAYFCHEYNYVFSEIWANNKDVREALRVREGTKGHVRCNITNLAFTKDVSTVAYHQNLNTGLRALIYS
GDHDM SIPHIGTQEWINSNLTLTLEDPWRTWCTDQVAGYTETFTNDDFDLTFATVKGAGHVAIEYKPKCEYAMIDRWFAH
YPLQ

>VvSCPL38

MAEHRHFPRLLLLLPLFLSAIASTSSI IKTLPGYSGELPFYLETGYVGVGENEEVQLFYFVKSRNPVLDPLVMWLT
GGPGCSTFAFFYNGPLSFYKNTGGLPSLLLNEYTWTSGLNIIYVDTPVAGFSYSRTQEGYSSDDYKSSHTYEFEL
NKWLLDPHEFLKNLYVGGDSYSGIVLPMITEKIYYNGIGTFLQMLNQLGYILGNPVTD SYIDGNAQIKIAHRLTLIPDN
LYESAKASCNGDFVTNASNEECVADMEAI SELISPIYTMQVLEPNCGISSQKPNKWSQQRS LIENSKHFPSGLGKAAA
YHCHEYMYVFSEIWSNDESVREALHVREGTKGHVRCNVSGLAYTRDVKSSIPYQRNLQTGLRALIYSGDHMSIPHV
TQEWINLLNLTLADTWRAWYTDAQVSGYTRFTNDDFSLTFATVKGAGHVAIEYKAKECYAMIKRWFGYYPQLQ

>VvSCPL39

MASGWSWDRAFGVGVLLCDVCGAANNWPEEDLVVRLPGQPKVGFRRQFGGYVDVDEKAGRSMFYFVEAEEDPQNKPLT
LWLNCGGPGCSSVGGGAFTALGPPFPKGHSRGRVRRNSKSWNKVSNLLFVESPAGVGSYSNTSADYNGDASTASDMLTFM
LKWFKKFPYKLRPLFLTGESYAGHYIPQLANVLLDYNKSKDFKFNIGVAIGNPLLQLDRDVPVAYEFFWSHGMI SDE
VGLAIMNDCNFEDYTFSGTHNVSTECSTALNDAYSIVGSYINPYDVIDVCYPSIVQQELRLRKVVTKISIGVDVCM TAE
RTFYFNLPEVQKALHANRTNLPYHWTCSNLFYNEGDSNLDMLPLLKRILQDKIPVWIFSGDQDSVVPMLMGSRTLREL
AKDLNFQHTVPYGAWFHKGQVGGWQTEYGNLLTFATVRGAHMVSYSPSRALHLFATFIHGRRLPNNTRPSID

>VvSCPL40

MAMAYRSQDGTTEEWEVVRPKAHMFWWLYRSPYRVESPSKPWP ILLWLQGGPGASGVGIGNFQEI GPLGTDLKPRNSTW
LRKADLLFVDNPVGTGYSFVEDTKLLVKT DVEAAVDLTTLTLLKEIFNRNESLQQSPLYIVAESYGGKFAVTLGLAALEAIE
AGNLKLLKGGVALGDSWISPEDFVFSWGPLLKDVSRIDNQLQKSNLARKIRQQLIDGQYVDATSSWSELEGVISRSSN
SVDFYNFLDSNMDPLSLTSVELREQFAKRRYLRYLDSLRLSPGGDVIDTLMNGI IKDKLRIIPKNVSWGQSDLVFST
LSGDFMKPRIKEVDELLAKGVNVTIYNGQLDLICATMGTEAWVEKLDKWDGLKEFLSMKRTPLYCGGEGGTKGFTKSYKNL
HFYWILGAGHFVPVDQPCIALNMVGGITHSPMASIS

>VvSCPL41

MASTFSLFLSLCLLLSSQFSSARVQNSYLHVSPTLNTPKTEAERLIRSLNLSPKKAVNMGFDHGEVAPRMVEKSLNFPF
LEGSSGSSVQDLGHRAGYFKLAHTVDARMFYFFFESRGSKKDPVVIWLTGGPGCSGQLALFYENGPFHITDNLTLTWNDY
GWDQASNILFVDQPTGTGFSYSSSES DIRHSEEGVSNLDYDFMQAFFKHPFVRNDFFITGESYAGHYIPAFARVQKG
NKAKEGVHINLKGFAIGNGLTDPAIQYKAYTDYALTMKIIGKSDYDSINELIPDCEESAKSCGPAGGVACDTAYYSCNQI
FQSIINVAGNINYYDIRKQCEGSLCYDFSLENFMGLKSVKEAIGVGDMEFVSCSSEVYNAMQRDWMRDMEVGIPALLED
GIKMLIYAGEYDLICNWLGNNSWVHAMKWSGQKDFEASPTVPYLDGKEAGQLKYHGRLAFLKVNAGHMVPMQPKAAL
QMLKTWTQGLAPKIKDETTW

