Corbadrine *(rINN)* ⊗

Corbadrina; Corbadrinum; *l*-3,4-Dihydroxynorephedrine; Levonordefrin; *l*-Nordefrin. (–)-2-Amino-1-(3,4-dihydroxyphenyl)propan-1-ol.

Корбадрин

$C_9H_{13}NO_3$ = 183.2.

CAS — 829-74-3 (corbadrine); 6539-57-7 (nordefrin); 61-96-1 (nordefrin hydrochloride).

Pharmacopoeias. In *US*.

USP 31 (Levonordefrin). A white to buff-coloured, odourless, crystalline solid. Practically insoluble in water; slightly soluble in alcohol, in acetone, in chloroform, and in ether; freely soluble in aqueous solutions of mineral acids.

Profile

Corbadrine is a sympathomimetic (p.1407) that has been added to local anaesthetic preparations in dentistry to diminish absorption and to localise the effect; a concentration of 1 in 20 000 has been used.

Preparations

USP 31: Mepivacaine Hydrochloride and Levonordefrin Injection; Procaine and Tetracaine Hydrochlorides and Levonordefrin Injection; Propoxycaine and Procaine Hydrochlorides and Levonordefrin Injection.

Proprietary Preparations (details are given in Part 3)

Used as an adjunct in: ***Canad.:*** Polocaine†; ***USA:*** Carbocaine with Neo-Cobefrin; Isocaine; Polocaine.

Coriander

Coentro; Coriand.; Coriander Fruit; Coriander Seed; Coriandre; Coriandri fructus; Fruto del cilantro; Kalendrų vaisiai; Koriander; Koriandertermés; Koriandrový plod; Korianteri; Owoc kolendry.

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

Ph. Eur. 6.2 (Coriander). The dried cremocarp of *Coriandrum sativum*, containing not less than 0.3% v/w of essential oil, calculated with reference to the dried substance. Protect from light. The BP 2008 directs that when Powdered Coriander is prescribed or demanded material containing not less than 0.2% v/w of essential oil shall be dispensed or supplied.

Profile

Coriander is the source of coriander oil (below). It is a carminative and is used as a flavour.

Preparations

Proprietary Preparations (details are given in Part 3)

Multi-ingredient: ***Arg.:*** Salutaris; ***Austria:*** Brady's-Magentropfen; Mariazeller; Planta Lax; ***Braz.:*** Fitolax; Florlax; Fontolax; Frutalax†; Laxarine†; Laxtam; Naturetti; Sene Composta†; Tamaril; Tamarine; Tamarix†; ***Cz.:*** Abfuhr-Heilkräutertee†; Carminativum Babynos†; Hertz- und Kreislauftee†; ***Fr.:*** Mediflor Tisane Digestive No 3; ***Ger.:*** Carminativum Babynos†; Floradix Multipretten N; Gastrol S†; Presselin Dyspeptikum†; Ramend Krauter†; ***Ital.:*** Cadifen; Cadimint; Dicalmir; Tamarine; ***Mex.:*** Naturetti†; ***Pol.:*** Cholesol; Diges-Tonic; ***S.Afr.:*** Melissengeist; Spiritus Contra Tussim Drops; ***Spain:*** Agua del Carmen; Jarabe Manceau; Pruina; ***Switz.:*** Alcoolat de Melisse†; ***UK:*** Melissa Comp..

Coriander Oil

Cilantro, aceite esencial de; Coriandre, huile essentielle de; Coriandri aetheroleum; Coriandri Etheroleum; Kalendrų eterinis aliejus; Korianderolja; Koriandrová silice; Korianteriöljy; Ol. Coriand; Oleum Coriandri.

Pharmacopoeias. In *Eur.* (see p.vii). Also in *USNF*.

Ph. Eur. 6.2 (Coriander Oil). An essential oil obtained by steam distillation from the fruits of *Coriandrum sativum*. A clear colourless or pale yellow liquid, with the characteristic spicy odour. It contains not less than 65% and not more than 78% of linalol. Relative density 0.860 to 0.880. Store in well-filled airtight containers at a temperature not exceeding 25°. Protect from light.

