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EFFECT OF POTASSIUM HUMATE ON BIOCHEMICAL ASPECTS OF WHEAT

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ABSTRACT

Pot experiment was conducted to study the effect of potassium humate (salt of humic acid) on biochemical aspects of wheat (*Triticum aestivum* L.). For the study of physiological (chlorophyll-a, chlorophyll-b and total chlorophyll pigments a+b) and biochemical (*Beta*-carotene, proteins, phenols and reducing sugars) aspects of wheat, one percent potassium humate solution was used as treatment and water as control. The biochemical aspects of wheat were studied after 53 days from sowing in pot. Results obtained during this investigation clearly indicated that potassium humate treated plants showed significantly increased biochemical aspects of wheat than control plants (untreated plant).

Key Words: *Humic Acid, Potassium Humate and Biochemical Aspect*

INTRODUCTION

Soil is a living biological system containing billion of microorganism. These microorganisms feed on soil organic matter and break it down into humus (Fahri Yigit and Murat Dikilitas, 2008). Humic substances are component of humus. Humic substances are widely distributed over earth surface. Humic substances classified into three categories like humic acid, fulvic acid and humin (Solange and Rezende, 2008). Potassium humate is the salt of humic acid. Potassium humate is dark colored, water soluble but alkali insoluble. Humic acid influence the plant growth both directly and indirectly. The indirect effect of humic acid improves physical, chemical and biological condition of soil. Its direct effects attributed due to its metabolic activity in plant growth (Mallikaarjuna Rao *et al.*, 1987 Tejada *et al.*, 2006). Therefore when plants were treated with potassium humate, chlorophyll contents were also increased. On entering in plant cell, the functional group of humic and fulvic acids can serve as supplementary source of respiratory catalysts (e.g. polyphenols) and oxidation / reduction regulations (e.g. quinines) (Vaughan and Ord, 1991, Irfan *et al.*, 2005 Sritharan *et al.*, 2005). Increased contents of chlorophylls enhanced overall photosynthetic activities of crops plants and there by yield in general. (Sladky, 1959; Kui Zeng, 2002 and Roberto *et al.*, 2008) Metabolic effects are assumed to be stimulated by humic acid, resulting in a net increase in metabolism due to increase in production of enzymes, amino acids, proteins and other metabolites (Jackson, 1993; Nardi *et al.*, 1994; Perg, 2001 and Ryosuke *et al.*, 2008).

MATERIALS AND METHODS

In order to see the effect of potassium humate on biochemical aspects of wheat (*Triticum aestivum* L.), Pot experiment was conducted. The effect of potassium humate (1.0%) against control (tap water) in three replications were tested for physiological and biochemical aspects of wheat at Botanical Garden of Yeshwant Mahavidyalaya, Nanded during year 2007. Seeds of wheat were collected from field. Four kg seeds of wheat in small gunny bags were stored in laboratory for experiments. The solutions of potassium humate of concentration 1.0% were prepared by dissolving 1.0 gm of potassium humate in 100 ml water. After 53 days of seeds sowing of treatment the fresh leaves were collected from crop for determination of

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amount chlorophyll-a and chlorophyll-b, *Beta*-carotene and protein (Wadje and Baig, 2004), phenol and reducing sugar (Mahadevan and Sridhar, 1986).

RESULTS

Results presented in Table-1 show that there was an increase in amount of *Beta*-carotene, proteins, phenols, reducing sugars, chlorophyll-a, chlorophyll-b and total chlorophylls. Treated plants showed *Beta*-carotene 6.2 mg (control 5.1 mg), proteins 11.24 mg (control 9.8 mg), phenols 2.4 mg (control 1.8 mg), reducing sugars 0.64 mg (control 0.53 mg), chlorophyll-a 2.43 mg / gm (control 1.78 mg / gm), chlorophyll-b 1.88 mg / gm (control 1.42 mg / gm) and total chlorophylls 4.31 mg / gm (control 3.20 mg / gm).

Table 1: Effect of potassium humate (1.0%) on biochemical decomposition of wheat (*Triticum aestivum* L.) cv. Lokvan

Sr. No	Biochemical composition	Potassium humate (1.0%)	Control (water)
1	<i>Beta</i> -carotene (mg/ 100 gm of fresh leaves)	6.2	5.1
2	Proteins (mg/ gm of fresh eaves)	11.24	9.8
3	Phenols (mg/gm of fresh leaves)	2.4	1.8
4	Reducing sugars (mg/gm of fresh leaves)	0.64	0.53
5	Chlorophyll –a (mg/gm of fresh leaves)	2.43	1.78
6	Chlorophyll –b (mg/ gm of fresh leaves)	1.88	1.42
7	Total Chlorophylls (a+b) (mg/gm of fresh leaves)	4.31	3.20

DISCUSSION

Results obtained during this investigation clearly indicated that potassium humate treated plants showed significantly increased biochemical aspects of wheat than control plants (untreated plant).

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