

- **Group II.** Specific treatment is usually only required if symptoms are severe. Physostigmine has been used to treat antimuscarinic symptoms. As mushrooms containing ibotenic acid and muscimol may also contain small amounts of muscarine, atropine may be required to control muscarinic symptoms.
- **Group III.** Pyridoxine hydrochloride has been given as an intravenous infusion as specific therapy to overcome the inhibition of pyridoxal phosphate by methylhydrazine, but the use of large doses of pyridoxine might itself produce adverse neurological effects. Methylthionium chloride may be required if methaemoglobinaemia is severe.
- **Group IV.** Atropine sulfate may be required to control the symptoms of muscarine poisoning but it should only be used if definite muscarinic symptoms are present.
- **Group V.** There is no specific treatment for the 'disulfiram-alcohol' reaction except for the maintenance of blood pressure.
- **Group VI.** If symptoms are severe some patients may require sedation with diazepam.

#### ◇ General reviews.

1. Köppel C. Clinical symptomatology and management of mushroom poisoning. *Toxicol* 1993; **31**: 1513–40.

**Amanita phalloides.** The use of specific antidotes in the treatment of poisoning due to *Amanita phalloides* remains controversial. Acetylcysteine, benzylpenicillin, sulfamethoxazole, thiocetic acid, cytochrome C, ascorbic acid, insulin, growth hormone, silymarin or silibinin, and corticosteroids have all been used or suggested. Evidence to support most of these is lacking;<sup>1,2</sup> there is limited evidence to support the use of silibinin and acetylcysteine, but benzylpenicillin, although widely used, does not have proven efficacy.<sup>1</sup> In patients who develop fulminant liver failure the definitive treatment is liver transplantation.<sup>1,2</sup>

1. Enjalbert F, et al. Treatment of amatoxin poisoning: 20-year retrospective analysis. *J Toxicol Clin Toxicol* 2002; **40**: 715–57.
2. Berger KJ, Guss DA. Mycotoxins revisited: part I. *J Emerg Med* 2005; **28**: 53–62.

#### Uses

**Homeopathy.** Several types of poisonous mushrooms have been used in homeopathic medicines under the following names:

- *Amanita phalloides*: Agaricus phalloides; Agaricus bulbosus
- *Russula emetica*: Agaricus emeticus; Agar. e.
- *Amanita muscaria*: Agaricus muscarius; Agar. m.
- *Coprinus stercorearius* (*Stropharia stercorearia*): Agaricus stercorearius; Aga. ster.

#### Musk

Almíscar; Almozde; Deer Musk; Mosc.; Moschus.

CAS — 541-91-3 (muskone).

**Pharmacopoeias.** In *Chin*.

#### Profile

Musk is the dried secretions from the preputial follicles of the musk deer, *Moschus moschiferus* or some other spp. of *Moschus* (Cervidae). It is used as a fragrance and fixative in perfumery. The main source of musk's fragrance is muskone (muskone).

A series of nitrated tertiary butyl toluenes or xylenes, or related compounds, are used as artificial musks. Musk ambrette, a synthetic nitromusk compound used in perfumery and as a food flavour, has been reported to cause contact dermatitis and photosensitivity.

**Homeopathy.** Musk has been used in homeopathic medicines under the following names: Moschus; Mosc.

#### ◇ References.

1. Schmeiser HH, et al. Evaluation of health risks caused by musk ketone. *Int J Hyg Environ Health* 2001; **203**: 293–9.

#### Black Mustard

Graine de Moutarde Noire; Mostarda Preta; Mostaza negra; Moutarde Jonciforme; Schwarzer Senfsame; Semen Sinapis; Semilla de Mostaza; Sinapis Nigra.

**Description.** Black mustard is the dried ripe seeds of *Brassica nigra* (*B. sinapioides*) (Cruciferae).

**Pharmacopoeias.** In *Swiss* which allows *B. nigra*, *B. juncea*, and other species.

#### White Mustard

Mostaza blanca; Sinapis Alba.

