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Genotoxic effects of Food Dyes on mitotic chromosomal entity in root meristems of Cluster bean (*Cyamopsis tetragonoloba* (L.) Taub.)

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Abstract : Synthetic colouring dyes are applied in diverse fields including food industry, wherein they are destined to enhance the aesthetic value of food items. Attempts are made to make food items conspicuous by application of food dyes. But their elevated application may incite various health concerns. The present cytological work is designated to investigate the effects of food dyes on the cellular level by analysing its responses on the meristematic root tip cells of Cluster bean (*Cyamopsis tetragonoloba* (L.) Taub.). Freshly germinated root tips were treated with graded concentrations (viz. 0.5%, 1%, 1.5% and 2%) of Orange G and Brilliant blue dyes along with a control set (roots dipped in distilled water) for duration of three hours each. Roots were then fixed in Carnoy's fixative and preserved in 90% alcohol. Cytological monitoring displayed that both the food dyes were increasingly mitoinhibitory and chromotoxic. Various chromosomal anomalies were encountered included scattering, stickiness, forward movement etc. But an important abnormality of concern was the formation of micronuclei, which are the indicators of genomic loss. The decline in mitotic index and subsequent increment in frequency of chromosomal aberration was higher in the case of Brilliant blue as compared to Orange G, which reflects higher genotoxicity of Brilliant blue compared to Orange G on somatic cellular complement.

Key Words : Cluster bean, Brilliant blue, Orange G, Mitotic Index (MI) and Total Abnormality Percentage (TAB %).

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