

**VARIASI INTRASPEKIFIK DAN HUBUNGAN KEKERBATAN PEGAGAN
(*Centella asiatica* (L.) Urb.) BERDASARKAN KARAKTER MORFOLOGIS
DAN PENANDA MOLEKULER *SIMPLE SEQUENCE REPEATS***

oleh:
Anshary Maruzy
21/476259/PBI/01764

INTISARI

Centella asiatica (L.) Urb. merupakan tumbuhan asli Jawa yang menjadi salah satu sumber bahan dalam pengobatan tradisional dan modern. Belum ada laporan tentang variasi intraspesifik dan kekerabatan aksesori *C. asiatica* dari populasi alami di Jawa Tengah berdasarkan karakter morfologis dan penanda molekuler *Simple Sequence Repeats* (SSR). Penelitian ini bertujuan untuk mendokumentasikan dan menganalisis variasi morfologis dan genetis serta hubungan kekerabatan aksesori *C. asiatica* di Jawa Tengah. Dalam penelitian ini, 32 aksesori *C. asiatica* diperoleh dari populasi alam dari delapan gunung di Jawa Tengah. Karakter morfologis yang diamati meliputi 25 karakter dari organ vegetatif dan 34 karakter dari organ generatif. Data morfologis organ vegetatif 32 aksesori digunakan untuk penyusunan kekerabatan fenetik menggunakan analisis kluster dan analisis komponen utama. Data morfologi organ generatif dianalisis secara deskriptif, mengingat tidak semua aksesori dijumpai dalam kondisi berbunga. Data SSR digunakan dalam analisis filogenetik dan variasi genetis. Hasil analisis kluster dan analisis komponen utama menunjukkan pola pengelompokan aksesori yang secara umum tidak berdasarkan lokasi asal. Hasil analisis komponen utama menunjukkan bahwa pengelompokan aksesori terutama dipengaruhi oleh karakter warna tangkai daun, warna stolon, warna permukaan adaksial daun, panjang stolon, warna permukaan abaksial daun, panjang tangkai daun, panjang daun, lebar daun, dan tepi daun. Hasil analisis SSR menunjukkan bahwa populasi *C. asiatica* di Jawa Tengah memiliki variasi genetis yang tinggi. Hal tersebut terbukti dari ulangan sekuen (CT)_n yang bervariasi, komposisi nukleotida yang bervariasi, persentase jarak genetis yang tinggi, situs polimorfik yang banyak, dan variasi *haplotype* yang tinggi. Hasil analisis filogenetik berdasarkan SSR menunjukkan terbentuknya tiga klad yang tidak menunjukkan hubungan dengan asal geografis aksesori. Hasil penelitian ini memberikan indikasi bahwa variasi intraspesifik pada *C. asiatica* di Jawa Tengah memiliki dasar genetis dan tidak dipengaruhi oleh lokasi tumbuh.

Kata kunci: karakterisasi, kekerabatan taksonomi, penanda molekuler, taksonomi numerik, variasi morfologi

INTRASPECIFIC VARIATIONS AND TAXONOMIC RELATIONSHIP OF
ASIATIC PENNYWORT (*Centella asiatica* (L.) URB.) BASED ON
MORPHOLOGICAL CHARACTERS AND SIMPLE SEQUENCE REPEATS

by:

Anshary Maruzy
21/476259/PBI/01764

ABSTRACT

Centella asiatica (L.) Urb. is a native Javanese plant species used as herbal materials in traditional and modern medicine. There have been no reports on intraspecific variation and taxonomic relationships of *C. asiatica* accessions from natural populations in Central Java based on morphological characters and Simple Sequence Repeats (SSR) molecular markers. This study aims to document and analyze morphological and genetic variations as well as taxonomic relationships of *C. asiatica* accessions in Central Java. In this study, 32 accessions of *C. asiatica* were obtained from natural populations from eight mountains in Central Java. The morphological characters observed included 25 characters from the vegetative organs and 34 characters from the generative organs. Morphological data from vegetative organs of 32 accessions were used to construct phenetic relationships using cluster analysis and principal component analysis. Morphological data from generative organ were analyzed descriptively, since not all accessions were found in flowering condition. Simple sequence repeats data was used in phylogenetic analysis and assessment of genetic variation. The results of cluster analysis and principal component analysis showed that grouping patterns of accessions were in general not related to growing location of accessions. The results of principal component analysis showed that the grouping of accessions was mainly influenced by the characters of petiole color, stolon color, color of leaf adaxial surface, stolon length, color of leaf abaxial surface, petiole length, leaf length, leaf width, and leaf margin. The results of the SSR analysis showed that *C. asiatica* populations in Central Java had high genetic variation. The high genetic variations was indicated by variations in (CT)_n repeats, number of nucleotide composition, high percentage of genetic distances, polymorphic sites, and high haplotype variations. The results of phylogenetic analysis based on SSR showed the formation of three clades that did not show a relationship with the geographic origin of accessions. The results of this study indicate that the intraspecific variation from *C. asiatica* in Central Java has a genetic basis and is not influenced by growing location.

Keywords: characterization, taxonomic relationship, molecular marker, numerical taxonomy, morphological variation