Essential oil from *Ruta graveolens* L. and reversal scopolamine-impairment in social memory in mice

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Introduction: *Ruta graveolens* L. (Rue) has been used to treatment of many disease like aches and pains, rheumatism and dermatitis (Conway, J Ethnopharmacol; v.1, p.241–61, 1979. Miguel, Econ Bot; v.57, p.231–44, 2003). This plant have more than 120 compounds which those alcaloids, essential oil, flavonoids among others (Kuzovkina, Phytochemistry; v.65, p.1095–100, 2004). The aim of this study was to verify if the acute and oral administration of *Ruta graveolens* modulates social short-term memory in male mice.

Experimental part: The dry plant was hydro-distilled in a clevenger apparatus and a chromatographic analysis of the oil was performed. The mice were divided randomly into five groups (10 mice per group): the Control group (C) received only vehicle orally (canola oil) and saline (0.9%, i.p), Scopolamine group (S) received vehicle orally and scopolamine (3mg/kg, i.p), first experimental group (EI) received 100mg/kg of Rue oil plus scopolamine; second experimental group (EII) 200mg/kg of Rue oil plus scopolamine and the last group (EIII) received 100mg/kg of Rue oil and saline. The Recognition Social task was used to verify the social short-term memory of mice. This paradigm consist in two following presentations of the animal in test to another unknown and the time spent by the test animal to investigate the different one is registered.

Results/Discussion: The extraction rendiment was 0.8% of essential oil. The chromatographic analysis shows three majority compounds: 2-Nonanone (37.91%), 2-Undecacnone (34.71%), oleic acid (21.83%). The S group showed a significant deficit of memory since no difference was observed in time to investigate the different mice in first to second presentation. On the one hand, the treatment of rue at doses of 100 and 200mg/kg reverses the impairment caused by scopolamine since a significant difference was seen in time of investigation, the first compared to second presentation. In the other hand, in the E III group, no facilitatory effect was shown on short-term memory since no significant deference was found when compared first and second presentation (Figure 1).

Conclusion: The essential oil of rue at acute doses of 100 and 200mg/kg in social recognition task were able to prevent the impairment caused by scopolamine but not facilitated the not impaired short-term memory in mice.

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Figure 1: Effects of *Ruta graveolens* L. treatment on scopolamine-induced memory impairment on social recognition task, short-term memory. Control: pre-treatment with canola oil orally and saline (0.9 g%, i.p); Scopolamine: pre-treatment canola oil orally and scopolamine (3 mg/kg, i.p); EI: pre-treatment with *R. graveolens* L. (100 mg/kg, p.o) and scopolamine (3 mg/kg, i.p.); EII: pre-treatment with *R. graveolens* L. (200 mg/kg, p.o) plus scopolamine (3 mg/kg, i.p.) EIII: pre-treatment with *R. graveolens* L. (100 mg/kg, p.o) and saline (0.9 g%, i.p). Results are presented as media ± S.D of time spent in social investigation, in seconds (n=10 mice per group). *P < 0.05, differences between time of investigation of juvenile in the training and test session, Newman-Keuls test.