



Chytriomycessp2 ltltvdvdivfakckkk-garkldyedfkkalvevadtrqvaieh-vvlm-----  
Chytridium1 vtatdidiifnktksk-gnrridwpvfleavqliaekrypek-sdqqalhctlydvcii--  
Chytridium2 vtatdidiifnktksk-gnrridwpvfleavqliaekrypek-sdqqalhctlydvcii--  
Chytridium3 ltvtdvdivfgrckv---grklfdkafkkalemaerrgctieh-vkal-----  
Chytridialesp1. vtttdidiifnkvkpk-tgrkidfktftqavgl laelkhpdk-qpedalhqvlydvcii--  
Siphonaria1 itstdidiifnkvkak-nsrridwdefqaavrlvaekkypek-haqdaftqvmydvcv--  
Podochytrium1 vtstdidiifnkvkak-nsrridwdefqgalkilaekkypek-hsqdghtqimydvcv--  
Podochytrium2 lspidvdiifakckqk-gkrklmyieflealrevaktrqcevdh-vval-----  
Obelidium1 itsteidiifnkvkak-nsrridweefqaalkmvaekkypek-haqdaftqvmydvcv--  
Obelidium2 lslidvdiifakckqv-gkrklfyadfqralreiadtrqcdidh-vvam-----  
Physocladial itsteidiifnkvkak-nsrrinwdeflmgvklisakkyper-hvhdaftqvmydvcv--  
Entophlyctissp1 itsteidivfnkvkak-tarrigweefvegvmiaekkyper-hpqdaftqimydvcv--  
Entophlyctissp2 itsteidivfnkvkak-tarrigwdefvegvmiaekkyper-hpqdaftqimhdvcv--  
Entophlyctissp3 lslidvdiifskckpv-gkrklidyahfqkalleiarvrqcdveh-vval-----  
Entophlyctisl1 itsteidivfnkvkak-tarrigweefvegvmiaekkyper-hpqdaftqimydvcv--  
Entophlyctisl2 itsteidivfnkvkak-tarrigwdefvegvmiaekkyper-hpqdaftqimhdvcv--  
Entophlyctisl5 lslidvdiifskckpv-gkrklidyahfqkalleiarvrqcdveh-vval-----  
Entophlyctish isatdidimfnkvkak-tarridfdqfqaalrliaakrfgnskspteafaaiirtivngn  
Zopfochytrium1 vttteidiifnkvkak-tarridwnefvkavqmlaekrypnk-rpqaldstlydvcii--  
Zopfochytrium2 ltivdvdlifekckiakgtrklfdkqfkkalqmvaekrqudysh-vvai-----  
Rhizoclosmatiumg2 lslidvdiifakvkqp-gkrklgyadfqralreiawtrqcdveh-vval-----  
Rhizoclosmatiumsp lslidvdiifakvkqp-gkrklgyadfqralreiawtrqcdveh-vval-----  
Phlyctochytriumb itatdidiifnkvksk-gnrridwpvflegvqliaekrypek-asqqamncilydici--  
Phlyctochytriuma vtstdvditfnkvkpk-gsrklwdntfldgltldiaekknpgk-kgrdaldivigtimk--  
Irineochytrium itatdidiifnkvkak-gnrriewpqlfleaiaymiadkrypek-iptqalscllydvcii--  
Dinochytrium1 -----meafqliaekrypek-tsqqsmhctlydvcii--  
Entophlyctisl6 lslidvdiifskckpv-gkrklidyahfqkalleiarvrqcdveh-vval-----  
Siphonaria2 lslidvdiifakckqv-gkrklvyadfqralreiadtrqcdveh-vvam-----  
SIPHONARIA3 itttevdivfnkakak-tarkidyaafesaigmladkrypgk-pheeayantiadvck--  
RHIZOCLOSMATIUMh itttevdivfnkakak-tarkidftafesaigmladkrypgk-pheealaatmadvck--  
CHYTRIOMYCESCF4 vtttevdivfgkvkak-tarkidfaqfetaiglladkrypgk-sheesvasamsdlck--  
OBELIDIUM3 itttevdivfnkakak-tarkidfaafesalgladkrypgk-pheealantmadvck--  
CHYTRIOMYCESH7 vtttevdivfgkvkak-tarkidlaqfesaiglladkrypgk-sheesvasamsdlck--  
CHYTRIOMYCESSP3 vtstevdivfgkvkek-tarkinyaqfegaiglladkrypgk-theeavaamadick--  
RHIZOCLOSMATIUMG1 itttevdivfnkakak-tarkidftafesaigmladkrypgk-pheealaatmadvck--  
DINOCHYTRIUM2 vlttdidiifnqckv---grklfdtafkrslleliaekrgcsvdh-lkal-----  
Physocladia2 lslidvdiifskckek-gkrklidyahfqkalleiarvrqcdvdh-vvam-----  
Chytridialesp2A ITTTDIDIIFNKVKPK-GARKIDFAFTAALQMLAEMKYPKK-EPQEALHATLIDVCI--  
Chytridialesp2B ITTTDIDIIFNKVKAK-TARKIDFDGFTNAFRMLAEMKYPKK-TPEEAFQAALEEVVK--  
Cladochytriumt2 lgpdadvvfeksrpvggprrrldfrafraalrglaergggyad-vvar-----  
Cladochytriumt1 itatdidlvfnkvksk-ssrrieweefvkcvqmlaekrypek-rpkdamdsilydvcii--  
Blyttiomycessp2 -----  
Blyttiomycessp1 -----  
Blyttiomycesh -----kkgngafdalikdlr--  
Cladochytriumr vtttdvdiifnkakak-gsrirdwttfqaavralaqkkyper-aemeafntvmlvtq--

Chytriomycesc1 -----lsgnpva-----rat-----tvkndavldr  
Chytriomycesc3 -----vvsaaape-----ingt-----lphadelidk  
Chytriomycesh1 -----lsgnpva-----rat-----tvkndavldr  
Chytriomycesh3 -----lsgnpia-----rat-----tvkndavldr  
Chytriomycesh4 -----vvsaaape-----ingt-----lphadelidk  
Chytriomycescf1 -----lsgnpva-----rat-----tvkndpvlldr  
Chytriomycescf3 -----vvsaaape-----ingt-----lphadelidk  
Chytriomycessp1 -----lshgptv-----rat-----svkkdavlldr  
Chytriomycessp2 -----itatape-----ingt-----lpehdelvqk  
Chytridium1 -----rspggpa-----kkggt-----tvqadavldr  
Chytridium2 -----rspggpa-----kkggt-----tvqadavldr  
Chytridium3 -----vigsepq-----lkggt-----vpdmipivek  
Chytridialesp1. -----kskg-pq-----angtv-----aerdsiiar  
Siphonaria1 -----raqgpla-----nkat-----avqkdavldr  
Podochytrium1 -----rssgpia-----kst-----avkndavlldr  
Podochytrium2 -----vvtavpe-----ingt-----ipevddlldk  
Obelidium1 -----rahgpvs-----kat-----avqkdavldr  
Obelidium2 -----vvtavpe-----lsgnpia-----ipqvteliek  
Physocladial -----kahgpva-----snat-----avkndavlldr  
Entophlyctissp1 -----kadgpia-----rat-----svkndavldr

Entophlyctissp2 -----kaegpia-----rat-----svkndavldr  
Entophlyctissp3 -----ivstepg-----ingt-----ipeasqivek  
Entophlyctisl1 -----kadgpia-----rat-----svkndavldr  
Entophlyctisl2 -----kaegpia-----rat-----svkndavldr  
Entophlyctisl5 -----ivstepg-----ingt-----ipeasqivek  
Entophlyctish vrpvlggtvrrsagcgtarvltgdclivagswlladrgcwlvargcwmaqaasndavtqr  
Zopfochytrium1 -----kakg-pv-----ssgta-----vkndavldr  
Zopfochytrium2 -----vvagspa-----ltgt-----ipdydpviek  
Rhizoclosmatiumg2 -----vvsapvl-----ingt-----ipqvdeitek  
Rhizoclosmatiumsp -----vvsapvl-----ingt-----ipqvdeitek  
Phlyctochytriumb -----rspagpa-----kaatt-----svqndavldr  
Phlyctochytriuma -----kggg-pi-----atgt-----tpkndaيدر  
Irineochytrium -----rspgpa-----ssst-----vskndavldr  
Dinochytrium1 -----rspagps-----kagtt-----  
Entophlyctisl6 -----ivstepg-----ingt-----ipeasqivek  
Siphonaria2 -----vvtape-----ingt-----ipqvteiek  
SIPHONARIA3 -----tkgpil-----kgt-----vaqndevtkr  
RHIZOCLOSMATIUMh -----vkgpil-----kgt-----vaqndevtkr  
CHYTRIOMYCESCF4 -----akgpvi-----kgt-----kagedevtkr  
OBELIDIUM3 -----tkgpil-----kgt-----vaqndevtkr  
CHYTRIOMYCESH7 -----akgpvi-----kgt-----kagedevtkr  
CHYTRIOMYCESSP3 -----akgpvi-----kgt-----kagedevtkr  
RHIZOCLOSMATIUMG1 -----vkgpil-----kgt-----vaqndevtkr  
DINOCHYTRIUM2 -----iiasepk-----lngt-----vpdlnpivek  
Physocladia2 -----ivtaape-----ingt-----ipqvdeiek  
Chytridialesp2A -----KSNPVA-----KGT-----TAQNDAILTR  
Chytridialesp2B -----SSGPVA-----KGT-----TAQNDAILNR  
Cladochytrium2 -----vveaspv-----iygt-----vpdidpvlek  
Cladochytrium1 -----ktrg-pa-----angttavlqsvkndavldr  
Blyttiomycessp2 -----xxxxxxx-----xxxx-----ipdvdpiek  
Blyttiomycessp1 -----xxxxxxxxxxxxlshndavver  
Blyttiomycesh -----ksvgpvs-----sgt-----vaqtdavldr  
Cladochytriumr -----argpli-----nkat-----taktdgvydk

Chytriomycesc1 ltdvsgygtgthknrf-----dsagr glglngrvtgkstdt lskivnrd  
Chytriomycesc3 ltdtslytgmhrrarfd-----pvtgqgrglagretisptadlsaivsrh  
Chytriomycesh1 ltdvsgygtgthknrf-----dsagr glglngrvtgkstdt lskivnrd  
Chytriomycesh3 ltdvsgygtgmhknrf-----dseghglglngrvtgkstdt lskivnrd  
Chytriomycesh4 ltdtslytgmhrrarfd-----pvtgqgrglagretisptadlsaivsrh  
Chytriomycescf1 ltdvsgygtgthknrf-----dsagr glglngrvtgkstdt lskivnrd  
Chytriomycescf3 ltdtslytgmhrrarfd-----pvtgqgrglagretisptadlsaivsrh  
Chytriomycessp1 ltdvngygtgthknrf-----dsagr kglglagretstkt dtlhki vnr d  
Chytriomycessp2 ltdvsltytgthrrarfd-----pvtgqglgldgrepvsp t adlsaivsrh  
Chytridium1 ldttaytgthksrf-----dengngrglagrdt gsktdrldklvsn  
Chytridium2 ldtayvspyphhvppkltitdgypqipirrkqr srssgrdtgsktdrldklvsn  
Chytridium3 ltdaslytgshrrerfd-----svtgvrgrgaagrdt vaktgslsdivsrh  
Chytridialesp1. ltdtsqytgthahrf-----dengkrglegrdthsktdslhki vnr d  
Siphonaria1 ltdvngygtgshknrf-----dsagr glglqgrdtisrtdt lskivsr d  
Podochytrium1 ltdvnaytgshknrf-----dsagr glglqgrdpvtkt dt lskivsr d  
Podochytrium2 ltdtslytgthknrfd-----pvtghglglegretv npt snlstivsrh  
Obelidium1 ltdvngygtgshknrf-----dsagr glglqgrdtisrtdt lskivsr d  
Obelidium2 ltdtslytgthkarfd-----pvtgqglgldgrepv npt anlssivsrh  
Physocladia1 ltnvsgygtgthkarf-----dsagr hglglqgrdtstkt dqlskivnrg  
Entophlyctissp1 ltdvngygtgthksrf-----dsagr glglngrdtmvktdqlskivsr d  
Entophlyctissp2 ltdvngygtgthksrf-----dsngr glglqgrdtmvktdqlskivsr d  
Entophlyctissp3 ltdtslytgshrnrfd-----pvtgqglglsgrepvsat adlsaivsrh  
Entophlyctisl1 ltdvngygtgthksrf-----dsagr glglngrdtmvktdqlskivsr d  
Entophlyctisl2 ltdvngygtgthksrf-----dsngr glglqgrdtmvktdqlskivsr d  
Entophlyctisl5 ltdtslytgshrnrfd-----pvtgqglglsgrepvsat adlsaivsrh  
Entophlyctish mtdhtlytgthknrf-----dasngl gmsgrdqpsr tndlakitnre  
Zopfochytrium1 ltdthaytgthklrf-----dadghgrgmegrdqpsktdrldklvnr d  
Zopfochytrium2 ltdtslytgthknrfd-----petgvgrglegrepvntt snlanlvsrh  
Rhizoclosmatiumg2 ltdvsltytgthkerfd-----pvtgqgrglagrdt inttanlstivsrh  
Rhizoclosmatiumsp ltdvsltytgthkerfd-----pvtgqgrglagrdt inttanlstivsrh  
Phlyctochytriumb lditgytgthkarf-----dengigr glagrdqpsrtdrldki vnr d  
Phlyctochytriuma ltdtskytgthklrf-----deagrgrgaegrdrasatdqlskitnre

Irineochytrium	ltdttgytgthkarf-----ddngvgrgaagrdqgsktdrldklvnrd
Dinochytrium1	-----gthkarf-----dengvgkglagrdapsrtdrldkivgrg
Entophlyctisl6	ltdtslytgshrnrfd-----pvtggglglsgrpvsatadlsaisvrs
Siphonaria2	ltdtslytgthkarfd-----pvtggglgldgrdtvnttanlssivrs
SIPHONARIA3	mtdvsqytgthvhrf-----nedgtgrgaagrdapsstadlsqivank
RHIZOCLOSMATIUMh	mtdvsqytgthvhrf-----nedgtgrgkegrdapsstadlsqivagk
CHYTRIOMYCESCF4	mtdvsqytgthkerf-----nedgtgkglagrdqpvqtadlsqivank
OBELIDIUM3	mtdvsqytgthvhrf-----nedgtgkglagrdapsstadlsqivank
CHYTRIOMYCESH7	mtdvsqytgthkerf-----nedgtgkglagrdqpvqtadlsqivank
CHYTRIOMYCESSP3	mtdvsqytgthkerf-----nedgtgkglagrdqpvqtadlsqivank
RHIZOCLOSMATIUMG1	mtdvsqytgthvhrf-----nedgtgrgkegrdapsstadlsqivagk
DINOCHYTRIUM2	ltdaslytgshrerfd-----retgvkggaagrdtfsataslshivrs
Physocladia2	ltdtslytgthkarfd-----pvtggglglsgrtisptanlsaisvra
Chytridialesp2A	LTDTSLYTGTHKERF-----DAEGKGKGMAGRDIYGSKTDRLDKIVNRD
Chytridialesp2B	LTDTSQYTGTHKERF-----DADGKKGKGLAGRDPGPQDTLDKIVNRE
Cladochytriumt2	ltdaslytgthkhrfd-----pstgvgrglegrepvsttaslativrs
Cladochytriumt1	ltneraytgihkrvs-----saagakagtastp--ag-----ttr
Blytitiomycessp2	ltdtslytgthkqrfd-----petgvgrglegrdtvattaslanivrs
Blytitiomycessp1	ltdvsqytgthksrf-----nadgtgrgmegrdsvsktdrldklvnrd
Blytitiomycesh	ltdtqaytgthklrf-----ddegghlgmagrdqpsktdnlakianre
Cladochytriumr	ltntqlytgahklrf-----deqgngrgmeglkerersn-----

:

Chytriomycesc1	apsqqplaqtnrqsvsn-----rrqesqst----mraptaassisqnkrasvltqs
Chytriomycesc3	nsattlgskasaanr-----alssp
Chytriomycesh1	apsqqplaqtnrqsvsn-----rrqesqst----mraptaassisqnkrasvltqs
Chytriomycesh3	apshqplaqtnresasn-----rrqesqst----mhaptaassisqnkrasvltqs
Chytriomycesh4	nsattlgskasaanr-----alssp
Chytriomycescf1	apsqqplaqtnrqsvsn-----rrqesqsk----mraptaassisqnkrasvltqs
Chytriomycescf3	nsattlgskasaanr-----alssp
Chytriomycessp1	apelpaksaraslapag-----r-----vsvgpasprgkrsvltqs
Chytriomycessp2	nsaktlgklararak-----spt
Chytridium1	dst-tpti-----ppisa-----
Chytridium2	dst-tpti-----ppisagrkrsvlltas
Chytridium3	npnttlgspkvmrva-----titpp
Chytridialesp1.	thrs-----pvlqrkak-----
Siphonaria1	vpqrpslpgqrangtp-----a-vmrppt----asqqnrqsvkapkrssvltqs
Podochytrium1	apaqrqgsvvrpsvgap-----rqsmgppp----n----rasqggaqkrssvltqs
Podochytrium2	nsaktlgsrvtptrg-----mslpt
Obelidium1	iavqrpsvpqns-----rpit----tteknrtstvasgkrqsvltqs
Obelidium2	ntartlgskalptph-----ashps
Physocladial	tgksvasm-----appp----v----rqpstatvkrpsvltks
Entophlyctissp1	rpgvam-----pppt----g----raenngpskrpsvltns
Entophlyctissp2	haglam-----pppa----a----rvennaaskrpsvltns
Entophlyctissp3	naaktlgahpvatat-----ataat
Entophlyctisl1	rpgvam-----pppt----g----raenngpskrpsvltns
Entophlyctisl2	haglam-----plpa----a----rvennaaskrpsvltns
Entophlyctisl5	naaktlgahpvatat-----ataat
Entophlyctish	esnrvrgvplsaaaygsnsmadgrystssitpsihsnsnshvngtssgkrghqsvvtas
Zopfochytrium1	gagt-----aastkrqqvltqs
Zopfochytrium2	npnktlgapt--ppk-----spams
Rhizoclosmatiumg2	ntartlgskgplsp-----ssfsa
Rhizoclosmatiumsp	ntartlgskgplsp-----ssfsa
Phlyctochytriumb	aep-l-----a-plagakrvatltas
Phlyctochytriuma	etsvrglp-----m----sidpkekdktskrshsnlatas
Irineochytrium	fvgtat-----slrasgskrgkvntas
Dinochytrium1	vgggygi-----ppisaggkrsvltas
Entophlyctisl6	naaktlgahpvatat-----ataat
Siphonaria2	nsaktlgskslptph-----ashps
SIPHONARIA3	-----
RHIZOCLOSMATIUMh	k-----
CHYTRIOMYCESCF4	-----
OBELIDIUM3	-----
CHYTRIOMYCESH7	-----
CHYTRIOMYCESSP3	-----
RHIZOCLOSMATIUMG1	k-----
DINOCHYTRIUM2	npnttlgspkvrhprt-----ptvtv

