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Structural Design and Environmental Analysis of Oyster Mushroom Cultivation House in Korea

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Abstract : Most of the recent on-sale oyster mushrooms are raised in a oyster mushroom house, in which the necessary adjustment of growing condition is feasible. The rationale for such artificial growing is the impossibility of successive cultivation in the case of a natural cultivation due to external weather conditions. A oyster mushroom house adopts an equipment called growing bed, laying one growing bed upon another in a multi-column fashion, growing and developing the mushrooms on the respective equipments. The indispensable environment management factors of mushroom cultivation are temperature, humidity, and CO2; on which an appropriate regulation of the three requisites is a necessitated condition for the sake of the total output's increase. However, due to the multiple layers of growing bed's disturbance on air circulation, a oyster mushroom house's internal environmental uniformity meets with considerable instability. This research presents a technology which assures the facilitation of environment regulation over all the internal space of a oyster mushroom house, irrespective of its location. The research staff reinforced the oyster mushroom house's insulation in order to minimize the external environment's influence on the oyster mushroom house's internal environment and installed circulation fan to improve the oyster mushroom house's interior environmental uniformity. Also, the humidifier nozzle's position was set to prevent dew condensation when humidifying. As a result, a highly sophisticated management over all the oyster mushroom house's internal space was realized with the temperature of 0.2~1.3℃, and the relative humidity of 2~7% at the cultivating stage of mushroom's growth. Therefore, to maximize oyster mushroom house's internal environmental uniformity, it can be concluded that consideration of various factors such as insulation reinforcement, decision on the humidifier nozzle's location, disposition of circulation fan's installation and the direction of wind discharge is needed.

Keywords : mushroom growing facility, environmental uniformity, temperature, relative humidity, CO2 concentration
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