

PALM LEAF MANUSCRIPT CONSERVATION, THE PROCESS OF SEASONING WITH SPECIAL REFERENCE TO SARASWATI MAHAL LIBRARY, TAMILNADU IN INDIA: SOME TECHNIQUES

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Abstract

The Palm leaf manuscripts contribute to our most valuable and precious national heritage as rare collection of recorded knowledge. Before the advent of paper in any region of the world, palm leaf was one of the important sources for writing. These manuscripts have existed over the years and are very much important till today. The major factors for the deterioration of Palm leaf manuscripts have been discussed; their preservation process, the ancient as well as the modern techniques have been dealt with. Since these palm leaf manuscripts are important for the retention of knowledge, therefore their conservation is a vital point to be taken note of.

Key Words: Palm-leaf, Gingili oil, Seasoning, Shritala.

1.0 Introduction

Palm-leaf has been used by man as a material for writing and keeping records in ancient India. In 6th century B C, it came into practice as a writing material vehemently. Palm-leaf manuscript is one of the oldest medium of writing materials in India and especially in the region of Southern India. In the South and South Asian countries like Myanmar, Srilanka, Nepal and Indonesia, the palm-leaf was used for writing and painting (Agarwal, 1984). [1]Agarwal states "It is difficult to say exactly when the palm-leaf first began to be used for writing". [1]It has been mentioned that the species of a tree were brought to India from Africa - they are the Palmyra palm (*Borassus flabellifera* Linn) which is named as 'Tala', and the second one is Fan palm (*Corypha umbraculifera* Linn). It is also called as 'Sritala' or 'Talipot'. These manuscripts which have been found in India contain traditional knowledge like medicine, astronomy science, hymns; literature etc. The prime responsibility of the present day archivists & librarians is to look for exact solution for the conservation of the palm-leaf manuscripts. So, it is our duty to save these treasures for our future generation.

2.0 Palm-leaf manuscript: The Prologue

Traditionally, palm-leaf manuscript has been transmitted from generation to generation through scholars and scribes. Copyists of these manuscripts were categorized as: professional (self-employed); the person appointed by the King

to do this job, while some others undertook it as a hobby. Generally, the decay or affected old manuscript was either burnt in a cooking medium or thrown into the river after the manuscript was totally replicated.

Writing on palm-leaf manuscripts was done in two ways. One was to engrave on the leaves with a pointed metal 'stylus', & the other one was to write with ink on leaves using 'bamboo pen' or 'brush'. A pointed tip was used for the 'stylus' or 'salaka', which was being made up of iron, steel, brass and bone etc. While writing with stylus, the left hand thumb would support the pointed tip for movement. To give clarity of letters, the engraved leaves were treated with turmeric powder and a mixture of vegetable juice with lamp shoot. [2]For this, turmeric powder was spread on 'Ramayana' and 'Mahabharata' manuscript. Lamp shoot was also mixed with some volatile oil like citronella oil for clarity of letters.

