

## Behaviour of *Jasminum Sambac* Plants to Different Frequencies of Classic Music Application

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**Abstract:** This study was conducted during 2014 and 2015 seasons to examine the effect of exposing *Jasminum sambac* plants to different frequencies of application of classical music (Sonata Mozart No.7) for one hour (once, twice or thrice) on vegetative growth characteristics, flowering and leaf pigments. Subjecting the plants once, twice or thrice with classical music materially was accompanied with enhancing plant height, number of leaves per plant, leaf area, total surface area per plant, number and fresh weight of flower, chlorophylls a & b, total chlorophylls and total carotenoids in the leaves over in silence control. The stimulation on these parameters was in proportional to the increase in frequencies in frequencies of application. Meaningless promotion was exerted among the application of classical music twice or thrice. Exposing *Jasminum sambac* plants to classical music (Sonata Mozart No.7) for one hour twice in the morning between 8.0 to 9.0 am and the evening between 8.0 to 9.0 pm gave satisfactory promotion on growth and flowering of the plants.

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**Keywords:** *Jasminum sambac*, classical music, Sonata Mozart No7., frequencies of application, growth, flowering, leaf pigments.

### 1. Introduction

*Jasminum sambac*, Ait. belonging to family oleaceae is one of the most desirable and showy small evergreen flowering shrubs in Egypt. It is widely grown in home gardens, in the landscape and extensively used as a pot plant in roof, terrace and balcony gardens. The large, double white flowers with too nice smelling blooming in Spring, Summer and Fall are very attractive for the use as cut flowers. Most important, the extractable crude oil is very expensive and is extensively demand by foreign markets for preparing high quality perfumes and cosmetics.

It is well known that types and frequencies of sound and music substantially governed plant growth. Music can influence plant growth positively and negatively. Exposing the plants to music besides adjusting environmental conditions and nutrition resulted in an obvious stimulation on plant growth and flowering. An announced impact of music was observed on the biosynthesis of hormones, amino acid, sugars and most antioxidants in plants (Pixton, 1977 and Qina *et al.*, 2003). Subjecting most ornamental plants to classical and different types of music was found by many authors to enhance growth and flowering aspects (Braam and Davis, 1990; Collins and Foreman, 2001; Dossey, 2001 and Benford, 2002). Growth of chrysanthemum callus was greatly stimulated when the plants exposed to different music treatments (Yiyaoa *et al.*, 2002 and Yia *et al.*, 2003). Subjecting horticultural crops to sounds was followed by stimulating growth traits (Xiujuan *et al.*, 2003; Creath and Schwarts, 2004; Abd El-Naby-Zeinab

and Saker, 2012; Asha and Pawan, 2012; Abraham *et al.*, 2012; Pavan *et al.*, 2013; Singh *et al.*, 2013 and Chivukula and Ramaswamy, 2014).

The target of this study was elucidating the effect of various frequencies of classical music application on growth traits, flowering and leaf pigments of *Jasminum sambac* plants.

### 2. Materials and Methods

This study was carried out during 2014 and 2015 seasons in greenhouse in a private ornamental Nursery located at Minia city, Minia Governorate on one-year old *Jasminum sambac* plants with one branch.

The plants were pruned to equal height (20 cm length) and planted in pots filled with clay soil (0.09%N + 0.6 ppm P and 401 ppm K) on the first week of March during both seasons. The management practices like nutrition, irrigation, weeding and pest control were carried out for all the selected plants (36 plants) during the entire period of study.

The present experiment included the following four classical music treatments:

1. Exposing the plants to classical music once for one hour at 8.0 to 9.0 am in the morning.
2. Exposing the plants to classical music twice for one hour per each at 8.0 to 9.0 am in the morning and at 8.0 to 9.0 pm in the evening.
3. Exposing the plants to classical music thrice for one hour per each at 8.0 to 9.0 am in the morning, 5.0 to 6.0 pm in the afternoon and 2.0 to 3.0 am in the early morning.
4. Kept the plants in silence (control).

Each treatment was replicated three times, three plants per each. The period of exposing was extend for four months. Care was taken to ensure minimal ambient noise and to ensure that the amount of sunlight and water was equal for all the selected plants. The control plants received no external sound exposure. The volume of the selected sound (Sonata Mozart No.7). Played was fixed throughout the exposure period (four months).

