

[illegible]

```
-----R  
SSLIRKRSTRRSVRGSQAQDRK-----LSTKEALD  
ESIPPVSFWRIMKLNLTEWPFVVG-----VFCAIING  
GLQPFA-  
IIFSKIIGVFTRID-----DPETKRQNSNLFSLFF  
LALG-----IISFITFLQGFTFGKAGE-----  
-----  
-----  
-----  
-----  
-----  
-----  
-----  
-----  
-----  
-----ILTKRL  
RYMVFRSMLRQDVSWFD-----DPKNTTGALTTRLANDAAQ-----  
-----  
-----  
-----VKGAIGSRLAV-  
-----ITQNIAN-----LGTGIIISFIYGWQLTLLLLAIVP-  
-----IIAIAGVVEMKMMSGQALKDKKELEGAGK-----  
-----IATEAIENFRTVVSLTQE--QK  
FEHMYAQSLQVPYRNSLRKA-  
-----HIFGITFSFTQAMMYFSYAGCFRF-----GAYLVAKHL-MSFEDVLLVF  
S-----AVVFGAMAVGQVSSFP  
D-----YAKAKISAHIIMIIEKT-----PLIDS  
YSTEGLMP-  
-----NTLEGNVTFGEVVFNYPTRP-----DIPVLQGLSLE-VKKGQTLA  
LVGSSGCGKSTVVQLLER-----FYDPLAG-----  
-----KVLLDGKEIK-----RL  
NVQWLRAHLGIVSQEP-----ILFDCSIAENIAYGDNJR-----  
-----VVSQEEIVRAAKEANIHFIESLP-----  
NKYSTKVGDK---GTQLSGGQKQRIAIARALVR--QPHILLDEATSALDTESI-----  
-----KVVQEALDKARE-----GRTC  
IVIAHRLSTIQNA-----DLIVV  
FQN-----GRVKEHG-----THQQLLAQKGI-----  
-----YFSMVS-----  
VQAGTKRQ
```



[illegible]



[illegible]

```
>gi | 976929120
```

-----MMFGWTPPHGVGPLTPVSENSEVPDSPLPYLDTTTSR-RNFPEKND  
DIEEEDEVIPP-SAVPFTALFACADGFD-----WILI  
AVGS-----LAAVVHG-----  
-----ASLAVYLHLFG-----KIIHLLS  
FHS--NADELFNHFSQLIVSFFHNFSRFLFVINMQ-----  
-----  
-----HALYIVYIGLAVFAA-----  
-----GWIEVWCWILTAERQTAVIR-----TKYVQVILN  
QNMSFFDAYGH----NGDIVSQVLTDOVQVIH-----CVLGEKHIQS  
RERTLCYQ-----  
-----VGNVYVHNIATFLGGLVIAFVNCWQIALVALA-----TGPIIVAAGALSD  
IYL-----  
-----  
-----HK  
FAESLQD-AYVDAARVAEEVFVTLTLLKLNALSNIRTLYAFTNEALAKY-SYASSLHDTLK  
YGIISLVQGLG-----LGFTYGLGMCSCALQLWVGGFLVTNGKS  
-----  
-----  
-----  
-----SGAEIVTAVFAMILSGL-----GMNQAWANLYSFEQGRIAAY  
RLYGVTRHSASAAA-----SDGNTL  
VSVQGKIEFRNVYFSYP-SC-----  
-----  
-----  
-----PVDPILSG  
FYLTVPK---KTVALVGRSGSGKSSLIPLLERHYDPTLG-----  
-----EVLLDGVNTKSLKLEW--FRRQIGLVT-----  
-----QEPALTCLSITDNIAYGRPN-----  
-----ITFK--QIEEAAKIAHVHAFINS-----LENG  
YETQVG-----KVGLELTDEQKIKISVARAVLLNP  
SIILLDEVTSKLDLE-----AEKSVQEVLRIMLGR-----  
-----STIMIARKLSLVK-----  
YVDLIAVME----GGQCVE-----  
-----  
-----MGTHDELISAH-----  
-----  
-----  
-----  
-----  
-----  
-----GLYSEILRCEEVVKLPVKLPS-----



[illegible]

MESILARALEY  
LKYWLKSFTRDQFKLQGRVTQLSNLDINGDALHASLGLPPALNVTTAKVGKLEIILPYLS  
NVQVEPIVVQIDKLDLVL EENDDL DAYKATDSAQTPSSPAKSSGYGFADKIADGMTLEVR  
TVNLLLLETHGGARRCGGATWASPMASITIRNLLLYTTNENWQVVNLKEARDFSNDKKFIY  
VFKKLEWEHLSIDLPHPDMAAFSEGA FKDDGAKRVFFGGERFLEGISGEAYITI QRT  
ELNSPLGLELRHLHTEAVCPALSEPGLRALLRFFTGLYVCLNRGDVNPNSQEVGFLFHCC  
YLVCKLFRALLYEMAIRNSLFWQRSAEAAAGRTLVSIMVDHIFFCIKD TDFQLELLMQSLV  
FSRASLSDGEIAKCLTQVMIGGLFLRDTSSRPPCALVQPSMQDAAEELLHFPDFGKNFCP  
PIYPLGDQQWKSSDHAPLMSLHCLQFMPSPTPPSFCSTQVINCQPLMIHLQEESCLRIS  
LLADGIVINPGDISLDFS VNSLEFNVKGLDITIPIENRRSNSPCDNYPIYETSFTGARLH  
IDNLFFYESPSRLKMLNLEKDPACFCLWKGPIDASQKKWTS GASLLRSL ETCNNSKG  
AGGSLSHSSELWSCVEIKGACIQVAMVTADGSPLIEVPPPGGVVRVGVACEQYLSNTSVE  
QLFFVL DLYAYFGMVSEKMATVGRSKYKVVKHEPCDGLIEKVPDGTAVSLAVKDLKLR  
FLESSMDIQGMPLVQFVGEDLFMEVTHRTLGGAMAISSTLRWDKQVQVECAETERSSINA  
NGVMPDATTDFLPFPNGNPKLRTVFWQNRNRYQANDSAVSTPFLNLRVVHVIPYNAQDT  
ECHLSVSACIAGVRLAG - - GMNYAEALLHRFGILGPDGGPGVGLSKGLEHLSAGPLSKL  
FKASPLLVKDFRENCKSESMEEKHSGYLHLGAPDDVDISLELKD WLF ALEGAEMAERWWF  
YNSDDSYREERCWHTTFQSFVKANSSINNSVNGKKNLPGAQKYPVESVTVGVEGLKTLK  
PQQQKGIVATNGHKHDSHGVDLEADIVLSEDDGANKWVVESLKFSAKHPVEAIVSRDEL  
QHVAQLCKSEVDSMGRITAGVLRVLKLEGSVGTAMDQLSNLGFYKIFSQKNL - - - -  
- - - - - HRDSNASSPSSVATADNQCSSSSFNSTLTLL  
EAALLDSQTNCATLADELSSSESSKRHLDRVEQLAQKLESMQKLLSKLQTQKQAVIRSKT  
GFGRKLFVFINIMGGNKNGIFRYADGLD - - - - - KFLM  
FWGT - - - - - LGSIGDG - - - - -  
- - - - - LQVPLMMYVLS - - - - - GVINQYG  
- - - - - DPKAIVTCSTVDK - - - - -  
- - - - - YSLRLLYVAIAVGLS - - - - -  
- - - - - AFVEGLCWSRTAERQTSRMR - - - - - LHYLKSVLK  
QDVAF FDTQQPAASSTTYQVVSTITADSNAIQ - - - - - VTIGEKIPD -  
- - - - - TLAYLSSSFFCHIFAFTLSWRLT LAALP - - - - - FSIMFLVPALGFG  
KLM - - - - -  
- - - - - MD  
VGMLMIA - SYATAGTIAEQAISS - - - - - IRTVYSYVGEHQTTII - NFGNALQTTME  
LGIKQGFARGLM - - - - - LGSM - GIIYVSWAFQAWVGSLLVTKHDE  
- - - - -  
- - - - -  
- - - - - KGGDV FVAGFNVLMGGL - - - - - NILTALPNLT AIAESKGAAT  
RINEMIDRNPTINS - - - - - EDKKGKAL  
SYVRGKIEFKGIYFSYP - SR - - - - -  
- - - - -  
- - - - -  
- - - - - PDSPILQG  
LNLMPAG - - - - - KTVGLVGGSGSGKSTTMSLILRFYDPIEG - - - - -

[illegible]



[illegible]

```
>gi|976899659
```

[illegible]

[illegible]



VVTPPTSTAKNSNGYDNHVNHDHSETKDDDELITETVALS QLYRYATPMDKALLALGIVMSGI  
GGALFPCMALVFQDAINSFAQADGGVDRDAVNNSAALDFFLISIALFVTDYSSGVLFAYTA  
ERQMKELRTEVLKHLLYLDISWYDKIDPLQLSSRMTGDTV KIKDGMGQKFGDAVRFIGQF  
FSGYVIGLVRGWDIALLMSCLPFMAGSMGVLLKIMQKRAVHSQQMYAEAGAVAEE TLGS  
IRTVSSLNAEKRAIDKYNERALAAEETNIQVGKLSSIAFAFFIGCVLWMLYAIGLWYGGSK  
VARDKTPSPDVFQAFFGVLMGTISLGQIKPNMSAIAEAKGAATEIYKILDTPSAIDASKD  
NEGEKPESCLGRIQATGVNFTYPSRPDVQILNDYNVTIEPGQTVAFVGASGGGKXTLISL  
LERFYDPQEGSILLDGRDVKTLNVKWLRSQIGLVSQEPVLFATTIFENIAAGGNEISRQX  
VMAAAKLANAHNFMISLPEQYDTLVGEKGVSLSGGQKQRVAIARAIVREP KILVLDEATS  
ALDAESERVVQAALNDLMDKTRMTTLVIAHRLSTVRRADKIVVVGHHVVEEGNHAELLT  
TEDGIYNKLYTIQEEKAQEEAAEAVTTSVNDEDIQRGLPRRVSSRSVNDDAGFTNCEVESQ  
AAETMSKFTIFDAIAFSRPERKTFIVGIIASGILGCALPVSAVLISELVAVMTTKYSEYQ  
TSHDQSALDDLKHDMVYGLCYIAGAIVVFLSAFVQNYAFKYMAEKLTSRLRNHFTALC  
RQNIQGFDEKKNATGALTADLSTNATKVALISGDSQGRVVQVIFTFAAALVVSFAFGSWL  
LTLVMLAVFPFLIMGQAARGKHKMTAGGLSDELSGVGAQASEALSNI RTVASLGLEESLT  
GKLSDLLLEPLTRGRREAHVNGFALGFGSFVLFAAYALAFWYGGKLVDDGDITFKELMRT  
LMAIMMSAQGIGMASTFVADSDHALKAGKAI VNLRDREPPIDSFDEKGLRPAQLEGRIDF  
QNVTFRYPTRPEITVLKNYNLTIEAGQTVAF CGPSGGGKSTCVSLIERFYDPVEGQVLLD  
GVDTKELNLNWLRSQIGLVGQEPTLFIGTIAENIAYGLTEKPTQHDIEEAAKMANAHGFI  
TKFPDGYNTQVGMKGELSGGQKQRIARA IAILKNPNILLX EATSALDSESEKVVQEA  
DKVAVAXKRRTTIIIAHRLSTIRKADKICV - - - - VSGGKIAEQGTHQELIKLNGIYAKLV  
AKATAFQSTMVQPQLHQEVLDGNGADAAPQNDYVQVMTPRGNGDIQDAAPVISTANDADS  
EVSQPTEDKKKVPTIAFKELYRYGTTAD - - - - - NLLL  
SIGV - - - - - LFAGANG - - - - -  
- - - - - ALFPCMALVFQ - - - - - DAIGAF  
- - - - - QADG - - - - -  
- - - - - - - - - - - GVDM  
DAVNNAALNLYLIAVALFIT - - - - -  
- - - - - DYIAYVVFVNSSERQMKALR - - - - - DAAFKHMLH  
MNIGWYDSSDPLT - - - - - LSSRLTGDTV KIK - - - - - DGMGNKLG  
- - - - - SVKYTCQFITGYVIGFVRGWDSLVMAC - - - - - IMPFMVASLGILM  
TSL - - - - -  
- - - - - - - - - - - RK  
RAVHSQQ-MYAEAGAVAEE TLSS - - - - - IRTVSSLNAEKLAIN-KYNERAVKAE  
TNIQMAKFASCV - - - - - FGLFMCSIWLMYAAGLWYGGSKVAHDK -  
- - - - -  
- - - - - ASPSEVFQAFFGVLMGTI - - - - - SLGQITPNISAVAEAKGAAA  
QIYKILDTPSAIDA - - - - - SKDNEGEKP  
ESCLGRIQATGVNFTYPSRP - - - - -  
- - - - -  
- - - - - DVQILND  
YNVTIEPG - - - - - QTVA FVGASGGGKSTLISLLERFYDPQEG -  
- - - - - SILLDGRDVKTLNVKW - - - - - LRSQIGLVS - - - - -  
- - - - - OEPVLFATTIFENIAAGGNE - - - - -

-----ISRQVMAAAXLANAHNFIMS-----LPEQ  
YDTLVG-----EKGVSLSGGQKQRVAIARAIIVREP  
KILVLDEATSALDAE-----SERVVQAALNDLMDKTR-----  
-----MTTLVIAHRLSTIR-----  
  
NADKIVVVN----GGHVVEE-----  
  
-----GNHAELLTIED--G-----  
  
-----IYNKLYTIQEEKAQEEAQAASALKEAELGEPHSQ  
SLRHHSSRSVNSDHMEEDKKASLEKADTSKFTTIFDAIAFSRP-----  
  
-----ERSAFIVGIFAAAVMGCAL-----PSSAVLIS  
ELVATMT-----LKHDMVMVYGLCY  
TNYTLYKESNVQSALDD-----VGGG-----VVMFLAAATQNYCFKYMAE-----  
  
-----KLTSRL  
RDIHFTALCRQNI GFFD-----EKKNATGALTADLSTNAT-----  
  
-----KVALISGDSQGRVVQAI FT  
FVAALVISFTTG-----SWLLTLVMLAVFPFLIAGQMVR-----  
-----MHQ-MKSSGHL S--DELSDVGA-----  
-----HASEALSNI RTVVSLGLE--NS  
ICGKFSALLEEPLATGRREA-----  
-----QLNGLALGFSSFILFATYSLVFWY-----GGKLVD DREINFKELMR--  
-----TLMAIMMSAQGIGNATSFMG  
E-----SDNALKAGKAIVELQDRQ-----PPID-----  
  
-----SFQEGGRRIDKLQKIEFKNITFRYPTRP-----EITVLKNYNLT-IEAGQTVA  
FCGPXGGGKSTCVSLXER-----FYDPVEG-----DTKEL  
-----QVLLDGV-----  
NLNWLRSQIGLVGQEP-----TLFIGTIAENIAYG-----LT-----  
-----E-KPTQHDIEEA AKMANAHGFITKFPDG-----  
  
--YNTQVGMK----GEQLSGGQKQRIAIARAILK--NPNILLDEATSALDSESEK-----  
  
-----VVQEALDKVVALKR-----RTT  
IIIAHRLSTIRKAD-----KICV  
VSG-----GKIAEQG-----THQELIKMN-----  
-----GIYAKLVEHAVN-----

.....

>gi|970631645

.....

-----MATSDYVEANTPKKGELRDNSDVAVLEHTPSVI  
SKDTAAHAKSNGKLVSLSDLLSFADDDKDHLLMAAG-----  
-----TIGALAAG-----  
-----MAQPLQIVLIG-----DVLNGLN  
PTDSSSSIVGKVD-----  
-----DAVLNYVYVAVVAMLA-----

[illegible]

```
>gi|674592105
```

[illegible]

[illegible]

[illegible]



[illegible]

.....

>gi|966668882

.....

-----MGKKDKLNISNGKKEENGDVSG  
EKNGKEEEEKVKVMPFEVFRYADGVDFLMLVG-----  
-----TVMSIANG-----  
-----AVLPLMVIVFG-----GMTNSFV  
D-DTIAENLKNITLSPNFTF-----  
-----PQSSNETLGEQMTR-----  
-HAIYY---SIMGFVV-----  
-----LFAAYMQVAFWTLAAGRQVKKLR-----KRFFHSIMK  
QEIGWFDVNETGQ-----LNTRLTD-----DVYKINEGIGDKLGML

[illegible]



[illegible]

RSRLFKSILHQEMSWFD-----DKNNTTGLLCTRLTVDSAR-----MLTMRI  
-----  
-----VKGASGVKIGL-----  
--SVQILGH-----MLTAVICCFIYEWRLALLVFAPVP-  
-----VMVLASTLEQKMFTDTLSQKSELMEEAIN-----  
-----LSSEVFHNIKTVLSLSLE-----KM  
FYEKCLSKLYSSSKENMKSA-----  
-----YKTGITFAVSQAMIYLYACNFYV-----GSLISKCY-MDYVEVKIL  
C-----VIVIVMLIIGQHATLLP  
D-----VTEVSLSAARIMNLLDQL-----PAIDM  
YLEKGDKP-----  
-----DSFKANIQFKDVEFRYPSPR-----NINVLQGLNFD-VKQGETVA  
LVGGSGCGKSTCMQLLEK-----FYKADTG-----DL  
-----SVLLDGKNLN-----  
NTSWLRQQFAIVSQEP-----VLFSCSIQENIAYGDLSR-----  
-----TVTDFEVVKAQAQANIHSFIDSLP-----  
ERYETKPGGK---GSQLSGGQKQRIAIARALVR--NPKILLDEATSALDTESE----  
-----KVVQEALNKARQ-----GRTC  
LVVAHRLSTIQDS-----DKIAV  
VVN-----GKVHEIG-----TPNELEQKKGV-----  
-----YFKLLTNQN-----

>gi|939397839

-----MADP  
GPEVEREERRKNRSRPREHSVTSRHQSRRGVSARRSSNASRPSSSGRADGDGPSSVGHAS  
TAYHSVRPYPARSIGTSGSDDRPSTGSSAAASTPSSSSAQPPRGARADRATKSSVRPDNS  
GPQINAAT- - -TEDLKRTESHEQNLKR-VGAQASGTATMSAAAGMAMLGAGMISQQQG  
SGAMRGAADSQASEHAVTQGLHRAERARLTLSPEALRQNEQAGLMRGTSYNQGSVAQQL  
SPVTPSWPNTSPSSPLDDFHTAVNTPYSIHGELAQSPVHAKKMLPDDEKAGINSYDQPYDS  
ANQTPSRASPPHHAKLES DNSDGRSQHSVLSGDQDSTLETPPYKAT-----  
-----TGDLFRFATKFELFLNFLGL-----  
-----IAACGAG-----  
-----VAQPLMTVVFGNLTTSFLDYT-----NQLGR  
DPTLPGAM-----EAMQRARDEL RDAVG-----  
-----RDALLLLYIGIAMFGA-----  
-----TYLYMATWMYTGETITGRIR-----QNYLAAMVR  
QEIA YFD-LVGA-----GEITSRIQSDIQLIQ-----EGISDKVPMS  
-----FMFLATFVAGFAVAFAKSWLLALVM-SSIVPCIIAAGALMNVLAT  
KHQ-----  
-----QTELDYVSHAATVAEEAMST-----VRTAKAFGIEQRLVD-LYDEYNVPTSR  
TGRAKAVINGVGMGVFFF-----VIYSSYALAFWEGSRLIAN-----  
-----GTIETGVVMNVVFSILMGAFS-----MAMLAPNAQAWAYGIASAG  
KIFETIDRVPEI-----DSASDSGARP-----  
TRCDGEIEVCNVDFRYPARR-----  
-----EVPILEN  
FSVQIPRG-----KITALVGASGSGKSTIVSLVERFYDPESGAVFLD-----  
-----GRDLRDLNLKW-----LRTQIGLVS-----  
-----QEPTLFATTIRQNI GFLLNTVWEKA-----  
-----DQEKKDELIIEAAKQANAHAFIQQLPD-----  
-----GYETMVGERGFLLSGGQKQRVAIARAIVKNP  
RILLLDEATSALDTQ-----SEGI VQDALDKASRGR-----  
-----TTITIAHRLSTIK-----





```
>gi|954194202
```

[illegible]

```

HREEIFDP-----
-----IKDFSFKGEIEFKDVFVKYPSR-----DKYVLNGISFK-IKPGQKCA
LVGPSGCGKSTIMQILLR-----FYEIEA-----
-----GSITID-----GIDYKEY-
DIRGLRAQYGVVSQEP-----ILFKGTIRENILYNSQN-----
-----VTQQQIEQAEEQANAKDFIEKNELEN-----
-----QIDSDKDLG
QGYDRQVGPK---GSFLSGGQKQRIAIARAIKSP--KILLLDEATSALDNKNEK---
-----
-----IVQESLDKLMQGR-----TT
LSIAHRISTIKDSD-----QILV
FEA-----GQIVEKG-----TYEQLVAKK-
-----GFFYRLERGDQN-----

```

ETIKIGDLQKILKNNDKEFFYEDNENEKKNNDVNLNESSSDSAEIEYEK-NCLEKFFDFIF  
CRSNQQPLKFKEKPVPTLKLKFKGSYSDIVLVIIG-----CILSFICG-----  
-----IFQPIFSILT-----KLANTLL  
IDDIHSET-----FI  
KECIKCIIFFIITGILLSTM-----AFLQLVFNIACVKIVRKLR-----CAFLNSIIK  
QDAAWFEKNHSGT-----LNTKLNDN-----IERICEGIGDKFGL  
-----LRNSCQFIAGLCVAFYTSWRMTLPLCI-----LSPTVAFFFGLTG  
K-----LMM  
YYTKEEMNIYSSAGKIALEAIGN-----VTTVASLNGQKEEVK-KYEKLLDEGKK  
KGIKKGLVNSILFSTVNL-----IILTFVGASIFYGGSFLYKYG--  
--YIN-----  
-----TPGEIFIVILCLLSGAY-----HLGLASPHMMVILTARVAAA  
TIYKTIDR-----KPDIDSSSSVGKTLYD--  
--VKGKIEFKNVTFSYPTSENIKTLK-----  
-----N  
LSIKINPG---ETVALVGHS GSGKSTIASILTRLYDYNDGIVTID-----  
-----DVDIKQLNIKW--LRTCIGIVQ--  
-----QIPVILNRTIKENLKIGNS--  
-----TLTHDQMVEACKIANAHEFIMKLAN--  
-----GYDTYIGDGGVQLSGGQCQRICIAIAIARNP  
KILILDEATSALDSK-----SESI VQDALNKAS--  
-----KGRSTLIIAHLRATIR-----  
KADRIYVLD---KGEVLET-----  
-----GTHNELLE-LNGTYTNYVNSQ--  
-----LIEDYNDNDNDIDDVENN-----  
-----ETINLNQNEPIKKS LNPFDIDNNEELN-----SFLNKKTIKNRKS KRKTI  
VDKGDNNNIDETFKNSIRQK--YNR-----  
-----EFKKINTDIDAEGERLEEE-----IKS--RG  
TIQ-----VSLLDVLKIGRSQ-----WITFGIATGISALLSSTSPFVG--  
LLYGLSFESIYEDGNRD-----HVT--DATYLCFAN  
IIYA-----IYESSLSCLASYLFAKVG-----



>gi|953450957

[illegible]





[illegible]

LVGASGSGKSTICQLLER-----FYDAEDG-----  
-----QVTIDGH-----DIRDL  
GLDSFRSSVSLVSQDP-----VLFSGTIRFNVLLG--SPDPSKVSE-----  
-----ADLFDACRSANIHDFVQSLPLG-----  
-----  
--YETEVGGR---GSQLSGGQRQRLCLARALIR--KPRILLLDEATASLDAHSE-----  
-----  
-----VVQAALDKAAH-----GRSC  
ISIAHRLSSIAHAD-----VIYV  
IEA-----GQVIEKG-----SHSELMRIRDGHYRAMIGSL  
RPFLSGIT-----

-----LMNKQVTKRSRQST-----

>gi|928117688

-----MEPNVPNAEKPREPFGQGLVE  
ASAENRHSGHSGVDNDLENSSSAFHAYVDESVDVSLNPGKRPASVEREDATSSLGSESPVF  
SAEEVVKPKQNRQSVSALAIFRYADTADRILMIVG-----TLMAIASG-----  
-----AGIPLFCLFFG-----HISTDLI  
-STKGNTANTT-A-----  
-----KTALIMVYIGIGMFVV-----  
-----CGGHVLCWTIAASRQMARIR-----LRFFEAVLR  
QDIGWHDEHSPGE-----LTARMTGDTRVIQ-----NGINDKLSQ-  
-----GVMNASMGLLGFI GFIFSWELTLVMLG-----MMPFIAIMAALLG  
NIV-----  
-----AK  
MTESSRK-HFAKAGSMATEV-----MENIRTVQTFGKEEYETQ-RFHDAVLLAQD  
RGIRKEFAANLS-----AATIMGVVFTSYTIAFFFGSYLVQWGRS  
D-----  
-----MQNVISTFFCVLMG-SFGLGFVA-----PSTTAFTESRAAAAY  
EIFKAIDRVP-----PVDIDAG-----GVPV  
TGFRDSIEFRSVKFAYPTRP-----  
-----DMMLFRD  
LSLTIKCG---QKVAFSGASGCGKSSMIGLVQRFYDPLGGAVLCD-----  
-----GVDMRELCLRD--WRDQIGIVS-----  
-----QEPNLFAGTMMENVRVGKVDATEEEV-----  
-----IEACRQANIHDTIM-----SLPDQ  
YNTSVGA-----VGSQLSGGQKQRIAIARALVKRP  
PILLDEATSALDRK-----SELEVQGALDQLMLK-----  
-----GGMTVIIIAHRLATIR-----  
DVDCIYYVKYDGVESKITES-----  
-----GTFDELMA--MGGEFAAMAKIQG-----  
-----VPADGGRAGGKSETAKAK-----KDLLN  
VILDEAALAKLDAEAPRTERQKVP---I-----EILAKWE  
VKQAKVGFRRMLQMKNKDKTWAILG-----FIGSALTG  
ASGPVNA-----VKALRSGTNLYAPLF  
ILFGEVLGVLGYQVDKD-----  
MVFA-----ASTFLGWSLQGFYGYAGE-----



[illegible]

[illegible]

.....

>gi|943971029

.....

