

Could rosemary scent boost brain performance?

February 24 2012

Hailed since ancient times for its medicinal properties, we still have a lot to learn about the effects of rosemary. Now researchers writing in *Therapeutic Advances in Psychopharmacology*, published by SAGE, have shown for the first time that blood levels of a rosemary oil component correlate with improved cognitive performance.

Rosemary (*Rosmarinus officinalis*) is one of many traditional medicinal plants that yield [essential oils](#). But exactly how such plants affect [human behaviour](#) is still unclear. Mark Moss and Lorraine Oliver, working at the Brain, Performance and Nutrition Research Centre at Northumbria University, UK designed an experiment to investigate the [pharmacology](#) of 1,8-cineole (1,3,3-trimethyl-2-oxabicyclo[2,2,2]octane), one of rosemary's main [chemical components](#).

The investigators tested [cognitive performance](#) and mood in a cohort of 20 subjects, who were exposed to varying levels of the rosemary aroma. Using [blood samples](#) to detect the amount of 1,8-cineole participants had absorbed, the researchers applied speed and accuracy tests, and mood assessments, to judge the rosemary oil's affects.

Results indicate for the first time in human subjects that concentration of 1,8-cineole in the blood is related to an individual's cognitive performance – with higher concentrations resulting in improved performance. Both speed and accuracy were improved, suggesting that the relationship is not describing a speed–accuracy trade off.

Meanwhile, although less pronounced, the chemical also had an effect on mood. However, this was a negative correlation between changes in contentment levels and blood levels of 1,8-cineole, which is particularly interesting because it suggests that compounds given off by the rosemary essential oil affect subjective state and cognitive performance through different neurochemical pathways. The oil did not appear to improve attention or alertness, however.

Terpenes like 1,8-cineole can enter the blood stream via the nasal or lung mucosa. As small, fat-soluble organic molecules, terpenes can easily cross the blood–brain barrier. Volatile 1,8-cineole is found in many aromatic plants, including eucalyptus, bay, wormwood and sage in addition to rosemary, and has already been the subject of a number of studies, including research that suggests it inhibits acetylcholinesterase (AChE) and butyrylcholinesterase enzymes, important in brain and central nervous system neurochemistry: rosemary components may prevent the breakdown of the neurotransmitter acetylcholine.

"Only contentedness possessed a significant relationship with 1,8-cineole levels, and interestingly to some of the cognitive performance outcomes, leading to the intriguing proposal that positive mood can improve performance whereas aroused mood cannot," said Moss.

Typically comprising 35-45% by volume of rosemary essential oil, 1,8-cineole may possess direct pharmacological properties. However, it is also possible that detected [blood levels](#) simply serve as a marker for relative levels of other active compounds present in rosemary oil, such as rosmarinic acid and ursolic acid, which are present at much lower concentrations.

More information: Plasma 1,8-cineole correlates with cognitive performance following exposure to rosemary essential oil aroma by Mark Moss and Lorraine Oliver is published today, 24th February in

Therapeutic Advances in Psychopharmacology.

Provided by SAGE Publications

Citation: Could rosemary scent boost brain performance? (2012, February 24) retrieved 26 April 2024 from <https://medicalxpress.com/news/2012-02-rosemary-scent-boost-brain.html>

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