

Anethum graveolens L. (dill): One plant for many Gynaecological disorders

Pradip Kinage, Deepika Chaudhari



Abstract-

Unhealthy Dietary habits like excessive intake of junk food, improper timing of diet; lack of exercise, excess stress have made females prone for many gynaecological disorders like dysmenorrhoea, infertility etc. In spite of advances in science, management of gynaecological disorders is still not satisfactory. As hormonal and surgical treatment approach is having various side effects, herbal treatment following Ayurvedic principles is most dependable. *Anethum Graveolens* (*Shatapushpa*) commonly known as “Dill” has been recognized in different system of traditional medicines for the treatment of different diseases and ailments of human beings. *Anethum graveolens* is especially useful in menstrual disorders and also in other gynaecological disorders. Use of *Anethum graveolens* has been described in the treatment of many diseases in Ayurveda literature. Various recent researches have also proved its beneficiary effects in various disorders like dysmenorrhoea, post partum haemorrhage etc. Present study is done in view to study *Anethum graveolens*, with respect to its active components, its uses in gynaecological diseases and exploiting its future scope in management of gynaecological disorders.

Key Words: Gynaecological disorders, *Anethum graveolens*, *Shatapushpa*

Introduction

Anethum graveolens (Dill), from *Apiaceae* family, is a traditional herb that has various medical indications worldwide [1]. *Anethum graveolens* L. (dill) believed to be the native of South-west Asia or South-east Europe and distributed throughout India. Dill usually grows to 40-60 cm [2]. Dill has a very long history of herbal use going back more than 2000 years. The seeds are a common and very effective household remedy for a wide range of digestive problems. The dill is used as an aromatic, carminative, mildly diuretic, galactagogue, stimulant and stomachic. It is also used to increase the flow of milk in nursing mothers, to help prevent colic, for bad breath, cough, cold and flu, period pains [3,4,5]. *Anethum graveolens* is used in the preparations of more than 56 ayurvedic preparations, which include *Dasmoolarishtam*, *Dhanwanthararishtam*, *Mrithasanjeevani*, *Saraswatharishtam*, *Gugguluthiktaquatham*, *Maharasnadi kashayam*, *Dhanwantharam quatham* and so on[6].

This review study is focused on diversity of plant *Anethum Graveolens*, its active component and its biological roles reported and studied in humans and animals mainly in Gynaecological disorders.

Joinsysmed ID: JID15038RA

Submitted Date: 13-07-2014

Approved Date: 20-07-2015

Corresponding Author:

Pradip Kinage, Asst. Professor,
Dept of Prasuti Tantra & Striroga,
MGACH&RC, Salod(H), Wardha.

Email: kinagepradeep@gmail.com

Co-author (s):

Deepika Chaudhari, Asst.
Professor, Dept of Sharir Kriya.
R.D. Memorial PG College
Bhopal.

Conflict of Interest: NIL

Source of Support: NA

Ethical Clearance: NA

Registered to: NA

Acknowledgment: NIL

How to cite the article:

Pradip Kinage, Deepika Chaudhari.
Anethum graveolens L. (dill): in
Gynaecological disorders, Joinsysmed
2015, vol 3(3), pp 141-148

Methodology

Search criteria

Original articles and research papers in published journals and in Pubmed central on *Shatapushpa* (*Anethum graveolens*) in relation to gynecological diseases were studied out and related articles and papers were taken into consideration (table-1). Ayurveda literature including *Samhita* and *Nighantu* related to *Shatapushpa* (*Anethum graveolens*) was also studied. Information regarding gynaecological disorders was collected from modern and Ayurveda literature. All the literature was especially studied for medicinal use of *Anethum graveolens* in gynaecological diseases and taken in to consideration. More emphasis has been given on clinical trials carried out on *Anethum graveolens*. Finally results were obtained from all the data and literatures studied.

In present review it is observed that other variant of *Shatapushpa* (*Peucedanum graveolens*) was used in the research study of Clinical efficacy of Ayurveda treatment regimen on Subfertility with Poly Cystic Ovarian Syndrome (PCOS) [7].

