



“EFFECT OF LOWER CONCENTRATION AQUEOUS EXTRACTS OF *ENTEROMORPHA FLEXUSA* ON GERMINATION AND SEEDLING GROWTH OF TEST PLANT *RAPHANUS SATIVUS* VAR. JAPANI”

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ABSTRACT:

The micro flora of the soil plays significant role in soil economy. Soil flora is composed of bacteria, fungi and algae. Seaweed increases the water holding capacity soil & fertility of soil. Seaweeds have generated considerable interest in their application in agriculture and resource management. Some algal species may offer economical and ecologically sound alternative to chemical fertilizers for increasing agricultural productivity of crop plants.

To find out the effect of different concentration of fresh aqueous extract of an alga *Enteromorpha flexusa* extract of different concentration viz. 0.1, 0.01, 0.001, 0.0001 % increased the root growth, shoot growth, and total seedling growth of the test plant *Raphanus sativus* Var. Japani seedling growth promotion was co – related with extract concentration.

Key word: *Enteromorpha flexusa*, *Raphanus sativus*, agriculture, chemical fertilizers.

INTRODUCTION:

The beneficial effects of seaweeds are probably due to the alginates in seaweeds that improve soil structure, increase humus and water holding capacity of the soil. Seaweed extracts improve plant productivity, plant resistance to stress and pests, seed germination, absorption of nutrients from the soil, plant growth and development, yields and quality. Foliar spray of seaweed extracts contains many organic compounds known to affect plant growth (Jolivet *et al.*, 1991).

Use of organic biostimulant, a proprietary mixture of humic acids, marine algae extracts, thiamine and ascorbic acid increase the yield of *Phaseolus vulgaris* (Russo and Berlyn, 1992). Seaweed extracts contain biologically active compounds that work as soil conditioner (Blunden and Gordon, 1988).

Dried, fresh or liquid seaweed extracts are being used by horticulturists, gardeners, farmers and orchardists as fertilizers since they contain microelements and plant growth regulators like cytokinins. Seaweed extracts enhance seed germination, increase plant nutrient uptake and plant resistance against frost and fungal diseases. They are effective for ripening of fruits, increasing shelf life of produce and are an excellent soil conditioner (Zodape, 2008). (Misra 1960) recognized four zones viz. Supra- littoral zone, upper mid- littoral zones comprising *Ulva*, *Enteromorpha belt*, lower mid littoral belt and Infra littoral zone comprising *Champia – codium*, *chondria* belts.

Maine algae have been extensively studied for their various potentials. Though, an appreciable amount of work concerning ecology, limnology, hydrobiology, taxonomy,

water pollution and distribution of fresh water algae has been carried out by number of workers from various parts of India, few workers of Maharashtra have attempted the work on applied aspects of marine and fresh water algae. There is an increasing demand for seaweed products. Therefore, it is necessary to carry out the basic research on ecologically valuable algal species.

MATERIALS AND METHOD:

Enteromorpha flexusa L. was collected from Konkan Harnai, Kolthare and Alibag growing in shallow tide pools and rock pools, attached to stones or rocks and even on open rock surfaces. The collected material was washed with tap water. Make extract of *Enteromorpha flexusa* with different lower concentration viz. 0.1, 0.01, 0.001, 0.0001%, were prepared in distilled water.

Seeds of test plants *Raphanus sativus* var. Japoni procured from local market were surface sterilized with 0.1% mercuric chloride and washed thoroughly. 30 seeds were placed in three Petri dishes. Germinating paper was used 10 ml of aqueous extract *Enteromorpha flexusa* was added in every Petri plate. Seeds were allowed to germinate in the laboratory conditions. On 5th day measurements of seedling growth were taken. Percentage inhibition or stimulation over control and ANOVA variance was calculated.

% Inhibition or stimulation: $(C-T / C) \times 100$ (Where C: control, T: treatment).

REASULT AND DISCUSION:

Aqueous extract of *Enteromorpha flexuosa* (Wulfen) J. Agardh. promoted 'Rg' and 'TSg' of the test plant. var. 'Japoni' at 0.05% P-

value. There was an increase in root growth (Rg) minimally by 22.47% at 10^{-1} % and maximally by 55.61% at 10^{-4} % concentration over control. Shoot growth (Sg) was significantly promoted from 43.09% to 65.46% at 10^{-1} % to 10^{-4} % concentration respectively over control.

Total seedling growth (TSg) was promoted by 31.96% to 60.15% over control. Seed germination was inhibited by 3.85 to 11.53% at higher 10^{-1} to 10^{-3} % extract concentration and slightly promoted by 3.84% at lower 10^{-4} % extract concentration over control.

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Effect of lower concentration of aqueous extract *Enteromorpha flexusa* on germination and seedling growth of test crop plant *Raphanus sativus* var. Japani

Algal species	Growth Parameter	Control	Extract Concentration				P - Value
			0.1	0.01	0.001	0.0001	
<i>Enteromorpha flexusa</i>	Rg	3.56a	4.36b [22.47]	4.48c [25.84]	5.13d [44.1]	5.54e [55.61]	0.2238
	Sg	3.04a	4.35b [43.09]	4.77c [56.9]	4.87d [60.19]	5.03e [65.46]	0.04488
	TSg	6.6a	8.71b [31.96]	9.25c [40.15]	10d [51.51]	10.57e [60.15]	0.10188
	Ger %	86.67	76.67 -11.53	83.33 -3.85	80 -7.69	90 3.84	

Data presented are means of three replicates; values within the same row with different letters are significantly different at 0.05% P-level by Single factor ANOVA test followed by CD & Tukey's test.



