Spearmint oil

Botanical Source Mentha spicata

Synonyms

IUPAC Name

CAS Reference 8008-79-5
84696-51-5

E Number

Food Legislation

Council of Europe (CoE)	
Number	Comment
285	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
3032	Generally recognised as safe as a flavour ingredient:GRAS List Number 3

Natural Occurrence and Use in Food
Found in spearmint; used in chewing gum, ice cream, candy, baked goods.

Estimated Intake from Food and Drink	
Daily Intake mg/kg/day	FEMA Possible Average Daily Intake mg
0.3997	227.612

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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	0.08000	At maximum application level this ingredient is not associated with significant increases in levels of Hoffmann analytes in smoke.

Ames Activity		
Published Source	Level Tested %	Comment
BAT	0.08000	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.

Micronucleus		
Published Source	Level Tested %	Comment
BAT	0.08000	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	0.08000	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.

Inhalation		
Published Source	Level Tested %	Comment
BAT	0.08000	The results indicate that the addition of the ingredient had no discernible effect on the inhalation toxicity of mainstream smoke.
Lorillard	0.00007	The results indicate that the addition of the ingredient had no discernible effect on the inhalation toxicity of mainstream smoke.

Mouse Skin Painting		
Published Source	Level Tested %	Comment
Lorillard	0.00019	None of the changes appeared to be substantial enough to conclude that the tumour promotion capacity of the condensate was discernibly different between condensate produced from cigarettes with the ingredient in comparison with condensate from cigarettes without the ingredient.

References

Baker RR, Pereira da Silva JR, Smith G. The effect of tobacco ingredients on smoke chemistry. Part I: Flavourings and additives. Food Chem Toxicol. 2004; 42 Suppl:S3-37.

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Gaworski CL, Dozier MM, Heck JD, Gerhart JM, Rajendran N, David RM. Brennecke LH, Morrissey R. Toxicologic evaluation of flavor ingredients added to cigarette tobacco: 13 week inhalation exposures in rats. Inhal. Toxicol. 1998; 10:357-381

Gaworski CL, Heck JD, Bennett MB, Wenk ML. Toxicologic evaluation of flavor ingredients added to cigarette tobacco: skin painting bioassay of cigarette smoke condensate in SENCAR mice. Toxicology. 1999; 139(1-2):1-17.

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Tobacco Product Related Chemical and Biological Studies for Ingredients Tested Singly

References
Baker RR, Bishop LJ. The pyrolysis of non-volatile tobacco ingredients using a system that simulates cigarette combustion conditions. J. Anal. Appl. Pyrolysis 2005, 74, 145-170.

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Toxicological Data on the Unburnt Ingredient

In vivo

Species	Test conditions	Endpoint	Results	Reference
Mouse, 6 males per group	Bone marrow micronucleus test. Single intraperitoneal dose of up to 800 mg/kg bw or four intraperitoneal doses of 400 mg/kg bw, one every 24 hr. The animals were killed 24 hr after the final dose. There was no clear evidence of toxicity.	Chromosome damage	-ve	Hayashi et al. 1988
Drosophila melanogaster	Mutation and recombination test. 18 hr exposure to *Mentha spitica* essential oil. (Oil placed on filter paper in centre of Petri dish.)	Mutation; Recombination	Mutation +ve Recombination -ve	Franzios et al. 1997

In vitro

Test system	Test conditions	Endpoint	Activation status	Results	Reference
Chinese hamster lung (CHL) cells	Chromosome aberration test. Continuous treatment with up to 0.3 mg/ml of "mint oil" or pulse treatment with up to 0.5 mg/ml. Cells harvested 24 and 48 hr later. [No further details in English table].	Chromosome damage	Continuous treatment: without S9. Pulse treatment: with and without S9	-ve	Sofuni, 1994

Chinese hamster ovary (CHO) cells	Chromosome aberration test. Cells treated with up to 0.125 mg/ml and harvested 24 hr later.	Chromosome damage	Without S9	-ve [Limited assay: only tested without S9]	Ishidate et al. 1984
Salmonella typhimurium strains TA98, TA100, TA1535, TA1537, TA1538	Ames test with "mint oil" at up to 0.1 ul/plate.	Mutation	With and without S9	-ve	Sofuni, 1994
Salmonella typhimurium strains TA98, TA100	Ames test [with up to 1 mg/plate?]. [Paper in Japanese.]	Mutation	With and without S9	-ve [Limited assay: only tested in two strains]	Haresaku et al. 1985
Salmonella typhimurium strains TA98, TA1535, TA1537, TA1538	Ames test with 5 or 10 pl [*sic*] per plate of test substance. This was apparently prepared from spearmint fried in groundnut oil but is listed in the report as "spearmint essential oil".	Mutation	None	+ve [Unreliable study: background colony count very high; dose tested extremely low; only tested without S9.]	Sivaswamy et al. 1991
Bacillus subtilis strains M45, H17	Differential toxicity (rec) assay with 15 mg/disc of "mint oil".	DNA damage [indicative test]	N/A	+ve	Sofuni, 1994

Bacillus subtilis	rec assay with 10 mg/disc. [No further details in English.]	DNA damage [indicative test]	With and without S9	Without S9: weak +ve With S9: –ve	Anon, 1985

References

Anon. (1985). Tokishikoroji Foramu (Toxicology Forum) 8, 91-105 [in Japanese with English tables].

Franzios G et al. (1997). Insecticidal and genotoxic activities of mint essential oils. Journal of Agricultural and Food Chemistry 45, 2690.

Haresaku M et al. (1985). Mutagenicity study (Ames test) of toothpaste ingredients. J. Soc. Cosmet. Chem. Jpn. 19, 100-104 [in Japanese with English abstract].

Hayashi M et al. (1988). Micronucleus tests in mice on 39 food additives and eight miscellaneous chemicals. Food and Chemical Toxicology 26, 487-500.

Ishidate M et al. (1984). Primary mutagenicity screening of food additives currently used in Japan. Food and Chemical Toxicology 22, 623-636.

Sivaswamy S N et al. (1991). Mutagenic activity of South Indian food items. Indian Journal of Experimental Biology 29, 730-737.

Sofuni T (1994). Mutagenicity tests on food additives (Series 12). Collaborative study supported by the Ministry of Health and Welfare of Japan. Hen'igensei Shiken 3, 206-215 [in Japanese with English abstract and tables].