Physocladia2 nsaktlgspskmart-----tshss  
 Chytridialesp2A TNATIGISTATFGSGVI-----LSGSNSGS--N-----SSMNKGRGKYVAGAS  
 Chytridialesp2B TNPTVGLSSKNGITAKS-----TSSVTKKS--TTNVSSAAPASKLNDLTAKS-SNS  
 Cladochytrium2 nphrtlgatsggsaa-----svaav  
 Cladochytriumt1 tggd-----ttagkraqvltas  
 Blytтиomycessp2 npnktlggplvtppk-----tpsss  
 Blytтиomycessp1 dkk-----rvqiltas  
 Blytтиomycesh atslrglpvsadpaaga-----ssasrnatpgkrshasvvtas  
 Cladochytriumr ag-----gqkrgqthivtas

Chytriomycesc1 eekl-----enivnap-kkapvag---rrsqaph-tttkggnytasssla---  
 Chytriomycesc3 p-----h-----  
 Chytriomycesh1 eekl-----enivnap-kkapvag---rrsqaph-tttkggnytasssla---  
 Chytriomycesh3 eekl-----enivnap-kkapiag---rrsqaph-aktkggnyttsssla---  
 Chytriomycesh4 p-----h-----  
 Chytriomycescf1 eekl-----enivnap-kkapiag---rrsqaph-attkggnyttsssla---  
 Chytriomycescf3 p-----h-----  
 Chytriomycessp1 eerl-----edsssrp-pl---ag---gtrqarq-lhpr-----e--  
 Chytriomycessp2 p-----  
 Chytridium1 --rl-----eiiattp-kkpt-n-----rsih-----gsstsiass--  
 Chytridium2 eerl-----eiiattp-kkpt-n-----rsih-----gsstsiass--  
 Chytridium3 k-----spptp-----  
 Chytridialesp1. -----gsnd-k---lgssgsig---  
 Siphonaria1 eekl-----enitnap-kktpvag---rratann-y--sssfattsssvs---  
 Podochytrium1 eerl-----eqstnap-kkal-ag---rraaape-v---tgnyktssmas---  
 Podochytrium2 p-----rsls-----p-----  
 Obelidium1 eerl-----enitnap-kktpvag---rratqqs-a----nyttsssla---  
 Obelidium2 s-----p-ts-----p-----  
 Physocladial1 eeql-----enitnsp-kktpvag---rratqvs-v--ksknyttasts---  
 Entophlyctissp1 eeql-----ekttnsp-kkav-ag---rrvtqny-t-----ttsstns--  
 Entophlyctissp2 eeql-----ekttnsp-kkav-ag---rratqny-a-----ttsstns--  
 Entophlyctissp3 g-----h-----  
 Entophlyctisl1 eeql-----ekttnsp-kkav-ag---rrvtqny-t-----ttsstns--  
 Entophlyctisl2 eeql-----ekttnsp-kkav-ag---rratqny-a-----ttsstns--  
 Entophlyctisl5 g-----h-----  
 Entophlyctish serl-----dlqsskp-kkvgspv---krs-----tsnlanik  
 Zopfochytrium1 eeql-----daiaqap-kkai-ag---rraanvpvss-k---fgsstsik---  
 Zopfochytrium2 -----rtastpn-----rs-----gse-----  
 Rhizoclosmatiumg2 s-----apii-----aw-----  
 Rhizoclosmatiumsp s-----apii-----aw-----  
 Phlyctochytriumb eerl-----dmsanlp-kkek-gp---msggprsrlt-----gsssslas--  
 Phlyctochytriuma sdr1-----dqssskp-kstkk-----gsntnla--  
 Irineochytrium eeql-----diasnap-kksn-pt---frsvydkdgnvn---ptpalsvgn--  
 Dinochytrium1 eerl-----elvatqp-kksn-sv---iv---prslh-----gsntslan--  
 Entophlyctisl6 g-----h-----  
 Siphonaria2 s-----p-tg-----r-----  
 SIPHONARIA3 -----  
 RHIZOCLOSMATIUMh -----  
 CHYTRIOMYCESCF4 -----  
 OBELIDIUM3 -----  
 CHYTRIOMYCESH7 -----  
 CHYTRIOMYCESSP3 -----  
 RHIZOCLOSMATIUMG1 -----  
 DINOCHYTRIUM2 -----  
 Physocladia2 s-----l-----  
 Chytridialesp2A NERLTG-----KDFLP-KKPAVASDFSHKTQQETTSN-----NT---  
 Chytridialesp2B KAKLAG-----TSSVS-NSTAKLAKTGSKAS-----IA---  
 Cladochytriumt2 aars-----gsfsstpprtggvpv---art-----gsngp-----  
 Cladochytriumt1 eeql-----dslankp-kkpi-ag---rravgagaas-r---tttasaageph  
 Blytтиomycessp2 -----niaddas-----ns-----s-----  
 Blytтиomycessp1 eerlghgdtldndtitdliansp-kkpi-ag---rradtptntmnis-dvvgqsqsslas--  
 Blytтиomycesh sekl-----dltaskp-kkadarr-----sntnlaak-----aattparrpn  
 Cladochytriumr serl-----dlvahap-krsadsa-----skptt-----

Chytriomycesc1 -----

Chytriomycesc3 -----  
 Chytriomycesh1 -----  
 Chytriomycesh3 -----  
 Chytriomycesh4 -----  
 Chytriomycescf1 -----  
 Chytriomycescf3 -----  
 Chytriomycessp1 -----  
 Chytriomycessp2 -----  
 Chytridium1 -----vgks-----tg-----  
 Chytridium2 -----vgks-----tgsls---  
 Chytridium3 -----  
 Chytridialesp1. -----sspssnkg  
 Siphonaria1 -----  
 Podochytrium1 -----  
 Podochytrium2 -----  
 Obelidium1 -----  
 Obelidium2 -----  
 Physocladia1 -----  
 Entophlyctissp1 -----  
 Entophlyctissp2 -----  
 Entophlyctissp3 -----r-----  
 Entophlyctisl1 -----  
 Entophlyctisl2 -----  
 Entophlyctisl5 -----r-----  
 Entophlyctish p-----sept  
 Zopfochytrium1 -----s---stpg  
 Zopfochytrium2 -----g-----  
 Rhizoclosmatiumg2 -----g-----  
 Rhizoclosmatiumsp -----g-----  
 Phlyctochytriumb -----vpsk--s-----assla---  
 Phlyctochytriuma -----  
 Irineochytrium -----lgrnttn-----agsssis  
 Dinochytrium1 -----iasktss-----tgsla---  
 Entophlyctisl6 -----r-----  
 Siphonaria2 -----  
 SIPHONARIA3 -----  
 RHIZOCLOSMATIUMh -----  
 CHYTRIOMYCESCF4 -----  
 OBELIDIUM3 -----  
 CHYTRIOMYCESH7 -----  
 CHYTRIOMYCESSP3 -----  
 RHIZOCLOSMATIUMG1 -----  
 DINOCHYTRIUM2 -----  
 Physocladia2 -----  
 Chytridialesp2A -----  
 Chytridialesp2B -----  
 Cladochytriumt2 -----vg-----gaggarggg-----  
 Cladochytriumt1 ppsgfvataaaartplggstrslaalrmatgssgdaae---s--ghggadgggssskpr  
 Blytтиomycessp2 -----  
 Blytтиomycessp1 -----  
 Blytтиomycesh p--slagpaassssttrrsnqdlssstpastrasradrapaaasttrrsntdlas--garr  
 Cladochytriumr -----

Chytriomycesc1 ----ssqqslak--ssttasklsvfdrldtssgytgthqhrfnadgsgrglagrdsaplg  
 Chytriomycesc3 -----ertaassagpsvfdrlnnvksftgthkhrfnadgsgrglagrdsaplg  
 Chytriomycesh1 ----ssqqslak--ssttasklsvfdrldtssgytgthqhrfnadgsgrglagrdsaplg  
 Chytriomycesh3 ----ssqqslak--ssttaskssvfdrldtssgytgthqhrfnadgsgrglagrdsaplg  
 Chytriomycesh4 -----ertaassagpsvfdrlnnvksftgthkhrfnadgsgrglagrdsaplg  
 Chytriomycescf1 ----ssqqslak--ssttaskssvfdrldtssgytgthqhrfnadgsgrglagrdsaplg  
 Chytriomycescf3 -----ertaassagpsvfdrlnnvksftgthkhrfnadgsgrglagrdsaplg  
 Chytriomycessp1 ---reqqldadtveehwkssqdvfdrldtsgytgthqhrfnkdgtgrglagregapmg  
 Chytriomycessp2 -----atageseqaagpsvfdrlnhvstftgthkhrfnadgtgrglagrdsaplg  
 Chytridium1 -----ssvfdrldtssngytgthklrfnasgtgrglagrdsipk-  
 Chytridium2 tl-heg----kglkdt-----ssvfdrldtssngytgthklrfnasgtgrglagrdsipk-  
 Chytridium3 -----rmqsprtngqsvfdrldtsspttftgthkhrfnpdgtgrglagrtgegag  
 Chytridialesp1. sd-----sslnktkvfdrldtsgytgshkhrfdadgkgrglagr-----

Siphonaria1 ----ssqqslapknssmtsskgsvfdrltdshgytgahkhrfnadgtgrglagrdsaplg  
Podochytrium1 ----sqqslaqhknsmtsskgsvfdrltdssgytgahkhrfnadgsgrgmagrdapalg  
Podochytrium2 -----vsslgggagspsvferlnhvssftgthrhrfnedgtgrgkagre-----  
Obelidium1 ----ssqqslatknsvssskasvfdrltntkdytgahkhrfnadgtgrglagrdsaplg  
Obelidium2 -----vrysedqggresvfdrlnnvstftgthkhrfnedgtgrgkagred----  
Physocladia1 -----slnknaatssskasvfdrltdssgytgahkhrfnvdtgrgiagrldpplg  
Entophlyctissp1 ---lnkstsslknksatgaskgnvydrldntqaytgshkhrfnadgtgrgiagrddapalg  
Entophlyctissp2 ---lnkstsslknkpatgaskgnvydrldntqgytgshkhrfnadgtgrgiagrddapalg  
Entophlyctissp3 -----vnspplsaghempavferlnhvstftgthkhrftedgrgrgkagre-----  
Entophlyctisl1 ---lnkstsslknkpatgaskgnvydrldntqaytgshkhrfnadgtgrgiagrddapalg  
Entophlyctisl2 ---lnkstsslknkpatgaskgnvydrldntqgytgshkhrfnadgtgrgiagrddapalg  
Entophlyctisl5 -----vnspplsaghempavferlnhvstftgthkhrftedgrgrgkagre-----  
Entophlyctish pl-----sslknrstsgsmgssvferltdtkaytgthkhrfnddgsgrgidgrdpnagt  
Zopfochytrium1 si-----ttlknsvtgstavrfdrltdtsgytgshkhrfnadgtgrgaagreivskg  
Zopfochytrium2 -----slgsapsspsarpsvfdrltsvstftgshkhrfnadgtgrgkegrvvdgag  
Rhizoclosmatiumg2 -----enrsmgsedgkpsvfdrlndvstftgthkhrfnpdgtgrgkegrdspss-  
Rhizoclosmatiumsp -----enrsmgsedgkpsvfdrlndvstftgthkhrfnpdgtgrgkegrdspss-  
Phlyctochytriumb pitsmk----ggpkdn-----snvfdrltnsngytgthkhrftstgvgrglagrdsipk-  
Phlyctochytriuma -----sksspaakseeytakgsvfdrltdsnqytgahkhrfnadgsgkgivgrdspksg  
Irineochytrium klpvstkgstssvnfaqtgskgsvfdrltdsnqytgshkhrftagvggrglagrdsipk-  
Dinochytrium1 tl-reg----kglkdnngsktavfdrltnsngytgthkhrfnaagtgrglagrdsipk-  
Entophlyctisl6 -----vnslplsaghempavferlnhvstftgthkhrftedgrgrgkagre-----  
Siphonaria2 -----yseehaggragsvfdrlndvstftgthkhrfnedgtgrgkagre-----  
SIPHONARIA3 -----  
RHIZOCLOSMATIUMh -----  
CHYTRIOMYCESCF4 -----  
OBELIDIUM3 -----  
CHYTRIOMYCESH7 -----  
CHYTRIOMYCESSP3 -----  
RHIZOCLOSMATIUMG1 -----  
DINOCHYTRIUM2 -----  
Physocladia2 -----tsrdsdvempavferlnssssftgtqkhhkfsedgkptrdwk-----  
Chytridialesp2A -----KKKDTKM-----ATIE-----D-----  
Chytridialesp2B -----SKSGSKI-----LTDS-----KRQLNA-----  
Cladochytriumt2 -----ggssagsgggsggnvfrltsvdtftgthrhrfnsdgtgrgkagrtgdgag  
Cladochytriumt1 avssktsslagskslvtvgsrvgvfdrltdttgytgahkhrfdaegkgrglagrdfptkg  
Blyttiomycessp2 -----tsptpghgsgsvfdrltsvssftgshkhrfnadgtgkgmgrtgdgag  
Blyttiomycessp1 -----saynkgltslsekksvfdrltdssgytgshkhrfnadgsgrglagrddtiaks  
Blyttiomycesh tv----atpaskgtynasgtnssvfdrltttagytgthklrfnadgtgrgmagrdapakg  
Cladochytriumr -----aktgaqkggtvnydrldntgaytgthklrfdasgggrglagrdsapakg

Chytriomycesc1 k---ggvtqyrngnvnslsqilrs--  
Chytriomycesc3 -----  
Chytriomycesh1 k---ggvsqyrngnvdslsqilrs--  
Chytriomycesh3 k---ggvsqyrngnvnslsqilrs--  
Chytriomycesh4 -----  
Chytriomycescf1 k---ggvsqyrngnvnslsqilrs--  
Chytriomycescf3 -----  
Chytriomycessp1 a---gtvgqyrngnvtslsqilrn--  
Chytriomycessp2 -----  
Chytridium1 ----ngvgvyrggdvkelkqlrpgf  
Chytridium2 ----ngvgvyrggdvkelkqlrpgf  
Chytridium3 e-----tvnslsqitrk--  
Chytridialesp1. -----  
Siphonaria1 n---ggeskyrggdvkelkqlrn--  
Podochytrium1 s---ggvstykggnvhslsqilrn--  
Podochytrium2 -----  
Obelidium1 s---ggeskyrggdvkdllkqilrt--  
Obelidium2 -----  
Physocladia1 s---g-pgtyrggdvkslsqilrn--  
Entophlyctissp1 a---ggisvyrggdvknlsqilrn--  
Entophlyctissp2 a---ggvsvyrggdvknlsqilrn--  
Entophlyctissp3 -----  
Entophlyctisl1 a---ggisvyrggdvknlsqilrn--  
Entophlyctisl2 a---ggvsvyrggdvknlsqilrn--  
Entophlyctisl5 -----



Blytomycesp2 -----  
 Blytomycesp1 -----  
 Blytomycesh -----  
 Geranomyces lkeyvafcafgsnrnlas-----s----sdvqgptmdgakfakfardnklidnkkvt  
 Powellomyces lreiyefcafgsnrnlst-----s----tdvsqgptmdgakfakfardnklidnkkvt  
 Gaertneriomyces lreiyefcafgsnrnlss-----tgsleniagpmdgakfakfardnkiidgkvt  
 Spizellomycesp lreiyefcafgsnrnlst-----phgsmesiagpmdgakfakfardnrlidnkrvt  
 Fimicolochytrium lreifdafcafgsnrnlst-----g----eaggntmdgakfakfardnklidnkkvt  
 Thoreauomyces lreiyefcafgsnrnlst-----s----ndvagptmdgskfakfardnklidnkkvt  
 Caulochytrium lrvvfesyanfgasrnvas-----ngslnnlagpqldnakfaklcretkvvdgkvt  
 Rhizophlyctis1 lqkmfeafcsfgssknla-----ssgsmtldlsgpmdgakfakfardnklit-ktlt  
 Rhizophlyctis2 lqrmyefafcsfgssknlaggtp----asgsmtldlsgpmdgakfakfardnklit-ktlt  
 Borealophlyctis lrgmyefafcsfgssnrnlst-----phssmesiagpmdgakfakfardnriidnkkvh  
 NowakowskiellaA lhtvyesfcsfgssnrnlsssi-----tdlsgnptmdgakfakfardtklidgkriv  
 NowakowskiellaB lkniyesfcsfgstrnssgs-----lmdingstmdgakfakfardtkivdgkvt  
 Quaeritorhiza lrvvfesfcsfgsnrnlagnlgt-----dslfvqgptmdgakfakfardskivdnkvt  
 Lobulomycesp lrdlfesfcsfgsnrnlstgss-----snlsgdmqmdnarfskfkckdckviegkvt  
 Lobulomyces lnylyisfcsfgltsqlegsk-----snstlmssqsfkskfkdcsvlqknvis  
 Clydaea1 lnylyisfcsfgltsqlegsk-----snstlmssqsfkskfkdcsvlqknvis  
 Clydaea2 lyeifefcsfgstrnlstgss-----dmln-gvtmdnqkfskfkdcsvlqknvis  
 Polychytrium1 lrstyefcsfgssnrnlsgisaas-----mdlvtgptmdgakfakfardsglvegkvt  
 Synchronytrium lrtvydsfcafgsnrnlssn-----smsmesltgaqldnakfaklkskdtgvdgkvt  
 Synchronytrium lrdryefcafgsnrnlaga-----atsi-digghqmdnakfakfardtkivdgkvt  
 Batrachochytrium lymtfgsfcsfgssnrnlstgss-----gsmtld-issgptmdgskwafkardtkivdgkvt  
 Gorgonomyces1 lyesfdafcfqfgssnrnlstgss-----g---sst-nlapqmdgakfakfardnklidgkvt  
 Globomyces1 lygvyesfcsfgstrnlstgss-----slssslnnlkgpmdgskwafkardtkivdgkvt  
 Boothomycesp1 lyqlfesfcsfgstrnlstgss-----gslsnlkgpmdnakwafkardtkivdgkvt  
 Boothomycesp2 lyqlfesfcsfgstrnlstgss-----gslsnlkgpmdnakwafkardtkivdgkvt  
 Polyrhizophytrium lytafcqfcsfgssnrnlstgss-----s---mtld-itgptmdgakfakfardtkivdgkvt  
 Terramyces lyqlfesfcsfgsnrnlstgss-----gslsnlkgpmdnahfakfardtkivdgkvt  
 Kappamyces1 lhtlfdsfvngfagatrnpe-----s---pmakksstpqmdgarfakfardtkivdgkvt  
 GLOBOMYCES2 lnrafvaycqqfgasknps-----sdaltmdgarfakfckdtkivdgkvt  
 GORGONOMYCES2 veeiynrfctfgstrnlstgss-----dlgtwmdnskfaklcrdtkivdgkvt  
 GORGONOMYCES3 lievfesycsfgsstlts-----m-----n-smggqmdgakfaklckdcklts-gkvt  
 BOOTHIOMYCESSP2 iqtifnafchfgtarnastdnl--hktgsmtdlnsgpmdgskqfakfckdcklts-lkvt  
 BOOTHIOMYCESM2 iqnlfnafchfgtarnastdnl--nkntsasalnsdpmdgskqfakfckdcklts-lkvt  
 KAPPAMYCES2 lqqvfesfcsfggskgnl-----sagikpsltpdvtmtnqkfkfckdcklts-dgis

