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List of references supporting the assessment of *Centaurium erythraea* Rafn. s.l., herba

Final

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

Aberham A, Pieri V, Croom EM, Ellmerer E, Stuppner H. Analysis of iridoids, secoiridoids and xanthenes in *Centaurium erythraea*, *Frasera carolinensis* and *Gentiana lutea* using LC-MS and RP-HPLC. *J Pharm Biomed Anal* 2011, 54(3):517-525

Aquino R, Behar I, Garzarella P, Dini A, Pizza C. Composizione chimica e proprietà biologiche della *Erythraea centaurium* Rafn. [Chemical composition and biological properties of *Erythraea centaurium* Rafn.] *Boll Soc Ital Biol Sper* 1985, 61:165-169 (source: ESCOP Monograph)

Bellavita V, Schiaffella F, Mezzeti T. Triterpenoids of *Centaurium erythraea*. *Phytochemistry* 1974, 13:289-290 (source: ESCOP Monograph)

Berkan T, Ustünes L, Lermiöglu F, Özer A. Antiinflammatory, analgesic and antipyretic effects of an aqueous extract of *Erythraea centaurium*. *Planta Med* 1991, 57:34-37

Bisset NG, editor (translated from Wichtl M, editor. Teedrogen). Herbal drugs and Phytopharmaceuticals – A handbook for practice on a scientific basis. Medpharm Scientific Publications, Stuttgart 1994

Blaschek W, Ebel S, Hackenthal E, Holzgrabe U, Keller K, Reichling J, Schulz V. *Centaurii herba*. HagerROM 2006. Springer Medizin Verlag, Heidelberg 2006

Blumenthal M, Busse WR, Goldberg A, Gruenwald J, Hall T, Riggins CW, *et al.*, editors. *Centaurii herb*. The Complete German Commission E Monographs. American Botanical Council Austin, Texas 1998

Botion LM, Ferreira AV, Côrtes SF, Lemos VS, Braga FC. Effects of the Brazilian phytopharmaceutical product Ierobina (registered trademark) on lipid metabolism and intestinal tonus. *J Ethnopharmacol* 2005, 102(2):137-142

British Herbal Pharmacopoeia. Part II. *Centaurium*. British Herbal Medicine Association, 1979:41-42



Brudzińska-Kosior A, Kosior G, Samecka-Cymerman A, Kolon K, Mróz L, Kempers AJ. Metal contents in *Centaurium erythraea* and its biometry at various levels of environmental pollution. *Ecotoxicol Environ Saf* 2012, 80:349-354

Capasso F, Mascolo N, Morrica P, Ramundo E. Phytotherapeutic profile of some plants used in folk medicine. *Boll Soc Ital Biol Sper* 1983, 59:1398-1404 (source: ESCOP Monograph)

Ceban E. Efficacy of a fixed combination of *Centaurii herba*, *Levistici radix* and *Rosmarini folium* in urinary lithiasis. *Zeitschr Phytother* 2012, 33(1):19-23

Dombrowicz E, Swiatek L, Zadernowski R. Phenoloc acids in bitter drugs. Part III Examination of *Herba Centaurii*. *Farm Pol* 1988, 44:657-660 (source: ESCOP Monograph)

Dweck AC. Skin treatment with plants of the Americas. *Cosmetics-and -toilettries* 1997, 112 (Oct)

Erg. B.6. Ergänzungsbuch zum Deutschen Arzneibuch. Deutscher Apotheker Verlag, Stuttgart 1953:126

ESCOP monographs 2nd ed. *Centaurii herba* - Centaury. European Scientific Cooperative on Phytotherapy, editor. Thieme, Stuttgart 2003, 70

European Pharmacopoeia 6th ed. Centaury – *Centaurii herba*. Council of Europe. 01/2008:1301

Evans WC. Trease and Evans' Pharmacognosy, 14th ed. WB Saunders Company Ltd, London 1996

Gaybullaev AA, Kariev SS. Effects of the herbal combination Canephron (registered trademark) Non urinary risk factors of idiopathic calcium urolithiasis in an open study. *Zeitschr Phytother* 2013, 34(1):16-20

Haloui M, Louedec L, Michel JB, Lyoussi B. Experimental diuretic effects of *Rosmarinus officinalis* and *Centaurium erythraea*. *J Ethnopharmacol* 2000, 71(3):465-472

Hamza N, Berke B, Cheze C, Le Garrec R, Lassalle R, Agli A-N, *et al.* Treatment of high fat diet induced type 2 diabetes in C57BL/6J mice by two medicinal plants used in traditional treatment of diabetes in the east of Algeria. *J Ethnopharmacol* 2011, 133(2):931-933

Hänsel R, Keller K, Rimpler H, Schneider G, editors. Hagers Handbuch der Farmazeutischen Praxis. Drogen: A-D. Vol 4. 5th ed. Springer-Verlag, Berlin 1992

Harlev E, Nevo E, Mirsky N, Ofir R. Antidiabetic attributes of desert and steppic plants: A review *Planta Med* 2013, 79(6):425-436

