

acsA

HpacsA	-----MTATSSQLPDPYHYLDNFSVORVLR--LDDHRDGL---LNAPFACGGRHVRAGCDVIAL	56
CaacsA	MTPSDTTTNRTRSRAAASANSASHAMQPAASQTHSDYLAASFDIQAQRDFPTTPTNDESE--LGNAYFAPVGRHLRAGCGERIAL	84
CcacsA (WP_144726521.1)	MTTRDDTTTNRTRSRAANVTSA'DAT'FEP'PTHSQLQELGASFDIDA'RSEPLASGSESEPEPERPTGNAYFAPVGRHLRAGCGERIAL	86
HkacsA (WP_181514112.1)	-----MSTQSLQELGASFMERFSIDEVLR--LDDHADCK---LNAPFACGGRHLRAGCGEPAL	54
HvacsaA (WP_106230398.1)	-----MST--LPDQSYLETFSIDDEVLR--LDDHRDCK---ANAFESSCGRHLRAGCDVIAL	52
HpacsA	VQEDSQGDMLHLSYALIEEISAKLAGWFKSGLGIQDRITACMLRSPQLLVAVATWRIGAVYQPLFTAFGEDAVYRLGRAPTRL	142
CaacsA	VHEDQCGVRSPLSYALIEEISARMDAALKAGVGMQRVACMLSRTPELMIALAATWRIGAVYQPLFTAFGDALYRLSRAPTQIL	170
CcacsA (WP_144726521.1)	VHEDQCGVRSMSYALIEDISARMDALALAGVGFQDRITACMLSRTEPELLVALAATWRIGAVYQPLFTAFGEDALYRLSRAPTQIL	172
HkacsA (WP_181514112.1)	VHEDQCGHRSPLSYALIEEISAKLAGWFAERGLGVQDRITACMLRSPQLLVAVATWRIGAVYQPLFTAFGEDAVYRLGRAPTRL	140
HvacsaA (WP_106230398.1)	VHEDQCGQNTLTSYALIEASARLAGWFAERGLGVQDRITACMLRSPQLLVAVATWRIGAVYQPLFTAFGEDAVYRLGRAPTRL	138
HpacsA	VITDHANRKKFDGTSOCPEVTLAVGSA-TSEHADDLDWQAALHTHTSMDKPRRAFPAFLQMFTSGTVGKPKGVAVELAGWBAFAL	227
CaacsA	VITETSQRKFTEDARHFVITCVREGGDALEADLDWQTLQOSETEFEVMPAPAPFLQMFTSGTVGKPKGVAVANALBAFAM	256
CcacsA (WP_144726521.1)	VITETQRKFTEDERHPSLTCVRRRDESLDQGLDWQVLMQSEFVQFVPLSSDAPFLQMFTSGTVGKPKGVAVANALBAFAM	258
HkacsA (WP_181514112.1)	VITDHDNRKKFDGTSOCPEVTLAVGCEP-SEGHDLDWSEARSHSSEANPRRSPRPLFLQMFTSGTVGKPKGVAVELAGWBAFAL	225
HvacsaA (WP_106230398.1)	VITDHANRKKFDGTSOCPEVTLAVGCEP-DADHADLDWNNVAHAHLETTTPRRSRPEFLQMFTSGTVGKPKGVAVELAAWBAFAL	223
HpacsA	YMLELAIDLDDDRFWNMADPGWAYGLYYAIGPILLGVYTFCEKGFSAEGCALAFMKRRHTNFNFAAAPTAYRMLKASGLFDDAHEK	313
CaacsA	YQRLAVLDLRFGERFWNMADPGWAYGLYYAIGPILLGATTFYMGKFFSAEGGLAFMRHRINDNFNFAAAPTAYRMLKASGLGEGAFER	342
CcacsA (WP_144726521.1)	YQRLAIDLRLPDRFWNMADPGWAYGLYYAIGPILLGATTFYMGKFFTAEGGLAFMRHRINDNFNFAAAPTAYRMLKASGCEGAFER	344
HkacsA (WP_181514112.1)	YMLELAIDLRESDRFWNMADPGWAYGLYYAIGPILLGVYTFCEKGFSAEGCALAFMRHRHTNFNFAAAPTAYRMLKASGLFDDAHEK	311
HvacsaA (WP_106230398.1)	YMLELAVDLRDLDRFWNMADPGWAYGLYYAIGPILLGVYTFCEKGFSAEGCALAFMKRRHTNFNFAAAPTAYRMLKASGLFDDAHEK	309
HpacsA	LELRVASSAGEPLNTEVWVWVRSLGCEVMDHYQOTETGMTCNNHHALEBPKKVGAMCVMPMPGYRLAILDREYNELPFGEPGVLA	399
CaacsA	LELRVASSAGEPLNTEVWVWVRELGCEVMDHYQOTETGMTCNNHHALEBHVVVGVGCEPLPGYRLAVLDRREYRELPGEPGVLA	428
CcacsA (WP_144726521.1)	LELRVASSAGEPLNTEVWVWVRELGCEVMDHYQOTETGMTCNNHHALEBHVIVGVGCEPLPGYRLAVLDRREYRELPGEPGVLA	430
HkacsA (WP_181514112.1)	LELRVASSAGEPLNTEVWVWVRSLGCEVMDHYQOTETGMTCNNHHALEBPKKVGAMCVMPMPGYRLAILDREYNELPFGEPGVLA	397
HvacsaA (WP_106230398.1)	LELRVASSAGEPLNTEVWVWVRSLGCEVMDHYQOTETGMTCNNHHALEBPKKVGAMCVMPMPGYRLAILDREYNELPFGEPGVLA	395
HpacsA	DIKNSPAHFPGYTWQERKFFPAGYYLTGDVVIRNEDGCECFAGRDDDDIITTAGYRVGFADVENSVMLHPVAESAAVGQPDFIRG	485
CaacsA	DIARSPAHFPGYTWQERKCFVAGYYLTGDVVVAEPDGRFFAGRDDDDIITTAGYRVGFADVENAVLHPVAESAAVGKPDFALRG	514
CcacsA (WP_144726521.1)	DIARSPAHFPGYTWQERKCFVAGYYLTGDVVVAEPDGRFFAGRDDDDIITTAGYRVGFADVENAVLHPVAESAAVGKPDFALRG	516
HkacsA (WP_181514112.1)	DIERSPAHFPGYTWQERKFFPAGYYLTGDVVIRNEDGCECFAGRDDDDIITTAGYRVGFADVENAVLHPVAESAAVGQPDFIRG	483
HvacsaA (WP_106230398.1)	DIENSPAHFPGYTWQERKFFPAGYYLTGDVVIRNEDGCECFAGRDDDDIITTAGYRVGFADVENSVMLHPVAESAAVGQPDFIRG	481
HpacsA	EVIKSYVILRFGCYEASDALAEIRKQVRERLSHAFPRVIEFVIELPKTPSGKIQRFKLRADAVDEEAKASQ--	556
CaacsA	EIKRNVVILRFGCHVGSDELAEBIRASVQRORLSAHSYPRIEFVDSLPKTPSGKIQRFKLRADARAS-----	580
CcacsA (WP_144726521.1)	EIKRNVVILRFGCHVGSDELAEBIRQSVQRORLSAHSYPRIEFVDSLPKTPSGKIQRFKLRADARED-----	582
HkacsA (WP_181514112.1)	EIKRNVVILRFGCHVGSDELAEBIRQSVQRORLSHAFPRVIEFVDTLPKTPSGKIQRFKLRADAAEKATGAAQ	556
HvacsaA (WP_106230398.1)	EIKRNVVILRFGCYEASDALAEIRKQVRERLSHAFPRVIEFVIELPKTPSGKIQRFKLRADAVDWKAEAPAK	554

fdhA

HpfdhA MN-ANRNGVYKGFGEVAVESIAYPELALGN-----RKCDHGVLKVVVTNICGSDQHMVRGRTTAPSGVLVGH EITGVVVE C 77
 CafdhA MSANANRNGVYQCAKRVSVESLDYPTLALGN-----RKCDHGVLKVVVSTNICGSDQHMVRGRTTAPSGVLVGH EITGVVVE A 78
 PafdhA (ABG39378.1) MNKTSNRNGVYKGFGEVAVESIAYPELALGN-----RKCDHGVLVIVVTNICGSDQHMVRGRTTAPSGVLVGH EITGVVVE V 78
 NkfdhA (WP_017574614.1) --MPGNRNGVYQCGFGEVDVTDIAYPEFELKPGPGVHPDNVCRKVPFHGVILEVVVATNICGSDQHMVRGRTTAPSGVLVGH EITGVVVE T 86
 SsfhdA (WP_020606316.1) --MCHNRNGVYQISGIVVEVETIYPKLALGE-----RKCDHGVILOIVSTNICGSDQHMVRGRTTAPSGVLVGH EITGVVVE A 76

HpfdhA GRDVEFIKFGDGLVSVFPFNIA CGGRCRNCKEGRGTGICLNVNPARPGEAYGYVDMGGWVGGQTEYVMVPYADFNLLFPDADQAMEKIKDL 165
 CafdhA GRDVEFIKVGDIVSVFPFNIA CGGRCRNCKEGRGTGICLNVNPARPGEAYGYVDMGGWVGGQTDYVMVPYADFNLLFPDADQAMEKIRDL 166
 PafdhA (ABG39378.1) GRDVEFIKFGDGLVSVFPFNIA CGGRCRNCKEGRGTGICLNVNPARPGEAYGYVDMGGWVGGQTEYVMVPYADFNLLFPDPEQAMEKIQDL 166
 NkfdhA (WP_017574614.1) GFDVEFVQEGDGLVSVFPFNIS CGGRCRNCKARTEICLNVNPARPGEAYGYVDMGGWVGGQAYALVPYADWNLLFPDRQAMDKIMDL 174
 SsfhdA (WP_020606316.1) GRDVEFIKFGDGLVSVFPFNIA CGGRCRNCKVCGTGICLNVNPARPGEAYGYVDMGGWVGGQAYVMVPYADFNLLFPDKDQAMAKIRDL 164

HpfdhA TLLSDIFPTGFHGCVVTAGVCGSGSVYIAGAGPVGLAAAVSAQLLGAACVIVGDMVERLQAARSFGCETIDLQDGEDMADKIEVILGE 253
 CafdhA TLLSDIFPTGFHGCVVTAGVCGSGSVYIAGAGPVGLAAAVSAQLLGAACVIVGDMVERLQAARSFGCETIDLROESMSMEKVEVILGE 254
 PafdhA (ABG39378.1) TLLSDIFPTGFHGCVVTAGVCGSGSVYIAGAGPVGLAAAVSAQLLGAACVIVGDMVERLQAARSFGCETIDLQDGEDMADKIEVILGE 254
 NkfdhA (WP_017574614.1) TMLSDIFPTGYHGCVVTAGVCGSGSVYIAGAGPVGLAAAVSAQLLGAACVIVGDLKEORLQAARVFGCETVNVSECDPAPLVEGVILGT 261
 SsfhdA (WP_020606316.1) TLLSDIFPTGYHCAVVTAGVCGSGSVYVAGAGPVGLAAAVSASCHLLGAACVIVGDMVERLQAARSFGCETVDLTKDPTLADQIADIIIV 252

