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List of references supporting the assessment of *Commiphora molmol* Engler, gummi-resina

Draft

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

Abo-Madyan AA, Morsy TA, Motawea SM, Morsy AT. Clinical trial of Mirazid in the treatment of human fascioliasis, Ezbet El-Bakly (Tamyia Center) Al-Fayoum Governorate. *J. Egypt. Soc. Parasitol.* 2004, **34**(3):807 – 818

Ahmed F, Ali M, Singh O. New compounds from *Commiphora myrrha* (Nees) Engl. *Pharmazie* 2006, **61**(8):728 – 731

Al-Awadi FM, Gumaa KA. Studies on the activity of individual plants of an antidiabetic plant mixture. *Acta Diabetologica* 1987, **24**:37 – 41

Al Faraj S. Antagonism of the anticoagulant effect of warfarin caused by the use of *Commiphora molmol* as a herbal medicine: a case report. *Annals of Tropical Medicine and Parasitology* 2005, **99**(2):219 – 220

Al-Harbi MM, Qureshi S, Raza M, Ahmed MM, Giangreco AB, Shah AH. Anticarcinogenic effect of *Commiphora molmol* on solid tumours induced by Ehrlich carcinoma cells in mice. *Chemotherapy* 1994, **40**(5):337 – 347

Al-Harbi MM, Qureshi S, Raza M, Ahmed MM, Afzal M, Shah AH. Gastric antiulcer and cytoprotective effect of *Commiphora molmol* in rats. *Journal of Ethnopharmacology* 1997, **55**:141 – 150

Al-Suwaidan SN, El-Rab MOG, Al-Fakhiry S, Al-Hoqail IA, Al-Maziad A, Sherif AB. Allergic contact dermatitis from myrrh, a topical herbal medicine used to promote healing. *Contact dermatitis* 1998, **39**(3):137

Atta AH, Alkofahi A. Anti-nociceptive and anti-inflammatory effects of some Jordanian medicinal plant extracts. *Journal of Ethnopharmacology* 1998, **60**:117 - 134



- Barakat R, Elmorshedy H, Fenwick A. Efficacy of myrrh in the treatment of human *Schistosomiasis mansoni*. *American Journal of Tropical Medicine and Hygiene* 2005, **73**(2):365 – 367
- Barnes J, Anderson LA, Phillipson JD. Herbal medicines. Pharmaceutical Press, London 2007
- Blumenthal M. Herbal medicine, Expanded Commission E Monographs. American Botanical Council, Austin 2000
- Botros S, William S, Ebeid F, Cioli D, Katz N, Day TA, Bennett JL. Lack of evidence for an antischistosomal activity of myrrh in experimental animals. *American Journal of Tropical Medicine and Hygiene* 2004, **71**(2):206 – 210
- Botros S, Sayed H, El-Dusoki H, Sabry H, Rabie E, El-Ghannam M, Hassaneim M, El-Wahab YA, Engels D. Efficacy of mirazid in comparison with praziquantel in Egyptian *Schistosoma mansoni*-infected school children and households. *American Journal of Tropical Medicine and Hygiene* 2005, **72**(2):119 – 123
- Bradley P. British Herbal Compendium Volume 1. British Herbal Medicine Association, Bournemouth 1992
- Braun H. Heilpflanzen-Lexikon für Ärzte und Apotheker. Anwendung, Wirkung und Toxikologie. Gustav Fischer Verlag, Stuttgart 1968
- Council of Europe. Plants used in cosmetics. Volume II. Council of Europe Publishing, Strasbourg 2001
- Delaveau P, Lallouette P, Tessier AM. Drogues végétales stimulant l'activité phagocytaire du système réticulo-endothélial. *Planta Medica* 1980, **40**:49 – 54
- Dolara P, Luceri C, Ghelardini C, Monserrat C, Aioli S, Luceri F, Lodovici M, Menichetti S, Romanelli, MN. Analgesic effects of myrrh. *Nature* 1996a, **379**:29
- Dolara P, Moneti G, Pieraccini G, Romanelli N. Characterization of the action on central opioid receptors of furaneudesma-1.3-diene, a sesquiterpene extracted from myrrh. *Phytotherapy Research* 1996b, **10** Suppl. 1:S81 – S83
- Dolara P, Corte B, Ghelardini C, Pugliese AM, Cerbai E, Menichetti S, Lo Nostro A. Local anaesthetic, antibacterial and antifungal properties of sesquiterpenes from myrrh. *Planta Medica* 2000, **66**:356 – 358
- El-Ashmawy IM, Ashry KM, El-Nahas AF, Salama OM. Protection by turmeric and myrrh against liver damage and genotoxicity induced by lead acetate in mice. *Basic Clinical Pharmacology and Toxicology* 2006, **98**(1):32 – 37
- El Ashry ESH, Rashed N, Salama OM, Saleh A. Components, therapeutic value and uses of myrrh. *Pharmazie* 2003, **58**(3):163 – 168
- ESCOP Monographs. The scientific foundation for herbal medicinal products. 2nd ed. European Scientific Cooperative on Phytotherapy, Thieme 2003
- European Pharmacopoeia. 6th ed. Myrrh – Myrrha. Council of Europe 1/2008:1347;2461.
- European Pharmacopoeia. 6th ed. Myrrh tincture – Myrrhae tinctura. Council of Europe 1/2008:1877;2461-2462
- Gallo R, Rivara G, Cattarini G, Cozzani E, Guarrera M. Allergic contact dermatitis from myrrh. *Contact dermatitis* 1999, **41** (4):230 – 231

