

DYING OF NATURAL SILK WITH NATURAL DYES OBTAINED FROM PLANTS

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ABSTRACT

Experimental methods were used to study the production of natural dyes from various parts of some plants and the dyeing of natural silk with natural dyes in different colors. Then the dyed fabric is dried in a hanger for 30 minutes. After that, the fabric is removed from the hanger and shaken in a solution of vinegar. After shaking, the silk fabric is washed in running water and allowed to dry. The creative approach of the master to paints, a good and thorough knowledge of the methods of dyeing raw materials and tools used for dyeing, allows you to create a new range of fabrics and increase their demand.

KEYWORDS: *Natural Silk, Silkworm, Natural Dye, Plantágo Májor, Indigofera Tinctoria L, Rosa, M. Multicaulis, Crocus Sativus, Solanum Lycopersicum, Fabric Dyeing.*

INTRODUCTION

Silk is a soft and durable fabric with a pleasant glossy sheen. Natural silk is an easily dyed valuable raw material, which is characterized by high mechanical and physical properties, as well as a refined appearance. For the production and primary processing of silk, a huge amount

of labor is expended. Therefore, this product of the textile industry, unlike others, is expensive and has limited application [1].

Textile, carpet weaving, embroidery and flower printing on fabric are some examples of folk arts and crafts, and dyeing is the main process in their production. Fabric dyeing is a complex process that involves dyeing fabric, preparing silk for dyeing, and bringing raw materials to a state of readiness for dyeing. The creative approach of the master to paints, a good and thorough knowledge of the methods of dyeing raw materials and tools used for dyeing, allows you to create a new range of fabrics and increase their demand. Failure to select the correct colors or ignorance of the compositional aspects of color can lead to distortion of patterns and colors on the fabric and the fabric itself as a whole [2-4].

The purpose of this work is to obtain natural dyes from plants and dye natural silk with them.

Materials and research methods

Indigo was obtained from the plant *Indigofera tinctoria L.*, (blue). Weighed 4 g of *Indigofera tinctoria L.* leaves, poured 3 liters of water and boiled. After boiling, they fermented for a week and defended for three days. Upon completion of the settling process, the dye was filtered off.

A dye obtained from the plant *Plantago májor* (yellow). Weighed 5 g of *Plantago májor* leaves, poured 5 liters of water and boiled. After boiling, they fermented for a week and defended for three days. Upon completion of the settling process, the dye was filtered off.

Dye obtained from the plant *M. multicaulis* (burgundy color). Weighed 500 g of mulberry fruit, poured 10 liters of water into it and boiled it. After boiling, they fermented for a week and defended for three days. Upon completion of the settling process, the dye was filtered off.

A dye obtained from the flowers of the *Rosa* plant (pink). Weighed 30 g of flowers, added 4 liters of water and boiled. After boiling, they fermented for a week and defended for three days. Upon completion of the settling process, the dye was filtered off.

A dye obtained from the flowers of the plant *Crocus sativus* (yellow). Weighed 30 g of saffron flowers, added 4 liters of water and boiled. After boiling, they fermented for a week and defended for three days. Upon completion of the settling process, the dye was filtered off.

A dye obtained from the plant *Solanum lycopersicum*. (green color). Weighed 5 g of the leaves of the plant, the dye was extracted by manual squeezing of the leaves. Upon completion of the settling process, the dye was filtered off.

A vinegar solution is prepared by adding 100 g of 96% acetic acid per 100 liters of water. Silk fabric is impregnated with vinegar solution. The impregnated fabrics are air dried.

The process of dyeing fabrics with prepared dyes.

Blue colour. The paint obtained from the leaves of the plant *Indigofera tinctoria* was poured into a 500 ml flat-bottomed flask, then boiled, 1 g of alum was added to the boiling paint and mixed. Silk fabric is added to the boiling mixture and the fabric is rinsed. Then the dyed fabric is dried in a hanger for 30 minutes. After that, the fabric is removed from the hanger and shaken in a solution of vinegar. After shaking, the silk fabric is washed in running water and allowed to dry.