3.0 Literature review

A review of related literature has been made, and information collected about the factors of deterioration and preservation and conservation of Palm leaf manuscripts through indigenous methods. Chakravarti, S (1947) studied the physical properties of palm leaves. He found that, the palm leaf is four times stronger than good quality handmade paper. [3]Suri (1947) discussed about the traditional methods adopted in Jaisalmir for keeping manuscripts safe that includes, keeping small bags of a sort of grass known as 'Panadi' among the manuscripts bundles to save them from white ant. [20]Nordstrand (1958) described the procedures followed in the Royal Library of Copenhagen for the treatment of embrittled palm leaves with drying oil. [13]Gupta, C.B. (1974) pointed out the availability of palm leaves in south India, Bihar, Bengal and in the countries of Nepal, Ceylon, Italy and even in the British Museum, London. He categorized the causes of deterioration as physical and chemical damage; biological and microbiological damage; constant handling and improper storage. [6]Padhi, B.K. (1974) mentioned about the availability of palm-leaf manuscripts in abundance in Odisha and illustrated that palm leaves used for writing are primarily of two types, namely Sritala and Tala. He focused through his study the various indigenous methods of preservation with emphasis on rubbing of turmeric paste, keeping powered neem leaves, ghorabach, kumkum fruit and a paste mixing the juice of country bean, Eclipta Alba and Black Thorn Apple Stramonium as well as periodical drying under tender sun light. [14]Agrawal, O.P. (1984) in his study mentioned that palm leaves should not be stored in very dry conditions. To bring flexibility to palm leaves, various types of oil such as citronella oil, camphor oil and walnut oil can be used. He also mentioned the process of seasoning of palm leaves that are prevalent at South Asian countries namely India, Sri Lanka and Thailand. [1]Suryanwanshi et al. (1992) experimented on the use of a number of oils for regaining flexibility of brittle palm leaves. Application of camphor, eucalyptus and clove oil in normal atmospheric conditions found to be helpful in improving flexibility of hardened palm leaves as these are more volatile, light, dry and are easily absorbed by the leaf, while in hot weather conditions Margosa (Neem oil), lemon grass and citronella oils are very effective in softening and improving flexibility of palm-leaves. [21]Sinha, D.G. and Agrawal, O.P. (1994) mentioned that palm leaf is the typical writing medium in Indian influenced cultural regions. The study recommends some treatment procedures to prolong the longevity of the manuscripts. [19]Joshi, Y (1995) in her study has given some prominent examples of early palm leaf manuscripts available in India that include 'Panchmi Kaha' which was written in 1109. He cited various methods of seasoning and how they differed from place to place. The study also described that, in some parts of South India the palm leaves are dried and boiled in water, any abnormal growth then paired off with a knife and gingili oil is rubbed to smoothen the surface. The author has also mentioned the writing procedures for Sritala and Tala variety of leaves. In her study, she pointed out that palm leaf is a natural product and organic in nature. Like all organic products it is very susceptible to deterioration caused by changes in climatic conditions i.e. temperature, relative humidity, light and by biodegradation. She also illustrated about indigenous methods of preservation as well as the modern preservation techniques and stated that separation of stuck-up palm leaf is effected by exposing to moisture, placing them in a bath of hot water at 60 degree centigrade containing 5-10% glycerin. For regaining flexibility of the dried and brittle leaves a number of chemicals like citronella oil, camphor oil, and clove oil in combination with water and alcohol in different proportions have been tried and found effective. For inking the engraved characters, use of powdered graphite, lamp black, citronella oil or alcohol and carbon black has been recommended. The traditional housing of palm leaf manuscripts in wooden shelves or wrapping with heavy cloth is conducive for easy access for insects and rodents. So, a suitable casing for individual manuscripts should be prepared. [9]Prajapati, C.L. (1995) in his study described the system of writing over palm leaves. He is of the view that, there are two systems of writing viz. by using fluid inks and quill pens and by engraving letters and characters first, then colouring them are followed. He also mentioned the factors responsible for decay and damage of palm leaves and the agencies responsible for decay