HpfdhA REVDADFVDCVGFEAHAGCCNHGREAPATVNLNSAMSLTRAGGQIGIPGLYVTDPGAADDAKQCALSMRFGLWAKSHSEHTGQCPVM 341
 CafdhA REVDCEVDVCGFEAHGGCCDHGREAPATVNLNSAMALTRAGGQIGIPGLYVTDPGAEDDAKQCALSMRFGLWAKSHSLHTGQCPVM 342
 PafdhA (ABG39378.1) REVDADFVDCVGFEAHAGCHNHGREAPATVNLNSAMKMTRAGGQIGIPGLYVTDPGAADDAKQCALSMRFGLWAKSHSEHTGQCPVM 342
 NkfdhA (WP_017574614.1) REVDASVDVAVGFEAHYGTGEEAGSEAPASVNLNADMDVTRAGGQIGIPGLYVTDPGASDDPAKQEGSLIRSGLWGSKSHAFTGQCPAM 349
 SsfhdA (WP_020606316.1) PEVDSAVDVCVGFEAHGHGSGSSEKREAPATVNLNAAITVTRAGGQIGIPGLYVTDPGAATEDPAKQGNLSIRFGLWGAKSHSEHTGQCPVM 340

HpfdhA KYHRP LMQAILFGKVNITADAVNVQMIITLDQAFQGYADFDGGAAKKFVIDPHGSVA----- 396
 CafdhA KYHRP LMQAILFGRVNITADAVNVQVIVSLEEARQGYADFDGGAAKKFVIDP HAMVRNGRAA 402
 PafdhA (ABG39378.1) KYHRA LMQSILFGKVKIATAKAVNVKIVISLDDAEKGYADFDGGAAMKFVIDPHGNAA----- 397
 NkfdhA (WP_017574614.1) KYHRE LMMAILLHKVHTADAVNAVALPLEEARQGYQDFDRGAAKKFVLDPNQYLTGTG--- 406
 SsfhdA (WP_020606316.1) KYHRL MNNAILYDKVQIATAKAVNVQVIVSILDKAKKGYQDFDKGAAKKFVIDPHCLIPN--- 396

Hpicd **MTKTPKIIYTLTDEAPALATHSLLPIIDAFTD** **SAGIV**EVETRDISLAA **RIITAC**FPFVYLS **EECRIGD**HLAELG **ELT**TKTPEANI **IKLPNISA** 89
Alicd (WP_148254375.1) **MSKTPKIIYTLTDEAPALATHSLLPIIDAFTD** **SAGIV**EVETRDISLAA **RIITAC**FPFVYLS **EECRIGD**HLAELG **ELT**TKTPEANI **IKLPNISA** 89
Mticd (WP_224420928.1) **MSKSPKIIYTLTDEAPALATHSLLPIIDAFTD** **SAGID**EVETRDISLAA **RIIT**SLFPVYLS **EECRIGD**HLAELG **ELT**TKTPEANI **IKLPNISA** 89
Hsicd (WP_163502434.1) **MSKTPKIIYTLTDEAPALATHSLLPIIDAFTD** **SAGIV**EVETRDISLAA **RIIT**SLFPVYLS **EECRIGD**HLAELG **ELT**TKTPEANI **IKLPNISA** 89
Mticd (WP_224415265.1) **MSKSPKIIYTLTDEAPALATHSLLPIIDAFTD** **SAGID**EVETRDISLAA **RIIT**SLFPVYLS **EECRIGD**HLAELG **ELT**TKTPEANI **IKLPNISA** 89

Hpicd **STPOLKAVIKELQ**QGYKLPDYPFA **FQ**SDPE **KLI**QARYDK **VKGS**AVNPVLR **REGNS**DRRAF **VSVKN**VFRKY **PHR**MGEWS **SDSK**SHVA **MS** 178
Alicd (WP_148254375.1) **STPOLKAVIKELQ**QGYKLPDYPFA **FQ**SDPE **KLI**QARYDK **VKGS**AVNPVLR **REGNS**DRRAF **VSVKN**VFRKY **PHR**LGEWS **SDSR**SHVA **MS** 178
Mticd (WP_224420928.1) **STPOLKAVIKELQ**QGYKLPDYPFA **FQ**SDPE **KLI**QARYDK **VKGS**AVNPVLR **REGNS**DRRAF **VSVKN**VFRKY **PHR**LGEWS **SDSR**SHVA **MS** 178
Hsicd (WP_163502434.1) **STPOLKAVIRELQ**QGYKLPDYPFA **FQ**SDPE **KLI**QARYDK **VKGS**AVNPVLR **REGNS**DRRAF **VSVKN**VFRKY **PHR**MGEWS **SDSK**SHVA **MS** 178
Mticd (WP_224415265.1) **STPOLKAVIKELQ**QGYKLPDYPFA **FQ**SDPE **KLI**QARYDK **VKGS**AVNPVLR **REGNS**DRRAF **VSVKN**VFRKY **PHR**LGEWS **SDSR**SHVA **MS** 178

Hpicd **EGDFY**CSEK **SALT**EK **TDLK**ELVA **KD**GS **TIVL**KQK **TSVI**E **CE**VVDA **AVMS**RN **ALR**RFVA **DE**VADAKAK **DVLF**SLHLKAT **MMK**VSDP **IM** 267
Alicd (WP_148254375.1) **EGDFY**CSEK **SAMT**ATAG **NK**ELVA **DG**ST **QTLK**E **TIVL**GE **VDAA**VMS **RNR**LAR **FVA**E **ED**AK **SRN**VLFS **LHLK**AT **MMK**VSDP **II** 267
Mticd (WP_224420928.1) **EGDFY**GSET **SAV**MES **AG**SV **K**ELVA **HG**DG **SVK**LK **BA**VV **LAGE**VD **AA**VMS **RQ**LAR **FVA**E **ED**AK **Q**DVLF **SL**HLKAT **MMK**VSDP **IM** 267
Hsicd (WP_163502434.1) **EGDFY**ASEK **SALT**EK **TDLK**ELVA **KD**GS **TIVL**KQK **TSVI**E **CE**VVDA **AVMS**RN **ALR**RFVA **DE**VADAKAK **DVLF**SLHLKAT **MMK**VSDP **II** 267
Mticd (WP_224415265.1) **EGDFY**ASET **SAV**MAE **ES**VK **VTL**H **GD**GN **VTV**LK **BA**VV **LAGE**VD **AA**VMS **RQ**LAR **FVA**E **ED**AK **Q**DVLF **SL**HLKAT **MMK**VSDP **IM** 267

Hpicd **FGVIVSEFYQ**VDV **SK**HADD **QAA**G **FD**NN **GIG**DLY **SAL**KS **EE**FR **Q**TC **E**DE **FQ**LYAER **RL**AMV **NS**HKG **IT**NL **HVP**SD **VI**ID **AS**MP **A** 356
Alicd (WP_148254375.1) **FGVIVSEFY**EVL **DK**HAG **EL**DK **Y**GF **DN**G **I**GD **LY**ST **IKAL**PK **AK**NE **IT**SD **ES**LYAER **RL**AMV **NS**HKG **IT**NL **HVP**SD **VI**ID **AS**MP **A** 356
Mticd (WP_224420928.1) **FGVIVSEFY**EVL **AK**YAD **EL**DK **Y**GF **DN**G **I**GD **LY**AT **Q**SD **AK**R **Q**AT **ES**D **I**Q **LYA**ER **RL**AMV **NS**HKG **IT**NL **HVP**SD **VI**ID **AS**MP **A** 356
Hsicd (WP_163502434.1) **FGVIVSEFY**D **VL**AR **YAD**EL **DK**AG **F**DN **S**G **I**GD **LY**AT **IK**EL **PK**AK **Q**EA **IK**AL **Y**ER **LYA**ER **RL**AMV **NS**HKG **IT**NL **HVP**SD **VI**ID **AS**MP **A** 356
Mticd (WP_224415265.1) **FGVIVSEFY**EVL **AK**YAD **EL**DK **Y**GF **DN**G **I**GD **LY**AT **Q**SD **AK**R **Q**AT **ES**D **I**Q **LYA**ER **RL**AMV **NS**HKG **IT**NL **HVP**SD **VI**ID **AS**MP **A** 356

Hpicd **MIRD**SC **KMW**GAD **D** **LD**HD **KAVI**PD **RCY**AG **I**Y **Q**V **AT** **ED**CK **N** **G**AL **D**PT **TM**GS **V**PN **V**GL **MAQ**KA **E**EY **G**SH **D**K **T**F **I**PA **D**ST **V**R **V**D **S** **GS**AL 445
Alicd (WP_148254375.1) **MLRD**SC **KMW**GAD **DA**LD **HD**KAVI **PD**RCYAG **I**Y **Q**V **AT** **ED**CR **N** **G**AL **D**PT **TM**GS **V**PN **V**GL **MAQ**KA **E**EY **G**SH **D**K **T**F **I**PA **D**ST **V**R **V**D **S** **GS**AL 445
Mticd (WP_224420928.1) **MIRD**SC **KMW**GAD **DA**LD **HD**KAVI **PD**RCYAG **I**Y **Q**V **AT** **ED**CK **N** **G**AL **D**PT **TM**GS **V**PN **V**GL **MAQ**KA **E**EY **G**SH **D**K **T**F **I**PA **D**ST **V**R **V**D **S** **GS**AL 445
Hsicd (WP_163502434.1) **MIRD**SC **KMW**GAD **D** **LD**HD **KAVI**PD **RCY**AG **I**Y **Q**V **AT** **ED**CK **N** **G**AL **D**PT **TM**GS **V**PN **V**GL **MAQ**KA **E**EY **G**SH **D**K **T**F **I**PA **D**ST **V**R **V**D **S** **GS**AL 445
Mticd (WP_224415265.1) **MIRD**SC **KMW**GAD **DA**LD **HD**KAVI **PD**RCYAG **I**Y **Q**V **AT** **ED**CK **N** **G**AL **D**PT **TM**GS **V**PN **V**GL **MAQ**KA **E**EY **G**SH **D**K **T**F **I**PA **D**ST **V**R **V**D **S** **GS**AL 445

