



Asafoetida (*Ferula asafoetida*) "Hing" scientific classification and pharmacological activity: A review

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Abstract

Asafoetida is fetid resinous gum obtained from the roots of herbaceous plant, used in herbal medicine and Indian cooking. Asafoetida is commonly called as hing or heeng in India. It's also been known as devil drug, ferula, food of god's as well as incense of devil. It is an important spice crop belonging to family Apiaceae. It is a dark brown resin-like substance that is derived from root or stem of ferula. Asafoetida is also known for its strong and pungent odour. Asafoetida is cultivated in cold arid region of Afghanistan, Kazakhstan, Uzbekistan and Iran. It is also found in gulmarg region of Kashmir, India. It is grown in unproductive cold desert of Dry temperature area of Himalayas. The plant is propagated by seed. Asafoetida contains resin (40-64%), gum (25%) and essential oil (10-17%). The most important constituents of asafoetida are butyl propenyl disulphide, responsible for aroma, and asaresinotannol, major constituent present in resin. It is widely used all over the world as flavouring spice in variety of food. Ex-curies, sauce and pickles. It is for the treatment of various diseases such as asthma, epilepsy, weak digestion, whooping cough and chronic bronchitis.

Keywords: ferula asafoetida, antioxidant, apiaceae, umbelliferae

Introduction

Allopathic medicines have high toxicity and high side-effects than herbal medicine, so use of herbal medicines are increasing in today's world. In India, there are about 20,000 medicinal plant species, out of which 800 plant species are used by more than 500 traditional communities to treat variety of diseases. The common name of *Ferula asafoetida* is asafoetida or devil's drug and it is also called as Hing or hingu in India. It is an oleo-gum-resin. *Foetida regel* belongs to the Apiaceae (umbelliferae) family. Carrier or vehicle is meaning of Asa in Latin and Farsi. Asa means resin and *Foetida* means smelling fetid. There are two principal applications of Asafoetida, i.e. tear from and mass from. Asafoetida is differentiated in two types: Asafoetida (hingra) and asafoetida hing. It has sulfurous odour, it is used in metaballs, pulses and pickles and flavouring agents in curries.

In Ayurveda, it is used as antidote for opium. The plant of Hing is used to treat variety of diseases like ulcer. In United States and Europe, Asafoetida is used in flavouring and perfumes. It is also used in treatment against women to cure problems like sterility, painful leucorrhoea and menstruation, unwanted abortion, abnormal pain. The resin (40-64%), essential oil (10-17%) and gum (25%) are active constituents of Asafoetida. Due to the active constituent, it has many curative effects and medical specialities like antispasmodic, anti-microbial, neuroprotective, hypertensive properties. Asafoetida might increase the risk of bleeding during and after surgery, stop taking asafoetida at least 2 weeks before a scheduled surgery. The main constituents of ferula asafoetida is resin. It is used in the treatment of Hyperlipidemia. It reduces the cholesterol level in the blood, it can decrease the cholesterol absorption in gastrointestinal tract and reduce cholesterol metabolism in the body. Hot potency is also required to reduce the cholesterol level because hot potency of hing also improves metabolism of cholesterol in the body. Introduction: Asafoetida is used as flavouring agent in food in most part of the world. Asafoetida is oleo-gum resin. It is obtained from stems of *Ferula* plants. The family of Asafoetida is umbelliferae. In India, Asafoetida is also called Hing or Hingu. Asafoetida is extracted from massive taproots or carrot-shaped roots of *Ferula* plants. Odour of Asafoetida is strong and sulfurous. It is used for treatment of ulcer, cough, epilepsy, whooping cough. Asafoetida stimulates bile flow and digests dietary lipids. Asafoetida is used in treatment of unwanted absorption, unusual pain, sterility [4, 5].