USNF 26 (Coriander Oil). The volatile oil obtained by steam distillation from coriander. Specific gravity 0.863 to 0.875. Soluble 1 in 3 of alcohol (70%). Store in airtight containers at a temperature not exceeding 40°. Protect from light.

Profile

Coriander oil is aromatic and carminative and is used as a flavour.

Preparations

BP 2008: Compound Orange Spirit; Compound Rhubarb Tincture; ***USNF 26:*** Compound Orange Spirit.

Proprietary Preparations (details are given in Part 3)

Multi-ingredient: ***Ger.:*** Floradix Multipretten N; Gastricard†; Gastrysat; ***Ital.:*** Valda Propoli; ***Pol.:*** Argol Essenza Balsamica; Argol Grip; Argol Rheuma; ***Rus.:*** Espol (Эспол).

Corn Silk

Maíz, barba del; Stigma Maydis; Zea.

Pharmacopoeias. In *Fr.*

Profile

Corn silk, the stigma and style of maize (*Zea mays*) (Gramineae), has diuretic properties and is used for urinary-tract disorders including renal calculi.

Maize is widely used as a food and has also been used in herbal medicine.

Preparations

Proprietary Preparations (details are given in Part 3)

Fr.: Insadol; ***Switz.:*** Insadol; ***UK:*** Protat.

Multi-ingredient: ***Austral.:*** Althaea Complex; Urinase†; ***Pol.:*** Neopoldanen; ***Spain:*** Diurinat; Renusor†; ***UK:*** Elixir Damiana and Saw Palmetto.

Cottonseed Oil

Algodón, aceite de; Bomullsfröolja; Coton, huile de; Cotton Oil; Gossypii oleum; Gossypii Oleum Latin; Gyapotmagolaj; Ol. Gossyp. Sem.; Oléo de Algodoeiro; Oleum Gossypii Seminis; Puuvillansiemenöljy; Vilnamedžių aliejus.

CAS — 8001-29-4.

Pharmacopoeias. In *USNF*, which also includes hydrogenated cottonseed oil.

Eur. (see p.vii) includes only the hydrogenated oil.

Ph. Eur. 6.2 (Cottonseed Oil, Hydrogenated; Gossypii Oleum Hydrogenatum). Obtained by refining and hydrogenation of oil obtained from seeds of cultivated plants of various varieties of *Gossypium hirsutum* or of other species of *Gossypium*. It consists mainly of triglycerides of palmitic and stearic acids. It is a white or almost white mass or powder which melts to a clear pale yellow liquid when heated. M.p. 57° to 70°. Practically insoluble in water; very slightly soluble in alcohol; freely soluble in dichloromethane and in toluene. Protect from light.

USNF 26 (Cottonseed Oil). The refined fixed oil obtained from the seed of plants of various varieties of *Gossypium hirsutum* or of other species of *Gossypium* (Malvaceae). It is a pale yellow, oily liquid, odourless or nearly so. Slightly soluble in alcohol; miscible with carbon disulfide, with chloroform, with ether, and with petroleum spirit. Store in airtight containers at a temperature not exceeding 40°. Protect from light. At temperatures below 10° particles of solid fat may separate from the oil and at about 0° to –5° the oil becomes a solid or nearly so.

USNF 26 (Hydrogenated Cottonseed Oil). It is obtained by hydrogenating Cottonseed Oil and consists mainly of triglycerides of palmitic and stearic acids. A white mass or powder that melts to a clear, pale yellow liquid when heated. M.p. 57° to 70°. Practically insoluble in water; very slightly soluble in alcohol; freely soluble in dichloromethane and in toluene. Store in airtight containers. Protect from light.

Profile

Cottonseed oil is used as an oily vehicle.

An extract of cottonseed oil, gossypol (p.2316), has been tried as a contraceptive in males.

Couch-grass

Agropyron; Chiendent; Chiendent, rhizome de; Dogs Grass; Grama; Graminis rhizoma; Juolavehnänjuurakko; Kłącze perzu; Kvickrot; Pýrový oddenek; Quackgrass; Tarackbúza-gyökértörzs; Triticum; Twitch; Varpučių šakniastiebiai.

Пырей Ползучий

NOTE. Distinguish from Wheat, *Triticum aestivum* (see p.2415).

