Effect of neem leaf extract on growth characteristics and organic constituents of *Trigonella foenum-graceum* L.

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SUMMARY

Trigonella foenum – graceum, L. plant has been valued as a medicinal crop in many parts of the world. The ayurvedic pharmacopoeia has described many therapeutic uses to it. It has wide spread use as a therapeutic in chronic diseases. The leaves of the plant are commonly used as a vegetable in India. Morphological characteristics and biochemical investigations were conducted to study effects of neem leaf extract on *Trigonella*. Four per cent of leaf extract of neem was applied through foliar sprays. Growth characteristics such as root length, shoot length and root nodules increased at 0.8% concentration of leaf extract. There was significant increase in the organic constituents such as chlorophyll and proteins over control at 0.6 and 0.8 per cent concentration.

Methi *Trigonella foenum – graceum* L. is an important food crop as well as a quick cash crop all over India, especially in Maharashtra. The duration of crop varies from 25 to 40 days. It is grown for it's green leaves and young pods. The leaves are quite rich in protein (4.4 g), minerals (1.5 g), vitamin A (6450 IU) and vitamin C (54 mg) per 100 g of edible portion. Seeds are used in condiments. The whole plant is medicinally much important.

The use of neem leaves (*Azadirachta indica* Juss.) in pest control has been known since ancient time. It contains different chemicals which have insect repellant, insecticide, antifeedant, nematicide and antimicrobial properties. The chemical ingredients reported are azadirachtin, meliantrol and salanin.

Fuji *et al.* (2002) while taking the review of recent work in allelopathy explained that allelopathy now refers to any process involving secondary metabolites produced by plants, viruses, microorganisms and fungi that influences the growth and development of agricultural and biological systems. According to Bhat and Chauhan (2000) and Singh and Narsing Rao (2003) the chemicals present in the extract (aqueous or alcoholic) have stimulatory or inhibitory influence on seed germination, seedling growth, yield and physiology of subsequent crops.

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MATERIALS AND METHODS

Trigonella seeds were obtained from market. The earthen pots (20 x 30 x 40 cm) were used for growing the *Trigonella* seeds. The pots were filled with mixture containing garden soil and well decomposed compost (3:1). About 500 seeds of uniform size from cultivar were selected for the experiments. The seeds were surface sterilized with 0.1% $HgCl_2$, washed thoroughly 3-4 times in sterilized distilled water and then soaked in distilled water for 12 hours. 25 well imbibed seeds were sown in each earthen pot. The seedlings were grown under natural and uniform conditions.

For the preparation of extract freshly mature green leaves of neem are used. About 4 g leaflets of neem were uniformly homogenized in 100 ml of 80% ethanol and condensed on rotary evaporator to 10 ml at temperature below 60^0C to avoid evaporation of volatile compound and denaturation of bioactive chemicals. This was filtered and the filtrate was made to 100 ml with sterile distilled water. This extract was diluted with distilled water to required concentrations and used for foliar spraying.

The experimental plants of *Trigonella* grown in pots were treated with freshly prepared alcoholic extract at the concentrations of 0.2%, 0.4%, 0.6%, 0.8%, 1.0%. Spraying was usually done in the morning.

The controlled and treated seedlings were then used for further biochemical analysis. Chlorophylls were extracted and estimated by Arnon's (1949) method. The leaf proteins were estimated by using Lowry *et al.* (1951) method.