



## Note Sedative Activity of the Crude Extract of *Rauvolfia densiflora*

S.W. Weerakoon, L.S.R. Arambewela, G.A.S. Premakumara & W.D. Ratnasooriya

To cite this article: S.W. Weerakoon, L.S.R. Arambewela, G.A.S. Premakumara & W.D. Ratnasooriya (1998) Note Sedative Activity of the Crude Extract of *Rauvolfia densiflora*, *Pharmaceutical Biology*, 36:5, 360-361, DOI: [10.1076/phbi.36.5.360.4655](https://doi.org/10.1076/phbi.36.5.360.4655)

To link to this article: <https://doi.org/10.1076/phbi.36.5.360.4655>



Published online: 29 Sep 2008.



Submit your article to this journal [↗](#)



Article views: 165



View related articles [↗](#)



Citing articles: 4 View citing articles [↗](#)

NOTE

## SEDATIVE ACTIVITY OF THE CRUDE EXTRACT OF *RAUVOLFIA DENSIFLORA*

S.W. Weerakoon<sup>1</sup>, L.S.R. Arambewela<sup>1</sup>, G.A.S. Premakumara<sup>2</sup> and W.D. Ratnasooriya<sup>2</sup>

<sup>1</sup>Ceylon Institute of Scientific & Industrial Research, Colombo, Sri Lanka

<sup>2</sup>Department of Zoology, University of Colombo, Colombo, Sri Lanka

### ABSTRACT

*The sedative activity of Rauvolfia densiflora Benth ex Hook. f. (Apocynaceae) roots and leaves was evaluated using the rat hole board technique. The results indicate that crude extracts of R. densiflora has sedative properties as the leaf extract significantly reduced dips and rearing, and the root extracts reduced dips, motor and rearing activities related to exploratory behaviour of rats.*

### INTRODUCTION

*Rauvolfia densiflora* Benth. ex. Hook.f. (Apocynaceae) is a small tree occurring in the forests between 700 and 2200 m in Sri Lanka. It is reported that this plant contains reserpine type alkaloids, (Youngken, 1951) and is also used as an adulterant for *Rauvolfia serpentina* (L.) Benth ex. Kurz (Mukarji, 1956). This study was carried out to investigate the possible sedative activities of *R. densiflora* using rat hole board technique (File & Wordwill, 1975)

### MATERIALS AND METHODS

#### Plant Materials

*Rauvolfia densiflora* plants were collected from Rattota (Matale district), Sri Lanka and identified by Mr.

---

**Keywords:** Exploratory behaviour, rat hole board technique, *Rauvolfia densiflora*, *Rauvolfia serpentina*, sedative activity.

---

Address correspondence to: Dr. L.S.R. Arambewela, Ceylon Institute of Scientific & Industrial Research, P.O. Box 787, Colombo 7, Sri Lanka.

R.M.S. Ratnayake of Royal Botanical Gardens, Peradeniya. The identity was authenticated by the late Prof. S. Balasubramaniam, University of Peradeniya. The herbarium specimens are available at Royal Botanical Gardens, Peradeniya.

#### Extraction of Plant Materials

Shade dried powdered leaves and root bark of *R. densiflora* were separately extracted by agitation with ammoniated methanol (1:10) and filtered. The marc was again extracted by shaking with methanolic NaOH (1%) for 2 h and filtered. The filtrates were treated separately. The ammoniated MeOH was evaporated to dryness under reduced pressure and at 50°C and the resultant residue was dissolved in 1 M HCl and extracted with pet ether to remove fatty materials. The aqueous layer was extracted with chloroform in acidic and basic media, to obtain the bases. The methanolic NaOH layer was similarly treated. The bulked chloroform extracts were evaporated to dryness under reduced pressure and weighed to calculate the percentage yields of alkaloids in the leaves and the roots (1.62 and 1.68%, respectively).

#### Preparation of Crude Extracts for Animal Studies

The crude extract (CE) was dissolved in 8–10 ml of MeOH. Polyvinyl pyrrolidone (500 mg of PVP, Aldrich Chemical Co.), used as a vehicle for the extract, was dissolved in 10–12 ml of MeOH. The CE and PVP solutions were mixed at 1:2 (w/w) ratio, dried (50°C) under pressure and kept under vacuum. The dried mixture was dissolved in saline for interperitoneal administration to rats.

#### Test Animals

Cross bred albino rats (250–260 g, age 100–115 days) from our own colony were housed 3/cage under natural

TABLE 1. Effects of *Rauvolfia densiflora* extracts on rat hole board performance (mean  $\pm$  S.E.M.).