are climatic factors, polluting factors and biological damage. The elements of climate generally considered are light, heat and moisture for which palm leaves are deteriorated affected by the changes in these elements. [16]Bisoi. K.K. (2000) in his study mentioned that, till 19th century palm-leaves were used as writing materials in Odisha and the writing was done with the help of iron stylus. For writing metal stylus was used and the ink was prepared by mixing oil with black pigment of coconut shell. [2]Ramana, Y.V. (2005) has illustrated in his paper, about ample collections of India's ancient manuscript and its availability. The author has given the indigenous techniques like wrapping and also suggested some natural products of preserving Palm leaf manuscript. [18]Harinarayan. N.S. (2005) in his study has classified the causes of deterioration of palm leaf manuscripts into six categories such as atmospheric factors, physical wear and tear, dust, attack by living organism, mishandling, stains and discolouration. He mentioned vividly the traditional methods of preserving palm-leaf manuscripts that are prevalent in different parts of India. In some places palm leaves are taken out at least on Vijayadasami day, cleaned and kept back. In some places the annual ritual is to apply paste of coconut juice, wood charcoal or turmeric then the leaves are wiped away with a clean cloth. [7]Udayakumar et al. (2009) mentioned about various palm leaves which were used in India for writing like *Borassus flabellifer* Linn (the palmyra palm), *Corypha Umbraculifera* Linn (talipot, fan palm) and *Corypha Taliera* Roxb. They have described about the seasoning process of palm leaves. Gaur, Ramesh C. and Chakraborty, Mrinmoy (2009) elaborated about National Manuscript Mission that aims to bring out and conserve the ancient Palm leaf manuscripts of India. They have also suggested that the life span of a Palm leaf manuscript is quite longer than that of a device like CD or microfilm. [2]Kumar, U.D., Sree Kumar, G.V. & Athvankar, U.A. (2009) introduced the varieties of species of Palm leaf which were used in India as writing materials. The author has emphasized the use of herbal extracts to prevent natural decay. The elements or metals used as writing materials have been mentioned in their paper. [11]Kharbade, V.B. (2009) contrived the importance of cultural heritage, the factors of deterioration and assessed the appropriate method and treatment of Palm leaf manuscript. [10]Ghosh, Rituparna (2012) in her case study on "Palm leaf Manuscript Conservation" has discussed the importance of Palm leaf manuscript in India and also explained the types of damages caused by parasites. [5]

4.0 Palm-leaf manuscripts: preparation for writing

The process of preparation of palm-leaf manuscript for writing varies from one region to another. Sometimes the tender leaves are cut, dehydrated under partial or relative darkness. It is then buried into marshy water, kept wet for 3 months, and used for writing. Generally, in India the leaves were dried in a controlled way and boiled. The dried leaves were boiled in a turmeric solution. [5]

For writing on palm-leaf, the type of leaves is important. In 'Tala' leaves, a sharp pointed 'Stylus' was used; lamp black and gingili oil (*Sesamum indicum*) were mixed and used for engraving the portions. But only ink was used for 'Shritala' leaves. After writing, the leaves were arranged and two holes were made on both sides of the leaves, and tied with two wooden planks of softwood like bamboo. Sometimes, teak wood was used to get rid of any type of insects. The palm-leaf bundles were then kept together, and were overlaid with a red cloth. It is significant that the red cloth is highly repellent for insects. It also protects the palm-leaf from dust. [8]

5.0 Processing of Palm Leaves

Processing or seasoning is an important aspect for palm-leaf conservation. At first, five to six months old leaves were collected, the edge ribs removed, separated and then dried in shadow for writing. The dried leaves were cut out through its edges into a commodious length. The leaves were divided into its equal parts, using the holes and for passing thread to tie up. In most of the cases, by incising method, the leaves were used for seasoning. The process of seasoning helped to soften palm leaves through its surface. Generally, Palm-Leaf processing differs from one place to another. [7] These are as follows:

1. At first, the collected leaves were boiled in milk and water.
2. These leaves were also boiled in steam and for their softness the leaves were buried in wet sand; after boiling these were kept aside for considerable softness.
3. After getting the softness, gingili oil was mixed with the leaves to make them smoother.
4. Seasoning in Thailand and South India is quite different. In Thailand, the leaves were kept between two wooden planks, but in South India, for seasoning, the leaves were kept along with wet rice. The seasoning of palm leaf manuscript gives softness to the surface for writing.

