Sustainable Rice Straw

Sakr, Mohamed (School: Obour STEM School)
Hassan, Jana (School: Obour STEM School)

According to World Health Organization, by 2030, climate change is expected to cause approximately 250,000 additional deaths annually. One of the most critical factors leading to increased climate change impacts is increasing greenhouse gases (GHGs). We define two significant sources of GHGs emissions: the burning of Rice straw and the manufacturing of polystyrene. Also, polystyrene causes a lot of environmental issues. Our project solves this by treating rice straw biologically using mycelium and converting it into a material that can replace polystyrene. Our process is divided into four major stages: selection of mushroom type, extraction of mycelium, collection and sterilization of rice straw, and observation of mycelium growth. After our treatment with mycelium, the improved Rice Straw developed many properties that made it a better choice than polystyrene in many applications, such as thermal insulation panels and packaging, as it has a low thermal conductivity of 0.057 W·m?¹·°??¹ also it has a low water absorption of 1.9%. In addition, our material is fire-resistant and has high biodegradability, making it environmentally safe. Our project will have a potent effect in reducing GHGs emissions as it will prevent emissions from burning rice straw and manufacturing polystyrene. Also, our material functions as a tremendous eco-friendly replacement for polystyrene. Widespread adoption of our rice straw-mycelium composite could contribute to the global effort to combat climate change and protect our planet.

Awards Won: