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EFFECT OF HYDROSOL OF *IPOMEA CARNEA* LEAVES, FLOWERS AND *LANTANA CAMERA* LEAVES ON THE GROWTH OF WHEAT, MAIZE AND COTTON PLANT

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ABSTRACT: The Wheat, Maize and Cotton are the major crops in the agriculture field specially in Maharashtra, India. So for better productivity this study aims to prepare steam soluble aroma compounds called hydrosols. Hydrosols of different plant species (*Ipomea carnea* Leaves and Flowers, *Lantana Camera* Leaves) were prepared by steam distillation method. The purpose of this study was to determine the effect on the growth of Wheat, Maize and Cotton crops by using *Ipomea carnea* leaves and flowers and *Lantana camera* leaves. In this study the wheat, maize and cotton crops were germinated in different pots and continuous dosing of hydrosol was applied with fixed quantity and result was observed after 15-days.

INTRODUCTION: Hydrosol, floral water, distillate water or aromatic water are the coproducts or by products of steam distillation of plant material. They are quite complex mixture containing traces of the essential oils and other water soluble components¹. *Ipomea carnea* is popularly known as Besharam, Behaya in India and morning glory in English. It is large diffused shrub with milky juice. The flowers are pale rose pink.

The plant belongs to family *Convolvulaceae*. *Ipomea carnea* grows to height of 6 meters on terrestrial land but acquires a shorter height in aquatic habitat². *Ipomea carnea* is a medicinal plant and its leaves shows antibacterial activity against gram positive and gram negative bacteria³.

Lantana Camera (*Verbenaceae*) is one of the well known medicinal plant in traditional medicine⁴. In India *L. Camera* is popularly known as Haladi-Kunu in Marathi. It is commonly known as wild sage, is a flowering shrub native of tropical America. Different parts of the plant are used in folklore remedies and traditional systems of medicine for the treatment of various ailments. The extract of *L.camera* leaves exhibit antibacterial property⁵. Traditionally *L.camera* oil and extract are used in herbal medicine for the treatment of various human diseases such as itches, asthma, tetanus and rheumatism⁶.

Hydrosol derived from Latin word “Hydro” meaning “Water” and “sol” for solution. In the world of aromatherapy hydrosols are also known as hydrolates, hydrolats, floral water. Hydrolate uses “Hydro” for “water” and “late” from the French “lait” for “Milk”⁷.

Essential oils aromatic and volatile extracted from plant material using different methods. One of these method is steam distillation in which the hot produced from water breaks the structure of plant

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cells, releasing the volatile molecules from the cellulosic substrate. The steam charged with aromatic molecules is condensed through a serpentine condenser which is located in an enclosure which is cooled using a cold water steam. Finally the essential is obtained generally in upper phase and Hydrosol in lower phase⁸. The essential oils of *Ipomea carnea* plants, with ovicidal, larvicidal, repellent, deterrent, antifeedant and toxic effects against a wide range of insects have the potential for use in crop protection⁹.

Wheat, Maize and Cotton are the major crops in Maharashtra even in Buldana district. Day by day new technologies are developing for better productivity in agriculture. New fertilizers, new insecticides are emerging though the productivity of these crops is not satisfactory. This study was concerned about the growth of Wheat, maize and cotton plants by using hydrosols of different plant species.

METHODS AND MATERIAL:

The plant materials (*Ipomea Carnea leaves*, *Ipomea Carnea flowers*, *Lantana Camera leaves*) were collected from different places of Malkapur tahsil during February 2016, washed gently with de-ionized water to remove dust particles. These materials (250 gm) were grinded with minimum water. The hydrosol of these material was prepared by steam distillation for 1hr and 100ml hydrosol was collected at each time. (Total quantity

prepared-500ml). The prepared hydrosol were kept in refrigerator for further use.

The plants of Wheat, Maize and Cotton were germinated in plastic tray. In each tray the four rows of three plants were planted, first row was for water, second for 1ml hydrosol, third for 5ml hydrosol and fourth for 1ml hydrosol with soaked seed. Then hydrosol was applied to these plant for 15 days and growth was measured in cm.

RESULT AND DISCUSSION: Hydrosols of the selected plants were prepared by steam distillation and applied to Wheat, Maize and Cotton plants. These plant were grew up to 15-days. The result was observed after 15-days. The result of this study was observed that the effect of *Ipomea Carnea flowers* on the growth of Maize plant was found to be most efficient as compared to Wheat plant. The hydrosol of *Ipomea. Carnea leaves* showed very little effect on the growth of wheat and Maize plant as compared to water. The hydrosol of all species were shown very little effect on the growth of cotton plant.

