



European Medicines Agency
Evaluation of Medicines for Human Use

London, 16 July 2009
Doc. Ref.: EMEA/HMPC/13632/2009

COMMITTEE ON HERBAL MEDICINAL PRODUCTS (HMPC)

DRAFT

LIST OF REFERENCES FOR ASSESSMENT OF

Rosmarini aetheroleum; Rosmarini folium
***Rosmarinus officinalis* L., aetheroleum; *Rosmarinus officinalis* L., folium**
(rosemary oil; rosemary leaf)

The EMEA acknowledges that copies of the underlying works used to produce this monograph were provided for research only with exclusion of any commercial purpose.

Abdul-Ghani AS, El-Lati SG, Sacaan AI and Suleiman MS. Anticonvulsant effects of some arab medicinal plants. *Int J Crude Drug Res* 1987, 25(1): 39-43.

Al-Sereiti MR, Abu-Amer KM, Sen P. Pharmacology of rosemary (*Rosmarinus officinalis* Linn.) and its therapeutic potentials. Abstract. *Indian J Exp Biol* 1999, 37(2): 124-30.

Anadón A, Martínez-Larrañaga MR, Martínez MA et al. Acute oral safety study of Rosemary extracts in rats. *J Food Prot* 2008, 71(4): 790-5.

Aqel MB. Relaxant effect of the volatile oil of *Rosmarinus officinalis* on tracheal smooth muscle. *J Ethnopharm* 1991, 33: 57-62.

Aqel MB. A vascular smooth muscle relaxant effect of *Rosmarinus officinalis*. *Int J Pharmacog* 1992, 30(4): 281-8.

Asai A, Nakagawa K, Miyazawa T. Antioxidative effects of turmeric, rosemary and capsicum extracts on membrane phospholipid peroxidation and liver lipid metabolism in mice. *Biosci Biotechnol Biochem* 1999, 63(12): 2118-22.

Babu US, Wiesenfeld PL, Jenkins MY. Effect of dietary rosemary extract on cell-mediated immunity of young rats. *Plant Foods for Human Nutrition* 1998, 53(2): 169-74.

Barceloux DG. Medical toxicology of natural substances. John Wiley & Sons Inc. 2008, 84: 574-578.

Barnes J, Anderson L, Phillipson JD. Herbal Medicines. A guide for health-care professionals, 2nd ed. London, Pharmaceutical Press, 2002.

7 Westferry Circus, Canary Wharf, London, E14 4HB, UK
Tel. (44-20) 74 18 84 00 Fax (44-20) 75 23 70 51

E-mail: mail@emea.europa.eu <http://www.emea.europa.eu>

© European Medicines Agency, 2009. Reproduction is authorised provided the source is acknowledged

Benjilali B, Ettalibi M, Ismaili-Alaoui M et al. Méthode d'étude des propriétés antiseptiques des huiles essentielles par contact direct en milieu gélosé. *Plantes médicinales et phytothérapie*, Tome XX, 1986, 2: 155-67.

Bisset NG, editor & translator. *Herbal Drugs and Phytopharmaceuticals*. Wichtl M. ed. London, Medpharm Scientific Publishers 1994, 428-30.

Boatto G, Pintore G, Palomba M. Composition and antibacterial activity of *Inula helenium* and *Rosmarinus officinalis* essential oils. *Fitoterapia* 1994, 65(3): 279-80.

Bult H, Herman AG, Rampart M. Modification of endotoxin-induced haemodynamic and haematological changes in the rabbit by methylprednisolone, F(ab')₂, fragments and rosmarinic acid. *Br J Pharmac* 1985, 84: 317-27.

Cabo J, Crespo ME, Jimenez J, Zarzuelo A. The spasmolytic activity of various aromatic plants from the province of Granada. *Plantes Médicinales et Phytothérapie*, 1986, 20(3): 213-8.

Calabrese V, Scapagnini G, Catalano C, et al. Biochemical studies of a natural antioxidant isolated from rosemary and its application in cosmetic dermatology. *Int J Tissue React* 2000, 22(1): 5-13.

Chandler. *Rosemary*. Clinical Edge, 1985, 40-53.

Collins MA, Charles HP. Antimicrobial activity of Carnosol and Ursolic acid: two anti-oxidant constituents of *Rosmarinus officinalis* L. *Food Microbiology* 1987, 4: 311-5.

Council of Europe, Committee of Experts on Flavouring Substances of the Council of Europe. 48th Meeting Strasbourg, 2001, 2-6 April.

