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Ethnobotanical Survey, Quantitative Analysis and Antioxidant Activity of *Myrtus communis* and *Pulicaria odora*

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Abstract

This study aimed to evaluate the phytochemical composition and antioxidant activity of *Myrtus communis* and *Pulicaria odora*. Aqueous leaf extracts were prepared using the decoction method. Extraction yield, total polyphenol content, and total flavonoid content were determined using spectrophotometric methods. Antioxidant activity was evaluated using the DPPH radical scavenging assay.

The results showed that the extraction yield was higher in *M. communis* (16.97%) than in *P. odora* (11.40%). The aqueous extract of *M. communis* also exhibited higher polyphenol and flavonoid contents compared to *P. odora.* The DPPH assay demonstrated antioxidant activity for both plants, with IC_{50} values of approximately 0.0476 mg/mL for *M. communis* and 0.097 mg/mL for *P. odora.*

These findings indicate a relationship between antioxidant activity and the phenolic and flavonoid contents of the studied extracts.

Keywords: Myrtus communis, Pulicaria odora, polyphenols, flavonoids, antioxidant activity.

الملخص

تهدف هذه الدراسة إلى تقييم التركيب الكيميائي النباتي والنشاط المضاد للأكسدة لكل من *Myrtus communis* و*Pulicaria odora*

تم تحضير المستخلصات المائية للأوراق بطريقة الغليان، ثم تحديد مردودية الاستخلاص، والمحتوى الكلي للبولي فينولات والفلافونويدات باستخدام الطرق الطيفية الضوئية. كما تم تقييم النشاط المضاد للأكسدة باستخدام اختبار DPPH.

أظهرت النتائج أن مردودية الاستخلاص كانت أعلى عند *M. communis* (16.97%) مقارنة بـ *P. odora* (11.40%). كما سجل المستخلص المائي لنبات *M. communis* محتوى أعلى من البولي فينولات والفلافونويدات مقارنة بـ *P. odora*. وأظهرت نتائج اختبار DPPH نشاطًا مضادًا للأكسدة لكلا النباتين، حيث بلغت قيمة IC_{50} حوالي 0.0476 ملغ/مل بالنسبة لـ *M. communis* و0.097 ملغ/مل بالنسبة لـ *P. odora*.

توحي هذه النتائج بوجود علاقة بين النشاط المضاد للأكسدة ومحتوى المركبات الفينولية والفلافونويدية في المستخلصات المدروسة.

الكلمات المفتاحية: *Myrtus communis* ، *Pulicaria odora*, متعددات الفينول، الفلافونويدات، النشاط المضاد للأكسدة

Résumé

Cette étude a pour objectif d'évaluer la composition phytochimique et l'activité antioxydante de *Myrtus communis* et *Pulicaria odora*. Les extraits aqueux des feuilles ont été préparés par décoction. Le rendement d'extraction, la teneur totale en polyphénols et en flavonoïdes ont été déterminés par des méthodes spectrophotométriques. L'activité antioxydante a été évaluée par le test DPPH.

Les résultats ont montré que le rendement d'extraction était plus élevé chez *M. communis* (16,97 %) que chez *P. odora* (11,40 %). L'extrait aqueux de *M. communis* a également présenté des teneurs plus élevées en polyphénols et en flavonoïdes par rapport à *Pulicaria odora.* Le test DPPH a révélé une activité antioxydante pour les deux plantes, avec des valeurs d'IC_{50} d'environ 0,0476 mg/ml pour *Myrtus communis* et 0,097 mg/ml pour *Pulicaria odora.*

Ces résultats indiquent une relation entre l'activité antioxydante et la teneur en composés phénoliques et flavonoïdes des extraits étudiés.

Mots-clés : Myrtus communis, Pulicaria odora, polyphénols, flavonoïdes, activité antioxydante.

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Introduction

Introduction

Despite the remarkable progress achieved in modern medicine and the development of numerous synthetic drugs, plants and their natural compounds continue to attract considerable interest and remain widely used in the treatment of various diseases worldwide **(Younessi-Hamzekhanlu et al., 2022).** They represent an important source of bioactive compounds employed in the medical field and in drug development. In addition, many countries, whether developed or developing, rely on herbal medicine to maintain human health and treat various diseases **(Mohamed, 2019).**

Nowadays, traditional medicine and plant-based therapies are receiving increasing attention in the search for new natural therapeutic agents. Medicinal and aromatic plants constitute an important source of bioactive molecules with diverse biological properties, including antioxidant, antibacterial, anti-inflammatory, and antitumor activities. These plants continue to contribute significantly to the development and production of numerous pharmaceutical preparations used to this day **(Bahorun et al., 2005).**

Many edible and medicinal plants possess antioxidant properties due to their phytochemical constituents. Regular consumption of phytochemicals with antioxidant activity has been associated with a reduced prevalence of oxidative stress-related diseases, such as cancer, cardiovascular diseases, and atherosclerosis, as well as with lower mortality rates **(Dellaoui, 2021).**

Algeria is characterized by a rich and diverse medicinal flora. Among the medicinal plants commonly used in traditional medicine are common myrtle (Myrtus communis), belonging to the family Myrtaceae, and Pulicaria odora, belonging to the family Asteraceae.

Myrtus communis is traditionally used in the treatment of several disorders, including diarrhea, gastric ulcers, and inflammatory conditions. It is widely distributed throughout North Africa and Western Asia and is also found in certain regions of South America and other parts of the world.

Similarly, Pulicaria odora is distributed in North Africa and Europe and is traditionally used for the treatment of digestive disorders, gastric ulcers, and inflammatory conditions due to its richness in biologically active secondary metabolites.

Introduction

Therefore, the present study aims to evaluate the phytochemical characteristics and antioxidant activity of Myrtus communis and Pulicaria odora in order to highlight their biological properties and assess their potential as natural sources of antioxidant compounds.

This work is divided into two main parts. The first part consists of a bibliographic review covering general information on medicinal plants, oxidative stress, and antioxidants. It also includes a description of the two studied plants and highlights their major secondary metabolites and associated biological activities.

The second part represents the experimental section of the study and is divided into two chapters. The first chapter is devoted to the presentation of the materials, equipment, methods, and techniques used. The second chapter focuses on the presentation and discussion of the results related to the determination of total polyphenol and flavonoid contents, as well as the evaluation of the antioxidant activity of the aqueous extracts of the two studied plan