Erratum

Response to Environmental Stress as a Global Phenomenon in Biology: The Example of Microorganisms

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Table 1. Non-exhaustive list of abiotic stresses

Stress	Synonym, similar or close to	Example of concerned microorganisms	Taxonomic position	Reference
Physical				
• Temperature	Thermal			
Heat				
Sublethal	Mild	<i>Sulfolobus islandicus</i>	Hyperthermophilic Archaea Crenarchaeota	34
Lethal		<i>Bacillus cereus</i>	Bacteria Gram +	45
Cold	Hypothermic/Cooling			
Above 0°C	Chilling	<i>Arthrobacter globiformis</i>	Psychrotrophic Bacteria Gram +	8
Under 0°C		<i>Geotrichum candidum</i>	Fungi Yeast	42
• Drying				
Freeze drying	Lyophilization	<i>Lactobacillus reuteri</i>	Bacteria Gram +	40
Spray drying	Atomization	<i>Beijerinckia</i> sp.	Bacteria Gram –	11
• Pressure	Barotolerance/Pressurization	<i>Saccharomyces cerevisiae</i>	Fungi Yeast	15
• Gravity	Gravitational			
Microgravity		<i>Streptomyces clavuligerus</i>	Bacteria Gram +	18
			Actinomycete Streptomycete	
Hypergravity		<i>Synechocystis</i> sp.	Cyanobacteria	16
• Radiation	Irradiation			
Gamma		<i>Lactobacillus sake</i>	Bacteria Gram +	10
Ultraviolet		<i>Saccharomyces cerevisiae</i>	Fungi Yeast	29
Visible light		<i>Escherichia coli</i>	Bacteria Gram –	53
• Ultrasonic	Acoustic	<i>Pseudomonas aeruginosa</i>	Bacteria Gram –	49
• Electrical stress		<i>Pseudomonas oleovorans</i>	Bacteria Gram –	2
• Magnetic field		<i>Escherichia coli</i>	Bacteria Gram –	38
• Mechanical stress				
Vibration	Vibrational	<i>Escherichia coli</i>	Bacteria Gram –	1
Shear	Shearing	<i>Lactobacillus delbrueckii</i> subsp. <i>bulgaricus</i>	Bacteria Gram +	3
Chemical				
• Starvation	Deprivation/Nutritional stress/ Nutrient limitation			
Carbon				
Glucose starvation		<i>Lactococcus lactis</i>	Bacteria Gram +	30
Energy stress		<i>Macrophomina phaseolina</i>	Fungi Mould Phytopathogen	27
Oxygen	Anaerobic stress/ Hypoxia/ Anaerobiosis/Low oxygen/ Anoxia	<i>Penicillium chrysogenum</i>	Fungi Mould	36
Nitrogen		<i>Anabaena</i> sp.	Cyanobacteria	54
Phosphate		<i>Synechococcus</i> sp.	Cyanobacteria	55
Iron		<i>Helicobacter pylori</i>	Bacteria Gram –	37
• Overexposure				
Heavy metal		<i>Chlamydomonas reinhardtii</i>	Microalgae Chlorophyta	25
Bile salt		<i>Enterococcus faecalis</i>	Bacteria Gram +	51
Ethanol		<i>Oenococcus oeni</i>	Bacteria Gram +	65
Organic solvent		<i>Pseudomonas putida</i>	Bacteria Gram –	57
Sanitizer		<i>Yersinia enterocolitica</i>	Bacteria Gram –	19
Food Preservatives		<i>Gluconobacter oxydans</i>	Bacteria Gram –	17
Nitrosating agents	Nitrosative	<i>Giardia intestinalis</i>	Protozoa Flagellate	33
• Oxidative				
R-O-	Oxidation/Superoxide	<i>Streptococcus thermophilus</i>	Bacteria Gram +	63
O ₂	Oxygen peroxide/ Peroxidative/Hydroperoxide	<i>Bifidobacterium</i> sp.	Bacteria Gram +	39
• Reductive		<i>Saccharomyces cerevisiae</i>	Fungi Yeast	66
• Acid	Low pH			
Strong acid		<i>Rhodococcus equi</i>	Bacteria Gram + Actinomycete Nocardioform	7
Weak acid		<i>Zygosaccharomyces bailii</i>	Fungi Yeast	47
• Alkaline		<i>Enterococcus faecalis</i>	Bacteria Gram +	21
• Low water activity				
Dessication	Dehydration /Drought tolerance/Water stress	<i>Pseudomonas fluorescens</i>	Bacteria Gram –	56
Hyperosmolarity	Salinity/NaCl	<i>Lactobacillus plantarum</i>	Bacteria Gram +	48
• High water activity	Hypoosmotic/Dilution stress	<i>Dunaliella tertiolecta</i>	Microalgae Chlorophyta	23