

>CHLRE1

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WRELLGRL-----DVLVCTPAVLLGALVHAYVRVSDVGLLVLDEAHC--T
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QPPPQRAAPVRPRLLGLTASPLEPLALQAAMCGARLITP-----VDRSGCISAHASRPK
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QEQRVADGRGGAQQPRQLVDVACGEGELQNAEGSEWDPDSVAAGSFVVPGAAVCFRRAGQ
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>Arabidopsis_thaliana_DCL-3_ARATH

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VAKNRNIIAVLGTGIDKSEITKRLIKAMG-----SS---DTDKRLIIFLAPT
NL---QCCE-----
-----IRALVN----LKVEEYFGAK-----GVDKWTSQR
WDEEFSKH-----DVLVMTQIILLDVLRS AFLKLEMVCLLIIDECHHT--T
GNHPYAKLMK-----

-----IFNPEEREG-----
V-----EKFATTVK-----
EGPILYNP---SPSCSLELKEKLETS-----HLKFDAS-----LRLQEL
GKDSFLNMDNKFETYQ-----KRLSIDYREILHCLDNLGLI--CAHLAAEVCLEKISDT
KEESETYKECSM-----
-----VCKEF-----LED
ILSTIGVYLPQ---DDKSLV-----
-----DLQQNHLSAVISGHVSPKLELHLLDSFRGD
KQKQ-----CLILVERIITAKVIERFVKKEASLAY-----

-----LNVLYLTENNPSTNVSAQ-----KMQIEIPDLFQH
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QRDHLH-----DLMRREVL-----

-----IQDPE
A----PNLKSCPPVK-----

-----NGHGVKEIGSMVIPD
SNITV-----
-----SEEAASTQTMSDPPSRNEQLPP-----CKKLR----LDNN-----
-----LLQ-----
-----SN
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----IDGATFQAYKFD-----
-----FCCNISGEV-----

-YSSFLLLLLESTLAEDVG-KVEMDL-YLVRKLVK-ASVSPCGQIRLSQEELVKAK-----
-----YFQQFFF
NGM-----

----FGKLFVGSKSQGTKREFLLQTDTSSLWHPAFMFLLLPVETNDLASSAT-----

----IDWSAIN-----SCASIVEFLKKNLLDLRDS-----
-----GNQCNTSS---GQEVLLDDKMEET--NLIHFA-----N
ASSDKNSLEELVIAIHTGRIYSIVEA-----
-----VSDSSAMSPFEVDASS---GYAT
YAEYFNK-----KYGIVLAHPNQPLMKLKQSHHAHNLVDFNEEMVVKTEPKA
GNVRKRKPNIAHLPPEL--LARIDVPRAVLKSIIYLLPSVMHRLESMLASQ-----
-----LREEIDCS-IDNFSISS

-----TSILEAVTTLT
CPES--FSMERLELLGDSVLKYVASCHFLKY---PDKDEGQLSRQRQSIISNSNLHRL
TTSRKLQGYIRNGAFEP RRWT-----
-----APG-----QFSLFPVPC
CGIDTREVPLDPKFFTENMTIKIGKSC-----DMGHRWV-----VSK
SVSDCAEALIGAYY-----VSGG-----
-----LSASLHMMKWLGIDVDFDPNL
VVEAINRVSLRCYIPKEDE-----LIELERKIQHEFSAKFLK
EAITHSSLRE---SYSYERLEFLGDSVLDLITRHLFNTYEQTGPGEMTDLRSACVNNE
NFAQVAVKNNLHHTLQRCATVLETQINDYLMSF-----

-----QKPDET----GRSIPSIQ--GPKALGDVVESIAGALLIDTR--
-----LDLDQVWRVFEPLLSPLV-----

-----TPDKLQLPPY-----
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-----YFFRVK---CSNDG
VKAQATI-----
-----QLQLDDVLLTG----
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-----HSDRETLTSETTEIQSIV-----

-----IPFIGPI
NMKKGPR-----

-----GTLHEFCKKH-----LWPMPTFDTSEEKSRTPFEF
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>Populus_trichocarpa_DCL-3_POPTR

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HLVNQAC-F-----
-----IKSQTN----FRVGEYYGAK-----GIDEWSLKS
WEKEIDEH-----DVLVMTQPQILLDALRKAFNLKMSVLLILDECHRS--T
GNHPYKKIMK-----

-----IYTIEDRAE
V-----HVYVPSAK-----

ELCRFYDK---AWCSYVELKDIEAS-----WSKFDAS-----MLALQGS
TQSCYKDMDDKLRKATR-----KQLSKDHAKILNCLEDGLI--CAYEAIKVCLENAGNP
TGECKLYQEISL-----
-----QCRYF-----LED
VLHIIGESLLH----GDNFSL-----
-----DHGFDCSAALGF--GYISPKLHELLQLFLSFGEA
REVL-----CLIFVERIITAKVVERFMKKV-EVLA-H-----

-----FTVSYLTGTNASADALAP-----KMQMETLESFRS
GKVNLLFATDVVEEGIHVPCNSCVIRFDLPKTVRSYVQSRGRARQNNSHFITMLERGNTK
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-----NRDPN
V----WNLKACASEAA-----

-----KAYVVDVTGASVTAD
SS-----
-----LPPNAAFQTLVGPTCRNQQQLAKQLVLCLEACKKLHQMGAALDDH-----
-----LLPSVE-----
-----EP
SEIAVVK--KSTSAGAGTTKRKELHGTACIHALS-----GSWGEK-----
----LDGATFHAYKFD-----
-----FSCSIVSQI-----

-YSGFILLIESKLDDVDG-NIELDL-YLVAKIVK-SSISSCGVVHLDAAQMTKAK----
-----RFQEFFF
NGL-----

----FGKLFT--GSKSSREFLLQKETTLLWSPSNMYLLLPLEPWSISSNDWCK----

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-----ARSYSGGG--NPLPDNVQSSTIECNGTNIHFA-----N
ALVNVENIKDMVVLAIHTGRIYSIVK-----
-----VNDSSAESAFEGNADN--VTEFST
YTEYFNK-----RYGIVLMHPGQPLLRLKQSHNPHNHLVNFNDEGLLVCDISKD
-GMVGRKQQQHVMPPPEL--LIKIDVPISVVKSIYLMPSLMHRLECLMLASQ-----
-----LRQEIDCH-APNFYIPS

-----SLILEAITLR
CCES--FSMERLELLGDSVLKYAVSCHLFLKY---PNKHEGQLSSWRSGAVCNSTLHKL
GTDCVKVQGYILDSAFDPRRWA-----
-----APG-----QKSVRTPAPCK
CGVDTLEVPLDRKFQTESAIVKVGKPC-----DSGHRWM-----GSK
TISDCVESVIGAYY-----VSGG-----
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ISEAITSASLRSYIPKEDE-----IKSLESKLGTYFGVKFVLQ
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-----TPEKLELPPL-----
-----RELVELCDSIG-----

