

protein	sequence name used in Fig. 2	contig number or accession number	predicted evolutionary type	N-terminal length (amino acid residues in blue in the next column)	N-terminal amino acid sequence blue, predicted N-terminal extension (dollar sign; cleaved site predicted by SignalP) red, region matched with the homologous sequence in a cyanobacterium (see the next column)	cyanobacterial sequence compared	SignalP prediction ^a	TargetP prediction ^c
GTR	Karenia-1	0173944140 Karenia brevis CCMP2229	VI	212	XQPDVVRTHLRGVSSSDAASADPSASSASSSYTQTAALAGLCAFAVSASHGLQRRTRRARHGGGRRLRSSLRVTSLDTEVAQRSSSMVVRQEEGLDFDSVETIAQFVPRIWALQRQAEALLRSGELQKVVSAMKDLRKTLEHVSFNEVDQLLCALVEAIQNLKESAIQIRRDDELQEINMDSDAEVFSGLEGTVESLTKLAIGNENDVDTMMEVHVVGLSH	Synechocystis sp. PCC 7509	N	- (1)
GTR	Karenia-2	0173766322 Karenia brevis CCMP2229	EA	137	MMKSALALTACMACVGVGSRRLHSALQLDAEAAAANFNSAAGVQLSRSSPSLAASSPQVLGGRQDLGRVAPLTKMAAQAVAEPPVQGGKEGVQGEALASXXXXXXXXXXXXXEAARPKDKKAPDETFGKPFVVGLSHHTAS	Synechocystis sp. PCC 7509	Y	S (3)
GTR	Karlodinium-1	0169242318 Karlodinium micrum CCMP2283	VI	215	XPSASSLRNEVADPAKHASARQSARSRLRGEPHLAIVAEANARWGNVALLVAGLSGLAAGVARRKTEGRRRTNARLAKGSRVMALNVSADSSLETRTEELDSVEALTTFPVKMIDLRNQALLRSSELKEVIQAMKELGKTDIRS VFGEVDQLLCALVDIAQNLKETAQIRQDELQNIQDEQSAEQNGARTGDMSTSTSSSHDEIETMMEVHVVGLSH	Synechocystis sp. PCC 7509	N	- (1)
GTR	Karlodinium-2	0169115198 Karlodinium micrum CCMP2283	EA	133	MILGLYSVILHSLICWVSGVSSSEPQETSLQDRRRPEKPSLASFLASNPRFTHGSTMVVGRRXVPGKMVLASSPPKVQATAIELEKTLISQHKVQAQAKELQAKVDIDRAIVSTSTKDEAQDDARKXLLAIGLTHDTPAV	Synechocystis sp. PCC 7509	Y	S (1)
GTR	Lepidodinium-1	comp33846_c0_seq1 Lepidodinium chlorophorum NIES-1868	VI	231	MGRGIVLMAAVRQLVAIFLVTATANLAAAF\$VAPAAAAASKNIIVPGAHLRGITSAHQNAANESAATVSVAGLACLCGFASLGAATRRASQRRARKTGRQATATPGIRVTAIEKVQATDDVEESIAKFVPKIHAKQQAASLRSLASVMDSLKELSKPELRGVFGEVDQLLCALIESIESLRSAVITRRRELRFQFDQLDQSQSMVTVNTPTKLNNAVEEVETMMEVHVIGLSHH	Synechocystis sp. PCC 7509	Y	S (1)
GTR	Lepidodinium-2	comp92172_c0_seq1 Lepidodinium chlorophorum NIES-1868	LA	150	MPPEISTWQPVRLIEPLRGIMFLFLFTQMMQVATQ\$EASDRDLRDMADTLFHPALRAWPLQMQSPMQGHY LSTAPHPLRGIGSSPAGVAVLWNHFQTLVRAARSVSSNVGSSQVQSHTEVDAVALVDKEAPTTVSVRKQSQFDPSTLKVLCGLGSIH	Synechocystis sp. PCC 7509	Y	S (5)