This study suggest that as far as agriculture problems are concerned, we need to produce effective fertilizers. So the hydrosol of *Ipomea Carnea flowers* can be suited as fertilizer for Maize plants in limited doses.

The result shown in following tables,

TABLE 1: SHOWING THE GROWTH OF MAIZE PLANTS

Day	Average Height of 3-Maize plants in cm									
	Hydrosol dosing									
	Water	<i>I.Carnea Leaves</i>			<i>I.Carnea Flowers</i>			<i>L.Camera Leaves</i>		
1ml	1ml	5ml	Soak+ 1ml	1ml	5ml	Soak+1ml	1ml	5ml	Soak+ 1ml	
4	1.2	1.6	1.1	1.1	1.5	1.0	1.4	-	-	0.5
5	2.6	2.2	2.1	2.7	2.4	2.4	3.0	1.0	1.5	2.5
6	3.6	3.0	3.6	3.6	4.2	4.8	4.5	1.5	2.0	4.0
7	6.5	5.5	6.0	6.5	7.4	10.0	9.5	2.5	3.5	6.5
8	9.5	8.2	7.2	9.5	8.5	12.5	11.0	4.0	4.5	8.0
9	13.4	13.0	12.5	13.4	11.5	23.0	16.0	8.0	8.5	11.2
10	21.0	22.8	20.0	21.3	18.5	30.0	23.5	11.0	12.5	17.5
11	27.5	28.0	26.5	27.0	21.0	32.0	30.5	17.5	17.5	23.5
12	32.0	33.0	32.5	32.0	24.0	40.5	35.0	24.0	23.0	28.0
13	33.5	33.5	34.0	33.0	25.5	43.0	35.5	29.0	25.0	28.5
14	36.0	35.5	36.5	36.0	26.5	46.0	37.0	30.0	26.5	29.5
15	40.0	40.2	41.2	40.0	28.0	48.0	43.0	32.0	27.0	32.0

TABLE 2: SHOWING THE GROWTH OF WHEAT PLANTS.

Day	Average Height of 3-Wheat plants in cm										
	Hydrosol dosing										
	Water	<i>I.Carnea</i> Leaves			<i>I.Carnea</i> Flowers			<i>L.Camera</i> Leaves			
	1ml	1ml	5ml	Soak+1ml	1ml	5ml	Soak+ 1ml	1ml	5ml	Soak+ 1ml	
4	5.6	4.5	4.0	4.2	2.4	3.6	3.2	5.5	4.4	4.5	
5	7.8	7.0	6.8	5.5	4.0	4.8	6.0	7.5	6.5	7.4	
6	9.4	10.5	9.5	6.6	6.4	6.6	8.5	11.0	9.5	10.5	
7	13.4	11.4	11.0	8.2	8.6	9.8	10.5	13.0	11.0	12.0	
8	17.0	13.2	12.5	10.0	11.4	13.8	13.6	14.5	12.5	13.5	
9	19.4	14.0	13.0	12.0	13.5	16.5	16.5	15.5	15.0	14.0	
10	21.5	18.0	15.5	16.0	16.5	18.0	19.0	16.0	18.5	16.0	
11	22.0	20.0	19.5	19.5	17.5	19.8	19.5	16.5	19.0	19.0	
12	22.5	23.0	21.5	20.5	19.5	23.0	22.4	18.0	23.0	20.0	
13	23.0	24.5	22.0	21.5	21.0	23.5	24.0	18.5	26.0	23.0	
14	26.0	26.0	23.0	22.5	22.0	25.0	25.4	21.0	26.5	23.5	
15	27.0	28.0	25.5	25.0	24.5	27.0	26.0	23.5	29.0	26.0	

TABLE 3: SHOWING THE GROWTH OF COTTON PLANTS

Day	Average Height of 3-cotton plants in cm						
	Water	<i>Ipomea Carnea</i> leaves		<i>Ipomea Carnea</i> Flowers		<i>Lantana camera</i> leaves	
		Hydrosol	Hydrosol	Hydrosol	Hydrosol		
	5ml	1ml	1ml	1ml	1ml		
4	1.5	1.6	1.5	1.4			
5	1.8	1.8	1.9	1.8			
6	2.2	2.2	2.0	2.4			
7	2.9	2.8	2.8	2.8			
8	3.2	3.2	3.2	3.4			
9	4.6	4.6	4.6	4.8			
10	5.8	5.6	5.8	5.6			
11	6.6	6.8	6.6	6.2			
12	7.4	7.2	7.2	7.4			
13	8.1	8.2	8.2	8.4			
14	8.6	8.6	8.6	8.8			
15	9.0	9.1	9.2	9.0			

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