

investigation. Opebacan is a modified recombinant fragment of bactericidal permeability increasing protein that is under investigation for the treatment of Crohn's disease and meningococcal septicemia. Other derivatives of bactericidal permeability increasing protein are under investigation for retinopathies and acne.

Bactericidal permeability increasing protein also possesses antifungal activity.

References.

- Giroir BP, et al. Preliminary evaluation of recombinant amino-terminal fragment of human bactericidal/permeability-increasing protein in children with severe meningococcal sepsis. *Lancet* 1997; **350**: 1439-43.
- Levin M, et al. Recombinant bactericidal/permeability-increasing protein (rBPI) as adjunctive treatment for children with severe meningococcal sepsis: a randomised trial. *Lancet* 2000; **356**: 961-7.
- Levy O. A neutrophil-derived anti-infective molecule: bactericidal/permeability-increasing protein. *Antimicrob Agents Chemother* 2000; **44**: 2925-31.
- van der Schaft DW, et al. The antiangiogenic properties of bactericidal/permeability-increasing protein (BPI). *Ann Med* 2002; **34**: 19-27.

Barium

Bario; Baryum.
Ba = 137.327.
CAS — 7440-39-3.

Description. Barium is a soft, highly reactive, silvery-white metal.

Adverse Effects and Treatment

All barium salts that are water- or acid-soluble are very toxic. The symptoms of barium poisoning arise from stimulation of all forms of muscle and include vomiting, excess salivation, colic, diarrhoea, slow or irregular pulse, hypertension, dysarthria, confusion, dizziness, paraesthesiae, vertigo, muscle tremors, seizures, muscular paralysis, and respiratory or metabolic acidosis. Hypokalaemia is common. Renal impairment due to barium poisoning has been reported. Death from cardiac or respiratory failure may occur.

In acute poisoning, emptying the stomach by lavage is recommended if possible. Magnesium or sodium sulfate may be given to convert barium to insoluble barium sulfate. Hypokalaemia and metabolic acidosis should be corrected and ventilation assisted if necessary. Excretion may be increased by diuresis. Haemodialysis may be used in severe poisoning.

Reports of barium intoxication.

- Lewi Z, Bar-Khayim Y. Food poisoning from barium carbonate. *Lancet* 1964; **ii**: 342-3.
- Diengott D, et al. Hypokalaemia in barium poisoning. *Lancet* 1964; **ii**: 343-4.
- Gould DB, et al. Barium sulfide poisoning: some factors contributing to survival. *Arch Intern Med* 1973; **132**: 891-4.
- Berning J. Hypokalaemia of barium poisoning. *Lancet* 1975; **i**: 110.
- Wetherill SF, et al. Acute renal failure associated with barium chloride poisoning. *Ann Intern Med* 1981; **95**: 187-8.
- Phelan DM, et al. Is hypokalaemia the cause of paralysis in barium poisoning? *BMJ* 1984; **289**: 882.
- WHO. Barium. *Environmental Health Criteria* 107. Geneva: WHO, 1990. Available at: <http://www.inchem.org/documents/ehc/ehc/ehc107.htm> (accessed 24/07/08)
- Sigue G, et al. From profound hypokalaemia to life-threatening hyperkalemia: a case of barium sulfide poisoning. *Arch Intern Med* 2000; **160**: 548-51.
- Wells JA, Wood KE. Acute barium poisoning treated with hemodialysis. *Am J Emerg Med* 2001; **19**: 175-7.
- Jacobs IA, et al. Poisoning as a result of barium stypthinate explosion. *Am J Ind Med* 2002; **41**: 285-8.
- Bahlmann H, et al. Acute barium nitrate intoxication treated by hemodialysis. *Acta Anaesthesiol Scand* 2005; **49**: 110-12.

Uses and Administration

The soluble barium salts are not used in therapeutics but are widely used in industry. For the uses of barium chloride and barium hydroxide lime, see below. Barium sulfide has been used as a depilatory and barium carbonate was used as a rodenticide. The insoluble barium sulfate (p.1477) is used as a contrast medium.

Barium Chloride

Barii chloridum; Bario chloridas; Bariumchlorid; Bariumchloridi; Baru chlorok; Baryum, chlorine de.

Бария Хлорид.
Ba Cl₂ = 208.2.
CAS — 10361-37-2 (anhydrous barium chloride); 10326-27-9 (barium chloride dihydrate).

Pharmacopoeias. *Eur.* (see p.vii) includes a form for homeopathic preparations.

Ph. Eur. 6.2 (Barium Chloride Dihydrate for Homeopathic Preparations; Barii Chloridum Dihydricum ad Praeparationes Homeopathicas). A white or almost white, crystalline powder or colourless crystals. Freely soluble in water; very slightly soluble or practically insoluble in alcohol.

Profile

Barium chloride has several industrial uses including the manufacture of pigments and dyes, leather tanning, boiler detergents, water softeners, and aluminium refining.

