SYSTEMIC ADMINISTRATION OF Δ^9-THC PRODUCES DEFICITS IN SPATIAL MEMORY IN RATS

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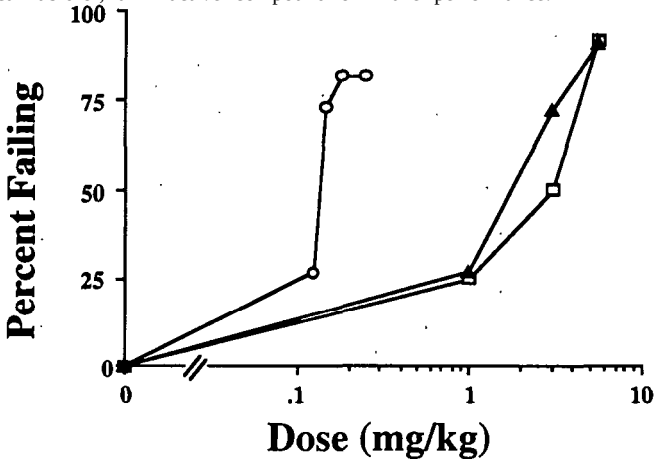
The purpose of this study was to examine the effect of cannabinoids on working memory as assessed in the eight arm radial maze. Twelve Sprague-Dawley rats were trained to obtain a food reinforcement in each arm of an eight arm radial maze with a maximum of 1 error (defined as revisiting an arm). Subjects committing more than 1 error or failing to visit all 8 arms during the 10 min test were scored as failing the task. We evaluated the effects of Δ^9-THC, CP-55,940, WIN-55.212-2, anandamide, the putative endogenous ligand, and cannabidiol, an inactive compound on maze performance.



The effects of Δ^9-THC (□), CP-55.940 (○), and WIN-55,212-2 (▲), on spatial memory as assessed in the eight arm radial maze. ED_{50} values for each respective drug were 2.1 mg/kg, 0.15 mg/kg, and 1.7 mg/kg.

The percent of subjects failing to reach criteria in the eight arm radial maze task increased in a dose-related manner after treatment with Δ^9-THC, CP-55,940, or WIN-55.212-2. Although the highest dose of each drug significantly increased the amount of time requited to complete the maze, doses corresponding to the ED_{50} values, failed to significantly increase completion time. In contrast, neither cannabidiol nor anandamide (10mg/kg or 30 mg/kg, for both) had any appearent impact on spatial memory. The apparent failure of anandamide to disrupt maze performance may be due to either its rapid metabolism or its inability to pass the blood-brain-barrier. These findings taken together are consistant with the notion that cannabinoids disrupt working memory through a cannabinoid receptor.

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