

Studies on Relationship between Taste and Content of Sulfur Dioxide in Crude Drugs Obtained from the Japanese Market

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Summary

Sulfur dioxide and sulfites are registered in “The Japan’s Specifications and Standards for Food Additives”, and are mainly used as bleaches and anti-oxidants. The Food Sanitation Law prohibits their use with sesame, legumes and vegetables. In China, sulfur fumigation is performed for the purpose of bleaching, drying, and as an insecticidal and antibacterial process, in the preparation of some crude drugs. Recently, it has been reported that large quantities of sulfur dioxide may be present in sulfur-fumigated crude drugs. In the course of our survey of impurities in herbal materials, we analyzed the content of sulfur dioxide in 31 kinds of crude drugs purchased from the Japanese market.

Furthermore, with the aim of developing a new, simple method for the measurement of sulfur dioxide, we investigated the correlation between the color value obtained by spectrophotometry and the sulfur dioxide content in 19 kinds of crude drugs. A good correlation between the color index L^* value and the sulfur dioxide content, and the good inverse correlation between the color index C^* value and the sulfur dioxide content were observed in 4 powdered crude drugs. However, other crude drugs did not show any correlation between color and sulfur dioxide content.

Seeking other new methodology for the measurement of sulfur dioxide, we examined the correlation between taste intensity and sulfur dioxide content in 5 kinds of crude drugs with the use of a taste-sensing system. High levels of sulfur dioxide (more than 80 mg/kg) influenced the taste intensity of umami, and the astringency and anionic bitterness of 4 crude drugs (Platycodon Root, Fritillaria Bulb, Ginger and Forsythia Fruit). Therefore, measurement of the taste intensity may be suitable as a screening procedure for sulfur dioxide content in these crude drugs.

Key words

Sulfur dioxide, Taste-sensing system, Taste, Crude drugs