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CLASSICAL RAGAS : A NEW PROTEIN SUPPLEMENT IN PLANTS

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ABSTRACT

In the recent years music therapy is becoming popular even though it is known from ages that music has an impact on our physical and physiological conditions. Soothing and rhythmic music has an impact on physical and physiological conditions of living organisms plants, animals, especially human plays his flute with melodies music, birds, animals, humans all are drawn towards the music as a magnetic attraction. Our aim was to find out which of the selected Indian classical raga: Sindhu Bhairavi. Kapi, Desh, played through instrument and vocal exhibit an impact on the growth rate and protein production in the common herbs like Palak (*Spinacia oleracea*), Wheat (*Triticum asteivum*), Paddy (*Oryza sativa*), Soya (*Glycine max*), Horse gram (*Macrotyloma uniflorum*). If positive effects are shown by any of the raga that can be used to increase the plants Productivity and medicinal values.

KEYWORDS : Music Theraphy, Indian Classical Raga's, Growth Rate, Protein Production

Everything from photonic light particles to dense matter is composed of energy vibrating at different speeds or frequencies, and the world that we are able to perceive consciously is but a minute fraction of what vibrationally surrounds us (Coglan,1994).

Audible sound is vibration traveling through matter and is perceivable to the human ear within a frequency range of around 20 to 20,000 cycles per second, or Hertz (HZ). Sounds below this frequency range are called “subsonic” and above this threshold are called “ultrasonic” (Klein and Edsall, 1965).

Sound is a wave and more specifically, a pulse wave. This simply means that it is formed by areas of higher and lower pressure in the atmosphere through which it travels. Terms such as “amplitude,” when used in reference to sound, are actually referring to the plot of the air pressure versus time on a graph. Now, it is difficult to believe such (extremely small) fluctuations in air pressure could have any effect on a plant's growth. This is very little difference, to a plant, in music and ambient noise. (Gnanam ,1960).

Music is a composite of audible frequencies, so it is logical to infer that if both matter and music are composed purely of vibration, one could likely affect change in the other (Tompkins and Bird, 1973).

A property of living things is that plants respond to stimuli. Plants are complex multicellular organisms considered as sensitive as humans for initial assaying of effects and testing new therapies (Benford, 2002). Sound is known to affect the growth of plants and plants respond to music the same as humans do (Dossey, 2001).

Just outside the borders of conventional science lies the idea of plant perception or biocommunication in plant cells that plants are sentient, that they experience pain, pleasure, or emotions such as fear and affection, and that they have the ability to communicate with humans and other forms of life in a recognizable manner. While plants can communicate through chemical signals, and certainly have complex responses to stimuli, the belief that they possess advanced affective or cognitive abilities is not accepted by mainstream science. This is not to say, however, that there isn't evidence to support proponents of the theory (Retallack and Broman, 1973).

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 plants (Galston and Slayman, 1979).

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 e.g. Soft-melodious music or loud. Certain types of music can wreck 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, they will eventually die on the other hand classical or devotional

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music enhances the plant growth and increases yield has been observed (Kristen, 1997).

Indian classical music is well-favored by plants. In recent experiments that have been conducted, 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 (Weinberger and Das ,1972)

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 (Retallack,1973).

However, the previous studies on plants using music and/or noise have been controversial (Weinberger and Graefe ,1973)

We hope that if we do find results that suggest that music does have a beneficial effect on crop protein production, acoustic biology can then have some viable supplications in agriculture. This could bring about new discoveries into the development of novel farming methods.

MATERIALS AND METHODS

Materials

- Glass chambers of 16x16 inches
- Portable speakers
- plastic pots
- Thick woolen bed sheet
- Mobile phone
- Spectrophotometer

Indian Classical Ragas

- Sindhu bharavi -violin by Ambi Subramanyam.
- Kapi -vocal by M.S.Subbalakshmi
- Sindhu bhairavi -vocal by M.S.Subbalakshmi.
- Desh -violin by Lalgudi Jayaraman..