The symbol † denotes a preparation no longer actively marketed

Barium chloride is a soluble salt and therefore potentially toxic if ingested. Systemic toxicity arising from burns to skin from molten barium chloride has been reported. For the adverse effects and treatment of barium and barium salts, and reference to barium chloride poisoning, see under Barium, above.

Homoeopathy. Barium chloride has been used in homeopathic medicines under the following names: Barium chloratum; Barya muriatica; Bar. mur.

Barium Hydroxide Lime

Bario, cal con hidróxido de.
CAS — 17194-00-2 (anhydrous barium hydroxide); 12230-71-6 (barium hydroxide octahydrate).

Pharmacopoeias. In *US*.

USP 31 (Barium Hydroxide Lime). A mixture of barium hydroxide octahydrate and calcium hydroxide; it may also contain potassium hydroxide. White or greyish-white granules, or coloured with an indicator to show when absorptive power is exhausted. It absorbs not less than 19% of its weight of carbon dioxide. Store in airtight containers.

Profile

Barium hydroxide lime is used similarly to soda lime to absorb carbon dioxide in closed-circuit anaesthetic apparatus. Barium hydroxide lime contains a soluble form of barium and is toxic if swallowed. For the adverse effects and treatment of barium poisoning, see above.

Precautions. Excessive drying out of barium hydroxide lime in anaesthetic apparatus, which may occur if oxygen flow through the equipment is left on for prolonged periods, can lead to the production of carbon monoxide and the risk of inducing carboxyhaemoglobinaemia in patients undergoing anaesthesia using the apparatus.¹

- Committee on Safety of Medicines/Medicines Control Agency. Safety issues in anaesthesia: volatile anesthetic agents and carboxyhaemoglobinaemia. *Current Problems* 1997; **23**: 7. Also available at: http://www.mhra.gov.uk/home/idcplg?ldcService=GET_FILE&dDocName=CON2023230&RevisionSelectionMethod=LatestReleased (accessed 14/07/06)

Basil

Albahaca; Basil Herb; Basilic; Basilici Herba; Basilienkraut; Sweet Basil.

Pharmacopoeias. In *Fr*.

Profile

The aerial parts of basil, *Ocimum basilicum* (Lamiaceae), are used in preparations for gastrointestinal disorders and as a diuretic. It is also used as a culinary herb.

Basil oil is an essential oil with antiseptic properties. It is used in perfumery and cosmetics and also in aromatherapy.

Preparations

Proprietary Preparations (details are given in Part 3)

Multi-ingredient: *Ger.*: Gastrol S†; Weleda-Rheumasalbe M; *Ital.*: Cit-rossystem; *Rus.*: Bronchitussin (Бронхитуссен); Bronchocin (Бронхоцин).

Bay Oil

Laurel dulce, aceite esencial de; Myrcia Oil; Oleum Myrciae.

NOTE. Distinguish from Laurel Leaf Oil (Bay Leaf Oil) which is obtained from the leaves of *Laurus nobilis* (Lauraceae).

Profile

Bay oil is a yellow volatile oil that darkens rapidly on exposure to air and has a pleasant odour and spicy taste. It is obtained by distillation from the leaves of *Pimenta racemosa* (Myrtaceae) and probably other allied species. The principal use of bay oil is in the preparation of bay rum, which is used as a hair lotion and as an astringent application. Bay oils from both *P. racemosa* and *Laurus nobilis* are used in aromatherapy.

Preparations

Proprietary Preparations (details are given in Part 3)

Multi-ingredient: *UK:* Adiantine; Medicated Extract of Rosemary.

Bayberry

Árbol de la cera; Bayberry Bark; Candle Berry Bark; Myrica; Wax Myrtle Bark.

NOTE. Bayberry has also been used as a synonym for bog myrtle (see p.2267).

Profile

Bayberry, the root bark of *Myrica cerifera* (Myricaceae), is used in upper respiratory-tract disorders and as a gargle for sore throat. It has also been used in gastrointestinal disorders, to treat vaginal discharge, and topically on ulcers and sores.

Homoeopathy. Bayberry has been used in homeopathic medicines under the following names: Myrica cerifera; Myri. cer.

Preparations

Proprietary Preparations (details are given in Part 3)

Multi-ingredient: *UK:* EP&C Essence; Peerless Composition Essence.

Bearberry

Bärentraubenblätter; Bearberry Leaves; Busserole; Busserole, feuille de; Gayuba; Lišč ma; Medvědicový list; Medveszöldlevel; Meškauguji lapai; Mjölönrisblad; Ptarmiganberry Leaves; Sianpuolukanlehti; Uvae ursi folium; Uva-Ursi.

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

Ph. Eur. 6.2 (Bearberry Leaf). The whole or cut dried leaves of the bearberry, *Arctostaphylos uva-ursi*. It contains not less than 7.0% of anhydrous arbutin, calculated with reference to the dried drug. Protect from light.

Profile

Bearberry has been reported to be a diuretic, bacteriostatic, and astringent and has been used in the treatment of urinary-tract disorders.

Homoeopathy. Bearberry has been used in homeopathic medicines under the following names: Uva ursi; Uva ur.

