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MYCELBIOSIS

Living in synergy with other species



MATERIAL TURN

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In the current era of Anthropocene humans have been exploiting the planet at an unprecedented scale often caused by extraction, production, and manufacturing of building materials. Human habitats compared to their non-human counterparts, are entwined with nature contributing to ecosystem services. This sets the curiosity to explore areas of bio fabrication to create human habitats that are no longer intruders to nature but works in synergy. The use of bio-based materials possibly enhances the symbiotic relationship among species to promote both environmentally friendly and sustainable innovation. Research and findings show a potential use of mycelium to produce bio-composite building materials. Fungal lignocellulosic material shows inherent property obtained from the cellulose substrate and mycelium making it a suitable bio-composite material with high insulative, tensile and compression properties. On the other hand, mycelium is also used to feed bees to develop resistance to diseases especially colony collapse disorder, where many bee populations disappeared. Bees provide vital ecosystem service to regulate and maintain world food security through effective pollination in turn preserving the biodiversity of plant species. But due to various human driven factors

including use of pesticides, urbanisation and climate change their population is in danger.

Mycelium forms an integral part of the thesis exploration to stitch the gap between the humans and bees for their symbiotic co-existence. A monolithic mycelium wall is grown by maintaining the fungi in alive state using growth as an element of design propagation. The life cycle of the wall forms a closed loop circular system by providing shelter and food throughout the year and finally goes back to soil as compost offering vital ecosystem services.

Using biomimicry and computational design tools, desired structure has been achieved to test the technique of casting mycelium composite in 3D printed moulds. Experiments have been conducted to understand the qualities of mycelium composite by merging different cellulose-based substrates to explore material properties that influence the habitation of the two species to expand its architectural application and usability in creating a monolithic living mycelium composite wall to celebrate mycelium as a key to symbiosis.

Keywords: mycelium; symbiosis; bee; human; monolithic wall.