Aromatic Bromination Abolishes Deficits in Visuospatial Learning Induced by MDMA ("Ecstasy") in Rats While Preserving the Ability to Increase LTP in the Prefrontal Cortex

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Abstract
It has recently been demonstrated that aromatic bromination at C(2) abolishes all typical psychomotor, and some key prosocial effects of the entactogen MDMA in rats. Nevertheless, the influence of aromatic bromination on MDMA-like effects on higher cognitive functions remains unexplored. In the present work, the effects of MDMA and its brominated analog 2Br-4,5-MDMA (1 mg/kg and 10 mg/kg i.p. each) on visuospatial learning, using a radial, octagonal Olton maze (4 × 4) which may discriminate between short-term and long-term memory, were compared with their influence on in vivo long-term potentiation (LTP) in the prefrontal cortex in rats. The results obtained indicate that MDMA diminishes both short- and long-term visuospatial memory but increases LTP. In contrast, 2Br-4,5-MDMA preserves long-term visuospatial memory and slightly accelerates the occurrence of short-term memory compared to controls, but increases LTP, like MDMA. Taken together, these data are consistent with the notion that the modulatory effects induced by the aromatic bromination of the MDMA template, which abolishes typical entactogenic-like responses, might be extended to those effects affecting higher cognitive functions, such as visuospatial learning. This effect seems not to be associated with the increase of LTP in the prefrontal cortex.

Author keywords
2-Br-4,5-MDMA; long-term potentiation; MDMA (3,4-methylenedioxymethamphetamine); prefrontal cortex; visuospatial learning