Asian Journal of Chemistry Vol. 17, No. 2 (2005), 1307–1308

NOTE

Assay of Total Phenolics in Some Common Spices

S. MUMTAZUDDIN
Department of Chemistry, B.R. Ambedkar Bihar University, Muzaffarpur-842 001, India

Due to significant nutraceutical and functional applications of food phenolics such as antimicrobial, antiviral, antioxidant and anticarcinogenic effects and also insecticidal and antifungal activities of spices which make them effective grain protectants, assay of total phenolics as gallic acid equivalent has been carried out in some common spices. It has been observed that different spices contains high level of phenolics content.

Key Words: Total phenolics, Spectrophotometric assay, Common spices.

Spices are substances which are used to season and flavour various food preparations. These are obtained from almost any part of the plant, *e.g.*, rhizome (ginger), bark (cassia), flowers and flower buds (capers, cloves), fruits (pepper), seeds (mustard), leaves (basil), etc. Thus, classification of spices is based on the parts from which spices are derived.

Significant nutraceutical and functional applications of food phenolics such as antimicrobial, antiviral, antioxidant and anticarcinogenic effects have been reported[1]. Insecticidal[2–4] and antifungal[5] activities of the secondary compounds (which include phenolics and related compounds) present in spices make them effective grain protectants. Results indicate that some of the spices may ameliorate the effect of environmental mutagens especially present in the food[6]. Taking these things into consideration, the assay of total phenolics in some common spices has been investigated.

The assay of total phenolics in the spices was carried out by the method recently reported[7].

The spices chosen for the purpose were: (a) Cinnamon (*Cinnamomum zeylanicum*); (b) Cloves (*Syzigium aromatica* = *Eugenia caryophyllata*), (c) Cumin (*Cuminum cyminum*); (d) Coriander (*Coriandrum sativum*); (e) Greater or Nepal cardamomum; (*Amomum subulatum*); (f) Fenugreek (*Trigonella foenum-graecum*); (g) Indian mustard (*Brassica juncea*); (h) Thyme (*Thymus vulgaris*); (i) Black fennel (*Negella sativum*).

All spectrophotometric readings were made on Systronics UV-Vis spectrophotometer 119. The spices were oven-dried for 48 h. 50 mg of the powdered samples were individually homogenized with 5 mL of hot 80% ethanol in a clean and dry mortar with the help of a pestle. The homogenate was centrifuged at 3000 r.p.m. for 15 min. In 1 mL of the supernatant, 3 mL of neutral $FeCl_3$ was added followed by the addition of 3 mL of water. The blank was prepared in distilled water by adding the same reagents in the same amount except the plant sample.

Optical density was then recorded at 296 nm (Table-1). The percentage of total phenolic compounds was calculated by comparing the reading with that of standard curve for gallic acid.

Table-1 gives the optical densities and concentrations of the total phenolics (as gallic acid equivalent) in the different spices as determined by comparing the optical densities of these spices with the standard curve for gallic acid.

TABLE-1
O.D. (ABSORBANCE) OF THE EXTRACTS FROM THE DIFFERENT SPICES AND CONCENTRATIONS OF PHENOLIC COMPOUNDS OBTAINED THEREFROM

	Spices	O.D.	Conentration of phenolic compounds (in mg/g)
1.	Cinnamon	1.084	8.5
2.	Cloves	*2.500	Higher than 25
3.	Cumin	1.143	9.3
4.	Coriander	*0.541	Lower than 5
5.	Greater cardamomum	*0.580	Lower than 5
6.	Fenugreek	0.981	6.9
7.	Indian mustard	1.138	9.2
8.	Thyme	0 837	5.0
9.	Black fennel	1.425	13.1

*O.D. values where deviation from Beer's law observed. Hence, exact corresponding concentration values not predictable.

From Table-1, it is obvious that the different spices contained high level of phenolics contents. This is perhaps one of the reasons for their great medicinal, antimicrobial, insecticidal and antifungal value. Among the spices studied, cloves have got the highest phenolics content. *Negella sativum* (vern. Mangraila) has also very high phenolics content, perhaps being one of the reasons for it finding place in religious books as the one having high medicinal value.

REFERENCES

1. F. Shahidi and M. Naczk, Phenolics in Food and Nutraceuticals, Culinary and Hospitality Industry Publications Services (2003).
2. A.E. Bell, L.E. Fellows and S.J. Simmonds, Natural products from plants for the control of insect pests, in: E. Hodgson and R.J. Kuhr (Eds.), Safer Insecticide Development and Use, Marcel-Dekker, USA (1990).
3. B.T. Neber, J. Helenius and A.L. Varis, *J. Appl. Entomol.*, **113**, 202 (1992).
4. J.I. Olaifa, W.O. Erhun and A.E. Akingbohungbe, *Insect Sci. Appl.*, **8**, 221 (1987).
5. N. Paster, M. Menasherov, U. David and B. Juven, *J. Food Protect.*, **58**, 81 (1995).
6. K.K. Soudamin, M. Unnikrishnan, K. Sukumaran and R. Kuttan, *Indian J. Physiol. Pharmacol.*, **39**, 347 (1995).
7. S. Mumtazuddin, *Asian J. Chem.*, **16**, 1203 (2004).

(*Received*: 12 June 2004; *Accepted*: 3 November 2004) AJC-4089