



## The Anti-inflammatory effects of the Jamaican species of *Cymbopogon citratus* (lemon grass) and *Croton linearis* (wild rosemary) plant extracts on carrageenan-induced inflammation

A. Jacob <sup>\*1</sup>, L.A.D Williams <sup>2</sup>, Anthony Weblly <sup>1</sup>, Michael Heron <sup>1</sup>, E.A Thomas <sup>1</sup>

<sup>1</sup> Department of Basic Medical Sciences, University of the West Indies

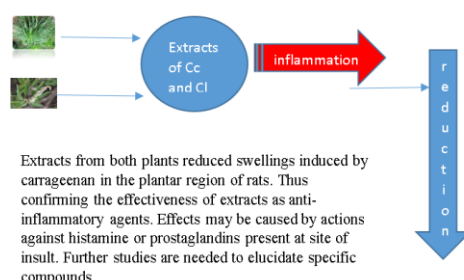
<sup>2</sup> Scientific Research Council, Hope Gardens, Kingston, Jamaica

### Abstract

Inflammation occurs in response to injury and if left untreated can lead to several diseases including arthritis. In Jamaican folklore practice plant extracts have been traditionally used to treat inflammatory conditions including rheumatoid arthritis and asthma. This is the first preliminary scientific investigation of the anti-inflammatory effects of extracts from the Jamaican species of *Croton linearis* (wild rosemary) and *Cymbopogon citratus* (lemon grass) leaves on carrageenan-induced rat paw edema. The methods used involved testing of plant extracts on inflammation induced by carrageenan lambda on the rat paw model. 0.1ml of 1% Carrageenan lambda in saline solution (0.9%) was injected into the plantar region of the right hind paw of all groups to induce inflammation. Hexane extract (50mg/kg) of *Croton linearis* screened by BSA assay represents a sample inhibiting denaturation greater than 0%. Findings show that *Croton linearis* extract and aspirin (NSAID) shows comparable efficacy in reducing rat paw oedema ( $p < 0.05$ )( $n=18$  Sprague Dawley rats). This extract might be blocking the COX enzymes, with emphasis on COX-2 actions inflammation. Lemon grass extract 400 mg/kg showed reduction in paw volume ( $p < 0.001$ ), 200 mg/kg extract ( $p < 0.01$ ), saline group showed no significance compared to aceclofenac group ( $p < 0.05$ ),  $n=24$ . In concluding extracts of both Wild rosemary and lemon grass showed comparable efficacy to aspirin and aceclofenac in reducing the inflammatory response induced by carrageenan lambda. This data indicates that the extracts of Jamaican species of our samples contain components with anti-inflammatory potential. We are hoping to assess if the extracts are arresting inflammation at the early stage where there is release of histamine, 5-hydroxytryptamine and bradykinin or in in the late phase where prostaglandins are detectable (Prakash et al., 2011). Further work needs to be done to assess for toxicity and to purify the extracts to ensure safety.

**The Anti-inflammatory effects of the Jamaican species of *Cymbopogon citratus* (lemon grass) and *Croton linearis* (wild rosemary) plant extracts on carrageenan-induced inflammation.**

### Image



### Biography

Dr Audrey Jacob is a lecturer in Pharmacology in the Department of Basic Medical Sciences. Faculty of Medical Sciences Kingston Jamaica. She holds a PhD in Pharmacology. Her main area of interest is to assess the effectiveness of herbal extracts on the airways and to identify the primary secondary metabolites involved. Her research is geared towards the identification of receptor sites through which bioactive agents act by assessing actions of compounds via in vitro systems. Other areas of interest are associated with actions of plant derived compounds on inflammation and pain. She has presented at several conferences in her related areas. Her aim is to conduct thorough research and execute full toxicity studies to confirm safety for traditional use. She is hopeful that in the near future cell lines can be used in some of these studies to advance her investigations.

### Publications

Gossell-Williams M, Fletcher H, McFarlane-Anderson N, Jacob A, Patel J, Zeisel S. (2005). Dietary intake of choline and plasma choline concentrations in pregnant women in Jamaica. *West Indian Med J.* 54(6): 355-9.

Jacob AS, Simon O, Reese P and Singh P. (2007). Demonstration of antihistamine properties with AST-1, a bioactive extract from garden slugs

(*Diplosolenodes occidentalis*). *West Indian Med J.* 56 (1):11-16.

Jacob, A.S, Simon OR, Wheatle D, Ruddock P, McCook K. (2014). Antihistamine Effect of a Pure Bioactive Compound Isolated from Slug (*Diplosolenodes occidentalis*) Material. *West Indian Med J*;63 (5): .401-7

Cameron C, Jacob AS, Thomas EA. Levy AS. (2015) Preliminary Investigations of the Anti-asthmatic Properties of the Aqueous Extract of *Justicia pectoralis* (Fresh cut) *West Indian Med J*; 64 (4): 320-4.

Williams K, Jacob AS, Levy SA.(2015) Investigation of the Anti-Inflammatory and Analgesic Effects of the Aqueous Extract Obtained from the Bark of *Guaiacum officinale* (*Lignum Vitae*). *West Indian Medical Journal*. DOI: 10.7727/wimj .2015.089[ Epub ahead of print]