

Standardization of different Chemicals for Bleaching of Prepared Leaf Skeletons for Dry Flower arrangements

Saima Mir* and M M Jana

National Chemical Laboratory, Pashan Road Pune 411008, INDIA

Available online at: www.isca.in, www.isca.me

Received 18th April 2015, revised 10th May 2015, accepted 30th May 2015

Abstract

Dried or preserved plant materials complement any home decor in both formal and informal arrangements unlike fresh flowers dried flowers last almost indefinitely, if carefully preserved and require very little care. Beautifully arranged dried flowers may be a little bit expensive, but they are quite long lasting and can even last for many years. Preparing leaf skeletons and showcase them in natural form is an interesting art. Dried leaf skeletons can add more importance to dry flower industry. Skeleton zed leaf is purely cellulose in which some of the leaves look like fabric, some like lacework, silk or organza and some like paper which are quite durable. The leaf skeletons can be prepared and preserved by various techniques for their future use in crafting of beautiful flowers and many other decorative articles. Present study describes the use of various chemicals for removal of unwanted color from prepared venation skeletons.

Keywords: Dry flowers, bleaching, leaf skeletons.

Introduction

Dried flowers have been used as a decoration from time immorial. The interest of dried flowers comes in waves bringing all the old applications and techniques along with fresh ideas and inspiration. There is also a huge market of dry flowers throughout the world, sophisticated training and expensive equipments are not required to come up with a variety of decorative designs. Dried flowers are extremely useful because of its advantages as the dried floral arrangement can be kept anywhere with no worries. Though flower drying was well practices in ancient times but commercially the flowers were dried in Germany first. Dried and preserved flowers offer a wide range of qualities like novelty, longevity, aesthetic properties, flexibility and year round availability². Dried flowers constitute 60% among the total flower export from India³

Skeleton leaf preparation is an art which can be used for beautification and for interior decorations. Skeleton leaves are semi-transparent leaves, also called as fossil leaves. The fresh leaves wither and lose freshness. After a long span of time, these leaves get dry and the fleshy portion is naturally removed, leaving behind the damaged network of veins which is not the case in chemically prepared ones (By fermentation)⁴, (as shown in before and after figures-1 and 2) this technique would help to produce large scale production of leaf skeletons. Thus naturally processed skeleton leaves cannot be used further because of the deteriorated network of veins. Skeleton leaves prepared from fermentation need to be bleached, as the yellowing or some other kind of discoloration is the main problem in them to overcome with this skeletonised leaves can be processed for bleaching to remove their discoloration. Further they can be processed for softening to make them soft and unbreakable.



Figure-1
Before Fermentation



Figure-2
After Fermentation

Material and Methods

The studies were carried on fine and undamaged skeletons of *Ficus religiosa* leaves. In present study commercial grades of Hydrogen peroxide and Ala the commercial fabric bleach whitener that has been used for many years by house wives to whiten the clothes of white colour were used. In studying the techniques of bleaching the prepared leaf skeletons were cut and were given a square shape.

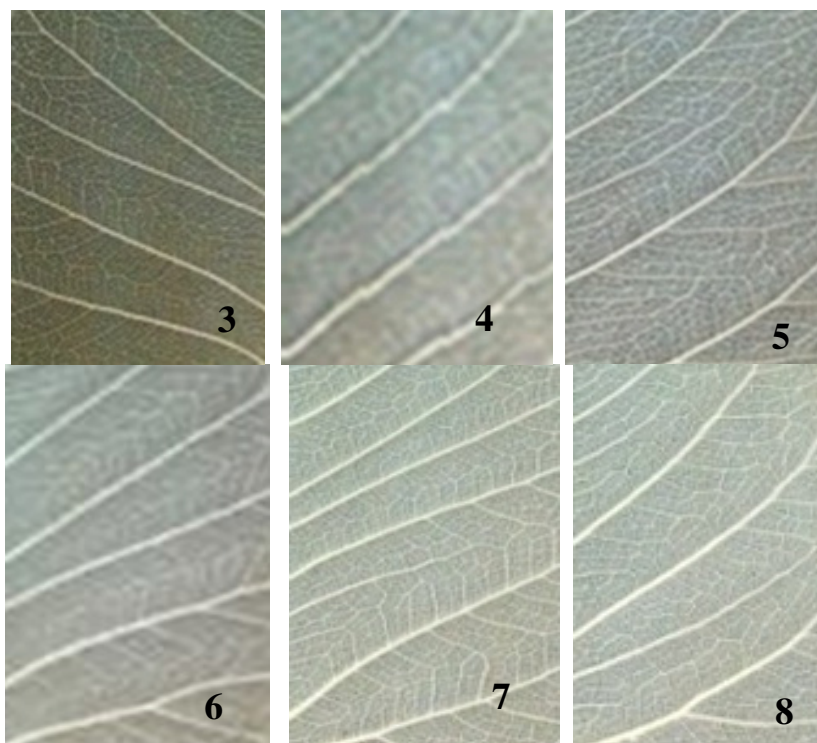
Bleaching effect of hydrogen peroxide at different concentrations on *Ficus religiosa* skeleton leaves: For studying the effect of hydrogen peroxide on leaf skeletons, different formulations of solution were prepared (the dilution of hydrogen peroxide was done with distilled water). The prepared concentrations were control 5%, 10%, 15%, 20% and 25% (table-1). The selected leaf skeletons were immersed in the prepared solutions for carrying out the bleaching process and were kept in a solution for a standardized duration of two hours. They were then taken out from the solution and were subjected for drying (set drying). No results were found in control as shown in figure-3. Poor results were found in 5% as shown in figure-4. Good results were found in 10% and 15% solution as shown in figures-5 and 6 and best results were obtained in 20% as shown in figure-7. The 25% solution showed much transparency but some loosening of veins occurred at this concentration as shown in figure-8.

