CALIFORNIA SCIENCE & ENGINEERING FAIR
2018 PROJECT SUMMARY

Name(s)

Ishaan S. Brar

Project Number

38050

Project Title

Effect of X-ray, Ultraviolet, and Microwave Radiation on the Seed Germination and Growth of Phaseolus vulgaris

Abstract

Objectives/Goals

We are exposed to a large number of electromagnetic waves such as Ultraviolet (UV), Microwaves, and X-ray radiations. This experiment is testing the effect of these radiations on seed germination and plant growth.

Methods/Materials

Materials: 4 bags Miracle-Gro potting soil, 84 containers, water, X-ray machine, UV emitter, Microwave emitter, Phaseolus vulgaris seeds.To perform my experiment, I used kidney bean (Phaseolus vulgaris) seeds. I divided the seeds into several groups. First group was marked as Control. Second group of beans was irradiated with the X-rays. Third group of seeds received UV radiation exposure. Fourth group received microwaves radiation exposure. The seeds were planted in potting soil and watered on alternate days. The day of germination and the length of the plants were recorded for 30 days.

Results

During the first few days, the x-ray plants grew the fastest. Most of the X-ray exposed plants were taller than the control. Finally, in microwave group, few seeds germinated only in 10 seconds (s) and 20s exposure group and growth was stunted. The results of the experiment show the X-rays actually simulated the initial plant growth, especially in low intensity X-ray exposure group. Also, the UV radiation, delayed the plant seed growth, and then stimulated it to go faster. The only form of radiation that inhibited the growth was the microwaves.

Conclusions/Discussion

The results of the experiment show Microwave radiation has deleterious effect on seed germination and plant growth. UV and low-intensity X-ray stimulated seed germination and enhanced plant growth.

Summary Statement

The project showed X-ray and UV radiations enhance plant growth and microwaves inhibit plant growth compared to control.

Help Received

I set up and performed the experiment myself. X-ray irradiation was performed by licensed professional at Premier Valley medical Group, Bakersfield, CA.