

Biosistematika *Bazzania* Gray (Lepidoziaceae) Berdasarkan Karakter Morfologis, Anatomis dan Molekular

Intisari

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Bazzania mempunyai jumlah spesies terbanyak pada suku Lepidoziaceae. Identifikasi dan penentuan batasan di tingkat spesies kadang mengalami kesulitan karena luasnya variasi morfologis. Keragaman spesies dan data taksonomis *Bazzania* di Jawa Tengah masih sedikit. Penelitian ini bertujuan mengkaji variasi, keragaman spesies dan hubungan kekerabatan berdasarkan karakter morfologis-anatomis, penanda molekular ISSR dan sekuen DNA daerah *trnL-F*. Sampel penelitian berasal dari Gunung Lawu, Gunung Ungaran dan Gunung Slamet Jawa Tengah. Pengumpulan spesimen dilakukan dengan metode jelajah. Karakterisasi dan identifikasi spesies berdasarkan pustaka yang berisi kunci identifikasi, deskripsi dan ilustrasi *Bazzania*. Isolasi DNA genom mengikuti metode CTAB yang dimodifikasi. Primer untuk amplifikasi DNA ISSR: IS-807, IS-810, IS-834 dan IS-881. Amplifikasi DNA daerah *trnL-F* menggunakan primer c [5'CGAAATCGGTAGACGCTACG3'] sebagai primer *forward* dan primer f [5'ATTTGAACTGGTGACACGAG3'] sebagai primer *reverse*.

Identifikasi 44 sampel berdasarkan karakter morfologis dan anatomis diketahui sebanyak 11 spesies, yaitu *B. calcarata*, *B. fauriana*, *B. japonica*, *B. javanica*, *B. pectinata*, *B. perfalcata*, *B. praerupta*, *B. serpentina*, *B. spiralis*, *B. succulenta* dan *B. tridens*. *B. fauriana*, *B. perfalcata*, dan *B. succulenta* merupakan catatan baru spesies *Bazzania* (*new record species*) di Pulau Jawa. Karakter morfologis, anatomis, penanda ISSR dan sekuen DNA daerah *trnL-F* dapat digunakan untuk pengelompokan dan pemisahan spesies *Bazzania* di Jawa Tengah. Hubungan kekerabatan berdasarkan morfologis–anatomis pada tingkat spesies mempunyai koefisien similaritas berkisar 0,81-1,00, berdasar penanda ISSR pada tingkat spesies koefisien similaritas berkisar 0,71-0,96, sedangkan berdasar sekuen DNA daerah *trnL-F* mempunyai kisaran jarak genetik intraspesies 0,0–0,0375 dan interspesies 0,0046–0,0655. Hasil analisis hubungan kekerabatan berdasarkan karakter morfologis-anatomis, penanda ISSR dan sekuen DNA daerah *trnL-F* menunjukkan bahwa pengelompokan sampel *Bazzania* berdasarkan kesamaan spesiesnya. Populasi *Bazzania* di Jawa Tengah mempunyai variasi genetik yang tinggi dengan nilai heterozigositas total (H_T) sebesar 0,334. Tingginya variasi genetik juga tercermin dari banyaknya mutasi pada sekuen DNA *trnL-F* di daerah intron.

Kata kunci: *Bazzania*, variasi genetik, hubungangan kekerabatan, ISSR, *trnL-F*, Jawa

Biosystematics *Bazzania* Gray (Lepidoziaceae) Based on Morphological, Anatomical and Molecular Characters

Abstract

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Bazzania has the most species among Lepidoziaceae family. As the result, it is difficult to identify and determine the boundaries at each species level due to the wide range of morphological variations. There is still a few data about the diversity of species and taxonomic data of *Bazzania* in Central Java. This research aimed to examine the variation, the species diversity and the relationship based on morphological-anatomical characters, molecular markers of ISSR and DNA sequences of *trnL-F* regions. The samples of the research were collected from Mount Lawu, Mount Ungaran, and Mount Slamet in Central Java. The plotless analysis method was used to collect the specimens. The characterization and identification of the specimens were based on some references containing the identification keys, descriptions and illustrations of *Bazzania*. The isolation of genomic DNA followed the modified CTAB method. The primers for ISSR DNA amplification were: IS-807, IS-810, IS-834 and IS-881. The DNA amplification of the *trnL-F* region used primer c [5'CGAAATCGGTAGACGCTACG3'] as the forward primer and f [5'ATTTGAACTGGTGACACGAG3'] primer as the reverse primer.

The identification of the 44 samples based on morphological and anatomical characters discovers 11 species, they are *B. calcarata*, *B. fauriana*, *B. japonica*, *B. javanica*, *B. pectinata*, *B. perfalcata*, *B. praerupta*, *B. serpentina*, *B. spiralis*, *B. succulenta* and *B. tridens*. *B. fauriana*, *B. perfalcata*, and *B. succulenta* were found as the new records of the *Bazzania* species in Java. The morphological- anatomical characters, the ISSR markers and DNA sequences of *trnL-F* region can be used to classify and separate some species of *Bazzania* in Central Java. The relationship based on morphological-anatomical characters at species categories had similarity coefficients ranged between 0.81 and 1.00, while by ISSR marker had range between 0.71 and 0.96. The genetic distance of intraspecies and interspecies based on DNA sequence of *trnL-F* were 0.0–0.0375 and 0.0046–0.0655 respectively. The result of the analysis of relationship based on the morphological-anatomical characters, the ISSR markers and the DNA sequences of *trnL-F* indicated that the clustering of *Bazzania* samples was not determined by the similarity of the species. *Bazzania* population in Central Java had high genetic variations with the high total value of heterozygosity (H_T) of 0.334. The high genetic variation was also shown in the large number of mutations in the *trnL-F* DNA sequence in the introns.

Keywords: *Bazzania*, , genetic variation, relationship, ISSR, *trnL-F*, Java