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Hydroxybenzoic Acid as a Potential Regulator of Low-Molecular Antioxidants in Plant Cells

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Aim of the study: Hydroxybenzoic acid widely distributed in plants refers to phenolic compounds of the C_6-C_1 group. It is known that it participates in respiration processes as a precursor of plastoquinones, in allelopathic processes, in the induction of plant resistance to unfavorable environmental factors. Information about its effect on the antioxidant system of plants, in particular the accumulation of phenolic compounds (PC) - antioxidants with high biological activity - are few in number.The aim of the research was to study the effect of exogenous p-hydroxybenzoic acid (HA) on the accumulation of phenolic compounds in plant cells, for example, the callus culture of a phenol-producing tea plant (*Camellia sinensis* L.).

Material and Methods: The object of the study was a heterotrophic callus tea culture grown on Heller's nutrient medium containing glucose (2.5%) and 2,4-D (5 mg / l). At the age of 20 days, it was aseptically held for 2 hours in water (control) or aqueous HA solution (10^{-5} M). After exposure, callus was transferred to the main nutrient medium. As PC are products of secondary metabolism, their contents were analyzed 1 and 7 days after exposure. For this, the plant material was extracted with 96% ethanol (45°C, 45 minutes). The supernatant was separated by centrifugation (16000 rpm) and used for spectrophotometric determination of the amount of PC with Folin-Denis reagent at 725 nm. The calibration curve was built for the (-) epicatechin.

Results: Established, that 1 day after impact of HA the total phenol content in callus was 20% lower than in the control variant. This effect can be a consequence of either the catabolism of these secondary metabolites or the conversion of them into more polymeric forms (eg lignin). Seven days after impact the content of the phenolic compounds in both variants was almost twice lower that in comparison with the earlier period of their growth. And in this case their level in callus exposed to action was higher (on 12%) compared to the control.This way, it can be concluded that after exogenous influence of HA in cultivated *in vitro* cells of the tea plant the content of low-molecular antioxidants of phenolic nature increased that possibly is a consequence of activation of their metabolism. This confirms the possibility of using HA as a "regulator" for the accumulation of these secondary metabolites.

Keywords: hydroxybenzoic acid, *Camellia sinensis* L., callus, phenolic compounds.