**Description.** White mustard is the dried ripe seeds of *Brassica alba* (Cruciferae).

**Pharmacopoeias.** *Chin.* allows *B. alba* or *B. juncea*.

The symbol † denotes a preparation no longer actively marketed

#### Volatile Mustard Oil

Allylsenföl; Essence of Mustard; Mostaza, aceite esencial de; Oleum Sinapis Volatile.

#### Allyl Isothiocyanate (USAN)

Isothiocyanato-l-propene.

C<sub>4</sub>H<sub>7</sub>NS = 99.15.

CAS — 57-06-7.

**Pharmacopoeias.** *Fr.* and *US*

**USP 31** (Allyl Isothiocyanate). A colourless to pale yellow, very refractive, liquid with a pungent, irritating odour and an acid taste. Slightly soluble in water; miscible with alcohol, with carbon disulfide, and with ether. Store in airtight containers.

#### Profile

Black and white mustard seeds have been used as emetics, in counter-irritant and rubefacient preparations, and as condiments. Volatile mustard oil, prepared from black mustard seeds, is largely composed of allyl isothiocyanate. It is an extremely powerful irritant that has been used as a counter-irritant and rubefacient. Expressed mustard oil contains a smaller proportion of volatile oil and has been used as a less powerful counter-irritant.

**Adverse effects.** A report of 2 cases of IgE-mediated anaphylaxis to mustard condiment.<sup>1</sup>

1. Vidal C, et al. Anaphylaxis to mustard. *Postgrad Med J* 1991; **67**: 404.

**Handling.** Allyl isothiocyanate is a potent lachrymator, with a pungent irritating odour. Care should be taken to protect the eyes, to prevent inhalation of fumes, and to avoid tasting.

#### Preparations

**Proprietary Preparations** (details are given in Part 3)

**Mon.:** Autoplasme Vaillant; Sinapisme Rigolot.

**Multi-ingredient:** **Braz.:** Alivioli; Analgent; Benegel; Gelfex; Gelof; Gelonevral; Mialgeç; Mostardina; Nevrol; **Canad.:** Rheumalanç; **Cz.:** Apisarthron; Rheumosinç; **Ger.:** Cor-Select; **Pol.:** Reumobonisol; **Rus.:** Apisarthron (Аписартрон); Efcamon (Эфкамон); **Spain:** Doloc; **Switz.:** Knobel Huile N; **UK:** Nine Rubbing Oils; Radian-B Red Oils; Red Oil; **USA:** Dermolin; Methalgent; Musterole Extra.

#### Myristyl Alcohol

Alcohol miristilo; Alkohol mirystylowy; NSC-8549; 1-Tetradecanol.

C<sub>14</sub>H<sub>30</sub>O = 214.4.

CAS — 112-72-1.

**Pharmacopoeias.** In *USNF*.

**USNF 26** (Myristyl Alcohol). M.p. 36° to 42°.

#### Profile

Myristyl alcohol is used as an oleaginous vehicle. Contact dermatitis has been associated with its use.

#### Myrrh

Gum Myrrh; Gummiresina Myrrha; Mira; Mirhami; Mirra; Mirrha; Myrhovniková klejoprskyčice; Myrra; Myrrha; Myrrhe.

Myrra

CAS — 9000-45-7 (Myrrh); 8016-37-3 (myrrh oil).

**Pharmacopoeias.** In *Eur.* (see p.vii) and *US*.

**Ph. Eur. 6.2** (Myrrh). A gum-resin, hardened in air, obtained from the stem and branches of *Commiphora molmol* and/or other species of *Commiphora*. Protect from light.

**USP 31** (Myrrh). The oleo-gum resin obtained from the stems and branches of *Commiphora molmol* and other related species of *Commiphora* (Bursaceae) other than *C. mukul*. Store in airtight containers in a dry place.

#### Profile

The principal source of myrrh is *Commiphora myrrha* (*C. molmol*) (Bursaceae). Myrrh is astringent to mucous membranes; the tincture is used in mouthwashes and gargles for inflammatory disorders of the mouth and pharynx. It has also been used as a carminative. Myrrh has been tried in the treatment of schistosomiasis and fascioliasis.

