

Characterisation of Henna as a Determinant for Organic Fabric Integrity

Umadevi R, Gursharanpreet K.B., Mariam-Aisha F.

Faculty Health and Life Sciences, Management and Science University.

Abstract:

Lawsonia inermis is a small flowering shrub which is commonly known as Henna and its leaves produces a natural dye. The main dyeing component present in a henna leaves is Lawsone or 2-hydroxy-1, 4-naphthoquinone (HNQ) which confers the dark orange colour when it strongly binds to proteins via Michael addition causing a permanent dye stain. Natural fibres of animal origin such as silk, and wool are protein based while, plant origin fabric for instance cotton are cellulose based. Synthetic fabrics are made up from synthesized polymers. Contact dermatitis occurs when a substance comes in contact with the skin developing a red, itchy rash for example from some synthetic fabrics and latex may cause such allergic reactions. In this research henna dye was used to stain and differentiate between organic animal-based and synthetic fabric allergens. Water extracts of *L. inermis* and commercial cone henna was used to stain seven different types of fabric. Pure lawsone (97%) was used as a positive control dye. Cotton, wool, silk and latex fabrics were stained by lawsone and washed with bleach, silk and latex maintained the orange stain while cotton returned to its original white colour. However, synthetic cotton, silk and wool fabrics did not bind to lawsone. Analytical methods were used to examine the effect of pH, absorbance and stain permanence. Quantitative spectroscopic methods were used to measure lawsone concentration found in *L. inermis* extracts comparing it to pure HNQ measurements. Results of this study may enable quick and easy organic fabric integrity evaluation for patients with contact dermatitis.

Keyword: Henna, lawsone, fabric, allergent, contact dermatitis