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martie, 2016, anothermilestone.eu				Lipase activity of ice bacteria				Identity and similarity scores between PSL-2 and PSL-3 and homologous enzymes							
NTRODUCTION						Ice age (years BP)	Lipase activity (2- naphthyl- myristate)					PSL-2		PSL-3	
ychrophilic microorganisms can produce highly ficient cold-active enzymes (extremozymes) that e used as catalysts in various industries. ar study focused on the lipolytic activity of seven cterial strains isolated from ice deposits cumulated in Scarisoara Ice Cave, Romania. We oned and characterized two lipases from the uchrobacter sn cave isolate:			Strain		Abbr.					Stı	Strains		Similarity (%)	Identity (%)	Similarity (%)
			Psyc	Psychrobacter sp.		5.3k	4			Psychrol	pacter sp G	99	99	99	99
			Micro	Microbacterium sp.		92	3		Psychrophilo	Glaciihactor superstes		20	/13	28	/13
			Pseuda	Pseudarthrobacter sp.		10.1k	3		1 Sychrophies	Giucilouci			43	20	40
			Arti	Arthrobacter sp.		10.1k	1			Moritell	Moritella sp PE36		43	28	42
			В	Bacillus sp.		10.1k	3		Mesophiles	Pseudomon	Pseudomonas aeruginosa		48	37	58
			Brevi	Brevundimonas sp.		721	3			Escher	Escherichia coli		43	26	43
PSL-2 (483 aa, 53,6kDa)			Cand	lidimonas sp.	CA	456	1		Thermophiles	s Stenotrophom	onas maltophilia	30	41	55	57
PSL-3 (315 aa, 34,6kDa)			(Paun et	al., 2021, <u>Scientifi</u>	c Reports	11)		_							
				Cold-active adaptation of					L-2 and PSL-3		3D modelling of PSL-2 and PS-3 tertiary structure				
Lipolytic activity on natural oils							ro/			Arg/					
	Olive oil Grape seed Thist		tle oil	e oil Hon		(Arg	(+ Lys)		mologs	(Arg + Lys)	9	5 6			
Strain	$\begin{array}{c c c c c c c c c c c c c c c c c c c $		25°C	PS	SL-2	0.39		PSL-3		0.26	8	ARD.	Co	PSL nserved motifs	2 S: HGGGF and
Psychrobacter sp.	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		23 C	Glaciibact	<i>Glaciibacter superstes</i>		$\frac{0.82}{0.17} Glacii$		cter superstes	0.86	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		Ca	GDSAG wit talytic triad: S	h Gly297 er299-Asp414-
Microbacterium sp.	+ + + + +					$\frac{66}{0}$	$\begin{array}{c c} 0.47 & N101 \\ 0.90 & E_{c} \end{array}$		la sp. PE36	0.43			BB SP	His4 art of family IV	14 7 or bacterial
Pseudarthrobacter sp.		+	+	Depudomon		$\frac{0}{n n s a}$	09 L 88 Psoud	omor	nas aprilainasa	0.01	ASPA	the state	Í.	lipas Template: este	es rase Est8 from
Bacillus sp.	acillus sp.			Stenotro	1054 0. IS	Ste	tenotronhomonas		0.72	Si de	SAL	20	Parvibaculum 2017, Appl	Pereira et al., Microbiol	
Brevundimonas sp. + + + + + +			malt		1		tophilia	0.84	Sec.	9 F		Biotec	hnol)		
Arthrobacter sp.	+					CONC	LUSIONS				VS	LOG	- (
							o hactoria a	ro	blo to budrol	veo olivo oil				a la	



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Cold active lipases from Scarisoara Ice Cave and their applicative potential

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- grape seed oil and thistle oil. PSL-2
- *Psychrobacter sp* G.

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Ice cave bacteria are able to hydrolyse onve on,

and PSL-3 structural possess elements related to cold adaptation.

Primary structure of PSL-2 and PSL-3 is homologous to cold-active lipase from Antarctic

• PSL-2 and PSL-3 have similar folding with coldactive esterases from *Parvibaculum* sp and Psychrobacter kryohalolentis K5T respectively.