Hpicd **VLEH**SV **E** **G**DI **WR**MC **T**K **D**AP **I** **D**W **V**K **L**AV **N** **R**AR **S** **Q**PA **V**FL **D**AN **R**HA **D**AL **I** **K**VE **S** **V** **L**E **H**DT **GL**DIR **I** **M** **P** **D**AM **R**ES **L**ER **I** 534
Alicd (WP_148254375.1) **VLEH**SV **E** **G**DI **WR**MC **T**K **D**AP **I** **D**W **V**K **L**AV **N** **R**AR **S** **Q**PA **V**FL **D**AN **R**HA **D**AL **I** **K**VE **S** **V** **L**E **H**DT **GL**DIR **I** **M** **P** **D**AM **R**ES **L**ER **I** 534
Mticd (WP_224420928.1) **VLEH**SV **E** **G**DI **WR**MC **T**K **D**AP **I** **D**W **V**K **L**AV **N** **R**AR **S** **Q**PA **V**FL **D**AN **R**HA **D**AL **I** **K**VE **S** **V** **L**E **H**DT **GL**DIR **I** **M** **P** **D**AM **R**ES **L**ER **I** 534
Hsicd (WP_163502434.1) **VLEH**SV **E** **G**DI **WR**MC **T**K **D**AP **I** **D**W **V**K **L**AV **N** **R**AR **S** **Q**PA **V**FL **D**AN **R**HA **D**AL **I** **K**VE **S** **V** **L**E **H**DT **GL**DIR **I** **M** **P** **D**AM **R**ES **L**ER **I** 534
Mticd (WP_224415265.1) **VLEH**SV **E** **G**DI **WR**MC **T**K **D**AP **I** **D**W **V**K **L**AV **N** **R**AR **S** **Q**PA **V**FL **D**AN **R**HA **D**AL **I** **K**VE **S** **V** **L**E **H**DT **GL**DIR **I** **M** **P** **D**AM **R**ES **L**ER **I** 534

Hpicd **KCED**TI **S**VT **G**N **V**LR **D**YL **T**DL **F**PE **IM**EL **GT**S **AK**ML **S**IV **PL**M **NG**GL **F**ET **G**AG **S**AP **K**H **V**Q **Q** **LE**N **H**LR **W**DS **L**GE **F**L **A**LA **S**LE **H**L **C** **H**D 623
Alicd (WP_148254375.1) **QCED**TI **S**VT **G**N **V**LR **D**YL **T**DL **F**PE **IM**EL **GT**S **AK**ML **S**IV **PL**M **NG**GL **F**ET **G**AG **S**AP **K**H **V**Q **Q** **LE**N **H**LR **W**DS **L**GE **F**L **A**LA **S**LE **H**L **C** **H**D 623
Mticd (WP_224420928.1) **ACKD**TI **S**VT **G**N **V**LR **D**YL **T**DL **F**PE **IM**EL **GT**S **AK**ML **S**IV **PL**M **NG**GL **F**ET **G**AG **S**AP **K**H **V**Q **Q** **LE**N **H**LR **W**DS **L**GE **F**L **A**LA **S**LE **H**L **C** **H**D 623
Hsicd (WP_163502434.1) **KCED**TI **S**VT **G**N **V**LR **D**YL **T**DL **F**PE **IM**EL **GT**S **AK**ML **S**IV **PL**M **NG**GL **F**ET **G**AG **S**AP **K**H **V**Q **Q** **LE**N **H**LR **W**DS **L**GE **F**L **A**LA **S**LE **H**L **C** **H**D 623
Mticd (WP_224415265.1) **ACKD**TI **S**VT **G**N **V**LR **D**YL **T**DL **F**PE **IM**EL **GT**S **AK**ML **S**IV **PL**M **NG**GL **F**ET **G**AG **S**AP **K**H **V**Q **Q** **LE**N **H**LR **W**DS **L**GE **F**L **A**LA **S**LE **H**L **C** **H**D 623

Hpicd **N**RA **K**ML **A**LD **A** **D**AN **G** **E**FL **D**SN **K**SP **E** **R**K **V**GE **L**DN **R**GS **H**F **L**Y **L**Y **W** **A**LA **B** **A** **E** **C**SE **S** **E** **M** **O** **T** **F** **E** **R** **L** **A** **D** **A** **L** **T** **A** **K** **E** **A** **T** **I** **V** **E** **L** **N** **S** **V** **O** **G** **O** **P** **E** **D** 712
Alicd (WP_148254375.1) **N**RA **K**ML **A**LD **A** **D**AN **G** **E**FL **D**SN **K**SP **E** **R**K **V**GE **L**DN **R**GS **H**F **L**Y **L**Y **W** **A**LA **B** **A** **E** **C**SE **S** **E** **M** **O** **T** **F** **E** **R** **L** **A** **D** **A** **L** **T** **A** **K** **E** **A** **T** **I** **V** **E** **L** **N** **S** **V** **O** **G** **O** **P** **E** **D** 712
Mticd (WP_224420928.1) **N**RA **V**FL **A**LD **A** **D**AN **G** **E**FL **D**SN **K**SP **E** **R**K **V**GE **L**DN **R**GS **H**F **L**Y **L**Y **W** **A**LA **B** **A** **E** **C**SE **S** **E** **M** **O** **T** **F** **E** **R** **L** **A** **D** **A** **L** **T** **A** **K** **E** **A** **T** **I** **V** **E** **L** **N** **S** **V** **O** **G** **O** **P** **E** **D** 712
Hsicd (WP_163502434.1) **N**RA **V**FL **A**LD **A** **D**AN **G** **E**FL **D**SN **K**SP **E** **R**K **V**GE **L**DN **R**GS **H**F **L**Y **L**Y **W** **A**LA **B** **A** **E** **C**SE **S** **E** **M** **O** **T** **F** **E** **R** **L** **A** **D** **A** **L** **T** **A** **K** **E** **A** **T** **I** **V** **E** **L** **N** **S** **V** **O** **G** **O** **P** **E** **D** 712
Mticd (WP_224415265.1) **N**RA **V**FL **A**LD **A** **D**AN **G** **E**FL **D**SN **K**SP **E** **R**K **V**GE **L**DN **R**GS **H**F **L**Y **L**Y **W** **A**LA **B** **A** **E** **C**SE **S** **E** **M** **O** **T** **F** **E** **R** **L** **A** **D** **A** **L** **T** **A** **K** **E** **A** **T** **I** **V** **E** **L** **N** **S** **V** **O** **G** **O** **P** **E** **D** 712

Hpicd **IRGY**HP **D** **H**EL **T**AK **V**MR **PS** **T** **I** **N** **E** **T** **A** **M** **V**AK **G** 744
Alicd (WP_148254375.1) **IRGY**HP **D** **H**EL **T**AK **V**MR **PS** **T** **I** **N** **E** **T** **A** **M** **V**AK **G** 744
Mticd (WP_224420928.1) **IRGY**HP **D** **H**AL **T**AK **V**MR **PS** **T** **I** **N** **E** **L** **G** **V** **K** **B** 743
Hsicd (WP_163502434.1) **IRGY**HP **D** **H**EL **T**AK **V**MR **PS** **T** **I** **N** **E** **L** **G** **V** **V** **A** **G** 744
Mticd (WP_224415265.1) **IRGY**HP **D** **H**AL **T**AK **V**MR **PS** **T** **I** **N** **E** **L** **G** **V** **K** **B** 743

icd of *Cobetia amphilecti* N-80

Caicd
 Psicd (WP_064482494.1) MGFQKIQVPEEGAKKITANSNDTLNVPNIPIPFIEGGDIGVDVTPAKKIAVDAAVDKAYGGERKIHMEVYAGEKATHVYDADTWLFF 87
 Pzicd (WP_128121199.1) MGYQKIQVPEASGDKITVNDNTLNVNPIPIPYIEGGDIGVDISPVMIKVVDAAVEKAYGGERKIAMMEIYAGEKATQVYDQDTWLF 87
 Haicd (WP_027351550.1) MAFEKIQLEPAGGEEKITVNAADNSLNVNPIPIPFIEGGDIGVDVTPAKKIAVDAAVEKAYGGERKIHMEVYAGEKATITLYDADTWLFF 87
 Pbicd (PPC77059.1) MGYQKIQVPEEGAKKITVNAADNSLNVNPIPIPFIEGGDIGVDVSPVMIKVVDAAVEKAYGGERKIAMMEVYAGEKATQVYDQDNTWLF 87

Caicd
 Psicd (WP_064482494.1) EETLEAVKDYIVSIKGPLTTPVGGGIRSLNVALRQKLDLYICLRPVRWFTGVPSPVKKEPADVMVIFRENSEDIYAGVEWKAGTPEA 174
 Pzicd (WP_128121199.1) KETLEAVRDFVVISIKGPLTTPVGGGIRSLNVALRQELDLYICORPVRWFTGVPSPVKKEPADVMVIFRENSEDIYAGVEWKAGSPEFC 174
 Haicd (WP_027351550.1) EETLRVAQEVVVISIKGPLTTPVGGGIRSLNVALRQKLDLYICERPVRWFTGVPTPVKKEPADVMVIFRENSEDIYAGVEWKAGSPEFA 174
 Pbicd (PPC77059.1) AETLEAVKDYIVVISIKGPLTTPVGGGIRSLNVALRQKLDLYICORPVRWFTGVPSPVKKEPADVMVIFRENSEDIYAGVEWKAGSPEA 174

Caicd
 Psicd (WP_064482494.1) DKVIEFLREEMGVNTIRFDECGIGVKPVSEEGTQRLVRKALQAVTIDNDRS SLTLVHKGNIMKFTEGAFKDWGYEIVKDFEGEELLD 261
 Pzicd (WP_128121199.1) EKVIKFLTEEMGVKKIRFTENCGIGIKPVSEEGTQRLVRKALQAVVDNDRR SVTIVHKGNIMKFTEGAFKEWGYEVARDFEGEELLD 261
 Haicd (WP_027351550.1) DKVIEFLREEMGVNTIRFDECGIGVKPVSEEGTQRLVRKALQAVTIDNDRS SVTLVHKGNIMKFTEGAFKNWGYEVARDEFAEELLD 261
 Pbicd (PPC77059.1) EKVIKFLTEEMGVKKIRFTENCGIGIKPVSEEGTQRLVRKALQAVTIDNDRS SLTLVHKGNIMKFTEGAFKEWGYEVARDEFAEELLD 261

Caicd
 Psicd (WP_064482494.1) GGPWVTFKNPNNGKDIIVKDIADAMLQQIILLRPEYDVIAATLNLNGDYLSDALAAEVGGIGIAPGANISDTIAMFEATHGTAPKYA 348
 Pzicd (WP_128121199.1) GGPWVTFKNPNNGKDIIVKDIADAMLQQIILLRPEYDVIAATLNLNGDYLSDALAAEVGGIGIAPGANISDTIAMFEATHGTAPKYA 348
 Haicd (WP_027351550.1) GGPWVAHDPNPNNGKRIIVKDIADAMLQQVLLRPEYDVIAATLNLNGDYLSDALAAEVGGIGIAPGANISDAVGMFEATHGTAPKYA 348
 Pbicd (PPC77059.1) GGPWVTFKNPNNGKDIIVKDIADAMLQQIILLRPEYDVIAATLNLNGDYLSDALAAEVGGIGIAPGANISDTIAMFEATHGTAPKYA 348

