Oyster Mushroom Disease Detection Using Machine Learning

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Abstract

The industry that cultivates mushrooms has experienced a significant expansion due to the growing demand for edible mushrooms and in particular for oyster mushrooms, as they are highly valued for their distinct flavor and high nutritional content. However, a major threat to the productivity is the susceptibility of oyster mushroom fields to diseases. This research presents a machine learning-based technique for the early detection of fungal infections in oyster mushrooms to address this issue. The main goals of the study are to create a large dataset of high-resolution images, provide a diagnosis method for several fungal diseases that affect oyster mushrooms, and carry out dataset splitting, augmentation, and preprocessing techniques. Using a dataset of 1500 data points, the study utilizes deep learning models and machine learning techniques like VGG16, ResNet50, and InceptionV3 to identify and classify oyster mushroom infections, demonstrating remarkable accuracy and precision in complex disease categories. This research significantly contributes to agriculture and the mushroom-growing industry, enhancing the understanding and classification of oyster mushroom infections. The study aims to use convolutional neural networks (CNNs) for feature extraction to create an accurate disease detection system for oyster mushroom fungal diseases. However, it acknowledges limitations like the need for a larger dataset and the need for diverse datasets for better generalization. Future research should focus on adding new characteristics to improve the accuracy of disease diagnosis. The proposed machine learning-based approach could revolutionize the mushroom cultivation industry by reducing financial losses from fungal infections and promoting greater yield sustainability. The research's potential benefits include early disease detection, prompt disease treatment, and reduced crop losses.

Keywords: *Oyster Mushroom, Fungal Disease Diagnosis, InceptionV3 Model, CNN Model*