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Effect of foliar application of micronutrients on vegetative growth and flowering in coriander (*Coriandrum sativum*) cv. Chhattisgarh Dhaniya-1

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Abstract
Present investigation "Studies on growth parameters and seed production of Coriander (*Corianderum sativum* L.) as influenced by foliar application of micronutrients under agro-climatic conditions of Chhattisgarh plains" was conducted during *Rabi* season 2022-23 at farm of KVK, (Raipur) under department of vegetable science, Indira Gandhi Krishi Vishwavidyalaya, Raipur, Chhattisgarh. The field experiment was conducted in randomized block design with three replications, consisting nine treatments of three micronutrients with different levels including of $ZnSO_4$ @ 0.4% and 0.5%, $CuSO_4$ @ 0.4% and 0.5%, $FeSO_4$ @ 0.4% and 0.5%, $ZnSO_4$ + $CuSO_4$ + $FeSO_4$ @ 0.4% and $ZnSO_4$ + $CuSO_4$ + $FeSO_4$ @ 0.5% as foliar application at pre flowering stage (40 DAS) and pre seed setting stage (60 DAS). The results showed that the application of $ZnSO_4$ + $CuSO_4$ + $FeSO_4$ @ 0.5% gave maximum plant height (78.5cm), primary branch (8.06) and secondary branch (12.56) plant^{-1} and days to 50% flowering was also maximum with $ZnSO_4$ + $CuSO_4$ + $FeSO_4$ @ 0.5%.

Keywords: Foliar application, micronutrients, vegetative growth, *Coriandrum sativum*

Introduction
Coriander (*Coriandrum sativum* L.) is an aromatic and herbaceous plant grown as annual herb in India during *rabi* season. Coriander belongs to the apiaceae family and has chromosome number 22. The main nutritional benefits of coriander leaves and seeds are their high vitamin A and C content. Fresh leaves have an 87.9% moisture content, 3.3 percent protein, 6.5 percent carbohydrates, 1.7 percent total ash, 0.4 percent calcium, 0.06 percent phosphorus, 0.01 percent iron, 60 mg/100 gm vitamin B2, 0.8 mg of niacin, 35 mg of vitamin C, and 10,460 international units (IU) of vitamin A per 100 grams of leaf. approximately 11g of starch, 20 g of fat, 11g of protein, and approximately 30 g of crude fiber are included in 100 g of coriander seed (Peter, 2004) [8].

The micronutrients *viz*., Zn, Cu and Fe plays a significant role in the production of superior quality and high yield of crops. Due to deficits of micronutrient the physiological and metabolic processes in plants may be severely disrupted. 50 percent soil around the world are deficient in Zinc (Korayem, 1993) [4], which is essential for the transformation of carbohydrates and synthesis of tryptophan. application of micronutrients had significant impact on growth and seed yield of coriander (Kalidasu *et al*, 2008) [2]. micronutrients are required in less amount for growth, development and production of crop but their deficiency severely damages the physiological and metabolic processes of the plant. zinc helps in building up the natural auxin (IAA) and enhance the cell division and cell enlargement. Verma (1997) [9]. All crops metabolic processes are powered by a number of enzymes and zinc is a crucial component of these enzymes. Plants deficient in zinc shows dramatically decreased production of carbohydrates, proteins and chlorophyll. In order to achieve optimal growth and maximum production zinc must be provided continuously. Foliar application of micronutrients play crucial role for producing crops with high yields and good quality (Amjad *et al*., 2014) [1].

Materials and Methods
Experiments were conducted during *Rabi* season 2022-23 at of KVK farm of Indira Gandhi Krishi Vishwavidyalaya, Raipur (C.G.). Raipur district is in the tropical zone of Chhattisgarh located at 21.25° N, latitude and 81.62° E longitude having an elevation of 289 m above the mean sea level.

A newly developed variety of coriander Chhattisgarh Dhaniya-1 was used as a planting material with 9 treatments of micronutrient. The experiment was laid out in Randomized Block Design. The experiment consisted of foliar application of micronutrients i.e., $ZnSO_4$ (0.4 and 0.5%), $CuSO_4$ (0.4 and 0.5%), $FeSO_4$ (0.4 and 0.5%), combination of $ZnSO_4$ + $CuSO_4$ + $FeSO_4$ @ 0.4% and combination of $ZnSO_4$ + $CuSO_4$ + $FeSO_4$ @ 0.5% as foliar application at 40 DAS and 60 DAS including control.

Observations: The Observations was recorded on the growth and yield parameters *i.e.* Plant height (cm), number of Primary branch and Secondary Branch and days to 50% flowering.

Table 1: Detail of different treatment combinations of micronutrients

T_1	**$ZnSO_4$ @ 0.4%**
T_2	$ZnSO_4$ @ 0.5%
T_3	$CuSO_4$ @ 0.4%
T_4	$CuSO_4$ @ 0.5%
T_5	$FeSO_4$ @ 0.4%
T_6	$FeSO_4$ @ 0.5%
T_7	$ZnSO_4$ + $CuSO_4$ + $FeSO_4$ @ 0.4%
T_8	$ZnSO_4$ + $CuSO_4$ + $FeSO_4$ @ 0.5%
T_9	Control

Results and Discussion

The result shows that the maximum plant height was recorded in $ZnSO_4$ + $CuSO_4$ + $FeSO_4$ @ 0.5% is 34.6 cm at 45 DAS, 58 cm at 65 DAS and 78.5 cm at harvest. which are significantly superior to control. Zinc promotes cell division and expansion by helping to build up the natural auxin (IAA). Copper plays important role in flowering, seed formation, production of peroxidase and certain oxidase. iron is essential for energy transmssion and chlorophyll biosynthesis. These outcomes are similar with the conclusions reached by Maurya *et al*. (1990) [7] Khattab *et al*. (1999) [3], Kalidasu *et al*. (2008) [2] and Mahorkar *et al.* (2008) [6].

