

NOTE

Detection of Ratanjot in Spices and Food Preparations by Reverse Phase Chromatography

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In the present work, the author has described the detection of Ratanjot as an adulterant in spices and food preparations by reverse phase chromatography.

Ratanjot¹ is a common natural coloured herb, used in giving red colour to food preparations, particularly non-vegetarian preparations. It is also used for giving shining red colour to spices, particularly chillies of poor quality. A reverse phase chromatography method has been suggested to detect the presence of ratanjot.

Red colour is known to improve the lyolytical qualities of food stuffs from time immemorial, particularly in Arabic and Indian cuisines. The thick gravy having red colour is preferred in most regions. To impart red colour to the curry of the vegetarian and non-vegetarian preparations, ratanjot is used widely. It is also used to colour the dull looking chillies so that they look bright and fresh. For this purpose ratanjot is mixed with oil and then spices are coloured. Chilli pods and powder of poor quality and dull colour are polished with ratanjot extract in oily medium. This gives chillies a bright red colour and the product fetches good price in the market, despite being of poor quality.

The herb ratanjot is derived from *Onsoma* species. *Onsoma hispidium* is found widely distributed in Western Himalayan regions. *Amebia nobilis* is also a source of ratanjot of Afganistan origin. Ratanjot has medicinal properties. Bruised roots of ratanjot are applied externally to cutaneous eruptions. The flower of the plant is said to have stimulant properties and is also used as cardiac tonic. In early days the roots were employed for colouring wool and silk. Clinical trials on rats have shown that in low concentration the colouring matter of ratanjot is nontoxic or only slightly toxic but in high concentration and continuous feeding, it has the property of destroying liver cells. Ratanjot is sparingly soluble in water but is readily soluble in organic solvents and in alcohols. It yields a good red colour in oils and fats.

Detection of Ratanjot

1. In spices: Take 5 g of chilli powder/spices in a beaker and mix with 50 mL of petroleum ether (40–60°C, LR grade). Let the material release the colour for approx. 5–8 min. Decant the petroleum ether and transfer to a 250 mL separating funnel.

2. In food preparations: Take 50 g of sample; try to take upper oily layer as a major portion; mix with 100 mL of petroleum ether (40–60°C, LR grade) in a beaker. Let the sample release colour for 10–12 min. Occasionally stir the material. Decant the petroleum ether and transfer to a 250 mL separating funnel.

Take 20 mL NaOH solution (2% w/v) and mix with the decanted petroleum ether in a separating funnel and shake. Keep the separating funnel for 10 min. The lower NaOH solution layer will become blue if ratanjot is present. Now take this lower blue coloured NaOH soln. layer in another 250 mL separating funnel and neutralise with 2% HCl (v/v) till the colour returns to red. Extract with 25 mL pet. ether (40–60°C, LR grade) by shaking vigorously. Now discard lower colourless layer and take upper red-coloured layer in a glass basin; repeat with 25 mL pet. ether and concentrate on a water bath. Spot on a reversed phase chromatographic paper (treated with 5% paraffin in pet. ether at 40–60°C and properly dried). Develop in 80% C₂H₅OH and run up to 12–15 cm height of paper. Spot will run along with liquid phase (R_f = 1). Confirm by spraying 5% w/v NaOH solution. The change of colour of spot to blue shows the presence of ratanjot in the representative sample.

Observation

It has been observed by the authors that in roadside hotels (dhabas), ratanjot is used extensively to colour the curry of non-vegetarian preparations. Particularly, the chilli powder sold in the rural market has also been found to be adulterated with ratanjot treatment.

The test for the presence of ratanjot colouring shall be made mandatory in the PFA Act (1954) to safeguard the interests of the consumers, and the said method is an easy and reliable method of detecting ratanjot in food articles.

REFERENCES

1. Wealth of India, CSIR, New Delhi.

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