GTR	Lepidodinium-3	comp80736_c0_seq2 Lepidodinium chlorophorum NIES-1868	LA	135	MLSTMGIFLLISVVQAASHTAITFTNMLVDNCDRLRLQRTKLQSHRDLRGAQSFATRSPIGHAPTVAWPSAISGFTRVSHSDIHASLLPKASGFVARAGDAVAVIEKKPNIVVDVAPAKSPSRLELPPTLNVINFGISIL	Synechocystis sp. PCC 7509	Y	S (4)
GSAT	Karenia	0174148230 Karenia brevis CCMP2229	uncertain	76	MQKPAFLLVCLACVGGRRVQAQ\$FEQAQSNPSPLSALSAVLQALNSEASYNPSGLGAQQTKRVSKSRTPASPMAFVTEKSDKVFTE	Synechocystis sp. PCC 7509	Y	S (4)
GSAT	Karlodinium	0169080304 Karlodinium micrum CCMP2283	uncertain	58	XTFLLSLACLWSAQVRG\$HQEPSDAFSCMLLALNPASARSSSNARAARAAPAKAFVTEKSDAIFAEAKTL	Synechocystis sp. PCC 7509	Y	S (2)
GSAT	Lepidodinium-1	comp77636_c1_seq10 Lepidodinium chlorophorum NIES-1868	uncertain	113	MTVMFVTRKTGVTWSWLRALFVGGVLVISQVATSMKVCKGLVFTIAKTFTYGSATNSLRGSYYRTEIMQRHVTASDGSSTGAVMVFAACGLASRGFRRRRKDANACQAVMTDFKTQVS	Synechocystis sp. PCC 7509	N	S (3)
GSAT	Lepidodinium-2	comp86847_c0_seq1 Lepidodinium chlorophorum NIES-1868	uncertain	107	MRTVSVITLLSVLHAADAD\$ELDGKDSLAERDVIDISIRFALQAHPLAFAENSTLGTGRALPHTPKAAIAPKPERSIGSRWGWCTGLQHTPRGAQIRQSTVTEFTDVSENI	Synechocystis sp. PCC 7509	Y	S (1)
GSAT	Lepidodinium-3	comp196565_c0_seq1 Lepidodinium chlorophorum NIES-1868	LA	NA	Lack the N-terminal extension or the extension is too short to analyze	Synechocystis sp. PCC 7509	NA	NA
ALAD	Karenia	0173985684 Karenia brevis CCMP2229	VI	99	MRKISVVLACACVGHGS\$RLQKRVPPAESQOPLTVADALAMFLSGFSPEAGFKPSSPTVKFNGNLRHSPLMQDGVLTKEGAKVPEGTPIVPHIGIRTMRNRNR	Synechocystis sp. PCC 7509	Y	S (4)
ALAD	Karlodinium	0169115526 Karlodinium micrum CCMP2283	VI	89	MTSLMTWALAFICSCVCTAH\$RSKSPDMRTAGSTDPRASLAIFFASNPASARAQRSSAKSLRSLTRSPSLMQEAKVPEGTPVVSMDGIRKRPNRNRSAV	Synechocystis sp. PCC 7509	Y	S (2)
ALAD	Lepidodinium-1	comp100813_c0_seq1 Lepidodinium chlorophorum NIES-1868	VI	117	MAVPRSVRSNGKLSLLLACGLAMMLSWG\$PSTRNAGERQVATINVFQPLSSVPERFQPLVASASSTRAHDLVAGDFTHRPPIRFSSRAVEVRAPVTASAAARVPEGTPKVEPLPIRQPRNRNRSSVARE	Synechocystis sp. PCC 7509	Y	S (2)
ALAD	Lepidodinium-2	comp213547_c0_seq1 Lepidodinium chlorophorum NIES-1868	LA	NA	Lack the N-terminal extension or the extension is too short to analyze	Synechocystis sp. PCC 7509	NA	NA
