

P-123 (232)**EFFECT OF VARIOUS NITROGEN SOURCES ON YIELD, ANTIOXIDANT ACTIVITY AND ACTIVE SUBSTANCES OF SAFFRON (*CROCUS SATIVUS L.*)**

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To improve quality and quantity of active substances in saffron affected by different nitrogen sources, an experiment was performed in research farm of University of Zanjan in 2016-2017. The treatments were including Azotobarvar-1 bio-fertilizer (containing free-living nitrogen-fixing bacteria *Azotobacter vinelandii*) at two levels (0.1 and 0.2%), Nitrokara (containing symbiotic and free-living nitrogen-fixing bacteria *Azorhizobium caulinodan*) at two levels (1 and 2%), and combination of both at four levels (1% Nitrokara + 0.1% Azotobarvar-1, 1% Nitrokara + 0.2% Azotobarvar-1, 2% Nitrokara + 0.1% Azotobarvar-1, 2% Nitrokara + 0.2% Azotobarvar-1) compared to control (no treatment) and one nitrogen level (70 kg/ha) in the form of Urea. Based upon statistical analysis, the results showed that the most number of flowers (62.5 in m²), the performance of stigma (352.5 mg/m²) and the maximum length of stigma (2.98 cm) was observed in 0.2% Azotobarvar-1. The highest leaf nitrogen content (1.946 and 2.112%) and chlorophyll a (2.1598 and 2.0496 mg/100 gFW) obtained in 0.2% Azotobarvar-1 and 70 kg/ha of nitrogen, respectively. Also 0.1 and 0.2% Azotobarvar-1 and 2% Nitrokara treatments resulted in highest dry weight of stigma (6.23, 6.29 and 6.16 mg respectively). The highest antioxidant of stigmas (62.39%) and total phenol stigmas (1941 mg/100gDW) was determined in 1% Nitrokara and the highest amount of flavonoids (364 mg/gDW) was observed in 0.1% Azotobarvar-1. Highest crocin and safranal were obtained in 0.1% Azotobarvar and 1% Nitrokara treatments respectively. Collectively, the results showed that high levels of different nitrogen sources had positive impact on quantity of stigma such that the highest yield was obtained in 0.2% Azotobacter. However, lower levels of the fertilizers, i.e. 0.1% Azotobarvar and 1% Nitrokara improved the antioxidant activity as well as active substances of saffron.

Keywords: Antioxidant activity, Crocin, Flavonoid, Phenol, Safranal, Stigma