

The hottest chilli

A new horizon in agri-entrepreneurship

Its journey to number one position as the world's hottest chilli is an interesting one. In the year 2000, Mathur, a scientist from Defense Research Development Organization (DRDO), Tezpur, Assam first reported it to be the hottest chilli. However, its fame spread around the world only after a British couple Joy and Michael Michand from Dorschester, U.K. laid their hands on a few fruits of this variety in an oriental store in U.K. In 2004, the couple sent a sample out of curiosity to a laboratory in USA and was stunned when their sample recorded an unbelievable 923000 SHU.



A ripe fruit

It breathes fire and proudly pronounces so by its bright red, wrinkled and ominous looking flesh. Its saga of fierceness, however, remained obscure for hundreds of years to the people beyond the North-Eastern region of India until it captured the imagination of the world in 2006 having earned the distinction of being the hottest chilli in the world. Locally known as 'Bhut Jolokia' (Vernacular meaning *Bhut*= 'ghost', *Jolokia*= 'chilli'), 'Bih Jalakia' (meaning poison chilli) and 'Naga Jalakia' (named after the once ferocious 'Naga' warrior tribe of North East India) it belongs to the species *Capsicum chinense* Jacq.

This cultivar is being grown and consumed in different states of the region like Assam, Nagaland, Manipur and Mizoram from time immemorial. So hot is the chilli that local people handle and consume it with respect. Any normal person who dares

to eat a whole *Bhut Jalakia* would almost certainly require hospital treatment. Nevertheless, because of its refreshing aroma, palatability and medicinal properties, people have been using it for pickle preparation, flavoring curries and for home remedies of ailments like gastritis, arthritis and chronic indigestion problems.

Rise to glory

Its journey to number one position as the world's hottest chilli is an interesting one. Although for hundreds of years people of North East India must have sweated and sworn by its name with watery eyes every time after consuming *Bhut Jolokia*, but nobody really bothered to compare its heat with other record setters. In the year 2000, Mathur, a scientist from Defense Research Development Organization (DRDO), Tezpur, Assam first reported it to be the hottest chilli. However, its fame spread around the world only after a British couple Joy and Michael Michand from Dorschester, U.K laid their hands on a few fruits of this variety in an oriental store in U.K. They grew the plants in poly tunnel because low temperature was not convenient for proper growth of *Bhut Jolokia*. They knew that the fruits were very hot because they had to wear gloves and remove the seeds outdoor while preparing them for drying. In 2004, the couple sent a sample out of curiosity to a laboratory in USA.

Till that time Red Savina Habanero held the Guinness Book of Records for being the hottest chilli in the world with a rating of 570000 Scoville Heat Units (SHU). The couple was stunned when their sample recorded an unbelievable 900000 SHU. A fresh sample



A plant of *Bhut Jolokia*

was then sent to a lab in New York just to recheck the ratings but the result was, once again, an astounding 923000 SHU. An independent analysis of heat of *Bhut Jolokia* by the Chile Pepper Institute, New Mexico University, USA in 2006 revealed a rating of 1001304 SHU, almost double than that of Red Savina, which established beyond any doubt that the chilli originally from North East India is the hottest.

The pungent principle

The fiery sensation of chilli is caused by a compound 'capsaicin' localized mainly in the placenta and the flesh of a chilli fruit. It survives both cooking and freezing and dissolves in fat. Capsaicin is found only in chillies and not in other plants and animals. Detectable to the human taste buds to one part in one million, this powerful alkaloid is extracted from chillies as an oleoresin (thick oil). The oleoresin is refined into a white crystalline powder which is the pure capsaicin. The measurement of heat of a chilli was originally done by tasting a dilute solution of chilli extract and giving a value to it. In 1902, Wilbur Scoville had developed this method and so the heat value was expressed as Scoville Units. Now-a-days, heat of chilli is tested using spectrometer or HPLC (High Pressure Liquid Chromatograph) to rate the chillies in Scoville units which indicate parts per million of capsaicin. The Scoville units of pure capsaicin are between 150,00,000-160,00,000.

Use of capsaicin

Capsaicin is becoming more popular every day in applications that range from the strange to the ingenious. Capsaicin has been found to trigger the brain to produce endorphins, a natural pain killer that promotes a sense of well being. There are now dozens of brands of capsaicin creams in the market to combat the pain of arthritis and for topical use for disease like shingles, psoriasis, and other skin disorders. Researchers are putting new twists on these medications almost weekly. One recent application format is the capsaicin patch used for pain relief. Other medical developments include the introduction of capsaicin gels and the addition of other medicines or herbs to make the capsaicin products more efficacious as pain killers for minor muscle aches, joint arthritis, backaches, bruises and sprains.

