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Bio-fortification of Spirulina platensis to enhance the zinc status in plants of *Amaranthus gangeticus, Phaseolus aureus* and tomato

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The yield of agricultural crops depends on balanced nutrition. Micro elements distribution within plants influences the growth and development of plant. The trace element zinc is directly involved in hormone regulation and pigment synthesis in plants. The influence of various concentrations of zinc uptake by plants has been studied by many researchers. Zinc deficiency in food crops is wide spread and almost 50% of productive agricultural soils are deficient in zinc. About 50% of world human population is also zinc deficient. Several types of zinc fertilizers are available in the form of chelated zinc that is relatively mobile in the soil. The inorganic fertilizers like zinc oxides, sulphate and nitrates are widely used but are highly expensive. The low cost bio-fertilizers had shown good effects in increasing the zinc concentration in soil and crops. It has been suggested that the integrated use of organic and inorganic fertilizers hugely benefits the sustainable agriculture in the form of obtaining great yields and good quality grains. To enhance the zinc levels in the foods bio-fortification is the best approach. Enrichment of zinc in seeds of wheat, pulses and vegetables are helpful in meeting the zinc requirement. Bio-fortification is done through effective fertilization and selection of crops that have potential to efficient absorption of zinc from soil and ability to translocate the zinc to various plant parts. In the present study, the zinc levels were found to be increased after supplementation of Spirulina in different combinations and experimental setups. The NIN standard values of zinc in Amaranthus were 0.18 mg/100 g, which were increased after experiment in Spirulina + chemical fertilizer combination in 75: 25 proportions (6.9 mg/100 g). The NIN standard values for green gram are 3 mg/100 g which were increased further after the field experiment in Spirulina + organic manure treatment in 50: 50 proportions the value (5.4 mg/100 g). The NIN standard zinc values for tomato are 0.41 mg/100 g and this has been much increased after the field experiment in Spirulina two hours soaking method (0.52 mg/100 g). Further studies have to be carried out at molecular level to establish the zinc transport mechanism and bioavailability with the positive results from present study.

Biography

Layam Anitha has completed her PhD from Sri Padmavathi Mahila Women's University and has post graduate teaching and research experience. She has published several research articles in reputed journals in food science and nutrition areas. To her credit, she has a patent for product development. Currently, she is working as Associate Professor in Princess Noura University, Riyadh, KSA.

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