6.0 Palm-Leaf manuscripts: Factors of Deterioration

Durability of manuscript depends on quality of new materials. The use of chemicals during manufacturing and the quantity of impurities affect the materials. Manuscripts made with component having long cellulose fibre (i.e. alpha-cellulose) are more durable, and also increase the tensile effect of manuscript. Presence of lignin in palm leaf also breaks down the polymer chains of cellulose molecules, and affects the fibre bond of the leaves. [8] Some other factors of deterioration are discussed below:

Fungal effect: Fungus is most injurious to palm leaf. In a suitable condition, fungus grows enormously and affects the leaves badly. Basically, humid climate is the ideal for fungus replication. After a certain time, the palm leaves stick to one another and makes the leaves softer. After drying, the affected leaves are denatured, and also this leads to cleavage.

In 'Shritala' manuscript, cleavage is formed in the surface layer from the main body of the leaf. Rough handling and storage are the main cause for cleavage. Here, a solution like ethanol and water can be used to soften the portion, and Poly-vinyl-acetate (PVA) emulsion adhesive can be used to fix the position.

Insect damage: The common damages of palm leaf may also be done by insects. They not only affect or eat the manuscript, but the insects destroy the whole manuscript within a very short duration. Insects are attracted, when palm leaf absorbs more moisture. Some commonly found insects like cockroaches, termites and warms are harmful to manuscript.

Stains and Sports: Sometimes dust accumulation, insect's excreta, lamp shoot etc, can be found on the surface of palm leaf which damages the manuscripts.

Discoloration: Most of the acidic ingredients are water soluble. Old manuscripts become brown and yellowish due to the oxidation of lignin.

7.0 Manuscript Conservation: Case Study of Thanjavur Saraswati Mahal Library, Thanjavur

The Thanjavur Maharaja Serfoji's Saravati Mahal Library is one of the eminent medieval libraries that exist in India. Situated in the southern part of India, it is an unbounded repository of culture and inexhaustible treasure house of knowledge built by the successive dynasties of Nayaks and Marathas of Thanjavur. It has a lot of manuscript collections, especially rare collections of ancient manuscripts. A complete indigenous method is used in their conservation, including several natural products devoid of any chemicals.

A list of total holdings of Palm leaf and Paper manuscripts in various languages is illustrated below:

Table 1: Number of Manuscripts in different languages

| Sl. No. | Languages | Palm Leaf | Paper | Total |
|--------------|-----------|-----------|--------|--------|
| 1 | Sanskrit | 18,877 | 21,068 | 39,945 |
| 2 | Tamil | 5,968 | | 5,968 |
| 3 | Telegu | 778 | 44 | 822 |
| 4 | Marathi | | 3,080 | 3,080 |
| 5 | Hindi | | 22 | 22 |
| Total | | 25,623 | 24,214 | 49,837 |

The Library has the richest collection of manuscripts in India which reflects the culture of South India. These manuscripts represent the entire collection of Maratha rulers, the collection of Maharaja Sarfoji from all over the world, works written by scholars, researchers etc. This library represents an eminent Oriental manuscript library in India for its rare collection of manuscripts.

For the preservation of the Palm leaf manuscripts, Citronella oil is smeared on them to give flexibility to leaves. To keep away the insects, an indigenous preservative consisting of the powder mixture of sweet flag, black cumin and

bark of Cinnamon with camphor is also used with it. In addition to these, the modern insect repellents like naphthalene balls or nifol is used along with it. The library has used cloves and pepper to ward off manuscript from parasites.

The manuscripts and books are being cleaned and conserved periodically. Palm leaves are periodically cleaned and smeared with citronella oil, and it acts as an insect repellent. Generally, if the script or part of the manuscript is not legible to read and write, then the lamp soot is mixed with Citronella oil which is used for making the letters more transparent. A list of indigenous preservative products and their uses for Palm leaf preservation has been discussed below:

7.1 Palm leaf Manuscript Conservation (INDIAN SCENARIO)

The concept and use of conservation is an old aged tradition. There are numbers of traditional and herbal treatment used to avoid insect attack. There is also ways of fungus, dust accumulation, etc. From ancient times, several indigenous methods have been used for conservation of manuscripts. For instance, people were quite aware of the four basic factors of deterioration, namely, dust accumulation, light, heat and humidity. From that viewpoint, people used the red cloth to cover the manuscript because there colour itself is an insect repellent. Some traditional techniques which were used by the people for preservation of manuscripts and some of these techniques are still being practiced as below: [15]

