

Mandarin oil

Botanical Source Citrus reticulata Blanco.

Synonyms

IUPAC Name

CAS Reference 8008-31-9

E Number

Food Legislation

Council of Europe (CoE)	
Number	Comment
142	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
2657	-

Natural Occurrence and Use in Food
Found in tangerines, mandarin oranges; used in candy, frozen dairy products.

Estimated Intake From Food and Drink	
Daily Intake mg/kg/day	FEMA Possible Average Daily
0.01112	80.821

Tobacco Legislation

Tobacco				
Country	Cigarettes	RYO	Cigars	Pipe
Afghanistan				
Algeria				
Argentina				
Australia				
Bahrain				
Brazil				
Burundi				
Canada				
Comoros				
Djibouti				
EEC				
Egypt				
Eritrea				
EU TPD2				
Fiji				
France	Y	Y	Y	Y
GCC (Bahrain,				
Germany	Y	Y	Y	Y
Hong Kong				
Hungary	Y	Y	Y	Y
Iceland				
Iran				
Iraq				
Jordan				
Kazakhstan				
Kuwait				
Latvia				
Libya				
Macedonia				
Madagascar				

Mandarin oil

Malaysia				
Maldives				
Mexico				
Moldova				
Montenegro				
New Zealand				
Nigeria				
Norway				
Pakistan				
Palestine				
Papua New Guinea				
Rwanda				
Samoa				
Saudi Arabia				
Serbia				
Solomon Island				
Somalia				
Somaliland				
South Sudan				
Sri Lanka				
Sweden				
Switzerland	Y	Y	Y	Y
Syria				
Tunisia				
Turkey				
UK				
United Arab				
Uzbekistan				
Vietnam				

Y=Permitted for use in tobacco products. If use is limited, the maximum permitted level is given.

Tobacco Product related Chemical and Biological Studies

Smoke Chemistry		
Published Source	Level Tested %	Comment
Philip Morris	0.01320	An overall assessment of the data suggests that this ingredient did not add to the toxicity of smoke.
BAT	0.00470	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	0.00470	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	0.01320	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	0.00400	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	0.00470	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	0.01320	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	0.00470	The results indicate that the addition of the ingredient had no discernible effect on the inhalation toxicity of mainstream smoke
Philip Morris	0.01320	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

In vitro Studies

Species	Test Conditions	End Point	Results	Reference
<i>Salmonella typhimurium</i> , strains TA98 and TA100	Bacterial reverse mutation (Ames) assay in which mandarin oil was apparently tested	Mutation	-ve	Stacchini and Mangegazzini, 1987

In vivo Studies

Species	Test Conditions	End Point	Results	Reference
Human	Five volunteers received a 48-hour closed patch test with 8% mandarin oil (in petrolatum).	Skin irritation	No irritation	Ford et al, 1992
Rabbit	As part of an acute dermal study, animals [possibly 7] were treated, under 24-hour covered contact, with 100% mandarin oil (5000 mg/kg bw)	Skin irritation	Slight irritation (slight oedema and erythema).	Ford et al, 1992
Mouse, hairless; swine, miniature	As part of a phototoxicity study, three different samples of 100% mandarin oil were applied and left uncovered	Skin irritation	Two out of the three samples were 'irritating'.	Ford et al, 1992
Human	A maximization test with 8% mandarin oil (in petrolatum) on 25 subjects	Skin sensitization.	No sensitization reactions	Ford et al, 1992
Rat	Ten rats each received a single dose of 5000 mg/kg bw mandarin oil	Mortality	LD ₅₀ >5000 mg/kg bw. No deaths occurred	Ford et al, 1992
Rabbit	Seven rabbits received a single application of 5000 mg/kg bw mandarin oil	Mortality	LD ₅₀ >5000 mg/kg bw. No deaths occurred	Ford et al, 1992
Mouse, A/J	Groups of 3 females were given 0 or 30 mg/dose mandarin oil in cottonseed oil by oral gavage, on alternate days (3 doses), killed 24 hours after the final dose; the forestomach, liver and small intestinal	Effects on glutathione S-transferase (GST) activity in the liver, forestomach and small intestinal mucosa	GST activity increased no more than 2.5 times control level in each of the tissues examined	Lam and Zheng, 1991

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	mucosa were removed for enzyme preparation			

References

Ford, R.A., Api, A.M., Letizia, C.S., 1992
Fragrance raw materials monographs: Mandarin oil, expressed. *Fd Chem. Toxic.*, 30 (Suppl.), 69S-70S.

Lam, L.K.T. and Zheng, B., 1991
Effects of essential oils on glutathione S-transferase activity in mice. *J. Agric. Fd Chem.*, 39, 660-662.

Stacchini, A. and Mangegazzini, C., 1987
Aromatic plants used in foods: criteria for evaluating their safety. *Boll. chim.-farm.*, 126, 88-92.