>VvSCPL42

MQAERLIRSLNLSPKKAVNLDVSHGEAVAPRMIEKSLFEPFLDGSSGTSIQDLGHHAGYFRLAHSIDARMFYFFFESRHS
KKDPVVVWLTGGPGCGSEVALFYENGPFHVRDNLTLNWNQYGDQVSNILFVDQPTGTGFSYSSDEGDIRHNEEAVSNDL
YDFMQAFFAKHPEFVKNDFYITGESYAGHYIPAFARVQKGNKANEGVHINLKGFAIGNGLTDPAIQYKAYTDYALNMKI
IGKSDYDSINELIPECEESAKSCGPDGGDACETAYTNCNFI NSILNVAGNINYYDIRKQCEGSLCYDFSLENFMGLKS

VKKALGVGDVEFVSCSTVVYDAMQRDWMRDMEVGIPALLEDGIKMLIYAGEYDLICNWLGNNSNVWHAMKWSGQKDFEASP
TVPYLVGKEAGQLKNHGPLAFLKVNAGHMVPMQPKAALQMLKTWTQGLAPIETKDDQ

>VvSCPL43

MEDDLIEGGLPGQPSGVLFKQYSGYVTVNELKGRNLFYFAEAAEDPSSKPLLLWLNNGPGCSSLGVGAMVEIGPFGVKP
DGKTLYLRYAWNKVANTLFLESPVGVGFSYSNNSFEYNENGDKRTAQDTYAFLINWFRRFPHYKNRDFYIMGESYAGFY
IPELADTIIRRNMKAVSSSI IHLKGI MINGIMNDMTDNRGFYDYLWSHALISDKTHQGLVEYCKFPDSYECKKLEDHIE
LEVGLIDFYNIYAPVCLRASNSRKPKRHGGFDPCEADYVLRYLNLQVQALHANRTKIPYAWEVCSVITSWTDSPST
MFPIYKRLISSGLQILISGDVDAVVSVVGTRYSINALNLKVI RPHWPWSESTKVVGGRVYVEGLTFATIRGAGHEVPR
FQPRRAFALMESFVAGKQ

>VvSCPL44

MRPNIFNQIRKMNRYDLLGKLMQAQRSKRQSEHGSIESMSTEYSPVYMGSDGLKGDRIQALPGQPNGLNLDQYSGYV
TVDPQAGRALFYFVESQNSSSKPLVLWLNNGPGCSSLGS GAMMELGPFVNGDGTLSYNEYAWSNVANILFLESPAGV
GFSYSNTTSDYDKSGDKQTAEDNYTFLNLWLERFPEYKTRDFFITGESYAGHYVPLSQKILQNNKITNQTVINLKGIAI
GNAWIDYETGLKGMDFWTHSLISDEINENINLNCNFSSETTISDVCEQYLDAAAVGYIYDIYAPLCSSSSNSTR
PISVFDPCSEDIQTYLNIPEVQKSMHANVTNIPGPWESCNDAI FYGWKDMPLTVLPVIEELMVSGISVWIYSGDTDGRV
PTTSTRYSINNLTGTSVKTPWYPWYTQGEVGGYAVGYKNSLFSVTIRGAGHFVPSYQPTRALAFFSSFLAGLKPSADEPQ

