

Development of Natural Mosquito Repellent Coil Using Tea Fluff as a Filler Material

R.M.D.C.S. Ranasinghe¹, A.G.A.W. Alakolanga¹, A.N.R. Weerawansa¹,
H.G.H. Samaranyaka²

¹Department of Export Agriculture, Uva Wellassa University, Badulla,
Sri Lanka

²Imperial Tea Exports (PVT) Limited, Kelaniya, Sri Lanka

Control of mosquitoes is of extreme importance at the present day, with increasing number of mosquito borne illnesses. Therefore specialty products like mosquito repellents are used to combat mosquitoes. Chemical mosquito repellents have a remarkable safety profile, but they are toxic. Due to its high health risk researchers are making attempts to find out new filler materials and active ingredients derived from natural plants. Tea fluff has the required properties of the filler material. Hence tea fluff as a waste product produced during the secondary manufacturing process of the *Camellia sinensis*, can be utilized as a filler material for the production of the natural mosquito repellent coil. Citronella (*Cymbopogon* sp.) oil was used as the natural repellent. The preliminary trials were conducted with seven different tea fluff and binder ratios to find out the suitable tea fluff and binder range. Ratios were selected based on the sensory evaluations which were breakability, width, color, appearance and overall acceptability as sensory parameters based on 5-point hedonic scale. The effectiveness of the mosquito coils were evaluated on flammability, burning time and mosquito repellency level. 3% repellent level was identified as the best effective mosquito repellency level without causing human toxicities. Mosquito repellency level tests were conducted according to the World Health Organization reference and as the test arena model of Peet Grady chamber. The final product was determined through another sensory evaluation on breakability, color, aroma, appearance and overall acceptability as sensory parameters based on 5 point Hedonic scale. Data were statistically analyzed using Friedman test at 5% level of significance using MINITAB 16 statistical software. The finally developed new coil had five and half hours of burning time.

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