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## BIODEGRADABLE TEXTILES AS AN ALTERNATIVE TO STANDARD FABRICS

***The purpose of the research*** is to show that biodegradable fabrics reduce waste and pollution in the apparel industry out of fashion and do not create damage to our environment.

***The object of the research*** is biodegradable textiles as a substitute to standard fabrics to combat the harmful effects of fast fashion.

***Methods and techniques.*** This research is based on the method of information analysis.

***Research results.*** "Biodegradable" is often used in the textile industry from an environmental perspective. The term refers to the ability of a substance to decompose naturally via living organisms.

According to the article "What are Biodegradable Fabrics?" by Nina Lewis, we should not confuse biodegradable with the term "bio-based". Bio-based fabrics may have been made from naturally grown fibers such as cotton, but are not always readily biodegradable after being made from fabric because may contain mixed synthetic fibers. Although some fabrics are not made of synthetic fibers such as non-organic cotton, they cannot be easily biodegraded due to the use of a large amount of dyes or finishing agents [2].

Many studies have shown that the common materials used in our fabrics (such as nylon, polyester, and acrylic) release small plastic microfibers when washed. These toxic microfibers pass through the sewer system and eventually enter the ocean, where marine life absorbs them.

Now, a small but growing group of innovators is turning to nature to solve waste and pollution from the clothing industry at their source. They are using live organisms to grow pieces of biodegradable textiles, creating environmentally friendly materials in the laboratory and are even producing some near-complete items without the need for factory assembly [1].

The following list details some 100 % ecological fabrics that biodegrade without problems in the cycle of nature:

1. Organic cotton refers to cotton produced without the use of any chemicals, pesticides or synthetics. Full biodegradation can take from 1 to 5 months.
2. Silk is made naturally from the fibers that silkworms use when spinning cocoons into moths. It starts to show signs of biodegradation after about 4 years. Science has shown that the use of acidic enzymes accelerates the biodegradation of silk. It makes sense when you consider that the original purpose of silk was to be eaten by the moth that hatched from the cocoon.
3. Wool is produced under natural conditions without the addition of chemicals (harvested from farm animals) and has been the leading textile for clothing, upholstery and blankets for thousands of years. If wool is not treated with chemicals, it is 100 % biodegradable in a period of 1 to 5 years.
4. Hemp is the most versatile plant on the planet. It is used to produce clothing, paper, biodegradable plastics, paints, insulation materials, biofuels, fabrics, and even food sources of omega essential oils. There is little information on how long it takes hemp fibers to biodegrade; however the old saying “hemp wears in, not out”, explains the fact that hemp fibers naturally soften over time. Hemp is as strong as a completely natural fiber because the fiber is composed of a large portion of silicon dioxide (sand), which can stand the test of time and eventually biodegrade back into the sand.

5. Organic bamboo is broken down quickly with natural enzymes to produce a fabric and is often a more expensive process. Manufacturers of pure bamboo fibers and fabrics say natural degradation takes from 4 to 6 months.
6. Tencel or eucalyptus is a 100 % organic fiber extracted from an eucalyptus plant. The eucalyptus fabric is highly moisture-absorbent and feels very soft. Perfect for sensitive skin. The plant itself is grown in sustainable plantations and the tencel production process is ecological. In addition to being recyclable, it also requires a minimum amount of water during processing and no use of pesticides.
7. Abaca, also known as "Manila hemp" is a leaf fiber made from the leaves of the abaca plant. The leaf stalks are usually manually handled, stripped and pulped, before being simply washed and dried to make the fibers. Abaca has been used as a natural fiber in ropes, cords and nets for centuries because it has high lignin content and is therefore exceptionally strong. Despite being so highly durable, abaca was shown to begin disintegrating after 2 months in a degradation experiment conducted [2].

***Conclusions.*** It is well-known that the textile and clothing industry has a huge impact on the environment: not only in terms of water consumption and greenhouse gas emissions, but also in terms of waste generation. Today more than ever textile innovation must operate at different levels, with a particular focus on improving production processes to reduce water and energy consumption, waste production and the use and dispersion of toxic substances. So manufacturers and designers should use live organisms to grow pieces of biodegradable textiles, creating environmentally friendly materials in the laboratory and use eco-friendly fabrics already known in nature.

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