Chytriomycesh1 stdidifnkvka-kstrridweefqvavklvagkkyk-mheqdaytktiydacilsng  
 Chytriomycesh4 lidcdvifskckkv-gkrkleyddfkralaeiadirqch-vs-----hvvalv--saa  
 Chytridium1 atdidifnkvtks-kgnrridwpvfleavqliaekrype-ksdqalhtlydvcirspg  
 Chytridium3 vtdvdvifgrckv---grkldfkafkalemiaerrgct-ie-----hvkalvi--gse  
 Chytridialesp1. ttdidifnkvkp-ktgrkidfktftqavgliaelkhp-dkpedalhqvlydvcikskg  
 Siphonaria1 stdidifnkvka-knsrridwdefqaavrlvaekkye-khaqdaftqmydvcvrsg  
 Podochytrium1 stdidifnkvka-knsrridwdefqgalkilaekkye-khsqdftqmydvcvrsg  
 Podochytrium2 pidvdiiifakckqk-gkrklmyieflealrevaktrqce-ve-----hvvalv--tav  
 Obelidium1 steidiiifnkvka-knsrridweefqaalkmvaekkye-khaqdaftqmydvcvrahg  
 Obelidium2 lidvdiiifakckqv-gkrklfyadfqrallreiadtrqcd-id-----hvvamv--taa  
 Physocladia1 steidiiifnkvka-knsrrinwdeflmgvklisakkye-rhvhdafqmydvcvkaag  
 Entophlyctissp2 steidivfnkvka-ktarrigwdefvegvkmiaekkye-rhpqdaftqimhdvcvkaeg  
 Entophlyctissp3 lidvdiiifskckpv-gkrklfyahfqalleiarvrqcd-ve-----hvvalv--ste  
 Entophlyctish atdidimfnkvka-ktarridfdqfqaalrliaakrfgnskspteafaaiirtivngn-v  
 Zopfochytrium1 tteidiiifnkvka-ktarridwdefvkvqmlaekrypn-krpqaldstlydvcikakg  
 Zopfochytrium2 ivdvdliifekckiakgtrklfdkqfkkalqmvaekrqqd-ys-----hvvaiiv--ags  
 Rhizoclostridium2 lidvdiiifakvkqp-gkrklgyadfqrallreiaawtrqcd-ee-----hvvalv--sap  
 Phlyctochytriumb atdidiiifnkvks-kgnrridwpvflegvqliaekrypd-kasqqamncilydvcirspa  
 Phlyctochytriuma stdvditfnkvkp-kgsrklwntfldgltdiaekknpg-kkgdalddivigtimkkgg  
 Irineochytrium atdidiiifnkvka-kgnrriewpqlfleaiaiyadkrype-kiptqalscllydvcirspg  
 Dinochytrium1 -----meafqliaekrype-ktsqgsmhctlydvcirspa  
 Siphonaria2 lidvdiiifakckqp-gkrklvyadfqrallreiadtrqcd-ve-----hvvamv--taa  
 SIPHONARIA3 ttevdvifnkaka-ktarkidyaafaalglmadkkye-kpheealantiadvck-tkg  
 OBELIDIUM3 ttevdvifnkaka-ktarkidfaafesalglmadkrye-kpheealantiadvck-tkg  
 CHYTRIOMYCESH7 ttevdvifgkvka-ktarkidlaqfesaiglladkrye-kpheealantiadvck-akg  
 RHIZOCLOSTRIDIUM1 ttevdvifnkaka-ktarkidftafesaiglladkrye-kpheealantiadvck-vkg  
 DINOCHYTRIUM2 ltdidiiifnqckv---grkldftafkrsleliaekrgcs-ve-----hkalii--ase  
 Physocladia2 lidvdiiifskckek-gkrklfyahfqalleiarvrqcd-ve-----hvvamv--taa

Chytridialesp2A TTDIDIIFNKVKP-KGARKIDFSAFTAALQMLAEMKYPK-KEPQEALHATLIDVCIKSNG  
 Chytridialesp2B TTDIDIIFNKVKA-KTARKIDFDGFTNAFRMLAEMKYPK-KTPEEAFQAALEEVVK-SSG  
 Cladochytriumt2 padadvvfeksrpvggprrdfracraalrglaerggge-ya-----dvvarv--eas  
 Cladochytriumt1 atdidlvfnkvks-kssrrieweeefvkcvmqlaekrype-hrpkdamdsilydvciktrg  
 Cladochytrium ttdvdiifnkaka-kgsrrldwttfqaavralaqkkye-raemeafntvmlevt-qarg  
 Blytтиomycessp2 -----xx---xxx  
 Blytтиomycessp1 -----  
 Blytтиomycesh -----kkgngafdalikdlsrksvg  
 Geranomyces stdvdiifnkvkp-kgarkldwntflegltqiaekknpg-kqgrdaldsliglikkkgg  
 Powellomyces stdvdiifnkvkp-kgarkldwntflegltqiaekknsg-kqgrealdsliglikkkgg  
 Gaertneromyces ttdvdiifnkvkp-kgarkldwntfldaltqlaekkyag-kkgrealeavtgdvkrsg  
 Spizellomycesp ttdvdiifnkvkp-kgarkldwntfidglteivkkypp-kqgraldavtgidimkkgg  
 Fimicolochytrium stdvdivfnkvkp-kgarkidwngfiegltlvaekk-tg-kqgraldaviglikkkgg  
 Thoreauomyces ttdvdiifnkvkp-kgarkldwntflegltliaekknpg-kqgkdaldslvglikkkgg  
 Caulochytrium tteidisfskvl--kggrkmdfgqfgevlrllaekkgg-av--daqkkliaqic-qskg  
 Rhizophlyctis1 stdvdiifnkvkp-kgarkidwntfleaerlvgekk-g-kkgdeafdtvvgqllragk  
 Rhizophlyctis2 ttdvdiifnkvkp-kgarkidwntfleglrlvgekragg-kkgneafdavtllragk  
 Borealophlyctis stdvdiifnkvkp-kgarkldwntfqdalqlvaekk-hg-kkgegaraalvteivrkkg  
 NowakowskiellaA stdidiiifnkvks-kgarridwdefqnglkliaekrypp-kpegerfnsilfdvc-ktkg  
 NowakowskiellaB itdidiifnkvka-kssrridwnefnalyliaekkypp-kpvgertniltldic-rsqg  
 Quaeritorhiza stdidilfnkaka-kgarrldwdsflvafqelaekkypp-knpseafnslndvafksk  
 Lobulomycesp stdvdilfnkikt-kgarkitwvefqaefatlaemryps-knardayqslhvs--neg  
 Lobulomycesa tididiifnkvkvdkkrkinfnflvaiglladlkfkd-ieknerfgrlitfvl--dkg  
 Clydaea1 tididiifnkvkvdkkrkinfnflvaiglladlkfkd-ieknerfgrlitfvl--dkg  
 Clydaea2 ttdcdilfnkvka-kgarrldfegfqtafqqladkkypp-rnpkeaydtllnhiv--dkg  
 Polychytrium1 stdvdiifnkaka-kgarrldwntfleacrllsekkypa-atpaegwskflndvvytgk  
 Synchronium nadiditfnkvka-kgarkldwesfqdalallaekkyat-lpaeqafsrlvtdil-sngs  
 Synchronium iidvdiifnkvka-kgarkldwntfqdalahlakkypp-lqpeggfnklvsdvl-assg  
 Batrachochytrium ttdidiifnkvka-ktvrkidfeqfqaalhlvaakrygsskppateaynllvrsilnsg-a  
 Gorgonomyces1 ptevdifnkvkg-ktarkidkefgeglrllaakkyeg-knpieqfnaivrhitsgdnk  
 Globomyces1 ptevdifnkvks-kterkidydqfiegllkmisakkyss-ktttesfvlvqfvlstrga  
 Boothiomycessp1 stecdiifnkvk-ktarkidhdhfeclrliaakkyss-ktpteayvilcqnlnsgrq  
 Boothiomycesmm1 stecdivfnkvk-knerkinfdqfgeclrhiaakkyss-kspteayp-----  
 Polyrhizophyidium stdadiifnkvka-ksarridfdqfgealrlaaakrfggsktpqegymllvreivgggga  
 Terramyces stecdivfnkika-kterkinfeqfqnclqiaakkyss-kspteayvtvcqnlnsgrq  
 Kappamyces1 ptevditfnkvkg-ktarkinfdqfgealrliaakkyss-kspsayvhlvrvtqagap  
 GLOBOMYCES2 ntdvdivfsvkva-knarrinqefilgiqqgkfkf--tpedslnniisqilksggv  
 GORGONOMYCES2 ptdvdiifnkvrt-knprkidfdeflqgklklgaikfpe-keplrqlmcdivngkpk  
 GORGONOMYCES3 stdidiiifnkvke-ktarkigfpefmealkliaakkyed-ksqndalgtlindmlntss  
 BOOTHIOMYCESSP2 ttdvdiifnkvka-ktarkidekqfkdalvllsqinypg---qsngefllsdvvsqsgt  
 BOOTHIOMYCESM2 ttdvdiifnk-----idekqfrealnllsqinypg---qdnafdllvasvvsqsgt  
 KAPPAMYCES2 stdtdiifnkvka-ktarninfsqftealrqiavkrfpk-aepaaafdqlvakilksgg

Chytriomycesh1 p-va-rat-----tvkndavldr1  
 Chytriomycesh4 p-eingtl-----phadelidkl  
 Chytridium1 g-pakkg-----tvqadavldr1  
 Chytridium3 p-qlkgtv-----pdmipivekl  
 Chytridialesp1. p-qa-ngt-----vaerdsiiarl  
 Siphonaria1 p-lankat-----avqkdavldr1  
 Podochytrium1 p-ia-kst-----avkndavlnrl  
 Podochytrium2 p-eingti-----pevddlldkl  
 Obelidium1 p-vs-kat-----avqkdavldr1  
 Obelidium2 p-elngti-----pqvteliekl  
 Physocladia1 p-vasnat-----avkndavldr1  
 Entophlyctissp2 p-ia-rat-----svkndavldr1  
 Entophlyctissp3 p-gingti-----peasqivekl  
 Entophlyctish rpvlqgtvrrsagcgtarvltgdclivagswlladrgcwlvargcwmaqaasndavtqrm  
 Zopfochytrium1 p-vs-sgt-----avkndavldr1  
 Zopfochytrium2 p-altgti-----pdydpviekl  
 Rhizoclosmatiumg2 v-lingti-----pqvdeitekl  
 Phlyctochytriumb g-pakaat-----tsvqndavldr1  
 Phlyctochytriuma p-iatgt-----tpkndaiddrl  
 Irineochytrium g-passt-----vvkndavldr1  
 Dinochytrium1 g-pskagt-----  
 Siphonaria2 p-eingti-----pqvteliekl  
 SIPHONARIA3 p-ilkgtv-----aqndevtkrm

OBELIDIUM3	p-ilkgtv-----aqndevtkrm
CHYTRIOMYCESH7	p-vikgtk-----agedevtkrm
RHIZOCLOSMATIUMG1	p-ilkgtv-----aqndevtkrm
DINOCHYTRIUM2	p-klngtv-----pdlnpivekl
Physocladia2	p-eingti-----pqvdeiiekl
Chytridialesp2A	P-VAKGTT-----AQNDAILTRL
Chytridialesp2B	P-VAKGTT-----AQNDAILNRL
Cladochytrium2	p-viygtv-----pdidpvlekl
Cladochytriumt1	p-aangtt-----avlqsvkndevlqrl
Cladochytrium	p-linkat-----taktgdgvydkl
Blytthiomycessp2	x-xxxxxi-----pdvdpiekl
Blytthiomycessp1	---xxxxx-----xxxxlshndavverl
Blytthiomycesh	p-vssgt-----vaqtdavldrl
Geranomyces	p-iatgt-----apksdaivdrl
Powellomyces	p-iatgt-----apksdaivdrl
Gaertneriomyces	p-iasgtv-----rdtpqsdaivdrl
Spizellomycesp	p-iatgt-----tpksdgivdrl
Fimicolochytrium	p-iatgt-----apksdaivdrl
Thoreauomyces	p-iatgt-----apkndaivdrl
Caulochytrium	p-kasgtt-----pdakgahnrl
Rhizophlyctis1	p-vssgt-----vpqndavidrm
Rhizophlyctis2	p-vssgt-----vpqsdaivdrl
Borealophlyctis	p-vvsgt-----vpqgdaildrml
NowakowskiellaA	p-ssshtt-----mktgdgvygkl
NowakowskiellaB	p-vskste-----iktdgvygkl
Quaeritorhiza	p-ktnstv-----aqadgvfdkl
Lobulomycetalessp	p-varat-----itktngvyskl
Lobulomycesa	p-vlrnit-----vskvngifdrl
Clydaea1	p-v-----skvngifdrl
Clydaea2	p-iargt-----iteangvydkl
Polychytrium1	p-vvsgtt-----astegiyekl
Synchytriumm	p-hltnta-----vpknsaivdrl
Synchytriume	p-sltgta-----vsknaaivdrl
Batrachochytrium	rpvatgt-----ittsdsvtqrl
Gorgonomyces1	--piaya-----tlpandsitqrl
Globomyces1	pvvq--tn-----lknsvqmdvtnrl
Boothiomycessp1	pvvq--ss-----vnsnaqldvtarl
Boothiomycesmm1	-----nvqmdvtarl
Polyrhizophyidium	rpiaqgt-----lpssdsvtqrm
Terramyces	ptvq--ss-----vnnaaqldvtarl
Kappamyces1	kavslvkt-----pskgsvnditarl
GLOBOMYCES2	pklaega-----tqvekstivekl
GORGONOMYCES2	---vka-----tsvqsdpvtqrl
GORGONOMYCES3	lpslnkt-----tkastsdltkrl
BOOTHIOMYCESSP2	pklvata-----tppvknkivskl
BOOTHIOMYCESM2	pklvpnv-----tppvknkivskl
KAPPAMYCES2	pkiqdgq-----rpvndavtsrl

Chytriomycesh1	tdvsgytgthknrfds-agrglglngrvt-gks-tdtlskivnrd--apsqqplaqtnrq
Chytriomycesh4	tdtslytgmhrarfdpvtgqgrglagret-isp-tadlsaivsrh--nsattlgskasaa
Chytridium1	tdttaytgthksrfde-ngngrglagrdr-gsk-tdrldklvsrn--dst-----t----
Chytridium3	tdaslytgshrerfdsvtgvgrgaagrdr-vak-tgslsdivsrh--npnttlgspkvmr
Chytridialesp1.	tdtsqytgthahrfde-ngkgrglegrdr-hsk-tdslhkivnrd--thrsp-----
Siphonaria1	tdvngytgshknrfds-agrglglgqrdr-isr-tdtlskivsrdr--vpaqrpslpqgra
Podochytrium1	tdvnaytgshknrfds-agrglglgqrdr-vtk-tdtlskivsrdr--apaqrggsvvrps
Podochytrium2	tdtslytgthknrfdpvtghglglegret-vnp-tnslstivsrh--nsaktlgsvrvtpt
Obelidium1	tdvngytgshknrfds-agrglglgqrdr-isr-tdtlgkivsrdr--iavqrpsvpqns-
Obelidium2	tdtslytgthkarfdpvtgqglgldgprep-vnp-tanlssivsrh--ntartlgskalpt
Physocladial	tnvsgytgthkarfde-aghglglqrdr-stk-tdqlskivnrg--tgksvasm-----
Entophlyctissp2	tdvngytgthksrfds-ngrglglgqrdr-mvk-tdqlskivsrdr--hagla-----
Entophlyctissp3	tdtslytgshrnrfdpvtgqglglsgrprep-vsa-tadlsaivsrh--naaktlgahpvat
Entophlyctish	tdhtlytgthknrfda-sgnglgmsgrdq-psr-tdnlakitnr--eesnrvgvplsa
Zopfochytrium1	tdthaytgthklrfda-dghgrgmegrdr-psk-tdrldklvnrdr--gagta-----
Zopfochytrium2	tdtslytgthknrfdpetgvgrglegprep-vnt-tnlanlvsrh--nnpktlgapt--p
Rhizoclosmatiumg2	tdvslytgthkerfdpvtgqgrglagrdr-int-tanlstivsrh--ntartlgskgpls
Phlyctochytriumb	tditgytgthkarfde-ngigrglagrdq-psr-tdrldkivgtr--aep-----l----

