

Astrobiological Studies on Halophilic Psychrophiles Isolated from High Altitude cold region of North of Pakistan

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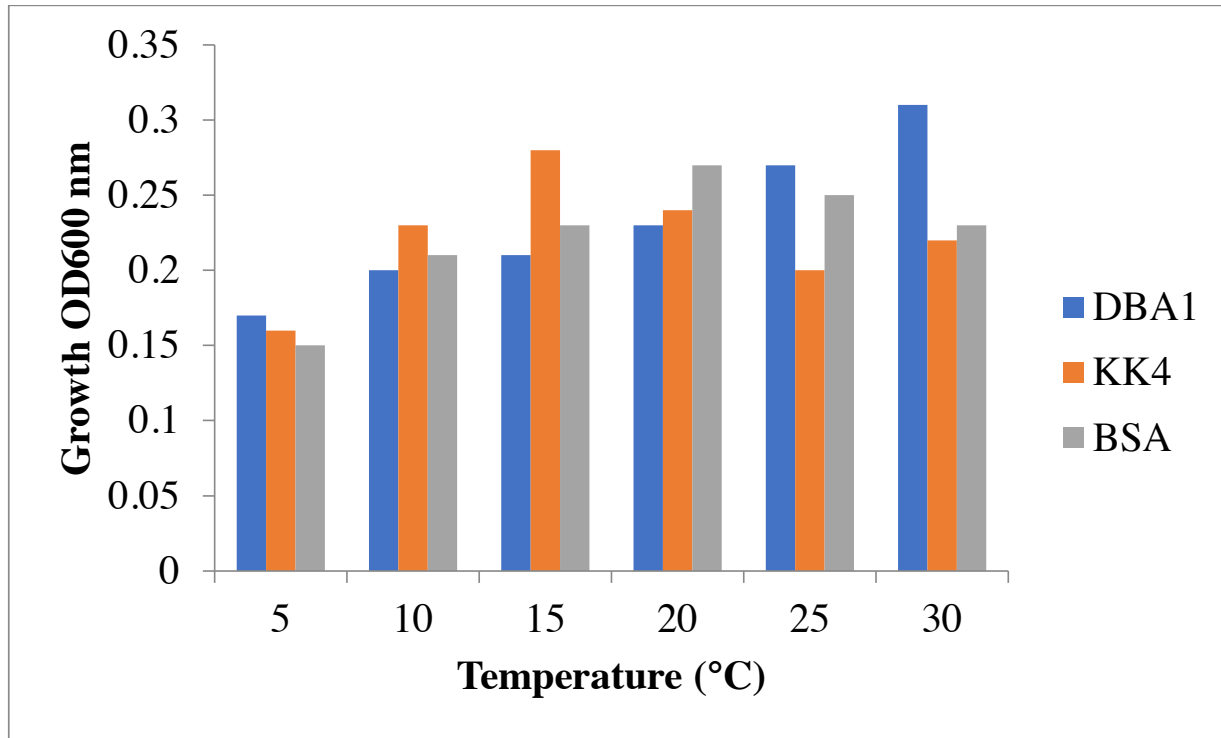
<https://youtu.be/J4N1MEaLhq4>

<https://www.youtube.com/watch?v=wTgloQyFbOA>

Growth of strains at different salinity range

Strains	NaCl concentration (%)																			
	2	4	6	8	10	12	14	16	18	22	24	26	28	30	32	34	36	38	40	
<i>Halorubrum chaoviator</i> DBA1	-	-	-	-	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	
<i>Halostagnicola</i> spp. KK4	-	-	-	-	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	
<i>Chomohalobacter salexigens</i> BSA	-	-	-	-	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	
<i>Pseudoalteromonas haloplanktis</i> HTP-9	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	
<i>Psychrobacter cryohalolentis</i> HTP-11	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	
<i>Janthinobacterium lividium</i> HTS-4	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	
<i>Arthrobacter citreus</i> HTS-27	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	

+ means growth, - means no growth



Halorubrum chaoviator DBA1, *Halostagnicola* spp. KK4, *Chomohalobacter salexigens* BSA and their tolerance to wide range of temperatures