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

Ph. Eur. 6.2 (Couch Grass Rhizome). The whole or cut, washed and dried rhizome of *Agropyron repens* (*Elymus repens*); the adventitious roots are removed. Protect from light.

Profile

Couch-grass is a mild diuretic that has been used in herbal medicine in the treatment of urinary-tract disorders. It contains glucose, mannitol, inositol, and triticin (a carbohydrate resembling inulin). The Latin binomials *Elytrigia repens* and *Triticum repens* have also been applied to couch-grass.

Preparations

Proprietary Preparations (details are given in Part 3)

Ger.: Acorus.

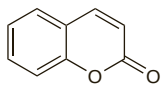
Multi-ingredient: ***Austria:*** Abfuhrtee†; ***Fr.:*** Drainuryl; Herbesan; Mediflor Tisane Antirhumatismale No 2; Mediflor Tisane No 4 Diuretique; Obeflorine; Tisane Hepatique de Hoerdt; ***Ger.:*** Hevert-Blasen-Nieren-Tee N; Presselin Stoffwechsel-Tee Hapeka 225 N†; Renob Blasen- und Nierentee; ***Ital.:*** Betulla (Specie Composta)†; Emmenoiasi; Gramigna (Specie Composta)†; Tisana Kelemata; ***Pol.:*** Dentosept; Diabetofort; Diabetosol; Laxantol; NeoFitolizyna; ***Spain:*** Diurinat; Renusor†; ***UK:*** Antitis; Kas-Bah.

Coumarin

1,2-Benzopyrone; 5,6-Benzo-α-pyrone; Cumarin; Cumarina; Kumaryna; Tonka Bean Camphor. 2*H*-1-Benzopyran-2-one.

$C_9H_6O_2$ = 146.1.

CAS — 91-64-5.



Pharmacopoeias. In *Ger.*

Profile

Coumarin is the odorous principle of Tonka seed (Tonka or Tonquin bean); it may be prepared synthetically. Coumarin has been given to reduce excess tissue protein and associated fluid in the treatment of lymphoedema (see below). It has also been used as a fixative in perfumery and as a flavour. It is reported to be an immunostimulant and has been tried in the treatment of malignant neoplasms.

Coumarin derivatives are used as anticoagulants; coumarin itself is not an active anticoagulant.

Effects on the liver. Coumarin has been classified as hepatotoxic based on studies in *animals* and effects ranging from elevated liver enzymes to serious organ damage has been reported in humans. Seventeen of 2173 patients enrolled in a study of coumarin developed elevated liver enzyme values;[1] the majority of patients were given 100 mg coumarin daily for 1 month followed by 50 mg daily for 2 years. However, none of the patients developed permanent liver damage and liver enzyme values returned to normal in 5 patients who continued taking coumarin. Results from 5 studies supported by the Lymphoedema Association of Australia, in which patients received 400 mg daily for a mean duration of 14.6 months, showed 2 cases of hepatotoxicity among 1106 patients.[2] In the period of 14 months up to May 1995, the Australian Drug Evaluation Committee received 10 reports of suspected adverse reactions to coumarin,[3] including 6 cases of jaundice in women who had taken 400 mg daily for 1 to 4 months. Periportal and lobular necrosis were found on biopsy in 1 case and another had a fatal outcome due to massive hepatic necrosis.

Reports of hepatotoxicity have led to the withdrawal of coumarin in a number of countries.

1. Cox D, *et al.* The rarity of liver toxicity in patients treated with coumarin (1,2-benzopyrone). *Hum Toxicol* 1989; **8:** 501–6.
2. Casley-Smith JR, Casley-Smith JR. Frequency of coumarin hepatotoxicity. *Med J Aust* 1995; **162:** 391.
3. Anonymous. Lodema and the liver. *Aust Adverse Drug React Bull* 1995; **14:** 11. Also available at: http://www.tga.gov.au/adr/aadrb/aadr9508.htm (accessed 30/07/08)

Lymphoedema. Benzopyrones such as coumarin are reported to reduce excess protein in tissues with high-protein oedema, hence the use of coumarin in lymphoedema of various causes, including postmastectomy, and filarial lymphoedema and elephantiasis.[1-5] Evidence for its efficacy is, however, conflicting;[4-6] at best the action is slow and treatment may need to be given for 6 months to 2 years before any benefit is seen.