>VvSCPL45

MESMWMGRHLFLTILLFASKAVTSQTI VTSLPGFSGTLPFTLETGYVVGEESEVQLFYFVESQSSPSQDPLMLYIAGG
PGCSSLSSLFYENGPYILNYQYYDGGVPSLNL SADAWTQGLNMIYIDAPVGTGFSYSNTSQGYVDDAENAAQTYEFLRK
WLQHPDFLGNELIYAGVSYSGIPVPMIVNEIEGNILGLSPGMNIKGYVLGSPVTDSEIDDNSKIPFAHGLSLISHELY
NSAKTNCENYVNSSEASLNFHQLLRYINVAQVLPYCYPTVKPSERQGNRRSSLEEANYRSCDLYSSVPI SIWANDE
SVRAALNVRNGTKGNWQPCNSSLTGYTEDVTTTLAYHRNFSHTSSLRALIYSGDHDMSIPNIGTQEWIRSLNMTLADTWR
GWMVDAQVAGYTKRYTYGDFSLTYATVKGAGHIPATYKTRQCYEMIERWLAHYPLQ

>VvSCPL46

MVNREISASMVLLSLLLIAVVDAGSHGVNGVRGEEEEADRITALPGQPKVSFQQYSGYVTVNHVAGRALFYWLNEAVHD
PLSKPLVIWLNNGPGCSSVAYGASEEIGPFRINKTASGLYLNKFSWNTLANLLFLETAGVGFYSYNSKSSDLLDTGDRRT
AKDSL VFLVRWLERFPRYKHREVIYINGESYAGHYVPLQAREIMAYNAKYKHA INLKGIMVGNVAVTDNYNDNLGTVTYVWWS
HAMISDKTYRQLINTCDFHRQKESNECESLSYAMDQEFGNIDQYNIYAPPCNNSDGS GATRQTIRLPHRSHRIFRQISG
YDPCTEKYAEIYYNRPDVQKALHANTTKIPYGTACSEVLNRNWNDAESVLPYIREMIAAGLRVWVFSGDVDSVVPVTA
TRYSLAHLKLATKIPWYPWYVKKQVGGWTEVYEGLTFATVRGAGHEVPLFKPRAALEL FKSFLRGLPLPKS

>VvSCPL47

MRIKTTLFFWSSAFLIALLSITVALFTISSSTATITQGDLELAFLRRIVKQSGVEDFLSLLNQATDRASQRHHHHHHHHHR
KPEVICDDAKWKSKI ISSYNVSLILTVDLKGCANFSSVQKAVDAVPDSSLSRTLIIMDSGIYREKVVVGASKTNLIFQQQ
GYLNTAIAWNDTANSTGGTSYSYSVAIFAPNFTAYNISFQNTAPPASPGDVGGQAVLRVANDQAAFYGCIFYGAQDTLH
DDRGRHYFRECFIQGSIDFIFGNARSLYEECTINSTAKEVSSGISGAI TAQGRQSVDEKTGFVFKCVIGGTGRVWLGRA
WGAYATVVFNSNTYMADL VASDGWNDWRDPSRDQTVFFGEYDCKGPGSNNTYRVSYAKQLMQSEAAPYLDVSYIDGNEWLL
PLPKDPTNERHRKICHACRYLLNQFHFITMVAAMEKNSFLFLSFLVLFPLLHGTYAFAAGTDDGSEQWGYVEVRPKAHLF
WWLYKSPDRVEDPSNPWPILLWLQGGPGGSGVGFNFLEIGPLDGNLQPRNSTWLRKADLLFVDSPVATGFSYVEDESLV
VTTDDEAATDLTTLKELFNGNETLQKSPLYIVAESYGGKFAVTLGLSALKAI EAGELKLQLGGVALGDSWISPEDFVLS
WGPLLKDVSRDLGNGLNSSNRLALQIQQQLAEGQYKEATETFFELENVISISSNDVDFYFMVDYANDPVLSTSGGWNEV
MMGRDPRYLGAKKSLSSNGSSSTDDLPSLMNGPIREKLKIIPESVSWGQGNLVFPAMAGDFMRPRINEVDELLAKGINV
TIYNGQLDVICSTKGAEAWLDKLGWDLKTFLSLDRTPLYCGNDETTTKGFVKSYNLFFYWI LGAGHFVPEQPCVSLE
MVGNITRSPNLHSQ