Methodology

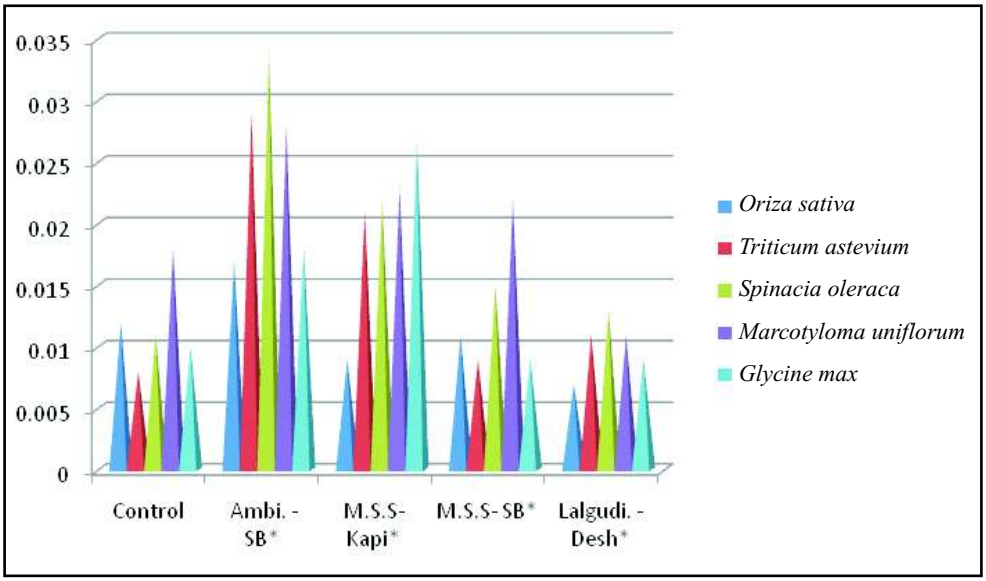
Pots were prepared and groomed with garden soil and the seeds of the above plants were selected and soaked overnight for germination and the seeds were sowed in a standardized procedures for 9 repeats and the music of the selected ragas were recorded in Mobile and PSP with the help of the speakers and were kept in glass case and the top was covered with thick woolen bed sheet, in order to avoid other noise. Equal amount of water was poured in each pot and placed under normal environmental conditions (e.g. light and temp.).

They were played regularly for 3 months between 5-7am every day. The time taken for germination and height, number of leaves were recorded to study morphology. After one month the plants were harvested and from this protein estimation was done by using common protein estimation and the results were recorded and the photographs were taken. Control plant without exposing to music was also maintained.

Table 1 : Protein production of saplings after 20 days of growth period

	Oryza sativa	*Triticum asteivum*	*Spinacia olerecea*	*Macrotyloma uniflorum*	*Glycine max*
Control	0.012	0.008	0.011	0.015	0.01
Ambisubramanyam SB	0.017	0.029	0.034	0.028	0.018
M.S. Subbalaxmi Kapi	0.009	0.021	0.022	0.023	0.027
M. S. Subbalaxmi	0.011	0.009	0.015	0.022	0.09
Lalgudi jayaraman Desh	0.007	0.001	0.013	0.011	0.009

*Note: The OD values were estimated through Spectrophotometer at the wavelength of 600nm.



Graph 1 : Showing The Amount of Protein Production in Control and in Experimental Plants Subjected to Ragas

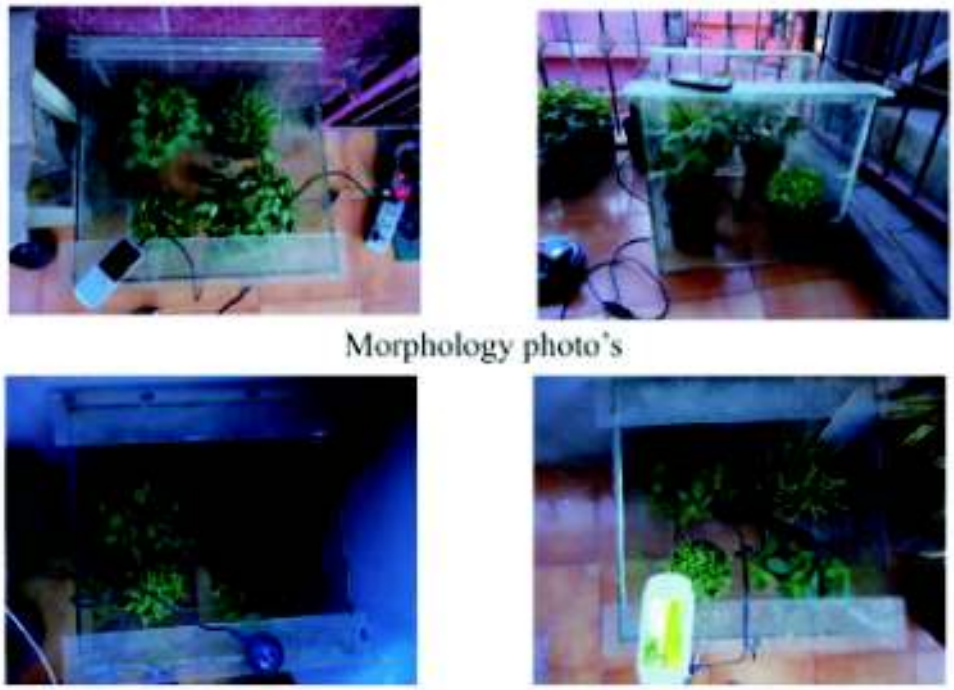
(Note:
Ambi.-SB* = Ambi Subramanyam.- Sindhu bhairavi M.S.S.- Kapi* = M.S.Subbalakshmi -Kapi
M.S.S.- SB* = M.S.Subbalakshmi- Sindhu bhairavi Lalgudi.- Desh* = Lalgudi Jayaraman- Desh)

