INTERNATIONAL JOURNAL OF NOVEL RESEARCH AND DEVELOPMENT (IJNRD)
© 2026 IJNRD | Volume 11, Issue 2, February 2026 | ISSN: 2456-4184 | IJNRD.ORG

Asafoetida (Hing) Therapeutic and Pharmacological Potential in Gynecological Disorders and Women's Health: A Unani Review

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Abstract: Asafeotida is a well-known herbal drug of the Umbelliferae family in various traditional medicines for its tremendous effects on different gynecological diseases and women's health. It is oleo-gum resin obtained by incision from the rhizome and roots of *Ferula foetida Regel*, *Ferula rubricaulis Regel*, and other species of Ferula. It is commercially available in three forms: tear, mass, and paste. This herb is found from the the Mediterranean region to Central Asia, specifically Iran, Afghanistan, and Pakistan, and is also cultivated in India. It is listed in the British Pharmacopeia as Antispasmodic, Stimulant in Hysteria, Emmenagogue, and Uterine Tonic. In the Unani System, it is used as an antispasmodic, Stimulant, Emmenagogue, Abortificant and Contraceptive, Resolvent, for Sexual potency, Analgesic, Antiseptic, Anti-inflammatory, and Uterine Tonic. In recent studies, it has shown Anti-tumor and Antioxidant activity in Breast Cancer, Analgesic, Antispasmodic and anti-inflammatory effects in Dysmenorrhea, effective in hormonal imbalance in Menopause and PCOS, Emmenagogue in Amenorrhea and PCOS, Anti-fungal effect in Vaginal Candidiasis, Antimicrobial effect, Anti-parasitic effect in Trichomonas Vaginalis, Antifertility and abortifacient effect, and Anxiolytic and sedative effect in Hysteria. This article discusses the pharmacognosy, therapeutic potential, pharmacological studies, and effect of *Ferula foetida Regel*. (Asafeotida) along with women's health and gynecological uses, with comprehensive review based on Unani Medicine.

Keywords: *Hilteet, Ferula foetida Regel*, Oleo-gum resin, Unani Medicine, Gynecological disorder, Women's health.

1. Introduction:

The women's health is very sensitive and one of the most critical topic in our society, and gynecological health play main role. Women's reproductive health is important to their overall well-being, yet it doesn't receive the attention it deserves. (1) There are many Gynecological disorders found in women that needs to be timely diagnosed and cured to avoid major health problems. Common gynecological disorders that most of the females suffer from are *Usr-e-tams* (Dysmenorrhea), *Ehtabas-e-tams* (Amenorrhea), *Sailan-e-reham* (Leucorrhoea), *Warm-e-Farj wa Mehbal* (Vulvitis and Vaginitis), *Warm-e-anq-ul-rehem* (Cervicitis), *Warm-e-Reham* (Metritis), *Warm-e-sadaen* (Mastitis), PCOD and PCOS (Polycystic ovarian diseases and Polycystic ovarian syndrome), and Menopausal syndrome. (2) From common infections to complex conditions like fibroids or cancers, gynecological disorders can affect women's health at different stages of life. (1) The Unani system has

many herbal single and compound drugs that are effective on women's health and gynecological diseases. As per classical Unani literature, *Hing (Ferula foetida regel)* has very effective results on gynecological diseases. Asafoetida *(Ferula foetida Regel)* is an old traditional phytomedicine used to treat various diseases in different countries. *Ferula foetida Regel* (Asafoetida) is one of the most important native species of Ferula. [3] Asafoetida is the oleo-gum resin obtained by incision from the rhizome and roots of *Ferula foetida Regel, Ferula rubricaulis Regel*, and other species of Ferula that belong to the Umbelliferae family. [4] A genus of perennial herbs distributed from the Mediterranean region to Central Asia. The more important ferula gum-resins imported into India, from Persia and Afghanistan, are Asafoetida *(Ferula foetida Regel)*, Galbanum *(Ferula gummosa)*, and Sumbul *(Ferula sumbul or Ferula moschata)*. Commercially, Asafoetida occurs in three forms, viz., tears, mass, and paste. [5]

