

## **Abstract**

Nowadays induction of polyploidy by using mutagenic chemicals to increase secondary metabolic production as a modification method of pharmaceutical plants is very usual. In the past 35 years polyploidy method as a modification method became popular and used for modifying plants. This study has done to demonstrate colchicum effect on auto- tetra- polyploidy and also on cytogenetic features of meristematic cells in roots and morphological features of pharmaceutical fenugreek in indigenous mass of Sistan. Therefore the experiment has done factorial and base on an accidental plan by 3 repeats and experiments such as colchicines concentration in four levels (0/2, 0/5, 0/75 and 1 gram in each liter) and the period of experiment was in three levels (6, 12 and 18 hours). Cytogenetic features have studied by using video analyze. The number of basic chromosomes in sample was  $x=8$ . The results showed that the concentration and period of colchicines' experiment and their interaction influence on becoming polyploidy of fenugreek by 1% possibility. The highest level of polyploidy induction achieved by plunging seedling in 0/5 concentration in one liter of colchicines for 12 hours. At last these modifications influenced on chromosomes' length and karyotypic formulation. There was a meaningful difference between karyotypes in all chromosomal features by 1% possibility. In this way to study morphological features of plants, the most influenced ways of auto- tetra- polyploidy induction have done on seeds (0/5 gram in one liter of colchicines for 12 hours) and planned in a block plan accidentally. In studying and comprising quantity features such as; height, leaf length, branching root, acid index, chlorophyll a, chlorophyll b, general chlorophyll, and karnoid of tetra- ploid and some descriptions such as; germination speed, flowers number, leaves, scabbard number, leaf width, root diameter, diameter of base stem and sub- stems and sub- branch of diploid plants, were the best ones. Some quantities such as wet and dry weight between plants in every ploidy level (tetra- ploid and diploid) didn't show a meaningful difference by 5% possibility.

**key words:** Fenugreek, Colchicine, Poly ploidy, Cytogenetic traits, Morphological traits



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