Variations of Zeaxanthin epoxidase and Phosphoglucomutase in Landoltia punctata

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While Landoltia punctata, commonly known as duckweed, has many potential uses, very little of its genome has been sequenced and cataloged. The purpose of this research was to sequence and analyze samples of Landoltia punctata DNA and determine how the genes compare with those expressed in other species. The DNA was initially analyzed by running gel electrophoresis on Polymerase Chain Reaction (PCR) samples and Restriction Digest samples. After verifying that the DNA existed in the sample, the DNA was sequenced and a BLAST analysis was conducted. While analyzing the samples with the BLAST database, the researcher found two new protein variations for the Zeaxanthin epoxidase and Phosphoglucomutase proteins. Zeaxanthin epoxidase functions in the conversion of zeaxanthin to violaxanthin, a process that produces the plant hormone abscisic acid (ABA). Abscisic acid regulates the resistance of stresses, seed development and plant dormancy. Phosphoglucomutase bidirectionally catalyzes glucose-1-phosphate and glucose-6-phosphate (breaks and forms glucose). Lack of Phosphoglucomutase in human's leads to Phosphoglycerate mutase (PGM) deficiency, a condition similar to muscular dystrophy. This means further research on Phosphoglucomutase could aid the medical community. After the end of experimentation, the researcher confirmed the alternate hypothesis and concluded that genes sequenced from Landoltia punctata are similar to genes expressed in other species. Future research could involve confirming the role of the proteins in Landoltia punctata. This may lead to further experimentation to determine how Phosphoglucomutase from Landoltia punctata can be used to create pharmaceuticals for patients suffering from PGM deficiency and/or muscular dystrophy.

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