

UNRAVELLING THE MOLECULAR BIOLOGY OF ASAFOETIDA

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Home remedy: That this herb has been used for long in traditional medicine has a long history.
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Readers may recall our write-up in the column dated July 30, 2009 on Asafoetida (*hing* in Hindi, *perungayam* in Tamil, *inguva* in Telugu, *ingu* in Kannada) and how this smelly spice has been of use in our cuisine and also in traditional medicine. It has been known since the Mahabharata times, and has been imported from Afghanistan. The Bhagavata Purana says that one should not eat *hing* before worshipping deity. Indian historical records suggest that we have been importing asafoetida since the 12th century BCE. The word *asa* comes from Persian, meaning mastic, while *foetidus* refers in Latin to its strong and stinking smell. And *Wikipedia* suggests that Jewish early literature mentions it as *Mishnaha*. Rabindranath Tagore wrote about how he would buy from “Kabuliwala” dry fruits, but did not mention asafoetida, since it was surely in his family kitchen already!

It is a thick gum, or a resin, which comes from the perennial taproots of the *Ferula* family. The article in *Indian Mirror* titled *Asafoetida* points out that asafoetida has a wide range of applications in the field of medicine. It has been suggested to fight viruses such as influenza. It may thus be worthwhile for current day drug chemists and molecular biologists to study its mode of action. (Indeed, this has been done by Professor M. S. Valiathan of The Manipal Academy of Higher Education, and his collaborators). Ayurveda specifies three types of *Dosha*, or deficiencies in the body, namely *Pitta*, *Vata* and *Kapha* each of which has specific functions.

Asafoetida is believed to be one of the best spices to balance the *Vata Dosha*. The site *Home Remedies for Hiccups* says that asafoetida is good to stop hiccups! You mix it well with butter, and swallow –and the hiccups stop!

How long do we need to import it? Well, it appears no longer! In a report that has appeared in *The Hindu* dated November 10, 2020, and cited in *The Wire*, *Science*, Dr Sanjay Kumar, who is the Director of the CSIR Institute of Himalayan Biotechnology (CSIR- IHBT), says that the cold desert climatic conditions in the Lahaul–Spiti area in Himachal Pradesh are remarkably similar to those in the Iran and Afghanistan, and wondered whether asafoetida cannot be grown in India too. This led the IHBT to import its seeds from Afghanistan and began growing the plant in the research centre under the guidance of the National Bureau of Plant Genetic Resources. The experiment was a success. Two types of asafoetida resins became available – the milky white type and the red type. He further points out that since currently the farmers in Himachal Pradesh largely limit themselves to growing potatoes and peas, motivating them to grow asafoetida and offer technical support will increase their income. The article mentioned above describes these efforts of the laboratory, colour photographs of the flowers and the large-scale production of the plant at the Centre. Dr. Kumar also told this to the *Times of India* in the article, *Why ‘made-in-India’ heeng is a big thing*.

That this herb has been used for long in traditional medicine has a long history. Groups in Egypt have used it since long. Ayurveda scholars have known it for centuries. We had discussed earlier how Prof. M.S. Valiathan and collaborators had shown, using fruitflies as models, that Ayurvedic formulations are effective *in vivo*. Likewise, Eigner et al., have shown how the herb is effective in the traditional medical practices and diet in Nepal (*Journal of Ethnopharmacology*,

1999; 67:1-6). It is in this context that an excellent and updated report by Dr. Poonam Mahendra and Dr. Shradha Bisht of the School of Pharmacy, Suresh Gyan Vihar University, Jaipur, titled, *Ferula asafoetida: Traditional uses and pharmacological activity*, in the journal *Pharmacognosy Reviews*, July-December 2012, Vol. 6, Issue 12, is of value.

Their analysis of its chemical constituents shows that the raw herb has about 70% carbohydrates, 5% proteins, 1% fat, 7% minerals, and has compounds of calcium, phosphorus, sulphur and various aliphatic and aromatic alcohols. It is the sulphide content in the fat that leads to the fecal odour. Chemical trials using rats in the laboratory suggests asafoetida plays an essential role in digestion. The group cites references to the role that the herb might play as an anti-cancer agent, and also against some women's ailments. They list about 30 molecules which form the chemical constituents in the herb that play roles as anti-oxidants, anticarcinogenic, antibacterial and antiviral and even anti-HIV. Given this list, it is time for groups across India to isolate these molecules from this herb and study their roles in these diseases, using modern methods of molecular biology, immunology and drug design. Let us go for it!

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