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BIOFORTIFICATION OF *AMARANTHUS GANGETICUS* USING *SPIRULINA PLATENSIS* AS MICROBIAL INOCULANT TO ENHANCE IRON LEVELS

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ABSTRACT

Biofortification of crops with cyanobacteria to enhance vitamins and minerals is a novel practice employed widely all over the world. *Spirulina platensis* is a unicellular blue green algae which is a nutrient dense (iron content 20.88mg/100g) and also used as microbial inoculant to enhance the nutrient status of the plant. In the present study, *Spirulina platensis* has been used as biofortifying agent to enhance the iron status in *Amaranthus gangeticus* plant. Iron is an important dietary component and the bioavailable iron form should be high to overcome iron deficiency anemia which is more prevalent in India (Pregnant women 87% and Children75%). Different methods like Soaking of seeds at different time intervals (1, 2, 3, 4, 5 hours and overnight), in different concentrations of *S.platensis* (5, 10, 15, 20, 25 and 30g) in 200ml of water and other methods like, *S.platensis* in combination with Biofertilizer, Vermicompost, Organic fertilizer and Chemical fertilizer, in different proportions (25:75, 50:50, 75:25) and Spray method (25, 50, 75 and 100g of *Spirulina* in 5Liters of water) were used.

Estimation of iron is carried out in the yield after the germination and growth of plant. The iron content after experimental treatments was found to be high in 2hours- 18.35mg/g for soaking the seeds in different time intervals, high in 30g-20.88mg/100g for the experimental set up of using different concentrations of *S.platensis*. In the set up of *S.platensis* in combination with biofertilizer, vermicompost, organic manure and chemical fertilizer, the iron content was recorded highest in 75:25 ratio (44.85mg/100g), 25:75ratio (43.99mg/100g), 50:50 ratio (4.2 mg/100g) and 50:50 ratio (15.5mg/100g) respectively. In the set up of *S.platensis* spray method, the iron content was recorded less when compared with control for all the variations. The results obtained were analyzed statistically and it was found that there is significant increase in iron levels of *Amaranthus* plants by using *S.platensis* as microbial inoculant when compared with control except Spray method.

KEYWORDS: *Spirulina platensis*, *Amaranthus gangeticus*, Iron, Dietary Supplements and Microbial Inoculants