De Smet, Keller K, Hänsel R, Chandler RF. *Adverse Effects of Herbal Drugs 2*. Springer-Verlag, 1993, 72.

Del Baño MJ, Castillo J, Benavente-García O, Lorente J, Martín-Gil R, Acevedo C, and Alcaraz M. Radioprotective-Antimutagenic Effects of Rosemary Phenolics against Chromosomal Damage Induced in Human Lymphocytes by γ -rays. *J Agric Food Chem* 2006, 54: 2064-8.

Dias PC, Foglio MA, Possenti A, de Carvalho JE. Antiulcerogenic activity of crude hydroalcoholic extract of *Rosmarinus officinalis* L. *J Ethnopharm* 2000, 69: 57-62.

Diego MA, Jones NA, Field T, Hernandez-Reif M, Schanberg S, Kuhn C, McAdam V, Galamaga R, Galamaga M.. Aromatherapy positively affects mood, EEG patterns of alertness and math computations. Abstract. *Int J Neurosci* 1998, 96(3-4): 217-24.

Dorman, HJD, Peltoketo A, Hiltunen R, Tikkanen MJ. Characterisation of the antioxidant properties of de-odourised aqueous extracts from selected Lamiaceae herbs. *Food Chemistry* 2003, 83: 255-262.

Duke JA. *Handbook of medicinal herbs*. Boca Raton, FL: CRC Press, 1985, 412-3.

Erenmemisoglu A, Saraymen R, Ustun S. Effect of a *Rosmarinus officinalis* leave extract on plasma glucose levels in normoglycaemic and diabetic mice. *Pharmazie* 1997, 52 (8): 645-6.

European Food Safety Authority. Scientific opinion of the Panel on Food Additives, Flavourings, Processing Aids and Materials in contact with Food (AFC) on a request from the Commission on Camphor in Flavourings and other food ingredients with flavourings properties. *The EFSA Journal* 2008, 729: 1-15.

European Food Safety Authority. Scientific opinion of the Panel on Food Additives, Flavourings, Processing Aids and Materials in contact with Food (AFC) on a request from the Commission on the use of rosemary extracts as a food additive. *The EFSA Journal*, 2008, 721: 1-29.

Fahim FA, Esmat AY, Fadel HM, Hassan KF. Allied studies on the effect of *Rosmarinus officinalis* L. on experimental hepatotoxicity and mutagenesis. Abstract. *Int J Food Sci Nutr* 1999, 50(6): 413-27.

Fang Xin, Wada Shun. Enhancing the antioxidant effect of α -tocopherol with rosemary in inhibiting catalysed oxidation caused by Fe^{2+} and hemoprotein. *Food Research International* 1993, 26: 405-11.

Felter HW & Lloyd JU. *King's American dispensatory*. Eclectic Medical Publications, Sandy, OR, 1983.

Fleurentin J, Hoefler C, Mortier F, Pelt JM. Pharmacologie des extraits de jeunes pousses et de plante entière de *Rosmarinus officinalis*. *Phytotherapie* 1986, 20: 19-30.

Forster HB, Niklas H. Antispasmodic Effects of Some Medicinal Plants. *Planta Medica*, 1980, 40(4): 309-19.

Fu Y, Zu Y, Chen L, Efferth T, Liang H, Liu Z, Liu W. Investigation of antibacterial activity of rosemary essential oil against *Propionibacterium acnes* with atomic force microscopy. *Planta Med* 2007, 73(12): 1275-80.

Giachetti D, Taddei E, Taddei I. Pharmacological Activity of Essential oils on Oddi's Sphincter. *Planta Med* 1988, 389-392.

Guerreiro M, Cunha A, Hydroxyl Scavenger Activity of *Rosmarinus Officinalis* L. XXI Congrès International de la Société de Pharmacie de la Méditerranée 7/9-10-1994, Italy.

Haloui M, Louedec L, Michel JB, Lyoussi B. Experimental diuretic effects of *Rosmarinus officinalis* and *Centaurium erythraea*. *J Ethnopharm* 2000, 71: 465-72.

Hatfield John G. *The Botanic Pharmacopoeia*. Birmingham: White & Pike, Moor Street Printing Works. 1886.

Haraguchi H, Saito T, Okamura N, Yagi A. Inhibition of Lipid Peroxidation and Superoxide Generation by Diterpenoids from *Rosmarinus officinalis*. *Planta Med* 1995, 61: 333-6.

