

REVIEW OF LITERATURE

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1. INTRODUCTION AND DISTRIBUTION

Chilli is an indispensable condiment of Indian home. Columbus, on his discovery of the New World, did not find the spices of the Orient as he had hoped, but he did find capsicum or chillies, which is America's most important contribution to the spices. At this time the spice was widely spread and used throughout the Caribbean, Mexico, Central and South America. Capsicums were soon spread throughout the tropics and warm temperate regions of the old World.

Capsicum is also known as chilli (usually spelt 'chili' in United States), paprika, pimiento, and sweet, red, cayenne or bird pepper depending upon the type and the way in which it is used. It should not be confused with black and white pepper from *piper nigrum*, long pepper from *piper longum*, Jamaica pepper, pimento or all spice from *pimenta dioica* or Melegueta or Guinea pepper from *Aframomum melegueta*.

Sweet peppers, sometimes known as green or bell peppers have the mildest flavour with little of the pungent ^{Principle} principle. They are X forms of Capsicum annum var *annuum*. They are generally used green, but sometimes they are used in the fully ripe state when they are red, or more occasionally yellow. They are eaten raw in salads or are cooked in various ways; they are often stuffed with meat and are cooked in various ways; they are often stuffed with X meat and are sometime pickled. They can hardly be called a spice, but are more of vegetable. The so called pimiento of Spain and the United States is used in such food as pimiento cheese and stuffed olives.

Paprika, which may be sweet or mildly pungent, is grown mainly in southern Europe, and has been grown commercially in the United States only since the beginning of the Second World War. The dried fruits are finely ground to produce paprika. The brilliant red powder is used as a flavouring and garnish, particularly on pale-coloured foods such as eggs, cheese, potatoes and some sauces.

Chillies are dried ripe fruits of pungent forms. In the northern temperate countries the fruits are hot cultivars of Capsicum ^{annuum} X annuum, with the exception of 'Tabasco' grown in Louisiana, which is a cultivar of C. frutescens.

Capsicum annuum are grown in India and elsewhere in the tropics. In South America they can be C. baccatum var. pendulum and C. Chinense at the lower altitudes; the latter also occurs in the caribbean; and C. pubescens of higher altitudes in the Andes; it also occurs in the mountains of southern Mexico. For further details of the different species see 'Systematic' below.

Extracts of chillies are used in the manufacture of ginger beer and other beverages. Capsicum form oleoresin. C. frutescens is used in medicine, internally as a powerful stimulant and carminative and externally as a counter-^{irritant} ~~irritant~~ in the treatment X of diseases such as rheumatism.

Capsicum in a fresh state is very rich in Vitamin C (ascorbic acid), as was shown by Dr. Szent Gyorgyi, the Hungarian scientist, who was awarded the Nobel prize in 1937 for isolating Vit. C. from paprika fruits and showing that they were one of the richest sources available of this vitamin. Capsanthin is the most important pigment of capsicums. The pungent principle is

capsaicin, which is present in the placenta, and is said to retain its pungency in a dilution of one part in million. A very full bibliography is given ^{by} Ferrar^ri and Allaud (1971). X

2. History and Origin

At the time of Columbus's discovery of the New World in 1492, capsicum was widely grown and used in the Caribbean and in South and Central America and Mexico. In the Las Casas abstract of Columbus's 1492-3 journal of the first voyage, translated by Morison (1963), we read in the entry for January 15th 1493, 'Also there is much axi, which is their pepper, and it is stronger than pepper, and the people, won't eat without it, for they find it very wholesome.'

double Columbus was expecting to find black pepper, and it is stronger than pepper, and the people won't eat without it, for they find it very wholesome.

Columbus was expecting to find black pepper, of which he had brought a sample with him from Spain, so it is not surprising that he called the new spice pepper and took some back to Spain with him.

