GROWTH AND YIELD OF ZUCCHINI TYPE SUMMER SQUASH (*CUCURBITA PEPO* L.) FERTILIZED BY COMBINED *AZOTOBACTER CHROOCOCUM* MUTANTS AND MINERAL N-FERTILIZATION

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Abstract

Summer squash (*Cucurbita pepo* L.) zucchini type cv "Eskandarany" grown in reclaimed sandy soil at the Horticulture Research Station, Arab El-Awammer, Assiut Governorate, Egypt was fertilized with nitrogen (0, 30, 60, 90 and 120 units / feddan) from ammonium nitrate (NH_4NO_3) after being either inoculated with one of *Azotobacter chroococum* strains (5 mutants and wild type strain) or without inoculation. *Azotobacter chroococum* mutant strains were induced by N- methyl N- nitro –N-nitrosogaunidine (NTG) treatment for suspension of the wild type cells in Microbial Genetics Lab. at the Department of Genetics, Minia University. Assessment of plant growth, development and yield indicated that application of 120N units/feddan gave the longest stem, greatest number of leaves, female flowers and immature fruits and early and total yield as compared to other sole N applications. Bio-fertilization using *Azotobacter* wild type strain resulted in a significant increment in stem length, number of female and male flowers, number and size of immature fruits and early and total yield under the conditions of N fertilizer application up to 120 units per feddan. Number of leaves and female flowers showed similar result all N fertilization levels but not 120 N units. In general, use of induced *Azotobacter* mutants resulted in an increase in all studied parameters comparing with the use of wild type strain. One of the *Azotobacter* mutant strains (denoted #7) seemed to be the best among the others for enhancing plant growth, development and yielding. This *Azotobacter* mutant strain combined with 90 mineral N units had 5.5% increase over the yield produced with sole 120 N units, thus saving one quarter of the mineral N amount added. It is concluded that combined utilization of *Azotobacter chroococum* and mineral N-fertilizer could enhance productivity of summer squash in new reclaimed sandy soil and mutation could be employed as potential approach to elevate the efficiency of this bacterium species as a bio-fertilizer.