



Diversity of Sweet Orange in India (Present Status and Its Management)

(*Shahnawaz Ahmed¹, Simaranpreet Kaur² and Anshu Kamboj²)

¹Assistant Professor, RIMT University, Mandi Gobindgarh, Punjab-147301

²Research Scholar, RIMT University, Mandi Gobindgarh, Punjab-147301

* shahnawazpomol@gmail.com

Citrus sinensis (L.) Osbeck

Common name: Sweet orange

Vernacular name: Mosambi, Sonamitri, Ser-nam, Sohning-raing, Tasi, Mitha chakola, Chakola tenga

Introduction

Among the cultivated species, *Citrus sinensis* (L.) Osbeck (sweet orange) is the most important commercial fruit crop of Citrus and occupies the second position after mandarins in India. *C. sinensis* is believed to be a hybrid between pummelo (*Citrus maxima*) and mandarin (*Citrus reticulata*). The peel of the fruit is used for making perfume and soaps. Cooking oil is extracted from its seeds. Juice extracted from its leaves is used to control several diseases like ulcers, sores etc.

Description

The tree is medium sized upto 12ft in height, profusely branched, dense canopy and spiny. Leaves have elliptic to ovate lamina with acute or slightly acuminate apex, lamina margin almost entire to slightly crenate, narrowly winged petiole with obovate in shape. Flowers in small racemes or singly in the axils of the leaves, medium-sized; calyx with 5 lobes; petals 5; stamens 20-25; ovary sub-globose with 10-13 locules; style slender, clearly delimited. Fruits subglobose, oval or spheroid, peel thin, tight, not bitter, central axis (pith) solid, pulp yellowish; seeds cuneate-ovoid with rough-margined plane surfaces, white inside, cotyledon creamish, chalazal cap brown seeds highly polyembryonic.

Exploration and Collection of germplasm

Exploration and Collection Germplasm of *C. sinensis* (Sweet orange) was collected through various surveys and exploration missions conducted to diversity rich areas in different parts of India. *C. sinensis* is found in cultivation at large scale in India for production of juice and processed products. A total of 56 accessions of sweet oranges indigenous as well as exotic cultivars/types viz. Mosambi, Sohoj, Sonamitri, Ser-nam, Sohning-raing, Tasi, Mitha Chakola, Jaffa, Joppa, Satgudi, Blood oranges, Naval oranges, Valencia, etc. were collected from Punjab, Rajasthan, Himachal Pradesh, Meghalaya, Assam, Nagaland, Mizoram, Arunachal Pradesh and West Bengal. However, large collection representing indigenous and exotic cultivars were made from the Field genebank of Punjab Agricultural University, Regional Station, Abohar, Punjab. Important local cultivars Tasi which is vanishing rapidly

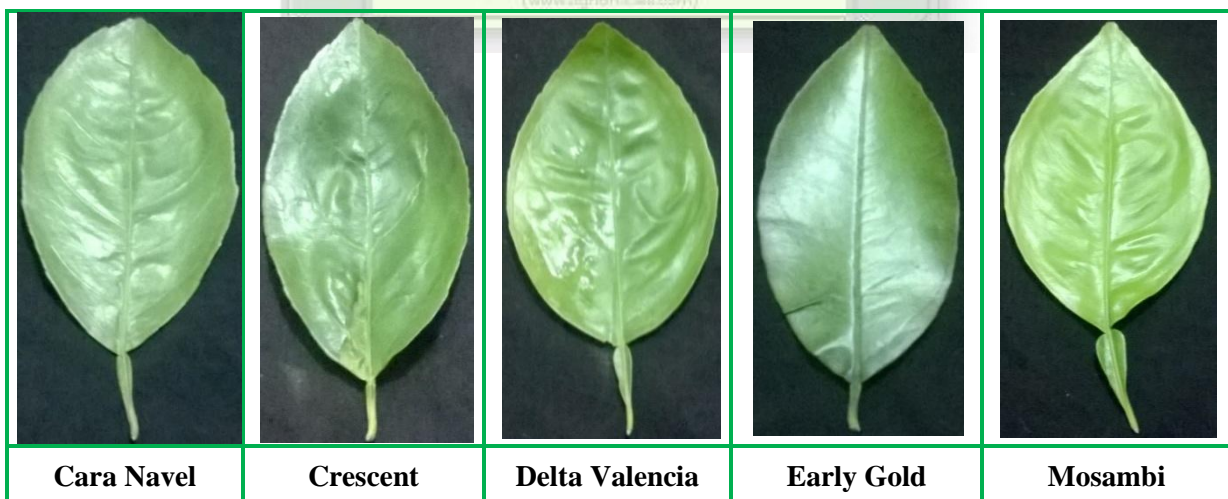
from the natural habitat, farmers fields due to less demand was collected from the B asar area of Arunachal Pradesh. Mitha chakola and Chakola tenga, cultivars of sweet oranges were collected from Tinsukhia area of Upper Assam, which are found as semi-domesticated in these locations. These local cultivars are also under the threat due to the farmers liking for more remunerative commercial crops.