Heiser (1969) states that 'although Columbus never reached the spices of the Far East, he did find one that has come to rival them. By 1493, Peter Martyr, a historian, reported that Columbus found that the New world had peppers more pungent than those of the Caucasus and Dr. Chanca, the physician who accompanied Columbus in 1494 mentions the use of these peppers as a condiment and in medicine pickersgill (1969) records that Cobo during 50 years of travel in Spanish America in the sixteenth and seventeenth centuries reported a great variability in capsicum, X

as old de la Vega, Acosta and Oviedo showing that the variability was well established before the Spanish conquest. She also states that chilli were used as currency.

Heiser (1969) states that the oldest known records of peppers from Mexico. There is evidence that oldest known records of peppers from Mexico. There is evidence that Chillies were eaten by the Indians perhaps as early as 7000 B.C. and ^SSmith (1968) records that fragments of pepper have been identified from both the Ocampo Caves, Tamaulipas, and the Tehuacan caves at about the same level and are referable to C. annuum. It is presumed that the first peppers came from wild places, but Heiser (1969 a) says that apparently between 5200 and 3400 B.C. the Indian were actually growing the plants, which places peppers among the oldest cultivated plants of the Americas. The earliest records in 'South America' are from Ancon and Huaca Prieta in Peru, dated 2500 B.C. Pickersgill (1969) has identified these as cultivated forms of C. baccatum var. pendulum as the fruits are non-deciduous and include orange forms which are not known in a wild state. They belong to a pre-ceramic age and are found with cotton, canna and canavalia.

The early explorers and chroniclers all talk of the great variety of peppers and the many ways that they were used by the Indian in Mexico and Central and South America. They are known by different names in different parts. Chilli or Chili comes from the Nahuatl dialect of Mexico and Central America. Throughout much of South America they are known as aji and axi, which is name the Spanish first used for them in the Caribbean. Heiser (1969) considers it likely that peppers went from South America

to the West Indies in prehistoric times with the name *aji* or *axi* already attached to them.

Capsicum must have been taken back to Europe by Columbus and to have reached South East Asia within a comparatively short time. Burkill (1966) records that so rapid had been its dissemination towards India that we find Fuchs, in 1542, figuring three races, calling it the pepper of Calicut' C. annuum var. annuum and C. frutescens were spread to most of the warmer regions of the world and the latter species became naturalized in many tropical countries.

3. Taxonomy

The genus Capsicum belongs to the family Solanaceae which has about 90 genera and some 2000 species of herbs, shrubs and small trees, generally distributed, but most numerous in the tropics. The family has several other economic plants, of which the most important are : Solanum tuberosum L., the Potato; S. melongena L., the egg plant or brinjal; Lycopersicon esulentum Mill, the tomato, and Nicotiana tabacum L., tobacco.

4. Botany

Capsicum annuum is variable herb or sub shrub sometimes woody at base, Erect much branched 0.5-1.5 m high grown as an annual, strong taproot usually broken or arrested in growth on transplanting and numerous profusely branched laterals develop extending to one metre.

Main shoot is radial but lateral branches at each node remaining undeveloped and subtending bracts or bracts are adnate and are carried up a lateral shoot to node above.

Leaves are variable in size, simple, petiole 0.5, 2.5 cm long

lamina broadly lanceolate to Ovate, entire, thin, sub-glabrous
 1.5-12 ^{cm long and} ϕ 0.5-7.5 tip acuminate, base acute.

Flowers usually borne singly and are terminal but due to the form
 of branching appear to be axillary, pedicels upto 1.5 cm long;
 calyx ^a campanulate, shortly 5 ^{dentate} ~~dentate~~, 10 ribbed about 2mm long X
 enlarging the enclosing base of fruits, Corolla rotate
^a campanulate, deeply 5-6 partite, 8.75 mm in diameter, white or X
 greenish stamens 5-6, inserted near base of corolla, anther
 bluish dehiscing longitudinally, ovary 2 celled but often
 multiplying under domestication; style simple, white or purple,
 stigma ^t capitate. X

5. Climate and soils

Capsicums are usually grown as a rainfed crop in areas with 600 -
 1250 mm of rain. In areas of low rainfall they can be grown X
 with irrigation. They cannot tolerate water logging. Too heavy
 rainfall can be detrimental as it can lead to poor Fruit-set and
 rotting of the fruits.

