

Analysis of Madder Dyed Textiles after Degradation Treatment

Cheunsoon Ahn[†]

Department of Fashion and Industry, University of Incheon

I. Introduction

The loss of original color in a badly faded textile raises problems in the identification of the dye of the textile piece. Unlike the standard alizarin which has been highly purified to be used as reagent chemical, the madder dye used in archaeological textiles is a composite mixture of natural compounds comprising not only major coloring substance but also a large amount of its derivatives and other extraneous matters inherent in the plant. The purpose of this investigation was to investigate the change of color of madder dyed fabrics after selective degradation conditions with the ultimate goal of identifying madder dye from the badly faded textiles of archaeological origin.

II. Experimental

Silk fabrics dyed with madder extraction were degraded in the laboratory condition. The thermal series degradation included refrigeration at 7°C (labeled 'LT' in the following), room temperature with minimal light exposure (RT), and oven treatment at 100°C (OV). Dyed fabrics was arranged for each degradation time/ degradation system combinations. Degradation times for each thermal system were 24h, 48h, 1wk, 2wk, and 4wk. The color of madder dyed fabrics were evaluated in terms of CIE L*a*b* data (D65/10) measured with the Macbeth Color-eye 1500/PLUS Color Measurement System with Optiview software version 2.0f.

III. Results and Conclusion

The control specimens of madder dyed fabrics were brighter (L*), less red (a*), and more yellow (b*) than standard alizarin dyed fabrics. After degradation, both madder and alizarin dyed fabrics became brighter. Degradation also resulted in decrease of redness and yellowness in both fabrics (negative a* and b*). Such loss of color was most apparent in the PER samples which exhibited an increasing rate of color loss with degradation progression. The result of this study, together with our previous results will become part of the cumulative collection of analytical data which can then be used as the fingerprint for the identification of madder dye in badly faded textiles of archaeological origin.

[†] Corresponding author : cssong@incheon.ac.kr