Myrrh oil is used in aromatherapy.

Contact dermatitis has been reported.

**Helminth infections.** Myrrh was of benefit in a small study<sup>1</sup> of 7 patients with fascioliasis and in another study<sup>2</sup> of 204 patients with schistosomiasis. However, it showed low cure rates in the treatment of schistosomiasis when compared with praziquantel.<sup>3,4</sup>

1. Massoud A, et al. Preliminary study of therapeutic efficacy of a new fasciolicidal drug derived from *Commiphora molmol* (myrrh). *Am J Trop Med Hyg* 2001; **65**: 96–9.

2. Sheir Z, et al. A safe, effective, herbal antischistosomal therapy derived from myrrh. *Am J Trop Med Hyg* 2001; **65**: 700–4.
3. Botros S, et al. Efficacy of mirazid in comparison with praziquantel in Egyptian Schistosoma mansoni-infected school children and households. *Am J Trop Med Hyg* 2005; **72**: 119–23.
4. Barakat R, et al. Efficacy of myrrh in the treatment of human schistosomiasis mansoni. *Am J Trop Med Hyg* 2005; **73**: 365–7.

#### Preparations

**Ph. Eur.:** Myrrh Tincture;  
**USP 31:** Myrrh Topical Solution.

**Proprietary Preparations** (details are given in Part 3)

**Ger.:** Inspiral P; **Rus.:** Myrtoplex (Миртоплекс).

**Multi-ingredient:** **Arg.:** Parodontax Fluor; **Austral.:** Eczema Relief; **Austria:** Brady's-Magentropfen; Dentinox; Paradenton; Parodontax; **Braz.:** Paratonic; Parodontax; **Canad.:** Lotion pour Feux Sauvages; **Chile:** Astrijes; **Cz.:** Dr Theiss Rheuma Creme; Dr Theiss Schweden Kräuter; Dr Theiss Schwedenbitter; Original Schwedenbitter; **Denm.:** Dolodent; **Ger.:** Ad-Muc; Infi-trac; Mint-Lysoform; Myrrhin-Intest; Ratanhia comp; Repha-Os; **Hong Kong:** Ad-Muc; **Israel:** Parodontax; **Ital.:** Gengiario; **Rus.:** Original Grosser Bittner Balsam (Оригинальный Большой Балзам Биттнера); **S.Afr.:** Helmontskruie; Lewensessen; **Spain:** Buco Regis; **Switz.:** Baumeff; Eubucal; GU Eau; Parodontax F; Parodontax; Pomade au Baume; Sanoencic; **UK:** Herbal Indigestion Naturbats; HRI Golden Seal Digestive; Indigestion and Flatulence; Vocalzone; Wind & Dyspepsia Relief; **Venez.:** One Drop Spray.

#### Myrtillus

Baccæ Myrtilli; Bilberry; Blåbär (bilberry fruit); Blaeberry; Borůvkový plod; Fekete áfonya termés (bilberry fruit); Heidelbeere; Huckleberry; Hurtleberry; Melynių uogos, džiovintos (bilberry fruit); Mirtilo; Mustikka (bilberry fruit); Myrtille, fruit de (bilberry fruit); Myrtilli Fructus; Myrtilli fructus (bilberry fruit); Whortleberry.

**Pharmacopoeias.** In *Eur.* (see p.vii). *US* includes Powdered Bilberry Extract.

**Ph. Eur. 6.2** (Bilberry Fruit, Dried; Dried Bilberry BP 2008; Bilberry Fruit, Fresh; Fresh Bilberry BP 2008). The ripe fruit of *Vaccinium myrtillus*. It has a sweet and slightly astringent taste. The dried fruit contains a minimum of 1.0% of tannins, expressed as pyrogallol, calculated with reference to the dried drug. The fresh or frozen fruit contains a minimum of 0.30% of anthocyanins, expressed as cyanidin-3-glucoside chloride (chrysanthemine, C<sub>21</sub>H<sub>21</sub>ClO<sub>11</sub> = 484.8), calculated with reference to the dried drug. The frozen fruit should be stored at or below –18°.

