Developments in harmine pharmacology - implications for ayahuasca use and drug-dependence treatment.

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Published in *Progress in Neuro-Psychopharmacology and Biological Psychiatry.*
Volume 39, Issue 2, 3 December 2012, Pages 263-272

Abstract

Ayahuasca is a hallucinogenic botanical mixture originating in the Amazon area where it is used ritually, but is now being taken globally. The 2 main constituents of ayahuasca are N,N-dimethyltryptamine (DMT), an hallucinogen, and harmine, a monoamine oxidase inhibitor (MAOI) which attenuates the breakdown of DMT, which would otherwise be broken down very quickly after oral consumption. Recent developments in ayahuasca use include the sale of these compounds on the internet and the substitution of related botanical (anahuasca) or synthetic (pharmahuasca) compounds to achieve the same desired hallucinogenic effects. One intriguing result of ayahuasca use appears to be improved mental health and a reduction in recidivism to alternate (alcohol, cocaine) drug use. In this review we discuss the pharmacology of ayahuasca, with a focus on harmine, and suggest pharmacological mechanisms for the putative reduction in recidivism to alcohol and cocaine misuse. These pharmacological mechanisms include MAOI, effects at 5-HT(2A) and imidazoline receptors and inhibition of dual-specificity tyrosine-phosphorylation regulated kinase 1A (DYRK1A) and the dopamine transporter. We also speculate on the therapeutic potential of harmine in other CNS conditions.

PMID: 22691716 [PubMed - as supplied by publisher]