

**APLIKASI PENANDA MOLEKULER ITS SEBAGAI *DNA BARCODE*  
UNTUK IDENTIFIKASI MANGROVE DARI TELUK BALIKPAPAN DAN  
DELTA MAHAKAM, KALIMANTAN TIMUR**

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**INTISARI**

Mangrove merupakan ekosistem pesisir yang sangat produktif dan berperan penting dalam berbagai aspek kehidupan. Indonesia memiliki hutan mangrove terluas di dunia, salah satu sebaran terluas berada di wilayah Kalimantan Timur. Namun, kondisi hutan mangrove Kalimantan Timur saat ini mengalami penurunan akibat adanya ancaman pengembangan kawasan IKN yang akan berdampak pada keberadaan vegetasi mangrove dan keberlangsungan organisme yang ada di dalamnya sehingga perlu dilakukan penyusunan informasi biodiversitas di kawasan tersebut. Tujuan penelitian ini adalah mempelajari karakteristik sekuens DNA dengan penanda molekuler ITS serta mengetahui keragaman dan hubungan filogenetik mangrove dari Teluk Balikpapan dan Delta Mahakam Kalimantan Timur dengan *DNA barcode* menggunakan penanda molekuler ITS. ITS digunakan sebagai penanda molekuler untuk penentuan *DNA barcode* tanaman. Sampel daun mangrove diekstraksi (*Geneaid Kit*) dan diamplifikasi dengan teknik PCR (primer ITS U4 dan ITS P5). Sekuen DNA dianalisis *contig* dan *aligned* dengan GeneStudio. Konstruksi dendrogram menggunakan metode *Maximum Likelihood* dan *Neighbor-Joining* berdasarkan metode Kimura 2 Parameter dengan MEGA 11. Hasil yang diperoleh menunjukkan bahwa karakteristik molekuler sekuen ITS (primer ITS U4 dan ITS P5) dapat menghasilkan fragmen DNA sebesar 750 bp dan spesifik dalam membedakan spesies mangrove. Keragaman spesies mangrove di Teluk Balikpapan dan Delta Mahakam, Kalimantan Timur cukup bervariasi, terdiri atas *Avicennia alba* Blume, *Avicennia marina* (Forssk.) Vierh., *Avicennia marina* var. *rumphiana* (Hallier f.) Bakh., *Rhizophora apiculata* Blume, *Rhizophora mucronate* Poir., *Aegiceras corniculatum* (L.) Blanco, *Croton coriifolius* Airy Shaw, dan *Scyphiphora hydrophyllacea* C.F.Gaertn., serta menunjukkan adanya hubungan monofiletik, parafiletik, dan polifiletik.

**Kata kunci** : DNA inti, bakau, identifikasi, kawasan IKN, keragaman spesies

## APPLICATION OF ITS MOLECULAR MARKER AS DNA BARCODE FOR IDENTIFICATION OF MANGROVE FROM TELUK BALIKPAPAN AND DELTA MAHAKAM, KALIMANTAN TIMUR

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### ABSTRACT

Mangroves are a very productive coastal ecosystem and play an important role in various aspects of life. Indonesia has the largest mangrove forest in the world, one of the largest distributions is in the East Kalimantan region. However, the condition of East Kalimantan's mangrove forests is currently experiencing a decline due to the threat of developing the IKN area which will have an impact on the existence of mangrove vegetation and the sustainability of the organisms in it, so it is necessary to compile biodiversity information in the area. The aim of this research is to study the characteristics of DNA sequences with ITS molecular markers and to determine the diversity and phylogenetic relationships of mangroves from Teluk Balikpapan and Delta Mahakam, Kalimantan Timur with DNA barcoding using ITS molecular markers. ITS is used as a molecular marker for determining plant DNA barcodes. Mangrove leaf samples were extracted (Geneaid Kit) and amplified using PCR techniques (primers ITS U4 and ITS P5). DNA sequences were contig analyzed and aligned with GeneStudio. Dendogram construction used the Maximum Likelihood and Neighbor-Joining methods based on the Kimura 2 Parameter method with MEGA 11. The results obtained showed that the molecular characteristics of the ITS sequence (primers ITS U4 and ITS P5) could produce DNA fragments of 750 bp and were specific in distinguishing mangrove species. The diversity of mangrove species in Teluk Balikpapan and Delta Mahakam, Kalimantan Timur is quite varied, consisting of *Avicennia alba* Blume., *Avicennia marina* (Forssk.) Vierh., *Avicennia marina* var. *rumphiana* (Hallier f.) Bakh., *Rhizophora apiculata* Blume., *Rhizophora mucronata* Poir., *Aegiceras corniculatum* (L.) Blanco, *Croton coriifolius* Airy Shaw, and *Scyphiphora hydrophylacea* C.F.Gaertn., and shows the existence of monophyletic, paraphyletic, and polyphyletic relationships.

**Keywords** : nuclear DNA, mangrove, identification, IKN area, species diversity