UNIVERSITI TEKNOLOGI MARA

BIOASSAY-GUIDED ISOLATION AND IDENTIFICATION OF ANTIMICROBIAL AND CYTOTOXIC COMPOUNDS FROM THE LEAVES OF *Muntingia calabura*

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of the requirements for the degree of
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AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the result of my own work, unless otherwise indicated or acknowledged as reference work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

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ABSTRACT

In the present work, isolation and identification of antimicrobial and cytotoxic compounds from the leaves of *Muntingia calabura* (Elaeocarpacea) was carried out based on bioassay-guided approach. The methanol leaf extract of *M. calabura* (MCME) and its partitioned extracts [petroleum ether (MCPE), ethyl acetate (MCEA) and aqueous (MCAQ)] were subjected to antimicrobial and cytotoxic activities using micro-broth dilution and MTT assays, respectively. MCEA, which appeared to be the most active extract against MSSA (*S. aureus 25923*) (MIC = 125 µg/mL) and HL60 cell line (human acute promyelocytic leukemia) (IC_{50} = 17.26 µg/mL), was further fractionated using vacuum liquid chromatography (VLC) to afford seven fractions (F1-F7). These fractions were again subjected to antimicrobial and cytotoxic activities. Purification of the most bioactive fraction, F5 with column chromatography (CC) and radial chromatography (RC) resulted in the isolation of four compounds **(MC1-MC4)**. The structure of these compounds were elucidated by spectroscopic methods (1D-NMR, 2-D-NMR, UV, IR and MS) and compared with published data. **MC1, MC2**, **MC3** and **MC4** were identified as 5,7-dihydroxy-3,8-dimethoxyflavone, 2',4'-dihydroxychalcone, 5-hydroxy-3,7-dimethoxyflavone and 3,5,7-trihydroxy-8-methoxyflavone, respectively. Antimicrobial activity showed that **MC2** exhibited the most significant activity against MSSA (MIC = 50 µg/mL) whereas, cytotoxic activity showed that **MC2** and **MC3** exhibited very strong activity against HL60 (IC_{50} values of 3.43 and 3.34 µg/mL, respectively). The results clearly indicate that antimicrobial activity of *M. calabura* is ascribable to the presence of **MC2**. Meanwhile, cytotoxic activity of *M. calabura* is ascribable to the presence of **MC2** and **MC3**. The leaves of *M. calabura* show promise as a source of antimicrobial and anticancer agents and warrant further exploration.

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