At the end of the study (last week of June), the following data of *Jasminum sambac* were measured by adopting standard procedures:

- 1- Plant height (cm).
- 2- Number of leaves/plant.
- 3- Leaf area (cm)<sup>2</sup>.
- 4- Total surface area (m)<sup>2</sup> per plant.
- 5- Number of flowers/plant.
- 6- Fresh weight of single flower (g).
- 7- Leaf pigments namely chlorophylls a & b, chlorophylls and total carotenoids in the fresh leaves (mg/1g F.W) according to Moran (1982).

All the obtained data were tabulated and statistically analyzed. Mean of the four classical music treatments were compared using L.S.D. test at 5% according to Mead *et al.* (1993).

### 3. Results

#### 1- Effect of different frequencies of application of classical music on vegetative growth characteristics:

The obtained data (Figure 1) clearly show that varying frequencies of classical music application had significant effect on plant height, number of leaves/plant, leaf area and total surface area per plant. Using classical music (Sonata Mozart No.7) once, twice or thrice significantly succeeded in enhancing these growth characters comparing to the check treatment. The promotion on these growth aspects was related to the increase in the exposure to music from once to thrice. Increasing frequencies of music application from twice to thrice had no significant promotion on these growth aspects. Therefore, it is enough to use classical music twice every day for one hour percentage at 8.0 to 9.0 am in the morning and again at 8.0 to 9.0 pm in the evening for producing vigorous plants.

*Jasminumsambac* plants of the plants left without subjecting to music (control) gave the lowest values. These results were true during both seasons.

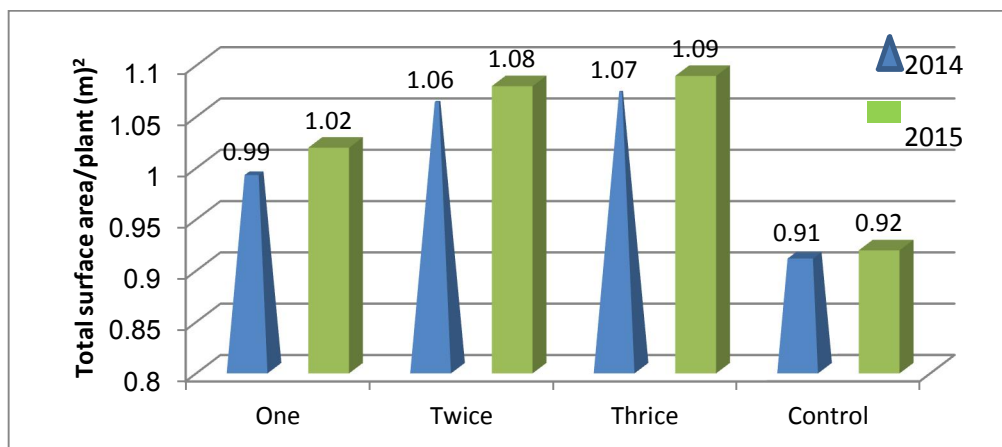


Fig. 1: Effect of different frequencies of application of classical music (Sonata Mozart No. 7) on the total surface area (m)<sup>2</sup> of *Jasminum sambac* plants during 2014 and 2015 seasons.

#### 2- Effect of different frequencies of application of classical music on number of flowers/plant and fresh weight of flower:

It can be stated from the obtained data (Figure 2) that number of flowers/plant and fresh weight of flower were significantly improved in response to application of classical music once, twice or thrice a day rather than those plants under silence state. There was a gradual stimulation on such two flowering aspects with increasing frequencies of exposure from once to thrice. Meaningless acceleration on such two flowering aspects was noticed among the higher two

frequencies namely twice or thrice. Thereby, the conclusion was the applications of classical music twice for enhancing flowering of *Jasminumsambac* plants during both seasons. Similar trend was observed during both seasons.

