

## Gastric Ulcers in Rats by the Herbal Medicine Vinay Kumar

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### Editorial

Sangre de Grado is a traditional medicine of various ethnic groups of the Amazon River basin. Sangre de Grado is a red, latexy tree sap that is applied to the skin for the treatment of cuts, bites, abrasions for its remarkable wound healing properties. Sangre de Grado is also diluted and taken orally for the treatment of severe gastrointestinal distress and cancer. There have been no reports validating the ethnomedical evidence that Sangre de Grado offers benefit in the management of gastric ulcers, and for this reason we conducted a series of experiments in rats and *in vitro*. Experimental gastric ulcers were induced in Sprague-Dawley rats by brief topical application of acetic acid to the serosal surface of the stomach of anesthetized rats. This results in a transmural inflammation and an ulcer of a defined size, which takes up to three weeks to heal. Sangre de Grado, sap from *Croton palagnostigma*, was included in the drinking water post-surgically at dilutions of 1:1000 to 1:30,000 fold to mimic ethnomedical use. After 7 days, rats were euthanized and ulcer size measured (gross and histological measurements), along with determinations of myeloperoxidase activity (MPO) and bacterial counts in the ulcer. Antibacterial activity of Sangre de Grado *in vitro* was determined against *E. coli*.

In untreated rats, serosal application resulted in a large, craterous, inflamed ulcer that was colonized by gram-negative bacteria (mainly *E. coli*). Treatment with Sangre de Grado resulted a significant reduction in bacterial colony forming units present in the ulcer from  $1.5 \times 10^{11}$  in controls to  $1.2 \times 10^8$  at the 10,000 fold dilutions. Efficacy was lost at 1:30,000 fold dilutions. MPO

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activity was reduced significantly ( $p < 0.05$ ) from control values of  $608 \pm 67$  by Sangre de grado dilutions of 1:1000 ( $289 \pm 42$ ) to 10,000 ( $371 \pm 77$ ) but not at 30,000 ( $589 \pm 105$ ). Concomitant with the anti-inflammatory and antimicrobial actions of Sangre de Grado, ulcer size was significantly reduced. *In vitro* Sangre de grado was completely effective in killing *E. coli* at concentrations of 1:100 and above. These results lend support to the traditional use of Sangre de Grado in the Amazon River basin as an agent to heal gastric ulcers. It appears that this effect is registered in part through the antimicrobial actions of Sangre de Grado. Considering the inability of these ethnic groups and other communities in South America to afford standard Western antibiotics and the low cost of this herbal remedy (a two week treatment would cost 25 cents). Sangre de Grado may be an effective means of treating gastric ulcer and gastrointestinal distress in the developing world.