SPECIES

THE GREEN AND GLORY OF THE GOLDEN BERRY

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India is one of the 12 megacentres of biodiversity in the world. The lush green forests of Western Ghats and north eastern India are home to many diverse flora and fauna. The tropical spice black pepper, scientifically *Piper nigrum*, has originated in the humid forests of Western Ghats from where it has spread to throughout the tropics.

If there is any one commodity besides petroleum that influenced and infused the course of world history, it is the berries of this tropical vine most aptly called as 'black gold'. The flavour and fragrance of this oriental spice had a magic spell in human civilization and culture since very ancient days. In middle ages dowries, taxes and rents were frequently paid in pepper and infact the 'Pepper corn rent' was very much *in vogue* those days. Pepper was one of the earliest articles of commerce between the Orient and Europe and of course an item of cut throat trade for which wars have been fought, kings overthrown, unknown

Bush Pepper

oceans braved, sea routes established and continents discovered - all for the sake of the shrivelled berries of this tropical climber!

The course of Indian history would have been a different one had not the Portuguese sailor Vasco de Gama took of the historic journey from Lisbon in 1497 and landed in Calicut on 20th May 1498 raging the waters around Africa's Cape of Good Hope. Incidently, this was the singular event which sowed the seeds of colonialism in India and many other countries of Asia and Africa, during the two centuries that followed. The rest is history - the establishment of Dutch and English East India companies, the Indian freedom struggle etc. are all well engraved in the annals of history.

Domestication of black pepper started approximately 6500 years ago apparently from the wild state. Natural selection coupled with the guided effect of mankind has resulted in many distinct black peppers. And today, there are about hundred and odd black pepper cultivars.

During the course of domestication much transformation has taken place in the plant from its wild condition such as change from unisexuality to bisexuality, morphological features etc. Most of the cultivated varieties are

Black Pepper (Piper nigrum)

bisexual and also there exists remendous diversity among the cultivars for many of the morphological features such as cordate eaf bearing, long spiked Panniyur - I'; small ovate eaved, profusely spiking 'arimunda'; droopy nched, obovate leafy, 'abar cultivar 'Balankotta'; small leaf bearing amundi'; twisted spike cing 'Aimpirian'; high g Travancore cultivar dan' etc. Most of the epper cultivars are vernacular indicatific feature of the vine

such as spike nature, leaf colour, shoot tip colour etc. or after the place (locality) of domestication.

The advent of a few high yielding black pepper varieties as well as the indiscriminate deforestation are resulting in large scale erosion of the gene pools of black pepper. Unless preserved many of the cultivars will be lost for ever and they will be just a memory for the posterity. Conservation is the password here. And the name and work of the National Research Centre for Spices, established at Calicut, the very landing place of Vasco de Gama, assumes a special significance in this context. Forseeing, the genetic erosion this climber would be facing, the centre has embarked upon a massive programme of collection and conservation of black pepper germplasm. And today, it has the world's largest collection of gene pools of black pepper comprising cultivated types, breeding lines, off types (freaks) and wild species.

Species diversity of *Piper* is also tremendous. It includes ornamental types such as *Piper magnificum* (a shrub) & *Piper crocatum* (a climber); erect spike bearing medicinal types such *Piper longum* & *Piper chaba;* another erect spike bearing type *Piper hapnium* ; shruby *Piper arboreum* and *Piper colubrinum* ; hairy *Piper hymenophyllum* very long spike *producing Piper attenuatum* as well as *Piper argyrophyllum,* etc.

Eventhough traditionally black pepper has been a climber, it can now be grown even as bush in pots known as bush pepper which will be a boon to city dwellers. Bush pepper yields green berries around the year. Any black pepper can be grown as a bush pepper by propagating the fruiting branches or lateral of the plant.

Erect Spike bearing Piper Chaba

If 'Black is beautiful', definitely 'black gold' is not only beautiful but also bountiful! Let us cherish this heritage and conserve this beauty and bounty, this green and glory, for the welfare of mankind.

CROP IMPROVEMENT IN BLACK PEPPER

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Black pepper of commerce, christened as "King of spices" is one of the important and earliest known spices produced and exported from India. *Piper nigrum* is indigenous to the tropical forests of the Malabar cost of peninsular India from where it has spread throughout the tropics. Today, black pepper is cultivated in 11 countries viz., India, Brazil, Indonesia, Malaysia, Madagaskar, Micronesia, Sri Lanka, Thailand Vietnam, China and Mexico.

Even though India accounts for 45% of the total world area her share in the world production is only 24.35% (55000 t.), whereas Indonesia with lesser (11800 ha.) accounts for 27% of the production (61,000 t.). Brazil with 8.6% of area (30,000 ha.) accounts for 21% of the world production (47,500 t.) and Malaysia with just 3.2% of the area(11,200 ha;) accounting for 12.8% of the world production (29,000 t.). Productivity of the crop is highest in Malaysia at present (2589 kg/ha), followed by Thailand (1985 kg/ha) and Brazil (1583 kg/ha.) Productivity of black pepper in India is reported to be only 353 kg/ha., which is abysmally low. Lack of high yielding, disease and stress tolerant/resistant cultivars were considered to be one of the reasons for low productivity of black pepper in India. Due to the concerted and systematic research efforts of the last 3 decades, 9 high yielding black pepper cultivars were released for general cultivation in addition to building up of a large collection of black pepper germplasm.

COLLECTION OF BLACK PEPER GERMPLASM

In the hot and humid tropical evergreen forests of Western ghats of South India, *Piper nigrum*, still occurs as wild plants.. It is believed that domestication of black pepper started about 6, 000 years ago in the uplands and the coastal areas of Kerala and Karnataka States and about 100 and odd cultivars are prevalent in India. *Piper nigrum* belongs to the family *Piperaceae*. About hundred species of *Piper* occur in India. In addition to *Piper nigrum*, the other economically important species of the genus are *Piper betle* (betel vine), *P. longum*, and *P. chaba* (long pepper).

Systematic collection of cultivated and wild germplasm has been one of the thrust areas of research undertaken by NRCS, Calicut and maintains over 2,500 accessions of germplasm. Systematic screening of the germplasm for locating tolerant/resistant lines against disease, pests and drought is in progress.

LAND RACES IN BLACK PEPPER

Over a hundred traditional black pepper cultivars are prevalent in Kerala and Karnataka. Many of these are very popular in their respective tracts.

EXOTIC VARIETIES

'Kuching', 'Matang', Semongok Perak', Semongok emas' 'LDK' 'Jamby', Bangka', 'Sarikai', Phnom-pas', 'Kamaely', 'Hybrid' - 10' (Balankotta x Kutching) are some of the popular high yielding varieties of Malaysia, Indonesia and Kampuchea.

BREEDING STRATEGIES

Blessed with the twin advantages of vegetative propagation and viable sexual reproduction, black pepper offers immense scope for exploiting hybrid vigour as well as selection breeding. Clonal selection, hybridisation and open pollinated progeny selection have been used for evolving new varieties of black pepper.

SELECTION

Wide variability for yield and quality characters even within a particular cultivar is a frequent phenomenon in black pepper. Clonal selection in Karimunda and Kottanadan have resulted in identifying superior lines of these highly popular cultivars.

HYBRIDIZAION

Black pepper is predominantly a self pollinated crop. The wide variability encounteed in different black pepper cultivars for yield, quality and other yield attributes coupled with the advantages of sexual reproduction and vegetative multiplication have helped in releasing two superior black pepper hybrids.

Hybridizaion procedure in black pepper is as follows. The anther lobes of the female spike (female parent) are removed before the emergence of the stigma with a fine needle. Usually only