

Acute and Ninety-day Oral Toxicity of the Water Extract from the Fresh Leaves of *Pseuderanthemum palatiferum* in Rats

Parirat Khonsung^{1*}, Natthakarn Chiranthanut¹, Ampai Panthong¹,
Sunee Chansakaow², Sophaphan Intahphuak³,
and Seewaboon Sireeratawong¹

¹Department of Pharmacology, Faculty of Medicine, Chiang Mai University, Chiang Mai 50200, Thailand

²Department of Pharmaceutical Sciences, Faculty of Pharmacy, Chiang Mai University, Chiang Mai 50200, Thailand

³School of Nursing, Mae Fah Luang University, Chiang Rai 57100, Thailand

*Corresponding author. Email: wparirat@yahoo.com
<https://doi.org/10.12982/CMUJNS.2020.0061>

Received: November 25, 2019

Revised: April 7, 2020

Accepted: April 17, 2020

ABSTRACT

The objectives of this study were to assess acute and ninety-day oral toxicity of the water extract from the fresh leaf of P. palatiferum in rats. Acute oral toxicity study was conducted by a single administration 2,000 mg/kg of the water extract to female rats. The clinical signs related to toxic effects and the mortality of the rats were observed for a 14-day further. Repeated dose oral toxicity study was performed in both sexes of rats by giving 1,000 mg/kg of the extract once daily for 90 days. The toxic signs and health of the animals were monitored. At the end of the study, blood and the internal organs were collected for chemistry assay and the histopathological examination, respectively. The results revealed no significant difference between the control and treated rats in the acute oral toxicity study. There was no death of animals during 90-day orally given the water extract. All assessed parameters were similar to those of the control rats and were within the normal range. No significant pathologic feature and no difference between the groups of the animals were observed. In conclusion, the water extract of the fresh leaf of P. palatiferum at the single oral dose of 2,000 mg/kg produces neither any acute toxicity signs nor mortality in female rats. The daily dose of 1,000 mg/kg of the extract repeated administration for 90 days reveals well tolerance and safety profile in both sexes of rats.

Keywords: *Pseuderanthemum palatiferum*, Water extract, Acute oral toxicity, Ninety-day oral toxicity

INTRODUCTION

The leaf of *Pseuderanthemum palatiferum* (Nees) Radlk, family Acanthaceae, was dosed for both treatment and prevention of many diseases and symptoms e.g., wound, stomachache, diarrhea, and high blood pressure (Dieu et al., 2006). The dose for prevention and treatment are approximately 3 to 6 and 7 to 9 fresh leaves, respectively (Dieu et al., 2005). Numerous pharmacological activities of *P. palatiferum* has been reported including antibacterial and antifungal activities (Nguyen and Eun, 2013), antidiarrheal activity (Dieu et al., 2006), hypoglycemic activity (Padee et al., 2010; Panomket and Wanram, 2011), anti-inflammatory activity (Khumpook et al., 2013), acetylcholinesterase inhibitory activity in the hippocampus of the rats (Buncharoen et al., 2010), cytotoxic activity against lung cancer cell and antioxidant activity (Dechayont et al., 2010), and anti-cancer activity against MDA-MB-231 human breast cancer cells (Komonrit and Banjerdpongchai, 2018) and A549 human lung cancer cells (Kongprasom et al., 2019).

Phytochemical study of *P. palatiferum* leaf revealed the high contents of amino acids and mineral elements (Dieu et al., 2005), β -sitosterol, kaempferol, stigmasterol, triterpenoid saponins, apigenin, phytol, flavonoids, palmitic acid, and salicylic acid (Padee and Nualkaew, 2009).

Evaluation of the safety of herbal medicine in animals provides valuable information for further clinical study and the development of the medicinal plant product used in primary health care. The previous study of an 80% ethanol extract of dry leaf of *P. palatiferum* showed no cytotoxicity in vero cells and caused neither signs nor symptoms of toxicity in single-dose and once-daily administration for 14 days in male Wistar rats (Padee et al., 2009). As the potential botanical applications to treat chronic diseases of the plant, however, the fresh leaf of *P. palatiferum* has been used. The water extract from the leaf of *P. palatiferum* reveals the hypotensive and bradycardic activities (Khonsung et al., 2011), anti-inflammatory and analgesic activities (Inchab et al., 2019), and gastroprotective activity (Inchab et al., 2018). This study aimed to assess acute and ninety-day oral toxicity of the water extract of the fresh leaf of *P. palatiferum* in rats because some signs and symptoms of toxicity may appear after repeated exposure.