



**University of Zabol
Graduate School
Faculty of Agriculture**

Department of Horticulture Science and Green space

The Thesis Submitted for th for the Degree of Master of Science

(in the Field of Horticultural Sciences)

Title:

**Effect of Foliar application of zinc and boron chemical fertilizers
and nanoclates on quantitative and qualitative traits of urban balango**

(*Lallemantia iberica*)

Supervisor:

Dr. Mehdi Aran

Advisers:

Dr. Seyed Ali Mohammad Modares

Dr. Dariush Ramadan

By:

Fatemeh Fayyaz

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Abstract:

The aim of this study was to investigate and compare the foliar nutrition of zinc and boron elements from chemical fertilizers and nanocoders on the quantitative and qualitative traits of urban medicinal plant in two separate experiments in a completely randomized design in two separate experiments. 1000, 2000 and 4000 mg per liter); Zinc nanofertilizer (500, 1000 and 1500 mg / l) and control treatment (foliar spraying) and the second experiment - foliar feeding treatment of boric acid with concentration (1000, 2000 and 3000 mg / l); Boron nanofertilizers (500, 1000 and 1500 mg / l) and control treatment (foliar spraying) were studied. The results of the first experiment showed that foliar feeding of both zinc sulfate and zinc nanofertilizer treatments led to a significant increase in traits. Maximum plant height (49 cm); Flowering stem (44/05 cm); Number of reproductive branches (13/85) Number of cycles in the main branch (26.36); Number of flower cycles per plant (50/26) and boron (0/186 ppm) at 1% probability level and inflorescence length (22/36 cm) and potassium (12/785 ppm) at 5% probability level It was treated with zinc sulfate, which had a higher yield than the treatment of nanofertilizers. Number of hazelnuts in the flower cycle (5/93); Number of hazelnuts per plant (255/83); Number of seeds per plant 772/1); Seed weight per plant (1/38 g); Grain yield per square meter (2/77 g); Grain yield per hectare (277/68 kg); Biological yield (2776/92); percentage of mucilage (6/7); Zinc element (241/05 ppm); Carbohydrates (154/212 ppm) at the level of 1% probability and nitrogen percentage (1/373); Phosphorus (5/771 ppm); 1000-seed weight (1/8 g) was significant at 5% probability level under the influence of zinc nanofertilizer. Harvest index, phenol and flavonoids were not significant in this experiment. The results of the first experiment showed that if zinc sulfate is consumed more than the plant needs, it has adverse effects on the quantitative and qualitative growth of the plant and leads to a decrease in yield in the plant. The second experiment showed the highest plant height (48/8 cm); Flowering stem (43/66 cm); Inflorescence length (23 cm); Number of cycles in the main branch (28/56); Number of flower cycles per plant (56/7); Phosphorus (12/6 ppm); Phenol (47/36 ppm) was related to boric acid treatment at 1% probability level. Number of reproductive branches (16/06); Number of hazelnuts in the flower cycle (5/9); Number of hazelnuts per plant (258/3); Number of seeds per plant (758/03); Seed weight per plant (1/36 g); Grain yield per square meter (2/729 g); Grain yield per hectare (272/95 kg); Biological function (2729/32); Percentage of mucilage (6/7); Potassium (12/41 ppm); Carbohydrates (185/7 ppm); Flavonoids (7/37 ppm) at 1% probability level and 1000-seed weight (1/8 g); Grain nitrogen (1/509); Zinc (204/5 ppm) and boron (0/185 g) were significant at the 5% probability level under the influence of boron nanofertilizer. In the second experiment, the harvest index was not significant. The general results of this experiment showed that nanofertilizers in lower concentrations than chemical fertilizers increased quantitative and qualitative traits in Balango plant. The results of both experiments showed that foliar feeding of the plant with nano-fertilizers, while reducing fertilizer consumption, helps to preserve the environment and takes the first steps towards modern agriculture.

Keywords: urban balango, nutrition, greenhouse, yield.