

Report on the best practices for conservation of Palm-Leaf Manuscripts in Sri Lankan Libraries

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Sri Lanka is a tropical climate country, which is located in the Indian Ocean, enriched with diverse document heritage such as inscriptions, palm-leaf, glass, gold leaf, copper leaf, silk cotton and cloth materials (*The scoping IFLA workshop on palm leaf manuscripts, 2017*). Among these, palm-leaf manuscript heritage is considered vital and its history goes back to its civilization. In the meantime, Palm-leaf manuscripts include an enormous extent of indigenous knowledge in different subjects such as Buddhism, history, archaeology, traditional medicine, folktales and astrology, etc., (*The scoping IFLA workshop on palm leaf manuscripts, 2017*) preserved by the Buddhist monks and other communities until today. These Palm-leaf manuscripts are in different sizes and styles, enriched with unique characteristics such as external code bindings, wooden covers and different artistic decorations (*Alahakoon, C.N.K., 2009*). Further, Palm-leaf are located in different places such as Buddhist temples, libraries, museums and personal collections under different conditions. Therefore, since Sri Lanka located in a tropical weather condition, the storage and handling of palm leaf manuscripts are more crucial. Lack of standard storage systems directly caused for different contextual issues in Sri Lankan palm-leaf manuscripts collections today. In this context, palm-leaf stored cupboards are closed for a long period and environment condition and types of the cupboards are supported for a deterioration of the Palm-leaf collection. Since this situation is very common in Sri Lanka, conservation to be considered to safeguard the palm-leaf collections for future generations. National Library and Documentation Services Board (NLBD) of Sri Lanka provides instructions to preserve Palm-leaf manuscripts in the country.

Madhuka longifolia seed oil (Ericales: Sapotacea) or *Mee* oil and *Vateria copallifera*, (Malvales: Dipterocarpaceae) resin oil or *Dummala* oil have been used traditionally since ancient time for the preservation of palm leaf manuscripts. Accordingly, the paper conservators of government institution follow mainly traditional methods for the preservation of palm leaf manuscripts under their custody. They use charcoal powder obtained from *Trema orientalis* (Rosales: Cannabaceae) mix with *V. copallifera* resin oil, which is obtained by distillation of *V. copallifera* resin excreted from its bark to rub with soft cotton cloth dip in *Dummala* oil and fine powered charcoal mixture. Thereafter it is left to dry and then leaf surface is cleaned with finely powered rice bran (Dhaieya) to remove excess oil on the palm leaf (Gunawardana, 1997).

It is believed that this herbal oil could improve the flexibility of palm leaves in addition to keep away the bacteria, mold and insects which are harmful for the permanence of the palm leaf manuscripts. This trusted herbal oil which have been handed down from generation to generation

was tested against bacteria, mold and insect pests commonly associated with palm leaf manuscripts.

Results indicated that oil could control bacteria species of *Bacillus* sp., *Bacillus pumilus* strain, *Kocuria marina* strain, *Sphingomonas pseudosanguinis* and common mold found in palm leaf manuscripts of *Cladosporium cladosporioides*, *Penicillium corylophilum* and *Acremonium alternatum* (Cabral *et al.*, 2012).

The palm leaf around 200 years old housed in National Library of Sri Lanka regular treated by *Dummala* herbal oil was examined through Microscope (Model 100, (230V,50/60 Hz)- W30600-230 (1005402) observed hair cracks on the surface of palm leaf (Figure 1). It was examined deeply through Scanning electron microscope (Regulus, 8100) and confirmed a rot fungus widely spread in the core area of the leaf (Figure 2). It is obvious that traditional treatments are not validated for the preservation of palm leaf manuscripts. Hence for the safe guard of native palm leaf collections a hybrid method was developed with the assistance of available chemical and traditional preservation disciplines. According to this method palm leaf manuscripts are stored and preserved. According to this method once palm leaf manuscripts are treated traditionally by *Dummala* oil it is kept in a specially design fume cupboard (Figure 3). The 5g of crystal 2-isopropyl-5-methylphenol (C₁₀H₁₄O, Thymol) is placed the bottom of the cupboard made out of neem wood. Turnstone bulb (70W) gives heat to evaporate 2-isopropyl-5-methylphenol vapor to goes through palm leaf manuscripts placed on the shelves of the cupboard. Shelves are designed to expose the maximum 2-isopropyl-5-methylphenol vapor on the palm leaf manuscripts stored in the cupboard. Palm leaf manuscripts are stored in a such cupboard with the aim of long-term preservation. The system was run (switch on the bulb) two hours per month. A significant control of rot fungi and disappeared them from the palm leaf was observed after two months of period. Palm leaf manuscripts found in Sri Lanka are prepared technically, from refined *Corypha umbraculifera* (Arecales:Areceaceae) leaves. They are very resistance and stable in the tropical climate in Sri Lanka. Hence this storage system was kept in normal environmental condition in a library (In high RH and temperature) but cupboards are opened for 3 hours once in two weeks get fresh air circulation. This storage system may safeguard our documentary heritage for the coming generations.



