Effect of Eco Enzyme on Television Electromagnetic Radiation

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1. Introduction

Radiation is energy emitted in the form of waves or particles [1]. Sources of radiation can come from high-energy electrical devices such as electronic devices [2]. One electronic device that can emit electromagnetic radiation is a television. The wavelength and frequency of electromagnetic radiation emitted on a television monitor screen will be captured by the cornea of the eye so that it can have a negative impact on symptoms including eye fatigue, headaches, nausea, anxiety, and hypertension [3].

Efforts are made to reduce the negative impacts of electromagnetic radiation from television or can be anticipated in several ways, including limiting viewing time, maintaining distance from radiation sources, and using natural ingredients that have been produced into eco enzyme liquid. Eco enzyme (EE) liquid was first introduced by Dr. Rasukon Poompanvong, a researcher and environmental observer from Thailand, in his research using leftover kitchen ingredients (organic waste) [4]. Eco enzyme is the result of the fermentation of organic waste from vegetables, fruit, and...
fruit peels which is added with water and brown sugar [5]. Several enzymes contained in eco enzymes such as lipase, trypsin, amylase which can kill or prevent pathogenic bacteria, acetic acid \((H_3 COOH)\) which can kill germs, viruses, and bacteria as well as the nitrate \((NO_3)\), and carbon trioxide \((CO_3)\) content needed by soil for plant growth. Apart from its benefits in agriculture, there are many benefits of eco enzymes in everyday life, namely that it can clean air from pollution, clean polluted water, act as a floor cleaner, reduce chemicals, and reduce levels of electromagnetic radiation [6].

Eco enzyme liquid also contains flavonoids which come from organic fruit and vegetable waste which is one of the basic ingredients for processing eco enzyme [7]. Flavonoids contain conjugated aromatic systems so they show strong absorption bands in the UV and visible spectrum regions [8]. The basic principle is that if electromagnetic radiation in the ultraviolet region and visible light passes through compounds that have double bonds, some of the radiation is usually absorbed by the compound [9]. Absorption of radiation rays is caused by a reduction in the energy of the radiation rays when electrons in low-energy orbitals are excited to higher-energy orbitals [10].

2. Method

This research method uses 2 types of the eco enzyme (pineapple eco enzyme and eco enzyme variations of organic matter, varying the volume of the eco enzyme, 1 liter (see Fig. 1.a) and 2-liter volume (see Fig. 1.b). The position of the eco enzyme is placed in front of the LED television screen with the bottle cap open and the measuring instrument parallel to the surface of the bottle mouth.

![Fig. 1. Treatment eco enzyme to television by using a. 1 L EE, b. 2 L EE](image)

Television electromagnetic radiation measurements were carried out at measuring distances varying from 25 cm to 200 cm with durations of 5 minutes, 10 minutes, 15 minutes, 20 minutes, 25 minutes, and 30 minutes. For each measurement distance, the duration of the measurement is 5 minutes to 30 minutes, whether the treatment uses 1 liter or 2 liter of eco enzyme.

3. Results and Discussion

The results of this research are that the amount of television electromagnetic radiation decreases after the influence of the eco enzyme. Television electromagnetic radiation in the form of electric field values experienced the highest decrease at a measurement distance of 25 cm when a 2-liter pineapple eco enzyme was used. Television electromagnetic radiation in the form of electric field values experienced the lowest decrease at a measurement distance of 200 cm. Television electromagnetic radiation in the form of unstable magnetic field values decreased after using 1 liter or 2 liter of eco enzyme. The results of research on large amounts of television electromagnetic radiation in the form of large electric and magnetic fields before and after using eco enzymes can be seen in Fig. 2 and Fig. 3.
Figure 3 shows that at a distance of 25 cm the highest electric field value when the television was on before using eco enzyme was 30 V/m and the lowest electric field value was at a distance of 200 cm, namely 2 V/m. Based on the graph above, the highest decrease occurred at a distance of 25 cm for treatment using pineapple eco enzyme and eco enzyme, a variety of organic materials with a volume of 2 liters, namely 6 V/m - 9 V/m.

Figure 3 shows that the magnitude of the magnetic field experienced the highest decrease at a distance of 25 cm after using 2-liter pineapple eco enzyme and 2-liter BO variant eco enzyme. The farther the measurement distance, the greater the magnetic field decreases. The lowest magnetic field size before and after using eco enzyme was at a distance of 200 cm with the lowest magnetic field size of 0.07 μT
4. Conclusion

The conclusion obtained in this research is that the amount of television electromagnetic radiation decreased after using the eco enzyme, whereas the electromagnetic radiation of live television before using the eco enzyme had a large electric field and magnetic field respectively, namely 30 V/m and 0.22 μT. After using eco enzyme, the highest reduction in television electromagnetic radiation occurred in the treatment using 2 liters of pineapple eco enzyme at a measuring distance of 25 cm, namely 6 V/m and 0.18 μT. In this research it can also be concluded that the distance of the radiation source influences the amount of radiation generated from the radiation source, the further the measurement distance from the radiation source, the lower the radiation generated.

References