-----VFVKEK--CTKKA
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-----Q-----VCNSGNCNHAFCCFLMNSIVPSNI----

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-----IESI

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HLVNQQYEV-----
-----IKANTS-----FDAGAYYGAK-----GVDGWTLKL
WEKEIDEH-----DVLVMTQIILLDALRKAFLNLDMSLMIIDECHRA--T
GNHPYTKIMK-----

-----VYTIEDRTE
M-----DIHVPSAR-----
ETCRFYDK---AQCYSELKSKIEAS-----WSKFDAS-----MLSLQGS
IQSGYKDIDDKIRTLR-----QRLSNDHAKILNCLEDLGLI--CAYEAVKVCLOSAPNS
TEDCVIYREISL-----
-----QHRYF-----LEE
VLSLIGESLPH---CDNFLL-----
-----DLDFDLKAVVF--GYISPKLYELLQLFLSFGGA
RQIL-----CLIFVDRIVTAKVIERFVKKV-AVLA-H-----

-----FTVSVVTGTNTSVDVAVTP-----KTQKETLESFRS
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-----NRDPD
V----QSLKTCAAET-----

-----KAYIVNATGASVTAD
SSVNLIYRYCEKLPD-----
-----SAAFQTLVGPICRSQQLAKQLVLEACKKLHQMGLDDH-----
-----LRPSFD-----
-----DP
MEDNCIMRSKETLAGAGTT-KRKELHGTTGIHALS-----GSWGEN-----
----LDGTTFYAYKFD-----
-----FSCSIATEM-----

-YSGFILLIESKLDLDDVG-NVELDL-YLVRKIVR-ASVSSCGQVHLDAAEQMMKAK-----
-----CFHELFF
NAL-----

----FGKLTGS-KSSKTRELLQKEKSLFWIPSNMYLLLPLETFSASNDESWK-----

----INWSGVD-----SCTYVVEFL-KNSFLG-----
-----AEQCNGES-RRSSSCRVGSSVTECSGVNTIHFA-----N
FSVDADKLDVVLAIHTGKIYSVIEV-----
-----VSDMSAESPFEQNAGD-APSNYSS
FTEYFNK-----KYGIVLMHPGQPLLLLQSHKPHNLLPNPNDE----VTSK
DGMVAVKQRQFVHMPPEL--LVSIDIPVQTLKSFYLLPSLMYRLESLMLASQ-----
-----LRQEIDCR-IPDCYIPS

-----SLMLEAITLR
CSET--FSMERLELLGDSVLKYAISSDLFLRY---PTKHEGQLSARRIQAVCNLSALHKL
GISLKLQGYIRDSAFNPRCWV-----
-----APG-----QRPAYY-IPCK
CGVDTLEVPLDAKFQTEDPKIKIAICC-----SMGHRWI-----CSK
TISDCVEAILGAYY-----VSGG-----
-----LIAAVHVMKWLGMIDIEYDPSL
VDEAISSASLRSYMPKENE-----VTSLESKLGYTFSVKFLIQ
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-----CESDEA----TKLSTVPK--GPKALGDLLESIAGAMLVDTK--
-----FDLDEVWRIFKPLLSPIA-----

-----TPESLELPPL-----
-----RELIELCDSHG-----

-----YFIKER--CTIKN
DIVHAHL-----
-----RLQLNDVLLVG----
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-----SLDLTNAHTWSSGVPSLVGSPKEGLPVIES-----

-----|
NMKKGPR-----

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>Ricinus_communis_DCL-3_RICCO

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NP-----RSYQVKVFE
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HLVNQQYEV-----
-----IKDNTN-----FKVGEYYGAK-----GIDGWSMKV
WEKEINEH-----DVLVMTPQILLDALRKAFLNLEMVSLMIIDECHRT--T
GNHPCTKIMKEFYHKLS-----
-----NPKPIFGMTASPVVQKGVSSA-----VDCEDQISELETILD
SQ-----IYTIEDRTE
M-----DVHVPSAR-----
EICKFYDIAQL---YSSDIKSKIEAS-----WSKFDAS-----LLSLQGS
IQSSYKDADDRYKTLQ----QRLYNDYSKILNLCLEELGLI--CAYEAVKICLENSP-S
TAAFDIYREISL-----
-----KCKYF-----LEE
VLSIIGTYLPH----GDSYLL-----
-----DLGFDYLKAVRL--SYISPKLYELLQVFLSFGVD
KEVL-----CLIFVDRIITAKVIERFVKKVAALVH-----

-----FTVSYVTGSNTSVDALTP-----KTQRETMYAFRS
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-----NRDPD
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-----LLPSVE-----
-----EP
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-----CFHELFF
NAL-----

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ISVDVERVKDMVVLAIHTGKIYSVVEV-----
-----VGDASAESPFEQNVGG-APSKFST
FSEYFNK-----KYGIVLLRPRQPLLLLKQSHKPHNLLNPPDEA-----
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-----LRQEIA-----

-----CQILEAITPR
SCEK--VSMERLELLGDSVLKYSVSCDLFLRY---PTKHEGQLSAQRTRAVCNSTLHQL
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-----APG-----QQPAFY-VSCT
CGVDTLEVPLDAKFQTEDPKVQIAICC-----SKGHRWM-----CSK
TISDCVEAVIGAYY-----VSGG-----
-----LMAALHVMQWLGMDFEFDPSL
VDKIIKTASVRSYTPKEDE-----IKGIESKLG YTFSVKFLQ
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-----HESDEV-----AKATGPK--GPKALGD LLES IAGAMLIDAK--

L-----DGFVSSPL-----
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HQT-----QTLLSMK-----RLKRSHDNLIYTLNLGLW--GAIQAQIQLNSDH--
--NVQDEPVGKN-PKS-----
-----KICDTYL-----SMA
AEALSSGVAKD-----
-----ENASDLLSLAALKEPLFSRKLVLKILSVFRLE
PHMK-----CIIFVNRIVTARTLSCILNNL-ELLR-S-----

-----WKSDFLVGLSSGLKMSR-----RSMETILKRFQS
KELNLLVATKVGEEGLDIQTCCLVIRYDLPETVTSFIQSRGRARMQPQSEYAFLVDSGNEK
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-----YRSSE
E-----TCPRLDE-----

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SSISLLYKYCSRLPH-DEFFQPKPEFQFKPVDEFGGT--I-----
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-----LLPDSK-----
-----DE
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----TSCVNLHSYYIM-----
-----FVPHPADRI-----

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KVL-----

----FER----GELIPDFVPLELQDSSRTSKSTFYLLLPLCLHDGESVIS-----

----VDWVTIR-----NCLSSPIFK-----
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GCWNIDDVKNLSLVFTTYSKQFYFVADI-----
-----CHGRNGFS--PVKESS----TKS
HVESIYK-----LYGVELKHPAQPLLRVKPLCHVRNLLHNRMQT---NLEPQE
----LDEYFIEIPPELSHLKIKGLSKDIGSSLSLLPSIMHRMENLLVAIE-----
-----LKHVLSASPEIAEVSG

