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**RESEARCH OF CONSUMER PROPERTIES OF
ECO-FRIENDLY NETTLE FABRIC**

**ИССЛЕДОВАНИЕ ПОТРЕБИТЕЛЬСКИХ
СВОЙСТВ ЭКОЛОГИЧНОЙ ТКАНИ
ИЗ КРАПИВЫ**

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Abstract. The ecological situation on the planet forces textile workers to actively look for eco-friendly, biodegradable and affordable raw materials for the production of clothing materials. A growing number of designers are turning to eco-friendly materials when developing their collections. More and more consumers prefer natural eco-friendly fabrics. There is an active search for alternative materials to cotton fabrics [1]. At the same time, nettle fabric is becoming more and more popular. The article presents the results of research on the consumer properties of nettle fabric in comparison with cotton fabric. The growing interest in nettle fabric requires the study of its basic properties.

Аннотация. Экологическая ситуация на планете заставляет текстильщиков активно искать экологичное, биоразлагаемое и доступной сырьё для производства одёжных материалов. Растёт число дизайнеров, которые обращаются к экологичным материалам при разработке своих коллекций. Всё больше потребителей отдаёт предпочтение натуральным экологичным тканям [1]. Идёт активный поиск альтернативных материалов тканям из хлопка. При этом всё более популярной становится ткань из крапивы. В статье приводятся результаты исследований потребительских свойств ткани из крапивы в сравнении с хлопчатобумажной тканью. Растущий интерес к ткани из крапивы требует исследования её основных свойств.

Currently, two main varieties of nettle are known: nettle dioecious and rami. The first grade is used for the production of coarse and thick yarn. The rami variety allows you to get a thin shiny silky fabric. Nettle is an unpretentious plant that does not require the use of herbicides, abundant watering. Nettle

material has antibacterial properties, allows a person to feel comfortable at high and low ambient temperatures.

In Russia at the end of the 19th century, clothes made of nettle fabric were sewn by the peoples of the North (Khanty and Mansi). Nettles in Russia were called "forest wool". Coarse and durable nettle yarn was used to make sails and bags. In the USSR, cheap costume and coat fabric was made from nettle called "cheviot". Military and school uniforms were made from it. Now nettle is also in demand for the manufacture of special clothing [2].

In Europe, the nettle of the Rami variety is mainly used, a thin shiny fabric is in demand by designers in modern collections [3].

However, the consumer properties of nettle fabric have not been studied enough.

The consumer properties of nettle fabric were investigated in comparison with cotton fabric. Previously, an expert survey was conducted among potential consumers of hemp clothing. It was proposed to note the most important properties of nettle fabric from the consumer's point of view. As a result, the most important properties included the following: thickness, surface density, tensile strength and elongation, drapery, indelibility, abrasion resistance and breathability.

Further, mechanical and physico-chemical properties of a series of hemp tissue samples were tested in laboratory conditions. The results of the conducted studies are shown in Table 1.

Table 1

Material of the sample series	Thickness, mm	Surface density, g/m ²	Shrinkage after washing, %. Warp/weft	Tensile strength, N	Elongation at break, %. Base/weft	Abrasion resistance, cycles	Breathability, dm ³ /m ² ·s (p = 49 Pa)
Nettle fabric	0,19	140	1,5/1	371/296	5/18	After 5000 cycles, external signs of wear	690
Cotton fabric	0,20	148	2,5/1,5	273/101	7/22	After 2750 cycles, there are noticeable signs of surface wear	480
Testing Equipment	Automatic Digital thickness Gauge TF121C	GAUGE Laboratory scales VIBRA ALE-2202	Washing Fastness Tester. TF418	Breaking machine RM-250		Martindale Abrasion and Pilling Tester. TF210-A F 210A	Electronic device for determining the breathability of textile materials SA 164 E

To compare the properties, samples of cotton fabric and fabric made of 100% nettle of plain weave, similar in surface density, were selected. Nettle fabric was dyed with natural dyes. The results of the study showed that nettle fabric has a high tensile strength compared to cotton fabric, while elasticity is very low. This is consistent with the results obtained by foreign researchers [3–5]. During the abrasion tests after 5000 cycles, signs of surface wear and a 10 % decrease in the mass of the samples were revealed. The wear resistance of nettle fabric significantly exceeded that of cotton fabric (see table 1).

A high air permeability index was also obtained, which confirms the exceptional comfort of the fabric for the manufacture of clothing. At the same time, the nettle fabric is heavily wrinkled and draped poorly.

Thus, according to a number of indicators of physical and mechanical properties (strength, wear resistance, breathability), nettle-based fabric is superior to cotton fabric, which means it serves as an excellent alternative to cotton materials [6]. The results of the conducted research can be used for the reasonable design of modern nettle products.

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