

RAISIN

SYNONYMS

Raisin extract
Raisin juice concentrate
Oils, raisin

CHEMICAL STRUCTURE

Undefined (mixture of components)

CHEMICAL FORMULA

Undefined (mixture of components)

IDENTIFIER DETAILS

CAS Number	:	68915-86-6 [raisin juice concentrate]
CoE Number	:	
FEMA	:	
EINECS Number	:	
E Number	:	

CLP CLASSIFICATION

Ingredient CLP Classification: No

Endpoint	Classification	Category
Acute Oral Toxicity	-	-
Acute Dermal Toxicity	-	-
Acute Inhalation Toxicity	-	-
Skin Corrosive/Irritant	-	-
Eye Damage/Irritation	-	-
Respiratory Sensitisation	-	-
Skin Sensitisation	-	-
Mutagenicity/Genotoxicity	-	-
Carcinogenicity	-	-
Reproductive Toxicity	-	-
Specific Target Organ Toxicity	-	-
Aspiration Toxicity	-	-

SPECIFICATIONS

Melting Point: Undefined (mixture of components)

Boiling point: Undefined (mixture of components)

PURPOSE

Flavouring substance.

STATUS IN FOOD AND DRUG LAWS

CoE limits:

Beverages (mg/kg)	Food (mg/kg)	Exceptions (mg/kg)
-	-	-

Acceptable Daily Intake:

ADI (mg/kg)	ADI Set by	Date Set	Comments
-	-	-	

FDA Status:

Section Number	Comments
136.160	Raisin bread, rolls and buns

HUMAN EXPOSURE

Natural Occurrence: Raisins are a natural product made by drying grapes [botanical family *Vitaceae*]. The water content after drying is around 15% [source: website – <http://home.nycap.rr.com/useless/raisins/>].

TOXICITY DATA

No toxicity data was identified for raisins specifically, however, some data are available for raisin juice concentrate and/or extract [CAS No.: 68915-86-6].

Carmines *et al.*, (2002), Rustemeier *et al.*, (2002), Roemer *et al.*, (2002) and Vanscheeuwijck *et al.*, (2002) reported on a testing program designed to evaluate the potential effects of 333 ingredients added to typical commercial blended test cigarettes on selected biological and chemical endpoints. The studies performed included a bacterial mutagenicity screen [Ames assay] a mammalian cell cytotoxicity assay [neutral red uptake], determination of smoke chemical constituents and a 90-day rat inhalation study. Based on the findings of these studies, the authors concluded that the addition of the combined ingredients, including raisin juice concentrate at levels up to 47925 ppm, “did not increase the overall toxicity of cigarette smoke” [Carmines *et al.*, 2002].

***In Vivo* Toxicity Status**

Inhalation Toxicity

A recent study investigated the effect of cigarettes, containing various additives in three combinations, in a 90-day nose-only smoke inhalation study in rats. These ingredients included raisin juice concentrate at 47925 ppm, a level described as a multiple of its typical use in a US cigarette. The data from this study, along with that from a number of other biological and chemical studies indicate that the addition of the combined ingredients “did not increase the inhalation toxicity of the smoke, even at the exaggerated levels used” [Vanscheeuwijck *et al.*, 2002].

The addition of raisin extract at 11,400 ppm and raisin juice/concentrate at 600ppm to reference cigarettes, used in a 90 day-sub-chronic inhalation exposure in rats, led to a series of pathological changes to smoke exposure that were indistinguishable from those changes caused by the control cigarettes. This indicated that addition of raisin extract or raisin juice/concentrate to a reference cigarette had no discernable effect upon the type or severity of the treatment related pathological changes associated with tobacco smoke exposure [Baker *et al.*, 2004].

Other relevant studies

Cheng *et al.*, (2003) reported that nicotine [3-(1-methyl-2-pyrrolidinyl)-pyridine] is a major alkaloid in tobacco products. Many natural dietary products can suppress the DNA adduction, and hence act as inhibitors of cancer. In this study, we investigated the inhibitory effects of curcumin, garlic squeeze, grapeseed extract, tea polyphenols, vitamin C, and vitamin E on nicotine-DNA adduction in vivo using an ultra sensitive method of accelerator mass spectrometry (AMS). The results demonstrated that all the dietary constituents induced marked dose-dependent decrease in nicotine-DNA adducts as compared with the control. The reduction rate reached about 50% for all agents, except garlic squeeze (40%), even at its highest dose level. Amongst the six agents, grapeseed extract exhibited the strongest inhibition to the DNA adduct formation [Cheng *et al.*, 2003].

El-Ashmawy *et al.*, (2007) investigated the effects of grape seed extract on oral administration of ethanol, simultaneously, taken daily for 10 weeks. An analysis of epididymal spermatozoal, serum testosterone level, weight and histopathological examination of testis, liver and brain were conducted. Glutathione level and lipid peroxidation content as malondialdehyde in the testis, liver and brain were measured. The repeated intake of ethanol (10 ml/kg body weight, 25% v/v) was followed by fertility disturbances with low sperm count, impaired sperm motility and decrease in serum testosterone level. Moreover, ethanol toxicity induced significant alterations in the histological structures of the testis, liver and brain. The results revealed a significant increase in lipid peroxidation and decrease in the level of glutathione in the testis, liver and brain in the ethanol-treated group. However, co-administration of grape seed extract resulted in minimizing the hazard effects of ethanol toxicity on male fertility, liver and brain tissues. It may be concluded grape seed extract is a useful herbal remedy, especially for controlling oxidative damages.