Jerkovic I, Gaso-Sokac D, Pavlovic H, Marijanovic Z, Gugic M, Petrovic I, Kovac S. Volatile organic compounds from *Centaurium erythraea* rafn (Croatia) and the antimicrobial potential of its essential oil. *Molecules* 2012, 17(2):2058-2072

Kaluzova L, Glatz Z, Pospislova J, Musil P, Unar J. Determination of gentiopicroside in *Centaurium erythraea* by means of HPLC. *Ceska-A-Slovenska-Farmacie* 1995, 44(4):203-205

Kneipp S. Das große Kneippbuch. München 1935:969 (source: Madaus, Lehrbuch der Biologischen Heilmittel)

Kumarasamy Y, Cox PJ, Jaspars M, Nahar L, Sarker SD. Screening of Scottish plants for antibacterial activity. *J Ethnopharmacol* 2002, 83(1-2):73-72

Kumarasamy Y, Nahar L, Sarker SD. Bioactivity of gentiopicroside from the aerial parts of *Centaurium erythraea*. *Fitoterapia* 2003a, 74(1-2):151-154

- Kumarasamy Y, Nahar L, Cox PJ, Jaspars M, Sarker SD. Bioactivity of secoiridoid glycosides from *Centaurium erythraea*. *Phytomedicine* 2003b, 10(4):344-347
- Küpeli Akkol E, Suntar I, Keles H, Aktay G. Evaluation of the wound healing activity of *Buxus sempervirens* L. and *Centaurium erythraea* (L.) Rafn. by using *in vivo* and *in vitro* Methods. *Planta Med* 2013, 79:13
- Loizzo MR, Saab AM, Tundis R, Menichini F, Bonesi M, Piccolo V, *et al.* In vitro inhibitory activities of plants used in Lebanon traditional medicine against angiotensin converting enzyme (ACE) and digestive enzymes related to diabetes. *J Ethnopharmacol* 2008, 119(1):109-116
- Madaus G. Lehrbuch der Biologischen Heilmittel. Abt. 1. Heilpflanzen. Vol 1. Thieme, Leipzig 1938
- Mansion G, Zeltner L, Bretagnolle F. Phylogenetic patterns and polyploid evolution within the Mediterranean genus *Centaurium* (Gentianaceae - Chironieae). *Taxon* 2005, 54 (4):931-950
- Mroueh M, Saab Y, Rizkallah R. Hepatoprotective activity of *Centaurium erythraea* on acetaminophen-induced hepatotoxicity in rats. *Phytotherapy Res* 2004, 18(5):431-433
- Naber KG. Efficacy and safety of the phytotherapeutic drug Canephron (registered trademark) N in prevention and treatment of urogenital and gestational disease: Review of clinical experience in Eastern Europe and Central Asia. *J Urol* 2012, 5(1):39-46
- Newall C. Herbal Medicines-Guide for Healthcare Professionals. Pharmaceutical Press, London 1994
- Pereira EMR, Gomes RT, Freire NR, Aguiar EG, Brandao MDG, Santos VR. In vitro antimicrobial activity of Brazilian medicinal plant extracts against pathogenic microorganisms of interest to dentistry. *Planta Med* 2011, 77(4):401-404
- Piatczak E, Krolicka A, Wysokinska H. Genetic transformation of *Centaurium erythraea* Rafn by *Agrobacterium rhizogenes* and the production of secoiridoids. *Plant Cell Rep* 2006, 25(12):1308-1315
- Popov S. Sterols of the Gentianaceae family. *Compt Rend Acad Bulg Sci* 1969, 22:293-296 (source: ESCOP Monograph)
- Pinkhof, *et al.* Pharmacotherapeutisch Vademecum. 13th ed. Unieboek b.v. Bussum 1979, 119
- Schimmer O, Mauthner H. Polymethoxylated xanthenes from the herb of *Centaurium erythraea* with strong antimutagenic properties in *Salmonella typhimurium*. *Planta Med* 1996, 62(6):561-564
- Schulz V, Hänsel R, Tyler VE. Rational Phytotherapy. Springer-Verlag, Berlin Heidelberg New York, 1998
- Sefi M, Fetoui H, Lachkar N, Tahraoui A, Lyoussi B, Boudawara T, *et al.* *Centaurium erythraea* (Gentianaceae) leaf extract alleviates streptozotocin-induced oxidative stress and (beta)-cell damage in rat pancreas. *J Ethnopharmacol* 2011, 135(2):243-250
- Siler B, Zivković S, Banjanac T, Cvetković J, Nestorović Živković J, Cirić A,, *et al.* Centauries as underestimated food additives: Antioxidant and antimicrobial potential. *Food Chem* 2014, 147:367-376
- Stefkov G, Miova B, Dinevska-Kjovkarovska S, Stanoeva JP, Stefova M, Petrusevska G, *et al.* Chemical characterization of *Centaurium erythraea* L. and its effects on carbohydrate and lipid metabolism in experimental diabetes. *J Ethnopharmacol* 2014, 152(1):71-77
- Steinmetz, EF. *Erythraea Centaurium*. *Materia Medica*. Amsterdam 1954:339
- Tahraoui A, Israili ZH, Lyoussi B. Acute and sub-chronic toxicity of a lyophilized aqueous extract of *Centaurium erythraea* in rodents. *J Ethnopharmacol* 2010, 132(1):48-55