Phlyctochytrium tdttskytgthklrfde-agrgrgaegrdr-asa-tdqlskitnre--e-tsvrglpmsi-  
 Irineochytrium tdttygtgthkarfdd-ngvgrgaagrdr-gsk-tdrldklvnrd--fvgtas-----  
 Dinochytrium1 -----tgthkarfde-ngvgkglagrda-psr-tdrldkivgrg--vggeggyip----  
 Siphonaria2 tdtstlytgthkarfdpvtgqglgldgrdt-vnt-tanlssivsrh--nsaktlgskslpt  
 SIPHONARIA3 tdvsqytgthvhrfne-dgtgrgaagrda-pss-tadlsqivank-----  
 OBELIDIUM3 tdvsqytgthvhrfne-dgtgkglagrda-pss-tadlsqivank-----  
 CHYTRIOMYCESH7 tdvsqytgthkerfne-dgtgkglagrdr-pvq-tadlsqivank-----  
 RHIZOCLOSMATIUMG1 tdvsqytgthvhrfne-dgtgrgkegrda-pss-tadlsqivagk--k-----  
 DINOCHYTRIUM2 tdtaslytgshrerfdretgvvgkgaagrdr-fsa-taslshivsrh--npnttlgspkvhr  
 Physocladia2 tdtstlytgthkarfdpvtgqglglsgrdt-isp-tanlsaivsra--nsaktlgspkma  
 Chytridialesp2A TDTSLYTGTHKERFDA-EGKGKGMAGRDRY-GSK-TDRLDKIVNRD--TNATIGISTATFG  
 Chytridialesp2B TDTSQYTGTHKERFDA-DGKGKGLAGRDP-GPQ-TDRLDKIVNRE--TNPTVGLSSKNGI  
 Cladochytrium2 tdtaslytgthkhrfdpstgvgrglegred-vst-taslativsrh--nphtlgtatgsgs  
 Cladochytrium1 tneraytgihkrvssa-agakagtastpa-g-----  
 Cladochytrium tntqlytgahklrfde-qgngrgmeglke-rer-sn-----  
 Blytthiomycessp2 tdtstlytgthkqrfdpetgvgrglegrdt-vat-taslanivsrh--npnktlggplvtp  
 Blytthiomycessp1 tdvsqytgthksrfna-dgtgrgmegrds-vsk-tdrldklvnrd--dkk-----  
 Blytthiomycesh tdtqaytgthklrfdd-eghglgmagrdr-psk-tndlakianre--a-tslrglpvsa-  
 Geranomyces tdttskytgthklrfde-agqgrgaagrdr-pp-tdsdlskitnre--e-tslrglpvsi-  
 Powellomyces tdttskytgthklrfde-agqgrgaagrdr-psa-tdsdlskitnre--e-tslrglpvsi-  
 Gaertneriomyces tdttskytgthklrfde-qghgrglagrdr-pak-tddlsklvnre--p-ttvrglpvsv-  
 Spizellomycesp tdttskytgthklrfde-agrgrgaegrdr-psa-tdqlskitnre--e-tsvrglpvsi-  
 Fimicolochytrium tdttskytgthklrfdd-aghgrgaagrdr-pta-tadlsqitnre--e-tsvrglpvsi-  
 Thoreauomyces tdttskytgthklrfde-agqgrgaagrdr-psg-tdsdlskitnre--e-tslrglpvsi-  
 Caulochytrium tdtstqytgthklrfde-egrgrglagrda-pap-tadlsqildrs--g-atvrgvplkta  
 Rhizophlyctis1 tdtstmytgthklrfda-eghgrglegrdr-psk-tndlskitnrd--eqasvrgipasa-  
 Rhizophlyctis2 tdtstlytgthklrfda-eghgrgiegrda-psk-tndlatitnrd--epasvrgipasa-  
 Borealophlyctis tdtstlytgthklrfde-egrgrgaegrdr-psk-tddlskitnre--e-tsvrglpvsa-  
 NowakowskiellaA tdtksytagaqlrfdd-letsqvq-----ftsnt--tta--a-----  
 NowakowskiellaB ssnkntfsgqklrfdd-lettaqe-----fvsnlasnd--e-----  
 Quaeritorhiza tntqlytgthkhrfdd-dgrgrgmegrdr-psk-tnqlesfinrd--vattitgapvsvs  
 Lobulomycetalessp tdtkqytgshknrfde-ngvgkgaagrdr-gqa-tlnhsqvvnrs--snnnissntyss-  
 Lobulomycesa tdtstlytgthklrfde-ngnglgldgrds-gid-gntldrmvnra--ssskararsl---  
 Clydaea1 tdtstlytgthklrfde-ngnglgldgrds-gid-gntldrmvnra--ssskararsl---  
 Clydaea2 tntnlytgshkerfde-sgvvgkgaagrqm-idsttanlsqvlvnr--tnsnvpnntygc-  
 Polychytrium1 tntstlytgthksrfda-ngkglglagrda-psk-tnrldtlvnrd--skgpsstlagskp  
 Synchronium tdtstfpvthknrfed-kglgsqgalna-----ksstg-----ttptk--  
 Synchroniume tdststfpvthknrfed-hgvlksspfgas-r----eglgksng-----ttptk--  
 Batrachochytrium tdhthytgthknrfde-agqglglagrdr-hsr-tnelskivnr---keadirgvplaas  
 Gorgonomyces1 tdtsttlytgthknrfde-ngrglgmqrdrp-kt--i-slsnlanr---epadirgvnfsk  
 Globomyces1 tdpqkytgihkekshg-tm---gsvy-----dlsdsgre-----  
 Boothiomycesp1 tdpqsytgrhkaqhse-lekskstnsng-----nlssstrn-----  
 Boothiomycesmml tdpqsytgrhkaqhse-mekskstssg-----nladssrn-----  
 Polyrhizophyidium tdtstlytgthknrfds-agrgrgmagrdr-lpk-tnelakitnr---eesnvrpmsaa  
 Terramyces tdpqsytgrhkvqhse-mekskstsig-----nlsestrn-----  
 Kappamyces1 tdpkskftgtqkvtfeg-rss-----  
 GLOBOMYCES2 tdttskytgthkerfdg-ngkkgldgrtdlgsq-tlslsqitnr---keadvrgvak---  
 GORGONOMYCES2 tdtstqytgtsknrfdd-ngkglgmtllgsq-----anlsklrdnlnkraeskemlq-eg  
 GORGONOMYCES3 tdtstqytgthkqrfde-sgqgrgkagrdd-gsq-i-tlqsianrd--dradvrgvnqsfk  
 BOOTHIOMYCESSP2 tdtstlytgthknkfneg-hgkglglagrdr-----vkelsqitnr---kdadvrgvqk---  
 BOOTHIOMYCESM2 tdtstlytgthknrfde-hgkglgmagkdke---fkelsqitnr---kdadvrgvqk---  
 KAPPAMYCES2 tdtstqytgthknrfda-dgkkgkldgrtdkfeg-vmtmknvtnr---keadvrgvqrt--

Chytriomycesh1 svsnrrqesq-----stm--raptaassisqnkr-asvlt  
 Chytriomycesh4 nral-----s  
 Chytridium1 -----pti-----p  
 Chytridium3 vati-----t  
 Chytridialesp1. -----vlqrk-ak---  
 Siphonaria1 ngtpa-vmrp-----pta--sqqqnrqsvkapkr-ssvlt  
 Podochytrium1 vgaprqsmpg-----ppn-----rasqggaqkr-ssvlt  
 Podochytrium2 rgms-----l  
 Obelidium1 -----rp-----itt--teknrtstvasgkr-qsvlt  
 Obelidium2 phas-----h  
 Physocladia1 -----ap-----ppv-----rqpsatvtkr-psvlt  
 Entophlyctissp2 -----mpp-----paa-----rvennaaskr-psvlt  
 Entophlyctissp3 atat-----a

Entophlyctish	ygsnsnmadgrystssit-psihnsns-----shvngngtssgkrgh-qsvvt
Zopfochytrium1	-----astkr-qqvlt
Zopfochytrium2	pksp-----a
Rhizoclosmatiumg2	psss-----f
Phlyctochytriumb	-----aplagakr-vatlt
Phlyctochytriuma	-----dp-----qek--dkt-----skrsh-snl
Irineochytrium	-----lrasgskr-gkvnt
Dinochytrium1	-----pisaggkr-vsvlt
Siphonaria2	phas-----h
SIPHONARIA3	-----
OBELIDIUM3	-----
CHYTRIOMYCESH7	-----
RHIZOCLOSMATIUMG1	-----
DINOCHYTRIUM2	ptpt-----v
Physocladia2	rtts-----h
Chytridialesp2A	SGVILSGSNS-----GSN-----SSMNKGRGKYVAG
Chytridialesp2B	TAKSTSSVTK-----KSTTNVSSAAPASKLNDLTAHSV-S
Cladochytriumt2	aasv-----a
Cladochytriumt1	-----ttrtgddtagkr-aqvlt
Cladochytrium	-----aggqkrqg-thivt
Blytitiomycessp2	pktp-----s
Blytitiomycessp1	-----r-vqilt
Blytitiomycesh	-----dp-----aaga-ssasrnatpgrsh-asvvt
Geranomyces	-----dp-----nek--s-----spakrgh-ssvvt
Powellomyces	-----dp-----nek--s-----spakrgh-snvvt
Gaertneriomyces	-----dp-----daq--eqs-kpssgskrgh-asvvt
Spizellomycesp	-----dp-----eeg--dkqeltssagkrgh-ssvvt
Fimicolochytrium	-----dp-----qer--g-----asakrsh-snlvt
Thoreauomyces	-----dp-----ner--ss-----nspgkrah-anvvt
Caulochytrium	ertantt-----aagtrr-ta--t
Rhizophlyctis1	-----dp-----aek--gk-----krgh-gnvvt
Rhizophlyctis2	-----dp-----aek--gk-----gkrgh-gnvvt
Borealophlyctis	-----dp-----faq--tqqpr-tstgkrgh-qnvvt
NowakowskiellaA	-----kp-----s-----trgqkreq-asivt
NowakowskiellaB	-----np-----i-----nrghkreq-asivt
Quaeritorhiza	a--ttsqlsa-----aggsnsvg---aakkrqga-avvt
Lobulomycetalessp	--rsl--tn-----isgp-snntsvgaskkrqg-tsvvt
Lobulomycesa	-----s
Clydaea1	-----s
Clydaea2	--tp-----vaakkrqt-taivt
Polychytrium1	gsmsnlssap-----kpl-----takrgq-vaivt
Synchytriumm	-----sp-----ggg-----vkgspvgn-krsvt
Synchytriume	-----sp-----at-----vklgvsgn-krvvt
Batrachochytrium	pigsp-----r-----g-----svtmsyspkskrah-aavvt
Gorgonomyces1	pssnsnslsnhgsksnlittgsksnlittgsksnlatkivqqpkreh-dnivt
Globomyces1	-----sistik-----ttngr-----rysnfgqetstkrqf-nnvvt
Boothiomycessp1	-----sqvsmq-----knf-g-----sssklnqptsgkrqy-ntlt
Boothiomycesm1	-----sqasiq-----kny-g-----sssklnqassgkrqy-tstlt
Polyrhizophyidium	saaamaagdsrrasststmaasstnlaa-----aasgsgvprgkrsh-qavtt
Terramyces	-----sqtsmq-----knf-g-----sssklnqpasgkrqy-natlt
Kappamyces1	-----vpstpsgkrsh-sniat
GLOBOMYCES2	-----
GORGONOMYCES2	---ptklpkigskgnltra-----
GORGONOMYCES3	k-----
BOOTHIOMYCESSP2	-----
BOOTHIOMYCESM2	-----
KAPPAMYCES2	-----
Chytriomycesh1	qseekl-----enivnapkkapvagrirsqaphtttkggnyta-----
Chytriomycesh4	ppp-----h-----
Chytridium1	pisarl-----eiiattpkkpt-----
Chytridium3	ppk-----sppt-----p-----
Chytridialesp1.	-----gsndklgssgsi-----
Siphonaria1	qseekl-----enitnapkktpvagrerratanny--sssfatt-----
Podochytrium1	qseerl-----eqstnapkkal-agrraaipev---tgnykt-----
Podochytrium2	ptp-----rsls-----

Obelidium1	qseerl-----enitnapkktpvagrratqgsa-----nytt-----
Obelidium2	pss-----p-ts-----
Physocladia1	kseeql-----enitnspkktpvagrratqsv--ksknytt-----
Entophlyctissp2	nseeql-----ekttnspkkav-agrratqnyattsstns1-----
Entophlyctissp3	atg-----h-----
Entophlyctish	asserl-----dlqsskpkkvgsppvkrstsnlanikp-----
Zopfochytrium1	qseeql-----daiaqapkkai-agrraanpvpsskfgsstsi-----
Zopfochytrium2	ms-----rtastpn-----
Rhizoclosmatiumg2	sas-----apii-----
Phlyctochoytriumb	aseerl-----dmsanlpkkekgpmsggp-----
Phlyctochoytriuma	assdrl-----dqssskpkstkkgsntnlasksspa-----
Irineochoytrium	aseeql-----diasnapkksnptfrsvy-----dkdgnvnptpals
Dinochoytrium1	aseerl-----elvatqpkksnviv-----
Siphonaria2	pss-----p-tg-----
SIPHONARIA3	-----
OBELIDIUM3	-----
CHYTRIOMYCESH7	-----
RHIZOCLOSMATIUMG1	-----
DINOCHYTRIUM2	tv-----
Physocladia2	sss-----l-----
Chytridialesp2A	ASNERLTGKDFLPKK---PA---VASDFSHKTQ-QET-----T-----
Chytridialesp2B	NSKAKLAGTSSVSNS---TA---KLAKTGSKAS-----
Cladochytriumt2	avaars-----gsfstpprt-----ggvp
Cladochytriumt1	aseeql-----dslankpkkpi-agrravgagaasrtttasaagephppsgfv
Cladochytrium	asserl-----dlvahapkradsaskpt-----
Blyttiomycessp2	ss-----niaddas-----
Blyttiomycessp1	aseerlghgdtldndtitdlianspkkpi-agrradtpntmnis-----
Blyttiomycesh	assekl-----dltaskpkkadarrsntnlak-aat---tparrpn--psla
Geranomyces	asserl-----dqaaskpkagrvggsnsnlngksasnl--sk-----
Powellomyces	asserl-----dnaasqpkssklgsnsnlag-----k-----
Gaertneriomyces	assekl-----dvnahkpkatkpaektkkaepkpyt-----
Spizellomycesp	asserl-----dlasskpkssklgsntnlankpktpq-----
Fimicolochytrium	asserl-----dreaskpkntkvgstnlagkpktag-----
Thoreauomyces	asseql-----dqaankpkatklgstklgs-ssslaq--sk-----
Caulochytrium	-qrtplgsqgs1-----sastpppkrvt-----ptpsts
Rhizophlyctis1	assehl-----dlvaskpkktgttsnrastnlapkna--gg-----
Rhizophlyctis2	assekl-----dliankpkktggtstrasaadlskst---sp-----
Borealophlyctis	asserl-----gefaqikfaggt-----
NowakowskiellaA	assetl-----dliahsqkkqdvnlssnlkagss-----
NowakowskiellaB	asserl-----dlissspksdtrnsktnlassssktnvsr-----
Quaeritorhiza	astekl-gtyllsde--nlvahkpkdsklgstts-lnksasnmssl-----
Lobulomycetalessp	asvetl-----eikskpskv-dahsstgkl-----
Lobulomycesa	qs--rt-----nstspkkife-----
Clydaea1	qs--rt-----nstspkkife-----
Clydaea2	astesl-----eikaqpkkkadvhnsnssl-----
Polychytrium1	vsseki-----dseahktkkapestltstapas-----gvk
Synchytriumm	esmdkl-----elaanppksnkalgsmnms-----
Synchytriume	estekl-----dmsknpvksnknmgsm-dma-----
Batrachochytrium	msteal-----daeanrpkkavtsqaprtv--kpivk-----
Gorgonomyces1	assetl-----dkqmakpkr-----
Globomyces1	asteyl-----dmnsnktkkqemyssn--tqlpkvnf-----
Boothiomycessp1	psverl-----dnlanqpkkadfkss----lpklne-----
Boothiomycesmm1	psvekl-----dnianqpkkadfkss----lpklne-----
Polyrhizophydium	asteml-----dkqasqpkrtlppvnasrga-----
Terramyces	psvekl-----dnlanqpkkadfkrs----lpklne-----
Kappamyces1	vssegl-----dkiaspkkpemspr----mpkqgl-----
GLOBALOMYCES2	-----
GORGONOMYCES2	-----
GORGONOMYCES3	-----
BOOTHIOMYCESSP2	-----
BOOTHIOMYCESM2	-----
KAPPAMYCES2	-----
Chytriomycesh1	-----sslassqgs--
Chytriomycesh4	-----
Chytridium1	-----nrsihgsstsiass-----

Chytridium3 -----  
Chytridialesp1. -----gsspssnkg-----  
Siphonaria1 -----sssvsssqq-----  
Podochytrium1 -----ssmassqqsl-----  
Podochytrium2 --p-----  
Obelidium1 -----ssslasqq-----  
Obelidium2 --p-----  
Physocladia1 -----asts-----  
Entophlyctissp2 -----nksts-----  
Entophlyctissp3 -----r-----  
Entophlyctish -----sept-----  
Zopfochytrium1 -----ks---stpgs-----  
Zopfochytrium2 --rsgse-----g-----  
Rhizoclosmatiumg2 --aw-----g-----  
Phlyctochytriumb -----srsltgssslasvp-----sks-ass--lap  
Phlyctochytriuma -----aks-----  
Irineochytrium vgnlgrnttnagssssisklp-----vst-kgs-----  
Dinochytrium1 -----prslhgsntslania-----skt-sstgslat  
Siphonaria2 --r-----  
SIPHONARIA3 -----  
OBELIDIUM3 -----  
CHYTRIOMYCESH7 -----  
RHIZOCLOSMATIUMG1 -----  
DINOCHYTRIUM2 -----  
Physocladia2 -----  
Chytridialesp2A -----SNNTK-----KKDTKMATIE--D-----  
Chytridialesp2B -----IAS-----KSGSKILTDS--KRQLN-----A-----  
Cladochytrium2 vartgsngpvg-----gaggarggg-----  
Cladochytriumt1 ataaaartplggstrslaalrrmatgssgdaaesghggadgggssskpravssktssl--  
Cladochytrium --nss-----  
Blytтиomycessp2 -----dvvgsgqssla-----s  
Blytтиomycessp1 gpaassssttrrsnqdlstpastrasradrapaaasttr---rsntdlasgarrtva-  
Geranomyces -----qssavdakqs-----  
Powellomyces -----pkppsasaqs-----  
Gaertneriomyces -----avtk-----  
Spizellomycesp -----akidks-----  
Fimicolochytrium -----ggnaaaass-----  
Thoreauomyces -----tgsksdisk-----  
Caulochytrium trpaa-----akta-----aaskaaat-----  
Rhizophlyctis1 -----ttkpttagkt-----  
Rhizophlyctis2 -----akkpttasks-----  
Borealophlyctis -----  
NowakowskiellaA -----snssl-----  
NowakowskiellaB ---ltsnvstsgsnsni-----  
Quaeritorhiza -----nrntsksgsignlnkktsgvsvmmdt--aktls-----stasqtqpdtlap  
Lobulomycesalp -----nk-----gstssl  
Lobulomycesa -----  
Clydaea1 -----  
Clydaea2 -----kssntslatks-----ttnvsksnsslk  
Polychytrium1 -----vvg-----kspstksvs-----  
Synchytriumm -----  
Synchytriume -----  
Batrachochytrium -----sset-----  
Gorgonomyces1 -----  
Globomyces1 -----gs-----  
Boothomycessp1 -----  
Boothomycesmm1 -----  
Polyrhizophyidium -----  
Terramyces -----  
Kappamyces1 -----a-----  
GLOBOMYCES2 -----  
GORGONOMYCES2 -----  
GORGONOMYCES3 -----  
BOOTHIOMYCESSP2 -----  
BOOTHIOMYCESM2 -----  
KAPPAMYCES2 -----