Preparations

Proprietary Preparations (details are given in Part 3)

Braz.: Uromed; **Cz.**: List Medvedice Lecive†; Medvedice†; **Ger.**: Cystinol Akut; Uvalysat; **Mex.**: Uvavid†; **Pol.**: Uversan.

Multi-ingredient: *Arg.*: Ajolip; KLB6 Fruit Diet; Water Pill c Potasio†; *Austral.*: Althaea Complex; Bioglan Cranibiotic Super; Cranberry Complex; De Witts New Pills; Extralife Fluid-Care; Extralife PMS-Care; Extralife Uri-Care; Fluid Loss†; Herbal Diuretic Formula†; Medinat PMT-Eze†; Proflu-id†; Protemp†; Urinase†; Uva-Ursi Complex†; Uva-Ursi Plus†; *Austria*: Uropurat; **Braz.**: Composto Anticelulítico†; Emagrevit†; Lisian†; Pilulas De Witt†; **Canada**: Herbal Diuretic; **Chile**: Primacy Phyto ††; **Cz.**: Blasen- und Nierenentee†; Species Urologicae Planta; Urocyton Planta; Urologicka Cajova Smes; **Fr.**: Mediflor Tisane Antirhumatismale No 2; Mediflor Tisane No 4 Diuretique; Uromil; Urophytum†; **Ger.**: Arctuvan; Harntee STADA; Presselin Nieren-Blasen K 3†; Prostatin F†; **Israel**: Jungborn; **Mex.**: Noxivid; **NZ**: De Witts Pills†; **Pol.**: Nefrosept Urofort; **Port.**: Asic†; Rilastil Dermo Solar; **Rus.**: Herbion Urological Drops (Гербийон Урологические Капли); **Spain**: Genurat; Urison†; **Switz.**: Demonatur Dragees pour les reins et la vessie; Dragees S pour les reins et la vessie; Strath Gouttes pour les reins et la vessie; Tisane pour les reins et la vessie; Urinex; **UK**: Antitis; Aqua Ban Herbal; Backache; Backache Relief; Cascade; De Witt's K & B Pills; Diuretabis; HealthAid Boldo-Plus; HRI Water Balance; Kas-Bah; Modern Herbals Water Retention; Prementa†; Sciargo; Tabritis; Uvacin; Watershed.

Belladonna

Belladon; Belladonna; Belladone; Belladone, feuille de (belladonna leaf); Belladonnaablad (belladonna leaf); Belladonnae folium (belladonna leaf); Belladonnaheiti (belladonna leaf); Deadly Nightshade; Lišč pokrzyku (belladonna leaf); Nadragulyalevel (belladonna leaf); Rulkový list (belladonna leaf); Šunvyšnių lapai (belladonna leaf); Tollkirschen.

ATC — A03BA04.

ATC Vet — QA03BA04.

Pharmacopoeias. *Eur.* (see p.vii) and *US* include a monograph for Belladonna Leaf. *Chin.* includes Belladonna Herb.

Eur. also includes Prepared Belladonna Leaf, Standardised Belladonna Leaf Tincture, and Standardised Belladonna Leaf Dry Extract.

Jpn includes only Belladonna Root.

Ph. Eur. 6.2 (Belladonna Leaf; Belladonnae Folium). It consists of the dried leaf, or dried leaf and flowering, and occasionally fruit-bearing, tops of *Atropa belladonna*. It contains not less than 0.30% of total alkaloids, calculated as hyoscyamine. The alkaloids consist mainly of hyoscyamine together with smaller amounts of hyoscyne. It has a slightly nauseous odour. Protect from light.

The BP 2008 directs that when Belladonna Herb, Belladonna Leaf, or Powdered Belladonna Herb is prescribed, Prepared Belladonna Herb shall be dispensed.

Ph. Eur. 6.2 (Belladonna, Prepared; Belladonnae Pulvis Normatus; Prepared Belladonna Herb BP 2008). It is belladonna leaf powder adjusted to an alkaloidal content of 0.28 to 0.32% of total alkaloids, calculated as hyoscyamine. Store in airtight containers. Protect from light.

USP 31 (Belladonna Leaf). It consists of the dried leaf and flowering or fruiting top of *Atropa belladonna* (Solanaceae). It yields not less than 0.35% of the alkaloids of belladonna leaf. When moistened, its odour is slight, somewhat tobacco-like. Avoid long exposure to direct sunlight. Protect powdered Belladonna Leaf from light.

Stability in mixtures. Atropine in belladonna preparations was unstable at alkaline pH and would quickly be degraded in mixtures with a pH above 7.¹ Such mixtures in the BPC 1973 included Aluminium Hydroxide and Belladonna Mixture, Cascara and Belladonna Mixture, and Magnesium Trisilicate and Belladonna Mixture.

- PSGB Lab Report P71/9 1971.

Adverse Effects, Treatment, and Precautions

As for Atropine Sulfate, p.1219.

Interactions

As for antimuscarinics in general (see Atropine Sulfate, p.1220).