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Effect of marine waste on plant growth

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ABSTRACT

Marine waste contains minerals, proteins, carbohydrates and moisture which provides nutrient to the soil. In the present work crab and prawn waste were used as nutritional supplements to plants. It was found that crab shell waste increased the germination rate and growth of plants in terms of shoot and root length when compared to prawn waste.

Keywords: Biofertilizer, Prawn shell, crab shell, growth, root length, shoot length

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INTRODUCTION

Biofertilizers are low cost, eco-friendly fertilizers, which are being used to improve the quality and fertility of the soil [1,2]. They are used as an alternative for chemical fertilizers. They are basically made from microorganisms cultured in a laboratory and packed with a suitable carrier. They are beneficial to the soil, as they enrich the soil with micro-organisms that help in producing organic nutrients, which in turn help the soil to fight diseases. They therefore enrich the nutrient quality of the soil. They also restore the depleted nutrients of the soil. The main sources of bio-fertilizers are bacteria, fungi and cynobacteria (blue-green algae). They have become a major constituent for organic farming. Bio-fertilizers are being viewed as the future of fertilizers, as they have the ability to solve the problems of salinity of the soil, chemical-run offs from the fields. Application of compost/manure, thin stillage, distiller grain and fish food additives which can provide Nitrogen, Phosphorus and other important nutrients and minerals have been studied [2,3].

Waste management is an important aspect that has been widely studied in recent times. The Department of Science and Technology, Government of India, had called for proposals in the area of waste management by August 2015, as it has been the major reason for pollution especially in major cities. Many new methods have been adopted to treat industrial effluents [4-8]. However, solid waste management of especially medical waste, e-waste and nuclear waste is of major concern due to its drastic environmental effects. Organic waste can be put to a variety of uses. They have been used as a substrate for ethanol production [9-11], production of alternate energy, enzymes etc. Marine waste has been used for the extraction of chitin [12]. They have been used for the isolation of industrial enzymes also [13,14]. An attempt was made in studying the effect of germination of seeds using crab and prawn waste [15]. The present study was carried out to assess the growth of tomato and pea seedlings using marine waste.

MATERIALS AND METHODS

Collection of marine waste

The fish waste (prawns and crab shell) was collected from the fish market in Tambaram, Chennai. The meat was

separated from the shells by boiling in hot water, washed thoroughly, dried under sunlight for few days, powdered and then stored for future use.

Assessment of growth

Two types of seeds namely of tomato and pea was selected to carry out this experiment. The soil sample was collected from a local nursery. It contained an equal proportion of river soil, peat ant compost. The soil (150 g) was taken in small pots. To this 1g and 3 g of prawn powder and crab powder each was added separately. Similarly in another set of experiment a mixture of both crab and prawn was used (0.5 g prawn+2.5 g crab and 2.5 g prawn+0.5 g crab each). The shoot and root length was measured after 20 days.

RESULTS AND DISCUSSION

The growth parameters of plants were analyzed after they were supplied with prawn and crab waste. Neem powder (1 g) was added to the growth medium as a disinfectant and pesticide. The shoot and root length of pea and tomato plants treated with 1 g and 3 g of marine waste is shown in Tables 1 and 2. It was seen that the plants provided with crab grew faster than that of prawns.

Table 1 Effect of prawn waste on plant growth

S.NO	PARTICULARS	PRAWN					
		PEA			TOMATO		
		Control	1 g	3 g	Control	I g	3 g
1	Days of germination	2	3	2	5	6	15
2	Shoot Length (cm)	20	23	24	9.5	9	6
3	Root Length (cm)	11	6	7	1	0.5	1.3

The same experiment was again carried out in mixtures of prawn and crab in different ratio (Table 3). It was observed that the growth of plants was more when it was supplied with the mixture of 0.5 gm prawn and 2.5 gm crab. The results have emphasized that crab waste was more effective than prawn waste. It was also found that the germination and growth was subdued when more prawn waste was added [15].

Table 2 Effect of crab waste on plant growth

S.NO	PARTICULARS	CRAB					
		PEA			TOMATO		
		Control	1 g	3 g	Control	1 g	3 g
1	Days of germination	2	2	2	5	5	5
2	Shoot Length (cm)	20	22	25	9.5	10	11
3	Root Length (cm)	11	12	12	1	2	2

Table 3 Effect of prawn and crab mixture on plant growth

S.NO	PARTICULARS	PRAWN + CRAB (P+C)					
		PEA			TOMATO		
		Control	0.5 g P + 2.5 g C	2.5 g P + 0.5 g C	Control	0.5 g P + 2.5 g C	2.5 g P + 0.5 g C
1	Days of germination	2	2	3	5	5	15
2	Shoot Length (cm)	20	23	22	9.5	8.5	5
3	Root Length (cm)	11	12	12	1	2	1.3

CONCLUSION

The results have shown that crab waste was found to increase the germination time. This was in accordance with our previous work on the effect of marine waste on seed germination. More work has to be done to emphasize this statement. Currently we are working to study the effect of this waste on plant yield.

REFERENCES

[1] JK Vessey. *Plant Soil*, **2003**, 255, 571-586

[2] S Sukhdev Malhi; S Tarlok Sahota; et al. *Agricultural Sustainability*, **2013**, 77-101

[3] Preetmonider Lidder; Andrea Sonnino. *Advances in Genetics*, **2012**, 78: 1-167
[4] S Sharmila; L Jeyanthi Rebecca. *Research Journal of Pharmaceutical, Biological and Chemical Sciences*, **2012**, 4(1), 731-735
[5] S Sharmila; L Jeyanthi Rebecca; Merina Paul Das; Amit Jha; Arup Chakraborty; Anuranjan Kumar; Shailesh Anand. *Research Journal of Pharmaceutical, Biological and Chemical Sciences*, **2012**, 4(1), 670-674
[6] S Sharmila; L Jeyanthi Rebecca; Md Saduzzaman. *Journal of chemical and pharmaceutical Research*, **2013**, 5(2), 279-282.
[7] Md Saduzzaman; S Sharmila; L Jeyanthi Rebecca. *Journal of chemical and pharmaceutical Research*, **2013**, 5(2), 139-143
[8] Shashi Bala; S Sharmila; L Jeyanthi Rebecca. *Journal of chemical and pharmaceutical Research*, **2013**, 5(2): 144-147.
[9] S Anbuselvi; T Balamurugan. *Research journal of pharmaceutical, biological and chemical sciences*, **2013**, 4(2), 1755-1761
[10] S Muthumani; S Anbuselvi. *Research journal of pharmaceutical, biological and chemical sciences*, **2014**, 5(1), 188-192.
[11] S Anbuselvi; S Muthumani. *International Journal of chem. Tech*, **2014**, 6(4), 2374-2376.
[12] San- Lan-Wang; Tzu-Wen-Liang; et al *Carbohydrate Polymers*, **2011**, 84, 732-742
[13] L Jeyanthi Rebecca; S Sharmila; Merina Paul Das; T V Rishikesh; S Anandanarasimhan. *Journal of Chemical and Pharmaceutical Research*, **2012**, 4(10), 4542-4544.
[14] L Jeyanthi Rebecca; S Sharmila; Merina Paul Das; F Abraham Samuel. *Journal of Chemical and Pharmaceutical Research*, **2012**, 4(10), 4597-4600.
[15] L Jeyanthi Rebecca; S Anbuselvi; Prathiba Medok; Dola Sarkar. *Journal of chemical and pharmaceutical Research*, **2014**, 6(3), 192-195.