ABSTRACT

Indana Zulfa. 24020122140146. Genetic Diversity Characterization of Cassava *(Manihot esculenta)* in Plantation Fields of Kudus, Central Java, Using *the psbA–trnH* Molecular Marker. Under the guidance of Jafron Wasiq Hidayat and Anggiresti Kinasih.

Kudus Regency is one of the cassava production centers in Central Java, however information regarding the genetic diversity of cultivated cassava in this region remains limited. Cassava identification is generally based on morphological characteristics and has not been extensively studied using molecular approaches. Molecular identification can be conducted using the *psbA–trnH* marker, which has been reported to be polymorphic compared to other markers. This study aimed to identify cassava plants, namely sticky cassava from Rejosari Village (KTT 1, KTT 2, KTT 3) and cassava from Hanggosoco Village (KTS 1, KTS 2, KTS 3), Kudus, Central Java, through phylogenetic analysis using the *psbA–trnH* marker. The methods included pre-survey, DNA isolation, DNA quantification, DNA amplification, DNA visualization, sequencing, species identification using BLAST analysis, phylogenetic tree reconstruction, and haplotype network comparison. Based on BLASTn analysis of the *psbA–trnH* marker, cassava samples from Kudus were identified as *Manihot esculenta*. This result was supported by a percent identity of 100%, query cover of 100%, and an e-value of 0.0 compared with *Manihot esculenta* sequences in GenBank, indicating that the Kudus cassava sequences were identical to the reference sequences. All cassava samples clustered within the same clade with a pairwise genetic distance of 0.000 and shared a single haplotype. These findings indicate that no genetic variation was detected among cassava samples from Kudus using the *psbA–trnH* marker. The results suggest that the *psbA–trnH* marker is highly conserved and less effective for detecting genetic diversity at the intraspecific level. Future studies are recommended to employ molecular markers with higher variability, such as *matK*, *rbcL*, *ITS*, or other nuclear markers, to better resolve genetic diversity at the cultivar or local population level of cassava.

Keywords: cassava, molecular, BLASTn.