In Unani system of medicine, various formulations and method are available in the treatment of gynecological disorders, which Hing have been used orally in the form of *safoof* (powder), *joshanda* (decoction), *Majun* (sweet-paste), *Hab* (Pills), *Qurs* (Tablets) and locally in the form of *Humool* (Pessary), *Shiyaf* (suppository), *Farzaja* (tampon), *Zimad and Qairooti* (Ointment), *Huqna* (enema), *Abzan* (sitz bath), *Malish* (Massage), *Dhooni* (Fumigation), *Nutool* (Irrigation), *Shamoom* (Inhalation), *Tila* (oiling). [6–9] Hing (Asafoetida) exhibiting the properties of *Muharrik-e-A'sab* (Stimulant) [5,10–23], *Daf-e-Tashannuj* (Antispasmodic) [5,11–26], *Muqawwi-e-Rahem* (Uterine tonic)[5,12,16], *Qatil-e-kirm-e-Shikam* (Anthelmintic) [11,17,20,21], *Muddir-e-Baul* (diuretic)[10,12,14,15,19,20,25–27], *Muqawwi-e-Bah* (Aphrodisiac) [11,12,17,19,20,23,28], *Daf-e-Taffun* (Antiseptics) [10,15,16,20,23,25–27], *Mudir-e-Haiz* (Emmenagougue) [10,12,14,15,19–21,23,25,26,28], Musakkin-e-dard (Analgesic)[12,14,20].Due to its volatile oil fraction it has properties of *Kasir-e-Riyah* (Carminative)[10,12–17,20,21,23,25–28] and *Munjiz-e-Balgham* (Expectorant)[12,13,15,18,20–23,25,26] [29]. It increases sexual appetite*(Muharrik-e-Bah)*[12,14,23,25], increases lochial discharge after childbirth [20], also act as a powerful nervine stimulant used in the nervous disorder of *Ikhtinaqur-rahem* (hysteria)[5] [17]. Hing (Asafoetida) given as *Humool* (pessary) for expulsion of dead fetus[12,14,24]. Hing gum-resin reduces and melts unwanted mass *(Baad Ghost*) and acts as *Muhallil* (Resolvent). [12, 19] Scientific studies have reported, that shows medicinal values of hing (Asafeotida) which have Antispasmodic activity[30,31], Antifungal activity[32], Antimicrobial activity[33–35], Anxiolytic effect[36], Effect in Hormonal imbalance[37,38], Antioxidant activity[39–43], Analgesic and Anti-inflammatory activities [44,45], Contraceptive effect and Abortificant effect [46–48].

This review article gives a detailed description of *Ferula foetida Regel* (Asafoetida/Hing), taxonomical and botanical description, history, geographical distribution, collection, temperament, action, therapeutic uses, treatment as per authentic Unani literature, and its effect in gynecological disorders and women's health in view of Unani literature and Scientific Studies.

2. Material and Method:

2.1. Taxonomical Classification:

Kingdom	Plantae [49,50]
Phylum	Streptophyta [49,50]
Class	Equisetopsida [49,50]
Subclass	Magnoliidae [49,50]
Order	Apiales [49,50]
Family	Apiaceae [49,50]
Family Synonym	Umbelliferae juss. [51]
Genus	Ferula[49,50]

Species	Ferula foetida
Binomial name	Ferula foetida (Bunge) Regel [49,50]
Synonym	1.Ferula scorodosma Bentley & Trimen 2.Scorodosma foetidum Bunge [49,50]
Common names	Asafoetida, Gum Asafoetida, Devil's dung, Food of the gods, Stink finger, Hing. [4,52]

2.2. Botanical Description:

Perennial herb; leaves 2–4 pinnatifid or 2–4 pinnate; umbels compound; flowers yellow, often polygamous; calyx teeth obsolete; petals ovate, obtuse, or emarginate; fruit orbicular or ellipsoid, much compressed dorsally; dorsal and intermediate filiform or obscure, lateral ridges winged, vittae broad, usually occupying the whole furrow, and as long as the carpel; seed much dorsally compressed, inner surface plane. [17, 21, 52]

Plants[49]

Steam[49]

Umbels [49]

Compound inflorescence[49]

The tree of Hing is called Anjudan. These trees are not found in India. It is a resin (gum) obtained from the roots of the Anjudan tree. It is harvested by making an incision or cut in the root of the plant. Initially, the juice is a milky-white liquid that turns into a solid, brownish substance upon drying. It has intense, persistent, penetrating, and alliaceous odour. It has a bitter and acidic taste.[4,10,12–14,16,19,20,25–27,29]

Types & Forms:

A. According to *Dioscorides*, it has two types in color:[12,15,16,20,25,26,28]

1. White Hing: It is called *Hilteet Taib*. It is also called Hira Hing. Its plant is 2-4 feet long and white colored flowers and fruits. It having pleasant smell and taste.

2. Black Hing: It is called *Hilteet Munash*. In Hindi, it's called Hingra hing. Its plant is 4-5 feet long and black colored fruit. It has an intense and pungent odour. This hing is cheaply available and used in house hold for cooking and medicinal use.

B. Commercially it has three forms:[5,13,15,16,27,29]

1. Tear Shape: The tears, constituting the purest form of the resin, are rounded or flattened, 5–30 mm. in diam., and greyish or dull yellow in color. Two types are recognized according as the tears retain the original color for years or gradually become dark or reddish brown.

2. Mass shape: It is the common commercial form. It consists of tears agglutinated into a more or less uniform mass, usually mixed with fragments of root, earth, etc.

