ABSTRACT

Mango plants hold significant economic potential, particularly in tropical and subtropical countries. In Indonesia, mangoes are a high-value export commodity, requiring an effective monitoring and early disease detection to maintain their quality and market value. This study focuses on developing a modified ConvNeXt model for classifying mango leaf diseases. While ConvNeXt is known for its performance in image classification, we introduced specific modifications to enhance its suitability for this task. The model was optimized by reducing the number of blocks in each stage to improve computational efficiency and by incorporating residual connections across stages. These architectural changes successfully facilitate better gradient flow and stabilize training, achieving a balance between high accuracy and computational feasibility. The model was trained on a comprehensive dataset combining images from four sources, covering eight distinct classes: Anthracnose, Bacterial Canker, Cutting Weevil, Die Back, Gall Midge, Powdery Mildew, Sooty Mould, and a category for healthy leaves. Results demonstrated that our modified ConvNeXt achieved an impressive 97.52% accuracy, significantly outperforming the baseline ConvNeXt-Tiny model, which reached only 95.21%. This research provides a practical and efficient approach for early disease detection, enabling farmers and stakeholders to take timely action, thereby safeguarding crop quality and supporting consistent agricultural productivity.

Keywords: *ConvNeXt, mango leaf disease, classification, deep learning*