Treatment	No. head dips	Time/dip	No. locomotory activity	No. rears	No. faecal boluses
Control (PVP)	7.5 $\pm$ 1.3	1.9 $\pm$ 2.4	14.0 $\pm$ 2.1	16.2 $\pm$ 1.8	6.5 $\pm$ 1.4
Leaf extract (12.5 mg/kg)	3.5* $\pm$ 0.85	1.5 $\pm$ 0.07	10.5 $\pm$ 1.5	10.8* $\pm$ 0.04	3.38 $\pm$ 1.02
Root extract (12.5 mg/kg)	3.17* $\pm$ 0.8	3.67 $\pm$ 2.4	2.5* $\pm$ 0.7	2.8 $\pm$ 0.7	0.67 $\pm$ 0.4
Root extract(25 mg/kg)	1.3* $\pm$ 0.67	1.8 $\pm$ 0.5	3.8* $\pm$ 1.1	4.17* $\pm$ 0.6	0.38 $\pm$ 0.02

\* $P < 0.05$  (Mann-Whitney test).

photoperiod with free access to pelleted rat food (Fats & Oil Co. Seeduwa, Sri Lanka) and tap water. The photo period was 12 h of light per 24 h at a constant temperature ( $30 \pm 1^\circ\text{C}$ ).

### Evaluation of Sedative Activity

The rat hole board technique (File & Wordwill, 1975) was used to evaluate the sedative activity of the extracts. The extracts (12.5 or 25 mg/kg) and PVP mixtures were administered intraperitoneally to groups of six rats. The animals were placed singly on the center of the hole board (7.30–8.30 h) 60 min after the administration of either the vehicle or extract and observed for a 7.5 min trial period. The number of head dips (poking into holes), rears, locomotory activity and the number of fecal boluses were recorded. The time spent on head dipping behaviour was also evaluated.

### Statistical Analysis

Results were expressed in mean  $\pm$  S.E.M. Data were analysed using the Mann–Whitney U-test ( $P < 0.05$  was considered as significant)

## RESULTS

Table 1 summarises the results. The leaf extract showed significant reduction in the number of head dips and rears while the root extract significantly reduced the number of head dips, locomotory activity and the number of rears. This effect appears to be dose related. The number of fecal boluses also decreased.

## DISCUSSION

The sedative activity of *R. densiflora* root and leaf extract was evaluated using the rat hole board technique. This procedure is extremely sensitive and predictive for clinically useful sedatives (File & Wordwill, 1975). The results indicate that the crude leaf and root extracts of *R. densiflora* has sedative properties, as the leaf extract

significantly reduced two of the components and root extract three of the components of exploratory behaviour in rats. These effects appear to be dose-related. None of the animals showed overt signs of toxicity at the effective doses. There is a wide gap between the effective dose and the dose at which rats were unconscious (100 mg/kg). Therefore, the activity of the extract cannot be due to incipient toxicity. Several indole alkaloids such as ajmaline, peraksine, vomifoline, isoreserpiline and three new compounds lankanescine, lankafoline, and sridensine were isolated and identified from the plant (Kalpage, 1991; Weerakoon, 1992). Some of these compounds may be responsible for reserpine like activities. Based on these results, it could be concluded that crude extracts of *R. densiflora* possesses sedative activities similar to *R. serpentina* and *R. canescens* (Madawela et al., 1994).

## ACKNOWLEDGEMENTS

The first two authors are grateful to Natural Resources, Energy & Science Authority of Sri Lanka for a Research Grant.

## REFERENCES

- File SE, Wordwill A (1975): Validity of head dipping on a measurement of exploration in modified hole board. *Psychopharmacol* 43: 53–57.
- Kalpage SW, Weerakoon SW (1991): Studies on *Rauvolfia densiflora* and *Solanum xanthocarpum* M.Phil. Thesis p. 43, University of Peradeniya, Sri Lanka.
- Madawela PG, Arambewela LSR, Premakumara GAS, Ratnasooriya WD (1994): Studies on the sedative activity of crude extract of root bark of *Rauvolfia canescens* on rats. *J Ethnopharmacol* 42: 63–65.
- Mukarji B (1956): Indian Pharmaceutical Codex. 1, 219 pp.
- Weerakoon SW, Arambewela LSR (1992): Further studies on *Rauvolfia densiflora*. *Proc Inst Chem, Ceylon* 9: 14.
- Youngken SW (1954): Malabar Rauvolfia. *J Am Pharm Assoc* 43: 70–72.

Accepted October 1, 1997.