

ABSTRACT

Adulteration of consumer products to achieve economic gains is a common practice in the developing countries. This unethical practice may not only lower quality of the products, they can affect the health of the consumers as well. The objective of this research was to identify and quantify adulterants added to the spices in Sri Lankan market. During the research, three of the widely used commercially available powdered spice samples, chili, turmeric and black pepper were subjected to the investigation.

Being biological products, each of these spices are highly complex mixtures having different types of chemicals including the chemicals inherited to the spices and agricultural byproducts such as pesticides, fertilizers and plant debris. A reference sample was prepared for each of the spice type by grinding the spice samples (using the acceptable procedures) obtained from Organic Farming Research and Development of Department of Export Agriculture (Peradeniya), from a farmer at Anuradhapura and a commercial sample of turmeric rhizomes. The chemical and physical characteristics of these reference samples were tested and compared them with the commercially available samples from the open market. Any considerable deviation of the chemical or physical properties in the commercial samples with respect to the reference samples was further investigated to identify the type of adulteration. Further, suspected adulterants (lead chromate for turmeric and Sudan Red dye for chili) were added to reference samples to devise analytical protocols in detecting these specific adulterants.

Based on the analytical data, it can be concluded that some of the commercially available turmeric samples were adulterated with a starchy material such as flour, rice husk and sodium salts. Some of the chili samples were adulterated with sodium salts and sandy material. A sample of black pepper was adulterated with a foreign plant matter rich with both crude fiber and mineral matter.

Analytical protocols developed for identification of Sudan Dye from chili powder was successful and the dye can be traced with sufficient accuracy and precision for the concentration range of 2 ppm to 10 ppm by weight.