Plant description-

The Plant is a glabrous (hairless) aromatic annual herb, hallow finely grooved stem, Stripdark green and white with bluish spots; leaves compound, 2-3 pinnate, bluish green, segments fil form, leaf sheath surrounds the stem, flowers yellow, in flat compound umbels, fruits narrowly winged, vittae large and conspicuous..

Distribution-

It grows throughout India, chiefly in Punjab, Uttarpradesh, Gujarat, Maharashtra, Assam and west Bengal [8-9].

Vernacular Names and Properties of *Shatapushpa* are as shown is Table no. 2-

Table 1 showing the search results			
Search string	Article in Google	Article in Google scholar	Article in Pubmed
<i>shatapushpa</i>	3220	91	8
<i>Shatapushpa</i> in Gynaecological disorders	1160	27	1
<i>Anethum Graveolens</i>	64900	8910	176
<i>Anethum Graveolens</i> in Gynaecological disorders	1530	164	1



Figure -1 : *Shatapushpa* Habitat



Figure -2 : Inflorescence of *Shatapushpa*

Table 2: showing the description of Shatapushpa

Plant Description	Vernacular Names	Properties
Kingdom: Plantae Subkingdom : Tracheobionta	English Name- Dill	Rasa- <i>Katu-Tikta</i>
Super d ivision : Spermatophyta	Hindi- Soya	Virya- <i>Ushna</i>
Division : Magnoliophyta	Marathi- Balantshopa	Vipak – <i>Katu</i>
Class : Magnoliopsida	Kanna da- Sabbasige	Guna- <i>Laghu, Ruksha, Tikshan</i>
Subclass : Rosidae	Malayalam- Satakuppa	Doshakarma- <i>Kaphavata shamak</i> [10]
Order : Apiales	Sanskrit- <i>Shatapushpa</i>	
Family : Apiaceae	Tamil- Satakuppi	
Genus : Anethum	Telugu- Satakuppivittulu	
Latin Name- Anethum Graveolens	Other names- <i>Shatahva, Potika, Madhavi, Chhatra, Sugandha, Shatprasuna, Shifa, Karvi, Shatpushpika</i> [10]	

Part used- Fruits [9].

Taste- Bitter (tikta), Acrid (Amla) [8, 11].

Chemical Constituents-

Anethum graveolens contains proteins (15.68%), carbohydrates (36%), fiber (14.80%), ash (9.8%), essential oils, fatty oil, moisture (8.39%) and mineral elements such as calcium, potassium, magnesium, phosphorous, sodium, vitamin A and niacin.

Fruits of *Anethum graveolens* contain 1 - 4% essential oil comprising of major compounds: carvone (30 - 60%), limonene (33%), α -phellandrene (20.61%), including pinene, diterpene, dihydrocarvone, cineole, myrcene, paramyrcene, dillapiol, isomyristicin, myristicin, vicenin, glycoside dillanoside.

Anethum graveolens essential oil also contained furanocoumarin, 5-(4''-hydroxy-3''methyl-2''- butenyloxy)-6, 7- furocoumarin, oxypeucedanin, oxypeucedanin hydrate and falcarindiol.

Seed oil also contains tripetroselinin, petroselinicdiolein, dipetroselinicolein [12-18].

Observations-

The major biological properties and gynaecological uses of *Anethum graveolens* includes:

1. Postpartum hemorrhage-

Atonic uterus is the most common cause of post partum haemorrhage. Researchers have proved

that Dill seed extract is useful for the contraction of uterus. A dose of 6-7 gm of dill seed extract after delivery decreases postpartum haemorrhage due to its contractive characteristic. Limonene and *Anethum* showed contractive effect on uterine myometrium [19-25]. Ishikawa *et al.* and Mahdavian *et al.* also found that aqueous extract of Dill fruit decreases postpartum haemorrhage through increasing the uterus contractions [26].

2. Dysmenorrhoea-

Dysmenorrhoea literally means painful menstruation. It is one of the most common gynaecological problems. Primary dysmenorrhoea is one where there is no identifiable pelvic pathology. Incidence of primary dysmenorrhoea of sufficient magnitude with incapacitation is about 5-10% [27]. In double-blind randomized study by Reza *et al.*, it was demonstrated that Dill can be as effective as mefenamic acid in decreasing the pain severity of primary dysmenorrhoea. [28].

3. Labour pains-

Anethum Graveolens seed affect the pattern of uterine contraction and shorten the fall time although feedback mechanism is not known. Dill seed consumption, due its contents and combination such as limonene and tannin increases the contraction of uterus and causes better progress of

delivery process. Dill seed consumption shortens the first stage of labour. Dill seed can be used for augmentation of uterine contraction in low risk women in labour and also prevention of post term pregnancy [29-31].

4. Galactagogue-

Adequate breast feeding is must for normal physiological growth of baby especially up to the first six month of life. Sometimes if there is inadequate production of milk, growth of baby is likely to be affected. *Anethum Graveolens* has capacity to increase the production of milk and researchers, literature have proven it. So it can be used as Galectogogue [32-34].

5. Postmenopausal female-

Postmenopausal women are at a risk of developing diseases like osteoporosis, cardiovascular diseases and cancer along with their mortality rate and burden of their management and side effects have turned attention of all medical sciences to a safe, cheap and effective alternative. Phytoestrogens are now being thought beneficial in such patient and gaining popularity [35]. *Anethum Graveolens* contains Beta-Sitosterol and can be used as a source of Phytoestrogen. Phytoestrogens bind to oestrogen receptors just as oestrogen, but they have more affinity for oestrogen receptor β found in brain, bone, bladder and vascular epithelia. In breast and endometrial tissue, phytoestrogens acts as anti estrogenic. So when used in proper way these can be beneficial in breast CA, Endometrial CA, and also in the management of menopause. These are also useful in reducing the menopausal sign and symptoms like hot flush, vaginitis, anxiety and osteoporosis [36].

6. Infertility-

Use of *Shatapushpa* oil for *Nasya*, *abyanga* and *basti* is beneficial in female infertility. Oral intake of *Shatpushpa kalpa* and *Shatapushpa* oil also found useful in infertile female [37].

7. Hyperlipidaemic effects

The crude extract of *Anethum graveolens* L showed anti-hyper cholesterolaemic and anti-hyperlipidaemic activities [38-39].

8. Anti oxidant:

Antioxidant activities of ethanolic extract from dill flower and its various fractions were evaluated with 2, 2-diphenyl-1-picrylhydrazyl radical scavenging, Trolox equivalent antioxidant capacity,

reducing power, chelating power, and β -carotene bleaching assays [40-41].

9. Antimicrobial:

Anethum graveolens is found activity against *S. aureus*, *E. coli*, *P. aeruginosa*, *S. typhimurium*, *Shigella flexneri* and *Salmonella typhi*. [42-44].

10. Anti-inflammatory and analgesic effects:

The hydro alcoholic extract of the *Anethum graveolens* seed caused significant decrease in the inflammation and pain in rats. *Anethum graveolens* oil and diclofenac-gel showed a significant ($p < 0.001$) decrease in the paw volume in rats compared to the blank group. *Anethum graveolens* oil showed even more decrease in the paw volume compared to the diclofenac. So it can be used as an anti-inflammatory and analgesic agent [45-46].

11. Other-

Seeds have essential oil and are used for treatment of stomach illnesses, food digestion, stopping hiccup, relieving of pain and as anticonvulsant and antivomiting [47].

