

PHYTOCHEMICAL AND BIOLOGICAL STUDY ON CERTAIN PLANTS BELONGING TO FAMILY MYRTACEAE

A Thesis Submitted
In Partial Fulfillment of the Requirements
for the Degree of Philosophy in Pharmaceutical Sciences
(Pharmacognosy)

by

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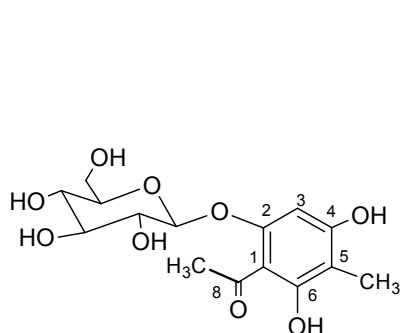
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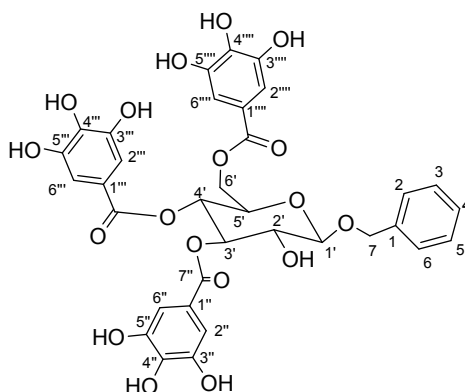
Abstract

Phytochemical and Biological Study on Certain Plants belonging to Family Myrtaceae

The phytoconstituents of *E. gomphocephala* DC. and *E. camaldulensis* Dehnh. were identified using HPLC–PDA–ESI/MS/MS technique. The employed method was optimized for separation and identification of different phytoconstituents including ellagitannins, flavonoids, phloroglucinol derivatives and galloyl esters. Fractionation of the EtOAc soluble part of *E. gomphocephala* using different chromatographic techniques resulted in the isolation of two new compounds namely, 2,4,6-trihydroxy-5-methyl-acetophenone 2-*O*- β -D-glucopyranoside (**3**) and benzyl 3',4',6'-tri-*O*-galloyl- β -D-glucopyranoside (**8**), along with eight known compounds. The structures of the isolated compounds were elucidated on the basis of 1D and 2D NMR (^1H , ^{13}C , 1D-TOCSY, DQF-COSY, HSQC, HMBC) and ESI-MS/MS.



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The antioxidant effect of the EtOAc fraction of *E. gomphocephala* DC. and the total aqueous acetone extract of *E. camaldulensis* Dehnh. together with their sub-fractions was determined *in vitro* using 1,1-diphenyl-2-picrylhydrazyl (DPPH $^{\cdot}$), hydroxyl radical and superoxide anion radical scavenging assays. The results indicated that most of the aforementioned samples exhibited strong antioxidant activity. The cytotoxicity was evaluated on MCF-7, Hep-2, HepG-2, HeLa, HCT-116 and Caco-2 cell lines. The EtOAc fraction of *E. gomphocephala* DC reduced the viability of all cell lines and was more active on MCF-7 and

HepG-2 cell lines. Subsequently, the cytotoxicity of the sub-fractions and the isolated compounds were tested on MCF-7, HepG-2. The aqueous acetone extract of *E. camaldulensis* Dehnh. reduced the viability of all cell lines and was more active on MCF-7 and HCT-116 cell lines. This study suggests that these extracts are sources of different antioxidant and cytotoxic compounds with potential chemopreventive properties that can prevent or delay the carcinogenic process.

Keywords: *Eucalyptus gomphocephala*, *E. camaldulensis*. HPLC–PDA–ESI/MS/MS; cytotoxicity; antioxidant, DPPH[•], hydroxyl radical, superoxide.

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