

SOME WILD TEMPERATE FRUIT SPECIES IN JUMLA AND MUSTANG DISTRICTS OF NEPAL

T.B. Pun and G.K. Shrestha

Institute of Agriculture and Animal Science, Rampur, Chitwan, Nepal.

ABSTRACT

Nepal has diverse ecological and edaphic conditions that favor natural existence of many wild fruit species. Some of these species, but more commonly available in Jumla and Mustang districts of western Nepal are reported; these are Crab apple (Ghobligen, Edimayal and Useu), wild peach, wild apricot, wild cherry, wild walnut, and wild pear. Some important horticultural characters inherent in these wild fruits are described so that they can be used for improving respective fruit cultivars to suit them better for local ecosystems. More detail information and research evidence are needed for better understanding of specific characters and genotype abilities of these wild fruits.

Additional Key Words: Apple, apricot, cherry, pear, peach, walnut

INTRODUCTION

Although it is very small country, Nepal has diverse climatic and edaphic condition prevailing in different parts of the country. The climatic variations alone ranges from hot humid tropical situation in the southern terai to cold dry alpine belts in the northern Himalayas. Compared to the more humid eastern districts, the Mid-western and Far-western districts are quite dry receiving annual rainfall less than 500 mm. Between eastern and western parts of Nepal from the terai belts to the higher altitudes in the mountains there are differences in soil texture, soil structure, soil fertility, water holding capacity and retention, etc. These variations present real opportunities for accommodating various plant biodiversity in terms of natural and existing plant species. Nepal is said to be a rich country in its plant genetic resources, including diverse fruit species from the tropical to temperate species.

In different parts of high hills and mountainous regions of Nepal, various fruit trees are seen growing wild adapting various climatic and soil conditions. In western Nepal, various fruit trees growing wildly in the temperate forest and Trans Himalayan regions were observed. These wild species were found growing vigorously struggling against adverse eventualities such as snow, frost, hail, rocky soil, disease and insects. Most of them were either resistant or tolerant to these adverse eventualities. Some of these specific wild species were utilized as rootstocks for grafting, budding or both, While some others were being used for edible purposes in various forms. In addition, they imparted good qualities of horticultural performances on the scion portion. Some of these wild species as observed in Mustang and Jumla areas are briefly described in this paper.

Note: The first author is postgraduate student of horticulture, Inst. Agric. Anim. Sci., Rampur, Chitwan, Nepal.

WILD TEMPERATE FRUIT GERMPLASM

Nepal is rich in its plant genetic resources. Chalise et al. (1993) have reported over 6500 flowering plant species that are available in Nepal. There are many edible wild fruits in Nepal; they belong to 37 genera and 45 species as referred by Kaini (1995). He reports a rich diversity in fruits species of *Annona*, *Phyllanthus*, *Aegle*, *Phoenix*, *Castanopsis*, *Citrus*, *Morus*, *Pyrus*, *Malus*, *Prunus*, *Myrica*, *Berberis*, *Vitis*, *Rubus*, *Fragaria*, *Actinidia*, etc. indicating that this country may be the original home of many species of fruits. But because of deforestation the valuable wild fruit germplasm is also eroding fast and such available yet very useful genetic fruit resources must be used rationally, conserved properly, and collected and documented safely for sustainable development of fruit industry in Nepal.

During the last several years (from 1992 to 1999) different places in Mustang and Jumla districts were visited and many wild fruits observed. Some of the important horticultural characteristics of these fruits growing wild in forests and other cultivated area were noted. Wherever possible, the use of fruits from these species in some other products was also noted. The growth and fruiting of these wild fruits in relation to climatic variation and altitude range was recorded qualitatively. Important wild fruits, commonly found in these two districts, are mentioned in order to make them known to the scientific community for their proper collection, evaluation, utilization and conservation.

