# ABSTRAK

## ANALISIS FILOGENETIK LEMPUYANG LOKAL (*Zingiber zerumbet*) BERBASIS GEN Ribulose-1,5-Bisphosphate Carboxylase/Oxygenase large subunit (*rbcL)*DAN UJI AKTIVITAS ANTIBAKTERI TERHADAP *Staphylococcus aureus*

**Oleh**

**YUYUN KUMALASARI**

Lempuyang merupakan tanaman rimpang dari famili Zingiberaceae yang memiliki potensi besar sebagai agen antimikroba alami, namun identifikasi taksonominya seringkali rancu jika hanya berdasarkan karakter morfologi. Penelitian ini bertujuan untuk mengidentifikasi secara molekuler sampel Lempuyang asal Lampung Barat menggunakan marka gen *rbcL* serta menentukan aktivitas antibakterinya terhadap *Staphylococcus aureus*. Metode penelitian meliputi isolasi DNA, amplifikasi gen *rbcL*, analisis filogenetik dengan metode *Neighbor-Joining*, serta uji antibakteri melalui metode *Kirby-Bauer* dan *Minimum Inhibitory Concentration* (MIC). Hasil analisis filogenetik mengonfirmasi bahwa sampel Lempuyang asal Lampung Barat terbukti merupakan spesies *Zingiber zerumbet* karena berada dalam satu klade monofiletik dengan *Zingiber zerumbet* dari database GenBank. Spesies tersebut kemudian diberi nama *Zingiber zerumbet* Unila dengan nomor akses GenBank LC903195.1. Pada uji aktivitas antibakteri metode *Kirby-Bauer*, ekstrak Lempuyang menunjukkan pembentukan zona bening pada media agar dengan efektivitas yang menyerupai kontrol positif. Nilai MIC ditetapkan pada konsentrasi 2.500 ppm yang menunjukkan persentase penghambatan yang signifikan terhadap pertumbuhan bakteri. Penelitian ini menyimpulkan bahwa *Zingiber zerumbet* Unila (LC903195.1) memiliki identitas genetik yang stabil dan potensi aktivitas antibakteri yang efektif sebagai kandidat agen antimikroba alami.



**Kata kunci:** *Zingiber zerumbet*, *rbcL*, *Staphylococcus aureus*, *Kirby-Bauer*, MIC.

## ABSTRACT

**PHYLOGENETIC ANALYSIS OF LOCAL LEMPUYANG (*Zingiber zerumbet*) BASED ON THE Ribulose-1,5-Bisphosphate Carboxylase/Oxygenase large subunit (*rbcL*) GENE AND ANTI-BACTERIAL ACTIVITY TEST AGAINST *Staphylococcus aureus***

**By**

**YUYUN KUMALASARI**

Lempuyang is a rhizome plant from the Zingiberaceae family that holds great potential as a natural antimicrobial agent; however, its taxonomic identification is often ambiguous when based solely on morphological characteristics. This study aims to molecularly identify Lempuyang samples from West Lampung using the *rbcL* gene marker and to determine their antibacterial activity against *Staphylococcus aureus*. Research methods included DNA isolation, *rbcL* gene amplification, phylogenetic analysis using the Neighbor-Joining method, and antibacterial testing via the Kirby-Bauer method and Minimum Inhibitory Concentration (MIC). The results of the phylogenetic analysis confirmed that the Lempuyang sample from West Lampung was indeed the species *Zingiber zerumbet*, as it was in a monophyletic clade with *Zingiber zerumbet* from the GenBank database. This species was subsequently named *Zingiber zerumbet* Unila with GenBank accession number LC903195.1. In the Kirby-Bauer antibacterial activity test, the Lempuyang extract exhibited the formation of clear zones on agar media with efficacy comparable to the positive control. The MIC value was determined at a concentration of 2,500 ppm, indicating a significant percentage of inhibition against bacterial growth. This study concluded that *Zingiber zerumbet* Unila (LC903195.1) possesses stable genetic identity and effective antibacterial activity potential as a candidate for a natural antimicrobial agent.



Keywords: *Zingiber zerumbet*, rbcL, *Staphylococcus aureus*, Kirby-Bauer, MIC.