3. Paste shape: The paste form also contains extraneous matter.

Ferula foetida Regel. (Resin) [54]

Whole Plant parts[55]

2.3. Geographical Distribution:

It is a genus of perennial herb of 60 species distributed from the Mediterranean region to Central Asia, Specifically native to Iran, Afghanistan, Pakistan, and Persia. Three Species of Ferula are found in India. Ferula narthex occurs in Kashmir. It is also found in Punjab.[4,5,10,11,13,15–17,20,22–27,29,53]

2.4. History:

It is the most popular spice in ancient Rome. Commercial Asafeotida (Hing) is generally collected from Afghanistan and Iran.[27] The more important Ferula gum-resin imported into India, chiefly from Persia and Afghanistan, are Asafoetida *(Ferula foetida Regel)*, Galbanum *(Ferula gummosa)* and Sumbul *(Ferula sumbul or Ferula moschata)*.[5]

I n *May, 1884*, Dr. Peters, of the Bombay Medical Service, when stationed at Quetta, observed the flowering stem of an Asafoetida plant which was being offered for sale in the bazaar as a vegetable by the Kákar Pathans. Specimens which he kindly forwarded to one of us were identified by Mr. E. M. Holmes as *F. foetida, Regel*. Dr. Peters also found the dried root of the same plant in the drug shops, and learned that it was the plant from which Asafoetida was collected in Western Afghanistan.[24]

This is ancient medicine in Unani system of medicine use since thousands year by Unani physicians. *Theophrastus* (371BC-287BC), *Jalinoos* [Galen] (131-210A.D), *Dioscorides*(70A.D), *Ibn sina*[Avicenna](980-1037A.D) and *Rhazi*(850A.D) were mention this herb in their books. *Rhazi* (850 A.D) used this drug in paralysis and made *Majun* (Sweet-paste) for oral administration and named it as *"Majun Hilteet*".[11,13] Asafoetida appear to have introduced from East by Arabian Physician.[29]

2.5. Vernacular names:*(5,10–12,14–26*)

Arabic: Anjdan, Hilteet,Tyib, Samag-ul-Mehrus

Persian: Angoza, Angzoo

Assamese: Hin

Bengali: Hing, Hingra

English: Asafoetida

Gujarati: Hing, Vaghami

Hindi: Hingra, Hing

Kannada: Hingu, Ingu, Hing

Kashmiri: Yang

Malayalam: Kayam, Perungayam, Perugkayam

Marathi: Hing, Hira

Oriya: Hengu, Hingu

Punjabi: Hing,

Sanskrit: Ramatta, Bhūtnasan, Hingu, Sulanasan, Balhika,Gathukam

Tamil: Perungayam, Perungkayam

Telegu: Ingura, Inguva, Ing.,Ingumo

Urdu: Hilteet, Hing,Anjdan

Unani: Saleqoon, Forinas, Suryanafs

Syriani: Halteesha

2.6. Procedure and Time of Collection:

In Afghanistan, the resin is obtained from carrot-shaped massive roots and rhizomes of the plants which are about 4 - 5 years of age and 12 - 15 cm in diameter. In the month of March-April, just before the flowering season of the plant, the upper part of the roots, very close to the crown, is cut off. The milky juice oozes out of the cut surface and starts coagulating. This cut surface is covered by the dome-shaped device made up of leaves and the branches to avoid contamination with sand and foreign organic matter. After few days, the coagulated matter is scrapped off and the fresh cuts are given to collect more exudate. This is continued for about three months or until the plants cease to produce latex. On average, plant yields about 1 kg of the oleo-gum resin. After collection, it is dried thoroughly and packed in suitable containers.*(4,5,10,13,15,17,20,24,29)*

2.7. Adulterants:

Asafoetida is adulterated with gum arabic, other gum-resin, gypsum, red clay, chalk, barley or wheat flour, slices of potatoes, Broad bean flour (*Bakla Atta*),etc.[4,5,12,20]

2.8: Parts Used: Gum-resin [16,17,23,25]

2.9: Temperament (*Mizaj*):

Mizaj	References
Hot Dry [2]	(13,16,20,25)
Hot[3] Dry[2]	(15,20)
Hot[4] Dry[2]	(12,14,20,23,27,53))
Hot Dry[3]	(20,28)

3. Result:

3.1. *Af'al* (Action):

Action	References
Muharrik-e-A'sab (Stimulant)	(5,10–23)
Daf-e-Tashannuj (Antispasmodic)	(5,11–26)
Muqawwi-e-Rahem (Uterine tonic)	(5,12,16)
Qatil-e-kirm-e-Shikam (Anthelmintic)	(11,17,20,21)
Muddir-e-Baul (diuretic)	(10,12,14,15,19,20,25–27)
Muqawwi-e-Bah (Aphrodisiac)	(11,12,17,19,20,23,25,28)
Daf-e-Taffun (Antiseptics)	(10,15,16,20,23,25–27)
Mudir-e-Haiz (Emmenagougue)	(10,12,14,15,19–21,23,25,26,28)
Musakkin-e-dard (Analgesic)	(12,14,20)
Kasir-e-Riyah (Carminative)	(10,12–17,20,21,23,25–28)
Munjiz-e-Balgham (Expectorant)	(12,13,15,18,20–23,25,26)
Muhallil (Resolvent/Anti-inflammatory)	(12,19)
Hazim (Digestive)	(13,16,20,28)
Muharrik-e-bah (sexual Stimulant)	(25)
Muqawwi-e-Meda (Stomachic)	(25)
Muhammir-e-Jild (Skin rubificent)	(15,20,25,26)

Daf-e-Tiryaq (Antidote)	(12,19–21,28)
Mulattif (Demulcent)	(19,28)
Musaqqit-e-Janeen (Abortificant)	(12,14,24)
Mufaateh (Deobstruent)	(12,19)
Jali (Detergent)	(12)
Daf-e-Humma (fever)	(12,19,28)
Munawwim (Sedative)	(20)

3.2. Uses *(Istemal)*:

Uses	Refrences
Ikhtinaq-ur-Rahem (Hysteria)	(5,11,12,15–18,20,21,23–25)
Zof-e-Bah (Sexual weakness)	(11,12,15,17,19,20,23,25,28,29)
Muqawwi-e-Rahem (Uterine tonic)	(5,18,21)
Rashaa (Convulsions)	(11,12,15–17,20,22,23)
Sara (Epilepsy)	(5,12,13,16,18–20,22,23)
Masqat-e-Janeen wa Mashima (Abortifacient)	(12,20)
Zeeq-un-Nafs (Asthama)	(5,15,18,21,23,25)
Shaheeqa (Whooping Cough)	(5,18,22,23)
Iltehab-e-Shaub Muzmin (Chronic Bronchitis)	(5,11,17,18,21–24)
Khansi (Cough)	(12,18–20,25,25,27–29)
Waja'al-Fu'ad (Gastro-esophageal reflex diseases)	(13,15)
Falij (Paralysis)	(10,12,13,15,16,19–21,27,28)
Laqwah (Bell's Palsy)	(10,12,13,13,15,16,20,27)
Zauf-e-Hazam (Indigestion)	(10,12–14,16,22,25)
Dard-e-Shikam (Stomach pain)	(13,15,16,20,21,27)
Tashnnuji Dard (Spasmodic pain)	(11,17–25,28)
Tajabbun al-Laban (Coagulation of breast milk)	(19)
Nafakh-e-Shikam (Flatulent)	(10,12,13,15,16,18,20,23,25,27,29)
Zof-e-Basar (Eye weakness)	(19–21,23,28)
Kirm-e-Meda wa Ama (Intestinal worms)	(11,12,17,18,20,21)
Waja-ul-Asnan (toothache)	(12,19,20,23)
Ethebas-e-Tamas (Amenorrhea)	(10,12,16,19,20,23,25,28)
Usr Tamas (Dysmenorrhea)	(10,12,16,19,20,28)
Ehtebas-e-Baul (Urine Retention)	(10,12,19,20,25,27)
Hummiyat (Fever)	(17,20,23,28)
Tiryaq-e-Samoom (Antidote)	(12,13,15,18–20,28)

Qulanjh (Colic Pain)	(16,18,19,23,27)
Waja-ul-Mufasil (Joint Pain)	(12,19,21,28)
Quba (Ringworm)	(12,19,20,28)
Muhalil-e-Awram (Anti-inflammatory)	(5,15,16,18,19,19–22,25,26,28)
Daf-e-Taffun (Antiseptic)	(5,12,13,15,16,20,22,23,27)
Amraz-e-Jlid (Skin diseases)	(12,15,19,20,22,25)
Mukassin-e-Dard (Analgesic)	(12,20,21)

3.3. Gynecological and women's health uses:

1. *Ihtebas-e-Tamas* (Amenorrhea):

- Hing powder is useful in this.[25]
- Hing, *mur* (Myrrh) and *filfil siyah* (black pepper) make powder of these 3 drugs and take this powder orally.[12,14]
- Hing and *Post-anar* with *Sirka*(vinegar) use orally.[28]
- *Farzaja* (Vaginal pessary) hing mixed with honey stimulates blood flow and treat amenorrhea. [56,57]
- *Hab-e- Ehtebas-e-Tamas*: Hing (1grain=6.799 mg) and *Sibr Zard* (Alovera) (1 grain) make a pill and give one pill twice a day. [58]

2. *Usr-e-Tamas Tashannuji* (Dysmenorrhea):

- *Zimad* (Paste): Hilteet and vinegar paste applied externally to relive pain & spasm. [59]
- 2.15 g hing with *Sakbenaj* it remove *Ghaliz Ikhlat* (thick humor).[12,19]
- *Malish* (Massage): Massage the abdomen with hing oil.[20]
- *Hing, Suddab* (garden rue) with *filfi siyah* (black pepper) oral administration. [14,19]
- *Heeng* (500mg) and Jaggery (6gm) mix both and take daily in the morning for three to five days during menstrual period.[60]

3. *Qatil-e-Janeen* (Abortificant/Contraceptive):

- Hing decoction combine with *Murmakki* (Myrrh) and Soya (Dill) seed.[61]
- *Humool* (Vaginal Pessary): Use *hilttet* as vaginal pessary.[12,14,20,62]
- *Dhooni* (Fumigation) and oral use of hing cause abortion.[12]

4. *Awram-e-Basur & Sala-e-Rahem* (Uterine Tumors & Fibroid):

