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List of references supporting the assessment of *Trigonella foenum-graecum* L., semen

Final – Revision 1

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.

Abdel-Barry JA, Al-Hakiem MH. Acute intraperitoneal and oral toxicity of the leaf glycosidic extract of *Trigonella foenum-graecum* in mice. *J Ethnopharmacol* 2000, 70:65-68

Abdel-Barry JA, Abdel-Hassan IA, Jawad AM, Al-Hakiem MH. Hypoglycaemic effect of aqueous extract of the leaves of *Trigonella foenum-graecum* in healthy volunteers. *East Mediterr Health J* 2000, 6(1):83-88

Abdo MS, Al-Kafawi AA. Experimental studies on the effect of *Trigonella foenum-graecum*. *Planta Med* 1969, 17:14-18

Adhikary P, Banerji J, Choudhury D, Jana S, Mukherjee DSR, Chatterjee A. Anti-implantation activity of some indigenous plants in adult female rats. *Indian J Pharmacol* 1990, 22:24-25

Ahmadiani A, Javan M, Semnianian S, Barat E, Kamalinejad M. Anti-inflammatory and antipyretic effects of *Trigonella foenum-graecum* leaves extract in the rat. *J Ethnopharmacol* 2001, 75:283-286

Ahmed SM, Mukherjee PK, Bahadur S, Kar A, Mukherjee K, Karmakar S, *et al.* Interaction potential of *Trigonella foenum-graecum* through cytochrome P450 mediated inhibition. *Indian J Pharmacol* 2015, 47:530-534

Ajabnoor MA, Tilmisany AK. Effect of *Trigonella foenum-graecum* on blood glucose levels in normal and alloxan-diabetic mice. *J Ethnopharmacol* 1988, 22:45-49

Ali L, Azad Khan AK, Hassan Z, Mosihuzzaman M, Nahar N, Nasreen T, *et al.* Characterization of the hypoglycemic effects of *Trigonella foenum-graecum* seed. *Planta Med* 1995, 61:358-360

Al-Jenoobi FI, Alam MA, Alkharfy KM, Al-Suwayeh SA, Korashy MH, Al-Mohizea AM, *et al.* Pharmacokinetic interaction studies of fenugreek with CYP3A substrates cyclosporine and carbamazepine. *Eur J Drug Metab Pharmacokinet* 2014, 39:147-153