1. Jamal S, *et al.* The effects of 5,6 benzo-[a]-pyrone (coumarin) and DEC on filaritic lymphoedema and elephantiasis in India: preliminary results. *Ann Trop Med Parasitol* 1989; **83:** 287–90.
2. Turner CS. Congenital lymphedema. *JAMA* 1990; **264:** 518.
3. Casley-Smith JR, *et al.* Treatment of lymphedema of the arms and legs with 5,6-benzo-[α]-pyrone. *N Engl J Med* 1993; **329:** 1158–63.
4. Casley-Smith JR, *et al.* Treatment of filarial lymphoedema and elephantiasis with 5,6-benzo-α-pyrone (coumarin). *BMJ* 1993; **307:** 1037–41.
5. Casley-Smith JR. Benzo-pyrones in the treatment of lymphoedema. *Int Angiol* 1999; **18:** 31–41.
6. Loprinzi CL, *et al.* Lack of effect of coumarin in women with lymphedema after treatment for breast cancer. *N Engl J Med* 1999; **340:** 346–50.

Preparations

Proprietary Preparations (details are given in Part 3)

Arg.: Esberiven; ***Ger.:*** Venalot mono†; ***Ital.:*** Linfovenodren.

Multi-ingredient: ***Arg.:*** Esberiven; Microsuy; ***Braz.:*** Flebotrat†; Micotox†; Varicoss; Venalot; Venalot H; ***Ger.:*** Caye Rheuma-Balsam; Venalot; Venalot N†; ***Ital.:*** Flebolider; ***Mex.:*** Venalot.

Coutarea Latiflora

Copalchi.

NOTE. The name copalchi has also been applied to *Croton niveus* (Euphorbiaceae).

Profile

Coutarea latiflora is an ingredient of herbal remedies used in the management of diabetes mellitus. For a report of hepatotoxicity associated with a preparation containing *Coutarea latiflora* see Centaury, p.2279.

Adverse effects. Rhabdomyolysis and haemolysis occurred in a 58-year-old man 2 days after starting treatment with *Coutarea latiflora*.[1] The patient had a similar reaction 4 years earlier after taking the same product.

1. Roca B. Rhabdomyolysis and hemolysis after use of Coutarea latiflora. *Am J Med* 2003; **115:** 677.

Preparations

Proprietary Preparations (details are given in Part 3)

Ger.: Sucontral.

Cowberry

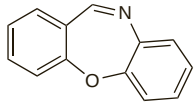
Alpine Cranberry; Arándano rojo; Liść brusznicy (leaf); Red Whortleberry; Vitis Idaeae Folium (leaf).

Pharmacopoeias. In *Pol.*

Profile
The leaves of the cowberry, *Vaccinium vitis-idaea* (Ericaceae), have astringent properties and have been used as a domestic remedy for diarrhoea.

Preparations
Proprietary Preparations (details are given in Part 3)
Multi-ingredient: ***Pol.:*** Diuronis.

CR Gas
EA-3547; Gas CR. Dibenz[*b,f*][1,4]oxazepine.
$C_{13}H_9NO$ = 195.2.
CAS — 257-07-8.



Profile
A riot-control gas with irritant and lachrymatory properties similar to those of CS gas (p.2290); it is described as a tear gas. CR gas is reported not to be hydrolysed by water and therefore to be suitable for use in water cannons.

◊ References.

1. Blain PG. Tear gases and irritant incapacitants. 1-chloroacetophenone, 2-chlorobenzylidene malononitrile and dibenz[b,f]-1,4-oxazepine. *Toxicol Rev* 2003; **22:** 103–10.

Cranberry
Arándano.

Pharmacopoeias. *US* includes a liquid preparation.
USP 31 (Cranberry Liquid Preparation). The bright red juice derived from the fruits of *Vaccinium macrocarpon* or *V. oxycoccos* (Ericaceae). It contains no added substances and is for manufacturing purposes only. pH between 2.4 and 2.6. Store at 2° to 8°.

Profile
Cranberry consists of the fruit of *Vaccinium macrocarpon*, the American cranberry or *V. oxycoccus*, the European cranberry. Cranberry juice has been reported to reduce the incidence of urinary-tract infections.

Interactions. For a report of interactions between cranberry juice and *warfarin*, see p.1430.

Urinary-tract infections. Cranberries and cranberry juice have been used widely for many years for both the prevention and treatment of urinary-tract infections. A systematic review[1] of available data concluded that there was some evidence that cranberry juice for prevention may decrease the number of symptomatic urinary-tract infections in women over a 12 month period, particularly those with recurrent infections. However, evidence for efficacy in the elderly is inconclusive, and currently lacking in patients with neurogenic bladder. The authors recommended further controlled studies in all susceptible patient groups, and also into more acceptable dosage formulations. However, another such review[2] assessing the effectiveness of cranberry for treatment concluded that there was no good quality evidence to suggest that it is effective.

1. Jepson RG, Craig JC Cranberries for preventing urinary tract infections. Available in The Cochrane Database of Systematic Reviews; Issue 1. Chichester: John Wiley; 2008 (accessed 18/04/08).
2. Jepson RG, *et al.* Cranberries for treating urinary tract infections. Available in The Cochrane Database of Systematic Reviews; Issue 4. Chichester: John Wiley; 1998 (accessed 18/04/08).

Preparations
Proprietary Preparations (details are given in Part 3)
Arg.: Urosedac; ***Austral.:*** Uricleanse†; ***Canad.:*** Cran Max†; ***Fr.:*** Cys Control; Gyndelta; ***Ital.:*** Ivumir.

Multi-ingredient: ***Arg.:*** Uridon; ***Austral.:*** Bioglan Cranbiotic Super; Cranberry Complex; Extralife Uri-Care; ***Canad.:*** Cran-C†; Prostease; ***Hong Kong:*** Prostease; ***Pol.:*** Diabetosol; Urosept.

Crataegus
Aubépine; Aubépine, baie d' (hawthorn berries); Aubépine, feuille et fleur d' (hawthorn leaf and flowers); Biancospino; Crataegi folium cum flore (hawthorn leaf and flowers); Crataegi fructus (hawthorn berries); Crataegi Inflorescentia (hawthorn leaf and flowers); English Hawthorn; Galagonyatermés (hawthorn berries); Gudobelių vaisiai (hawthorn berries); Hagtornsbär (hawthorn berries); Haw; Hlohový plod (hawthorn berries); Kwiatostan głogu (hawthorn leaf and flowers); Orapihlajanmarja (hawthorn berries); Owoc głogu (hawthorn berries); Pilriteiro; Weissdorn; Whitethorn.
ATC — C01EB04.
ATC Vet — QC01EB04.

Pharmacopoeias. In *Chin.*, *Eur.* (see p.vii), and *US*.
Ph. Eur. 6.2 (Hawthorn Berries; Crataegi Fructus). The dried false fruits of *Crataegus oxyacantha* (*C. laevigata*), or *C. monogyna*, or their hybrids or a mixture of these false fruits. They contain not less than 1% of procyanidins, calculated as cyanidin chloride ($C_{15}H_{11}ClO_6$ = 322.7) with reference to the dried drug. Protect from light.
Ph. Eur. 6.2 (Hawthorn Leaf and Flower; Crataegi Folium cum Flore). The whole or cut, dried flower bearing branches of *Crataegus oxyacantha* (*C. laevigata*), or *C. monogyna*, or their hybrids or, more rarely, other European *Crataegus* species including *C. pentagyna*, *C. nigra*, and *C. azarolus*. It contains not less than 1.5% of flavonoids, calculated as hyperoside ($C_{21}H_{20}O_{12}$ = 464.4) calculated with reference to the dried drug. Protect from light.
USP 31 (Hawthorn Leaf with Flower). The dried tips of the flower-bearing branches up to 7 cm in length of *Crataegus monogyna* or *C. laevigata*, also known as *C. oxyacantha* (Rosaceae). It contains not less than 0.6% of *C*-glycosylated flavones, expressed as vitexin ($C_{21}H_{20}O_{10}$ = 432.4), and not less than 0.45% of *C*-glycosylated flavones, expressed as hyperoside, calculated with reference to the dried drug. Protect from light.