- *Farzaja* (Pessary): *Hilteet* mixed with *Muqil* (Guggul) and Soya (Dill) oil and use as vaginal suppository.[61,63]
- Decoction of hing and *Beekh-e-Kasni* (Chicory root).[61]
- *Abzan* (Sitz bath): boil hing and *baboona* (Chamomile) in water and allow patient to sit it help to shrink uterine growth.[64]
- *Nutool* (Irrigation): Decoction of hing is poured from height onto lower abdomen. [65]
- Hing with *Sakbenaj* use orally.[12]
- Hing alone or with suddab (garden rue), *Bor Armani*, and honey orally.[19]
- *Qairooti* (Ointment) or pulp of anjeer mix with hing and use orally it reduces the tumor size.[62]

5. *Ikhtinaq-ul-Rahem* (Hysteria):

- Inhalation (*Shamoom)* of raw resin of hing which suppresses the vapors causing hysteria.[57,59,60]
- *Huqna* (Enema) : hing and water enema.[20]
- Pills *(hab):* hing+ aloes + little honey.[23]
- *Qurs Hilteet* is taken orally 2 tablets with water at bed time.[60]
- *Hab-e-Ikhtinaq-ur-Rahem*: hing (4 grain=259.196 mg) and Kafoor (4 grain) mix and make a pill and give one twice a day.[58]

6. *Tafreegh-e-Rahem* (Post-Postpartum cleansing):

- Pills : small pills *(Hab)* of hing mixed with *Zanjabeel* (ginger) and *Filfil siyah* (black pepper).[66]
- *Hilteet* with vinegar and honey prevent *Humma-e-Nifasi* (Puerperal Fever) and ensure uterine hygiene.[66]
- Decoction of hing with *Tukhm-e-Gandana* (leek seed) expulse retained placenta and relive postpartum uterine colic.[67]
- *Hab* (Pills) : Fried hing, garlic and Palmyra jaggery made pill and give in morning.[20,23]

7. *Ikhtitam-e-Tamas* (Menopausal syndrome):

- Orally 125mg of *hilteet mudabbir* (purified hing) is taken with warm water or mixed with *Majun Dabidul ward*.[59]
- Pomegranate juice with hing .[28]
- Asafoetida pill with little soup help in nervousness and anxiety.[23]
- Alone hing oil or mixed with heena oil and alovera oil (*roghan e aaresa*) and massage on joints it divert the direction of bad matters.[28]

8. *Salanat-e-Rahem* (General Uterine Hardness):

- *Abzan* (Sitz bath): boil hing, *baboon* (Chamomile) and soya (dill) in water and allow patient to sit into it and its vapors soften the uterine tissues.[66]

9. *Amraz-e-Khusyat-ur-Rahem* (PCOS):

- *Hab e Hilteet* : Equal amount of *hilteet*, soya (dill) and *jawakhar* (Potassium Carbonate) make a pill and use 1 pill (250-500mg) twice a day.[68]

10. *Injemad-e-Laban* (Coagulation of milk):

- Oral administration of hing and *sakbenaj*.[12,19,20]

11. *Zof-e-Bah* (Sexual Weakness):

- Put small amount of hing at reproductive part it will enhance the libido.[12,19,20]
- Mix hing with jasmin oil (*roghan e chanbeli*) and put in sunlight for longtime the use it .[12,19,20]
- *Tila* (oiling) with hing also effective.[25]

3.4. Adverse effect (*Muzir)*:

Adverse effect	Refrences
Liver	(12,14,15,19,20,27)
Brain	(12,14,15,20,27)
Stomach	(12,19,20)
Intestine	(20)
Rectum	(20)
Hot temperament people	(14–16,20,25)
Cause vomiting	(20)
Aza-e-Asfal (Lower body parts)	(14)
Urinary Bladder	(28)

3.5. Correctives *(Musleh):*

Zarishk (Berberis aristata DC)[17,20], *Kateera (Sterculia galbaniflua Roxb,)*[12,14–17,20,25,27], *Saeb* (Apple & Apple juice) [12,14,20], *Anar* (Pomogranate) [12,14,15,20], *Anisoon (Pimpinella anisum L.)* [12,14,17,20], *Zeera (Cuminum cyminum L.)* [20], Syrup of Jasmine roots [20], *Nilofer (Nymphaea alba L.)* [12,14,20], *Banafsha (Viola odorata L.)* [12,20], *Sandal Safeed & Sharbat-e-Sandal (Santalum album L.* and its juice)[12,14,20].

3.6. Substitute (*Badal*):

Jaosheer (Ferula galbanifula Boiss.)[14,14–16,20,27], Carrot seeds [12,20], *Zeera (Cuminum cyminum L.)*[14,20,25], *Sakbenaj (Ferula persica)*[12,14]

3.7. Therapeutic doses (*Miqdar-e-khurak*):

Doses	References
125 mg	(22)
400 mg	(11,17)
500mg	(15,16,22,25,27)
1 gm.	(10,15,16,20,27)
1.75 gm.	(12)
2 gm.	(14,20)
2.25 gm.	(12,14)
3 gm. (maximum dose)	(20)

