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INTERNATIONAL AGENCY FOR RESEARCH ON CANCER

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Volume 10

Some Naturally Occurring Substances

Summary of Data Reported and Evaluation

Actinomycins
Adriamycin
Azaserine
Cantharidin
Cholesterol
Coumarin
Cycasin
Cyclochlorotine
Daunomycin
Griseofulvin
Luteoskyrin
Mitomycin C
Native carrageenans
Parasorbic acid
Patulin
Penicillic acid
Reserpine
Safrole, isosafrole and dihydrosafrole
Sterigmatocystin
Tannic acid and tannins

Pyrrolizidine Alkaloids

Hydroxysenkirkine
Isatidine
Jacobine
Lasiocarpine
Monocrotaline
Retrorsine
Riddelliine
Seneciphylline
Senkirkine

ACTINOMYCINS

VOL.: 10 (1976) (p. 29)

5. Summary of Data Reported and Evaluation

5.1 Animal carcinogenicity data

Actinomycin D is carcinogenic in rats following its intraperitoneal injection: it produced malignant mesenchymal tumours in the peritoneal cavity. Actinomycins L and S produced sarcomas at the site of their subcutaneous injection in mice. Actinomycin C produced no carcinogenic effect in rats following its intravenous injection.

5.2 Human carcinogenicity data

No case reports or epidemiological studies were available to the Working Group.

Subsequent evaluation: [Suppl. 7 \(1987\)](#)

Last updated: 22 March 1998

ADRIAMYCIN

VOL.: 10 (1976) (p. 43)

5. Summary of Data Reported and Evaluation

5.1 Animal carcinogenicity data

Adriamycin was tested only in rats by single intravenous injection. No evaluation of the carcinogenicity of this compound is possible on the basis of this limited study.

5.2 Human carcinogenicity data

No case reports or epidemiological studies were available to the Working Group.

Subsequent evaluation: [Suppl. 7 \(1987\)](#)

Last updated: 22 March 1998

AZASERINE

VOL.: 10 (1976) (p. 73)

CAS No.: 115-02-6

Chem. Abstr. Name: Serine diazoacetate

5. Summary of Data Reported and Evaluation

5.1 Animal carcinogenicity data

Azaserine is carcinogenic in rats following its intraperitoneal injection, the only species and route tested: it produced adenocarcinomas of the pancreas and tumours of the kidney.

5.2 Human carcinogenicity data

No case reports or epidemiological studies were available to the Working Group.

Subsequent evaluation: Suppl. 7 (1987) (p. 57: **Group 2B**)

For definition of Groups, see [Preamble Evaluation](#).

Synonyms

- L-Azaserine
- Diazoacetate (ester) L-serine
- L-Diazoacetate (ester) serine
- Diazoacetic acid ester with serine
- *O*-Diazoacetyl-L-serine

Last updated: 22 March 1998

CANTHARIDIN

VOL.: 10 (1976) (p. 79)

CAS No.: 56-25-7

Chem. Abstr. Name: (3a α ,4 β , 7 β ,7a α)Hexahydro-3a,7a-dimethyl-4,7-epoxyisobenzofuran-1,3-dione

5. Summary of Data Reported and Evaluation

5.1 Animal carcinogenicity data

Cantharidin was tested only by skin application in mice; it produced an increased incidence of skin papillomas and a low incidence of skin carcinomas.

5.2 Human carcinogenicity data

No case reports or epidemiological studies were available to the Working Group.

Subsequent evaluation: Suppl. 7 (1987) (p. 59: **Group 3**)

For definition of Groups, see [Preamble Evaluation](#).

Synonyms

- Cantharides camphor
- Cantharidine
- Cantharone
- 2,3-Dimethyl-7-oxabicyclo-(2.2.1)heptane-2,3-dicarboxylic anhydride
- Exo-1,2-*cis*-dimethyl-3,6-epoxyhexahydrophthalic anhydride
- Hexahydro-3a,7a-dimethyl-4,7-epoxyisobenzofuran-1,3-dione

CHOLESTEROL

VOL.: 10 (1976) (p. 99)

5. Summary of Data Reported and Evaluation

5.1 Animal carcinogenicity data

There are no adequate feeding studies with pure cholesterol available to evaluate its carcinogenicity. Experiments involving subcutaneous injection of cholesterol in various vehicles cannot be evaluated because of variations in parameters unrelated to the dose of cholesterol administered. Implantation experiments using cholesterol are difficult to interpret, because the effects of the physical factors must be taken into consideration.

On the basis of the experimental evidence available no assessment of the carcinogenicity of cholesterol is possible.

