

**THESIS**

**ANTIMICROBIAL ACTIVITIES OF THE EXTRACTS AND  
SECONDARY METABOLITE COMPOUNDS FROM  
*CLAUSENA* GENUS - A REVIEW**



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COMPOUNDS FROM *CLAUSENA GENUS* - A REVIEW**

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**DECLARATION**

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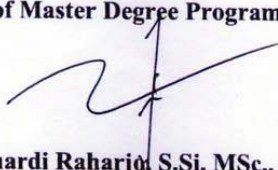
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**Musa, Abdullahi, 2022, “ANTIMICROBIAL ACTIVITIES OF THE EXTRACTS AND SECONDARY METABOLITE COMPOUNDS FROM *CLAUSENA GENUS* - A REVIEW”**  
**this final project is under the guidance of Prof. Dr. Nanik Siti Aminah, M.Si. and Dr. Olabisi Flora Davies-Bolorunduro. Department of Chemistry, Faculty of Science and Technology, Universitas Airlangga, Surabaya.**

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### **ABSTRACT**

Antimicrobial drug resistance has become a global challenge and one of utmost concern due to the global epidemiological infections. Medicinal plants have long performed an essential function in medicine and can be an essential source of recent antimicrobials and techniques for treating resistance. *Clausena* is a genus of flowering plants in the Rutaceae family which are widely recognized and utilized in traditional medicines to treat various infectious illnesses. Many members of this genus have been a primary source of medications and drug lead history. The antimicrobial effectiveness of the secondary metabolites from the roots, stems, leaves, rhizomes, twigs, seeds, fruits, and flowers of several *Clausena species* has been widely examined, and was found to be more effective against bacteria with *Clausena anisata* been the most promising specie among the members of the genus. A total of sixteen active compounds including twelve alkaloids, two coumarins and two terpenoids were reported to be isolated from different part of the plant species. Nine compounds were active as antibacterial, ten compounds as antifungal and mukonal been the only compound that shows dual potency both against fungi and protozoa. This review aims to sum up research advances made from 2000 to date, on the antibacterial, antifungal and antiprotozoal activities of *Clausena species*, and highlight the potential use of *Clausena* plants in the prevention and treatment of infectious diseases.

**Keywords:** *Clausena*, Antimicrobial, Antibacterial, Antifungal, infectious disease

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### **ABSTRAK**

Resistensi obat antimikroba telah menjadi tantangan global dan salah satu perhatian utama karena infeksi epidemiologi global. Tanaman obat telah lama melakukan fungsi penting dalam pengobatan dan dapat menjadi sumber penting dari antimikroba dan teknik terbaru untuk mengobati resistensi. *Clausena* adalah genus tumbuhan berbunga dalam famili Rutaceae yang dikenal luas dan dimanfaatkan dalam pengobatan tradisional untuk mengobati berbagai penyakit infeksi. Banyak anggota genus ini telah menjadi sumber utama obat-obatan dan menghasilkan senyawa sebagai penciri obat. Efektivitas antimikroba senyawa metabolit sekunder dari akar, batang, daun, rimpang, ranting, biji, buah, dan bunga dari beberapa spesies *Clausena* telah diteliti secara luas, dan ditemukan bahwa lebih *Clausena* anisata memiliki aktivitas antibakteri yang paling menjanjikan dibanding spesies lainnya. Sebanyak enam belas senyawa aktif yang terdiri dari dua belas alkaloid, dua kumarin dan dua terpenoid dilaporkan diisolasi dari bagian yang berbeda dari berbagai spesies *Clausena*. Sembilan senyawa aktif sebagai antifungal, sepuluh senyawa aktif sebagai antifungal, dan mukonal menjadi satu-satunya senyawa yang menunjukkan potensi ganda baik terhadap jamur dan protozoa. Review ini bertujuan untuk memaparkan kemajuan penelitian tentang aktivitas antibakteri, antijamur dan antiprotozoal dari spesies *Clausena*, dan menyoroti potensi penggunaan tanaman *Clausena* dalam pencegahan dan pengobatan penyakit menular yang dibuat dari tahun 2000 hingga saat ini.

**Kata kunci:** *Clausena*, Antimikroba, Antibakteri, Antijamur, penyakit menular

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