Peppermint oil

Botanical Source Mentha piperita

Synonyms

IUPAC Name

CAS Reference 8006-90-4

E Number

Food Legislation

Council of Europe (CoE)	
Number	Comment
282	Listed by the Council of Europe as acceptable for use in food.

US Food and Drug Administration	
Number	Comment
182.20	Approved by the US FDA. FDA 21 CFR 182.20

Joint FAO/WHO Expert Committee on Food Additives (JECFA)		
Number	ADI	Comment
-	-	-

FEMA	
FEMA No.	Comment
2848	Generally recognised as safe as a flavour ingredient:GRAS List Number 3

Natural Occurrence and Use in Food
Found in peppermint; used in chewing gum, meat products, ice cream,

Estimated Intake from Food and Drink	
Daily Intake mg/kg/day	FEMA Possible Average Daily Intake mg
1.1751	35.772

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Tobacco Product Related Chemical and Biological Studies for Ingredients Added in a Mixture

Smoke Chemistry		
Published Source	Level Tested %	Comment
BAT	0.01800	At maximum application level this ingredient is not associated with significant increases in levels of Hoffmann analytes in smoke.
Philip Morris	0.00390	An overall assessment of the data suggests that this ingredient did not add to the toxicity of smoke.

Ames Activity		
Published Source	Level Tested %	Comment
BAT	0.01800	Within the sensitivity and specificity of the system the Ames activity of the cigarette smoke condensate was not increased by the addition of the ingredient.
Philip Morris	0.00390	Within the sensitivity and specificity of the system the Ames activity of the cigarette smoke was not increased by the addition of the ingredient.

Micronucleus		
Published Source	Level Tested %	Comment
BAT	0.01800	Within the sensitivity of the in vitro micronucleus assay the activity of the cigarette smoke condensate was not increased by the addition of the ingredient.

Neutral Red		
Published Source	Level Tested %	Comment
BAT	0.01800	Within the sensitivity of the test system the in vitro cytotoxicity of the cigarette smoke condensate was not increased by the addition of the ingredient.
Philip Morris	0.00390	Within the sensitivity of the test system the in vitro cytotoxicity of the cigarette smoke was not increased by the addition of the ingredient.

Inhalation		
Published Source	Level Tested %	Comment
BAT	0.01800	The results indicate that the addition of the ingredient had no discernible effect on the inhalation toxicity of mainstream smoke.
Philip Morris	0.00390	The data indicate that the addition of the ingredient, when added with one of three groups, did not increase the inhalation toxicity of the smoke.

Mouse Skin Painting		
Published Source	Level Tested %	Comment

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Tobacco Product Related Chemical and Biological Studies for Ingredients Tested Singly

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Toxicological Data on the Unburnt Ingredient

[+ve, positive; -ve, negative; ?, equivocal; with, with metabolic activation; without, without metabolic activation]

In vivo

Species	Test conditions	Endpoint	Results	Reference
Drosophila melanogaster (Assays in fruit flies can also be classed *as in vitro*)	Peppermint oil extracted from peppermint (*Mentha x piperita L.*) herb. The oil contained 59.17% menthol and 18.78% menthone amongst other ingredients. Fed to larvae at concentrations of 0.1-1.5% for about 48 hr. Adults examined for wing spots.	Somatic mutation and recombination	Weak +ve	Lazutka et al. 2001

In vitro

Test system	Test conditions	Endpoint	Activation status	Results	Reference
Salmonella typhimurium strains TA98, TA100, TA1535 and TA1537	Peppermint oil containing 38.1% menthol, 33.7% menthone, 1.7% pulegone. The remaining	Mutation	With and without S9	-ve The low concentration tested would have limited sensitivity	Andersen & Jensen, 1984

	components were not identified. Tested at up to 160 ug/plate. Higher concentrations were said to be toxic.				
Salmonella typhimurium strains TA98 and TA102	Extract from the peppermint plant, *Mentha piperita* L. was tested at 10 mg.	Mutation	Without	+ve in TA102	Mahmoud et al. 1992
Salmonella typhimurium strains TA98 and TA100	Paper in Japanese. Searches of Toxline indicate that peppermint oil was one of the chemicals tested.	Mutation	With and without	-ve [All of the tested agents gave –ve results.]	Haresaku et al. 1985
Salmonella typhimurium, strains TA98, TA1535, TA1537 and TA1538	Peppermint I and II essential oils. Cells treated with concentrations of 5 and 10 picolitres/plate.	Mutation	Without	Peppermint I oil apparently gave a weakly +ve result in TA98 and TA1538 and peppermint II was apparently +ve in TA1537. However, the study is unreliable as these positive	Sivaswamy et al. 1991

				results were reported at minuscule levels (pico-litres/plate) and spontaneous mutation rate was around 100-fold higher than normal	
Bacillus subtilis	Peppermint oil. Tested at 5 ul/disc	DNA repair	?	+ve	Anon, 1985
Bacillus subtilis	Peppermint oil. Tested in a rec assay. No details on the test conditions were given in the expert review.	DNA repair	With and without S9	+ve without S9 activation	Kuroda et al. 1989
Chinese hamster lung cells	Peppermint oil. Cells treated with concentrations of up to 0.25 mg/ml for 24 hr and examined for chromosomal aberrations.	Chromosome damage	Without	Equivocal 7% of cells had structural aberrations.	Ishidate et al. 1984
Chinese hamster lung cells	Peppermint oil. Cells treated and examined for chromosomal aberrations. No details on	Chromosome damage	Without	-ve	Ishidate et al. 1988

	the test conditions were given in the expert review.				
Mouse lymphoma cells (L5178Y $TK^{+/-}$)	Peppermint oil. Cells treated with concentration of 150 ug/ml. No further details on the test conditions were given in the expert review.	Mutation	Without	-ve	Heck et al. 1989
Rat liver cells	Peppermint oil. Cells treated with concentrations of 155 ug and assessed for unscheduled DNA synthesis. No further details on the test conditions were given in the expert review.	DNA damage	Not applicable	-ve	Heck et al. 1989
Human lymphocytes	Peppermint oil extracted from peppermint (*Mentha x piperita L.)* herb. The oil contained 59.17% menthol and 18.78% menthone amongst other	Chromosome damage and chromosome effects	Without	+ve for chromosome damage equivocal for SCEs	Lazutka et al. 2001

	ingredients. Cells treated with concentrations of 0.1, 0.15, 0.2, 0.25 or 0.3 ul/ml for 24 hr and assessed for chromosome aberrations and sister chromatid exchanges (SCEs).				

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