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      *      20      *      40      *      60      *      80      *      100      *
BGI_novel_1 : ~~~~~MANHSCFSLLFLVSLLAGHG-VLHLEASHHVYQHLLSTSDHETQSSSSASS-----: 51
EVM00020702 : ~~~~~MVNSSLRLLFFIFITLLGHGNIILEASDHHHHYQCH-----: 38
EVM00012852 : ~~~~~MTNPISLSYLFICVFLGKG-VLELEASHHVARYQTSFKFLHKSFPV-----: 48
EVM00002578 : ~~~~~MANLSIPLSFLFCVFLGKG-VLELEASHHVARYQTSFKFLHKSFLVN-----: 48
EVM00002051 : ~~~~~NEIFAGLIVLMSCCFLSNGTEIACSCQTCTNNNFQSIAPSN-----: 43
EVM00018616 : MVNQNLVPSFFKYSENNYDPLPDGSDSPATRRNPTKTVVIALCGLVVVGFTLASIDCNAYDDK-RENEQGSISNSKLKPAR--MPHMSRGVSAGVSEKSNRNFLGSSSPSYPNWN : 112
EVM00014291 : MDTHPHAPYYTLPLEH---PSVAGPPEPTLRRS-FKGVALILASVIFLLSPGLIINQSYFLPSPNNNNNIPSSPPSPSTFSRRVRPGVEEGVSAKSNPSVFDEEASYNWTN : 110

      120      *      140      *      160      *      180      *      200      *      220      *
BGI_novel_1 : ---SQPMRTCYHFQSRNWMNDPENGNIYKGIYHIFYQYNPKGAVWGN-LVWAHSTSDLLNIIPHNFAYPSQPSHYGCRSGSATMLPGCKPVLYLTCIIDPKPINTQVQNLVV : 163
EVM00020702 : ---QPMRTCYHFQSRNWMNDPENGNIYKGIYHIFYQYNRYGA-----SGSATILPGCKPAMLYTSIDSQ--GTQVQNIAM : 110
EVM00012852 : ---QAMRTCYHFQSRNWMNDPENGNIYKGIYHIFYQYNPKGAVWGN-LVWAHSTSDLLNTPHKAIFPSCQADIKGNSGSATILPGCKPVMLYTSIDSQ---RQVQNIAM : 138
EVM00002578 : ---QAMRTCYHFQSRNWMNDPENGNIYKGIYHIFYQYNPKGAVWGN-LVWAHSTSDLLNTPHKAIFPSCQADIKGNSGSATILPGCKPETS-SKLGHAL---KIYCOLTS : 155
EVM00002051 : ---HQPMRTCYHFQSRNWMNDPENGNIYKGIYHIFYQYNPKGAVWGN-LVWAHSTSDLLNTPHKAIFPSCQADIKGNSGSATILPGCKPETS-SKLGHAL---KIYCOLTS : 153
EVM00018616 : SLLSWCRTAFHFQSRNWMNDPENGNIYKGIYHIFYQYNPKGAVWGN-LVWAHSTSDLLNTPHKAIFPSCQADIKGNSGSATILPGCKPETS-SKLGHAL---KIYCOLTS : 223
EVM00014291 : AMFSWCRTHFHFQSRNWMNDPENGNIYKGIYHIFYQYNPKGAVWGN-LVWAHSTSDLLNTPHKAIFPSCQADIKGNSGSATILPGCKPETS-SKLGHAL---KIYCOLTS : 221

