

The Effect of Sound Therapy on the Growth of Holy Basil (*Ocimum Sanctum L*)

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Abstract

Music has long been known to produce remarkable results for humans and other animal species, and music therapy appears to be beneficial for plant life as well. Plants are able to sense and respond to vibrations and frequencies. They grow at certain frequencies; while other frequencies can stop their growth. Their distribution area varies according to the species. Many scientific researchers have shown that there is a considerable growth of plants due to music therapy. It is therefore a great success in the agricultural field.

Keywords: Music; Plant growth; Sound therapy

works and the clinical information in the back of this method and the way it facilitates in agricultural field.

How can plants hear

How could music affect plant growth if plants don't have ears? To explain how it may work, let us look at how we humans receive and hear sound. Sound is transmitted in the form of waves that travel through a medium, such as air or water. The waves cause the particles in this medium to vibrate. When you switch on your radio, the sound waves create vibrations in the air that cause your ear drum to vibrate. This pressure energy is converted into electrical energy for the brain to translate into what you understand as musical sounds. In a similar manner, the pressure from sound waves creates vibrations that could be picked up by plants. Plants would not "hear" the music; they would feel the vibrations of the sound wave.

Introduction

To the skeptic, the idea that plants have feelings or feel pain is ridiculous. Over the years, several studies have indicated that plants may respond to sound. However, the subject is still hotly debated in scientific circles. Below, I describe several of these studies and their findings in detail, along with the critics' views, so that you can weigh the evidence and draw your own conclusions. First, we'll discuss the studies that support the idea that music helps plants grow, and then we'll look at the opposition. Music is lengthily regarded to provide exceptional consequences for human beings and different animal species, song remedy seems to advantage for flora as well. There are specific evaluations approximately the impact of song on flowers, whether or not they experience or apprehend song. It has been referred to that human communication with inside the location of flowers might purpose improved and sturdy boom. Studies at the impact of song on plant boom commenced as early as 1968 with Dorothy Retallack. She in comparison the results of various sorts of song on plant boom. She turned into the primary to supply this concern *via* her book. The sound of Music and Plants [1]. Her observations had been that flora flourished whilst dealt with to classical song and withered whilst subjected to rock song. These findings opened a brand new global to song theory. Hence in this text an honest attempt has been made to understand and gather the preceding studies

Facts of music on plant growth

Music is sound and sound is a wave. Sound waves are produced by generation of vibrations, which are disturbances in the atmosphere. Sound waves need a medium to travel. They are emitted by a source and their frequency, or volume is determined by the frequency of the vibrating source, from the music of the radio to the guitar being played, all of these are mechanical pressure waves that are translated into sounds and on a higher level music [2]. Growth is a process which results in the increase of 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. Genes, Temperature, moisture, soil quality, mineral retention, water retention, and atmospheric changes are various factors that influence plant growth.

Different techniques and sounds that can influence plant growth

Classical music influence-The music played to plants should have a time limit about three hours. It helps to grow healthy and properly. An over dose of music can Protein and Molecular Music seriously destroy the plants. Which was developed by Joel

Sternheimer? This technique has Special melodies which regulate Biosynthesis. He studied and investigated the vibrational frequencies of amino acids. Ribosome plays an important role in the creation of proteins from a variety of 20 amino acids depending on the need of the cell and its organisms. While this process takes within the ribosomes, the amino acids turn comparatively slow, making it possible for the researchers to measure their individual frequencies as a note. When the frequencies are recognized, each of these notes can then be recorded into a sequence, or melody. Sternheimer successfully replicated the recorded melodies for the selected proteins. When these melodies were played, he noticed that it increases the manifestation of the corresponding protein and accelerated the growth of the plant. As a result there are greater yields, plants having higher nutrient levels and their shelf life is more [3].

Sonic Bloom Techniques-Developed by Dan Carlson found out that the melody of frequencies originating between 3000 to 5000 kHz helps the stomata of plants to open up quicker. This helps them to absorb nutrients more effectively. This technique helps to assist the organic farm, particularly with low water availability and poor soil condition [4]. Ultrasonic and Infrasound-When the frequency of sound extends beyond the human hearing limits it is known as ultrasound. With the development of electronic oscillators scientists were able to experiment with ultrasonic plant growth acceleration. Evidence support the theory that sound acts as a catalyst, activating the production of plant hormones called auxins that can stimulate plant growth [5].

