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Evaluation of the Phenolic Composition of Curcumin from Different Turmeric (Curcuma longa L.) Extracts: A Comprehensive Study Based on Chemical Turmeric Extract, Turmeric Tea and Fresh Turmeric Juice

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Abstract : Turmeric (Curcuma longa L.), is used as a food additive (spice), preservative and coloring agent in Asian countries, including China and South East Asia. It is also considered as a medicinal plant. Traditional Indian medicine evaluates turmeric powder for the treatment of biliary disorders, rheumatism, and sinusitis. It has rich polyphenol content. Turmeric has yellow color mainly because of the presence of three major pigments; curcumin 1,7-bis(4-hydroxy-3-methoxyphenyl)-1, 6-heptadiene-3,5-dione), demethoxy-curcumin and bis demothoxy-curcumin. These curcuminoids are recognized to have high antioxidant activities. Curcumin is the major constituent of Curcuma species. Method: To prepare turmeric tea, 0.5 gram of turmeric powder was brewed with 250 ml of water at 90°C, 10 minutes. 500 grams of fresh turmeric washed and shelled prior to squeezing. Both turmeric tea and turmeric juice pass through 45 lm filters and stored at -20°C in the dark for further analyses. Curcumin was extracted from 20 grams of turmeric powder by 70 ml ethanol solution (95:5 ethanol/water v/v) in a water bath at 80°C, 6 hours. Extraction was contributed for 2 hours at the end of 6 hours by addition of 30 ml ethanol. Ethanol was removed by rotary evaporator. Remained extract stored at -20°C in the dark. Total phenolic content and phenolic profile were determined by spectrophotometric analysis and ultra-fast liquid chromatography (UFLC), respectively. Results: The total phenolic content of ethanolic extract of turmeric, turmeric juice, and turmeric tea were determined 50.72, 31.76 and 29.68 ppt, respectively. The ethanolic extract of turmeric, turmeric juice, and turmeric tea have been injected into UFLC and analyzed for curcumin contents. The curcumin content in ethanolic extract of turmeric, turmeric juice, and turmeric tea were 4067.4, 156.7 ppm and 1.1 ppm, respectively. Significance: Turmeric is known as a good source of curcumin. According to the results, it can be stated that its tea is not sufficient way for curcumin consumption. Turmeric juice can be preferred to turmeric tea for higher curcumin content. Ethanolic extract of turmeric showed the highest content of turmeric in both spectrophotometric and chromatographic analyses. Nonpolar solvents and carriers which have polar binding sites have to be considered for curcumin consumption due to its nonpolar nature.

Keywords : phenolic compounds, spectrophotometry, turmeric, UFLC
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