



Antinociceptive effect and toxicological study of the aqueous bark extract of *Barringtonia racemosa* on rats

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Abstract

Barringtonia racemosa Linn. (Family Lecythidaceae) possesses several bioactivities and is used in traditional medicine of Sri Lanka, but its analgesic potential has not been investigated so far. The aim of this study was therefore to examine the antinociceptive potential of an aqueous bark extract (500, 750, 1000 or 1500 mg/kg) of *B. racemosa* in male rats using three models of nociception (tail flick, hot plate and formalin tests). The results showed that the extract has antinociceptive activity (when evaluated in hot plate and formalin test but not in tail flick test) without producing unwanted side effects or toxicity. Further, the extract did not alter fertility, gestational length, peri- and neonatal development and appears to be non-teratogenic. The antinociceptive effect was mediated mainly via opioid mechanisms. Such inhibition of pain could arise from phenolic and steroidal constituents as was shown to be present in the extract.

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1. Introduction

Sri Lanka possesses many plant species of medicinal value. Several medicines used today are derived straight from plants. The plant kingdom represents a virtually untapped reservoir of new and exciting chemical compounds, many of them extraordinarily biodynamic.

Barringtonia racemosa Linn. (Family Lecythidaceae) (Sinhala: Godamidella, Tamil: Arattam) is a small tree capable of reaching 20 m or more with leaves tufted at the ends of stout twigs. In Sri Lanka, it is common in the moist low country, especially near the shores of backwaters, lakes, rivers and the banks of paddy fields (Macnae and Fosberg, 1981).

The methanol extract of the bark of *B. racemosa* possesses significant antifungal activity against plant pathogenic fungi *Curvularia* sp., *Colletotrichum gloeosporioides*, *Cylindrocladium quinquesepatum*, and *Rigidiporus lignosus* (Palanakumbura et al., 1996). The ethanol extract of the roots, its chloroform soluble fraction and isolated triterpenoid nasimalun A of *B. racemosa* showed antibacterial activity against several Gram-positive and Gram-negative bacteria (Khan et al., 2001). The protein fraction isolated

from the stem bark of *B. racemosa* has been shown to have high mitogenic activity in mouse lymphocytes (Tachibana et al., 1996), whilst the ethanol extract of *B. racemosa* leaves displayed cytotoxic activity against the HeLA (human cervical carcinoma) cell line with a CD₅₀ value of 10 µg/ml (Mackeen et al., 1997).

The ethnopharmacological uses of *B. racemosa* indicate it to be a rich source of phytomedicine (Jayaweera, 1981). *B. racemosa* is widely used in the form of a decoction in traditional medicine in Sri Lanka. The bark and leaves are used for rat-snake bites, rat poisoning and on boils. The seeds along with other ingredients are employed in the preparations for the treatment of itch, piles and typhoid fever. The bark is claimed to be specific for gastric ulcers (Jayaweera, 1981). The variety of unrelated ailments/diseases for which *B. racemosa* is used in folkloric medicine suggests that it may be having an analgesic effect. This prompted us to investigate the antinociceptive activity of this species.

2. Materials and methods

B. racemosa bark was collected from a mature tree in Kaleliya, Mirigama in the Gampaha district of Sri Lanka in August 2001 and was identified and authenticated by Professor B.A. Abeywickrama of the Botany Department of

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