



Field Marigold (*Calendula arvensis* L.) accelerates wound-healing in vivo: role of transforming growth factor-beta1 (TGF- β 1), inflammatory, and biochemical molecules

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Abstract

Medicinal plants are major sources of natural products, which have gained a renewed interest in recent years because of drawbacks associated with synthetic ones used for human health disorders. *Calendula arvensis* L. is a traditional medicinal plant used for many inflammatory-related diseases. The study explores the acute toxicity and wound-healing effects of methanolic extracts of *Calendula arvensis* L. aerial parts (MECAA) on excisional neck injury in rats. A two-week acute toxicity procedure was applied to find the safety of MECAA in animal models. For the wound-healing experiment, a uniform dorsal neck injury was created for twenty-four Sprague–Dawley rats, which were aligned arbitrarily into 4 groups and received topical treatments; group A rats addressed with normal saline; group B rats had intrasite gel; groups C and D rats had 0.2 ml of 250 and 500 mg/kg of MECAA, respectively. There was no toxicity nor mortality in rats supplemented orally with up to 5 g/kg MECAA. MECAA topical addressing accelerated wound contraction represented by higher deposition of fibroblast and keratinocytes, angiogenic factors, and reduced inflammatory cells. MECAA treatment up-regulated tissue antioxidants (SOD and CAT), transforming growth factor- β 1, and hydroxyproline (collagen) contents while lowering MDA and serum inflammatory mediators (TNF- α and IL-6). The outcomes can serve as scientific evidence for the traditional use of *Calendula arvensis* as a wound healer, which requires further molecular isolation and identification as a viable source of a potent drug formulation.

Keywords *Calendula arvensis* · Antioxidants · Immunohistochemical · Wound healing · Inflammatory cytokines