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ROSMARINUS OFFICIALIS L. (ROSEMARY): AN ANCIENT MEDICINAL PLANT USES AND PHARMACOLOGICAL ACTIVITIES: A REVIEW

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ABSTRACT

Rosemary (Rosmarinus Officinalis L.) known as Rujamari in Ayurveda is a very important medicinal and aromatic plant belonging to the Lamiaceae family and has been cultivated for long time. Recently, The use of herbs and other natural substances in the prevention and treatment of disease has gained popularity recently. This review's goal is to draw attention to rosemary's intriguing pharmacological properties and its active ingredients. It has been observed that rosemary extract possesses anti-inflammatory, anti-cancer, antidiabetic, and antioxidant qualities. There is proof that people have used rosemary herbs for its cosmetic, medicinal, and culinary uses. Numerous polyphenols may be discovered in rosemary extract, with the largest concentrations being carnosic acid and rosmarinic acid. Because of the high concentration of antioxidant compounds in the family Labiatae, which includes various species including Thymus, Salvia, and Lavandula, it is frequently utilized in cosmetics. An overview of rosemary's literature is presented in this paper. The purpose of this review article focuses on application of derivatives of this plant. Examine the clinical research that shows Rosmarinus Officinalis's potential as a preservative and medicinal.

KEYWORDS: Rosmarinus officinalis, medicinal plants, carnosic acid, rosmarinic acid, antioxidants, cosmeceuticals, skin care, cardiovascular disease.

INTRODUCTION

Rosmarinus Officinalis Linn.(rosemary) belonging to the family Lamiaceae ia an evergreen aromatic plant with 1m height, upright stems, whitish blue flowers, and dark green leaves distributed in the Mediterranean region. In many countries, rosemary is frequently used as medicinal plant in the traditional and modern medicines to treat various diseases. Rosemary extract, especially the leave extract, was shown to be one of the most popular herbal products that has been consumed as a flavoring and antioxidant agent in food conservation and cosmetics. Analysis of chemical composition of different rosemary extracts shows that the most important pharmacologically active constituents are phenolic diterpenes, triterpenes and phenolic acids such as carnosic acid, carnosol, rosmanol, ursolic acid, betulinic acid and rosmarinic acid. Rosemary essential oil contains 10–20% camphor.Medicinal plants have been in the centre of attention for their potential effect in improving and maintaining human health, low side effects and they are commonly used to treat various disorders.




TAXONOMY

Kingdom	Plantae
Phylum	Spermatophyta
Subphylum	Angiospermae
Class	Dicotyledonae
Order	Lamiales
Family	Lamiaceae
Genus	Rosmarinus
Species	Rosmarinus Officinalis

THERAPEUTICAL ACTIVITY

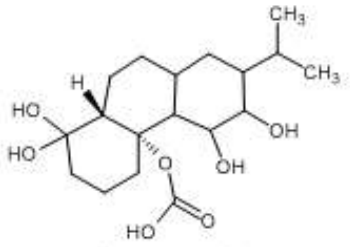
Anticancer activity:- Cancer develops in three stages: start, promotion, and progression.The process via which a cell's genetic makeup is changed to prepare it for malignancy is known as initiation. During the stage of promotion various factors permit a single mutated cell to survive and replicate, promoting growth of a tumor.Ultimately, the illness status worsens as the malignant cell multiplies and turns into a tumor. The anticancer mechanisms of Rosmarinus officinalis have been documented in several investigations. Rosemary has demonstrated noteworthy anti-proliferative properties against many human cancer cells. Major compounds in the plants extract, such as carnosic acid, carnosol and rosmarinic acid have been shown to induce These cancer cells may undergo apoptosis via nitric oxide generation. It seems that the most potent apoptosis promoter is carbosic acid.

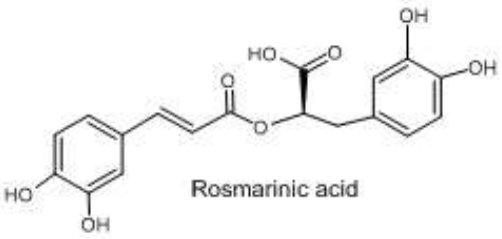
Antioxidant properties:- The literature evaluated for this study provides ample evidence of Rosmarinus officinalis's antioxidant properties. Rosemary’s antioxidant activity is directly attributable to chemical compounds in the plants essential oils and extracts. While synergistic mechanisms between many oil components likely contribute to the antioxidant activity, phenolic diterpenes such as carnosic acid, carnosol and rosmarinic acid have been identified as the strongest antioxidants present in rosemary essential oil. Using many metabolic pathways, Rosmarinus officinalis produces its antioxidant action. Free radicals can be eliminated and prevented, for instance, by rosemary essential oil and extract. In addition, oxidative stress may also be exploited by rosemary to stop the harmful process known as lipid peroxidation. Numerous illnesses have oxidative stress as a contributing factor. It has been shown that oxidative damage and a deficiency in antioxidant defenses are the causes of cancer and diabetes. Rosemary helps to prevent illnesses that rely on the buildup of free radicals and other reactive species in the body by reducing oxidative stress in the body.