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- Al-Jenoobi FI, Al-Thukair AA, Alam MA, Abbas FA, Al-Mohizea AM, Alkharfy KM, *et al.* Effect of *Trigonella foenum-graecum* L. on Metabolic Activity of CYP2D6 and CYP3A4. *Forsch Komplementmed* 2015, 22:180-184
- Al-Habori M, Al-Aghbari AM, Al-Mamary M. Effects of Fenugreek Seeds and its Extracts on Plasma Lipid Profile: A Study on Rabbits. *Phytother Res* 1998, 12:572–575.
- Al-Yahya AA. Reproductive, cytological and biochemical toxicity of fenugreek in male Swiss albino mice. *Afr. J. Pharm. Pharmacol* 2013, 7:2072-2080
- Assad T, Khan RA. Effect of methanol extract of *Trigonella foenum-graecum* L. seeds on anxiety, sedation and motor coordination. *Metab Brain Dis* 2017, 32(2):343-349
- Barnes J, Anderson LA, Phillipson JD. Herbal Medicines, 3rd ed. Pharmaceutical Press, London 2007, 260-262
- Bartley GB, *et al.* Maple syrup urine odor due to fenugreek ingestion. *The New England Journal of Medicine* 1981, 305(8):467
- Bawadi H, Maghaydah S, Tayyem R. The postprandial hypoglycemic activity of fenugreek seed and seeds' Extract in type 2 diabetics: a pilot study. *Pharmacog Magazine* 2009, 5:134-138
- Begum SS, Jayalakshmi HK, Vidyavathi HG, Gopakumar G, Abin I, Balu M, *et al.* A Novel extract of fenugreek husk (FenuSMART™) alleviates postmenopausal symptoms and helps to establish the hormonal balance: a randomized, double-blind, placebo- controlled study. *Phytother Res* 2016, 30:1775–1784
- Belguith-Hadriche O, Bouaziz M, Jamoussi K, Simmonds MS, El Feki A, Makni-Ayedi F. Comparative study on hypocholesterolemic and antioxidant activities of various extracts of fenugreek seeds. *Food Chem* 2013, 1, 138(2-3):1448-1453
- Bessot JC, *et al.* Allergie respiratoire au fénugrec. *Revue Française d'allergologie et d'immunologie Clinique* 1996, 36(5):510-512
- Blumenthal M, Busse WR, Goldberg A, Gruenwald J, Hall T, Riggins CW, *et al.*, editors. Klein S, Rister RS (trans.). In: The Complete German Commission E Monographs—Therapeutic Guide to Herbal Medicines. Austin, TX: American Botanical Council; Boston: Integrative Medicine Communication 1998, 130
- Bruneton J. Pharmacognosie: Phytochimie des plantes médicinales. 3ième ed. Editions Tec & Doc. Paris 1999, 105
- Casey RCD. *Indian J Med Sci* 1960, 14:590-600
- Chaturvedi U, Shrivastava A, Bhadauria S, Saxena JK, Bhatia G. A mechanism-based pharmacological evaluation of efficacy of *Trigonella foenum graecum* (fenugreek) seeds in regulation of dyslipidemia and oxidative stress in hyperlipidemic rats. *J Cardiovasc Pharmacol* 2013, 61(6):505-512
- Che CT, Douglas L, Liem J. Case reports of peanut-fenugreek and cashew-sumac cross-reactivity. *J Allergy Clin Immunol Pract* 2017, 5:510-511
- Chevassus H, Gaillard JB, Farret A, Costa F, Gabillaud I, Mas E, *et al.* A fenugreek seed extract selectively reduces spontaneous fat intake in overweight subjects. *Eur J Clin Pharm* 2010, 66:449-455

Chevassus H, Molinier N, Costa F, Galtier F, Renard E, Petit P. A fenugreek seed extract selectively reduces spontaneous fat consumption in healthy volunteers. *Eur J Clin Pharmacol* 2009, 65(12):1175-1178

Chou IW, Cheng YH, Chen YR, Hsieh PC, King K. Fenugreek Compound (N55) Lowers Plasma Glucose through the Enhancement of Response of Physiological Glucagon-like peptide-1. *Sci Rep* 2017, 7, 12265

Demmers A, Korthout H, van Etten-Jamaludin FS, Kortekaas F, Maaskant JM. Effects of medicinal food plants on impaired glucose tolerance: A systematic review of randomized controlled trials. *Diabetes Res Clin Pract* 2017, 131:91-106

Deshpande P, Mohan V, Thakurdesai P. Preclinical safety evaluation of low molecular weight galactomannans based standardized fenugreek seeds extract. *EXCLI Journal* 2016, 15:446-459

Devi BA, Kamalakkannan N, Prince PS. Supplementation of fenugreek leaves to diabetic rats. Effect on carbohydrate metabolic enzymes in diabetic liver and kidney. *Phytother Res* 2003, 17:1231-1233

Eidi A, Eidi M, Sokhteh M. Effect of fenugreek (*Trigonella foenum-graecum* L) seeds on serum parameters in normal and streptozotocin-induced diabetic rats. *Nutr Res* 2007, 27:728-733

Elbetieha A, Al-Hamood MH, Al-Kofahi A. Anti-implantation potential of some medicinal plants in female rats. *Arch STD/HIV* 1996, 10:181-187

ESCOP Monographs 2nd ed. European Scientific Cooperative on Phytotherapy, editor. Thieme, Stuttgart 2003, 511-520