-----HRVLEALTEK
CHER--LSLERLEVLGDAFLKFAVSRHLFLHH---DSLDEGELTRRRSNVNVNNSNLCRL
AIKKNLQVYIRDQALDPTQFF-----
-----AFG-----HPCRVT CDEV
ASKEVHS--LNRDLGILESNTGEIRC-----SKGHHWL-----YKK
TIADVVEALVGAF-----VDSG-----
-----FKGAVKFLKWIGVNVDFESLQ
VQDACIASRRYLPLTRNN-----LETLENQLDYKFLHKGLLV
QAFIHPYSNR-HGG-GCYQRLEFLGDAVL DYLMTSYFFTVFPKLPKGQLDRLRSLSVNNE
ALANVAVSFSLKRFLFCESIYLHEVIEDYTNFL-----

-----ASSPLA---SGQSEGPR---CPKVLGDLVESCLGALFLDCG--
-----FNLNHVWTMMLSFLDPVK-----

-----NLSNLQISPI-----
-----KELIELCQSYK-----

-----WDREIS--ATKKD
GAFTVEL-----
-----KVTKNGCCLTV---
---SATGRNKREGTKKAAQLMITNL-----
-----K-----AHENITTSHPLEDVLKNGIRNEAK---

-----LIGYNEDPIDVV--DLVGLDVENLNILET-----

-----FGGNSERSSSYVIR-----RGLPQAPSKTEDRLPQKA
IIKAGGPSSK-----TAK-----

-----SLLHETCVAN-----CWKPPHFEC-----
EEEGPGHLKSFVYK VILEVEDAPNMTLECYGEARATK-----

-----KGAAEHAAQAIIWCLKHSGFLC-----

-YKQFGLFLKAPLPLEAD-KMSLEL-HLARGRSVMTKLVPSGLSKFSTDEITHAT-----
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KAI-----

----LDR-----SEFVHEYVPLGKDALS KSCPT-FYLLLPVIFHVSERRVT-----

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GCSSIRDVENS LVYTPHQKFFYFITNI-----
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HKDHLTT-----TFGIHLRYPEQPLLRAKQLFCLRNLLCNRKKE---DSELQE
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-----FIRDQPFDPYQFF-----
-----ALG-----HPCPRICTKE
SEGTIHS--QCGSHVTGQAKGSEVRC-----SKGHHWL-----HNK
TVSDVVEALIG AFL-----VDSG-----
-----FKA AIAFLRWIGIKVDFDDSQ
VINICQASRTYAMLNPSMD-----LATLENLLGHQFLYKGLL
QAFVHPSH-K-NGG-GCYQRLEFLGDAVL DYLITSYLSVYPKMKPGHLTDLRSVLVNNR
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-----RTPKSE----RRLLEGPK--CPKVLGDLVESSVGAILLDTG--
-----FDLNHIWKIMLSFLNPIS-----

-----SFSNLQINPV-----
-----RELKELCQSHN-----

-----WDFEVP--ASKKG
RTFSVDV-----
-----TLSGKDMNISA----
----SASNSNKKEAIRMASEKIYARL-----
-----K-----DQGLIPMTNSL EEVLRNSQKMEAK----

-----LIGYDETPIDVAL--DAHGF--ENSKIQEP-----

-----FGIN---CSYEVR-----DSCPFRFEAVDAWSLSPL
DFTGGQPSEATGDLRCDRDVLITGKVDLGTAR-----

-----SRLREICAA-----SWKPPSFECC-----
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>Populus_trichocarpa_B_DCL-4_POPTR

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GSQLQ-----KTEKD-----PRKMARKYQLELCK
KALEENIIVYLGTCGKTHIAVLLIYE-M-----GHLIRQPQKSACVFLAPTV
ALVHQQAKV-----
-----IEDSTD----FKVGIYCGKS-----NR-LKTHSS
WEKEIEQN-----EVLVMTQPQILLYNLSHSFIKMDLIALLIFDECHHAQVK
SGHPYAQIMKVFY-----
----KNNDGKLPRIFGMTASPVVVGKEKYRERVTSLEILLHHLIRENLPRSINSLENLLD
AK-----VYSVEDKEE

L-----ECFVASPV-----
IRVYLYGPVANGTSSSYEAYNILEGV-----KRQCI-----VEIGKKTGD
NQSL----ESLRSTK----RMLIRMHENIIFCLENLGLW--GALQACRILLSGDH-S
EWNALIEAEGNT-SDV-----

-----SMCDRYL-----NQA

TNVFAADCTRD-----
-----GVTSNVSQVEVLKEPFFSRKLLRLIEILSNFRLQ
PDMK-----CIVFVNRIVTARSLSHILQNL-KFLT-S-----

-----WKCDFLVGVHSGLKMSR-----KTMNVILERFRT
GKLNLLLATKVGEEGLDIQTCCLVIRFDLPETVASFIQSRGRAMPQSEYVFLVDSGNQK
ERDLIEKFKIDEARMNIEIC-----

-----DRTSR
E-----TFDSIEE-----

-----KIKVHATGASITSG
LSISLLQQYCSKLP-DEYFDPKPKFFY--FDDSEGT--V-----
-----CHIILPSNAPTHKIVGTPQSSIEVAKKDAKLAIEQLHKLGFSEF-----
-----LLPQQE-----
-----DT
NELELVSS--DSDNCEKDK-SRGELREMLVPAVLK-----ESWTEL-----
-----EKPIHLNSYYIE-----
-----FCVPEDRI-----

-YKQFGLFLKAPLEAD-KMSLEL-HLARGRSVMTKLVPSGLSKFSTDEITHAT-----
-----NFQELFL
KAI-----

-----LDR-----SEFVHEYVPLGKDALS KCPT-FYLLLPVIFHVSERRVT-----

-----VDWEIIR-----RCLSPVF--KN-----
-----PANAVDKG-----ILPSN--DCLQLA-----N
GCSSIRDVENS LVYTPHQKKFYFITNI-----
-----VPEKNGDS--PCKGSN-----TRS
HKDHLTT-----T-----ELQE
-----LDEHFVDLAPELCELKIIIGFSKDIGSSISLLPSVMHRLNLLVAIE-----
-----LKCILSASFSEGDKVTA

-----HRVLEALTTEK
CQER--LSLERLETGDAFLKFAVGRHFFLLH----DTLDEGELTRKRSNAV-----
-----FIRDQPFDPYQFF-----
-----ALG-----HPCPRICTKE
SEGTIHS--QCGSHVTGQAKGSEVRC-----SKGHHWL-----HNK
TVSDVVEALIGAF-----VDSG-----
-----FKAAIAFLRWIGIKVDFDDSQ
VINICQASRTYAMLNPSMD-----LATLENLLGHQFLYKGLL
QAFVHPHK--NGGEFGVMILQFAMTLMFPPEIGVPWRFCFYPKMKPGHLDLRSVLVNNR
AFASVAVDRSFHEYLICDSDALSAATKKFVDFV-----

