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STUDIES ON COMMERCIAL SAFFRON

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ABSTRACT: *Two commercial samples of saffron were analysed for moisture and ash contents, solubility in water, action with sulphuric acid, presence of foreign dyes and colour intensity of water soluble solution.*

The moisture content in Laccha was 12.7% while it was 11% in Mogra. The ash was 4.7% in both the samples. The water soluble matter in Laccha was 52.7% and 45.8% in Mogra. There was no foreign dye in these samples. The colour intensity of 0.02% saffron solution of both the samples corresponded to 0.07% of potassium dichromate at 470 mm.

INTRODUCTION

Saffron is dried stigma of *Crocus sativus* **L,** with or without the style. Commercially at least 3 varieties of saffron are available designated Laccha, Guchi and Mogra. Two commercial samples, one of the Laccha and one of Mogra were analysed for moisture and ash contents, water soluble extract, action with sulphuric acid, presence of foreign dyes and colour intensity of water soluble dye. These values were compared with the reported values in earlier literature to judge the standard of these two commercial varieties.

MATERIALS AND METHODS

Two commercial samples of Laccha and Mogra were gifted by the Chief Botanist, Tampcol, Madras.

Analytical Methods

Ash, water soluble extractives and loss on drying at 100^0C were determined as detailed in the British Pharmacopoeia (Anonymous, 1958).

Test with sulphuric acid

One piece of saffron was taken on a microscope slide and two to three drops of sulphuric acid were added. The colour developed was viewed through a simple microscope.

Colour intensity

0.02g saffron was taken in a100 ml standard flask, shaken with water and made upto the mark with water. 0.1g potassium dichromate was dissolved in water in 100 ml standard flask and made upto the mark. The optical density of potassium dichromate and saffron solutions were compared at 440, 450, 470 and 500 nm in Bausch and Lomb spectronic 21 spectrophotometer against distilled water as blank.

Test for organic dyes

10 mg of saffron was shaken with 5ml of xylene, chloroform, diethyl ether and carbon tetrachloride. The solvent was filtered and optical density was recorded at 430 nm in Bausch and Lomb spectronic 21 spectrophotometer using corresponding solvents as blank.

Floral waste

200 mg of saffron was weighed and the parts | portions representing stigma and style alone were separated and weighed.

Results

Saffron of Laccha type was composed of pale yellow thread like styles, each with 3 dark blood-red elongated stigma as shown in figure.1 The Mogra type was made up of fragments of the stigmas only, as in figure 2.

The analytical values are summarized in Table 1. Ash, moisture content and solubility in water were within the range of reported values of saffron (Mukerji, 1953 and Anonymous 1980).

The optical density of potassium dichromate and saffron solutions are compared in Table 2. Optical density of both samples at 470 nm corresponded to that of 0.07% potassium dichromate solution.

Discussion

Both the samples had normal values of saffron. There was no extraction of colour in the organic solvents from both the samples thereby indicating the absence of foreign dyes. According to Mukerji (1957) the colour intensity of 0.02% saffron solution should match to 0.1% potassium dichromate solution. In both the samples colour intensity corresponded to 0.07% of potassium dichromate solution at 470 nm. The matching of colour intensity cannot be taken as a criterion for the purity of saffron as it depends on the method of purification. Further there are different grades of saffron which are based on the method of purification. Alam *et al* (1988) have also observed the same in the analysis of saffron.

It has been reported in the literature that the Mogra saffron is obtained by gently beating the dried flowers, sifting to separate the stigmatic fragments and removing floral waste by floatation when the saffron fragments settle down (Anonymous 1950). The lower water extractive value for Mogra and the higher value for Laccha is thus explained.

The Laccha variety has thread like styles which account for part of the weight of saffron. This probably had caused the matching of colour intensity to mogra variety.

This study revealed that from the pharmaceutical point of view, Laccha variety should be preferred since the Mogra variety loses part of the water soluble principles by the flotation treatment.

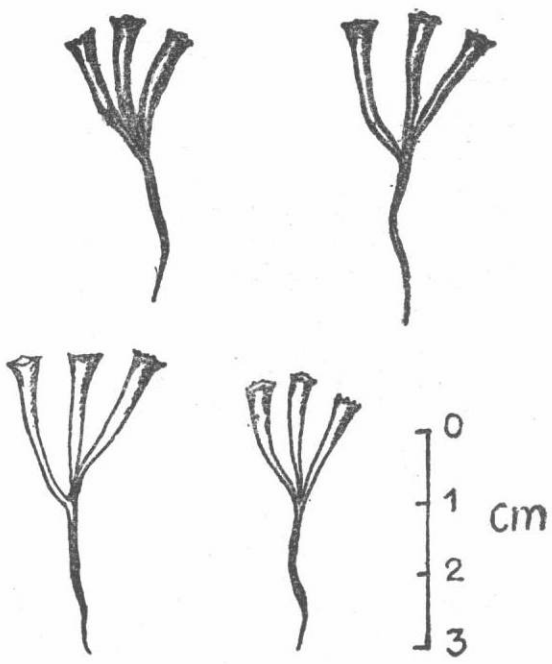

FIG. 1

LACCHA SAFFRON

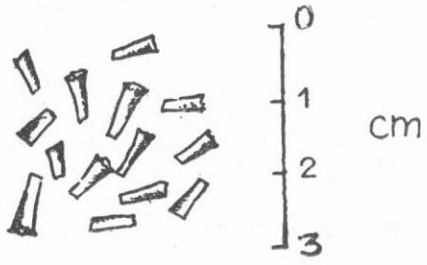

FIG. 2

MOGRA SAFFRON

TABLE 1

Analytical values of commercial saffron

Parameter	Laccha	Mogra
Ash % (W/W)	4.7	4.7
Moisture % (W/W)	12.7	11.0
Solubility in water % (W/W)	52.7	45.8
Floral waste % (W/W)	Nil	Nil
Test with sulphuric acid	Dark blue colour	Dark blue colour
Test for organic dyes:		
i. Benzene	No colour	No colour
ii. Diethyl ether	No colour	No colour
iii. Carbon tetra chloride	No colour	No colour
iv. Xylene	No colour	No colour
v. Chloroform	No colour	No colour

TABLE 2

Optical density of commercial saffron and potassium dichromate at different wave lengths

Wave length (nm)	Optical density		
	Potassium dichromate	Laccha	Mogra
430	Outside range	1.05	1.05
440	Outside range	1.05	1.05
450	Outside range	0.96	0.96
470	0.99	0.7	0.7
500	0.2	0.1	0.1

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