Profile
Crataegus contains flavonoid glycosides with cardiotonic properties similar to those of digoxin (p.1259). Crataegus is used in herbal medicine.

Homoeopathy. Crataegus has been used in homoeopathic medicines under the following names: Crataegus oxyacantha; Crat. oxy.

◊ Crataegus is used in herbal medicine for cardiovascular disorders.[1-4] A systematic review[4] of controlled studies concluded that it shows significant benefit compared with placebo as an adjunctive treatment for chronic heart failure. A review[3] of data currently available indicates that it is rarely associated with serious adverse affects, although the authors noted that problems may occur with its unsupervised use, especially if given with other drugs.

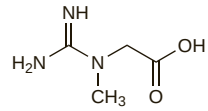
1. Rigelsky JM, Sweet BV. Hawthorn: pharmacology and therapeutic uses. *Am J Health-Syst Pharm* 2002; **59:** 417–22.
2. Chang Q, *et al.* Hawthorn. *J Clin Pharmacol* 2002; **42:** 605–12.
3. Daniele C, *et al.* Adverse-event profile of Crataegus spp.: a systematic review. *Drug Safety* 2006; **29:** 523–35.
4. Pittler MH, *et al.* Hawthorn extract for treating chronic heart failure. Available in The Cochrane Database of Systematic Reviews; Issue 1. Chichester: John Wiley; 2008 (accessed 18/04/08).

Preparations
Ph. Eur.: Hawthorn Leaf and Flower Dry Extract.

Proprietary Preparations (details are given in Part 3)
Austria: Bericard; Crataegan; Crataegutt; ***Belg.:*** Aubeline; ***Braz.:*** Dekatin; ***Chile:*** Cratenox; ***Cz.:*** Caj z Hlohu; Cardiplant†; Hloh; Kneipp Pflanzen-Dragees Weissdorn†; ***Fr.:*** Aubeline; Cardiocalm; Spasmosedine†; ***Ger.:*** Adenylocrat†; Ardeycordal mono; Basticrat†; Born; Chronocard N; Cordapur Novo; Corocrat†; Craegium; Cratae-Loges; Crataegutt; Crataegysat; Crataepas†; Cratecor†; Dr Niedermaier Herztonikum; Esbericard novo; Faros; Koro-Nyhadin; Kytta-Cor; Lomacard†; Natucor; Orthangin novo; Oxacant-mono; Poikilocard Mono†; Protecor novo; Regulacor-POS; Senicor†; Steicorton†; Stenocrat mono; ***Hung.:*** Crataegutt†; ***Pol.:*** Cardiplant; Chronocard; Cratonic; ***Rus.:*** Doppelherz Cardiovital (Доппельherц Кардиовитал); Novo-Passit (Ново-Пассит); ***Switz.:*** Cardiplant; Crataegisan; Crataegitan; Faros; Sedosan-N†; Vitacor.