-----RTPKSE----RRLEGPK---CPKVLGDLVESSVGAILDTG--
-----FDLNHIWKIMLSFLDPIS-----

-----SFSNLQINPV-----
-----RELKELCQSHN-----

-----WDFEVP--ASKKG
RTFSVDV-----
-----TLSGKDMNISA---
---SASNSNKKEAIRMASEKIYARL-----
-----K-----DQGLIPMTNSLEEVLRNSQKMEAK---

-----LIGYDETPIDVAL--DAHGF--ENSKIQEP-----

-----FGIN---CSYEVR----DSCPPRFEAVDAWSLSPL
DFTGGQPS-----KVDLGTAR-----

-----SRLREICAAN-----SWKPPSFECC-----
TEEGPSHLKSFTYKVVVEIEEAPEMSFEFCVGPQMKK-----

-----KAAAEDAAEGALWYLKHQRHLS-----

>HbDCL4

-----MSKKLPYRREVNYEIELELGA
YLQPW-----YQLELCK
KAMEENIIVYLGTCGKTHIAVLLIYE-L-----GHLIRKPQKNVCVFLAPT
ALIQQQAKV-----
-----IEESTD----FKVGIFYGS-----SKHLKNHYD
WEKEIEQY-----EVLVMTQPILLHTLSHSFIKMELISLLIFDECHHAQVK
SNHPYAEIMRVFY-----
----KANDGKLPRIFGMTASPVVGQGASSQ-----ANLPRSINSLENLLD

AK-----VYSVEDKEE
L-----EHCVASPV-----
VKIYEYGPVANGTSSYMYTYCSKLEEI-----KHTCI-----SELHKKVDE
CQSV---QGLRNTK---KVL SRMHDNVVFCLENLGLW--GALQACQILLSGDP-S
EWNALIEEEGNI-SND-----
-----SFCDRYL-----AQA
ANFLAAVCTD-----
-----GVESDISLVEVLNEPFFSRKLLRLIGILCNFRLQ
PNMK-----CIIFVN RIVTARSLSYILQNL-KFLT-S-----

-----WKCDFLVGVHSGLR SVSR-----KTMNNILEKFRT
GKLNLLIATKVGEEGLDIQTCCLVIRFDLPETVASFIQSRGRARMPQSEYAFVLD R GKQK
ELDLIESFKYNEDQMNREIA-----

-----SRTSN
E-----TFVGL EE-----

-----KVYKVDISGASVSSA
YSISLLHRYCSKLPH-DEYFDPMPKFFY--FDDLGGT---I-----
-----CHIILPSNAPVHQIVGTPQPSQEAAKKDACLAIEQLHQLGALNNF-----
-----LLPHQE-----
-----DA
DEESVLLSS-DSDNCEDEG-SRGELHEMLVPALLK-----ESWTAS-----
----ENWIHLHSYYIE-----
-----FCPFKDRT-----

-YEKFLFIKAPLPQAE-QMQLDL-HLARGRIVTTKLVLSGVMKFNTDEITMAM-----
-----NFQEMFL
KVI-----

----LDR----KELISEFVPLGKDSFCKSSHT-FYLLLPVILRGCGSGVT-----

----VDWEVIR-----RCLLSPVF-----
-----RSVQKE-----NFPSV--AHLQLA-----N
GCRSMRDIENSLVYIAHKKQFYFVSNI-----
-----FHGKNGFS--PHKGSS-----TPS
HLEHLIQ-----TFGIQLKYPEQPLLQAKPLFCLHLLHNRRQE---DSETQE
-----LDEYFIDVPAELCELKIIGFSKDIGSSVLLPSIMHRENLLVAIE-----

-----LKSLLSGSFSEGAQVTA

-----FRVLEALTTEK
CQER--LSLERLEVLGDAFLKFAVGRHLFLLH---DTLDEGELTRKRSNAVNNSNLLKL
ARRKNLQVYIRDQPFDPQFF-----
-----ALG-----RPCHIICTKE
SEGNHS-----QNANGVRC-----SKGHHWL-----HRK
TIADVVEALVGAFI-----VDSG-----
-----FKAATAFLKWLGRVDFEASE
VIKVCCLASRSFMPLAPSID-----NVDLEKLLGHRFLHKGLL
QAFVHPSYNK-HGG-GCYQRLEFLGDAVLDYLITSYLFVYPKPKPGHLTDLRSALVNNR
AFANVAIDRSLHKFLLCSSNLSEAIKNYVDSV-----

-----KTPASG---RGLLEGPK--CPKDRGYSRKS-----
-----NYLEEVLRSSQKMEAKLI-----

-----GYDETPI-----
-----DIAASCATT-----

-----LENLKV--QEPVG
SNFNPKI-----

---YSMSASKQPASHLAVGGQ-----
-----P-----SETVAYSRSDDSLAKDGSVRSR---

-----KSRLHEICAAN-----CWKPPSFECC-----
FEEGPSHLK-----

>Ricinus_communis_DCL-4_RICCO

-----MPDGEAD-----ISPDDSSSICTVNRAGDD---DGDEC
NSMPQ-----QPEKD-----PRKIARKYQLELCK
KALEENIIVYLTGCGKTHIAVLLIYE-L-----GHLIRKPLKNVCVFLAPTV
ALV-QQVRV-----
-----IEQSID----FKVGVYCGNS-----NH-LKSHRD
WEKEIEQN-----EVLVMTQPQLLHTLGHSFIKMEISLLIFDECHHAQVQ
SSHPYAEIMKVFY-----
----KTGDGKFPFRIFGMTASPVVVGKASNQ-----ANLPKSINSLENLLD
AK-----VYSVEDNEE
L-----ELFVASPV-----
VRIYLYAPVANEKSSSYMTYFSKLEEI-----KRKCL-----LELHKKADS
CQSL----HGLQNAK----KVFIRMHDNVVFCLENLGFW--GALQACKILLSDDH-F
EWNALIEAEGNI--DA-----
-----SVC DKYL-----AQA
ANMFASVCTKD-----
-----CIAFDLSSVEVLTEPFFSRKLLRLIGILSTFRLQ
PNMK-----GIVFVNRIVTARSLSYVLQNL-KFLI-S-----

-----WKCDFLVGVHSGLKSMR-----KTMNSILEKFKT
GKLNLLIATKVGEEGLDIQTCCLVVRFDPETVASFIQSRGRARMPQSEYAFVDSGNQK
ELDLIERFRREDEDRMNMEIS-----

