## Effect of two types of bacterial growth promoters or and Azola compost on ornamental traits and growth factors of Zinnia

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Zinnia (Zinnia elegans Thumbelina) is an annual plant the family of Compositeae with a long flowering period so that it flowers late spring to mid-autumn. The effects of two growth stimulating bacteria and Azolla compost were studied on some ornamental traits and growth factors of zinnia in pot culture and greenhouse conditions at Lahijan Ornamental Flower Research Station, Lahijan, Iran. It was a factorial experiment based on a Randomized Complete Block Design with two factors including Azolla compost in six levels (0, 10, 20, 30, 40 and 50%) and growth stimulating bacteria in three levels (no bacteria, Azospirillum and Azotobacter) with three replications. The recorded traits included flower, shoot, root and leaf fresh weight and dry matter percentage, number of leaves, number of lateral branches, flower diameter, number of nodes and internode spacing, leaf chlorophyll, petal anthocyanin, leaf and substrate N, P, K contents, plant height, and stem diameter measured during and at end of the period. It was found that A1B1 treatment (10% Azolla and Azospirillum) significantly influenced leaf, stem, flower and root dry matter and the treatment with a higher percentage of compost, i.e. A5B1 (50% Azolla and Azospirillum), affected leaf, root, stem and flower fresh weights, significantly. The highest petal anthocyanin and shoot P content were observed in a3b1 (Azospirillum and 30% compost). The treatment of A5B1 (Azospirillum and 50% compost) was related to the highest leaf N and K contents, final height, and final stem diameter. Azospirillum accompanied with 40% compost had the highest impact on chlorophyll a content, and Azotobacter and Azospirillum with different compost rates significantly influenced chlorophyll b and total chlorophyll contents. The highest number of leaves was observed in A3B2 (30% Azolla compost and Azotobacter), and the number of lateral branches was significantly determined by various dosages of

compost and growth stimulating bacteria. The results revealed that growth stimulators (Azospirillum and Azotobacter) and Azolla compost had a significant effect on the studied traits, but the best treatments were found to be A5B1 (50% Azolla compost and Azospirilium), A3B1 (30% Azolla compost and Azospirillum) and A1B1 (10% Azolla compost and Azospirilium) which exerted the highest significant impact on different traits as compared to control.

Keywords : Zinnia, Azolla compost, Azotobacter, Azospirillum, growth factors

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