

EFFECT OF SOME MICRO ELEMENTS ON DAMSIS PLANT.

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Abstract

The present investigation was conducted in Faculty of Agric. Ain Shams Univ. In Shubra EL- Khama Kaluabia Governorate Egypt, to study three concentrations 0, 100 and 150 ppm manganese chloride and 0, 50 and 100 ppm Fe EDTA as foliar spray on *Ambrosia maritime* L plant during the two successive season 1997 and 1998. The results showed a significant increase in plant height, number of branches, fresh and dry weight per plant and per plot as well as ambrosin and demisin in mg/100g leaves by foliar spray of high levels 150 ppm manganese and 100 ppm Fe in the two season.

Key word : Manganese chloride, Fe EDTA, Foliar spray, Damsis *Ambrosia maritime* L.

INTRODUCTION

Ambrosia maritime L (Damsis). Fam. Asteraceae (compositae), is a perennial herbaceous plant, Turckholm (1974), declared that it is richly branched, gray herb with finely dissected fragrant leaves.

The plant is widely distributed throughout the Mediterranean region. In Egypt the plant is a wild herb growing on the banks of canals and the river as a common weed.

The leaf is simple, alternate, stipulate, petiolate, hairy, pinnatisect divided into 3-7 parts with coarsely serrately loaded margin with acute apex.

The stem is green, hairy, cylindrical monopodially bunched and measures 30-90 cm up to one meter. It flowers from April to May and fruits in July.

The wild plant is not sufficient for continuous supply. Damsis is used in Egyptian folklore medicine as a remedy of rheumatic pains, decoction of plant for asthma, bilharzias diabetes and to expel kidney stones. Flowering, branch stimulant stomach, pain expel renal stones, Amin (1990). When the plants grown near the banks of canals snails

escape far from these plants and even some dead snails were found, Sherif *et al.* (1962). The plant was proved to show a molluscicidal activity for the control of bilharzias and has effect on miracidia and cercariae of chistosoma, Sherif and El Sawy (1977). The active ingredients of this plant were ambrosin and damsin shown to be toxic to the snails representing the intermediate host of schistosomiasis and facioliiasis found in canals Picmari *et al.* (1986).

The roles of manganese in plants are undoubtedly, of a primary or accessory catalyst, Mn element probably plays a direct part in oxidation—reduction phenomenon, especially in relation to iron compounds. Manganese plays the role of such as oxidizing agent, and is also an activator of some enzyme systems including certain dehydrogenises and carboxylases. Some of the same enzymes activated by magnesium are also activated by manganese and less commonly by certain other metabolic actions. As for the physiological effect of manganese "Mn

It was stated that Mn is considered as an essential mineral nutrient which activates many enzymes in plant and can substitute for Mn to activate phosphate transferring enzymes.

Iron is a necessary element for plant nutrition in soil, it is most abundant either as components of various minerals or in the amphoteric oxides and hydroxides, Ambergar(1974). The absorption of iron is influenced by some factors as phosphorus and P/Fe ratio.

The aim of this research was to study the effect of Mn and Fe as foliar spray on growth yield and active ingredients of damsis plant.

MATERIALS AND METHODS

This study was Camied out in the Experimental Farm of the Faculty of Agri., An shams univ., at Shoubra El-Khema Kaluabia Governorate during two successive' seasons 1997 and 1998.

The seeds were obtained from the farm of medicinal and aromatic, plant at Dokki. Seeds were sown in the nursery bed on 10th February in the two seasons after 45 days and when the seedlings reached 15 cm. It was transplanted, on ridge 60 cm apart.

The distance between hills was 25 cm. each plot contained 6 ridges, its length was 4m the area of every plot was 14.4 m².The application of micro elements ,were used as

foliar spray with three concentrations 0, 100 and 150 ppm manganese chloride and 0,50 and 100 ppm Fe EDTA. (Sequestrene Fe) the treatments which were distributed in the experiment was completely randomized design with three replicates. The plants were sprayed with different elements concentrations twice, the first was one month, after transplanting and the second after 15 days from the first one, these treatments were replicated after the first mowing of plants. The plants were harvested two times, first on 15th June and second on 15th November in the two seasons. The following data were recorded: plant height, branches number per plant, fresh and dry weight per plant and per plot, dabsin and ambrosin mg/100g.hesl

Ambrosin and dabsin contents were determined according to the methods described by Amin (1990). The data were statistically analyzed according to Snedecor and Cochran (1972).

RESULTS AND DISCUSSION

A. Effect of manganese chloride as foliar spray on vegetative growth of Dabsin plant

A-1 Plant height

The highest dabsin plant obtained, when plants were foliar sprayed by manganese chloride in the two seasons as shown in Tables (1 and 2) in the two mowings. The difference between treatments 0 and "100 ppm Mn" was significant in the two seasons. The obtained results are in agreement with those recorded by Makarim and Bishr (1988) who found that application of Mn on *Matricaria chamomilla* plants, gave the tallest plants than untreated plants and Naguib *et al.* (1998) on dill plants.