#### 3- Effect of different frequencies of application of classical music on the leaf pigments:

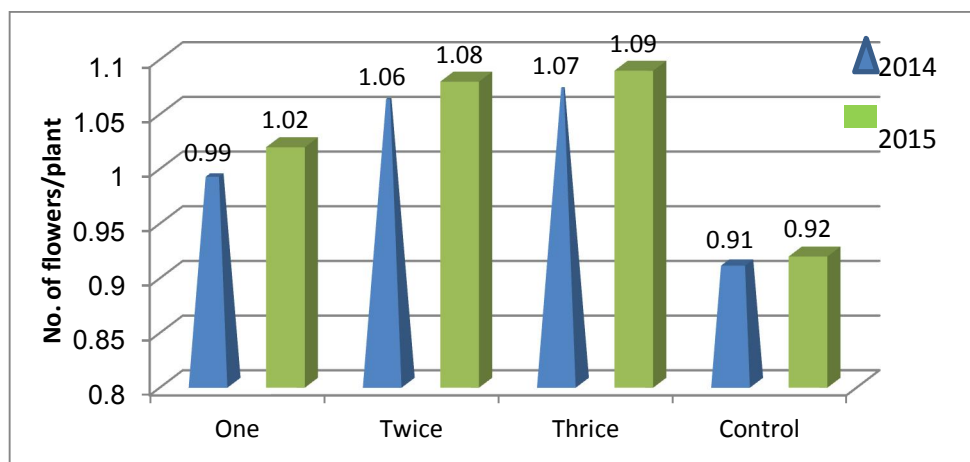
It is evident from the obtained data (Figures 3 & 4) that exposing the plants to classical music once, twice or thrice significantly was followed by enhancing chlorophylls a & b, total chlorophylls and total carotenoids over the check treatment (no

exposure to music). The promotion on these plant pigments was clearly depended on increasing the time of exposure of this music. A slight and insignificant promotion on these plant pigments was detected among the application of music twice or thrice.

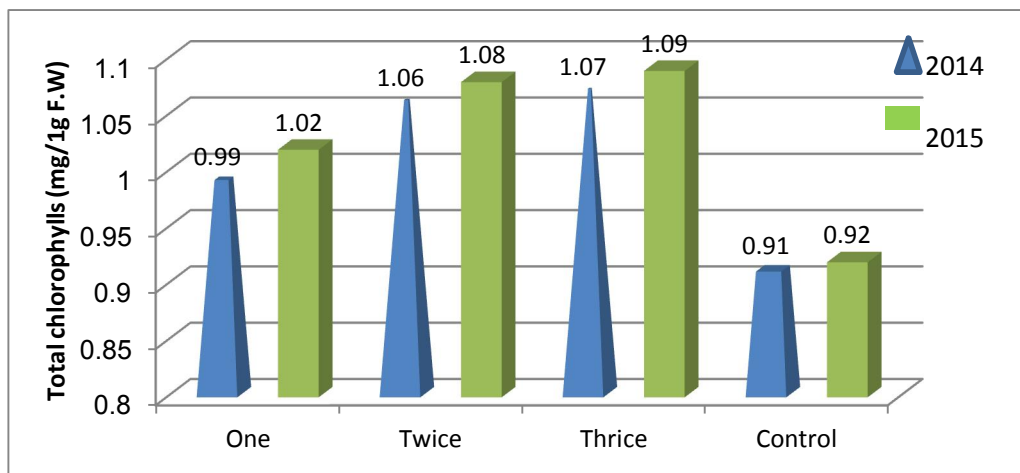
Therefore, it is necessary to use classical music twice for accelerating plant pigment in *Jasminumsambac* plants. Unsubjecting to classical music gave the lowest values. These results were true during both seasons.

**Table: Effect of different frequencies of application of classical music (Sonata Mozart No. 7) on some vegetative growth characteristics, flowering and leaf pigments of *Jasminum sambac* plants during 2014 and 2015 seasons.**