Research updates

The effect of mantras the classic texts of Indian origin records the influence of Mantras on plants and animals. Ayurveda also recognize the importance of this realm of medicine. The author during his various experiments on plants found that these from the stage of seedling to the maturity are affected by certain types of sound waves, especially the mantras. In the study *ocimum santum* (Tulasi) were grown in the garden. Seeds of the herb were sown in polythene bags filled with black cotton soil and on germination the saplings were planted in different beds according to lunar phases or Nakshatras. The plants were subjected to sound recordings of Gayatri mantra on tapes with lower frequency and were played in morning, afternoon and evenings [6]. The growth parameters were assessed and recorded accordingly and the fully grown plants were taken. Phytochemical studies of colloidal gels from extracts of the plants were done. The parts of the plants the leaves, stem, flowers, fruits and roots were taken and medicine were prepared and given to patients thrice a day in a dose of 1 to 2.5 gm and progress of his/her condition was recorded. There were outstanding results obtained from patients whom showed favorable response like increase in digestion and their mental agitation subside, blood pressure lowered and sleep increased. This study reveals that the plants have shown a positive response to this type of particular sound waves regarding the growth their efficacy in curing the effect of music on physicochemical diseases etc. Parameters this study was an attempt to understand the effect of music on plant growth and

development [7]. Eight medicinal and ornamental plants were selected for the study. Two sets of selected plants were prepared, one of them was subjected to rhythmic soft-melodious music and a control set of plants was not exposed to any particular music. Music was played for fixed period for a month. After the treatment various growth and physiological parameters of treated plants were studied against the control plants. From the results, it was observed that plant growth in treated plants was better than control plants especially showing increased level of various Effects of different musical elements on metabolites. Plant growth[8]. In this study effects of strong, complex, rhythmic music with sekunda and kvarta intervals and frequently reprised and opus with rhythmic dynamically changing lyrics which contain more extensive kvinta septa oktava intervals on mitotic index and growth root were investigated in onion(*Allium cepa*) root tip cells during germination. For this the music samples of Wagner, Mozart, and Schubert were chosen. They found correlation between root elongation and Mitotic Index. Both kinds of music have positive effects measuring effects of music and healing on root growth. Energy using a seed germination bioassay [9]. A series of five experiments were performed utilizing okra and zucchini seeds germinated in acoustically shielded, thermally insulated, dark, humid growth chambers. Conditions compared were an untreated control, musical sound, pink noise and healing energy. Healing energy was administered for 15-20 minutes every 12 hours with the intention that the treated seeds would germinate faster than the untreated seeds. The objective marker was the number of seeds sprouted out of 25 seeds counted at 12-hour intervals over a 72-hour growing period. Temperature and relative humidity were monitored every 15 minutes inside the seed germination containers. A total of 14 trials were run testing a total of 4600 seeds. Musical sound had a highly statistically significant effect on the number of seeds sprouted compared to the untreated control over all five experiments for the main condition ($p < 0.000002$). This effect was independent of temperature, seed type, and position in room, specific Petri dish and person doing the scoring. Musical sound had a significant effect compared to noise and an untreated control as a function of time ($p < 0.03$) while there was no significant difference between seeds exposed to noise and an untreated control. Healing energy also had a significant effect compared to an untreated control (main condition < 0.0006) and over time ($p < 0.0001$) with a magnitude of effect comparable to that of musical sound. Hence this study suggests that sound vibrations (music and noise) as well as bio fields (bio electromagnetic and healing intention) both directly affect living biologic systems and that a seed germination bioassay has the sensitivity to enable detection caused by various applied energetic conditions.

Discussion

In 1962, Dr. T. C. Singh, head of the Botany Department at India's Annamalai University, experimented with the effect of musical sounds on the growth rate of plants. He found that balsam plants grew at a rate that accelerated by 20% in height and 72% in biomass when exposed to music. He initially experimented with classical music. Later, he experimented with raga music (improvisations on a set of rhythms and notes)

played on flute, violin, harmonium, and veena, an Indian instrument. He found similar effects. Singh repeated the experiment with field crops using a particular type of raga played through a gramophone and loudspeakers.

The size of crops increased to between 25 to 60% above the regional average. Through his several experiments, Singh concluded that the sound of the violin has the greatest effect on plant growth. He also experimented on the effects of vibrations caused by barefoot dancing. After exposure to dancers performed Bharata-Natyam, India's most ancient dance style, with no musical accompaniment, several flowering plants, including petunias and marigold, flowered two weeks earlier than the control.

Music has a profound effect on plant growth. External vibrations whether from music, sound or physical disturbance, affect the internal vibrations, either stimulating growth or hampering it. The various research works has given an idea about the different types of sound vibrations that helps a plant to grow and helps to produce good yield. These facts were early mentioned in Ayurveda. As Ayurveda is an upaveda of Atharvaveda and it is evolved from agama or Aptopadesha and is preceptor by sabda pramana, the base of which is again the sound. Surapala Vrikshayurveda is an ancient Sanskrit text on the science of plant life Figure 1.

