Algae Facade Technology in Improving Air Quality and Building Health: Analysis of Microclimate and Growth of Aspergillus sp

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Photobioreactor (PBR) based algae façade not only has the potential for bio-energy use in buildings but also for its microclimate. Previous studies show the ability of PBR in reducing abiotic components of the sun so it is possible to tackles the phenomenon of Sick Building Syndrome (SBS) and toxic-mold appearance due to the microclimate issues. Therefore, this study aims to test the effect of PBR installation on room microclimate and the growth of toxic mold, Aspergillus sp. Twenty samples of Aspergillus niger were tested for 11 days inside four glass chambers and were given different treatments, two chambers were installed PBR and the other two chambers were not installed PBR (control). As a result, the PBR chambers had a lower temperature and humidity at the peak phase by differences 4.31°C and 5.54% RH than control. Also, seven from ten molds in control chambers appeared by growth area was 1.4 cm2/day and the spore production was 5.4x10.000 CFU/ml on average. While three from ten molds of PBR chambers appeared by growth area was 0.94 cm2/day and the spore production was 1,9x10.000 CFU/ml. This result concludes that algae façade is better in solving microclimate and toxic mold problems in building using a revolutionary and environmentally friendly solution.

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