.....MSPKAESVDVSSPIDIARPDYMNGSIK  
DANDAKEKDKNVQNVSFFTLFRFASTLDKIYMFLS.....ILFSTLCG.....  
.....ITVPLSVILFA.....DVLQAMV  
NYGQSVVAGAPENEVFLKAITDFVIYNICALGLVAFIISYAATVLMNVAALNHINDTLDKI  
YIFLSILFSTLCGITVPLSVILFADVLQAMVNYGQSVVAGAPENEVFLMA.....  
--ITDFVIYNICALGLVA-  
-----FIISYAATVLMNVAALNQVYNIR-----CEYLRNALN  
QDFEYYDTHQTGD-----FAQKMTD-----DISKVEDGIGEKLSNF  
.....  
-----IFYQSSFVACVVMALIKGWLALLCLI-----SFPITFIPVAMAG  
WIS-  
.....  
-----S  
RLSKKEAEATGKAGSIAEEVLTA-----VRTVYAFSGQDKEVK-RYEKHLIKARD

[illegible]



```
>gi|443899016
```

-----GAASG  
LVGSAGALPRCDRPAPRRGGEAG-GQAGVGQPGHRVVRDDGARGRDQEHRPRQRPRGL  
KWWNPLFSVPTSSRSPSSHIVVVTQVTRALWLAERISTMPTVYVASFFSHRNQRSLSPS  
LAFLNMARQDKRTGAKRQSEAHSPAQHGLLQQRPATRSVGSASFSSDYSGAAAMPNQAF  
EAIQPGEAG-ATLEPHLDSGAKDAQNAILSDPQPIHAIDAEHA-----DQGGLDHDH  
AQHD-----DDHQTAASS--SSRADHVNIPIDATSRRPTSASSSPVSDKE--RV  
ASDGSSRSSSPARDSNEKQSDSAKNKRTKKKKGDDEAVDRVGFQK-----  
-----LYRYATVDHLFNFVGL-----  
-----IAAAAAG-----  
-----AVQPLMTIVFGSLTTAFLEYS-----NALLE  
GGDIP-----AARDHLNSEIV-----  
-----HGVLFLVYIGVAMLVA-----  
-----TYVYMAAWIYTGVVTRRIR-----EHYLQAILR  
QDIAYFD-VVGA----GEITTRIQSIDIQLIQ-----EGISDKIPMS  
-----VMFISAFVTGFIVAYVKSWQLALAL-SSMIPCIIIAGALMNVA  
KLQ-----  
-----QAELDRVSKAASIAEESLAT-----LRTAKAFGIEHNLVQ-LYDESNRQATR  
FGIKRSLYQGIGMGVFFF-----VIYSGYALAFYFGAKLLAS---  
-----  
-----GHIKSGTVMNVILSILIGAFS-----MAMMAPNMQALSIFAAGA  
KVFEIDRVPPI-----DSSDPSGLRP-----  
ESCAGHISFRDVDFAYPARP-----  
-----DVPVLGD  
FNLEVPA-----KVTALVGASGSGKSTIVSLVERFYDPDAGAAAYLD-----  
-----DIDLRLNLKW--LRTQIGLVS-----  
-----QEPTLFSTDIFSNIAGHLINTPQQHL-----  
-----PDDEKEKIIIDAANKMANAHGFISQLPD-----  
-----GYRTMVGERGFLLSGGQKORIAIARAVVKNP  
TILLDEATSALDTQ-----SEAVVQDALEQASQNR-----  
-----TTITIAHRLSTIK-----  
NADKIVVMGKG----VILETGT-----  
-----HDELLALN-GAYAQLVDAQKIRAKVATEKLDGEDSDSDDNHAPLTAE  
AN-----  
-----AAPAPLATTTDAEKARLRDEAKAEMPA  
GLDKSVTRG--SVASAILQQRQRQ-----  
-----AEAD-KESEKI  
PSIFYLLYRLAKINRDHIMTLYPG-----VIASICSG  
AAYPCFSI-----LFGHALQNFSCL  
SPIGG--GACPEPARSIM-----LHDANKWALFF  
FVIA-----ILCTLAISIQTYTELMKASSV-----

-----LMERI  
RRMSLFAYLRADVSYHD-----EDAHSSGSLSNSLADNSQK-----

-----INGLVGVTLTGTIIQSIST  
LVTGAIIALANG-----WKLSLVVIACIPLTLSAGFVRLQLV  
VLK-----DARIKKAYEGSAAKACEAAG-----

-----AMRIV-ASLTREQDCLDI

YRKELDEPSRISRNTAFYGN-----

-----FLYAVSQALQFWIIGLFWYG-----SLLIRGEYTSQYFT---

-----ILTAVVFGSIQASNAFSFVP

D-----ISNAKTAAWDSIKLLDMV-----PEIDV

TSDEGE-----

-----VLSEVOGHIRLSNVHFRYPTRP-----TVRVLRGLDIE-VKPGTYVA

LVGASGCGKSTTIQLIQR-----FYDTLSG-----

-----RVTIDGK-----DISDL

NLREIRKHMSLVSQEP-----TLYDGTIEFNIRLG-AFEDADTVSM-----

-----DDLRAAAASANILAFIESLPDK-----

-----WDTEVGGK-----GTQLSGGQKQRIAIARALIR-NPKILLLDEATSALDSDSEK-----

-----IVQEALDKAAA-----GRTT

IAIAHRLSTISRAD-----MIYC

LKD-----GRVAEKG-----THAQLLALNGIYADLVH---

-----MQQLORDE-----

[illegible]

GRDESNADSLESSRATLRRNSSDD-----TRQRMDDVAEGDESEGAEA  
-----AQDDKAAAGRVPDEPTEKDATEAQIEQHKL  
VRYPPRVILRRVLWLVRRL-EWAFILLG-----LFTSTIMG  
GSYSGEA-----  
VLFGHVIALNP-Q-----CHSPDGVRSRGREFARYF  
FILA-----LIQLVAYSINGLVWGLVAERLLFRL-----  
-----  
-----  
-----  
-----  
-----  
-----  
-----  
-----  
  
RRVSFNTMMHQRLTWFEAQ-----DQNPAASMIASLSNDANN-----  
-----  
-----  
-----  
-----LGGVTGTVIGTIFCIFYN  
LLAGIIVSHAIA-----WRIAVVILA-LVPIILTAYLRKL-  
-----VLADFQKRHETAYIKSNA-----  
-----LAIEAVQCIRTVASLGRE--DD  
VMRKFRSLQKPYRESMRHF-----  
-----LFGNVFLALALSISYFIYAFAYWWG-----SQNIAEGRYSQTAFFI---  
-----VLPALLFSQAQSGQLLAFAP  
D-----FSKAHVSAANFFRLMDQRPEAVQEKMKGKVEGAAQ-----  
-----EGG-----  
-----DADAVEKTKATRIFIEDADVSTYPTR-EEA-----ALKKVSLT-IEPGCFAA  
FVGQSGSGKTAMSLIEN-----FYTPTSG-----  
-----CVRVD-----GLRTDRT  
SDAVLRRDMAIVPQEP-----VIFYGTVRFNVLLGLRPDMPSATAARKSKRGRGREEDE  
LLAPYREDVSWQ-----TSVSDSDIEAACKAAGIHETIMSFRKG-----  
-----  
-YDTLITS-----SQLSGGQKQRLSIARALIR--KPRLLLLDESTSALDSHSEQ-----  
-----AFQQTLDAIRREG-----KCTI  
LIAAHMRMTIKDAD-----KIFL  
FENGQ-----LQAQG-----AYAELVKNN-----  
-----DSFKAMVAY-----Q  
SLN-----



[illegible]





[illegible]

[illegible]

>gi|849274542

MVSQQDDARLDERQRAILDRQLNGLGGEAEQ  
RKNVFAYATVSDRIILSVSS  
ICAVLAG  
ALNPLVPVIYGLLVSVYDGFAAG  
TVP  
ASELRS  
KTATFSLY  
YVYLSIGLFVL  
TYVATVGFYYTGERIARALR  
TTYLAAILR  
QNMAFFD-LLGP  
GEITSRIMSDMGTVQ  
EAVTSKLAVM  
LTAIATFCAAFVVAFIMYWKTALII  
SPFFVIMIVTETLGGAYMV  
KHH  
KRAMDLYTQAAGIAEEAIAA  
IKHVTAFGIQTLLSQ  
RYLTVLEQAAK  
ADRKAENMVAGMIAWMNA  
MPNLIYALAFWAGSIYLTR  
GQMSVAEVSATTLAVTIGSFA  
IIRIAPSAQALLSGIAITG  
EILKSIARRSPQ  
DPLRKEGEEP  
STVVGDIVLDRVGLVPSRD  
DVDILND  
VSLRCAAM  
KKTAIVGSSGSGKSSILGLVERFYEPTSGAVLLD  
GRDIQSLNLRW  
LRRQISLVD  
QMPVLFNATILENILYGCSDI  
VGQL  
SESEKHEKVFAQSKKANAHDFISALPD  
GYHTHVGEKGLQLSGGQRQRVAIARALIRDP  
KILLDEATSALDSK  
SEAMVQKALDAAAEHR  
TTIIVAHRLSTIQ  
NADHIIVLDQG  
KVVEEGT  
HHALIARNGVYAALVQKQQIGDTNDHKT

PDGTRLSDDD-----DDS  
 PYGGNTEYVDEKDIRTEEVALSSAA-----QEEGTQRESHK  
 LSPLQT-ISFIARLSKRDWKVLLFG-----LANAILAG  
 LTIPVQSVFFA-----RSEVDFWSGLY  
 -KILTVIG-FAPPQYSQL-----  
 VMLT-----GTTFLFWMGVEITLSYATQK-----  
 -----LARRV  
 REVCFRSILVQDMAFFD-----VPGNSPSALSSVLSKSTND-----  
 -----LAGMGGPVLGGILTFTST  
 IAGIVLALAIG-----WKLLALVCTATIPVACGWLRLQVL  
 STF-----DSKVRQSGIESAAYAGELVR-----TVRTV-ASLGLLEEHALAR  
 YDGILAKQAAKSLRSILLAS-----GTLIASHEYSTFQVYI---  
 -----ALYAASASIVYLCAALAFWYG-----CFVSLISGSQIAGSIFTYAP  
 D-----ASKAMHASREIQDIMNLK-----PTINN  
 IVP-TKPPPTQA-----TRRAEDLHIT-VEPGQTLA  
 -----ATEKNQTQONFSACRVEFEHVSFTYPSRP-----FYDPDQG-  
 LVGQSGSGKSTCVSLLER-----RILIDGQ-----DIKLR  
 DVDEYRLDISLVSQET-----IIFSGTIRDNIIVSLAGQEVPD-----  
 -----DEILEACKQANILEFVQSLPDG-----  
 -----LSTLVGTG---GSMLSGGQKQRIAIARAFLR---KPKILLLDEATSALDSQSEA---  
 -----IVQEAMDAIRK-----DRTT  
 IMVAHRLSTVKNAD-----VICV  
 LQD-----GKLEIG-----THEQLMG-----  
 -----ERGSNESVGPYPTAP  
 VTPWLLPLFVLPYIMLHREELDDDDVENAFSKINGTVRQSSQFGDESSIDVPLTHLPVLT  
 RSKTAN-----SRTGLAKSLPYASLDAPRSTIEEQNVLIKTWAILLHQAIVSDTVAF  
 IIGKSDPSGYRRRASTQVVVSQWSTTPATAQSSGPQLQYVTDPSQHGSRVNTALDFT  
 AVYHPSNDFSIVLHWSEEGAGDLR---LYTQSSVPTKFASALWTTLLINTR---VRTA  
 DPLLKYRPISKADQRAISSFITAPFEARKCLHHLFLDSARATPQAPAVQGWGDSLTYAE  
 LDQLSNNVARQLLHRGVRKGQYVPFSFEKSVMMVVAIIGILRAGGVVASIDPSQPQSRAR  
 EIIQET-GTTVIVASTAQASIFAGSVDTVVPISADTVHYVVNDT---GLHTSLPQVHPE  
 DPAVVIFTSGSTGKPKGIVIQHGAVATRMVAEGRAFQYHGARTLQFAASTWDIFMTDIFT  
 TLAENG-CVCIPSEEDRRFN-LPKFCAEYDVSLALITPSLANLLEPTG---FPTLKT  
 LIFGGEALKEEVTRKWEAIDGSLHQGYGPAETGPCVAGRLAERPEILGYALDN---SICVL  
 VDPSPNPQLVPLGAVGELVVGGPSLLREYINDPGKTEAAVIESPPWALDMLTPVRRFYRT  
 GDLLRYSVDTLDGRLEFVGRGTDQVKYHGQRIELGEIEHHLRLPG-VESEVVLVKTGF  
 FKDRIVAVVQAGKTSGGNSHG-----KQLSLRYDQNTITITHMRSFLSSRLP  
 EFMIPNEL---LVVHELPHNSSMKLDRGRVAKWISDMQSRPSEALSKPHTLSN-----  
 -ELLAHESTARTIAREYAKIVTGDNVARRREYEERDFNLQEGGIDSIQIMLSMFLTEQF  
 GFOVPMADILSS-RATVRSIASLIDANTSRGFGIGOGOPLNRONKTRIP-----

```
>gi|358336140
```

[illegible]

-----IVQQALDGIVGT-----CTS  
IVVAHRLTTVENVD-----KIVV  
MEN-----GRKIEDV-----NESSVKENHLPVVQTVAQFS  
RFRMRAIIDVFCHKDLLELDIRWRVFQDKVYTTITRAHFKHVLSTEKRRAYLNDSEERKTN  
VGRRNVDHRTLCVKVYAARDLAGRLWLSGYKQFVSALSAWGATDGTQSIKHPEILRMATSI  
RRILGCQRLLRSHSQPIRTRLYAAGGSDELG-----

>gi|930677302

[illegible]



[illegible]

[illegible]





-----YTGGQVINNVFAILTGSM-----AIGNASPSISIAIEGQSAAH  
RLFEIINRKPKIDISD-----TSGIVL  
DDIKGDVELNNVFFRYP-AR-----  
-----  
-----  
-----PEQLILNG  
LSLQVPSG---TTMAIVGESGSGKSTLISLVERFYDPQAG-----  
-----EVLIDGINIKNLKLQW--IRGKISLVS-----  
-----QEPLLFMTSIKDNITYGK-----  
-----EDATLEEIKRAAELANAANFIEK-----LPNA  
YETMVGQS-----GAQLSGGQKQRIAIARAILKNP  
KVLLLDDEATSALDVE-----SERVVQEALNRIMVGI-----  
-----TTLIVAHRLSTVR-----  
-----  
NADCITVVH---QGVVE-----  
-----  
-----QGAHDQLIKDPDGAYC-----  
-----QLIKLQQVHTEG-----  
MHEGPANTSSQEHKEFG-----  
-----DSEAP-----  
QKAPIGRLFNLNKP-EAPILLLAVIAAFVHG-----LLFPLFSIMMSGG  
IRTFYPAHQLRKDSRFWALLCLLLAIISLIAIQLEFFLFGMAGGKLVER-----  
-----  
-----  
-----VRALSFQS-----  
-----  
-----IMHQEVA-----WFDDPSNSSGALGARLFI  
DALNIRRLVGDNLAILVQCTITLISGFAIAFASDWKLTIVICVIPFLGLQNYIQVKFLN  
SFSEDAKFVHD-----  
-----GKSTFKDVFRVYFALVFTAFGISQTSAMASDSTK  
AQESTTSILAVIDRRSKIDPTSDEG-----IKLEKVDG  
NIDFNHV-----  
SFKYPSRPDVQVFSDFTL-----GIPSGKTTALVG  
ESGS-----GKSTVIALLERFYDPDSGT-ISLDGTELKNLTLSWLRDQMGLVSQEPVLF  
NDTIRANIAYG-KRGEATEEEIITVAKAANAHEFISSLPQG--YNTNVGERGTQLSGGQK  
-----QRVAIAR-----AILKDPRVLLLDEATS-----  
-----ALDAE---SER-----SVQDALDKVMVSRTTI-----  
-----VVAHRLSTIKGADTIAVIKDGSAEKGKHESLMGIKGG  
VYASLVELHSHKAGEDA-----  
-----EKGERERKTEGARKVPFFSMFRYASRADMALMAVGTVAAVMVNGMG  
DPLMTVVFAAVIECFGAGDNVLQRVSKVVMYYIYLGIGTAVASFLQVSCWT-----  
-----M  
TGERQSIRIRSLYLEAVLKQDVSFFDVEMTTGEAISRMSADTVLVQDALGEKVGKYAQLL  
TTFVGCFIIGFGKSLFGQSLLLENIDNISKQVISFNGEKKAIALYNTLTKRAYKATVLEGI  
ATGLGTGGIFSFFCGYSLAFWAIGTASPSISIAIEGQSAAYRLFEIMNKEPKIDITDTS  
GIVLDGIRGDVELNNVFFRYPARPEQLILNGLSLHVPSTTMAIVGESGSGKSTIISLVE  
RFYDPQAGDVLIDGINIKSMKLQWIRGMISLSQEPLLFMTSIKDNITYGKEDATLEEIK  
RAAELANATNFIEKLPN-----AYETMVGQNGAQLSGGQKQRIAIARAILKNPRVLLLD  
EATSALDVESERVVQEALNRIMVGITTTLIVAHRLSTVRNADCIAVVHQGKVAERGVDHDL  
IKDPDGAYSHLIRLQ-----  
-----  
-----  
-----AH  
TEETPEMPYVA-----NWKLTLSTIIGVIPFLGLQNYI-----  
-----QLRFLKGFGEKAKVMEYEDASQ-----  
-----VVAEAIKSIRTVASFGAE--KR  
VITLYSQKCQASMKGIRSG-----  
-----MVGGVGFSFNSMLLYLTALCFY-----VGAQFVHDGKSTFQNVFR---  
-----VYFALVFTAFGISQTSDMAS  
D-----STKGRESATSILSFIDRK-----P-----  
--KIDST-----  
-----SDEGIKLEKVDGTIEFNHVRFKYPSRP-----DVQIFSDFTLR-IASGKTTA  
LVGESGSGKSTVIALLER-----FYDPDSG-----  
-----TISLDGT-----ELRKL  
TLSWLRDQMGLVSQEP-----ILFNDTIRANIAYGK-----  
-----RGE-ATEEEIITMAKANAHEFISGLPQGYNTN-----  
-----  
-----VGER---GTQLSGGQKQRVAIARAILK--DPRILLLDDEATSALDAESEH-----  
-----  
-----IVQDTLDQVMVS-----RTT



MSVDNAVDLVEVRLD  
 NDDIGDDRIDAVIDSKADSKGDENKTDKYDVPGGGDADSNVNI  
 ID  
 ATDKNEEKEETAPTVSFLQLFRFADKWD  
 ILMI  
 LVAA  
 ICSSIHG  
 ILMSVIAIFFG  
 DAFDAYD  
 PTDPN  
 SSLE  
 DAMRPAVFKFIFFGIAAFFT  
 SYAQVGFFILAASRQARRIR  
 NKYLKSIIS  
 QEMAWFDTVDSGA  
 LTARVAGDVVKIE  
 SAIGDKVGS  
 FIQYMSMCISGFAIGFYWGQLTLVIMA  
 CTPVLAISGAFMA  
 KVM  
 TD  
 AATEGQT-AYAKAGAVVEEAFGM  
 IRVVTAFSGQEDEYK-RYAKGLEEAYQ  
 SGKKKGMFSGLS  
 LAFTMGFMLLTALGFWFGNKMVVE  
 G  
 H  
 LSVGNVTVFFFAVIMGAF  
 ALGQAAPSLTAFATGRGTAH  
 YIFSIIIDREPAINN  
 LSTTG-IVP  
 KTCNGNIKFDNVEFNYASR  
 EEKVCNG  
 MDFDLQGG  
 KTLALVGHSGCGKSTCIQLLERYDVTGG  
 SIKIDGEDIRNVNIQW  
 LRSQIGIVS  
 QMPTLFAKSIAENIAMGASIEEVPDWDGEGPRFR  
 RKQVCQEEIVAAAKNANAHNFICQ  
 LPDG  
 YDTMVG  
 SRGSQLSGGQKQRIAIARALIRNP  
 AVMLLDEATSALDSE  
 SERVVDALKASTGR  
 STIVIAHRLTTVQ  
 NADTIAVE  
 AGRIVEA  
 GSHDELLAKKG  
 KYFDFVQLQLMNG  
 DSSDDCSSDDEATAYQNTKHV  
 SKKHSRKSSRKSS  
 KMSSVKRAEIQRLKEETDAAKLR  
 ELVDGDTD  
 KVVDDGVVVRAFKMNVGEWKLIVLG  
 LIGAAGIG  
 FLWPGFA  
 VVFSRIINAMLE-SDQD  
 EVDFLTFMF  
 VCLA  
 VFAFFAQWLAITPLAMSGE





```
>gi|929766109  
MLKGIKHKGKKRPQVRYHALFKYHTTKDKWFTAS-----ILLTVGVG-  
-----ALLPIFCIFIG-----DLLQSLT-----DIVQNIL  
NAGLGNSVDILSVQWRNTTLYDVVFDDDEVQEGIKG-----IVNIVQTRNQSQELLAQLQ  
ADLNLLVIRMAIMGIGLVLG-----TLQRVSSGIATRSAMERIR-----RLYIESLLA  
QDMSFHDKHTGGE-----LVAHATVDMIKLE-----YAFGTAHSFL  
Y-----MMIGTGISGIVVGFLYDVKLAAFLI----FVPFIMLTGLVLS  
RIA-----S  
ASQGKASQVYCQAAACAEEALCL-----IKTVCSLGGQEHEVE-QYYTQVKDVEQ  
KTILQSLTLGIGTG-----ASMCIYASCALIMWFAYGMVDSGE-  
ITAGAAMTVFYAVIVSAVA-----LGQIFLPISDIAAARGCAY  
TIYNTIDRVSAIDSLS-----DEGIVP  
DSLQGTLDFTNVKFRYP-----DGQVILHD  
FSLQFPAG---KTVALAGSSSGSKSTALMLLERFYDVEEGRVEVD-----  
-----GHNIKDLHLGW--LRNQIGYVG-  
-----QEPVLFAFSIATNIALGAEMIANPDFNAKRPPADVYAN-  
-----PRFVRQEVTLQDVIAASSMANAHEFISNMPDG-  
-----YDTLIGEGGMLS GGQKQRIAIARALLRDP  
RILLLDEATSALDVK-----SESVQAAMEKAAAGR-  
-----TTIIVAHRLRTIR-  
NADVICFMH-----QGRILET-  
GSHDELVAR-GGGYAEYVRIQTKHSPSEANRD-
```

[illegible]

```
>gi | 929763489
```

```

-----MYTYDAIDD-----LGGR
K-----PKRKWGKKKD KTK-----EDDKNKVPD-----
--DEEAVDIG--FKDMFIMATKKDWYLMLLG-----
-----AITSGVAG-----
-VAFPFGLLLG-----DTMDGFY
PTYQP-DVVKDAS-----
-----LNFFYFAIVLFLT-----
-----SFLGYACFAVAANQVEILR-----AEALRATLK
QELGWYDVREPTQ-----LSSRIAGDTVLIQ-----GAIGQKLSE-
-----FIKYICQFFGGFILGVKGWKMALMMCA-----GLPVMIIAFGALG
VAI-----
-----KI
ITEQQQT-AYAKAGGVAEET-----FSSMRTVASLSAECTQTE-RYEGFVAGA EK
VAIKAGLLLALS-----LGFIFMIIFLT YALGWWWGGYLISND DP
N-----
-----IQSVGDVTNVFFSFMMG-TMAIAQVG-----PNFTSILEGRGAME
SIMRILKRNPRI P-----EDGGAKP

```

[illegible]

-----EFAKLNAVQPV-----

>gi|929758703

FQVARLAIILTLMGVVGMVCG-----M  
-----FASKLAFGTVSTRLGHRIR-----RLYVESVLRL  
QDMAFLSMHTAGE-----LSNRLALDIKLIE-----DALGDTLQLL  
S-----  
-----MLVGLCVSGIAVGFAFSWQLAIAITVT-----MTPMIAISGAYLS  
YAL-----  
-----K  
SSAERSSTIFARAGATAEESLSL-----IRTVTAFNGQRFERE-RFNGKLHEAYR  
LAISSHIKNGLLVG-----LAMFIMLASNAWSLWFASQLVGARE-----  
-----  
-----  
-----MSPGVGMTVFFAIVMASLG-----LGQMFTPASKISRACGVAY  
NVYKVVIDHIPAINALD-----TTGSRL  
ENVSGCIEFRGVTFPTYPTDYDARADEKAEEQDSLDRSTSYIGKRK-----  
-----  
-----DNAAVLRN  
FNLTIDAG---TKVAIVGGSGSGKSTTIRLIQRLYDPEAGSISLD-  
-----GVNLKQLNVQW--LRGAIGLVS-----  
-----QEPRLFSGTIAENIALGSGVELNDEFEADLVMDSYLN-----  
-----RLYNAESVSMEQIVNAATLANAHDFIMQLPDG-----  
-----YDTLIGHSG-QLSGGQKQRIAIARAIVRDP  
KIVLLDEATSALDVA-----SEVLVQKALQQATAGR-----  
-----TTIMVAHRLTTIR-----  
DADVIFVVA----DGHIVER-----  
-----  
-----GSHDELRYKKNGYYAKYFDTPDSSTTEQGHQG-----  
-----  
-----  
-----SDHSQTLATRLDSGSEADSDCSEMRRNLNGSPDGYGLDSMDDNTATQ  
LTQHDIASEKSFPHASAATQSDSLEDNG-----EVADRE  
VLKANGVTRRVYRLNRPEWPLFILG-----GCGAILVG  
LVWPCYA-----  
WFFGELIFLLMNND-----QGEVDTMVIKF  
IVLAA-----VAFVGNVINTVCFGYANE-----  
-----  
-----  
-----RLVRRV  
RRMLFSAYMR0DVAFD-----IEDHLPSSLKSLASDALA-----

VTGVTGSSYLSTQITLLAA  
LCGALVVGFFVSC-----WQLAFLFLTIVPMVGLGVLIG---  
-----LRITGKAQHFAYMQLAEGNE-----  
-----RAVEAIDEARTILGLGSAPVYK  
FLDDYRTALGKPGKALERAL-----  
-----VYNSFAFGFSQLVVLVWGGAFYY-----GMELIKG-----AHCDIIGM  
IR-----TVCAVIFGGGLGLQGVLAVIP  
N-----PKAAQIAATWIFNIVDRVP-----LGAEVPS  
KKEKKGK-----Y  
FENTRVPRSRANK--PLQGEVEFRDVFAYPSRP-----QAQVLKRLSLK-IMPGEVVG  
TVGESGSGKSTLVSLLER-----FYTAQDG-----  
-----DVLLDQG-----PISEY  
DVSWLRTQIGLVSQEP-----HLFSTVRENLLYGHPAVD-----  
-----TISEDHLMDCLEKNAMEFVSQLP-----  
LGVDTLVGEK----GGSMGGMKQRLAIARMLLR--NPSIILLDEATSALDNTSER---  
-----LVQTALDRVMSG-----RTT  
IIVAHKLATLAKAD-----KIVV  
VVK-----GEVKEMG-----THQELEQA-----  
-----GGLFTAMLKQQRDATE-----

>gi|929746827

-----MALIAI  
YIKHCERTGFKKTSKHSRTIFSGMGSEIKGKQSLPGAD-----  
-----IYSVNANH  
ARKSSFRWTELIKFPTRPAIFRYTNKAD-----GFLI  
VFGA-----IGSVSHG-----  
-----AIIPIWTLFG-----EMIDLFI  
-----DNPDQR-----  
-----SNVQ  
SEVAKYIVVIVALGVLAMFT-----  
-----AYVQYATFHITSERQGRVIR-----TNFLRSILH  
KEQAFYETN-LVG-----SLTLTLNMVDQIQ-----DALGPKSSE-  
-----ILRYTSQAITAFAIALATNWKMALVTMS-----TLPFLILSLTFAK  
KAA-----  
-----VE  
RAKVTSQ-TYRNAAIFADEIISG-----VRVVQTMPESLPMLEGRYNSGVNQVLS  
TGIRYAWIVGTA-----SGVMFALIPLAFALGLWYGSRLVYNGE-  
-----  
-----  
-----  
-----ITGGAVVTVFAAVMLGKT-----ALSFVHPGLLIWNDGCVAAR  
TLFAMIDSEVFIDA-----SSE-EGLRP  
QTCTGEIEFEKVDFSYPTRP-----  
-----  
-----EIDALQN  
VSFTAKHS---HIVALVGSSSGSGKSSCVSLIQRLYDVKRG-  
-----RILLDGIDIKDLNVAW-LRDQIGIVS-  
-----QEPILFNISVADNISFGRPV-  
-----KMDMTIIAAAKESNAHEFITN-----LPEG  
YNTIVG-----ERGGMLSGGQKQRIALARALIGDP  
RILLLDEATSALDNK-----SERVVQDALDKACSSR-----  
-----TTIVVAHRLTTIQ-----  
NATTIIAMD-----RGTIER-----  
-----GTHDELILES KSGSG-----





>gi|929355731

MVSSSYNVS IQGP-----SDLAEDFKKLEGLPGPKD  
FEATQNESSTTEKKYPYLELFRYATIWDCLTMVIG-----ILAASIAS-  
-----ISVPYSVILYA-----EFTTLI  
DRNMGIG-ISTPAPILSVFGGG-----KTLTNATHAENMQAVE-  
DDAMAFGLGT VVGCMVQ-----  
----LLLLSLAVTILNKVALRQIAKMR-----KLFLFESILR  
QDMSWYDTSAGNT----FANKMTE-----DLDKMKKEGIGEKVAMP  
-----VFLIMTFVAGVIFSFIYGWLLTLIVLS----CCPFIIIVSTALVA  
KI-  
-----QG  
TFTEKELKAYS NAGAVAEEVFSG-----IRTVLAFS GERIETE-RFSKLLVPAEK  
MGRKKGFYSGVGS GVMWF-----IIYIAYAI AIWVG IKLILKYRY  
  
--MDEKL---YTAGSLVIVLF S IIVGAQ-----NLGFSLPHMEAFATAKAAAQ  
NVFATIDR-----KSAIDPLNESGEKLEN-  
--MIGNISFENLHFRYPARSDVQVLKG-

[illegible]

[illegible]

[illegible]

```

-----VKGATGSRLAL-----
--MTMTFFT-----LVTALIIAFANGWQLTLLILACIP-
-----FILVAKTFQMKSMTGHA AQDQKALEEAGR-----
-----ISTEVVENIRTVVALTRE--DP
FFENYKASLYKPHKDILKKA-----
-----PINGLSYAIGMSFNFFINAAVFSF-----GAWLIAHCF-MNFEQLFIVF
S-----SVVFAAMNAAQVNSLAP
D-----FSKSKVSAQRIFHLLDQK-----PVIDS
YSEEGDKL-----
-----EKFEGNIEFKDIHFAYPTRP-----EVQVLQGLNIK-INKGQTLA
LVGSSGCGKSTSIQLLER-----FYDPVSG-----
-----QVIADGVDIK-----SL
HIQWLRSRLGLVQQEP-----ILFDCSIAENIQYGDNSR-----
-----VVSQEEIEEAKAANIYNFIENLP-----
EKNYNTRVGDK---GAQLSGGQKQRIAIARALVR--KPAVLLLDEATSALDTESE---
-----KVVQKALDEARK-----GRTC
IVIAHRLSTIQNS-----DIIAV
IQN-----GSVVEQG-----THSQLLALEGF-----
-----YYALVNAQVSH-----

```

-----MATKSNVDEEKQPLLGKKSQTRSGQSYDTTM  
KRDNHQTLDEPKPKVSLRALFRYASLLDKFLITLG-----SLFAFVHG-  
-----AGWPMLALI-F-----GEMTNTP  
VQQAQSGFLVSE--NQSLESIISSSTLLPQTFTQMTDNSSSNITR-----SDVFE  
-----SAVTSLLKAVMATFAPGGFSSFDSIP-----SDVFE  
SMMNQYSLYYVYIGIAVFVA-  
-----SYCQIVCWMLACERQVYRLR-----QEFFYEIMR  
QEIGWFDKHQSGE-----LTTRLNDD-----LERIREGIGDKFSMF  
-----IQYAATFLSGFIVGFFVGVWELTLVIMS-----LTPLLALSSAFMG  
K-  
-----MIA  
SSSAREQEKYAQAGSVAEEVLGN-----IRTVAVFRGEKREVT-RYTEALLAGKK  
VAMRKYIFISIGLGFTFL-----VLYGSYALAFWYGSILILNG--  
--NMDP-  
-----  
-----GSVFTVFFAVLIGSF-----SLGNAVPHLTAIATAKGSAG  
VIFNIVDN-----KPKIDPYSKGIFFPQ--  
--MTPSIEFRKVNFTYPCRKSVQVLK-----  
-----D  
ISFTIKEG---QTVALCGSSGSGKSTIISLLRLFYDPQKGSITID-----  
-----GYSLTNLNVRW--LRSIIGVVN-  
-----QEPILFGCSIAENIRYGSD-  
-----DTTFQEVIEAAKMANAHEFIINLPE-  
-----AYDTLVGDRGAQLSGGQKQRVAIARALVRDP  
KILLLDEATSALDAE-----SEATVQRALDKAR-  
-----QGRTTIIVAHRLSTIK-  
DADVIFAME-----NGEIKES-  
-----GTHQELMDKEGVYYTLVMSQMF-  
TDQSG-  
-----

