Contents available at www.iamt.net.in

International Journal of Music Therapy
(ISSN 2249-8664)
Volume 2, Issue 1-2/2013, Pages 10-12

Effects of Woofing Sound Vibrations on Seed Germination of *Vigna aconitifolia*

Omkar Acharya and Maulik Gadani*
Biology Department,
St. Xavier's College, Ahmedabad-9, Gujarat
Correspondence: maulikgadani@yahoo.co.in

Article Information

Article history:
Received: 25.07.2012
Revised: 20.08.2012
Accepted: 18.09.2012

Keywords:
Vigna aconitifolia,
sound,
seed germination

Abstract

In the present paper, the effects of vibrations caused due to woofing sound on the growth of the selected plant – Moth bean (*Vigna aconitifolia*) was studied. Vibrations of two frequencies – high (about 200 Hz) and low (about 20Hz) were selected for the experimental work. Three sets were maintained – one exposed to vibrations of high intensity (about 200Hz), second exposed to vibrations of low intensity (about 20Hz) and the third set untreated i.e. control. It was found that seed germination was enhanced in the sets under the influence of vibrations as compared to the control set. Amongst the two sets of music treated plants the seed coat ruptured faster in the pots exposed to higher frequencies of sound. This is probably because the vibrations help in loosening or rupturing the seed-coat.

1. INTRODUCTION:

A property of living things is that they respond to stimuli. Plants are complex multicellular organisms considered as sensitive as humans for initial assaying of effects and testing new therapies (Benford, 2002; Dossey, 2001; Kristen, 1997). A change in plant growth or development in response to mechanical stimulation is called thigmomorphogenesis. There are various types of mechanical stimulation which includes touch, wind, vibrations and so on. Sound is known to affect the growth of plants and plants respond to music the same as humans do. Jagdish Chandra Bose made a number of pioneering discoveries in plant physiology. He used his own invention, the cresco graph, to measure plant response to various stimuli, and thereby scientifically proved parallelism between animal and plant tissues.

There have been mentions suggesting that music causes drastic changes in plants metabolism. Plants enjoy music, and they respond to the different types of music and its wave-length. Music containing hardcore vibrations could be devastating to the plants. There is a right and a wrong way to play music to plants. For example, the volume should be taken into consideration and also the type of music played eg. soft-melodious music or loud. Certain types of music can wreak havoc on plants. Other types of music can make your plants thrive. Heavy metal music should never be played around a plant. It can have devastating effects. Even played at

a low volume, heavy metal music can be very damaging to a sensitive plant. Plants are not fond of pop music. Plants subjected to rock music become stunted. If they are continually exposed to rock music for more than 10 days, they will eventually die on the other hand classical or devotional music enhances the plant growth and increases yield has been observed. Country music is well-favored by plants. In recent experiments that have been conducted, country music has beat out classical music by a slight margin. Classical music has a gentle vibration, and it's easy on plants. It is relaxing and has no hard beat. They will practically dance to it. The foliage will point upwards as if it is looking up to the heavens. Violin music significantly increases plant growth. Overall, the best options for a plant are country, classical and violin music. If farmers and gardener know what type of music, if any, helps plants grow more quickly, stronger, or more lush, it could affect the efficiency of their farming techniques. This could result in a much more successful business for farmers

However, the previous studies on plants using music and/or noise have been controversial (Galston and Slayman, 1979; Klein and Edsall, 1965; Retallack, 1973; Retallack and Broman, 1973; Tompkins and Bird, 1973; Weinberger and Das, 1972; Weinberger and Graefe, 1973; Weinberger and Measures, 1978). Thus, the present experimentation was done with the objective to check our hypothesis that music especially the vibrations of woofing sound would enhance the seed germination.

2. Materials and Methods

The plant material used for the experiment here is moth beans. The scientific name of moth bean is *Vigna aconitifolia.* It is a small, drought-resistant, annual, trailing herb with small yellow flowers and deeply lobed leaves, grown for its tiny edible beans, which range in color from light brown to dark reddish brown.

2.1. Methodology:

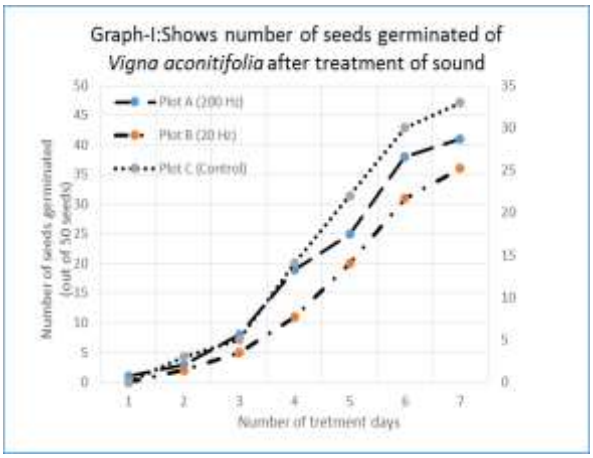
- 50 seeds of *Vigna aconitifolia* (moth bean) are sown in each of the three pots- A, B & C.
- Pot A is kept near the woofer speaker and a heavy bass music was played for half an hour daily for a week with maximum volume of about 200 Hz. and then it shall again be kept in the sun.
- Pot B is kept near the woofer and a low bass music of about 20 Hz was played for half an hour daily for a week.
- Pot C was allowed to germinate without the woofing vibrations considering it as control.
- This experiment was carried out for 7 days and the number of seeds germinated were noted in each pot every day and the following observations were made.