Caicd
 Psicd (WP_064482494.1) GQDKVNPGSVILSAEMMLRHMGWEEADLIIRNGTEGATAAKGEVTYDPERLMDGAKLLKCSFEFGAIVANNDA 420
 Pzicd (WP_128121199.1) GQDKVNPGSVILSAEMMLRHMGWEEADLIIRNGTEGATAAKTIVTYDPERLMDGAKLLKSCSEFGDAMISHM-- 418
 Haicd (WP_027351550.1) GQDKVNPGSVILSAEMMLRHMGWEEADLIIRNGTEGATAAKTIVTYDPERLMDGAKLLKSCSEFGDAMISHM-- 418
 Pbicd (PPC77059.1) GQDKVNPGSVILSAEMMLRHMGWEEADLIIRNGTEGATAAKTIVTYDPERLMDGAKLLKCSFEFGAIVANN-- 418

HpnarG ---MSHFLDRLNFRKRSRPFANRHEGLRSESRQWEVSYRNRWQHDKVVRSSTHGVNCTGSCSWKIVKNGLVTWEQQTDDYFRTRE 84
AanarG (WP_019699762.1) ---MSHFLDRLNFRKRSRPFANRHEGLRSESRQWEVSYRNRWQHDKVVRSSTHGVNCTGSCSWKIVKNGLVTWEQQTDDYFRTRE 84
AanarG (WP_019699762.1) ---MSHFLDRLNFRKRSRPFANRHEGLRSESRQWEVSYRNRWQHDKVVRSSTHGVNCTGSCSWKIVKNGLVTWEQQTDDYFRTRE 84
BtнарG (WP_010677859.1) MAKQNSLFRSLKHLVR-GRINDQWTEENPRDRDWEISYRQWHDKVVRSSTHGVNCTGSCSWKIVKNGLVTWEQQTDDYFRTRE 86
EhnarG (WP_006810897.1) ---MSKFLDRFRVFKQKGEFADGHCQLDTRDWEVGYRQWHDKVVRSSTHGVNCTGSCSWKIVKNGLVTWEQQTDDYFRTRE 84

HpnarG LPNHEPRGCRGASYSWYLYSNRKLKYPILRKLPLALWRLKANKPDPVDAWASVLEDPARTKQVKKRARGMGGFVRCNDEINELVA 171
AanarG (WP_019699762.1) LPNHEPRGCRGASYSWYLYSNRKLKYPILRKLPLALWRLKANKPDPVDAWASVLEDPARTKQVKKRARGMGGFVRCNDEINELVA 170
AanarG (WP_019699762.1) LPNHEPRGCRGASYSWYLYSNRKLKYPILRKLPLALWRLKANKPDPVDAWASVLEDPARTKQVKKRARGMGGFVRCNDEINELVA 170
BtнарG (WP_010677859.1) EPIVPEPRGCRGASYSWYLYSNRKLKYPILRKLPLALWRLKANKPDPVDAWASVLEDPARTKQVKKRARGMGGFVRCNDEINELVA 173
EhnarG (WP_006810897.1) LPNHEPRGCRGASYSWYLYSNRKLKYPILRKLPLALWRLKANKPDPVDAWASVLEDPARTKQVKKRARGMGGFVRCNDEINELVA 171

HpnarG ASNVVYIARQVGPDRILGFSPIPAMSMVSYAAGSRVLSLIGVYVMSFYDWYCDLPPASPMTWGEQTDVPESADWNSYIILWGSNVF 258
AanarG (WP_019699762.1) AANVYIARQVGPDRILGFSPIPAMSMVSYAAGSRVLSLIGVYVMSFYDWYCDLPPASPMTWGEQTDVPESADWNSYIILWGSNVF 257
AanarG (WP_019699762.1) AANVYIARQVGPDRILGFSPIPAMSMVSYAAGSRVLSLIGVYVMSFYDWYCDLPPASPMTWGEQTDVPESADWNSYIILWGSNVF 257
BtнарG (WP_010677859.1) ASTIVYIARQVGPDRVGFSPVAMSMVSYAAGSRVLSLIGVYVMSFYDWYCDLPPASPMTWGEQTDVPESADWNSYIILWGSNVF 260
EhnarG (WP_006810897.1) ASNVVYIARQVGPDRVGFSPVAMSMVSYAAGSRVLSLIGVYVMSFYDWYCDLPPASPMTWGEQTDVPESADWNSYIILWGSNVF 258

HpnarG QTRTPDAHFTTEVRVYGTKEVSVTIDVYENSKLTDLWLSAKGTDALAMAMGHVILKEFHLDN---PSCYTDYVRSYTDMPFLV 342
AanarG (WP_019699762.1) QTRTPDAHFTTEVRVYGTKEVSVTIDVYENSKLTDLWLSAKGTDALAMAMGHVILKEFHLDN---PSCYTDYVRSYTDMPFLV 344
AanarG (WP_019699762.1) QTRTPDAHFTTEVRVYGTKEVSVTIDVYENSKLTDLWLSAKGTDALAMAMGHVILKEFHLDN---PSCYTDYVRSYTDMPFLV 341
BtнарG (WP_010677859.1) QTRTPDAHFTTEVRVYGTKEVSVTIDVYENSKLTDLWLSAKGTDALAMAMGHVILKEFHLDN---PSCYTDYVRSYTDMPFLV 344
EhnarG (WP_006810897.1) QTRTPDAHFTTEVRVYGTKEVSVTIDVYENSKLTDLWLSAKGTDALAMAMGHVILKEFHLDN---PSCYTDYVRSYTDMPFLV 342

HpnarG LEVRE---DGSAPGQLRASDFDAALGCENNPEWKTVAQETRDLLVVRGSGTGRWGETG---DEVGWNLSL---AAGTEIK 420
AanarG (WP_019699762.1) LREQALPDGRVVRVDPYVRASDFADRLGCGHPEWKTVAQETRDLLVVRGSGTGRWGETG---DEVGWNLSL---AAGTEIK 427
AanarG (WP_019699762.1) LKRR---DG---YAPDFHLRASQLDGLGCEQNNPEWKTVAQETRDLLVVRGSGTGRWGETG---DEVGWNLSL---AAGTEIK 423
BtнарG (WP_010677859.1) LNKR---ENNRSDLELRASDFDQHELG---BWKTVVDEENTNIAVENGSGTGRWGETG---DEVGWNLSL---AAGTEIK 414
EhnarG (WP_006810897.1) LEEER---DGYAAGMLRSLALVDALGCENNPEWKTVAQETRDLLVVRGSGTGRWGETG---DEVGWNLSL---AAGTEIK 415

HpnarG ELISLANH-HDSVAR---VAFYFPGIEHEHTEHVKGAGVGAADDLPHNLFRKRLKRAQGS---EMLAVTVFDLMAQVAGTDR 497
AanarG (WP_019699762.1) ELISLEAGDAEAHWETAQVFPYFPGIASEHE-----PANVQSDVHARTVPRRLATVAGGTARVLEAVFDLMAQVAGTDR 508
AanarG (WP_019699762.1) ERLSLVDG-ADAVGV---VGFYFPGIASEHE-----AEHDELVLRNVVPRRLATVAGGTARVLEAVFDLMAQVAGTDR 485
BtнарG (WP_010677859.1) ERLSLVKE-SDETVM---VGFYFPGIASEHE-----KEGGKVVGVVPRRMLDNSGN---EMLAVTVFDLMAQVAGTDR 476
EhnarG (WP_006810897.1) LRLSLVGS-QDETAD---VGFYFPGIASEHE-----LQNVLMHRLFRKRLKRAQGS---EMLAVTVFDLMAQVAGTDR 486

HpnarG GFVGDGEDCETSFDQIRVYTPAWQEKITGVVPAEACTRIAREFVLAHAKTNGRSMIVGAGNHWYHMDNRYGLINMLVMGCGIGV 584
AanarG (WP_019699762.1) GEP---GELVAGYDDVYTPAWQEKITGVVPAEACTRIAREFVLAHAKTNGRSMIVGAGNHWYHMDNRYGLINMLVMGCGIGV 592
AanarG (WP_019699762.1) GEP---GGVYASVDDVYTPAWQEKITGVVPAEACTRIAREFVLAHAKTNGRSMIVGAGNHWYHMDNRYGLINMLVMGCGIGV 569
BtнарG (WP_010677859.1) GK---GDYPTDYNPAAREVYTPAWQEKITGVVPAEACTRIAREFVLAHAKTNGRSMIVGAGNHWYHMDNRYGLINMLVMGCGIGV 560
EhnarG (WP_006810897.1) GLN---DENCTSYDVKAYTPAWQEKITGVVPAEACTRIAREFVLAHAKTNGRSMIVGAGNHWYHMDNRYGLINMLVMGCGIGV 570

HpnarG SGGGWAHYVGQEKLRPDTGWTLAFGLDWRPFRPNNSTSFYFASHSQWRMEKLEIKELSLPLAKEDVPG-SLIDFNVRAERMGWL 670
AanarG (WP_019699762.1) SGGGWAHYVGQEKLRPDTGWTLAFGLDWRPFRPNNSTSFYFASHSQWRMEKLEIKELSLPLAKEDVPG-SMIDFNVRAERMGWL 678
AanarG (WP_019699762.1) SGGGWAHYVGQEKLRPDTGWTLAFGLDWRPFRPNNSTSFYFASHSQWRMEKLEIKELSLPLAKEDVPG-SMIDFNVRAERMGWL 656
BtнарG (WP_010677859.1) NGGGWAHYVGQEKLRPDTGWTLAFGLDWRPFRPNNSTSFYFASHSQWRMEKLEIKELSLPLAKEDVPG-SKSNMHPADFNAMASRLGWL 644
EhnarG (WP_006810897.1) SGGGWAHYVGQEKLRPDTGWTLAFGLDWRPFRPNNSTSFYFASHSQWRMEKLEIKELSLPLAKEDVPG-SLIDFNVRAERMGWL 656

HpnarG PSAPLQNNLPLAKKABAACMST---ADYAVOOLKSGEAFFAAEDPDAHENFRNFIWRSNLLGSGKGHEVYMLKLLGTGRLG 754
AanarG (WP_019699762.1) PSAPLQNNLPLAKKABAACMST---ADYAVOOLKSGEAFFAAEDPDAHENFRNFIWRSNLLGSGKGHEVYMLKLLGTGRLG 762
AanarG (WP_019699762.1) PSAPLQNNLPLAKKABAACMST---ADYAVOOLKSGEAFFAAEDPDAHENFRNFIWRSNLLGSGKGHEVYMLKLLGTGRLG 740
BtнарG (WP_010677859.1) PSAPLQNNLPLAKKABAACMST---ADYAVOOLKSGEAFFAAEDPDAHENFRNFIWRSNLLGSGKGHEVYMLKLLGTGRLG 731
EhnarG (WP_006810897.1) PSAPLQNNLPLAKKABAACMST---ADYAVOOLKSGEAFFAAEDPDAHENFRNFIWRSNLLGSGKGHEVYMLKLLGTGRLG 740

