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INFLUENCE OF *MANTRA* ON *ASHWAGANDHA* (*WITHANIA SOMNIFERA L*) WITH SPECIAL REFERENCE TO MORPHOLOGICAL STRUCTURE -AN EXPERIMENTAL FIELD STUDY

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ABSTRACT

Background- The medicinal plants are influenced with many factors like sound, light, manure, surrounding atmosphere etc, among such influencing factors, sound is one of the important factors which seem to be get influenced the growth of the plants. In Indian tradition, especially Vedic culture, there are enormous works done and documented on *Mantras* which are supposed to be the energy base sounds. The whole *Aushadhi sukta* from *Rig Veda* (10.97.1-23) is devoted to the praise of the plants and gives it most importance. The experiment was planned to evaluate on such documented knowledge with the mentioned plan of study. Aim-To analyzes the influence of *Mantra* on growth of *Ashwagandha* (*Withania somnifera L*). Materials and Methods - Two groups (Experimental and Control) with 36 plants in each for study. The *Mantras* (*Aushadhi sukta*) from *Rig-Veda* (10.97.1-23) were selected and played through the Bluetooth Speaker with lower frequency in morning for 30 minutes up to a period of 6 months for experimental group. The samplings were collected at a particular interval of the period and analyzed for the pre-decided parameters. Result and Discussion-the effect of *Mantras* from (*Aushadhi sukta*) had a positive effect on the quality and quantity of the *Ashwagandha* plants in terms of their height, flowering leaves, flower-buds etc. Conclusion-The *Mantras* from *Aushadhi sukta* on *Ashwagandha* plant showed significant effect in Morphological characters. It may open the benchmark for further strategy of plant cultivation in view of increasing the bulk of needed part of plant and desired chemical entity.

Keywords *Ashwagandha, Aushadhi sukta, Mantra*

INTRODUCTION

Mantras are energy base sounds or *Shabdas.* The *Sanskrit* word *Mantra* is derived from the root *man-* "to think" and *tra-* meaning, tool literally means instrument of thought. In *Ayurved,* Plants also considered as a *Sendriya* (sentient) *dravya.*[1] it means that plants also have consciousness inside and understand comfort and discomfort. The chanting documented and practiced in Indian culture has scientific background and were meant for wellbeing of Nature. The study on the effect of religious chanting on plants, were conducted at various levels throughout the world including India, China and Nepal. Some of such researches on *Mantras* like *Gayatri Mantra, Agnihotra Mantra* and *Mahamrityunjaya Mantra* have been studied to observe the effect on plant growth / performance. Their studies showed that *Gayatri* and *Mahamrityunjaya Mantra* have a positive

effect on the growth of medicinal plants like *Tulsi* and Rose.[2]

In *Rig Veda*, the specific *Aushadhi sukta* (group of *Vedic Mantras*) [3] is mentioned in the 10th*Mandala* (book) which includes 23 *Mantras*. *Aushadhi sukta* is a hymn related with the medicinal plants. *Vedic* scholars believe that the healing power of the herbs is increased by chanting of this hymn. The whole *Aushadhi sukta* is devoted to the praise of the plants and it conceptualizes *Aushadhi* as a deity. In this study an attempt had been made to observe the effects of *Aushadhi sukta* (*Vedic Mantras*) on growth of *Ashwagandha* plant.

AIM

1. To analyze the influence of *Aushadhi sukta* (*Vedic Mantras*) on growth of *Ashwagandha.*

OBJECTIVES

1. To analyze the influence of *Aushadhi sukta* (*Vedic Mantras*) on morphological structure of *Ashwagandha*.

MATERIAL AND METHODS

The cultivation land was selected in Govt. Ayurved college campus, Vadodara. The plots were divided as Control group (Group-B) and Experimental group. (Group-A) The Experimental group was planned in *Charaka* garden and Control group was situated at *Dhanvantari* garden, Govt. Ayurved College, Vadodara. The authentic and have identical seeds of *Ashwagandha* were sourced from the Anand Agriculture University, Anand. The seeds of *Ashwagandha* had been sown in two plots by broad casting manner for germination in the month of October 2019. The 3 week old saplings were transplanted to the field in accord with the respective groupings and site. Each group had 36 plants for the study. The distance between the plants was 30 cmx30cm.