5.2 Human carcinogenicity data

No data are available to assess the carcinogenicity of exogenous cholesterol in man. Studies of cancer in relation to dietary fat, serum cholesterol levels and the degradation of biliary steroids are not directly relevant to this question.

Subsequent evaluations: [Vol 31 \(1983\)](#); [Suppl. 7 \(1987\)](#)

Last updated: 22 March 1998

COUMARIN

VOL.: 10 (1976) (p. 113)

CAS No.: 91-64-5

Chem. Abstr. Name: 2*H*-1-Benzopyran-2-one

5. Summary of Data Reported and Evaluation

5.1 Animal carcinogenicity data

Coumarin is carcinogenic in rats following its oral administration, the only species and route of administration tested; it produced bile duct carcinomas.

5.2 Human carcinogenicity data

No case reports or epidemiological studies were available to the Working Group.

Subsequent evaluation: Suppl. 7 (1987) (p. 61: **Group 3**); [Vol. 77 \(2000\)](#)

For definition of Groups, see [Preamble Evaluation](#).

Synonyms for Coumarin

- 1,2-Benzopyrone
- *cis-o*-Coumarinic acid lactone
- Coumarinic anhydride
- Cumarin
- 2-Oxo-2*H*-1-benzopyran
- Tonka bean camphor

Last updated: 22 March 1998

CYCASIN

VOL.: 10 (1976) (p. 121)

CAS No.: 14901-08-7

Chem. Abstr. Name: (Methyl-*ONM*)azoxymethyl- β -D-glucopyranoside

5. Summary of Data Reported and Evaluation

5.1 Animal carcinogenicity data

Cycasin is carcinogenic in mice, rats, hamsters, guinea-pigs, rabbits and fish; it produced a variety of malignant tumours, mainly in the liver, kidney and intestine. It is carcinogenic in rats, hamsters, guinea-pigs, rabbits and fish following its oral administration. It is active in newborn and suckling mice and newborn rats and hamsters after its subcutaneous injection both in single doses and following prenatal exposure. The carcinogenicity of its aglycone, methylazoxymethanol, has been demonstrated in rats following its intraperitoneal administration and in hamsters following its intraperitoneal or intravenous administration. The closely-related synthetic substance, methylazoxymethanol acetate, is carcinogenic in rats by various routes of administration (see Appendix).

5.2 Human carcinogenicity data

The one epidemiological study reported showed no appreciable increase in cancer mortality 2 to 7 years after heavy intake of cycads. This negative result is insufficient to exclude a possible carcinogenic effect of cycasin in man. No case reports or other epidemiological studies of cancer in relation to exposure to cycasin or methylazoxymethanol were available to the Working Group.

Previous evaluation: [Vol. 1 \(1972\)](#)

Subsequent evaluation: Suppl. 7 (1987) (p. 61: **Group 2B**)

For definition of Groups, see [Preamble Evaluation](#).

Synonyms for Cycasin

- β -D-Glucosyloxyazoxymethane
- Methylazoxymethanol- β -D-glucoside

CYCLOCHLOROTINE

VOL.: 10 (1976) (p. 139)

CAS No.: 12663-46-6

5. Summary of Data Reported and Evaluation

5.1 Animal carcinogenicity data

Cyclochlorotine is carcinogenic in male mice following its oral administration, the only species, sex and route of administration tested; it produced liver tumours and reticuloendothelias.

5.2 Human carcinogenicity data

No case reports or epidemiological studies were available to the Working Group.

Subsequent evaluation: Suppl. 7 (1987) (p. 61: **Group 3**)

For definition of Groups, see [Preamble Evaluation](#).

Synonyms

- Chlorine-containing cyclic pentapeptide of *Penicillium islandicum*
- Islanditoxin

Last updated: 22 March 1998

DAUNOMYCIN

VOL.: 10 (1976) (p. 145)

CAS No.: 20830-81-3

Chem. Abstr. Name: (8*S*-*cis*)-8-Acetyl-10-[(3-amino-2,3,6-trideoxy- α -L-lyxohexapyranosyl)oxy]-7,8,9,10-tetrahydro-6,8,11-trihydroxy-1-methoxy-5,12-naphthacenedione

5. Summary of Data Reported and Evaluation

5.1 Animal carcinogenicity data

Daunomycin is carcinogenic in rats following intravenous injection of single doses and in mice following its repeated subcutaneous injection; it produced mammary and kidney tumours in rats and local sarcomas in mice. No carcinogenic effect was observed in one oral study in mice.

5.2 Human carcinogenicity data

No case reports or epidemiological studies were available to the Working Group.

Subsequent evaluation: Suppl. 7 (1987) (p. 61: **Group 2B**)

For definition of Groups, see [Preamble Evaluation](#).

Synonyms

- 8-Acetyl-10-[(3-amino-2,3,6-trideoxy- α -L-lyxohexapyranosyl)oxy]-7, 8,9,10-tetrahydro-6,8,11-trihydroxy-1-methoxy-(8*S*,10*S*)-5,12-naphthacenedione
- 3-Acetyl-1,2,3,4,6,11-hexahydro-3,5,12-trihydroxy-10-methoxy-6,11-dioxo-1-naphthacenyl-3-amino-2,3,6-trideoxy- α -L-lyxohexapyranoside(1*S*,3*S*)
- Cerubidine (as the hydrochloride)
- Daunorubicin
- Daunorubicine
- NSC 82151
- RP 13057
- Rubidomycin
- Rubomycin C
- Rubomycin C₁

GRISEOFULVIN

VOL.: 10 (1976) (p. 153)

5. Summary of Data Reported and Evaluation

5.1 Animal carcinogenicity data

Griseofulvin is hepatocarcinogenic following its oral administration to adult mice or its subcutaneous administration to male infant mice.

5.2 Human carcinogenicity data

No case reports or epidemiological studies were available to the Working Group.

Subsequent evaluations: [Suppl. 7 \(1987\)](#); [Vol. 79 \(2001\)](#)

Last updated: 22 March 1998

LUTEOSKYRIN

VOL.: 10 (1976) (p. 163)

CAS No.: 21884-44-6

Chem. Abstr. Name: (1 β , 1' β , 3 β , 3' β) 8,8'-Dihydroxy-rugulosin

5. Summary of Data Reported and Evaluation

5.1 Animal carcinogenicity data

Luteoskyrin is carcinogenic in mice following its oral administration, the only species and route of administration tested; it produced benign and malignant tumours of the liver.

5.2 Human carcinogenicity data

No case reports or epidemiological studies were available to the Working Group.

Subsequent evaluation: Suppl. 7 (1987) (p. 65: **Group 3**)

For definition of Groups, see [Preamble Evaluation](#).

Synonyms

- Flavomycelin
- Stereoisomer of 1,4,7,9,12,15,17,20-octahydroxy-3,11-dimethyl-5*H*,6*H*-6,13 α ,5 α ,14-1,2,3,4-butane-tetra-cycloocta[1,2-b:5,6-b']dinaphthalene-5,8,13,16(14*H*)-tetrone
- 2,2',3,3'-Tetrahydro-2,2',4,4',5,5',8,8'-octahydroxy-7,7'-dimethyl-(1,1'-bianthracene)-9,9',10,10'-tetrone

Last updated: 22 March 1998

MITOMYCIN C

VOL.: 10 (1976) (p. 171)

CAS No.: 50-07-7

Chem. Abstr. Name: [1aR-(1a α ,8 β , 8a α , 8b α)]-6-Amino-8-[[aminocarbonyl]oxy)methyl]-1,1a,2,8,8a,8b-hexahydro-8a-methoxy-5-methylazirino[2',3':3,4]pyrrolo[1,2- α]indole-4,7-dione

5. Summary of Data Reported and Evaluation

5.1 Animal carcinogenicity data

Mitomycin C is carcinogenic in mice following its subcutaneous injection and in rats following its intraperitoneal or intravenous injection. In rats it produced both local and distant tumours.

5.2 Human carcinogenicity data

No case reports or epidemiological studies were available to the Working Group.

Subsequent evaluation: Suppl. 7 (1987) (p. 67: **Group 2B**)

For definition of Groups, see [Preamble Evaluation](#).

Synonyms

- Ametycin
- 6-Amino-8-[[aminocarbonyl]oxy)methyl]-1,1a,2,8,8a,8b-hexahydro-8-methoxy-5-methyl[1aR-(1a α ,8 β ,8a α , 8b α)]azirino(2',3':3,4)-pyrrolo-(1,2- α) indole-4,7-dione
- 6-Amino-1,1a,2,8,8a,8b-hexahydro-8-(hydroxymethyl)-8a-methoxy-5-methylazirino-(2',3':3,4)pyrrolo(1,2-a)-indole-4,7-dione, carbamate ester
- MIT-C
- Mitomycin
- Mitomycinum
- NSC 2798
- Mutamycin (Mitomycin for injection)
- Mytomycin

