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IMPACT OF NOISE ON GERMINATION OF VIGNA RADIATE AND BRASSICA NIGRA IN POLLUTED AND MILD POLLUTED AREAS

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ABSTRACT Noise pollution is an unwanted or disturbing sound caused by traffic and machinery which can interfere with normal activities of humans and wildlife, such as sleeping, conversation, reproduction, communication, or disrupt or diminish one's quality of life.

Noise pollution can come from many sources, such as automobiles, motorcycles, aircraft, ships, trucks, buses, jet planes, construction equipment, electrical machinery, lawn mowers and leaf blower etc.

Plants are sensitive to heat, cold, light and noise, as like humans.

Music, noise and healing energy has certain effect on germination of seeds. Some plants do worse in noisy areas, a study found, while others seem to do better, depending on the surrounding environment. Either way, the ripple effects can be far reaching and long lasting, especially for trees, which often take decades to grow from seedlings into adults.

The present paper deals with the impact of noise with on seed germination of two different types of seeds. Two plant species, Vigna radiate (Green gram) Brassica nigra (Black Mustard) were selected because of their relatively fast growing rates if placed under the proper conditions, which include a cold atmosphere and relatively moist soil.

Germination rate is observed in polluted and mild polluted areas of Hyderabad by measuring the noise levels by noise meter.

KEYWORDS : Noise meter, pollution, growth rate, moist soil

INTRODUCTION

Plant stress refers to any unfavorable condition or substance that affects a plant's metabolism, reproduction, root development, or growth.

With the growth of superhighways, air traffic, construction and other machine-based activity, the globe has been growing louder and louder over the last century.

Sound wave can accelerate growth of plants and the stimulation of sound wave has an obvious effect on the growth and development of plants. Sound vibrations directly affect the living systems and also the effects caused by various applied energetic conditions can be detected by seed germination bioassay.

This paper is intended to showcase the impact of noise pollution on seed germination. Germination rate is observed for two different plant species in low , moderate and heavy polluted areas in Hyderabad and it was observed that seed germination rate in heavy polluted area is very poor compared to seed germination in moderately polluted area. Seeds germinated well in low traffic area. The effect was analyzed with noise meter.

MATERIAL AND METHODS

1. Selection of seeds

Seeds with relatively fast growing rates, **Vigna radiate, Brassica nigra** are selected for germination as shown in figure 1

Seeds are soaked in water overnight before planting to ensure faster germination .The seeds swell as water penetrates the seed coat and the embryo inside begins to plump up. Once the seeds have swollen, they have been spread into moist soil with a pH 6.0 to 6.0 to 7.0 in three different traffic zones.

The germination rate of both the seeds are compared and was observed every day for a period of 20 days in moderately polluted , polluted and low polluted areas and the noise levels are measured by noise meter.

FIGURE 1- SELECTION OF SEEDS

Brassica nigra (Black Mustard) | Vigna radiate (Green Gram)

FIGURE 2 - GERMINATION OF GREEN GRAM

Fig (2a) Non polluted area – Effective germination

Fig(2b) Polluted area Very Slow germination

Fig(2c) Moderately Polluted – average germination rate

FIGURE 3 GERMINATION OF BLACK MUSTARD

Fig (3a) Non polluted area showing Good seed germination rate

Fig (3b) moderately Polluted area - showing slow germination rate

Fig (3c) Polluted area – Less germination leading to plant decay

RESULT AND CONCLUSION

It has been observed that the seeds started germinating well in low traffic zones when compared to moderate and heavy traffic zone as shown in figures (2a), (2b), (2c) and figures (3a),(3b),(3c).

When the noise levels are measured as shown in Table I , it is found to be extremely high (95dBA) in heavy traffic zones which is having an indirect effect on plant growth as well.

The effects of noise vary with the noise to which a person is exposed. Prolonged exposure to loud noises (75 dBA over eight hours a day for years) can lead to hearing loss. The body can also respond to lower noise levels: sleep can be disturbed by an outdoor noise of 40 dBA.

TABLE 1 MEASUREMENT OF NOISE LEVELS

Area	Level of Noise (dBA)	Noise type	Rate of germination
Polluted	95	Heavy Traffic	Very slow and only 40 seeds germinated out of 100 seeds
Less polluted	43	Quiet office/Library	80 seeds out of 100 germinated showing good growth rate
Moderately Polluted	65	Light Traffic	60 seeds out of 100,germinated

Pollution has an adverse effect on seed germination .As a result the plant growth is affected leading to slow growth, root damage, inability to photosynthesize properly resulting in plant decay.

Therefore it is essential to maintain a pollution free environment, for proper and healthy growth of plants and also for a well-being of human beings.

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