A-2 Number of branches per plant

Data listed in Tables (1 and 2) showed that there was a significant increase in number of branches per plant in the two mowings on the first season where plants treated with 150 ppm Mn compared with untreated plant while in the second season insignificant. These results are in agreement with those recorded by Makarim and Bishr (1988) on chamomill and Morsy (1993) on mustard plants.

A-3 Fresh and dry weight per plant and per plot

The present data listed in Tables (1 and 2) showed that there was a significant increase in fresh and dry weights per plant and per plot in the first and second mowings and in the two seasons by increasing manganese chloride concentrations, these results were in agreement with those obtained by Makarin and Bishr (1988) on chamomill and Naguib *et al* (1998) on dill plant.

The increase in the plant height , the fresh and dry weights and the higher number of branches of the plant may be due to the effect of manganese on the activity of the plant enzymes.

A-4 Effect of manganese chloride foliar spray on chemical contents of Damsis plant

Data listed in Tables (1 and 2) showed that there was an increase in the quantity of damsins and ambrosin in damsis dry matter in the first and second mowings in the two seasons, in the plants treated with the two concentrations (100 and 150 ppm Mn) compared with the untreated plants.

Generally, the application of microelement Mn had directed the biosynthesis process towards formation of some hydrocarbons as well as some oxygenates compounds, Azza and Laila (2001).

B- Effect of Fe EDTA as foliar spray on vegetative growth of Damsis plant**B-1 Plant height**

The height of damsis was highest when plants were foliar sprayed with Fe EDTA "50 and 100 ppm" compared with untreated plants. These results were significant in the two seasons as shown in Tables (3 and 4) in the two mowings. Many investigators reported that, iron application have a positive effect on plant height. For example, Makarim and Bishr (1988) on *Matricaria chamailia* plants, Helal and Khalil (1997) on cathranthum plants, Soliman (1997) on black cumin plants and Naguib, *et al.* (1998) on dill plants.

B-2 Number of branches per Plant

Data in Tables (3 and 4) indicated that plants which were foliar sprayed with Fe EDTA gave higher number of branches compared with those produced by untreated plants. Fe EDTA 50 and 100 ppm concentrations significantly increased number of

branches compared with untreated plants. These results are in agreement with those recorded by Morsy (1993) on white mustard, Helal and Khalil (1997) on *Cathranthum* and Naguib *et al* (1998) on dill plants.

B-3: Fresh and dry Weights per plant and per plot:

Data illustrated in Tables (3 and 4) indicate that there was a significant increase in fresh and dry weights per plant and per plot by using Fe EDTA as foliar spray on the plants compared with the control treatment in the two seasons and two mowings.

These results may be due to the effect of iron as co-enzyme to increase vegetative growth.

The obtained results are in agreement with those recorded by Makarim and Bishr (1988), on chamomile, Morsy (1993) on white mustard plants and Naguib *et al.* (1998) on dill plants.

B-4 Effect of Fe EDTA as foliar spray oil chemical contents of demsis plants

Data listed in Tables (3 and 4) showed that there were an increase in demsin and ambrosin quantity (mg/100g) in damsis herb dry matter in the first and second mowings and in the two seasons with the plants treated with the two concentrations (50 and 100 ppm Fe EDTA) compared with the untreated plants.

Generally, the application of microelement mixture (Fe and Mn) was reported to affect the quality and quantity of many essential oils, El-Ghadban (1994) on spearmint and Gamal El-Din *et al* , 1997 on lemon grass. At the same time Tarraf *et al.* (1991) obtained positive effects on the quality of lemon grass oil due to the foliar application of microelement mixture (Fe, Mn and Zn).

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Table 1. Effect of manganese chloride as foliar spray on Damsis plant in the first mowing during the two seasons 1997 and 1998.

Manganese Chloride	First Season						Second Season									
	Plant Height cm.	Branch no.	Fresh weight			Dry weight			Plant Height cm.	Branch no.	Fresh weight			Dry weight		
			/plant Gm.	/plot Kg.	/plant Gm.	/plot Kg.	/plant Gm.	/plot Kg.			/plant Gm.	/plot Kg.	/plant Gm.	/plot Kg.	/plant Gm.	/plot Kg.
Zero	70.33	13.00	95.00	3.14	24.03	0.793	885	80.00	10.33	114.38	3.77	28.05	0.955	900	950	950
100ppm	85.67	17.00	137.00	4.52	35.32	1.17	1040	85.33	12.00	187.67	6.19	47.32	1.56	1250	1700	1700
150ppm	89.00	18.00	157.00	5.48	40.42	1.33	1057	94.00	12.33	205.33	6.78	52.44	1.37	1457	1660	1660
Mean	81.67	16.00	129.67	4.28	33.16	1.09	993	86.44	11.55	169.1	5.58	42.90	1.42	1202.33	143667	143667
L.S.D. 0.05%	18.56	4.53	49.72	1.65	10.09	0.33	345	8.86	5.97	54.14	1.78	14.11	0.46	545	683	683

Table 2. Effect of manganese chloride as foliar spray on Damais plant in the second mowing during the two seasons 1997 and 1998.

