

Cytogenetic studies of *Psoralea corylifolia* Linn. due to exposure of physical mutagens (Gamma radiations)

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Mutations are the important tools to produce many cultivars with improved economic value and study of genetics and plant development phenomena. Various mutagenic agents are used to induce favourable mutations at high frequency that include ionizing radiation and chemical mutagens. In the present study, the effect of physical mutagens *i.e.* gamma radiations have been studied on the cytogenetic of *Psoralea corylifolia* Linn. seeds. Different dosages of gamma rays were used to irradiate ranging from 5KR to 80KR. The frequency of dividing cells were increased at lower exposures while found decreased at higher exposures in M1 generations of *Psoralea corylifolia*. The mitotic index increased upto 20KR while it decreased at high exposures. Various chromosomal aberrations were recorded in mitosis like laggards, bridges, clumping of chromosomes and precocious movement of chromosomes. The frequency of abnormalities increased with increase in dose of gamma rays.

Key words : *Psoralea corylifolia*, Physical mutagens, Chromosomal abnormalities

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INTRODUCTION

Psoralea corylifolia is considered to be very effective plant in Indian indigenous system of medicine (Gidwani, 2011). It is a common herbaceous weed of road sides, cultivated fields and waste places, found mainly in Bengal, Bombay, throughout Indian plains and in Pakistan, Srilanka, Burma and China (Kirtikar and Basu, 1994). It has been extensively used in dental caries (Mukherjee, 2002), diarrhoea (Rangari and Agarwal, 1992), aphrodisiac (Kirtikar and Basu, 1994) and inflammatory diseases of skin (Uniyal and Ghandhak, 1998). Mutations are the tools to study the nature and function of genes which are the building blocks and basis of plant growth and development, thereby producing raw materials for genetic improvement of economic crops (Adamu and Aliyu, 2007). Induced mutations have great potentials and serve as a complimentary approach in genetic improvement of crops (Mahandjiev *et al.*, 2001). It is highly instrumental in plant biology to induce genetic variability in a great number of crops (Boureima *et al.*, 2009). Gamma radiations have been found to be very useful both for sterilisation in medicine and the preservation of food and cereals in nutrition and agriculture (Mokobia and Anomohanran, 2004). In the present investigation, the study was carried out to observe the

effectiveness of gamma radiations (physical mutagens) in the M1 generation of *Psoralea corylifolia* seeds. The attempts made in the present study can be useful as a guideline for mutation breeding using gamma radiations.

RESEARCH METHODOLOGY

The attempt made in the present study was carried out to observe the effectiveness of gamma radiations (physical mutations) in the M1 generations of *Psoralea corylifolia* as well as to estimate the dosages of mutagen to bring cytogenetic changes. The seeds of *Psoralea corylifolia* L. were procured from the Amravati University Campus for the experiment and the exposures to gamma radiations was performed in the gamma cell of USIC, Nagpur University, Nagpur. The seeds were exposed with gamma rays at different dosages *i.e.* 5, 10, 20, 40, 60 and 80KR at dose rate 10KR/inute by cobalt-60 source.

The air dried seeds of *Psoralea corylifolia* were exposed to different doses of gamma rays *i.e.* 5-80KR from cobalt source-60 source. Five-hundred seeds of each treatment were sown in the field on the same day in the evening and watered immediately. Control seeds were handled in the same way as the treated ones. Chromosomal abnormalities in mitosis were