European Pharmacopoeia 6th ed. Fenugreek-*Trigonellae foenugraeci* semen. Council of Europe. 01/2008:1323, corrected 6.6

Faeste CK, Christians U, Egaas E, Jonscher KR. Characterization of potential allergens in fenugreek (*Trigonella foenum-graecum*) using patient sera and MS-based proteomic analysis. *J Proteomics* 2010, 73:1321-33, in press, doi 10.1016/j.jprot.2010.02.011

Faeste CK, Namork E, Lindvik H. Allergenicity and antigenicity of fenugreek (*Trigonella foenum-graecum*) proteins in foods. *J Allergy Clin Immunol* 2009, 123 :187-94, in press, doi 10.1016/j.jaci.2008.09.012

Farnsworth NR, Bingel AS, Cordell GA, Crane FA, Fong HH. Potential value of plants as sources of new antifertility agents I. *J Pharm Sci* 1975, 64:535-598

Flammang AM, Cifone MA, Erexson GL, Stankowski LF. Genotoxicity testing of a fenugreek extract. *Food Chem Tox* 2004, 42:1769-1775

Gaddam A, Galla C, Thummiseti S, Marikanty RK, Ianisamy UD, Rao PV. Role of Fenugreek in the prevention of type 2 diabetes mellitus in prediabetes. *J Diabet Metab Dis* 2015, 14(74):1-10

Gautam S, Ishrat N, Yadav P, Singh R, Narender T, Srivastava AK. 4-Hydroxyisoleucine attenuates the inflammation-mediated insulin resistance by the activation of AMPK and suppression of SOCS-3 coimmunoprecipitation with both the IR- β subunit as well as IRS-1. *Mol Cell Biochem* 2016, 414(1-2):95-104

Goto M, Noguchi T, Watanabe T, et al. Uterous-contracting ingredients in plants. *Takeda Kenkyusho Nempo* 1957, 16-21

