



ORIGINAL RESEARCH PAPER

Ayurveda

EFFECT OF DIFFERENT MANTRAS ON PLANT GROWTH AND DEVELOPMENT: A REVIEW

KEY WORDS: Agnihotra, Gayatri, Mantra, Music, Seed germination

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ABSTRACT

Background: Musical sound play significant role in living biological process by its effect on number of seeds sprouted and treated with ultrasound to help in germination process. In Hindu Veda such as Gayatri and Agnihotra mantra have their effect on plant growth performance. **Aim And Objective:** To review the effect of different Mantras on plant growth and development. **Materials And Methods:** Relevant Ayurvedic literature, modern texts as well as the data bases search engines, journal, were used to searched and presented in an organized manner. **Result:** Musical vibrations stimulated seed germination of various plant species such as Okar, Zucchini, Vigna radiate, Oryza sativa, etc. Mahamrtyunjaya mantra had encouraging effects on emergence, radical length, fresh weight and dry weight of emerged seeds and also accelerated the rate of growth of fenugreek seeds. The positive effects of Agnihotra on yield of crops. Gayatri mantra chanting enhanced the performance of Guduchi. **Conclusion:** It can be concluded that music has a positive effect on the seed germination due to enhanced metabolic rate of growth and development.

INTRODUCTION

Plants are exposed to various environmental conditions in nature which effects, growth and development, can recognize to signal and respond according, to the perception. The signal may be in form of light, electromagnetic, physical, acoustic, chemical, etc¹. The audible sound falls into frequencies ranging from 20 Hz - 20,000 Hz (Hertz) that human can hear. The behavior of plants in responses to various stimuli studied by Sir Jagdish Chandra Bose. The ability to sense and respond to various physical stimuli, light, temperature and chemical signals detected by biological organisms².

Musical sound plays significant role in living biological process by its effect on number of seeds sprouted and treated with ultrasound to help in germination process. High frequency, sound ton increase the rate of sprouting of alyssum seeds. Musical or sound have significant effect on plant growth with positive effects.

In Vedic knowledge, the sound is the purest form of manifestation of energy and consciousness. Mantras are believed to be religious thought, prayer, sacred utterance or weapon of supernatural power. Mantra, classical musical sound and rhythmic rock music has increased the germination, radical length and growth of the plants³. In Hindu Veda such as Gayatri and Agnihotra mantra have their effect on plant growth performance⁴. Research showed, Gayatri mantra in certain plants has significant influence on growth of medicinal plant and also efficiency in curing disease⁵.

Report suggests that plants enjoying music and respond to various types of music and their wave length. Optimal growth and yield occur when the plant is exposed to wavelength. Musical vibrations stimulated seed germination of various plant species such as Okar, Zucchini, Vigna radiate, Oryza sativa, etc⁶. Hence, in the present article, an attempt has been planned to review the effect of different Mantras on plant growth and development.

AIMS AND OBJECTIVES

To review the effect of different Mantras on plant growth and development.

MATERIALS AND METHODS

Relevant Ayurvedic literature, modern texts as well as the data bases Google scholar, PubMed, AYUSH Research Portal, DHARA, studies available on Research Gate web-based search engines, journal, were used to searched and

presented in an organized manner.

RESULT

Studies reported that Buddhist chant in the field of paddy, helped to increase rice production by 15% and yield larger grains in Fujian provinces of East China⁷. Research also reported that the rhythmic chanting effect of pirith on growth and yield performance was higher in Oryza sativa⁸. Effect of low frequency audible sound waves i.e. 660 hz, 680 hz has a detrimental effect on germination, weight gain, stem elongation and growth of pea seeds. A medicinal plant i.e. seeds of Echinaceae angustifolia revealed improved germination rate to sound stimulation⁹. Report also suggests that 400Hz AND 106 dB revealed positive effect of paddy rice seeds on growth stimulation, but sound wave of greater frequency and intensity were dangerous¹⁰.

The contents of soluble sugar, protein and amylase activity in chrysanthemum increased significantly in response to sound waves. Sound stimulation of certain intensities (100 dB) and frequencies (1,000 Hz) could enhance metabolism of roots and growth in chrysanthemum and also enhance root development of paddy rice¹¹. The effect of mechanical vibration including frequency and amplitude promotes seed germination in Cucumis sativa and Oryza sativa using 50 Hz¹². Amplitude of vibration at 0.42 mm and frequencies above 70 Hz in Arabidopsis thaliana, when provided showed increased rate of seeds germination. Soft rhythmic audible frequencies (music) accelerate germination of seeds, growth and development of plants. Music played positively an important role on root elongation and mitotic division in onion root tips during germination. Sound-treated tomato revealed 13.2% increased yields compared with the control. Treatment with 5 kHz (92 dB) sound waves showed increased tiller growth and dry weight in wheat. The improvement of plant growth by sound treatment in many crops such as chrysanthemum, cucumber, cotton, rice, wheat etc. Hence, music sound helped to improve the quality of crops. Vegetable plants showed increased level of IAA content when exposed to musical acoustic level. Indian classical ragas had a positive effect on growth of plants such as wheat, spinach, horse gram, soya and paddy¹³.