>VvSCPL48

MQKKKKMASGAGVMTLVLFILCLVSHGSFVAGIKAESSQENDRIINLPGQPSSPPIITQFSGYITVKNKAHGRALFYWFFEA
QSQPSNRPLLLWLNNGPGCSSIGYGAAVELGPLRVSKNGDGLHFNDFAWNKEANLLFVESPVGVGFSYNTSSDLTKLTD
GFVAEDAYNFLVNWLKRFPQYKAHDFFIISGESYAGHYVPLAELVYDRNKDRTKYPLINLKGFIVGNPETNDYYDYKGLL
EYAWSHAVISDQLYYKSKQVCDFKVADWSSECITNMNKVFDYREIDIYNIYAPSCLLNTSSSAELNGNGFRMRVPGG
YDPCFSIYAAEYFNRPDVKLALHAATHKWEVCSDSVFHAYHYTVFSVLPITYTKLIKAGLRIWVYSGTDGRVPAIGTRY
CVEALGLPLKAPWRSWYHHHQVGGRIVEYEGLTYLTVRGAGHLVPLNKPSQAFALHISFLTATQLPTRK

>VvSCPL49

MAAKRPSNSSMFHGGLFLRLLLVLVLSANAASAGSIVEYLPGYGNLTFKLETGYVSVGDSELYFYFIESQGNPQTDPPFL
WLTGGPGCSSFNGLIYEIGPMEFDIHNYPGGLPRLLPYKYAWTKTASILFLDAPVGTGFSYSTSADGWSSSDTDSALETY
EFLRKWLEIHPKYLPLQLYVGGDSYSGIIVPLVVKHIVDAIDEHTVPRFNLQGYLVGSPTDENINTNAKVVFHRLALI
SDELYEAAKENCNGYADVPSNTKCLSSLGEIQHCVKDLFRNDILEPKCVFESPEPTRRSLDEKPGDFILNTPKLEEFW
CRNFNYALSYIWANDESVEALNVRVGTVKYWSRCNKSLSYTKDVQSVIDVHRYLSKKQLEVLVEVGDRDLVVPYPGAVE
WIRLLNLTIVSPWRPWFVDEIAGYTEKHSQNGYRLTYATVKGAGHTAPEYRRECYMFKRWVHYPLQ

>VvSCPL50

MNLQYFLLPPLLLFSATVVVSQNIVRTLPFGFSGELPFKLETGYVSVGDIIEFFYYFVESQGNPGADPLILYINGGPGCSGL
NGFVYQVGPVAFNTTDTYTCGLPTLLLPHSWTKTANIIFLDAPVGTGFSYATTTQAYTTSDTLSAIQTIEFLKNWLNHDL
DFNSNPFGLTDSYSGILAPIIAQEIIDGNVKKCYVLKSNMTYCKIEAKSYQFKLLKGLVVQ

>VvSCPL51

MVIPHGGIEQWIKSLNISIDSDWRPWYVDGQVAGYTRKYTNNGYRLTYSTIKGAGHSPPEYKRRECYEMFYRWIHYYPFQ

>VvSCPL52

MGLMYLHFLLLLLFSGKAVSRNIVKTLPGFSGELPFKLETGYVSVGDIIEFFYYFVESQGNPGADPLILYMNGGPGCSGLN
GFFYQVGPVFNNTTDTYTGIPPTLLPYPRSWTKTANIIFVDAPVGTGFSYATTSQAYTTSDTLSVIQTLGFLRNWLNHDP
FKLNPLFIGADSYSGLIAPIIAQEIMDGNVGEPPHINLKGYLIGSPHTDTTIELNSRIVYAHMALISDALYEAATGC
NGRYVDIDPSNAKVEALESISLCIEQVSLQDILEPKCSFISPKQNKERRSLRENSRSFLLPSQYRTGNDWCRNFEHSL
SDIWANYKSVQDALYIRPGTVEEFFRCNSSLTYTENNVNFGYHKNLTNSGLRVLVFSGDHDMVIPHVIEQWIKSLNIS
LGS DWRPWFVDGQIGGYTRKYVNKAYSLTYSTLKGAGHSPTEYRRRESYEMFYRWIHYPLQ

>VvSCPL53

MVKLQGCRAVYGHNKYQMTFAVVKGGGHTAPEYRPEKCFAMRFLTEQKDQNLPRPTLDLQIVQKKK

>VvSCPL54

MGLMYLHFLLLLLFSGKAVSRNIVKTLPGFSGELPFKLETGYVSVGDIIEFFYYFVESQGNPGADPLILYMNGGPGCSGLN
GFFYQVGPVFNNTTDTYIGGLPTFLPYPHSWTKTANIIFVDAPVGTGFSYATTSQAYTTSDTLSVIQTLGFLRNWLNHDP
FKLNPLFIGADSYSGLIAPIIAQEIMDGNVGEPPHINLKGYLIGSPHTDTTIELNSRIVYAHMALISDALYEAATGC
NGRYVDIDPSNAKVEALESISLCIEQVSLQDILEPKCSFISPKQNKERRSLRENSRSFLLPSQYRTGNDWCRNFEHSL
SDIWANYKSVQDALYIRPGTVEEFFRCNISLSYTENNVNFGYHKNLTNSGLRVLVFSGDHDMVIPHVIEQWIKSLNIS
LGS DWRPWFVDGQIGGYTRKYVNKAYSLTYSTLKGAGHSPTEYRRRESYEMFYRWIHYPLQ

