Features of *Origanum vulgare* L. basal metabolism substances in the plants treated with entomopathogenic bacteria *Bacillus thuringiensis*

Kryzhko A.V., Shirma A.V.

FSBSI "Research Institute of Agriculture of Crimea", Simferopol, Crimea

E-mail: solanum@ukr.net

Key message. The treatment with *B. thuringiensis* 888 strain of *O. vulgare* courses the increasing of the sugar content. The sample #2 demonstrated the increasing of ascorbic acid content. So, the treatment can influence the dynamic of protector substances in *O. vulgare* plants.

Keywords: *Bacillus thuringiensis*, *Origanum vulgare* L., metabolism, protector substances

Origanum vulgare L. is a valuable essential oil and medicinal culture. One of the main problems of its cultivation is a protection from one of the main pest belonging to the group of *Eriophye* ssp. The entomopathogenic bacterium *Bacillus thuringiensis* can be used for this purpose. However, the effect of this entomopathogen on the metabolism and the main indicators of the physiological state of oregano plants is not studied.

The purpose of this work is to study the features of basic metabolism substances content in the leaves of *O. vulgare* when treating plants with entomopathogenic bacteria *B. thuringiensis*.

The liquid spore culture of the strain *B. thuringiensis* var. *thuringiensis* 888 from the Crimean collection of microorganisms of the FSBSI "Research Institute of Agriculture of Crimea" (registered on the website <http://www.ckp-rf.ru> under the number 507484) used as a research material. As well as a varieties of *O. vulgare* #1 with a predominant content of germacrene D (21.5%) and β -caryophyllene (19.4%), #2 with a content of α -terpineol up to 59.85% and G4 with a content of carvacrol up to 52.04%.

The content of green pigments was measured spectrophotometrically according to the method of V. F. Gavrilenko et al., 1975 in wavelength 665 and 649 (chlorophylls a and b). The total content of soluble carbohydrates in plants was determined using phenolic compounds according to Dubois M. et al. (1956). The amount of ascorbic acid in the leaves was determined by Okuntsov M.M. et al. (1974), and phenolic compounds by titrimetric method by Zaprometov M.N. (1974).

There were no significant fluctuations in the content of chlorophyll in the vegetative shoots of *O. vulgare* on the 10th day after treatment with a liquid spore culture of the strain *B. thuringiensis* 888. However, a 2-fold decrease of the chlorophyll content in sample #2 and a 1.4-fold increase in its content in the G4 sample was observed on day 20.

The mass fraction of phenolic compounds in all studied varieties of oregano varied within 18.8-19.5 % of the completely dry mass and sugars within 89.6-141.0 % on the 10th day after treatment. Excepted the sample #2, for which the culture of the *B. thuringiensis* 888 strain showed a simultaneous increase in the sugar content to 141.0% (by 30.8% to control) and a decrease in the content of phenolic compounds to 13.03 % (by 20.35% to control). On day 20 after treatment, the strain 888 showed an increase of the phenolic compounds mass fraction in the samples #2 and G4 by 24.9 and 29.8%, respectively, to control. There were no significant fluctuations in the content of compounds in sample # 1 after the treatment with strain 888. The quantity of sugars increased in all the studied samples, especially #1 to 96.2% and #2 to 116.1% of the raw mass (by 28.9 and 37.2 % of the control, respectively).

There is no a significant impact on the ascorbic acid content in the leaves of oregano during the whole experiment. Only in the sample number one we observed the increasing of this compound to 23.6% on day 10 experiment.

Thus, the treatment with *B. thuringiensis* 888 strain of all the *O. vulgare* samples courses the increasing of the sugar content. The sample #2 demonstrated the increasing of ascorbic acid content. So, the treatment can influence the development of ecological plasticity and protector substances of the different chemical nature accumulation in *O. vulgare* plants.

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