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Organic Pest Repellent

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ABSTRACT

The public's interest in environmentally sound pest control methods and the pest group's resistance to pesticides have recently driven the search for pesticides. In the home and city environment, parasites are mice, birds, insects, and other organisms that share their habitat with humans to feed and damage items. This pest control is carried out by exclusion, subtraction, physical removal or chemical means. Some pesticides not only harmful to cancer but also to human health, but can also harm wildlife. Therefore, an alternative organic pest repellent has been developed by using organic materials which were cinnamon and clove oil in order to make movement of insects outside the source of odor without direct contact and direct contact. The organic pest repellent (cinnamon and clove) was extracted using methanol solvent. The filtered extracts were then evaporate using centrifugal rotary evaporator to get the paste. This paste was mixed with a small amount of methanol. The results showed that, an ant is move away from the food that has been sprayed with organic pest repellent in the surrounding plate of food. This product is environmental friendly and chemical free for the usage in the household.

1. INTRODUCTION

People are increasingly concerned about the effects of pesticides on humans and other organisms, and many pests have developed resistance to some of the most commonly used pesticides. Some pesticides not only cause cancer and other health problems in humans, but can also harm wildlife [1, 2]. Many countries have set a maximum residue limit for pesticides in food and animal foods [3]. General interest in pesticide-safe pest control methods and the increase in insecticide resistance in pest populations has led to research on insect repellents in recent years [4].

Pest control is a regulation or management of species that are designated as pests, which are members of the animal kingdom that affect human activities. In a home and urban environment, parasites are rats, birds, insects, and other organisms that live with humans that feed and destroy goods. This pest control is carried out by exclusion, subtraction, physical removal or chemical means [5].

All of these factors lead to increase interest in non-chemical and environmentally friendly pest management methods [6]. This category can also be called non-chemical "organic" pesticides because the product is derived from soil, plants or even animals. The use of natural pesticides is one way of "organic"

treatment and reducing your carbon footprint. In general, natural pesticides are more environmentally friendly. Natural pesticides work better in the long run because pests tend to be less resistant. This means that over the long term, these pesticides are more effective than pests developed resistance. However, some natural products may be less effective than synthetic products. This largely depends on the ingredients used in organic pesticides.

In pest management, the true goal of repellent is to create an odor barrier to prevent an arthropod into potential host areas such as "safe zones" to reduce confrontation between insects and guests [7]. It is a fact that most pests do not like strong smells and will disappear from them. Therefore, cinnamon and clove has been used as an organic pest repellent which is environmental friendly and chemical free. Cinnamon or its scientific name *Cinnamomum verum* is actually a tree and the bark is used as a spice. It may not be a scientifically proven fact, but many homeowners succeed in getting rid of ants with cinnamon [8]. Cinnamon derives its strong taste and aroma from the various compounds used by the plant specifically to repel attacks from insects and fungi. These versatile chemicals are not harmful to most mammals but cause specific deaths for many fleas, fungi and bacteria [9].

Meanwhile, cloves are essentially aromatic dry buds from plants called *Syzygium aromaticum* which are dark brown, spicy and nail-shaped. Cloves also have insect repellent properties, especially for flies and mosquitoes [11]. Dried cloves can be used as an insect repellent because even if the oil dries, the spicy smell of cloves repels pests such as ants, flies and moths due to distinctive scent is not noticed by humans, but insects [10]. Dayan et al. also reported that clove oil is an effective fast-acting insecticide on arthropods, army worms, leaf lice, and mites [12]. Clove oil-based insecticides are much safer than commercial insecticides and can be used in the home without fear of insecticide poisoning.

2. INNOVATION DEVELOPMENT

This product is designed to be easy to use at anywhere and non-toxic. The raw sample of cinnamon and clove has been cut into small pieces and dried in oven for 24 hours. Then, the dried sample will be grinded using blender to turn it into powder form. A 10 g powder samples were soaked overnight in 100 mL methanol. Each residue as filtered and the filtrate was extracted using centrifugal rotary evaporator in order to get paste product. The paste is mixed with 30 % methanol and the ratio was varied to get the optimum dosage in 10 mL of repellent spray. The product was tested with two pieces of biscuit which one of it was sprayed surrounding with organic pest repellent meanwhile, the others is not. Figure 1 show the flow of experiment and Figure 2 show the results comparison of two pieces biscuit with organic pest repellent and without pest repellent.

The cinnamon and clove were dried overnight in oven.

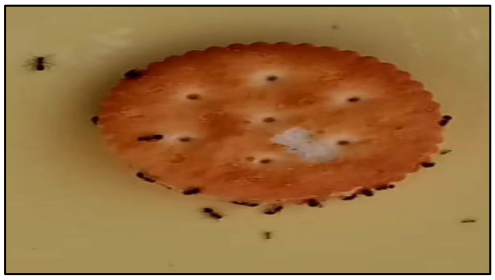
The cinnamon and clove were crushed to fine powder

The product was evaporated using centrifugal rotary evaporator

The extraction oil of cinnamon and clove

Figure 1: The flow of experiment

The biscuit with organic pest repellent



The biscuit without organic pest repellent

Figure 2: Comparison the use of organic pest repellent and without pest repellent

3. COMMERCIAL POTENTIAL

This product is made for community especially housewife that always faced the pest problem and for home gardening to avoid the pest from damage the food and vegetables. This product has a potential for commercialization since it is environmental friendly and easy to use.

4. CONCLUSION

This product is an alternative to solve the problems of community especially household that always faced the pest problem and for home gardening. This product can be used to prevent the pest especially ant or flies from gathering near the food. The uniqueness of our product is easy, economically and green technology. This product can be improved by using other organic materials and recommended to be applied for industry scale.

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