The Experimental group of plants had been subjected to sound recordings of *Mantras* (*Aushadhi sukta*) from *Rig-Veda* (10.97.1-23) chanted by Rigvedishri Prakash Pandeyji. The *Mantras* had been played on the Bluetooth Speaker with lower frequency. It had been played in morning at 8:00 AM to 8:30AM duration of 30 minutes up to period of 6 months i.e. October 2019 to April 2020.The control set of plants was not exposed to any such music.

Field study worksheets:

The readings of 36 plants from each group were noted in the field study sheet. The onset/span of reading was from 30 days old plantlets to 180 days old plants. The readings were taken at regular interval of 30 days, 60 days, 90 days, 120 days, 150 days and 180 days after transplantation. The mean value of all plant readings were taken into consideration. Morphological characters of *Ashwagandha* had been studied every month up to 6 months for both groups of plants as.

1. **Height of the plant** -Height of whole plant was measured with help of Graduated Scale (cm).
2. **Inter nodal length** - It was measured with help of graduated scale (cm).
3. **Numbers of Leaves** - Number of Leaves were manually counted.
4. **Number of Axillary buds** - Number of axillary buds were manually counted.
5. **Number of flower buds** - Number of flower buds was manually counted.
6. **Numbers of flowers** - Number of flowers was counted manually and opening flower bud was also taken into consideration.
7. **Number of fruits** - Number of fruits was counted manually including unripe fruits.

The root of *Ashwagandha* plant had been studied in the 3rdmonth (January, 2020) and 6th month (April-2020) for both groups of plants.

The Morphological parameters for the root were as following:

1. **Length of primary root** - It was measured with help of graduated scale.
2. **Maximum length of secondary root** – It was measured with help of graduated scale.

3. **Maximum diameter of primary root -** It was measured with help of vernier caliper.
4. **Minimum diameter of primary root -** It was measured with help of vernier caliper.
5. **Number of secondary roots -** Number of secondary roots were manually counted.
6. **Maximum diameter of secondary root -** It was measured with help of vernier caliper.
7. **Minimum diameter of secondary root -** It was measured with help of vernier caliper.

Among 36 plants, 18 plants were uprooted at interval of 90 days from each group and the rest of 18 plants were uprooted at 180 days from both group.

RESULT AND DISCUSSION

The Experimental and Control group were compared by applying **one way ANOVA test.**

The test was performed by using SigmaStat[4] 3.1 software.

Table 1: Shows mean data of Morphological character of *Ashwagandha* (*Withania somnifera L.*)

No	Morphological character of Withania somnifera L.	1st month		2nd month		3rd month		4th month		5th month		6th month	
		G-A	G-B	G-A	G-B	G-A	G-B	G-A	G-B	G-A	G-B	G-A	G-B
1.	Height	9.66	3.88	15.10	6.38	32.41	24.03	31.64	29.03	33.58	31.13	36.83	33.37
2.	Inter nodal length	1.68	0.89	1.41	1.0	2.67	1.57	1.68	1.37	1.74	1.70	1.58	1.55
3.	No. of Leaves	6.42	3.61	12.36	7.56	37.14	19.11	53.22	33.89	67.00	46.39	74.33	56.72
4.	No. of Axillary buds	0.0	0.0	3.06	0.0	10.3	2.56	11.6	8.28	15.3	9.89	16.6	16.1
5.	No. of Flower buds	0.0	0.0	3.58	0.0	4.44	0.00	17.2	6.44	21.3	10.3	18.4	18.8
6.	No. of Flowers	0.0	0.0	0.00	0.0	4.44	0.00	6.78	4.11	7.22	8.44	45.6	13.2
7.	No. of Fruits	0.0	0.0	0.00	0.0	45.6	13.2	15.5	7.78	30.6	13.7	47.6	22.4

Table 2: Shows P-Values of One way ANOVA test

No.	Morphological character of *Withania somnifera* L.	1st month	2nd month	3rd month	4th month	5th month	6th month

1.	Height	<0.001	<0.001	<0.001	0.183	0.195	0.027
2.	Inter nodal length	<0.001	<0.001	0.216	0.018	0.729	0.717
3.	No. of Leaves	<0.001	<0.001	<0.001	<0.001	<0.001	0.002
4.	No. of Axillary buds	1	<0.001	<0.001	0.015	0.009	0.808
5.	No. of Flower buds	1	0.002	<0.001	<0.001	0.001	0.934
6.	No. of Flowers	1	1	<0.001	0.034	0.416	<0.001
7.	No. of Fruits	1	1	<0.001	0.011	<0.001	<0.001

A level of P value <0.05 was considered as statistically significant, P < 0.01 and P < 0.001 were considered as highly significant.