- Tuluçe Y, Ozkol H, Koyuncu I, Ine H. Gastroprotective effect of small centaury (*Centaurium erythraea*) on aspirin induced gastric damage in rats. *Cell Membranes and Free Radical Research* 2011, 2(1):34
- Valentão P, Fernandes E, Carvalho F, Andrade PB, Seabra RM, Bastos ML. Antioxidant activity of *Centaurium erythraea* infusion evidenced by its superoxide radical scavenging and xanthine oxidase inhibitory activity. *J Agric Food Chem* 2001, 49(7): 3476-3479
- Valentão P, Andrade PB, Silva E, Vicente A, Santos H, Bastos ML, Seabra RM. Methoxylated xanthenes in the quality control of small centaury (*Centaurium erythraea*) flowering tops. *J Agric Food Chem* 2002, 50(3):460-463
- Valentão P, Fernandes E, Carvalho F, Andrade PB, Seabra RM, Bastos ML. Hydroxyl radical and hypochlorous acid scavenging activity of small centaury (*Centaurium erythraea*) infusion. A comparative study with green tea (*Camellia sinensis*). *Phytomedicine* 2003, 10(6-7):517-522
- Valnet J. Phytothérapie. Maloine, Paris 1983:294-295 (source: Hänsel *et al.* 1992)
- Van der Sluis WG, Labadie RP Secoiridoids and xanthenes in the genus *Centaurium*. *Planta Med* 1981, 41(2): 150-160
- Van der Sluis WG. Secoiridoids and Xanthenes in the genus *Centaurium* Hill (Gentianaceae). PhD Thesis, University of Utrecht. Elinkwijk BV Utrecht, 1985
- Van Hellemont J. Fytotherapeutisch Compendium. Algemene Pharmaceutische Bond, Brussel 1985:227-228
- Vashchula VI, Nitkin DM, Viliukha AI. Phytotherapy in the prevention of recurrent uncomplicated urinary tract infection in women. *Eur Urol, Supplem* 2013, 12(1):e621-e622
- Walther HJ. Tausendgüldenkraut-Heilpflanze des Jahres 2004. *Pharm Zeit* 2004, 15(30):149
- Weiss RF. Lehrbuch der Phytotherapie. 3rd ed. Hippokrates, Stuttgart 1974:44-49
- Wurtz AS, Vial T, Isoard B, Saillard E. Possible hepato-toxicity from Copaltra, an herbal medicine. *Annals Pharmacoth* 2002, 36(5):941-942
- Yamahara J, Kobayashi M, Matsuda H, Aoki S. Anticholinergic action of *Swertia Japonica* and an active constituent. *J Ethnopharmacol* 1991, 33:31-35
- Yamahara J, Konoshima T, Sawada T, Fujimura H. Biological active principles of crude drugs: pharmacological actions of *Swertia japonica* extracts, swertiamarin and gentianine. *J Pharm Soc Japan* 1978, 98:1446-1451

References assessed, but not cited in the assessment report:

Arumugam G, Manjula P, Paari N. A review: Anti diabetic medicinal plants used for diabetes mellitus. *J Acute Dis* 2013, 2(3):196-200

British Herbal Pharmacopoeia. Centaurium. British Herbal Medicine Association, 1983:55-56

Calvo MI, Caverro RY. Medicinal plants used for cardiovascular diseases in Navarra and their validation from Official sources. *J Ethnopharmacol* 2014, 157:268-273

Crockett SL, Schuhly W, Bauer R. Components, molecular mechanisms of action and clinical evidence: Antiemetics from herbal medicine. *Pharm Uns Zeit* 2007, 36(5):381-388

Eddouks M, Bidi A, El Bouhali B, Hajji L, Zeggwagh NA. Antidiabetic plants improving insulin sensitivity *J Pharm Pharmacol* 2014, 66(9):1197-1214

Radovic M, Siler B, Nestorovic Zivkovic J, Banjanac T, Zivkovic S, Nikolic M, *et al.* Bioreactor cultivation of *Zeltnera beyrichii* (Torr. & A. Gray) Mans.: A novel source of biologically active compounds. *Rec Natl Prods* 2013, 7(4):266-280

Schwarz H, Liu B, Peters S, Barillas W, Beerhues L. Purification, cDNA cloning and functional expression of NADPH-cytochrome P450 reductase from *Centaurium erythraea* cell cultures. *Plant Biology* 2009, 11(3):300-306

Wade A, editor. Centaury. Martindale The Extra Pharmacopoeia. 27th ed. Pharmaceutical Press, London 1977, 254