

## Seed imbibed effect of sugarcane industrial effluent on germination percentage and seedling growth of millets (*Pennisetum typhoides* cv. ICTP-8203 and *Sorghum vulgare* cv. CSH-14)

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### SUMMARY

The effect of various concentration of sugarcane industrial effluent on seed germination and seedling growth of *Pennisetum typhoides* cv. ICTP-8203 and *Sorghum vulgare* cv. CSH-14 is presented. The results shows that there is significant increase and decrease in the lower and higher concentration of effluent. In the present findings lower doses of the effluent show promotory effects where as higher doses show inhibitory effects on seed germination and seedling growth.

**Key words :** Sugarcane industrial effluent ,Germination, Seedling growth, *Pennisetum typhoides*, *Sorghum vulgare*

Western U.P. is considered as “Bowl of sugar” and here sugarcane crop is known as “Cash crop”. Largest number of sugar mills are established in this region. One hand, this bring prosperity among farmers and on other hand, this creates drastic change in chemical and physical nature of air soil and water. The physico-chemical characteristics of sugar mill effluent, denoted the high magnitude of pollution load (Arindam kumar 1996) and suggested the study of toxic effect of effluent on the biological system. Hari *et al.* (1994) studied the combined effect of waste of distillery and sugar mill on seed germination, seedling growth and biomass of Okra *Abelmoschus esculentus* (L). Goel and Kulkarni (1994) studied the effect of sugar factory waste on germination of gram seed (*Cicer arietinum* L.) Kumar Rajesh (1995) noted the effect of sugar mill effluent on seed germination and seedling growth of *Cicer arietinum* cv. NP 58. To understand the effect of sugar mill effluent, seeds of *Pennisetum typhoides* cv. ICTP-8203 and *Sorghum vulgare* cv. CSH-14 were treated with different concentrations (from 10% to 100%) of sugarcane industrial effluent and such treatment was studied on seed germination and seedling growth.

### MATERIALS AND METHODS

The seeds of uniform size, shape, colour and weight of *Pennisetum typhoides* cv. ICTP-8203 and *Sorghum vulgare* cv. CSH-14 as far as possible were selected,

surface sterilized with 0.1% HgCl<sub>2</sub> solution, thoroughly washed with distilled water and kept in solutions of different concentrations (from 10% to 100%) of sugarcane industrial effluent separately for imbibition period. Seeds simultaneously kept in distilled water constituted the control. After requisite imbibition they were transferred to petridishes having distilled water moistened filter paper and kept for germination and subsequent seedling growth at 25± 3°C in dark.

Germination was assessed by radicle emergence (2-3 mm) and the per cent germination in each case was recorded. For dose response relationships, seedling growth was studied at a particular day (*i.e.* 5<sup>th</sup> day) of germination by dissecting the seedling into various parts and subjecting to measurement of their length, fresh weight and dry weight.

### RESULTS AND DISCUSSION

Table 1 and Fig. (1) and (1a), (1b) and (1c), shows that lower doses of effluent show promotion in germination while higher dose show inhibition in *Pennisetum typhoides* cv. ICTP-8203. Doses from 10% to 50% show promotory effects on seedling growth. Dose 20% show maximum promotion, because in this dose, length of radicle and coleoptile is 530% and 268 %, fresh wt. of radicle, coleoptile and residual cotyledon is 170%, 157% and 66% and dry wt. of radicle, coleoptile and residual cotyledon is 166%, 300% and 65% of control respectively. On the other hand doses from 60% to 100% show inhibitory effects. Dose 60% show maximum inhibition, because in this dose, length of radicle and coleoptile is 166% and 63%, fresh wt. of radicle, coleoptile and residual cotyledon is 135%, 61% and 93 % and dry wt. of radicle, coleoptile and residual cotyledon is 50%, 57% and 117% of control

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