

		C30	C38	
A0A9P5KX09 <i>P. crustosum</i>	-mkkviftatillwqmvmg	LTPAEWRSQSIYFLLTDRFGRSDNSVTAT	ENVNDRIY	CGGS
EPS26265.1 <i>P. oxalicum</i>	--mkflglaalflaqtvag	LTAAQWRSQSIYFLMTDRFGRTDNSVTAS	CNTNDRVY	CGGT
A1CFQ9 <i>A. clavatus</i>	mkwstvplsllsgqavna	LTPAEWRSQSIYFLLTDRFGRDDRST	SAPCDTNQ	RMVYCGGT
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		CSR VI		
A0A9P5KX09 <i>P. crustosum</i>	WQGIINQLDYIQGM	GFSAIWITP	VTKQLSQDTGDGTSYHGYWQQDIYDVNPNHGT	SDDLL
EPS26265.1 <i>P. oxalicum</i>	WQGIINQLDYIQGM	GFTAIWITP	VTEQLPQDTGDGEAYHGYWQQEIYNVNNNYGTAADLK	
A1CFQ9 <i>A. clavatus</i>	WQGIINQLDYIQGM	GFTAIWITP	VTEQFYESTGDGSSYHGYWQQNINEVNRKHG	TQDLK
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		CSR I ▲N121	C150	
A0A9P5KX09 <i>P. crustosum</i>	ALSKALHARGMYLMV	DVVAN	HMGYAGAGNTVDYSVF	TPFSSSSYFHPY
EPS26265.1 <i>P. oxalicum</i>	ALSQALHSRGMVLMV	DVVAN	HMGYAGAGNTVDYSVFKPFSSSSYFHPY	CLISDYSNQTNV
A1CFQ9 <i>A. clavatus</i>	NLADALHARGMYLMV	DVVAN	HMGYRGSGQNVDFNTFHPFNRAEHYNSFCTITDYN	QNSV
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		CSR V	CSR II	
	C164	▲D175	197N	D206◆
A0A9P5KX09 <i>P. crustosum</i>	EN	WLGDTTVS	LPDLD	TTQSSVQTLWNNWIGDLVSNYSID
EPS26265.1 <i>P. oxalicum</i>	EDCWLGD	TTVSLPDLD	TTLSSVQTIWYNWVSDLVSNYSID	GLRVD
A1CFQ9 <i>A. clavatus</i>	EKCWLGSNTVSLPD	LA	TTHPWVRSTWYDWVRDLVKDYSID	GLRID
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		CSR III ◆E230		
A0A9P5KX09 <i>P. crustosum</i>	AAGV	YAVGEVFD	GD	PAYTC
EPS26265.1 <i>P. oxalicum</i>	AAGV	YCVGEVFS	GD	PAYTCPYQNYLDGVLNYP
A1CFQ9 <i>A. clavatus</i>	AAGV	YCVGEIFS	GD	PGYTCDYQNHMDGVLNYP
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		CSR IV ◆D285	CSR VII	
A0A9P5KX09 <i>P. crustosum</i>	DCADSTLLGN	F	FIENHD	NPRFPSYTS
EPS26265.1 <i>P. oxalicum</i>	DCADPTLLGN	F	FIENHD	NPRFASYTS
A1CFQ9 <i>A. clavatus</i>	KCRDPTLLGN	F	FIENHD	NPRFAHYTNDISQAKNVLTFMFLTD
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A0A9P5KX09 <i>P. crustosum</i>	ANREAIWLSGYSTTAELYQYIATTNKIRKAAIAADSSYITTKNVPFYQDSNTLAMKKGSG			
EPS26265.1 <i>P. oxalicum</i>	ANREATWLSGYSKNAQLYQHIASTNKIRSLAISKDANYITSKNNAFYTDSENTIAMKKGSS			
A1CFQ9 <i>A. clavatus</i>	HNREATWFSGYNKNAELYTWIAKTNKIRSLAVSKDSGYVTARNNPFYHDTTTLAMRKGS			
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A0A9P5KX09 <i>P. crustosum</i>	-SSPVITVLSNAGSSGSSSYTSLSLSGSGYSSGEKLLEMYTCT	SITVDSSGS	SIPVPMASGLP	
EPS26265.1 <i>P. oxalicum</i>	-GSQVVTVLSNRGSSGSSSYTSLSLSGSGYEAGTKLVEMYTCTAVTVDSNGNIAVSMTSGLP			
A1CFQ9 <i>A. clavatus</i>	DGAQVITIVSNKGASGDGYTMQLSGHGYSGATVMEMYTCTPLTVGGNGIIPVPMVSGQP			
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A0A9P5KX09 <i>P. crustosum</i>	RVLVLASSVSNGLCGSSVPSTT-TTTATQTT-TTTTKTTTGTCVQATALPVL	FQELVAT		
EPS26265.1 <i>P. oxalicum</i>	RVFMLASSACS--LCSSACSLCSSACSATATT-LKTTTATATSCTQATALPVL	FKDTVAT		
A1CFQ9 <i>A. clavatus</i>	RVLVPSSWVAGSGLCGSTGTPSTTTTPSTTTTATEPGTTCTAASTLPVQFQERVTT			
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	Y508	W524	Y537	
A0A9P5KX09 <i>P. crustosum</i>	SYGQDIYVSGSISQLGT	W	DTSQAIALSATS	YTSSNPLWQATITL
EPS26265.1 <i>P. oxalicum</i>	SYGQSVYLAGSISQLG	W	NAANAVALSADK	YTSSNPLWYATVTL
A1CFQ9 <i>A. clavatus</i>	NYGDSVFIVGSIPQLGG	W	VKKAVALS	AEKYTPGNPEWRATITL
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		W572	■N577	
A0A9P5KX09 <i>P. crustosum</i>	SSAVT	W	ESDPN	RSYTVPTGCSGTTATVTASWK
EPS26265.1 <i>P. oxalicum</i>	SGSVT	W	ESDPN	RSYTVPTGCVGSTATVTATWR
A1CFQ9 <i>A. clavatus</i>	NGQIV	W	ENDPN	RTYNVPSQCAGTVATASSWK
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Supplementary Figure 2. Alignment of the α -amylase sequence from *P. crustosum* with α -amylase sequences from *P. oxalicum* (GenBank EPS26265.1) and *A. clavatus* (UniProt A1CFQ9). Signal peptide sequences are shown in dark brown and lowercase letters. The catalytic domain is underlined in dark blue. Domains B, C, and CBM20 are underlined in orange, red, and green, respectively. The seven conserved sequence regions (CSRs) are highlighted in yellow. The three catalytic residues in the active site (Asp206, Glu230, and Asp285) are shown in bold red and marked with a black diamond. Calcium-binding residues (Asn121, Asp175, and His210) are highlighted in magenta and marked with a black triangle. Key substrate-binding tryptophan residues (Trp524 and Trp572) and tyrosine residues (Tyr508 and Tyr537) in the CBM20 domain are shown in bold purple and dark brown, respectively. Predicted *N*-glycosylation sites (Asn197 and Asn577) are highlighted in magenta and marked with a black square. Predicted cysteine residues involved in disulfide bond formation (Cys30–Cys38 and Cys150–Cys164) are highlighted in green. Residue numbering starts at the first amino acid after the signal peptide. Symbols indicate residue conservation: (*) identical residues; (:) non-conserved substitutions; (.) semi-conserved substitutions.