Yellow. The paint obtained from the leaves of *Plantago májor* was poured into a 500 ml flat-bottomed flask, then boiled, 1 g of alum was added to the boiling paint and mixed. Silk fabric is added to the boiling mixture and the fabric is rinsed. Then the dyed fabric is dried in a hanger for 30 minutes. After that, the fabric is removed from the hanger and shaken in a solution of vinegar. After shaking, the silk fabric is washed in running water and allowed to dry.

Red color. The paint obtained from the fruit of the mulberry tree was poured into a 500 ml flat-bottomed flask, then boiled, 1 g of alum was added to the boiling paint and mixed. Silk fabric is added to the boiling mixture and the fabric is rinsed. Then the dyed fabric is dried in a hanger for 30 minutes. After that, the fabric is removed from the hanger and shaken in a solution of vinegar. After shaking, the silk fabric is washed in running water and allowed to dry.

Pink color. The dye obtained from the flowers of the *Rosa* plant was poured into a 500 ml flat-bottomed flask, then boiled, 1 g of alum was added to the boiling dye and stirred. Silk fabric is added to the boiling mixture and the fabric is rinsed. Then the dyed fabric is dried in a hanger for 30 minutes. After that, the fabric is removed from the hanger and shaken in a solution of vinegar. After shaking, the silk fabric is washed in running water and allowed to dry.

Yellow. The paint obtained from the flowers of the saffron tree was poured into a 500 ml flat-bottomed flask, then boiled, 1 g of alum was added to the boiling paint and stirred. Silk fabric is added to the boiling mixture and the fabric is rinsed. Then the dyed fabric is dried in a hanger for 30 minutes. After that, the fabric is removed from the hanger and shaken in a solution of vinegar. After shaking, the silk fabric is washed in running water and allowed to dry.

Green color. The paint obtained from the leaves of *Solanum lycopersicum* was poured into a 500 ml flat-bottomed flask, then boiled, 1 g of alum was added to the boiling paint and stirred. Silk fabric is added to the boiling mixture and the fabric is rinsed. Then the dyed fabric is dried in a hanger for 30 minutes. After that, the fabric is removed from the hanger and shaken in a solution of vinegar. After shaking, the silk fabric is washed in running water and allowed to dry.

RESULTS AND DISCUSSION

For any fabric, especially natural, the best way to dye is to use natural materials such as plants. Alum was used to fix the resulting shade. In this case, alum is also used for coloring in light colors. In fig. 1 shows the results of dyeing natural silk with natural dyes. On fig. 1a silk dyed warm taupe with dye obtained from the leaves of the plant *Indigofera tinctoria*. On fig. 1b shows a sample of silk dyed light yellow with a dye obtained from the leaves of *Plantago májor*. Ocher-dyed silk was obtained by dyeing with a dye from the mulberry fruit (Fig. 1c). 1g shows a sample of silk dyed pink with a dye obtained from the flowers of the *Rosa* plant. 1e shows a sample of silk dyed light yellow with a dye obtained from the flowers of *Crocus sativus*. A dye obtained from the leaves of *Solanum lycopersicum* dyes silk green (Fig. 1.e).



Figure 1. Samples of natural silk dyed with different natural dyes.

In conclusion, the following should be noted. A natural dye is a colored organic compound that has the ability to pass from solution to fibers and bind strongly to them. For dyeing, an aqueous organic solvent, a mixture of water and an organic solvent, an aqueous dispersion and its evaporated dye state are used. In addition to the dye, the dye solution also contains various auxiliary chemical compounds. Dyeing of textile materials gives them a durable and even color. Dyeing is a very complex process in which the dye passes from solution into the fiber and binds to its active centers. Color strength is determined by the type of bond formed between the fiber and the dye.

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