

STUDY ON THE RELATIONSHIP OF 73 INTRODUCED AND INDIGENOUS BANANA ACCESSIONS BASED ON QUALITATIVE MORPHOLOGICAL CHARACTERS

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ABSTRACT

*In order to characterize the potential of banana (*Musa spp*) germplasm, 73 accessions consisting of 27 accessions introduced from INIBAP (International Initiative of Banana and Plantain) and 46 accessions of indigenous banana are subjected to relationship analysis through 22 qualitative morphological characters, including pseudostem, petiole, and lamina. Characterization based on scoring method of banana descriptor of IPGRI (International Plant Genetics Resources Institute). Similarity analysis reveals that distance among banana accessions genetics ranges at 0.0-1.0 of similarity value. Highest genetics similarity (1.0 level of similarity) is shown by banana accessions introduced from INIBAP (International Initiative of Banana and Plantain) or FHIA25 group. On the contrary, lowest genetics similarity (0.0 level of similarity) is shown by INIBAP accession of AA cv Rose with indigenous accession of Ambon Amerika B, and Triolin. Dendrogram generated by using SAHN-UPGMA (Sequential, Agglomerative, Hierarchical, and Nested -Unweighted pair-group method, arithmetic average) indicates that the evaluated accessions separates at 0.21 coefficient of similarity, subsequently at 0.38 coefficient of similarity, the accessions are divided into seven groups. Among those groups, two groups are exclusively, consisting of INIBAP accessions, one group consists of indigenous accessions, and the other four groups shared by INIBAP accessions and indigenous bananas.*

Key words : *Musa spp*, genetics relationship, morphological characters

INTRODUCTION

Current commercial banana (*Musa spp*) presumably originates from *Musa acuminata* Colla ($2x=22$) and *Musa balbisiana* Colla ($2x=22$). Mutation, domestication, and selection play important role in banana evolution [1]. Ploidy and genome derives from *M. acuminata* denoted with A symbol, and those derives from *M. balbisiana* denoted with B symbol. Crossing between wild banana of *M. acuminata* and *M. balbisiana* produce hybrids of diploid AB, triploid AAB and ABB as well as tetraploid AAAB, AABB and AB BB [2].

Base consumption pattern banana is separated into desert bananas and cooking bananas. Genome composition of the banana showed correlated to the grouping of use. Bananas derived from *M. balbisiana* genome are cooking banana, and bananas derived from *M. acuminata* genome are dessert banana. However, bananas developed from crossing of *M. acuminata* with *M. balbisiana* produce both of desert and cooking bananas [3]. Plantain is a sub group of cooking banana that should be processed prior to be consumed [2].

Most of wild banana is located in Southeast Asia (4), therefore Indo-Malaysia region (Indonesia, Malaysia, Philippines, and New Guinea) is the center of origin of banana, lately distributed to tropical and subtropical countries in Asia, America, Africa, and Australia [1]. Southeast Asia region is reported to have rich banana diversity [3]. Indonesia as a part of Southeast Asia Region also has rich bananas cultivars [5], however, characterization and identification of Indonesian banana is lack behind.

Characterization and identification of banana germplasm in Indonesia are very important, since the same banana cultivar has several local names. On the contrary, the same local name refers to a different banana cultivar. Characterization based on morphological marker is common to be utilized to resolve duplication problem of germplasm. Genetics relationship studies by using morphological characters have been widely used [6;7;8;9;10].

This study aims to characterize banana collections in Center of Tropical Fruit Studies (CETROPS) based on their morphological markers, and to elucidate relationship among the accessions. Obtained data are necessary to optimize their potentiality for banana improvement and develop phenotypic markers for commercial use.

MATERIALS AND METHODS

Plant Materials

Banana collections of CETROPS (Center for Tropical Fruit Studies) including 27 accessions introduced from INIBAP (International Initiative of Banana and Plantain) and 46 accessions of indigenous banana grows in Tajur Field Station located 250 m above sea level. List of evaluated accessions is presented in Table 1.

Morphological Analysis

Field observations are conducted from August to September 2004, based on 22 vegetative characters as described by Banana Plant Descriptor of International Plant Genetics Resources Institute [11] by slight modification [12]. Observed characters in-