

## Influence of an alkylating agent (EMS) on production of alkaloid contents in *Phyllanthus niruri*

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### SUMMARY

Seeds of *Phyllanthus niruri* were treated with various concentrations (0.0150%, 0.0301%, 0.0601%, 0.1205%, 0.241%, 0.482%) of EMS to record its effect on production of alkaloid from different plant parts (leaf, stem, root). Maximum content of alkaloid was observed in stem of plant developed from seeds treated with 0.0602% EMS (0.7800 mg/gdw) followed by root (0.7420 mg/gdw) and leaf (0.6270 mg/gdw). Alkaloid content was quite high in plant parts of plants raised from mutagen treated seeds when compared with that of control. Hence the effective concentration of EMS to increase the alkaloid content was 0.0602%.

Key words : Alkaloid, Concentration, Ethyl methane sulphonate, *Phyllanthus niruri*.

Mahna and Singh (1971) was studied effects of some alkylating on growth of some Solanaceous crop. Mutagen specificity and interaction of chemical, physical and environmental variability in Soybean observed by Jain (1972). Jain and Agarwal (1987) studied the effect of chemical mutagens (EMS, MMS, NaN<sub>3</sub>) on level of ascorbic acid and trigonelline in *Trigonella* species. Securinine type of alkaloid from *Phyllanthus niruri* has been extracted by Hanssarajani and Mulchandani (1990). Chauhan and Kumar (2003) studied effect of an alkylating agent on growth of Euphorbiaceous plant. Effect of various treatments on seed germination of *Cassia angustefolia* has been reported by Goswami and Reddy (2004). Firoz Mohammad (2004) has studied Phosphorus application to improve physiological parameters, growth and yield of mustard (*Brassica juncea* L.). Lots of work has been done to study the effect of chemical mutagen and growth hormones on Euphorbiaceous plants but so far no work has been reported as far as the effect of chemical mutagen on alkaloid content of *Phyllanthus niruri* is concerned. In the present study effect of ethyl methane sulphonate (EMS) on alkaloid content of *Phyllanthus niruri* has been carried out.

### MATERIALS AND METHODS

Presoaked seeds of *Phyllanthus niruri* were treated with different concentration of ethyl methane sulphonate (0.0150%, 0.0301%, 0.0602%, 0.1205%, 0.241%, and 0.482%). A control was run along, using distilled water. Treated seeds were sown in three replicates using 750 seeds per replicate. Plants were harvested after 120 days

and different parts (leaf, stem, root) after shade dried were subjected to extraction following the well established method. Dried alkaloid extract was weighed and used directly for thin layer chromatography. Purple-Red spot at R<sub>f</sub> 0.67 after 10% sulfuric acid spray was identified as Phyllanthin when compared with that of standard phyllanthin. Identified spot was eluted from 200 unsprayed plates was crystallized, weighed (mg/gdw) and was subjected for m.p. IR-spectral studied for confirmation.

### RESULTS AND DISCUSSION

Increase in alkaloid content was observed in stem of plants raised from seeds treated with 0.0602% EMS (0.7800 mg/gdw). Thereafter it decreased (0.2720 mg/gdw, 0.2388 mg/gdw and 0.1383 mg/gdw) in higher concentrations (0.1205% to 0.482%). However, lower concentrations (0.0301% and 0.0150%) showed almost same amount (.3740 mg/gdw and .3492 mg/gdw) of alkaloid. Whereas stem of control plant showed very less amount (0.0967 mg/gdw).

In roots, maximum alkaloid content was observed in plants raised from seeds treated with 0.0602% EMS and thereafter it decreased with increased concentrations, However higher concentration (0.241%) of EMS showed almost same amount to that of control (.2492 mg/gdw).

Alkaloid content in leaves increased with increased concentration and maximum content of alkaloid found in plants raised from seeds treated with 0.0602% of EMS (Table and Figure). This study indicates that EMS with different concentrations influence the alkaloid content plant parts in *Phyllanthus niruri* to considerable extent. Higher concentration of EMS has toxic effects as

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