Multi-ingredient: ***Arg.:*** Hepatodirectol; Passacanthine†; Sequals G; ***Austral.:*** Asa Tones; Bioglan Bioage Peripheral; Coleus Complex; Dan Shen Compound; For Peripheral Circulation Herbal Plus Formula 5; Gingo A†; Ginkgo Biloba Plus†; Ginkgo Complex†; Lifechange Circulation Aid†; Lifesystem Herbal Formula 6 For Peripheral Circulation†; Multi-Vitamin Day & Night†; ***Austria:*** Corodyn†; Omega; Rutivisal; Virgilocard; Wechseltee St Severin; ***Belg.:*** Natudor; Sedinal; Seneuval; ***Braz.:*** Anevrase†; Calman; Calmazin†; Calmiplan; Floriny; Pasalix; Pasic; Passi Catha†; Passiflora Composta†; Passiflorine; Sedalin†; Serenus; Sominex; ***Chile:*** Armonyl; ***Cz.:*** Alvisan Neo; Fytokliman Planta; Hertz- und Kreislaufte†; Hypotonicka; Novo-Passit; Valofyt Neo; ***Fr.:*** Anxoral†; Biocarde; Euphytose; Germose†; Lenicalm†; Mediflor Tisane Calmante Troubles du Sommeil No 14; Mediflor Tisane Circulation du Sang No 12; Natudor; Neuroflorine; Nicoprive; Nocvalene†; Okimus; Passiflorine; Passinevryl; Phytocalm†; Sedatif Tiber; Sedopal; Spasmine; Sympaneurol; Sympathyl; Sympavagol; Tranquital; Vagostabyl; ***Ger.:*** Antihypertonicum S; Ardeycordal N†; Asgoviscum N†; Biovital Aktiv†; Biovital Classic; Bomacorin; Cardibisana†; Cardio-Kreislauf-Longoral; Chlorophyl liquid "Schuh"†; Convallocor-SL; Convastabil; Cor-Select†; Fovysat†; Ginseng-Complex "Schuh"†; Herz-Starkung N†; Heusin†; Ilja Rogoff; JuVi-ton†; Korodin; Lacoerdin Mg Plus†; Nephrisan P†; Nitro-Crataegutt†; Oxacant N†; Oxacant-forte N†; Oxacant-Khella N†; Oxacant-sedativ; Passin; Presselin Arterien K 5 P†; Protecor; Salus Herz-Schutz-Kapseln†; Saluscor Herz-Schutz; Septacord; Stenocrat†; Tornix; Viscorapas duo†; ***Hong Kong:*** Ginkgo Plus Vivo-Livo†; ***Hung.:*** Biovital†; ***Indon.:*** Procardio; ***Israel:*** Nerven-Dragees; Passiflora; ***Ital.:*** Anevrasi; Bianco Val†; Controller; Lenicalm; Noctis; Parvisedil; Passiflorine; Sedatol; Sedofit; Sedopuer F; Vagostabil; ***Malaysia:*** Circarol; ***Mex.:*** Ifupasil; ***Philipp.:*** Circulan; ***Pol.:*** Alliorut; Biovital N; Cardiactiv; Cardiobonisol; Cardiol C; Cardiotonic; Cravisol; Fitoven; Ginkgocard; Herbaton; Kelicardina; Melis-Tonic; Melisal; Melissed; Neocardina; Neospasmina; Neospasmol; Nerwobonisol; Nerwonal; Passibil; Passispasmin; Passispasmol; Perfocrat; Sedomix; Tabletki Tonizujace; Venoforton; ***Port.:*** Gabisedil†; Neurocardol†; ***Rus.:*** Doppelherz Vitalotonik (Доппельherц Виталотоник); Herbion Drops for the Heart (Гербион Сердечные Капли); Passifit (Пассифит); ***Singapore:*** Noricaven†; ***Spain:*** Natusor High Blood Pressure†; Natusor Somnisedan†; Passiflorine; Sedasor†; Sedonat; Sonofit†; Tensiben†; ***Switz.:*** Arterosan Plus; Cardiaforce; Circulan; Dragees pour le coeur et les nerfs; Dragees sedatives Dr Welti; Gouttes pour le coeur et les nerfs Concentrees†; Ipasin; Phytomed Cardio; Sirop Passi-Par†; Strath Gouttes pour le coeur; Tisane pour le coeur et la circulation; Triallin; Valverde Coeur; ***Venez.:*** Cratex†; Equaliv; Ervostal; Eufytose†; Pasidor; Pasifluidina; Passiflorum.

Creatine
N-(Aminoiminomethyl)-*N*-methylglycine.
$C_4H_9N_3O_2$ = 131.1.
CAS — 57-00-1 (creatine); 6020-87-7 (creatine monohydrate).



Creatine Phosphate
Creatina, fosfato de; Creatine Phosphoric Acid; Fosfocreatine; Phosphocreatine. *N*-[Imino(phosphonoamino)-methyl]-*N*-methylglycine.
$C_4H_{10}N_3O_5P$ = 211.1.
CAS — 67-07-2 (creatine phosphate); 922-32-7 (creatine phosphate disodium).
ATC — C01EB06.
ATC Vet — QC01EB06.

Profile
Creatine is an endogenous substance found mainly in skeletal muscle of vertebrates. Creatine phosphate and its disodium salt have been tried in the treatment of cardiac disorders. Creatine phosphate has also been added to cardioplegic solutions. Creatine monohydrate has been tried in metabolic disorders and used as a dietary supplement. It is also under investigation for the treatment of Parkinson's disease, motor neurone disease (p.2380), Duchenne muscular dystrophy, and Huntington disease.