The book deals with various subjects such as planting a garden, importance of various trees; collection, examination and treatment of seeds. selection of suitable land, soil characteristics, digging of planting pits, different methods of irrigation, plant nutrition, fertilizers, diseases of trees and their treatment, the wonders of horticulture, plant conservation. Vrikshayurveda has references about chanting of mantras to protect crops and grains from keeta, patanga, piplika, mushaka. The effect of sound on plants apparently depends on frequency, intensity and exposure time Figure 2.

Low frequency sound does not damage cell structure but instead activates enzymes. Increases cell membrane fluidity and promotes DNA replication and cell cycling. Music notes create inaudible quantum vibrations that happen when amino acids join the protein chain.

Hence by overall assessing these modern techniques and by our Ayurveda facts we can apply in our present cultivation practices.

Conclusion

The sound vibrational methods help the exploration works demonstrates that music plant to become solid and infection free. Treatment developed therapeutic plants can give. The low recurrence sound aides in great generally excellent medical advantages.

Development of plants while high recurrence just chose plants are till now utilized for sound decays the development of plants. Explores thus more significance research works ought to be done on therapeutic plants.

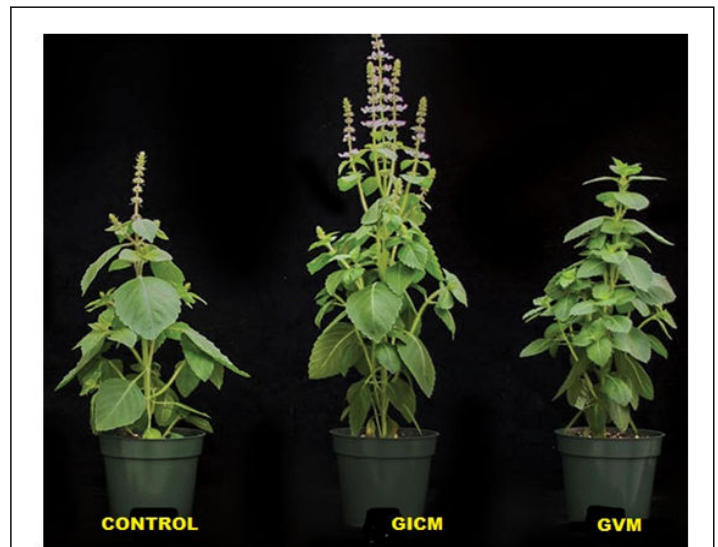


Figure 1: Comparative analysis of plant growth exposed to different music.

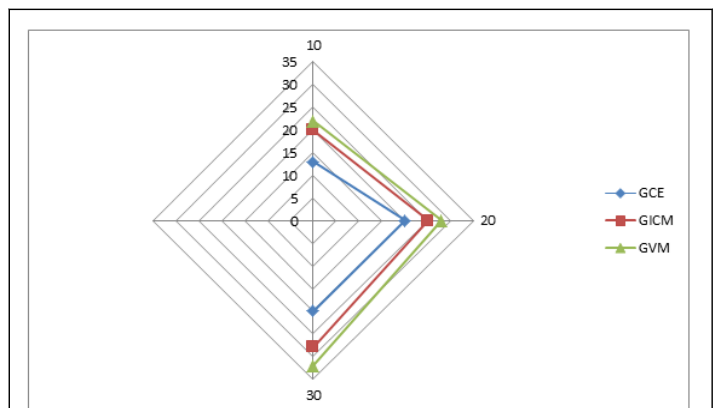


Figure 2: Comparative analysis of plant growth exposed to different music.

References

1. Retallack D (1973) The sound of music and plants. Santa Monica, CA: De Vorss and Co.
2. Klein RM, Edsall PC (1965) on the reported effects of sound on the growth of plants, Bioscience 15:125-126
3. Joel Sternheimer, protein music
4. Weinberger P, Das G (1972) the effect of an audible and low ultrasound frequency on the growth of synchronized cultures of scenedesnus obtusiusculus. Can J Botany 50:361-365
5. Weinberger P, Burtonc (1981) the effect of sonication on the growth of some tree seeds. Can J Forestry Res 11:840-844
6. Kritaker CR (1983) Effect of mantras on plants, published in journal Ancient science of life 2:141-147
7. Deepti sharma, Urvi Gupta, Ancy fanant (2015) The effect of music on physico- chemical parameters, published in Int J plant, animal and Environ Sci 5:282-287
8. Nuran Ekici, Feruzan Dane, Leyla mamedoa, Isin Metin and Murand Huseyinou (2007) The effect of different musical elements on root growth and mitosis in onion (*Allium cepa*) root

apical meristem (Musical and Biological Experimental study),
6:369-373

9. Creath K, Schwartz GE. (2004) Measuring effects of

music, noise, and healing energy using a seed germination
bioassay. J Altern Complement Med 10:113-122