-----SRTSN
E-----TFVSIEE-----

-----KVYKVESGACISSA
YSISLLHHYCSKLPH-DEYFDPKPQFFF--FDDLGGT--I-----
-----CHIILPANAPVHQIVGTPQSSREAAKDAKLAIEQLHKLGSLSNF-----
-----LLPHEK-----
-----DV
NEESMLASS-EPENNEGEG-VRGELHEMLVPAVFK-----ESLTSS-----
----ENWINLHSYFIK-----

-----LIGYDETPIDITAH-DPIGL--QNLKIQDP-----

-----SCSD---FNPKIRSMKLTNTCSPCFIAANIQPPSPS
VMVGGQPSATVAYPTSDMDKPT-----SAK-----

-----SRLHDICAAN-----CWKPPLFECC-----
YEEGPSHLKSFYKIVIVEIEAAPDMILECFGAPREK-----

-----KAAAEHAAEGALWYLQHVGYLTVK-----

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-----MVMEDPREATIKPSYWLDACEDISCDLI
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VTPQVIKETVKENGLQKNGGKRDEFSKEEGDKDRKRARVCSYQSERSNLSGRGHVNNR
EGDRFMNRKRTRNWDEAGNNK-----KRECNNYRRDGRDREVRGYWERDKVGS
NELVYRSGTWEADHERDVKKVSGGNRECDVKAENKSKPEERKEKVVEEQARRYQLDVLE
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PLVYQQAQEV-----
-----IRNQTC----FQVGHYCGEM-----GQDFWDSRR
WQREFESK-----QVLVMTAQILLNLRHSIIRMETIDLLILDECHHA--V
KKHPYSLVMSEFYHTTP-----
-----KDKRPAIFGMTASPVNLKGVSSQ-----VDCAIKIRNLETKLD
ST-----VCTIKDRKE
L-----EKHVPMP-----
EIVVEYDKAAT-MWSLHETIKQMIAAVEEAAQASSRKSQWQFMGARDAGAKDELQVYGV
SE-----RTESDGA-----ANLIHKLRAINNYTLAELGQW--CAYKVGQSFLSA---L
QSDERVNFQVDVKFQE-----
-----SYLSEVVSLQCELLEGAAAQKVAEEVGPEN---GNA
HDEMEEGELPD----DPVVS-----
-----GEHVDEVIGA AVADGKVTPKVQSLIKLLKQHT
ADFR-----AIVFVERVVAALVLPKVFAL-PSLS-F-----

-----IRCASMIGHNNSQEMKSS-----QMQDTISK-FRD
GHVTLVATSVAEEGLDIRQCNVVMRFDLAKTVLAYIQSRGRARKPGSDYILMVERGNVS
HAAFLRNARNSEETLRKEAI-----

-----ERTDL
SHLKDTSRLISIDAVPG-----

-----TVYKVEATGAMVSLN
SAVGLVHFYCSQLPG-DRYAILRPEFSMEKHEKPGGHTEYS-----
-----CRLQLPCNAPFEILEGPVCSMRLAQAVCLAACKKLHEMGAFTDM-----
-----LLPDKG-----
-----SG
QDAEKADQDDEGEPVPGTARHR---EFYPEGVADV LKGEWVSSGKEVCESS-----
-----KLFHLYMYNVR-----
-----CVDFGSSKDPFLSE-----

-VSEFAILFGNELDAEVL-SMSMDL-YVARAMITKASLAFKGLDITENQLSSLK----
-----KFHVRLM
SIV-----

-----LD-----VDVEPSTTP-----WDPKAYLFPVTDNTSMETPIK-----

-----INWELVE-----KITKTAW--DNPLQRARPDVYLGTNERTLGGDRREYGF
GKLRHNIVFGQKSHPTYGIRGAVASFDVVRASGLLPVR--DAFEKEVEEDLSKGKLMMD
GCMVAEDLIGKIVTAAHSGKRFYVDSI-----
-----CYDMSAETSFPRKEGYLGPLEYNT
YADYYKQ-----KYGVDLNCQQLIKGRGVSYCKNLLSPRFEQ---SGESE
---TVLDKTYVFLPPELC--VVHPLSGSLIRGAQRLPSIMRRVESMLLAVQ-----
-----LKNLI-----SYPIPT

-----SKILEALTAAS
CQET--FCYERAELLGDAYLKWVVSRLF LKY---PQKHEGQLTRMRQMVSNMVLVYQF
ALVKGLQSYIQADRFAPSRWS-----
-----APG-----VPPVFDEDTKD
GGSSFFD-----EEQKPVSEENSDFEDGEMEDGELEGLDSSYRVL-----SSK
TLADVVEALIGVYY-----VEGG-----
-----KIAANHLMKWIGIHVEDDPDE
VDGTLKNNVNPESVLKSID-----FVGLERALKYEFKEKGLLV
EAITHASRPS-SGV-SCYQRLEFVGDAVL DHLITRHLFFTYTSLPPGRLDLRAAAVNNE
NFARVAVKHKHLHLYLRHGSSALEKQIREFVKEV-----

-----QTSSKPGFNSFGL-GDCK--APKVLGDIVESIAGAIFLDSG--
-----KDTTAAWKVFQPLLQPMV-----

-----TPETLPMHPV-----
-----RELQERCQQA-----

-----EGLEYK--ASRSG
NTATVEV-----
-----FIDGVQVGVAQ----
--NP--QKKMAQKLAARNALAAL-----
-----K-----EKEIAESKEKHINNGNAGEDQGEN----

-----ENGNKKNHGHP-----

-----FTR-----

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KDMVFRLGTWEADHNKEGREANDKIQECKGELEKKSEES--KEKVPEEQARQYQLDVLD
QAKKKNTIAFLETGAGKTLIAVLLIRSIC-----NDLQRQNKILAVFLVPKV
PLVYQQAEV-----
-----IRER-G----YQVGHYCGEM-----GQDFWDTRR
WQREFETK-----QVLVMTAQILLNLRHSIIKMEAINLLILDECHHA--V
KKHPYSLVMSEFYHTTP-----

-----KEKRPSVFGMTASPVNLKGVSSQ-----VDCAIKIRNLESKLD
SI-----VCTIKDRKE
L-----EKHVPMPA-----
EVVVEYDKAAS-LWSLHEQIKQIEAAVEEAAQSSRRSKWQFMGARDAGAKEELRQVYGV
SE-----RTESDGA-----ANLIQKLRAINIALGDLGQW--CAYKVAQSFLTA---L
QNDERANYQLDVKFQE-----
-----SYLERVLLLLQCQLTEGAVTDKDTKVSDNGNDNIQDGP
FDEIEEGELPD----SHVVS-----
-----GEHVDVIIGAAVADGKVTPKVQSLIKVLLRYQHT
EDFR-----AIIFVERVVAALVLP-----