HpnarG CKDLGDFGGQPEEYVWRDEAPEKGLDLDLVDLDFRMSSTOLYSDIVLPLATWYEKDNLNTSDMHPFIHPLTAATDPAWESRSDW 841
AanarG (WP_019699762.1) CKDLGDFGGQPEEYVWRDEAPEKGLDLDLVDLDFRMSSTOLYSDIVLPLATWYEKDNLNTSDMHPFIHPLTAATDPAWESRSDW 848
AanarG (WP_019699762.1) GDEAD---ATVYVNNQEDAAEAKGLDLDLVDLDFRMSSTOLYSDIVLPLATWYEKDNLNTSDMHPFIHPLTAATDPAWESRSDW 824
BtнарG (WP_010677859.1) SDPEQ---SWQEKDNTSEKPEKGLDLDLVDLDFRMSSTOLYSDIVLPLATWYEKDNLNTSDMHPFIHPLTAATDPAWESRSDW 815
EhnarG (WP_006810897.1) CKDLGDFGGQPEEYVWRDEAPEKGLDLDLVDLDFRMSSTOLYSDIVLPLATWYEKDNLNTSDMHPFIHPLTAATDPAWESRSDW 827

HpnarG KCLAKRFKSKVCGHLEGETDLVTLPMQHSPEGLAQE---ANMDWKKGEAFIPGKTFPSEIVYKRYNETVPEFESVGEHLESIG 926
AanarG (WP_019699762.1) KCLAKRFKSKVCGHLEGETDLVTLPMQHSPEGLAQE---ANMDWKKGEAFIPGKTFPSEIVYKRYNETVPEFESVGEHLESIG 934
AanarG (WP_019699762.1) KCLAKRFKSKVCGHLEGETDLVTLPMQHSPEGLAQE---ANMDWKKGEAFIPGKTFPSEIVYKRYNETVPEFESVGEHLESIG 910
BtнарG (WP_010677859.1) REEAKRFKSKVCGHLEGETDLVTLPMQHSPEGLAQE---ANMDWKKGEAFIPGKTFPSEIVYKRYNETVPEFESVGEHLESIG 901
EhnarG (WP_006810897.1) KCLAKRFKSKVCGHLEGETDLVTLPMQHSPEGLAQE---ANMDWKKGEAFIPGKTFPSEIVYKRYNETVPEFESVGEHLESIG 913

HpnarG KGIKAWNTDAVEHLEKTLNHRKLD-CPHKGRLELISAIIDAEEMITLAPETNGHVAVKAWDLKSIKGRDHTHLARKKPEDEKIRFR 1012
AanarG (WP_019699762.1) KGIKAWNTDAVEHLEKTLNHRKLD-CPHKGRLELISAIIDAEEMITLAPETNGHVAVKAWDLKSIKGRDHTHLARKKPEDEKIRFR 1021
AanarG (WP_019699762.1) KGIKAWNTDAVEHLEKTLNHRKLD-CPHKGRLELISAIIDAEEMITLAPETNGHVAVKAWDLKSIKGRDHTHLARKKPEDEKIRFR 997
BtнарG (WP_010677859.1) TRGVIPGDKVFEASMDRLGPKSVGVGKLESLITSAIDAEEMITLAPETNGHVAVKAWDLKSIKGRDHTHLARKKPEDEKIRFR 988
EhnarG (WP_006810897.1) KGIKAWNTDAVEHLEKTLNHRKLD-CPHKGRLELISAIIDAEEMITLAPETNGHVAVKAWDLKSIKGRDHTHLARKKPEDEKIRFR 999

HpnarG VVAQPRKLISSPFWSGLEDHVSYNAGYTNVHELIPWTLVSGROCFYDHAHNRAGFESLIVYRFDIDRAAKGFQLPADNFRKSKA 1099
AanarG (WP_019699762.1) VVAQPRKLISSPFWSGLEDHVSYNAGYTNVHELIPWTLVSGROCFYDHAHNRAGFESLIVYRFDIDRAAKGFQLPADNFRKSKA 1108
AanarG (WP_019699762.1) VVAQPRKLISSPFWSGLEDHVSYNAGYTNVHELIPWTLVSGROCFYDHAHNRAGFESLIVYRFDIDRAAKGFQLPADNFRKSKA 1084
BtнарG (WP_010677859.1) VVAQPRKLISSPFWSGLEDHVSYNAGYTNVHELIPWTLVSGROCFYDHAHNRAGFESLIVYRFDIDRAAKGFQLPADNFRKSKA 1075
EhnarG (WP_006810897.1) VVAQPRKLISSPFWSGLEDHVSYNAGYTNVHELIPWTLVSGROCFYDHAHNRAGFESLIVYRFDIDRAAKGFQLPADNFRKSKA 1086

HpnarG	LNFLTPHQKWGIIHSTYSDNLLMLTLNRRGGPVVWLSEADAAEIDIEDNDWIEVYNANGSIAARAVVVSQRVKAGMVM MYHAQERNVNVF	1186
AanarG(WP_019699762.1)	LNFITPHQKWGIIHSTYTDNLLMLTLNRRGGPCVWISEDDAKRAQIEDNDWIELFNANGALTARAVVVSQRVKPGMVM MYHAQEKIVNTP	1195
AxnarG(WP_006386096.1)	LNWITPHQKWGIIHSTYSDNLRMLTLNRRGGPHVWVISEAEARQAGLVDNDWVEVFVNVNGTLTARVVVSQRVPVGMCLMYHAQEKIVNVF	1171
BtnarG(WP_010677859.1)	LRYMTPHQKWGIIHTMFTDTRNMVQLFRGWQVVWLNEDAAEIGIKDNDWIELYNRNGAVVARAVLTYRMPRGAVYMHHAQDRTMGVP	1162
EhnarG(WP_006810897.1)	LNFLTPHQKWGIIHSTYSDNLLMLTLNRRGGPIVWVWSEADAKDLGIEDNDWIEVFNSNGALTARAVVVSQRVPAGMTMMYHAQERIVNLF	1173

HpnarG	GSEVTGTRGGIHN SVTRVCPKPTHMIGGYAQLSYSFNYYGTVGSRDEFVLVRKMKHVDWLDGE--GNDSVQKNSAQEAVK	1265
AanarG(WP_019699762.1)	GSEVTGTRGGIHN SVTRVVLKPTHMIGGYAQLSYGFNYYGTIGTNRDEFIVLRKMNRVDWLDTP-VADPLVRPTLDQGETA	1275
AxnarG(WP_006386096.1)	GAETSGKRGGIHN SVTRTVLKPPTHMIGGYAQQAYGFNYYGTVGANRDEFVVLVRKMKKVDWLEGLPLVEDPAVQTQQEEKQS-	1251
BtnarG(WP_010677859.1)	GNTINKNRGGIHN SVTRIYPKATHMIGGYSQLSYGFNYYGPTGSQRDTLTIVRPLKEVDWLEN-----	1225
EhnarG(WP_006810897.1)	GSEITEQRGGIHN SVTRITPKPTHMIGGYAQLAYGFNYYGTVGSRDEFVVVRKMKNIINWLDGE--GNDQVQ-----ESVK	1247

narI

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HpnarI      MYDAIAHYLTHLIYGYYPYLAGTVFLLGSLLRFDHGQYTWKGTGSSQMLSSKKNMRLGNSLFHIGIIVIFFGHLVGMMLTPHWVYEPFLHA 88
PbnarI (WP_090438698.1) ---MFEFYLOHLIYGYYPYLAGTVFVLVGSLLRFDHGQYTWKAHSSQILSKKNMRLASNLHFVHGILVIVFFGHLEFGMLTPHWVYAPFLISA 85
PbnarI (WP_090500693.1) ---MFEFYLOHLIYGYYPYLAGTVFVLVGSLLRFDHGQYTWKAHSSQILAKKNMRLASNLHFVHGILVIVFFGHLEFGMLTPHWVYAPFLISA 85
PanarI (WP_147185795.1) ---MFEFYLOHLIYGYYPYLAGTVFVLVGSLLRFDHGQYTWKGTGSSQMLSTKKNMRLASNLHFHIGILVIVFFGHLEFGMLTPHWVYAPFLISA 85
AlnarI (WP_148252143.1) ---MFEFYLOHLIYGYYPYLAGTVFVLVGSLLRFDHGQYTWKGTGSSQMLSSKKNMRLASNLHFHIGIIVIFFGHLVGMMLTPHWVYAPFLISA 85

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HpnarI      GTKQLVAIVVGGIAGAMCVVGGAMLLYRRLANPRVKASSSMMDTLILGLIVLQACLGMVTIIFSLGHMDGEMMLTLLSSWAQSIIVFFSG 176
PbnarI (WP_090438698.1) GNKQLLAIIVGGIAGAMCVVGGAMLLYRRMTNPRVKASSATMDNVILALILFQACLGMITIIIFSLGHLEGDVMLTLASWAQAIVFFSG 173
PbnarI (WP_090500693.1) GNKQLLAIIVGGIAGAMCVVGGAMLLYRRMTNPRVKASSATMDNLILALILFQACLGMITIIIFSLGHLEGDVMLTLASWAQAIVFFSG 173
PanarI (WP_147185795.1) GTKQILAIIVGGIAGVMLVGGAMLLYRRLYNPRVKASSSMMDTLILGLIVLQACLGIITVIFSLGHLDGEMMLTLGWAQSIIVFFSG 173
AlnarI (WP_148252143.1) GAKQILAIIVGGIAGVMLVGGAMLLYRRLENPRVRASSGEMDNLILALILVQACLGLVTVVIFSLGHLDGEMMLTLASWAQAIVFFSG 173

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HpnarI      GAADYMQEVSWIYKLHIFIGLTIILLFPFSRLVHVWSAPLGYVTRRYQLVRRRG 230
PbnarI (WP_090438698.1) GAANYLEEVSWIYKIHFVGLTIILLFPFSRLVHVWSIPLGYLGRNYQIVRKRK 227
PbnarI (WP_090500693.1) GAANYLEEVSWIYKVHIFVGLTIILLFPFSRLVHIVSIPLGYLGRNYQIVRKRK 227
PanarI (WP_147185795.1) NAADYMANVSWIYKLHVFLGLTIILLFPFTRLVHVWSIPLGYLGRRYQIVRRRG 227
AlnarI (WP_148252143.1) GAADYMTQVSWIYKLHIFLGLTIILLFPFTRLVHVWSAPLGYVTRRYQLVRRRK 227

