RINGKASAN

Ubi jalar adalah alternatif karbohidrat selain nasi yang diminati masyarakat karena rasanya yang manis. Kandungan antosianin tertinggi terdapat pada ubi jalar ungu, namun rasanya yang kurang manis menyebabkan ubi jalar ungu kurang diminati konsumen. Penurunan produksi ubi jalar yang salah satunya disebabkan belum tersedianya varietas unggul. Sifat ubi jalar dapat diperbaiki melalui program persilangan. Keragaman genetik merupakan landasan utama dari setiap program pemuliaan. Keragaman genetik memberikan informasi terkait tetua yang akan dijadikan sebagai sumber plasma nutfah dalam program pemuliaan tanaman. Penelitian ini bertujuan untuk melakukan karakterisasi dari aspek morfologi, mengelompokkan genotipe-genotipe hasil persilangan, serta melakukan seleksi terhadap keturunan ubi jalar unggul yang diharapkan memiliki kandungan antosianin tinggi dan rasa manis.

Persiapan biomassa genotipe dilakukan di Desa Gandatapa, Kecamatan Sumbang, Kabupaten Banyumas. Karakterisasi morfologi dilakukan di Laboratorium Pemuliaan Tanaman dan Bioteknologi Fakultas Pertanian Universitas Jenderal Soedirman. Uji kualitas dan kuantitas DNA dilakukan di Laboratorium Riset Universitas Jenderal Soedirman. PCR (*Polymerase Chain Reaction*) dilakukan di Laboratorium bioteknologi ternak, Integrated Academic Building, Universitas Jenderal Soedirman. Penelitian ini dilakukan pada Maret 2024-Januari 2025. Metode yang dilakukan meliputi karakterisasi berbagai macam karakter morfologi berdasarkan panduan UPOV (*International Union for the Protection of New Varieties of Plants*) ubi jalar (2010). Bagian batang, daun, dan umbi didokumentasikan kemudian dikarakterisasi mengikuti panduan UPOV. Data hasil karakterisasi morfologi dimasukkan kemudian analisis menggunakan *software* MVSP (*Multi Variate Statistical Package*). Seleksi terhadap keturunan ubi jalar unggul dilakukan berdasarkan warna ungu dan rasa manis pada 80 keturunan F1.

Hasil karakterisasi dikelompokan dalam bentuk dendrogram (pohon filogenetik) menggunakan jarak *Euclidean* untuk melihat kekerabatannya. Berdasarkan karakterisasi morfologi 80 keturunan F1 membentuk 6 klaster. Hasil seleksi berdasarkan kriteria warna ungu pada umbi dan rasa manis didapatkan 7 genotipe sesuai dengan tujuan pemuliaan tanaman, yaitu genotipe 41, 45, 55, 63, 70, 72, dan 76. Genotipe yang memiliki tingkat kemiripan tertinggi adalah genotipe 71 dan 75 dengan jarak *Euclidean* kurang dari 2,5. Genotipe yang memiliki kekerabatan paling jauh dengan jarak *Euclidean* 15 adalah genotipe 30 dan 50. Genotipe 25 memliki kekerabatan paling tinggi dengan tetua A. Genotipe 40 memiliki kemiripan morfologi paling dekat dengan tetua B. Genotip yang memiliki kekerabatan paling dekat dengan tetua C adalah genotipe 61, 69, 72, dan 76.

SUMMARY

Sweet potatoes are a carbohydrate alternative to rice that is popular with the public because of its sweet taste. Purple sweet potatoes have the highest anthocyanin content, but their less sweet taste makes them less popular with consumers. The decline in sweet potato production is partly due to the lack of superior varieties. Sweet potato traits can be improved through crossbreeding programs. Genetic diversity is the main foundation of any breeding program. Genetic diversity provides information regarding parents that will be used as sources of germplasm in plant breeding programs. This study aims to characterize the morphological aspects, group the genotypes resulting from crossbreeding, and select superior sweet potato offspring expected to have high anthocyanin content and a sweet taste.

Genotype biomass preparation was conducted in Gandatapa Village, Sumbang District, Banyumas Regency. Morphological characterization was conducted at the Plant Breeding and Biotechnology Laboratory, Faculty of Agriculture, Jenderal Soedirman University. DNA quality and quantity tests were conducted at the Jenderal Soedirman University Research Laboratory. PCR (Polymerase Chain Reaction) was conducted at the Animal Biotechnology Laboratory, Integrated Academic Building, Jenderal Soedirman University. This research was conducted from March 2024 to January 2025. The methods used included characterization of various morphological characters based on the UPOV (International Union for the Protection of New Varieties of Plants) sweet potato guidelines (2010). The stems, leaves, and tubers were documented and then characterized following the UPOV guidelines. Morphological characterization data were entered and analyzed using MVSP (Multi Variate Statistical Package) software. Selection of superior sweet potato offspring was carried out based on purple color and sweet taste in 80 F1 offspring.

The characterization results were grouped in the form of a dendrogram (phylogenetic tree) using Euclidean distance to see their kinship. Based on the morphological characterization of 80 F1 offspring formed 6 clusters. The selection results based on the criteria of purple color on the tuber and sweet taste obtained 7 genotypes according to the objectives of plant breeding, namely genotypes 41, 45, 55, 63, 70, 72, and 76. The genotypes that have the highest level of similarity are genotypes 71 and 75 with a Euclidean distance of less than 2.5. The genotypes that have the most distant kinship with a Euclidean distance of 15 are genotypes 30 and 50. Genotype 25 has the highest kinship with parent A. Genotype 40 has the closest morphological similarity with parent B. The genotypes that have the closest kinship with parent C are genotypes 61, 69, 72, and 76.