

Extraction of natural dyes from cutch, ratanjot and madder, and their application on wool

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ABSTRACT

Studies were conducted to extract natural dyes from biomass products namely cutch, ratanjot and madder. Extracted natural dyes were used for dyeing on mordanted wool with alum, chrome, iron and copper. In all ten different shades were developed. Fastness properties (light, wash and crocking) were also studied on these samples. There is a need to carry out further research in this field and explore the possible ways for its use in other fibrous products viz. jute, silk and cotton etc.

Introduction

IN the present study three agricultural produce cutch, ratanjot and madder have been selected as dye raw material, which are described below:

Katha (Acacia catechu) (Cutch, Kher)

Katha or catechu is a brown natural dye obtained chiefly from the wood of tropical trees called Acacias. Katha or cutch is used in dyeing, tanning. Catechu makes rich brown dyes (The Wealth of India, 1948).

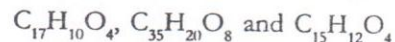
Molecular formula of catechu is: $C_{15}H_{14}O_{16} \cdot 3H_2O$ (Perkin, et al. 1918; Mayer, et al. 1943). It is used in the dyeing of ship sail ropes and mailbags. Material dyed with cutch exhibits greater fastness to weather and sea water conditions. It is an indispensable ingredient of pan preparation. Catechu is an extract, obtained from boiling the chopped wood pieces in water, contains mainly catechin.

Ratanjot (Onosma echioides) (Laljari)

Little information is available regarding the chemical structure of 'Ratanjot'. The general properties and colouring reactions of this dye is believed to be very

similar to those of alkanet and there can be little doubt that it contains either the same or closely allied colouring matters. It may belong to naphthaquinone class; alkanin as a main component (Perkin, et al. 1918; Mayer, et al. 1943).

Alkanet is one of the most ancient dyestuff have been employed by the Romans, but it did not at any time attain such importance as madder, indigo or even turmeric. The colouring matter of alkanet, known as anchusin or alkanin, has been examined by several chemists, but it is doubtful whether this compound has been obtained in a chemically pure condition. Its composition is variably given as



Alkanin forms a dark red amorphous powder possessing a beetle green iridescence, is readily soluble in most of the usual solvents and its alkaline solution is deep blue coloured. This dye is applied at 4-5 pH. For maintaining this pH, buffer solutions is used (Maulik, 1996; Gulrajani et al., 1999).

Madder (Rubia cordifolia) (Majith, Manjeet, Manjistha)

The colouring matter present in the roots of Rubia cordifolia is a mixture of purpurin (trihydroxy anthraquinone) [I] and munjistin [II]. The roots also contain small amounts of xanthopurpurin [III] and pseudopurpurin [IV] (Perkin, et al. 1918; Mayer, et al. 1943).

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