



Extraction Process and Phenolic Profiling of *Glebionis Coronaria*: Insight into Antioxidant and Cytotoxic Activities with ADME-Based Therapeutic Potential

Larbi Derbak¹ · Hamdi Bendif² · Radia Ayad³ · Khellaf Rebbas⁴ · Ibrahim Demirtas⁵ · Ilyas Yildiz⁶ · Fehmi Boufahja² · Stefania Garzoli⁷

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Abstract

This study sought to maximize the extraction of *Glebionis coronaria*'s total phenolic content (TPC) and total flavonoid content (TFC), determining the best conditions for separating these beneficial substances. Liquid–liquid partitioning was carried out after extraction using solvents of different polarities, such as n-butanol, ethyl acetate, and chloroform. While antioxidant activity was evaluated using DPPH, ABTS, reducing power, phenanthroline, and silver nanoparticle assays, TPC and TFC were measured using the Folin-Ciocalteu and AlCl₃ techniques, respectively. Cytotoxic effects were evaluated against two cancer cell lines (CAPAN-1 and dld-1) as well as a healthy cell line (L929), and the ethanolic extract's substance composition was examined using LC–ESI–MS/MS. The optimal TPC and TFC extraction parameters were found to be X₁ (48 h), X₂ (70% ethanol), and X₃ (30 mL/g). The n-butanol fraction showed significant antioxidant activity (IC₅₀: 13.89 µg/mL for DPPH, 29.18 µg/mL for ABTS) and had the highest TPC (325.33 mg GAE/g dw) and TFC (112.5 mg QE/g dw). Additionally, it demonstrated a considerable ability to chelate metals. Twelve bioactive compounds were identified in the ethanolic extract, with chlorogenic acid being the main component (422.47 µg/g). Cytotoxicity testing revealed significant effects against CAPAN-1 cells, reducing viability by 38.53% at 1 mg/mL. An ADME model provided insights into the pharmacokinetics and bioavailability of the identified compounds, highlighting their therapeutic applications.

Keywords *Glebionis coronaria* · Polyphenols · Flavonoids · Antioxidant activity · LC–ESI–MS/MS · Bioactive compound

✉ Stefania Garzoli
stefania.garzoli@uniroma1.it

Larbi Derbak
larbi.derbak@univ-msila.dz

Hamdi Bendif
hlbendif@imamu.edu.sa

Radia Ayad
radia.ayad@univ-jjel.dz

Khellaf Rebbas
khellaf.rebbas@univ-msila.dz

Ibrahim Demirtas
ibrahim.demirtas@igdir.edu.tr

Ilyas Yildiz
ilyas.yildiz@igdir.edu.tr

Fehmi Boufahja
faboufahja@imamu.edu.sa

² Biology Department, College of Science, Imam Mohammad Ibn Saud Islamic University (IMSIU), 11623 Riyadh, Saudi Arabia

³ Laboratory of Phytochemistry and Pharmacology, Department of Chemistry, Faculty of Exact Sciences and Informatics, University of Jijel, 18000 Jijel, Algeria

⁴ Laboratory of Agro-Biotechnology and Nutrition in Arid and Semi-Arid Areas, Ibn Khaldoun University, 14000 Tiaret, Algeria

⁵ Department of Pharmaceutical Chemistry, Faculty of Pharmacy, Ondokuz Mayıs University, Samsun, Turkey

⁶ Research Laboratory Application and Research Center (ALUM), Foundation of the Faculty of Health Sciences, Nutrition and Dietetics Department, Igdir University, Igdir 76000, Turkey

⁷ Department of Chemistry and Technologies of Drug, Sapienza University, 00185 Rome, Italy

¹ Department of Natural and Life Sciences, Faculty of Sciences, University of M'Sila, University Pole, Road Bordj Bou Arreiridj, 28000 M'Sila, Algeria