NATIVE CARRAGEENANS

VOL.: 10 (1976) (p. 181)

CAS No.: 9000-07-1

Chem. Abstr. Name: Carrageenan

CAS No.: 11114-20-8

Chem. Abstr. Name: κ -Carrageenan

CAS No.: 9064-57-7

Chem. Abstr. Name: λ -Carrageenan

CAS No.: 9062-07-1

Chem. Abstr. Name: ι -Carrageenan

5. Summary of Data Reported and Evaluation

5.1 Animal carcinogenicity data

One type of carrageenan was tested in rats by subcutaneous injection and produced local sarcomas. In mice and rats administered food-grade native carrageenan orally, the incidence of tumours was not greater than that in controls; however, this negative experiment is inadequate in terms of the number of animals used.

5.2 Human carcinogenicity data

No case reports or epidemiological studies were available to the Working Group.

Subsequent evaluations: [Vol. 31 \(1983\)](#); [Suppl. 7 \(1987\)](#) (p. 59: **Group 3**)

For definition of Groups, see [Preamble Evaluation](#).

Synonyms for Carrageenan

- 3,6-Anhydro-D-galactan
- Burtonite V-40-E
- Carrageenan gum
- Carrageenin
- Carragheen
- Carragheenin
- Chondrus
- Chondrus extract
- Galozone
- Gum carrageenan
- Gum chon 2
- Gum chond
- Irish moss gelose
- Killeen
- Pearlpuss
- Pellugel
- Pigwrack
- Self rock moss

- Viscarin

Last updated: 22 March 1998

PARASORBIC ACID

VOL.: 10 (1976) (p. 199)

CAS No.: 10048-32-5

Chem. Abstr. Name: (S)-5,6-Dihydro-6-methyl-2*H*-pyran-2-one

5. Summary of Data Reported and Evaluation

5.1 Animal carcinogenicity data

Parasorbic acid administered by subcutaneous injection to rats produced local sarcomas. Feeding experiments in rats where parasorbic acid was given in combination with sorbic acid cannot be evaluated because of the relatively low dose of parasorbic acid administered and the lack of contemporary control groups. A further oral study in rats was considered inadequate due to the small number of surviving animals.

5.2 Human carcinogenicity data

No case reports or epidemiological studies were available to the Working Group.

Subsequent evaluation: Suppl. 7 (1987) (p. 69: **Group 3**)

For definition of Groups, see [Preamble Evaluation](#).

Synonyms

- 5-Hydroxy-2-hexanoic acid δ -lactone
- Sorbic oil (Vogelbeeröl)

PATULIN

VOL.: 10 (1976) (p. 205)

5. Summary of Data Reported and Evaluation

5.1 Animal carcinogenicity data

In the only study available patulin was shown to produce sarcomas in rats at the site of its subcutaneous injection.

5.2 Human carcinogenicity data

No case reports or epidemiological studies were available to the Working Group.

Subsequent evaluations: [Vol 40 \(1986\)](#); Suppl. 7 (1987) (p. 69: **Group 3**)

For definition of Groups, see [Preamble Evaluation](#).

Last updated: 22 March 1998

PENICILLIC ACID

VOL.: 10 (1976) (p. 211)

CAS No.: 90-65-3

Chem. Abstr. Name: 3-Methoxy-5-methyl-4-oxo-2,5-hexadienoic acid

5. Summary of Data Reported and Evaluation

5.1 Animal carcinogenicity data

Penicillic acid was tested by subcutaneous injection in mice and rats; it produced local sarcomas.

5.2 Human carcinogenicity data

No case reports or epidemiological studies were available to the Working Group.

Subsequent evaluation: Suppl. 7 (1987) (p. 69: **Group 3**)

For definition of Groups, see [Preamble Evaluation](#).

Synonym

- γ -Keto- β -methoxy- δ -methylene- $\delta(\alpha)$ -hexenoic acid

Last updated: 22 March 1998

RESERPINE

VOL.: 10 (1976) (p. 217)

5. Summary of Data Reported and Evaluation

5.1 Animal carcinogenicity data

No adequate tests to assess the carcinogenicity of reserpine in experimental animals were available to the Working Group.

5.2 Human carcinogenicity data

Results from a number of epidemiological studies are not consistent in indicating an increased risk of cancer in patients exposed to *Rauwolfia* derivatives, and any conclusion about the existence of a risk should await further evidence.

