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Production of Tannin by Tissue Culture of Woody Plants and Tannin Biosynthesis

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Abstract: This review deals with production of condensed tannins and four types of hydrolysable tannins by plants tissue cultures, especially of woody plants. Tannins are plant polyphenols which are widely distributed in the plant kingdom. Medicinal plants that contain high amounts of tannins have been used in traditional medicine, and various pharmacological activities of tannins, such as anti-virus and anti-tumor effects, have been newly discovered. The effective production of such bioactive tannins in plant cell cultures has been required for further studies of their biological activities or for development of new natural medicines. Several cell and tissue cultures which are capable of producing a large amount of condensed and hydrolysable tannins have been established from tannin-producing plants. Galloylglucoses were common constituents in those undifferentiated cell cultures induced from plants producing hydrolysable tannins. Ellagitannin production was accompanied by tissue differentiation of these cell cultures, substantiating that galloylglucoses were precursors of ellagitannins. Tannin production was controlled by culture conditions, especially the concentration and the ratio of nitrogen sources in the culture media as well as light irradiation.

Keywords: proanthocyanidin, hydrolysable tannin, tissue culture, biosynthesis

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