



SCAN ME

Research Paper

DETECTION OF RHODAMINE B DYE IN TOMATO, RED CHILLI AND SZECHUAN SAUCES SERVED BY STREET FOOD JOINTS IN PUNE CITY (INDIA)

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Abstract

These days the consumption of fast food from street food joints has increased. These street foods come with toxic food dyes which are harmful to our body. Mainly there are two types of food colours, natural and synthetic food colours. Synthetic food colours, also known as artificial food colours are manufactured by chemical methods and are commonly used in the food and pharmaceutical industries. Some common synthetic food colours used in fast food are Tartrazine, Sunset Yellow, Brilliant Blue, Allura red, Erythrosine, Indigo Carmine, Sudan dye III, Rhodamine B, etc. Rhodamine B is a banned colour. The aim of this study was to detect the presence of synthetic food dye Rhodamine B present in chilli powders used for the preparation of different sauces in Street food joints of Pune city, Maharashtra. 10 samples of each sauce (Tomato sauce, red chilli sauce and Szechuan sauce) were collected from different street food joints. Different chemical analysis tests were performed to detect the presence of Rhodamine B. In certain samples presence of Rhodamine B was observed. These results indicate that even though Rhodamine B is banned by the Indian government, its presence can be seen.

Key words: Synthetic colours, Rhodamine B, Street food, Sauces, fast food.

INTRODUCTION

Fast food and street foods have become more popular with the changing lifestyle. Street food joints help a lot of livelihoods and the poor urban population by providing an inexpensive variety of food. In view of its increasing popularity, the quality and safety aspects of street foods need continuous evaluation. [1] This sector needs more improvement in context with the use of different additives. Tomato sauce, red chilli sauce and szechuan sauce are very commonly consumed as accompaniments with a variety of street foods.

Adulteration is the act of either including extraneous substances (adulterants) into food items or products or decreasing important nutrients partially or totally for economic advantage or because of careless behaviour and absence of the right hygienic situation during processing, storing, transportation and marketing. This ultimately results that the consumer is either cheated or often turns out to be a victim of diseases. Because of that, the consumer needs to realise the common adulterants and their impact on health because of the increasing variety of food manufacturers and excellent quantity of foodstuffs imported permits the manufacturers to deceive and cheat consumers. [2]

Food colouration is one type of adulteration. In 1856 W. H. Perkins derived synthetic colour from coal tars, and opened the first synthetic colouring factory. Only eight types of food colours are permitted in food under Food Adulteration Act (1954). They are Ponceau 4R (E124), Carmoisine (E122), Erythrosine (E127), Tartrazine (E102), and Sunset Yellow (E110), Indigo Carmine (E132), Brilliant Blue FCF (E133), and Fast Green FCF (E143). Different types of artificial colouring agents are usually used in the preparation of food products. Rhodamine B dye is an artificial red dye belongs to xanthene dyes that turns into a vibrant reddish colour, extensively used in many industries such as cosmetics, textile, medical as well as paper production.[3] Rhodamine B has high solubility and low cost makes it a commonly used colouring agent. According to some studies, this dye is considered carcinogenic to animals and humans and also shows some harmful effects such as skin pigmentation, respiratory inflammation, degenerative changes in the liver and kidneys etc.[4] The use of Rhodamine B dye in food products is banned by FSSAI [5]. It is feared that the addition of this colour is still carried out which may show certain harmful effects.

MATERIAL AND METHODOLOGY

Materials- Tomato sauce, chilli sauce and szechuan sauce- 10 samples each.

Reagent- Acetone.

Methodology-

The total 30 samples of tomato sauce, red chilli sauce and szechuan sauce, 10 samples each were collected from different street food joints in Pune city. Detection of Rhodamine B was carried out for all samples using standardised detection methods given by the national regulator (Food Safety and Standards Authority of India-FSSAI).[6]

Detection of Rhodamine B in all sauces

Procedure

- i. Take a 2-gm sample in a test tube.
- ii. Add 5 ml of acetone.
- iii. Observe the colour of the acetone layer.

