

RINGKASAN

Cabai besar (*Capsicum annuum* L.) dan cabai kecil (*Capsicum frutescens* L.) merupakan anggota famili Solanaceae yang paling banyak dibudidayakan di Indonesia karena memiliki prospek ekonomi yang tinggi. *C. annuum* dan *C. frutescens* sangat bervariasi dan terdiri atas banyak kultivar. Oleh karena itu, karakterisasi morfologi dan molekuler penting dilakukan guna melihat keanekaragaman di antara kedua jenis cabai tersebut. Penelitian ini bertujuan untuk mengetahui karakteristik morfologi dan molekuler beberapa kultivar *C. annuum* dan *C. frutescens*, serta mengetahui hubungan kekerabatan di antara kultivar *C. annuum* dan *C. frutescens* berdasarkan karakter morfologi dan marka RAPD.

Penelitian ini dilakukan menggunakan metode survei eksploratif dengan teknik pengambilan sampel secara *purposive random sampling* di beberapa lokasi di Banyumas. Karakterisasi morfologi dilakukan dengan mengamati 25 karakter morfologi, sedangkan analisis molekuler dilakukan dengan mengamati polimorfisme fragmen-fragmen DNA hasil PCR-RAPD. Data morfologi dan molekuler diskor, kemudian digunakan untuk analisis kluster dengan metode UPGMA menggunakan *software* MEGA 7.

Hasil penelitian menunjukkan bahwa lima kultivar *C. annuum* yaitu *C. annuum* ‘Jacko 99’, Lado F1, Lentur F1, Hai-Lux, dan Iggo, serta lima kultivar *C. frutescens* yaitu *C. frutescens* ‘Japlak’, Sret, Mahkota, Rembaka, dan Madun mempunyai karakter morfologi yang berbeda-beda. Analisis molekuler menggunakan primer OPA 01, OPA 02, OPA 10, OPB 11 dan OPB 12 menghasilkan total pola pita sebanyak 50 pita, terdiri atas 45 (90%) pita polimorfik dan lima (10%) pita monomorfik. Analisis kluster terhadap 25 karakter morfologi menghasilkan fenogram dengan jarak genetik berkisar antara 0-20%, sedangkan analisis kluster berdasarkan marka RAPD menghasilkan fenogram dengan jarak genetik berkisar antara 0-25%. Analisis kluster berdasarkan karakter morfologi sejalan dengan marka RAPD yaitu pada jarak genetik 20% *C. annuum* terpisah dari *C. frutescens*. Meskipun terdapat satu kultivar *C. frutescens* yaitu *C. frutescens* ‘Japlak’ yang mengelompok ke dalam *C. annuum*.

Berdasarkan penelitian ini dapat disimpulkan bahwa *C. annuum* dan *C. frutescens* memiliki karakteristik yang berbeda-beda berdasarkan morfologi dan marka RAPD. Analisis hubungan kekerabatan menunjukkan bahwa *C. annuum* dan *C. frutescens* membentuk kelompok yang berbeda.

Kata kunci: *Capsicum annuum*, *Capsicum frutescens*, morfologi, RAPD, polimorfisme

SUMMARY

Cayenne pepper (*Capsicum annuum* L.) and chili pepper (*Capsicum frutescens* L.) are members of the family Solanaceae which are commonly cultivated in Indonesia because of the high economic prospect. *C. annuum* and *C. frutescens* are varied and consist of many cultivars. Therefore, morphological and molecular characterizations are important to see the diversity between the two types of peppers. The purposes of this study were to determine the morphological and molecular characteristics of several cultivars of *C. annuum* and *C. frutescens*, and to find out genetic relationship between several cultivars of *C. annuum* and *C. frutescens* based on morphological characters and RAPD markers.

This research was conducted using an exploratory survey method with a purposive random sampling technique in several locations in Banyumas. The morphological characterization was carried out by observing 25 morphological characters, while molecular analysis was carried out by observing polymorphisms of DNA fragments from the PCR-RAPD results. The morphological and molecular data were scored separately, and then used to cluster analyze based on UPGMA method employing the MEGA 7 software.

The results showed that five cultivars of *C. annuum* namely *C. annuum* 'Jacko 99', Lado F1, Lentur F1, Hai-Lux and Iggo as well as five cultivars of *C. frutescens* namely *C. frutescens* 'Japlak', Sret, Mahkota, Rembaka and Madun were different based on morphological characters. Molecular analysis showed that of 50 band patterns of DNA resulting from five primers (OPA 01, OPA 02, OPA 10, OPB 11 and OPB 12 primers), 45 (90%) were polymorphic and five (10%) were monomorphic. Cluster analysis of 25 main morphological characters resulted in a phenogram with genetic variation of about 0-20%, while cluster analysis based on the RAPD markers gave rise to a phenogram with genetic variation of about 0-25%. Both clusters showed that *C. annuum* were separated from *C. frutescens* at a genetic distance of 20%, although there is one cultivar of *C. frutescens*, namely *C. frutescens* 'Japlak' which is grouped into *C. annuum*.

Based on this study it can be concluded that *C. annuum* and *C. frutescens* have different characteristics based on morphology and RAPD markers. Genetic relationship showed that *C. annuum* and *C. frutescens* are grouped into different clusters.

Keywords: *Capsicum annuum*, *Capsicum frutescens*, morphology, RAPD, polymorphism