

**Identifikasi Kadar Gula Jeruk Siam Pontianak (*Citrus nobilis* var. *microcarpa*) Berdasarkan Citra menggunakan Metode GLCM, *K-means Clustering*, dan CNN**

**Abstrak**

Penelitian ini mengkaji tentang kadar gula pada buah jeruk siam Pontianak untuk menentukan tingkat kematangan buah. Ada 5 tahap dalam proses penelitian ini, yang terdiri dari uji kadar gula, pengolahan citra, pembagian kelas, penentuan fitur citra, dan analisis *Convolutional Neural Network* (CNN). Pengujian kadar gula dilakukan menggunakan refraktometer brix digital yang bertujuan untuk mengetahui persentase kadar gula dalam daging buah jeruk siam Pontianak. Rentang kadar gula yang terkandung pada buah jeruk siam Pontianak sebesar 7,6%brix – 13,4%brix. Pengolahan citra dimulai dengan memotong citra hingga bagian yang diinginkan, kemudian dilakukan *resize* dan *remove background* untuk mendapatkan citra dengan fokus objeknya saja. Pembagian kelas bertujuan untuk membagi kelas jeruk berdasarkan tingkat kadar gula menggunakan metode *k-means clustering*. Penentuan fitur citra menggunakan metode *Gray Level Co-occurrence Matrix* (GLCM) untuk mengetahui fitur citra di setiap kelas. Hasil akurasi citra jeruk siam Pontianak berdasarkan tingkat kematangan menggunakan metode CNN sebesar 75%.

Kata kunci : Jeruk siam Pontianak, *Convolutional Neural Network*, *Gray Level Co-occurrence Matrix* (GLCM), *k-means clustering*, kadar gula.

***Identification Sugar Content of Pontianak Siamese Orange (Citrus nobilis var. microcarpa) Based on Image using GLCM, K-means Clustering, and CNN***

***Abstract***

*This study examined the sugar content in Pontianak Siamese citrus fruits to determine the level of fruit maturity. There are 5 stages in this research process, which consist of sugar content testing, image processing, class division, determination of image features, and analysis of Convolutional Neural Network (CNN). Sugar content testing is carried out using a digital brix refractometer which aims to determine the percentage of sugar content in Pontianak Siamese orange fruit flesh. The range of sugar content contained in Pontianak Siamese citrus fruits is 7.6% brix – 13.4 % brix. Image processing begins with cutting the image to the desired part, then resizing and removing the background to get the image with the object focused only. The class division aims to divide the class of oranges by the level of sugar content using the k-means clustering method. Determination of image features using the Gray Level Co-occurrence Matrix (GLCM) method to determine the image features in each class. The results of the accuracy of Pontianak siamese orange imagery based on the maturity level using the CNN method of 75%.*

*Keywords : Siamese orange Pontianak, Convolutional Neural Network, k-means clustering, Gray Level Co-occurrence Matrix (GLCM), sugar content.*