- Gong J, K Fang, Dong H, Wang D, Hu M, Lu. F. Effect of fenugreek on hyperglycaemia and hyperlipidemia in diabetes and prediabetes: A meta-analysis. *J Ethnopharmacol* 2016, 194:260–268
- Gupta A, Gupta R, Lal B. Effect of *Trigonella foenum-graecum* (fenugreek) seeds on glycaemic control and insulin resistance in type 2 diabetes mellitus: a double blind placebo controlled study. *J Assoc Physicians India* 2001, 49:1057-1061
- Haghani K, Bakhtiyari S, Mohammadpour JD. Alterations in Plasma Glucose and Cardiac Antioxidant Enzymes Activity in Streptozotocin-Induced Diabetic Rats: Effects of *Trigonella foenum-graecum* Extract and Swimming Training. *Can J Diabetes* 2016, 40(2):135-142
- Hänsel R, Rimpler H, Keller K, Schneider G, editors. Hagers Handbuch der Pharmazeutischen Praxis. Vol 6. Berlin: Springer, 1994
- Haratake A, Watase D, Setoguchi S, Nagata-Akaho N, Matsunaga K, Takata K. Effect of orally ingested diosgenin into diet on skin collagen content in a low collagen skin mouse model and its mechanism of action. *Life Sciences* 2017, 174:77–82
- Heck AM, et al. Potential interactions between alternative therapies and warfarin. *American Journal of Health-system Pharmacy* 2000, 57(13):1221-1227
- Jelodar GA, Maleki M, Motadayen MH, Sirus S. Effect of fenugreek, onion and garlic on blood glucose and histopathology of pancreas of alloxan-induced diabetic rats. *Indian J Med Sci* 2005, 59:64-69
- Jin Y, Shi Y, Zou Y, Miao C, Sun B, Li C. Fenugreek Prevents the Development of STZ-Induced Diabetic Nephropathy in a Rat Model of Diabetes. *Evid Based Complement Alternat Med* 2014, 259368
- Joshi DV, Patil RR, Naik SR. Hydroalcohol extract of *Trigonella foenum-graecum* seed attenuates markers of inflammation and oxidative stress while improving exocrine function in diabetic rats. *Pharm Biol* 2015, 53(2):201-211
- Kawabata T, Cui MY, Hasegawa T, Takano F, Ohta T. Anti-inflammatory and anti-melanogenic steroidal saponin glycosides from fenugreek (*Trigonella foenum-graecum* L.) seeds. *Planta Med* 2011, 77:705-710
- Kamal R, Yadav R, Sharma JD. Efficacy of the steroidal fraction of fenugreek seed extract on fertility of male albino rats. *Phytotherapy Research* 1993, 7:134-138
- Kandhare AD, Subhash L. Bodhankar, V. Mohan & Prasad A. Thakurdesai. Pharmacokinetics, tissue distribution and excretion study of a furostanol glycosidebased standardized fenugreek seed extract in rats. *Renal Failure* 2015, 37(7):1208-1218
- Kassem A, Al-Aghbari A, Al-Habori M, Al-Mamary M. Evaluation of the potential antifertility effect of fenugreek seeds in male and female rabbits. *Contraception* 2006, 73:301-306
- Khalki L, Ba M'hamed S, Bennis M, Chait A, Sokar Z. Evaluation of the developmental toxicity of the aqueous extract from *Trigonella foenum-graecum* (L.) in mice. *J Ethnopharm* 2010, 131:321–325, in press, doi 10.1016/j.jep.2010.06.033
- Khalki L, Ba M'hamed S, Bennis M, Chait A, Sokar Z. The developmental neurobehavioral effects of fenugreek seeds on prenatally exposed mice. *J Ethnopharm* 2012, 139:672–677, in press, doi 10.1016/j.jep.2011.12.011
- Khalki L, Ba M'hamed S, Sokar Z, Bennis M, Vinay L, Bras H, et al. Prenatal exposure to fenugreek impairs sensorimotor development and the operation of spinal cord networks in mice. *PLOS ONE* 2013, 8:e80013, in press, doi 10.1371/journal.pone.0080013

