

Potential of Microalga for Enhancing Growth of Vegetable Crops Seedlings

Научный руководитель – Ondriinkhon Rentsenkhand Tserennadmid

Bumandalai Odgerel

Выпускник (магистр)

Государственный Университет шт. Джорджия, Атланта, Соединенные Штаты

E-mail: odgoo22@gmail.com

Most of the agriculture sectors have been dependent heavily on inorganic chemical-based fertilizers, which are harmful for both human health and environment. The utilization of beneficial microbes, such as microalgae, has become major concern in industrial agriculture for their potential role in food safety and sustainable crop production. Microalgae are considered as a one of the potential organic fertilizers due to the presence of macro and microelements, some growth regulators, polyamines, natural enzymes, carbohydrates, proteins and vitamins that are implemented for improving vegetative growth and yield [2-4].

In this study, we examined the effect of microalgal strain (*Chlorella* sp.) on germination of barley and wheat grains. These seeds were germinated in culture media containing different concentrations of microalga (*Chlorella* sp.) and grown for 3, 6, 9 and 12 days in order to study its effect on growth parameters of seedlings. The growth of microalgal strain was measured in terms of cell number and dry weight biomass. As results, the growth of barley shoot at day 3 was close to that of control. Also, the lengths of both shoot and root were much longer at day 3, 9, and 12 as compared to that of control. The highest length of shoot was obtained at day 12, which was 1.9 times higher than that of control. However, the highest length of root was observed at day 9 and it was 2.4 times higher than that of control.

In conclusion, microalgal suspension can be used to enhance the growths of vegetable crop seedlings. This idea was previously confirmed by Abd El-Bake (2008), who found splaying wheat cultivated with microalgae extracts obtained from *Chlorella* sp. led to keep good growth and yield of wheat compared to those received recommended dose of chemical nitrogen. Similar trends were found by Adam (1999) [1]. It can be concluded that *Chlorella* suspension can enhance the germinations of wheat and barley seeds. The treatments of microalgal suspension of 0.06 g/L and 0.23 g/L concentrations were found to be the most suitable for the growth parameters of barley and wheat seedlings, respectively.

Источники и литература

- 1) Adam M.S. The promotive effect of the cyanobacterium *Nostoc muscorum* on the growth of some crop plants // *Acta Microbiologica Polonica*. 1999. V. 48. No. 2. P. 163–171.
- 2) Santos V.B., Araujo A.S.F., Leite L.F.C., Nunes L.A.P.L., Melo W.J. Soil microbial biomass and organic matter fractions during transition from conventional to organic farming systems // *Geoderma*. 2012. V. 170. P. 227–231.
- 3) Sinha R.K., Valani D., Chauhan K., Agarwal S. Embarking on a second green revolution for sustainable agriculture by vermiculture biotechnology using earthworms: Reviving the dreams of Sir Charles Darwin // *J. Adv. Biotechnol. Sustain. Dev.* 2010. V. 2. No. 7. P. 113–128.
- 4) Youssef M.M.A., Eissa M.F.M. Biofertilizers and their role in management of plant parasitic nematodes. A review // *E3 Journal of Biotechnology and Pharmaceutical Research*. 2014. V. 5. No. 1. P. 1–6.