WILD APPLE: Two types of crab apple were encountered to have grown vigorously in cold temperate regions. One was the very small-fruited crab apple, which is locally called *Ghobligen* in Mustang district. This is probably the same crab apple locally named *Edimayal* in Jumla areas. The tree was somewhat larger than normal trees of Delicious types. They grew at the altitude of more than 2,300 m where the annual rainfall is very low and average annual temperature is 4 to 8 deg. C. The main tracts of *Ghobligen* are Kobang, Sauru, Thini, and more specifically the Muktinath region. It is the subject of investigation that the small fruited crab apple, like *Ghobligen* is genetically the same as those of *Edimayal* growing wild in Jumla areas. It was also observed that the ecological adaptations of *Ghobligen* differed from that of *Edimayal*. For example, *Ghobligen* was consistently available in Mustang area where rainfall is less than 500 mm whereas *Edimayal* was observed maximum in Jumla region where the rainfall is usually higher than 500 mm. The *Ghobligen* growing in the semi-arid cool temperate areas of Mustang had smaller and narrower leaves with stiff spined branches. The fruits were in clusters and looked like wild cherry but fruit size was smaller than those of wild cherries found in warm temperate region of Nepal. The roots grew very deeper in the soil. They were very hard to cut with tools. The fruit was small, reddish brown skin with light yellow flesh attached to seed and ripen in September. Each fruit had many black seeds.

The other crab apple locally called *Useu* in Mustang district possessed somewhat bigger trees. They were grown as live fences or grown in nearby forests without care. Local people use fruits of *Useu* to make local liquor called *Raksi* in Nepali but the fruits of *Ghobligen* are rarely used for this purpose due to very small fruits to pick or collect. However, farmers are wiping out these valuable *Useu* trees these days, making them extinct from the native places such as, Kobang, Tukuhe, Marpha, Syang, and some other places of Mustang district. They generally thrived well in the altitude ranging from 2100 m to 2600 m. Fruits of *Useu* were round and green at maturity but changed to light yellow to yellow color at ripening. A single fruit contained many viable seeds, producing many seedlings for propagation of commercial cultivars. Twigs had relatively more spurs. Except powdery mildew, most of other

diseases were hardly ever seen in this *Useu*. Fruit ripened in September and could be collected then after.

WILD PEACH: The trees of wild peach, locally called *Khale* or *Khalya* were found thriving abundantly in the aforementioned tracts of Mustang district, mostly in semi arid cool temperate areas of western Nepal. Trees were smaller and fruit also very small; the stones looked like that of hard-shelled almond. Except gummosis other diseases were rarely noted in this species. Fruits were ripened in August and collection made during August-September. Graft compatibility was reported with all cultivated peaches; however, fruit cracking was noted.

WILD APRICOT: Locally called wild apricots such as *Chuli* (in Jumla) or *Chily* (in Mustang) had trees that were bigger than those of cultivated apricots. But, leaves were smaller and the number of twigs was many per branch. Fruits were small as compared to the commercial varieties and were yellow at ripe stage. *Chuli* was very good rootstock for apricot and peach but not for plum and almond.

HIMALAYAN CHERRY: The wild cherry trees, locally named *Paiyu* or *painyu* were found growing luxuriantly in the warm temperate forest. Wild cherry has been recommended as important rootstock for most of the improved cherry cultivars in other countries. But wild cherry used as rootstock in this hilly tract revealed some incompatibility in budding and grafting, whereas wild cherry reported from other countries are good for cherry propagation and are compatible also. After 6-8 months after operation, the incompatibility was reflected as growing of the scion portion thicker and thicker while the rootstock grew very slowly in its girth, which could not sustain supporting the scion growth anymore and then the tree collapsed.

BLACK WALNUT: The local name for wild walnut is *Hade Okhar*. They were also observed from the warm Temperate Zone of mid-hills to the cool temperate forests of high hills. They were not observed at altitudes less than 1200 m. They adapt better in areas where the annual average temperature is 7 to 13 deg. C. While observing these wild walnut trees two groups of trees were noted. They differed in terms of tree canopy, fruit size, growing habit and flowering time. One type had tall and erect trees, fruits small size, kernel percentage medium and flowering was 4th week of April and considered a late type. The another type had spreading to tall trees with medium- to big sized fruits. The kernel percentage was less to medium and flowering was early (1st week of April) to mid-season (3rd week of April). Areas facing North had dense forest of *Hade Okhar* in Jumla than in the south-facing slopes.