- Khosla P, Gupta DD, Nagpal RK. Effect of *Trigonella foenum graecum* (Fenugreek) on blood glucose in normal and diabetic rats. *Indian J Physiol Pharmacol* 1995, 39:173-174
- Korman S, et al. Pseudo-maple syrup urine disease due to maternal prenatal ingestion of fenugreek. *Journal of Paediatrics and Child Health* 2001, 37(4):403-404
- Korthikunta V, Pandey J, Singh R, Srivastava R, Srivastava AK, Tamrakar AK, et al. *In vitro* anti-hyperglycemic activity of 4-hydroxyisoleucine derivatives. *Phytomedicine* 2015, 22(1):66-70
- Kumar P, Bhandari U, Jamadagni S. Fenugreek seed extract inhibit fat accumulation and ameliorates dyslipidemia in high fat diet-induced obese rats. *Biomed Res Int* 2014, 2014:606021
- Lambert JP, et al. Potential interaction between warfarin and boldo-fenugreek. *Pharmacotherapy* 2001, 21(4):509-12
- Losso JN, Holliday DL, Finley JW, Martin RJ, Rood JC, Yu Y, et al. Fenugreek bread: a treatment for diabetes mellitus. *Journal of medicinal food* 2009, 12:1046-1049
- Lu FR, Shen L, Qin Y, Gao L, Li H, Dai Y. Clinical observation on *trigonella foenum-graecum* L. total saponins in combination with sulfonylureas in the treatment of type 2 diabetes mellitus. *Chinese journal of integrative medicine* 2008, 14:56-60
- Madar Z, Abel R, Samish S, Arad J. Glucose-lowering effect of fenugreek in non-insulin dependent diabetics. *European journal of clinical nutrition* 1988, 42:51-54
- Maheshwari A, Verma N, Swaroop A, Bagchi M, Preuss HG, Tiwari K, et al. Efficacy of Furosap™, a novel *Trigonella foenum-graecum* seed extract, in Enhancing Testosterone Level and Improving Sperm Profile in Male Volunteers. *Int J Med Sci* 2017, 14:58-66
- Malhi BS, Trivedi VP. Vegetable Antifertility drugs of India. *Q J Crude Drug Res* 1972
- Mathern JR, Raatz SK, Thomas W, Slavin JL. Effect of fenugreek fiber on satiety, blood glucose and insulin response and energy intake in obese subjects. *Phytotherapy research* 2009, 23:1543-1548
- Memon A, Memon AR, Shah SS, Khand F, Shaikh IA, Khushk IA. Effect of combination of nigella sativa and *trigonella Foenum-Graecum* seeds with glibenclamide on blood sugar levels in type-2 diabetes mellitus patients. *Vaccimonitor* 2010, 19:129-130
- Minciullo P, Calapai G, Miroddi M, Mannucci C, Chinou I, Gangemi S, et al. Contact dermatitis as an adverse reaction to some topically used European herbal medicinal products – part 4: *Solidago virgaurea* – *Vitis vinifera*. *Contact Dermatitis* 2017, 77:67-87
- Mital N, Gopaldas T. Effects of fenugreek (*Trigonella foenum graecum*) seed based diets on the birth outcome in albino rats. *Nutr Reprod Int* 1986, 33:363-369
- Mohammadi A, Gholamhosseinian A, Fallah H. *Trigonella foenum-graecum* water extract improves insulin sensitivity and stimulates PPAR and γ gene expression in high fructose-fed insulin-resistant rats. *Ad Biomed Res* 2016, 5:54
- Mondal DK, Yousuf BM, Banu LA, Ferdousi R, Khalil M, Shamim KM. Effect of fenugreek seeds on the fasting blood glucose level in the streptozotocin induced diabetic rats. *Mymensingh Med J* 2004, 13:161-164
- Moriwaki S, Murakami H, Takahashi N, Uemura T, Taketani K, Hoshino S, et al. Yamogenin in fenugreek inhibits lipid accumulation through the suppression of gene expression in fatty acid synthesis in hepatocytes. *Biosci Biotechnol Biochem* 2014, 78(7):1231-1236