The influence of sound and music on plants growth under optimal stimulation conditions (100 dD and 800 Hz) can enhance the growth of Chrysanthemum callus and can improve the assimilation of tissues or cells, physiological activity and accelerate the growth of plants. Studies revealed

that corn plants exposed to music had sprouted faster and stems were thick and tough. The internode elongation was maximum when exposed to Indian classical music and promotes the growth of plants. Exposure to sound treatment leads to increased photosynthetic ability in strawberry and rice. At 8 h after 250 or 500 Hz sound exposure in *Arabidopsis*, proteomics analysis showed photosynthesis was highly expressed¹⁴.

More number of seeds are germinated in mantra treated than control. The height, variation in leaf morphology, number of leaves and leaf color was also found to be best for mantra treated plants. Overall plant growth was better when exposed to mantra and also upgrade of physical and organic states of the plants because of exposed to music¹⁵.

Reported studies suggest that chanting of Vedic Omkara mantras play a significant role in growth and germination of green gram and *rosa chinensis*. Reported study revealed that chanting of mahamritunjaya mantra had positive impact on all the growth and yield parameters of both green gram and black gram. Furthermore, Mahamrtyunjaya mantra had encouraging effects on emergence, radical length, fresh weight and dry weight of emerged seeds and also accelerated the rate of growth of fenugreek seeds¹⁶.

The positive effects of Agnihotra on yield of crops have been studied and well documented. Emergence of new *Ocimum* plants in the pot from the seeds and appearance of new leaves from the stem after an exposure to agnihotra vapour and also in mango plant not only produced increased inflorescence, but also bore fruits in large number. In response to exposure to Agnihotra fumes, plants such as rose, croton and money plant had good production and proliferation of new leaves. Plants like rose, Chrysanthemum, *Ocimum*, etc. producing inflorescence, had stimulated production of buds, inflorescence and increased senescence (yellowing or patches on leaves leading to their falling)¹⁷.

According to reports, *Guduchi* (*Tinospora cordifolia*) plant appreciate music and are sensitive to both the genre of music and its wave length with the typical of the primary leaf dimensions, growth is at its best. Gayatri mantra chanting enhanced the performance of *Guduchi*. The sound field (100 dB and 800 Hz) promote growth, boost tissue or cell assimilation, improve their physiological activity and speed up the growth of *Guduchi* plant¹⁸. Sound stimulation has the potential to speed up the development of *Guduchi* plant roots and improve root metabolism. According to studies, *Guduchi* plant exposed to mantra chanting showed more quickly growth, had greener leaves and thicker and durable stems than other plants. Mantra chanting increased metabolic rate of *Guduchi* plants means has a favourable impact on growth and development¹⁹.

DISCUSSION

Musical or sound have positive effect on growth and development of plant. Indole Acetic Acid (IAA) is hormone that helps in plants growth and development found at an increased level in site species of vegetable plants when exposed to musical acoustic level. The levels of soluble proteins and soluble sugars increase in response to sound treatment²⁰. Playing an appropriate music tune found to stimulate the plants synthesis of its appropriate protein. The music sound vibrations as well as bio-electro-magnetic both had great impact on living biological systems and seed germination bioassay has sensitivity to enable detection of effects caused by various applied energetic conditions give different effect towards the rate of germination²¹. Increased height of the plants, number of leaves and overall healthier development of plants resulted to musical frequencies leads to faster absorption of nutrients from soil and better production of metabolites and growth at a better rate. Exposure of seedling and mature plant to classical music

elevates the levels of polyamines and increased the uptake of oxygen²².

The Omkara mantra being the original sound may have matched to the natural frequency of the seeds, hence, responsible for the significant role in growth of radicals in seeds and also more percentage of germination in the test. Mantra or wave theory which bring about extra ethereal vibration into motion which in its turn activates the static electrical points with the plant and help in growth²³.

Agnihotra vapour has specific action on brassinolide (a plant steroid involved in light induced expression of genes) on the shoot system of the plants²⁴. Microbiological studies revealed reduction in aeromicroflora in agnihotra atmosphere and which component of the vapour responsible for bacteriostatic action is yet to be explored and results point out this component is present in high rising vapour²⁵.

Exposure of seedling and mature plant to Gayatri mantra elevates the levels of polyamines and increased the uptake of oxygen which in turn accelerate growth and development of plants. The change in amplitude of manta causes change in pressure that makes the air molecules to move forth and back and create brushing action on the leaf and removes the film of moisture and helps in transpiration and results in overall development of plant⁵.

CONCLUSION

From the above review, it can be concluded that music has a positive effect on the seed germination due to enhanced metabolic rate of growth and development. Different forms of music and their various frequencies have encouraging role in seed growth parameters. The action mechanism of Agnihotra probably involves a complex root-shoot balance for its final effects on plants offers a holistic energy system for plant growth. Mantra boosts up the productivity of crop. Gayatri mantra an immense scope as a tool for breaking seed dormancy, growth and enhanced the yield. There is a wide scope to carry out further research to validate further.

Competing Interest

No competing interest exists.

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