

Aerva lanata (Polpala): Its effects on the structure and function of the urinary tract

Mangala Gunatilake, M.D.S. Lokuhetty¹, Nuwan A. Bartholameuz¹, Dilan T. Edirisuriye, Muditha U. Kularatne¹, Anand Date²

Departments of Physiology, and ¹Pathology, University of Colombo, Colombo, Sri Lanka, ²Department of Pathology, Sultan Qaboos University, Muscat, Oman

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ABSTRACT

Context: *Aerva lanata* is not prescribed for long-term use in Ayurveda as it is believed to produce structural changes in the urinary tract of the patients leading to renal failure. **Aim:** To investigate the toxic effects of *Aerva lanata* on the structure and function of urinary tract of a rat model (Sprague-Dawley rats). **Settings and Design:** An experimental study. Thirty male and thirty female healthy rats were randomly assigned to three groups (test groups 1, 2 and control) and administered dried infusion of *A. lanata* 25g/200ml (low dose), 100g/200ml (high dose) and distilled water respectively, for 30 days. **Materials and Methods:** Blood and urine were collected and creatinine was measured. Creatinine clearance (Ccr) and urine flow rate (UFR) of rats were determined to assess renal function. Kidneys, ureters, and bladders of rats were harvested for light microscopic (LM) studies. Electron microscopic (EM) studies were done on kidney tissues. **Statistical Analysis Used:** Difference in mean values of Ccr and UFR between test groups and the control group were compared statistically using independent T test. LM and EM findings of the two treated groups (T1 and T2) were statistically compared with the control group (C) using standard normal distribution. **Results:** Ccr and UFR of test groups were not significantly different from that of the control group. LM studies did not show any histological changes suggesting toxicity. EM, however showed significant ultra structural changes in proximal convoluted tubular epithelial cells of rats in the two test groups. **Conclusion:** Administration of dried *Aerva lanata* for a period of one month did not produce significant effects on renal function of rats. However administration for the same period caused significant ultra structural changes in the proximal convoluted tubular epithelial cells.

Key words: *Aerva lanata*, kidney, Sprague-Dawley rats, toxic effects

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INTRODUCTION

Aerva lanata, known as polpala in Sri Lanka, is a medicinal plant belonging to the Amaranthaceae family. It is widely spread in the drier parts of the tropics and the sub tropics of the world.

Aerva lanata is commonly described in Ayurveda as a diuretic with anti-inflammatory, antihelmintic, anti-bacterial and mild analgesic effects. It is used in the treatment of lithiasis, cough, asthma, and headache and as an antidote for rat poisoning.^[1-3] This herb is used as a decoction or as an herbal tea with or without other herbs in Ayurveda. It is believed that long-term ingestion of *Aerva lanata* is harmful, as it has adverse effects on the urinary tract.

Address for correspondence:

Prof. Mangala Gunatilake, Department of Physiology, University of Colombo, Kynsey Road, Colombo 08, Sri Lanka.
E-mail: mangalagunatilake@hotmail.com

Alkaloids, terpenoids, sterols, several flavonoid glycosides and polyphenols had been isolated from *Aerva lanata* by researchers in Russia and India.^[4] Chemical composition of the different components of this herb is said to be different.^[2,5] The compounds β -sitosterol, campesterol and chrysin have been isolated from *Aerva lanata* plants in Egypt and β -sitosterol, daucosterol, syringic acid, vanillic acid, feruloyltyramine and feruloylhomovanillylamine from plants in Russia.^[6]

Diuretic effect of *Aerva lanata* has been investigated by three research groups in Sri Lanka during the last century. When it was given to humans in concentrations of 50g/200 ml and 100 g/200 ml, a significant increase in the urine volume was observed when compared with controls in one study in which the diuretic property was determined by measuring the urine output.^[7]

A more comprehensive study by Goonaratna *et al.*,