Hay IC, Jamieson M, Ormerod AD. Randomized trial of aromatherapy - successful treatment for alopecia areata. *Arch Dermatol* 1998, 134(11):1349-52.

Héthelyi É, Koczka I, Tétényi P. Phytochemical and antimicrobial analysis of essential oils. *Herba Hungaria* 1989, 28(1-2).

Hjorth AB, Christophersen C, Hausen BM, Menné T. Occupational allergic contact dermatitis from carnosol, a naturally occurring compound present in rosemary. *Contact Dermatitis* 1997, 37: 99-100.

Ho, Chi-Tang, Osawa T, Huang Mou-Tuan, Rosen RT. Food Phytochemicals for Cancer Prevention II, 1994, ACS Symposium Series 547, Chapter I.

Hoefler C, Fleurentin J, Mortier F, Pelt JM, Guillemain J. Comparative Choleric and Hepatoprotective Properties of Young Sprouts and Total Plant Extracts of *Rosmarinus Officinalis* in Rats. *J Ethnopharm* 1987, 19: 133-43.

Hof S, Ammon HTP. Negative inotropic action of Rosemary oil, 1,8-cineole and bornyl acetate. *Planta Med* 1989, 55: 106-7.

Hosseinzadeh H, Nourbakhsh M. Effect of *Rosmarinus officinalis* L. Aerial parts extract on morphine withdrawal syndrome in mice. *Phytother Res* 2003, 17: 938-41.

Houlihan C, Ho CT, Chang S. The Structure of Rosmariquinone – a new antioxidant isolated from *Rosmarinus officinalis* L. *JAOCs* 1985, 62(1).

Huang Mou-Tuan, Ho Chi-Tang, Wang Zhi-Yuan et al. Inhibition of skin tumorigenesis by Rosemary and its constituents carnosol and ursolic acid. *Cancer research* 1994, 54: 701-8.

Ilarionova M et al. Cytotoxic effect on leukemic cells of the essential oils from rosemary, wild geranium and nettle and concret of royal Bulgarian rose. Abstracts of the Fourth International Conference of Anticancer Research, 1992, 21-25 October, Rethymnon, Crete, Greece.

Jain M, Banerji R, Nigam SK, Scheffer JJ, Chaturvedi HC. *In Vitro* Production of Essential Oil from Proliferating Shoots of *Rosmarinus officinalis*. *Planta Med* 1991, 57:122-4.

Joyeux M, Rolland A, Fleurentin J, Mortier F, Dorfman P. Tert-Butyl Hydroperoxide-Induced Injury in Isolated Rat Hepatocytes: A Model for Studying Anti-Hepatotoxic Crude Drugs. *Planta Med* 1990, 56:171-3.

Karamarkovic AR, Djuranovic SP, Popovic NP, Bumbasirevic. VD, Sijacki AD, Blazic IV. Hepatic abscess secondary to a rosemary twig migrating from the stomach into the liver. *World journal of gastroenterology* 2007, 13(41): 5530-2.

Khare CP, ed. *Indian Medicinal Plants. An Illustrated Dictionary*, 2007, 557-558.

Khatib S, Alkofahi A, Hasan M, Najib N. The cardiovascular effects of *Rosmarinus officinalis* extract on the isolated intact rabbit heart. *Fitoterapia* 1998, 69(6): 502-6.

Kimura Y, Okuda H. Studies on the activities of tannins and related compounds, x. effects of caffeetannins and related compounds on arachidonate metabolism in human polymorphonuclear leukocytes. *Journal of Natural Products* 1997, 50(3): 392-9.

Konstantopoulou I, Vassilopoulou L, Mavragani-Tsipidou P, Scouras ZG. Insecticidal effects of essential oils. A study of the effects of essential oils extracted from eleven Greek aromatic plants on *Drosophila auraria*. *Research articles. Experientia, Birkhäuser Verlag Basel*, 1992, 48(6): 616-9.

Kovar KA, Gropper B, Friess D & Ammon HPT. Blood levels of 1.8-Cineole and locomotor Activity of Mice After Inhalation and Oral Administration of Rosemary Oil. *Planta Med* 1987, 315-7.

Kuhlman et al. Phenolic Antioxidant Compounds Produced by in Vitro Cultures of Rosemary (*Rosmarinus officinalis*) and Their Anti-inflammatory Effect on Lipopolysaccharide-Activated Microglia. *Pharmaceutical Biology* 2006, 44(6): 401-10.