WILD PEAR: Two types of wild pear, locally called *Mayal* were observed in western Nepal. Wild pear that grew well in warm temperate regions where altitude ranged from 1000 m to 1600 m from mean sea level, average annual rainfall from 1400 to 1600 mm and annual average temperature from 10 to 15 deg. C. Fruits were borne in clusters, each fruit contained many but small seeds. This type of *mayal*, probably *Sano Mayal*, is found in different parts of Nepal. Fruit color is brown to dark brown. This *mayal* is good for rootstocks.

The another type of wild pear growing well was found at altitudes above 2000 m high from sea level where annual average rainfall is 700 mm and temperature between 6 and 9 deg. C. They differed visually from the other kind described above in terms of leaf size and fruit size. Normally, the fruit and leaf sizes were smaller than those that were recorded from trees available in lower altitudes. This *mayal* was usually found in Jumla areas of Nepal. Fruit color was brown black when ripe. However, the *Thulo Mayal* or *Bhote Mayal* with big fruits which are available in higher areas of Kathmandu valley were not recorded in the western hills of Nepal.

Reports on wild genotypes of fruit species were not made although this note also lacked in specific observation in terms of defining species differences in its quantifiable vegetative and reproductive characters, graft compatibility with different cultivars, disease and pest tolerances, breeding abilities, economical uses, etc. Srivastava et al. (1977) also studied wild fruit species of the Himalayan region of India and recorded that Crab apple, wild peach, wild pear, wild apricot, wild cherry, wild walnut, wild pomegranate, wild aonla and many others from the dense forest. Apparently, the wild apples described by Srivastava et al. (1977) could be different from those noted in this paper as there were 3 variations on tree and fruit characters observed in western Nepal. Many of their horticultural good characters have been used to improve various fruit cultivars of temperate nature by various methods (Srivastava, 1966; Pathak and Srivastava, 1975; Bose and Mitra 1990). In Nepal also, one or more of the inherent qualities of these wild fruits can be incorporated in commercial varieties that need improvement research work through breeding or other improvement technologies.

CONCLUSION

For several years two districts of western Nepal namely Jumla and Mustang were observed for wild fruit species. The local uses of some of these wild fruits that are important in terms of horticultural characters, including their economic application were noted. As there are many problems confronted with fruit production in hills and high mountains of Nepal these indigenous, yet wild fruit germplasm could be utilized to solve production problems. However, for this detailed studies must be undertaken to characterize wild fruit genotypes of temperate fruits for specific values. Wild gene pools of existing fruit species must be collected, evaluated and documented properly in a systematic yet scientific basis.

REFERENCES CITED

- Bose, T.K. and S.K. Mitra (ed). 1990. Fruits: Tropical and Subtropicals. Naya Prokash, Calcutta -6, India.
- Chalise et al. 1993. Natural resources management in a mountain environment. ICIMOD, Lalitpur, Nepal.
- Kaini, B.R. 1995. Status of fruit plant genetic resources in Nepal, pp. 103-111. In: Plant Genetic Resources: Nepalese perspective. NARC and IPGRI, Khumaltar, Lalitpur, Nepal.
- Pathak, R.K. and R.P. Srivastava. 1975. Walnut propagation by vegetative methods. Indian Horticulture 19(4): 13-16.
- Srivastava, R.P. 1966. Research on horticultural crops at Chaubattia. Indian Horticulture 10(4): 9-11.
- Srivastava, R.P., R.K. Pathak, D.S. Bana and V.S. Pandey. 1977. Utilization of some important fruit trees growing wild in the Himalayan region. In: J.S. Nijjar (ed). Fruit Breeding in India. Oxford and IBH publishing Co., New Delhi.