[illegible]



>gi | 925673327

[illegible]

[illegible][illegible]

[illegible]

```
>gi | 920718983
```

-----MDGKGSSAE  
R-EEQRKQKGAETVPFRKLFAFADCAD-----IMLM  
AVGS-----IGAING-----  
-----LGFPLMTLLFG-----EIIHSFG  
SNQNSSGIVEKVSQFLCNWNSDPMDGKGSSAEREEQRKQKGAETVPFRKLFAFADCAD  
IM-----LMAVGSIGAIGNLGFPLMTLLFGEIHSFGSNQNSSGIV  
EKVSQVSLKFVYLAVGSGVA-----  
-----AFLQVTCWMVTGERQAARIR-----ELYLKTILR  
QDIAFFDKATNTG-----EVIGRISGDTVLIQ-----EAMGEKNCEM  
SPEAATASGCVLGGRHCI RSALWRFPPQDRSTTWACYLLLLSEEEGGGGNETVKGLR  
THSRTEYNRQNRIRCKQFLVSTRGTGYSIGIEYTIGNRILHLQNFRTLWNRILLQGAAMA  
IMQ-----  
-----GR  
MASRGQV-AYAKAAHIVQQTI-----ASIRTVASFTGEKQAVS-DYRKFLVEAYV  
TGVHEGVSAGVA-----LGTVMMLLVFSGYALAVWFGAKMIIENGK  
-----  
-----  
-----  
-----KYNGGTVLNVIASLLTASM-----SLGEASPIMSAFAAGQAAAY  
KMFETITRTPEIDAYD-----PNGKIL  
EDIEGEIELRDVCFSTP-AR-----  
-----  
-----PEELVLNR  
FSLDIPSG---TSAALVGQSGSGKSTVISLIERFYDPQEG-  
-----QVLIDGINLKEFQLRW-MRGKIGLVN-----  
-----QEPVLFASSIKDNIAYGK-----  
-----EGATIEEIRSASELANAAKFIDK-----LPQG  
LNTMVGEQ-----GTQLSGGQKQRIAIARAILKDP  
RILLDEATSALDAE-----SERTVQEALDRVMVNR-----  
-----TTVVVAHRLSTVR-----  
NADTIVVIH-----KGKVVE-----  
-----  
-----KGTHSELVKDLEGAYS-----  
-----QLIRLQEVNKESEETT-----SFHS  
KSELSTESSALLTKKISTWRSISVSVP-----  
-----DTESDDALLETQE  
QVVSRLRLASLNKP-EVPVLLIGCLAAIANG-----VILPIFGVLISTA  
VKIFYEPVDEMCKDSKFWALMFVVLGLASFLVIPARAYFFSVAGCKLIQR-----  
-----  
-----  
-----  
-----IRVICFEK-----  
-----  
-----VVMMEVG-----WFDEPSNSSGAISARLSA  
IATSVRTLVGDALGLLVQNLTCALAGLIAFIACQLALIILVLIPLIGANGYVQTKFMK

[illegible]

>gi|919075571



[illegible]



[illegible]

```
>gi|916414256
```

-----MSDSKNPAEP-----ESSSMLPQSD  
QN-----AADAPQELNP-----AEAPPGAGENNANVAP  
KTSKDQ-----RALEISENAVYKYR-----AADEPKHRKKSG-----  
-----WHDDIFASFRHASKLDIVLILCG-----  
-----GTASASVG-----  
-----ALLPVFFLI FG-----NLLEEMS  
-T--TL DTS-----  
-----  
-----YYVKIMAWLGFGAFIA-----  
-----AWISTSCFEIVADRQSKAFK-----ESYFKSIIR  
QEMAWYDQSNVAS-----LASRMEANVASIR-----SGIGLKLSM  
-----LIQLSTVVVGAI AVGFIKSWKL TLVSAA-----AVPVVLGFGLLVG  
WAV-----  
-----RK  
QESDTMD-SYASAGSVSEEA-----FMSIRTVVSLGIEGLMSQ-KYKSKLEEAEER  
AALHATFWVALG-----LAGLMTSMFLMSSLALWYG GELL ANSTE  
DALKVLTVPDEND PSTW-----  
-----  
-----  
-----PKPEFSGASAITVFFCIFI G-AFSLGQII-----NNVTALVKANTAAM  
DLEEVI RTS-AIDPLASGG-----RTD-  
VKLDGDIEFKNVAFSYPSRP-----  
-----  
-----DRPIFTN  
LNL RIPAG---KC VALVGGSGCGKSTIL QLLQRVYDCDSGTITVG-----  
-----GIPTRDINVAT---LRRHLGVVS-----  
-----QEPRLFSTTVRKNI ELGSPDPVTMEQ-----  
-----VIAAAKEANADGFIT-----RFPEG  
YETDCGA-----YGGQLSGGQKORIAIARALIRR  
NIL IFDEATSALDTQ-----SERVVQEALDALVQT-----  
-----SKATT LIVAHRLSTIQ-----  
NADLIIVLE-PSPQGATVAQQ-----  
-----  
-----GTHHELMK-DTSGLYYHLVSSQIVPT-----  
-----  
-----  
-----  
-----VEETEDDTKP-----QQVKREESE-----VDDI  
EAAAPNQ TWR---ESMKHV G-----  
-----GS IARAS

[illegible]

```
>gi|915294748
```

[illegible]



.....

>gi|915038518

.....

-----MAETTEKHGIYINEKDLNGECSTPQPDEPHVNESTTTTGNTTQIPL-----  
-----P  
GELANQREQKSPAFGPYFRVLR YATALDHILRCYG-----LFAAAAFGA AV-----  
-----PLMTVVLG-----NTVDDL N  
SWGSGERDITALANRTSKN-----  
-----ALWLT YLFIGCFFS-----



```
>gi | 914961353
```

[illegible]

FLFADLQSVFAEPSIAVL-----IKGVKFYCFWF  
FIQG-----LISGVSQLGQTAFFGIAGER-  
  
-----  
-----  
-----  
-----  
-----  
-----  
-----  
-----  
-----  
-----  
-----LASRL  
RASCFSKSLVSMQNHPLKMAYFDTPQNAPSRLIARLSSEVDS-----  
  
-----  
-----  
-----LKKLTGPLFGTLIQALVT  
VGLGLFVAFYSG-----YKLAIILVLCMPLMAIASFFERNT-  
-----RTYFGSNIERSSELAQARMG-----  
-----EALHYRRTVSGLCRES--W  
FLEQYCKQLDAPHRLSVISA-  
-----FVGAIGFGLSQAMLCWIYAISFYFG-----AKLVLSGELDYAAMNR--  
-----VLysiIFCAMAAGKTIACLP  
D-----VPSGRLLAAQSIFELLSYG-----DGGNA  
NASLDEYRKD-  
-----QAIASNVPPQIRLENVRFSYPSRP-----ETRVLDLNLNLT-FEAGKRIA  
IVGPSGSGKSSIFGLFER-----FYEPQTG-----  
-----SILFDGK-----DISTI  
PLSVVRETFLASKEP-----VLFSRSIWENICLRQLLKEKEEEE-  
-----APSI PQVDVENASILAGIHSDIISLSCG-----  
--YETQLGEFG---SQLSGDQKQRIAIARVLLK--NPPILLFDEATCALDAQSEE----  
-----KIQAALMKDFASSER-----PRTF  
IVIAHRLSTIRDFD-----LIYV  
MDK-----GKVVMG-----DHSSLKSKRG-----  
-----LYYKLYKKESROAHEDKGVN-----

[illegible][illegible]

KILLLLDEATSALDSA-----SEKAIQAAIDIASKHR-----  
 -----TTIIIAHRLSTIR-----  
 NADLIVVLSRG----QIADQGT-----  
 -----HDELMARNGLYADLIEKQIQKE-ESQKQ-----  
 -----AGASIGQDDD-----VDV  
 MLPGTQGATQESENEKAGTTETTRL-----EGTTNEDTDLS  
 VPNRKGAFSFLLAMSKPDWKVLTIG-----LICSLLAG  
 LEIPAESIFFA-----RRDVNLWSGLY  
 VALA-----AAGFVLWLVGVTTLAYATQK-----  
 -----LSKRVL  
 RETCCDKITVQSMEFFD-----EAKNSPSALSNALSKGTDD-----  
 -----LAGMGGSVMSGILTFTAT  
 IIGGIAVSLAVG-----WKLALVCTATIPVVVACGWRLQVL  
 AAF-----DARIRQSGVDSAAYAGQIVR-----SMRTV-ASLGLEKRVLGM  
 YGGFLSNHAAKSLRSILVTS-----GTLIANGEYSAFQVYV-----  
 -----ALYAASQSVVYLCAALGFWYG-----CFVCLISGSQIAGSIFTAP  
 D-----AGKAMHAAQELQKIAELP-----DGEKE  
 TQQSHVTEHTEK-----HKPALNHFTVS-VEPGKTLA  
 -----KAVANHLLDGPDPWQVTFQDVSFAYPSRP-----FYALQHG-----  
 LVGQSGSGKSTCLALLER-----DIRSL  
 DLNSYRLAISLISQEA-----VIFSSSMRENIAGVGVQDVND-----  
 -----DEILAACRQANILDFVNSLPDG-----  
 -LASPVG TG--GSMLSGGQKQRIAIARAFLR--KSKLLLLDEATSALDSESEA-----  
 -----VVQTAIEAVKK-----DRTT  
 IMVAHRLSTVMNAD-----VICV  
 MRE-----GSVAEIG-----S-----  
 -----K  
 PSVNGNG-----ASHELMQMEYWTRQ  
 LERSNPAEFLFDKPRPRVLSTSNISRQELKITGSLYDHLQRFCCKDHQVPLISILLAARV  
 THYRLSGTEDATIGTNKSGASLGPEDVDTKQSPNTRLSSRDLCIRIKVQDELTFEQVVR  
 LVDETLKNAHLNQQISFEDLVSQIFPQGSDLRHLPLIQTAFSLDSVRPIEAPVTANGDTA  
 EKRSSNLPVLDLEFRLSQASGGLYGHAFQCDLFHEETIRAIIEVFYEVLTRGMEEPQTP  
 IASLRISGNNTPTEINTTSSDS--RYSRDSSIIIEVFQRQVTAMPTAMAVKDSLQMQTYDE  
 LDKASGIIIEVWLKNKGLAPETLVGVLA PRSCOAVAATILGILKANLAYMPLDVKAPASRIN









-----MATTSTNTMTTPNSSMAQPAPSY  
DLVLCIGFGAAQLATAIANRESREPSRVLFVEQKPSFSWGSTSNLSRTRMESPFMYDLATL  
RNPRTAFSYVNYLLSRKRLVEFANSDRNLNPLREEFADYMKWCAEQFKDEVRYGSEVVGVA  
PEAEGDIVQGWKVAVKDNTGKTMVVRARSIVAPAPSRESGPAAQPLPTVDFLAGQRIIST  
NDYPARRNELRGANEPRLSVSLVSGSAGKTTEILDDLSCPRLGNITVVTEDESLAPLTIL  
DDAKPPQPQLCISIWAKPTSCQTPSVTEAPELVQTLYMRAYEKHVQTKGEFRLRVIIGKDA  
SAACAGSNFIIRDAATSPLSNSALFQSIDTIILGCRPKGE-----SLEE  
VQFKRGTVAEGCRLWLVSXSDGGGRALAKDVALMAGEIVRKASKGSKEARDGAASMVQVA  
RIMPSRASIRPFFGFLHLLFYADPTWLDYILVCVG-----CIAAIAAGVPF-----  
-----PLIGIVFG-----QLVDEIN  
TATCNNQTGAS-----SGSEEDITP-----  
-----KILLLVYIAIASFAC-----  
-----IYIHLVCWSLASQRLAQRVR-----DRYLRNLLR  
QDMAFFDNLQAGE-----VSS-RLNGDIQAIE-----SGTGEKVGVA  
-----LTCMSFCVTAYIVGFIKNAELAG-MLVSLIPAFLLMAVIGGHFVG  
KYS-----  
-----AKLGECFGSASAIASEALSH-----VGLVHALGANTRLEE-KFRGHLEKARE  
QGIKKSTAAAVQAGLLYF-----IAFSASALGYWQGSRRVAASLE  
G-----  
-----NGNATIGEIYTVTFILLDGAIV-----LSQIAPMLPLFGGAISAFE  
RLRKDIETQP-----TIDNTST-----SAEKPI  
DVTG-AIEFRNVAFTYSSRP-----  
-----DHPVLNG  
ISLECEAAGYVGQLTAIVGLSGSGKSTVASLISRFDYDPSG-----  
-----DVLLD-GRNVKDINIRS--LRGFISLVQ-----  
-----QEPSLLDRSILENIALGLVNSPP--HAHLEKTLLSGVLGVAEDARNGT  
SLNEAAEKAGAEVIEIVELVKHAADLADVAV-FIDRLIEFG-----  
-----FATAVGSSGSL-VSGGQKQRVALARALVRDP  
KILILDEATAALDSA-----SEQRIQAAIER--ASRGR-----  
-----TVISIAHRLSTIR-----  
AASKIIVMKKG----DIIEQ-----  
-----GTHEQLMDLNG--SYADMIRLQTVKAED-----GPSSS-----  
-----RTSLDSHDADTISDEK-----  
-----QILKAQEADTTFGGALPASDPAEPTK  
GVVIAGSITKTMPLTRP-YLLLIVIMA-----FFGALIVG  
GQYCGSG-----CNEPDYIRSRGELLSGLW  
LLFGNIMGLMSP-----CIAFLANFTSWAAFGLLSERLIYKV-----FMLA-----

RNLSLQTLLHQPLQWHESE-----ARSPSMLLEYITKDGNS

>gi|909549879

-----MKRNESVKSLQQFRGGRHEKPGVALGWRQNSLTISAFQAHSAYLAEKA  
RTKEAEEQQDQPAPVSWFHLFRYATPWELLLLAFAG-----VFLATMNG-----  
-----LMVPIGVIIYG-----EFTALLI  
DRTVMVG-TSNPTITISMFGGG-----RILTNASAEENRIALI-----  
EDSQAFGIGCTVFSVLQ-----FICGAVSVDLFNYAASRQIDRVK-----ERFLKAVLR  
QDITWYDLNTTMN-----FATKVSD-----DVEKYREGIGEKVAMF  
-----VYLVMFVTAVIISLVYGWELTLVILS-----CAPVVIATTAVVA  
KV-----QS  
SLTTQELKAYSIAGVVAEEVLSS-----IRTVVAFGGEEKEIE-RYSDRLAPAKK  
TGTRKGVYSGMGSGFMWL-----IIYMTYSLSFWYGVGLILDSRH  
-----  
--EDIPI---YTPAVLMIFFSVLQGAQ-----NVGLTSPHIEAMASARASAS  
AIFRVIDR-----KPVIDSLSTEGSKPE---  
--LDGDLELKDVFYFRYPARPDVQVLNG-----  
-----  
LSLKINRN---ETVALVGASGCGKSTVLQLLQRMYPDEEGSVRAS-----  
-----GHDLRELNVRH--LRNHIAVVG-----  
-----QEPVLFAGSIKENIRLSNP-----  
-----SCTDEEIIIVAAKQAYCHHFIKNLPE-----  
-----GYDTMIGERGAQLSGGQKQRIAIARALVRRP  
KILLLDEATSALDSH-----SEAKVQRALDAAAHG-----  
-----RTTVMVSHRLATVL-----



.....

>gi|909137551

.....

.....-MLLMGPRLPATESQGA AKLKLPS  
RQRQSRNGTRPAGQYVWHPSRSVVFRKSARTARRCCWLTWRLEPDAAAQLLP GAVPD  
NEVAPTAIPLNDVHSAPPPHSAAADRKIEDLKAPLMADAEQPL-  
.....-DRPSAE  
ASGEAKDDDNSSKAVPFLSLFRFADTKD-.....-KVL M  
AVGF-.....-LGAIGYG-  
.....-ITNPLISVLLG-.....-DAVNPFI  
DYARTRAIYGS--GPQVDLAA-  
.....-EALR  
TNVVNTVVL FVGIGVATMVA-  
.....-AYLMQASYMWAGERQARRAR-.....-AHFIRTTMR  
QDLAWFDKNKAGD-.....-LTTRLTSDALMFQ-.....-EGISEKVVQ-  
.....-AAAYLIQFITGFVIAFILSWKLT LVLMA-.....-TFPAFGASGVIVG







[illegible]





[illegible]



[illegible]

```
>gi | 871255334
```







[illegible]

-----GNHNELSAKDGIIYSRMLKSHGGTDSDAAA-----

-----KADGEQDAQLPGPHPLEQGPAPARAVSDGKEV

SRKAEAGDEKEVKARISLTS-----

-----KLWDKSRSDWPFIALG-----VFGSIGMG

LVMPSPFS-----

FILSEMMKAFFQPDVEAG-----ARKWAFVF

FGLA-----AYQMVSSVIATSNFAIVGE-----

-----RLTYKL

RVDLFRAFLRQDVSWFD-----HPDNAPGILNIKLSNDCE-----

-----RVRGLTVGSMSTLVQVITM

LVVGLGIAFYYG-----WRLALVLLATGPILAIAGAAQLALI

VD-----NKQKA-AFEFAG-----R-----

-----IANEACGAIRTVASLTAE-----RQ

VIADFDAKLRPVTASARLQA-----

-----IAAGAAFGMSQFVMFSVYCVAFYY-----GAWLVKEGLMNT-----

D-----GAKARQAAVDIFNFLEMC-----PVVDP

TDTKSGQKM-----

-----SLHG-----QSITFDNVDFSYPTRP-----DSTVLDKLRLQ-CPAGKTLA

LVGPSGSGKSSTVALIAR-----FYEPSA-----

-----GSRIG-----DVPLTAL

NVVDFRRQIGLVSQEP-----VLFSGSIRDNIAYGRPS-----

-----ATTEEIQEAARQANASEFIDR-L-----

-----P

DGLQTLVGTR---GSQLSGGQRQRIAIARALLIDP---QLLLLDEATSALDNESEA---

-----LVQAALDTLMKGR-----TS

IVIAHRLSTIKNAD-----VIVV

MEK-----GRVIEQG-----THAELVAAG-----

-----GTYSHLHALQH-----

[illegible]

[illegible]

```
>gi|857970527
```





-----LTTRI  
RDRSLEAMLSQEIGWFD-----EARN SVGALTTSLSAATQ-----

-----IQYMSGSTLGSMLELCTG  
VVGAAVLVSLITG-----WELALVVLACLPLIVASNKKRMDMM  
RKG-----NIATKEYYEKSAQVACEAVG-----

-----AMRTV-ASLTREQHVYDL

YCRDLVEPLAIGTHHAIYGS-----

-----VLFALSESMTFLVNAFAFG-----GYLFIHHGYTTQRMFT---

-----VLMAVIFAGQSSGRVFSMMP

D-----LTKALLYARDVLGLLART-----PLVAN

PTTSPVVA-----

-----THDNTPGLIEFKDVQFEYPTRP-----GLRVLRGLSIT-VQPGQYVA

LVGASGCGKSTAVGLVER-----FYDVQAG-----

-----QVLIDGR-----DVSSI

DLRSLRQVVSIVTQEP-----SLFHMTVKDNILLG--VPDPAAVSQ-----

-----AEIEQAARDANIHFIA SMADG-----

-----YATNVGAK---GGQLSGGQKQRIAIARAIL--KPRILLLDESTSALDATSEK---

-----

-----VVQAALDQAAR-----GRST

ISIAHRLSTIKHAD-----QIYV

LQN-----GVVVEHG-----THDELVGIDGLYRLLAS---

-----

-----

-----

-----QQDLNS-----

-----

-----

-----

-----

-----

-----

-----

-----

-----

-----

-----

-----

-----

-----

-----

-----

-----

-----

-----

-----

-----

-----

-----

-----

-----

-----

-----

-----

-----

-----

-----

-----

-----

-----

-----

-----

-----

-----

-----

-----

-----

-----

-----

-----

-----

-----

[illegible]

[illegible]

```
>gi | 813212536
```

---NRAAKSLTSATSLAEEVLGQ-----IRTVKAFNSQSTLSK-EHDEGLRVAWK  
 WSVRKACAAAVALGGVWF-----VAYAANACAFWYGAHMIAS-----  
 --FP-----

[illegible]



-----MGRSEDGPAASATDKQAVPEEQEKSESKNDGKP-----

-----TETVSLGNYFRALSYATGKDRLVLTVA-----LISAIASGVPL-----

-----PLMNIVFG-----NLVGEFNM-----

GYFMPGTTVTEAQFKASVKNLRYEGQKRLVAHVLSS-----

-----DSLYIVYLFIKFL-----

-----TYFAMFCFRVTGLRVSAVIR-----LEYVQALFS-----

QPISKVDQVS-VG-----TVTNTITTLSENTIQ-----QSIDKLAILE-----

-----FQSLALLLAFFIIAFKYSWALT-VTSSALLFVVVGCSVTLPFMT-----

KIQ-----

-----QKIDKADEKHSSIAAEVFGS-----IRTVVSLGAQESLSK-RYTTWVEEARK-----

RGNGLSLIFGIHFALVFF-----ALYASFSLAFWFGCLKLYREGHI-----

G-----

-----EINTVITVFFSVMIVVSV-----LGNIASPLIIVSKAASAAG-----

SFFELID-----SEKVDSGGLRE-----PDAS-----

AH-VDIIFRDVRFITYPTRP-----

-----DVPVLKGG-----

LDIRFQNG-----KTTALVGPSGSGKSTIVALIERWYQLAMS-----

PEDQNG-----GSIYAG-PHDINSLDLKW-----WRSQIGLVQ-----

-----QEPFLFNDTIFNNVAFGLIGTQWE-----

-----KEPDSVKKE-----LIEKACREAFAEFIQRLPEG-----

-----YATIVGQNG-IKLSGGQRQRLAIARSIVKEP-----

KILILDEATSAIDVR-----GEKIVQAALDR-----VSRNR-----

-----TTIMIAHRLSTIR-----

RADHIVVMKGG-----VNVEE-----

-----GTHEELLQR-EGGVYRDLVNAQRLELLAEEDSHTGNAVLEL-----

-----QDEAQSPMTSVQ-----

-----EKVQDEDNTQDK-----

NRGFIRTIGLVLYEQRARWPLYVAVLI-----STAGA-----G-----

TAFPLQS-----

WLFKALIEVFRFTG-----QKLVDAAFWALMF-----

FLLA-----LAVGVLYSTVGFTANSLSVRISEAC-----

```

RKEYFQNILAKPIPFHDLS-----ENASGSIVSRLATDPKQ-----
-----
-----
-----
-----VQELIGLNGAFPLISTFS
MIGCIAIAFSFG-----WKLSLVTVFAALPCTFLAAFMRIK-
-----YELQFEAMNAAVYAGSSQ-----
-----FAAEAIDAFRTVSSLTME-----DA
ILDRTYQLLREQQKKAFRKA-
-----RYATLIFAFSDSVELCAMALTFWYG-----GQLLASREYQPTSFFV-----
-----IFMAIIQGGQSAGQFFSFAS
N-----FAQAAASANRILNSRP-----QSDELG-----
-----
-AASIEKQQLVRSGLTGATVEFHDVSFRYASQ-DVP-----LFTGLNVS-IQSGQFVA
FVGPSGCGKTTVISLLER-----FYSPSQ-----
-----TITFN-----GEDIRTL
EMTSYRRELSLVAQEP-----RLFEGSIRENITLGLDQSE
-----FTEELIQACKDAEIHDFITSLPEG-----
-----
--YATELGIIAQ--TSLSGGQRQRLCIARALLR--KPSLLLLDEATSSLDQSEK-----
-----
-----VVQGAMERLAQKRS-----LTI
VAVAHRLATIQKAD-----TIYV
FGTAHAGQASRIVEQG-----THQELLRAK-----
-----GTYWQMITI-----Q
VLIPNLDSELYFPQTSNPPSIRLSAKAATRIQPT

```



[illegible]

-----GVSAK-----  
-----TTHEEDAALVMAE-----  
-----VESKKEEKAMR  
FGLRAMSARVFKINR-DMWGWYALC-----FTGAVVNG  
MAFPVYAI-----  
-LLGLTIADFELP-LSEI-----KGALETKAIFP  
FVVA-----LVAGLSVACEILGSQRSGWE-----  
-----  
-----  
-----  
-----  
-----  
-----  
-----  
-----  
-----  
-----  
-----LSRKL  
RSAAFSATLRRPIAWFD-----G-ENS-GGLVARISDGPEK-----  
-----  
-----  
-----  
-----IQGLFGVTLGAALKAFVT  
IIGGCIVGLAYA-----PLLALVGIIATVPLVFSAGYIRLRVV  
VLA-----AVRVQAVHQASAQMATEAVG-----  
-----ALKTV-VALRREVDVRTR  
YSAALEKAAARSTHTSLRSN-----  
-----ALYAASQAMSFLSIALVFYVG-----ARFVADGRYDTQRFFT--  
-----GLTAVVLA AVNSGVFGFVP  
D-----AGQASAAKS VFGLIDGA-----PPPLP  
PTDEA-----  
-----VAPGHLRLDSVSFAYPTNP-----APVL RGLSLD-VPPGAFVA  
LVGHSGCGKSTVLALLER-----FYAPDGG-----  
-----SITLGGR-----DIATL  
DLTAYRAIMAI VSEQP-----VLYSGTLRFNM SLG-ASDPDAVSD-----  
-----ESVWAAAEGANIAEFIRSLPEG-----  
-----  
---LDTDIGDH---GAQLSGGQRQRVAIARALLR---NPSILLLDEATAALDSASER---  
-----  
-----AVQA ALEAARR-----GRSV  
IAVAHRLSTIQHAD-----LIYV  
MKA-----GTVVEKG-----THAELMAL KGEYYELV-----



[illegible]



[illegible]

RKDLFQKYLKMPISWFD - - - - HPHNTPGSLTQKLSTDCQ - - - - QLTFKL

- - - - -

- - - - -

- - - - -

- - - - -

- - - - -

- - - - -

- - - - -

- - - - -

LVSALALAFSAD - - - - - WRTTLVGLSLMPLMVLSQAWYMSRM

EG - - - - - FGEKTDAAFRDST - - - - N -

- - - - - MINEAACNIRTVTTSFGNN - - QQ

LVQNFTQILDKNIKEIKKSA - - - - -

- - - - - LEAGLAIACTNFILFAIYGTFYA - - - - GSTFHRDY -

- - - - - DLSIVDMFISIQLMFAAIGIGSNSHYL G

D - - - - - VGTSQNAAKGIFQVLDSV - - - - DENQL

NILN - - - - -

- - - - - FDNQDIHGEIQFKNVTFKYPQR - - - - DQIILKDVSFT - IPAGQKVA

FVGPSGAGKSSIIQLIQR - - - - - FYDNYQ -

- - - - - GEILLD - - - - - GVDIKNY -

DLLKYRSKFGVVSQEP - - - - TLFTGTIKENIIYNTE - - - -

- - - - - VNEQQIESITKQVNAYDFITN - - - -

- - - - - YSKNGV

NGFDRQVGLK - - - GNQLSGGQKQRIACRAMIKQP - - KIMLLDEATSALDSQNEK - - -

- - - - -

- - - - - IVQESLNEAMKQK - - - - TS

ICVAHRISTIKDSD - - - - - MIYV

MEN - - - - GNIVEQG - - - - KYDQLMNLK -

- - - - - NNFYKLQLGSSQ - - - -

[illegible]





[illegible]



FIVAHRLSTIKNAD-----EIAV  
IKD-----GRVVEKG-----SHKELMA-----  
-----KKQHYYELVSSQEFVTYEEDDETSGSN  
TPSPANTDHNDNNEHDDDDNDNDGGATGEHLPAPGDDHGDDDDGDDNGDGGMHTNGGV  
APRQSSTVSLTLAGDGGARKDSSTDPDESVQTIVI-----