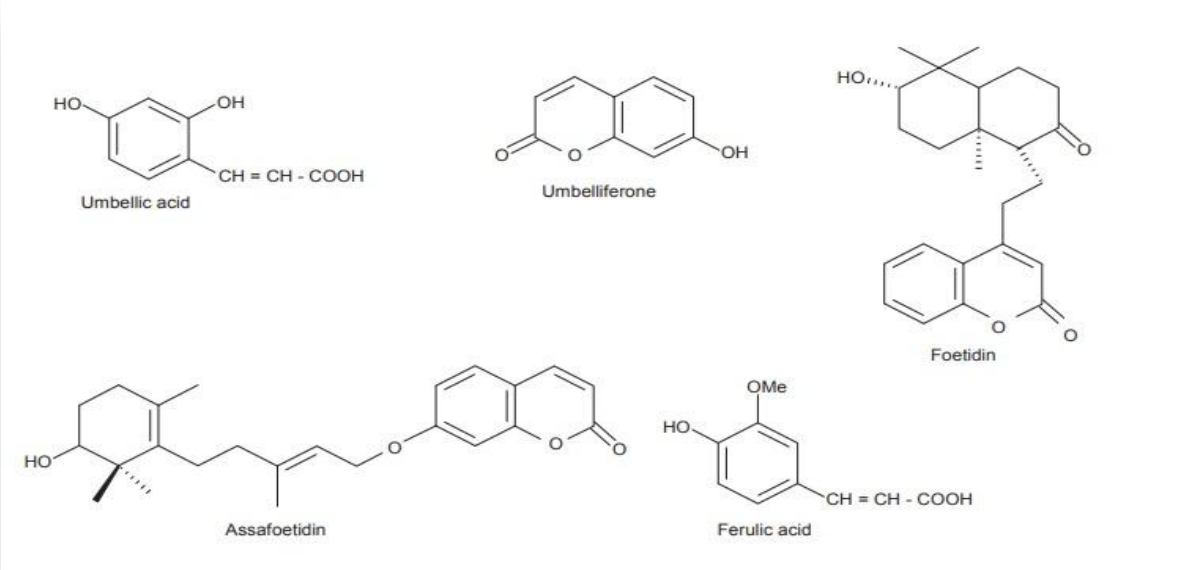
3.8. Compound formulation (*Murakkabat*):

- *Hab-e-Hilteet* [10,11,13,15–17,25,27]
- *Majun Hilteet*[13,16]
- *Majun Jograjgogul*[13,15,16]
- *Sufoof-e-Namak-e-Sulemani Siyah* [13,15,16,25]
- *Majun Laqwah*[13]
- *Sufoof-e-Qaqlah*[25],
- *Akseer-e-Dard-e-Gurda* [25]
- *Tiryaq-e-Asnan* [25],

- *Majun Antaki* [10,27]
- *Zimad Khanazeer* [10,27]
- *Tila jund* [10,27]

3.9. Chemical constituent:

- Resin 40-65% , Gum 25% and Essential oil .[5,10,11,15–18,22–24,27,29]
- Essential oil act protective against fat induced plasma fibrinogen and decreases the coagulation time and fibrinolytic activity also lower the serum cholesterol level.[69]
- Ash 1.5-10% [5,23,29], Volatile oil 5-17 % [5,15,16,22,23,25,27,29]
- Asaresino-tanol [5,22,23,25], Umbelliferone [5,5,15,15,18,23–25,29], Asaresinol ferulate [27,29], Franesiferol [16,22], Assafoetidin [16], Foetidine [16], Ferocaulicin [16], Feselol [16], Free Ferulic acid [15,18,22–25,27,29], Umbellic acid [22,29], Malic acid [22,23,25], Valerianic acid [22,23,25]), Formic acid [22,23,25]), Benzoic Acid [15,22,25], Acetic acid [22,25], Garlic-allyl [23], Allyl persulphide [23,25], Methyl galbanate [16], Pinene [5,15,18,22], Cadinene[22], Organic disulphide [15,18], Organic sulphur compounds [15,18,23,24]), salts [15], Sulphated Terpenes [5,22,23], Vanillin [22,29], Sesquiterpenoid coumarins [22,29], Sesquiterpenoid-10-epijunenol [69]. figure:[70]



3.10. Pharmacological Studies:

i.Amenorrhea and PCOS:

- The *Dehparvar et al. (2024*) a double blind randomized, patients received two 21-day treatment cycles with a 7-day break in between, starting on Day 5 of their menstrual cycle. The herbal group (n=15) took 1g of Asafoetida daily, while the conventional group (n=15) took one LD tablet daily (one tablet). Asafoetida improved menstrual cycle regularity and increased pregnancy rates in PCOS patients. It outperformed LD treatment in maintaining menstrual cycle without side effects. Overall, Asafoetida shows promise in addressing PCOS and Amenorrhea.[46]

ii.Antioxidant activity and Anti-cancer activity:

- This study evaluated the cytotoxic, phytochemical, and antioxidant properties of Ferula assafoetida gum (FAGE) and leaf (FALE) extracts, comparing their effectiveness. Ferula assafoetida gum (FAGE) extract showed higher phenolic content, antioxidant activity, and cytotoxic effects against breast cancer cells compared to leaf (FALE) extract. FAGE contains notable compounds like β-Bisabolol and has significant total phenol (94.8 mg/g) and flavonoid (90.9 mg/g) content. The extract exhibited good antioxidant activity, including Fe2+ chelating ability and radical scavenging.(39)
- This article reviews evidence on the anti-cancer effects of Ferula assa-foetida extracts, compounds, and essential oils, suggesting its potential in cancer treatment. Asafoetida's compounds show promise for developing new anti-cancer drugs, and its use as a food seasoning may aid cancer prevention. Leveraging nanotechnology and biotechnology could enhance its therapeutic applications.(41)

iii.Dysmenorrhea and Anti-spasmodic activity:

- A single-blind study compared Asafoetida with Mefenamic acid for treating dysmenorrhea and improving quality of life. Sixty patients were randomly assigned to receive either Asafoetida or Mefenamic acid (250mg, twice daily) for 5 days, starting 2 days before menstruation, for two cycles. Asafoetida significantly reduced menstrual pain, improved quality of life, and was as effective as Mefenamic acid.(31)

iv.Menopausal symptoms/ Menopausal Dysfunction :

- A double-blind randomized, placebo-controlled clinical trial of 64 postmenopausal women showed that Ferula extract (100mg/day for 90 days) significantly improved menopausal symptoms, sexual behavior, and BMI, while reducing oxidative stress. The extract, containing 20% ferutinin, reduced symptoms by 67% and kept platelet aggregation normal. It's a promising treatment for menopausal discomfort, improving overall quality of life(38).

3.11. Experimental studies:

i.PCOS:

- Ferula assa-foetida oleo-gum resin shows therapeutic potential in treating letrozole-induced polycystic ovary syndrome (PCOS) in rats. At 25 and 50mg/kg doses, it improved ovarian histopathology, including theca and granulosa layer thickness, and regulated target gene expression. Asafoetida may complement conventional PCOS therapies by regulating metabolic and ovarian cycle enzymes.(37)

ii.Antispasmodic activity:

- In this study Ferula asafoetida gum extract shows antispasmodic and hypotensive effects. It relaxes guinea-pig ileum contractions induced by acetylcholine, histamine, and KCl, and lowers blood pressure in rats. The extract's relaxant effects may involve interference with muscarinic, adrenergic, and histaminic receptors, or calcium ion mobilization, suggesting a non-specific mechanism.(30)

- Asafoetida and its seed essential oil showed relaxant effects on isolated rat ileum, exhibiting antispasmodic activity against acetylcholine (Ach)-induced contractions. At 0.2% and 0.3% concentrations, asafoetida reduced contractions by 43% and 12%, respectively. The essential oil also showed significant antispasmodic action against cumulative Ach concentrations. These findings support asafoetida's traditional use as an antispasmodic therapeutic.(71)

iii. Anti-inflammatory and Analgesic activity :

- In this study Ferula assafoetida shows anti-inflammatory and antinociceptive effects in mice. It exhibited significant pain relief at 10mg/kg dose, with peak effect at 15 minutes. The effects may involve antioxidant activity, lipoxygenase inhibition, and modulation of nociceptive pathways. Asafoetida's bioactive compounds, like monoterpenes and flavonoids, contribute to its therapeutic potential. Its mechanism likely involves suppressing peripheral inflammation and central nociceptive processes, but further research is needed to identify specific bioactive principles.(72)

iv. Antifungal activity:

- Asafoetida essential oils were tested against various fungi, including Aspergillus niger and Candida species, using the disc diffusion method. The oils showed varying inhibitory effects, with asafoetida oil inhibiting all tested fungi. The activity was compared to ketoconazole, and an activity index (AI) was determined.(32)

v. Antimicrobial activity:

- Asafoetida extracts (chloroform, ethyl acetate, ethanol, methanol, and aqueous) showed varying levels of antibacterial and antifungal activity against test microorganisms. The methanolic extract was most effective, followed by ethanol and ethyl acetate extracts. These extracts inhibited Bacillus subtilis, Staphylococcus aureus, Klebsiella pneumonia, Escherichia coli, Aspergillus niger, and Candida albicans, with MIC values of 1mg/ml (methanol and ethanol) and 2mg/ml (ethyl acetate). The results suggest Asafoetida extracts have promising antimicrobial properties, comparable to standards like Ciprofloxacin and Fluconazole.[33]

vi. Trichomonas vaginalis:

- Asafoetida was tested in vitro for its effect on the growth of Trichomonas vaginalis and compared with metronidazole, the reference drug. The results showed that asafoetida exhibited a strong antiparasitic effect against T. vaginalis, outperforming metronidazole. Because of this potent activity, further investigation is warranted to explore asafoetida's applicability in treating parasitic infections. The study concluded that asafoetida has a powerful antiparasitic action against Trichomonas vaginalis relative to metronidazole.[35]
- This study evaluated the in vitro effects of garlic and Ferula assafoetida extracts on Trichomonas vaginalis, testing various concentrations: garlic (0.1, 0.05, and 0.025 mg/ml) and Ferula assafoetida (2, 1, and 0.5 mg/ml). Ferula assafoetida (0.5-2 mg/ml) killed 90% of parasites within the first hour, while garlic extract (0.1 mg/ml) killed 95% in 2 hours. Garlic was also effective at lower concentrations (0.05, 0.025, and 0.0125 mg/ml), killing 90% of parasites after 24 hours, indicating both extracts have significant antiparasitic effects against Trichomonas vaginalis.[34]

vii. Anti-fertility activity/Abortificant :

