Research Cluster: Make – exploring innovative approaches to the ideation of artefacts and spaces | Timespan: 2018 – ongoing

InnoCell

From food waste to bio-degradable products, exploring the innovative potential of microbial cellulose

Team

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In an era of declining natural resources, global climate changes, continuous expansion of industry, and the constant growth of the economy taken for granted, our need of finding alternative solutions, substances and materials is becoming more evident, pressing and urgent.

Figure 1

Looking at our daily routine, an extensive part of our waste comes from durable materials which are paradoxically produced for only a single use. It would be therefore logical to use instead more adequate materials which should ideally follow the dynamics of nature: the waste of an organism is the nourishment of another. This is often referred to as cradle-to-cradle.

The InnoCell project adopts a novel approach by starting from the local agro-food waste, in the Alto-Adige region, and aims at exploring a symbiotic consortium of bacteria and yeasts called 'scoby', which forms a special type of biofilm of pure cellulose also called 'microbial cellulose'. The scoby can turn, through a fermentation process, food and other food-like agricultural wastes into highly valuable and unique substances: a fermented liquid (a.k.a 'Kombucha Tea' beverage) and a type of membrane which through various treatment resembles plastics, paper-pulp, textile or even leather.

Figure 2

Figure 3

This multidisciplinary project brings together a collaboration of Product Design, together with Food Science and Technology, in order to investigate the possibilities of converting food-waste biomass (produced in the region of South-Tyrol) into valuable biodegradable substances: a healthy fermented beverage and biodegradable cellulose layers which would then be processed into possible materials and products offering a substitution for daily used materials with a harmful and worse environmental footprint. The project serves as a means for Glocal design – working with local scales and issues while having significant global implications and a high scaling-up potential.

Figure 4

Figure 5, 6, 7


caramelle alle
ERBE ALPINE
SÜDTIROL


SPÜRE DEN
FROST
Alpen Kräuterbonbon
SÜDTIROL


KRÄUTER
5-8
KRÄUTER
5-8
KRÄUTER
5-8


5
KRÄUTER
5
KRÄUTER
5
KRÄUTER

Figure 8 - 10

Figure 11 -14