-----KSRGRARKPGSDYILMVERGNLS
HGAFLRNARNSEETLRKEAI-----

-----ERTDL
SHLKDTSRLIAVDSIPG-----

-----TVYQVESTGAVVSLN
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-----LLPDKG-----
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SIV-----

----LD-----VDVEPSTTP-----WDPKAYLFVPMVSDKSVDPIKE-----

----IDWDLVE-----NIIGTDAW--SNRLQRRPDPVYLGTNERTLGGDRREYGF
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-----CYDMTAEISFPRKEGYLGPLEYSS
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>HbDCL1

-----MYPIGGRVEGYRRA
RRDKYHNRRRDY-----NGRRDGRDRDWRDREPRGYWERDRSGS
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QAKKRNTIAFLETGAGKTLIAVLLIKSLY-----NDLQRQNKMLAVFLVPKV
PLVYQQAEV-----
-----IREHTS---YQVGHYCGEM-----GQDFWDARR
WQPEFESK-----QVLVMTAQILLNLRHSIIKMEAINLLILDECHHA--V
KKHPYSLVMSEFYHTTP-----
-----KEKRPSVFGMTASPVNLKGVSSQ-----VDCAIKIRNLESKLD
SI-----VCTIKDRKE
L-----EKHVPMPA-----
EIVVEYDKAAS-LWSLHEQIQMEVAVEEAAQSSRRSKWQFMGARDAGAKEELRQVYGV
SE-----RTESDGA-----ANLIQKLRAINIALGELGQW--CAYKVAQSFLMA---L
QNDERANYQLDVKFQE-----
-----SYLEKVVLLQCQLTEGAVTDKDTKSNENGV AQDGTD
PDDIEEGELPD----SHVVS-----
-----GEHVDVIIGAAVADGKVT PKVQSLIKILLKYQYT
EDFR-----AIIFVERVVAALVLPKVFAEL-PSLS-F-----

-----VRCASLIGHNNSQEMRTS-----QMQDTIAK-FRD
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-----ERTDL
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-----TVYQVESTGAIVSLN
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-----LLPDKG-----
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-----KLLKLYMYAVR-----
-----CVNSGTSKDPFLTQ-----

-VSDFAVLFGNELDAEVL-SMSMDL-FIARTIITKASLVFRGPINVTETQLASLK-----
-----SFHVRLM
SIV-----

-----LD-----VDVEPSTTP-----WDPKAYLFVPMVGDKFVDPIKE-----

-----IDWDLVE-----KIIRTDVW--SNPLQRARPDVYLGNTERTLGGDRREYGF
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TCVDAEDLVGRIVTAAHSGKRFYVDSI-----
-----RYDMTAENSFPRKEGYLGPLEYSS
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--EILDKTYVFLPPELC--LVHPLPGSLVIRGAQRLPSIMRRVESMLLAVQ-----
-----LKDMI-----DYSVPA

-----SKILEALTAAS
CQET--FCYERAELGDAYLKWVVSRLFYK---PQKHEGQLTRMRQQMVSNMVLYQY
ALNKGLQSYIQADRFAPSRWA-----
-----APG-----VLPVFDEDTKD
GESSLFD--QERLLEDKPGVDHADDGYQDDEIEDGELESDSSSYRVL-----SSK
TLADVVEALIGVYY-----VEGG-----
-----KNAANHLMKWIGIQVEFDHEE
VDSAIPANVPESILRSVN-----FDALEGLNIKFNDRGLLV
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-----TPETLPMHPV-----
-----RELQERCQQQA-----

-----EGLEYK--ASRSG
NLATVEV-----
-----FIDGIQVGLAQ---
---NP---QKKMAQKLAARNALAVL-----

-----K-----EKETAEAKEKGD---ENGTKKKNG----

-----NQTFR-----

-----QTLNDICLRR-----NWPMPLYRCV-----

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>Ricinus_communis_DCL-1_RICCO

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NGLS---LLVGEGERLNLLDNSVRENGSRGEGQRERDIDSDVRSCKRARITSYKNERQ

YSSRGQYDA-----RDRDRSSNRKRLRDWDDIDRRDRDYLRDRY

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AEKKVEETKEKIPPEEQARQYQLDVLVMTAQILLNLRHSIIKMEAINLLILDECHHA--V

KKHPYSLVMSEFYHTTL-----

-----KEKRPSVFGMTASPVNLKGVSSQ-----VDCAIKIRNLESKLD

SI-----VCTIKDRKE

L-----EKHVPMPS-----

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QSDERANYQLDVKFQE-----

-----SYLEKVVSLQCQLTEGAVTDKDTKSPENENGVAQAGSD

PDDIEEGELPD----SHVVS-----

-----GEHVDVIIGAAVADGKVTQVQSLVKILLKYQHT

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-----VRCASLIGHNNSQEMRTS-----QMQDTIAK-FRD

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-----RYDMTAENSFPRKEGYLGPLEYSS
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-----LKDII-----HYSVPA

-----LKILEALTAAS
CQET--FCYERAEELGDAYLKWVVSRLFLLKY---PQKHEGQLTRMRQQMVSNMVLYQY
ALIKGLQSYIQADRFAPSRWA-----
-----APG-----VLPVFEDETKD
GDSSLFD--QEKS LIENKPKVDHADDGYEDEIEDGELESDSSSYRVL-----SSK
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-----KTAANHLMRWIGIKVEFDHEE
IDSAIRPSNPESILRSID-----FDALEGALNIKFQDRGLLV
EAITHASRPS-SGV-SCYQRLEFVGDAVL DHLITRHLFFTYTNLPPGRITDLRAAAVNNE
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GKHPYACIMREFYHKEL-----
----NSGTSNVPRIFGMTASLVKTKGENLD-----S-YWKKIHELETLMN
SK-----VYTCENESV
L-----AGFVPFST-----
PSFKYYQHIKI-PSPKRASLVEKLERL-----TIKHRLS-----LGTLDL
NS-----STVDSVE-----KRLLRISSTLTYCLDDLGL--LAQKAAQ-SLSA---S
QNDSFLWGELNM-FSV-----
-----ALVKKF-----CSD
ASQEFLAEIPQ---GLNWSV-----
-----A-NINGNAEA---GLLTKTVCLIETLLGYSSL
ENIR-----CIIFVDRVITAIVLESLLAEILPNCN-N-----

-----WTKKYVAGNNSGLQNQTR-----KKQNEIVEDFRR
GLVNIIVATSILEEGLDVQSCNLVIRFDPASNICSFIQSRGRARMQNSDYLMMVESGDLL
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-----DHSLV
P---CPPLPDDS-DE-----

-----PLFRVESTGATVTL
SSVSLIYHYCSRLPS-DEYFKPAPRFDVNKDQG-----S-----
-----CTLYLPKSCPVKEVK--AEANNKVLKQAVCLKACIQLHKVGLSDH-----
-----LVP-----
-----DM
VVAETVSQKLEKIYQNTQPC-----YFPPELVS-----QFSAQP-----
----ETTYHFYLIRMK-----
-----PNSPRNFH-----