3. Results:

Table no.-1 and Graph-I shows number of seeds germinated of *Vigna aconitifolia* during 7 days of period

Table No-1

No of Days/ Sound level	Number of seeds germinated (out of 50 seeds)		
	Pot A (200 Hz)	Pot B (20 Hz)	Pot C (Control)
1	1	0	0
2	3	2	3
3	8	5	5
4	19	11	14
5	25	20	22
6	38	31	30
7	41	36	33



It was observed that seed germination was enhanced upon treating seeds with music. The seeds in the Pot A which received maximum vibration, because of the bass, germinated faster as compared to seeds in Pot B, which received low frequency vibrations and the seeds in Pot C, the control set (without vibrations). Low vibrations were not very effective until 7th day. Maximum vibrations, about 200 Hz frequency, were found to be best in the present study.

4. DISCUSSION:

The above data indicates that overall seed germination was better in plants exposed to high frequency vibrations as compared to the control set. This happened probably because the high-frequency vibrations caused by the woofer helped the seeds in loosening or rupturing of the seed-coat. This loosening or rupturing of the seed coats further assisted the seeds to germinate faster. Uchida and Yamamoto (2002) have also reported that vibration with frequencies higher than 70Hz increased the rate of seed germination.

Vibration is one type mechanical stress. It is also known to promote seed germination in *Cucumis sativus* and *Oryza sativa* (Takahashi *et al.* 1991). Creath and Schwartz (2004)suggests that sound vibrations (music and noise) as well as biofields (bioelectromagnetic and healing intention) both directly affect living biologic systems, and that a seed germination bioassay has the sensitivity to enable detection of effects caused by various applied energetic conditions.

Similarly, there also have been other reports on the enhancement of physiological conditions of the plants as a result of exposure to sound and music. (Yi *et al.,* 2003; Coglan, 1994).

Hence, it can be concluded that plants enjoy music and they have better effect when exposed to the appropriate style.

5. REFERENCES :

1. Ayuho Uchida and Kotaro T. Yamamoto. (2002). Effects of Mechanical Vibration on Seed Germination of Arabidopsis thaliana (L.) Heynh. *Plant Cell Physiol.43(6): 647-51.*
2. Benford, M.S.(2002). Implications of plant genome research to alternative therapies:A case for radiogenic metabolism in humans. *J. Theoretics* 4: 1-14.
3. Coglan, A. (1994). Good vibrations give plants excitations.*New Scientist.*142: 10.
4. Creath, K. and G. E. Schwartz (2004). Measuring effects of music, noise and healing energy using a seed germination bioassay. *J. of Alt. and Comp. Med. 10(1) : 113-22.*
5. Dossey, L. (2001). Being green : On the relationships between people and plants. *Altern Ther* 7 : 12-16, 132-140.
6. Galston, A.W. and C.L. Slayman (1979). The not-so-secret life of plants. *Am. Sci.* 67:337-44.
7. Klein, R. M. and P. C. Edsall (1965). On the reported effects of sound on the growth of plants. *Bioscience* 15 : 125-126.
8. Kristen, U. (1997). Use of higher plants as screens for toxicity assessment. *Toxicol In Vitro* 11 : 181-191.
9. Retallack, D. (1973). The sound of Music & Plants. Santa Monica, CA : De Vorss & Co.
10. Retallack, D. and F. Broman (1973). Response of growing plants to the manipulation of their environment. In : The Sound of Music and Plants. Santa Monica, CA : De Vorss & Co. 82-94.
11. Takahashi. (1991). Growth promotion by vibration at 50 Hz in Rice and Cucumber seedlings. *Plant Cell Physiol,* 32 (5) :729-32.
12. Teleweki, F. W. (2006). A Unified Hypothesis of Mechanoperception in Plants. *American J. of Botany*. 93 : 1466-76.
13. Tompkins, P. and C. Bird (1973). The harmonic life of plants. In the Secret life of plants. New York : Harper and Row 145-62.
14. Weinberger, P. and M. Measures (1978). Effects of the intensity of audible sound on the growth and development of Rideau winter wheat. *Can J. Botany* 57 : 1036-39.
15. Weinberger, P. and U. Graefe (1973). The effect of variable-frequency sounds on plant growth. *Can J. Botany* 51 : 1851-1856.