Subsequent evaluations: [Vol. 24 \(1980\)](#); [Suppl. 7 \(1987\)](#)

Last updated: 22 March 1998

SAFROLE, ISOSAFROLE, AND DIHYDROSAFROLE

VOL.: 10 (1976) (p. 231)

Safrole

CAS No.: 94-59-7

Chem. Abstr. Name: 5-(2-Propenyl)-1,3-benzodioxole

Isosafrole

CAS No.: 120-58-1

Chem. Abstr. Name: 5- (1-Propenyl) -1,3-benzodioxole

Dihydrosafrole

CAS No.: 94-58-6

Chem. Abstr. Name: 5-Propyl-1,3-benzodioxole

5. Summary of Data Reported and Evaluation

5.1 Animal carcinogenicity data

Safrole and isosafrole are carcinogenic in mice and rats; they produce liver tumours following their oral administration. Safrole also produced liver and lung tumours in male infant mice following its subcutaneous injection. Dihydrosafrole given orally is carcinogenic in rats, in which it produces tumours of the oesophagus, and in mice, in which it produces liver tumours in males and an increased incidence of lung tumours in both males and females.

5.2 Human carcinogenicity data

No case reports or epidemiological studies were available to the Working Group.

Previous evaluation: [Vol. 1 \(1972\)](#)

Subsequent evaluation: Suppl. 7 (1987) (p. 62: Dihydrosafrole - **Group 2B**; p. 65: Isosafrole - **Group 3**; p. 71: Safrole - **Group 2B**)

For definition of Groups, see [Preamble Evaluation](#).

Synonyms for Safrole

- 5-Allyl-1,3-benzodioxole
- Allylcatechol methylene ether
- Allyldioxybenzene methylene ether
- 1-Allyl-3,4-methylenedioxybenzene
- 4-Allyl-1,2-(methylenedioxy)benzene
- 4-Allyl-1,2-methylenedioxybenzene
- Allylpyrocatechin methylene ether
- *m*-Allylpyrocatechin methylene ether
- 4-Allylpyrocatechol, formaldehyde acetal
- Allylpyrocatechol methylene ether
- 3,4-Methylenedioxyallylbenzene
- Rhyuno oil
- Safrol

- Safrole MF
- Shikimole
- Shikomol

Synonyms for Isosafrole

- 1,2-(Methylenedioxy)-4-propenylbenzene
- 3,4-Methylenedioxy-1-propenylbenzene
- 3,4-(Methylenedioxy)propenylbenzene
- 1,2-Methylenedioxy-4-propenylbenzene
- 1,2-(Methylenedioxy)-4-propenylbenzene
- 5-(Propen-1-yl)-1,3-benzodioxole
- 4-Propenyl-1,2-methylenedioxybenzene

Synonyms for Dihydrosafrole

- Dihydroisosafrole
- 1,2-(Methylenedioxy)-4-propylbenzene
- 3,4-Methylenedioxypropylbenzene
- 4-Propyl-1,2-(methylenedioxy)benzene

Last updated: 22 March 1998

STERIGMATOCYSTIN

VOL.: 10 (1976) (p. 245)

CAS No.: 10048-13-2

Chem. Abstr. Name: 3a,12c-Dihydro-8-hydroxy-6-methoxy-7*H*-furo-[3',2':4,5]furo-[2,3-*c*]xanthen-7-one

5. Summary of Data Reported and Evaluation

5.1 Animal carcinogenicity data

Sterigmatocystin is carcinogenic in mice and rats following its oral administration; it produced lung tumours in mice and liver tumours in rats. In rats, it also produced skin and liver tumours following its application to the skin and sarcomas at the site of its subcutaneous injection.

5.2 Human carcinogenicity data

No case reports or epidemiological studies were available to the Working Group.

Previous evaluation: [Vol. 1 \(1972\)](#)

Subsequent evaluation: Suppl. 7 (1987) (p. 72: **Group 2B**)

For definition of Groups, see [Preamble Evaluation](#).

TANNIC ACID AND TANNINS

VOL.: 10 (1976) (p. 253)

CAS No.: 1401-55-4

Chem. Abstr. Name: Tannic Acid

5. Summary of Data Reported and Evaluation

5.1 Animal carcinogenicity data

Tannic acid is carcinogenic in rats following its subcutaneous injection; it produced liver tumours. In mice, subcutaneous injection of hydrolysable tannins produced liver tumours, and that of condensed tannins produced both local sarcomas and liver tumours. No adequate published studies involving oral administration of tannins were available to the Working Group.

5.2 Human carcinogenicity data

No case reports or epidemiological studies were available to the Working Group.

Subsequent evaluation: Suppl. 7 (1987) (p. 72: **Group 3**)

For definition of Groups, see [Preamble Evaluation](#).