>gi|818165804













ETVEGTIELTNVDFIYPSRP-----

-----AVQVLYG

FSGTFPHG---KMTALVGGSGSGKSTIIGLMERFYDPVSGSITLD-----

-----GVELRELNVKW--LRNQIGLVS-----

-----QEPTLFATTVAGNIEHGLIGSRFENE-----

-----SPEDRRRRRVVEAAKQSNAHGFIEALPQ-----

-----GYDTQIGERGMLLSGGQKQRIAIARAIVSDP

AILLLDEATSALDTA-----SEAIVQDALDRASTGR-----

-----TTICIAHRLSTIK-----

DADQIIIVLTAG---HILESAMSADGSA-----

-----HELLLRNPDGPYSKLVNAQKFREDTEGPTSSSSSITDGDEKAPVPG-----

-----ELTRAQLDEMAANEKPQ

-FETVKRIGTGRSAASEALERQOND-----

-----LEAGGSEGPVQ

HNFPYLLFRMFKLNGRETTPHYVLA-----FAAAVLTG

CVYPPVFGIGKSCSFP-----RVFLKIYTDLPLS

IVFGGVLGVFSETDRDAL-----RSGGNRYALYC

FIIA-----IVATIGVIVQTWLFGATAER-----

-----LAARL

RLNTFKSILRQDIAYFD-----RDENSTGHLTATTSDLAQK-----

-----ILGLMGVTQG-----

-----TIVAGVIRLKVV

VLK-----DQKNKRSHEQSAQMACEAAS-----

-----AIRTV-ASLTREEDCSAI

YSEYLDKPMQESNRVAIWSS-----

-----ALYAISQSLSFVWIGLIFW-----

-----VVFGSIQAGNVFSFVP

D-----MSNARGAAADFVRLVDST-----PDIDA

EDTSGNQF-----

-----DLAASQGHIRFENCHFRYPTRP-----HVPVLRGLHLE-VKPGQFAA

IVGPSGCGKSTTIQLIER-----FYDPLAG-----

-----HVIVDGQ-----DISNL

NVQSYRRRAISLVSQEP-----TLYAGTIRFNITLG-AHVPAEQVTQ-----

-----EEVERACKQANIHFVMSLPDG-----

-----YDTQVG GK-----GAQLSGGQKQRIAIARALVR--DPKILLLDEATSALDSESEK-----

-----VVQTALDQAAK-----NRTT

IAIAHRLSSIQNAD-----VIFV

LKD-----GKVAERG-----THFELLAKKGIYFELVA-----

--Q0SLEKTQ--

>gi|551614020

[illegible]

```

-----LLKALTGERAGLAVSQUIAV
LIAGLYISFDAS-----WRLTLCIFGVIPAIPLVAVQAKVV
GRY-----AERANASLVR-----AAS-----
-----VASETLLQLRTIAAFGLE--AP
AVDAFTAELSLPYKQDVLKG-----
-----VALGVGSGTAAGTILFAAAFQYVV-----GALFFD-----
-----ADLISFSDIMSCLLVL-----IFMAFGFATVSRDVS
D-----RAEAMQAARRVYKLVSTL-----SA-----
IDALA-----
-----GTGAVPPSGRAAGRIELVEVSFAYPARR-----DVQVYQGLSLT-IEPGATVA
LAGPSGCGKSTLVALLER-----WYDVDG-----
-----GRVVLDTGA-----DVRSL
SVRWLRSQIGLVSQEP-----VLFNGTIAYNIGLGAAGAEGGGEG-----
-----GGEAAAAAVEVAARQANAHAFVS-----
-----AMP
DGYATEVGDK----GVQLSGGQKQRIAIARALVRDP--PILVLDEATSALDAESER----
-----
-----IVQAALDELLRA-----QRRTT
IVIAHRLSTIRNAD-----KIAV
VS-----GGRVVEEG-----PHDELVDRE-----
-----GGIYRSLVLHNNAGRVEL-----

```

[illegible]

-----FAPKVQGPASLVVGLRQRFGDPSTAPPSRPSNWRLNFAAAAN-----  
AVLASVKLARKTPPDGSKATLRL-----TRS  
EFFSPLWWQLMRLQDRGDLLMLVG-----LVFAVLLEG  
MTIPALG-----  
FIFTKTATSLFKMDPDR-----VHDETVFWGKAA  
LLVG-----ASYVPIMTIELGIFGTVE-----  
-----  
-----  
-----  
-----  
-----  
-----  
-----  
-----  
-----HLTRNL  
RALAARSLVKQEIGFFD-----DPNHSAGALTFLGEKVA-----  
-----  
-----  
-----LAQAVNGHRLAATARQLAT  
VLFSAYLIFTFG-----YWQLAAIMIVVLPIMGFSMSILMVVF  
LGL-----KADEGNKAAN-----VGS-----  
-----LIGEVLGVRTVASLGVE-----RR  
FLADFEAADAEARRGVGA-----  
-----FVSGLAVGMKGMLVCFIGIVSY-----GSLLVTKDIEQLTAEMTRMF  
LDPDAPPGPDDITSVDAATGCINSQIWTIVEKFLCPLIV-----VFFSSIGMGAAGVIAA  
D-----SRRAALACQALFRMIRRP-----SR-----  
IDATD-----  
-----NDGTKLPS-----VRGDISVRDVVFAYPAAP-----EHLVCNGYSLE-IGAGQTVA  
LCGPSGSGKSTLIQLLER-----FYDPQE-----  
-----GSVRLDG-----DLRDL  
NVRWLRSQLALVGQEP-----ILFVGTV AENIAYGKEGASR-----  
-----AEVEEAARSANAHEFIMN-----  
-----SLP  
HGYN SNVGLR-----GGMLSGGQKQRVAIARAIVRK-----AILLD EATSALDTT SER-----  
-----VVQAAIDEIMQK-----QKR TT  
VTIAHRLSTIRHAD-----KIAV  
IR-----EGRVVEQG-----THAELMLTG-----  
-----GVYAGLVDAQQS-----





[illegible]









[illegible]

```
>gi|512188095
```

[illegible]



.....

>gi|475562360

.....

.....-MEEKDCPVESFKPEDD  
KKSTPPEIAVADEPFPPFFCLLCYADALD- -WLLM  
VSGT- -IGSFVHG- -





-----MTFVLKKK-----KKKEKKK  
GKIRRKRMEMRMVRQHPASQFRFATSKDRWLMVLG-----SVMAFLHG-----  
-----AALPAMMVVFG-----EMTDVFI  
FATQMDRFIDAILPN-----LTVIFPNITKDWIK-----  
-DHSYIFEVSVMGAIV-----  
-----VVVGYLQVVCWRTSAVNQCQRIR-----KSVYKSILR  
QHIGWFDTRDSTE-----LNARLSD-----DINTIEQGIGDTLSIT  
-----IQMISAFHAGVIIGLLYCWDLTLLVLS-----SAPIFIAISVYVV  
WTG-----  
-----T  
KFADKELSAYARASSIAHEVFSS-----IRNVVTFGGQDKAIK-MYETSIDEPLE  
MEKKKGLAVGIGLGLTYG-----FIYVLFGAFLYGVDKLLADR-----  
-----  
-----  
-----GLTAGDILLSFFAILQALF-----SLGYGLPKLQEFKARGAAY  
CIFQLIDT-----KSEIDSCSEEGTVPDS-----  
--IEGNLEFRDVSFSYPSRP-----  
-----  
-----NTQVLKH  
LSFQLRHG---QIVALVGSSSGSGKSTVLQLLQRFYDPQVGQILLD-----  
-----GNNVRDLNVKW--LRSQIGMVN-----  
-----QEAVLFGTSIGANISFGKE-----  
-----GCTQEDIERASKLANAHEFIQKLP-----  
-----QKYDTLVGEEGALLSGGQRQRIAIARALVRDP  
RILLLDEATSALDPE-----NEGLLQTAFNQARK-----  
-----GRTTITISHRASTIG-----  
SADIIGLN---KGRVVM-----  
-----  
-----GNHSELLQQDGIYASLIRNQLSLATTNTVHKQ-----  
-----RLAYHRNOMILLPMKS-----







.....

>gi|405963166

.....

.....MEQNNTTLAKDIQMDEK-----IPIQNGEH  
VH-----QNGESGKQNGVSENGVPAE-----PKKGQATVTINPEVKVRT  
VNKD--KQKEKVQQIGFFTLFRYGSLFDKIILAVG-----  
-----ILCAMGTG-----  
-----CATPINFFVYG-----DLANYFI  
LYDIAKGTNFSDTNLTTLV-----















GIAFEAADDAPFAGICAEDQGAIWLNTKTQGMSTDGVKISNENTTNGASGEPMGGMSGSY  
SALARFADTTKYIFAWVSRGAIDVTENAWMGTGYTNVQNRTNGRNV AISLFSDKYTKVGA  
QATSEVGTEDGDSQVNWVTSGSNDCSNAHAAAFGSSNALVTWEEISNPTCDFIAMGCRGT  
FAGTYFQQVDSTGSKVGEAFSADDVYVAGDMVTMSDGRICWPYVNM TWLSQSIDDSSSS  
ATGKKMSIACLGLDGTDSSTTTAASLTTSASAKVAVSESASEVPKAA-----  
-----SSETTVKAPSQTTEAASSATTVEPSSQTTEPAAEATSGSVAAIGGGSANTSSSSV  
IEIATAVASSAASGIVDVTASGPDSELPAATTIYTPDTPSGVLAVSEVPTDAWTAIPSSV  
-----VSAIPSGTPTGIARGHGRKHGHWGHHGTEHHSSGHSSEYD  
EVPESEPQVSGACKS-----

>gi|768681818

-----MTSEEHKQAVLQRQLHGLPLDDTG-----  
-----RPLAHYATKLDRTILYVSS-----ASAVIAG-----  
-----ALNPLVPVIYGLLVGVFNFGAAG-----SVE  
VAEFRS-----KISTFSLY-----  
-----YVYLSIGLFVF-----





YDGFATQAANSLNSILIAS-----  
-----ALYAASQSVVYLCAALAFWYG-----GTLIADREYSQFQVYV---  
-----CFVSLISGSQIAGSIFTFAP  
D-----AGKAIHAAKELQNVMELR-----NPEDE  
IRSPLTDSGPSEL-----  
-----KQTEHDLQGSDFQVTFKNVAFAYPLRP-----SKYALQNFTIT-VDPGQTLA  
LVGQSGSGKSTCLALLSR-----FYRLHHG-----  
-----QILVNGH-----DIRNL  
DLDAYRSTLSLITQEP-----AIFSGTMRENIAGVLVRQEVSD-----  
-----DDILTACAQANILDFVQSLPDG-----  
-----  
--LSSTVGTS---GSMLSGGQKQRIAVARAFLR--KSKLLLLDEATSALDSESEA---  
-----  
-----AVQRAIDAIAIK-----DRTT  
IMVAHRLSTVMNAD-----VICV  
MKE-----GRVAEVG-----SPQQLMSFVVAVEYRLIPAS  
YRISRLHRLTNTPLGYHSSPSRAIMSSILKSTCIQATPREDGIFEQTLAQSHLWLLHR  
LYPNSTWQLLPFGLHLRGCLQLEALKAAFMALQDRHEILRTTFTHLNGTDVQVIGSIQK  
DLEVIDTSSDERDMLLLQLQHMQMMPFNLETETGWRACVFRLEEDDHFLSIVMHRISDK  
LSVEILGRELATLYSATIKNQDPLSRIRPLPMQYRDFAVWQNNQEKTGQRQDQIDCWVKQ  
LEGNHPATFLCDRPRKAVMSG-AVERQDIEIGGSYIDLLRFCKLYQATSFATLLTVFRI  
AHYRLTGAEDATVGS--LVANRNQDQKGLIGPFS-----NLQCIRIRVEDDISFEQLVH  
QVDKTTAEAHKNQDTPFERIVSELHVDDSDGSRHPIVQTSFSLHSKRDVVQFAFESLETE  
QLKVVATTRMDVEFHFLQFQADCLRGSVLFAANLYDHRTINAMVDIFYKILTRGLETPQTP  
VAYLDLMDSNSLLRDMSLLEINRTAYAHESSEVIEVFQRQVTSSPSSVAVKDSTSELYAQ  
LDERSDLVAVWLAKFGFAAETLVGVFAPRSCHAIALLGILKANLAYIPLDVKVPKSRIQ  
AILSAVSGHKLVLGPDVPPPDTQLVDVEFVSIADVLNHSVQTVRTLYGLGTASAAPSAT  
SLAYVMFTSGSTGKPKGVMIEHRGIVR--TADVLSTQWGAVPVAQMANLAFDTSTAEIYT  
PLLNGGTVCIDDMTSLDSVRLEKTFVTEKIEVAVFTPFLKQCLATSPATMQILRILYV  
AGDRFDAQDASKALGLVKGGVFNSYGPSTENSVMSTSYRIPPEMFVNGVPIGRAVNGSGA  
YVMGSQQHLVPIGVMGELVVTGDGVARGYTDPERDQDRFVR---VIIDG--ESLAYRT  
GDCVRYRP--SDGQLEFFGRMDYQVKIRGHRVELAEVEHALLTFES-VSEAVTVVRDS--  
-DGQDAELISFITISDRHG-----LSEWEEADDTGEQGQVETWRDHFDVTAAADID  
-DMDPKDLGRDFVGWTSMDYGSEIDKKEMEELDDTLAALLDGNPRNVLEVGTGSGMIL  
FNLPKSLKSYIGFELAKKAATFANKAADLVPSLRGKVELRIGTVTDLASMER--LNTPEL  
AVVNSTAQYFPTPEYLLRVVEDILRLDSIERLFFGDLRSYALYQEFQVTKALYTTGGRS--  
--TQDVLRLQKMTTIEREEEEELLIDPAFFTALRVRLPDLVSHVEILPKKMRAANELSCYRY  
AAIIH--KARQEGPFQPIYEVDEGQWINFVSDQLDRQSLRLRKG-----FPVTAVVAV  
SNIPYSNTIFERCULESLNGAQQ-QGVEGTDWLETCHEAARK---RPALSVVDLHEIAD  
LAGCRVSVSWARQSSHNGLDAVFHRYQPEDSGGKVLHFPTDHLGRNFDELNRPLWQR  
LKKKIEQQVRNKLKSLPSYMPFSIRVLEKMPINDNGKVDRRALAKSAQ-----FVK  
ANRSLEARQPPRNHIERILCQEFASVL---VEEVGITDSFYDLGGHSLQAARLVTRINHR  
LGCRLYVFDILNNSTPAALGEVVS-----MRIAEEGTNESTWN-----  
--SELIRKPHSRLTVAFIHGFWGQGSVYTPLVPLDDSFVLLHDPFFGQSEAPETIRQ  
WAEYLNNHVEKRAS--PGHVFIFFGYSLGGLIAYEMASLWRLRHGQYPALLVLLDAATYA  
STTTSAHEKEDEKEINYGLTLFGENQKQLVLNHNKVPALAR-EPHSLPIYQGEFCFLT  
PESVAVGALEWVLHAMADPPNSSMKELDLEGKAFDPSTFDARLADEENGKIENFQARKQA  
PKGAKELLTELENEFLNPSDKFSTKWLNTLQRRWDVSTDYADLFELAPTQSRTVTRFTRE  
GLEGRVTGYQEVTVPAASATAKNSTSLRRPAGRAEFVRGAAGFFPFAPGGLDAIEALAA  
MEADAQATEQSKNGKQSGLDRIINFGTGEGLLTTPPGFDNGVDFDEAKSKDATEGAQEVK  
TALLQEDSDLKVDQPEETADADTGAMAEELDDVSEDEDEEDIDALLPVEFPALERSQLLA  
GIHKQKGKEWAHVVDINKDIPNFNELVPDMAREWPFELDTFQKEAVYHLENGDSVFVAAH  
TSAGKTVAEYAIALAAKHMTKAIYTSPIKALSNQKYRDFRTEFDDVGILTGQVQINPEA  
SCLIMTTEILRSMLYRGADLIRDVEFVIFDEVHYVNDLERGVVWEEVIIMLPEHVTLLIL  
SATVPNTREFASWVGRTKKKDIYVISTHKRPVPLEHYLWAGKSKHKIVDSNKRFLSGLWK  
EADDILSGKDKAKAKKEAEAQAQSAQARAPVPQGRGRGPANVRGGRGGPQRGGPQRGRG  
QGDGQYSNRGTGNIARTGRGGGRTSAAQDKNTWVHLVSHLRKEDLLPGCVFVFSKKRCEE  
NADSLSNQDFSNASEKSLTHMFIEKSLTRLKPEDRTLPLQILRLRELLSRGIHVHGGLLP  
IMKEVVEILFARSLVKVLFATETFAMGLNLPTRTVVFSGRKHDGKSFRDLLPGEYTQMA  
GRAGRRGLDTVGYVIVTNSGKDEAPSAASLKQMILGDP TKLRSQFRLTYNMILNLLRVEA  
LKIEEMIKRSFSENATQALLPEHEKQVQVSEASLAKIKRTPCEICDLDMACHNAAMEYR  
KLTAEFHTELLSSPVGKRLFTTKRLVYRKDGQRTAGVITRDGVSAAVIGAVPCIQVFEI  
GTLNNKRHPTDILPFLPMFRPYFPLPNRVDDMSLRVCKIPLSDVECLTNTLVKITKPMW  
YLNIKKESTKWAIEILSQYTNWSIHSGWDEIDWQRIKEMEIRDILDKRQAQAEIAQSCHC  
LQCPDFVKHFEMQHDEWQVKENISELKQLMSDQNLQLLPDYEQRIHVLRELGFVDEQSRV  
QLKGKVACEIHSADLVLTLEVLNLAIEYEPEEIVALLSAFVFQEKTESTPTLTPRLEK  
GQKEIVRIAERVNDFQILHQVIQSTEDSNDFASQPRFGLAEVVYEWAKGMSFNRTDLTD  
VMEGTIVRVITRLDETCREVKNAAKLVGDPALHTKMQAQELIKRDVIFAASLYM  
>gi|768421959

-----  
-----  
-----  
-----  
-----

[illegible]

[illegible]

[illegible]

[illegible]

```
>gi|341903597
```

```

-----FCMPIESYAFG-----EVSQVLV
TITNAINNKTIET-----
-----TDLETAYQIFE
HDMNRVVYFFFCGVANLIFG-----
-----FFQ-----YSLMKFVGDNATYRLR-----KNYIFCLLR
KDVQYFDNVSTGS-----LSTILNDN-----LERFREVFNFKIALI

```

[illegible]

```

LM-----TLAMTSGMAGSATAYLP
E-----YKKAVHAAGLIFHLFTYP-----ASMPY
KSTDGKKNIE-----
-----NGEVVGSVDVHFHYNQRP-----DKIILDGINLE-VQSGKTLA
LVGPSGCGKSTIISLLER-----FYEADYG-----
-----EFSHFFRLFFNSTIVSFCEICSSLKQLPIGKNVVDI
NLHHLRASVALVSQEP-----TLFNCTIKENLLYG-LTK-----
-----MASPLEIEDALKIANAS-FVHNFP-----
-----
QGLETIVGER---GAQLSGGQKQRIARIAVLRL---KPKVLLLDEATSALDSESE----
-----
-----KVVQNALDTASE-----RLST
IIVAHRLSTIMN-----ADSIIV
MKN---GRIVEQG-----THQELLKLKNN---
-----YWRLVQNKEE-----

```



[illegible]

[illegible]

>gi|326481420

-----MPS- -RELP-  
GQDAKHANQADPAQVGVIGEMEDEDPFKHLPEHEKLILKRQLD-  
-----LPATNVHYMALYRYATRNDKIVLVLAA-----  
-----VAAIIGG-  
-----ALMPMTVLFGGLAGTFRNF-----LLGDIL  
DSEFTS-----ELASFTLY-  
-----FLYLAIGEFAM-  
-----VYMATIGFVYAGEHITAKIR-----ERFLAAILR  
QNVAFFD-ELG-----AVGLT  
-----LTAIATFVAALVISFIKYWKLALIM-CSTVVAIFVTSGFVGTFVA  
KLN-  
-----KSYLGHFAEGGTVVEEVISS-----IRNPVAFNTQEKLAR-RYDGYLVEAEK  
SGFKLKSATSSMLGFLFL-----YIYLNGLAFWMGSRFLVD-  
-----GSVGLAQILTIQMAIMMGAF-----LGNIIPNVQAITTAVAAAN  
KIYATIDRV SPL-----DPLLTEGLKL-  
EKLGQDVELKNIRHIYPSRP-  
-----DVVVMDD  
VSLIFPAG---KSTALVGASGSGKSTIVGLIERLYNPVGGS LYID-  
-----GHDIKDLNLRW--LRQQISLVS-  
-----QEPALFATTILGNIKHGLIGTPHEHV-  
-----SEKAITELVERAARIANVHDFISSLPE-  
-----RYDTNIGERGLLLSGGQKQRIAIARAIVSDP  
KILLLDEATSALDTK-----SEGVVQAALDKAAQGR-  
-----TTVIIAHLRLSTIK-



[illegible]



-LQN-----KFAELYEMEIRKPYKTSM-----LFHHIEGVAYG-MSQGMIFF  
GYALAFR-----

>gi|758988093

[illegible]











[illegible]

```
>gi|758349874
```

[illegible]

RGEVFAAYLKQEVAFDD-----ENSIGALTTALAINAGN-----KYSKRL  
 -----  
 -----  
 -----  
 -----VNEMITKVWGD-----  
 -----VSNLCIT-----VIVALIIAFTHSWAITLVTLCMSP-----  
 -----FLVASTAYEFYLQRGFEDATKVANAQSSQ-----  
 -----VAGEAIREVRTVAALNKQ-----QY  
 FQDRYFQATAHPHKLAVRKA-----  
 -----FLSSIGAACSKGISIYTNAIAFFA-----GVHFIKSGM-----ISFQDMFTS  
 MT-----VIMTASEAAGRSTTFVA-----  
 A-----FSKAKYAAIACFEILDRQ-----T-KID  
 PELEGIEPLK-----  
 -----ESIQGDVKFKNIGFAYPTRI-----NAPVFNGSLNLRVKPGQNVA  
 LVGPSGCGKSTTIGMIQR-----WYDPLQG-----  
 -----AACLDDQDVK-----NY  
 SLYNLRSHMAIVTQEP-----TLFDLSIVDNIRFGIDENES-----  
 -----VTQQGQIEDACRSANIHFIIISLP-----  
 -----  
 DGYNTFVGA---NGSQLSGGQKQRIAIARALVR--KPKVLLLDATSALDSDSE---  
 -----  
 -----RLVQEALNNVLQEG-----GRTT  
 ITIAHRLSTIQNA-----DIICV  
 MDG-----GKVVEQG-----THYELLALNGR-----  
 -----YTAL-----  
 -----WFSVHN-----VFAAFFEREFRASTIHSVAIKTT-----  
 -----  
 -----IEVISHVNMTLNIAKN---VSFEDENKSDTVDSKADNNG-----  
 -----  
 -----IANAVEAKVING-----HTEQE  
 AIDQMMLPYLQLQITAKFEYI-----



[illegible]

[illegible]

.....

>gi|749158321

.....

-----MQGQNSMREGQGSLAEAGQKSLREGQGSLPEAG  
QKSLREGQGSLREGEQNNVSEAGFLQAVSSDRQNSLNQDAVPHRQQSLTKPASTMQRVSS  
LAGELVRAGSVVAPGLTTLGSTVPVMGDDVNRAIDAVYEEEDTALMATDRGETELAKRDAA  
VGEASVGLGAEKGSKNPLLAFSFADKWDILMLVVG-----TLLYIGLG-----  
-----TLQPIMTTFFG-----SGMTDAG  
-MGKTDGLV-----  
---DACTKMAYLGVAFFG-----  
-----MLFATICYEVSARQVARIK-----RQYIQSALR  
LNVGFYDTVDVGT-----LASDVETSCVQIR-----NGVGNKTGE-----  
-----IFKNLSLFVSGYVVALMHHWKMTLIMTC-----AVPFLAGALFVMV  
LFI-----  
-----GK  
SAARSKE-TYTLAGSVAEEA-----IPATRTVAAFGLEENFIQ-RFAERIDVSLA

[illegible]

```
>gi|748381816
```

-----MGYIPPSNS-----  
-----KIFIVKEQFRFGTSDWHFCLFIG-----  
-----LVCAILSG-----  
-----ISQPVLLALVSG-----RVTNVLL  
V-YPPNSKE-----FR  
NKAYENVYIFLGIGVFIFIT-----  
-----NFIQ-----YVRAILR  
QNAGWFDKNHSGT-----LTTKLNDN-----MERIREGIGDKLGLL  
-----LRGCAMFVASVIIAFIYEWRLALMMLG-----VAPSTCLIMSFMA  
RVSSRDESLAHGFCSEKYCVL-----  
-----QKMT  
STTMKELAGVGKAGSIAEESLMG-----VRTVQAFNGQQEMVD-RYSAELSRGKA  
FAIWKGFWSGFLGGFFFF-----VLFSFLGCGMLYGGYLLKVQ--  
--IIK-----  
-----  
-----  
-----  
-----TPGEVFIVVMSMLLGAY-----FLGLISPHLMVLLNARVAAA  
TVYQAIDR-----VPKIDVYSPLGRRPDR--  
--VTGRVVFENVHFRYPSRKDVVKVSYPCRLCRSHQENSFQV-----  
-----  
-----  
-----LNG  
LNLVIEPG---QTVALVGHSGCGKSTSVGLLTRLYEPEAGRVTLD-----  
-----GEDVRELNIEW--LRNTVGIVQ-----  
-----QEPCLFNDTVEGNLRMGNP-----  
-----HISMEQMVYVCKMANAHDFIVKLPK-----  
-----GYETYIGDGGVQLSGGQKQRIAIARTLARDP  
KVLLLDEATSALDAQ-----SESIVQSALNNAS-----  
-----RGRSTIVIAHRLSTVR-----  
-----  
DADKIVYFE---KGEIAEQ-----  
-----  
-----  
-----GTHEQLVAL--RGSPLVIGQ-----  
-----FEVLTYTQ-----  
-----  
-----  
-----  
-----  
-----  
-----  
-----  
-----ASTNYRSGYDAFVRGQSMNDSFGQHS-----HTAEQ-----  
--DAENEARALEVKKVMEEDGVISA-----  
-----  
-----GFYDIYKNATGNYHWMLLG-----LITAMCRG  
LELPALA-----  
LIFGYVFEAFTMPVWGA-----DMMHR-LCMAVIFI  
SSVG-----VGIMIFOLLS-----

```
-----VSDASYFD-----NPAHTPGKLITRLATDAPN-----  
-----  
-----IKAVIDGRALQ-----  
-VIYAVTA-----IIACVVIGFVYCQVTLTGIGLLF-----  
-----LLATSMIWLARTIMNKNIELIK-NDEAGR-----  
-----LAIETIENVRTIQLLTRT--TL  
FYSRYESASKNQKRSELAGK-----  
-----IFEGINFTISQSFTYIMMCLTYAV-----GIHIIYTE--QKTSDKVFRS  
II-----AMLLGSVAVMNSSAYFP-----  
E-----FVKARTAAGLLFSMIYRK-----PKTGD  
ADKG-EKVTI-----  
-----RGNILFDDVKFSYPQRP-----RQPVMRGLQFS-AQRGQTVA  
LVGPSGSGKSTIISMLER-----FYDATGG-----FDGKDICTL  
SLNHLRTQMALVGQEP-----RLFAGTIKDNICFG--LG-----  
-----EVPMEQINRALELANAKRFLSNLP-----  
-----  
AGIDTEVGEK---GTQLSGGQKQRIAIARALVR--DPKILLLDATSALDSESE-----  
-----  
-----RAVQEALDLARE-----GRTC  
ITIAHRLSSIQN-----ADLIVY  
VEN-----GKVRES-----GTHSQLMHRKGR-----  
-----YYOLIKKODLAT-----
```

```
>gi|628303672
```



DKHAAAPIQKSISAKGPQNQAGTLEGA-----KATRAS-  
-----TILESKSVTR  
RFSLIRCLLIMLSDQKSIIPVFGGLI-----GSLVA--G  
GLIPIQA-----  
FLFSRLVTIFQY-----QGSKLVTKADFWALMF  
FLLA-----LAYLVFAVTWFLFAVAGARSSLKC-----  
-----  
-----  
-----  
-----  
-----  
-----  
-----  
-----  
-----  
-----  
RAEYLGRLLNQDITFFEEK-----GNSSGGLTALLGLDGDE-----  
-----  
-----  
-----MDLMISLNIGLIVVFIVD  
LIASIILALAVY-----WKLALVGVLCCVPLLLLAGYLRMR-  
-----IDRESEDRAAKFFIESAR-----  
-----FSSEAVGAIRTVASLTME--SK  
VIERYSARLKTAAVSSLRRT-----  
-----VLSMLFFSLADSIDLLAMSLVFWYG-----GRLVSYGD LGVSAYFL---  
-----VYGAVIFGGQSAGFIIGYTA  
S-----ITKSQAAMNRIFYMQKKPTINLP-----  
-----GIDPRLLPTEAAIEFKDVSFRYPARPVE-----VLHNLSFR-IQPGEKVC  
ITGPSGCGKSTIVALLER-----FYDVTGG-----  
-----EILIE-----GTDIRML  
DVNAYRSTLG FVSQET-----TLYQGT LRHNL LLAVQDDS-----  
-----TITDQQLEAACRIANIYDFIISLPSG-----  
-----  
--YDTECGPHG----QAFSGGQRQRIAIA RALLR--DPQILL LDEPTSALD VENE A-----  
-----  
-----IIRDALDKAA----AAAA-----AAGTKEEENGASPSRRTM  
INISHRVETIKSAE-----TIFV  
VDKGT-----VIESG-----TFEELMRKK-----  
-----GFLWEMMVE-----G  
DLT-----



[illegible]

```
>gi|731361723
-----MKLDIEKFDRSINFLWQVKMKALL
IQNGVHKALEGKVKKPTTMTTEEKWEEDLKALLAIQLCLSNEVLREVAKEDSSAGLWLKL
ESLYMAKSVTNRLLLSKRLYSRLRLEEGNSLKSHIDEFYSIVMDLQNIDVILDDEDIATWL
LCSLPHSYKHFRETILYGRDDLIDDVRDALNQRELIDNQLTSKSSNSSDGLFVRGRSND
VASTYQGGNGGKNRSGSKSKKPNNSKHKT CNYCHLKGHIKSECYKLNKNQKSGSKPRKGK
EPMNSADVSYVDFDESGLDVSKEWIMDSGCSFHVTPYKDMFTSYEEFGSGDVTMGN
ATCKVVGIGSVIDITMFDGTVRTL SKVRHVPMEKKNLISLGTLDNNGCKYIAEGGVNLNVR
GALVLMKGIKRGSlyVLQGSVMVSGSANVSTGTMSDDDTKLWHLRLGHMGEHGMSELCKQG
LLENVKLDNLGFCHECHVDYDEKKTDDKKIKVLRDTNGLEFVEKKFTKYLLDEVIVRHRTC
VWRPQQNGVAERMNRTL LERARSYIHVKEDKLEPRARKCVFIGYGLGVKGYRVWCEKSRR
VITSRDVVFDESCMITPEKELSI CNDVGSSHDTGEKVELESASQDDAL THERHVEASPQT
QRKTLASERQRRQIKPPQRYVEECDYVQYALTVANEVETFPDDPCSYKEAMSLPDSSKWLM
AMKQEMESLHKNNHIVL VAPAKKKKIGVCKWVYKRKEGTPDSGGPIYKARVVARFPQVE
GVDFHEVFPPVKNWHSIRVLLALEMDELEHLQDVKTAFLHGDLEEEIYMKPKQKGFVE
GKEEHVCRLLVKSlyGLKOSProwRRDFSMLAHEFTRRSSDYSCVYYKMLVSGSFTYLL
```