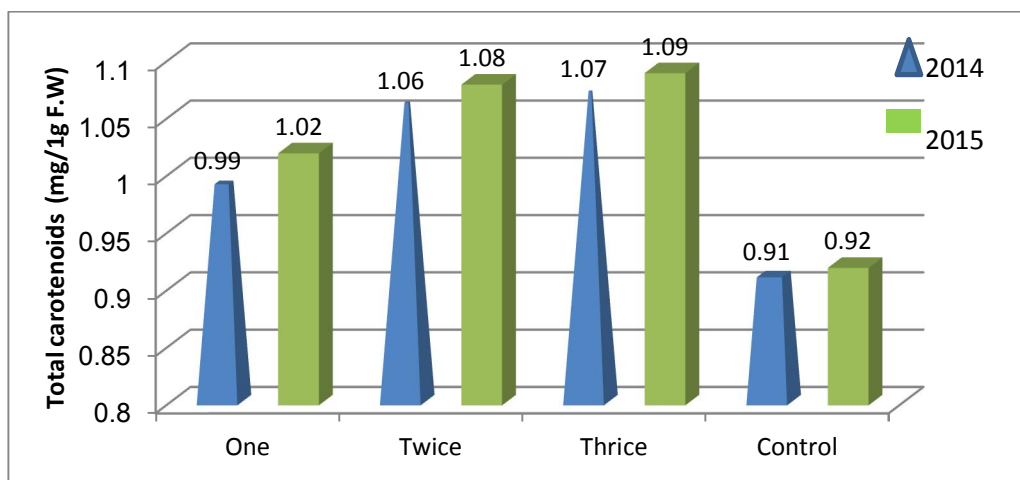
Treatment	Plant height (cm)		No. of leaves/plant		Leaf area (cm) <sup>2</sup>		Total surface area/plant (m) <sup>2</sup>		No. of flowers/plant	
	2014	2015	2014	2015	2014	2015	2014	2015	2014	2015
1. Exposing to classical music once	43.0	44.6	39.0	41.0	26.3	25.9	0.10	0.11	25.0	25.0
2. Exposing to classical music twice	44.9	47.0	41.9	43.3	28.9	29.9	0.12	0.13	27.9	28.0
3. Exposing to classical music thrice	45.0	47.6	42.0	44.9	29.1	30.1	0.12	0.14	28.0	29.0
4. Kept in silence (control)	41.0	42.0	36.0	38.0	22.9	21.9	0.08	0.08	21.0	22.0
New L.S.D at 5%	1.9	2.0	2.0	2.0	2.9	2.8	0.02	0.02	2.9	3.0
Characteristics	Fresh weight of flowers (g)		Chlorophyll a (mg/1g F.W)		Chlorophyll b (mg/1g F.W)		Total chlorophylls (mg/1g F.W)		Total carotenoids (mg/1g F.W)	
	2014	2015	2014	2015	2014	2015	2014	2015	2014	2015
1. Exposing to classical music once	0.52	0.49	2.10	2.09	0.96	0.99	3.06	3.08	0.99	1.02
2. Exposing to classical music twice	0.58	0.55	2.21	2.23	1.00	1.05	3.21	3.28	1.06	1.08
3. Exposing to classical music thrice	0.59	0.56	2.23	2.25	1.02	1.07	3.25	3.32	1.07	1.09
4. Kept in silence (control)	0.46	0.44	1.99	2.00	0.89	0.94	2.88	2.94	0.91	0.92
New L.S.D at 5%	0.05	0.04	0.08	0.07	0.04	0.03	0.06	0.07	0.04	0.04



**Fig. 2: Effect of different frequencies of application of classical music (Sonata Mozart No. 7) on the number of flowers/ plant of *Jasminum sambac* plants during 2014 and 2015 seasons.**



**Fig. 3:** Effect of different frequencies of application of classical music (Sonata Mozart No. 7) on the total chlorophylls (mg/1 g F.W) of *Jasminum sambac* plants during 2014 and 2015 seasons.



**Fig. 4:** Effect of different frequencies of application of classical music (Sonata Mozart No. 7) on the total carotenoids (mg/1 g F.W) of *Jasminum sambac* plants during 2014 and 2015 seasons.

#### 4. Discussion:

The great beneficial effects of music on plant growth, flowering and leaf pigments might be attributed to its positive action on metabolism of plants through its important role in controlling and balancing the biosynthesis of sugars, amino acids, natural hormones and vitamins as well as enhancing the uptake of nutrients and water, cell division, formations of flowers and antioxidants. Music reacted with climatic factors such as temperature and light to produce vigorous plants (Pixton, 1977 and Qina *et al.*, 2003).

These results regarding the stimulating effect of music on growth characteristics, flowering and

pigments are in agreement with those obtained by Braam and Davis, (1990); Collins and Foreman, (2001); Dossey, (2001); Benford, (2002); Yia *et al.*, (2003) and Saker, (2012).

#### Conclusion:

It is clear that times of classical music has a profound impact on the growth, flowering and pigments of *Jasminumsambac* plants. It can also be stated that application of classical music twice for two hours one at 8-9 am in the morning and one at 8-9 pm in the evening was favourable for producing vigorous plants.

## SONATE

W. A. Mozart  
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*Allegro con spirito*

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