Discussion-

All these above studies prove that *Anethum graveolens* is useful in gynaecological disorders like dysmenorrhoea (Especially in Primary dysmenorrhoea), Post partum haemorrhage, for increasing labour pains. *Shatapushpa* oil is beneficial for *Nasya*, *Abyanga* and *Basti* in cases of infertility. *Artav (Ovum)* is having *Agney* (hot) Property, *Shatapushpa* is with *Katu Rasa* and *Ushna Virya* can be used for the purpose formation of *Stri Beej* (Ovulation). Researchers and literature have proven that *Anethum Graveolens* has capacity to increase the production of milk. It is also rich source of Phytoestrogen hence can be effectively used in menopausal females for symptoms like hot flush, vaginitis, anxiety and osteoporosis. Phytoestrogens acts as anti estrogenic in breast and endometrial tissue, so when used in proper ways these can be beneficial in breast CA, Endometrial CA. Along with this it is also beneficial as antioxidant, antihyperlipidemic, antiinflammatory and antimicrobial. Seed oil is also effective in stomach illnesses, food digestion, stopping hiccup, relieving of pain. *Shatapushpa* grows throughout in India and

easily available. It is also cheaper, hence can be used widely for treating various disorders.

Conclusion-

In present review it is clear that *Shatapushpa* has properties which are useful for treating many gynaecological disorders. *Shatapushpa* can prove key plant especially in the management of dysmenorrhoea, infertility and menopause.

So it is concluded that existing preparations of *Anethum graveolens* can be effectively used in the management of various gynaecological disorders. Also, there is a great scope for development of new *Ayurvedic* preparations of *Anethum graveolens*.

References:

[1] DS Emami, Jahansooz MR, Sefidkon F, Mazaheri D. Comparison of planting season effect on agronomic characters and yield of Dill. *Journal of crops improvement*; Spring 2010; 12(1):4147.

[2] Ravindran P, Balachandran I. Under utilized medicinal spices II. *Spice India*; Vol. 17. India: Publisher; V K Krishnan Nair; 2005. p. 3236.

[3] Setorki M, Rafieian-Kopaei M, Merikhi A, Heidarian E, Shahinfard N, Ansari R, et al. Suppressive impact of *Anethum graveolens* consumption on biochemical risk factors of atherosclerosis in hypercholesterolemic rabbits. *Int J Prev Med*; Aug 2013;4(8):889895.

[4] Shakiba-Dastgerdi A, Rafieian-kopaei M, Jivad N, Sedehi M, Yousefi-Darani M, Shirani F. Effect of hydro alcoholic extract of *Anethum graveolens* leaves on time response to pain stimuli in mice. *J Shahrekord Univ Med Sci*; 2013;15(2):7076.

[5] Hosseinzadeh H, Karimi GR, Ameri M. Effects of *Anethum graveolens* L. seed extracts on experimental gastric irritation models in mice. *BMC Pharmacol*;2002;2,(1):21.

[6] Khare CP. *Indian herbal remedies, Rational western therapy, Ayurvedic and other traditional usages, botany*; Berlin; New York; Springer, 2004, p. 6061.

[7] S. A. Dayani Siriwardene, L. P. A Karunathilaka, N. D. Kodituwakku, and Y. A. U. D. Karunarathne. Clinical efficacy of Ayurveda treatment regimen on Subfertility with Poly Cystic Ovarian Syndrome (PCOS). *Ayu*, 2010 Jan-Mar; 31(1): 2427.

[8] Kaur, Gurinder Jeet, and Daljit Singh Arora. Bioactive potential of *Anethum graveolens*, *Foeniculum vulgare* and *Trachyspermum ammi* belonging to the family Umbelliferae-Current status. *Journal of Medicinal Plants Research*; 2010;4(2):087-094.

[9] Warriar P.K. *Indian Medicinal Plants*; vol-1; kottakal; Aryavaidyashala; 2008, p.153.

[10] Sharma P. V. *Drvyagunavidnyan*; vol-2, reprint 2013; Varanasi; Chaukhamba prakashan; p. 403-404.

[11] Yoganarasimhan, Jadhav Dinesh. *Medicinal Plant of India*; vol-1; Interline Pub; 1996, p. 20-21.

[12] Ali Esmail Al-Snafi. The pharmacological importance of *Anethum graveolens*, a review. *International Journal of Pharmacy and Pharmaceutical Sciences*; 2014; 6(4):12-13.