- Muralidhara, Narasimhamurthy K, Viswanatha S, Ramesh BS. Acute and subchronic toxicity assessment of debitterized fenugreek powder in the mouse and rat. *Food Chem Tox* 1999, 37:831-838.
- Muralidharan P, Thenmozhi M, Prakash R. Cell proliferative action of hydroalcoholic extract of *Trigonella foenum graecum* in rats. *IJPSR* 2016, 7(2):708-713
- Murugesan M, Revathi R, Manju V. Cardioprotective effect of fenugreek on isoproterenol-induced myocardial infarction in rats. *Indian J Pharmacol* 2011, 43(5):516-519
- Naicker N, Nagiah S, Phulukdaree A, Chuturgoon A. *Trigonella foenum-graecum* Seed Extract, 4-Hydroxyisoleucine, and Metformin Stimulate Proximal Insulin Signaling and Increase Expression of Glycogenic Enzymes and GLUT2 in HepG2 Cells. *Metab Syndr Relat Disord* 2016, 14(2):114-120
- Nathan J, Panjwani S, Mohan V, Joshi V, Thakurdesai PA. Efficacy and safety of standardized extract of *Trigonella foenum-graecum* L seeds as an adjuvant to L-Dopa in the management of patients with Parkinson's disease. *Phytother Res* 2014, 28:172-178
- Neelakantan N, Narayanan M, de Souza RJ, van Dam RM. Effect of fenugreek (*Trigonella foenum-graecum* L.) intake on glycemia: a meta-analysis of clinical trials. *Nutrition Journal* 2014, 13:1-11, in press, doi 10.1186/1475-2891-13-7
- Ohnuma N, et al. Anaphylaxis to curry powder. *Allergy* 1998, 53(4):452-454
- Ouzir M, El Bairy K, Al-Yahya SA. Toxicological properties of fenugreek (*Trigonella foenum graecum*). *Food Chem Tox* 2016, 96:145-154
- Panda S, Tahiliani P, Kar A. Inhibition of triiodothyronine production by fenugreek seed extract in mice and rats. *Pharmacol Res* 1999, 40:405-409
- Paris RR, Moyses H. Matière médicale Tome III. *Masson & Cie*, Paris 1967, 393
- Parvizpur A, Ahmadiani A, Kamalinejad M. Probable role of spinal purinoceptors in the analgesic effect of *Trigonella foenum* (TFG) leaves extract. *J Ethnopharmacol* 2006, 104:108-112
- Patil SP, Niphadkar PV, Bapat MM. Allergy to fenugreek (*Trigonella foenum graecum*). *Ann Allergy Asthma Immunol* 1997, 78(3):297-300
- PDR for Herbal Medicines. 3rd ed. Montvale: Thomson-PDR 2004, 318-319
- Petit P, Sauvaire Y, Ponsin G, Manteghetti M, Fave A, Ribes G. Effects of a fenugreek seed extract on feeding behaviour in the rat: metabolic-endocrine correlates. *Pharmacol Biochem Behav* 1993, 45:369-374
- Piao CH, Bui TT, Song CH, et al. *Trigonella foenum-graecum* alleviates airway inflammation of allergic asthma in ovalbumin-induced mouse model. *Biochemical and Biophysical Research Communications* 2017, 482(4):1284-1288
- Prasanna M. Hypolipidemic effect of fenugreek: a clinical study. *Indian Journal of pharmacology* 2000, 32:34-36
- Pundarikakshudu K, Shah DH, Panchal AH, Bhavsar GC. Anti-inflammatory activity of fenugreek (*Trigonella foenum-graecum* Linn) seed petroleum ether extract. *Indian J Pharmacol* [serial online] 2016 [cited 2021 February 19], 48:441-4. Available at: <https://www.ijp-online.com/text.asp?2016/48/4/441/186195>