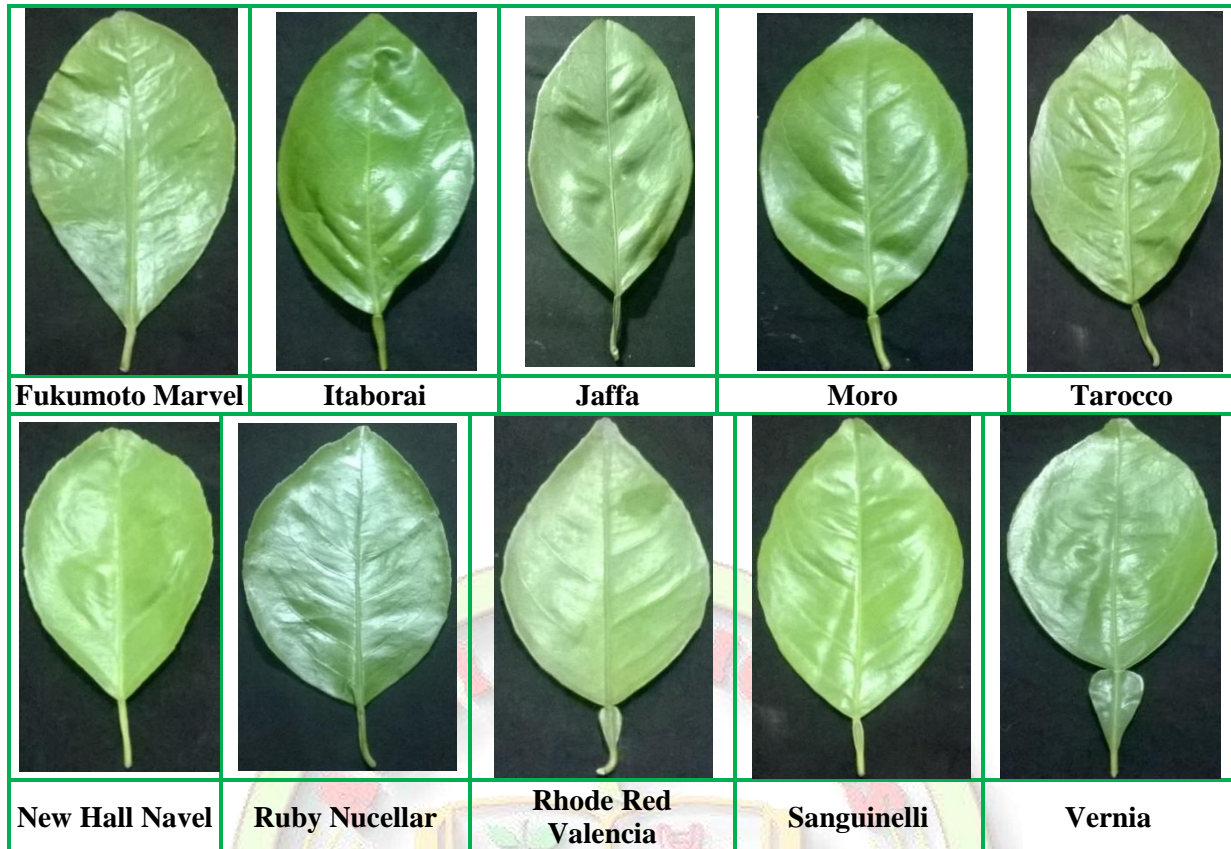
Characterization

Fruits were spheroid, ellipsoid, ovoid and oblique in shape. Fruit apex varied from rounded to truncate. Fruits were greenish yellow to orange in colour with pitted surface texture in most of the cultivar and rarely smooth texture in some cultivars. Seeds were clavate, ovoid and semi-deltoid in shape with creamish to white cotyledons and reddish chalazal spot. A large variability was recorded in almost all of the fruit characters. Large variation was found in fruit weight, ranged from 71.84 gm to 38~.33 gm. A very large variation was found in TSS value of the fruit. Highest TSS was 31.33°B and lowest TSS was recorded as 2.00oB. Seeds also showed a large variability in shape, size and colour. Ten seed weight varied from 0.20 to 8.20 gm.