[13] Ishikawa T M, Kudo M, Kitajima J. Water-soluble constituents of dill. *Chem Pharm Bul*; 2002;50(4): 501-507.

[14] Khafagy S M, Mnajed H K. Phytochemical investigation of the fruit of Egyptian *Anethum graveolens*. I. Examination of the volatile oil and isolation of dillapiole. *Acta Pharmaceutica Suecica*; 1968;53:155162.

[15] Stavri M, Gibbons. The antimycobacterial constituents of Dill (*Anethum graveolens*). *Phytother Res*; 2005; 19(11):938-941.

[16] Radulescu V, Popescu M L, Ilies D C. Chemical composition of the volatile oil from different plant parts of *Anethum graveolens* L.(Umbelliferae). *Farmacia*; 2010;58(5):594-600.

[17] Orthan I E, Enol F S, Ozturk N, Celik S A, Pular A, Kan Y. Phytochemical contents and enzyme inhibitory and antioxidant properties of *Anethum graveolens* samples cultivated under organic and conventional agricultural conditions. *Food chem Toxicol*; 2013;59:96-103.

[18] Yazdanparast R, Bahramikia S. Evaluation of the effect of *Anethum graveolens* L. Crude extracts on serum lipids and Lipoproteins profiles in hypercholesterolaemic rats. *DARU*; 2008;16(2):88-94.

[19] Bertram G Z, Emertius P H. *Basic and Clinical Pharmacology*; 8th ed; New York Mc Graw Hill;2001; p.282-286.

[20] Gharibn Aseri M K, Mard S A, Farboud Y. Effect of *Anethum graveolens* fruit extract on rat uterus contractions. *Iranian J Basic Med Sci*; 2005;8(4 (28)):263-270.

[21] Committee for Veterinary Medicinal Products, EMEA/MR "Juniperi Fructus is the dried berry like cones of *Junipers communis*", 1999.

[22] Mahdavian M, Golmakani N, Mansoori A, Hosseinzade H, Afzalaghvae M. An investigation of effectiveness of oral Dill extracts on postpartum hemorrhage. *J Women Midwifery Infertil Iran*; 2001;78(4):1926.

[23] Hekmatzade SF, Mirmolaei ST, Hosseini N. The effect of boiled dill (*Anethum graveolens*) seeds on the long active phase and labor pain intensity. *Armaghane-Danesh*; 2012;17(1(67)):50-59.

[24] Roberts L, Gulliver B, Fisher J, Cloyes KG. The coping with labor algorithm: An alternate pain assessment tool for the laboring woman. *J Midwifery Womens Health*; 2010;55(2):107-116.

[25] Soares PM, Lima RF, de Freitas Pires A, Souza EP, Assreuy AM, Criddle DN. Effects of anethole and structural analogues on the contractility of rat isolated aorta: Involvement of voltage-dependent Ca²⁺ channels. *Life Sci*; 2007; 81(13):1085-1093.

[26] Ishikawa T, Kudo M, Kitajima J. Water-soluble constituents of Dill. *Chem Pharm Bull (Tokyo)*; 2002;50(4):501-507.

[27] Hiralal Konar. Dutta D. C, *Textbook of Gynecology*. 4th edition, Delhi, India; Jaypee medical; 2007, p. 52-56.

[28] Reza Heidarifar,¹ Nahid Mehran, Akram Heidari, Hoda Ahmari Tehran, Mohammad Koohbor, Mostafa Kazemian Mansourabad. Effect of Dill (*Anethum graveolens*) on the severity of primary dysmenorrhea in compared with mefenamic acid: A randomized, double-

blind trial. *J Res Med Sci*; 2014 Apr;19(4):326-330.

[29] Samira ebrahimzadeb zagmi, Nahid Golmakani, Maryam Kabirayan, Mohammad Taghi Shakiri. Effect of Dill (*Anethum Graveolens* seed) on uterine contraction in active phase of labour. *Indian Journal Of Traditional Knowledge*; oct2012;11(4): 602-606.

