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

Eman Mohamed Kamal Al Sayed

B.Pharm.Sci., 2002
Faculty of Pharmacy, Ain Shams University
M.Pharm.Sci., 2006
Faculty of Pharmacy, Ain Shams University

Under the Supervision of

ABDEL-NASSER B. SINGAB Ph. D.
Professor of Pharmacognosy
Vice Dean for the Society Service Affairs
and Environmental Development
Faculty of Pharmacy
Ain Shams University

NAHLA A. AYOUB Ph. D.
Professor of Pharmacognosy
Head of the Department of Pharmacognosy
Faculty of Pharmacy
Ain Shams University

KALEVI PIHLAJA Ph. D.
Professor of Organic Chemistry and Chemical
Biology, Department of Chemistry, University of
Turku, Finland

Department of Pharmacognosy
Faculty of Pharmacy
Ain Shams University
Abbasia, Cairo, Egypt
2011

دراسة فيتوكيميائية و بيولوجية على بعض النباتات التابعة لعائلة المرتيسى

رسالة مقدمة من

إيمان محمد كمال السيد

بكالوريوس في العلوم الصيدلية
كلية الصيدلة – جامعةعبن شمس ٢٠٠٢

ماجستير في العلوم الصيدلية
كلية الصيدلة – جامعةعبن شمس ٢٠٠٦

و ذلك لإستكمال متطلبات الحصول على
درجة الدكتوراه في العلوم الصيدلية (عقاقير)

ا.د./ عبد الناصر بدوى سنجاب
أستاذ العقاقير و وكيل الكلية لشئون خدمة المجتمع و تنمية البيئة
كلية الصيدلة – جامعة عين شمس

ا.د./ نهلة عبد الحميد أيوب
أستاذ العقاقير و رئيس قسم العقاقير
كلية الصيدلة – جامعة عين شمس

ا.د./ كاليفى بلچى
أستاذ الكيمياء العضوية و الكيمياء البيولوجية
بقسم الكيمياء – جامعة توركو فنلندا

قسم العقاقير
كلية الصيدلة – جامعة عين شمس
العباسية – القاهرة
جمهورية مصر العربية

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Acknowledgement

First of all, I would like to extend due praise and thanks to ALLAH for guiding me and granting me the chance and the ability to successfully complete this work.

I would like to express my sincere gratitude to many people who helped me in this work, it is a pleasant aspect that I have now the opportunity to express my gratitude for all of them.

I feel a deep sense of gratitude for my advisory committee; Professor Abdel Nasser B. Singab, Professor of Pharmacognosy, Vice Dean for the Society Service Affairs and Environmental Development, Faculty of Pharmacy, Ain Shams University for recommending the research group at the Laboratory of Organic Chemistry and Chemical Biology, University of Turku, Finland for my Ph.D research program, for his help in providing the scientific mission, for his advice, encouragement and for providing constructive suggestions and valuable comments. Professor Nahla A. Ayoub, Professor of Pharmacognosy, Faculty of Pharmacy, Ain Shams University and Head of Department of Pharmacognosy, for her advice, encouragement, constructive and helpful suggestions. I wish to express my gratitude to my external supervisor Professor emeritus Kalevi Pihlaja Professor of Organic Chemistry and Chemical Biology, Department of Chemistry, Faculty of Mathematics and Natural Sciences, University of Turku, Finland for his guidance and for providing the facility for my research work at the Laboratory of Organic Chemistry and Chemical Biology, University of Turku, Finland.

I extend my sincere gratitude and appreciation to many people who made this thesis possible:

I greatly acknowledge the Egyptian government for funding and providing the opportunity for a Ph.D research program at the Laboratory of Organic Chemistry and Chemical Biology, University of Turku, Finland according to the channel system and joint supervision scheme (2008-2010).

Many thanks are due to Professor Jari Sinkkonen Professor of Organic Chemistry and Chemical Biology, Department of Chemistry, University of Turku,

Finland for providing useful suggestions and giving valuable practical tips for operating the NMR instruments.

I am deeply grateful to Dr. Olis Martiskainen, Department of Chemistry, University of Turku, Finland for providing extensive guidance for operating LC-HRESI/MS instruments. I would also like to extend my thanks to all the research staff members and technicians in the Laboratory of Organic Chemistry and Chemical Biology, University of Turku, Finland.

I extend my sincere gratitude to Professor Kid Törnquist Professor of Cancer Biology, Department of Biology / Cell biology, Åbo Akademi University, Finland and his team for their guidance with the cytotoxicity tests and providing the facility for carrying out these tests in his laboratories.

Professor Juha-Pekka Salminen, Department of Chemistry, University of Turku, Finland is acknowledged for the use of LC-ESI/MS facility in his laboratory and providing some funding for testing other bioassays.

I would like to extend my thanks to Professor Pia Vuorela and her group at the Department of Biochemistry and Pharmacy, Åbo Akademi University, Finland for providing the facility for testing the inhibition of acetylcholinesterase and antibacterial biofilm activity.

Many thanks go to my colleagues for their friendly help. Special thanks are due to Dr. Mohamed Ashour and Dr Mohammed El Shazly for searching chemical abstract while they were in Germany.

Finally and mostly, I would like to give my warm thanks to my parents, who taught me the value of hard work by their own example. They rendered me enormous support, constructive advice, inspiration and motivation all the time. I also wish to express my deep sense of gratitude for my brother for his love, motivation, and continuous care. I would like to share this moment of happiness with them.

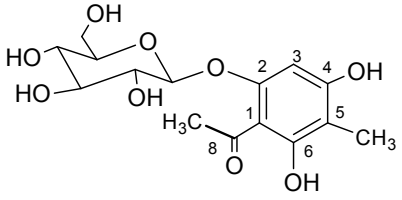
Eman M. Al Sayed

Cairo, 2011

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 (^{1}H, ^{13}C, 1D-TOCSY, DQF-COSY, HSQC, HMBC) and ESI-MS/MS.



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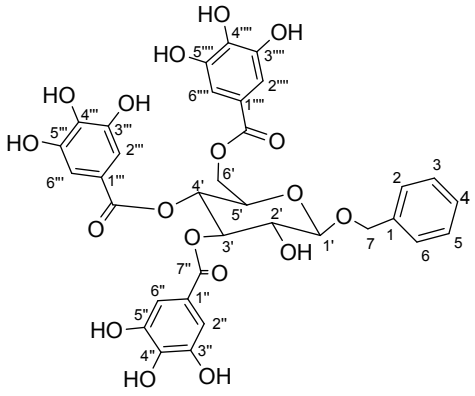

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The antioxidant effect of the EtOAc fraction of *E. gomphocephala* DC. and the total aqueous acetone extract of *E. camaldulensis* Dehnh. together with their sub-fractions was determined *in vitro* using 1,1-diphenyl-2-picrylhydrazyl ($DPPH^{\cdot}$), 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. camaldulentis*. HPLC–PDA–ESI/MS/MS; cytotoxicity; antioxidant, $DPPH^{\cdot}$, hydroxyl radical, superoxide.

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