◊ References.

1. Pedone V, *et al.* An assessment of the activity of creatine phosphate (Neoton) on premature ventricular beats by continuous ECG monitoring in patients with coronary cardiac disease. *Clin Trials J* 1984; **21:** 91.
2. Ferraro S, *et al.* Acute and short-term efficacy of high doses of creatine phosphate in the treatment of cardiac failure. *Curr Ther Res* 1990; **47:** 917–23.
3. Mastoroberto P, *et al.* Creatine phosphate protection of the ischemic myocardium during cardiac surgery. *Curr Ther Res* 1992; **51:** 37–45.
4. Stöckler S, *et al.* Creatine replacement therapy in guanidinoacetate methyltransferase deficiency, a novel inborn error of metabolism. *Lancet* 1996; **348:** 789–90.
5. Mujika I, Padilla S. Creatine supplementation as an ergogenic aid for sports performance in highly trained athletes: a critical review. *Int J Sports Med* 1997; **18:** 491–6.
6. Juhn MS, Tarnopolsky M. Oral creatine supplementation and athletic performance: a critical review. *Clin J Sport Med* 1998; **8:** 286–97. Correction. *ibid.* 1999; **9:** 62.
7. Benzi G. Is there a rationale for the use of creatine either as nutritional supplementation or drug administration in humans participating in a sport? *Pharmacol Res* 2000; **41:** 255–64.
8. Persky AM, Brazeau GA. Clinical pharmacology of the dietary supplement creatine monohydrate. *Pharmacol Rev* 2001; **53:** 161–76.
9. Mazzini L, *et al.* Effects of creatine supplementation on exercise performance and muscular strength in amyotrophic lateral sclerosis: preliminary results. *J Neurol Sci* 2001; **191:** 139–44.
10. Groeneveld JG, *et al.* A randomized sequential trial of creatine in amyotrophic lateral sclerosis. *Ann Neurol* 2003; **53:** 437–45.
11. Persky AM, *et al.* Pharmacokinetics of the dietary supplement creatine. *Clin Pharmacokinet* 2003; **42:** 557–74.
12. Shefner JM, *et al.* A clinical trial of creatine in ALS. *Neurology* 2004; **63:** 1656–61.
13. Ellis AC, Rosenfeld Jo. The role of creatine in the management of amyotrophic lateral sclerosis and other neurodegenerative disorders. *CNS Drugs* 2004; **18:** 967–80.
14. Tarnopolsky MA, *et al.* Creatine monohydrate enhances strength and body composition in Duchenne muscular dystrophy. *Neurology* 2004; **62:** 1771–7.
15. Pline KA, Smith CL. The effect of creatine intake on renal function. *Ann Pharmacother* 2005; **39:** 1093–6.
16. Hersch SM, *et al.* Creatine in Huntington disease is safe, tolerable, bioavailable in brain and reduces serum 8OH2'dG. *Neurology* 2006; **66:** 250–2.
17. Bender A, *et al.* Creatine supplementation in Parkinson disease: a placebo-controlled randomized pilot trial. *Neurology* 2006; **67:** 1262–4.
18. Kley RA, *et al.* Creatine for treating muscle disorders. Available in The Cochrane Database of Systematic Reviews; Issue 1. Chichester: John Wiley; 2007 (accessed 18/04/08).

Preparations
Proprietary Preparations (details are given in Part 3)
Arg.: Musashi Creatina†; ***Cz.:*** Neoton; ***Ital.:*** Creatile; Neoton†; ***Pol.:*** Neoton; ***Rus.:*** Neoton (Неотон).

Multi-ingredient: ***Ital.:*** Fortium.

Creatinine
Creatinina. 2-Amino-1-methyl-4-imidazolidinone.
$C_4H_7N_3O$ = 113.1.
CAS — 60-27-5.

Pharmacopoeias. In *Ger.* Also in *USNF*.
USNF 26 (Creatinine). White, odourless, crystals or crystalline powder. Soluble in water; slightly soluble in alcohol; practically insoluble in acetone, in chloroform, and in ether.