

DR-14. EXTRACTION OF CHLORELLA GROWTH FACTOR FROM DRY CHLORELLA POWDER IN WATER MEDIA AT DIFFERENT TEMPERATURES

I. Y. Almudhhi, E. Kovaleva

Ural Federal University of the first President of Russia B. N. Yeltsin,
Mira St., 19, Yekaterinburg, 620002, Russia

E-mail: e.g.kovaleva@urfu.ru

Growth factor in *Chlorella* microalgae (CFG) consists of different known and unknown compounds. *Chlorella* growth factor was suggested to be a glycopeptide. This compound has shown biological activity in different studies and has been mostly supplied as a hot water extract from *Chlorella* powder. A microalgae as any other microorganisms contain a lot of compounds that are water soluble which could affect the final quality of extract. The absorbance at 260 nm is usually used as an indicator of *Chlorella* growth factor quality in a sample [1], therefore the same measurement has been followed to check our extract samples combining it with measuring proteins content in each sample may aid in realising the nature of any higher yields we get by enhancing extraction process. The dimensionless CGF index was defined as the total absorbance of the crude extracted CGF per 1 g *chlorella* powder and calculated according to the following equation:

$$\text{CGF index} = A \times D \times W_1/W_2,$$

where A is the A_{260} of extract solution supernatant, D is dilution factor, W_1 and W_2 are weights of the lyophilized extract and *Chlorella* powder, respectively. The extraction yield was expressed as solid recovery and calculated as ratio weight of the evaporated extract to the weight of the *Chlorella* powder.

Six samples were prepared by water extraction at room temperature (21 °C) (three extracts) and 95 °C (three extracts) using 2 grams of *chlorella* dry powder in 100 ml distilled water mixed on magnetic stirrer at 200 rpm for 30 min. 20 ml out of 100 ml from each of the six samples were evaporated and dried to measure extract weight. The extracts obtained then were diluted as 1 : 50 for measuring the absorbance at 260 nm and CGF index. The average values of the CGF index were found to be 1,1 and 3,3 at 21 °C and 95 °C, respectively, whereas an increase in temperature did not lead to changing in solid recovery. It was found the same (19 %) under extraction at the above-mentioned temperatures. The samples were also examined for proteins content measured by Lowry protein protocol [2]. The results showed no direct positive relationship between protein content and CGF index. There are noticeable differences in protein concentrations yet those differences does not seem to be highly affected by absorbance readings.

From the results obtained one may suggest that hot extraction does not give a higher yield in term of final extract weight, however, it leads to different quality of the extract (CGF increases). We can also conclude that the higher concentration of compound measured at 260 nm may not surely suggest higher concentration of growth factor identified as a peptide but it could generally mean higher concentration of RNA and higher quality RNA extraction in hot water samples [3]. In case growth factor appears to be a subnuclear peptide, higher concentration of nucleic acids in a sample is an indication of better extract yet. Such a method does not measure the quality directly which is highly affected by the microalgae strain and growth conditions [4].

References

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