

Biodegradable Textile from Fungus-Mycelium Textile

Ambica Khurana
Asst. Professor,
Khalsa College for Women,
Amritsar, Punjab143002.
Email id- vikrambical@gmail.com



Abstract

The area of artificial yarns is growing at a rapid rate, and as a result many companies are exploring the possibilities this area of modern science offers. The companies has successfully bio-fabricated a leather substitute called MuSkin, The advanced material is constructed from collagen (a protein) – the main constitute of natural leather is designed and grown in a lab from animal-free collagen derived from yeast. Mushrooms can now be fabricate into pliable leather-like clothing, purses, pants, and even durable furniture and building bricks for a cleaner, more eco friendly planet. The challenge is to create a cruelty-free option that is both economically and environmentally sustainable.

Keywords- biodegradable, environmentally, Enzymes, Mycelium, bio fabrication, chemicals

1. Introduction

One of the greatest challenges faced by the textiles and fashion industry is to make itself more eco friendly, not just in terms of economic and labour force issues but in the face of ecological necessity. The manufacturing of textiles involves a long chain of complex processes to transform raw materials such as fibres or petroleum into finished fabrics or fashion products. These processes are typically resource intensive, requiring high concentrations of chemicals, large amounts of water and involving high temperatures and long processing times. This often results in high energy consumption and waste.

There may be new strategy but the problems with the textile industry have long been known. Very high water usage, pollution, a high carbon footprint and bad working conditions mean that the textile industry is known to be hugely environmentally and socially damaging. This is before we even observe the influence of fast fashion, reasonable clothing produced speedy in response to the latest trends. Such items inevitably end up in an loaded landfill site. The creation of stuff using living plant networks which could be used to fabricate garments of the future.

As a way to disrupt the fashion system as a whole, fungi or bacteria based textile replacement might still be some way off. But while the excess and harmful wastefulness of the fashion and traditional textile industry carry on with, design in this area can also be seen as an act of environmental protest. Enzymes are particularly biocatalysts originate within the cells of all living creatures. They suggest the chances of producing textiles using easy and less severe processing conditions which can lower the consumption of chemicals, energy and water and

the generation of waste. Duly, enzymes have successfully replaced a range of industrial textile processes. (6)

With the textile industry attributed to emitting more greenhouse gases a more sustainable route by developing a biodegradable textile made from the vegetative part of fungi's lattice-like "roots," called Mycelium. Muskin is one such fabric, and is possible replacement for animal leather.

Fabrics produce from fungus has created by a technical process called bio fabrication. This is the process of growing materials from small organism like bacteria and fungi, and is a comprehensive fast growing sphere of science. Clothing made from the biodegradable textile is decaying and as pliable as traditional fabrics. Fabric produced from mycelium is harmless, waterproof, and fire-resistant. It can be as thin as paper for dresses and lamp shades, or incredibly thick for heavy-duty items, and in both cases, the end result is extraordinary flexible and strong. (4)



Muskin is sustainable leather, which has its origin from mushrooms. There are different ways to make mushroom leather. In nature, mycelium grows underground in soil, forming networks of threads that help recycle organic matter on the forest floor, while providing nutrients to plants and trees. The threads interweave and self-assemble themselves into a 3D matrix that can spread for miles. The material looks like hand-crafted leather and shares leather's warm touch and pliable. Fabric is also manufactured by combining mycelium cells with a substrate of corn stalks and nutrients. Mycelium only needs little water to grow, within about 10 days the cells grow into the substrate, which can be cut into almost any size. Mycelium can be produced in days, without the need for animal hides or the harmful chemicals used in the production of synthetic leathers. (1)



Creating textiles out of modules provide several benefits. The material is anti microbial and suitable to delicate skin. The fabric is adequate for environment as the fabric is 100 per cent biodegradable and acts as nutritious soil for other plants as no harmful toxic chemicals are used for production. Another desirable environmental benefit is at the end of its life, the material is completely biodegradable and compostable. These biodegradable properties make certain that the fabric returns to the earth without causing any pollution. The products made of this material are not unusually light but also have an excellent insulating effect. Also its highly absorptive natural characteristic, mushroom leather can take in lot of wetness. As such, shoes produced from mushroom leather do not require harmful chemicals sprays to get rid of bad smell.

Mushroom leather is organic, gluten and chemical free and has a marbled, velvety surface. It is only visually similar to animal leather but is a vegan product with highly absorbing, antibacterial and antiseptic properties. The giant amount of air gives the mushroom leather its lightness and at the same time, has an insulating effect. Mycelium is carbon-negative and can be naturally dyed any colour. (5)

The fabric can be mending without interfering with its glance. Moreover, garments are produced using body-based modelling,



three dimensionally ensuring that the clothes fit the end user body flawlessly without the need for any cutting and sewing. This process also eliminates any excess waste. The length of the garment can be changed, even made longer, or elements can be added. This permits for the growth of the right amount of material, removing waste. (2)

2. Mushroom Materials Create Sustainable Fashion

Many companies are creating mushroom options to packaging, building materials and leather. In the apparel industry, mushroom leather is light weight and very flexible, which makes it practical for a wide range of products to standardise the material and make it useful for multiple applications. All such leathers can simply shape into 3D forms like purses, watch straps, shoe insoles and hats.



- Textile developers Bolt Threads make innovative materials more available to the fashion industry. They convert innovative constituents into conventional textiles by employed with brands such as Stella McCartney and Adidas.
- German company create high-end, vegan shoes made from fungus. The leather component of the shoe is made from Fungus, This alternative to animal leather which the brand says has a “vintage look” and a soft texture is environmentally-friendly, organic, vegan, gluten-, and chemical-free. (2)



3. Conclusion

Considering the waste the fashion industry causes and the trend of ‘fast fashion’, textiles that are biodegradable, welcome addition to the wardrobe. Mushroom textiles certainly have a future in many industries. It can be found in clothing and bags, and even durable furniture and building bricks. Muskin adds to many other eco-friendly alternatives that can replace leather to protect animals, people and the environment.

Bibliography:

1. <https://www.fabriclink.com/consumer/topten-2018.cfm>
2. <https://materialdistrict.com/article/mycotex-textile-mushroom-mycelium/>
3. <https://settingmind.com/biodegradable-clothing-textile-made-from-fungus/>
4. <https://www.the-sustainable-fashion-collective.com/2016/08/24/fabric-made-fungi#:~:text=Fabric%20made%20from%20fungus%20is,fast%2Dgrowing%20sphere%20of%20science.>
5. <https://www.watsonwolfe.com/2020/02/08/what-is-mushroom-leather/>
6. <https://www.whatsorb.com/community/sustainable-fashion-fungi-roots-from-mycoworks-inspidere>