      RT SFHQF 4 WNDP1G  g yh fyqynp Av g  w h s d w  a  d  w3GSaT6LP g  ly3g  qvQnL

      240      *      260      *      280      *      300      *      320      *      340      *
BGI_novel_1 : FRNLSRYRENIKYPNNLMSITVENCLNGSSRDPTTAWGHNINWRVIGSRTH-TRGATILYSSRDFHRTAKKHEHSKAKNTGMWECDFDFHFVVKASLDDTKHEYTYIG : 277
EVM00020702 : FRNLSRYRENIKYPNNLMSITVENCLNGSSRDPTTAWGHNINWRVIGSRTH-TRGATILYSSRDFHRTAKKHEHSKAKNTGMWECDFDFHFVVKASLDDTKHEYTYIG : 221
EVM00012852 : FRNLSRYRENIKYPNNLMSITVENCLNGSSRDPTTAWGHNINWRVIGSRTH-TRGATILYSSRDFHRTAKKHEHSKAKNTGMWECDFDFHFVVKASLDDTKHEYTYIG : 250
EVM00002578 : QNGSSH---FNVMAITPMNKNASSRDPTTAWGHNINWRVIGSRTH-TRGATILYSSRDFHRTAKKHEHSKAKNTGMWECDFDFHFVVKASLDDTKHEYTYIG : 258
EVM00002051 : FRNLSRYRENIKYPNNLMSITVENCLNGSSRDPTTAWGHNINWRVIGSRTH-TRGATILYSSRDFHRTAKKHEHSKAKNTGMWECDFDFHFVVKASLDDTKHEYTYIG : 263
EVM00018616 : FRNLSRYRENIKYPNNLMSITVENCLNGSSRDPTTAWGHNINWRVIGSRTH-TRGATILYSSRDFHRTAKKHEHSKAKNTGMWECDFDFHFVVKASLDDTKHEYTYIG : 333
EVM00014291 : FRNLSRYRENIKYPNNLMSITVENCLNGSSRDPTTAWGHNINWRVIGSRTH-TRGATILYSSRDFHRTAKKHEHSKAKNTGMWECDFDFHFVVKASLDDTKHEYTYIG : 331

      p  s  p  l  w  k  Np66  p  6  FRDP3TAW g  WR6 IGS  G6 66Y 3 1F 5  1  TgWEC DF5p V  d s

      *      360      *      380      *      400      *      420      *      440      *      460      *
BGI_novel_1 : TYNITDRYFADKGSVESLCL-----RDYGRFYASKTFEDHNRRLWGWINSSSVADVRKGSQICIPRTHLL-KSGKQLVQWPFVEIEEL : 370
EVM00020702 : NFRHVLRLISLLTTLRIATLLCH-----RDYGRFYASKTFEDHNRRLWGWINSSSVADVRKGSQICIPRTHLL-KSGKQLVQWPFVEIEEL : 315
EVM00012852 : KVRVILANSLDETKHDYIIGTYDAVKDKYFDRGMIEGDSGRDYGRFYASKTFEDHNRRLWGWINSSSVADVRKGSQICIPRTHLL-KSGKQLVQWPFVEIEEL : 349
EVM00002578 : KVRVILANSLDETKHDYIIGTYDAVKDKYFDRGMIEGDSGRDYGRFYASKTFEDHNRRLWGWINSSSVADVRKGSQICIPRTHLL-KSGKQLVQWPFVEIEEL : 372
EVM00002051 : SVKQMMRASFKS--HDYIIGTYDAVKDKYFDRGMIEGDSGRDYGRFYASKTFEDHNRRLWGWINSSSVADVRKGSQICIPRTHLL-KSGKQLVQWPFVEIEEL : 375
EVM00018616 : SVKQMMRASFKS--HDYIIGTYDAVKDKYFDRGMIEGDSGRDYGRFYASKTFEDHNRRLWGWINSSSVADVRKGSQICIPRTHLL-KSGKQLVQWPFVEIEEL : 448
EVM00014291 : GTRHVLRLISLLTTLRIATLLCH-----RDYGRFYASKTFEDHNRRLWGWINSSSVADVRKGSQICIPRTHLL-KSGKQLVQWPFVEIEEL : 446