YVDDMLVACKHLIEVNNLKKLLNSGFDMMKNLGEAKKILGMEIWRDRSKGVLYLSQRRYIE  
KVLERFSMNNNAKPVSTPLGSHFKLSKELCPQSEEEERAMAHIPYTSAVGSMYAMVCSRP  
DIAQAVSIMSRYSRPGKGHWEALKWLLRYLKGTSHVCLEFGQDANGVIGYYDSYGGDL  
DDRKSTSGYVFTLLGGTAVSWQSLLQDVVALSTTEAEFIAITESFKEAKRLKGLVGEISSC  
SKEVSVFCDSQSAIHLDKNQNTFHRRTKHIDVKYNFIRNVIDQKELTLMKIRTEENPSDM  
LTKPLPTTKFILCVNLVLEIAFIDNNTLAKATGQACHATTAEHANVVHVSKY- - - - -  
- - - - -LANPPVAKSLSKSLLAHFLDSGILSTPSTKG  
VIINYVKKPTNKTSSVATVVQGKGKGMIVAQSFCSDNSFDDEVVLLFTRVSPPHVPYKG  
KIVGDTGPAPPSKAPSPIQVFSASDLFDENQFLALTSPEILLLLTSVIMKMILANNAFLI  
RFVSGEETKNAIFDLALDKSPGPDGFSPPFFQKYWTLAATGASKLVGVPVGK- - - - -  
- - - - -TGLRIPFLTTFADDTMIFAKATNYSYLII- - - - -RQILDKY  
YAMSGQDRICKPKSVGGLGREATVNNQALQMCLLWRIKND- - - - -  
- - - - -SNLWVKQISFIC  
SCHLQNSLYLVYLGLITFAC- - - - -  
- - - - -SWIGVAFWMQTGERQTARLR- - - - -LKYLQAVLK  
KDMIYFDTEAQ- - - - -NQNLVFQISSDTILIQ- - - - -DAIGDKIG- -  
- - - - -HSLRYLSQFVMGFILGFMSVWKLTLVTL- - - - -VVPLIAGGAYT  
VIM- - - - -  
- - - - -ST  
LSQKAEA-AYAESGKVAEEVISQ- - - - -VRTVYSFVGEKRAVE-RYSRSLQKAVK  
FGKKSGLAKGLG- - - - -IGSTYGLLLCSWALLLWYSSILIRHHT  
- - - - -  
- - - - -  
- - - - -  
- - - - -EGGKAFTTILNVIFSGF- - - - -ALGQAAPNLAAIAKARAAAT  
NIISMIKSNTDSSR- - - - -EFAPGITL  
PKIVGEIEFREVCFAYP-SR- - - - -  
- - - - -  
- - - - -  
- - - - -SK-MIFEG  
LSFSVSAG- - - - -KSFAVVGPSGSGKSTIISLVQRFYDPSAG- - - - -  
- - - - -NILLDGHDIRNLQLKW- - - - -LRQQMGLVN- - - - -  
- - - - -QEPVLFAATIAENILYKG- - - - -  
- - - - -ENAGIQQVVEAAKTANAHSFIQS- - - - -LPDG  
YHTQ- - - - -VGEGGTQLSGGQKQRIAIARAVIRNP  
TILLLDEATSALDSE- - - - -SELVVQKALEQIMSQR- - - - -  
- - - - -TTIVVAHRLSTIR- - - - -  
DVDQIIVLN- - - - -GGGVVE- - - - -  
- - - - -  
- - - - -FGSHAQLISKG- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - -GEYAALVRLHSSSENQEKAES- - - - -  
- - - - -YKQTTQVLSYSEHTNNVSPSQDIK- - - - -PNFCREQPISKNNKEDSKT  
TDYKRPSFKELVMLNASEFPYAILG- - - - -SIGAALVG  
IQAPLFA- - - - -  
FGITYMLTAFYSNNEAR- - - - -IKHDVQITAFVF  
LGVA- - - - -VITIPIYLMQQYFYTLMGE- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - -

RLLMFSAILSNEIGWFD - - - - - LEENNVGSLTSKLAGDAT - - - - - RTARV  
 - - - - -  
 - - - - - LVRTLALVDRLSTIVQNTAL  
 ITAAFAVAFKL - - - - - SWRIAAVTIVMFPLIIGASVA - - - - -  
 - - - - - EQLFLKGFGGDYTSAYYQANS - - - - -  
 - - - - - LAREAISNIRTVAAFGVE - - EQ  
 ISKQFAMHLKKPNKQSLVRG - - - - -  
 - - - - - HISGLGYGISLCLTFCSYALTWY - - - - - GSVLIKDGKSSFGDIK - - -  
 - - - - - AFMVLLASAFSTAEALALTP  
 E - - - - - ILKGTNTLGSMFSIIKRK - - - - - T - - - - -  
 - - AIN -  
 - - - - - SDDPKSTVVTDSKGEIEFRNVSFYPTRP - - - - - EIMVLKDLSLK - VPAGKSLA  
 VVGQSGSGKSTLISLVMR - - - - - FYDPSSG - - - - -  
 - - - - - SVLIDGI - - - - - DIRSL  
 NLKSLRRSIGLVQQEP - - - - - ALFSTTVYENIQYG - - - - -  
 - - - - - NE - AATEIEIMKAAKANAANAHGFISRMQEGYDTR - - - - -  
 - - - - -  
 - - - - - VGEK - - - - - GSQLSGGQKQRVAIARAILK - - DPSILLLDEATSALDTSSEK - - - - -  
 - - - - -  
 - - - - - LVQEALDKLMQG - - - - - RTT  
 IIVAHRLSTIRDAD - - - - - SIAV  
 MNL - - - - - GKVVEIG - - - - - SHEELISIEGS - - - - -  
 - - - - - VYAQLVDFQQ - DKTQLVT - - - - -

>gi|703130431  
MKSDTLDDYAVFQLSPKRSRCELLVSSGGYTEKLASGSVKPFLTHLKVAEEQVALAVQSI  
KLESEKSKNAETWFTKGTLERFVRVSTPEVLELVNTFDAELSQLAARKIYSQNNNEIF  
ICFTSGGNGAGITAADATKKELLRAIDVRLTAVRQDLTTAYARASAAGFNPDTISDLQV  
FADRFGAHRLNEVCAKFTSLCQRRPDLINQWKPSVDDGAVRSSYGSDMSIDDPTEPSGP  
HHRPQNKREQQPEQSRLSTCQQPNSLIPTSFPTLRNVNGKNDAAEEESPNEASEKEKKEES  
QTESRSSSTLAGPPARRLSVQDRINLFENKQKEQSSAGSGGKPVVGKSVELRRLSSDVSS  
AAVGVEKAVLRRWSGVSDMSIDLAEKDTESPLCTPSSVSSVSHAKSNNVTGGGSEGKDH  
KGLNDSNFSSKAETRSGSLRVAGDSLKDQAEGKTQVVISSSKDEESASKLRDNWKEQAAS  
QTQKFSTSRTAEQVSPNDQKVSQEEKNSLNSEDRRGWFKDQASSAMQSRGSEAKSQVTK  
TGNFASKAGDVSSDGGFAYKVEDHEQVDQPVVSQSRSTFQSHSRSSSGQFEFGGFKLKE  
ASSAQPKWDDQLPPHPQWKSFTTEGLVGGDVDLASSGKQARAEDSGFQKMKFQKPGSSS  
REQIKNSQVRRDESNVANQDSKLDNFVKKV SANQESLATMSKPPVEQVQRTROTGNQEL  
NDELKMKANELEKLF AEHLRVPGDQSSSARRNKLADMQIESGASTQYKKPAPEEIVPSQ  
LPEKSMVIESFSGYSNTTDFSTPPPKIAGNQASADLRQNFSELGFSDDSRGKFYERYMQ  
KRDSKLREEWGSKRAEKEAKLKAMQESLERSRAELKAKFSGLADRQDSASNAHWRAEKL  
SFNLRSSIKRQQSIDSIASEEDELSEFPGQKFYQDRFLSEASSGDGSARPTQNKKLLP  
NRNLSSTPRTTGVPAPRSSYKLLNSSSGKRRTQSENPLTQSVPNFSDFRKENTKPMMSGV  
SKTASRSQVRSYARSSKNEDTPNVKEEKPRRSHSLRKNSANPVELTDLSTLKSEGIILA  
PLKYDTEQTDHSLYEKFPKSMETKSFLRKNGIGPGSGASIAKLKASVALETQNEEFDE  
SGFEEDDFVDMCKEEEEEELETMAVEDCANMDNGKSRPSNESDKSGNSGSDNGDSRRFL  
SQVDPASVAELPAAMPSSFHAIEALQDSLGEPSVLWNSRNHHPFSYPHETSDIDASVDS  
IGSPASWNSHGLAQTEADAARMRKKWGS AQKPVLASNSSHNQSRKDMTKGFKRLKFGRK  
NRGTESLVDWISATTSEGDDDTEDGRDTANRSSEDLRKSRMAFFQGPSDD-SFNSGEEEE  
EDDDGDEDEEATKSVGLFSLFKYSTKWD-----LVLI  
VLGC-----LGALVNG-----  
-----GSLPWYSYFFG-----K FVNKIA  
VDFSRSDKTQLMKDVQQV-----  
-----CLLMSALAAIVLIG-----  
-----AYLEITCWRLVGERSAQIR-----TEYLRAVLR  
QDVGFDDTQIS-----TGDIMHGISSDVAQIQ-----EVMGEKMAL-  
-----FIHNVFTFICGYIVGFIGSWKVS LVVFS-----VIPLMMFCGIAYK  
AVY-----  
-----VG  
LTAKEEV-LYRRAGSVAEQAISS-----IRTVFSFVAEDHLAA-RYAELLAKSVP  
FGAKIGFAKGAG-----MGVIYLVTYSTWALAFWYGAILVFRKEI  
-----  
-----SGGAAIACFFGVNVGGR-----GLALSLSYFAQFAQGTVAAS  
RVFEVIERVPEIDP-----YSPVGRAL  
SNVRGRIEFKSVSFSYP-SR-----  
-----PEAQVLNS  
LNLVIPSS---KTTALVGSSGGGKSTIFALIERFYDPNKG-----  
-----TITLDGHDLRTLQVKW---LRGQIGMVG-----  
-----QEPVLFGTTILENVMGK-----  
-----ENATKKDAIAACVAANAHSFISS-----LPQG  
FDTQLG-----DRGTQLSGGQKQRIALARAMIKDP  
KILLDEPTSA LDPE-----SESVVQQAIDKISSGR-----  
-----TTIVIAHRLATVR-----  
NSDTIAVLE----RGSIVE-----  
-----IGNHRQLMEK-----

[illegible]



[illegible]

[illegible]



-----MGSRNEKEEMTMGSSSSSSSSS-----

-----FGVIFRYADWVD-----ILLM

FLGT-----IGAIGDG-----

-----MSTNCLLVFAS-----SLMNLSLG

NGHIQQ--NFMDNVNK-----

-----CSLYFVYLGLVVMVL-----

-----AFMEGYCWSKTSERQVLKIR-----HKYLEAVLR

QEVGFFDSQE---ATTADVNSISKDTSLLQ-----EVLSEKVPL

-----FIMNSSVFLSGLGFSAYFSWRLALVAFP-----TMLLLVIPGVTYG

KYL-----

-----VH

VTNKRKK-EYGKANGIVEQALSS-----IKTIYAFTAETKRVIE-NYKRILERTTR

VGIKQGIAGLA-----VGSS-GLAFAIWGLIAWYGSRLVMYKGE

-----

-----SGGRIYAAGISFILAGL-----SLGVALPDLKHLTEAKIAAS

RIFTIDRSPLIDG-----EDSKGLIL

NNLQPHIEFDHITFAYP-SR-----

-----

-----PDSFVLKD

FNLKLDPG---KTLALVGPSGSGKSTVISLLQRFYDPIDG-----

-----VLKVDGVDIKALQLKW---IRSKMGLVS-----

-----QDHALFGTSIKENILFGK-----

-----LDASMEEIMVAAMAANAHNFITQ-----LPEG

YETK-----VGERGALLSGGQKQ-----

-----RIVVAHKLSTIR-----

KADVIHAVN---GGGIVE-----

-----IGSHNDLINRKN-----

-----

-----GHYAKLAKLQR-----LSSYD

DVEQNIEIR---ASSVGRSSARSSPT-----

-----FFAKSPLPMEILPQETSS-----

--PKPPSFTRLRLSNPEWKQALTG-----SLSAIAFG

AVQPIYA-----

LTVGGMISAFFAQSHYE-----MQARIRTYSMIF

CSSL-----LVSIILNLVQHYNFAYMGE-----

RLRTLEKILTFETAWFD-----KEQNSSGALCSRLSNEAS-----HLTKRI  
 -----  
 -----  
 -----  
 -----LVKSLVADRVSLLVQTTSG  
 VTIAMILGLVV-----AWKLAIVMIAVQPLTILCFYT-----  
 -----RKVLLSSISTNFTKAQNQSTQ-----  
 -----IAVEAVYNHRIVTSFSSI-----EK  
 VLQIFDKAQEAPRNEAVKKS-----  
 -----W FAGIGM GSAQCLTFMSWALDFWF-----GGTLVQKGEISAGDVFK-----  
 -----TFFILVSTGKVIAEAGSMTT  
 D-----LAKGSAAVASVFEILDRK-----S-----  
 --LISD-----  
 ---PSKDGRGSKMEKITGNIEMKKVDFWYPSRP-----NNMVLRFQSLE-VKAGRSVG  
 LVGKSGCGKSTVIGLILR-----FYDVVKG-----  
 -----TVKVDGV-----DIREM  
 DLQWYRKHVALVSQDP-----VIFSGSIRDNILFG-----  
 -----KLDASENELVDAAARAANAHEFISSLKDGYGTE-----  
 -----  
 -----CGER-----GVQLSGGQKQRIAIARAIIR--NPTILLDEATSALDVQSEQ-----  
 -----  
 -----VVQQALDRIMVG-----RTT  
 LVVAHRLNTIKKLD-----SIAP  
 VAD-----GKVVEQG-----SYAQLKNQRG-----  
 -----AFFNLANLQIQS-----





```
>gi|695461129
```



[illegible]



[illegible]

[illegible]

[illegible]

[illegible]



[illegible]



-----  
-----  
-----  
----- - VLLAGEMDGDARPAT  
VELWNAKDGRDWPGGDADDHDEADARPRVPPLRYCEFDLTQEKALKAAATVGAPNREAAIS  
APALAPSEGPAALPLVSHLQSLVPTPTSATPIEDAPVQAKDIVATIVSIALKKPAKGIAF  
DQSVKALSGGRSTLQNEITGDLDAEFLVPDGADELPLSDLVSILQKSFIGSLGKCTKSL  
VDRVFSAKMPGGFNQSKVREMLQADGFAAGRQDSILLMAIQTPPAARLGSEAEANEFWSA  
TTKAYVSAAGITINKTAGAVAQSPVLPVDPKALDALNKRSDNLHREVCEAYARHLGDNK  
NAAGEELAQLKSDMQSMQIELDLWNLEHGNEYANGIKPSFDRKVRVFDSEFWNWALQDLF  
KIYHGVRQGDRLRGSDEVARRRHVLCSSKRLISVLVHMIDDMKKQSACSIAVELWFEN  
LLEDCTIAMKKAPTYYADKIMTAPRTTIDANGAIKFMETAAACARSTALAFAITAKAEF  
EDGLICGSGKGPLPTHMGLGMPPTPLRTPSNSSKSELNWFDPSPPARNTYHLKIQKSN  
GSWNDSEELSTQYGGILDRAISTGLGFQGNVLVTGSGKGSIGANIVQGLLSGGARVIVT  
TNSYTKATKFYQKMFSEWGAKGSCLMVIPYNAGSSKDAEALVEYIYSLSDAEWDLDHVVP  
----- FAASETANGIELGPKSELHRMMLTNTLRLLGAVKKAKEAR  
YIITRPAQVILPLSPNHGVFGDGLYSESKLGLEGLLNKWHTEWSEYLSLCGAVIGWTR  
GTGLMNDNNIVAEGVEALGLKTFSQDEMALNIMGLMASPVLEATHMEPLLAELSGGMSVM  
PNLKEQITAIRKKLSDTSSRRALVKEQKAEFDMPLLTSTKSTTLAPFKKRANIKFDFPRV  
LDYSSKIEQLSALEGMIDLEKVVVVVGFGEVPGHSSRTRWQMESSGQYTLLEGIIEMAWM  
MGLIVYQTGEGQSYSGWIEKDTRKPINDEIKEKYEEHILKHSGVRVLDARSLDGNPAA  
RQVLHEIDIQHDFTPFEVSKETAADILRENGNKVTVKPNPDGDTCVVTLHKGARLMVPKA  
LAFDRTVGGQVPTGWCAKTYGISVDIVNQVDPTTLYALVCTAEALLSAGVTDPYEFYKHI  
HVSQLGVCVSGFGGTASLQGIYKERFMGKPVQNDVLAESFINTGNWINMLLLSSCGPN  
ITPVGACATALESLDVGVEVITSGKAKAVFVGGYDSLTKDIAHEFAKMKATINTDEDFAH  
GRTAQEMSRPATSTRSGFVESESGVQLLTSAKLAIEMGLPIHGIVALTRTASDKAGRSL  
PAPGRGTINFSGASKSSFDSPLLNMSYRKRQIELRMSQIMEYEHSEIECLNDEIAGYKIG  
SVDNFNDTYRQHRLDAITIEIKKQRCVDLNSYGNEFWKRDSKISPMRGALATWGLTVDDI  
QVASFHGTSTIKNELNECGVIEQEQMAQLGRTKGNPVLAVFQKHLTGHPKGAAAAMLNGA  
FQIMNTNMIPGNKNADNIDNALEKFDYIAFPSETIHTSQEVKAVLVSSFGFGQKGAQAI  
IHPKYLFAAAGSEAYSTYQEKVRRRQNKAYHHFHKSIMTNTMFQAKDDPPYAREQEAEFL  
TNP DARLPMNLEL-----

>gi|682430006



```

-----LTGLSGSALGIVLICLST
LISGI VVSLAG-----WKLALVCLSVVPLMICGGYYGVLLV
GEF-----AEKNEIFANEA EFAGETLH-----
-----GIQTI-AALTREPTALSQ
FHDTLRASEGKAFTANLQAS-----
-----LMYALTQTAYYACMALSFWYG-----GRLILRGEYTLFQAVA--
-----VQSAMLLSAFSAGMVFSWTP
N-----IGKAKQAASSLQRLLARI-----SAID-
-----
-----PSSPDGIDGDVMQGRIEFNSVGFSYPSRP-----NHPALKNLSFT-IPAGANVA
FVGATGSGKSTIVSLIER-----FYDPTSG-----
-----SVLVDSK-----PVKSY
RTSKYRKRIGLVSQEP-----TLYRGTIKMNLTVGLDEDDIAMPSP-----
-----ESIEEACEANIYDFISSLPDG-----
-----
--FNTEVGSG---GNQLSVGQKQRIVLARALLR--KPTILLLDEATSALDSQSES--
-----
-----LIQQALEKVKK-----GRTT
ITIAHRLSTIVKAD-----TIFV
IGE-----GSVVESG-----THTQLMA-----

```

>gi|682367251

-----MEGDDAGTTSALTAAGGRACDTCRARKVSFLYVDLIPLSN  
AFRFDVIESHLAQTAFLKLRVDFLLKPVSIDKGFSLAAKERLVGIENSLRTLVLVESQQ  
RAHPGTAHAPTAAPKVPQNMASQPLCEDSPRSDTEENFEGDTSLLAHS LHAKGVFEKLSL  
RSLAAPSPRLDAAIISLQKTLKSENEPGEFYDMRFSSHRQTVDSEMPPEAVLDLLRTA  
KEKISRMFLEWPIFSEADFTKCRDLYFSPTGYSPAHFIIVNSGLYFLFAEQSDTAPEHK  
AAELRRYSSMCRSNFERALEKLHLLITPSLEACQALLGAFFAAEFAPKPSLCIRMTSTAA  
QMCQDLGYHRLPAAEVETQQLRNKKTILFWGVHALDKALSTRIGRTSIIQDCDISTALPAY  
PTNPAFNSWHEISLTIWQFAKFQGRVFSELYTVSAISLPSATRESHAKLAAELHEWQKS  
NSQIPFCDDIYPEDFQMALDSL DIVCYSVLTIIYRAIPPSSNDGTQIFYSQCVASARKAL  
ELHQVAATRFRGSDKIWNGYIHWTLLYSPFAPFMVVFCEAIATFNFTDLHNLGEFVSSIQ  
PSSGDSEAAVRLYNLCSAFYEVARVYLADSSASTPAPDITTTVPHIPQGLSEQGSNFAQS  
SRNAQQSPENFTLAPDTNFLGNLPEDDAFMTWPAENCAYKHIITMKAFGLQVEHEDTER  
QENDLLTNRVATHTLALVESNLLPPQVLS DILILYKTDKEQSLRVFVMGIQEE SPTVEKE  
DEAVTIASENAGGFADYLKIFRYADRW DWILNAIS-----

-----LCGSIAAGTTM-----  
-----PLMTVVFG-----NFTKTFN  
EFSEGKLSTSRYQEETHKH-----

-----MLLFVYLFIAKLFL-----  
-----SYAATTCITISGMRTTRAIR-----QAFLDHLLR  
LEIWHFD TAS-NG-----AAATQVTTNGNRIN-----QGIAEKLGLV

-----VQSAAMFVSAFIIALAVQWKLAL-ITMSTIPVIFIVVGITVAIDA  
TLE-----

---SRVVRIYSQGSVLVQEAISS-----IKTIHAFWAQEKMAE-KYETFLQKAHI  
EGNKKSANYGIMFSVEYF-----CVYAGTALAFWQGH RMFQSGEI  
G-----

-----NVGTVFTVEMAVLMAATS-----MSLLAPQFTALSGAAAAAA  
ELFHIMD-----KPSLLDPLDPSGQK--P  
STCEGSISIRNIDFAYPSRP-----

-----SAPVLQG  
FSIDIPAG---KTTALVGASGSGKSTLIGLLERWYEPSHG-----  
-----SITLD-GVMLSDYNLKW--LRSNIRLVQ-----  
-----QEPVLFKGSVFENVAKGLVKSQLS-----  
-----LTDEQKME--LVQKACTSSNADDFIQQLPQG-----  
-----YHTQVGERA-SRLSGGQKQRIAIARSIISDP  
KILLLDEATSALDPK-----AERTVQDALDR--VSKER-----  
-----TTIVIAHRLSTIM-----

DADNIAVMSEG---KIVEM-----

-----GTHENLIKLG--RYSALVHAQDLGGKQEKPSK-----HHENLDS  
GDD-----

[illegible]

[illegible]

[illegible]

```
>gi|676381397
```



[illegible]

----- LVAGVTGLGLGGAVSSACA  
 ILFGLALALRAC ----- WRSLSLAMLAMIPVIMMSMAFVKLI  
 MGD ----- GGESGG-AHSGAS ----- A -----  
 ----- VASEAVLHVRTVRAARAE ----- AD  
 VLARFAKITDAVAAEKVGAA -----  
 ----- WKGGVAYGLGMAIIFTLYLVVFAF ----- GPVCVDEGWCS -----  
 ----- PTDMWKALFCIMFGAFGAGSSAIFAQ  
 D ----- ANKAKIAAFDVFVFLDRD ----- SAVDA  
 TADSGGARE -----  
 ----- LAGL ----- DLVFDVASFAYPARR ----- EALVLDGLCLR-VPASSTCA  
 FVGPSGSGKSTIIQLVQR ----- FYEPSA -----  
 ----- GAVTLG ----- GAALASY  
 DVAYLRSILGFVGQEP ----- VLFDA SLADNVRYGAPD -----  
 ----- ATDGALAEVAALAKLDFLLDG -----  
 ----- R  
 VAWTDGLGPR --- GGRLSGGQKQRVAIARALVRDP - KLALLDEATSALDSRSEK ---  
 -----  
 ----- LVQEALEQARAGR ----- TT  
 LVVAHRLSTIEDSD ----- QIVV  
 MVG ----- GTCAESG ----- THASLLEKR  
 ----- GVYHTLQNRARA -----

[illegible]

[illegible]

[illegible]

[illegible]

```
>gi | 675868070
```

```

-----MTHLYDLEQTSGNDPTSNNHHDEITSHNHNKIGNDQ
VLSNGSSNLNTN-----HTMVPIKKNLSLKEETG- -KASD
GNAYQNSMVG-----LEDVSDKKSQRGKKNKTKDSSADKE--
-----SKKKEKMKTVSILQLFRFADKYDIMLITVG-----
-----LICACAHG-----

```

[illegible]



```
>gi|675865148
```

[illegible]

[illegible]

[illegible]

-----QVLIDGVDLKEFQLKW--IRGKIGLVS-----  
-----QEPVLFSSSIEENIRYGN-----  
-----ERATVEEIKTAAKLANAAKFIDK-----LPRG  
LETMVGEH-----GTQLSGGQKQRIAIARAILKDP  
RILLLDEATSALDAK-----SERTVQEALDRVMVNR-----  
-----TTVIVAHWLSTVPEILSFVAQMDQHIEPYSCPS  
PSINNCVTVKLTEKTYIVWKLQFESFLAGQNLFGFVDGTTAPAKTMMVRGVNDVENEVP  
NPDYPAWIR----SDQVVRSWIFGSLSEDVLSVVAHCTTGQEVWLTIAKHFNRVSSSRL  
FELQRKLQTVTKNDKTMAYEYLSEIKKICDQLKFIGSPVTETMKVFTALNGLGQEYEPIKT  
TIEGAMDSFLVPVFEDVVPKLTAFDHRLQSYTQGYISPHLAFFANQSDASTNRGRGRSGY  
NRGRGTFTTKGRGFHQITQAPHSGFSSSGSASGGNNKTVQCICGKSGHPAIRCWHRFNN  
SYQDEDMPKALAAMRITEVPDASGLEWFPDTGASAHITSSPLHLQQACSYTGSDSVMVGD  
GNFLPITHTGASLASAWKQGLSPVPDLGGSPESPSPADDSPPRRSFRPSRLPTSA  
GNVLVAPDSVIPPDTPPLPLVQIDVVSEVSEDEDVGCTAGLDSAPIGNNTPLSSADLTST  
PSPARRRPTVSNPT-RVTHHPMLTRAKAGIVKPNPRYALLTQKVSYPEPKTVSSALKHSG  
WTAAMQDEIGNCAEAETWSLVPYTPDMHVLGSKWVFRTKLTADGELDKLRARIVAKGFNQ  
EEGIDYLETYSPVVRTATVRTVLHTATVMNWEIKQMDVKNAFLHGELSETVYMTQPAGFE  
DKAHPDHVCQLHKSIIYGLKQSPRAWDFKFSTYLLFEGFVCSKKDPSLFVYSKGKDIIMLL  
LYVDDMLITGNSSRVLEELLVELNKHFRMKDLGKLHYFLGIQAHFHEAGLFLSQAKYAED  
ILAVAGMSNCVPMPTPLPTQPDVSDQEKEFENATYFKSLAGKLQYLTLTRPDLQYAVNF  
VCQRMHKPTQGDfKLLKRILRYVKGTLMGISFSKNTDFTLRAYSDSDWVGCTVTRRSTG  
GYCTFLGNLISWSSKKQDVARSSTEAEYRALSEAAMEITWLCIVMKELGIPLKHTPEL  
YGDNLSSVYLTANPTYHKRTKHFELDFHYIRERVALGAVEVGWFDENSSSGVIGARLSA  
DAALVRTIVGDSLSSVKNAAASAVSGLIIAFAASWRLALIILVMIPLIGINGYLQIKFIK  
GFTADAKAKYEEASQVADAVGSIRTVASFCAEEKVIEMYKKRCEDTIKSGIKQGLISGL  
GFGFSFLILYSVYATCFYAGARLVKDGTNFNDVFQGFALALMTTIGISQASSFAPDSSK  
AKSAAASIFGIIDRKSIDSRSDESG-----MVLENVKG  
DIELCHI-----  
NFTYQSRPDIHIFRDLCF-----TIRAGKTVALVG  
ESGS-----GKSTVISLLQRFYDPDSGY-ITLDGVEFKKLQLKWLRQMGVLVGQEPVLF  
NDTIRANIAYGKGKKEATEAEIVAASELANAHMFISGIQQG--YDTVGERGIKLSGGQK  
-----QRVAIAR-----AIMKEPKILLLDEATS-----  
-----ALDAE-----SER-----VVQEALDRVMVNRRTTV-----  
-----VVAHRLSTIKNADVIAVVKNGVIAEKGTHTLINIED-----  
-----SCDFSLMIVGVSVGAMGNGLG  
FPLMTFLFGDLIDVIG-RNLNNRDSVGVVSEVCLKFVYLGGLTLVA AFLP-----  
-----MAGAAMSIMFSKASSREQSAYAKASTVVEQTFGSI  
RTVASFTGEKQATSSYKELINSAYKSSVKQGFSTGLGFGVMFLVFFCSYALAIWFGGEMI  
LTKGYTGGEVINVMIVVVGSSMSLGQTAPCLSAFAAGQSAAYKIFETIKRKPIIDAFDLS  
GKVLEDIRGEIELRDVCFSYSPRPKEEIFGGFSLLIPSGATVALVGESGSGKSTVISLIE  
RFYDPSSGQVLIDVDLKEFQLKWIRGKIGLVSQEPVLFSSSIMENIGYGKESATEEEIK  
AAAKLANAVKFIDKLQP-----GLETMVGQHGQTQLSGGQKQRIAIARAILKNPRILLD  
EATSALDAESEKVVQEALDKVMVNRRTTVIVAHRLTTVRNADMIAVIHRGKIVEEGSHSEL  
LKDHEGAYSQILRLQEINKEPKQSENSNGSRDGSISVGSS-----  
--RGNRRHDDSVSDIGLLTAQENTQLPQEQQNSITRIALNKPETPILVLGTLVGAV  
NGTIFPIFGFLFSKVIAFYKPPHELNRNDSRFWSMIFVFLGVASLILFPINMYLFAVAGG  
RLVQRIRSMCFEKVVHMEIEWFDKPESSGALGARLSVDAALIRTMVGDSLSSVKNTAS  
AVTGMIIAFSA-----SWEVAVIILVMIPLTGINGYV-----  
-----QLKLLKRFSADAKTKYEEASQ-----  
-----VANDAVGSIRTVASFCAE--EK  
VIEMYKKRCEDPIKSGIKQG-----  
-----LITGLGFGFSFFVLYSVYATCFY-----AGSRLVKAGKTNYNDFVQ---  
-----VFLALAMTTIGISGASSFAP  
D-----STKAKSAAASIFGIIDRK-----S-----  
--KIDSS-----  
-----DDLGMVLENVKGDIELCHINFTYQTRP-----DIHIFRDLCLT-IRAGKTVA  
LVGESGSGKSTVISLLQR-----FYDPNSG-----  
-----YITLDGV-----EFKKL  
QLKWLRQMGVLVGQEP-----VLFNDTIRANIAYGK-----  
-----DGKEATEAEIVAASELANAHGFISSIIQQGYDTV-----  
-----VGER---GIQLSGGQKQRVAIARAIVK--EPKILLLDEATSALDAESER----  
-----VVQEALDRVMVN-----RTT  
VVVAHRLSTIKNAD-----VIAV  
VKN-----GVIAEKG-----THETLISIQGGVY-----  
-----ASLGQLHMSASN-----  
-----  
-----  
-----  
-----  
-----

```
>gi | 673015494
```

[illegible]

```
>gi|672829244
```



[illegible]

[illegible]

>gi|672818270

[illegible]

.....

