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Analgesic Activity of Water Extract of *Spilanthes acmella* Flowers on Rats

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Abstract. The objective of this study was to evaluate the analgesic potential of fresh flowers of *Spilanthes acmella* Murr. (family: Compositae) used by some Sri Lankan traditional medical practitioners to suppress toothache. Different doses of water extract of fresh flowers (111, 335 and 671 mg kg^{-1}) were orally administered to male rats and their analgesic potential was determined at different post treatment periods by using hot plate and tail flick tests. Sedative potential of the extract was evaluated by using rat hole board technique. The extract was well tolerated. A dose-dependent analgesic activity with a EC_{50} =313 mg kg^{-1} was evident when evaluated in hot plate but not in tail flick test. This analgesic activity had a rapid onset and short duration of action and was not blocked by naloxone, an opioid receptor antagonist. The mid dose of the extract also induced significant sedation. It is concluded that the analgesic activity is mediated supra-spinally accompanied with sedation.

Keywords: ***Spilanthes acmella*** **Analgesia, Nociception, Sedation.**

INTRODUCTION

In Sri Lanka,about 35% of the population are primarily dependent on Ayurveda and traditional systems of health care.[1] Sri Lankan traditional medical practitioners especially in the Uva province often recommend chewing of fresh yellow flowers of *Spilanthes acmella* Murr.(Family:Compositae, Sinhala: Acmella, Tamil: Akkirakaran) to suppress acute tooth ache. In Sri Lankan Ayurvedic Pharmacopoeia it is indicated that the juice of fresh flowers of this plant possesses several pharmacological properties including analgesic and anti-inflammatory activities [2]. However, these claimed activities are neither scientifically proven nor refuted. The aim of this study was to assess the antinociceptive potential of *S. acmella* flowers in rats using tail flick[3] and hot plate[3] tests, two well defined and commonly used algesimetric tests based on phasic stimulus of high intensity.

MATERIALS AND METHODS

Fresh flowers of *S. acmella* were collected from Ayurvedic medicinal garden at Haldummulla (Uva province), Sri Lanka, in March 2000. The identity of the plant was authenticated by Mr.S.B.Weerakoon, Department of Ayurveda, Colombo, Sri Lanka. The fresh flowers were homogenised in distilled water (DW) and filtered (yield 19% w/v) to obtain three concentrations of 111, 335 and 671-mg kg^{-1} (FE) in terms of mg fresh flowers kg^{-1} body weight (to be administered orally). The FE was subjected to qualitative testing for alkaloids, flavonoids , phenols, steroids, triterpinoides, coumarins, saponins, amino-acids and peptides as described by Farnsworth[4].

Healthy adult male Wistar rats (200-250 g) were used as experimental animals. They were kept under standardised animal house conditions (temperature; 28-31 C °, photoperiod; approximately 12 h natural light per day, relative humidity 50-55%) with free access to pelleted food (Vet House Ltd, Colombo Sri Lanka) and drinking water.

Rats were orally administered with either low, mid and high doses of FE (n =12/doses), DW (n =18) or acetylsalicylic acid, the reference drug (n =6). Nociception was evaluated in terms of reaction time in these rats 5-6 hours pre-treatment and upto 8 hours post-treatment at several time points using tail flick [briefly, the time taken to flick the tail, when the tail is immersed (5-6cm from its tip)in a water bath at 55c°] and hot plate [briefly, the time taken either to lick the hind paw or jump from the surface of hot metal plate maintained at 50c°] test with a cut off time of 15 sec. In the hot plate test, the reaction time was also calculated in terms of area under the curve using normal trapezium method. These rats were monitored for toxicity such as salivation, rhinorrhoea, lacrymation, convulsions, tremors, ataxia, diarrhoea, postural changes, abnormal behaviours, stress (exophthalmia and erection of fur) and for the presence of morphine-like behavioural changes such as excitation and Straub's tail reaction throughout the study period. Two groups of rats were either subcutaneously treated with naloxone hydrochloride (5 mg kg^{-1}, n = 6) or normal saline (n =6).