Taxonomical Classification of Asafoetida plant [3, 4]

Asafoetida is herbaceous, monoecious, perennial herb that belongs to family *Apiaceae* (umbelliferae). The plant has a fetid smell due to the presence of sulfur constituent. Asafoetida or Hing is the dried latex or oleo gum resins extracted from the rhizomes or roots of this perennial herb. The height of this plant reaches up to 2m. The leaves of plant are shiny, oblong, pinnate that grows up to 45cm in length. The stem is 2.5-3cm long, short, stout, hollow, 10cm thick, succulent solid, smooth, herbaceous containing several ducts in the cortex.

that posses resinous gum.6cm in breadth containing a milky juice. Flowers are thin, flat and pale yellow. The white exudate of fruit is pure and crystalline. Commercial Asafoetida is isolated from the root part of the plant. The taproot of the plant are carrot like bearing diameter of 12-15cm at the crown after 4-5years.



Fig 1: Asafoetida plant.

Table 1

Taxonomical Rank	Taxon
Kingdom	Plantae
Division	Magnoliophyta
Family	Umbeliferae
Genus	Ferula
Species	Asafoetida
Common name	Hing

Cultivation of Asafoetida

Seed Sowing: Propagation of asafoetida mostly carried by seed & it is effective method. Seeds germinate within 20 days of sowing & it was completed in one month. Old seed exhibit less dormancy than newly harvested seed. Under open conditions, winter or spring sowing are preferred. The seed sown during winters (December-January) gave higher percentage & more tuber yield than spring planting (April). Protective mulching is given in winter season. Dormancy of asafoetida seed is long & seed germination is poor. Seed germination is also increased by seed vernalization at 4-5 degree celsius for two weeks. It is done in month of september. It was not an advisable method because plants dislike root disturbance manures and fertilizers. For yield improvement zinc sulphate application in zinc deficient soils. **Irrigation:** Asafoetida prefer moist condition only during germination. Water stress reduces the plant growth & productivity. So in draught condition sprinkler or deep irrigation should be done. one digging of soil around the bushes (August-September) **Collection & Harvesting:** The older plants are more productive. Latex gum is obtained from the roots & rhizomes of the plants. Harvesting is done just before flowering & March & April are the best month. The roots which have 6-10cm diameter were recommended for the extraction of asafoetida. For extraction of asafoetida incision was made vertically on the stem near the roots of the plant. Process of extraction is repeated after every 4-5 days till gum stops oozing. Conventional method, Crown cutting, Concave conventional method are the different cutting method. Concave method is the best method & have highest gum yield & best regeneration rates. **Yield:** On average single plant yields around 40g to 900g of fresh gum. The essential oil yield varies from 2.53-2.85%. **Processing:** Oleo gum resin was extracted from the stem & root of different ferula species. Resinous gum appears greyish /white when fresh & darkens to deep yellow/ amber when dried. Hinga obtained from stems of *F.alliacea* which is soft, transparent & purest form in India. According to Giri, most common available form is compound asafoetida compound asafoetida is in the fine powder form. It is mostly sold in bricket form. Asafoetida is marketed in three forms -tears, mass and paste. It is adulterated with inferior quality asafoetida along with gum resins, rosin, wheat, stones. Etc [6, 7]



Fig 2: Cultivation product of Asafoetida.

