The chemopreventive potential of *Curcuma purpurascens* rhizome in reducing azoxymethane-induced aberrant crypt foci in rats

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**Published Date** July 2015  **Volume** 2015:9  **Pages** 3911–3922

**DOI** [http://dx.doi.org/10.2147/DDDT.S84560](http://dx.doi.org/10.2147/DDDT.S84560)

**Received** 13 March 2015, **Accepted** 18 May 2015, **Published** 27 July 2015

**Approved for publication by** Dr Wei Duan

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**Abstract:** *Curcuma purpurascens* BI. rhizome, a member of the Zingiberaceae family, is a popular spice in Indonesia that is traditionally used in assorted remedies. Dichloromethane extract of *C. purpurascens* BI. rhizome (DECRP) has previously been shown to have an apoptosis-inducing effect on colon cancer cells. In the present study, we examined the potential of DECRP to prevent colon cancer development in rats treated with azoxymethane (AOM) (15 mg/kg) by determining the percentage inhibition in incidence of aberrant crypt foci (ACF). Starting from the day immediately after AOM treatment, three groups of rats were orally administered once a day for 2 months either 10% Tween 20 (5 mL/kg, cancer control), DECRP (250 mg/kg, low dose), or DECRP (500 mg/kg, high dose). Meanwhile, the control group was intraperitoneally injected with 5-fluorouracil (35 mg/kg) for 5 consecutive days. After euthanizing the rats, the number of ACF was enumerated in colon tissues. Bax, Bcl-2, and proliferating cell nuclear antigen (PCNA) protein expressions were examined using immunohistochemical and Western blot analyses. Antioxidant enzymatic activity was measured in colon tissue homogenates and associated with malondialdehyde level. The percentage inhibition of ACF was 56.04% and 68.68% in the low- and high-dose DECRP-treated groups, respectively. The ACF inhibition in the treatment control group was 74.17%. Results revealed that DECRP exposure at both doses significantly decreased AOM-induced ACF formation, which was accompanied by reduced expression of PCNA. Upregulation of Bax and downregulation of Bcl-2 suggested the involvement of apoptosis in the chemopreventive effect of DECRP. In addition, the oxidative stress resulting from AOM treatment was significantly attenuated after administration of DECRP, which was shown by the elevated antioxidant enzymatic activity and reduced malondialdehyde level. Taken together, the present data clearly indicate that DECRP significantly inhibits ACF formation in AOM-treated rats and may offer protection against colon cancer development.

**Keywords:** colon cancer, PCNA, Zingiberaceae

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