

ABSTRAK

Diversitas genetik suatu populasi memiliki arti penting baik bagi program pengembangan tanaman melalui pemuliaan tanaman maupun bagi keseimbangan ekosistem. Penelitian yang bertujuan untuk mengetahui pola diversitas genetik 51 aksesori kecipir dan respons kecipir terhadap pemangkasan reproduktif telah dilakukan melalui tiga seri penelitian. Penelitian seri pertama yang bertujuan mengetahui pola diversitas dan kekerabatan genetik berdasarkan karakter morfologi agronomi dan kualitas biji, telah dilakukan di Kebun Percobaan Ciparanje selama dua musim tanam mulai Juni 2009 s.d. September 2010. Percobaan lapangan disusun dalam rancangan acak kelompok yang terdiri atas 51 aksesori kecipir sebagai taraf perlakuan dan diulang dua kali. Variabel yang diamati adalah 33 karakter morfologi agronomi yang metode pengukurannya mengacu pada deskriptor kecipir dari IBPGR. Selain karakter morfologi agronomi, diamati pula enam karakter kualitas biji. Penelitian seri kedua yang bertujuan mengetahui pola diversitas berdasarkan marka molekuler SSRs telah dilakukan di Laboratorium Ilmu Tanaman Faperta Unpad, mulai bulan September s.d. Desember 2011. Penelitian seri ketiga yang bertujuan mengetahui respons kecipir terhadap pemangkasan reproduktif pada dua musim tanam berbeda telah dilakukan di Kebun Percobaan Ciparanje mulai November 2008 s.d. Februari 2010. Percobaan disusun dalam rancangan petak terbagi yang diulang dua kali dengan tujuh aksesori sebagai anak petak dan perlakuan pemangkasan sebagai petak utama. Variabel yang diamati adalah hasil dan komponen hasil ubi kecipir. Data dianalisis dengan menggunakan analisis varians, analisis korelasi fenotipik dan genetik, Uji DNMRT, analisis komponen utama, analisis kluster, dan Uji Mantel. Hasil menunjukkan bahwa terdapat diversitas genetik yang luas dari 51 aksesori kecipir berdasarkan karakter morfologi agronomi, karakter kualitas hasil biji dan marka molekuler SSRs. Letak geografis memiliki korelasi dengan beberapa karakter morfologi agronomi kecipir, namun tidak berkorelasi dengan karakter kualitas hasil biji. Sebagian besar karakter morfologi agronomi berkorelasi secara fenotipik dengan satu atau lebih karakter lainnya kecuali karakter bobot 100 biji dan lebar polong. Berbeda dengan korelasi fenotipik, seluruh karakter berkorelasi genetik setidaknya dengan dua atau lebih karakter lainnya. Selain itu, terdapat pula korelasi antara beberapa karakter morfologi agronomi dengan karakter kualitas biji. Pada sisi lain, tidak terdapat korelasi antara pola diversitas genetik yang diestimasi berdasarkan marka morfologi agronomi dan berdasarkan marka molekuler SSRs. Hasil juga memperlihatkan bahwa terdapat perbedaan respons aksesori kecipir terhadap pemangkasan reproduktif pada dua musim tanam berbeda. Perbedaan tersebut terlihat pada karakter bobot ubi per tanaman dan diameter ubi. Untuk karakter jumlah ubi, respons kecipir terhadap pemangkasan bergantung pada aksesinya tanpa bergantung pada musim tanam. Selain itu, untuk karakter bobot tunggal, terdapat perbedaan variasi aksesori antara kedua musim tanam.

ABSTRACT

Genetic diversity of a population has significant importance both for crop improvement through crop breeding and for balanced ecosystem. Research to find out genetic diversity pattern of 51 winged bean accessions and response of winged bean to reproductive pruning, was conducted in three series of experiments. First experiment to find out pattern of genetic diversity and relationship based on characters of morphology agronomy and seed quality, was conducted in experimental Station Ciparanje during two growing season started from June 2009 until September 2010. Each field experiment in two growing seasons was arranged in a randomized block design with 51 winged bean accessions as treatment levels and replicated twice. Variables observed were 33 characters of morphology agronomy which measurement methods were referred to winged bean descriptor issued by IBPGR. Apart from that, six characters of seed quality were also observed. Second research to find out genetic diversity and relationship based on molecular marker SSRs, was conducted by using nine SSRs markers in Laboratory of Plant Science, Faculty of Agriculture, Unpad, started from September 2011 until December 2011. Third research to find out response of winged bean to reproductive pruning in two growing seasons, was conducted in experimental station Ciparanje started from November 2008 until February 2010. Each of field experiment was arranged in a split plot design with seven accessions as sub plot and pruning treatment as main plot, and replicated twice. Variables observed were tuber yield and yield components of winged bean. Data were analyzed using several statistical procedures namely, analysis of variance, analysis of phenotypic and genotypic correlation, DNMR test, principle component analysis (PCA), cluster analysis, and Mantel test. Results showed that there was large genetic diversity among 51 winged bean accessions based on morphology agronomy characters, seed quality, and molecular marker SSRs. Three of geographical factors were correlated with several morphology agronomy characters, yet none of them were correlated with characters of seed quality. Most of morphology agronomy characters were phenotypically correlated with one or more of other characters. Different from phenotypic correlation, all characters were genetically correlated with at least with two or more of other characters. In other hand, there was no correlation between diversity pattern estimated based on morphology agronomy marker and SSR molecular marker. Results also showed that there were different responses of winged bean accessions to reproductive pruning in two different growing seasons. Such differences were shown on characters of tuber weight per plant and tuber diameter. For character of tuber number per plant, winged bean response to pruning depended on accessions and did not depend on growing season. Apart from that, for single tuber weight, there was different variation of accessions between such two growing seasons.