

Colchicine induced variability in *Zanthoxylum armatum* Rox. (Rutaceae)

RAMDAS, G.K. DHINGRA AND M.A. RATHER

Received : February, 2011; Accepted : April, 2011

SUMMARY

The genus *Zanthoxylum* is a member of family Rutaceae. The family Rutaceae embraces 1,800 species in 150 genera. It is found as forest undergrowth. During the present investigation, *Z. armatum* was explored for the colchicine induced variable characteristics. For the colchiploid plant study, seed samples were soaked in distilled water in a beaker for 10-15 minutes then were treated with various concentrations (1.0 M, 0.50 M and 0.05 M) of colchicine solution for half to two hours in small vials and then were kept in a refrigerator. After the treatment, seeds were washed thoroughly with distilled water for 4-5 times and then were planted in polybags having mixture of soil, sand and cocopit (2: 2: 1 V/V/V). The analysis was carried out for control and treated plants using parameters viz., total length of the plants, length of unbranched stem, length of primary, secondary and tertiary branches, diameters of unbranched stem, stem girth, number of leaflets, length and breadth of leaflets, diameter of seed and seeds per panicle etc. Studies on developmental and morphological characters of control and treated plants showed that the colchiploids exhibited delayed flower and leaf emergence. The leaves were thicker, shorter and darker green in colour with reduction in number of leaves per plant. There was reduction in the number of flower per plant. Floral variants observed included smaller sized flowers, flowers with deep pigmentation and orange red pigmented anthers. Total mean length of control and treated plants ranged from 160.45 – 181.00 and 118.50 -1.48.50, respectively. Mean number of leaflets in control ranged from 3-13 while in colchicine treated plants mean number of leaflets ranged from 2-9, respectively. Length and breadth of leaflets in control ranged from 2.97 x 1.46 to 4.02 x 1.59 cm., while in treated plants it ranged from 1.47 x 0.83 to 2.49 x 1.30 cm. Diameter of seeds in treated plants were observed higher than to control plants.

Ramdas, Dhingra, G.K. and Rather, M.A. (2011). Colchicine induced variability in *Zanthoxylum armatum* Rox. (Rutaceae). *Internat. J. Plant Sci.*, **6** (2): 251-256.

Key words : Cocopit, Colchiploidy, Distilled water, Leaf emergence, Polybags, Vial tubes

The genus *Zanthoxylum* is distributed worldwide from tropical to temperate zones. There are over 200 species from small shrubs to large trees. It has some other synonyms as *Z. planispinum*, *Z. alatum subtrifoliolatum* (French.), etc. It is known as winged prickly ash, tejbal, tejphal, timroo timber or Nepali dhaniya. It is widely distributed throughout the warmer region of the world, extending into temperate region of Europe, Asia and Australia. About 50 species among 20 genera are reported from India. Out of which 9 species are classed as commercial timbers (Pearson and Brown, 1932). About 50 species of *Zanthoxylum* among 20 genera are reported

from India. The Uttarakhand Himalaya harbours 4 species of *Zanthoxylum*, namely *Z. armatum* DC. *Z. acanthopodium* DC. *Z. oxyphyllum* Edgew and *Z. budrunga*. The genus is represented by *Z. limonella* in the plains but the other species are restricted to montane and sub-montane regions. All the 8 species, namely *Z. ovalifolium*, n=18, 34; 2n=ca. 136; *Z. acanthopodium*, n=32; *Z. armatum*, n=33; *Z. nitidum*, n=34; *Z. scandens*, n=34; *Z. limonella*, n=34; *Z. oxyphyllum*, n=36; and *Z. tomentella* n=36 are cytologically investigated.

All the plant parts like seeds, bark, fruits, branches, thorns are used in different ailments (Gupta, 1945; Uphof, 1959; Gamble, 1972; Usher, 1974; Chopra *et al.*, 1986). During winter, a soup made from the dried fruit (locally known as hag) is consumed by the local people to keep them warm. A chutney (like a sauce), locally known as dunkcha, is also a popular food item. It is also used as a spice, and as pepper substitute (Gupta, 1945; Tanaka, 1976). The seed is ground into a powder and used as a condiment (Facciola, 1990). The fruit is rather small but is produced in clusters which make harvesting easy. Each fruit contains a single seed and young leaves are used as

Correspondence to:

RAMDAS, Department of Botany, R.C.U. Gov.t P.G. College, UTTARKASHI (UTTARAKHAND) INDIA
Email : ram84.uki@gmail.com

Authors' affiliations:

G.K. DHINGRA, Department of Botany, R.C.U. Gov.t P.G. College, UTTARKASHI (UTTARAKHAND) INDIA

M.A. RATHER, Department of Chemistry, R.C.U. Gov.t P.G. College, UTTARKASHI (UTTARAKHAND) INDIA