      v6k s  6G  yDYG 5YaSK3F5D K RR6LWGW E3 3 dd6 KGW 6Q 6P4 6 LD k G 66QW6 E6e L

      *      480      *      500      *      520      *      540      *      560      *
BGI_novel_1 : RGKQIQLPKSKIKKGSVFEVSGVTAVADIEISFEIS-DFKKAPILDPSTNTPQLLCSK-SASVKSAPGPGIITASKDLHAYTAVFFRIFKQCGQYVVLMSQDSRSSIND : 483
EVM00020702 : HENQVILPSKPIEGGSULIFGVTAADIEISFEIT-KLDKAPILDPSTNTPQLLCSK-SASVKSAPGPGIITASKDLHAYTAVFFRIFKQCGQYVVLMSQDSRSSIND : 423
EVM00012852 : RRNQVILPSKPIEGGSULIFGVTAADIEISFEIT-KLDKAPILDPSTNTPQLLCSK-SASVKSAPGPGIITASKDLHAYTAVFFRIFKQCGQYVVLMSQDSRSSIND : 374
EVM00002578 : HGNQVILPSKPIEGGSULIFGVTAADIEISFEIS-DFKKAPILDPSTNTPQLLCSK-SASVKSAPGPGIITASKDLHAYTAVFFRIFKQCGQYVVLMSQDSRSSIND : 485
EVM00002051 : RSKQASINDKPIEGGSULIFGVTAADIEISFEIT-KLDKAPILDPSTNTPQLLCSK-SASVKSAPGPGIITASKDLHAYTAVFFRIFKQCGQYVVLMSQDSRSSIND : 488
EVM00018616 : RLTSKEDNVLPKGSVLDVGTATLDIVAEFELD---ADAKTAESNEEFSNSSSGAQRGALGPGIITASKDLHAYTAVFFRIFKQCGQYVVLMSQDSRSSIND : 559
EVM00014291 : RQKSTHEDVLPKGSVLDVGTATLDIVAEFELD---ADAKTAESNEEFSNSSSGAQRGALGPGIITASKDLHAYTAVFFRIFKQCGQYVVLMSQDSRSSIND : 552

      6 GS 6  TA q d  fe  -----  PLESGGEEGYSG-  GSNRSKLGPGIIVVDDSLSL  PVFPRPTNTTGTLDITYCADETRSSLAP : 552
      ss

      580      *      600      *      620      *      640      *      660      *      680      *
BGI_novel_1 : DNDKTYCAFTNVPNPLERLSIRSLIHSSIVESGGGGRACITRVRVPLIATGKDAHLVAFNYGIEKVKLSISLAWSKKRAFIY-----: 567
EVM00020702 : KNDKTYCAFTNVPNPLERLSIRSLIHSSIVESGGGGRACITRVRVPLIATGKDAHLVAFNYGIEKVKLSISLAWSKKRAFIY-----: 523
EVM00012852 : DNDKTYCAFTNVPNPLERLSIRSLIHSSIVESGGGGRACITRVRVPLIATGKDAHLVAFNYGIEKVKLSISLAWSKKRAFIY-----: 424
EVM00002578 : HNDKTYCAFTNVPNPLERLSIRSLIHSSIVESGGGGRACITRVRVPLIATGKDAHLVAFNYGIEKVKLSISLAWSKKRAFIY-----: 569
EVM00002051 : DNDKTYCAFTNVPNPLERLSIRSLIHSSIVESGGGGRACITRVRVPLIATGKDAHLVAFNYGIEKVKLSISLAWSKKRAFIY-----: 579
EVM00018616 : DVNKTYSVAFNVPNPLERLSIRSLIHSSIVESGGGGRACITRVRVPLIATGKDAHLVAFNYGIEKVKLSISLAWSKKRAFIY-----: 663
EVM00014291 : EVFHKHYVSKVAFNVPNPLERLSIRSLIHSSIVESGGGGRACITRVRVPLIATGKDAHLVAFNYGIEKVKLSISLAWSKKRAFIY-----: 639

      yg  e  s  4  L6d  sl  esf  g  IT R6IPT A  65 FN t  L  W  6  A  I

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Fig. S4. Alignment of the deduced protein sequences of the *Xanthoceras* CWINs and VINs.