ABSTRAK

CLUSTERING CITRA TANAMAN OBAT MENGGUNAKAN METODE *K-MEANS*

Oleh

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Tanaman obat memiliki manfaat besar dalam menyembuhkan berbagai penyakit. Banyak masyarakat yang menggunakan tanaman obat sebagai sumber tanaman obat keluarga (TOGA). Bagian tanaman yang dapat dimanfaatkan sebagai obat adalah daun. Daun sulit diidentifikasi karena banyak daun yang memiliki bentuk dan warna yang mirip. Oleh karena itu, pengolahan citra dengan *K-Means Clustering* diterapkan untuk membantu mengidentifikasi daun tanaman obat. Citra akan di*scaling* menjadi 600 x 800 piksel. Ciri tekstur pada citra akan dihitung menggunakan *Gray Level Co-occurrence Matrix* (GLCM). GLCM menghasilkan nilai numerik yang kemudian digunakan untuk proses *K-Means Clustering*. *K-Means Clustering* akan mengelompokkan citra berdasarkan kesamaan nilai fitur dan *centroid* terdekatnya. Jumlah *cluster* optimal yaitu k=3 berdasarkan perhitungan nilai SSE. Hasil penelitian 900 dataset citra daun terbagi menjadi 3 *cluster* dengan akurasi tertinggi 51,54% pada *cluster* 2 yang memprediksi daun binahong. Proses *K-Means Clustering* kurang baik dikarenakan penetuan nilai *centroid* berpengaruh terhadap hasil *cluster*. *K-Means Clustering* diimplementasikan ke dalam sistem web menggunakan *flask*.

Kata Kunci: *K-Means Clustering, Gray Level Co-occurrence Matrix* (GLCM), Tanaman Obat, *Flask*

ABSTRACT

CLUSTERING OF MEDICINAL PLANT IMAGES USING K-MEANS METHOD

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Medicinal plants have significant benefits in treating various diseases. Many communities utilize medicinal plants as a source of family herbal medicine (TOGA). The part of the plant that is often used for medicinal purposes is the leaves. Identifying leaves can be challenging as many of them have similar shapes and colors. Therefore, image processing with K-Means Clustering is applied to aid in the identification of medicinal plant leaves. The leaf images are scaled to 600 x 800 pixels. The texture features of the images are computed using the Gray Level Co-occurrence Matrix (GLCM) method. GLCM generates numerical values that are later used in the K-Means Clustering process. K-Means Clustering method groups the images based on the similarity of their feature values and their closest centroids. The optimal number of clusters is determined to be k=3 based on the calculation of the Sum of Squared Errors (SSE). The results show that out of 900 leaf image datasets, the K-Means Clustering divides them into 3 clusters, with the highest accuracy of 51.54% achieved in cluster 2, which predicts the binahong leaves. K-Means Clustering process is less effective due to the influence of centroid initialization on the clustering results. K-Means Clustering is implemented into a web-based system using Flask.

Keywords: K-Means Clustering, Gray Level Co-occurrence Matrix (GLCM), Medicinal Plant, Flask