PBGD	Karenia-1	0173664682 Karenia brevis CCMP2229	VI	NA	Lack the N-terminal extension or the extension is too short to analyze	Synechocystis sp. PCC 7509	NA	NA
PBGD	Karenia-2	0174104254 Karenia brevis CCMP2229	EA	71	MIYVMAFLACAGHGR\$SRVQTVSKNVGSDANDIRRVLRALRSRFAAANPSAAWQNSGVNRHTRGLPQRQRMA SVHMAEPVLKLG	Synechocystis sp. PCC 7509	Y	M (3)
PBGD	Karlodinium-1	0169355422 Karlodinium micrum CCMP2283	uncertain	22	XSHATPRQVQRRTRISMLEPLIGTRASPLARA	Synechocystis sp. PCC 7509	N	-
PBGD	Karlodinium-2	0169217900 Karlodinium micrum CCMP2283	uncertain	59	XLGTAISSRRMQGSAEGKALHGAREAFASLLSLGAXSHATPRQVQRRTRISMLEPLIGTRASPLARAQAN	Synechocystis sp. PCC 7509	N	M
PBGD	Karlodinium-3	0169259902 Karlodinium micrum CCMP2283	uncertain	92	XLRLDRWLSARFTLLVMRHGVYFLACLATATYSRQKEIFEGSAAEESMRSQPTPQEAFTSLLSLGAMPKSNLRFQORRAKASMKESQAFVIGHDDAPLAKA	Synechocystis sp. PCC 7509	N	M (5)
PBGD	Karlodinium-4	0169202984 Karlodinium micrum CCMP2283	uncertain	NA	Lack the N-terminal extension or the extension is too short to analyze	Synechocystis sp. PCC 7509	NA	NA
PBGD	Lepidodinium-1	comp35568_c0_seq1 Lepidodinium chlorophorum NIES-1868	LA	170	MSALSVGHSQVLQDLHYIRIDREDLRHSTKLVRSLVSGICILLCLGVFTFSFRWKCPSDERRFWPFWPSSVNA VSTVLVEIVYGPRIPTSLGVKHAHSHACLHHVWVGSDVHISPARPERMRAGRRRASRWAGNVEQIDDDAMAD AELKAGEVYNNVPPNREEGLTIIGSRGSLLAM	Synechocystis sp. PCC 7509	N	-
PBGD	Lepidodinium-2	comp91161_c0_seq1 Lepidodinium chlorophorum NIES-1868	LA	135	MSLENHYRVEPEHSHKSKSTLLGYIFCLVLSLAAVAISWLTGSHGLQTSRENLPSSALVALAPSLRTPSLVRLP TPAFQPSMLSRQTNPRHGVQRAADAAEIDKAGAGAEKLDGDEVNNAKPPKREEGLAIIGSRSSKLAMV	Synechocystis sp. PCC 7509	N	-
UROS	Karlodinium-1	0169208488 Karlodinium micrum CCMP2283	uncertain	141	CICTGVARRKRP\$YDSNNPLSVLAEVLLASSPARRLRHSHVGYGSPVMDSSSTITTRRSASQSTJIAQKPSPLK VALTLEDGKNRELQAAISNACKDLP\$GALEFVEIPLIHSVPGKDLAALFILEKALFALSDEREDSLPFDIVMLTSPESA RIFVEGVQRLPEEMRIKQPPAMVCICQTAAV	Dactylococcopsis salina	N	M (5)
UROS	Karlodinium-2	0169295394 Karlodinium micrum CCMP2283	LA	NA	Lack the N-terminal extension or the extension is too short to analyze	Nostoc linckia	NA	NA