Behavioural data

No data identified

***In Vitro* Toxicity Status**

Carcinogenicity and Mutagenicity

Additional information concerning the *in vitro* mutagenicity of this material may be found in “An Interim report on data originating from Imperial Tobacco Limited’s Genotoxicity testing programme September 2003” or “An updated report on data originating from Imperial Tobacco Limited’s external Genotoxicity testing programme – Round 2 August 2007”.

Roemer *et al.*, (2002) reported on a study in which cigarettes containing various additives in three different combinations were produced. Smoke condensates prepared from these cigarettes were then tested in two different *in vitro* assays. The mutagenicity of the smoke condensate was assayed in the *Salmonella* plate incorporation [Ames] assay with tester strains TA98, TA100, TA102, TA1535 and TA1537 in the presence and absence of an S9 metabolic activation system. The cytotoxicity of the gas/vapour phase and the particulate phase was determined in the neutral red uptake assay with mouse embryo BALB/c 3T3 cells. The authors concluded that the *in vitro* mutagenicity and cytotoxicity of the cigarette smoke was not increased by the addition of the ingredients which included raisin juice concentrate at levels up to 47925 ppm [a multiple of its typical use in a US cigarette] [Roemer *et al.*, 2000].

Baker *et al.*, [2004]; examined the effects of the addition of 482 tobacco ingredients upon the biological activity and chemistry of mainstream smoke. The ingredients, essentially different groups of flavourings and casings, were added in different combinations to reference cigarettes. The addition of raisin extract at 11,400 ppm or raisin juice/concentrate at 600ppm was determined not to have affected the mutagenicity of the total particulate matter (TPM) of the smoke in either the Ames, *in vitro* micronucleus assay or the neutral red assay when compared with that of the control cigarettes [Baker *et al.*, 2004].

The mutagenicity of the smoke condensate was assayed in the *Salmonella* plate incorporation [Ames] assay with the tester strain TA98 in the presence of an S9 metabolic activation system. The cytotoxicity of the cigarette condensate was determined in the neutral red uptake assay and the (3-(4,5-dimethylthiazol-2-yl)-5-(3-carboxymethoxyphenyl)-2-(4-sulfophenyl)-2H tetrazolium, inner salt assay (MTS assay) with the human hepatocellular liver carcinoma cell line, HEP-G2. It was concluded that the *in vitro* mutagenicity and cytotoxicity of the cigarette smoke was not increased by the addition of the ingredients, which included *raisin extract* at levels up to 76 ppm.

In vitro toxicity testing of tobacco ingredients in burnt form (Internal document R-34).

In a study conducted by Coggins et al.,(2011) a battery of tests was used to compare toxicity of mainstream smoke from these experimental cigarettes to matched control cigarettes without test ingredients. Smoke fractions from each cigarette type were evaluated using analytical chemistry; in vitro cytotoxicity (neutral red uptake) and in vitro bacterial (Salmonella) mutagenicity (five strains) testing. For 10 ingredients (β -cyclodextrin, cleargum, D-sorbitol, high fructose corn syrup, honey, invert sugar, maltodextrin, molasses, raisin juice concentrate, and sucrose), 90-day nose-only smoke inhalation studies using rats were also performed. In general, addition of each ingredient in experimental cigarettes resulted in minimal changes in smoke chemistry; the exceptions were D-sorbitol and sucrose, where reductions in amount of 60% to 80% of control values for some smoke constituents were noted. Additionally, each ingredient resulted in small increases in smoke formaldehyde concentrations. Except for a reduction in cytotoxicity by inclusion of maltodextrin and an increase by inclusion of plum juice concentrate, the cytotoxicity and mutagenicity results were unaffected by addition of the other ingredients in experimental cigarettes. There were also very few statistically significant differences within any of the 10 inhalation studies, and when present, the differences were largely sporadic and inconsistent between sexes. The carbohydrates and natural products tested here as ingredients in experimental cigarettes as a class increased formaldehyde, but resulted in minimal toxicological responses, even at high inclusion levels compared with the levels used in commercial cigarette products.

The bacterial reverse mutation test showed that a procyanidin-rich extract from grape skins and seeds (GSSE) was weakly mutagenic to the dose of 5 mg/plate and 19.5 and 9.7 μ g/ml of GSSE did not show significant differences in the frequency of aberrant metaphases in relation to negative controls. Our results indicated slight mutagenicity under the study conditions, so further studies should be conducted at lower doses to demonstrate that this extract is not toxic. [Lluís L, 2011]

SMOKE CHEMISTRY AND PYROLYSIS

A total of 95 ingredients were tested individually through addition at different concentrations to the tobacco of experimental cigarettes. Mainstream cigarette smoke chemistry analysis, bacterial mutagenicity testing, and cytotoxicity testing were conducted. The authors concluded that these ingredients, which included raisin produced minimal changes in the overall toxicity profile of mainstream cigarette smoke, and in some cases, the addition of high levels of an ingredient caused a small reduction in toxicity findings, probably due to displacement of burning tobacco [Gaworski et al., 2011].

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Website – <http://home.nycap.rr.com/useless/raisins/>