-LNDVLLGTRVVLEDDIG-NTSFRL-EDHRGTIA-VTLSYVGAFHLTQEEVLFQR-----
-----RFQITLF
RVL-----

----LDH-----SVENLMEALNGLH--LRDGVALDYLLVP-STHSHETSL-----

----IDWEVIR-----SVNLTSHEVLEK-----
-----HENCSTNG-----ASRILHTK--DGLFCT-----
-CV---VQNALVYTPHNGYVYCTKGV-----
-----LNNLNGNSLLTKRNSG-----DQT

YIEYYEE-----RHGIQLNFVDEPLLNGRHIFTLHSYLHMAKKK----KEKE

-----HDREFVELPPELCHVILSPISVDMIYSYTFIPSVMQRIESLLIAYN-----

-----LKKSI----PKVNIPT

-----IKVLEAITTKK

CEDQ--FHLESLETLGDSFLKYAVCQQLFQHC---HTHHEGLLSTKKDGMISNVMLCQF

GCOQKLOGFIRDECFEPKGWM-----

-----VPG-----QSS

AAYSLVN-----DTLPESRNIY-----VASRRNL-----KRK

SVADVVESLIGAYL-----SEGG-----

-----ELAALMFMNWVGIVDFTTTK

IQR----DSPIQAEKLVN-----VGYMESLLNYSFEDKSLV

EALTHGSYMM-PEIPRCYQRLEFLGDSVLDYLITKHLYDKYPCLSPGLLDMRSASVNNE

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-----YNKEVVFASIKPLLGCMI-----

-----TPETVKLHPV-----

-----RELTELCQK-----

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DSFTVEV-----

-----KAKEMSFAM-----

---TAKASDKKMAKKLAYKEVLNLL-----

-----K-----

-----NSLDY-----

>Populus_trichocarpa_A_DCL-2_POPTR

-----MEPVSVDIDTTQQLPA
DPLPF-----ARSYQLEALE
QALKQNTIVFLETGSGKTLIATMLLRS-Y-----AHLLRKPSRFIAVFLVPEV
FLVRQQAGV-----
-----VRMHTD----LNVGMYWGDM-----GIDFSHAAT
WKQEIDKH-----EVLVMTHQILLNGLRQGYFKLDFIKVLIFDECHHA--R
GNHPYACIMTEFFHREL-----
----RSGHHDLPRIFGMTASLIKSGANSE-----SYRQIQICELENIMN
SK-----VYTCASETV
L-----AEFIPSPA-----
AEFLFYEPMKI-PDGIYACLEEELGNL-----KAKHELL-----LKQLDL
SE-----SAAESVH-----SKISKVHSALMFCSGELGVW--LAFQAAR-FLSHSD-T
DSDFIAWGKVDV-SGE-----
-----TIVKKF-----CWD
ASLVISNCFS-----AECCI-----
-----GDNTEADVGA---GLITAKVLCLIKTLLQYRDL
KDIR-----CIVFVERVITAVVLESLLRELLPKHS-S-----

-----WTKYIAGNNSGLQSQTR-----QMNEIVEEFRK
GMVNIIVATSILEEGLDVQSCNLVIRFDPPSSVSSFIQSRGRARMQNSDYLLMVKTEDST
THSRLNLYSSSEIMRRESL-----

-----RRSST
S----CSAPQSELYED-----

-----EFYSVEGTGAVVTLS
SSVSLIYFYCSR LPS-DGYFKPAPICIIDKEKE-----T-----
-----CTLHLPKSSPIQNIC--VQGNNKNLQKACLEACKQLHLIGALTDN-----
-----LVP-----
-----DV

THARLENYLASGDIMRRESL-----

-----RHASI
P----CSPL-LDELDD-----

-----EFYRVEGTGAVVSLS
SSVSLIYFYCSRLPS-DGYFKPAPRCIIDKETM-----T-----
-----CTLHLPKSSPVQTIC--VQGNIKTLKQKACLEACKKLHVSGALTDN-----
-----LVP-----
-----DI
VMEEAVAEDVGNERYDDEQPI----YLPPELVS-----RGPRNL-----
----KTKYYCYLIELN-----
-----QNFAYDIP-----

-VHDVVLVVRTELESDVIRSMGFDL-EAERGLLT-VNLRYIGDIDLERVLVLLCR----
-----RFQITLF
KVL-----

----LDH----SVNKLKEVLEGLD--LGSGAEIDYFLLP-AFRSCSQPS-----

----INWAPIS-----SVLFS--YKNEE-----
-----HFNCSRNG-----NAHVVQTK--CGPVCA-----
-CV---LQNSLVCTPHNGNIYCITGV-----
-----FEDLNGNSLLKMGDGG----AIT
YKEYFAKRPMSDLKLTDFRHGIQLLFNREPLLKGKHIFPVHLLNRCRKQ----KEKA
-----SKNTHVELPPELCEIILSPISISTLYSYTFIPSIMHRLESLLIAVN-----
-----LKKMHSDHYLQHVNIPS

-----MKVLEAITNK
CQEN--FNLESLETLGDSFLKYAASQQLFKIY---QNHHEGLLSFKKDKIISNAALCRR
GCNHKLQGFIRNESFDPKLWI-----
-----IPG-----GK
LGSDFLS-----EEPLSKGRKIY-----IRGRRKV-----KSK
TIADVVEALIGAYL-----STGG-----
-----EVTALLFMDWIGIKVDFMNTP
YER----HIQLQAEKFN-----VRYLESLLNYSFNDPSSLV
EALTHGSYML-PEIPRCYQRLEFLGDAVLDYLITLHMYKEYPGMSPGLLTLRSASVNND
CYALSAVKVGLDRHILHASHDLHKHIVATVKKI-----

WKQQIEQY-----EVLVMTQIILLDGLRHSFFKLDCKIKVLIFDECHHA--R
GKHPYACILTEFYHRQL-----
----TYRDSALPRIFGMTASPIKSKGAKSE-----LAYWTEIRELENIMY
SK-----VYTCASESV
L-----AEFIPFST-----
PKFKFYKPMDI-PYAIYASLAENLKIL-----KSKYECN-----LKLLDL
TD-----AVVESTS-----KRISKMHSTLMYCLDELGVW--LALKAAQILSCHES--
--EFFSCGKLDI-SGE-----
-----NIVKEF-----GLN
ASQALDNCINS----GPKWSI-----
-----GENAEADIEA---GLLTTKIFCLIDSLLDYRDI
RDLR-----CIIFVNRVIAAIVLQTLGELLPRYNSG-----

-----WKTQYIAGNNFRLQSQR-----KTQNEIVEEFRE
GKVNIIIVATSILEEGLDVQSCNLVVRFPSTTVSSFIQSRGRARMQNSDYLLMVKSGDVS
THSRLENYLASGDLMRKESI-----

