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ABSTRACT BOOK

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Effect of calli types on lectin activity in common bean

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Abstract

Cell and tissue cultures *in vitro* are widely used in modern biological experiments, particularly for production of natural biologically active food supplements and protein substances. Legumes are characterized by high level of proteins and protein compounds such as lectins [1]. Studying different patterns of hormonal regulation of lectins *in vitro* allows understand physiological mechanisms of growth and development in common bean. In this regard selecting the source of explants and optimizing concentration of minerals and hormones in culture media has helped us to obtain morphogenic and non-morphogenic calli. Presence of 2 mg/l of 2.4-D и indolyl acetic acid (IAA) in a medium resulted in formation of 87% and 15 % of morphogenic calluses respectively. Increased concentration of 2.4-D caused a degradation of morphogenetic calli, whereas in presence of 8 mg/l of 2.4-D necrosis was detected. It was supposed that high 2.4-D concentrations increased the rate of ethylene formation and simultaneously decreased the speed of cell extension. Probably high auxin concentrations influence on suppression of growth for dicotyledonous plants to be associated with the ethylene synthesis [2]. Non-morphogenic calli are characterized by low lectin concentration (about 18.4- 25.2 mg/100 g of wet weight) in all samples under investigation. It was assumed that these differences in lectin concentration might be related to hormones in the media, because morphogenic type was formed on culture media with IAA but low concentrations of 2.4-D. According to the literature the synthesis of lectins is regulated by abscisic acid (ABA) and high concentrations of 2.4-D which is known to decrease the content of ABA [3-5]. Biological activity of lectins, extracted from different types of calli, was determined visually by intensity of hemagglutination and related types. The level of lectins is controlled by concentration of auxins and cytokinins in media. All morphogenic samples of calli demonstrated higher activity comparing to non-morphogenic agglomeration. Maximal doses of lectins were observed at 2.4-D concentration of 1 mg/l and 0.5 mg/l of kinetin. The highest lectin activity was indicated in two representatives of morphogenic type of calli, "Aktatti" and "Juravushka". Experiments demonstrated that agglutinative activity in plants and the level of lectins in calli may show fluctuations in lectin activity across cells and tissues. The data might be used for study the hormonal processes during differentiation, proliferation and early development of common bean and improving current methods of lectin extraction.

Keywords: *Phaseolus vulgaris*, lectins, callus culture, activity, hormonal dependence.

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