Chytriomycesh1 ---lak--sstasklsvfdrldtdssgytgthqhrfnadgsgrglagrdsaplglk---gg  
Chytriomycesh4 -----ertaasssagpsvfdrldnnvksftgthkhrfnadgtgrgkagr-----  
Chytridium1 -----v---gkstgssvfdrldtngsytgthklrfnasgtgrglagrdsipkn-----g  
Chytridium3 -----rmqsprttngqsvfdrldtsspttftgthkhrfnpdgtgrglegrtgegag-----  
Chytridialesp1. ---d-----sslntkvfdrldtdtsgytgshkhrfdadgkgrglagr-----  
Siphonaria1 ---lapknssmtsskgsvfdrldtdshgytgahkhrfnadgtgrglagrdsaplgn---gg  
Podochytrium1 ---aqhknsmtsskgsvfdrldtdssgytgahkhrfnadgsgrgmagrdsapalgs---gg  
Podochytrium2 -----vsslgggagpsvfdrldnhvssftgthrhrfnadgtgrgkagre-----  
Obelidium1 ---latknssvsskasvfdrldtntkdytgahkhrfnadgtgrglagrdsaplgs---gg  
Obelidium2 -----vrysedqggresvfdrldnnvstftgthkhrfnadgtgrgkagred-----  
Physocladia1 ---slnknaatssskasvfdrldtdssgytgahkhrfnvdtgrgiagrldplslgs---g-  
Entophlyctissp2 ---slknpatgaskgnvydrldtntqgytgshkhrfnadgtgrgiagrdsapalga---gg  
Entophlyctissp3 ---vnspplsaghempavferldnhvstftgthkhrftedgrgrgkagre-----  
Entophlyctish -lsslknkrstsgsmgssvferldtdkaytgthkhrfnadgtgrgidgrdpnagts----g  
Zopfochytrium1 ---ittlnksvtgsrtavfdrldtdtsgytgshkhrfnadgtgrgaagreivskgh---s-  
Zopfochytrium2 ---slgsapsspsarpsvfdrldtstftgshkhrfnadgtgrgkegrvsgdgdgag-----  
Rhizoclostridiumg2 ---enrsmgsedgkpsvfdrldndvstftgthkhrfnpdgtgrgkegrdsps-----  
Phlyctochytriumb itsmgk---gpkdnsvfdrldtngsytgthkhrftstgvgrglagrdsipkn-----g  
Phlyctochytriuma -ee-----y--takgsvfdrldtdsnqytgahkhrfnadgsdkgvgvrdspksgg-----  
Irineochytrium ---tssvnfaqtgskgsvfdrldtdsnqytgshkhrftagvgrglagrdsipkn-----g  
Dinocytrium1 lregkglkdnngsktavfdrldtngsytgthkhrfnadgtgrglagrdsipkn-----g  
Siphonaria2 -----yseehaggragsvfdrldndvstftgthkhrfnadgtgrgkagre-----  
SIPHONARIA3 -----  
OBELIDIUM3 -----  
CHYTRIOMYCESH7 -----  
RHIZOCLOSTRIDIUMG1 -----  
DINOCHYTRIUM2 -----  
Physocladia2 -----tsrdsvempavferldnsssstftgtqkhhkfsedgkptrdwk-----  
Chytridialesp2A -----  
Chytridialesp2B -----  
Cladochytriumt2 ---ggssagsgggsggnvfrldtstvtftgthrhrfnadgtgrgkagrtgdgag-----  
Cladochytriumt1 ---agssksltvgsrvgvfdrldtdtgytgahkhrfnadgtgrglagrdsapkgg-----s  
Cladochytrium -----taktgaqkgtnvydrldtntgaytgthklrfdasgqgrglagrdsapkgg-----s  
Blyttiomycessp2 -----tsptpghgsgsvfdrldtstftgshkhrfnadgtgkkgmrtgdgag-----  
Blyttiomycessp1 saynkglstslsekkpsvfdrldtdssgytgshkhrfnadgsgrglagrdsiakst---kg  
Blyttiomycesh -tpaskgtynasgtntsvfdrldttagytgthklrfnadgtgrgmagrdsapakga----a  
Geranomyces -yg-----tanakaggsvfdrldtdtgytgahkqrfnadgtgrgiagrdsapakgs-----  
Powellomyces -yg-----tnnskaggsvfdrldtdssgytgahkqrfnadgtgkglagrdsapakgs-----  
Gaertneriomyces -ts-----cgqsskgsvfdrldtdssgytgshkerfnadgtgrglagrdsapakgs-----  
Spizellomycesp -yg-----a--nakgsvfdrldtngsytgthkhrfnadgsgrgiagrdsapakgs-----  
Fimicolochytrium -yg-----as--skgsvfdrldtdssgytgahkqrfnadgtgkglagrdsapakgs-----  
Thoreauomyces -yg-----antgkaggsvfdrldtdtsgytgahkqrfnadgsgrgiagrdsapakgs-----at  
Caulochytrium -ktagkayaasspaggsvfdrldtntagytgshkerfnadgtgrglagrdsapakgs-----a  
Rhizophlyctis1 -ystvkttpktggsssvfnrldtdssgytgthkerfnadgsgrglagrdsapakgs-----  
Rhizophlyctis2 -ynat---tpqgtgssvfnrldtdssgytgthkqrfnadgsdkglagrdsapakgs-----  
Borealophlyctis -----  
NowakowskiellaA ---nktgkpttgkstavfdrldtdtsgytgthkqrfnadgtgrglagrdsaplgr-----n  
NowakowskiellaB ---sfktpk--svggiavfdrldtngsytgthkqrfnadgtgrglagrdsaplgr-----g  
Quaeritorhiza ---tv----tdsmmlamaadslagiprlkgtlqeptavet-----  
Lobulomycetalessp -arpatsgystkksgsvfdrldtdtsgytgshahrfnadgtgkglgtgretvrkngst-----  
Lobulomycesa ---nqrspspirnsmvsvfdrldtdtstfkgthkhrfnpdgtgrgrdgrvdeg-----  
Clydaea1 ---nqrspspirnsmvsvfdrldtdtstfkgthkhrfnpdgtgrgrdgrvdeg-----  
Clydaea2 -pttstktfttskpsvsvfdrldtdvqygtgahkerfnadgtgkglagrdsapakgs-----  
Polychytrium1 ----yaavpstssgsvfdrldtdnqygtgshklrfnadgtgrglagrdsapakgs-----n  
Synchytrium ---plgasksksgsvgydrldtdtkygtgthklrfnddgtgrgiagrdsapakgs-----  
Synchytriume ---slsasksksgsvgydrldtdhksytgthklrfnddgtgrgiagrdsapakgs-----  
Batrachochytrium -llntttkktvgassgvfdrldtntkgytgthkerfnadgtgrglagrdsapakgs-----  
Gorgonomycet1 -----pegnsvfdrldtdakytgthkerfnadgsgrgiagrdsapakgs-----  
Globomyces1 -kqnltsnslnqngvdrldtntqgytgthkqrfdehngnrgldgrdstpakgs-----g  
Boothiomycessp1 -----ksnvydrldtdakgytgshkhrfnadgtgrglagrdsapakgs-----g  
Boothiomycesmm1 -----ksnvydrldtdskgytgshkhrfnadgtgrglagrdsapakgs-----g  
Polyrhizophyidium -alsssrnlsgmsvsvfdrldtdtkaytgthkerfnadgtgrglagrdsapakgs-----g  
Terramyces -----gksnvydrldtdkgytgshklrfdefghgkymgrdsapakgs-----g  
Kappamyces1 ---gssslnsagsgsvfdrldtdtklytgthkerfnadgtgrglagrdsapakgs-----g  
GLOBOMYCES2 -----

GORGONOMYCES2 -----  
 GORGONOMYCES3 -----  
 BOOTHIOMYCESSP2 -----  
 BOOTHIOMYCESM2 -----  
 KAPPAMYCES2 -----

Chytriomycesh1 vsq-yrggnvdslsqilrs--  
 Chytriomycesh4 -----  
 Chytridium1 vgv-yrggdvkelsqilrpgf  
 Chytridium3 -----tvnslsqitrk--  
 Chytridialessp1. -----  
 Siphonaria1 esk-yrggdvkelkqilrn--  
 Podochytrium1 vst-ykgnvhslsqilrn--  
 Podochytrium2 -----  
 Obelidium1 esk-yrggdvkdlsqilrt--  
 Obelidium2 -----  
 Physocladia1 pgt-yrggdvkslsqilrn--  
 Entophlyctissp2 vsv-yrggdvknlsqilrn--  
 Entophlyctissp3 -----  
 Entophlyctish tkt-----lasilrt--  
 Zopfochytrium1 vgt-yrggdvkdlsqilrn--  
 Zopfochytrium2 -----vvsdlsqitr--  
 Rhizoclosmatiumg2 -----tadlsqivsark  
 Phlyctochytriumb vgv-yrggdvkelsqilrpgf  
 Phlyctochytriuma pgt-yrggdvkdlsqilrs--  
 Irineochytrium vgv-yrggdvkelsqilrn--  
 Dinochytrium1 vgv-yrggdvkelsqilrpgf  
 Siphonaria2 -----  
 SIPHONARIA3 -----  
 OBELIDIUM3 -----  
 CHYTRIOMYCESH7 -----  
 RHIZOCLOSMATIUMG1 -----  
 DINOCHYTRIUM2 -----  
 Physocladia2 -----  
 Chytridialessp2A -----  
 Chytridialessp2B -----  
 Cladochytriumt2 -----vvadlsqitr--  
 Cladochytriumt1 agt-yrggdvkdlsqilrn--  
 Cladochytrium agq-yrggdvkdlsqilrn--  
 Blyttiomycessp2 -----ivadlsqivr--  
 Blyttiomycessp1 qgt-yrggdvrdlsqilrn--  
 Blyttiomycesh pga-yrggdvkdlsqilrs--  
 Geranomyces pgk-yrggdvkdlsqilrn--  
 Powellomyces pgk-yrggdvkdlsqilrn--  
 Gaertneromyces agk-yrggdvkdlsqilrs--  
 Spizellomycesp pgs-yrggdvkdlsqilrs--  
 Fimicolochytrium pgk-yrggdvkdlaqilrs--  
 Thoreauomyces ntk-yrggdvkdlsqilrs--  
 Caulochytrium pgt-yrggnvdslsqilrt--  
 Rhizophlyctis1 pgq-yrggdvkdlsqilrs--  
 Rhizophlyctis2 pgq-yrggdvkdlsqilrs--  
 Borealophlyctis -----  
 NowakowskiellaA pgt-yr-----  
 NowakowskiellaB pgt-yrfl-----  
 Quaeritorhiza -----  
 Lobulomycetalessp -----qdglarilra--  
 Lobulomycesa -----tkplsslikr--  
 Clydaea1 -----tkplsslikr--  
 Clydaea2 -----sm-vsrs-----  
 Polychytrium1 pgt-yrggdvkdlsqilrn--  
 Synchroniumm vgpvrdgqnvndlsqilrr--  
 Synchroniume tgvvrdgqnvndlsqilrr--  
 Batrachochytrium -----  
 Gorgonomyces1 -pylyrtgssssitra-----  
 Globomyces1 tqsiyrggnvnslsqilrs--  
 Boothiomycessp1 shgtyrggnvnslsqilrn--

```

Boothiomycesmm1      shgvyrvggnvnslsqilrn--
Polyrhizophydium    tvgvyrvggdvkslsqilrs--
Terramyces           tngvyhggnvnslsqilrn--
Kappamyces1         tntiyrggnvtslsqilrq--
GLOBOMYCES2         -----
GORGONOMYCES2       -----
GORGONOMYCES3       -----
BOOTHIOMYCESSP2     -----
BOOTHIOMYCESM2     -----
KAPPAMYCES2         -----

```

**CLUSTAL O(1.2.4) multiple sequence alignment for Figure 4**

```

Gonapodya           lldafe---awanfgtgsi-----na-----lnsmtstsmmdgarwakfckeaglvdg
Chytriomycesh1     lharfe---kfcafgrgsvgssld-s-lt--a-----gstm dgakwakfardcnlidn
Chytriomycesh4     lraafe---efssfgasrhpigspg----p-v-ph-haggiamdsskfaklcrdsglidn
Chytridium1        lhdvfe---rfaafgsnrnlssldss-ll--s-i--sgggltldgprfakfardtglvdg
Chytridium3        leeafi---afaafgsarkprhgrs-----s-----gsrisklaresgmigg
Chytridialesp1.    lrvvfd---kfcafgsnrnlsttsae-----yqmdgakfvkfardtgitdg
Siphonaria1        lrntfe---rfcafgrgsvgssld-s-lt--g-----gstm dgakwakfardstlidn
Obelidium1         lrntfe---rfcafgrgsvgssld-s-lt--g-----gstm dgakwakfardsnlidn
Obelidium2         lrtafe---efalfgspqrtqahs-----t---ttapvqmdnakfaklcrdsglvdn
Entophlyctissp2    lhrqfe---kfcafgrgssigsld-n-is--g-----gstm dgs kwakfardsgild-
Entophlyctissp3    lraafe---dfalfgapraalaaqs----p-s-aaaprdpvsmdsakfaklcrdsglidn
Entophlyctish      lyncfs---sfcqfgssnrnlssmg-----smt d-lagptmdgarwakfardsglldk
Zopfochytrium1     lhdvfe---rfcsfgssnrnlasm das-fg--p-----gltmdg akfakfardsglidg
Zopfochytrium2     lrsafe---afasfgssnrnl asap-----ipnaaattidsarfaklardt gliap
Rhizoclosmatiumg2 lraafe---efalfgtpktiapr-----p-ahlpnppi qmdskcfaklcrdsglidd
Dinochytrium1      -----
Siphonaria2        lraafe---efalfgtprtaa-----vnpnvqmdnakfaklcrdsglvdn
SIPHONARIA3        lrevfd---kfg-----kdgemdgakfakftkdaglvdg
OBELIDIUM3         -----fg-----kdgemdgakfakftkdaglvdg
CHYTRIOMYCESH7     lkevfe---kfg-----akdgemdg tkfakftkdtg lmdg
RHIZOCLOSMATIUMG1 -----msdlredaglvdg
DINOCHYTRIUM2      leeafi---afaafgssnrnl atgdv-----paaglgwalnsasfakltresgiigs
Chytridialesp2A    LRVTYN---KFCAFGSNRNLSE-----YSDVQMDGAKFAKFARDTGIIDN
Chytridialesp2B    LRVTFN---KFCAFGSGSA-----AENAGMEGSKFAKFARDSGLIDS
Cladochytriumt2    lraafe---afatfggsnrnl aaagadghspss-saatpaavtmdsarfaklvreagvlaa
Cladochytriumt1    lrdtfd---kfcafgst rslsssst-la--a-stssslslasmdgtrfakfardsglvdg
Cladochytrium      lrsvye---tfcnasgsssrml asphss--l-sdlsgagltmdgarfakfardcklidg
Blyt tiomycessp2   -----
Blyt tiomycessp1   -----
Blyt tiomycesh     -----
Geranomyces        lkevvy---afcafgsnrnl as-----sdvqgptmdg akfakfardnklidn
Powellomyces       lreiye---afcafgsnrnl ats-----tdvsgptmdg akfakfardnklidn
Gaertneriomyces    lreiye---afcafgsnrnl ss-tg-----sleniagp qmdg akfakfardnkiidg
Spizellomycesp     lreiye---afcafgsnrnl snphg-----smesiagp qmdg akfakfardnr lidn
Caulochytrium      lrvvfe---syangasrnvas-ng-----slnnlagp qldnakfaklcretkvvdg
Rhizophlyctis1     lqkmfe---afcsfgssknlas-sg-----smt dls g p qmdg akfakfcrdnklit-
Borealophlyctis    lrgmye---sfcsgssnrnl asphs-----smesiagp qmdg akfakfcrdnriidn
NowakowskiellaA    lhtvye---sfcsgssnrnl sssit-----dl--sgnptmdg akfakfardtklidg
Quaeritorhiza      lrhvfe---sfcsgssnrnl agnlgs-----tdslfv g p tmdg akfakfardski vdn
Lobulomycetalessp lrdlfe---sfcsgssnrnl atgss-----sn-lsgdm qmdn arfskfckdckvieg
Lobulomycesa       lynlyi---sfcqfgltksqlegsk-----s---nstlmssqsfskfskdcsvlqk
Clydaea1           lynlyi---sfcqfgltksqlegsk-----s---nstlmssqsfskfskdcsvlqk
Clydaea2           lyeife---sfcsgstrnl atgsn-----dm-ln-gvtmdnqkfskfkakdckivdg
Polychytrium1      lrstye---tfcsgssnrnl sgisa-----a-smdlvtg p tmdg akfakfcrdsglveg
Synchytrium        lrdrye---afcafgsnrnl agaat-----s-idiggh qmdn akfakftkdtg ivd-
Batrachochytrium   lymtfg---sfcqfgssnrnl s-g-----smt d- is g p tmdg skwakfcrdtgiidk
Gorgonomyc es1     lyesfd---afcfqgssnrnl ag-----sst-nlapqmdg akfakfcrdnkligg
Globomyces1        lygvye---sfcqfgstrtsnasl-----ssslnnlk g p tmdg skwakfcrdckvidk
Boothiomycesm1     lyhlfe---sfcqfgssnrnl s--g-----gslqnlkgp emdn akw akftrdckll dr
Polyrhizophydium   lytafc---qfcqfgssnrnl ss-----mtd-itg p tmdg akw akfcrdsgiiag
Terramyces         lyqlfe---sfcqfgssnrnl in-----gslqnlkgp emdn ahfakftrdskll dk

