

Critical study of curcumin extraction

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SUMMARY : The study of curcumin extraction from turmeric varieties grown in Maharashtra was under taken in the College of Agricultural Engineering, M.A.U.Parbhani. Curcumin was extracted from Salem, Krishna, Rajapuri and Pratibha varieties by ethanol, acetone, hexane, and HPLC (High performance liquid chromatography) method. From the analysis it was found that to extract more curcumin percentage it is better to go for variety Pratibha, curcumin extraction method HPLC and steam cooking method. The turmeric variety Salem is widely grown and well established in Maharashtra, now efforts have to be taken to convince farmers to cultivate turmeric variety Pratibha having the highest curcumin content. The range of curcumin percentage in Pratibha was from 3.584 to 7.730 per cent followed by Salem 2.169 to 5.932 per cent, Rajapuri 2.812 to 4.366 per cent and Krishna 1.599 to 3.520 per cent, respectively. The highest percentage of curcumin was extracted by HPLC method as compared with the solvents ethanol, acetone and hexane. The highest percentage of curcumin was found in variety Pratibha (7.730%) and minimum in Krishna (2.308%) by HPLC method. The range of curcumin extracted by HPLC method was found as 2.308 to 5.662 per cent from boiled turmeric and 3.520 to 5.932 per cent from steam cooked turmeric, respectively.

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Turmeric (*Curcuma longa* L.) belongs to “Zingiberaceae” family and is a native to south east India and Indonesia. India is the leading producer (90%) and exporter, of the world and utilizes 80 per cent of it. India has nearly 1.84 lakh ha of area under turmeric with total production of 8.56 lakh tonnes during the year 2006-07 (Anonymous, 2004). Generally it contains protein 6.3 per cent, fat 5.1 per cent, minerals 3.5 per cent, COH 69.4 per cent, m.c.13.1 per cent, essential oil 3.5 per cent, curcumin 2.5 to 6 per cent, and oleoresins 5.7 per cent. It is a principal ingredient in food preparations and medicines. It is also used as dye in textile industry, in the preparation of oils, ointments and poultice, in cosmetic product to prepare natural and herbal creams, lotions and hair dye (Negi *et al.*, 1999).

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Curcumin is yellow colour pigment, most valued constituent of turmeric consists of 1,7-bis (4-hydroxy, 3-methoxy phenyl) hepta-1, 6-diene 5-diene (www.turmeric.co.in). In the pure isolated state, curcumin separates as an orange yellow crystalline powder having melting point of 180-183°C. It is insoluble in water, slightly soluble in alcohol and glacial acetic acid curcumin can be extracted by solvent extraction, HPLC (High performance liquid chromatography) and supercritical carbon dioxide extraction method (Balashanmugan, 1991).

The study was conducted at the Dept. of Agricultural Process Engineering, C.A.Engg. and Dept. of Food Engineering, C.F.Tech. (M.A.U. Parbhani), and Dept. of Food Technology, Institute of Chemical Technology, Bhimrao Ambedkar Marathwada University, Aurangabad to know the best turmeric variety, curcumin extraction method and turmeric cooking method helpful to farmers, businessmen and industrialist.

EXPERIMENTAL METHODS

The study of curcumin extraction from four turmeric varieties (V), V₁-Salem, V₂-Krishna, V₃-Rajapuri and V₄ Pratibha mostly grown in Maharashtra were used for four