UROS	Lepidodinium	comp839_c0_seq1 Lepidodinium chlorophorum NIES-1868	LA	140	MKVSSRCVGSARQRAVSAVALTALVLGPKISYYRPHDIYSVAQTSPLKLAHKFNQADMVSDVADHLTDNLV NKALKPSPVLRANLDRNRHNVWGQHACPSLWSPWQRIKSVWNQCTSLISTSEVRHMSERRSARMSRHAV SF	Geminocystis sp. NIES-3709	N	M (2)
UROD	Karenia-1	0173889316 Karenia brevis CCMP2229	EA	285	MFSALTPLLAAHSVAAS\$WHHPSGVLGHNARDRLGSRVAGVSMKEQQDGAIVSQKQFAIDVSDVINPERPPIDY VRLPAEAYNVLDNSAVKRLGGRFEVSPGSKIMLIGEVEPTATIRLQVGEQGVQIIEGIYMKGKAGKPGMVL DQINKTMRLEVTNSVAALPTGEITCRLLINGHFKEGLMAKVP\$GATLSKLFITTTVAAMPWFLQQLRNDYS\$SWA RGEKNRMKIGAGEMQKAMQVIANGTVLPPGMREIDVQGS\$AEDLIGPSLNDSSPASGKSSKDPDLLRAA	Synechocystis sp. PCC 7509	Y	S (4)
UROD	Karenia-2	0173802408 Karenia brevis CCMP2229	EA	93	MAALVLACLFWVGHS\$QIEASIRLGGSHLPERQHLLRRSRQAGTIGKAKTLEALSRIILAFRIAAGSDGVADP GLVRASKNAAPAAVMSASKDPDLLVRAARGETVERTPV	Synechocystis sp. PCC 7509	Y	S (2)
UROD	Karenia-3	0173945920 Karenia brevis CCMP2229	LA	140	XVFSNTAMQRVSVSLAYLACVGHGKRLQRPMEHLKRPPELAAKFP\$LSQFAEANLLDGQGRHLPLETVASFFF ALNPLAAFNRNLAALAPASATLANRSPAPRGGCPMAVATVMPTE\$GVKICDFTRKAI\$DQNEEH\$ILLRAARGE VTKRPPVW	Synechocystis sp. PCC 7509	N	M (4)

Table S1. (continued; 2/3)

protein	sequence name used in Fig. 2	contig number or accession number	predicted evolutionary type	N-terminal length (amino acid residues in blue in the next column)	N-terminal amino acid sequence blue, predicted N-terminal extension (dollar sign; cleaved site predicted by SignalP) red, region matched with the homologous sequence in a cyanobacterium (see the next column)	cyanobacterial sequence compared	SignalP prediction ^a	TargetP prediction ^c
UROD	Karenia-4	0173653438 Karenia brevis CCMP2229	EA	93	MHICWFQLVCVACVGYGR\$RVQTPTLQLQNRPLAESQRPAEATSEALLALRPVSAYNPSMSSARFALARRCRTS SRQVAPILAEHAPAPLNLNDL\$MVRAARGEATEKTPVW	Synechocystis sp. PCC 7509	Y	S (5)
UROD	Karenia-5	0173962192 Karenia brevis CCMP2229	VI	145	MFVFASLGSPSPHSLGHGFSNGRHLQAPPPQRIARQANAARDPSAFASDWSGPGVMVAVVGGLCVGAASSRH AARRSRHPCRSRAASVHALSPQGAAVET\$APGPDFSDIAQAPSNLREWRVQEKEKLLSTGSRWPAPKND RLLR\$AAQ\$K\$VD\$RPPK	Synechocystis sp. PCC 7509	N	M (5)
UROD	Karlodinium-1	0169276646 Karlodinium micrum CCMP2283	EA	60	XVQNPFDILWTDQIPLRNLEAF\$SKVLLASSLPGHAGASRPVQRTDRRVRSISAAAPETL\$LVRAARGEVEHPTV	Synechocystis sp. PCC 7509	N	- (1)
UROD	Karlodinium-2	0169333044 Karlodinium micrum CCMP2283	EA	58	XSLLGNGRRVQTPLD\$PVEIK\$EARRNHEAFGELLASSQHSRI\$QSRREQSDVRPKAS\$MTEASSDPILLRA	Synechocystis sp. PCC 7509	N	- (5)
UROD	Karlodinium-3	0169231014 Karlodinium micrum CCMP2283	LA	241	SMLLIHFTNTLFARRVQSMARANAFQDWTPESGGLWQVVDNTAESGLDSLKQQTTEEHPNPPLASFLSLTPI SDRSISKRTNVRMDALGDRDILVRAARGEHVERTPVWLMRQAGRYMAEFRKYSDKYPFRERSETPSMATELSL QCHRAYGKILLMMCFASAYCS\$RRVQGRGV\$D\$VHVEESVLPQLVDRNHAEDFVPCARSSAFANLLSLPSVS SRPASARN\$MRMEAMP\$GDRDIL\$VRAARGE\$D\$VERTPV	Synechocystis sp. PCC 7509	N	M (3)
UROD	Karlodinium-4	0169182992 Karlodinium micrum CCMP2283	EA	77	VQTPIEHLPDARDELAGRERHSD\$VMHDP\$RDEQPA\$F\$QLLLS\$FNAET\$MVSSAARAAPRSSLYVSLSEK\$S DSP\$MVRVARGESAD\$PIVW	Synechocystis sp. PCC 7509	N	- (1)
UROD	Lepidodinium-1	comp101059_c0_seq1 Lepidodinium chlorophorum NIES-1868	LA	111	MR\$SVTVIPLLATVAMLD\$AE\$DPSDKLV\$DKLVANVLSLDH\$ADLHDMAFGKPGH\$VAPSRSSRASPRLVNGLQFC WKPPQNGLMQVRGVRSTQGAALFVRAV\$AQEGK\$DTS\$STSS\$SGDHDIL\$VRS\$ARGETVERTP\$VW	Synechocystis sp. PCC 7509	Y	S (2)
UROD	Lepidodinium-2	comp144032_c0_seq1 Lepidodinium chlorophorum NIES-1868	VI	125	MERQPLAMLNAAWVTTRLVPAQTNNFRHGDRLHFLARP\$TSSSP\$FGGATPQIHKFFALVVGAVISTLSWKSR G\$Q\$SF\$AVPL\$SRRGVNI\$RLGR\$RIVSIATPFRRAV\$LVREVSTSG\$SVDDAV\$PTR\$TAP\$HDQ\$LLR\$VARG\$SHD\$GR TPVW	Synechocystis sp. PCC 7509	N	M (5)
UROD	Lepidodinium-3	comp109512_c0_seq1 Lepidodinium chlorophorum NIES-1868	VI	141	MLLWGRFLELRGSM\$K\$PQLALAESLLHESVPG\$VCR\$DEK\$FCTRLFLI\$GLV\$MMMNM\$RMPDTH\$SFGQAATTN MALLPRAAGAGVQLLRG\$WSP\$WCSRWRAASLQIAAPLAPRLSEGWTRG\$WCAASAPASTPAIDGAAS\$VLEE RVEHFPLCRVAM	Synechocystis sp. PCC 7509	N	M (5)
UROD	Lepidodinium-4	comp13953_c0_seq1 Lepidodinium chlorophorum NIES-1868	VI	199	MPNSTVDRVAPILLQESAPRSARGRRRLVCCFLICFVGLTAFPGSPVSPRGDDWRQRTHEIAPVILARTDPTTAAR AVSLH\$WRHGT\$RVK\$VAPKAHSLHSPGHRW\$LLGIRGASRSLPLRTVLGVTAEAD\$EFGDAVIPPYGSAD\$PSRQ PSASND\$EIPGT\$YKTEENENLAQVLQLAA\$YAGK\$SDGEEEDDMF\$M\$ASPANETIMQFPLCRVAMGLKVVAG	Synechocystis sp. PCC 7509	N	- (4)
