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RESEARCH ARTICLE

**EFFECT OF SPRAYING WITH IRON CHELATE IN GROWTH OF BLACK SEEDS
(*NIGELLA SATIVA L.*)**

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ABSTRACT

The Research was conducted in the vegetable's house of Biology Department - College of Education for Pure Sciences-University of Diyala during the season 2014-2015 on Black Seeds (*Nigella sativa L.*) in order to study the effect of spraying with iron chelate (Fe 6%) by five levels (0, 50, 100, 150, 200) mg/L in the growth of Black cumin. In some recipes of vegetative growth and Yield by using the global experience according to a complete randomized design C.R.D with three observations and the averages were compared by using Duncan test which is polynomial test at probability level of 0.05. The results indicated lack of significant differences between treatment at a concentration of 200 mg/L Fe in plant height, number of branches, chlorophyll concentration and Number of cans which was 61.000 cm, 13.000, 0.390 mg/g, 12.666 cans respectively, while the treatment 150 mg/L excelled in the recipes stem diameter, reaching 1.766 mm. There are no significant between treatment the 50 seed weight.

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INTRODUCTION

Medicinal plants have been a major source of the therapeutic agent since ancient times to cure human disease. The World Health Organization estimated that up to 80% of people still rely on herbal remedies for their health care (1, 2)

Nigella sativa L. is an annual flowering plant, native to south west Asia and cultivated in countries like middle eastern Mediterranean region, south Europe, Syria, Turkey, Saudi Arabia, Pakistan, India (9) in the religion of Islam the plant has been given great importance because of its number of uses. Depend on the religion it is one of the greatest healing plants. The Islamic prophet Muhammad once stated that the black seed can heal every disease except death. Ibn Sina, most famous for his volumes called (the Canon of Medicine) refers to *Nigella* as the seed that stimulates the body energy and helps recovery from fatigue and dispiritedness (8, 10) of all the plant organs it is only the seeds which attracted most of the researchers (6)

Black seeds are used as a carminative, aromatic, stimulant, diuretic, anthelmintic, galactagogue and diaphoretic, they are used as a condiment in curries. A tincture prepared from the seeds is useful in indigestion, loss of appetite, diarrhoea, dropsy, amenorrhoea, dysmenorrhoea and in the treatment of worms and skin eruption. Externally the oil is

used as an antiseptic, to arrest vomiting seeds are roasted and given internally (13) *Nigella sativa* seeds have been frequently used in folk medicine for treatment of various diseases (10) despite the importance of this plant from neighboring countries and other to meet the needs of the local market. And the elements necessary to increase and improve the quality quotient is the use of iron chelate where it enters in many physiological processes such as photosynthesis and outputs of chlorophyll and enzymatic reactions and then to influence the growth and development of plant (3) Preferably iron chelate spraying of the plant because the plant elements, food processing through the shoot fertilization increase the efficiency as well as reduce the amount of loss and the installation of the elements added (14).

MATERIALS AND METHODS

The experiment was conducted in the department of biology – college of education for pure science /Diyala University from September 2014 to April 2015 on *Nigella sativa L.* the study includes spraying the plants with Iron chelate at five concentrations (0, 50, 100, 150, 200) mg/L, as sprayed by two phases after month of germination, the second only to spray flowering.

Seeds are planted at 27/10/2014 in a plastic pot which is 25 in diameter which contains 12 Kg of an aerobically dried space

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of garden soil and petmos by propotion (1:3) and the irrigation made manually when the soil dried and hoeing to dismantle the soil and dispose of the jungles developing .

The flowing characteristics are studied: plant height (cm), number of branches (branch /plant) and plant diameter (mm), seed weight and measuring the content of leaves of chlorophyll. Chlorophyll was estimate by the following equation (9).
 $Chl.a = (12.7 (D663) - 2.69 (D645)) \times V/(1000 \times W)$.
 $Chl.b = (22.9 (D645) - 4.68 (D663)) \times V/(1000 \times W)$.

RESULTS AND DISCUSSION

Plant Height

Results in table (1) shows that where was significant differences in plant height with increased of Iron chelate concentration compared with control treatment, reaching the highest average of plant was 61 cm at the treatment of 200 mg /L of Irone chelate, while lowest average was 51 cm in control treatment that did not spray with iron chelate

Number of branches / plant

Results in Table (1) shows the existence of significant differences between treatments for the number of branches recipe during spraying with Iron chelate as the highest average in plants of 200 mg/L treatment reaching to 13.00 branch / plant, while the lowest rate in the number Of branches amounted to 6.66 branch/ plant at control treatment

Stem diameter

The result in table 1 for the stem diameter showed the existence of significant differences between the treatment ,reaching the highest average 2.570 mm when treated by 150 mg/L while lowest average 1.363 mm in control treatment.

Concentration of chlorophyll

Results in table 1 shows the existence of significant differences in chlorophyll concentration between treatments ,as the highest average for the content of chlorophyll in the treatment of 200mg/L reached to 0.390 mg/g , while the lower content of chlorophyll in the control treatment and the concentration of 50 mg/L amounted to 0.224 ,0.231 respectively.

Table 1Effect of sprayed of iron chelate in some recipes vegetative growth of *Nigella sativa L.*

Characteristics Concentration Fe mg/l	Plant height (cm)	Number of branches	Stem Diameter(mm)	concentration of chlorophyll mg/g
0	51.000b	6.666Cb	1.363b	0.224c
50	65.000ab	5.000C	2.150ab	0.231C
100	56.000ab	7.000Cb	2.346ab	0.292B
150	58.000a	8.666b	2.570a	0.309B
200	61.000a	13.000a	1.766a	0.390A

*the numbers that carry similar letters do not differ significantly among themselves according to the polynomial Duncantest at probability level of 5%

It can be seen from table (1)that the sprying with iron effect increased all recipes vegetative growth ,this due to the role of iron in the events vital catalysesin the formation of chlorophyll and cytochromes of greate importance in the process of the photosynthesis (7),this is consistent with what be found (4) of *Nigella sativa L.*

The Number of cans

The results in table (1) shown the occurs of asignificant increase when plants spraying with iron chelate , reaching the highest rate of the number of cans at the concentration of 200 mg / L amounting to 12.666, while reached to 6.677 in the control treatment.

Weight of 50 seeds

Results did not appear in Table 2 no significant differences between the treatment for the weight50 seed when spraying with iron chelate

Table 2 the effect of sprayed of iron chelate in some recipes holds of *Nigella sativa L.*

Characteristics Concentration Fe mg/l	Number of cans	Weight of 50 seeds
0	6.677 Cb	0.1440 a
50	5.667C	0.1393 a
100	7.000 Cb	0.1577 a
150	8.000 b	0.1623 a
200	12.666 a	0.4200 a

**the numbers that carry similar letters do not differ significantly among themselves according to the polynomial Duncantest at probability level of 5%

It can be seen from table (3) that the spraying of iron chelate transaction that may have affected morally in recipes winning this may be attributed to the spraying with appropriate element iron, it has led to increase vegetable hormones Auxin and jebbrline as well as increasing carbohydrates, chlorophyll, and cause to induce flowering and prevent the loss of flowers (11), as well as the role of iron in many enzymes Catalase, peroxidase, cytochromes oxidase and others that promote many of the physiological processes within the plant (5) which has increased the efficiency of photosynthesis process and increase the efficiency of their products and move them to different estuaries which reflected an increase of the number of cans.

CONCLUSIONS

The spraying with Ironchelate had a positive effect in recipes of vegetative growth and chlorophyll content and number of cans. There was no significant differences in weight of 50 seeds

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