



BIOLOGICALLY ACTIVE SUBSTANCES IN *INDIGOFERA* *TINCTORIA* PLANT

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Abstract

Competitive products are being produced based on the reforms implemented in our country, modernization of production, and attraction of investments in production. These are steps that contribute to the development of our country and the welfare of our people.

Keywords: *analysis, benzene, hexane, extract Indigo, Identification, linolenic, component, palmitin, essential oil, fraction*

At present, artificial dyes are mainly used in the textile industry of our republic. Such paints are inexpensive to buy and give a beautiful color. *Indigofera tinctoria* is one such dye-giving plant.

Competitive products are being produced based on the reforms implemented in our country, modernization of production, and attraction of investments in production. These are the steps that contribute to the development of our country and increase the well-being of our people [2].

Indigofera tinctoria grows naturally in many countries of the world, and natural "Indigo" blue dye is obtained from its leaves and stems [2].

Until the XIX century, there was no natural dye without the "Indigo" dye pigment in all the countries of the world. *Indigofera tinctoria* is found in several tropical regions of the world and is more common than other natural dye plant species. Indican is the precursor chemical source of the dye, found in all plant leaves that carry indigo, which gives the blue color after dye processing[3].

The presence of isoprenoids in the leaves of *Indigofera tinctoria* was found. Pharmacological research of identified isoprenoids and the creation of medicinal





products based on them is of practical importance for medicine.

It was determined that the plant contains isoprenoids based on qualitative reactions and experiments. In the study of isoprenoids in the leaves of *Indigofera tinctoria*, better results were obtained when using a solvent rather than an aqueous solution [1].

Indigofera tinctoria contains biologically active substances that are extracted from its leaves. The leaves of *Indigofera* contain colorless glycoside-indican, biologically active substances, and dyes obtained from their glycosides, and it was found that they have medicinal properties used for the treatment of various diseases.

According to the phytochemical composition of the plant *Indigofera tinctoria*, 53 components were identified in the essential oil obtained from the surface, and 33 of them were identified. Palmitic (1.16%) and linolenic (1.02%) fatty acids were also found in this essential oil. 12 different components of hexane extract, and 25 components of fatty acids of plant seeds were identified, and 12 of them were identified. 7 fatty acids were identified from the seed and their amount was 94.3%, and the remaining 5.7% was dimethyl phthalate compound.

Also, the fatty acids of the studied plant seeds were studied by gas-liquid chromatography (GSX) method. Fatty acid methyl esters were extracted and analyzed on an Agilent 7890B gas chromatograph with an ionization detector. The analysis was carried out in an HP-5 stationary phase capillary column 30 m × 0.32 mm, and hydrogen was used as the carrier gas, the programmed temperature was 150-270°C. The identification of methyl esters of fatty acids was carried out using the following method: the seeds (2 g) were crushed to a size of 2-3 mm and extracted with gasoline in a soxhlet apparatus. The obtained amount was added from an ethereal solution of diazomethane freshly prepared by dissolving it in dry methanol. The solution was kept in the refrigerator for 2 days and the solvent was removed in a rotary evaporator. The sum was redissolved in chloroform, washed several times with 2% sodium hydroxide solution, dried with sodium sulfate, and





the solvent was completely evaporated. The result of the analysis is presented in Table 1.

Table 1.

Fatty acids of *Indigofera tinctoria* plant seeds

№	Fatty acid name	UV	IUPAC formula	%
1	Myristic acid	9.6	14:0	10.4
2	Palmitic acid	14.2	16:0	51.4
3	Linoleic acid	17.9	18:2	25.9
4	Oleic acid	18.1	18:1	2.0
5	Stearic acid	18.7	18:0	1.5
6	Arachinic acid	22.9	20:0	1.2
7	Benzene acid	26.8	22:0	1.9

In total, 7 fatty acids were identified from the seeds of the *Indigofera tinctoria* plant, and their amount was 94.3%, and the remaining 5.7% was dimethyl phthalate compound.

The indigo dye obtained from the plant was used in national handicrafts, and carpet making, and was called the king of dyes. The clothes of the Ancient Egyptian King Tutankhamun, and the bricks of the cultural monuments of Bukhara, Samarkand, and Khiva were painted. It is still widely used in all kinds of handicrafts, textiles, and carpets.

List of used literature

1. Anitha R., Murugan A., Gnanendra S. Anti-Psoriatic Activity of *Indigofera tinctoria* Leaves Extract on Staphylococcus Aureus Embedded Hacat Cells: A Systematic Approach // Journal of University of Shanghai for Science and Technology. – 2020. – Vol. 22. – P. 738-745.
2. Мирзаахмедов Р., “Табийи ранглаш технологияси”. ЮНЕСКО, 2007.-80 б.



3. Singh B., Saxena A. K., Chandan B. K. et al. Hepatoprotective activity of indigtone - a bioactive fraction from *Indigofera tinctoria* Linn. // *Phytotherapy Research*, volume 15, Issue 4, June, 2001 p. 294-297.