#### Profile

Myrtillus has diuretic and astringent properties. It has been used for ophthalmic and circulatory disorders and for diarrhoea.

**Homeopathy.** Myrtillus has been used in homeopathic medicines under the following names: Vaccinium myrtillus; Vac. myrt.

#### Preparations

**Ph. Eur.:** Fresh Bilberry Fruit Dry Extract, Refined and Standardised.

**Proprietary Preparations** (details are given in Part 3)

**Arg.:** Mirtilene Forte; **Austral.:** Herbal Eye Care Formula; **Braz.:** Miralis; **Ger.:** Difrarel; **Indon.:** Lanavision; **Ital.:** Alcodin; Angiorex; Mirtilene Forte; Retinol; Tegens; **Malaysia:** Natberry; **Pol.:** Bilberin; Fibs; **Port.:** Difrarel; Tegens; Varisont; **Rus.:** Mirtilene Forte (Миртиллене Форте); **Switz.:** Myrtaven.

**Multi-ingredient:** **Austral.:** Bilberry Plus; Bilberry Plus Eye Health; Bioglan Pygno-Vite; Bioglan Vision-Eze; Extralife Eye-Care; Extralife Leg-Care; Herbal PMS Formula; Prophthal; Pynko; St Mary's Thistle Plus; **Austria:** Amersan; **Braz.:** Antiomipic; **Chile:** Gingo-Ther; **Cz.:** Amersan; Diabetan; Diabeticka Cajova Smes-Megadibetin; Tormentan; Urcyston Planta; **Fr.:** Diacure; Difrarel; Difrarel E; Flebior; Klorane Shampooing Antipelluculaire; Stomargil; **Ger.:** Salus Augenschutz-Kapseln NA; **Hung.:** Difrarel E; **Indon.:** Berry Vision; Bioretin; Eyevit; Lanavision; Lanavision Plus; Lutevision; Lutevision Extra; Matase; Matovit; Matovit Fifty; Nuvision; Oculex; Opi-bright; Opha-LI; Optimax; Visivit; Vita-Vision; Vitop; **Israel:** Opti-safe; **Ital.:** Alvear con Ginseng; Angiorex Complex; Angioton; Api Baby; Be-bimix Biolactine; Capili; Dermilia Flebozi; Evamilk Flebo-S; Flebofort; Levital Plus; Lipaven; Memovisus; Mirtilene; Mirtlux; Neomyr Plus; Nerec; Pik Gel; Promix 3; Retinovit; Rivudin; Tusso; Ultravision; Vancolif; **Malaysia:** Natberry Extra; Natberry Plus; **Neth.:** Difrarel; **Pol.:** Biavision; Pelogel; Reumosol; **Rus.:** Strix (Стрикс); **Spain:** Antiomipic; Mirtlux; **UK:** Se-Power.

#### Myrtle

Arrayán; Mirto; Myrte.

CAS — 8008-46-6 (myrtle oil); 8002-55-9 (myrtle).

NOTE: Distinguish from Myrtillus, p.2349, from *Vaccinium myrtillus*.

#### Profile

Myrtle (*Myrtus communis*, Myrtaceae) has been included in herbal preparations for cough.

Myrtle oil is obtained from the leaves and twigs. Myrtle oil is included in preparations for disorders of the upper respiratory tract and is used in aromatherapy.

The term myrtol has been used to describe an extract of myrtle, standardised on its content of  $\alpha$ -pinene, *d*-limonene, and cineole. It is used for respiratory-tract disorders.

#### ◇ References.

1. Matthys H, et al. Efficacy and tolerability of myrtol standardised in acute bronchitis. A multi-centre, randomised, double-blind, placebo-controlled parallel group clinical trial vs. cefuroxime and ambroxol. *Arzneimittelforschung* 2000; **50**: 700–11.

The symbol ⊗ denotes a substance whose use may be restricted in certain sports (see p.vii)