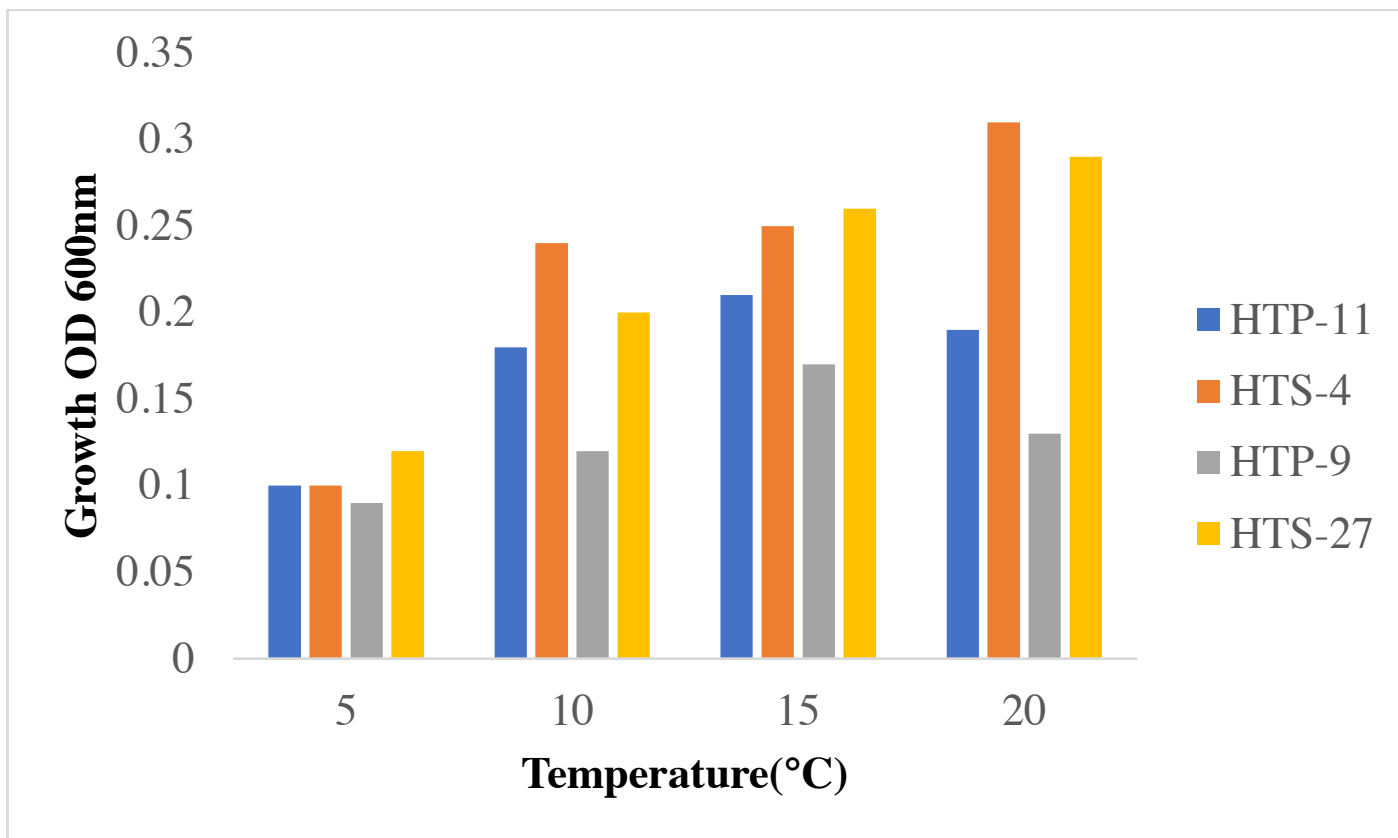


Figure 1 Effect of temperature on *Pseudoalteromonas haloplanktis* HTP-9, *Psychrobacter cryohalolentis* HTP-11, *Janthinobacterium lividium* HTS-4, *Arthrobacter citreus* HTS-27