Larrondo JV, Calvo M. Effect of essential oils on *Candida albicans*: a scanning electron microscope study. *Faculty press, Biomedical Letters* 1991, 48: 269-72.

Lemonica IP, Damasceno DC, Di-Stasi LC. Study of the embriotoxic effects of an extract of rosemary (*Rosmarinus officinalis* L). *Brazilian Journal of Medical and Biological Research* 1996, 29: 223-7.

Leuschner J. Reproductive Toxicity Studies of D-Camphor in Rats and Rabbits. *Arzneim.-Forsch./Drug Res* 1997, 47(1): 124-8.

Luqman S, Dwivedi GR, Darokar MP, Kalra A and Khanuja SP. Potential of Rosemary oil to be used in drug resistant infectins. *Altern Ther Health Med* 2007, 13(5): 54-9.

Makino T, Ono T, Muso E, et al. Inhibitory effects of rosmarinic acid on the proliferation of cultured murine mesangial cells. *Nephrol Dial Transplant* 2000; 15(8): 1140-5.

McGuffin M, Hobbs C, Upton R, et al. *American Herbal Products Association's Botanical Safety Handbook*. CRC Press, Boca Raton, FL, 1997.

Minnunni M, Wolleb U, Mueller O, Pfeifer A, Aeshbacher HU. Natural antioxidants as inhibitors of oxygen species induced mutagenicity. *Mutation Research* 1992, 269: 193-200.

Mongold JJ, Camillieri S, Susplugas P, Taillade C, Masse JP, Serrano JJ. Activité Cholagogue/Cholérétique d'un Extrait Liophilisé de *Rosmarinus Officinalis* L. *Plantes Médicinales et Phytothérapie* 1991, 25(1) : 6-11.

Monographie Rosmarini folium BAnz., No. 223, 30.11.1985

Monographie Rosmarini folium, BAnz. No. 221, 28.11.1986

Monographie Rosmarini folium BAnz. No. 50, 13.03.1990

Moreno S, Scheyer T, Romano CS, Vojnov AA. Antioxidant and antimicrobial activities of rosemary extracts linked to their polyphenol composition. *Free Radical Research* 2006, 40(2): 223-31.

Morton JF. *Major medicinal plants: botany, culture and uses*. Springfield, ILL: Thomas , 1977:779-780

Nadkarni's. Indian Materia Medica. Bombay, Popular Prakashan Pvt. Ltd. Reprinted 1999; Vol 1

Nusier MK, Bataineh HN, Daradkah HM. Adverse effects of Rosemary (*Rosmarinus officinalis* L.) on reproductive function in adult male rats. *Exp Biol Med.* (Maywood) 2007, 232(6): 809-13.

Offord EA, Macé K, Ruffieux C, Malnoë A, Pfeifer AM. Rosemary components inhibit benzo[a]pyrene-induced genotoxicity in human bronchial cells. *Carcinogenesis* 1995, 16(9): 2057-62.

Offord EA, Macé K, Avanti O, Pfeifer AM. Mechanisms involved in the chemoprotective effects of rosemary extracts studied in human liver and bronchial cells. *Cancer Letters* 1997, 114: 275-81.

Panizzi L, Flamini G, Cioni PL, Morelli I. Composition and antimicrobial properties of essential oils of four Mediterranean Lamiaceae. *J Ethnopharm* 1993, 39: 167-70.

Paris A, Strukelj B, Renko M, Turk V, Pukl M, Umek A, Korant BD. Inhibitory effect of carnosic acid on HIV-1 protease in cell-free assays [corrected]. *J Nat Prod* 1993, 56(8): 1426-30.

Parnham MJ. Kesselring, Rosmarinic acid, *Drugs of the Future.* 1985, 10(9).

Pérez C, Anesini C. In vitro antibacterial activity of Argentine folk medicinal plants against *Salmonella typhi*. *J Ethnopharm* 1994, 44: 41-6.

Pharmacopée Française. Rosmarin. 1989.

Ritschel WA, Starzacher A, Sabouni A, Hussain AS, Koch HP. Percutaneous Absorption of Rosmarinic Acid in the Rat. *Exp Clin Pharmacol* 1989, 11(5): 345-52.

Rodet HJA, *Botanique Agricole et Medicale*, 2^aEd., P. Asselin, 1872, 611.

Romero E, Tateo F, Debiaggi M. Antiviral Activity of a "Rosmarinus officinalis L." Extract. *Mitt. Gebiet Lebensm. Hyg.* 1989, 80:113-9.