UROD	Lepidodinium-5	comp67210_c0_seq1 Lepidodinium chlorophorum NIES-1868	VI	171	MPEPRFVLAEPFLRDTVARRARS\$G\$KILFTL\$SLIGLGLVTLFGLTELTRGEGRQRISVQEAAVLMGSTPPVAAKT AAGARLV\$RGW\$VNGWCSAWRTIGAQTVELSASRSGERLV\$FAASD\$SAATAAPSGSLGAFGKN\$AFASSATRLV LSATSS\$ATDGART\$ESSGCEPLKMQLTPOESKLFATLLAVCEHAGLQTLTRAAGGWVRDKLLGLTSHDIDALDD MGGVQFVEHIKEYLQATRG\$ALGYVAIVQNP\$EQ\$KHLETAKLSLEGFEIDLNLRAEDYTEM\$RIPTMTFGT\$PSE DALRDLTINALFYNLTELVEDFTGRMCDLRNGCVRTPLSPRTLLDDPLRALRAVRFASRF\$FTMDLPLLEAI ADRDVQTALETKVS\$RERV\$NEVDNMLKSGPDVFRGMHIMNDVRLLPAVFKTS\$AVPSDAH\$GAYSTCMQ\$QFVDA AVHGLLLAPGILNCSNEVEGREHVDLLLASALMPRACEVLEPDPRQKKKTRPEPRASRAVVTNLSLRQKQDAD TITIKIQAQ\$MRLRTALQOLLCAEAPDAVAA\$RACVDEE\$REAVGW\$VKELKEPWRVAVLLACTLDASAGDEVLG VPAYTAPRD\$TVAAEAARAVV\$GVEKLGLDHCWEW\$SPLFDGPA\$MMEVIGLKKGGPELGAAMKASIGWQMRHP DGEAEACA\$AWLKARQ\$AKV\$DATES\$AKPATVAAVAEST\$SKGVPALDVAIKLAGTQFPAPSEAPANIRGLRM QARDKRKALEAPWPP\$END\$RLLR\$ARGEQ\$VDRP	Synechocystis sp. PCC 7509	N	- (5)
UROD	Lepidodinium-6	comp150338_c0_seq1 Lepidodinium chlorophorum NIES-1868	VI	NA	Note: The portion colored in green showed a clear homology to CCA tRNA nucleotidyltransferase Lack the N-terminal extension or the extension is too short to analyze	Synechocystis sp. PCC 7509	NA	NA
UROD	Lepidodinium-7	comp130613_c0_seq1 Lepidodinium chlorophorum NIES-1868	VI	148	MALAQFAAT\$PQMPANVLDGTR\$AASAAVSRNPSRLARFEATPSGYLLRGMLQGGTAMVAAAVGFGGWAARR RKRD\$FTPLRAKHGTRH\$RSTQILKLQVVP\$PRIDGQVVAADWISV\$PNVSDLVQTEDP\$DNLREWLR\$RENELR\$T GTPWPAPTND\$RLLR\$ARGEAVDR	Synechocystis sp. PCC 7509	N	M (5)
CPOX	Karenia	0178299624 Karenia brevis Wilson	VI	67	XAAAAATAAAGAAT\$TAGRKRLRRRGK\$SRILVAQAQAQ\$QVDVQ\$AETLCKESDA\$PDSMRRRFEAVC	Synechocystis sp. PCC 7509	N	M (3)
CPOX	Lepidodinium-1 ^a	comp186503_c0_seq1 Lepidodinium chlorophorum NIES-1868	LA	NA	NA	Synechocystis sp. PCC 7509	NA	NA
CPOX	Lepidodinium-2	comp44233_c0_seq1 Lepidodinium chlorophorum NIES-1868	LA	142	MCRHFR\$KRRGIPCKCITTVLIAFVALAHAN\$ELWEHQLGNHSGHAQKAMGSMV\$KVRFGSQIYDAYD\$DSTLGK LGRQLQVPTCNPSFLFALPDGLLPRRFPCVWPFRSLLCVMKHEQPNWKKRRYLARGGAEG\$VEAAL\$RRRSR\$RP IMTGK\$SPRNDP\$SRIFD	Synechocystis sp. PCC 7509	Y	S (2)