- Hagers Handbuch. Hänsel R, Keller K, Rimpler H, Schneider G. (Eds). Drogen P –Z. Springer Verlag. Berlin, New York, London, Paris 1992
- Hamed MA, Hetta MH. Efficacy of *Citrus reticulata* and Mirazid in treatment of *Schistosoma mansonii*. *Memórias do Instituto Oswaldo Cruz*. 2005, **100**(7):771 – 778
- Hassan M, El-Motaiem M, Afify H, Abaza B, El-Shafei M, Massoud AM. In vitro effect of Mirazid on *Schistosoma mansoni* worms. *J. Egypt. Soc. Parasitol*. 2003, **33**(3):999-1008
- Kommission E. Monographie. BAnz Nr 193. 15.10.1987
- Lee TY, Lam Th. Allergic contact dermatitis due to a Chinese orthopaedic solution tieh ta yao gin. *Contact Dermatitis* 1993a, **28**(2):89 – 90
- Lee TY, Lam Th. Myrrh is the putative allergen in bonesetter´s herbs dermatitis. *Contact Dermatitis* 1993b, **29**(5):279
- Lv L, Yan GY, Zhao YL, Jiang X, Zhuo YQ, Wang YL, Wang L, Cen XB. Investigation of the dermal sensitizing potential of traditional medical extracts in local lymph node assays. *Exp Biol Med* 2009, **234**(3): 306 – 313
- Madaus G. Lehrbuch der Biologischen Heilmittel. Georg Thieme, Leipzig 1938
- Maradufu A. Furanosesquiterpenoids of *Commiphora erythraea* and *C. myrrh*. *Phytochemistry* 1982, **21**(3):677 – 680
- Maradufu A, Warthen Jr JD. Furanosesquiterpenoids from *Commiphora myrrh* oil. *Plant Science* 1988, **57**:181 – 184
- Massoud Ah, El Sisi S, Salama O, Massoud AF. Preliminary study of therapeutic efficacy of a new fasciolicidal drug derived from *Commiphora molmol* (myrrh). *American Journal of Tropical Medicine and Hygiene* 2001, **65**(2):96 – 99
- Massoud AM, El Ebiary FH, Abd El Salam NF. Effect of myrrh extract on the liver of normal and bilharzially infected mice. An ultrastructural study. *J. Egypt. Soc. Parasitol*. 2004a, **34**(1):1 – 21
- Massoud AM, El Ebiary FH, Abou Gamra MMM, Mohamed GF, Shaker SM. Evaluation of schistosomicidal activity of myrrh extract: parasitological and histological study. *J. Egypt. Soc. Parasitol*. 2004b, **34**(3) Supplement, 1051 - 1076
- Massoud AM, El Ebiary FH, Ibrahim SH. Light microscopic study of the effect of new antischistosomal drug (myrrh extract) on the liver of mice. *J. Egypt. Soc. Parasitol*. 2005, **35**(3):971 – 988
- Mohsin A, Shah AH, Al-Yahya MA, Tariq M, Tanira MOM, Ageel AM. Analgesic, antipyretic activity and phytochemical screening of some plants used in traditional Arab system of medicine. *Fitoterapia* 1989, **60**(2):174 – 177
- Moritz O, Frohne D. Einführung in die Pharmazeutische Biologie. 4. Auflage, Gustav Fischer Verlag, Stuttgart 1967
- Olajide O. Investigation of the effects of selected medicinal plants on experimental thrombosis. *Phytotherapy Research* 1999, **13**:231 – 232
- Omar A, Elmesallamy G-S, Eassa S. Comparative study of the hepatotoxic, genotoxic and carcinogenic effects of praziquantel distocide & the natural myrrh extract Mirazid on adult male albino rats. *J. Egypt. Soc. Parasitol*. 2005, **35**(1):313 – 329

