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Production of Eco-friendly mosquito coils from *Sphagneticola trilobata* (L.) Pruski

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Abstract
Mosquitoes transfer diseases without getting sick themselves. The Aedes aegypti mosquito transmits yellow fever, dengue fever, and Chikungunya. The Anopheles mosquito carries malaria. A mosquito coil is incense used in aromatherapy and religious rites to repel insects. Asia, Africa, and South America burn mosquito coils indoors and outdoors. Mosquito coils include an insecticide/repellant, smoldering organic fillers, a binder, synergists, dyes, and fungicide. Mosquito coils are popular because they're cheap and easy to use. However, continued use may breed mosquito resistance and harm users' health. This study aimed to make insecticidal mosquito coils from *Sphagneticola trilobata* (L.) Pruski. *Sphagneticola trilobata* is native to the northern part of South America and the West Indies. Synthetic mosquito repellent coils are commonly utilized in India. Long-term use of synthetic mosquito repellents causes neurotoxic and immunotoxic effects, skin allergies, seizures, eye irritation, insomnia, impaired cognitive function, cough, sneezing, headache, asthma, and bronchial irritation.

The primary reasons for employing Sphagneticola trilobata leaves are that it is an invasive weed that is numerous and readily available. According to a prior study, it has excellent insecticidal properties. It lessens the load on other medicinal plants that are extensively destroyed for mosquito repellent production. Since mosquito coils are inexpensive, they are accessible to all regions worldwide. It can be utilized in locations without power or when electricity is unavailable. They are safer and more eco-friendly for synthetic chemical-based coils than natural components. It has no adverse health consequences. It can be processed eco-friendly without hurting the ecosystem, but it will not be synthesized. To empower rural youth with work and to promote the use of herbal insect repellent coils as a completely safe alternative to chemical repellents. The research encourages the usage of natural mosquito coils rather than synthetic ones.

Keywords: *Sphagneticola trilobata*, mosquito coils, eco-friendly

Introduction

Mosquitoes are vectors that spread disease-causing viruses and parasites from person to person without becoming ill. The major mosquito-borne illnesses include the viral diseases yellow fever, dengue fever, and Chikungunya, which are usually transmitted by the Aedes aegypti mosquito, and malaria, which is carried by the Anopheles mosquito [1].

A mosquito coil essentially is incense like the one used in aromatherapy and religious rituals; only this one is used for repelling mosquitoes. Mosquito coils are burned indoors and outdoors in Asia, Africa, and South America. Mosquito coils consist of an insecticide/repellant, organic fillers capable of burning with a smoldering, binder, and additives such as synergists, dyes, and fungicide [2]. The mosquito coil is the most popular pesticide since it is inexpensive and straightforward to apply. However, its continued usage might build mosquito resistance and negatively impact the health of its users. This study aimed to make a mosquito coil from the *Sphagneticola trilobata* (L.) Pruski which is having insecticidal properties [3].

Sphagneticola trilobata (L.) Pruski

Sphagneticola trilobata is native to the northern part of South America and the West Indies. A creeping evergreen perennial that roots at the leaf nodes and spread widely. The leaves are ovate and usually three-lobed. The flower is a yellow daisy-like flower that is approximately1inch across. The plant makes an excellent ground cover. It grows well under trees. Recent research carried out indicates its uses such as antioxidant, anti-inflammatory, antimicrobial, wound healing, and antidiabetic activity [4].

Need for Natural Repellent Coil

Synthetic mosquito repellent coils are commonly utilized in India. Long-term use of synthetic mosquito repellents

causes neurotoxic and immunotoxic effects, skin allergies, seizures, eye irritation, insomnia, impaired cognitive function, cough, sneezing, headache, asthma, bronchial irritation, itching, ear, nose, and throat pain, dermatitis, reproductive dysfunction, developmental impairment, and cancer [1].

Objectives

1. The main objective of using *Sphagneticola trilobata* leaves is that it is an invasive weed that is available readily and abundant.
2. As per the previous research done, it is an excellent insecticidal property.
3. It reduces the burden on the other medicinal plants widely destructed for making mosquito repellent.

Reason for using mosquito coil

1. Mosquito coil is cheap; therefore, it can be affordable to all parts of the world.
2. It can be used in areas without electricity or in the absence of electricity.

Materials and Methods

New plant parts are washed, shade dried at room temperature, and powdered. After that, dry powder, sago starch, and *Eucalyptus* (Nilgiri) essential oil were added to a bowl, and a solid dough was made. Leaf powder and Sago Starch were taken in 1:1 proportion and essential oil in 1ml. Handmade Mosquito coil molds were made on hard card sheets, and then prepared dough was filled in the empty cavity of the mosquito coil mold. Dry it in sunlight with the cover of white muslin cloth of three layers. After drying, prepared mosquito coils were tested for burning capacity.

Fig 1: *Sphagneticola trilobata* Plant

Fig 2: Solid Dough

Fig 3: Mosquito Coil

Results & Discussion

Synthetic mosquito repellents are frequently utilized due to a lack of awareness about their hazardous consequences. Prolonged use of synthetic mosquito repellents causes neurotoxic, immunotoxic, skin allergy, seizures, eye irritation, insomnia, impaired cognitive function, cough, sneezing, headache, asthma, bronchial irritation, itching, ear, nose, and throat pain, dermatitis, reproductive dysfunction, development impairment, cancer, and death. DEET, picaridin, permethrin, and other synthetic insect repellents are hazardous. These disadvantages led to herbal mosquito coils [1]. Mandavgane *et al*. made the cow dung herbal coil based on the rituals, the chemical-based mosquito repellents available on the market contain some harmful and poisonous chemicals which are likely to cause a threat to human health. An attempt has been made to prepare a 100% herbal product based on traditional practices and rural wisdom. It is effective and cheaper than presently chemical-based mosquito repellent. The sago starch is proved an effective binding agent and suppresses the unpleasant smell of *Sphagneticola trilobata*; Nilgiri essence works very well.

Benefits of natural mosquito repellent coil

1. They better replace the synthetic chemical-based coil with natural ingredients that are safe and eco-friendly.
2. It does not have any adverse health effects.
3. It can be prepared under eco-friendly processing without disturbing the ecosystem, but synthetic will not be produced.

Conclusion

Production of mosquito coils employs rural youth and promotes the use of herbal mosquito repellent coils as a completely safe alternative to chemical repellents. The research promotes using natural mosquito coils as an alternative to synthetic coils. Its use does not cause any health hazards and disturb our ecosystem.

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