Other uses of the compound include manufacture of police grade pepper spray that comes handy in riot control, subduing criminals and even as a self defense kit for lonely woman. Capsaicin has been applied to veterinary sutures to prevent pets from pulling them out with their teeth. Its use has been suggested for coating fiber-optic cables to prevent rodents from gnawing on them. Capsaicin is also used as animal and insect repellent, specially, ants and cockroaches. In fact, many experts believe that capsaicin's use as a medicine has a great future that scientists are just beginning to discover.

Plant description

This particular chilli belongs to the species *Capsicum chinense* Jacq. It is a self pollinated species, however, considerable cross pollination (up to 10%) may occur when insect population is high. The plant behaves as a semi-perennial if grown under optimal condition. In North Eastern India, plant height range from 50-100 cm. Under semi-perennial situation it may grow even taller. The stem is green, with anthocyanin (dark color pigments) pigmentation on the nodes. The surface of the leaf has the characteristic crinkle look as in other *C. chinense* species. Leaves are ovate in shape and size ranges from 10 - 14 cm in length and 5.5 - 7.5 cm in width. Flowers are pendant, with creamy white corollas, often with a touch of light green. The anthers are blue while the filaments are purple. It has clustering flowering habit with 2-3 flowers per node but at maturity there are rarely more than two fruits per node. The elongated fruits are 5 to 7 cm in length, 2.5 to 3.0 cm in diameter (at shoulder), with an undulating surface. Depending on the soil and climate, fruit shape also seems to differ a bit. Fruits colour ranges from light green to green to bright red /bright orange at maturity. The fruit possess 4-5 hollow locules and bears about 25-35 slightly wrinkled seeds. The average fruit weight is around 5g and under field condition, in a single season a plant produces around 15-20 full sized fruits and 10-14 smaller fruits.



Cluster flowering habit

Growing *bhut jolokia*

That it can be grown under diverse soil and climatic conditions is apparent from the fact that it is already grown in few parts of India and neighbouring countries like Sri Lanka and Bangladesh. It has been grown experimentally even in the U.S.A and U.K. However, for optimum growth, it requires well drained sandy loam, clay loam or laterite soils.

Seeds should be extracted from completely matured fruits and dried. It is advisable to wear gloves during manual extraction of seeds. After drying, the seeds can be immediately germinated. However, the germination of seeds take long time (about 15-20 days) so it is advisable to treat the seeds with fungicides and insecticides to

avoid damage of the seeds due to fungal or insect attack during the germination period. The dried seeds should be stored in air tight containers/polythene packets under refrigeration as the germination percentage decreases rapidly in high ambient temperature. Seeds should be sown in seed beds established in sunny areas. Normal treatments of the seed bed should be followed. After 30 days, the seedling should be transplanted in the main field prepared with the fertilizer doses of normal chilli.

In North Eastern region there are two planting time, *kharif* and *rabi*. *Kharif* cultivation, practiced in the hilly states, starts in Feb/March and harvesting is done from May-June onwards. In the plains, it is grown as *rabi* crops during Sept-Oct. The productivity and pungency of *rabi* grown crop is generally more than *kharif* crop.

During the crop growth several diseases infest the plants in the North-East. The most common diseases are 'die-back', 'anthracnose' and 'leaf curl' and as such adequate plant protection measures should be taken. The chilli pods are picked when they are bright red/bright orange in colour. As in other chilli, several picking has to be done for complete harvesting. In the North East, the *Bhut Jolokia* is mainly traded as fresh fruits and only a limited portion is traded as dried products. Drying of this chilly is easier because of its thin flesh and 4-5 sun drying is enough to dry it completely. The chilli retains its lustrous colour even after drying. The average fresh fruit yield of this chilli is around 80-100q /ha under rainfed condition while dry weight ranges from 10-12 q/ha. In the local market, a kilo of fresh bhut jolokia fetches around Rs 100-150 depending upon the season.



Fresh & dried fruit

Prospect of *bhut jolokia*

Bhut Jolokia may definitely be the most ideal chilli variety of India for extraction of oleoresin and capsaicin as it is characterized by very high capsaicin content of 3-5%. Most of the Indian chilli varieties are unsuitable for the purpose as they contain less than 1% capsaicin, a standard needed for commercial extraction of Capsaicin. The oleoresin and capsaicin has very high market demand both at domestic and international level and it is a very costly product.

In the recent years chilli has made a dramatic entry in the world market. It is not only a hot favorite of the Asians but even the western world is shedding bland palate to embrace the placing several red hot the chillies are main with chilli is in great instant solution to nasal business now. The *Bhut* high vitamin-C content surely cut a niche in the a hot favorite in chilli Europe and USA and preparation of red hot chilli sauces beating the Mexican preserve. Thus, *bhut jolokia* is poised to become number one in the existing hierarchy of hot chillies. In Assam, already local initiative have been started to export value added products made from this chilli to European and US markets. Commercial cultivation of bhut jolokia thus appears to be an attractive proposition for Indian farmers.



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