CPOX	Lepidodinium-3	comp44233_c0_seq2 Lepidodinium chlorophorum NIES-1868	LA	148	MRLVAAGIRHFR\$KRRGIPCKCITTVLIAFVALAHANELWEHQLGNHSGHAQKAMGSMV\$KVRFGSQIYDAYD\$D\$S TLGKLGRQLQVPTCNPSFLFALPDGLLPRRFPCVWPFRSLLCVMKHEQPNWKKRRYLARGGAEG\$VEAAL\$RRRSR\$RSR PIMTGK\$SPRNDP\$SRIFD\$FIT	Synechocystis sp. PCC 7509	N	M (5)
PPOX	Karenia-1	0174085696 Karenia brevis CCMP2229	VI	NA	Lack the N-terminal extension or the extension is too short to analyze	Pseudoanabena sp. SR411	NA	NA
PPOX	Karenia-2	0173913076 Karenia brevis CCMP2229	uncertain	98	MSLAALVLVSLACAGRG\$GR\$RMRMMP\$EQVQGR\$SEQVET\$SPKALNSL\$SFFLLALAPTS\$GWTTTGHGGQIVLTA RPGVVANCWPRGNLAAAVMAEPIEADCLVVGAGISG	Pseudoanabena sp. SR411	Y	M (5)
PPOX	Karlodinium	0169395544 Karlodinium micrum CCMP2283	uncertain	118	FAYIAYGCHGRMQAQLH\$DRQ\$RSTGDVKNHLHSIRDSHLS\$EQEELDSFTGFKQLLLGFAASTG\$RRSHGR HFLNSHLDXQDASCVC\$VWQAPL\$GAGQL\$PECEPRACL\$RSRGA\$TMSAEQEPL	Pseudoanabena sp. SR411	N	M (5)
PPOX	Lepidodinium-1	comp112996_c0_seq1 Lepidodinium chlorophorum NIES-1868	VI	108	MSLFLPSAAD\$TPALRGHALH\$SSRAV\$VAVGVS\$MEAH\$SNLAKLDAPHRCGAIQV\$SAAWALAI\$FGL\$VG\$VQQR RRAKRSKRS\$AKSALH\$V\$SAAQ\$RGNM\$VNAKIHPLRETL\$D\$VVVGSG	Pseudoanabena sp. SR411	N	M (4)
PPOX	Lepidodinium-2	comp21517_c0_seq1 Lepidodinium chlorophorum NIES-1868	LA	85	MYG\$IGVLLV\$VVIVRCRAQAD\$DLVN\$MISARALNASPLRRTDVELTTLGKLGEAA\$FSP\$NGLH\$WSGL\$SGFTS KARAVN\$KGLRTA\$ASTD\$D\$TLVIGAGISG	Pseudoanabena sp. SR411	Y	S (2)
PPOX	Lepidodinium-3 ^a	comp24448_c0_seq1 Lepidodinium chlorophorum NIES-1868	VI	NA	NA	Synechocystis sp. PCC 7509	NA	NA
FeCH	Karenia-1	0173708630 Karenia brevis CCMP2229	LA	54	XLRRILGPHLV\$TCAMALV\$NRF\$MSPVPLQQA\$FVGR\$LPARQAL\$QSRAS\$QH\$HDT\$GVMIANL\$G\$PEE	Synechocystis sp. PCC 7509	N	S (5)
FeCH	Karenia-2	0173900314 Karenia brevis CCMP2229	LA	NA	Lack the N-terminal extension or the extension is too short to analyze	Synechocystis sp. PCC 7509	NA	NA
FeCH	Karenia-3	0173862386 Karenia brevis CCMP2229	LA	139	XIELNMFKALAI\$CTLYAHGR\$RVQGRHDAESRTAPT\$H\$IAVVDY\$EQLH\$DTRNPLK\$SFAKLL\$LESSPAAAFN PSGIGAGP\$AVG\$SAIHG\$AI\$PRDASE\$GK\$CLED\$RRIP\$VIM\$TAVK\$TLLDKD\$VMSI\$ASKL\$RRDK\$KVG\$VILLNL\$GGPE	Synechocystis sp. PCC 7509	N	M (3)
