Indian J. Pl. Genet. Resources 2(1) : 78-81, 1989

**Short Communication**

# Introduction of Plant Genetic Resources in Non-Conventional Plants and Vegetables

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Introduction of economic plants in the form of seeds, fruits, cuttings, rooted stocks etc. has been in vogue since pre-historic times from one part of the world to another. Nomads, traders, religious missionaries and travellers have been instrumental in the spread of such materials to distant regions. In medieval period with the development of faster modes of land and aquatic transport, the exchange of seeds and plants witnessed frequent and enhanced introduction. Coffee, a native of South-East Africa reached India through Saudi Arabia. *Solanum tuberosum, Nicotiana tabacum* and *Lycopersicon esculentum,* all native to South America were introduced in India during early 10th century. *Arachis hypogaea* native to Brazil found its way into India during early 16th century and *Trifolium alexandrium* used as a green legume fodder in India was introduced in the early years of present century from Egypt.

Since the inception of National Bureau of Plant Genetic Resources in 1976, a total of 3,48,536 accessions of different agri-horticultural and silvi-pastoral plants have been introduced. This paper, briefly reports the material introduced in non-conventional plants and vegetables.

*Non-conventional plants*

Amongst the introduced plants which have great potential and can grow in desert and other drought conditions is EC 33198 of Jojoba (*Simmondsia chinensis*). The seeds contain 50 per cent oil used in the wax industry and as a lubricant. Guayule (*Parthenium argentatum*) also grows in deserts (Anon. 1975) and cultivar Arizona No. 2 (ex USA) introduced in India has given best performance at Jodhpur and its rubber content ranged between 6 to 8 per cent in one year old plant (Anon. 1983). *Euphorbia* species are also high potential hydrocarbon yielding plants. *Euphorbia tirucalli* is reported to yield 37 to 50 barrels of oil per hectare per year. It is reported to have given 6.2 per cent hydrocarbon under non-irrigated conditions. *E. antisyphilitica,* containing high quality candelilla wax, can be grown successfully on dry and marginal lands. Besides, *Leucaena* species (*L. leucocephala, L. pulverulenta, L. diversifolia* and *L. esculenta*) have been introduced. Salvadore (EC 12290, ex Australia) and K-8 (EC 124343, ex Philippines) showed best performance at Jodhpur, Bhavanagar and Trichur. Variety K-155 and K-156 are also reported to be promising under Indian conditions. The introductions in non-conventional plants during 1976-86 are given in Table 1.

TABLE 1. GERMPLASM INTRODUCTION IN NON-CONVENTIONAL CROPS (1976-85)

| Crop Species | Accessions | Source Countries |
|---|---|---|
| *Parthenium argentatum* | 92 | Mexico, USA |
| *Parthenium fruticosum* | 1 | USA |
| *Simmondsia chinensis* | 69 | Mexico, Israel, UK, USSR, Tanznia |
| *Leucaena leucocephala* | 390 | Australia, Philippines, Malawi, Colombia, USA, Sierra-Leone, France |
| Other *Leucaena* spp, | 60 | Australia, USA, France. |

Among forage plants, salt tolerant *Atriplex nummularia*, *A. halimus* (EC 129607), *A. cenescens* (EC 129768) and *Acacia albida* (EC 123772, ex Senegal) with potential to grow in prolonged dry season have been introduced. *Prosopis tamarugo* and *P. juliflora* (EC 38596) have also been observed to perform well under arid conditions. Other important species include *Ceratonia siliqua* and *Cucurbita foetidissima* introduced in India and are thriving well on poor soils.

*Vegetable crops introductions*

Promising introductions in vegetable crops include tomato, *Capsicum*, french bean, cowpea, cauliflower, carrot, garlic and onion. Groupwise details of different vegetable crop introductions are given in Table 2.

