https://doi.org/10.53230/tgm.1310-912X.2024.1006.36

METHODS FOR EXTRACTING NATURAL DYES: TRADITIONAL AND MODERN APPROACHES

Nezabravka Popova-Nedyalkova
New Bulgarian University, Department of Design, Fashion program,
21 Monteveo Str., 1618 Sofia, Bulgaria
nezi_ned@abv.bg

This text aims to examine and compare various methods for extracting natural dyes, both traditional and modern. Natural dyes are becoming increasingly popular due to their eco-friendliness and safety, and the methods for extracting them vary in complexity and efficiency. Water extraction, for example, is one of the oldest and simplest methods, suitable for small-scale and individual projects. Fermentation is another traditional process, used for centuries to extract dyes, often resulting in richer colors.

Modern approaches include acid and alkaline extraction, which allow precise control over the chemical composition of the dyes, as well as solvent extraction, which is more effective for hard-to-reach sources. Technologies like enzymatic extraction, ultrasound, and microwave extraction offer faster and more energy-efficient processes. Supercritical fluid extraction, using carbon dioxide, is one of the most innovative techniques, enabling the extraction of dyes in an environmentally friendly way without the use of toxic chemicals.

In addition to the theoretical review, the author conducts an independent study on extracting dyes from madder roots. The goal is to compare the results of different extraction methods performed in uncontrolled laboratory conditions and to analyze the effects of using hard and soft water in the process. This practical study enhances the understanding of how various conditions impact dye yield and quality, providing valuable insights for applying these methods outside of controlled laboratory settings.

***Keywords**: natural dyes, extraction, methods, ecology, sustainability*