```

Kappamyces1 lhtlfd---sfvnfgatrnspfes-----pmakksstpqmdgarfakftrdcelvdk  
 GLOBOMYCES2 lnrafv---aycqfgasksnp-----sdaltdmdgarfakfckdtgvigg  
 GORGONOMYCES3 lievfe---sycsfsgsktllsm-----n-smggqmdgakfaklckdkklisg  
 BOOTHIOMYCESM2 iqnifn---afchfgtarnassdnl---nknstasalnsgpmmgdgsqfskfckdcnitkl  
 KAPPAMYCES2 lqqvfe---sfcsfggskgnlsag-----ikpsltptdvtmtngkfakfckdcdvhkd  
 Amoebophelidium vrqtfe---qfanfggssa-----ekhetidnskfaklcrdcgiidk  
 PARAPHELIDIUM LQDSFE---QFAQFGSSKNN-----LSQGTMDNAHFAMKCRDAKVLGK  
 Aphelidium LAHAFA---SFATFGAPNT-----QGPVTMDNAHFALCRDAHIVDK  
 Aphelidiumt LSHAFE---AFATFGAPST-----QGPVTMDNAHFALCRDARIVDK  
 AMOEBORADIX LRDRFN---AFCSFGSSRAVV-----SVEIDNSKFSKLARETGIIDK  
 SANCHYTRIUM LLKRFS---AFCSFGSSRAIN-----AVEIDNFKFSKLCKDSLILDK  
 Olpidium xxxxFQ---SFCAFGSSRNLSAN-----TxxxxphqDNQKFAKFARETKLISA  
 Allomyces lehlfv---afatfgaprtaiPg-----laqadaditmdstrwvfkfdlallsp  
 Paraphysoderma LYEVFT---QFCAFGASRSNPNLS-----GSLNNLSSGPDIDNVRFKFFRDLKVLNK  
 Blastocladia lab lhelfe---sfasfgasssrpsv-----aat-dgplidsarfvkfrdrtglls  
 Blastocladia lae lrtlfe---sfatfgasrssqst-----llqq-heplidsarfllkfkfdltllgdg  
 Catenaria1 lrelfe---qfasfgtpranasg-----pnfq-qetvmdsarflkffrdqnlldt  
 Catenaria2 lyqife---yfamfgvsriaasg-----s---dtvlidsarlaklfrdlnlfdk  
 Coelomomyces lkelfh---vysnlstasarsnlnnt-----sspahdlsmdatrfvfkfkdkqllnk  
 Sorochytrium lrelfe---rfcafsgsrssqnslnsppkptpalaaaaaiaidnaryvfkfkdlhltsk  
  
 Gonapodya kvvtvtevdvifn--kvrp-pnqrkvdyegfmrqlefisekrfpsvk-----t  
 Chytriomycesh1 krvtstdidvifn--kvka-ktarridweefqvavklvagkypkmh-----e  
 Chytriomycesh4 etftlidcdvifs--kckkv-gkrkleyddfkralaeiadirqch-----  
 Chytridium1 kkvtatdidvifn--ktkv-kgnrridwpvfleavqliaekrypeks-----d  
 Chytridium3 -nlvtvdvdivfg--rckvg---rkldfkafkkalemiaerrgct-----  
 Chytridialesp1. kkvttdidvifn--kvkp-ktgrkidfktftqavgliaelkhpdkq-----p  
 Siphonaria1 kkitstdidvifn--kvka-knsrridwefqaavrlvaekkyekh-----a  
 Obelidium1 kkitstdidvifn--kvka-knsrridweefqaalkmvaekkyekh-----a  
 Obelidium2 islslidvdiifa--kckqv-gkrklfyadfqralreiadtrqcd-----  
 Entophlyctissp2 rritsteidvifn--kvka-ktarrigwdefvegvkmiaekkyprh-----p  
 Entophlyctissp3 qslslidvdiifs--kckpv-gkrklfyahfqaalreiarvrqcd-----  
 Entophlyctish -disatdidimfn--kvk-aktarridfdqfqaalrliakrfgnsk-s-----p  
 Zopfochytrium1 rkvttteidvifn--kvka-ktarridwefvkvavqmlaekrypnkr-----p  
 Zopfochytrium2 psltivdvdlife--kckiakgtrklfdkgfkkalqmvaekrqcd-----  
 Rhizoclostridium2 islslidvdiifa--kvkqp-gkrklgyadfqralreiaawtrqcd-----  
 Dinochytrium1 -----meafqliaekrypekt-----s  
 Siphonaria2 iclslidvdiifa--kckqp-gkrklvyadfqralreiadtrqcd-----  
 SIPHONARIA3 kkitttevdvifn--kaka-ktarkidyaafesalqmladkkygkp-----h  
 OBELIDIUM3 kkitttevdvifn--kaka-ktarkidfaafesalqmladkrypgkp-----h  
 CHYTRIOMYCESH7 kkvtttevdvifg--kvka-ktarkidlaqfesaiglladkrypgks-----h  
 RHIZOCLOSTRIDIUMG1 kkitttevdvifn--kaka-ktarkidftafesaigmladkrypgkp-----h  
 DINOCHYTRIUM2 -vvtltdidvifn--qckvg---rkldftafkrslleliaekrgcs-----  
 Chytridialesp2A KKITTTDIDVIFN--KVKP-KGARKIDFSAFTAALQMLAEMKYPKKE-----P  
 Chytridialesp2B KKITTTDIDVIFN--KVKA-KTARKIDFDGFTNAFRMLAEMKYPKKT-----P  
 Cladochytrium2 lglpadadvvfe--ksrpvggprlrdfraalrglaerqgge-----  
 Cladochytrium1 kkitatdidvifn--kvks-kssrriewefvkvavqmlaekrypehr-----p  
 Cladochytrium krvtttdvdiifn--kaka-kgsrrldwttfqaavralaqkkypera-----e  
 Blyttiomycessp2 -----  
 Blyttiomycessp1 -----  
 Blyttiomycesh -----kk-----g  
 Geranomyces kkvtstdvdiifn--kvkp-kgarkldwntflegltqiaekknpgkq-----g  
 Powellomyces kkvtstdvdiifn--kvkp-kgarkldwntflegltqiaekknsgkq-----g  
 Gaertneriomyces kkvttdvditfn--kvkp-kgarkldwntfldaltqlaekkyagkk-----g  
 Spizellomycesp krvtttdvdiifn--kvkt-kgarkldwntfidglteiaavkkygkq-----g  
 Caulochytrium krittteidisfs--kvl--kggrkmdfgqfgevlrllaekkfvgav-----d  
 Rhizophlyctis1 ktltstdvdiifn--kvkp-kgarkidwqtflaalrlvgekk-tgkk-----g  
 Borealophlyctis kkvhstdvdiifn--kvkp-kgarkldwntfqdalqlvaekk-hgkk-----g  
 NowakowskiellaA krivstdidvifn--kvks-kgarridwefqnglkliaekrypgkp-----e  
 Quaeritorhiza kkitstdidilfn--kaka-kgarrldwdsflvafqelaekkyppkn-----p  
 Lobulomycetalesp kkitstdvdilfn--kikt-kgarkitwvfeqafatlaemrypskn-----a  
 LobulomycesA nvistididvifn--kvkvdkskrkinfnflvaiglladlkfkdie-----k  
 Clydaea1 nvistididvifn--kvkvdkskrkinfnflvaiglladlkfkdie-----k  
 Clydaea2 kkittdcdilfn--kvka-kgarrldfegfqtafqqladkkypgrn-----p  
 Polychytrium1 kaitstdvdiifn--kaka-kgarrldwntfleacrllsekkypaat-----p  
 Synchronium krvtiidvdiifn--kvka-kgarkldwntfqqalahlvaekkyplq-----p  
 Batrachochytrium -hittdidvifn--kvk-aktvrkidfeqfqaalhlvaakrygssk-p-----p

Gorgonomyces1	-kvtptevdivfn--kvk-gktarkidfkefqeglrlaakkyeg-k-n-----p
Globomyces1	-vitptevdivfn--kvk-skterkidydqfiegkkmisakkysn-k-t-----t
Boothiomycesm1	-titstecdivfn--kik-vknerkinfdqfgeclrhiaakkyss-k-s-----p
Polyrhizophyidium	-tttstdadiwfn--kvk-aksarridfdqfgealrlaaakrfggsk-t-----p
Terramyces	-titstecdivfn--kik-akterkinfeqfqnclkqiaakkysn-k-s-----p
Kappamyces1	-vitptevditfn--kvk-gkterkinfvqfqdalkliaakkyps-k-s-----p
GLOBOMYCES2	-pitntdvddivfs--kvk-aknarrinqqefilgiqqqlgekfkfkg---t-----p
GORGONOMYCES3	-kitstdidiifn--kvk-ektarkigfpefmealkliaakkyed-k-s-----q
BOOTHIOMYCESM2	-kvtttdvdiifn--kid-----ekqfrealnllsqinypg-----q
KAPPAMYCES2	-gisstdtdiifn--kvk-akterninfsqftealrqiavkrfpk-a-e-----p
Amoeboaphelidium	-kctsvdvdiifk--kvv-rkgerridfaefqkalkqlsekkfradd-----gg
PARAPHELIDIUM	-SVTTVDVDLVFK--KVL-IKGERRINFQFKAALMLAAQKYPDDA-----SA
Aphelidiumi	-RVTAVDVDITFK--QVL-TKGSRRITFDQFQQGLQTLATKKYAAAQLSD-----EEA
Aphelidiumt	-RVTSVDVDITFK--QVL-TKGARRITDAQFQQALKVLAAKKYGS-NVSE-----ADA
AMOEBORADIX	-KCTSTDVDIIFN--KAKKNKTRKLDQFKVALKLLAEVKYPGE--D-----G
SANCHYTRIUM	-KLTTTDVDIVFN--KAKKEKTRKLDQFKAALRLLAEIKYPGDE-E-----G
Olpidium	PKVTAVDVDNAFM--RVKP-RASRKIDFEGFQQALRILAEKRYPKD-----P
Allomyces	psfsttdldlifnakvhrqrdrklsydafryalklaafakyggkpasdpadplaaiae
Paraphysoderma	-ELTPTDIDIIFN--KVKKTKTRKLDQFKNALVLCSEKKYRPKM-D-----G
Blastocladiellab	-hltqttldihfakaksqfkradrklpfdaflyalqlaavskyggams-----e
Blastocladiellae	-altstslldlhftkarahfkrtdrklodyeaflyalqlaavtkfgaama-----d
Catenaria1	-nltptsldlhftkakafkrtdrklpwnaflyalqlaattkygsams-----d
Catenaria2	-sfnsialdinfskakatfqrprklpwaafiyalqlsaankyplks-----e
Coelomomyces	-hctvtlddivfnkvkqgak-kerkidyhafkklhilawirahpdpn---appesaitp
Sorochytrium	-tltttdldiifn--kckankadrklfdnafklalalaaaerkytganmd-----t
Gonapodya	qpermkmiisevlessg-----
Chytriomycesh1	qdaytktiydacilsng-----
Chytriomycesh4	---vshvvalvv--saa-----
Chytridium1	qqalhctlydvcirspg-----
Chytridium3	---iehvkalvi--gse-----
Chytridialesp1.	edalhqvlydvcikskg-----
Siphonaria1	qdaftqvmydvcvraagg-----
Obelidium1	qdaftqvmydvcvrahg-----
Obelidium2	---idhvvamvv--taa-----
Entophlyctissp2	qdaftqimhdvcvkaeg-----
Entophlyctissp3	---vehvvaliv--ste-----
Entophlyctish	teafaaiirtivngn-vrpvlqgtvrrsagcgtarvltgdgclivagswlladrgcwlvar
Zopfochytrium1	qdaldstlydvcikakg-----
Zopfochytrium2	---yshvvaivv--ags-----
Rhizoclosmatiumg2	---eehvvalvv--sap-----
Dinochytrium1	qqsmhctlydvcirspa-----
Siphonaria2	---vehvvamvv--taa-----
SIPHONARIA3	eeayantiadvck-tkg-----
OBELIDIUM3	eealantmadvck-tkg-----
CHYTRIOMYCESH7	eesvasamsdlck-akg-----
RHIZOCLOSMATIUMG1	eealaatmadvck-vkg-----
DINOCHYTRIUM2	---vdhkalii--ase-----
Chytridialesp2A	QEALHATLIDVCIKSNG-----
Chytridialesp2B	EEAFQAALKEEVVK-SSG-----
Cladochytriumt2	---yadvvarvv--eas-----
Cladochytriumt1	kdamdsilydvciktrg-----
Cladochytrium	meafntvmlevt-qarg-----
Blytitiomycessp2	-----xx---xxx-----
Blytitiomycessp1	-----
Blytitiomycesh	nqafdalikdlsrksvg-----
Geranomyces	rdaldsligliikkggg-----
Powellomyces	realdsligliikkggg-----
Gaertneriomyces	realeavtgdivkrsgg-----
Spizellomycesp	rqaldavistimkkggg-----
Caulochytrium	--aqkkliaqic-qskg-----
Rhizophlyctis1	deafdtvvgqllragkg-----
Borealophlyctis	egayaalvtivrkgkg-----
NowakowskiellaA	gerfnsilfdvc-ktkg-----
Quaeritorhiza	seafnsllndvafkskg-----
Lobulomycetalessp	rdayqslhvvv--neg-----
Lobulomycesa	nerfgrlitfvl--dkg-----

Clydaea1 nerfgrlitfv1--dkg-----  
 Clydaea2 keaydtllnhiv--dkg-----  
 Polychytrium1 aegwskflndvvytgkg-----  
 Synchytium eegfnklvsdvl--assg-----  
 Batrachochytrium teaynllvrsilnsg-arpvatgt-----  
 Gorgonomyces1 ieqfnaivrhitsgdnk--piaya-----  
 Globomyces1 tesfvilvqfvlstrgapvvq--tn-----  
 Boothiomycesm1 teaypvn-----  
 Polyrhizophyidium qegymllvreivggggarpiaqgt-----  
 Terramyces teayvtvcqnilnsgqrptvq--ss-----  
 Kappamyces1 seayvhlvrvatqagapkavslvkt-----  
 GLOBOMYCES2 edslnniisqilksggvpklaega-----  
 GORGONOMYCES3 ndalgtlindmltntsslpslnkt-----  
 BOOTHIOMYCESM2 dnafdllvasvvqsggtpklvpnv-----  
 KAPPAMYCES2 aaafdqlvakilksggcpkiqdg-----  
 Amoeboaphelidium yqkvlalvaks-----  
 PARAPHELIDIUM SEKVFLIAAAT-----  
 Aphelidiumi LKRITALVVNAA-----  
 Aphelidiumt LQKISALVTQAA-----  
 AMOEBORADIX YLKIVQLVNTSEPKVRKEVGSSGNL---KSI-----S-----LSDVRS  
 SANCHYTRIUM YSKLVALVVKNEPKVRTETGSNKNL---NGS-----  
 Oplidium EEAYLTLVNHVC-QSKG-----  
 Allomyces qailenlvseicatgila-----  
 Paraphysoderma YQAYEKIVTDIVSKDNA-----G-----  
 Blastocladiellab nealeqiiieacng--sg-----  
 Blastocladiellae ddalecliseacrstag-----  
 Catenarial adaleqlineavks--qg-----  
 Catenaria2 eeafsklvheirh--pg-----  
 Coelomyces dkayldfalqiyntkemq-----  
 Sorochytrium qhayaklvnealrkg-----ahg

Gonapodya plakt-nvaptteattsvvnrltdvtgytgthkerfnt-dgtgrgrdgrdt-tag-lgka  
 Chytriomycesh1 pva-rat----tvkndavldrldtvsqytgthknrfds-agrglglngrvt-gks-tdtl  
 Chytriomycesh4 peingt----lphadelidkldttslytgmhrrarfdpvtgqgrglagret-isp-tadl  
 Chytridium1 gpakkgt----tvqadavldrldttdtlytgthksrfde-ngnrglagrdt-gsk-tdrl  
 Chytridium3 pqlkgt----vpmipivekldtdaslytgshrerfsvtgvgrgaagrdr-vak-tgsl  
 Chytridialessp1. pqa-ngt----vaerdsiiarldttsqytgthahrfde-ngkrglegrdt-hsk-tdsl  
 Siphonaria1 plankat----avqkdavldrldtvsqytgshknrfds-agrglglggrdt-isr-tdtl  
 Obelidium1 pvs-kat----avqkdavldrldtvsqytgshknrfds-agrglglggrdt-isr-tdtl  
 Obelidium2 pelngt----ipqvteliekldttslytgthkarfdpvtgqglgldgsep-vnp-tanl  
 Entophlyctissp2 pia-rat----svkndavldrldtvsqytgthksrfds-ngrglglggrdt-mvk-tdql  
 Entophlyctissp3 pgingt----ipeasqivekldttslytgshrnrfdpvtgqglglsgep-vsa-tadl  
 Entophlyctish gcwmaq----aasndavtqrmdhtlytgthknrfda-snglgmsgrdq-psr-tndl  
 Zopfochytrium1 pvs-sgt----avkndavldrldtthaytgthklrfda-dghgrgmegrdr-psk-tdrl  
 Zopfochytrium2 paltgt----ipdydpviekldttslytgthknrfdpvtgvgrglegrep-vnt-tdsl  
 Rhizoclostratiumg2 vlingt----ipqvdeitekldtvslytgthkerfdpvtgqgrglagrdr-int-tanl  
 Dinochytrium1 gpskagt-----tgthkarfde-ngvgkglagrda-psr-tdrl  
 Siphonaria2 peingt----ipqvteliekldttslytgthkarfdpvtgqglgldgrdt-vnt-tanl  
 SIPHONARIA3 pilkg-tvaq----ndevtkrmdtvsqytgthvhrfne-dgtgrgaagrda-pss-tadl  
 OBELIDIUM3 pilkg-tvaq----ndevtkrmdtvsqytgthvhrfne-dgtgkglagrda-pss-tadl  
 CHYTRIOMYCESH7 pvikg-tkaq----edevtkrmdtvsqytgthkerfne-dgtgkglagrdr-pvq-tadl  
 RHIZOCLOSTRATIUMG1 pilkg-tvaq----ndevtkrmdtvsqytgthvhrfne-dgtgrgkegrda-pss-tadl  
 DINOCHYTRIUM2 pklngt----vpdlmpivekldtdaslytgshrerfdretvgvkgagrdr-fsa-tasl  
 Chytridialessp2A PVAKG-TTAQ----NDAILTRLTDTSLYTGTHKERFDA-EGKKGGMAGRDRY-GSK-TDRL  
 Chytridialessp2B PVAKG-TTAQ----NDAILNRLTDTSLYTGTHKERFDA-DGKKGGLAGRDRP-GPQ-TDTL  
 Cladochytrium2 pviygt----vpdidpvelekldtdaslytgthkhrfdpvtgvgrglegrep-vst-tasl  
 Cladochytrium paangttavqlsvkndevlqrltneraytgihkrvssa-agakagtastpa-g-----  
 Blyttiomycessp2 plinkat----taktdgvydklntqlytgahklrfde-qngrgmeglke-rer-sna-  
 Blyttiomycessp1 xxxxxx-----ipdvdpiekltdttslytgthkqrfdpvtgvgrglegrdt-vat-tasl  
 Blyttiomycesh --xxxxxxxxxshndavverldtvsqytgthksrfna-dgtgrgmegrdr-vsk-tdrl  
 Geranomyces pvssgt----vaqtdavldrldttdtqaytgthklrfdd-eghglmagrdr-psk-tndl  
 Powellomyces piatgt----apksdaivdrldttskytgthklrfde-agqgrgaagrdr-psp-tsdl  
 Gaertneriomyces piatgt----apksdaivdrldttskytgthklrfde-agqgrgaagrdr-psa-tsdl  
 Spizellomyces piastgt--rdtpqsdavdrldttskytgthklrfde-qghrglagrdr-pak-tddl  
 Caulochytrium piatgt----tpksdgivdrldttskytgthklrfde-agrgrgagrdr-psa-tdql  
 Rhizophlyctis1 pkasgt----tpdakgahnrltdttsqytgthklrfde-egrgrglagrdr-pap-tadl  
 Rhizophlyctis1 pvssgt----vpqndavidrmdttsmytgthklrfda-eghgrglegrdq-psk-tndl

