3RD Global Food Security, Food Safety & Sustainability Conference

May 21-22, 2018 | New York, USA

Comparison of antioxidant activity of different species and strains of turmeric (*Curcuma spp*.) and identification of active compounds

Md Zahorul Islam and Md Amzad Hossain
University of the Ryukyus, Japan

Synthetic antioxidants like butylated hydroxyanisole, butylated hydroxytoluene, tertiary butyl hydroquinone and propyl gallate are widely used as preservatives in food industry. However, it has been reported that synthetic antioxidants produce toxins and show carcinogenic effect. Therefore, it is an urgent need to identify potential non-toxic natural antioxidant sources. For this, scientists, food manufacturers, producers and consumers have a great interest on photochemical and antioxidant properties in plant materials. Some turmeric species have been reported for antioxidant activities. However, there are many species of turmeric (Curcuma spp.) of which some have multiple strains/varieties that may have different active ingredients and biological activities. Therefore, we compared the total phenolic, flavonoid levels and antioxidant activity of three *Curcuma longa* strains (Ryudai gold, Okinawa ukon, BK2), *C. xanthorrhiza, C. aromatica, C. amada and C. zedoaria*. The antioxidant activity was determined using the 1,1-diphenyl-2-picrylhydrazyl (DPPH) free radical scavenging activity, oxygen radical absorbance capacity (ORAC) and reducing power assay. Turmeric Ryudai gold contained the highest concentration of polyphenols (157.43 mg GAE/g extract), flavonoids (1089.507 mg Rutin/g extract). It also showed the highest DPPH radical-scavenging activity with the lowest 50% inhibitory concentration (IC50) (26.36 µg/mL), ORAC (14090 µMol TE/g extract) and reducing power absorbance (0.33). For this, Ryudai gold was chosen for isolation of antioxidant compounds using silica gel column, toyopearl HW-40F column and high-performance liquid chromatography. Structural identification of the antioxidant compounds was conducted using 1H NMR, 13C NMR and liquid chromatography-tandem mass spectrometry. The purified antioxidant compounds were curcumin (1), demethoxycurcumin (2) and bisdemethoxycurcumin (3). The IC_{50} for DPPH of curcumin, demethoxycurcumin and bisdemethoxycurcumin were 17.66 µM, 47.81 µM and 196.42 µM, respectively. Our findings suggested that the *Curcuma longa* strain Ryudai gold (developed by the University of the Ryukyus, Okinawa, Japan) is a promising source of natural antioxidants which could be used for feed additives/preservatives to the benefits to consumers.

Biography

Md Zahorul Islam published latest article in Microvascular research entitled Hypertension alters the endothelial-dependent biphasic response of bradykinin in isolated Microminipig basilar artery. This article is available in PubMed with an unique identification number PMID: 28587989 and it is published in 2017. The coauthors of this article are Zahorul Islam M, Kawaguchi H, Miura N, Miyoshi N, Yamazaki-Himeno E, Shiraishi M, Miyamoto A and Tanimoto A.

drzahorul@bau.edu.bd

Notes: