

Trehalose synthesis in *Cystidicola farionis* (Nematoda: Cystidicolidae): a preliminary study

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Disaccharide trehalose (α -D-glucopyranosyl-1,1- α -D-glucopyranoside) is common in nematodes where it plays a number of key functions: by energy source, assisting glucose uptake and protecting against environmental stress. In the majority of eukaryotes, including nematodes, trehalose synthesis is catalysed by two enzymes: trehalose-6-phosphate synthase (TPS, EC 2.4.1.15) and trehalose-6-phosphate phosphatase (TPP, EC 3.1.3.12). This enzymatic system requires UDP-glucose and glucose-6-phosphate as the initial substrates and trehalose-6-phosphate (T6P) as intermediate product.

There is no information available on synthesis of trehalose in *Cystidicola farionis* – parasitic nematode of salmonids and osmerids. The research material consisted of larvae and adults of *C. farionis* isolated from the swim bladder of European smelt from Vistula Lagoon. In the larvae and adults of *C. farionis* the activity of TPS and TPP were determined. Activity of TPS and TPP was determined using the method by Giaever et al. (1998) and Kassen et al. (1992), respectively. The end product of the reaction – trehalose was determined using HPLC (Dmitryjuk et al. 2009). We marked an optimum pH and temperature on the activity of both enzymes examined. The effects of pH on the enzymes were determined by employing 0.1 M acetic acid-ammonia buffer in the pH range 3.0–9.0. The optimum temperatures of enzymes activity were studied out in the temperature range of 5–60°C.

Both trehalose synthesis enzymes (TPP and TPS) were found to be active in larvae and adults of *C. farionis*. The TPS activity was higher in larvae (18.45 ± 3.24 mM/mg) than at adults (9.76 ± 1.46 mM/mg). The activity of TPP was higher than TPS in both stages of parasite. The TPP activity was also higher at larvae (21.87 ± 2.01 mM/mg) than at adults (19.66 ± 2.5 mM/mg). The optimum pH and temperature of TPS was pH 7.0 and 20°C for larvae and adults. The optimum pH of TPP was pH 7.0 for larvae and pH 8.0 for adults. The highest activity of TPP was observed also in 20°C in both stages of nematode.