Synonyms for Tannic acid

- Gallotannic Acid
- Gallotannin
- Glycerite

Last updated: 22 March 1998

HYDROXYSENKIRKINE

VOL.: 10 (1976) (p. 265)

CAS No.: 26782-43-4

Chem. Abstr. Name: 8,12,18-Trihydroxy-4-methyl-11,16-dioxosenecionanium

5. Summary of Data Reported and Evaluation

5.1 Animal carcinogenicity data

Hydroxysenkirkine was tested only by the intraperitoneal route in five male rats, producing tumours of the brain in one animal. The available information is insufficient to evaluate the carcinogenicity of this compound (see also section "General Information and Conclusions on Pyrrolizidine Alkaloids", in this volume).

5.2 Human carcinogenicity data

No case reports or epidemiological studies were available to the Working Group.

Subsequent evaluation: Suppl. 7 (1987) (p. 64: **Group 3**)

For definition of Groups, see [Preamble Evaluation](#).

Synonyms

- Stereoisomer of 4-ethylidene-7-hydroxy-7 α -(hydroxymethyl)-6,14- dimethyl-2,9-dioxa-1,14-azabicyclo (9.5.1) heptadec-11-ene-3,8,17-trione
- *trans*-15-Ethylidene-12 β -hydroxy-12 α -hydroxymethyl-4,13 β - dimethyl-8-oxo-4,8-secosenec-1-ene

Last updated: 22 March 1998

ISATIDINE

VOL.: 10 (1976) (p. 269)

CAS No.: 15503-86-3

Chem. Abstr. Name: 12,18-Dihydroxysenecionan-11,16-dione-4-oxide

5. Summary of Data Reported and Evaluation

5.1 Animal carcinogenicity data

Isatidine is carcinogenic in rats as shown by a limited study in which it produced liver tumours following its oral administration (see also section "General Information and Conclusions on Pyrrolizidine Alkaloids", in this volume).

5.2 Human carcinogenicity data

No case reports or epidemiological studies were available to the Working Group.

Subsequent evaluation: Suppl. 7 (1987) (p. 65: **Group 3**)

For definition of Groups, see [Preamble Evaluation](#).

Synonyms

- *trans*-15-Ethylidene-12 β -hydroxy-12 α -hydroxymethyl-13 β -methylsenec-1-enine-4-oxide
- Retrorsine *N*-oxide

JACOBINE

VOL.: 10 (1976) (p. 275)

CAS No.: 6870-67-3

Chem. Abstr. Name: (15 α ,20R)15,20-Epoxy-15,20-dihydro-12-hydroxy-senecionan-11,16-dione

5. Summary of Data Reported and Evaluation

5.1 Animal carcinogenicity data

No data were available concerning the carcinogenicity of pure jacobine. However, see also the section "General Information and Conclusions on Pyrrolizidine Alkaloids" in this volume.

5.2 Human carcinogenicity data

No case reports or epidemiological studies were available to the Working Group.

Subsequent evaluation: Suppl. 7 (1987) (p. 65: **Group 3**)

For definition of Groups, see [Preamble Evaluation](#).

Synonyms

- 12 β -Hydroxy-12 α ,13 β -dimethylsenec-I-enine-15S-spiro-2'-(3'R-methyloxiran)
- NSC 89936
- Stereoisomer of 5,6,9,11,13,14,14a,14b-octahydro-6-hydroxy-3,5,6-trimethyl-spiro[(1,6)dioxacyclododecino-[2,3,4-*gh*]pyrrolizine-3-(2*H*)-2'-oxirane-2,7(4*H*)-dione

LASIOCARPINE

VOL.: 10 (1976) (p. 281)

CAS No.: 303-34-4

5. Summary of Data Reported and Evaluation

5.1 Animal carcinogenicity data

Lasiocarpine is carcinogenic in rats following its intraperitoneal injection; it produced malignant tumours of the liver, skin and intestine. No other routes of administration or species have been adequately tested (see also the section "General Information and Conclusions on Pyrrolizidine Alkaloids", in this volume).

5.2 Human carcinogenicity data

No case reports or epidemiological studies were available to the Working Group.

Subsequent evaluation: Suppl. 7 (1987) (p. 65: **Group 2B**)

For definition of Groups, see [Preamble Evaluation](#).

