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Short Communication

GENETIC RESOURCES CONSERVATION ACTIVITIES AND THEIR UTILIZATION IN NORTH-WEST HIMALAYAS

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North-west Himalayas are endowed with very rich plant genetic diversity. Realizing the importance of this vast and valuable plant genetic wealth, the National Bureau of Plant Genetic Resources established a Regional Station at Shimla in the year 1960. Since inception, this regional station is involved in the various activities related to plant genetic resources. The main objectives of the station are (i) exploration and collection of genetic resources of agri-horticultural crops (ii) conservation, multiplication, evaluation, and utilization of the collections (iii) classification and characterization of germplasm collections (iv) preparation of inventories and catalogues of plant genetic resources for breeder use and (v) supply of relevant informations on plant genetic resources and seed/planting material to users. The station is also introducing plant genetic resources of several agri-horticultural crops suited to the north-west Himalayas, especially for the hilly states of India to broaden the existing genetic base. These germplasm lines are characterized/evaluated for its proper utilization.

Exploration and collection

During the last 30 years, the regional station has undertaken several multi-crop/crop specific collection missions to different parts of Himachal Pradesh, Jammu & Kashmir and Uttar Pradesh hills. A great deal of variability was observed and collected in rice, wheat, maize, barley, amaranath, buckwheat, pulses, minor millets, vegetables and various temperate fruits such as *Prunus, Malus, Pyrus, Sorbus, Docynia, Cydonia, Pistacia, Vitis, Punica, Rubus, Juglans* and a number of other minor fruit spp. Prominent and rare landraces of different crops collected were *Katheri, Hathal, Rangi* (cold tolerant), *Monga,*

Basmati, Ratuwa (scented types), *Risa, Tapta, Narkanda* (early types) in paddy; *chidku makki* (multi ears), white *desi makki* (ear length up to 30cm), and *sathoo* (60 days) in maize; *Dharmaurii* (high yielder, longer spike), *Desi Mundul* (awnless), *Mundau, Latar* (cold resistant), *Brad Kanak* (drought resistant) in wheat. Chamba and Sirmour districts of Himachal Pradesh were observed to have high genetic diversity of maize. In grain amaranath, three species were found to be predominant throughout the north west Himalayas. *Amaranathus hypochondriacus* and *A. caudatus* were observed in abundance in the high hills, whereas *A. cruentus* was mainly confined to low and mid hills. Exciting variability was observed and collected with respect to various cultivated/wild temperate fruits in the Almora, Nainital, Pauri, Chamoli adn Uttar Kashi hills of U.P.; Chamba, Lahaul Spiti, Kinnaur and Shimla districts of Himachal Pradesh. The station has also collected wild relatives of cultivated plants/ landraces of crop plants which are under the threat of genetic erosion or at the verge of extinction. These species/areas are : (i) *Cicer microphyllum* and wild *Rosa spp.* from Lahaul & Spiti district (ii) Landraces of rice, wheat, and maize from Karsog, Hamirpur and Chamba respectively, in Himachal Pradesh (iii) Wild pomegranate in Narang valley (Solan) and Shimla (near Mashobra) (iv) Walnut, Chilgoza and Hazelnut from Pangi valley of Chamba (v) *Prunus spp.* and *Sorbus spp.* from Kinnaur and (vi) *Sorbus spp.* from Pangi and Shimla.

Evaluation

The station is at present evaluating, documenting and maintaining germplasm of more than 13,000 collections of various agri- horticultural crops. The major economic groups of crops and number of accessions in each crop are given below.

Pulses : Frenchbean (2800); adzuki bean (70); ricebean (340), urid bean (175); mung bean (125); pea (281) and lentil (530).

Pseudocereals : Amarnath (3063); buckwheat (561); Chenopod (50).

Oilseeds : *Brassica* spp. (330); *Cuphea* (7).

Minor millets : Proso millet (330); little millet (148); finger millet (770); foxtail millet (750); kodo millet (210); barnyard millet (291).

Beverage : Hops (25); chicory (37).

Vegetables : Onion (16); meetha karela (29).

Fruits (i) **Pome fruits** : Apple (235); pear (33).

(ii) **Stone fruits** : Apricot (34); sweet cherry (8); European plum (12) peach (38); Japanese plum (10) and almond (15).

(iii) **Nut fruits** : Walnut (44); pecan (10); hican (1); filbert (6) and pistachio (4).

(iv) **Soft fruits** : Strawberry (15); currants (1) and raspberry (20).

(v) **Other fruits** : Pomegranate (9); chinese gooseberry (7): *Feijoa* (2); Chinese ber (3); persimon (3) and olive (6).

(vi) **Wild fruits** : (20)

Ornamentals : (110)

Besides, station is also maintaining the germplasm of various grasses, fodder, spices & medicinal plants and root/tuber crops.

Documentation

Three catalogues, one each on amaranath, frenchbean, sesame and three monographs/ books entitled "Grain Amarnaths: The Future Food Crop", "Buck wheat in India" and "*Rosa* species" have been published from this regional station.

Achivements/contributions

During evaluation, the promising lines were identified and released for cultivation. This include,

Amarnath : *Annapurna* — a released variety for the hills, average yield 22.3 q/ha, wider adaptability, drought resistant, protein (14.5%) and rich source of lysin (5.5%) and IC 38280. Amarnath also contains some anticholestrol factors so that use of this grain will be regarding to people suffering hypertension etc.

Buckwheat : *Himpriya* — a released variety for the hills, average yield 12.6 q/ha. The tender leaves and shoots are used as leafy vegetable; a flower and green leaves are used for the extraction of rutin (glucoside) (used in medicine).

Frenchbean : PLB-14, PLB-10, EC 10801 (high yielding types)

Adzukibean : EC 87896, EC 87900 (high yielding).

Ricebean : CXM $12P_2$-3 (high yielding).

Comfrey : EC 7296 ex U.K. It is very good green fodder for the hills. The grass contains 33 per cent protein and is palatable to all kinds of domestic animals.

Golden timothy : EC 94067 ex Australia (a grass resistant to drought and cold, herbage yield at shimla is about 446 q/ha.

Hops : Late cluster, Colden cluster and Tardif de Bourgouge (use as flavours and preservative in beverages and have occupied a sizable area in Lahaul and Spiti districts of H.P.

Apple : Spur type — Red Delicious (regular bearer), Red Baron (hgih yielder) and Vered (low chilling).

Pear : Max Red Bartlett (high quality, red colour)

Apricot : Nugget-suitable for mid hills.

Peach : Stark Earliglo (early and good quality), Candor (suitable for mid hills)

Pecan : Mahan (extra large nut and high yield).

Chinese gooseberry (kiwifruit) : Allison ex USA. It is a high yielder and having good quality (high total sugars ands ascorbic acid). The propagating material is in great demand in Himachal Pradesh. U.P. hills, Darjeeling (West Bengal), Sikkim and other North-eastern states, of the country.