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ENZYMATIC EXTRACTION OF GROWTH FACTOR IN CHLORELLA AND POSSIBLE ETHANOL-INTOXICATION PROTECTIVE EFFECTS OF CHLORELLA EXTRACTS

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Abstract. Microalgae have been known as potential sources of proteins and bioactive compounds, these microscopic algae have fueled interest in different research fields[1]. While different extraction techniques have been applied for recovery of bioactive compounds from these sources, high extractability remains a major concern. *Chlorella*, a prominent microalga, has been found to be an excellent source of carotenes, protein, fiber, vitamins, minerals, nucleic acids, polysaccharides, and chlorophyll,[2] and could serve as a food source for yeasts.

This work was aimed to assess the protective effect of *Chlorella* in yeast cells cultured in ethanolic environment. Additionally, the use of enzymatic treatment was employed for the extraction of *Chlorella* growth factor (CGF). Dry Chlorella powder and water at 95°C (as a solvent) have been used to prepare extracts.

From our pilot study carried out to check the protective effect of *Chlorella* extract on yeast, it was found that culturing yeast in a medium (Sabura) supplemented with 0.01% concentration of chlorella extract was found to greatly increase its (yeast's) viability up to 17 days. A 100% viability was recorded on the 13th day of inoculation on the medium. It was found that treatment of *Chlorella* algae with enzymatic preparation *Cellulox-A* (Sibbiopharm Ltd., Russia) increased the growth factor index from 3.5 to 7.5 (approximately 3% increment). The extractability of growth factor was observed to depend on extraction time with the optimal extraction yield obtained at 120 min.

Table 1. GF Index for samples prepared at different pre-treatment times

Sample	treatment duration (min)	enzyme (g)	Solid recovery (g)	Absorbance (260)	GF Index
D1	120	0	0.189	0.327	3.090
D2	30	0.03	0.089	0.355	1.579
D3	60	0.03	0.23	0.452	5.198
D4	120	0.03	0.313	0.488	7.649

References

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2. Plaza, M., Santoyo, S., Jaime, L., et al. (2012).Comprehensive characterization of the functional activities of pressurized liquid and ultrasound-assisted extracts from Chlorella vulgaris.*LWT – Food Science and Technology.* Vol. 46, pp. 245–253.