Figure 1. Hair cracks on surface X500

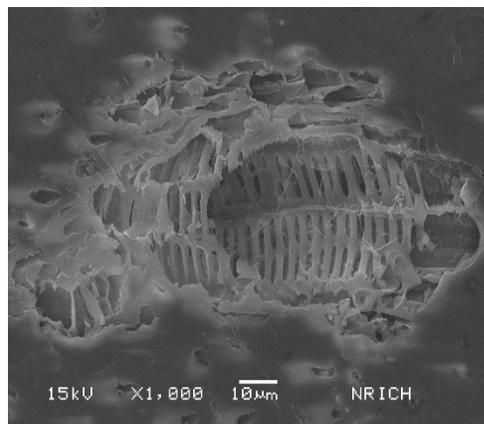


Figure 2 A rot fungus growth in core area X1000

Made of Neem Wood

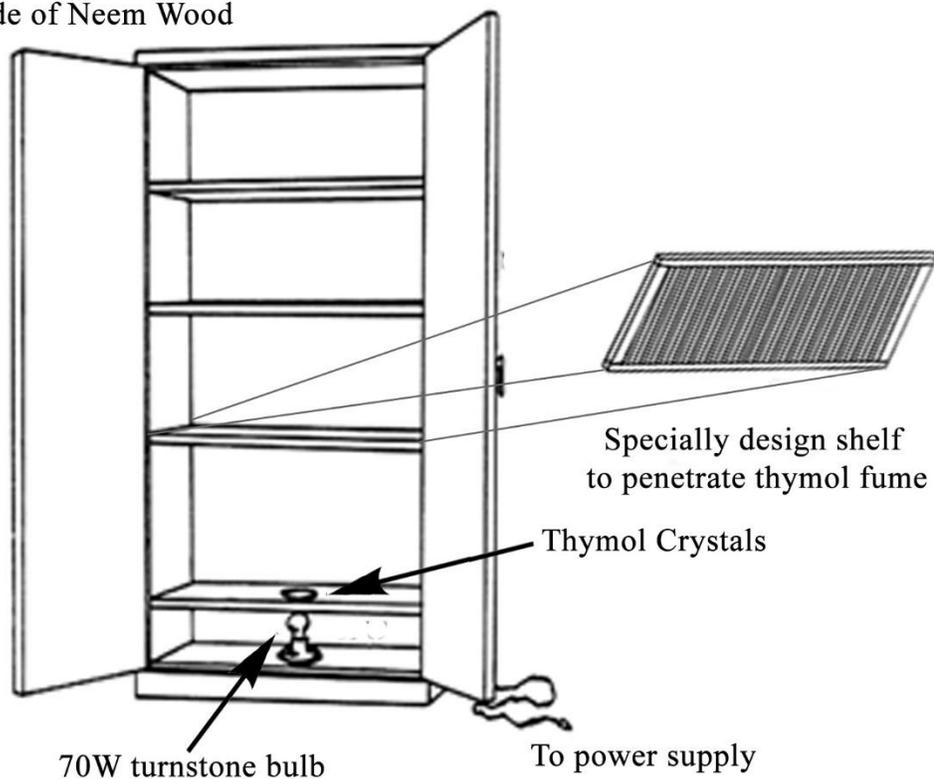


Figure 3. Palm leaf manuscripts stored cupboard

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