

## ***Evaluating Plant-Based Compounds and a Chemical Disinfectant to Control Abundantly-Colonizing Fungi on the Mirror- Wall, Sigiriya Sri Lanka***

P.W.C.K.Ranthilini<sup>1</sup>, K.G.R.Kurupparachchi<sup>2</sup>, D.M. De Costa<sup>3\*</sup>

<sup>1</sup>*Postgraduate Institute of Agriculture, University of Peradeniya, Sri Lanka*

<sup>2</sup>*Department of Archaeology, Chemical Conservation, Colombo 00700, Sri Lanka*

<sup>3</sup>*University of Peradeniya, Department of Agricultural Biology, Sri Lanka*

Fungal colonization threatens to the archaeological value of the mirror-wall, Sigiriya, Sri Lanka. This study aimed to evaluate the effectiveness of several plant-based compounds and a chemical-disinfectant against fungi, comparing them to the present recommended synthetic fungicide, mancozeb. Commercial grade neem oil (NO), cinnamon bark oil (CBO), clove oil (CO), NO + CBO + CO mixture (1:1:1 ratio at v/v), Dorana oil (DO), *Hal* bark extract (HBE) and a mixture of DO and *Hal* resin (2:1 ratio at v/v) were tested at five concentrations (v/v). Benzalkonium chloride (BKC), a commercial-disinfect, was tested at the same concentrations and the recommended dosage of Mancozeb (2g/l) served as the reference. Five fungi (i.e. *Acromonium* isolates 1 and 2, *Aspergillus niger*, *Penicillium* isolates 1 and 2 and two unidentified fungal isolates) which are highly abundant on the mirror-wall surface were used for the study. Colony growth inhibitions by each concentration of the treatments were tested by poison food technique according to a complete randomized design with three replicates. Percentage colony growth inhibition was quantified in comparison to untreated control treatment. Except for the two *Penicillium* isolates, the other three fungal isolates were completely inhibited by NO + CBO + CO (1:1:1). One *Penicillium* isolate was fully inhibited at 0.5% concentration of the NO + CBO + CO mixture, while the other was inhibited at 1%. Colony growth of all five fungal isolates was completely suppressed by 0.1% BKC. None of the DO concentrations fully inhibited *Acromonium* isolate 1; *A. niger* and *Penicillium* isolate 2, while other fungal isolates showed a slight growth suppression. Mancozeb recommended dosage could not inhibit the colony growth of *Acromonium* isolate 1, *A. niger* and *Penicillium* isolates 1 and 2 completely. The results indicate BKC and NO + CBO + CO (1:1:1) as safer and more effective alternatives for currently used fungicide.

**Keywords:** *Vateria Copallifera*, Traditional Medicinal Trees, Benzalkonium Chloride