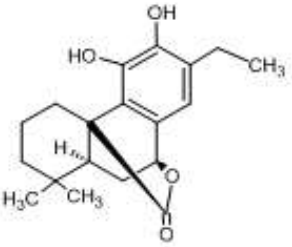
Antidiabetic activity:- Diabetes mellitus is a growing worldwide disorder. Elevated oxidative stress frequently contributes to the development of diabetes. Numerous anti-diabetic and anti-hyperglycemic actions are carried out by rosemary's antioxidant qualities. The blood glucose levels of normoglycemic, hyperglycemic, and diabetic rabbits were lowered by rosemary extract. The extract also increased insulin secretion by blocking lipid peroxidation and triggering antioxidant enzymes. Another significant side effect of diabetes that rosemary has been shown to reduce is delayed wound healing. The body's enhanced antioxidant state following rosemary inoculation is responsible for these antidiabetic effects.

Antimicrobial activity:- Numerous research have revealed the strong antibacterial and antifungal properties of Rosmarinus Officinalis. Similar to its antioxidant properties, the chemical makeup of rosemary's essential oil determines its antibacterial activity, which varies substantially according on the region, climate, and harvest season. Rosmarinus aureus, Listeria monocytogenes, and Escherichia coli have all been shown to be hindered in their proliferation by rosemary. Still, the antimicrobial properties of rosemary are significant in other ways. One research suggests that by conquering and lessening the impermeability of these bacteria's membranes, rosemary may be able to prevent medication resistance in some types of bacteria. Additionally, certain bacteria's sensitivity to common antibiotics may be increased by rosemary essential oil. Rosmarinus officinalis provides a potent resistance against popular foods because of its remarkable antibacterial activity.

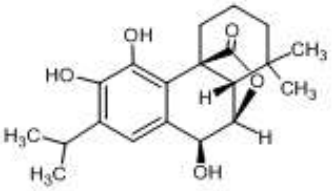
Cosmetics:- Since ancient times, rosemary has been one of the most well-known plants. The ancient Egyptians used creams and oils for protection against high temperature and desert heat. These preparations included extracts from several plants, not just rosemary but also myrrh, thyme, marjoram, chamomile, and cedar. Caring for personal appearance and using cosmetic products are very important. This situation is not new, as humans have had a special interest in taking care of the external appearance of the body since ancient times people not only want not just to look gorgeous but also to utilize safe, natural, and healthful products. For this reason, natural products such as plants are used as they are often considered not-toxic. Additionally, consumers want high-quality personal care products and are curious about the features of the items they use, looking for scientific evidence to support their claims the properties that appear on brand labels, even if those product do not have drug status. Fortunately, the cosmetic industries aware of this, and is becoming more demanding with the products they make rosemary plant with medicinal properties of which extracts appear in the composition of hundreds of cosmetics. According to this study, rosemary derivatives are found in anti-wrinkle cream, aftershave lotion, hydrating facial cream, essential oils for massages and aromatherapy, gels, shampoos, soaps, rosemary water, cleansing milk, deodorant, and creams for the eye contour area and wrinkles.

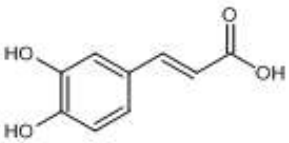

Cornosic acid

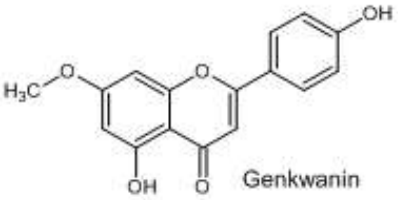

Rosmarinic acid

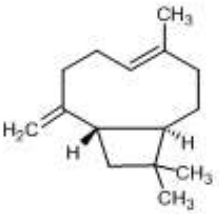

Cornosol


Betulinic acid


Rosmanol


Caffeic acid


Genkwanin


Verbenone

CONCLUSION

In the research evaluated for this project, Rosmarinus officinalis, or rosemary, has shown intriguing promise as a natural food preservative and medicinal ingredient. The low toxicity levels and strong antioxidant, antibacterial, antidiabetic, anticancer and antifungal activities of the plants extract make rosemary an effective food preservative with fewer side effects than artificial additives. It is known that the volatile essential oil contains at least 150 molecules, whereas the non-volatile fraction has fewer molecules. These molecules include flavonoids, ursolic acid, oleanolic acid, cornosic acid, and phenolic acids (rosmarinic acid). Rosemary has a significant deal of promise for topical use and prevents cosmetics from deteriorating. Its primary bioactive components and their mode of action could become

clearer with more study. We consider this plant as cosmeceutical product, which helps maintain skin homeostasis and prevents the appearance of some skin disease.

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