



TITLE: Curcuma xanthorriza Roxb potentiates to improve hydration state following exercise: A preliminary study in rats

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ABSTRACT

Background: Curcuma xanthorriza Roxb, a type of turmeric, is known for its antioxidant properties. However, its effects on red blood cell indices and redox system levels in response to endurance exercise have shown inconsistency. Aims: This study investigated the impact of long-term pre-exercise Curcuma supplementation on red blood cell indices, circulating malondialdehyde (MDA) and superoxide dismutase (SOD) levels. Methods: A total 20 male Rattus norvegicus Wistar rats (aged 12-16 weeks, weighing 160-200 g) was divided equally into four groups: an exercise-only group (C) and three groups supplemented with Curcuma extract at dosages of 6.75 mg (T1), 13.50 mg (T2), and 20.25 mg (T3). Both Curcuma extract supplementation and exercise were administered for 28 days. Results: Following 28 days of swimming until exhaustion, hematocrit increased by 15% ($p = 0.056$), with a concomitant linear increase in erythrocyte count by 15% ($p = 0.059$). Long-term exercise intervention induced a rise in MDA production by 41% ($p < 0.001$). Pre-exercise Curcuma supplementation attenuated the elevation in hematocrit levels and erythrocyte count. Moreover, the rise in MDA levels in response to long-term exercise intervention was moderately mitigated by Curcuma supplementation (-16.6%, $p = 0.09$ with a dosage of 13.50 mg).

Notably, Curcuma supplementation prior to exercise demonstrated a dosage-dependent increase in SOD levels (+82.6%, $p = 0.028$ with a dosage of 20.25 mg). Conclusion: Our pilot findings suggest that pre-exercise supplementation with Curcuma extract may mitigate dehydration state following exercise training. Our future direction involves applying the findings of this study to human subjects.

Keywords

Curcuma, endurance, exercise, redox, red blood cells



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