>VvSCPL55

MDACNAGITPTQSHKLLSFHLGFMISTFFFLIFPSATLSFNFTTFEPNNGQISFEGEARYSDDDIQLTRDVQDKSMDS
SWGRIATYKEQLYLWDRTSRNLDFASNFVINSRNSAYGDGITFFLNGIKLLAWPLPKEKQIRLVEVWVDLYGVGKL
VDAADPRLSDDFDEEQMERLMIVGLWCAHPDCNLRPSIRQAINVLNSEASLPLPLKMPVPMYSSPVLQTIISYGVDDM
DDVLLFYFVESERNPREDPDLLWLTGGPGCSAFSGLACEVGPFEYDILGCTHWHWIIILFAIGTRLQHLMFFLFPFCIVT
EWLINHPKFKKNPLYFSGYSYSGIIPMTVEDISNGISDLQVLSHKIFCLFVLVCTNIQALKTKAKILPSQFHHTTFSRQ
QTIISSHSQHGHHLRREISFICSSSMGTIPLMYCRLFRVLVLSIASSQSIKTLPGFPGNIPFKLETGYVGVDDMDD
VQLFYFVESERNPRQ

>VvSCPL56

MCFSILLLLFFTGVATSQSIVETLPGFPKLPFKLETGYISVGDVDDVQLFYFYFIESERNPRLDPLVLWLTGGPGCSGFS
ALVYEIGPLAFDVEGYDGLPTLKLNPYSWTKVASIIFIDAPVGTGFSYAETSYGYNVSDTSSAAQTYQFLRKWLFHPN
FAGNPLYIGGDSYSGIVAPILIKDILHGLEVLQPKIELQGYLLGNPLTDYLIDDNSRIPYAHVSLISDGLYKAAKETC
NGDYGNVDINNTLCVEALQTIKMCLLQINIAMIPEQCAFASPTTELQWDLRVQENTTMNYLLSLSRIPELRCRSFSYV
LSYKWLNDINVQNALHVQPGTVKTRRCPKSFPSYTENVDSTVAYHKNFTRTGLRALIYSGDHDLDSTPYIGTLEWIKSLD
VPVFDKWRPWYVDGQIAGYTTKFMNDHYRLTYATLKGAGLTAPEYKHESLALVDRWFAYYPIQ

>VvSCPL57

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VGVDMDVQLFYFYFVKSERNPRDDPLLLWLTGGPGCSAFSGLVYEVGPLSFDYAKSNENLPTFKLNPYSWTKLASMIFL
DAPVGTGFSYSRTAEGYNMNDTLSASQIYAFLRKWLINHPKFQKNPLYVSGDSYSGIIPMVVQEISNGNDEGKEPKMNI
QGYTIGNPVDHFSDFNSRIEYTHRVGILSDELYEELKESCNGKYVYVDPNSVECTNMLKVVYTCINKIYSAHILEPSCA
MLSPNPNASKLDRSSLQEINSIGLLSQPKPEPWCRSYNYVFSYLWANDKTVQKALHVREAIKDWVRCNESLSYTSNVF
SSVDYHRNLTKKAYRALIYSGDHDMLIPYVGTQAWIASLNLNISEDWQPWFVDGQVAGFRVEYLHNKYLMTFATVKGAGH
TAPEYRPKEGFAMVYRWLAHYFLQ

>VvSCPL58

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SQCLEVGSLSYTWIRKQCTVTMHIRPSFVIQAHEQPPVGSYFTTMYRSLLLVAFSSIAVSESIKTLPGFEGDLFPKL
ETGYVGVGKSDDIQLFYFYFIESERNPSLDPLMLWLTGGPGCSAFSGLVYEIGPLIFDYANRSGDIPALLSNPYSWTKVAS
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