

Extraction of Natural Paint from Japanese Sofara Plant Dying Wool and Fabrics

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Abstract The issue of dying blue is an important issue in the textile industry. Fabrics based on artificial dyes can cause skin allergies or skin diseases. The medicinal product is made on the basis of *Sophora japonica* (Safora), which contains rutin, flavonoids and other biologically active substances.

Keywords Wool, Wash comb, Felt, Shaft, Soap, Comb, Rutin

1. Introduction

Department of Chemistry of Natural Compounds of Tashkent State University opened in 1946 under the leadership of Academician O.S. Sadikova became a blacksmith of organic chemists specializing in the study of natural compounds. If we consider the chemical structure, mechanism of action and various transformations of alkaloids as the main direction of scientific research of the department and the problem laboratory opened in 1954, then research in the chemistry of natural plant dyes is no less important.

When searching for alkaloid plants, plants were also found in which natural dyes accumulated. Natural dyes are complex organic compounds that color various animal and plant cells and tissues. Until the 2nd half of the 19th century. Many natural dyes were used to dye textiles, leather, paper, perfumes, food products, etc. Most of them play an essential role in the life of the organisms that produce them. Many natural dyes have significant physiological and antibiotic activity and are often used as therapeutic agents. They are also used in the perfumery industry, in studies by optical and electron microscopy in cytology and analytical chemistry. Natural dyes are widespread and chemically extremely diverse, mainly compounds of yellow, brown, black and red colors of different shades, very few blue and purple, green, as a rule, are absent. In the studies of Academicians O.S. Sadikov, G.V. Lazurevsky, natural dyes "Sophoreols" were isolated from various plant species of *Sophora*. Further, chalcone ammotamidine and a number of flavonoid

substances also having coloring properties were isolated from the plant *Ammothamnus Lehmanni*. From *Sophora japonica* dyes were isolated that dyed wool and other fabrics in a beautiful yellow color. In general, these works gave impetus to research in the field of flavonoid compounds. The main target was the *Scutellaria* plant. The genus *Scutellaria* is a very diverse plant species in the world flora and is represented by 360 species. 56 species grow in Central Asia, 32 species grow on the territory of Uzbekistan, which are used in folk medicine for the treatment of epilepsy, allergies, neurosis, hypertension and other diseases.

2. Materials and Methods

The main flavonoids of plants of this genus - bacilli, baicalein, wogonin have antitumor, anti-HIV, antibacterial, anti-inflammatory and anticonvulsant effects. We have studied the chemical components of skullcap growing in the Fergana Valley for the content of flavonoids, phenol carboxylic acids, tannins, macro and microelements. An electronic presentation on the composition of phenolic substances in plants of the *Scutellaria* genus has been compiled. As a result of the studies carried out, the chemical properties and spectral characteristics were established - nepetaside A, immaculoside and wogonin-7-O- β -D-glucopyranoside turned out to be new natural compounds, and their chemical structure was established. Based on the complex use of chemical and spectral methods, 25 known flavonoids have been identified, including 10 flavone derivatives, 12 flavone glycosides, 2 flavones and 1 flavonol. To study the crystal structures of wogonin, an X-ray diffraction study was carried out.

Results of pharmacological studies of flavonoids apigenin, cinaroside, wogonin-7-O- β -D-glucopyranoside, nepetaside A, (\pm) -5,2'-dihydroxy-6,7,8,6'-tetramethoxyflavanone and

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chrysin-7-O- β -D-glucuronide made it possible to identify among them substances with pronounced anti-inflammatory and gastroprotective properties. As an additional source of cynaroside – flavonoid hypoazotemic action suggested aboveground part of *Scutellaria nepetoides* M. Pop. Taking into account that even in ancient settlements, natural plant dyes were widely used for dyeing fabrics, food products, we carried out research to find dyes for dyeing wool of sheep and rams. The basis was taken from the goods obtained from coarse wool in the form of kigiz, carpets, various household utensils. In Europe, in recent years, wool products have been widely developed in the form of bags, jewelry, various underwear as souvenirs.

3. Result and Discussion

Due to the fact that these products are bright and beautiful, it is required to use for their coloring are not harmful natural dyes. These include the bark pomegranate, barberry bark, grave, walnut pericarp and others. Taking into account the research of Uzbek scientists, restored technology for dyeing woolen products with flowers and fruits ornamental cultivated plant *Sofora Yaponica*. Dyeing was carried out in presence of mordants of potassium alum, copper sulfate, sulfate iron, tin chloride, chromium salts. The dyed wool is shown below in the pictures (Figure 1 and Figure 2).



Figure 1. The dyed wool of *Sofora Yaponica*



Figure 2. The dyed wool of *Sofora Yaponica*

All dyed yarns are tested for resistance to ultraviolet radiation, humidity, ironing processes, according to the points of stability, they correspond to GOST.



Figure 3. Dyed wool

The resulting products were shown at an exhibition in Germany, where they were positively evaluated by Professor Norbert Schuit from Flensburg European University.

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