ELSEVIER

Archives of Medical Research 34 (2003) 354

Archives of Medical Research

LETTER TO THE EDITOR

Crocus sativus Against Cancer

To the Editor

In view of renewed public interest in chemopreventive plant agents and within scientific and medical communities, it would be interesting to examine what has been achieved in basic research during the past decade. This letter is not intended to include every paper or review published on the subject of saffron and cancer. Instead, it will focus on the possible use of saffron in cancer chemoprevention in the immediate future.

From ancient times, saffron harvested from the dried, dark red stigmas of *Crocus sativus* L. flowers has been used as a drug to treat various human health conditions including cough, flatulence, stomach disorders, colic, insomnia, chronic uterine hemorrhage, amenorrhea, dysmenorrhea, gynecological disorders (including regulation of menstruation, alleviating uncomfortable menstruation or lack of menstruation), scarlet fever, smallpox, colds, insomnia, asthma, and cardiovascular disorders (1). In addition, saffron was also used to stimulate sweating and was sometimes utilized to help reduce fevers. Historical records detailing the use of saffron date back to ancient Egypt and Rome, where it was used as a dye in perfume and as a spice for culinary purposes. Currently, saffron supplies the characteristic flavor and color of Spanish paella, Italian risotto, French bouillabaisse, Mexican fiambre, Arabic lamb and chicken dishes, Iranian plov, Azerbaijanian pakhlava, and Indian dessert sauces, as well as Swedish, Cornish, and Pennsylvania Dutch holiday breads. Saffron has also been used in the cosmetic industry (2). Characteristic ingredients of saffron are coloring components or carotenoids, a bitter taste or picrocrocin, and the spice aroma of safranal (1).

In the early 1990s, it was reported for the first time that saffron extract inhibited growth of malignant cells *in vivo* and *in vitro* (3,4). During the last decade, a number of studies in animal and model systems demonstrated an antitumor effect of saffron and its constituents on different malignant cells, discussed in my recent review (5). Saffron had a dose-dependent inhibitory effect on carcinoma, sarcoma, leukemia, and several other malignant cells in the test tube. Saffron increased life span of treated tumor-bearing mice compared to untreated animals by 45–120% (3). Different hypotheses for anticarcinogenic and antitumor effects of saffron and its ingredients have been proposed, including inhibition of nucleic acid and free radical chain reactions and interaction of carotenoids with topoisomerase II. It was also reported that saffron was nontoxic and had no effect on growth of normal cells (5). My intention, therefore, is to point out four lines of necessary future investigation: 1) determine biologically active ingredients of saffron; 2) define mechanism(s) involved in therapeutic properties of saffron; 3) investigate mechanism(s) involved in the antitumor effect of saffron, and 4) define the efficacy and safety of saffron for cancer treatment and prevention in both animal models and clinical trials. These topics will be discussed at the 1st International Symposium on Saffron Biology and Biotechnology in Albacete, Spain, October 22–25, 2003 (http://www.uclm.es/CURSOS/AZAFRAN).

References

1. Abdullaev FI. Saffron (*Crocus sativus* L.) and its possible role in the prevention of cancer. In: Majumdar DK, Govil JN, Sing VK, editors. Recent progress in medicinal plants. Vol. 8. Houston, TX, USA: SCI Tech Publishing LLC;2003. pp. 53–67.
2. Szita E. The spice of antiquity: saffron. Vintage 1987;16:12–19.
3. Nair SC, Panikkar B, Panikkar KR. Antitumor activity of saffron (*Crocus sativus*). Cancer Lett 1991;57:109–114.
4. Abdullaev FI, Frenkel GD. Effect of saffron on cell colony formation and cellular nucleic acid and protein synthesis. Biofactors 1992;3:201–204.
5. Abdullaev FI. Cancer chemopreventive and tumoricidal properies of saffron (*Crocus sativus* L.). Exp Biol Med 2002;227:20–25.

FIKRAT ABDULLAEV

Jefe, Laboratorio de Oncología Experimental
Instituto Nacional de Pediatría, México, D.F., México

Address reprint requests to: Fikrat Abdullaev
Jefe, Laboratorio de Oncología Experimental
Instituto Nacional de Pediatría
Av. Insurgentes Sur #3700-C, Col. Insurgentes Cuicuilco
04530 México, D.F., México
Phone: (+52) (55) 5606-4606
Faxes: (+52) (55) 5666-6937 and 5606-9455
E-mails: fikrat@sin.conacyt.mx or fikrat@servidor.unam.mx
Website: www.fikrat.com

Received for publication March 7, 2003; accepted March 7, 2003 (03/040).

doi: 10.1016/S0188-4409(03)00048-1