

Chapter 6

Pharmacological Applications of Saffron (*Crocus sativus*): A Review

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ABSTRACT

Saffron spice also known as Crocus sativus (Saffron crocus) belongs to the family of iridaceae. Many studies have proved its potential role in disease eradication. It has been reported to possess the attributes of a sedative, an anti-asthma, an emmenagogue, an expectorant, and an adaptogenic agent. Crocin, crocetin, and safranal are the most important biochemically active ingredients that were found in different parts of the plants in varying proportions like the peels, fruits, seeds, and rind of Crocus sativus. The in vitro and in vivo studies showed that saffron has got its therapeutic implication in health management via anti-oxidant, anti-microbial, hepatoprotective, and anti-tumour activity. This review attempts to reveal the potential pharmacological properties of Crocus sativus. It also draws attention towards the use of herbs and spices in various ailments without facing the harmful side effects of chemically derived medicine.

INTRODUCTION

Crocus sativus L. is a stemless perennial herb belonging to the family Iridaceae. The word saffron was derived from the Latin word safranum that means “yellow. It is the native Mediterranean to western China, although cultivated in many countries such as Turkey, Morocco, Iran, Italy, Spain, Greece, Israel, Azerbaijan, Egypt, China, India and Mexico. It is commonly known as Red Gold in producer countries as it is the most expensive spice for its characteristic aroma, color and aphrodisiac properties. The botanical name of saffron is *Crocus sativus* L and in Hindi, it is called Keshar.

Saffron are dried red stigma (25-30 mm long) of the colored flower of *C. sativus* L. The flower of *C. sativa* is light purple containing three stigmas. For Centuries, it has been used in food for its bright orange-yellow color and intense flavor and aroma. Crocetin and crocin are the degraded carotenoids

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Table 1. Classification

Kingdom	Plantae
Clade	Angiosperms
Clade	Monocots
Order	Asparagales
Family	Iridaceae
Genus	<i>Crocus</i>
Species	<i>C. sativus</i>
Botanical name	<i>Crocus sativus</i> L.

responsible for the yellow color and the sweet fragrance of saffron is due to the presence of a specific essential oil in the flower. In folklore medicine, it has been useful in treating many digestive disorders, as a nerve sedative with antidiarrheal, antispasmodic, emmenagogue, eupeptic, and expectorant properties (Rios et al., 1996).

The stigmas of the saffron flower contain a number of chemical substances, including carbohydrates, minerals, mucilage, vitamins B1 & B2, pigments, and carotenoids. In addition, it contains small amounts of the pigment anthocyanin; oil-soluble pigments including alpha-carotene, beta-carotene and zeaxanthin. A phytochemical investigation of Saffron has been an isolated variety of biologically active constituents, including crocin, picrocrocin, and safranal, which is responsible for its distinct color, aroma, and medicinal properties. Safranal is the major principle of active compounds constituting around 70% of total essential oil. Saffron contained more than 150 volatile and several nonvolatile compounds and approximately 40–50 constituents have been detected thus far (Bolhasani et al., 2005; Caballero-Ortega et al., 2007). This review article aims to summarize the pharmacological/biological activities of saffron and its bioactive constituents with possible therapeutic applications.

Botanical Description

C. sativus L. is a stemless plant with subsoil corm approximately 3-5 cm in diameter. At the base of the corm short sprinkle roots grow, and above the soil it holds 6-8 leaves, a flowering stalk, bract, and bracteole. The yellow colored flower has three petals and three sepals. In the center of the flower, there is a single-ovule ovary, which grows to 10-30 cm long and is light yellow in color, has a long thin style, and ends in the 2-3cm long bright orange-red triple stigma. It multiplies by means of corms, since flowers do not produce any seeds (Srivastava et al., 2010).

Ethnomedicinal Importance

Saffron has long been used as both a spice and medicine over 3,600 years ago. It is an important medicinal plant that has been used in ethnomedicine against several health ailments in many cultures. Saffron is employed to prevent fever, inflammation, expectorant, asthma, melancholia, hysteria, leucorrhoea, enlarged liver, diabetes, high blood pressure, heart ailments, and cancer. Research studies have shown that this herb is a dense source of carotenoid, riboflavin, and folate and is beneficial in regulating and promoting menstrual periods and also reducing lumbar pains.

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