- Rafraf M, Malekiyan M, Asghari-Jafarabadi M, Aliasgarzadeh A. Effect of fenugreek seeds on serum metabolic factors and adiponectin levels in type 2 diabetic patients. *Int J Vitamin Nut Res* 2014, 84:196-205
- Raghuram TC, Sharma RD, Sivakumar B, Sahay BK. Effect of fenugreek seeds on intravenous glucose disposition in non-insulin dependent diabetic patients. *Phytotherapy research* 1994, 8:83-86
- Raju J, Gupta D, Rao AR, Yadava PK, Baquer NZ. *Trigonella foenum graecum* (fenugreek) seed powder improves glucose homeostasis in alloxan diabetic rat tissues by reversing the altered glycolytic, gluconeogenic and lipogenic enzymes. *Mol Cell Biochem* 2001, 224:45-51
- Rao A, Steels E, Inder WJ, Abraham S, Vitetta L. Testofen, a specialised *Trigonella foenum-graecum* seed extract reduces age-related symptoms of androgen decrease, increases testosterone levels and improves sexual function in healthy aging males in a double-blind randomised clinical study. *The Aging Male* 2016, 19:134-142
- Ribes G, Rguibi M, Belahsen R. Fattening practices among Moroccan Saharawi Women. *Eastern Mediterranean Health Journal* 2006, 12(5):619-624
- Sauvaire Y, Baccou JC, Valette G, Chenon D, Trimble ER, *et al.* Effects of fenugreek seeds on endocrine pancreatic secretions in dogs. *Ann Nutr Metab* 1984, 28:37-43
- Ribes G, Sauvaire Y, Da Costa C, Baccou JC, Loubatieres-Mariani MM. Antidiabetic effects of subfractions from fenugreek seeds in diabetic dogs. *Proc Soc Exp Biol Med* 1986, 182:159-166
- Ribes G, Sauvaire Y, Da Costa C, Baccou JC, Loubatieres-Mariani MM. Hypocholesterolaemic and hypotriglyceridaemic effects of subfractions from fenugreek seeds in alloxan diabetic dogs. *Phytother Res* 1987, 1:38-43
- Robert SD, Al-safi Ismail A, Wan Rosli WI. Reduction of postprandial blood glucose in healthy subjects by buns and flatbreads incorporated with fenugreek seed powder. *Eur J Nutr* 2016, 55:2275–2280
- Sabiri N, Kabiri M, Razine R, Barkat A. Risk factors leading to preterm births in Morocco: a prospective study at the maternity Souissi in Rabat. *Pan African Medical Journal* 2015, 22:21, in press, doi 10.11604/pamj.2015.22.21.5100
- Sabiri N, Kabiri M, Razine R, Kharbach A, Berrada R, Barkat A. Facteurs de risque des malformations congénitales: étude prospective à la maternité Souissi de Rabat au Maroc. *Journal de Pédiatrie et de Puériculture* 2013, 26:198-203
- Saha JC, Kasinathan S. Ecobolic properties of Indian medicinal plants. II. *Indian J Med Res* 1961, 49:1094-1098
- Selected Medicinal Plants of India. Chemexcil. Basic chemicals, pharmaceutical and cosmetic export promotion council. Bombay 1992, 329-332
- Sethi N, Nath D, Singh RK, Srivastava RK. Antifertility and teratogenic activity of some indigenous medicinal plants in rats. *Fitoterapia* 1990, 61:64-67
- Sewell A, *et al.* False diagnosis of maple syrup urine disease owing to ingestion of herbal tea. *The New Eng J Med* 1999, 341(10):769
- Sharma RD, Raghuram TC, Rao NS. Effect of fenugreek seeds on blood glucose and serum lipids in type I diabetes. *Eur J Clin Nutr* 1990, 44:301–306

