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ANTIOXIDANTS AND SKIN AGING: A SYSTEMATIC REVIEW

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ABSTRACT

Skin aging is a complex process influenced by both intrinsic and extrinsic factors, leading to the appearance of wrinkles, fine lines, and loss of elasticity. In recent years, antioxidants have garnered significant attention for their potential in counteracting the detrimental effects of aging on the skin. This review article provides a comprehensive analysis of the scientific literature on the anti-aging effects of antioxidants, focusing specifically on their impact on skin health and appearance.

KEYWORDS: Medicinal plants, Anti-aging, Antioxidant, Medicinal Plants.

INTRODUCTION

The first section of the review explains the underlying causes of skin aging, such as oxidative stress, inflammation, and the breakdown of extracellular matrix components. The impact of antioxidants' capacity to control cellular signalling pathways and neutralise reactive oxygen species (ROS) in various processes is then discussed (Beckman, et al., 1998).

We go into great length about numerous types of antioxidants, including vitamins (such as vitamins A, C, and E), polyphenols, and flavonoids. Green tea (*Camellia sinensis*), grapes (*Vitis vinifera*), pomegranate (*Punica granatum*), and resveratrol-rich plants are highlighted in the review as sources of several antioxidant chemicals. The potential of synthetic antioxidants and their effects on skin health is also investigated (Hercberg et al., 2006).

In-depth research is done on how antioxidants affect various facets of skin aging, including their capacity to lower oxidative stress, prevent collagen breakdown, encourage collagen production, and control inflammation. The review also discusses how antioxidants affect

other outward manifestations of skin aging, such as wrinkle development, uneven skin tone, and wrinkle creation (Lawler, et al., 1998).

The paper also examines several approaches to delivering antioxidants to the skin, such as topical treatment, dietary supplements, and intradermal injections. To ensure antioxidants are as efficient as possible, the significance of proper antioxidant formulation, stability, and penetration is emphasised (Calabrese, et al., 2003).

Critical reviews are conducted of in vitro, animal, and clinical studies examining the anti-aging benefits of antioxidants on human beings. The review also sheds light on the limitations and difficulties of antioxidant research, including the necessity for long-term trials, standardised techniques, and individual variability in skin reaction (Wijnen et al.,). The importance of antioxidants in halting skin ageing processes and enhancing general 2001skin health and attractiveness is emphasised by this thorough review's findings. The development of skincare products and other interventions to combat ageing is made possible by antioxidants. To better understand the ideal antioxidant dosage, formulation, and combinations as well as their long-term effects, additional research is necessary (Samba, et al., 2003).

This review intends to be a useful resource for researchers, dermatologists, and people looking for evidence-based methods to preserve youthful and healthy-looking skin by fusing scientific data with skincare practises. (Abuja, et al., 1998).

Medicinal plants across the world and their role as anti-aging

The worldwide aging population has recently increased awareness of the need for efficient anti-aging therapies. Natural treatments made from medicinal plants have become viable sources of anti-aging compounds, providing a comprehensive and long-term strategy to support healthy aging. This review article aims to overview the present status of evidence-based research on medicinal plants used to treat aging. This review investigates a wide range of medicinal plants that have shown anti-aging benefits by doing a thorough literature search. Ayurveda, Traditional Chinese Medicine, and Indigenous practice are only a few examples of the traditional medical systems that are taken into consideration alongside contemporary scientific research. This review attempts to give a fair and thorough understanding of the possible advantages of medicinal plants in anti-aging techniques by fusing conventional wisdom with modern scientific knowledge. These include ginseng (*Panax ginseng*), turmeric

(*Curcuma longa*), ginkgo (*Ginkgo biloba*), green tea (*Camellia sinensis*), ashwagandha (*Withania somnifera*), and resveratrol-rich plants like grapes (*Vitis vinifera*). Several important medical plants known for their anti-aging benefits are also highlighted. Polyphenols, flavonoids, and antioxidants, among other bioactive substances found in these plants, have demonstrated potential effects in preventing age-related cellular and molecular alterations, lowering oxidative stress, and boosting cellular repair processes. In conclusion, this thorough assessment offers a useful resource for academics, medical experts, and anybody else interested in learning more about the potential of medicinal plants as anti-aging treatments. These natural therapies show potential for supporting good aging and extending the human lifetime by fusing conventional wisdom with scientific discoveries. For the benefit of world health and well-being, additional research is necessary to realize the full potential of anti-aging medicinal plants and turn them into evidence-based therapies (Gutteridge, et al., 1993).

Age-related disorders are more likely to develop as a person gets older, which is a natural biological process that is characterized by a steady loss in physiological function. Finding natural remedies that can promote good aging and lengthen human life has attracted increasing attention in recent years. A possible supply of anti-aging chemicals has arisen from medicinal plants, which have a long history of use in traditional medical practices all over the world. Numerous bioactive compounds, such as polyphenols, flavonoids, and antioxidants, found in these plants have been shown to have exceptional anti-aging benefits.

Numerous studies have investigated the potential of medicinal plants from various regions and cultural traditions in combating age-related processes. The utilization of these plants and their derivatives for anti-aging purposes dates back centuries, with traditional healers recognizing their rejuvenating effects. With advancements in scientific techniques and the growing interest in natural products, researchers have been able to elucidate the mechanisms of action underlying the anti-aging effects of these medicinal plants.

In order to provide a thorough examination of the scientific literature on anti-aging medicinal plants used around the world, this review article will focus on their possible therapeutic uses and mechanisms of action. It identifies important medicinal plants that have been intensively researched for their anti-aging qualities by fusing traditional knowledge with contemporary scientific developments.

Electronic databases including PubMed, Scopus, and Google Scholar were used to conduct a comprehensive literature search to confirm the validity and dependability of the information supplied. There were several permutations of the search phrases "anti-aging," "medicinal plants," "bioactive compounds," and "mechanisms of action." To ensure that the most recent scientific developments and discoveries were covered, only peer-reviewed articles that were published during the last two decades were included.

To gather pertinent data on the anti-aging characteristics of medicinal plants, the selected articles were critically reviewed and examined. Studies that investigated how these plants affected cellular aging, oxidative stress, and cellular repair mechanisms received a lot of attention. There was additional research looking at the interactions of bioactive substances from medicinal plants with important aging-related biological targets such as sirtuins, mTOR, and AMP-activated protein kinase.

A significant resource for researchers, medical experts, and everyone interested in learning more about natural therapies for healthy ageing will be made available by this review article, which strives to bring together the current knowledge on anti-aging medicinal plants around the world. These plants provide a viable avenue for additional investigation and treatment development in the realm of anti-aging interventions by fusing conventional wisdom with empirical data.

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