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ISOLATION AND ANTIBACTERIAL ACTIVITY OF NODOSUXANTHONE FROM *Calophyllum nodosum*

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*A new xanthone derivative, nodosuxanthone (**1**), along with six known compounds **2–7**, were isolated from* Calophyllum nodosum *to our knowledge for the first time. Their structures were elucidated using various spectroscopic techniques, UV, MS, IR, and 1D and 2D NMR, and confirmed by comparison with the literature data. Compounds **1–7** were evaluated for their antibacterial activities on five different bacterial strains of* Acinetobacter baumannii*,* Klebsiella pneumoniae*,* Staphylococcus aureus*,* Pseudomonas aeruginosa*, and* Escherichia coli *by adapting the well-diffusion method. Among them, the hexane extract, compounds **4**, **5**, and **7**, demonstrated notable antibacterial and bactericidal effects.*

Keywords: antibacterial activity, *Calophyllum nodosum*, natural products, xanthone derivative.

Antimicrobial agents, including antivirals, antibiotics, antifungals, and antiprotozoals, play a pivotal role in combating diseases. However, the escalating issue of antimicrobial resistance (AMR) presents a significant danger to global health [1]. Factors such as the misuse and inadequate control practices of antibiotics have accelerated the development of resistance, rendering previously effective antimicrobial agents ineffective [2]. In 2019, the deaths of millions were attributed to drug-resistant infections, and this figure could soar to 10 million deaths annually by 2050 if no action is taken [3], making common infections untreatable [4].

Natural products have long been the foundation of medicinal chemistry and drug discovery throughout human history [5]. Bioactive compounds that are isolated from natural products are beneficial in daily skincare products, such as resveratrol [6], and pharmaceuticals [7]. Among them, the genus *Calophyllum* stands out for its diverse secondary metabolites such as flavonoids, terpenoids, coumarins, chromanones, and xanthones [8]. These classes of compounds exhibit biological activities such as antimicrobial [9], anti-inflammatory [10], and anticancer properties [11]. Xanthones, in particular, stand out for their antimicrobial properties [12, 13]. This class of compounds is also well-known for its broad spectrum of antibacterial properties, which include disrupting the bacterial cell-wall integrity, especially Gram-positive bacteria, owing to their hydrophobic structural elements that interact with lipoteichoic acids [14], inhibiting nucleic acid synthesis [15], and interfering with the membrane permeability [16]. Some of the xanthones also show inhibition toward bacterial efflux pumps [17] and biofilm formation [18].

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