- Sharma RD, Sarkar A, Hazra DK, Misra B, Singh JB, Maheshwari BB. Toxicological evaluation of fenugreek seeds: a long term feeding experiment in diabetic patients. *Phytotherapy Research* 1996a, 10:519-520
- Sharma RD, Sarkar A, Hazara DK, Mishra B, *et al.* Use of fenugreek seed powder in the management of non-insulin dependent diabetes mellitus. *Nut Res* 1996b, 16:1331-1339
- Sharma N, Suresh S, Debnath A, Jha S. *Trigonella* seed extract ameliorates inflammation via regulation of the inflammasome adaptor protein, ASC. *Front Biosci (Elite Ed)* 2017, 1(9):246-257
- Skalli S. Malformations associées à la prise de fenugrec au cours de la grossesse. *Bulletin d'Informations de Pharmacovigilance* 2016, 3. Centre Marocain de Pharmacovigilance (CMPV), Rabat
- Smereck J, *et al.* Aplastic anemia: a possible toxic effect of an herbal "colon cleansing" preparation. *J Emerg Med* 2009, 36:191-193
- Steels E, Rao A, Vitetta L. Physiological aspects of male libido enhanced by standardized *Trigonella foenum-graecum* extract and mineral formulation. *Phytother Res* 2011, 25:1294-1300
- Swaroop A, Sarkari Jaipuria A, Gupta SK, Bagchi M, Kumar P, Preuss HG, *et al.* Efficacy of a Novel Fenugreek Seed Extract (*Trigonella foenum-graecum*, Furocyst (TM) in Polycystic Ovary Syndrome (PCOS). *Int J Med Sci* 2015, 12:825-831
- Tahiliani P, Kar A. Mitigation of thyroxine-induced hyperglycaemia by two plant extracts. *Phytother Res* 2003, 17:294-296
- Udayasekhara Rao P, Sesikeran B, Srinivasa Rao P, Nadamuni Naidu A, Vikas Rao V, Ramachandran EP. Short term nutritional and safety evaluation of fenugreek. *Nutr Resh* 1996, 16:1495-1505
- Ulbricht C, Basch E, Burke D, Cheung L, Ernst E, Giese N, *et al.* Fenugreek (*Trigonella foenum-graecum* L. Leguminosae): an evidence-based systematic review by the natural standard research collaboration. *J Herb Pharmacother* 2007, 7:143-177
- Valette G, Sauvaire Y, Baccou JC, Ribes G. Hypocholesterolaemic effect of fenugreek seeds in dogs. *Atherosclerosis* 1984, 50:105-111
- Vats V, Grover JK, Rathi SS. Evaluation of anti-hyperglycemic and hypoglycemic effect of *Trigonella foenum-graecum* Linn, *Ocimum sanctum* Linn and *Pterocarpus marsupium* Linn in normal and alloxanized diabetic rats. *J Ethnopharmacol* 2002, 79:95-100
- Vijayakumar MV, Bhat MK. Hypoglycemic effect of a novel dialysed fenugreek seeds extract is sustainable and is mediated, in part, by the activation of hepatic enzymes. *Phytother Res* 2008, 22:500-505
- Vijayakumar MV, Singh S, Chhipa RR, Bhat MK. The hypoglycaemic activity of fenugreek seed extract is mediated through the stimulation of an insulin signalling pathway. *Br J Pharmacol* 2005, 146:41-48
- Vinje NE, Namork E, Løvik M. Cross-allergic Reactions to Legumes in Lupin and Fenugreek-Sensitized Mice. *Scandinav J Immunol* 2012, 76:387-397
- WHO monographs on selected medicinal plants. Vol 3. Semen *Trigonellae Foenugraeci*. World Health Organisation. Geneva 2007, 338-348
- Wichtl M. Herbal Drugs and Phytopharmaceuticals, Norman Grainger Bisset editors, CRC Press London, Medpharm Scientific Publishers, Stuttgart 1994, 203-205

- Wu X, Skog K, Jägerstad M. Trigonelline, a naturally occurring constituent of green coffee beans behind the mutagenic activity of roasted coffee? *Mutat Res* 1997, 391:171-177
- Xue WL, Li XS, Zhang J, Liu YH, Wang ZL, Zhang RJ. Effect of *Trigonella foenum-graecum* (fenugreek) extract on blood glucose, blood lipid and hemorheological properties in streptozotocin-induced diabetic rats. *Asia Pac J Clin Nutr* 2007, 16:422-426
- Yadav M, Tomar R, Prasad GBKS, Jain S, Yadav H. Complementary hypoglycemic and anti-hyperglycemic activity of various extracts of fenugreek seeds in rats. *Asian J Biochem* 2008, 3:182-187
- Yousefi E, Zareiy S, Zavoshy R, Noroozi M, Jahanihashemi H, Ardalani H. Fenugreek: A therapeutic complement for patients with borderline hyperlipidemia: A randomised, double-blind, placebo-controlled, clinical trial. *Adv Integ Med* 2017, 4:31-35
- Zia T, Hasnain SN, Hasan SK. Evaluation of the oral hypoglycaemic effect of *Trigonella foenum-graecum* L. (methi) in normal mice. *J Ethnopharmacol* 2001, 75:191-195
- Zhao HQ, Qu Y, Wang XY, Lu XY, Zhang XH, Hattori M. Determination of trigonelline by HPLC and study on its pharmacokinetics. *Yao Xue Xue Bao* 2003, 38(4):279-282