

Detection of linalool and 2-phenethyl alcohol in mouse brain after intraperitoneal administration of lavender and rose essential oils

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Lavender and rose essential oils, mixtures of plant-derived volatile organic chemicals (VOCs) obtained from the flowers, produce behavioral effects such as antianxiety-like effects in mice in the conflict tests after intraperitoneal administration. Linalool and 2-phenethyl alcohol are the major constituents of lavender and rose essential oils, respectively. Given that linalool and 2-phenethyl alcohol also produce antianxiety-like effects in the conflict tests after intraperitoneal administration, it is suggested that linalool and 2-phenethyl alcohol enter the mouse brain after intraperitoneal administration of the essential oils to produce the behavioral effects. We developed a simultaneous blood and brain microdialysis method in a free-moving mouse, and examined whether linalool and 2-phenethyl alcohol appear in the mouse brain after intraperitoneal administration of the essential oils using the microdialysis method coupled with GC/MS analysis. The solid phase micro extraction method was used to extract VOCs from the dialysate samples. Results of an intravenous injection of lucifer yellow showed that the blood brain barrier was functioning in the mice under the experimental conditions. Linalool was detected in both blood dialysate and brain dialysate samples after the administration of the lavender essential oils. 2-Phenethyl alcohol was also detected in both blood and brain samples after administration of the rose essential oil. Peak area-time profiles for linalool and 2-phenethyl alcohol were obtained. The results support the notion that linalool and 2-phenethyl alcohol enter the brain after the intraperitoneal administration of the lavender and rose essential oils.