NATURAL COLORANTS FROM ZONGO VALLEY (BOLIVIA) AND THEIR TEXTILE APPLICATIONS

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ABSTRACT

Three plants collected at the Zongo Valley were evaluated for textile dyeing applications. The species selected were extracted following acidic and basic procedures to obtain colored samples, that were submitted to direct and indirect (with mordents) dyeing techniques. In all experiments the need of a mordant was observed and the type of chemical mordant was identified. In each work, the strength of the fabric's dye with the natural colorant was evaluated using a series of washing, rinsing, drying, ironing and exposure to sun light protocols. It was found that the acidic extract of *Brachyotum microdon* (flowers) needs $Al_2(SO_4)_3$ to dye the fabric with a red cabernet tone, while the basic extract fixes the fabric with a brown color with $FeCl_3$ and green with $FeSO_4$. The acid extract of the stems of *Souroubea fragilis* dyed the fabric with a light orange color when $Al_2(SO_4)_3$ was used as a mordent, while the basic extract provided brown tones thanks to $CuSO_4$ or $FeSO_4$. Finally, the acidic extract of *Fuchsia boliviana* (flowers and fruits) gave a pale rose and a green tinting with $Al_2(SO_4)_3$ and $FeCl_3$, respectively. The basic extract of this plant provided a green dyeing with $CuSO_4$ and orange shading with $FeCl_3$. Different types of fabrics were evaluated, and the best dyeing results were observed with cotton. All the extracts studied presented antioxidant and photoprotector activities. The acidic extract of *Brachyotum microdon* (flowers) showed 82.5% of inhibition at 10µg/ml against DPPH and it absorbed the harmful UV B radiation. The acidic extract of *Fuchsia boliviana* (flowers and fruits) gave an 86.7% of inhibition at 10µg/ml against DPPH and it also absorbed the damaging UV B radiation. Finally, the acidic extract of *Souroubea fragilis* (stems) presented 92.1% of inhibition at 100µg/ml against DPPH and it absorbed both UV-B and UV-A radiations.

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