The introduction of tomato germplasm about three decades back, such as Sioux (ex USA), labonita (ex USA) and Molakai (ex Australia) have shown tremendous potential under Indian conditions. Other recent collections include EC 129571 and EC 130044, CV Patriot (ex USA) resistent to *Fusarium* wilt and root-knot nematodes; Karobeta (ex Bulgaria) resistant to TMV, cracking tolerent, β-carotene rich (3-4 mg/100 g) and ascorbic acid rich (20-30 mg/100 g), EC 162506, EC 162507, EC 162511 and EC 122516 (ex Taiwan) all heat and bacterial wilt tolerant and resistant to TMV. In *Capsicum*, California Wonder, World beater, Yolo Wonder-tolerant to TMV, Mississipi nema heart, a root-knot resistant type (ex USA). In sweet pepper, six accessions, EC 175960-66 (ex Hungary) are determinate, white, sweet with L gene blocky, and erect types with resistance to red spider. In French bean, Sanilac, BC-6 resistant to alpha, beta and gamma races of *Collectotrichum lindemuthianum* and races of BCMV. In cowpea, Pusa barsati (ex Philippines) adapted to long day conditions, EC 5000 (ex Rhodesia), high green pod yielder (Anon. 1985), EC 169716-25 (ex Nigeria) resistant to bruchids and aphids. In water melon, Ashahi Yamato (ex Japan), Sugar baby, Charleston Grey, Sugarlee (all from USA) are resistant to *Anthracnose* and *Fusarium* wilt. In muskmelon, Green Ice-resistant to three races of powdery mildew (*Sphaerotheca fulgines* L.) is vitamin C rich, CV WI 998 possesses resistance to melon aphid, watermelon mosaic virus 1 and 2, powdery mildew and sulpher tolerance. Cultivars Honeydew, Honeybush, Musketeer and Midget (ex USA), also resistant to *Fusarium* wilt, have been introduced in the recent past. In garlic, a collection with large bulbs and cloves have been introduced from Sultanate of Oman and in

TABLE 2. INTRODUCTION OF GERMPLASM IN VEGETABLE CROPS (1976-86)

| Crop Species | Accessions | Source Countries |
|---|---|---|
| Tomato *Lycopersicon esculentum* | 1,570 | USA, Bulgaria, Israel, Denmark, Netherlands, Australia, Italy, Japan, Philippines, Poland, USSR, Taiwan |
| Onion *Allium sativum* and related sp. | 507 | Australia, Netherlands, Denmark, Indonesia, Japan, USA, USSR, France, Hungary, Brazil, Iran, Poland, Nigeria, Germany, Taiwan |
| Colcrops (Cabbage, cauliflower Brussel's, sprout, Chinese cabbage) | 1,361 | Italy, Netherlands, UK, Taiwan, USA, USSR, Japan |
| Capsicum (Chillies, Sweet pepper and other *Capsicum* species) | 1,233 | Hungary, USA, USSR, Italy, Philippines, Australia. Czechoslovakia, Nigeria, Zambia, Netherlands, Taiwan, Yeman Arab Republic |
| Cucurbits (melons, cucumbers, squashes, gourds, pumpkin) | 1,346 | USA, USSR, UK, Philippines, France, Zambia, Nigeria, Turkey, Netherlands, Mexico, Hungary |
| Peas (*Pisum sativum*) | 119 | Bulgaria, Bangladesh, USSR, Newzealand, USA, Australia, Italy, Czechoslavakia |
| French bean (*Phaseolus vulgaris*) | 178 | USA, Bulgaria, Taiwan, Australia, Germany, Japan, Czechoslovakia |
| Brinjal (*Solanum melongena*) | 141 | Japan, Nigeria, Philippines, Australia, Israel, USA, USSR |
| Root vegetables (carrot and radish) | 388 | Australia, France, Netherlands, Denmark, Japan, Australia, France, Netherlands, USSR, USA, Brazil, Zambia, UK, Taiwan, Korea, Hungary |
| Leafy vegetables (*Lactuca*, *Spinacea*, *Asparagus* and *Trigonella* species) | 77 | Netherlands, UK, Poland, Italy, USA, USSR |
| *Abelmoschus* | 598 | Nigeria, West Africa, Ivory Coast, Philippines, USSR, UK, Singapore, Zambia, Turkey, Brazil, Sudan |

onion cv NU Mex BR-1 being short day, resistant to bolting and pink root disease (ex USA) is a promising introduction. Cauliflower accessions EC 175800 (ex USA) are reported to be multidisease resistant. In carrot, cv. Beta III (EC 180042) undergoing trials and adaptations studies has a very good flavour, is rich in carotene and vitamin A. It is being tested for vitamin A deficiency diets. In squash, cv. Early Straight Neck (ex USA) has vigrous bushy plants, creamy yellow fruits, and high yield. In Chinese cabbage, breeding lines resistant to club root (ex USA) and EC 16874-51 (ex Taiwan) are heat tolerant and resistant to black rot. Among lesser known leafy vegetables, *Cnidoscolus* sp. (EC 171029, ex Mexico) have been introduced and shown promise (Singh *et al.*, 1986).

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