Synonyms

- (7 α -Angelyloxy-5,6,7,8 α -tetrahydro-3*H*-pyrrolizin-1-yl)methyl-2,3-dihydroxy-2-(1'-methoxyethyl)-3-methylbutyrate
- 2-Butenoic acid, 2-methyl-7{[2,3-dihydroxy-2-(1-methoxyethyl)-3-methyl-1-oxobutoxy]methyl}-2,3,5,7 α -tetrahydro-1*H*-pyrrolizin-1-yl ester{1*S*-[1 α (*Z*),7(2*S*,3*R*)7 α]}
Chemical structure: COC(=O)C(C)C(O)C1=CC=CC=C1C2=CC=CC=C2C3=CC=CC=C3C4=CC=CC=C4C5=CC=CC=C5C6=CC=CC=C6C7=CC=CC=C7C8=CC=CC=C8C9=CC=CC=C9C10=CC=CC=C10C11=CC=CC=C11C12=CC=CC=C12C13=CC=CC=C13C14=CC=CC=C14C15=CC=CC=C15C16=CC=CC=C16C17=CC=CC=C17C18=CC=CC=C18C19=CC=CC=C19C20=CC=CC=C20C21=CC=CC=C21C22=CC=CC=C22C23=CC=CC=C23C24=CC=CC=C24C25=CC=CC=C25C26=CC=CC=C26C27=CC=CC=C27C28=CC=CC=C28C29=CC=CC=C29C30=CC=CC=C30C31=CC=CC=C31C32=CC=CC=C32C33=CC=CC=C33C34=CC=CC=C34C35=CC=CC=C35C36=CC=CC=C36C37=CC=CC=C37C38=CC=CC=C38C39=CC=CC=C39C40=CC=CC=C40C41=CC=CC=C41C42=CC=CC=C42C43=CC=CC=C43C44=CC=CC=C44C45=CC=CC=C45C46=CC=CC=C46C47=CC=CC=C47C48=CC=CC=C48C49=CC=CC=C49C50=CC=CC=C50C51=CC=CC=C51C52=CC=CC=C52C53=CC=CC=C53C54=CC=CC=C54C55=CC=CC=C55C56=CC=CC=C56C57=CC=CC=C57C58=CC=CC=C58C59=CC=CC=C59C60=CC=CC=C60C61=CC=CC=C61C62=CC=CC=C62C63=CC=CC=C63C64=CC=CC=C64C65=CC=CC=C65C66=CC=CC=C66C67=CC=CC=C67C68=CC=CC=C68C69=CC=CC=C69C70=CC=CC=C70C71=CC=CC=C71C72=CC=CC=C72C73=CC=CC=C73C74=CC=CC=C74C75=CC=CC=C75C76=CC=CC=C76C77=CC=CC=C77C78=CC=CC=C78C79=CC=CC=C79C80=CC=CC=C80C81=CC=CC=C81C82=CC=CC=C82C83=CC=CC=C83C84=CC=CC=C84C85=CC=CC=C85C86=CC=CC=C86C87=CC=CC=C87C88=CC=CC=C88C89=CC=CC=C89C90=CC=CC=C90C91=CC=CC=C91C92=CC=CC=C92C93=CC=CC=C93C94=CC=CC=C94C95=CC=CC=C95C96=CC=CC=C96C97=CC=CC=C97C98=CC=CC=C98C99=CC=CC=C99C100=CC=CC=C100
- (z)-2-Methylcrotonic acid, 2,3-dihydroxy-2-(1-methoxyethyl)-3-methylbutyrate(ester)
- NSC 30625
- Stereoisomer of 7-[2,3-dihydroxy-2-(1-methoxyethyl)-3-methyl-1-oxobutoxy]-methyl-2,3,5,7 α -tetrahydro-1*H*-pyrrolizin-1-yl-2-methyl-2-butenolate
- 2,3,5,7 $\alpha\beta$ -Tetrahydro-1-hydroxy-1*H*-pyrrolizine-7-methanol-1-angelate-7-[2,3-dihydroxy-2(1-methoxyethyl)]-3-methylbutyrate
- (z)-2-Methylcrotonic acid,2,3-dihydroxy-2-(1-methoxyethyl)-3-methylbutyrate(ester)

Last updated: 22 March 1998

MONOCROTALINE

VOL.: 10 (1976) (p. 291)

CAS No.: 315-22-0

5. Summary of Data Reported and Evaluation

5.1 Animal carcinogenicity data

Monocrotaline is carcinogenic in rats following its oral administration, the only species and route of administration tested; it produced carcinomas of the liver (see also the section "General Information and Conclusions on Pyrrolizidine Alkaloids", in this volume).

5.2 Human carcinogenicity data

No case reports or epidemiological studies were available to the Working Group.