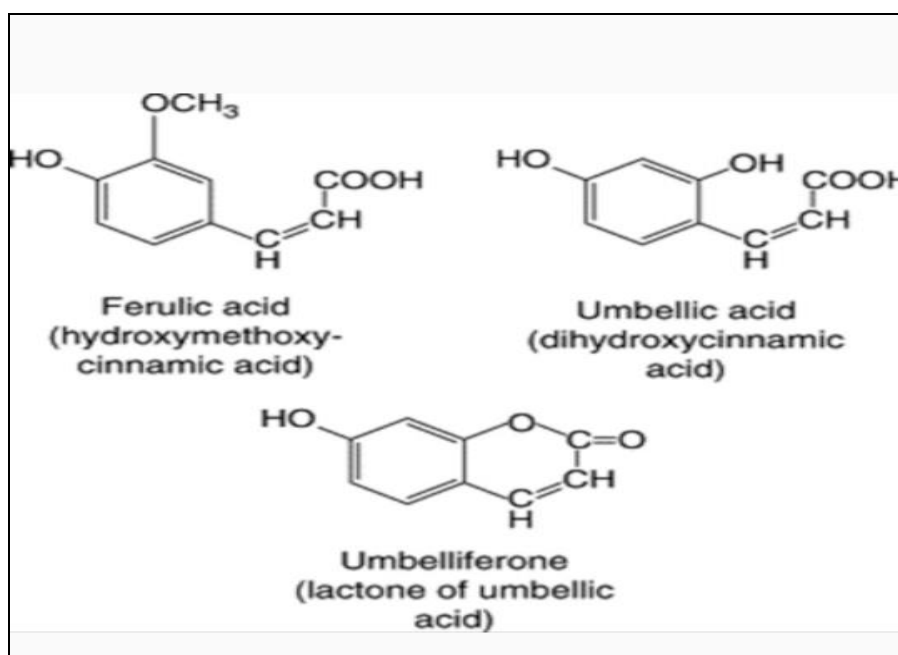


Fig 3

Chemical Constituents ^[1, 3]

Asafoetida contains resins (40-65%), gum (20-25%) & volatile oil (4-20%). The resins of the drug consist chiefly of asaresinotannol in the free or combined form with ferulic acid. Free umbelliferone is absent in the drug (distinction from galbanum). Ferulic acid on treatment with hydrochloric acid is converted into umbellic acid which loses water to form umbelliferone. Oil of Asafoetida is obtained by steam distillation of the oleo gum resins. The chief constituent of the oil is secondary butyl propanyl disulphide. Other constituents of oil are di and trisulphide and other terpenes. The specific odour of the drug is due to a sulphur compound.

Uses

Asafoetida is an effective cold remedy.
 It is a cure for asthma and bronchitis.
 Helps reduce menstrual cramps.
 Maintains blood pressure level.
 Good for skin.
 Relief against insect bite.

Pharmacological Activity

Antioxidant: Tested against the Sprague Dawley Rat it, Shows antioxidant property. We can clearly see a good antioxidant activity in the linoleic acid peroxidation test in all the extracts. The oral dosage of extract was given approximately 1.25% and 25%. Also various diseases are prevented by antioxidants.

Antilucer: Asafoetida plant contains antiulcerogenic property. It is in the form of aqueous Suspensions. The preventing the ulcers of Asafoetida was observed on models of wistar albino rats. Asafoetida was mainly used for healing of the duodenal and gastric ulcers.

Antidiabetic: A large number of people worldwide suffer from a lifelong disorder of diabetes. Asafoetida prominently helps in hyperinsulinemia. And also used to decrease in blood glucose level. We can also observe a significant rise in Insulin secretion of diabetic animals which were treated with extract 0.48± 0.05.

Antiviral: Asafoetida shows an antiviral activity against the Influenza A (H1A1) virus. This was firstly outlined by scientist Chang and Wuet. for describe the activity preparation of methanolic extract of Asafoetida and crude extract was divided between n- hexane -methanol and methanoic extract was obtained which was divided again in chloroform and water which gave us chloroform extract and it further used as antivirals.

Antimicrobial: The antimicrobial activity of Asafoetida was outlined by scientist Mishra in which he proposed the (MIC) of aqueous alcoholic form of extracts of Asafoetida. Aureus by the help of agar contact method. Thus we can conclude that Asafoetida has antimicrobial traits ^[4, 6]

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Conclusion

Asafoetida is a oleo gum resin. It is mostly valuable for antioxidant, antiulcer, antimicrobial properties against respiratory disorder. Asafoetida is a highly nutritious and chemical composition of oleo gum resin as compared to different volatile food resources.

Therefore more should be done in study, culture, cultivation, morphology, harvesting, taxonomy and beneficial use of their important inclusion. For this review it may be concluded that asafoetida shows antiviral, antioxidant, antiulcer activity against a variety of harmful viruses. This reviewed encourages further there research and encourages considering day by day benefits with asafoetida.

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