>gi|669306061

.....

.....MAASENEKQALLPSEGEKPPSSIGSYGSVD  
SLKSSAK-GSDKSRGIFSDLFYFADSWDYILMFVG-----TIFAIIHG-----  
-----AGWPTLSII-T-----GHMTDTF  
IRAQITDFTSNTSWQEAAES-----  
-----IAPLLSLSNHNSAQNISLTLRQIT-----VIEFV  
KAIKMYTLFYLLIGALMFVT-----

-----SYAQIACWSSACERQTHRIR-----KQFFKSVLH  
 MEIAWYDRSRSGE-----LTSKLNDD-----IERVREGIGDKVSL  
 -----CQYTAAFVSGFTIGFFYSWKLSLVMMS-----LSPLLALSSAWFS  
 A-----ALS  
 YMARREQKLFASASAVAEAAISS-----IRTVLAFNGQKNEIN-RYKKALEETR  
 LGYRKNLVIGFGFLITFV-----STFSTYALAFWYGSKLIDQD--  
 --PLLPR-----  
 -----GAIFTVFFAIMAGSM-----AFGSAAPHLTTIAIARGSAS  
 SVIALINT-----KPSIDSSSELGLHPNN-----  
 --IEGNVEFNHVTFSYPLRPEFQVLK-----  
 -----S  
 LSFVIAAG---QRIAIVGESGSGKSTAVNLLLRFYDCANGAIYID-----  
 -----GFNVKVFNVHA--LRSMIGVVS-----  
 -----QEPVLFDGTVEENIRLGKL-----  
 -----DATLEEIKNAAILANAFGFVSALPQ-----  
 -----FGGTRVGERGVQLSGGQKQRIATARALIRNP  
 KILLLLDEATSALDTE-----SEGVVQEALCQVMSKKQKSFQAK-----  
 -----KNRTTIAIAHRLSTIK-----  
 DYDKIFVLK-----NGVIREQ-----  
 -----GSHEELMQQRAIYYSMVLAQQIE-----  
 -----ENAMKPSEQSDSS-----  
 -----YSSSEQHESYVSEQRDDAKPGFPREGIQKKVSMPEKQDRTP  
 YGTISAGKPDHSVDDETAEKQKILS-----  
 -----AGFWSIVSSSKKNWHCLLFG-----SIGCLLSG  
 TVMPAFS-----DMLNDAMMWSLLL  
 LFFSQVIFYAYS-EQ GK-----  
 FMLG-----FVQGFSTLLAAFCFGKAGE-----  
 -----DLTLM  
 RVKLLLENLLRQEVSYFD-----HADHSTGQICTRLATDVPN-----  
 -----IRAAVGYRAAT-----  
 --VVTSAVS-----LASAVVIAFVFGWKLALVVIILVP-----  
 -----VMICSSYLDMKIKMRNQRRDDKLLNAGK-----  
 -----VFTEAVONIRCVOISLCRE--RR

```
>gi | 666436345
```

[illegible]



-KAVSTLS-LPPWEYPKL-----RHDASFWSLMF  
 LMLG-----LVTFLLYAFQGSLFAYCAEK-----



[illegible]



-----VXXNLRGXXXXXQX--XXXXXXDX-----XXXXXVXYRXKGX  
XLX-----  
-----XE  
XNLXMKL-TXXRSXGXVDP-----GWXHGVAQDEKKKKVKC-NYCEKIVSGGI  
NRFKQHLARIP-----GEVXXCKHAPDDVYVXIKENMKWXR--  
-----  
-----  
-----  
-----TGRRQR-----QPDSK-----DISNFDPLSDNEGQDDQME  
AVLPHMSQESFIDGDR-----RLG---  
-----QNLRNTFSLPST-----  
-----  
-----SSEPLFKR  
SRLDSLFL---TAPKSFPPQSYKQARVRTMSNKISHKEVI-----  
-----SGICK-----  
-----FFYHAGVPIQAADSLYFHKM-----L---  
--ELVGQY-----GQGMVAPPSQ---IITGRFLQE  
EIATIRNYLAEYKAS-----WATTGCSIMADSWRDT-----  
-----EGRILINLLASGP-----  
-----N  
GVYFVSSVD-----ATEIVE-----  
-----  
-----DALN-----  
-----LFMLLDKVVEEMG-----  
-----  
----EENVVQVITP-NTP-----  
-----  
-----  
-----  
-----SYKX-----  
-----  
-----AGKMLEEKRNLFWTPCATSCIDQTLEDFLRIRCVAECMEKGQKVTKLIY  
NQVWLLNFMKSDFTQGKELLRSSITRFASSFATLQSLDHKTGLKRMFQSNKWISSQCSK  
SFEGKEVENIVLNA-AFWKKLQFVRNSVDPIMQILQKVENGDLHSM----SSIYNDMYR  
AKIAIKTIH-VRKYEPFWSVIESHW-----NSLFYHPV  
YVAAYYL-----  
NPSYRYRPDFTAHEVMR-----GLN--ECIVRLE  
PDHS-----NRISASMQISDYNSAKADFGTELAISTRTELDPAAWWQQHGIS-----  
-----CLELQRIAVRILSQTCSFGCEHNWSIYDQLYNPRSNRLAQKRL  
N-----DLIYVHYN-----LRLREQKLRRRPENST-----  
-----SLDNVLLERLLD-----  
-----DWIVDAAENDLLDNE-----  
-----EVLYNEIEQVDEYENDLV  
DYECGIANGETR-----  
-----NGSIELVTLADADVNPNANAGVATDDDDDEEEGGGG  
RSLGNAS-----PCMSAFAAGQAAAYKMFETINRKPDI DAYDTN  
GQQLQDIRGEMELRDVXFSPARPDEQLFHGFSLSIPSGETAALVGESGSGKSTVISLIE  
RFYDPQAGEVLIDGINLKEFQLKWIRQKIGLVSQEPVWFLSSLTDNIAYGKDGTNEEIR  
AAAELANAAEFIDNLPQ-----GLDTMVGEHGTQLSGGQKQORVAIARAILKDPRIILLD  
EATSALEAESERVVQEALDRIMINRTTVIVAHRLSTVRNVDSIAVLHRGTIVEKGPHSEL  
VKHPEGAYSQ LIRLQEXNNTSDKTAVNDQERRSSVGSQNSQSIISHRRSISRGSSGGGNN  
RRHSFSISRCTRVLVAPAESDIPDSESSRPPEVSLCRLAYLNKPEIPVLLLATIAAIA  
NGVVLPIFGLVVGNVIKTLFEPHLLRNNSKFWALIFFVLGVGSCITFPSRQYLFVAVAGN  
RLIKRVRSMCFEKVVYMEVSWFEDPEHSSGAIGATLSADVAYLRGLVGDALGXLVQNLAT  
AIAGLHIAFVA-----NWQLALKIIVLLPLLGVNGYF-----  
-----QFKFTKGXSANAXRMYEEASQ-----  
-----VANDAVGSIRTIASFCAE--EK  
VVELYQRKCEGLIKTGIRQX-----  
-----LISGIGFGLSLFLQFSVFACIFY-----AGSRLVAEGKTTFADVFR---



HDEKEKLKNVSNGLVPFHKLLSYADSV-----MVKTTTPADQPDEQEEVIIIEVEEKNNNDG  
VLGT-----LGSIVHG-----WVLM  
-----LAQPVGYLLLL-----KALDAFG  
NNIN-DTHAMVQALDKV-----  
-----IPYVWYMAFATFPA-----  
-----GILEIGCWMYASERQLARLR-----LAFMEAVLS  
QEIGAFTDLT-----SGKIITGVTNHMSIIE-----DAIGEK-----  
-----LGHFLSSFAAFFSGILIAAICSWEVALVTLL-----VVPMLVIGATY  
KKM-----  
-----NA  
ISAAKML-YLSEATAMVEQ-----AICQIKTVFSFVGGENHEIK-SFSQSMFKQLS  
LKGGEALVKGV-----TGMFQTVTFTSWALIIVWGAIVVTANRS  
-----  
-----  
-----SGGEVIAVVMSILFGAI-----SLTHAAPDMQIFNQAKAAGT  
EVFQIIQRKS LINH-----NSKGKML  
NEVEGNIDIREVFAYP-SR-----  
-----  
-----QENLILKG  
FSL SIPAG---KMVALVGSSGCGKSTIISLVARFYDPQK-----  
-----GEILIDNHNIKEFDLKF--LRRNIGAVS-----  
-----QEPSLFAGTIKDNLKVG--N-----  
-----MDANDQQIQDAALMANAHSFISQ-----LPDQ  
YLTMGASNTVCNSLKDLKLQKLLLCKDIALMLTGERGVQLSGGQKORIAIRAILKNP  
PILL LDEATSALDSE-----SEKQVQDALERAMEGR-----  
-----TVILIAHRLSTIV-----  
NADMIAVVE-----NGQVTE-----  
-----  
-----TGTHSSLLATN-----  
-----  
-----  
-----  
-----  
-----NFYINLFNMQNISTVD-DSRNAAS-----  
----EDINHQNAIKKVEHH-----  
-----DKSSDFCLDP-----SQSSKQEEQKHR-----  
-TKSAIFFRIWF DLKQKELLKTAIG-----SFAAAFSG  
ISKPVFG-----  
FFIITVG VAYYKKD-----AKRQVGWYSIIF  
ALIG-----LLSFFTHTLOHYFFGIYGE-----

[illegible]



[illegible]

[illegible]

```
>gi | 576701538
```

```

---MGDKKDGENVLLEEFGARSTTSDD-----
-----
SYLLGADPDFGDASLKFYQLLRFSDATD-----KFLF
CLGI-----FGSVVTG-----
-----LAQPLSLLLLS-----KLVTST
DGSNVTLVE-----
-----KMKVFLPYYSISIGFVAFVI-----
-----SFVQMFALTVSAKRQSRIR-----LLLFKHILR
QDIAWFDKQTSGN-----LITKLSYSIDQIE-----GGIGDRLGN-----
-----
-----FLONVVTAAAAIVSLITGWKALVST-----MAPFILGAFTLTG
-----

```

[illegible]



-----MHADGVD-----KCLM  
GLGF-----FGTVADG-----  
-----FSTPLVLVFSS-----QLMNDIG  
SASSMDPASFRHSINK-----  
-----NALNLFYIACGLVVA-----  
-----CFLEGYCWTRTGERQAAKMR-----ARYLSAVLR  
QDVTYFDIHV----TSTDIIITSVSSDSLVIQ-----DVLSEKTG--  
-----DSWFP-----FAALLIIPGMIYG  
RTL-----  
-----IV  
IARKIRG-EYNKAGTIAEQALSS-----IRTVYAFAGESKTLS-EFSKALEGSVK  
LGLRQGLAKGLA-----IGSN-SIVFAIWSEFMAYYGSRMVMYHGY  
-----  
-----  
-----  
-----  
-----KGGTVVYVGAAITFGGV-----ALGAALSNLKYFSEACSAGE  
RIEEVIKRVPILDP-----ENMEGETI  
PNLEGNIEFRHIEFAYP-SR-----  
-----  
-----PENIIFGD  
FSLTIPSG---KTLALVGGSGSGKSTVISLLQRFYDPLSG-----  
-----QILLDGIANKLQIKW---LRSQMGLVS-----  
-----QEPTLFATSIKENILFGK-----  
-----ENAEMKEVIEAAKASNAHNFIQS-----LPQG  
YDTQ-----VGERGIQLSGGQKQRIAIARAIKAP  
RILLDEATSALDSE-----SEKIVQDALDRASIGR-----  
-----TTIIIAHRLSTVR-----  
HANNIAVIQ-----NGQKSE-----  
-----  
-----KQKPTDQVEKPE-----  
-----  
-----  
-----  
-----NQITS-----  
-----SILSMDG-YS---TSGRHLSKV-----  
-----SRSSSARSMAAVGPDDQK-----  
-IPIPSLRRLIALNSPEWKQAILG-----CISAMLFG  
AVQPVYS-----  
FAMGSMISVYFLKDHEE-----IKAKIRIYASCFF  
LGLA-----VFSLAVNAIQHYNFAFMGE-----



[illegible]



ATDGTENQGKEETVQSGLASTVEEQ-----CKFYGGDDDES  
 VPERRGPARGFISGLRAEDRVTLGAG-----LLLSILCG  
 CLNTAQSVVLS-----RHDVDFWAGMM  
 -ACIAAFG-KNALNYAQL-----LMLA-----FVGTLQSGQGITLALCSER-

-----LVRRA  
RNAVFRHLLRQDMSFFD-----APAHAAGSLGVLLSARAAD-----

-----LDGLGGSTLGMLLVGAST  
 IVSGIVVACSIG-----WKGLGLVCSATTPLLLAAGHLRMSFL  
 SAN-----EKRSAESYAAATAYACEAAS-----  
 -----CIRVV-ASLTLERTVLRR  
 FRSTLDSQARTNAISTCKAS-----  
 -----VFFAASQALVYCFSALCFWYG-----GKLMARGEYSMLQFFI--  
 -----CYSTVIFGAQSAGNALSVGA  
 D-----QAKARGAAREFETVMESK-----PHIDG  
 -APGSA-----  
 -----LDLVEGSIELRGVCFSYVTRS-----GRPALTVDNLH-IQPGQFVA  
 LVGPSGSGKSTALALLER-----FYDPASG-----  
 -----AVLVDGR-----DIREL  
 EVSSFRRHVALVSQDT-----ALSSGTVRDNILLGADAP-VSDEV-----  
 -----LQQACRDAALEEVVASLPDG-----  
 -----  
 -LDTCVGR--GAALSGGQRQRIAIARALVR--DARILLDEATSALDTASER--  
 -----  
 -----VVQAALARAAS-----GRTT  
 VAVAHRLSTIRHAD-----VIFV  
 LER-----GRVVETG-----RHEDLLAQQGVY-----

-----ASMVRAQSVEA

```
>gi | 597880196
```

[illegible]

```
>gi|597868404
```

[illegible]





[illegible]





[illegible]

```
>gi|585702635
```

[illegible]

-----ELTMR

RSLTFRAMLKQEISWFD-----EPKNSTGVLTTRLASDASL-----

-----VHGAAGIRIAT-----

-----VISSVAN-----MGTGIIIAFVFQWMTLVVLACVP-----

-----FVAVGGAIE MNVLSGYTNKDKEALEEAGK-----

-----IASEAIENIRTVVSLNRE-----KT

FNKLYHDSLYPPYKAGLKKA-----

-----HIYGLSFGFSQCMIYFVHAAAFRF-----GAWMIELGE-MDFEDVFLVF

S-----AIAFGAMALGQASAFAP-----

D-----ATAKAKSAANNIFVMLDRE-----PEIDS

SSTEG LKP-----

-----EVCNSEVEFQAVKF RYPTRP-----DVPVLRGLDMS-GMVVSWST

LLYS-----LIIQR-----LYDPWAG-----

-----MVILDGHNR-----DL

NIQWLRSQIGIVSQEP-----TLFDCSIAENIAYGDNSR-----

-----EVPMEEI IQAATNANIHSFIESLP-----

LGYETGVGDK---GTQLSGGQKQRVAIARALVR--NPKILLDEATSALDTESE---

-----SVVQEALDKASV-----GRTC

LVIAHRLSTIQDA-----DKIVV

IQH-----GKVIEEG-----KHNDLLNKEGV-----

-----YFRLNNTQVM-----

[illegible]

-----GGEERMSRASSAASLGSMRSRAASSNSLNGTAHAVPKEANVS  
ENTGDTEALLIS-PKPRQGGGGGNPSIVV-----  
-----KGTDTG---TENLPKVK-----  
-----SRRLWGLSRPEWKWMLA-----LIMAVVNG  
CTFPAYS-----  
LLLSNIVSYLY--DPDTH-----VVREKGYFWAGMF  
PILA-----AVVA VATFTQLLAFTVMGE-----  
-----  
-----  
-----  
-----  
-----  
-----  
-----  
-----  
-----  
-----RVTTTL  
RDMMFRATLRQDIAYFD-----NEENSTGAITARLATEIT-----  
-----  
-----  
-----LVKNVTGQN LGRSVQNLVT  
ISAAFI IAFVFG-----SLKMSLVLLC ILPLMV GGSFAQM KAL  
R-----QNTDLSQDRVASAG---A-----  
-----VAVQAISGIRTVTAFGMN--AK  
LLALYSQALQRPMILGIRSG-----  
-----LLKGFTLGVSQFISLSAYGLLFWY-----GSSLVLDSP-  
-----ADERGA AFQHMLRSLMAVTMSAQSVGQNTSFLG  
D-----QAAANSAAARIFAVVDRR-----PD-----  
IDSSQE-----  
-----GKGETLAKVEGRLEFRHVDFTYPSRP-----EAQIFHRFN LV-VEAGTTVA  
LV GASGSGKSTVVQLVER-----YYDPQR-----  
-----GTVCLDGK-----DVKDL  
NVRWL RQHIGLVSQEP-----ILFVG TIA ENIAYGLSSASR-----  
-----ESVIA AAKAANA H D FIM-----  
-----SFP  
DAYDTEVGDR---GVQLSGGQKQRISIARA I LKDP--AILLLDEATSALDSESE-----  
-----KIGECEGGG-----GRTT  
DGTLTR LWRYGDG-----RCGG-----

```
>gi|560139751
```

-----MTAIKEE-----EGSISRTFFEKLLDVL  
CRGDLSTEKLERKPVSVAELEFRYASRRDCHYVAAG-----  
-----FVLAVVVG-----  
-----AIMPLTCIFGG-----LYVNIYL  
MNTDHSVGNES-----  
-----LW-----  
RQAMYLCAGYFGVGIALFIL-----  
-----CYLQNYFLSLASHNIVGRIR-----KEFVKAVLA  
QNAAWFDENNAGT-----ITTKLNEN-----VAQIEDGIGDKIGML  
-----ARGVTVFIASAAFAFYDWRITLVCIW-----DGPVSAITMAIMS  
R-----  
-----LSS-----  
PPMQGMMSVSGEAGAIAEAIMN-----VKTVAACNGQKHMVK-KYDEQLRRGVS  
FAIRYSFINGFCEGFMFF-----QLYIFYAAAFLYGIPSYNG-----  
--ITA-----



[illegible]



[illegible]

RLATFSAMLEQEIGWFD - - - - LDENSSGALVSRLLSTDST - - - - RLVSRV  
- - - -  
- - - -  
- - - -  
- - - - VLQAMTSEMLNRGLVNATT  
LAIAFVIAFY - - - - SWQVTLILLAAPVVALSSFIAKQV  
A-G - - - - TNASKQNNDADTLAG - - - P - - -  
- - - - LLTEVIGSIRTVASFGME - - SA  
LNSVYSDLLNASKEIDAKTG - - - -  
- - - - IIGGLSFGVSQAAMLVIALVWYI - - - SGIWISDG - - -  
- - - - IITFEEMFMVVVVIMTSTFAVGMAVQGAT  
D - - - - GTTAKLAAQRVFKIIDRK - - - PK - - -  
INSTS - - - -  
- - - - HAG-LKLPCIDGNIEFCKID - - -  
- - - - GKSTAISLLER - - - - FYDPSA - - -  
- - - - GSVTLDBGY - - - - DLKEL  
NVQWLRENVSLVSQEP - - - - VLFSGTIAENISLGKPGSNR - - -  
- - - - EEIVEAAKKTNADFIS - - -  
- - - - NFP  
NGFDTDVGDR - - - GAQVSGGQKQRIAIARAILRDP - - SVLLSDEATSALDNESER - - -  
- - - -  
- - - - MVQVSLDRLLTQK - - - QRTT  
IIVAHRLSTIRHAD - - - - LIAV  
TQD - - - - GAIVEQG - - - - THDQLQLPN - - -  
- - - - GIYKGLVG - - -  
- HHTDIE -

>gi|309363750

-----MGLFKKKKDDSSSEGPTVVGFIKNFIFRSEKK  
EEA-----PPPPKISIFQLFRYTSTMDRIMLIVG-----ILVSCATG-----  
-----LGLPLMSII-M-----GNVSQNF  
VEIGTILMNSTD-----  
-----PAVIKKAK-----DDFS  
HDVIQNCLQYVYLGAGIFAA-----  
-----GMIQASCFLIICENLSNRFR-----REFFYSVMR  
HEIAWYDKNTSGT-----LSNKLFDN-----LERVREGTGDKVGLA  
-----FQMQAQLGGFAVAFSYDWLLTLIMMS-----LSPFMMICGLFLA  
K-----  
-----LLA  
TAATKEAKQYAVAGGIAEEVLTS-----IRTVIAFNGQEYECK-RYEEALSHGRK  
TGIKKSFLIGAGLASFFV-----IIYASYCLAFWGTNFBVYNG--  
--RLDS-----  
-----  
-----GTVLTVFFSVMGSM-----ALGQAGQQFATIGTALGAAA  
SLYEVIDR-----TPEIDAYSTKGVTPEK--  
--ISGRIKIQNIEFTYTPRPDVQILK-----  
-----  
-----D  
VSLEAQP-----QTIALVGSSGCGKSTIIQLLQRFYNPDAGKIYID-----  
-----DIAIEDFNIKY--LRQLVGVVS-----  
-----QEPNLFNTSIEQNIRYGRA-----  
-----DVDSDAINRALKEANALDFIKTFPE-----  
-----GLNTLVGDRGVQMSGGQKQRIAIARALVRNP  
KILLLDEATSALDAE-----SESVVQAALDNAS-----  
-----RGRTTIVIAHRLSTVR-----  
NADKIIVMK-----AGKVMET-----  
-----  
-----GTHDTLIEQKGLYHELVHAQVFA-----  
-----DVDEKPRAKKEAER-----

-----RLSRQTSARKGS-----LIKTESQAEEKSGPPP  
APEPAEK-EIKRLRKELEEEGAVKA-----  
-----NLFKILKYARPEWMIFFA-----IIAALIQG  
AVMPAFS-----  
LFFSQIINVFSNPDR-----QMKKDGHFWALMF  
LVLA-----AIQGTSM LFQCAFFGVAAE-----  
-----  
-----  
-----  
-----  
-----  
-----  
-----GLTMRV  
RSKVYRNVL RQDATYFD-----MPKHSPGRITTRLATDAPN-----  
-----  
-----  
-----IKSAIDYRLGS-----  
-----VFNAIAS-----VGGLGIAFYYGWMALLVMAIFP-  
-----FMAVGQALVIKYHGG SATADAKEMENSGK-----  
-----TAMEAIENIRTVQALT LQ-TK  
LYNIFCSHLDSPHSGNVSKA-----  
-----IIRGLTYGFANSIQFFTYAAAFRF-----GLFLIFNQNLMSPEHVLKV  
LF-----AISFSFGTIGFAASYFP  
E-----YIKATFAAGLIFNMLEEE-----PRIDG  
MTNAGTLPAL-----  
-----SGEVKL NKVFFRYPERP-----AVPILQGLDVH-VKPGQT LA  
LVGPSGCGKSTVISLLER-----LYDPLEG-----  
-----AVVSFSVY-----LVVRINHPI TFQIDNNNL RQM  
NPKHLRKHI ALVSQEP-----ILFDTSIRENI IYGLQPG-----  
-----EYTEEAIA VACEKAN IHKFISELPDVS FREFSDFFFK  
NREIYLSLFKFE-----  
NGYQTRVGEK--GTQLSGGQKQRI AIARALIR-NPKILLDEATSALDT ESE-----  
-----KQVQIALDAAA K-----DRTC  
IVVAHRLSTIVN-----AGCIMV  
VK N-----GKVVEQG-----THLELM AKRGA-----  
-----YFALT QKQSINQAGGEFDTGVAV  
EDDDDDNVKF-----

.....

>gi|551675610

.....

