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University Setif 1, Ferhat ABBAS
Faculty of Natural sciences and life

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DEPARTEMENT OF BIOTECHNOLOGY

DESSERTATION

Presented by

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Use of medicinal plants in patients with chronic diseases, followed by an antioxidant study on *Anchusa azurea* L.

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DEDICATION

I dedicate this work to Gaza and its people in general, and to its students in particular. The occupation has deprived you of the right to education, but your strong faith has been a source of inspiration for us in every way. We will keep going — and for you, we will continue.

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zineb

Dedication

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DEDICATION

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"And lower to them the wing of humility out of mercy and say, 'My Lord, have mercy upon them as they brought me up when I was small.'"

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Anisa

ملخص

من خلال تحليل خصائصه الفيزيائية والكيميائية، (Anchusa azurea L.) تتناول هذه الدراسة نبات لسان الثور الأزرق مع التركيز على استخلاص المركبات الفعالة بيولوجياً باستعمال مذيبات مختلفة مثل الماء المقطر، الإيثانول، وبترول إيثر، وتقييم مردود كل طريقة استخلاص. تحتل النباتات الطبية مكانة أساسية في الطب التقليدي والحديث بفضل غناها بالمركبات

النشطة مثل الفينولات والفلافونويدات، ما يجعلها مصدراً واعداً للعلاجات الطبيعية. أظهرت نتائج البحث أن مستخلصات لسان الثور الأزرق تتميز بفعالية مضادة للأكسدة والالتهاب، إضافة إلى قدرتها على تثبيط إنزيمات مرتبطة بتنظيم سكر الدم (α-amylase وα-glucosidase)، مما يعزز إمكانية استخدامه كعلاج مساعد في الأمراض المزمنة مثل السكري. وتؤكد الدراسة أهمية اختيار تقنيات الاستخلاص المناسبة لتعظيم الاستفادة من المركبات النشطة. تبرز هذه النتائج إمكانات النبات العلاجية في الجزائر، وتدعم تطوير بدائل علاجية طبيعية وآمنة من المصادر النباتية المحلية

Abstract

This study focuses on the plant *Anchusa azurea L*. by analyzing its physical and chemical properties, with particular emphasis on the extraction of bioactive compounds using different solvents such as Distilled Water, ethanol, and petroleum ether, and evaluating the yield of each extraction method. Medicinal plants occupy a fundamental place in both traditional and modern medicine due to their richness in active compounds such as phenolics and flavonoids, making them a promising source for natural therapies. The research results showed that extracts of Anchusa azurea possess antioxidant and anti-inflammatory activities, in addition to

their ability to inhibit enzymes involved in blood sugar regulation (α-amylase and α-glucosidase), which supports its potential use as an adjuvant treatment for chronic diseases such as diabetes. The study also highlights the importance of selecting appropriate extraction techniques to maximize the yield of active compounds. These findings underscore the therapeutic potential of this plant in Algeria and support the development of safe and natural therapeutic alternatives from local plant resources.

Résumé

Cette étude porte sur la plante *Anchusa azurea L*. en analysant ses propriétés physiques et chimiques, avec une attention particulière portée à l'extraction des composés bioactifs à l'aide

de différents solvants tels que l'eau distillée, l'éthanol et l'éther de pétrole, et en évaluant le rendement de chaque méthode d'extraction. Les plantes médicinales occupent une place fondamentale tant dans la médecine traditionnelle que moderne en raison de leur richesse en composés actifs tels que les phénoliques et les flavonoïdes, ce qui en fait une source prometteuse pour les thérapies naturelles. Les résultats de la recherche ont montré que les extraits d'Anchusa azurea possèdent des activités antioxydantes et anti-inflammatoires, en plus de leur capacité à inhiber les enzymes impliquées dans la régulation de la glycémie (α-amylase et α-glucosidase), ce qui soutient son utilisation potentielle comme traitement adjuvant des maladies chroniques telles que le diabète. L'étude souligne également l'importance du choix des techniques d'extraction appropriées afin de maximiser le rendement en composés actifs. Ces résultats mettent en évidence le potentiel thérapeutique de cette plante en Algérie et soutiennent le développement d'alternatives thérapeutiques naturelles et sûres à partir des ressources végétales locales.