Sastri (1950) says that in India in the Gangetic area, Capsicum
 is a cold weather crop, transplanted in September and harvested
 in January-February. In parts of the Punjab, it is sown towards
 the end of the cold season in March-April to avoid frost, and
 harvested in September-December. In Bombay the seeds are sown in
 nurseries in June and July, the seedling transplanted in August-X
 September and crop harvested after 3 to 4 months.

The crop can be grown on a variety of soils, provided they are
 well drained, but a fertile loamy soil rich in lime is considered
 the most suitable. In India a well drained heavy soil is said to
 be preferred and it is grown on ordinary red loam or black soils X

and clayey-loam. the optimum pH is said to be 6-6.5.

6. Cultivation

The land is ploughed and harrowed 3 to 4 times to obtain a fine with about 100 cartloads of farmyard manure or compost per^X hectare is applied at the last ploughing. Some farmers also do sheep-penning and per about 5,000 sheep per hectare, in addition to the application of manures. In A.P. the crop received a basal dressing of 10-12 tonnes of farmyard manure or compost. Green manuring is recommended for the areas of assured rainfall and also for the irrigated crop. In addition, 60 kg of N, 60 Kg of P₂O₅ and 50 kg of K₂O per ha. for the irrigated crop are applied as a basal dressing. The land for irrigated chilli is laid out into beds, 2-3 square metres or is made into ridges 1/2 m 1 metre apart. The winter crop is planned from July to September and the summer crop in February and March whereas these are the two important seasons for its cultivation, a third crop, known as the mid season (May-June) crop is also taken in certain parts of the country.

The chilli generally transplanted through sowing is also done in certain parts at the country, especially in A. Pradesh seeds taken from healthy, well matured fruits selected for purpose are mixed with ashes and sown evenly in well-manured nursery-beds. Beds are generally 1-2 m wide and 15 cm high, with channels between the beds to facilitate the drainage of excess water about 1100-1200 g of seeds sown in 0.01 ha will give sufficient seedlings to transplants in one hectare. The treatment of seed with ceresun or Agrosun Em, as a plant protection measure against seed borne diseases, is desirable. The seed is protected measure against seed borne diseases, is desirable.

mulch

The seed is protected from the sun with a thin mulch of straw or X leaves the mulch is removed on the completion of germination in about 7-10 days. The seedlings are irrigated every day and manured either with ammonium sulphate as with some oilcake. Spraying the crop with 1% Bordeaux mix or some other copper fungicide during the third week after sowing is desirable to prevent damping off the seedling are thinned, if necessary and those growing too tall are some times topped. The seedling are ready for transplanting in 40-45 days. They are generally transplanting on a cloudy evening preceding rain, or when it is actually drizzling. A studies at or after transplanting helps the seedlings to take a quick fast hold in the absence at it, a light watering is given. Seedlings are planted 45-60 cm apart in straight row 1/2 to 1m apart.

7. Harvesting

The crop becomes ready for harvesting in about 3 1/2 months after planting. The picking of ripe fruits continues for about 2 months and about 6-10 pickings are taken. If there is a demand for green chillies, the fruit one or two picking are taken for this purpose. The summer crop is wholly disposed as green chillies. Ripe fruits are picked along with stalks and are heaped in doors for 3 to 4 days for the partially ripe fruit to developed the proper red colour They are then dried in the sun for 4 to 5 days depending upon weather conditions and are graded for size and colour before marketing. Unripe chillies are sometimes boiled and dried for domestic consumption. Good fruit length atanning red colour high pungency and strong attachment of the Calyx^x are the important factors which the merchants consider X for the fetching a high price.