Analysis of Anthocyanidin in Mulberry and Composition of Cu Complex Compound and Natural Dyeing on Sangju silk

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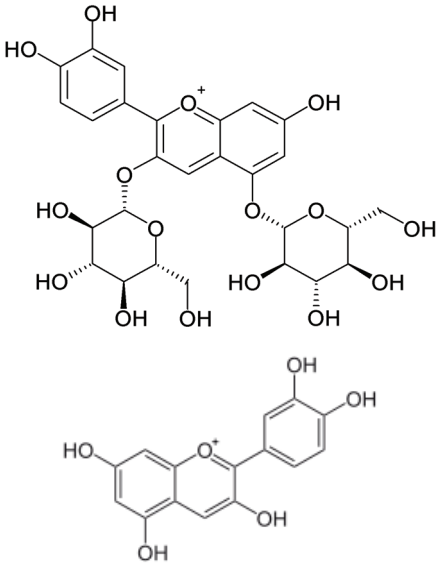
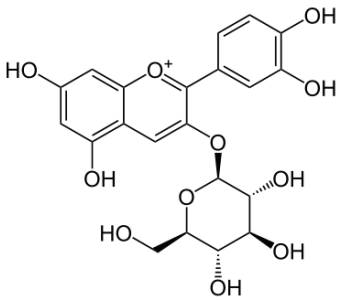
1. INTRODUCTION

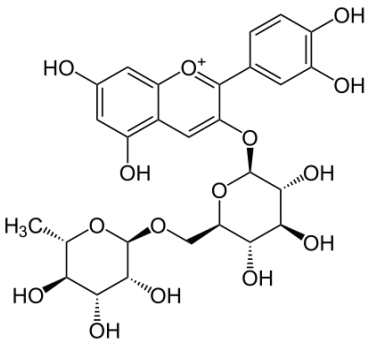
The natural dyeing with natural materials which use for food and medicine could be treated with the toxicity and allergies of artificial colorants. So the natural dyeing may be the easiest alternative plan to conquer these problems.

Currently, the concerns of food additive and color cosmetics have also prompted research in improving the effects of natural pigments, for instance, the research of using the anthocyanin extract from the Mulberry.



Scheme 1. The Anthocyanidin and Cyanidin Structure





Scheme 2. The Structural formal of Main pigment Component in Mulberry(Cyanidin - 3 - glucoside, Cyanidin - 3 - rutinoside)

2. EXPERIMENTAL

2.1. Materials

The substance of the Sangju silk was plain fabric, warp 150 D, weft 90 D, thickness 0.195 mm, density 106× 67/inch^2, width 37.5 cm and weight 31.5206 g/m.

2.2. Extraction of the Mulberry

In the experiments, in the first case of liquid sample, 5kg frozen Mulberry was extracted with 5kg distilled water for about 4h at 80℃ then used after filtration.

2.3 The Formation of the Anthocyanidin in the Extraction

The Mulberry extract was added to Copper acetate liquid at 40 ℃ with churning. This performance was continued until the sample was turned to Green or Blue color. After the sediment of the extract was set for an enough time, it was filtered then dried or alternatively, if the condition of keeping the sediment is complex for a plenty of time, it could be filtered then dyeing when the sediment appear. The dried sample was used as dyestuffs

2.4. Dyeing experiments

The dyeing was performed by using Japan INTEC CO. LTD(model sec. 36 no. SP-15) with churning 50 times/min at 80℃ dyeing temperature.

3. RESULTS AND DISCUSSION

Table 1.. The color index of extration solution, green solution and solid metreial.

	L*	a*	b*	C*	H*
179	54.134	10.526	13.406	17.406	52.768
181	44.454	8.296	21.586	23.125	68.949
180	53.460	6.4341	18.428	19.519	70.725

(179: Extration solution, 181,186: green solution., 180, 187: solid meterial)

Table 2. The colour fastness to washing of extration solution, green solution and solid metreial.

		stained wool	stained cotton
179	3-4	3-4	3-4
181	4-5	4-5	4-5
186	4-5	4-5	4-5
180	4-5	4-5	4-5
187	4-5	4-5	4-5

Table 3. The fastness test to light of extration solution, green solution and solid metreial.

179	2
181	4
180	4

4. CONCLUSION

This study could be brought out the solution of a variety of conditions of the natural dyeing with the Mulberry. To obtain this, the Cu complex compound was added into the extracts.

1. The Mulberry extract was added the Copper acetate to obtain the Black sediment; the metal complex compound of anthocyaidin.
2. The dyeing properties were excellent, according to the result of using the complex compound of the solid material.
3. The problem of fixing the density of extracts was completed by using the complex compound of the solid material for the natural dyeing by the Mulberry.
4. The metal complex compound acted as a mordant, thus it reduced the process of natural dying.

5. REFERENCES

[1] Sung Woo Nam, "Dyeing with Natural Dyes" ,Fiber technology and industry, Vol2 No2, 238-257(1998)