

**Variabilitas dan Hubungan Kekerabatan Fenetik Pala (*Myristica fragrans* Houtt.) di Pulau Sangihe Berdasarkan Penanda Morfologis dan *Inter Simple Sequence Repeat***

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**INTISARI**

*Myristica fragrans* merupakan komoditas yang penting dan memiliki nilai kegunaan tinggi karena kebermanfaatannya dalam bidang kesehatan, rempah-rempah, dan kecantikan. Pulau Sangihe dikelilingi lautan dan merupakan zona subduksi aktif tertua di wilayah Indonesia-Filipina yang menyebabkan wilayah ini sering mengalami gempa tektonik. Kondisi tersebut memungkinkan adanya potensi isolasi geografis dan disturbansi terhadap Pala Sangihe. Adanya isolasi geografis dan disturbansi ini diduga dapat mempengaruhi adaptasi dan spesiasi tumbuhan pala sehingga meningkatkan variabilitas Pala Sangihe. Menggunakan pendekatan morfologis dan molekuler, penelitian ini bertujuan untuk mengetahui variabilitas dan hubungan kekerabatan pala di Pulau Sangihe serta mengetahui karakter yang berpengaruh terhadap pola hubungan kekerabatan fenetik *M. fragrans* di Pulau Sangihe. Sejumlah 31 karakter makromorfologis telah diamati. Karakter molekuler yang digunakan berupa sidik jari penanda ISSR yang diamplifikasi menggunakan 8 primer. Data morfologis dan molekuler kemudian dianalisis secara deskriptif dengan taksonomi numerik berdasarkan analisis klastering UPGMA (*Unweighted Pair Group Method with Arithmetic mean*) dan ordinasi PCA (*Principal Component Analysis*). Hasil penelitian pada 20 koleksi Pala Sangihe menunjukkan lima variasi bentuk pala, yaitu pala berbuah bulat tebal, bulat tipis, lonjong tebal, lonjong tipis, dan bulat berlobus. Variabilitas karakter molekuler ditunjukkan dengan polimorfisme berkisar antara 0%-33,33%. Hubungan kekerabatan fenetik *M. fragrans* berdasarkan penanda morfologis dan ISSR sama-sama membentuk dua kelompok, tetapi dengan komposisi anggota kelompok yang berbeda. Karakter morfologis yang mempengaruhi pola hubungan kekerabatan fenetik adalah bentuk pohon, bentuk daun, bentuk buah, jumlah pecahan saat matang, indeks ukuran buah, jumlah lekukan buah, dalam lekukan, kerapatan aril, tempurung biji, dan jumlah biji.

Kata kunci: Hubungan fenetik, ISSR, morfologi, *Myristica fragrans*, Sangihe.

**Variability and Phenetic Relationship of Nutmeg (*Myristica fragrans* Houtt.) on Sangihe Island Based on Morphological and Inter Simple Sequence Repeat Markers**

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**ABSTRACT**

*Myristica fragrans* is an important commodity and high utility because of its usefulness in the pharmacology, spices and beauty industries. Sangihe Island is surrounded by sea and that is the oldest active subduction zone in the Indonesia-Philippines region which causes this region to experience frequent tectonic earthquakes. These conditions allow for the potential of geographic and disturbance isolation of Sangihe Nutmeg. Geographic isolation and disturbance on Sangihe Island are thought to lead to adaptation and speciation by increasing variation. Using morphological and molecular approaches, this study aims to determine the variability and phenetic relationships of nutmeg in Sangihe Island and to determine the characters that affect the phenetic relationship patterns of *M. fragrans* on Sangihe Island. A total of 31 macromorphological characters were observed. Molecular data was generated by ISSR fingerprinting using 5 primers. Morphological and molecular data were then analyzed descriptively and numerical taxonomy based on UPGMA (Unweighted Pair Group Method with Arithmetic mean) and PCA (Principal Component Analysis) analysis. The result on 20 Sangihe nutmeg showed five nutmeg shape variations i.e. bears thick round, thin round, thick oval, thin oval, and round lobed. The presence of variation in molecular characters is indicated by the polymorphism percentage between 0-33,33%. The phenetic relationship of *M. fragrans* based on morphological and ISSR markers both formed two groups but with different composition of group members. The morphological characters that influence the phenetic relationship pattern are tree shape, leaf shape, fruit shape, number of fractions when ripe, fruit size index, number of fruit indentations, in indentation, aryl density, seed shell, and number of seeds.

**Keywords:** ISSR, morphology, *Myristica fragrans*, phenetic relationships, Sangihe.