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Evaluation of the central activity of the ethanolic extract of *Acosmium subelegans* (Mohlenbr) in mice

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Abstract

The ethanolic extract (EE) of *Acosmium subelegans* (Mohlenbr) Yakovl (perobinha-do-campo) was tested to behavioral paradigms in mice to investigate its putative central depressant effect. Oral pretreatment with the EE significantly reduced in a dose-dependent way the locomotor activity and increased by 30-55% the barbiturate sleep duration relatively to control values. At the highest dose (1,0 g.kg⁻¹) it decreased the extension time/flexion time ratio of the maximal electroshock-induced convulsions, enhanced the latency to the pentylene-tetrazol-induced convulsions and diminished by 26% the number of seizures, indicating an anticonvulsant action. No changes were observed in the motor coordination, the core temperature, climbing behavior, catalepsy and the plus-maze performance. The preliminary results indicate that the EE of *A. subelegans* induce a CNS depressant effect, more specifically an anticonvulsant effect that deserve a thorough investigation.

Acosmium subelegans (Mohlenbr) Yakovl, Leguminaceae, popularly known as "perobinha-do-campo", is used in the Brazilian folk medicine as sedative or "tranquilizer", in epilepsy treatment, in hysteria, nervous breakdown and chorea¹. Previous pharmacological studies described that the benzenic extracts obtained from the related species *Acosmium dasycarpum* (Vog) Yakovl produced a depressant effect upon the central nervous system (CNS) of rats and mice, revealed by a potentiation of barbiturate-sleep, a reduction of the spontaneous and the amphetamine-induced locomotor activity. No protection against pentylene-tetrazol and stricnine-induced convulsions was seen². The extract main active constituent was identified as lupeol, a triterpene compound. Lupeol, also reduced the ambulation of mice and potentiated the barbiturate-hypnosis without affecting the animals motor coordination³. Comparatively, the ethanolic extract of *A. subelegans* presented a similar profile of action, decreasing the locomotion in rats⁴ and potentiating the barbiturate-induced sleep in mice⁵. The present

study aimed to investigate the putative CNS depressant activity of the EE of *A. subelegans* in several behavioral paradigms in mice.

One hour after the intragastric treatment with EE (0,1, 0,5 and 1,0 g.kg⁻¹) or tap water (control = C), mice were evaluated in the following behavioral tests: rota-rod, elevated plus-maze, automated locomotion cages, pentobarbital-induced sleep, apomorphine-induced stereotyped behavior, catalepsy and pentylenetetrazol- and maximal electroshock-induced convulsions, besides recording their rectal temperature. Oral pretreatment with the EE of *A. subelegans* significantly reduced in a dose-dependent way the locomotor activity as registered in the automated cage (C= 408,6 ± 29,9; EE0,1= 360,2 ± 34,8; EE0,5= 302,1 ± 40,7; EE1,0= 279,7 ± 24,3*). EE also increased by 30-55% the sleep duration relatively to control values (C= 54,2 ± 4,9; EE0,1= 69,7 ± 6,4; EE0,5= 76,8 ± 3,3*; EE1,0= 83,7 ± 6,6*). At the highest dose, decreased the extension time/flexion time ratio of the maximal electroshock-induced convulsions (Figure 1A) and enhanced the latency to the pentylenetetrazol-induced convulsions (Figure 1B). At the same time the number of seizures was diminished by 26%, without changing the motor coordination, the core temperature and the plus-maze performance (p > 0,05). The dopaminergic activity evaluated by the climbing behavior and catalepsy were not altered by the EE pretreatment. Neither the animals' behavior in the rota-rod and in the elevated-plus-maze tests nor their body temperature were changed by the EE treatment.

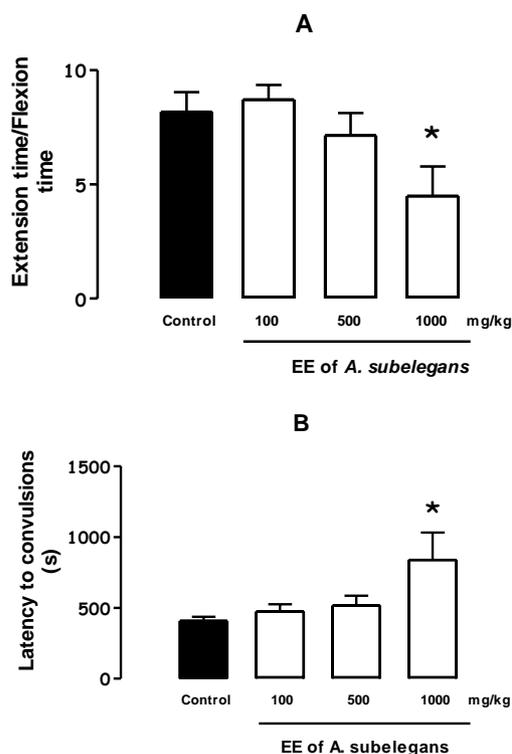


Figure 1. Effects of acute oral administration with the ethanolic (EE) extract of stem barks of *Acosmium subelegans* (Mohlenbr) Yakovl: A) on the extension time/flexion time ratio of the transcorneal maximal electroshock-induced convulsions (50 mA,

60 Hz, 0.2 s); B) on the latency to the first convulsive seizure induced by pentylenetetrazol (80 mg/kg, s.c.) in mice. Columns represent the mean and vertical bars the s.e.m. of a minimum of 8 animals per treatment. ** = p < 0.01 (one way ANOVA followed by Dunnet's test).

Conclusion

Our results confirm and extend that EE of *Acosmium subelegans* produce a CNS depressant effect and an anticonvulsant activity in mice. The role of lupeol in these effects is presently under investigation as well as the underlying mechanism of this central depressant action.

Material and Methods

The plant was supplied by Dr Elson Alves Costa from Universidade Federal de Goiás, Brazil. A voucher specimen is deposited at that University. The ethanolic extract (EE) of stem barks were obtained by exhaustive ethanolic extraction in Soxhlet (48 h), vacuum-concentrated, freeze-dried and re-suspended in tap water. Female Swiss adult mice (30-35 g), kept under controlled dark/light cycle (lights on at 07:00 a.m.) and temperature (22-24 °C), were intra-gastrically treated with EE of *A. subelegans* (0,1, 0,5 e 1,0 g/kg) or tap water (control). One hour later, the animals were submitted to the various behavioral tests as previously described⁶: rota-rod apparatus for 1 min, elevated plus-maze test for 5 min, automated locomotor cages for 1 h, pentobarbital-induced sleep (50 mg/kg, i.p.), apomorphine- induced stereotyped or climbing behavior (10 mg/kg, i.p.), catalepsy and pentylenetetrazol (80 mg/kg, s.c.) and maximal electroshock-induced convulsions (50 mA, 0.2 s, 60 Hz), besides registering their rectal temperature with a digital thermometer.

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