

Effect of Sweet Orange Aroma on Experimental Anxiety in Humans

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Abstract

Objectives: The objective of this study was to evaluate the potential anxiolytic effect of sweet orange (*Citrus sinensis*) aroma in healthy volunteers submitted to an anxiogenic situation.

Design: Forty (40) male volunteers were allocated to five different groups for the inhalation of sweet orange essential oil (test aroma: 2.5, 5, or 10 drops), tea tree essential oil (control aroma: 2.5 drops), or water (non-aromatic control: 2.5 drops). Immediately after inhalation, each volunteer was submitted to a model of anxiety, the video-monitored version of the Stroop Color-Word Test (SCWT).

Outcome measures: Psychologic parameters (state-anxiety, subjective tension, tranquilization, and sedation) and physiologic parameters (heart rate and *gastrocnemius* electromyogram) were evaluated before the inhalation period and before, during, and after the SCWT.

Results: Unlike the control groups, the individuals exposed to the test aroma (2.5 and 10 drops) presented a lack of significant alterations ($p > 0.05$) in state-anxiety, subjective tension and tranquillity levels throughout the anxiogenic situation, revealing an anxiolytic activity of sweet orange essential oil. Physiologic alterations along the test were not prevented in any treatment group, as has previously been observed for diazepam.

Conclusions: Although more studies are needed to find out the clinical relevance of aromatherapy for anxiety disorders, the present results indicate an acute anxiolytic activity of sweet orange aroma, giving some scientific support to its use as a tranquilizer by aromatherapists.

Introduction

ANXIETY DISORDERS are the most prevalent class of psychiatric disorders in the general population.¹ However, their treatment is still challenging, as the drugs used for the relief of anxiety symptoms can have important side-effects, promote therapeutic dependence, or present a delay in their onset of action.² Furthermore, not all patients benefit from the available treatments, and only a few of them have a response near complete recovery.³

These facts justify the growing search for alternative or complementary procedures for the relief of anxiety symptoms. Among these procedures, one can find aromatherapy, which is the use of essential oils as an alternative treatment for medical purposes.⁴

According to Charlesworth,⁵ about 60% of health complaints in the medical office are stress-related, and aromatherapy could be a great alternative to conventional medication since it has shown positive emotional effects. On

the other hand, this therapy still does not have much scientific support.^{6,7}

Double-blind, randomized, placebo-controlled clinical trials performed to evaluate the effect of essential oils on anxiety symptoms are gradually starting to appear in the literature (for a systematic review, see Cooke and Ernst⁸). However, in most of these studies, exposure to the essential oil odor was accompanied by massage. This makes it difficult to draw firm conclusions about the essential oil effect, as the massage *per se* is able to reduce anxiety scores.⁸ However, in a recent study performed with rats, animals submitted to two different experimental models of anxiety, after being exposed to *Citrus sinensis* aroma, showed less anxiety than animals exposed to air only.⁹ This result could not be attributed to massage, previous experience with the aroma, therapeutic relationship, or even to an unspecific effect of any aroma, as animals exposed to *Melaleuca alternifolia* essential oil did not behave differently from control animals. Thus, the probability of *C. sinensis* essential oil having a

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