- *Ferula assafoetida and Melia azedarach L.* extracts, which lack estrogenic activity, showed pregnancy interceptive effects in rats, with 65-85% pregnancy failure when administered on days 1-7. The extracts disrupted energy metabolism in the uterus, inhibiting key enzymes involved in glycolysis, hexose monophosphate pathway, and tricarboxylic acid cycle, particularly affecting oxidative energy metabolism. This disruption likely contributes to the antifertility action, suggesting plants without phytoestrogens can interrupt pregnancy by altering uterine energy metabolism.[48]
- A methanolic extract of Ferula assafoetida resin showed post-coital antifertility activity in rats, preventing pregnancy in 80% of cases at 400mg/kg dose (1-10 days post-coitum). As a PVP 1:2 complex, it achieved 100% pregnancy inhibition. Lower doses reduced implantation numbers. Active fractions were found in hexane and chloroform eluents. The extract lacked estrogenic activity in an immature rat bioassay. These findings suggest

Ferula assafoetida has promising antifertility potential, warranting further study on its contraceptive mechanism.(47)

viii. Antioxidant activity and antitumor activity :

- Ferula asafoetida (asafoetida) was studied for its effects on mammary tissue differentiation, liver enzymes, antioxidants, and N-methyl-N-nitrosourea (MNU)-induced breast cancer in rats. Asafoetida (1.25% and 2.5% in diet) promoted mammary duct development and differentiation, reduced cancerous changes, and modulated liver enzymes. It boosted antioxidant defenses (e.g., glutathione, superoxide dismutase) and reduced oxidative stress (lipid peroxidation). In MNU-treated rats, asafoetida decreased tumor multiplicity ($p < 0.001$), size ($p < 0.005$–0.001), and delayed tumor onset ($p < 0.005$). These findings suggest asafoetida has chemo preventive potential against breast cancer, warranting further study on its active compounds and mechanisms.(42)
- Ferula assa-foetida oleo-gum-resin (OGR) extract showed antitumor effects against HT-29 colorectal cancer cells in in vitro xenograft mouse model.. Phytochemical analysis revealed isoflavones, xanthones, and other derivatives. The extract inhibited cell growth (IC50: 10.5 ± 0.1 mg/mL) and colony formation (IC50: 3.60 ± 0.02 mg/mL), induced apoptosis, and increased pro-apoptotic proteins (PUMA, BIM, BIK, BAK). In a xenograft mouse model, OGR extract reduced tumor volume (550 ± 32 mm3) and burden (16.3 ± 3.6). These findings suggest Ferula assa-foetida OGR extract has potential antitumor effects against colorectal cancer(43).

ix. Anxiolytic and sedative activity in Hysteria:

- Asafoetida's anxiolytic, analgesic, and sedative properties were studied in rodents using various tests. Results showed dose-dependent anxiety-reducing and pain-relieving effects, with mild sedation at high doses. Compared to diazepam, asafoetida appears to be a promising alternative for anxiety disorders, but further research is needed to confirm its safety and efficacy for long-term use.(36)

3. Discussion & Conclusion:

- The findings from the present review of *Ferula foetida Regel (Hilteet/Hing*),Oleo gum resin used locally and orally in the form of *humool*(pessary), *Farzaja* (suppository), *Zimad* (paste), *Abzan*(sitz bath), *Shamoom* (Inhalation), *Nutool*(irrigation), *Dhooni* (Fumigation), *Qairooti* (Ointment), *Tila* (Oiling), *Huqna* (Enema), *Hab*(pills), *safoof*(Powder), *Qurs*(Tablets), *Joshanda* (Decoction) and its compound drugs is effective in the management of Gynaecological disorders.. Asafoetida has properties of *Muharrik-e-A'sab* (Stimulant), *Daf-e-Tashannuj* (Antispasmodic), *Muqawwi-e-Rahem* (Uterine tonic), *Muqawwi-e-Bah* (Aphrodisiac), *Daf-e-Taffun* (Antiseptics), Mudir-e-Haiz (Emmenagougue), Musakkin-e-dard (Analgesic), sexual appetite*(Muharrik-e-Bah)*, *Muhallil* (Resolvent),Contraceptive and Abortificant and Uterine cleanser. Its phytochemical shows, Ferulic acid, luteolin, vanillin, umbelliprenin, Azulene, and galbanic acid exhibit antioxidant propertie,anticanter properties and antispasmodic properties,α-pinene, diallyl-disulfide, alpha-terpineol, and valeric acid show antibacterial, antifungal and sedative properties. Hence, asafoetida (Hilteet/Hing) is a safe and effective herbal therapeutic option that can provide an alternate management option with no adverse events as caused by conventional treatments in Gynecological disorders and Women's health.

- Scientific research has confirmed the traditional uses of Hing, but more clinical studies are needed to unlock its full therapeutic potential.

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