Borealophlyctis pvvsgt-----vpqqdaildrmtdtslytgthklrfde-egrgrgaegrdq-psk-tddl  
 NowakowskiellaA psssgt-----tmktdgvygkldtdksytgaqklrfdd-letsqvq-----  
 Quaeritorhiza pktns-tvaq----adgvfdkldntqlytgthkhrfdd-dgrgrgmegrdt-psk-tnql  
 Lobulomycetalessp pvarat-----itktngvyskldtdtkqytgshknrfde-ngvgkgaagrady-gqa-tlnh  
 Lobulomycesa pvlrni----tvskvngifdrldtdtslytgthklrfde-ngnglgldgrds-gid-gntl  
 Clydaea1 pv-----skvngifdrldtdtslytgthklrfde-ngnglgldgrds-gid-gntl  
 Clydaea2 piargt-----iteangvydklntnlytgshkerfde-sgvvgkgaagrqm-idsttanl  
 Polychytrium1 pvvsgtt-----astegiyeklntnlytgthksrfa-da-ngkglglagrda-psk-tnrl  
 Synchytium psltgt----avsknaaivdrldtastfpvthknrfde-hgvlksspgf-----  
 Batrachochytrium -----ittsdsvtqrldtdhtygtgthknrfde-agqglglagrdt-hsr-tnel  
 Gorgonomycetes1 -----t-----lpandsitqrldtdtqytgthknrfde-ngrglgmqrdrp-kt--i-sl  
 Globomyces1 ----lk-----nsvqmdvtnrldtdpqkytgihkekshg-tm---gsvydl-----  
 Boothiomycetes1 -----qmdvtarldtdpsqytgrhkaqhse-mekskstssgnl-----  
 Polyrhizophyidium -----lpssdsvtqrmdhtlytgthknrfds-agrgrmagrdq-lpk-tnel  
 Terramyces ----vn-----naaqldvtarldtdpsqytgrhkvqhse-mekskstsignl-----  
 Kappamyces1 ----ps-----kgsynditarldtdpskftgtqkvtfeg-rss-----  
 GLOBOMYCETES2 -----t-----qvekstivekldtdskytgthkerfdg-ngkgkglmgrtdlgsq-tlsl  
 GORGONOMYCETES3 -----t-----kastsdltkrldtdtsqytgthkqrfde-sgqgrgkagrdd-gsq-i-tl  
 BOOTHIOMYCETESM2 -----t-----tpvnkkivskldtdtslytgthknrfde-hgkglgmagkde----fkel  
 KAPPAMYCES2 -----rpvndavtsrldtdhsqytgthknrfda-dgkgkkgdgrtdkfg-vmtm  
 Amoebophilidium pstsgt-----ltheadgvfekldtdtslytgthkekfdk-dgnakplng---ink-tadl  
 PARAPHELIDIUM PAQNGT-----QADASGIYSKLDTDSLTYGSHKLRFDA-DGKGRGIEGRDQ-PVQ-TSDL  
 Aphelidium1 PTSSGT-----TADTAGIFSKLDASQYTGSHRSRFADE-NGNGLGLAGRDT-HTR-TANL  
 Aphelidium2 PVSNGT-----AADASGIFAKLDTDTKYTGSAHRSRFADE-NGNGLGLAGRET-HVR-TANL  
 AMOEBORADIX ESESNT-----KQSSDSVDFRLTDHTKYTGSHKERFDE-DGKGKGLEGRITTEVH-H--I  
 SANCHYTRIUM GNELDS-----KASSDSVDFRLTDHTKYTGSHKERFDD-DGKGKGLDGRRDGQVN-H--I  
 Olpidium PKVHSI-----QPEATGIFEKLDTKLYTGSAHKARFDD-NGVGRGAAGQVD-AEDATRNL  
 Allomyces pvrrsa-----aadsvapfsaaataa-----cdap-----r-r-----  
 Paraphysoderma PLLHGT-----RPEASGVYSKLDHTLYTGSHKERFDE-EGRGKGVSGRNDSSIG-VKRL  
 Blastocladiellab piargt-----vratggyiskldtdptlytgqhkdkptg-ssggasrevtie-esr-t---  
 Blastocladiellae piarat-----vpvtdgvyiskldteggngahqqqa-----anytvves-gma-k---  
 Catenaria1 piarat-----vpvadgvygkldtdasqytgqhkdkpsg-qsegkgyt-ies-pla-k---  
 Catenaria2 pdfapd-----ypggaraq---dgaaapvs-rasrrsst---m-prr-t---  
 Coelomomyces pifhat-----vpettgifskldtdsksttdtentpkk-rn-----  
 Sorochytrium peihgt-----ipdasgiyskldtdskytgqkerfan-itpsgsqnnls----s-tskl  
  
 Gonapodya snrtyk----givqdv-vpptgkrai-----  
 Chytriomycetes1 sk-----ivnrapsqqplaqtnrqsvsnr-----qesqstmrap-----  
 Chytriomycetes4 sa-----ivsrhnsattlgskasa-----anral-----  
 Chytridium1 dk-----lvsrndstt-ptippis-----  
 Chytridium3 sd-----ivsrhnpnttlgspkvm-----rvati-----  
 Chytridialesp1. hk-----ivnrthrsp-----  
 Siphonaria1 sk-----ivsrdivpaqrpslpgqrang-----tpavmrpptas-----  
 Obelidium1 gk-----ivsrdivpaqrpsvpqns-----rpitt-----  
 Obelidium2 ss-----ivsrhntartlgskalp-----tphas-----  
 Entophlyctissp2 sk-----ivsrhdhaglam-----pppaa-----  
 Entophlyctissp3 sa-----ivsrhnaaktlgahpva-----tatat-----  
 Entophlyctish ak-----itnr-eesnrvgvplsaaygsnsmadgrystssit----psih----  
 Zopfochytrium1 dk-----lvnrldgagta-----  
 Zopfochytrium2 an-----lvsrhnpnktlgapt-----ppksp-----  
 Rhizoclosmatiumg2 st-----ivsrhntartlgskgpl-----spsss-----  
 Dinochytrium1 dk-----ivgrgvgeggypipis-----  
 Siphonaria2 ss-----ivsrhnsaktlgskslp-----tphas-----  
 SIPHONARIA3 sq-----ivank-----  
 OBELIDIUM3 sq-----ivank-----  
 CHYTRIOMYCESH7 sq-----ivank-----  
 RHIZOCLOSMATIUMG1 sq-----ivagkk-----  
 DINOCHYTRIUM2 sh-----ivsrhnpnttlgspkvh-----rptpt-----  
 Chytridialesp2A DK-----IVNRDTNATIGISTAT-----  
 Chytridialesp2B DK-----IVNRETNPVGLSSKN-----  
 Cladochytrium2 at-----ivsrhnphtlgtsgg-----saasv-----  
 Cladochytrium1 -----  
 Cladochytrium -----  
 Blyttiomycetes2 an-----ivsrhnpnktlggplvt-----ppktp-----  
 Blyttiomycetes1 dk-----lvnrddkkr-----  
 Blyttiomycetes ak-----ianrea-tslrglpvsa-----dpaaga-----  
 Geranomycetes sk-----itnree-tslrglpvsi-----dpnek-----

Powellomyces	sk-----itnree-tslrglpvsi-----dpnek-----
Gaertneriomyces	sk-----lvnrep-ttvrglpvsv-----dpdage-----
Spizellomycesp	sk-----itnree-tsvrglpvsi-----dpeegd-----
Caulochytrium	sq-----ildrsg-atvrgvplkt-----aertan-----
Rhizophlyctis1	sk-----itnrdeqasvrgipasa-----dpaek-----
Borealophlyctis	sk-----itnree-tsvrglpvsa-----dpfaqt-----
NowakowskiellaA	-q-----ftsn-----ttaa-----kp-----
Quaeritorhiza	es-----finrdvattitgapvs-----
Lobulomycetalessp	sq-----vvrssnnnisntyss-----rsltni-----
Lobulomycesa	dr-----mvnrassskararslsq-----s-----
Clydaea1	dr-----mvnrassskararslsq-----s-----
Clydaea2	sq-----lvnrntnsnvpntycg-----tp-----
Polychytrium1	dt-----lvnrdskgpsstlagskpgsmsnl-----ssap---kplt-----
Synchytriume	-----asreglgksngtptk-----spat-----
Batrachochytrium	sk-----ivnr-keadirgvplaaspigsp-----r-----
Gorgonomyces1	sn-----lanr-epadirgvnfskpsssnsslsnhgsksnlt---tgsksk---
Globomyces1	sd-----sg-----resistik-----
Boothiomycesm1	ad-----ss-----rnsqasiq-----
Polyrhizophyidium	ak-----itnr-eesnrvrgvpmsaasaaamaagdsrrasstst---maass---
Terramyces	se-----st-----rnsqtsmq-----
Kappamyces1	-----
GLOBALMYCES2	sq-----itnr-keadvrgvak-----
GORGONOMYCES3	qs-----ianrddradvrgvngsfkk-----
BOOTHIOMYCESM2	sq-----itnr-kdadvrgvqk-----
KAPPAMYCES2	kn-----vtnr-keadvrgvqrt-----
Amoebophelidium	sq-----ivarksgtt---p-----verptakstgaak-----
PARAPHELIDIUM	SQ-----IVNRKSGTA---A-----ATTGGKRSPTAS-----
Aphelidiumi	SQ-----MVDRSIAKV---P-----APTSTGKRTVTLS-----
Aphelidiumt	SD-----MVDRSLSKP---A-----A---PQKRTVTLS-----
AMOEBORADIX	SQ-----ILRK-----
SANCHYTRIUM	SE-----ILRK-----
Olpidium	ST-----IVSRDPASKQ-----
Allomyces	-----srsthqln-----esspkla---gtssk-----
Paraphysoderma	DK-----LVSRDPAVQNRAA-----SMNQTNKRGISAS-----
Blastocladiellab	-----srskrsrprgsr-----sasrsgsvsdltsalagasistpra
Blastocladiellae	-----mr---l-gggg-----ngsrsgssnlvamsgtgnrs---
Catenaria1	-----sr---a-----tgsrsnstsnnlldastgtrgs---
Catenaria2	-----sa---esn-dsg-----igesagessg---sfgsgsgslrs
Coelomomyces	-----sqnllhatsagni-----
Sorochytrium	ss-----srkssnalggstss-----kf-sgstaglgst-----
Gonapodya	-----
Chytriomycesh1	-----aassisqnkra---svltqse-ekl-----en
Chytriomycesh4	-----sppp-h-----
Chytridium1	-----arl-----ei
Chytridium3	-----tppk-spp-----tt
Chytridialesp1.	-----vlqrka---k-----
Siphonaria1	-----qqnqrqsvkapkrs---svltqse-ekl-----en
Obelidium1	-----eknrtstvasgkrq---svltqse-erl-----en
Obelidium2	-----hpss-p-t-----
Entophlyctissp2	-----rvennaaskrp---svltqse-eql-----ek
Entophlyctissp3	-----aatg-h-----
Entophlyctish	nssns-----shvgngtssgkrghq---svvtass-erl-----dl
Zopfochytrium1	-----astkrq---qvlqse-eql-----da
Zopfochytrium2	-----ams-----r
Rhizoclosmatiumg2	-----fsas-api-----
Dinochytrium1	-----aggkrv---svltase-erl-----el
Siphonaria2	-----hpss-p-t-----
SIPHONARIA3	-----
OBELIDIUM3	-----
CHYTRIOMYCESH7	-----
RHIZOCLOSMATIUMG1	-----
DINOCHYTRIUM2	-----vtv-----
Chytridialesp2A	-----FGSG-----VI
Chytridialesp2B	-----GITA-----KS
Cladochytriumt2	-----aava-ars-----gs
Cladochytriumt1	-----ttrtggdtttagkra---qvlqse-eql-----ds

Cladochytrium	-----ggqkrqgt---hivtass-erl-----dl
Blytтиomycessp2	-----sss-----n
Blytтиomycessp1	-----v---qiltase-erlghgdtldndtitdl
Blytтиomycesh	-----s---sasrnatpgkrsha---svvtass-ekl-----dl
Geranomyces	-----sspakrghs---svvtass-erl-----dq
Powellomyces	-----sspakrghs---nvvttass-erl-----dn
Gaertneriomyces	-----q---skpssgskrgha---svvtass-ekl-----dv
Spizellomycesp	-----k---qeltssagkrghs---svvtass-erl-----dl
Caulochytrium	-----t---ta---taagtrrta---tqrtplg-sgg-----sl
Rhizophlyctis1	-----gkkrghg---nvvttass-ehl-----dl
Borealophlyctis	-----q---qpr-tstgkrghq---nvvttass-erl-----ge
NowakowskiellaA	-----strgqkreqa---sivttass-etl-----dl
Quaeritorhiza	-----vsa-----t
Lobulomycetalessp	-----sgpsnntsvgaskkrqgt---svvtasv-etl-----ei
Lobulomycesa	-----rtn-----
Clydaea1	-----rtn-----
Clydaea2	-----vaakkrqgtt---aivttast-esl-----ei
Polychytrium1	-----akrgqv---aittvss-eki-----ds
Synchytriume	-----vklgvsgnk---rgvtest-ekl-----dm
Batrachochytrium	---g---svtmsyspkskraha---avttmst-eal-----da
Gorgonomyces1	nlttgsksnlnttgsksnlatkivqqpkkrehd---nivttass-etl-----dk
Globomyces1	-----ttngrrysnfgqetstkrqgn---nvvttast-eyl-----dm
Boothiomycesm1	-----knyg-ssskslnqassgkrqyt---stltpsv-ekl-----dn
Polyrhizophyidium	tnlaa-----aasgsgvprgkrshq---avttast-eml-----dk
Terramyces	-----knfg-ssskslnqpasgkrqyn---atltpsv-ekl-----dn
Kappamyces1	-----vpstpsgkrshs---niatvss-egl-----dk
LOBOMYCES2	-----
GORGONOMYCES3	-----
BOOTHIOMYCESM2	-----
KAPPAMYCES2	-----
Amoeboaphelidium	-----agnkn---skasgq---ra-----
PARAPHELIDIUM	-----MEKINGSKAANTATS---NKNLS-----
Aphelidiumi	-----MEEMNHQKP-SSSGR---RVVKPA-----
Aphelidiumt	-----MEEMNQQQRSSAGQ---RVVKPA-----
AMOEBORADIX	-----
SANCHYTRIUM	-----
Olpidium	-----K-----RAVSNSA-EAL-----DN
Allomyces	---sasrtnlgg-----tgsastrgrsrnmaat---aasa-ahv-----st
Paraphysoderma	-----MEAMDAQGPTKSIK---NLELPN-----
Blastocladiellab	aaatasfstlsstsagpsattghsprasrtslaykp---tasstsrn-----sl
Blastocladiellae	-----rsnlgp---tasgagasgggsrsnlayra---tasstart-----as
Catenaria1	-----tgalnk---s---tssprgsksnl-yap---ttss-----
Catenaria2	rsltrsrsssg---tsfsa---arapsvpvppiprsksptrarm-----sl
Coelomomyces	-----lg-----ssskpsmqpp-----
Sorochytrium	-----sk-lsstggglggt---stkfgs-----
Gonapodya	tqsm-----eqv-----
Chytriomycesh1	ivna-----pkkapvagrrrsqaphtttkggnyt-----
Chytriomycesh4	-----
Chytridium1	iatt-----pkkpt---nrshgsstsiavsg-----
Chytridium3	-----
Chytridialessp1.	-----gsndklgssgs-----
Siphonaria1	itna-----pkktpvagrrratanny---sssfat-----
Obelidium1	itna-----pkktpvagrrratqgsa---nyf-----
Obelidium2	-----
Entophlyctissp2	ttns-----pkka-vagrrratqnyattsstns-----
Entophlyctissp3	-----
Entophlyctish	qssk-----pkkvgspvkr-----st
Zopfochytrium1	iaqa-----pkka-iagrraanpvpsskfgssts-----
Zopfochytrium2	tast-----pn-----
Rhizoclosmatiumg2	-----
Dinochytrium1	vatq-----pkksnsvivprslhgsntslania-----
Siphonaria2	-----
SIPHONARIA3	-----
OBELIDIUM3	-----
CHYTRIOMYCESH7	-----
RHIZOCLOSMATIUMG1	-----