1. Traditionally, manuscripts were often stored in kitchen where evaporation of smoke kept insects away from palm-leaf.
2. Some antiseptic effect like burying the palm-leaves under mud or boiling in water have been done before writing on them, and this created natural protection against insects.
3. Wrapping of manuscripts in silk clothes created another remarkable effect on manuscripts. Book worm, which is injurious to palm-leaf, were unable to affect the manuscripts covered with silk-cloth.
4. Wooden chests also saved the bundles of manuscripts from the rigorous climate change.
5. Sometimes manuscript preservation was done on underground cells rooms too.

At present, to preserve palm leaves, lemon grass oil is applied to each leaf, then dried, and kept under air condition at low temperature. [11] Some other ways to preserve these manuscripts are:

1. To repel insects from palm leaves manuscripts, dried and powdered leaves of Aswagandha (*Withania somnifera*) are kept with covered manuscripts.
2. To save from insect attack, pieces of dried ginger, or so called 'vasambu' are kept with the bundles of manuscripts.
3. The use of lemon-grass or Citronella oil (*Cymbopogon nardus*) also increases the longevity of manuscripts. It helps to pull down the micro-organisms.
4. The use of natural herbs like Ghorbach (*Acorus calamus*) keeps insects away from manuscripts.
5. Application of KalaJeera (*Nigella sativa*) gives out a forceful aromatic smell which is a strong insect repellent.
6. Application of Camphor oil (*Cinnamomum camphora*) and Neem leaves (*Azadirachta indica*) on the surface of the palm-leaves keeps it more flexible. Synthetic Camphor oil is also used to prevent manuscript from insect attack.
7. Some libraries may also use the Sandal wood oil (*Santalum album*) to save the manuscript from insect attack.
8. Mint leaves (*Mentha spicata*) keep away cockroaches and ants.
9. Ajwan powder (*Trachyspermum ammi*) also acts as an insecticide and fungicide. Custard apple seed powder is also used to ward off insects from these manuscripts.
10. Some disinfecting agents like turmeric paste, bark of Cinnamon is (*Cinnamomum zeylanicum*) also well known in some libraries in India.
11. As an anti-fungal agent, eucalyptus oil is effective for repelling insects.

Recently, the chemical insecticides are used in a fumigation chamber. Other chemicals, like Naphthalene, Para-dichloro benzene (PDCB), Thymol are used extensively as fumigants.

8.0 Repairing of Palm leaf manuscripts

Palm-leaf manuscript requires repair due to damaged or broken leaves. Traditionally, stitching method was used to join the broken palm leaf, and later some papers with adhesive and cello tapes were also used for repairing. Now a days, the new palm leaf powder with PVA emulsion called 'Gesso' is used to join the damaged leaves.

Nowadays, a damaged item or single sheet is placed between two sheets. This is known as 'encapsulation'. Here, each leaf is kept in chemically inert materials like Polyester film, cellulose acetate etc., and the edges are sealed. In India, this process is followed in some manuscript libraries. [17] At present, Japanese conservation techniques have an influence over other techniques all over the world because of less use of chemical ingredients here for conservation of manuscripts.

9.0 Conclusion

Palm leaf manuscript is the most reliable source in the historical context. In the writings on palm leaf manuscript, we find the traditional life style, exposure of knowledge, hymns, religious scripts, etc. Palm leaf manuscripts are especially important in India and the South eastern part of Asia, since these were the most common medium of writing in ancient times. There is common proverb "Prevention is better than cure." The conservation process of these manuscripts includes some scientific methods and indigenous techniques to prevent these from future deterioration. Nowadays, large numbers of manuscripts are still available in some parts of India. So, it is proper time to preserve and save these valuable treasures for future generation.

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