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nirD

HpnirD	-MTATAMK	KEMDMADVHNSEAFENHASENN	TA--	WQK	VCTKD	DLVAFSGIAAWLE	TAE	GPAQVAIFY	LPG-LG	QGKGD	ELFALDHH	82	
CanirD	-MTSPAL	ATTFSTPLSSPSSATQD	TSAA	TS	PLRW	VTLCQRE	DLVPGSGVAAWLE	ADGQAR	QIALFT	LPATVDS-	DDLT	LF	84
HvnirD (WP_125746047.1)	-MTATALK	-----	HTV	STD	T---	WQPL	CTKADLVAFSGVAAWLNT	PEGPA	QVAIFY	LPKQH	POGHEK	ELYALDHF	66
AhnirD (WP_092568117.1)	MTTATALK	-----	TET	D	TMT---	WQT	ICSKADLVAFSGVAAWLNT	SDGPA	QVALFY	LPG----	HDQ	ELYAVDHH	62
HhnirD (WP_095602547.1)	-MTATALK	-----	HTV	STD	T---	WQPL	CAKADLVAFSGVAAWLNT	SEGPA	QVAIFY	LPRQR	SQGEK	ELYAIDHF	66

HpnirD	DPFSNANVIARGIVGDLKGS	AVVASPIYKQ	FRLEDGQCLEDED	VKLRTWKV	EFKG	DEVWVEG	-----	145
CanirD	DPVSGANVIARGLLGDHAGE	PLVISPLYKQ	RYRLSDGQCLDD	TLALTVPVRL	AGGEVQV	QCORTDDAC		154
HvnirD (WP_125746047.1)	DPFSNANVIARGIIGDVKGN	PVVASPLYKQ	FRLEDGQCLEDEN	IKLRTWKV	AFRGE	EVWVAG	-----	129
AhnirD (WP_092568117.1)	DPFSRANVIARGIVGDLKGP	VVASPIYKQ	FRLEDGQCLEDES	VQLRTWKV	SFKG	DEVCI	EV-----	125
HhnirD (WP_095602547.1)	DPFSNANVIARGIIGDIKGS	SVVASPLYKQ	FRLEDGQCLEDEN	IKLRTWKV	AFRGE	EVWVQ	-----	129

nirS

HpnirS MKKRNRYLRPLAVVTAASGLGIVHFFEDFNQDQEAERYRGTGSPVDAASANAVRTPGAPDLTEEFERAKEIYFQRCAGCHG 86
 FbnirS (MCG8523864.1) MRVETKMLKPLALAVAITSGVNAQAAPKADK---STMAYGTTSAVVAESAARIVRSPGAPDLTDFEFKAKQIYFQRCAGCHG 83
 MsnirS (GB088462.1) MRVSNMLKPLALAVASGTVTAQAAPKADK---SSVAYGTTASAVVPSARVVRTPGAPDLTDFEFKAKQIYFQRCAGCHG 83
 MpnirS (WP_091705256.1) MRVETKMLKPLAMAVFASGTVTAQAAPKADK---STMAYGTTSTVTPSSAKSVRTPGAPDLTDFEFKAKQIYFQRCAGCHG 83
 MnnirS (WP_227548888.1) -----MKPLALAVAITSGVNAQAAPKADK---STMAYGTTSAVVAESAARIVRSPGAPDLTDFEFKAKQIYFQRCAGCHG 77

HpnirS VLRKGTGKPLTDTIQEGLDYLKVFINYGSPAGMPNWCTSGDFEEVELMAKYVMHEPPVPEPFLADMKETWEVIVPPEDRF 172
 FbnirS (MCG8523864.1) VLRKGTGKPLTDTIQEGLDYLKVFINYGSPAGMPNWCTSGDFEEVELMAKYVMHEPPVPEPFLADMKETWEVIVPPEDRF 169
 MsnirS (GB088462.1) VLRKGTGKPLTDTIQEGLDYLKVFINYGSPAGMPNWCTSGDLTDFEEVELMAKYVMHEPPVPEPFLADMKETWEVIVPPEDRF 169
 MpnirS (WP_091705256.1) VLRKGTGKPLTDTIQEGLDYLKVFINYGSPAGMPNWCTSGDFEEVELMAKYVMHEPPVPEPFLADMKETWEVIVPPEDRF 169
 MnnirS (WP_227548888.1) VLRKGTGKPLTDTIQEGLDYLKVFINYGSPAGMPNWCTSGDFEEVELMAKYVMHEPPVPEPFLADMKETWEVIVPPEDRF 163

HpnirS TRQMNLDLLENMFVSLTRDAGQIALIDGSEVVKIIDTGYAVHISRMSAGRYVVTGRDALINMIDLWEEEPQIVAKIKVGMEA 258
 FbnirS (MCG8523864.1) TRQMNLDLLENMFVSLTRDAGQIALIDGSEVVKIIDTGYAVHISRMSAGRYVVTGRDALINMIDLWEEEPQIVAKIKVGMEA 255
 MsnirS (GB088462.1) TRQMNLDLLENMFVSLTRDAGQIALIDGSEVVKIIDTGYAVHISRMSAGRYVVTGRDALINMIDLWEEEPQIVAKIKVGMEA 255
 MpnirS (WP_091705256.1) TRQMNLDLLENMFVSLTRDAGQIALIDGSEVVKIIDTGYAVHISRMSAGRYVVTGRDALINMIDLWEEEPQIVAKIKVGMEA 255
 MnnirS (WP_227548888.1) TRQMNLDLLENMFVSLTRDAGQIALIDGSEVVKIIDTGYAVHISRMSAGRYVVTGRDALINMIDLWEEEPQIVAKIKVGMEA 249

HpnirS RSVETSKEFGYEDRFALAGYWPQVIMDGDTLEPKKIVSTRGMTVDTQEYHPEPRVAIVASHHPPEFIVNVKETGKILVNYE 344
 FbnirS (MCG8523864.1) RSVETSKEYGWEKDLAIACTYWPQVIMDGDTLEPKKIVSTRGMTVDTQEYHPEPRVAIVASHHPPEFIVNVKETGKILVNYE 341
 MsnirS (GB088462.1) RSVETSKEYGWEKDLAIACTYWPQVIMDGDTLEPKKIVSTRGMTVDTQEYHPEPRVAIVASHHPPEFIVNVKETGKILVNYE 341
 MpnirS (WP_091705256.1) RSVETSKEYGWEKDLAIACTYWPQVIMDGDTLEPKKIVSTRGMTVDTQEYHPEPRVAIVASHHPPEFIVNVKETGKILVNYE 341
 MnnirS (WP_227548888.1) RSVETSKEYGWEKDLAIACTYWPQVIMDGDTLEPKKIVSTRGMTVSTRQYHPEPRVAIVASHHPPEFIVNVKETGKILVNYE 335

HpnirS NDLDAISVETLRSFLHDGGWDSRYRFMTAANSNKILVVDQDRNLEAVVDVGTQHPGRGANVDFPEGEVWATSHLGDNTIC 430
 FbnirS (MCG8523864.1) DMEVMNLSIDARFLHDGGWDSRYRFMTAANSNKILVVDQDRNLEAVVDVGTQHPGRGANVDFPEGEVWATSHLGDNTIC 427
 MsnirS (GB088462.1) DDLDSVETLDAARFLHDGGWDSRYRFMTAANSNKILVVDQDRNLEAMVDVGTQHPGRGANVDFPEGEVWATSHLGDNTIC 427
 MpnirS (WP_091705256.1) DLDVMSHTLDAARFLHDGGWDSRYRFMTAANSNKILVVDQDRNLEAMVDVGTQHPGRGANVDFPEGEVWATSHLGDNTIC 427
 MnnirS (WP_227548888.1) DMEVMNLSIDARFLHDGGWDSRYRFMTAANSNKILVVDQDRNLEAVVDVGTQHPGRGANVDFPEGEVWATSHLGDNTIC 421

HpnirS LIGTDFEHPENAWRVVRLTGQGGGSLFKTHESSNLYVDTELNPCBEISQSVAVYDLNDLEAGYVLPPIAWADLGEQPKRVV 516
 FbnirS (MCG8523864.1) MIGTDFKHPDKAWKVVRTVGGGGSLFKTHESSNLYVDTELNPCBEISQSVAVYDLNDLEAGYVLPPIAWADLGEQPKRVV 513
 MsnirS (GB088462.1) LIGTDFEHPDKAWKVVRTVGGGGSLFKTHESSNLYVDTELNPCBEISQSVAVYDLNDLEAGYVLPPIAWADLGEQPKRVV 513
 MpnirS (WP_091705256.1) MIGTDFEHPDKAWKVVRTVGGGGSLFKTHESSNLYVDTELNPCBEISQSVAVYDLNDLEAGYVLPPIAWADLGEQPKRVV 513
 MnnirS (WP_227548888.1) MIGTDFEHPDKAWKVVRTVGGGGSLFKTHESSNLYVDTELNPCBEISQSVAVYDLNDLEAGYVLPPIAWADLGEQPKRVV 507

HpnirS QPEYNEKGEVWVFSVNNAMDQESALVIVDDTRKLLKVIKDERLVPTGKFNINTCQHDVY 577
 FbnirS (MCG8523864.1) QPEYNEKGEVWVFSVNNAMDQESALVIVDDTRKLLKVIKGVYLVPTGKFNINTCQHDVY 574
 MsnirS (GB088462.1) QPEYNEKGEVWVFSVNNAMDQESALVIVDDTRKLLKVIKGVYLVPTGKFNINTCQHDVY 574
 MpnirS (WP_091705256.1) QPEYNEKGEVWVFSVNNAMDQESALVIVDDTRKLLKVIKGVYLVPTGKFNINTCQHDVY 574
 MnnirS (WP_227548888.1) QPEYNEKGEVWVFSVNNAMDQESALVIVDDTRKLLKVIKGVYLVPTGKFNINTCQHDVY 568

norC

HpnorC	MADGI	TKSAARNIF	YGGSLFFF	LLFAAL	TAHSHWY	MVNV	STDSE	GLTDS	SVKH	GKEV	WEK	NM	CIN	CHT	IM	GEGAY	FAP	EL	SN	W	E	RY	GG	88																								
HsnorC (WP_027950149.1)	MME	SLSRSAARNIF	FGGSLFFF	LAFAG	LTAHSHWY	MVNV	STDKE	GLTES	VAA	GKH	VWE	KHS	CIN	CH	SLI	GEGAY	FAP	EL	GN	V	W	TR	Y	GG	88																							
CcnorC (WP_183317601.1)	MAD	SLTKSAARNV	FYGGSLFFF	VIFV	GLTAHSHY	FMVNV	STDK	AGLTD	AVAR	GKH	VWE	KHS	CIN	CH	TLL	GEGAY	FAP	EL	GN	V	W	DR	W	GG	88																							
TnnorC (WP_043740377.1)	MME	GLSRAAARNIF	LGGSLFFF	VVFVA	LTAHSHWY	I	VTQ	STDH	AGL	TES	SVKH	GKEV	WEE	HS	CIN	CH	TLL	GEGAY	F	G	PEL	GN	V	W	VR	Y	GG	88																				
AanorC (WP_128291034.1)	M	SERF	TKSAARNIF	YGGSIFFF	VAFV	GLTAE	SHWH	I	VSQ	STD	TAT	LT	PS	VAH	GKR	V	WE	K	N	A	C	I	D	C	H	T	L	L	G	E	G	A	Y	F	A	P	E	L	G	N	V	W	V	R	Y	G	G	88

