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[J Appl Toxicol](#), 31 (7), 633-9 Oct 2011

## In Vivo Genotoxicity Assessment of Nerolidol

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### Abstract

Nerolidol is a sesquiterpenoid component of essential oil used as a flavor and aroma enhancer. It has also been studied as a topical skin penetration enhancer, and has inhibitory activities against *S. aureus* and *E. coli*, among other activities. The objective of this study was to evaluate the ability of a single nerolidol treatment to induce DNA damage in peripheral blood and liver cells of mice and micronuclei in polychromatic erythrocytes of bone marrow cells of the same animals. In the dose range-finding assays, the maximum tolerated dose was higher than 2000 mg kg<sup>(-1)</sup>. The doses used in the experiments were 250, 500 and 2000 mg kg<sup>(-1)</sup>, administered by gavage in a single dose. Peripheral blood cells were collected 4

of the treatments and liver cells 24 h after. At least 100 nucleoids per cell type/animal were analyzed to determine the DNA damage scores and 2000 PCEs per animal for micronuclei in peripheral blood. A positive control was N-nitroso-N-ethylurea 50 mg kg<sup>(-1)</sup>. Cytotoxicity was assessed by scoring consecutive total polychromatic (PCE) and normochromatic (NCE) erythrocytes (PCE:NCE ratio).

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Feedback

showed that nerolidol induced weak levels of dose-related DNA damage in both types of cells analyzed, and enhanced the average number of micronucleated cells in the two high doses tested. The PCE:NCE ratio showed no cytotoxicity for the three doses of the compound. The data obtained support the view that nerolidol induces clastogenicity and very weak genotoxicity in the mouse cells tested.

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## [Genotoxicity Assessment of the Antimalarial Compound Artesunate in Somatic Cells of Mice](#)

I Aquino et al. *Food Chem Toxicol* 49 (6), 1335-9. Jun 2011. PMID 21419820.

Artesunate is a derivate of artemisinin that is both an antimalarial agent and acts cytotoxically on tumor cells. Despite its therapeutic use, its in vivo genotoxic poten ...

## [Genotoxicity Assessment of Garcinia Achachairu Rusby \(Clusiaceae\) Extract in Mammalian Cells in Vivo](#)

Ede S Marques et al. *J Ethnopharmacol* 142 (2), 362-6. 2012. PMID 22609977.

The results showed that GAE did not induce significant DNA damage in leukocytes (4 h and 24 h samples), liver, bone marrow and testicular cells (24 h samples). GAE also d ...

## [Genotoxic Effects of \(-\)-Cubebin in Somatic Cells of Mice](#)

EL Maistro et al. *J Appl Toxicol* 31 (2), 185-9. Mar 2011. PMID 21351285.

(-)-Cubebin belongs to the dibenzylbutyrolactone lignan group, which is widely distributed in the plant kingdom. Because this compound shows interesting biological activi ...

## [Toxicology and Carcinogenesis Studies of Androstenedione \(CAS No. 63-05-8\) in F344/N Rats and B6C3F1 Mice \(Gavage Studies\)](#)

Natl Toxicol Program Tech Rep Ser (560), 1, 7-31,33-171 passim. Sep 2010. PMID 21037592. - *Review*

under the conditions of these 2-year gavage studies, there was equivocal evidence of carcinogenic activity of androstenedione in male F344/N rats based on increased incid ...

## [In Vivo Rodent Erythrocyte Micronucleus Assay](#)

M Hayashi et al. *Mutat Res* 312 (3), 293-304. Jun 1994. PMID 7514741. - *Review*

The following summary represents a consensus of the working group except where noted. The items discussed are listed in the order in which they appear in the OECD guideli ...

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[Evaluation of Mutagenic and Antimicrobial Properties of Brown Propolis Essential Oil From the Brazilian Cerrado Biome](#)

FH Fernandes et al. *Toxicol Rep* 2, 1482-1488. 2015. PMID 28962491.

Biological, and particularly antimicrobial, activities have been demonstrated for the essential oil of propolis samples worldwide, yet their mutagenic effects remain unkno ...

## Nerolidol: A Sesquiterpene Alcohol With Multi-Faceted Pharmacological and Biological Activities

WK Chan et al. *Molecules* 21 (5). 2016. PMID 27136520. - *Review*

Nerolidol (3,7,11-trimethyl-1,6,10-dodecatrien-3-ol) is a naturally occurring sesquiterpene alcohol that is present in various plants with a floral odor. It is synthesize ...

## Antioxidant Effects of Nerolidol in Mice Hippocampus After Open Field Test

JD Nogueira Neto et al. *Neurochem Res* 38 (9), 1861-70. Sep 2013. PMID 23765368.

The aim of this study was to evaluate the neuroprotective effects of nerolidol in mice hippocampus against oxidative stress in neuronal cells compared to ascorbic acid (p ...

## Publication types

Research Support, Non-U.S. Gov't

## MeSH terms

Animals

Bone Marrow Cells / drug effects

Comet Assay

DNA Damage / drug effects

Dose-Response Relationship, Drug

Drug Evaluation, Preclinical

Erythrocytes / drug effects

Hepatocytes / cytology

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## Substances

Mutagens

Oils, Volatile

Sesquiterpenes  
nerolidol

## LinkOut - more resources

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Search result 11 of [24](#) for **(((t)-nerolidol) OR (trans-nerolidol)) OR (nerolidol) AND ((cytochrome) OR (liver))**

### Previous result

[Nerolidol effects on mitochondrial and cellular energetics.](#)

Ferreira FM, et al. *Toxicol In Vitro* 2012.

Samples of enriched natural extracts of **nerolidol** (a racemic mixture of cis and trans isomers) were tested on rat **liver** mitochondria and a decrease in phosphorylative system was observed but not in the mitochondrial respiratory chain activity, which reflects a direct effect on F1-ATPase. ...Our results also show that, in human hepatocellular **liver** carcinoma cell line (HepG2), **nerolidol** both induces cell death and arrests cell growth, probably related with the observed lower bioenergetic efficiency....

### Next result

[Hepatoprotection of sesquiterpenoids: a quantitative structure-activity relationship \(QSAR\) approach](#)

Vinholes J, et al. *Food Chem* 2014.

Endogenous lipid peroxidation (assay A) and induced lipid peroxidation (assay B) were evaluated in **liver** homogenates from Wistar rats by the thiobarbituric acid reactive species test. Sesquiterpenoids with different chemical structures were tested: trans,trans-farnesol, cis-**nerolidol**, (-)- $\alpha$ -bisabolol, trans- $\beta$ -farnesene, germacrene D,  $\alpha$ -humulene,  $\beta$ -caryophyllene, isocaryophyllene, (+)-valencene, guaiazulene, (-)- $\alpha$ -cedrene, (+)-aromadendrene, (-)- $\alpha$ -neoclovene, (-)- $\alpha$ -copaene, and (+)-cyclosativene. ...

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