

JHPR Special Issue 2021 – Recent Advances in Saffron

Introduction

Iridaceae, its name based on the genus *Iris*, also known as iris family, is a family of monocotyledonous flowering plants, including 80 genera, consisting of approximately 2000 species, worldwide distributed. The family includes a number of well-known cultivated plants, such as the *Irises* (the genus that gave its name to the family), the *Freesia*, the *Gladiolus* and the *Crocus* (the very expensive spice **saffron** is extracted from the stigmas of *Crocus sativus*), called the “golden spice”.

Saffron is an annual herbaceous plant. However, due to the annual corm proliferation, its perennial cultivation is more common. Saffron distribution areas are mainly in 30-50 °N and 10 °W to 80 °E. Despite some doubts, Iran and Greece have been suggested as the possible regions for its origination. Nowadays, Iran is the main saffron producer in the world, with around 120000 ha cultivation areas and 440 tons annual dry stigmata production, which includes about 90% of the global production.

Saffron growing season is from mid-fall to mid-spring (rainy season), which makes it very appropriate for arid and semi-arid areas. The life cycle of saffron begins with flowering and aboveground vegetative growth which requires fall rains or irrigation. Its growth period ends in spring after the production of replacement corms at about 220 days. In semi-arid areas like Iran, at the mid-spring (after leaf senescence), real dormancy of corms begins and continues nearly up to July 10. After that, the pseudo -dormancy starts which during this stage the transition to reproductive phase occurs. In the fall, with temperature reduction (~15-17 °C) and after water availability, the flowering phase occurs and takes about 20 days. Usually, at the end of the flowering stage, the leaves appear and vegetative growth starts. Concurrent with the flowering and leaf emergence, the production and growth of the fibrous root take place. From late-November to mid-December, replacement corms start to grow from the buds on the mother corm. These corms can be formed at lower rates during the late winter and even early spring. In late winter root system becomes weak and finally, at the end of May the leaves are withered and another period of real corm dormancy starts.

Saffron, the dried red-orange stigmas of *Crocus sativus* L, has been known as a flavoring agent, food coloring and traditional herbal medicine. Saffron oil has more than 150 volatile and aromatic compounds mainly includes terpenes, terpene alcohols, and esters. Pharmacological effects of saffron are mainly attributed to crocin, crocetin, picrocrocin and safranal. These components especially crocin, have significant effects including antidepressant and anticonvulsant, analgesic, anti-cancer and other therapeutic effects on different parts of our body.

Due to the importance of saffron in the pharmaceutical, cosmetic, health and food industries, the purpose of this special issue is to publish the latest scientific achievements about the production of this valuable plant.

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