Samman S, Sandström B, Toft MB, Bukhave K, Jensen M, Sørensen SS, Hansen M. Green tea or rosemary extract added to foods reduces nonheme-iron absorption. *Am J Clin Nutr* 2001, 73: 607-12.

Sayr LE. *A manual of Organic Materia Medica and Pharmacognosy.* 4th ed. P. Blakiston's Son & Co, Philadelphia, 23.

Schwarz K, Ternes W, Schmauderer. Antioxidative constituents of *Rosmarinus officinalis* and *Salvia officinalis*. *Lebensm. Unters. Forsch.* 1992, 195:104-7.

Senorans FJ, Ibanez E, Cavero S, Tabera J, Reglero G. Liquid chromatographic-mass spectrometric analysis of supercritical-fluid extracts of rosemary plants. *Journal of Chromatography A* 2000, 870(1): 491-499.

Singletary K, MacDonald C, Wallig M. Inhibition by rosemary and carnosol of 7,12-dimethylbenz[a]anthracene (DMBA)-induced rat mammary tumorigenesis and in vivo DNBA-DNA adduct formation. *Cancer Letters* 1986, 104: 43-8.

Singletary K. Inhibition of DMBA-induced mammary tumorigenesis by rosemary extract. Abstracts of the Fourth International Conference of Anticancer Research, 1992, 21-25 October, Rethymnon, Crete, Greece.

Steinmetz MD, Vial M, Millet Y. Actions de l'huile essentielle de Romarin et de certains de ses constituants (Eucalyptol et Camphre) sur le cortex cerebral de rat in vitro. *Journal de Toxicologie Clinique et Experimentale* 1987, 7(4): 259-71.

Svodoba K. A Study on the Variability of Rosemary and Sage and their volatile oils on the British Market: their Antioxidative Properties. *Flavour and Fragrance Journal* 1992, 7: 81-7.

Texidor Y, Cos J. *Flora Farmacêutica de España Y Portugal*, Imprenta de José M. Ducazcal, Madrid, 1871, 643-4.

Taddei I, Giachetti D. An interpretative research on the variability of the choleric action of the essence of *Rosmarinus officinalis* L. in rat. *Pharmacological Research* 1993, 27(1).

Taddei I, Giachetti D, Taddei P, Mantovani P. Spasmolytic activity of Peppermint, Sage and Rosemary essences and their major constituents. *Fitoterapia* 1988, 59(6).

Tateo F, Fellin M, Santamaria L, Bianchi A and Bianchi L. *Rosmarinus officinalis* L. Extract Production Antioxidant and Antimutagenic Activity. *Perfumer & Flavorist* 1988, 13: 48-54.

Texidor Juan. *Flora Farmacêutica de España y Portugal*. Imprenta de José M. Ducazcal, 1871, 643-4.

Ting Zhu Bao, Loder D, Xiaoxin Cai M, Ho Chi-Tang, Huang Mou-Tuan, Conney Allan. Dietary administration of an extract from rosemary leaves enhances the liver microsomal metabolism of endogenous estrogens and decreases their uterotrophic action in CD-1 mice. *Carcinogenesis* 1998, 19(10): 1821-7.

Van Dyke TE, Braswell L, Offenbachers. Inhibition of gingivitis by topical application of ebselen and rosmarinic acid. *Inflammation Research* 1986, 19: 5-6.

Vanaclocha B., Cañigüeral S., *Fitoterapia, Vademecum de Prescripción*, Masson, 4^a Ed. 2003.

Wada Shun, Fang Shin. Synergistic Antioxidant Effects of Rosemary and α -Tocopherol at Different Storage Temperatures and Its Application for Inhibiting Dried Sardine Meat Oxidation. *Yukagaku* 1994, 43(2): 109-114.

Wanga W, Wua N, Zu YG, Fua YJ. Antioxidative activity of *Rosmarinus officinalis* L. essential oil compared to its main components. *Food Chemistry* 2008, 108: 1019-22.

Wren R.C., F.L.S., *Potter's Cyclopedia of Botanical Drugs and Preparations*, 2nd Ed., Ed. Potters & Clarks, Lda, London, 1951, 240.

Yesil-Celiktas O, Girgin G, Orhan H, Wichers H, Bedir E, Vardar-Sukan, F. Screening of free radical scavenging capacity and antioxidant activities of *Rosmarinus officinalis* extracts with focus on location and harvesting times. *Eur Food Res Technol* 2007, 224: 443-51.