- Omer SA, Adam SE. Toxicity of *Commiphora myrrha* to goats. *Vet. Hum. Toxicol.* 1999, **41**(5):299 - 301
- Opdyke DLJ. Fragrance raw materials monographs. Myrrh oil. *Food and Cosmetics Toxicology* 1976, **14**(6):621
- Qureshi S, Al-Harbi MM, Ahmed MM, Raza M, Giangreco AB, Shah AH. Evaluation of the genotoxic, cytotoxic, and antitumor properties of *Commiphora molmol* using normal and Ehrlich ascites carcinoma cell-bearing Swiss albino mice. *Cancer Chemotherapy and Pharmacology* 1993, **33**:130 – 138
- Rahman MM, Garvey M, Piddock LJV, Gibbons S. Antibacterial terpenes from the oleo-resin of *Commiphora molmol* (Engl.). *Phytotherapy Research* 2008, **22**:1356 – 1360
- Rao RM, Khan ZA, Shah AH. Toxicity studies in mice of *Commiphora molmol* oleo-gum-resin. *Journal of Ethnopharmacology* 2001, **76**:151 – 154
- Sheir Z, Nasr AA, Massoud A, Salama O, Badra GA, El-Shennawy H, Hassan N, Hammad SM. *American Journal of Tropical Medicine and Hygiene* 2001, **65**(6):700 – 704
- Shen T, Lou H-X. Bioactive constituents of myrrh and frankincense, two simultaneously prescribed gum resins in Chinese Traditional Medicine. *Chemistry & Biodiversity* 2008, **5**:540 – 553
- Soliman OE, El-Arman M, Abdul-Samie ER, El-Nemr HI, Massoud A. Evaluation of myrrh (Mitrazid) therapy in fascioliasis and intestinal schistosomiasis in children: immunological and parasitological study. *J. Egypt. Soc. Parasitol.* 2004, **34**(3):941 – 966
- Tariq M, Ageel AM, Al-Yahya MA, Mossa JS, Al-Said MS, Parmar NS. Anti-inflammatory activity of *Commiphora molmol*. *Agents and Action* 1985, **17**:381 – 382
- Tipton DA, Lyle B, Babich H, Dabbous Kh. *In vitro* cytotoxic and anti-inflammatory effects of myrrh oil on human gingival fibroblasts and epithelial cells. *Toxicology in Vitro* 2003, **17**:301 – 310
- Tipton DA, Hamman NR, Dabbous MKh. Effect of myrrh oil on IL-1 β stimulation of NF- κ B activation and PGE(2) production in human gingival fibroblasts and epithelial cells. *Toxicology in Vitro* 2006, **20**(2):248 – 255
- Todd RG. Extra pharmacopoeia: Martindale. The Pharmaceutical Press, London 1967
- Ubillas RP, Mendez CD, Jolad SD, Luo J, King SR, Carlson TJ, Fort DM. Antihyperglycemic furanosesquiterpenes from *Commiphora myrrha*. *Planta Medica* 1999, **65**:778 – 779
- Wichtl M. Teedrogen. Ein Handbuch für die Praxis auf wissenschaftlicher Grundlage. 2nd Ed. Wissenschaftliche Verlagsgesellschaft m.b.H., Stuttgart 1989
- Wiendl RM, Müller BM, Franz G. Proteoglycans from the gum exudate of myrrh. *Carbohydrate polymers* 1995, **28**:217 – 226
- Zhu N, Kikuzaki H, Sheng S, Sang S, Rafi MM, Wang M, Nakatani N, DiPaola RS, Rosen RT, Ho C-T. Furanosesquiterpenoids of *Commiphora myrrha*. *Journal of Natural Products* 2001, **64**:1460 – 1462
- Zhu N, Sheng S, Sang S, Rosen RT, Ho C-T. Isolation and characterization of several aromatic sesquiterpenes from *Commiphora myrrha*. *Flavour and Fragrance Journal* 2003, **18**:282 – 285