SPICES/CONDIMENTS

NPARR, 7(1), 2016-96  Cancer chemoprevention effects of ginger and its active constituents: potential for new drug discovery

Ginger is a commonly used spice and herbal medicine worldwide. Besides its extensive use as a condiment, ginger has been used in traditional Chinese medicine for the management of various medical conditions. In recent years, ginger has received wide attention due to its observed antiemetic and anticancer activities. This paper reviews the potential role of ginger and its active constituents in cancer chemoprevention. The phytochemistry, bioactivity, and molecular targets of ginger constituents, especially 6-shogaol, are discussed. The content of 6-shogaol is very low in fresh ginger, but significantly higher after steaming. With reported anti-cancer activities, 6-shogaol can be served as a lead compound for new drug discovery. The lead compound derivative synthesis, bioactivity evaluation, and computational docking provide a promising opportunity to identify novel anticancer compounds originating from ginger [Wang, C.-Z.*, Qi, L.-W. and Yuan, C.-S. (Tang Center for Herbal Medicine Research, Department of Anesthesia and Critical Care, Pritzker School of Medicine, United States), American Journal of Chinese Medicine, 2015, 43 (7), 1351-1363].

NPARR, 7(1), 2016-97  Evaluation of coriander spice as a functional food by using in vitro bioassays

Coriander leaves and seeds are widely used as a condiment and spice. The use of roasted coriander seeds in food and beverage is very common. In this study, we investigated raw and roasted coriander seeds for their functional food quality using antioxidant, anti-inflammatory and human tumour cell proliferation inhibitory assays. The hexane and methanolic extracts of raw and roasted coriander seeds showed identical chromatographic and bioassay profiles. Chromatographic purification of the roasted seed extracts afforded tripetroselinin as the predominant component. Other isolates were petroselinic acid, 1,3-dipetroselinin, 2-C-methyl-d-erythritol, 2-C-methyl-d-erythritol 4-O-β-d-glucopyranoside and linalool. Hexane and methanolic extracts of both raw and roasted seeds and pure isolates from them showed comparable antioxidant and anti-inflammatory activities to the positive controls used in the assays, and inhibited the growth of human tumour cells AGS (gastric carcinoma), DU-145 and LNCaP (prostate carcinoma), HCT-116 (colon carcinoma), MCF-7 (breast carcinoma) and NCI-H460 (lung carcinoma) by 4-34%, respectively [Zhang, C.-R.*, Dissanayake, A.A., Kevseroğlu, K. and Nair, M.G. (Bioactive Natural Products and Phytoceuticals Laboratory, Department of Horticulture, Michigan State University, East Lansing, 48824 MI, United States), Food Chemistry, 2015, 167, 24-29].

NPARR, 7(1), 2016-98  Influence of modified atmosphere packaging on shelf-life of green chillies (Capsicum annuum L.)

The effect of passive modified atmosphere packaging (MAP) on postharvest shelf-life of green chillies was studied. Different types of polymeric packaging films such as microporous, low density polyethylene (PE-LD), polyolefin and anti-fog films were used for MAP of green chillies. The respiration rate of the chillies varied significantly (p<0.05) among the control and modified atmosphere packed samples during storage at 8±1°C (RH 85-95%). The anti-fog film packed chillies showed low respiration rates (19 mg CO₂ kg/h) by delaying the progress in senescence. The physico-chemical characteristics of modified atmosphere packed and control chillies also showed significant (p<0.05) changes in terms of physiological loss in weight, firmness, skin colour and ascorbic acid content. An increase in total phenolic content was observed in chillies, whereas a decrease in total antioxidant activity and capsaicin content was
observed with progress in senescence during storage at 8±1°C. The anti-fog film packed samples maintained pigment stability for a longer duration as compared to samples packed in other films. A shelf-life of 16, 18, 22 and 28 days was observed in chillies packed in microporous, PE-LD, polyolefin and anti-fog films, respectively, as compared to 15 days in the case of control samples. Anti-fog (RD45) film was effective to maintain postharvest quality of green chillies during low temperature storage (8±1°C, RH 85-95%) [Chitravathi, K., Chauhan, O.P. and Raju, P.S. (Defence Food Research Laboratory, Siddarthanagar, Mysore, India), Food Packaging and Shelf Life, 2015, 4, 1-9].

NPARR, 7(1), 2016-99 Moisture content and its impact on aflatoxin levels in ready-to-use red chillies

Moisture content (MC) and aflatoxin contamination were analysed to determine Red Chilli quality. A wide range (9.1–19.8%) of MC with a mean value of 11.4 ± 2.4% was found. Of 116 chilli samples, about 37% had low MC (<10%), 29.4% had medium-low MC (10–12%), 18.9% had medium-high MC (12 < MC < 14%) and 14.7% were above 14%. These four chilli groups had average aflatoxin levels of 2.1 ± 1.1, 5.3 ± 4.2, 8.9 ± 5.9 and 37 ± 20 µg/Kg, respectively. A direct relationship between moisture and aflatoxin content was found. The data best fitted a polynomial trend (R^2 = 0.89). The obtained equation could be utilised to assess aflatoxin levels based on MC. This study highlights the importance of using properly dried chillies with low MC, that is, ≤10%, to minimise health hazards associated with aflatoxin contamination [Sahar, N., Arif, S., Iqbal, S., Afzal, Q.U.A., Aman, S., Ara, J. and Ahmed, M. (Food Quality and Safety Research Institute, Pakistan Agricultural Research Council, University Block, University of Karachi, Karachi, Pakistan), Food Additives and Contaminants: Part B Surveillance, 2015, 8(1), 67-72].