-----RHGSV
P----CSPIRSEFHEG-----

-----EYFVESTNALVTLT
SSVSLIYFYCSRLPS-DGYFKPTPRCLIDKEME-----R-----
----CTLLLPKSCSIHTIS--VEGNVKIIKQKACLEACKQLHKIGALNDN-----
-----LVP-----
-----DI
VVEETVAQQSGNGPYDDEHPM----YFPPELVG-----QASQKS-----
----EAKYYCYLIELN-----
-----QNFVYEIP-----

-VHNFVLAMRSELES DIL-GLDLDL-EADRGLLM-VKLKYIGEIHLPETVIMCR-----
-----KFLITVL
KVL-----

----VDH-----SIDKLEDILKGLK--LRNGPEIDYLLLP-LVGSCQKPS-----

----IDWDAVT-----SVLFS--Y--ENVLED-----
-----HKNCPLKE-----AACVIQTK--DGVVCK-----
-CT---LQNSVVYTPHNGKVYFIDGT-----

-----DI
VMEEVVAQEVGNMPYDDEQPM-----YFPPELVS-----QGSKES-----
----KGTYYCYLIELN-----
-----QNFHSDIP-----

-VHNIILVMGSELES DIL-SLDFEL-EVDRGLLT-VKLKYIGELDLTTEMVLICR-----
-----KFLIALS
KVL-----

----VDH-----NVNELEEILNGLR--LRKDPEIDYFLLP-SMASCQKPV-----

----IDWSSIV-----SVLFS--Y--ANAWED-----
-----HVKCPLKD-----SAHIIWTK--NGQVCK-----
-CM----LENSLVYTPHNGEVYCIKGI-----
-----FNHLDGRSLLRLKNGD----CKT
YKEYYKD-----KHGINLSFDQQLLRGRHIFPLQNYLDRCRQH----KGKD
----SQNAYVQLPPELCCIKMSPISISTFYSFTFVPSIMHRLESLLIAVN-----
-----LKKLHLDQ-MRNVIIPT

-----IKVLEAITTKK
CQEK--FHLESLETLGDSFLKYAASQQLFKTY---QNYHEGLLSIKKEKLISNATLCKL
GCDRKLPGFIRNESFDKPNWM-----
-----IPG-----DT
HGYSLHE-----EFLSNARSIY-----IIRRRKL-----KRK
VVADVVEALIGAYL-----SAGG-----
-----ETAALLFLNWIGIEVDFLNT
YEP----QFKVNPEKYIN-----IRRLESLLNYSFKNPSLLL
EALTHGSYML-PEIPRCYQRLEFLGDSVLDYLITVYLYEKYPGMSPGLLDMRSASVNND
CYAFSAVREGLHKHILHLSQILHKDIAVAVENF-----

-----ENCSS--STFGWESDVS--FPKVLGDVIESLAGAIFVDSG--
-----YDKEVVFQSIKPLEPLI-----

-----TPETLKLHPA-----
-----RELNELCQVQH-----

-----FEERKPV--SSRSN
GMSSVTV-----

-----EVEANGLIFKH----
---TSSAGDKRTAKKLASKELST-----
-----CRGALTQDQVRSVAGSAG-----

-----FWPGRQSDT-----
RAQGMTSLAFSGGLVRRPAVGWCWGGTSARGGERREK-----

-----MGEREEMLGGRERRKKKKKRSV-----

>HbDCL2.2

-----MTFN
IFSGCENLNTEKIKMDETLKGS-----NLLFPGSSAVMEPAYMDIDDAQKLG
DPLPS-----ARSYQLEALE
MALKQNTVLFLETGSGKTLVAIMLLRS-Y-----AYLIRKPSHFIAVFLPHV
VLVQQQAEA-----
-----VEMHTD-----FNVGQLYGEK-----GVDCWDAAI
WKQHLEKH-----EVLVMTQPILLDGLKHSFFKLDLIKVLIFDECHHA--R
GNHPYACILTEFYHRQL-----
----SCGNFNLPRIFGMTASPIKSGANSE-----QAYGQKIFDLENMMH
SK-----VYTCVSDSV
L-----AEFIPST-----
PKFKFYNHKDI-PYAIYVSLVEKIL-----KAKHECK-----LKQLDL
TD-----SVVESTS-----KNISKMHSTLMYCLDELGVW--LAFKAAQIMSSHGS--
--NFPSWDKLDV-FGD-----
-----NIVKEF-----GFV
ASQEFNCIRT----GPKWSI-----
-----GDNAKYDVDA---GLLTKIFCLIDSLLLEYRDL
NDIR-----CIVFVERVITAIVLQSLLSELLPRYN-G-----

-----WSKYIAGNGSGLQTQTQ-----KTQNEIVEEFRK

GKVNIIVATSILEEGLDVQSCNLVVRFDPSATISSFIQSRGRARMHNSDYLLMVKSGDLS
TCSRLQNYLSSGDIMRKESI-----

-----RLASV
P----CSPLKIELRDD-----

-----EFYCVESTGAVVTLT
SSVRLIYFYCSRLPS-DGYFKPAPRCVIDKERE-----V-----
----CTLHLPKSCDIQNIC--VQGNIKTLKQKACLEACKELHKIGALTDN-----
-----LVP-----
-----DI
VMEEVVAQEVGNMPYDDEQPM-----YFPPELVS-----QGSKES-----
----KGTYYCYLIELN-----
-----QNFHSDIP-----

-VHNIILVMGSELES DIL-SLDFEL-EVDRGLLT-VKLKYIGELDLTTEMVLICR-----
-----KFLIALS
KVL-----

----VDH----NVNELEEILNGLR--LRKDPEIDYFLLP-SMASCQKPV-----

----IDWSSIV-----SVLFS--Y--ANAWED-----
-----HVKCPLKD-----SAHIIWTK--NGQVCK-----
-CM----LENSLVYTPHNGEVYCIKGI-----
-----FNHLDGRSLLRLKNGD----CKT
YKEYYKD-----KHGINLSFDQQLLRGRHIFPLQNYLDRCRQH----KGKD
----SQNAYVQLPPELCCIKMSPISISTFYSFTFVPSIMHRLESLLIAVN-----
-----LKKLHLDQ-MRNVIPT

-----IKVLEAITTKK
CQEK--FHLESLETLGDSFLKYAASQQLFKTY---QNYHEGLLSIKKEKLISNATLCKL
GCDRKLPGFIRNESFDPKNWM-----
-----IPG-----DT
HGYSLHE-----EFLSNARSIY-----IIRRRKL-----KRK
VVADVVEALIGAYL-----SAGG-----
-----ETAALLFLNWIGIEVDFLNT
YEP----QFKVNPEKYIN-----IRRLESLLNYSFKNPSLLL
EALTHGSYML-PEIPRCYQRLEFLGDSVLDYLITVYLYEKYPGMSPGLLDMRSASVNND

