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Short communication

Studies on the sedative activity of crude extract of root bark of *Rauvolfia canescens* on rats

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1. Introduction

For centuries, *Rauvolfia serpentina* Benth. (Apocynaceae) roots have been used as hypnotics and sedatives in neuropsychiatric disorders, in anxiety states and in epilepsy (Srivasta, 1978). A closely related species *R. canescens* L. is found in Sri Lanka, especially in the Benotota area. This plant is reported to contain chemical constituents which are closely related to those found in *R. serpentina* (Krishnamurthi, 1969). As such it may be possible that *R. canescens* roots be used as a substitute for *R. serpentina* in the treatment of the above mentioned diseases. This study was carried out to investigate the possible sedative effects of *R. canescens* using rat hole board technique (File and Wordwill, 1975.)

2. Methodology

2.1. Plant material

Fresh plants of *R. canescens* L. (Apocynaceae) were collected and authenticated by the late Professor S. Balasubramanium of the University of Peradeniya, Sri Lanka. A voucher herbarium specimen has been deposited at the Royal Botanical gardens, Peradeniya.

2.2. Extraction of plant material

Peeled out, shade dried, and powdered *R. canescens* root bark was exhausted 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 petether to remove fatty materials. The aqueous layer was extracted with chloroform in acidic and basic media to obtain the bases. The methanolic NaOH solution was similarly extracted. The $CHCl_3$ layers were evaporated to dryness under reduced pressure and the crude alkaloid extract was obtained. The yield was 6.34%.

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Table 1
Effects of *Rauvolfia canescens* root extract in rats on hole board performance

Treatment	No. of head dips	Time per dip (s)	No. of locomotory activity	No. of rears	No. of faecal boluses
Controls (PVP)	7.5 ± 1.3	1.9 ± 0.4	14.0 ± 2.1	16.2 ± 1.8	6.5 ± 1.4
Extract (50 mg/kg) i.p.	4.0 ± 0.7* (−46)	2.0 ± 0.4 (+15)	6.0 ± 1.6* (−57)	8.0 ± 2.5* (−57)	2.0 ± 1.1 (−60)
Extract (100 mg/kg) i.p.	1.5 ± 0.4* (−80)	4.4 ± 1.5 (+57)	2.5 ± 0.8* (−82)	0.8 ± 0.8* (−95)	0.8 ± 0.8 (−88)

*$P < 0.05$ (Mann–Whitney test).
The percent variation in comparison with controls is in parentheses.

2.3. Preparation of crude extract for animal treatment

The crude extract (CE) (250 mg) was dissolved in 8–10 ml. of MeOH. Polyvinyl pyrrolidone (500 mg of PVP, Aldrich Chemical Co., WI, was used as a vehicle for the extract) was also dissolved in 10–12 ml. of MeOH. The CE and PVP solutions were mixed at 1:2 (w/w) ratio, dried (50°C) under reduced pressure and kept in vacuo. This dried mixture was dissolved in saline for intraperitonial administration to rats.

2.4. Test animals

Cross-bred male albino rats, (250–260 g, 100–115 days) from our own colony were used. Rats were housed 3/cage with free access to pelletted food (Fats and oil Co, Seeduwa, Sri Lanka) and tap water, with a constant photo period of 12 h light per 24 h and at constant temperature (30 ± 1°C).

2.5. Evaluation of sedative activity

The sedative activity of the extract was evaluated using the rat hole board technique (File and Wordwill, 1975). The extract (50 mg/kg, 100 mg/kg) or PVP (vehicle) 50 mg/kg were administered intraperitonially to groups of six rats. The animals were placed singly on the centre of the hole board (7.30–8.30 h.) 60 min after the administration of either the vehicle or the extract. Each animal was given a 7.5 min trial period. During this period the number of head dips (poking into holes), rears, locomotory activity and number of faecal boluses were recorded. The time spent in head dipping behaviour was also evaluated.

2.6. Statistical analysis

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

3. Results

The results are summarized in Table 1. Administration of both doses of the root extract showed a significant reduction in the number of head dips, locomotory activity and number of rears. This effect appears to be dose related. The number of faecal boluses have also decreased.

4. Discussion and conclusions

In this experiment, the possible sedative activity of *R. canescens* root extract was evaluated using the rat hole board technique. This procedure is extremely sensitive and predictive for clinically useful sedatives (File and Wordwill, 1975) The results demonstrate that the crude extract of *R. canescens* has sedative properties, as three of the components of exploratory behaviour in rats were significantly reduced. These effects appear to be dose related. None of the animals exhibited overt signs of toxicity at the effective dose (50 mg/kg) indicating that there is a wide gap between the effective and toxic dose (100 mg/kg). Therefore the activity of the extract cannot be due to any incipi-

ent toxicity. Several indole alkaloids — namely ajmaline, yohimbine, isoreserpine, corynanthine, deserpidine — and a new alkaloid have been isolated and identified from the root bark (Madawela, 1991). The sedative property is likely to be due to reserpine-type alkaloids which are present in the plant. Based on these results it could be concluded that the root extract of *E. canescens* also possesses sedative activities like *R. serpentine* roots.

5. Acknowledgement

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