Table-1

Effect of hydrogen peroxide at different concentrations on *Ficus religiosa* skeleton leaves

Figure No.	Hydrogen Peroxide (%)	Results
3	control	No change
4	5	Incomplete bleaching
5	10	Incomplete bleaching
6	15	Incomplete bleaching
7	20	Complete bleaching
8	25	Over bleaching with loosening of veins

Bleaching effect of Ala- the fabric whitener at different concentrations on *Ficus religiosa* skeleton leaves: In studying the bleaching effect of Ala on venation skeletons of leaves, the following solution concentrations were prepared viz. control, 5%, 10%, 15%, 20% and 25% (table-2). The skeleton leaves were immersed at the above mentioned formulations, no results were found in blank solution as shown in figure-7. Poor results were found in 5% formulation as shown in figure-8. Better effects of bleaching occurred at 10% as shown in figure-9. Best results were found in 15% solution as shown in figure-10. Over whitening of leaf skeletons occurred at the formulation of 20% as shown in figure-11. Degradation of leaves and veins took place at 25% concentration as shown in figure-12.



Figures-3 to 8

Effect of hydrogen peroxide at different concentrations on *Ficus religiosa* skeleton leaves

Table-2
Effect of Ala at different concentrations on *Ficus religiosa* skeleton leaves

Figure No.	Ala (%)	Results
9	control	No change
10	5	Incomplete bleaching
11	10	Better bleaching of skeleton leaves
12	15	Complete bleaching with more whitening
13	20	Complete bleaching with more whitening
14	25	Over bleaching with slight degradation of veins

Effect of different bleaching agents on *Ficus religiosa* skeleton leaves: In studying the effect of different bleaching agents, the optimum concentrations of both the bleaching agents were prepared to find out the best effects of bleaching among the chemicals used. Hydrogen peroxide solutions having 20% concentration worked well. For Ala, a solution of 15% concentration was found to be better. The overall effects are summarized (table-3).

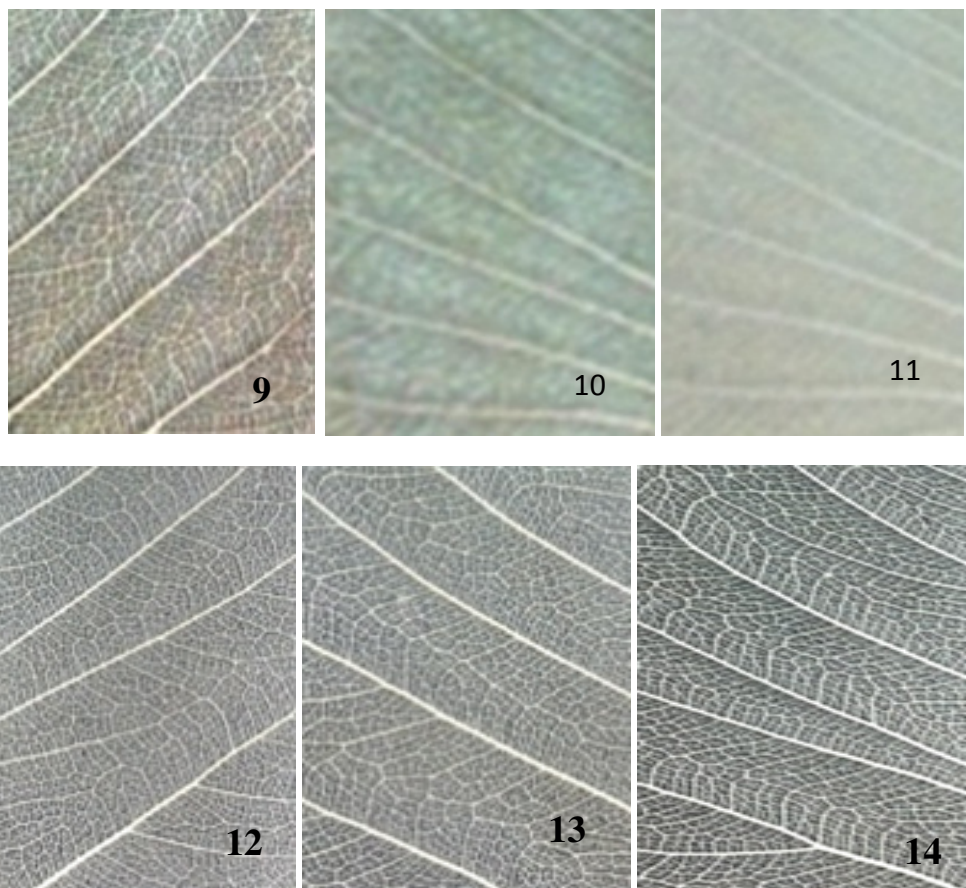
The control leaf shown in figure-13. Good effects of bleaching were found in the chemical formulations of H₂O₂ as shown in Figure 16. On comparing the skeleton leaves treated with different bleaching agents, the bleaching effect of Ala was found to be brighter in two hours with the lower concentration as shown in figure-15.