Table- 3: Shows Mean Score of Morphological Characters of *Ashwagandha* (*Withania somnifera L.*) root

No.	Morphological Characters of Root		G-A	G-B	P	A> B
1.	Length of Primary root (cm)	3rdmt	18.92	7.86	<0.001	**HS**
		6thmt	16.47	10.03	<0.001	**HS**
2.	Maximum Diameter of Primary root(cm)	3rdmt	7.31	3.31	<0.001	**HS**
		6thmt	9.71	5.51	<0.001	**HS**
3.	Minimum Diameter of Primary root(cm)	3rdmt	1.03	0.77	0.059	NSD
		6thmt	1.65	0.91	<0.001	**HS**
4.	No of Secondary root	3rdmt	13.39	4.39	<0.001	**HS**
		6thmt	10.72	7.06	<0.001	**HS**
5.	Maximum Length of Secondary root (cm)	3rdmt	11.86	3.42	<0.001	**HS**
		6thmt	11.25	7.63	<0.001	**HS**
6.	Maximum Diameter of Secondary root(cm)	3rdmt	1.96	1.18	0.001	**S**
		6thmt	2.34	1.40	<0.001	**HS**
7.	Minimum Diameter of Secondary root(cm)	3rdmt	0.84	0.56	0.008	**S**
		6thmt	1.46	0.56	<0.001	**HS**

All these above observations shows that the plants of Group-A, which were influenced by the *Aushadhi sukta* (*Vedic* hymns) had a positive effects on its growth. The increased rate of growth in terms of height, more flowers, leaves, flower buds etc. suggests that the effect of *Mantras* (*Aushadhi sukta*) might be affecting the quality and quantity of the plants. The growth is a process, which

results in the increase in number and size of leaves and stems in a plant. It also results in strengthening of roots and production of blossom. Plant growth is a result of cell division that takes place within the cell. The nucleus, chloroplast, vacuoles and ribosome play an important role in cell division.

Sound is a wave and music is a specific kind of melodious sound. These waves capable of moving through elastic media are characterized by specific frequencies. Plants being living organisms get affected by sound wave frequencies as external stimuli. These frequencies of audible sound may stimulate the opening of leaf stomata and thus, facilitate the plant to absorb more dew, more light energy and help it to grow better. Audible sounds with certain frequencies are expected to enable better respiration and absorption of nutrients as well. The effect of *Mantras* on plants might be leads to a better yield of plants.[5]

CONCLUSION

In an experimental study the Morphological Structure after 6th month shows that the experimental group was influenced by the *Aushadhi sukta* and had a positive effect on its growth in terms of height, more flowers, leaves, flower buds, Root length, No of secondary roots etc. The chanting must have influenced the entire Bio-Physiological changes in the plant *Ashwagandha* (*Withania somnifera L.*)

FURTHER SCOPE OF THE STUDY

Kirlian photography and other modern technology can be used for accuracy in Results. Although effect of *Aushadhi sukta* in *Ashwagandha* was found positive in morphological parameters but its more effectiveness should be tested in clinical trials towards different indications.

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Plate: 1 Shows field study for Group-A &B (Oct to Dec-2020)

Fig:1.1 Group-A (Nov-2019)

Fig:1.2 Group-B (Nov-2019)

Fig:1. 3 Group-A (Dec-2019)

Fig:1.4 Group-B (Dec-2019)

Fig:1.5 Group-A (Jan-2020)

Fig:1.6 Group-B (Jan-2020)

Plate:2 Shows field study for Group-A &B (Jan-March 2020)

Fig:2.1 Group-A(Feb-2020)

Fig:2.2Group-A(Feb-2020)

Fig:2.3 Group-A(Feb-2020)

Fig:2.4Group-A(Feb-2020)

Fig:2.5 Group-A(Feb-2020)

Fig:2.5 Group-A(Feb-2020)

Plate: 3 Shows Max. Height and Weight of Root(G-A & G-B)(April-20)

Fig: 3.1 Length of Root(A)

Fig: 3.2 Length of Root(B)

Fig: 3.3 Weight of Root (A)

Fig: 3.4 Weight of Root (B)

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