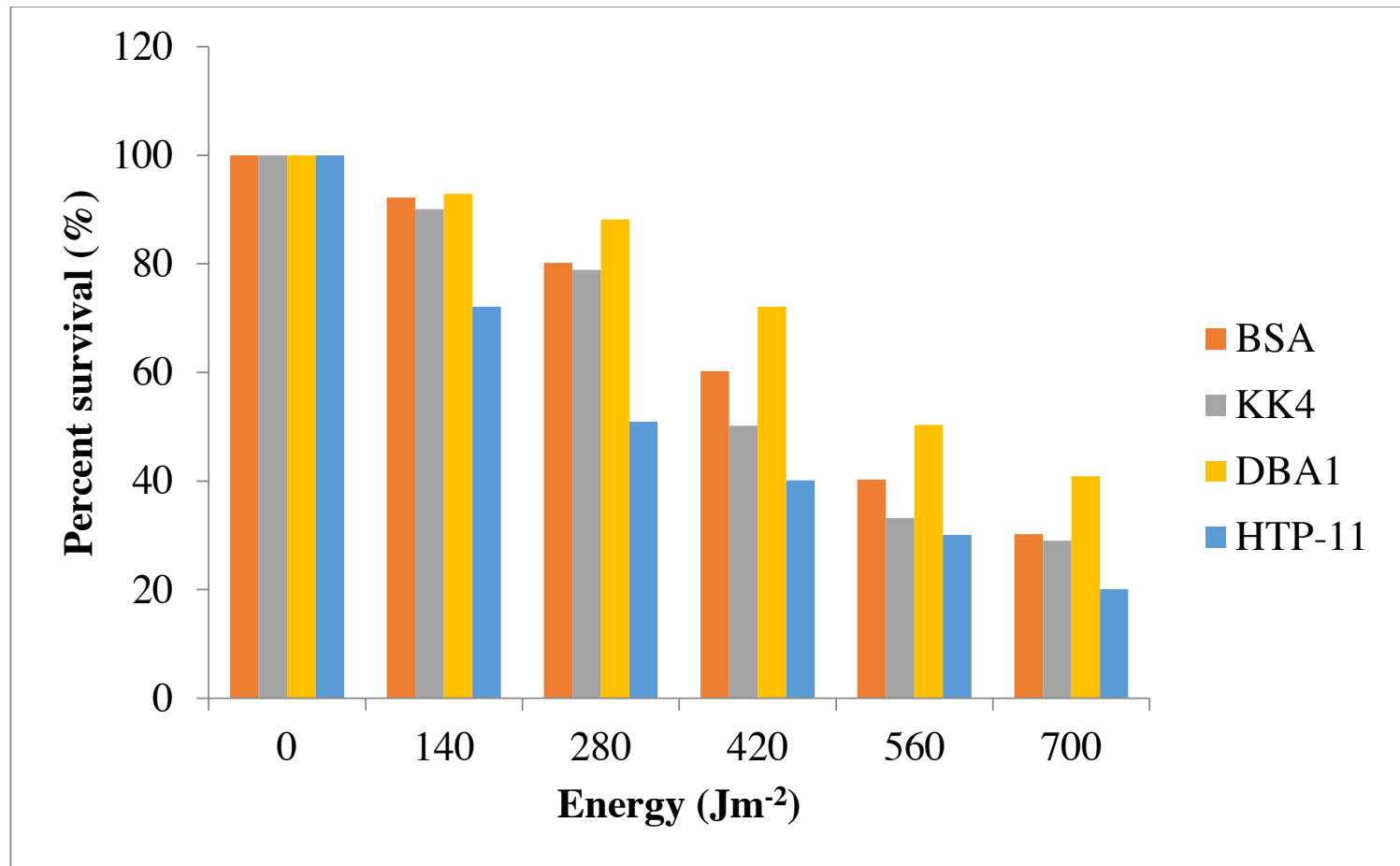


Figure 1 UV radiation profile of *Halorubrum chaoviator* DBA1, *Halostagnicola* spp. KK4, *Chomohalobacter salexigens* BSA, *Psychrobacter cryohalolentis* HTP-11,

Growth of strains at different concentrations of MgSO₄

Concentration of MgSO ₄ (mg/ml)	Growth		
	<i>Halorubrum chaoviator DB1</i>	<i>Pseudoalteromonas haloplanktis HTP-9</i>	<i>Psychrobacter cryohalolentis HTP-11</i>
0	+++	+++	+++
0.004	+++	+++	+++
0.008	++	++	++
0.016	+	+	+
0.032	-	-	-

+++ means well growth, ++ means moderate growth, + means slight growth, - means no growth

Growth of strains at different concentrations of CaCl₂

Concentration of CaCl ₂ (mg/ml)	Growth		
	<i>Halorubrum chaoviator DB1</i>	<i>Pseudoalteromonas haloplanktis HTP-9</i>	<i>Psychrobacter cryohalolentis HTP-11</i>
0	+++	+++	+++
0.0004	++	++	++
0.0008	++	++	++
0.0016	++	++	++
0.0032	-	-	-

+++ means well growth, ++ means moderate growth, + means slight growth, - means no growth

Growth of strains at different concentrations of Na_2HPO_4

Concentration of Na_2HPO_4 (mg/ml)	Growth		
	<i>Halorubrum chaoviator DB1</i>	<i>Pseudoalteromonas haloplanktis HTP-9</i>	<i>Psychrobacter cryohalolentis HTP-11</i>
0	+++	+++	+++
0.025	++	++	++
0.05	+	+	+
0.01	-	-	-
0.2	+++ means well growth, ++ means moderate growth, + means slight growth, - means no growth		

Growth of strains at different concentrations of KNO₃

Concentration of KNO ₃ (mg/ml)	Growth		
	<i>Halorubrum chaoviator DB1</i>	<i>Pseudoalteromonas haloplanktis HTP-9</i>	<i>Psychrobacter cryohalolentis HTP-11</i>
0	+++	+++	+++
0.05	+	++	++
0.1	-	-	-
0.2	-	-	-
0.4	-	-	-

+++ means well growth, ++ means moderate growth, + means slight growth, - means no growth

Growth of strains at different concentrations of KClO₄

Concentration of KClO ₄ (mg/ml)	Growth			
	<i>Chomohalobacter salexigens</i> BSA	<i>Pseudoalteromonas haloplanktis</i> HTP-9	<i>Arthrobacter citreus</i> HTS-27	<i>Janthinobacterium lividum</i> HTS-4
0	+++	+++	+++	+++
0.025	++	++	+	++
0.5	+	+	+	+
0.1	-	-	-	-
0.2	-	-	-	-

+++ means well growth, ++ means moderate growth, + means slight growth, - means no growth