RESULTS AND DISCUSSION

Result showed in table 1, graph 1 and figure 1. Table, 1 shows Protein production of saplings after 20 days of growth period.

Music is a vibratory phenomenon. Air particles are set in motion and these air particles in turn set matter that is within hearing distance into motion. This is called vibrational sympathy: when the vibrations of sound effect

Figure 1 : A Series of Experiment Conducted on Plants to Perform The Protien Production



Triticum asteivum

Glycine max

Spinacia oleracea

Macrotyloma uniflorum

the airwaves, the airwaves effect other matter that they come into contact with in a manner that is in sympathy with the originating source.

Music is used more and more as a therapeutic tool, because all subjects, whether musically trained or not, respond in a similar manner. Music is a combination of frequency, beat, density, tone, rhythm, repetition, loudness, and lyrics. Different basic personalities tend to be attracted to certain styles of music.

Energy block patterns can intensify, reduce, or change the natural inclinations of a person's identity.

Music has a definite effect on people, animals and plants. In fact it can have a powerful influence on our body, mind and emotions. Music with a 'beat' can stimulate the plants activity. Music with powerful melodies and harmonies performed with feeling can bring about changes in plant activities.

In fact, plants monitor their visible environment all the times. Plants see if we come near them; they know when we stand over them. Of course plants don't see in pictures as we do. Plants see the same ultraviolet light that gives us sunburn and infrared light that heats us up. Plants know if the sound is coming from the left, the right, or from above. They know if another plant has frown over them, blocking the sound and light. And they know how long the sound and light have been on.

The most benefit from music on plants is seen in classical and in meditation music, whereas heavy metal or techno are ineffective or even dangerous. Various studies suggested that this music not only makes plants happy, but has significant effects on the growth and production of protein, chlorophyll. Music is effective under different conditions and can be utilized as an effective intervention in plants.

In the present world, due to random changes in lifestyles and behavior, our food styles and food production has been modified accordingly. Currently we are in race of producing large quantities of food to satisfy the human greed. In order to produce the huge quantity of food we have neglected the quality of food that is being produced. Too many fertilizers and hybrid varieties are being used in the agricultural sector. Sometimes even the crops are cultivated through sewage water, which ultimately gives us a better yield, but even provides toxic metals into the crop, which causes health hazards in humans when consumed.

All we required is not the quantity of food, but the quality of food with the essential proteins, vitamins and minerals.

The author's objective was to determine the ability of the Indian Classical Raga's on plants growth and in protein production. Series of experiments was conducted on the plants to conform the protein production. The results achieved were fruitful which says that plants do exhibit its behavioral and response's to Indian classical ragas. When we can achieve the required proteins through plants just by playing music and not by adding any manure, fertilizer and pesticides, the intension of growing them solved out. Apart from electricity to run the music from speakers, suitable soil and water, nothing else is required for achieving this.

Though in this experiment the height of the plant growth was less than that of the control, but the protein produced by the plants which undergone through music produced more quantity of protein than normal plants. Ultimately the desire of having food is to get the required amount of protein supplements and not the quantity of food intake.

CONCLUSION

Hence, it can be concluded that plants enjoy music and they have better effect when exposed to the appropriate style. The above data indicates that overall plant protein production was better in plants exposed to Ambi Subramanyam- Sindhu bhairavi classical raga as compared to the control set and other ragas.

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