-----MSALPEQISNEASEIKGDVVLKNLASGSAVTLPDEDKCPVVLAGSDRP  
QPDEAKKDDDLGEKASFFALFRYADAFD-----CILI  
LISF-----VCSLATG-----  
-----AALPAFTLFFK-----DLIN--G  
GFESGSLASASKVNEK-----  
-----ALLFLWISLGLLVC-----  
-----GSISNGAMLLAAANQGSRLR-----RQYVKAILR  
QNIWFDTQKTG-----EITTSIERDCSNVQ-----GAIGEKAV--  
-----LFVHNLSTFVFGIALGFWQGWQMALVLCA----CLPLLAGAGAWMA  
KNL-----  
-----AD  
LATKGER-AYRSAGMTRRRRRKVL--GCADGLGRTVASLRGEQRENQ-RYCSNLDEALE  
MGIKKARTNGLG-----MGSVMGSFMGTYALGLWFGSWLIVHGV  
NSRTGV-----

[illegible]





-----MSGATIVFSAQD-----  
-----DLEMTSMQDHH-----  
-----DVKVEK-----  
LAEAGDPVVEK---ASFMELFKYADMVMDLLMSLG-----  
-----TLGAIANG-----  
-----CLLTMFSFFLG-----DLVQVLS  
GSQYASSSESIQRSL-----  
-----  
ERVNTVAIQFALVGLAFFC-----  
-----SYVEVGWWSASGFRQATRVK-----GAYLRAILS  
QSIGYFDEHDSA-----LSGKITMETQQMQ-----SSMGENVGK  
-----  
-----TVHYSVTFISALILSFVMGWQLSLFILG-----SLPVLIGAFVFQD  
TMM-----  
-----  
-----RR  
AQTSALA-AYSAAAVVSQES-----LSNIRTVKQLGIGTVVGR-QYGESLVTAEK  
SGIKGGLMNGIG-----FGLSTGIIFAFFGFTMWFGGYLIANQVK  
ATYTGQ-----  
-----  
-----  
-----  
-----PWNAGDVITVTFALLG-AMSLGQVQ-----APVTAILLGRAAAR  
NIFDMLAR-----RSESNVLSKEG-----KEL  
EKLEGHLSFKGVAFPCYPSRK-----  
-----  
-----EVMVLND  
FSLEIPAG---KTTALVGESGSGKSTVIQLIERFYEPTAGRIELD-----  
-----GVDISSLNIEW-LRKQIGLVS-----  
-----QEPVLFACSILDNIAMGKQGG-A-----LPQG  
-----VSREMVEAAARDANAHRFIMK-----  
YDTPCGER-----GAKLSGGQKQRIAIARAIVRGA  
KVLLLDEATSALDGA-----SEKVVQQALDRAAHGR-----  
-----TTLVIAHRLSTIR-----  
-----  
DADQIAVVQ---LGRVVEI-----  
-----  
-----GQHAELLELD-RLYAQMCQRQAAAAG-----  
-----  
-----  
-----  
-----  
DARKDSVFSLG-----VASTQAESESIQTCGENVTTELDEIAS-----  
FAALQKENKEENLEETRSEG-----  
-----  
-----  
-----  
-----VGTWRLLSYNRPENGIVILG-----ILFAGGYG  
CAYPIFA-----  
LFFSRAMTGLQG-----



>gi|546322163

-----MPPLATLSPPRQPGSALYCPADSHPSFLL  
HPSHSANTTPSRASSMASSMASSPLDGKAAVATDDNINSNEPLPTTDSGNNR-----SITSRIKAMIKPE  
ASDNEKDRDNSLPPVPARQLFAYSTPNE-----RWLM  
VIAC-----VAAAAHG-----  
-----TILPLFTIIFG-----SVIDVFD  
ENTIS--AEEL-----NTLT  
SAIGSKAKWFLILGAVAFVV-----  
-----SLIQVRFQLVFAQRVGNRLR-----RLFFDSLMLR  
QDYAWYDQNDGGE-----LTARVASDVSLIE-----GGIGDKFSS-----  
-----AVQFMSMFVSGFIIAFVYSWKLTLVILA-----IAPLLAISGALFG  
KLA-----  
-----AD  
STSESLG-AYGAAGGIANEVLNL-----IRTVTAFNGQETEA- RYEVHLQHAYR  
AGIMKSAFSGAA-----LGFTYFVIFATFAVAFSFGAGQVRN--E  
S-----  
-----  
-----VKAGDVIVTFFSVFVATI-----SIGQAAPAFNAFAIARGAAP  
RVYEVIRRQSMIDP-----LNEDEGRIL  
PNVRGDIEFRGVNFNYPTRNHDEMEDNS-----  
-----  
-----ARPNVLS  
FDLTVKAG---RSQALVGSSGCGKSTTVRLIERFYDVNEG-----  
-----QIFLDGVDLRDLNVRW- LRSQIGYVG-----  
-----QMPTLFMLSIRENIALGAAMEVVDADKSGRTVLK-----  
-----RSTVTEEAIVKAAKMANAHDFIMK-----LPER  
YDTLLG-----ERGALLSGGQKQRICIARALVRNP  
KILLLDESTSALDAR-----SERIVQDALEAAASEGR-----  
-----TTITIAHRLSTVK-----  
NADRISVID-----EGLVAES-----  
-----GTHDELIRVEG-----

[illegible]



[illegible]





-----MVDAPAPAGSTAAAKEKAS-----  
-----ALELVRYADARD-----WCLM  
ALGA-----LGSFGDG-----  
-----MMQPLSMLVLG-----DIVNSYG  
GAGTADSAFSSSAVDK-----  
-----FALRLLYVAVAVGAC-----  
-----AFLEGLCWTQTAERQASRM-----RPLYEAVLR  
QQVEFFDTSGPASQGTTFRVISTISDDADTIQ-----DFLAEKLPN  
-----VLANITLFFGTLAVAFVFAWRLALAGLP-----FTLLFVVPVSYLG  
KRM-----  
-----AA  
AAGQARA-AYQEAGGVAEQAVSS-----IRTVASYRGERRELE-RFGRALARSTA  
LGIKQGLIKGVV-----IGSM-GVIYAVWSFMSWIGSVLVIRFHA  
-----  
-----  
-----  
-----QGGHVFVASICIVLAGM-----SIMVALPNLRYFVDAATAAA  
RMREMIDKLQPLET-----EGKKGTAM  
ENIRGQITFKDVHFSYP-SR-----  
-----  
-----PDTRLHA  
VNLTISEG---ATVGLVGGSGSGKSTILSLLQRFYSQDSG-----  
-----EILLDGIDIGTLNVEW---LRSQIGLVS-----  
-----QEPVLFATTIRENILFGN-----  
-----EAASLKQVVVAAKMANAHDFITK-----LPHG  
YDTNVCRCFESWPQN-ELAICLFVLEQVQCLHLQVGQFGTQLSGGQKQRIAIARALIRDP  
KILLLDEATSALDSE-----SERAVQDALDRASVGR-----  
-----TTVVVAHRLSTVR-----  
-----  
KADMIAVLD---AGRVE-----  
-----RGTHDELLGAEAG-----  
-----  
-----  
-----  
-----  
-----  
-----  
-----  
-----  
-----EGGGFYARMAMLQRASVAREERQR-----VVEVE  
PESNRVSFRSVEIMSVPSDFHPSVPVSF-----RSVERSVEMEDEKVDGRDT  
ARGRKPSQLRLLKMNRPWEWKALLG-----CAGAIVFG  
AVLPLYS-----IRSKTRLYSLVF  
YSLGALPEVYFLGDDDL-----  
FGIA-----IVCITANIVQHYNFAVMGE-----

RGQMFAKILSFEVGFWD - - - - EDENSSAAVCLATQAT - - - - RLTERV  
 - - - - -  
 - - - - -  
 - - - - -  
 AALGFSLALAL - - - - - KVRSLVGDRMCLLVQASAN  
 - - - - - SWRLAVVMMAMHPLVIASFYF - - - -  
 - - - - - KKVLMTALSCKAKKAQVQGSQ - - - -  
 - - - - - LASEAVVNHRTITAFSSQ - - RR  
 MLRLYEAHEAPRKDNVRQS - - - - -  
 - - - - - WYSGFCLSLCQFSNTGSMALALWY - - - - - GGRLMAKGLITPTHLFQ - - -  
 - - - - - VFFMLMTMGRVIADAGSLTS  
 D - - - - - LAKGGDAVRSILDTLDRE - - - - - P - - -  
 - - MIQDDGDEADG - - - - -  
 - - PRKKRKQQQQKEMKGTIEFRDVHFSYPTRP - - - - GTTVLDGFSLE - IGAGKTVA  
 LVGPSGSGKSTVIGLIER - - - - - FYDVQKG - - - - -  
 - - - - - SVLIDGR - - - - - DIRSC  
 SLAHLRSHVALVSQEP - - - - - TLFSGTIRDNIVYG - - - - -  
 - - - - - DEHATEDEVTSAAKLANAHEFISAMEGGYDAR - - - - -  
 - - - - -  
 - - - - VGER - - - - GAQLSGGQKQRIALARAILK - - NARVLLLDEATSALDTVSER - - -  
 - - - - -  
 - - - - - LVQDAIDRMLQG - - - - - RTC  
 VVAHRLSTVQKVD - - - - - MIAV  
 VRG - - - - - GKVAERG - - - - - RHGELIAVGPGG - - - - -  
 - - - - - IYYNLMKLQLGRSPCLSPPK - - - - -

```
>gi|551663131
```



[illegible]

[illegible]

-----YYRLYARQHYFLIGPNIKQLIER  
PDGIYCFREQNRVYYVSENILKFANTMPADNIISLGTCTGKFTKTGKFKLHITALNYIA  
PYAQCKIWLKSSAEQQFLYGNNVTKAGLGRISENCEKYQGALVYSMSDLPLGFGVAARST  
AECKMVDPLTVVCFHQSDIGEYIRSEDDL-----

>gi|541045086

[illegible]



```

-----IRVAIDQKLAY-----
--ALQNISA--IIIVGVIIAFAYCAAVAPLGILIAL-
-----ILIGAQTVITFILKKRRIDAQLANKPAR-----
-----LIIEAIEHHEAVRYLTQE--QP
FCDLFEYHMKVEYRHTIICA-----
-----LIESFAFSLQACFAYINFACLRL-----GVALIATK--RYQPFNIFQV
VE-----TLNCASMSLLTFNAYIP
E-----YMRARFNAGLIFDMIRQR-----PQIDS
SSEAGHRFDV-----
-----FGNIAMEHVYFAYPSNR-----ANLVLRSVTLN-FPQGRTIA
LTGPNCGCNCAPIDLIER-----FYDPMDG-----
-----VLS-----FDGLDSREI
NMRYLRQQMALIECEP-----TLFSTIKENITYG--LR-----
-----DISQQVEQAAMLARVHDFIRTLF-----
EGYETRVDN--RVRLLPPVEKHKIAIARAIIR--NPRILLIDNSTSTLEPEEE-----
-----QEVDVLSHVRR-----GRTC
IMATQYSWNTQR-----CDWIVV
MKG--GRIIEHG-----SHDQLMKKQGL-----
-----YARLTRQQTFD-----

```

[illegible]

[illegible]



[illegible]

```
>gi | 309357787
```

-MVLSVKGDEPVEDGMKIATDHVELGHDPKRRIKSKSSGGN

[illegible]

-----VQAAIDHRLAE-----  
 -----VLNGVIS-----LFAGIAVAFWFGWSMAPIGLLTAL-----  
 -----LLVIAQSSVAQYLKYRGPKDMESAIEASR-----  
 -----IVTESISNWKTVQALTQK-----EY  
 MYGAFTTASKKPRQRAFAKG-----  
 -----LWQSLSFALAGSFFLWNFAIAYMF-----GLWLISNN-----WTFPAVFQV  
 IE-----ALNMASSVMMAASYFP  
 E-----YVRARISAGIMFTMIRQK-----SAIDN  
 RGLTGETPLI-----  
 -----KGDISMrgvYfAYPNRK-----RQLILNfnMS-----ANFGQTVA  
 LVGpSGCGKSTTIQLIER-----YYDAVCg-----  
 -----SVR-----IDDDVRDI  
 SVKHLRDNIALVGQEP-----TLFNLSIRENITYG-----LE-----  
 -----NVSQEQIEEAakLANIHNFVISLP-----  
 -----  
 EGYDTSVGAS---GGRLSGGQKQRIAIARAIVR---DPKILLLLDEATSALDSESE---  
 -----  
 -----KIVQEALDKARL-----GRTC  
 VVIAHRLSTIQNADKIIVCRNGKAIEEGTHQSLLARRGLYYRLLINAKKEHLIFLTPEFK  
 FPK-----EYARYEG-----KAWQLWWSLGF-----  
 -----HKSFCGGLQEAVHSFHTLSASF  
 PPLHPYCLRRALLAFFFFPAPFSASLSPKLEPSN-----



>gi|471879003

-----MELTKQD-----  
NTRNTSSRRPQHSGPAFFYAFTYADRADWLLYGVG-----GVAAIISG-----  
-----AGFPVLDLVYG-----YWTTALV  
SVDMPSSLRGTTN-----  
-----TMAGVCLGIGILQFIT-----  
-----GSIFLSCFTIASGRRTDRLR-----RAYLDSVLH  
QDAEFFEKVGPGE-----VGTRMIKDVGTIK-----TATGEKLGFM  
-----VWALTTLVVALIMAFSRAARLAGVVFG-----VVPLAFILFISSG  
YLA-----  
-----A  
KADARLLDVEGQAGTLLEQILSS-----VRVVQSFAAESFLVK-KYDQYLDQLQR  
LGKWSIVRGLELSISYC-----ILNLTYSVAFWYGSQLIVRDN-----  
-----  
-----LEVGLMFTVFWMFNAIFA-----IANILPHISAIRDSILIST  
RIRAEIERVPTIDVRS-----TKGDELWDSQTG  
EKINVSIEARNLTFSYPSRP-----  
-----  
-----DHKTLLD  
VSFVLEAG---KVTALVGASGSGKSTIASLLRYYDPSPAEGEKSTG-----  
-----GIFLAGRDIRDLSLPW---LRSQIGIIA-----  
-----QDPQLFTASIFENVAYGLSGTPWELPTSELEPNY-----  
-----QERLADAKIRVEYALKQAQAWDFVCKLPEG-----  
-----MDTRIKGGRTGVLSGGQRQRIAAARALIRKP  
RILLDEGTSALDAE-----TEQRLMAAIHEEQAQSG-----  
-----MTTILIAHRLSSIQ-----  
NADRIIAMT-----NGRVAEQ-----  
-----  
-----GTYNELMELGGVFSALVRHQASAGQSSPSSE-----

[illegible]

```
>gi | 471214754
```

[illegible]

.....

>gi|471204135

.....

.....-MRDQMRSFQNVMS  
NGSINIQKQSDNDKIEKGGMNKLTGSKNNGTKSDFVMELDSKSYDQFEQFETFNVSEDPN  
FLITMKPIKEESGKIAILSMYKYANWFDYTLLLVG-  
.....-IVGAIGVG-.....

[illegible]

```
>gi|470244866
```

[illegible]



[illegible]



[illegible]



[illegible]

AG-----MSDYDEASYKDAN-----L-----  
-----LAGDAINNRYRTVASFGYD-----DL  
LVKEYERYIDFPTQSALKKA-----  
-----HCIGFWFGFSQFVQNAVFALLYWA-----GAQFNHYST-----  
-----DTSGENVFEATFAMMFGAFAAGQANQFGP  
D-----MGKAKRAGLAIFGFIDLP-----TKINA  
VDIPEDAI-----  
-----EIIPGEFRGEIEFRDVWFRYPTRK-----NEWVFKGLNLK-IHPNESVA  
VVGESGSGKSTLVNLVLR-----FYDPNH-----  
-----GQVLID-----GIDARRY-----  
NLRQLRMKMGLVMQEP-----TLFNyTIRENilyGKDD-----  
-----SCDSEVRDAAKVANAIEFIESQELFMAYEDSAMVLS  
DAYNQKKEQIIQR LGQQKYEENIKILARLVKKEQNEGRFQGVKGDVDER-DQSKKDLELH  
QGFDIQCgVK---GGKLSGGQKQRIATARAVVRKP--NILILDEATSALDEESQR-----  
-----  
-----KVQLALDNIMVGR-----TS  
IVIAHRLTTVEKCS-----RIAV  
IEN-----GQVAEQG-----KFTDLKNQE-----  
-----GGFFANLAAGMKKAEEKEKHVKQTS  
KSKL-----

[illegible]

[illegible]



[illegible]



.....

>gi|313234010

.....

-----MKKDKKINAFEMQEKEEEKDK-----  
SEIVKKRG-----IIDLYKYADGLD-----VFMI  
ILSG-----IFSIIAG-----  
-----LLVPAAYVIFG-----DMTDTFV  
DFGFLGGCSNETAYEDYFNFT-----LYFL  
GTMTQYSLYFCYLSIAQTLT-----

[illegible]

```
>gi|298705125
```



VFLAQGQSPLYLEDTEQ-----MRKIGNRWALGF  
VGLG-----FLNLVGNNMALSTGFTVSGE-----  
-----  
-----  
-----  
-----  
-----  
-----  
-----RLTRTL  
RYMAFEAMVRHDIWFD-----EESSAVGVLTTRLEAEAS-----  
-----  
-----  
-----MVRKATGGNVAHATQLMMT  
LTVGTLLIGLAF-----AWQIGLLAIATIPLIIVAGIVQ-----  
-----MAMMTGGYGDNDGLDGGGKAAG-----  
-----LLSSALQGMSTVAAFNMQ-----ER  
LAAEYKQASEGSLDARRKRG-----  
-----LIAGAAFGYSQGITFWVFALMFYV-----GAIMVDNGQVEYGDDFF-----  
-----AMFAVIFGAFGVGGITGDFK  
D-----AGKGQQAAAKIFRLTDEP-----LNIDP  
-----LSEKGARPSETKGALEFKNIFFNYPCRPNMQIYGSDKYPQGFCLN-VAAGETVA  
LVGPSGGGKSTCMGLLLR-----FYEPSKG-----  
-----SVTIDGR-----DITEV  
NVTWLRSQIGYVGQEP-----VLFGQTIRENIAG-----DP-----  
-----SASDERIQEAACAANAHDFFILRDFQGG-----  
-----YEAEVGEK-----SALLSGGQKQRIARIAIRAILR--NPPILLDEATSALDNESEK-----  
-----VVQEALDQLQAKQK-----RTT  
LTVAHRLTTIRNSD-----KIAV  
LNG-----GGVQELG-----THDELLALK-----  
-----GLYSTLWNQQKSKPAGGGA-----

[illegible]

This image shows a full page of white paper with horizontal dashed lines, typical of primary school writing paper. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.



RIIIILDEATSALDAE-----SERIVQDALQNMVNR-----  
-----TTVIVAHRLTTIR-----  
-----  
NADNIAVVH-----QGKIVE-----  
-----  
-----QGTHMELIRDPDGAYS-----  
-----QLVRLQEGHNQVEDAQ-----SR  
VNPSVHHSYSLSSGIPDPT-----  
-----  
-VSLIRLAYLNKP-ETPVLLLGSIAAG-----FHGIYIP-  
-----DSRVWAFMFIGLGVLAFIALPLQNYLFGIAGGKLIQR-----  
-----  
-----  
-----ICSLSFEK-----  
-----  
-----VVHQEIS-----WFDDPANSSGSGVGARLST  
DASTVRSLVGDTLALVVQNLVTVAAGLVISFTANWILALIILAVLPLMGFQGYLQTRFLK  
GFSADAKVMYEEASQVANDAVSSIRTVASFCAEKKVMEYQQKCEGPMKHGVRLGLVSGA  
GLGFSFFSTYCTNAFCFYIGAVLVQHKGATFSEVFKVYFALTFLALAISEATAMAPDTNK  
AKDSTASIFELLDSKPKIDSSNEG-----TTL5IVKG  
DIELQNV-----  
SFRYSTRPDVQIFRDLCL-----SIPSGKTVALVG  
ESGS-----GKSTVISLLERFYNPDSGH-ILLDGMETQKFKLSWLRQQMGLVNQEPALF  
NETIRANIAYG-KQGEAAEEEEEIAATRAANAHNFISALPQG--YDTSVGERGLQFALDAE  
SERVVQDALDRVMVDRTTAWGLCVSEKCTCTSYKKKKDKRYFLRSSPSPSSSSLSLSLH  
MPRHPLHKHYFTMNGEGGETSKRDEISQKQVAFYRFLSFADGLDIVLMTVGTGLGAIADGF  
TQPLMTLMMGRAIHSFATSDPSHVHVQSVKVSMLFYLAAAGSGLAAFIQSSSWRVGTGAR-  
-----  
-----QANSIRSLYLKTILRQDIE  
FFDTETTAGEVIGRLSGDTILIEDAMGEKVGKFLQNMSTFVAGFTIAFLKG-----  
-----  
-----WRLVLVLLPTIPLVVMAGATMAMMMSKMSSHGQVAYAEAGAVVEETVGAI  
RTVASFTGEKHAIENYNKKLKVAYTSTVQQGLASGFAVGAVVVIVFSSYGLAIWYGSKLI  
IEEGYNGGTVVNVLLSLMVGSSSLGQASPCLSAFTAGQAAAYKMFETIKRKPKIDTYDTS  
GIVLEEIRGEIELKDVFYKYPSPRPDVQIFGGFSLHIPSRRTAALVGQSGSGKSTVISLLE  
RFYDPEAGEVLIDGVNLKKLNIRSIREKIGLVSQEPILFAGTIKENISYGKKDATNEEIR  
AAIELSNSARFINKLQR-----GLDTMVGEHGTQLSGGQKQRIATARAILKNPRILLLD  
EATSALDAQSERIVQDALLNIMADRTTVVVAHRLTTIRNADVIAVVHQKIVEQGTHVEL  
IRDPNGAYSQLVRLQEGTNQAAD-AQKVDKICER-----  
-ENTQKRSTRSLSYKSVMSDSSSEAEENEKSPKVPLRRLAYLNKPEVPVLLLGTIAAAV  
HGLVFPMFAFLLSTAVKIFYEPPNQLQKDSKFWALFFVGLGVLALIVGPLQNFLFGVAGG  
KLIERIRLSFEKVHVHQEITWFDHPGNSSGAVGARLSTDASTVRGLVGDALALLVQNLTT  
IIVGLIISFTA-----NWILALIILGVMPLLGFEGFV-----  
-----QGKFLKGFSAEAKVMYEEASH-----  
-----IVNEALGSIRTVASFCAE--EK  
VMEMYEQKCEATVKQGIRIG-----  
-----LVSGIGFGSSALALHCTNALVFY-----IGAILVEHGKATFPQLFK--  
-----VFFALTISAVGLSHASAMAP  
E-----TTKAKDSAASIFHLLDSK-----P--  
-KIDSS-----  
-----IKEGTTLSTVKGDIELQHVSKYPTRP-----DVQIFRDLCF5-IPSGKAVA  
LVGESGSGKSTVISLIER-----FYNPD5G-----  
-----AILLDGM-----EIHKF  
KLSWLRQQMGLVGQEP-----ILFNETIRANIAYGK-----  
-----QGN-ASEDEIIAATRTANAHDFISALPQGYETT-----  
-----  
-----VGER-----GMQLSGGQKQRIATARAIIK--DPKILLLDEATSALDAESER-----  
-----  
-----VVQEALDRVMVH-----RTT  
VVVAHCLTTIRGAD-----MIAV  
VKN-----GVIAEMG-----RHDKLMKIADGAY  
-----ASMVALHMSSSKGEEODFLOKTEY-----

```

-----M
FVGA-----VAAAANG-----
-----VSTPLMTILFG-----DVINSFG
K-DSNSKD-MVHEVS-----
-----
---KVSLKFVYLAIGTGVA-----
-----SFLQVTCWMLTGERQAARIR-----SLYLKTLIR
QDVGFDFDKFTNAG-----EVVGRMSGDTVFIQ-----DAMGEKVG-

```

-----  
-----KFIIQLMATFLGGFIVAFCKGWLLTLVMLS-----CFPPLVIVGAFTT  
MFI-----  
-----  
-----TK  
MASRGQA-AYSVAAVVVEQTI-----GSIRTVASFTGEKQAIK-KYNQSLSKAYT  
SGVQESVLSGLG-----FGLFMFVLFASYALAMWFGSKMIIDKG-  
-----  
-----  
-----  
-----  
-----YTGGAVMNIIFSUVAGSM-----SLGQASPCLSAFGSGQAAAF  
KMFETIERKPEIDAYS-----SDGQKL  
DDIQGDVELRDVYFSYP-TR-----  
-----  
-----  
-----PDEQVFKG  
FSLSIPSG---TTAALVGESGSGKSTVISLIERFYDPQAG-----  
-----EVLID-----  
-----  
-----ATIEEIRAAAE LANASKFIDK-----LPQG  
LDTLVGEH-----GTQLSGGQKQRVAIARAILKDP  
RILLDEATSALDAE-----SERVVQEALDRVMINR-----  
-----TTIIVAHRLSTV-----  
-----R  
NADMIAVIH-----RGKIVE-----  
-----  
-----  
-----KGAHSELKDPDGAYS-----  
-----LLIRLQEISSEQ-----  
-----  
-----N  
ASHDQEKPEISHPP-KVPLAAVVN-----  
-----GADARFWALMIR-----  
-----  
-----  
-----  
-----AMCFEK-----  
-----  
-----VVYMEVN-----  
-----ALSLLVQNSAAMIAGLVIAFVANWKMSFIILVLLPLFGANGYVQVKFLK  
GFTADAKKKYEEASQVANDAVGSIRTVASFCAEEKVMQLYQQKCEGPMNAGIREGLVGGV  
GYGVSFLLFAVYATAFYAGARLVDVGQATFAEVFQVFFVLTLAAVGVQSQSSSLAPDTGK  
AKNAAASIFAILDRESKIDSSDESG-----TTLENVKG  
EIEFHVV-----  
SFRYPTRPDIQIFRDLCL-----AIHSGKTVALVG  
ESGS-----GKSTAISSLQRFYDPDSGH-ITLDGVEIQKLQLKWFRQQMG-----  
-----NATEAEISAAAE LANAHKFISGLQQG-YDTTVGERGIQLSGGQK  
-----QRVAIAR-----AIVKDPKILLDEATS-----  
-----ALDAE-----SER-----VVQDALDRVMVNRTTL-----  
-----VVAHRLSTIKGADLIAVVKNGAIAEKGHETLINIKDG  
IYASLVALHMSASSYACSFPLNQSFNLLSFLTDSTDFSFSDPNIIYTQQTRASTRQTPA  
VETVKIPENAGNRQDSEKRSKATQGISSTVPFYKLFSAFADSWDYLLMLVGTVTAVGNMCM  
LPAVALLFGELMDAFG-KTVNTNMLHEVSKLCLKFVYLSGGAAVASFFQVTCWMVTGER  
QATRIRSLYLKTI LRQDIAFFDKETKTGEVVGRMSGDTVLIQDAMGEKVMVIQLAATFI  
GGFFVAFFKGWILVLLSCIPPLVASSAVMTILLAKLASQEQTSSVSAASVVEQTIGSI  
RTVISFTGEKQAIKAKYKSLTKAYDSAVREGLATGLGLGSVMFIVFCIFALAVWFGAKLI  
INKGYSGGNVVGIVAVLTASMSLGQTSPIKAFAGAQAFAFMFETINRKPEIDAYDTK  
GLKLDDISGDVELRDVYFSYPARPDEQIFSGFSISIPSGTTTALVGQSGSGKSTVISLVE  
RFYDPQAGEVLIDGINLKDFQLRWIRQKIGLVNQEPVLFASSIKDNIAYGKDDATIEEIR  
AAAE LANAAKFIHKLPO-----GLDTMVGEHGMHLSGGQKQRVAIARAILKDPRIILLD  
EATSALDLGSERIVQEALDRVMNRTTIIIVAHRLSTVRNADMIAVIHQKGKIVEKGSHTEL  
LRDPHGAYHQLVQLQEISSESEQHDEKG-----  
-----LVWRLACLNKPEIPVLLLGIVAAIA  
NGLILPAFAVLFTSTIIDNFYESADKLKESKFWALMFFILGVASLLITPRTYLFVAVAGC  
KLIKIRSMCFEKVVHMEVGFWDKAENSSGAIGGRLSADAASVRSVLGDALALVVQNIAT  
VIAGLAAAFEA-----NWLALITLVFLPLIGINGCI-----  
-----QLQFTKGFSGDAKKRYEEASQ-----  
-----VANEAVGNIRTVASFCAE--EK  
VMQLYQKKCEGPAKTGMTRG-----  
-----LISGLGFLSFFVYFIYAVTFY-----AGARLFRDGKTTFSKILR---

```
>gi|389633341
```



















RQNLFSSMLKQEMAWHD-----KPENNPGLSFLITSDAN-----KLTKRL

-----KVNTFCGTSLGRLLIESAVL

VTFSLTIAFVY-----NWKLTLVVLFSPVTILSSYLQ-----

-----LRQIHVN-----SD-VNNETMAAR-----

-----IIHEALSSARTVYAYGLE-----DY

FCKHYSTVLNLEMTAGNRTF-----

-----IIYSFVYALAQLSPICSYAATFSY-----GAYLMSLEEINLIAIFK-----

E-----MKHASLATNRIFKILDRD-----SKIPV

-----DEGLCPDQS-INNIPIEFRQVSRYPSRP-----TSWVLKDFSWT-FQPRQNTA

IVGLSGSGKTSILCLIHR-----LYETDSSNTN-----

-----SGIFLNDI-----NIRMI

SPKWIREQICVVNQEP-----QLFNLTLMENIAYG-----N-----

-----NAHPVTMDEITDAAQRANIHEFIMTLPOG-----

--YNTLAGPR---GTHISTGQRORIAIARALVR--KPKLLLLDEITSAMPENER---

-----YIQNLLTELSQD-----CTY

LLVTHRLLSTTQVD-----QILF

LSK-----GKIVESG-----SFDQLKQ-----

-----AKGAFYGLFCPEETEQT-----

>gi|315055313

MEQLSSSSRPSAVDDDESAREVLQRQLNGLPAVQMK--  
--NSTVLAYARPLDIALIAIST--LSAIIAG--  
--ALNPLLTVIYGLLVGSFQKHAHG--MEE  
SSQLSS--SVSKFTLY--  
--YVYLGVAEFVL--  
--IYIATVGFYYSGERITRSLR--QAYLKAIIR  
QNIGFFD-TLGP--GEVTTRISGDMNVVQ--EGISSKVSIF  
--LTAIATFLSAIIISFVNNWKLALIL-LSISILLGGAFLGATFAL  
KYS--  
--RKNSASLAKGASAAEETFGS--IQHVSAFGIQAAMAK-RYQYYLSTAEC  
WGLKMRLSVSFMIGAINA--LPYLAYALAFWQGSRYIVS--  
--GESTASAVVTIVLATIIGAF--VGRVAPSGEAFISSISHAG  
TILKAIARQSPL--DPFSTTGHQL--  
PKVQGDIELQNAACAGP--  
--EYTL--  
--GHKIADLNLNW--LRQQISYVV--  
--QEPVLFNRSILENILLGLPDP-GLSR--  
--PEQETRELVSAAKVAHAHDFIISLPQ--  
--GYQTEVGTKGLQLSGGQRQRICIARAVIANP  
KILLLDEATSALDVK--SERAVQEALSAQAQR--  
--TTIVVAHRLSTIR--  
NADNIIIVMSG--SVVEOG--



