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A STUDY ON THE EFFECTIVENESS OF HOMOEOPATHIC MEDICINE SULPHUR IN CONTROLLING DROSOPHILA MELANOGASTER ATTACKS IN HYDROPONIC ZEA MAYS

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ABSTRACT

Homoeopathy is a unique therapeutic system discovered by German physician Dr. Samuel Hahnemann. Homoeopathic medicines have become well-known for their ability to heal people all around the world. Homoeopathy is now being used in a variety of other industries, such as agriculture and animal husbandry. Hydroponics is the cutting-edge technology that has transformed green fodder production in the twenty-first century. The term 'hydroponics' comes from the Greek phrase for 'water working.' Hydroponics is a cost-effective and long-term option for dairy farming, allowing for faster production of nutritious green fodder. Young tender grass grown from cereal grain is used as hydroponic fodder. Hydroponic fodder is widely regarded as the best animal feed. Zea mays have been successfully grown and had positive feedback from animals as a fodder. Zea mays grain is the first choice for the development of hydroponics feed in India. Drosophila melanogaster wreaks havoc on Zea mays seedlings. In Dutch doctor Kaviraj's Agrohomoeopathy repertory, there are several homoeopathic medications for every medical condition and pest onslaught. Sulphur is a typical treatment for Drosophila infestations. There were two types of flytraps employed. The number of flies captured in the control and sulphur groups was counted every day. The number of fruit flies in the group sprayed with Sulphur 30 was found to be lower than the number of fruit flies in the control group in these flytraps as well. The study's findings suggest that the homoeopathic drug Sulphur 30 is effective in preventing Drosophila melanogaster attacks.

KEYWORDS: Drosophila Melanogaster, Homoeopathy, Hydroponic fodder, Sulphur, Zea mays

INTRODUCTION

Homoeopathy is a scientific therapeutic system of medicine founded on specific rules and principles discovered by Dr. Samuel Hahnemann in the 18th century. In humans, homoeopathic treatments have been found to be effective. Homoeopathic medicinal research and application in agriculture is slowly gaining traction. On numerous crops, significant outcomes have been documented utilising homoeopathy medications to combat stress situations during wet, hot, and dry circumstances; to improve germination and growth; to reduce pest, disease, and virus infection, among other things[(1)].

Domesticated animals are fed fodder / provender, which is a form of agricultural feed. Green fodder is a low-cost food source for dairy animals that is both appealing and digestible, and it helps to increase milk yield and quality. Green fodder is livestock's natural diet. Its production, in order to fulfil current demand, has become the most difficult task for cattle farmers. Green fodder supply has been severely hampered for a variety of reasons, and cattle output has suffered as a result [(2)]. Hydroponics is a cutting-edge technique that has transformed green fodder production in the twenty-first century. Hydroponics is a low-cost, long-term option for dairy farming, enabling the production of nutritious green feed easier and faster. It lowers concentrate feeding costs while raising profits [(3)]. Zea mays grain should be the first choice for developing hydroponics feed in India. One kilogramme of fresh hydroponics Zea mays feed yields 5-6 times on a fresh basis. Zea mays is a better choice for hydroponic fodder production because of its availability, lower seed cost, higher biomass production, higher seed to biomass ratio, and faster development habit [(4)].

Drosophila melanogaster wreaks havoc on Zea mays seedlings. In Dutch Dr. KAVIRAJ's Agrohomoeopathy repertory; there are several homoeopathic medications for every medical condition and pest onslaught. Sulphur is a typical treatment for Drosophilla infestations [(5)]. Using dilution preparations, according to homoeopathic science, is one of the most effective strategies to address phytosanitarian difficulties and restore biological dynamic equilibrium.

MATERIALS AND METHODS

Type of study and study design: Prospective experimental controlled study

Study Setting

Study has been conducted in hydroponics fodder system in green house at Neyyatinkara, Kerala (lat.80N, long. 77^0E) for a short duration (approximately 7 days).

Selection of Sample

Nine (9) Kgs of Zea mays were taken for the study. It was divided into 3 groups (Sulphur 30, plain Control and 91 % alcohol control) having 3 replicas each for scientific validity.

MATERIALS AND METHODOLOGY

This study was conducted to understand the control of Drosophila melanogaster with the homoeopathic medicine Sulphur 30. 9Kgs of Zea mays were divided into 3 groups each group having 3 replicas for scientific validity. 1 group of Zea mays were sprayed with Sulphur 30, the second group was sprayed with plain control and third group was sprayed with 91% alcohol. To understand the prevalence of Drosophila melanogaster various types of fly traps were used.

(a) Washing and Weighing

9 kgs of good quality fodder maize was selected for the study. Seeds were washed in tap water by stirring with wooden stick manually to remove chaff and dirt. 1 kg of fodder maize was weighed (figure 1) and was soaked in 9 different bowls (figure 2) in 1.5L distilled water for 24 hours.

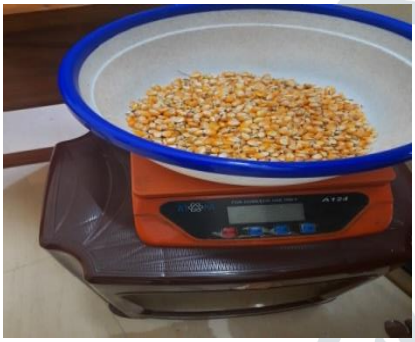

Figure 1 : Weighing maize seeds

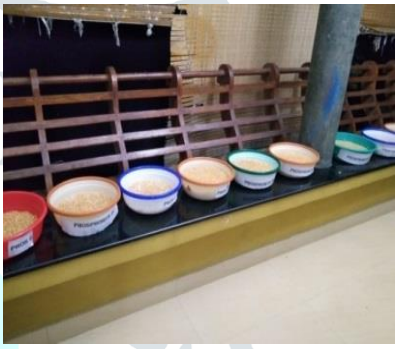

Figure 2: Soaked seeds

(b) Transfering to Germination Bags

After 24 hours of soaking, water was drained and seeds were transferred to germination bags for 24 hours for sprouting (figure 3).