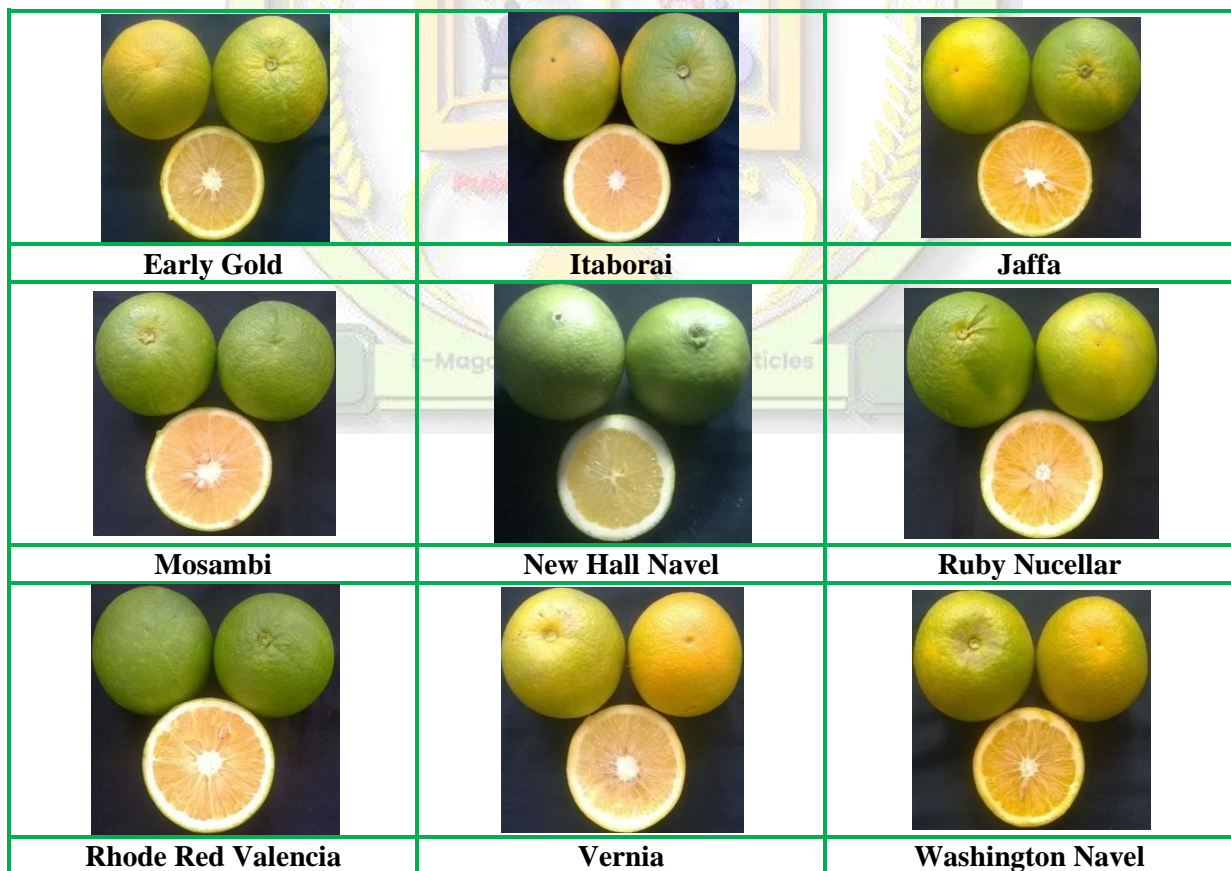
Conclusion

Erosion of genetic resources of Citrus due to various biotic and abiotic factors has resulted in loss of gene pools from nature and as well as from different centers of collections in India. Northeast India, rich in Citrus genetic diversity, represents several natural wild species namely *Citrus indica*, *C macroptera*, *C ichangensis*, *C. latipes*, *C. megaloxycarpa* and *C. assamensis* and commercially cultivated species. These species indicate interesting domestication trends leading to "in situ" and "in situ on-farm" conservation due to their cultural and economic significance. Management of genetic resources of vast and diverse genus like Citrus need appropriate planning for genetic resources management and complementarities of conservation approaches. All the activities related to genetic resources management viz. collection of germplasm, appropriate characterization of collected germplasm, conservation and utilization are required to be undertaken as a mission mode programme for Indian Citrus germplasm. Various conservation strategies presently being used for plant genetic resources and specifically for Citrus genetic diversity are both in situ and ex situ approaches. In the present scenario most appropriate strategy for Citrus germplasm conservation is to adopt immediate ex situ conservation (i.e. field genebank and cryogenebanking) complemented with in situ conservation (In situ on-farm conservation, gene sanctuary and National Parks) for wild and semi wild species of Citrus.





Diversity in leaf size and shape of different sweet orange varieties



Diversity in fruit size and shape of different sweet orange varieties