NNENELLPPENQKKYSNFTSFLVWVKCTSKLEKFLFLLGIASAVLTGLCQPFMSYTFG  
 EVSQVFVKITSAVNNKTIQWFGRTDYSSKVFFPDPSDLDRAYEIFHSDMNTVVIHFALVG  
 FAFAIFGFLQFSLFKYVGDNNTTYRVRKEYITRLLRKDAKYFDTVSTGSLSTILNDNLERF  
 REAFNEKIAFIICFTTDFIIGTSLAFYTDWRLASYSVFAVGIAFSGFINSASMMGSTGK  
 QNTHYANAGAIAFQALSSFKTVISLNGQKQELERYSNELKAGEKHGSRRAFFLATSRVST  
 HFFCNALNGIILYVGADLIYNKTMQDAIVTVSFPEQYFQGYSVFQLFHYMLFSAFSLGE  
 AFPHLSYLSNAISSASPIFQILTSKDDVIENRQTDHSDDQRTIKEGNIKFEDVRFVSYP  
 PDSQVLKGITFNVKKGEICIALVGGSGSGKSTIVQLLHHYDIDSGKISIDGLELNNINLK  
 ELRRAIGVVSQEPVLNNTTIEENIRFGNSEVSTLDIYEALKTANAYDFVCAFPRGIKTVV  
 GERGAQLSGGQKQRIAIARVLVKNPKILLDEATSALDNEENEREVQIALRKASEGRTTIV  
 IAHLSTIRNCDKIMVTSEGGIAELGNHDELIARGGLYKDLIIQAQFLDTAENQGDVNNKK  
 LIDVIAATSIDNRISDEELENILKDTPEEQMITSSIWEILRECRPNCILLFFAIFGSAIQ  
 GFSFPILAQLIVRQTYTVVYSIFCIQAYAMEGEEILINGHFWASMFVLVGLFRPITLYCQ  
 YFFFGKVGEKSLTRLIKSFQHLLSLPCAFYDESKNSPTRLANRLNTDASNKAAVDARL  
 GSVLMTLVSMVAITIACYYSWKLTMQVLLFFPVLYLAKYCYEKTTVQSVKQDSLAFESK  
 NKIAVEVLNDIKTVRSLNMEEKVLEMMTVQLRELKRKYHKRAFVLVYFRFGLASGFSAGC  
 SQIVYALSFKFGTYLILQKEVLPMDMYALVTLSTYNSNMAGSAISYLPDYKKAIHAAGLI  
 FNLFTYPATMPYKSKDQGLNIDNGEVKMKDVKFHYHQRPDHIVLKNVNLLEPGKTLALV  
 GPSGSGKSTIVSLIELFYRVDNGSIDVDGENVENVMHHLRSSLALVVSQEPSLFNSSIRE  
 NLVYGLTRQVHQLEMEKALITANAFRFVVFQFPNGLDTIVGERGAQLSGGQKQRIAIARAI  
 LRNPQVLLDEATSALDSENEKVVQNALNTASERLSTIIVAHRLSTIANADSIIVIKLKG  
 VVEQGSHEELKLKLGAYYKLLCTSPFEKLLFVLG-----IVFSILTG-----  
 -----LCMPFESYTLG-----ETSQVLI  
 TITNAINNKTIDP-----ADLDKAYKIFE  
 KDMNRVVLYFFLCGSAYFTFG-----KRYISCLLK  
 -----FLQSRFQFSIMKFVGDNTTYCVR-----NLERFREVFNKIALI  
 RDAQYFDINSIGH-----LSTILNEHNFS-----VALMTDFTIGTILAFYTDWELASYGIL-----FSLGIAFSGLWNS  
 S-----



-----SMM  
KTTELQSMHYADAGSVAFQALGS-----YKTVCSLNGQKREVE-RYTEKLIAGEK  
YGFQKAIFNSLSRGLSYF-----FSNALNTAVLYVGANMIYDGRLL  
QP-----  
  
-----  
  
-----TIVVRVFHYLLFGSY-----CLNEAIPHISRFSSAISSTA  
PIADMLFPSNQMFRLGHDNFFQ-----NDNVIERGDDTPHDESE--  
-VHGDISFRNVRFSPTRLETEVLK-----  
  
-----E  
ISFDVKIG---ECIALVGASGSGKSTVVQLLLRYYNIDSGNISID-----  
-----GVDLKEINLGK--LRKVIGVVS-----  
-----QEPVLFNTTIEENIRFGNP-----  
-----DASSPDIYEALREANAIDFVCAFPK-----  
-----GIKTIVGERGTQLSGGQKQRIAIARTLVARNP  
KILLLDEATSALDNE-----SEHIVQMALEKAS-----  
-----QGRTTIVIAHRLSTIR-----  
  
NANKIIVMD----KGKIVEV-----  
  
-----GNHDELISRKG VYKNL IEAQLMNAT-----  
  
-----  
  
-----EEQNKP SLIN  
EICNLTSRSISVLKETADEENVQDDEIKRIV-----NELKQ  
EGAKKSNLREIVEMCKPDYFILYLA-----VFGSAIQG  
VTYPISA-----  
QLIIRAYEAFAMEGED-----VVTYGHFWALT I  
LALA-----ILRPLALHLQYYYFGKVSE-----  
  
-----  
  
-----KLSTR L  
RIKSFKHLSLPCAYYD-----DPKHSATRLSNRLNTDASN-----  
  
-----VKA AIDDR LGC-----  
-----VIMTVVA-----IIIAVITASIYCWM TLQVLLFCP-  
-----ILYLA EYCYERMIDS AIEEDALAFGNSNRVECTCFIRFERCVL-  
-----QTAEALENI RTVRALNME--DK  
IMSLITNHLQKSHKSYFRRA-----  
-----IIQGVANGLSCGCYFFIYSVSFKF-----GYTLALRK--EVLPM DTYLV  
LM-----TISM TSSMAGSAAAYLP  
D-----YKKAVHAAGLIFNLFTYP-----ATMPY  
DSTDGKKNID-----  
-----KGEIVGENLOFH YDORP-----DRMILNGVN LK-V EPGKTL-

```
>gi|302830149
```



[illegible]

```
>gi|302818934
```



.....

>gi|302813477

.....

-----MGPERSVSYISLFRFADAKD-----FVLI  
AAGT-----LGAVVNG-----  
-----LTFPAMLIIRG-----HMIDNFG  
TLPQD-GAMSTKISQD-----  
-----ALLFVYIAIVAWIA-----  
-----SYIEVSCWMFTGERQASRLR-----ALYLRSVLR  
QNVSFLDNELS-----ATYIVNCVSDDTLLVQ-----EAISEKTG--  
-----NFIRNVVQFVGGYLVGFTQSWKLAIAILP----FTPLLILPGVFYG  
SAI-----  
-----LK  
FENEKQA-TYSKAGNIAEQTIAC-----IRTVYSLVAETKSLR-AYSLALEKTVA

[illegible]



ELYSLRRQIGLVSQEP-----CLFSATIHENIAYG-----  
 -----RESECTEAEVIQASRIANAHNFI STLPEGYKTH-----  
 -----SGRK-----GIRLSGGQKQRIAIARAVLK--SPQILL LDEATSALDLESEH-----  
 -----LVQDAL-KTMAG-----RTT  
 LVIAHRLSTVRNCD-----CISV  
 MHS-----GAVVEQG-----THEELMSMSG-----  
 -----TYFSLVRLQEAGCSG TKCS-----

SGSRSIDSSSYYSKSIILSIQDLQQR-----MEQQ  
-----  
-----TRSYDNLAR-----  
-----PSHAQQQQRDISDAHSVVVARDRDYGYGAVNE-----  
-----  
-----KDLAEEADSLSVYSIDATK  
NADQAQEDE----GFSYWKLQFANGLD-----WLMI  
AVGT-----ASAIAHG-----  
-----LSGPAVLLFG-----LMNNAFA  
LSPDAAFRG-----  
-----  
-----VVKVRS-----  
-----DLSQNVCWTQIGERQTAHIK-----TRYLDSLLK  
QDIAFYDTEAK-----VGDIVTAVSSDILLIH-----DAVGEKIGA-  
-----  
-----CVSNFAVLGGIVISISVYWKMLMGLT-----ATPLLLGSGFMFV  
AFY-----  
-----  
-----TK  
YVIQALT-AYRSADLVAEQAISQ-----VRTVVSFVGETKALN-SYAHILLEDVAK  
LSSKTGLSKGLG-----LGTVIAISYFSWTLQFWFGSKLVEKHEI  
-----  
-----  
-----  
-----  
-----KGDTVNSLIFISIISGK-----ALGDCMQVFGFIAKGKAAAS  
RLFRVIERQPRINN-----NSDQGKTL  
SRVRGRIELCNISFAYP-AR-----  
-----  
-----  
-----PEVPVFSN  
LSLNIPEG---KIVALVGSSGSGKSTVISLIERFYDPLKG-----  
-----EVKLDGRDIKCLQLKW--LRAQIGLVS-----  
-----QEPTLFATSIKKNILMGK-----  
-----PDASHEELISAACVAGAHLFICD-----LPDA  
YNTEVG-----DKGIQLSGGQRORIAIARAILKKP  
SVMLLDATSALDSE-----SEVLVQNALDRIMQGR-----  
-----TTIVVAHRLSTIR-----  
-----  
NADCILVFD----KGRIIE-----  
-----  
-----SGTHAELLGRE-----  
-----  
-----  
-----  
-----  
-----NGAYKSLVMTQES---AVVARKRRTRSRTPIAAPWA  
SPLRSPWTSPSRISYESFNSSIEMPPVQENFQ-----  
-----AAEEQGPATK  
LQTSYSVKSWFKERFRRVWGSIIIG-----TSGALTSG  
ILA AVFP-----  
LVMANVLVLLLQ----R-----RTKEAMKWTLGF  
IGLG-----IATLASNVVOYFFCHKVGA-----

[illegible]

>gi|302758292

[illegible]



[illegible]





[illegible]

RVLSLRSLLRQPLEWHNAD-----GRTPGLLVALVTSDSA-----  
-----  
-----  
-----  
-----LSSLTGTTIGVLFTSVAN  
LFAGVILSHIIA-----WKIAVLLA-TLPVLLASGVLRLR-  
-----VMAQYQKKHQKAYAKATA-----  
-----ITVETVDNIKSIAAFSLE--QE  
AYSVFNRSCLKAPYKSNMKS-  
-----LHGNFWLSLAYSISTLVYALAYWWG-----SQQILAGMYTQVQFFI--  
-----VLPALLFSTQSCGQMFALVP  
D-----ISKARIAASNIVDLLSIKHEGDEEYDKTGSKASAK-----  
-----HTDPRFNMLEDKPR  
DVEAQLTTTTSSFPKMGVQFRNVHFRYPSRPNQ-----ALDDL SIN-ISPQGFA  
LVGPSGSGKSTTFALLEK-----FYNPASG-----  
-----SIID-----GVDITKQ  
SGAAFRDTIALVPQEN-----VMFEGTVAFNIGLGARPDVEA  
-----TQEEEEACRLANIHTIAALPDG-----  
-----  
--YNTVCSQDG--KQFSGGQRQLRSIARALVR--KPRLLLLDESTSALDVESEK-----  
-----  
-----HVQDALAKVAR-----KTTI  
VAIAHRLNTIHRAD-----RIFM  
IEGKK-----CVDQG-----THAELVERC-----  
-----ESYRANVIH-----Q  
SLDA-----

>gi|296807607

-----MPIFCSIKQKLS-----RSNK-----  
-----HEDREVFSLFRVYGLLWRFSTSFVLLQILG-----TIAAIGAGTTH-----  
-----PLMTLVFG-----QFVNIFN  
NHDSS--KTGQLLASVNSA-----  
-----TLYFVYLFLAKAAL-----  
-----IYVHTVCFTISAARITASLR-----KSYLRTLLA  
QDVVFFDSRD-TG-----AITTIISQNAEMVQ-----NGLSERLGMT  
-----MQAVSMFISGFIIGFVKSWKLTIVTSTSIPALAAATFLTLHLD  
RIQ-----  
-----TRVLEIQAQAGILAETLKS-----MKIVTAFSAVEKLAR-RYSSLLATVAN  
LSRKRGPYIGAQYSVDYC-----VLLSAYALAFW-----  
-----VILCINQATTA-----LMTLVPSLGEVSKAAAAAR  
DLLSTIQ-----QR-PKEELNSLPRP--L  
KASSGELVLNEVHFSYPARP-----  
-----EVPVLNG  
VTLRIMPG---KRTAIVGPSGSGKSTIVGLIERWYDPDRG---  
-----SVTLD-GVDIRTLPKRW--LRKQLGLVQ-----  
-----QEPALFNDTIFENVRYGLLGSERH-----  
-----HGSSTEEEDRSRVREACMQVGIIHDFIETLPKG-----  
-----YDTKVGERG-DLLSGGQRQRVAIARCIISNP  
DIMLLDEATAALDPA-----SENIVQAALDL--VCKNR-----  
-----TTVVVAHKLSTIK-----  
SADQIVVMDHG-----KIMQQ-----  
-----GDHETLRQQDG--IYQMISNQDLIDDEPGVDEE-----

[illegible]

.....

>gi|294936183

.....

.....MSIGTAVAPSTAESD---  
.....DVVVASPTTRTKKKIVPY  
YKLFRFATRA-.....  
.....QLIAIVVA-.....VLAAALHG-  
.....ISLPMFAYVFG-.....DLVDVLG  
NP----EGVDFMD-.....  
-EISKRCVYLVYIGLAALVL-  
-----AGLWHGLLTFTAQSQATTIR-----RAYFEAVLS  
HDVAWFDTISPAE-----LPTRMTEDVSKVQ-----NAIGFKLGV-  
-----FTMNLSMFIFGYVLGFIRGWKVC LVALA----AMPVVIAASAILG  
HAM-.....  
-----AQ  
SANESQS-WYARAGAI AEEV-----LSSIRTVTMMGTQRHEVQ-RYTNSLEEARK  
GGTRLGFQAGLG-----LGLTFGAVYFSYALTFWYGGTLVRD GVE  
NDFTDE-.....

[illegible]

-----VVQKAIDELTTTRQSSTD-----GTVVKPTT  
LIIAHLSTITNAD-----LILV  
IAG-----GRLVEQG-----THTELLTKE-----  
-----GVYYDLYQKGS-----

>gi|294866649







>gi|6573748

-----MQPSNDPAI  
VDMAAAEKEKKRPSVSFLKLFADFADFYD-----CVLM  
ALGS-----IGACIHG-----  
-----ASVPVFFIFFG-----KLINIIG  
LAYLFPQEASHKVAK-----  
-----YSLDFVYLSVVILFS-----  
-----SWLEVACWMHTGERQAAKIR-----KAYLRSMLS  
QDISLFDTEISTG-----EVISAITSEILVVQ-----DAISEKVRYT  
KIKPVLVLNFGCWIFNFPIASMLVG-----  
-----NFMHFISRFIAGFAIGFASVWQISLVTLS-----IVPFIALAGGIYA  
FVS-----  
-----SG  
LIVRVRK-SYVKANEIAEEVI-----GNVRTVQAFTGEEKAVS-SYQGALRNTYN  
YGRKAGLAKGLG-----LGSLHFVLFLSWALLIWFTS-IVVHKGI  
-----  
-----ANGGESFTTMLNVVIAGFHNKALFLYR--SLGQAAPDISTFMRASAAAY  
PIFQMIER----NTED-----KTGRKL  
GNVNGDILFKDVTFTYP-SR-----  
-----  
-----PDVVIFDK  
LNFVIPAG---KVALVGSGSGKSTMISLIERFYEPTDG-----  
-----AVMLDGNDIRYLDLKW--LRGHIGLVN-----  
-----QEPVLFATTIRENIMYGK-----  
-----DDATSEEITNAAKLSEAISFINN-----LPEG  
FETQVCRTSDSLEHK--KLTTVNPFRCLLFGQLQVGERGIQLSGGQKQRISISRAIVKNP  
SILLLDEATSALDAE-----SEKIVQEALDRVMVGR-----  
-----TTVVVAHRLSTVR-----  
NADIIAVVG----GGKIE-----  
-----SGSHDELISNPDGAYS-----  
-----  
---SLLRIQEAAASN-----

-----LNHTPSLPVSTKPLPELPITETTSSIHQSVNQ

-----PDTTKQ  
AKVTVGRLYSMIRPDWKYGLCGTLG-----SFIAGSQM  
PLFALGI-----

AQALVS-----YYMDWET-----TQNEVKRISILF  
CCGS-----VITVIVHTIEHTTFGIMGERLTR--VRQKMFSAILRNEIG-----  
-----WFDKVDNTSSMLASRLES----DATLLRTIVVDRSTI

-----LLENL  
GLVVTAFIISFILNWRL-----TLVVLAT-----

-----YPLII-----SGHISEVKRSFLRFYILFFGR-----  
-----QKIFMQGYGGNLSKAYLKANM-----  
-----LAGESISNIRTVVAFCAE--EK

VLDLYSKELLEPSERSFRRG-----  
-----QMAGILYGVSOFFIFSSYGLALWYIYKLFHTKYGSILMEKGLSSFESVMK---  
-----TFMVLIVTALVMGEVLALAP  
D-----LLKGNQMVVSVFELDDR-----T-----

--QVVG-----  
-----DTGEELSNVEGTIELKGVHFSYPSRP-----DVTIFSDFNLL-VPSGKSMA  
LVGQSGSGKSSVLSLVL-----FYDPTAG-----

-----IIMIDGQ-----DIKKL  
KLKSLRRHIGLVQEP-----ALFATTIYENILYGK-----  
-----EGA--SESEVMEAAKLANAHSFISSLPEGYSTK-----

-----VGER---GIQMSGGQRQRIAIARAVLK--NPEILLDEATSALDVESER----

-----VVQQALDRLMRD-----RTT  
VVVAHRLSTIKNSD-----MISV  
IQD-----GKIIEQG-----SHNILVENKNGPY-----  
-----SKLISLQQRQRHHP-----

```
>gi|238500560
```

[illegible]

I A V A H R L A S I A H A N ----- C I Y V  
M D Q ----- G K I V D C G ----- S H E E L L A R Q G L Y -----

----- W Q L F T L Q E T D T G -----

>gi|268530808

-----MNRKREKESTISPSNSQSSSSSESSSSNS-----  
-----FSYCSLLRYSNKVDRLLLGLG-----  
-----IFLSISQG-----  
-----CCSSLNAILFR-----DLTDVLI  
SGQGSYTNQ-----TFDHQQFN  
NETLNIHTYFLYGTLFSL-----  
-----SFVSMCCWHTFCERQIFKIR-----VAYFSALLR  
QDWEWFDQNDSGA-----AIVRMNDG-----LERVRDGLGDKLGVI  
-----IAYLTHFFCGLSLAFYLSVENTITVTLI-----ITPAFILPIIISK  
K-----  
-----MIS  
KVTFKELEAYESAATAAGEVISG-----IKTVVSFNGEQKEIN-RYSKFLSKAMY  
WGLWRASLSSFEGLLGHSS-----CVFQWQFHSGWWGTRLVLKG--  
-SIT-----  
-----  
-----  
-----PGTTLAVFWAVNGAIY-----FVGQAIPHLTSVSSCYSAAV  
PVFQIIDR-----TVILDGTSDKGLKLKSK--  
-VKGKVKFENVWFKYPARQKVNVLK-----  
-----  
-----G  
ISLHANPG---ENIALVGHS GSGKSTTAALMMHFYELNGGKISID-----  
-----DTNIDELNLSH---LRNIVGIVS-----  
-----QEPLL FADTVENNMR LGAP-----  
-----DLDDNEMEYYCKLANAHDFIEQLPN-----  
-----GYKTAIGNGGVELSGGQRQRIARTLARKP  
SILILDEATSALDSE-----SESLVQIALENAA-----  
-----EGRTTITIAHRLGTIR-----  
NCNRIYVFD-----DGKIVEV-----  
-----  
-----GSHQELME-KDGHYAKMVQSQ-----  
-----EIEVGNRQUESTMEEYS-----  
-----  
-----  
-----  
-----  
-----FESRRES CDSKSSRQ-----KFSKK TARSCS  
LTSEKLLSDISPLP--IGEENEQPS-----  
-----TFLEILRYTKPEWGLLAIS-----ILISVLRG  
FNYP IYS-----  
ILYGRMFRI LSTGTDE-----EKSSNSGMNAIYL  
TALG-----IYALIVTMAAGCLIGYVGE-----





[illegible]

AKLIRMQEQAHEAALVNARRSSARPSSARNSVSS  
PIMTRNSSYGRSPYS  
RRLSDFSTSD FTLSIHDPPHHHRTMADKQLA  
FRAGASSFLRLARMNSPEWAYALVG SLGSMVCG  
SFSIFA  
YILSAVLSVYYAPDPRY MKREIAKYCYLL  
IGMS SAALLFNTVQHVFDTVGE  
NLTKRV  
REKMFAAVLRNEIAWFD ADENASARVAARLALDAQ  
NVRSAIGDRISVIVQNSAL  
MLVACTAGFVL QWRLALVLLAVFPLVVGATVL  
QKMFMKGFSGDLEAAHARATQ  
IAGEAVANLRTVAAFNAE RK  
ITGLFEANLRGPLRRCFWKG  
QIAGSGYGVAQFLLYASYALGLWY AAWLVKHGVSDFSRTIR  
D FVKGGRAMRSVFETIDRK T  
EVEPD  
DVDAAPVP ERPKGEVELKHVDfsYPSRP DIQVFRDLSLR ARAGKTLA  
LVGPSGCGKSSVLALVQR FYEPTSG  
RVLLDGK DVRKY  
NLRALRRVVAVVPQEP FLFAASIHDNIAYG  
REGATEAEVVEAATQANAHRFISALPEGYGTQ  
VGER GVQLSGGQRQRIAIARALVK QAAIMLLDEATSALDAESER  
WLFEANLRGPLRRCFWKGQIAGSGYGVAQFLLYASYALGLWYAAWLVK  
HGVSDFSRTIRVFM VLMV  
SAN GAAETLT LAPDFVKGGRAMR  
SVFETIDRKTEVEPDDVDAAPVPERPK  
GEVELKHVDfsYPSRPDIQVFRDLSLRARAGKTLALVGPSGCGKSSVLALVQRFFEPTSG  
RVLLDGKDVRKYNLRALRRVVAVVPQEPFLFAASIHDNIAYGREGATEAEVVEAATQANA  
HRFISALPEGYGTQVGERGVQLSGGQRQRIAIARALVKQAAIMLLDEATSALDAESERC  
QALERAGNGRRTTIVVAHRLATVRNAHTIAVIDDGKVVQSGSHLLKHHDPGCIYARMLQ  
LQRLTGGAAPGPPSSSNGAAA

[illegible]

[illegible]

-----YAAMVKAEEVEAQAF-----

>gi|167395240

[illegible]

```

-----LNGVTGNLIGTMIHCSFS
LIIGLILGYITN-----VKISWSTIFVPLIVFNTYIQ-----
-----LRISVGFAGPETKIYANAEN-----
-----LMTEVVENIKTIKMLAKE--DY
FKEKYCSYLVKPSK--RAPFT-----
-----AIINGLVLGWVHAFIFWKYSVL-----MYVAGQELKKD-----
-----PSQMPDIMKALCSIIFGAMSVGFAATYMA
D-----FGNAKVAAESIFKIIDRK-----SPQDPF
SNEGEKNFT-----
-----IDQVELDDIKFRYPTRP-----EQVILDGASFV-IPKGKSV
LVGSPSGCGKSTVIQLIER-----FYKPERG-----
-----TVKINGR-----NIIQEF
NLATLRNKIGYVGQEP-----LLFAGTIGENIVSGMCGSWTDDQLE-----
-----NGGNLVAENMDKIVAAAKMANCHNFICQLPQG-----
-----YNTIIGER---GTSLSGGQKQRIAIARALIT--QPELLILDEATSALDSESEM---
-----
-----IVQQAIDKIAKQ-----VTS
IVIAHRLSTVKDSD-----IIVV
LSG-----GKVVEQG-----THDELMKEEG-----
-----VYFHLVQIQAQ-----

```

[illegible]



[illegible]



[illegible]

```
>gi | 145523131
```

-----MNTQVNENDPL-----  
-KSETKKQDDQ-----

[illegible]

TVQQLFQNIIGFKQCYSSA  
IFVGFTLAFISS-----WKLTLLAIGIAPLSYLGSVLSSKYV  
VGS-----QQSFCQVYVTSN-----R-----  
-----ILMETLTNIRTVYSLRAE--NV  
LVEQYTKLLEEPSQQAKKLG-----  
-----AWIGVSSGYAQLKPFVNGYFLM-----GTLLLYYD-----  
-----GLAVLGIYQTILAIIFAVVGGAKDIYFQS  
D-----NAKAKMAINYYFNLLEVE-----DEFQR  
ENRLKSQR-----  
-----LKVPI LGNLEFKDVTFSYPQRP-----NIQVLRNLNLR-IEACTTVG  
FVGSSGCGKSTLFQLLL-----FYDVVS-----  
-----GDILL-----GQSIYDF-  
DLKYLRQHFAIVQQEP-----QLFNETIYYNIQYNLKG-----  
-----ITQEDIENAAKLSHAYDFIMQEDFG-----  
-----  
-GFKKKVGSK---GSLISGGQKQRIASRAVLRS--SVFLFDEATSALDSNVES-----  
-----  
-----IVQKQIEEYLIgK-----TS  
IVIAHRISTIKNCK-----VIYV  
FDK-----GQVIEQG-----DYNFLVSQK-----  
-----GHFYHLEQGLLNQNQENEMSFQQVD  
VDE-----

```
-----MTVLKTGNEFSDAFSEQYEQSAIDKFISTIL
CRGDFARQKLDAPVSFFQLFRFATTYDRFMMILG-----AFLAVICG-
--IGOPTICLIGG-----KITNILL
VTKN-----
--YIC-----
--LKNVSLNITCTMR-----KEYMKSLLR
QDATWFDQQKSGT----LTVQLNAN-----IEKIKDGIGDKVGMI
-----LRGVAMFLTSLVIGFIYEWRTLVMLG----TGPAASAALLSMA
R-----
-----QVE
RSSGQQISADGRAAAILEESIIN-----VKTVAACNAQETMIG-RYAKALKACRR
FALRAYAFAGFFDGLFFF-----ILYFFFAAGFYYGAYLYQIR--
--AVT-----
-----
-----NPGFIFAVANVIMFGSY-----YLGVLSPHLMAVLNARVAAA
DIYKIHDR-----KPSIDSSTDGIKLKE--
--VKGQVEFRNVKFSYPTSKEHLV-----
-----
-----LNG
LSWIAKPG---DTIAFVGHS GCGKSTSIGLLTRLTYCNSGTVLID-----
GINVLDINVHS--LRNVGVVVQ
--QEPLLTGTGVKENVRLGNL-----
--NLTDPR-----
-----NHRCIQLSGGQKORIAIARTIARNP
KILLLDEATSALDAE-----SEVVQNALKKAS-
--IGRTTIVIAHRLSTLR-----
DSNQIIVLD----KGQVAEI-----
-----
--GTHKELCNRKDGIYASLVKS-----
--QQFE EKQDMSPVPVDEL-----
```

[illegible]



AKAPXRGRKADEEKVPFYKLFSFADKLD-----MGEDGEAQ  
IVGT-----VCAMANG-----VGLM  
-----MTQPLMTLIFG-----QLINTFG  
DSDPSHVVEVSRKT-----  
-----SNKLPVIVTEVSS-----  
-----WMVTGERQATRIR-----GLYLKILR  
QDIAFFDTETTTG-----EVIGRMSGDTILIQ-----DAMGEKVG--  
-----KFIQLMSTFLGGFIIAFARGWLLSLVLLP-----SIPLLVISGGTMA  
IIM-----  
-----SR  
MSSRQQL-AYAEAGNVVEQTV-----GAIRTVASFTGEKKAIK-NYDNKLHIAYA  
STVQQGLASGIG-----LGTVLLIIFGTYGLAMWYGSKLVIERG-  
-----  
-----  
-----  
-----  
-----YDGGRVINCIMAIMSGGM-----SLGQTSPCLNAFAAGQAAAY  
KMFETIKRKPQIDAYD-----TSGTVL  
EDIRGEIELKDVFYNYP-AR-----

[illegible]

.....

>gi|66947665

.....

.....MPEPELLGYKPAATEGNGQ.....  
.....VPSTGANGIPDPDKVLFK-- --NGRVSPTSSQKDDKKKKKKK  
DGKDGEKEKEPEKMGFFFEVKYSTCVDKLLMIFG-----  
.....-SLFALAHG-.....

[illegible]



[illegible]

GGEEPFGE DRLPVVHHQEEVHQRL - - - - - VCG - - - - - VRGSQG GKY  
RGEGRGSR RVVLQR AAAEHP RMAHLH LCGDLL RH DQWSDA AGLRH PLL QD HHRLLITLVHE  
QLVKQIY - - - - -  
FPFVFPP FQVFVD P - - - - - DLESVRKKTEFFSLMF  
VVIG - - - - - CVS FVTMFLQGYC FGKSGE - - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - - ILTLKL  
RLRAFTAM MRQDL SWYD - - - - - DPKN TVGALT TRLAAD AAQ - - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - -  
- - - - - ITQN IAN - - - - - LGTSIIIA FVYGWELT LLILAVP -  
- - - - - LIAAAGAA EVKLLAGHA AKDKKELE KAGK -  
- - - - - IATEAIENVRTVVSLSRE - PK  
FETLYEENLRVPYKNSQKKA - - - - -  
- - - - - HVYGFTYSFSQAMIYFAYAACFRF - - - - - GAWLIEAGR-MNVEAVFLVI  
S - - - - - AVLYGAMAVGEANTFAP  
N - - - - - YAKAKMAASYLMMLINKK - - - - - PAIDN  
LSEEGVSP - - - - -  
- - - - - GTYDGNVLFESVKFNYP SRP - - - - - DVPILQGLNLK-VKKGETLA  
LVGSSGCGKSTTIQLLER - - - - - FYDARNG - - - - -  
- - - - - RVALDG VNVK - - - - - EL  
NIHWLRSQMGI VSQEP - - - - - VLFDCLSLAENIAYGD NSR - - - - -  
- - - - - SVAMDEIVAAA KAANIHSFID GLP - - - - -  
- - - - -  
QKYDTQAGDK - - - - - GTQLSGGQKQRIAIARAIR - - NPKLLLLDEATSALDTESEKVSGD  
SPWVHLTDPSGLYRAGDSRL - - - - -  
- - - - - QVVQEALDQARK - - - - - GRTC  
IVVAHRLSTIQNA - - - - - DCIAV  
FQG - - - - - GVVEKG - - - - - THQQLIAKKG V -  
- - - - - YHMLVTQM -

