

ABSTRAK

Identifikasi kesegaran cabe jamu (*Piper retrofractum* Vahl) penting untuk menjaga mutu dan nilai jual dalam rantai pasok maupun industri pengolahan. Namun, perbedaan antara cabe segar dan busuk, khususnya setelah proses pengeringan, sering sulit dikenali secara visual sehingga menimbulkan risiko penurunan kualitas. Penelitian ini bertujuan untuk mengembangkan dan membandingkan model *Convolutional Neural Network* (CNN) standar dan *EfficientNet B3* dalam mengklasifikasikan kesegaran cabe jamu. Dataset terdiri atas dua kelas utama (segar dan busuk) yang melalui tahap *preprocessing* berupa *resize* dan *augmentasi*. Model diuji dengan dua *optimizer*, yaitu *ADAM* dan *SGD*. Evaluasi dilakukan menggunakan metrik akurasi, presisi, recall, dan F1-score. Hasil penelitian menunjukkan bahwa *EfficientNet B3* dengan *optimizer ADAM* memberikan performa terbaik dengan akurasi 95%, presisi 94%, recall 96%, dan F1-score 95%. Nilai tersebut lebih tinggi dibandingkan CNN standar maupun penggunaan *optimizer SGD*, yang cenderung menghasilkan akurasi kurang stabil. Temuan ini menegaskan efektivitas *EfficientNet B3* dalam klasifikasi citra cabe jamu. Secara praktis, model terbaik berhasil diimplementasikan ke dalam aplikasi berbasis *Streamlit* yang memungkinkan prediksi dilakukan secara langsung melalui antarmuka sederhana.

Kata kunci: Cabe jamu, CNN, *EfficientNet B3*, klasifikasi citra.

Abstract

*The identification of the freshness of jamu chili (*Piper retrofractum* Vahl) is crucial for maintaining quality and market value throughout the supply chain and processing industry. However, distinguishing between fresh and spoiled chili, particularly after the drying process, is often visually challenging, leading to potential quality degradation. This study aims to develop and compare a standard Convolutional Neural Network (CNN) model and EfficientNet B3 for classifying the freshness of jamu chili. The dataset consists of two main classes (fresh and spoiled) and undergoes preprocessing stages including resizing and data augmentation. The models are evaluated using two optimizers, namely ADAM and SGD. Performance evaluation is conducted using accuracy, precision, recall, and F1-score metrics. The results show that EfficientNet B3 with the ADAM optimizer achieves the best performance, with an accuracy of 95%, precision of 94%, recall of 96%, and an F1-score of 95%. These results outperform the standard CNN model and the SGD optimizer, which tend to produce less stable accuracy. The findings confirm the effectiveness of EfficientNet B3 in jamu chili image classification. Practically, the best-performing model has been successfully implemented into a Streamlit-based application, enabling real-time predictions through a simple user interface.*

Keywords: *Piper retrofractum* Vahl, CNN, EfficientNet B3, image classification