Chapter 5
Applications of the Saffron European Kitchen Spice *Crocus sativus*

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ABSTRACT

Saffron, is derived from the dried stigmas of flowers of Crocus sativus plant, belonging to the Iridaceae family. It has been used for centuries as a spice for its colour, flavour and aroma. Saffron, the world's most expensive spice, is renowned for its culinary and medicinal properties. Crocin, crocetin, safranal, and picrocrocin are bioactive compounds from saffron that impart antioxidant and anti-inflammatory properties. Human clinical trials have reported saffron's therapeutic value as antioxidant, anti-inflammatory, anti-apoptotic, neuroprotective, and antidepressant. Saffron, is shown beneficial in pain relief, age-related macular degeneration cardiovascular diseases, cancer, Alzheimer's disease and neurodegenerative disorders. This book chapter will provide details on saffron and research on its therapeutic applications.

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INTRODUCTION

Saffron is a highly regarded spice known for its vibrant colour and distinct flavour, driving the demand for saffron-infused products. Valued at USD 1.16 billion in 2023, the global saffron market is expected to witness a steady growth of 4% compound annual growth rate from 2024 to 2032 (*Global Market Insights Inc.*, 2024). It is commonly used in culinary dishes such as risotto, paella, and desserts. Its increasing culinary applications add a unique flavour and enhance the visual appeal of the dish. The globalisation and supply chain effectiveness of saffron has allowed a variety of applications in food, beverages, supplements, cosmetics, textile dyes, flavouring agents and perfumes (*Sector Strategies | ITC*, 2023). Valued for its flavour, colour, and potential health properties, saffron finds increasing applications in the food, perfumery, pharmaceutical and cosmetic industries (*Saffron Market Size & Share, Global Forecast Report*, 2023).

Crocus sativus is more than just a spice, saffron boasts a long history of use in traditional medicine. The readily available natural substances from *Crocus sativus* have been used worldwide for centuries, in folk remedies for a variety of ailments, including depression, anxiety, and inflammation (Koch et al., 2023). Research in ethnobotany and ethnomedicine suggests saffron may hold promise for treating depression, anxiety, Alzheimer's, cancer and metabolic disorders. A growing body of scientific evidence supports saffron's potential pharmacological and therapeutic properties.(Mandal et al., 2022). Saffron's vibrant colour and aroma come from unique bioactive compounds like crocin, crocetin, picrocrocin, and safranal. These bioactive molecules are being investigated for their potential health benefits, including antimicrobial, antioxidant, and anticancer properties. Additionally, research suggests saffron may be cardioprotective, neuroprotective, and helpful in managing mood, cholesterol, and blood sugar (Alhumaydhi et al., 2021). These properties make *C. sativus* L. a potential candidate for the development of herbal medicine for treating various diseases.

GENUS *CROCUS*

The genus *Crocus*, consisting of over 90 species of flowering plants, has captivated the human imagination for centuries. The genus *Crocus* falls within the order Asparagales and the family Iridaceae. It is further divided into several subgenera and sections based on morphological and genetic traits. *Crocus*es feature a unique set of morphological characteristics that make them easily recognizable. These perennial plants typically have corms, which are enlarged underground stems that store energy and allow survival during periods of dormancy (Pandita, 2021). The leaves are narrow