

(39)

A Review on the Usage of Main Secondary Metabolites of *Crocus sativus* in Cancer Treatments

Sunderalingam S. *, Buddhapriya A.N.

Faculty of Science, Horizon Campus, Malabe, Sri Lanka

**ssanadana@horizoncampus.edu.lk*

Abstract

Saffron is the world's second most costly spice, with numerous advantages of culinary, cosmetics, pharmaceutical and medical fields. There is an inadequate awareness of how *Crocus sativus* L. (Family Iridaceae) which produces the spice saffron from the filaments that grow inside the flower, can possibly treat cancer. Since, cancers are regarded as a devastating disease in today's world, anticancer and antioxidant properties of secondary metabolites available in saffron will be highly invaluable. The present review focuses on investigating on the role of crocin, crocetin and safranal in cancer treatments, which are the main secondary metabolites of *C. sativus*, and evaluating the various methods of extracting, isolating and analysing them. The review conducted using subjective indexed journal articles that were published over the past ten years. Out of the available data, it found that crocin would be quite beneficial in healing cancer without revealing any adverse effects. Crocin showed immense potential in curing a wide range of cancer types, mainly prostate and lung cancers, by eliminating cancer cells through apoptosis and inhibiting tumour invasion. There were a limited number of researches conducted using crocetin and safranal. However, they will approve for cancer treatments shortly. Crocetin was widely employed as a chemo-preventive and anti-inflammatory medication for pancreatic and breast cancer treatments. It has recently been utilized only for treatments of few types of cancers. Only one publication recorded in the recent ten years, as the usage of safranal in cancer treatment, which was against leukaemia. Moreover, secondary metabolite analysis techniques including spectrophotometry and chromatography utilized effectively, whereas predominantly improved extraction techniques including ultrasound-assisted extraction, emulsion liquid membrane, high hydrostatic pressure extraction. The analysis affirmed that, microwave-assisted extraction (80±1%) followed by low-pressure liquid chromatography (99.04±0.01%) showed optimum recovery of crocin. Whereas for safranal, microwave-assisted extraction (15.9±0.1%) and ultraviolet (UV) spectrophotometry preferred methods. The analysed data will be useful for future studies that focus on the analysis of saffron secondary metabolites and potentiality in cancer treatments to provide the researchers with a wide range of alternatives for carrying out the processes of curing cancers.

Keywords: Anticancer, Crocin, Crocetin, Safranal, Saffron