STEM CONNECT

Tardigrades, Trehalose and Desiccation Resistance

Anhydrobiosis is the capability or some organisms to survive despite absence of water, otherwise called desiccation. The disaccharide of glucose, namely trehalose has been shown to maintain stability of enzymes and other proteins within cells of desiccated animals such as tardigrades as well as nematodes, thus allowing these organisms to be alive in harshly dry environments. Tardigrades or “little water bears” were discovered by the German zoologist Johann August Ephraim Goeze in 1773, while the name the Italian biologist Lazzaro Spallanzani, bas “tardi” meaning slow and grado which means walker s are commonly one millimeter in length. Th nd harsh environments with temperature range c ees Celsius) up to 420 K (150 degrees Celsius), a s six times higher than those in deepest trenche of ionizing radiation and even the vacuum envi space. During anhydrobiosis, tardigrad from the cytoplasm and the water that maintains shape and conformation of proteins, carbohydrat cids are greatly reduced. The disaccharid been reported to take the place of water in th rades so as to prevent their damage during desiccation. Through this finding,

preservation of other cells, tissues and organs could be developed.