The maximum number of primary branches of 5.7 at 45 DAS following by 7.06 at 65 DAS and 8.06 at harvest were recorded with the application of $ZnSO_4$ + $CuSO_4$ + $FeSO_4$ @ 0.5. number of secondary branches was found maximum of 5.23 at 45 DAS, 8.16 at 65 DAS and 15.56 at harvest with the application of $ZnSO_4$ + $CuSO_4$ + $FeSO_4$ @ 0.5%. These results are in conformity with the reports of Maurya *et al*. (1990) [7] Khattab *et al*. (1999) [3], kalidasu *et al*. (2008) [2] and Mahorkar *et al.* (2008) [6].

The highest days taken for 50% flowering (58.73) were found with the application of $ZnSO_4$ @ 0.4%. Though

Addition of nutrients like iron, copper and zinc delayed the flower's initiation but other yield-enhancing characteristics improve in the later stages. This is simply explained by the availability of balanced nutrition enhanced the life of the plants and helped them to grow to their full potential in both vegetative and reproductive stages. Similar results were reported by Lal *et al*. (2014) [5] where the maximum days to initiation and 50% flowering (58.73).were found in plot treated with $ZnSO_4$ @ 0.4%

Table 2: Effect of Foliar application of micronutrients Plant height, Primary branches, Secondary branches and days to 50% flowering

Treatment	Plant height (cm)			Primary branches			Secondary branches			Days to 50% flowering
	45 DAS"	65 DAS"	"At harvest"	45 DAS	65 DAS	At harvest	45 DAS	65 DAS	At harvest	
T_1	30.23	50.90	64.20	4.03	5.10	5.76	4.10	6.96	10.40	58.73
T_2	30.83	53.26	66.70	4.20	5.30	5.96	4.76	7.56	10.50	55.36
T_3	30.86	50.76	64.96	3.96	5.60	6.26	4.33	7.10	10.30	57.23
T_4	32.26	52.80	74.70	4.23	5.76	6.43	4.40	7.33	10.50	54.96
T_5	32.10	54.56	71.70	5.20	5.71	6.45	4.63	7.53	11.06	55.10
T_6	34.13	56.73	77.00	5.63	6.36	7.03	4.93	7.96	11.10	54.8
T_7	33.70	56.33	75.40	5.43	6.66	7.66	5.03	8.10	11.80	55.26
T_8	34.60	58.00	78.50	5.70	7.06	8.06	5.23	8.16	12.56	57.26
T_9	29.16	48.10	64.00	4.01	4.06	4.73	3.86	7.03	10.23	51.26
SE(m)	0.38	0.57	0.93	0.14	0.20	0.27	0.22	0.23	0.35	0.44
C.D	1.16	1.72	2.83	0.44	0.63	0.83	0.66	0.70	1.06	1.33

Conclusion

The result from the experiment reveals that the growth and flowering of coriander were significantly influenced by foliar application of micronutrients. The combination of $ZnSO_4$ + $CuSO_4$ + $FeSO_4$ @ 0.5% recorded maximum which were closely followed by $ZnSO_4$ + $CuSO_4$ + $FeSO_4$ @ 0.4%.

Reference

1. Amjad Z, Koutsoukos PG. Evaluation of maleic acid based polymers as scale inhibitors and dispersants for industrial water applications. Desalination. 2014 Feb 17;335(1):55-63.
2. Kalidasu G, Sarada C, Reddy YT. Influence of micronutrients on growth and yield of coriander (*Coriandrum sativum*) in rain fed vertisols. J Spi. and Aro. Cro. 2008;17(2):187-189.
3. Khattab ME, Omar EA. Influence of excessive fertilization with micro-nutrients on growth, yield, essential oil and micro-elements of some apiaceae plants. Egyptian Journal of Horticulture (Egypt); c1999.
4. Korayem AM. Effect of zinc fertilization on rice plants and on the population of the rice-root nematode. Hirschmanniella oryzae. Anzeiger Fuer Schaedlingskunde Pflanzenschutz Umweltschutz. 1993;66(1):18-21.
5. Lal G, Mehta RS, Maheria SP, Sharma Y. Influence of sulphur and zinc on growth and yield of coriander (*Coriandrum sativum* L.); c2014.
6. Mahorkar VK, Meena HR, Jadhao BJ, Panchbhai DM, Dod VN, Peshattiwar PD. Effect of micronutrients and humic acid on growth and leaf yield of fenugreek. Plant Archives. 2008;8(1):303-306.
7. Maurya KR. Effect of micronutrients on yield and essential oil content of coriander (*Coriandrum sativum* Linn.). Indian Perfumer. 1990;34(4):263-265.
8. Peter BJ, Kent HM, Mills IG, Vallis Y, Butler PJ, Evans

PR, *et al*. BAR domains as sensors of membrane curvature: the amphiphysin BAR structure. Science. 2004 Jan 23;303(5657):495-9.
9. Verma YK. Effect of crop geometry and zinc sulphat on growth, yield and quality of coriander (*Coriandrum sativum* L.) (Doctoral dissertation, M. Sc. Thesis, Rajasthan Agriculture University, Bikaner); c1997.