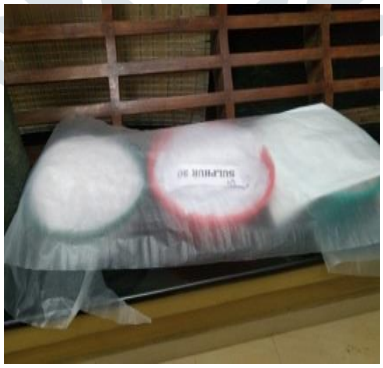

Figure 3: Transferred to Germination bags

(c) Transfering to Hydroponic Trays

24 hours after germination the sprouts were transferred to the respective labelled hydroponic fodder trays in the green house. The further assessment was done in the trays during its growth.

(d) Spraying Medicinal Solution

The sprouts in the trays were watered from a medicated solution containing 1 Litre of Distilled water mixed with 20 drops of Sulphur 30. Water was sprayed for 40 sec every 4 hourly.

(e) Fly Traps

Methyl eugenol Drosophila melanogaster traps were hanged above all the labeled trays. A yellow sticky paper was also placed in the trays which are replaced daily labelled and kept as evidence (figure 4). The numbers of flies are assessed daily until the 7th day. On the 7th day the methyl eugenol traps are taken out and the flies are counted and compared with those of the controls. The number of flies in the yellow sticky paper was also assessed.

Figure 4: Drosophila melanogaster traps

RESULTS AND DISCUSSION

In this group the study was conducted to understand the control of Drosophila melanogaster (fruit fly) with the homoeopathic medicine Sulphur 30. Two types of Drosophila melanogaster (fruit fly) traps were used to analyse the number of Drosophila melanogaster in each group. Methyl eugenol fruit fly traps and a sticky paper trap were used. This study was also conducted in 3 replicas. It was observed that in all the control groups both plain control and 91% alcohol control the number of flies captured were more than those observed in Sulphur 30. The same can be seen in photographic evidence.

Day 1

On day 1, not many flies were observed in both control and the sulphur 30 group.

Day 2

On day 2, on an average of all the three replicas 10 Drosophila melanogaster were observed in the control groups and none were captured in the Sulphur 30 group.

Day 3

On day 3, the number of Drosophila melanogaster in control was observed to be more than that in Sulphur 30.

Day 4

The number Drosophila melanogaster found in the sample sprayed with Sulphur 30 were very low compared to those in control group.

Day 5

The Drosophila melanogaster in the control group were very large compared to that of the Sulphur group.

Day 6

Just like the previous days the count of Drosophila melanogaster was very low in Sulphur 30 group compared to the control group.

Day 7

On day 7, the methyl eugenol fly traps were removed and the number of flies were counted and found that in these fly traps too the number of flies in the group sprayed with Sulphur 30 were far less than the number of Drosophila melanogaster in the control group as shown in *figure 5, figure 6 and figure 7*. The numbers of flies in the other fly trap were compared in the control group and Sulphur 30 group and it was found that the number of flies in the control group was much greater than the Sulphur 30 group as shown in *figure 8, figure 9 and figure10.*

Figure 5: Sulphur 30

Figure 6: 91% Alcohol

Figure 7: Plain Control

Figure 8: 91% alcohol

Figure 9: Plain control

Figure 10: Sulphur

Hence it can be concluded that Sulphur 30 can be effectively used against the Drosophila melanogaster which attack maize plants. Homoeopathy is a medical science that has proven to be beneficial in treating human illnesses. Plant treatment is identical to human treatment, according to a Dutch homoeopath [(6)]. The present controlled interventional study was performed to evaluate the efficacy of homoeopathic medicine sulphur in controlling drosophila melanogaster attacks in hydroponic Zea mays. The findings suggest that the homoeopathic drug Sulphur 30 is effective in preventing Drosophila melanogaster attacks. These findings correlate with those of several previous studies conducted on the use of potentised homoeopathic medicines in plants.

In a study laboratory evaluation of effects of powdered sulphur on the oviposition, fruit detection and behaviour of Drosophila suzukii, it is observed that powdered sulphur could be an appropriate alternative to

synthetic-organic insecticides for controlling D. suzukii and is compatible with organic crop management and waste reduction strategies [7].

In another study laboratory approach to the use of sulphur and kaolin as preventive control against Drosophila suzukii, the outcomes suggest that preventive use of powdered sulphur could be considered for sustainable control of D. suzukii in some berry crops [8].

CONCLUSION

The primary objective of study was to evaluate the effect of sulphur on Drosophila melanogaster (fruit fly) attack on maize. The medicines used in this study were selected from Kaviraj's agrohomeopathic Repertory. The results indicated that Sulphur 30 is effective on Drosophila melanogaster attack in maize.

In this study, two types of Drosophila melanogaster traps were used. Methyl eugenol Drosophila melanogaster (fruit fly) traps and sticky paper traps were used. It was observed that in all the control groups both plain control and 91% alcohol control the number of flies captured were more than those observed in Sulphur 30.

In Kaviraj's agrohomoeopathic repertory it is mentioned that pests like Drosophila melanogaster (fruit fly) can be controlled by using homoeopathic medicines Oci – b, Phos and Sulphur. We used sulphur 30 and found that it is effective against the Drosophila melanogaster (fruit fly) attacks in fodder maize.

Conflict of interest

The authors declare no potential conflicts of interest with respect to research, authorship and/or publication of this article

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