DINOCHYTRIUM2	-----
Chytridialesp2A	LSGS-----NSGS-----
Chytridialesp2B	TSSV-----TKKS-----
Cladochytriumt2	fsst-----pprtggv-----
Cladochytriumt1	lank-----pkkp-iagrravgagaasrtttasaagephppsgfvataaaaar
Cladochytrium	vaha-----pkrsadsaskpt-----
Blytitiomycessp2	iadd-----as-----
Blytitiomycessp1	ians-----pkkp-iagrradtpntmnisdv-----
Blytitiomycesh	task-----pkka-darrsntnlaak---aattparrpnpslagpaasssst
Geranomyces	aask-----pkag-rvpgsnsnln-k---gsasnlskqssavd-----
Powellomyces	aasq-----pkss-klgsnsnlag-----kpkppsa-----
Gaertneriomyces	nahk-----pkat-kpaektkae-----pkpyt-----
Spizellomycesp	assk-----pkss-klgsntnlan-k---pkt-----pqak-----
Caulochytrium	sast-----pppk-rv-----tptpsts-----
Rhizophlyctis1	vask-----pkkt-gttsnrasst-n---lapknaggttkptt-----
Borealophlyctis	faqi-----kfag-gt-----
NowakowskiellaA	iahs-----qkkq-dvnlnsssl-n-k---agsss-----
Quaeritorhiza	tsgl-----saag-----
Lobulomycetalessp	kskp-----skkv-dahsstgklnk-----
Lobulomycesa	-sts-----pkkife-----
Clydaea1	-sts-----pkkife-----
Clydaea2	kaqp-----klkkadvhnsnsslkss---ntslatk-----
Polychytrium1	eahk-----tkkapestltstapasgvkv-----
Synchytriume	sknp-----vksn-knmgs-----
Batrachochytrium	eanr-----pkkavtsqap-----rt
Gorgonomyces1	qmak-----pkr-----
Globomyces1	nnsk-----tkkqemyssn-----
Boothiomycesm1	ianq-----pkkadfkss-----
Polyrhizophyidium	qasq-----pkrtlppvna-----sr
Terramyces	lank-----pkkgdfkrs-----
Kappamyces1	iask-----pkkpemspr-----
GLOBALMYCES2	-----
GORGONOMYCES3	-----
BOOTHIOMYCESM2	-----
KAPPAMYCES2	-----
Amoebophelidium	-----
PARAPHELIDIUM	-----GKSTGN-LVK-----SN
Aphelidiumi	--ST-----TPKKGPTSIG-----AR
Aphelidiumt	--ST-----PKKN-AAFA-----AK
AMOEBORADIX	-----
SANCHYTRIUM	-----
Olpidium	KPPV-----KKYS-AVRSSNKSLNRA---GGSR---DRPASK-----
Allomyces	-----rsrparsg-----sr
Paraphysoderma	--D-----ASLSH-----SR
Blastocladiellab	-----aasgatgg-----sr
Blastocladiellae	shaltaggsgsrgasmhsltgggngg-----sr
Catenaria1	-nak-----iag-----sk
Catenaria2	fgaq-----psg-----
Coelomomyces	-----sr
Sorochytrium	--t-----ntl-----
Gonapodya	-----ygmeg-----laplakkg-----dvrststekma-----
Chytriomycesh1	-----asslassqqsla-----
Chytriomycesh4	-----
Chytridium1	-----k-----
Chytridium3	-----p
Chytridialesp1.	-----igsspssnkgsd-----
Siphonaria1	-----tsssvsssqqsla-----
Obelidium1	-----tsssllassqqsla-----
Obelidium2	-----sp-----
Entophlyctissp2	-----lnks-tssl-----
Entophlyctissp3	-----r-----vn
Entophlyctish	sn-----lani-----kpseptplssl
Zopfochytrium1	-----iks---stpgsit-----
Zopfochytrium2	-----rsgse-----gsl
Rhizoclosmatiumg2	-----iawg-----en
Dinochytrium1	-----s-ktsstgslatlregk

Siphonaria2 -----gr-----  
SIPHONARIA3 -----  
OBELIDIUM3 -----  
CHYTRIOMYCESH7 -----  
RHIZOCLOSMATIUMG1 -----  
DINOCHYTRIUM2 -----  
Chytridialesp2A -----N-----SSMNKGRGKYVAGASNERLT-----  
Chytridialesp2B -----TTNVSS-----AAPASKLNLDLAKSV-SNSKAKLA-----  
Cladochytriumt2 -----pvaragsng--pvggaggarg--g-----ggg  
Cladochytriumt1 tplggstrslaalrrmatgssgdaaesghggadg--ggssskpravssktssla-----g  
Cladochytrium -----  
Blytitiomycesp2 -----nss-----  
Blytitiomycesp1 -----gsqsslassaynk  
Blytitiomycesh tr--rsnqldsstpastrasrad--rapaaast--trr--sntdlasgarr-tvatpas  
Geranomyces -----a-----kqsygt-  
Powellomyces -----s-----aqsygt-  
Gaertneriomyces -----a-----vktsc-  
Spizellomycesp -----i-----dksyga-  
Caulochytrium -----trp-----aaakt--a-----aaska-aatktag  
Rhizophlyctis1 -----a-----gktystv  
Borealophlyctis -----  
NowakowskiellaA -----nsslknk  
Quaeritorhiza -----gsnsvg-----aakkrqqa-avtastekl-----  
Lobulomycetalessp -----gsts-slnarpa  
Lobulomycesa -----nq  
Clydaea1 -----nq  
Clydaea2 -----sttnvsksnss-lnkptts  
Polychytrium1 -----vgksp--stksvs-----y  
Synchytrium -----mdmasl  
Batrachochytrium v-----kpi-----vk-ssetllnt  
Gorgonomyces1 -----  
Globomyces1 tq-----lpkv-----nfgs---kqnl  
Boothiomycesm1 -----lpkl-----ne-----  
Polyrhizophyidium ga-----alss  
Terramyces -----lpkl-----ne-----  
Kappamyces1 -----mpkq-----gla-----gs  
GLOBOMYCES2 -----  
GORGONOMYCES3 -----  
BOOTHIOMYCESM2 -----  
KAPPAMYCES2 -----  
Amoebophilidium -----  
PARAPHELIDIUM KNLSASPAGQVQ-----K-SNKNLSVEN  
Aphelidiumi GTVSASAQSLAKP-----R-QANVTGSST  
Aphelidiumt SKVGSSSQSLAKP-----R-QTNVSASAN  
AMOEBORADIX -----  
SANCHYTRIUM -----  
Olpidium -----SE-----AAPKSAG  
Allomyces tn-----la----a-g-----aagskhelgsve  
Paraphysoderma SNSGASSNGLNKSNSNLTR-----SKSSGLSGSSSQ  
Blastocladiellab gn-----l-----tgsnaklgspd  
Blastocladiellae tn-----lspkrtta-a-----aggstsnlgtae  
Catenaria1 gs-----lagrtkga-a-----gtgshhtlgsse  
Catenaria2 -----daqatp-a-----tgarkhqlgsad  
Coelomomyces gs-----shssllsa-g-----tptksstignad  
Sorochytrium ---g-gktgktpv-tspsr-----sgsasnllgsad  
  
Gonapodya --gskgslkgnvfdrltnsnaytgthkerfna-dgtgrgmgrdsiakgagtq-----  
Chytriomycesh1 k--sstasklsvfdrltdssgytgthqhrfna-dgsgrglagrdsaplkg-----  
Chytriomycesh4 ertaasssagpsvfdrlnnvksftgthkhrfns-dgtgrgkagr-----  
Chytridium1 -----stgssvfdrltnsngytgthklrfna-sgtgrglagrdsipkn-----  
Chytridium3 rmqsprrtngqsvfdrlsspttftgthkhrfnp-dgtgrglegrtgegage-----  
Chytridialesp1. -----sslkktkvfdrltdtsgygtgshkhrfda-dgkgrglagr-----  
Siphonaria1 pknssmtsskgsvfdrltdshgytgahkhrfna-dgtgrglagrdsaplgn-----  
Obelidium1 tknssvsskgsvfdrltntkdytgahkhrfna-dgtgrglagrdsaplgs-----  
Obelidium2 vrysedqggresvfdrlnnvstftgthkhrfne-dgtgrgkagred-----  
Entophlyctissp2 nknpatgaskgnvydrltntqgytgshkhrfna-dgtgrgiagrdsapalgag-----

Entophlyctissp3	spplsaghempavferlnhvstftgthkhrfte-dgrgrgkagre-----
Entophlyctish	nkrstsgsmgssvferltdtkaytgthkhrfnd-dgsgrgidgrdpnagts-----
Zopfochytrium1	tlksvtgsrtavfdrldtsgygtgshkhrfna-dgtgrgaagreivskgh-----
Zopfochytrium2	gsapsspsarpsvfdrltsvstftgshkhrfna-dgtgrgkegrvrgdgd-----
Rhizoclosmatiumg2	rsmgsedgkpsvfdrlndvstftgthkhrfnp-dgtgrgkegrdspss-----
Dinochytrium1	glkdnnggsktavfdrldtstngygtgthkhrfna-agtgrglagrdsipkn-----
Siphonaria2	yseehaggragsvfdrlndvstftgthkhrfne-dgtgrgkagre-----
SIPHONARIA3	-----
OBELIDIUM3	-----
CHYTRIOMYCESH7	-----
RHIZOCLOSMATIUMG1	-----
DINOCHYTRIUM2	-----
Chytridialesp2A	--GKDF-----L---PKKPA-----VA-----SDFSHKTQOETT-----
Chytridialesp2B	--GTSS-----V---SNSTA-----KL-----AKTGSKAS-----
Cladochytriumt2	ssagsggsggnvfrltsvdtftgthrhfrfns-dgtgrgkagrtgdgagd-----
Cladochytriumt1	ssksltvgsrvgvfdrltdttgytgahkhrfda-egkgrglagrdftpkgagggg-----
Cladochytrium	taktgaqkggtnvydrldtntgaytgthklrfda-sgqgrglagrdsapkgg-----
Blytitiomycessp2	tsptpghgsgsvfdrltsvssftgshkhrfna-dgtgkgkmgrtgdgage-----
Blytitiomycessp1	gsltslsekkpsvfdrltdssgytgshkhrfna-dgsgrglagrdsiakstk-----
Blytitiomycesh	kgtynasgtntsvfdrltttagygtgthklrfna-dgtgrgmagrdsapakga-----
Geranomyces	----anakaggsvfdrltdttgytgahkqrfna-dgtgrgiagrdsapakgg-----
Powellomyces	----nnskaggsvfdrltdssgytgahkqrfna-dgtgkglagrdsapakgn-----
Gaertneriomyces	----gqsskgsvfdrltdssgytgshkerfns-dgtgrglagrdspsksg-----
Spizellomycesp	-----nakggsvfdrltnsgygtgthkhrfna-dgsgrgiagrdsapakgt-----
Caulochytrium	kayaasspaggsvfdrlnttagytgshkerfna-dgtgrglagrdspaksg-----
Rhizophlyctis1	kttpktggsssvfnrltdssgytgthkerfna-dgsgrglagrdspskga-----
Borealophlyctis	-----
NowakowskiellaA	tgkpttgtkstavfdrldtstgytgthkqrfna-dgtgrglagrdsvglr-----
Quaeritorhiza	--gtyl-----l---sdenlva--hpkpd-----sklgsttslnksasns--ssl
Lobulomycetialesp	tsgystkkssgsvfdrltdtsgytgshahrfna-dgtgkgltgretvrkgn-----
Lobulomycesa	rspspirnsmvsvfdrltdtstfkgthkhrfnp-dgtgrgrdgrvrgde-gt-----
Clydaea1	rspspirnsmvsvfdrltdtstfkgthkhrfnp-dgtgrgrdgrvrgde-gt-----
Clydaea2	tkfttskpsgsvfdrltdvkgytgahkerfns-dgtgkgisgrtynnegg-----
Polychytrium1	aavpstssgsgsvfdrltdtnqytgshklrfna-dgtgrglagrdsstpkkgg-----
Synchytriume	sasksksgsvsvydrldthksytgthklrfnd-dgsgrgiagrdspskkg-----
Batrachochytrium	ttkktvgassgnvfdrlntnkgytgthkerfhg-ssn--sihg-----
Gorgonomyces1	-----pegnsvfdrltdtakytgthkerfna-dgsgrgiagrdsstvgq-----
Globomyces1	tssnsnlngnvnvfdrlntnqygtgthkqrfde-hgngrglegreaiakgsg-----
Boothiomycesm1	-----ksnvdrldtstskgytgshkhrfde-hgvkglgrdsstpkkgsg-----
Polyrhizophyidium	srrnlsmsgsvfdrltdtkaytgthkerfnd-dgsgrglagrdsstvakgsg-----
Terramyces	-----gksnvdrldtstkytgshklrfde-fghgkmggrdsapkgsg-----
Kappamyces1	ssslnsagskgnvfdrltdtklytgthkerfde-fgngrglagrdsstpkkgsg-----
GLOBOMYCES2	-----
GORGONOMYCES3	-----
BOOTHIOMYCESM2	-----
KAPPAMYCES2	-----
Amoebophilidium	-----
PARAPHELIDIUM	SLSAAPKSKSGDVYDRLTNTSGYTGSHKERFDA-NGNGKGLAGRT-----
Aphelidiumi	SMAAKSVSGSGSVYDRLTDSKGYTGTHKHRFDD-TGKGRGMLGRDHPTT-----
Aphelidiumt	SLSAKSQGGSGNVYDRLTDSKQYTGTHKHRFDD-TGKGRGLAGRDQPTS-----
AMOEBORADIX	-----
SANCHYTRIUM	-----
Olpidium	APRSAAASADKNVFDRLTDPKGYRGTHAQRFDE-QGKGRGLAGRDSTSKGA-----
Allomyces	ftptvpsipkgsvfdrltnpskytgthkerfdpatgkgrglagrdsstqenlgtk-----
Paraphysoderma	LKTTVPQVPAGSVFDRLTDVKKYHGTHKHRFNE-DGSGKKGKAGRVQDVG-----
Blastocladiellab	yvptvpsipkgsvfdrlntnkgytgshrerfde-dgrgrgkagrsvqenvgtq-----
Blastocladiellae	faptqpeiprgsvfdrltnpkgytgthkerfde-egkgrglagrdsstddigak-----
Catenaria1	yvptqpsipkgsvydrldtnpkgytathkerfdd-qgkkgkagrsvqddlgtk-----
Catenaria2	fvptvpviprgsvfdrltnprgytgthkerfda-dgrgkkgagrsvetesvqm-----
Coelomomyces	yvptvpviprgsvfdrlntnkgytgthkerfne-dgsgrgiegrdsstddvqpv-----
Sorochytrium	fkptvpvikegsvfdrltrpsgytgrhkqtagd-aqk-----
Gonapodya	---svyrggdvkdls-----qivtr--r-----
Chytriomycesh1	-gvsqyrggnvdsls-----qilrs-----
Chytriomycesh4	-----
Chytridium1	-gvgvyrggdvkels-----qilrpgf-----

Chytridium3	-----tvnsls-----qitrk-----
Chytridialesp1.	-----
Siphonaria1	-geskyrggdvkelk-----qilrn-----
Obelidium1	-geskyrggdvkdldk-----qilrt-----
Obelidium2	-----
Entophlyctissp2	-gvsvyrggdvknls-----qilrn-----
Entophlyctissp3	-----
Entophlyctish	-tkt-----la-----silrt-----
Zopfochytrium1	-svgtyrggdvkdls-----qilrn-----
Zopfochytrium2	-----vvsdls-----qitrr-----
Rhizoclosmatiumg2	-----tadls-----qivsark-----
Dinocytrium1	-gvgvyrggdvkdls-----qilrpgf-----
Siphonaria2	-----
SIPHONARIA3	-----
OBELIDIUM3	-----
CHYTRIOMYCESH7	-----
RHIZOCLOSMATIUMG1	-----
DINOCYTRIUM2	-----
Chytridialesp2A	SNNTKK-----KDTKMATIED-----
Chytridialesp2B	--IASK-----SGSKILTDSKRQLNA-----
Cladochytriumt2	-----vvadls-----qitrr-----
Cladochytriumt1	-gagtyrggdvkdls-----qilrn-----
Cladochytrium	-sagqyrggdvkdls-----qilrn-----
Blyttiomycessp2	-----ivadls-----qivrk-----
Blyttiomycessp1	-gggtyrggdvrdls-----qilrn-----
Blyttiomycesh	-apgayrggdvkdls-----qilrs-----
Geranomyces	-spgkyrggdvkdls-----qilrn-----
Powellomyces	-spgkyrggdvkdls-----qilrn-----
Gaertneriomyces	-aagkyrggdvkdls-----qilrs-----
Spizellomycesp	-spgsyrggdvkdls-----qilrs-----
Caulocytrium	-apgtyrggnvsdls-----qilrt-----
Rhizophlyctis1	-gpgqyrggdvkdls-----qilrs-----
Borealophlyctis	-----
NowakowskiellaA	-npgtyr-----
Quaeritorhiza	nrntsksqsgsignlnkktsgvsvmmtdaktlsstasq
Lobulomycetalessp	-gstsqd-----gla-----rilra-----
Lobulomycesa	-k-----pls-----slikr-----
Clydaea1	-k-----pls-----slikr-----
Clydaea2	-kqlssm-----vs-----rs-----
Polychytrium1	-npgtyrggdvkdls-----qilrn-----
Synchytriume	-tgvvrdgqnvndls-----qilrr-----
Batrachocytrium	-----
Gorgonomyces1	--pylyrtgssssit-----ra-----
Globomyces1	-tqsiyrggnvnsls-----qilrs-----
Boothiomycesm1	-shgvyrnggnvnsls-----qilrn-----
Polyrhizophyidium	-tvgyvrggdvksls-----qilrs-----
Terramyces	-tngvyhggnvnsls-----qilrn-----
Kappamyces1	-tntiyrggnvtsls-----qilrq-----
GLOBOMYCES2	-----
GORGONOMYCES3	-----
BOOTHIOMYCESM2	-----
KAPPAMYCES2	-----
Amoebophilidium	-----
PARAPHELIDIUM	-----
Aphelidiumi	-----S-----QILRST-----
Aphelidiumt	-----S-----QILRS*-----
AMOEBORADIX	-----
SANCHYTRIUM	-----
Olpidium	-GPGAYHGGDVKDIS-----QILRS-----
Allomyces	-p-----ld-----klvhrs-----
Paraphysoderma	-----P-----KKLESFLRN-----
Blastocladiellab	-s-----le-----klvsrn-----
Blastocladiellae	-s-----ld-----qlverr-----
Catenaria1	-s-----le-----hlvark-----
Catenaria2	-t-----ls-----emvkrf-----
Coelomomyces	-s-----ld-----klvsrv-----
Sorocytrium	-----