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# MYACINTH ORGANIC FOAM BRICKS: ALTERNATIVE HEAT-INSULATING BRICK MADE FROM WATER HYACINTH PULP PROOFED WITH MYCELIUM AS NATURAL ADHESIVE

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This study aimed at analyzing the nutrient removal efficiency corresponding to the variations in hydraulic retention time (HRT) With the constant rise of global warming, passive cooling is a design solution that is getting harder and harder to achieve; given the rapid urbanization of the Philippines to be taken place in 2018. The outcome of this thesis resulted in an alternative heat insulating foam brick that proved to be more economically and environmentally efficient. It is comprised of self-adhering water hyacinth pulp sourced directly from the estuaries in Metro Manila (Philippines) such as the Pasig River and Laguna de Bay, rice bran sourced from local mills, hydrated lime, and sawdust sourced from local workshops. The mixture was then inoculated with privately cultured mycelium of the fungi species *Ganoderma lucidum* to act as the composite's primary binder. This biological method of binding includes a 4-step manufacturing process including: the inoculation of mycelium into the feedstock (comprised mainly of water hyacinth fragments and sawdust), filling the compound into a mold measuring 60 mm x 100 mm x 215 mm, proofing the compound for 30 days in a dark damp enclosed space to promote mycelial cell growth, removing it from the mold to strengthen for 4 days at room temperature, dehydrating the specimen for 3 hours at a temperature of 50°C, and finally baking the compound at a temperature of 350°C for 60 minutes to kill off any surviving mycelium in the medium. This proves less labor-intensive on the production line per brick, as the product itself is self-manufacturing and since no plastics or resins are used in the product's makeup, close to no non-biodegradable production waste will be dispelled into the surrounding environment. In addition, the product's call for frequent use and harvest of water hyacinths would help mitigate the issues caused by the invasive specie's overproduction in local Philippine estuaries such as the Pasig River and Laguna de Bay.

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