HpnorC	LEN	PEA	ARAGI	NAWIRA	QPL	GIE	GRRQ	MPA	FDF	SEK	DMNS	LID	FLE	WINS	IND	QD	WPP	HP	PAG	150																		
HsnorC (WP_027950149.1)	REN	PDA	ARAGI	KGIKA	QPL	NVP	GRRQ	MPK	FDL	SEE	ELDN	LV	DF	FR	WADS	INT	Q	G	W	P	P	H	P	V	G	150												
CcnorC (WP_183317601.1)	TED	PDT	ARE	MLKAW	MQS	QPT	GIE	GRRQ	MPQ	FNL	SDQ	ELND	LAD	FLE	WT	GRI	K	T	Q	N	W	P	P	N	K	A	G	150										
TnnorC (WP_043740377.1)	PDS	PE	GARAGI	KAWMQI	QPT	GIP	GRRQ	MPN	FDL	TDA	EL	DAL	V	DF	FE	WMS	R	INT	Q	G	W	P	P	H	V	A	G	150										
AanorC (WP_128291034.1)	RD	D	PEI	ARE	GLKAW	IRSM	PT	GIE	GRRQ	MPH	FDL	SE	KE	LN	D	L	I	D	F	L	E	W	T	S	R	I	D	T	Q	D	W	P	P	N	D	A	G	150

HpnosZ MSDKRKHIDQ-----IGRRHFTIRNTAVTGVAGAG---LASCFGAGALNSRQVAAAGANG--IDVAPGELDYYGFWSGGHSGEV 75
 MnosZ (WP_222448800.1) MKKRDDLTKDTEPEVSEGELSRRRRFMCAPALAGVAGAT----CHCSVMSRETFWAAAAABEARNKAHVAIPGELDYYGFWSGGHSGEV 82
 ManosZ (WP_230707954.1) MKKRDDLTKDLELPESEGQRFRFMCAPALAGVAGAT----CHCAVMSRETFWAAAAABEARNKYVIFPGELDYYGFWSGGHSGEV 82
 MgnosZ (WP_091987576.1) MKKRDDLTKGSALPESEGQRFRFMCAPALAGVAGAT----CHCAVMSRETFWAAAAABEARNKWIIFPGELDYYGFWSGGHSGEV 82
 HcnosZ (WP_011397207.1) MDAIKKSHHTEDARDSCISRRGFTLGGAVTGVSAVIGMAAMTFCGCSVMSRETFWAAAAKTHQKASVIFPGELDYYGFWSGGHSGEV 88

HpnosZ RVLGVPSMRELMRIPEVFNVDSATGWGITSNESKRLICSSSRFENGDCHHPHISMTDCGYDGKYLFINDKANTRVARIRLDIMKCDKIIIT 163
 MnosZ (WP_222448800.1) RVLGVPSMRELMRIPEVFNVDSATGWGITSNESKRLIGDQQLFENGDCHHPHISMTDCGYDGKYLFINDKANTRVARIRLDIMKCDKIIIT 170
 ManosZ (WP_230707954.1) RVLGVPSMRELMRIPEVFNVDSATGWGITSNESKRLVLDHNDTHFENGDCHHPHISMTDCGYDGKYLFINDKANTRVARIRLDIMKCDKIIIT 170
 MgnosZ (WP_091987576.1) RVLGVPSMRELMRIPEVFNVDSATGWGLTINESKRLVLDSSSRFENGDCHHPHISMTDCGYDGKYLFINDKANTRVARIRLDIMKCDKIIIT 170
 HcnosZ (WP_011397207.1) RVLGVPSMRELMRIPEVFNVDSATGWGLTINESKRLVLDSSSRFENGDCHHPHISMTDCGYDGKYLFINDKANTRVARIRLDIMKCDKIIIT 176

HpnosZ IPNVQAIHGLRLQKVPKTYVFNAAELPIEIQNDGCELENPDNYETMFNAIDAEISMVAVQWIVDGNLNDTDADYTGKVAASCTCYNSE 251
 MnosZ (WP_222448800.1) IPNVQAIHGLRLQKVPKTYVFNAAEYVIEIQNDGCELENPDNYETMFNAIDAEISMVAVQWIVDGNLNDTDADYTGKVAASCTCYNSE 257
 ManosZ (WP_230707954.1) IPNVQAIHGLRLQKVPKTYVFNAAEYVIEIHNDSGTSITSEETMFNAVDATIMEVAFOVIVDGNLNDTDADYTGKVAASCTCYNSE 257
 MgnosZ (WP_091987576.1) IPNVQAIHGLRLQKVPKTYVFNAAEYVIEIHNDSGTSITSEETMFNAVDATIMEVAFOVIVDGNLNDTDADYTGKVAASCTCYNSE 257
 HcnosZ (WP_011397207.1) IPNVQAIHGLRLQKVPKTYVFNAAEYVIEIQNDGCELENPDNYETMFNAVDATIMEVAFOVIVDGNLNDTDADYTGKVAASCTCYNSE 264

HpnosZ KGMVTEPMRNRDQWVVFVDEALTEAVANQNYKTLGESSFVPLDGRKQSCFTRVIFPKNPHGWNTPDGKYFIANGKLSPTVSIITA 339
 MnosZ (WP_222448800.1) RAVLDAGTMRNRDQWVVFVDEALTEAVANQNYKTLGESSFVPLDGRKQSCFTRVIFPKNPHGLNTPDGKYFIANGKLSPTVSIITA 345
 ManosZ (WP_230707954.1) RALDLAGTMRNRDQWVVFVDEALTEAVANQNYKTLGDSKVPVVDGRAGSEFTRVIFPKNPHGLNTPDGKYFIANGKLSPTVSIITA 345
 MgnosZ (WP_091987576.1) RALDLAGTMRNRDQWVVFVDEALTEAVANQNYKTLGDSKVPVLDGRAGSEFTRVIFPKNPHGLNTPDGKYFIANGKLSPTVSIITA 345
 HcnosZ (WP_011397207.1) KGLDLAGTMRNRDQWVVFVDEALTEAVANQNYKTLGDSKVPVVDGRAGSEFTRVIFPKNPHGLNTPDGKYFMANGKLSPTVSIITA 352

HpnosZ IDKLDLLEFDKIE-IRDFIVGPELGLGLPHTTFDGRGNAYTTLFIDSQVAKWNIDAIRHYNCGEDVNYIROKLDVYQPGHNHASIT 426
 MnosZ (WP_222448800.1) IDKLDLLEFDKIE-IRDFIVGPELGLGLPHTTFDGRGNAYTTLFIDSQVAKWNIDAIRHYNCGEDVNYIROKLDVYQPGHNHASIT 432
 ManosZ (WP_230707954.1) IDKLDLLEFDKIE-IRDFIVGPELGLGLPHTTFDGRGNAYTTLFIDSQVAKWNIDAIRHYNCGEDVNYIROKLDVYQPGHNHASIT 432
 MgnosZ (WP_091987576.1) IDKLDLLEFDKIE-IRDAVVGPELGLGLPHTTFDGRGNAYTTLFIDSQVAKWNIDAIRHYNCGEDVNYIROKLDVYQPGHNHASIT 432
 HcnosZ (WP_011397207.1) IDKLDLLEFDKIE-IRDFIVGPELGLGLPHTTFDGRGNAYTTLFIDSQVAKWNIDAIRHYNCGEDVNYIROKLDVYQPGHNHASIT 440

HpnosZ ESRDADGKWLVLKFSKDRFLFVGPLHEENDQLIDISGEMKLVHDGPTFAEPHDCILVRDQINPSRWTFRDDPPFFAVAVAAEAD 514
 MnosZ (WP_222448800.1) ESRDADGKWLVLKFSKDRFLFVGPLHEENDQLIDISGEMKLVHDGPTFAEPHDCILVRDQINPKKLYFRDDPPFFAVAVAAEAD 520
 ManosZ (WP_230707954.1) ESRDADGKWLVLKFSKDRFLFVGPLHEENDQLIDISGEMKLVHDGPTFAEPHDCILVRDQINPKKLYFRDDPPFFAVAVAAEAD 520
 MgnosZ (WP_091987576.1) ESRDADGKWLVLKFSKDRFLFVGPLHEENDQLIDISGEMKLVHDGPTFAEPHDCILVRDQINPKKLYFRDDPPFFAVAVAAEAD 520
 HcnosZ (WP_011397207.1) ESRDADGKWLVLKFSKDRFLFVGPLHEENDQLIDISGEMKLVHDGPTFAEPHDCILVRDQINPLKTVSRDDPPFFAVAVAAEAD 528

HpnosZ GVNLEGSCKVIREGNKRVVMTSIAFVYGLTEFRVKQGDDEVTVITNLDMVEDVTHGFCMVNHNQVSMESPOQASVSTETACKRGGVHW 602
 MnosZ (WP_222448800.1) GVNLESDNKVIREGNKRVVMTSIAFYGMTEFRVKQGDDEVTVITNLDMVEDVTHGFCMVNHNQVSMESPOQASVSTETACKRGGVHW 608
 ManosZ (WP_230707954.1) GVNLEADNKVIREGNKRVVMTSIAFYGMTEFRVKQGDDEVTVITNLDTIEDVTHGFCMVNHNQVSMESPOQASVSTETACKRGGVHW 608
 MgnosZ (WP_091987576.1) GVNLEADNKVIREGNKRVVMTSIAFYGMTEFRVKQGDDEVTVITNLDTIEDVTHGFCMVNHNQVSMESPOQASVSTETACKRGGVHW 608
 HcnosZ (WP_011397207.1) GVNLEADNKVIREGNKRVVMTSIAFYGLTEFRVKQGDDEVTVITNLDMVEDVTHGFCMVNHNQVSMESPOQASVSTETACKRGGVHW 616

HpnosZ YYCNWFCHALHMEMGRMIVKKA 625
 MnosZ (WP_222448800.1) YYCNWFCHALHMEMGRMIVKKA 631
 ManosZ (WP_230707954.1) YYCNWFCHALHMEMGRMIVKKA 631
 MgnosZ (WP_091987576.1) YYCNWFCHALHMEMGRMIVKKA 631
 HcnosZ (WP_011397207.1) YYCNWFCHALHMEMGRMIVKKA 639

Hppcc MSHPLHESFRNWRILGDLNQLRIADLGGAFVDKIETIRAHAKRCQCG---SLQQRRELLDYELDELPEQDILLPVTRAFNFOFLNLNNTA 86
 Cappc MSHPLHESFRNWRILGDLNQLRIADLGGDFVARIETIRALAKRCQCG---QAARHELIDYELDELPEQDILLPVTRAFNFOFLNLNNTA 86
 Oस्पcc (WP_019935846.1) --MNNHAAARNVVLLGOLLGDAIRDHFGAFVDKIETIRALAKSARQCG---DNDQQRLLITVLLGSDDELPLVTRAFNFOFLNLNNTA 84
 Mdppc (WP_017223576.1) -MSKYAALRSRNLGOLLGDLNQLRIADLGGAFVDKIETIRALAKSSAAG---DKDKRALITVLLGSDDELPLVTRAFNFOFLNLNNTA 85
 Flppc (WP_003189102.1) MSPLDARLRSDVHLLGDLNQLRIADLGGAFVDKIETIRGAKADIRGAVSEKTAGDELASLNQLQEDELPLVTRAFNFOFLNLNNTA 88

Hppcc BQHYRARFRVREYKFGSQPVLCGLLRRAEQAGNSPRLLVETLANMRVBLVLTAAHPTVEVTRRTTLQKYDAIDELCTLAESSESDYPERGT 175
 Cappc BQHYRGRFRVREYRGSQPDLCGLTIRIRERGFSAQKIVEEASMRVBLVLTAAHPTVEVTRRTTLQKYDAIEGCLTQMEGACDRPECAT 175
 Oस्पcc (WP_019935846.1) BQEHITSRGGRKAG---PNPLDEVSRFLKGNVNSQADIRGAVTLDLIDLVLTAHPTVEVTRRTTLQKYRVEINCDLAAWEL-DLDPEDRKT 169
 Mdppc (WP_017223576.1) BQVHTTSRNCADLVCV---PDSDELFLKNNISEQEVISAKNNLNDLVLTAHPTVEVTRRTTLQKRGKINIKKSQLLETLSLSDQRN 172
 Flppc (WP_003189102.1) BQYQLIHRRDESQPAFFESRVLPELRLRQSEGHNSNELARCARLDLDELVLTAHPTVEVTRRTTLQKYDAIAAQLQDHRDLTTARE 177

Hppcc RAQRRLLELLIQAWHTDEIRHERPPTVDEAKWGFAIENSLSWQAVEDEHRLDNLILDTAEEELPLDAAPIRNASWGGDRDGNENVTA 264
 Cappc LARARITLILIQAWHTDEIRHERPPTVDEAKWGFAIENSLSWQAVEDEHRLDNLIDEMTLDAAGEELPLDAAPIRNASWGGDRDGNENVTA 264
 Oस्पcc (WP_019935846.1) ELLARIDLLIQAWHSNIEISQRPTVDEAKWGFAIENSLSWQAVEDEHRLDNLQWRRELELPLNAAPEVTRNASWGGDRDGNENVTA 258
 Mdppc (WP_017223576.1) VYMTRELVLLIQAWHTDEIRVPRPTVDEAKWGFAIENSLSWQAVEDEHRLDNLQDRLLDYGLPDAISVFKVTSWGGDRDGNENVTA 261
 Flppc (WP_003189102.1) QIRERLQRLIQAWHTDEIRVPRPTVDEAKWGFAIENSLSWQAVEDEHRLDNLQAAHAATLELPLDAAPIRNASWGGDRDGNENVTA 266

Hppcc RVTRVLLIGRWMAADLYLRDIDELASELSMWKANSALRAEAGQVABPYREVLKRLLRKAKWESRDWARAGDEKRRHGVDTITREOLY 353
 Cappc SVTRVLLIGRWMAADLYLRDIDELASELSMWKCTAALRAEAGQVABPYREVLKRLILRRESRDWARAGDEKRRHGVDTITREOLY 353
 Oस्पcc (WP_019935846.1) RVTEVLLIGRWMAASLYLRDIDELVSELSMDSASTELRAASQSDDEPYRAVLRQDREDRELLHLNRVQKTDAROLDITQTEOFR 347
 Mdppc (WP_017223576.1) KVTEVLLIGRWMAIHFLKDVTHLASELSMNCDDTLRALVCESEHPYRWLLKIRSELTETLASLTHQKKESTESRDTITKTAOFR 350
 Flppc (WP_003189102.1) RVTRVLLIGRWMAADLYLRDIDELASELSMQOASFLHAKVCESEVPEYRALLKQRRERARAROWAHTSTSTTTPAPADVLQNNRDL 355

Hppcc SPLIACYRSILCDVGLDTTANGALLDLRRVAVFGVLLKLDLRQEASRHAQVFEELTSALGLGHVQWDEAKRQFLLEELASRRRPLIF 442
 Cappc TPLIACYRSILCDVGLDTTANGALLDLRRVAVFGVLLKLDLRQESTRHAQVFEELTSQTLGLGVNFWDEQQRCEFLTKELACRRRPLIF 442
 Oस्पcc (WP_019935846.1) QPEELCYRSIQCGGLGKATADGLLWVIRKACGVLLEKLDLRQDGERHAQVAEELTRVGLGQVWDESEADKQAPLNLNLSRRRPLIF 436
 Mdppc (WP_017223576.1) QPLIACYRSINACGMVAITAKGALLDIRRECGVGLLEKLDLRQDSDRHTDVAEAVTRVGLGQVWDESEADKQAPLNLNLSRRRPLIF 439
 Flppc (WP_003189102.1) APLOLYCYSLHECGMVAITAGFLLDLRRVAVFGVLLKLDLRQDSSRHSAAATEITDYLLGLGRWEDMDEBARISELTCPLTNRRRPLIF 444

Hppcc RRWFCSLEIREVLDTRVITQEHSEALCYIITSMAGAESDVLVGLLMKVECGQVTLTIFLFFETINDLHAQDWDQDLAIVCYRSIL 531
 Cappc RRWFCSLEIREVLDTRVITREHREALCYIITSMAGAESDVLVGLLMKVECGQVTLTIFLFFETINDLHRSFVHTDLGKIVYREQA 531
 Oस्पcc (WP_019935846.1) RWFQESDTRVLDTRVITRSHRPODAICVYITSMAGAESDVLVGLLKECGVDFAVIRLFFETINDLQAGAAVIRVYQGWRRGVY 525
 Mdppc (WP_017223576.1) ICWQESAVIREVLDTRVITKQDFESICVYITSMARKAESDVLVGLLKECGCFPLRVAVFLFFETINDLNAATWTASLADWVNYL 528
 Flppc (WP_003189102.1) GYRESADTAVLNTQPLTAAAPAAAGSVYVSMAGAESDVLVGLLKECGVQRFVIRVFLFFETINDLNAQFVWERLQLLGLFRAR 533

Hppcc DDRQEVMIQYSDSAKDAGQLAAAWAQYRAQESLVNVCNRHGVELLPHFGRGGTVGRGGGPAHAALLSQPPGSVNSURVTEQGMIRFK 620
 Cappc GDRQEVMIQYSDSAKDAGQLAAAWAQYRAQETLVEVTKRHGVELLPHFGRGGTVGRGGGPAHAALLSQPPGSVNSURVTEQGMIRFK 620
 Oस्पcc (WP_019935846.1) NGRQEVMIQYSDSAKDAGQVIAASWAQYSEMLKLVATSEREKVLLPHFGRGGSLGRGGGPAKCAILASQPPGSLTIGURVTEQGMIRFK 614
 Mdppc (WP_017223576.1) NGHCHEMIQYSDSAKDAGVIAASWAQYSEMLVATCEQEDINLLPHFGRGGSLGRGGGPAHAALLSQPPGSVNSURVTEQGMIRFK 617
 Flppc (WP_003189102.1) QGRQEVMIQYSDSAKDAGTAAAWAQYRAQERLVDICREQQVELLPHFGRGGTVGRGGGPAHAALLSQPPGSVNSURVTEQGMIRFK 622

Hppcc FGLPDIALRSMEIYACAVLEALLLPPRAFEHHVREEMDOLKVAHGAVGVVREDEDFVYFRVAVPPEGALGRLPLGSRERKRRQGGV 709
 Cappc FGLPDIASRSMEIYVCAVLEASMLPPEAKQOVRDEMDRLAGIAHKKVGVVREDEDFVYFRVAVPPEGALGRLPLGSRERKRRQGGV 709
 Oस्पcc (WP_019935846.1) FGLQVADISITLYASVLEALLLPPREFKPEWRKIMNDVSEVCAHYSRITAGEDFVYFRVAVPPELGLKPLGSRERKRRQGGV 703
 Mdppc (WP_017223576.1) FGLAVAQSSINLYTSAILLEALLLPPRAFOQWRDAMDQNSADSCERYSYIQGHEKVFYFRVAVPPELGLKPLGSRERKRRQGGV 706
 Flppc (WP_003189102.1) FGLPDIIEQNLNLYLAAVLEALLLPPREFEPAWRHMLMDELADGVRVRAVAVRENGQVVEYFRQSPPEQELGRLPLGSRERKRRR-AGGI 710

Hppcc ETLRAIPWIFRWTOQLRMLPAWLGSGEFSRRLEQFGRDVLQEMRNEWPFPGVLMEMMLAKADVALAAVYHRVLDVESKRALCK 798
 Cappc ETLRAIPWIFRWTOQLRMLPAWLGSGEFATRMOEGLVLRMNNWPFPGVLMEMMLKADISTAAVYHRVLDVESKRALCK 798
 Oस्पcc (WP_019935846.1) ESLRAIPWIFRWTOQLRMLPAWLGAHGLEKVA-D-CHEATLHAMNCGWPFRRARLLEEMVFLKADIGLAAVYHRVLDVESKRALCK 790
 Mdppc (WP_017223576.1) ESLRAIPWIFRWTOQLRMLPAWLGCATLAKNMLD-SQORTLEMOQGWPFRRARLLEEMVFLKADAWLAAVYDQCLVT-EDLHNLCK 793
 Flppc (WP_003189102.1) ESLRAIPWIFRWTOQLRMLPAWLGWAAVLSKALBRGEG-QILGVRREGWPFRRARLLEEMVFLKADADLAAVYDRDVEV-DPLTALCA 797

Hppcc QLRQRFASLEAVLDLQEKLEENLELIRGALHDVNRNYHDPLHGLQAEILLQNRDADGATASAEISRALMVTMAGISAGLRNRTG 882
 Cappc SLRDRERLERLEKVLIRDQALREHMLELIRGALHDVNRNYHDPLHGLQAEILLQNRDADGATASAEISRALMVTMAGISAGLRNRTG 882
 Oस्पcc (WP_019935846.1) TLREDRASTELVKKKKSLEASLASEFWIQSISKLRNRYTDPNVLQAEILLKRSPE-QGDHVEVDQALMVTMAGISAGLRNRTG 873
 Mdppc (WP_017223576.1) ELRASALATELITGTPANLDGQVNSKTSLELRNRYTDPNVLQAEILLKRSPE-NEDNPDLEQALMVTMAGISAGLRNRTG 876
 Flppc (WP_003189102.1) HLRDLSEQACDVLWTCQSQVLAHSEDTLFRLELRNRYTDPNVLQAEILLKRSPEQQAQODSPLEQALMVTMAGISAGLRNRTG 881