

**Title** The development of natural dye powder from fresh ground coffee beans

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### **Abstract**

The extraction of color from fresh coffee grounds into the dye powder and the dyeing process of silk were studied in this research. The dyeing process of silk with dye powder was compared to the color of the silk dyed with fresh ground coffee. The color of the dye extraction was golden brown with the maximum absorbance at 401 nm. The dye powder was prepared by boiling the coffee with water, filtering, evaporating to 1 in 3 of the total volume and baking the crude product at 100°C to give the dye power 8.24%. If the coffee grounds to find that roasting before extraction to give the dye power 8.35%. Adsorption of the coffee dye onto a silk was investigated in a batch system. The factor affecting the sorption process such as time on dye concentration at 4 g/water 50 cm<sup>3</sup> for 80°C with different time. The optimum time for dyeing process are 40 minute. The study of dyeing silk with the dye from fresh coffee grounds 5 g:50 ml of water compared to dyeing silk with the dye powder prepared from fresh coffee grounds to determine the color intensity (K/S) and shade close to the color of fresh coffee as possible. The concentration of dye powder of fresh coffee grounds used in dyeing silk is 2 g : 50 ml of water , 4 g : 50 ml of water and 6 g : 50 ml of water and used sodium chloride, sodium chloride salt: tamarind solution, sodium chloride salt: ashes solution, sodium chloride salt:copper sulfate , and sodium chloride salt: ferrous sulfate as mordants to give the shade of the dyed silk from golden yellow to dark green color. The K/S value of the dyed silk was investigated by Colorimeter. The shade of the dye silk with the dye power 6 g to 50 ml. of water gave the same color of the dyed silk with spent ground coffee. The color fastness to light, washing and crooking were investigated by standard method. Each dyed materials gave mostly fair to good level of color fastness in this research.

**Keywords:** dye, dye powder, dyeing, mordant, silk