Inference

The immediate appearance of red colour indicates the presence of Rhodamine B.

RESULT:

10 samples of each sauce (tomato sauce, chilli sauce and szechuan sauce) were collected from street food joints and analysed for detection of the presence of Rhodamine B. Immediate appearance of red colour indicates the presence of Rhodamine B.

Table 1- Detection of Rhodamine B in Tomato sauce

Sample	Rhodamine-B
1	Absent
2	Absent
3	Present
4	Absent
5	Absent
6	Present
7	Absent
8	Absent
9	Absent
10	Absent

Among 10 samples of tomato sauces 2 samples showed the presence of Rhodamine B dye. It signifies a low level of consumption.

Table 2- Detection of Rhodamine B in Red Chilli sauce

Sample	Rhodamine-B
1	Present
2	Present
3	Present
4	Absent
5	Present
6	Present
7	Present
8	Present
9	Present
10	Absent

Among 10 samples of chilli sauces, 8 samples contain Rhodamine B dye. It signifies the moderate level of consumption.

Table 3- Detection of Rhodamine B in szechuan sauce

Sample	Rhodamine-B
1	Present
2	Present
3	Present
4	Present
5	Absent
6	Present
7	Present
8	Present
9	Absent
10	Absent

Among 10 samples of szechuan sauces 7 samples show the presence of Rhodamine B dye.

From the above 3 tables, it was observed that nearly 56.67% of samples contain Rhodamine B dye.

DISCUSSION:

The colouring agent in food has an important role. Without colour, food is not imagined. Colour is the most important visual attribute of food and holds a prominent position in overall food quality. Colour affects the consumer's judgement of characteristics such as flavour, sweetness and freshness. Colour makes the food very attractive and appealing. Nowadays the use of synthetic food dyes in food products has increased more than natural food colour, as artificial food colours are less expensive and give intense colour to the food. Some foods are recognized by the colour they possess. Rhodamine B is one of the artificial colours which is banned by FSSAI. The presence of this dye in any food product is considered as illegal. For this study, chemical analysis was carried out to check the presence of Rhodamine B in sauces used in food products. For chemical analysis, 30 samples were tested, 10 samples each of tomato sauce, chilli sauce and szechuan sauces. From the chemical analysis, it was observed that 2 samples of tomato sauce, 8 samples of red chilli sauce and 7 samples of szechuan sauce had the presence of Rhodamine B dye in them. The study shows that there is a high (56.67%) tendency to use artificial food colours (Rhodamine B) in street food joints which can cause food toxicity and lead to cause health problems such as throat infection, allergic reactions like red rashes on the skin, food poisoning, cancer, etc. Therefore, it is necessary to control the use of artificial food colour.

REFERENCES

- [1] Suri S, Jain A, Lohia M, 2022, Determination of Quality of Green Chili Sauce Served by Street Food Venders (SFVs) in Delhi (India), Current Nutrition and Food Science Vol.18, number 5, pp. 502-506(5)

- [2] Anita G, & Neetu S, 2013. Hazards of New Technology in Promoting Food Adulteration. IOSR Journal of Environmental Science, Toxicology and Food Technology, Vol.5, pp. 08-10.
- [3] Merouani, S., Hamdaoui, O., Saoudi, F. and Chiha, M., 2010. Sonochemical degradation of Rhodamine B in aqueous phase: effects of additives. Chemical Engineering Journal, 158(3), pp.550-557.
- [4] Saigi Z, 2021, Various Adsorbents for Removal of Rhodamine B Dye: A Review, Indonesian Journal of Chemistry, Vol.21 Number 4, pp 1039-1056.
- [5] Food Safety and Standards Regulations, 2009, Substances added to food, Part 4.2, Substances added to food, Regulation 4.2.1.5.
- [6] FSSAI, A Manual of simple methods of testing common adulterants in food, pp. 44.
- [7] Dixit S, Mishra S, Khanna S, Das M, 2008, Benzoate and Synthetic colour risk assessment of fast food sauces served at street food joints of Lucknow, India, American Journal of Food Technology, Vol 3 (3), pp. 183-191.