Subsequent evaluation: Suppl. 7 (1987) (p. 67: **Group 2B**)

For definition of Groups, see [Preamble Evaluation](#).

Synonyms

- 14,19-Dihydro-12,13-dihydroxy-(13 α ,14 α ,)- 20-norcrotalanan-11,15-dione
- 12 β ,13 β -Dihydroxy-12 α , 13 α ,14 α -trimethylcrotal-I-enine
- NSC 28693
- Stereoisomer of 4,5,8,10,12,13,13a,13b-octahydro-4,5-dihydroxy-3,4,5- trimethyl-2*H*-(1,6)dioxacycloundecino[2,3,4-*gh*]pyrrolizine-2,6(3*H*)-dione

Last updated: 22 March 1998

RETORSINE

VOL.: 10 (1976) (p. 303)

CAS No.: 480-54-6

Chem. Abstr. Name: 12,18-Dihydroxysenecionan-11,16-dione

5. Summary of Data Reported and Evaluation

5.1 Animal carcinogenicity data

Retrorsine is carcinogenic in rats following its oral administration; it produced a variety of tumours. No other species or routes of administration were tested (see also the section "General Information and Conclusions on Pyrrolizidine Alkaloids", in this volume).

5.2 Human carcinogenicity data

No case reports or epidemiological studies were available to the Working Group.

Subsequent evaluation: Suppl. 7 (1987) (p. 71: **Group 3**)

For definition of Groups, see [Preamble Evaluation](#).

Synonyms

- 3-Ethylidene-3,4,5,6,9,11,13,14,14 α ,14 β -decahydro-6-hydroxy-6-hydroxymethyl-5-methyl(1,6)dioxacyclododeca[2,3,4-*gh*]pyrrolizidine-2,7-dione
- *trans*-15-Ethylidene-12 β -hydroxy-12 α -hydroxymethyl-13 β -methylsenec-I-enine
- β -Longilobine

RIDDELLINE

VOL.: 10 (1976) (p. 313)

CAS No.: 23246-96-0

Chem. Abstr. Name: 13,19-Didehydro-12,18-dihydroxysenecionan-11,16-dione

5. Summary of Data Reported and Evaluation

5.1 Animal carcinogenicity data

The available information is insufficient to evaluate the carcinogenicity of riddelline. However, see also the section "General Information and Conclusions on Pyrrolizidine Alkaloids", in this volume.

5.2 Human carcinogenicity data

No case reports or epidemiological studies were available to the Working Group.

Subsequent evaluations: Suppl. 7 (1987) (p. 71); [Vol. 82 \(2002\)](#)

For definition of Groups, see [Preamble Evaluation](#).

Synonyms

- *trans*-15-Ethylidene-12 β -hydroxy-12 α -hydroxymethyl-13-methylenesenec-1-ene
- Riddelline
- Stereoisomer of 3-ethylidene-3,4,5,6,9,11,13,14,14 α ,14 β -decahydro-6-hydroxy-6-(hydroxymethyl)-5-methylene(1,6)-dioxacyclododecino[2,3,4-*gh*]-pyrrolizidine-2,7-dione

SENECIPHYLLINE

VOL.: 10 (1976) (p. 319)

CAS No.: 480-81-9

Chem. Abstr. Name: 13,19-Didehydro,-12-hydroxysenecionan-11,16-dione

5. Summary of Data Reported and Evaluation

5.1 Animal carcinogenicity data

No data on the carcinogenicity of pure seneciphylline were available. However, see also the section "General Information and Conclusions on Pyrrolizidine Alkaloids", in this volume.

5.2 Human carcinogenicity data

No case reports or epidemiological studies were available to the Working Group.

Subsequent evaluation: Suppl. 7 (1987) (p. 71: **Group 3**)

For definition of Groups, see [Preamble Evaluation](#).

Synonyms

- *trans*-15-Ethylidene-12 β -hydroxy-12 α -methyl-13-methylenesenec-1-enine
- Jacodine
- NSC 30622

SENKIRKINE

VOL.: 10 (1976) (p. 327)

5. Summary of Data Reported and Evaluation

5.1 Animal carcinogenicity data

No carcinogenicity studies on pure senkirkine were available. However, see the section "General Information and Conclusions on Pyrrolizidine Alkaloids", in this volume.

5.2 Human carcinogenicity data

No case reports or epidemiological studies were available to the Working Group.

Subsequent evaluations: [Vol. 31 \(1983\)](#); Suppl. 7 (1987) (p. 71: **Group 3**)

For definition of Groups, see [Preamble Evaluation](#).

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