

## INTISARI

Pepaya kuning lokal (*Carica papaya* L.) merupakan bahan baku utama dalam produksi *tropical fruit salad* (TFS) di PT. Great Giant Foods, Lampung. Kendala utama dalam budidaya pepaya lokal adalah ketersediaan benih yang berkualitas dan seragam, terutama terkait ketidakstabilan rasio jenis kelamin, di mana keberadaan individu jantan sering kali menurunkan produktivitas. Penelitian ini bertujuan untuk mengevaluasi keragaman genetik pada populasi hasil *selfing* pepaya lokal hermafrodit, mengembangkan galur pepaya unggul dengan proporsi hermafrodit lebih tinggi, serta mengoptimalkan seleksi galur menggunakan penanda DNA spesifik jenis kelamin dan analisis segregasi genetik. Penelitian menggunakan tanaman induk pepaya lokal SA nomor 8 dan menghasilkan 92 individu *selfing* hermafrodit generasi pertama (S1) yang dianalisis melalui karakter morfologi dan penanda molekuler SCAR W11 serta PMSM2. Hasil penelitian menunjukkan adanya keragaman genetik yang teridentifikasi melalui perbedaan morfologi dan hasil panen buah, dengan proporsi tanaman hermafrodit mencapai 50% dari populasi, lebih tinggi dibandingkan betina dan jantan. Analisis segregasi genetik mendukung rasio teoritis pewarisan jenis kelamin, meskipun penanda DNA SCAR W11 dan PMSM2 belum sepenuhnya konsisten dalam membedakan jantan, betina, dan hermafrodit. Kombinasi analisis morfologi dan molekuler diperlukan untuk memperoleh galur pepaya lokal unggul yang stabil secara genetik, produktif, dan berpotensi memenuhi kebutuhan industri.

Kata kunci: pepaya lokal, *selfing*, hermafrodit, keragaman genetik, rasio kelamin

## **ABSTRACT**

Local yellow papaya (*Carica papaya* L.) is a primary raw material in the production of tropical fruit salad (TFS) at PT Great Giant Foods in Lampung. The major constraint in local papaya cultivation lies in the limited availability of high-quality and uniform seeds, particularly due to the instability of sex ratios, where the presence of male individuals often reduces productivity. This study aimed to evaluate the genetic diversity within a selfing population of local hermaphrodite papaya, to develop superior papaya lines with a higher proportion of hermaphrodite plants, and to optimize line selection using sex-specific DNA markers and genetic segregation analysis. The research utilized a selected local papaya plant, designated as SA number 8, as the parental line and generated 92 first-generation (S1) selfing progenies, which were analyzed based on morphological traits and molecular markers SCAR W11 and PMSM2. The results revealed genetic variation as reflected in differences in morphological traits and fruit yield, with the proportion of hermaphrodite plants reaching 50% of the population, higher than that of female and male plants. Genetic segregation analysis supported the theoretical sex inheritance ratio, although the DNA markers SCAR W11 and PMSM2 were not fully consistent in differentiating male, female, and hermaphrodite individuals. The combination of morphological and molecular analyses is therefore essential to obtain superior local papaya lines that are genetically stable, productive, and have the potential to meet industrial demands.

Keywords: local papaya, selfing, hermaphrodite, genetic diversity, sex ratio