[30] Mansouri A, Pourjavad M, Hosseinzadeh H, Tarahomy M, Effect of dill extract on the uterus of pregnant mice, 3rd International Congress of Health and Natural Products, Mashhad. 2004:64.

[31] Hekmatzadeh SF, Bazarganipour F, Malekzadeh J, Goodarzi F, Aramesh S. A randomized clinical trial of the efficacy of applying a simple protocol of boiled *Anethum graveolens* seeds on pain intensity and duration of labor stages. *Complementary therapies in medicine*; 2014;22(6):970-976.

[32] Monsefi M, Ghasemi M, Bahaoddini A. The effects of *Anethum graveolens* L. on female reproductive system. *Phytother Res*; 2006;20(10):865-868.

[33] Hornok L. Cultivation and processing of medicinal plants: Academic publications. 1992; p.338.

[34] Sharma R. *Agrotechniques of medicinal plants*. New Delhi, Daya Publishing House, 2004. p. 3-8.

[35] Hiralal Konar. D. C Dutta Textbook of Gynecology. 4th edition,; Delhi, India; Jaypee medical; 2007; p. 52-56.

[36] Gujarathi Jasmine, Murthy ARV. Prevention of Breast Carcinoma and Endometrial Carcinoma in Postmenopausal Women through Ayurveda. www.Reserchgate.net/publication/235338571.

[37] Tiwari P.V. Tiwari. *Ayurvediya Prasutitantra evum Striroga Part2*. 2nd edition; Varanasi; Choukhanba Prakasha; 2014, p. 289-304.

[38] Yazdanparast R, Alavi M. Antihyperlipidaemic and antihypercholesterolaemic effects of *Anethum graveolens* leaves after the removal of furocoumarins. *Cytobios*;

2001;105(410):185-191.

[39] Satyanarayana S, Sushruta K, Sarma GS, Srinivas N, Subba Raju GV. Antioxidant activity of the aqueous extracts of spicy food additives--evaluation and comparison with ascorbic acid in-vitro systems. *J Herb Pharmacother*; 2004;4(2):1-10.

[40] Yung-Shin Shyu, Jau-Tien Lin, Yuan-Tsung Chang, Chia-Jung Chiang and Deng-Jye Yang. Evaluation of antioxidant ability of ethanolic extract from dill (*Anethum graveolens* L.) flower. *Food Chemistry*; 2008; 115(2): 389.

[41] Mahmoud Mirhosseini, Azar Baradaran,¹ and Mahmoud Rafeian-Kopaei. *Anethum graveolens* and hyperlipidemia: A randomized clinical trial. *J Res Med Sci*; 2014 Aug; 19(8): 758761.

[42] Arora DS, Kaur JG. Antibacterial activity of some Indian medicinal plants. *J Nat Med*; 2007; 61(3):313-317.

[43] Chaurasia SC, Jain PC. Antibacterial activity of essential oils of four medicinal plants. *Indian J Hosp Pharm*; 1978; 15(6):166-168.

[44] Delaquis PJ, Stanich K, Girard B, Mazza G. Antimicrobial activity of individual and mixed fractions of dill, cilantro, coriander and eucalyptus essential oils. *Int J Food Microbiol*; 2002;74(1):101-109.

[45] Valady A, Nasri S, Abbasi N. Anti-inflammatory and analgesic effects of hydroalcoholic extract from the seed of *Anethum graveolens* L. *J Med Plants*; 2010; 9: 124-130.

[46] Naseri M, Mojab F, Khodadoost M. The study of anti-inflammatory activity of oil-based dill (*Anethum graveolens* L.) extract used topically in formalin-induced inflammation male rat paw. *Iranian Journal of Pharmaceutical Research*; 2012; 11 (4): 1169-1174.

[47] Zargari A. *Medicinal Plants*; Tehran, Iran: Tehran University Publication; 1996; pp. 52831.