FeCH	Karlodinium	0169088058 Karlodinium micrum CCMP2283	LA	143	QVLKERCIA\$PFCV\$FAMRE\$AFALICAQLANSKAIGW\$XETLVHDAEDIDGGR\$SGLARMLITLNAGVGR\$RSGNH ASLQ\$SAFGRH\$PSAALE\$VASTG\$SGCRTNSP\$VSTAAL\$SP\$RETA\$VLTPTNSDLARGT\$PANGT\$DDL\$G\$TK\$KVG\$VVL LNLGGP	Synechocystis sp. PCC 7509	N	S (5)

Table S1. (continued; 3/3)

protein	sequence name used in Fig. 2	contig number or accession number	predicted evolutionar y type	N-terminal length (amino acid residues in blue in the next column)	N-terminal amino acid sequence blue, predicted N-terminal extension (dollar sign; cleaved site predicted by SignalP) red, region matched with the homologous sequence in a cyanobacterium (see the next column)	cyanobacterial sequence compared	SignalP prediction ^a	TargetP prediction ^c
FeCH	Lepidodinium-1	comp36906_c0_seq1 Lepidodinium chlorophorum NIES-1868	VI	111	MSVVALIDVASSLVGAAMAI\$STTVGQHAKPFCVKVRAAAPVSATSTQIAHSWLKTRKTQEANGYRRIAMVGA SAVITTAVAIRRQRRRGKCHVAMRSGPPPNRSGKCHTGVILLNIGTPA	Synechocystis sp. PCC 7509	Y	S (2)
FeCH	Lepidodinium-2	comp20534_c0_seq1 Lepidodinium chlorophorum NIES-1868	LA	161	MRNAIINMSVFLVQVNFNDLAVGSTSNAHSSTTTLISKLVDKLLGVAYESWLRRSADLEETTLEMPGHIAIACHTN LLRPRLRPCALPPSDQGSDDPIWRQKIRQISRAVDINDKVLRRRIKDLLRKVAQGSPSYFALSYPATEEGEAKK RTLFIPPKRKTKVVFVQLGSPEA	Synechocystis sp. PCC 7509	N	S (3)
FeCH	Lepidodinium-3	comp115243_c0_seq1 Lepidodinium chlorophorum NIES-1868	LA	71	MIMTGRGCRRFPRKAWLLHALCALIATRMIRWCGSQLFVQQTFTGMPFVPRRQVFMHKS DALNVNDAHDTGV MIANLGSPE	Synechocystis sp. PCC 7509	N	S (4)
FeCH	Lepidodinium-4	comp121137_c0_seq1 Lepidodinium chlorophorum NIES-1868	LA	70	MMCRYRSICTYLLSSITHVLPVTLLEHAFAFAPSMRRPSAPARALPKIARATSVMMPSVKSSPPSVKDHLLGGVG VLLLNLLGGPE	Synechocystis sp. PCC 7509	N	S (1)
^a Putative cytosolic protein ^b Putative signal peptide (SP) was predicted by SignalP 4.1 Server with the default settings ("Y", SP predicted; "N", no SP predicted). ^c Putative intracellular localization was predicted by TargetP 1.1 Server with the default settings ("S", secretory pathway; "M", mitochondrion; "-", any other location; reliability class from 1 to 5 is provided in parentheses).								