Manganese Chloride	First Season						Second Season							
	Plant Height cm.	Branch no.	Fresh weight		Dry weight		Plant Height cm.	Branch no.	Fresh weight		Dry weight		Ambr osen Mg./ 100g	Damsen Mg./ 100g
			/plant Gm.	/plot Kg.	/plant Gm.	/plot Kg.			/plant Gm.	/plot Kg.	/plant Gm.	/plot Kg.		
Zero	82.76	15.67	175.00	5.78	55.36	1.83	850	12.00	135.00	4.46	43.20	1.14	900	917
100ppm	87.00	19.00	251.67	8.09	89.00	2.76	1633	14.33	258.00	8.52	83.53	2.76	1667	1300
150ppm	102.67	22.00	323.00	10.66	104.40	3.45	1533	15.33	347.00	11.45	111.97	3.40	1600	1567
Mean	90.78	18.89	249.89	8.18	82.92	2.68	1338.67	13.89	246.67	8.14	79.57	2.53	1389	1216.33
L.S.D. 0.05%	19.75	6.41	58.82	2.67	19.11	.67	637	3.77	60.37	1.99	27.70	.91	632	6.76

Table 3. Effect of Fe EDTA as foliar spray on Damsis plant in the first mowing during the two seasons 1997 and 1998.

Manganese Chloride	First Season						Second Season									
	Plant Height cm.	Branch no.	Fresh weight /plant Gm.	Dry weight /plot Kg.	Damsen Mg./ 100g	Ambr osen Mg./ 100g	Plant Height cm.	Branch no.	Fresh weight /plant Gm.	Dry weight /plot Kg.	Damsen Mg./ 100g	Ambr osen Mg./ 100g				
Zero	70.33	13.00	95.00	3.14	24.03	.79	917	833	80.00	10.33	114.67	3.76	28.95	0.96	900.00	884.00
100ppm	86.00	21.33	140.00	4.62	35.37	1.017	1233	1045	90.00	14.67	186.67	6.16	47.35	1.56	1200.00	1166.00
150ppm	87.33	18.33	136.33	4.49	34.13	1.63	1467	1157	90.00	11.33	163.33	5.39	78.17	1.73	1367.00	1267.00
Mean	81.22	17.55	123.78	4.08	31.18	1.11	1206.67	1011.67	86.67	154.89	154.89	5.10	51.49	1.42	1155.67	1105.67
L.S.D. 0.05%	16.63	6.23	17.11	0.56	3.93	.33	695	345	8.66	24.11	24.11	.83	8.19	0.17	652.00	404.00

Table (4): Effect of Fe EDTA as foliar spray on Damsons plant in the second mowing during the two seasons 1997 and 1998.

Manganese Chloride	First Season						Second Season								
	Plant Height cm.	Branch no.	Fresh weight		Dry weight		Ambr osen Mg./ 100g	Damsen Mg./ 100g	Plant Height cm.	Branch no.	Fresh weight		Dry weight		Ambr osen Mg./ 100g
			/plant Gm.	/plot Kg.	/plant Gm.	/plot Kg.					/plant Gm.	/plot Kg.	/plant Gm.	/plot Kg.	
Zero	82.67	15.67	175.00	5.78	55.36	1.38	883	933	84.33	12.00	135.00	4.46	43.20	1.43	950
100ppm	87.00	23.33	255.33	8.43	84.79	2.79	1333	1333	108.67	18.67	241.33	7.96	80.37	2.75	1567
150ppm	92.66	18.67	233.33	7.70	78.17	2.57	1200	1500	102.33	14.67	231.33	7.63	79.07	2.61	1700
Mean	87.44	19.22	221.22	7.03	72.77	2.40	1044.33	1255.33	98.44	15.11	202.55	6.68	67.5	2.26	1405.67
L.S.D. 0.05%	9.58	6.81	43.50	1.44	9.96	0.33	371	550	19.83	4.42	14.75	0.49	8.99	0.70	643

تأثير بعض العناصر الصغرى على الدمسيسة

مرتضى رضا خاطر^١ ، د/ اعتماد عثمان الغواص^١ ، د/ خيرى الجسمى^٢

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٢- كلية الزراعة - جامعة عين شمس.

أجريت تجربتين تفصيليتين في مزرعة كلية الزراعة - جامعة عين شمس - شبرا الخيمة بمحافظة القليوبية - القاهرة . وكانت الدراسة تأثير الرش على النباتات بمستويات مختلفة من كلوريد المنجنيز صفر ، ١٠٠، ١٥٠، ٢٠٠ ppm وذلك خلال موسم ١٩٩٧، ١٩٩٨ . وقد تم قطف النباتات مرتين في كل موسم من موسمي التجربة .
وقد أعطت المعاملات زيادة معنوية في طول النباتات وعدد الفروع والوزن الطازج والجاف للنبات والقطعة التجريبية وكذلك في كمية المادة الفعالة من الدمسين والأمبروزين. 100mg/ mg في المستويات المرتفعة من العنصرين الحديد المخلي وكلوريد المنجنيز وذلك في موسمي النمو وفي الحشتين .