

Antioxidant and anti-inflammatory activities of proteins isolated from eight *Curcuma* species

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Abstract

Curcuma species are used in traditional Indian medicine for their antimicrobial, anticancer, anti-inflammatory properties. The present study evaluated the bioactivity of proteins in aqueous extracts of rhizomes of eight *Curcuma* species (*C. aeruginosa*, *C. amada*, *C. aromatica*, *C. brog*, *C. caesia*, *C. malabarica*, *C. rakhakanta* and *C. sylvatica*), in comparison with *C. zedoaria*. The purified native proteins had a molecular weight of 66 kDa, which was resolved by SDS-PAGE as 12 and 14 kDa proteins. Proteins isolated from all species showed significant antioxidant activity which was found to be heat stable. *C. brog*, *C. amada* and *C. caesia* proteins showed highest antioxidant potential. The proteins also exhibited high anti-inflammatory activity at a dose level of 100mg/kg bw, when assayed by the carrageenan rat paw model system. The study indicated that these activities could contribute significantly to the pharmacological properties of these species.

Keywords: *Curcuma* species; rhizomes: soluble proteins; antioxidant activity; anti-inflammatory activity

Introduction

Curcuma species belongs to the family Zingiberaceae comprising of about 80 rhizomatous species, which occur widespread throughout the tropics of Asia, Africa and Australia. Many species of the genus are used in traditional systems of Indian and Chinese medicine particularly as an anti-inflammatory agent and in the treatment of flatulence, jaundice, and gastric ailments (Purseglove et al., 1981). *Curcuma longa*, the most commonly utilized species, as well as *C. zedoaria*, and *C. xanthorrhiza* possesses a wide range of medicinal properties (Srimal., 1997; Luthra et al., 2001; Wilson et al., 2005; Panda., 2010). Most of the studies on the pharmacological constituents in these species have focussed on organic compounds such as curcumin, phenolics, terpenoids, flavonoids which are present in the rhizomes, while very few investigations have been carried out on the aqueous principles. Biologically active proteins have been reported from Zingiberaceae plants. Proteins having significant antioxidant activity were found to be present in aqueous extracts of *C. longa* rhiz-