Table-3
Effect of different bleaching agents on *Ficus religiosa* skeleton leaves after 2 hours

Figure No.	Bleaching agent	Results
15	Blank solution	No change
16	H ₂ O ₂ (20%)	Optimum bleaching
17	Ala (15%)	Excellent bleaching with more brightness

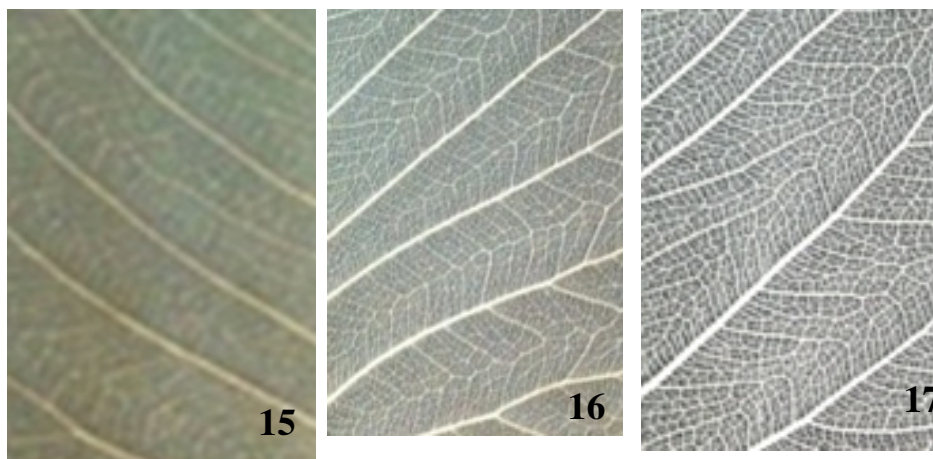
Results and Discussions

Bleaching lightens various types of foliage, pods and dry flowers, the bleaching imparts transparency and white colour to the processed material, and the duration required by the material to get sufficiently bleached varies from minutes to hours⁵. Oxidative bleaching agents can be used to remove the excess colour from the plant material⁶.



Figures-9 to 14

Effect of Ala- the fabric whitener at different concentrations on *Ficus religiosa* skeleton leaves



Figures-15 to 17
Effect of different bleaching agents on *Ficus religiosa* skeleton leaves

Bleaching of prepared leaf skeletons was done for the removal of discoloration. In the present study, bleaching agents such as hydrogen peroxide and Ala were used under different concentrations.

In studying the effect of hydrogen peroxide, solutions at different formulations were prepared and among all the concentrations, good effects of bleaching were seen at 20% formulation. For Ala, optimal bleaching of the venation skeletons was found at 15% formulation. The studies showed that the increased solution concentration gives much whitening effects but tends to destroy the network of veins.

Bleaching plays an important role in removing unwanted colour from prepared venation skeletons, but it is also necessary to identify that which bleaching agent is more effective in bleaching of processed material, by this investigation it was possible to make a comparison between the two different kinds of bleaching agents used in the study. Results shown that the performance of Ala was best under optimum concentration

Conclusion

In the present study bleaching of venation skeletons was done which were earlier prepared by fermentation. The bleaching agents such as hydrogen peroxide and a fabric whitener called Ala were used. Different formulation of 20% using hydrogen peroxide and the maximum effects of bleaching on venation skeletons were found to be at the duration of 120 minutes in both the chemicals used. The overall result of bleaching obtained by Ala was found to be better at a lower concentrations of 15% , at these particular concentrations the selected material was transformed complete transparent and whitish for its further use in crafting of variety of flowers and other artefacts.

Acknowledgement

First author is thankful to the NCL, Pune, for providing help in research work.

References

1. Jean L. and Lesley G, The complete guide to drying and preserving flowers, Webb and Bower Ltd, England, (1982)
2. Joyce D.C., Dried and preserved ornamental plant material not new, but often overlooked and underrated, *Acta Horticulturae*, **454**, 133-145 (1998)
3. Ranjan J.K. and Misra S., Dried flowers: a way to enjoy their beauty for a long period, *Indian Horticulture*, **46**, 32-33 (2002)
4. Saima et al., Standardization of preservation techniques of natural leaves for dry flower arrangements, *Current Horticulture*, 2347-7377 (2013)
5. Bale Sharon, Preserving Flowers and Foliages, college of Agriculture University of Kentucky, (2006)
6. Bernard Zeelie. Ella-christine Maske and Shawn Gouws, *Preservation of plant material*, (2011)