

Table S1. Accession Numbers of proteins shown in Figure 6¹

Name on the Figure	Species	Phylum	NCBI Accession No.
Monosiga	<i>Monosiga brevicollis</i>	Choanoflagellata ²	XP_001743131
Homo	<i>Homo sapiens</i>	Chordata	NP_057048
Drosophyla	<i>Drosophila melanogaster</i>	Arthropoda	NP_648881
Caenorhabditis	<i>Caenorhabditis elegans</i>	Nematoda	NP_491219
ROZELLA	<i>Rozella allomyces</i>	Rozellomycota	EPZ30999
GONAPODYA	<i>Gonapodya</i> sp. JEL0774	Monoblepharomycota	KAJ3339789
Chytriomycetes	<i>Chytriomycetes</i> sp. MP71	Chytridiomycota	KAI8613955
Chytriomycetes0	<i>Chytriomycetes confervae</i>	Chytridiomycota	TPX78276
CHYTRIOMYCES1	<i>C. confervae</i>	Chytridiomycota	TPX65886
CHYTRIOMYCES2	<i>C. confervae</i>	Chytridiomycota	TPX72533
Obelidium	<i>Obelidium mucronatum</i>	Chytridiomycota	KAI9342551
OBELIDIUM1	<i>O. mucronatum</i>	Chytridiomycota	KAI9351240
OBELIDIUM2	<i>O. mucronatum</i>	Chytridiomycota	KAI9342285
RHIZOCLOSMATIUM1	<i>Rhizoclosmatium globosum</i>	Chytridiomycota	KAJ3297182
RHIZOCLOSMATIUM2	<i>R. globosum</i>	Chytridiomycota	ORY45507
SPIZELLOMYCES	<i>Spizellomyces punctatus</i>	Chytridiomycota	XP_016604112
GORGONOMYCES	<i>Gorgonomycetes haynaldii</i>	Chytridiomycota	KAI8912588
GorgonomycetesA	<i>G. haynaldii</i>	Chytridiomycota	KAI8912823
GorgonomycetesB	<i>G. haynaldii</i>	Chytridiomycota	KAI8906053
Globomyces	<i>Globomyces pollinis-pini</i>	Chytridiomycota	KAI8895260
CAULOCYTRIUM	<i>Caulocytrium protostelioides</i>	Chytridiomycota	RKP02545
OLPIDIUM	<i>Olpidium bornovanus</i>	Olpidiomycota	KAG5460860+
APHELIDIUMi	<i>Aphelidium insulamus</i>	Aphelidiomycota	KAG5458366
APHELIDIUMt	<i>Aphelidium tribonematis</i>	Aphelidiomycota	Cf. Fig. S2
PARAPHELIDIUM	<i>Paraphelidium tribonematis</i>	Aphelidiomycota	Cf. Fig. S2
			TRINITY_DN24782 ³

¹Accession Numbers listed in Table 1 and Table 2 are not shown here. ²Class. ³<https://doi.org/10.6084/m9.figshare.7339469.v1> (accessed on 14 November 2022).

Aphelidium insulamus

>O14_transcripts_NODE_20210.p3 type: complete length:159

gc: universal O14_transcripts_NODE_20210:67-543(+)

MS**LAHAFESFATF**GAPNTQGPVTMDNAHFAKLCRDAHIVDKRVTAVDVDITFKQVLTKGSRRITFDQFQQGLQTLATKK
YAAAQLSDEEALKRITALVVNAAPTSSGTTADTAGIFSKLTDASQYTGSHRSRFDEN**GNGLGLAGRD**THTRTANLSQMV
*

>O14_transcripts_NODE_21726.p1 type: complete length:292

gc: universal O14_transcripts_NODE_21726:67-942(+)

MS**LAHAFESFATF**GAPNTQGPVTMDNAHFAKLCRDAHIVDKRVTAVDVDITFKQVLTKGSRRITFDQFQQGLQTLATKK
YAAAQLSDEEALKRITALVVNAAPTSSGTTADTAGIFSKLTDASQYTGSHRSRFDEN**GNGLGLAGRD**THTRTANLSQMV
DRSIKVPAPTSTGKRTVTLSMEEMNHQKPSSSGRRVVKPASTTPKKGPTSIGARGTVSASAQSLAKPRQANVTGSSTS
MAAKSVSGSGSVYDRLTDSKGYTGTHKHFDDT**GKGRGMLGRD**HPTTSQILRST

Aphelidium tribonematis

>P2_transcripts_NODE_21635.p1 type:5prime_partial length:297

gc: universal P2_transcripts_NODE_21635:956-66(-)

FSPKSKLHKLI**MSLSHAFEAFATF**GAPSTQGPVTMDNAHFAKLCRDARIVDKRVTSDVDITFKQVLTKGARRITDAQF
QQALKVLAAKKYGSNVSEADALQKISALVTQAAPVSNNGTAADASGIFAKLTDTTKYTGHAHRSRFDEN**GNGLGLAGRETH**
VRTANLSDMVDRSLSKPAAPQKRTVTLSMEEMNQQRSSAGQRVVKPASTPKKNAAFPAKSKVGSSSQSLAKPRQTNV
SASANSLSAKSQGGSGNVYDRLTDSKQYTGTHKHFDDT**GKGRGLAGRD**QPTSSQILRS*

>P2_transcripts_NODE_23454.p1 type:3prime_partial length:275

gc: universal P2_transcripts_NODE_23454:823-2(-)

MS**LAHAFESFATF**GAPNTQGPVTMDNAHFAKLCRDAHIVDKRVTAVDVDITFKQVLTKGSRRITFDQFQQGLQTLATKK
YAAAQLSDEEALKRITALVVNAAPTSSGTTADTAGIFSKLTDASQYTGSHRSRFDEN**GNGLGLAGRD**THTRTANLSQMV
DRSIKVPAPTSTGKRTVTLSMEEMNHQKPASSGRRVVKPASTTPKKGPTSIGARGTVSASAQSLAKPRQANVTGSSTS
MAAKSVSGSGSVYDRLTDSKGYTGTHKHFDDT**GKGR**

Figure S1. Sequences of *Aphelidium* TPPPs. The sequences were retrieved from

https://figshare.com/projects/Aphelida_Extended_Data/111539, on 17 March 2023. Green and blue background

indicates the *A. insulamus* and *A. tribonematis* sequences, respectively, used for phylogenetic analysis (Figure 6). Bold letters indicate the p25alpha domains; red letters indicate the LxxxFxxFxxF and GxGxGxxGR conservative sequences.