

Distribution and Characteristics of Plant Resources of Native *Pyrus* sp.

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ABSTRACT

The wild *Pyrus* plants belong to the deciduous woody plants in Rosaceae family. Most are cultivated for fruit productions, but some for ornamental plants. There are 5 *Pyrus* species including *Pyrus ussuriensis* and 8 varieties cultivated in Korea. In Korea, these plants are populated near villages or on the hills, and they are easily propagated since their fruit are very juicy and quite big in size. Plant breeding to get improved cultivars is not difficult because the *Pyrus* plants are easy to cross breeding among its genus. Because not only this reason but there have been shown lots of variation in wild groups, the *Pyrus* plants inhabited in Korea are excellent deciduous woody plants and favorable fruit trees to develop ornamental plants. It is necessary to develop many kinds of fruit trees and ornamental trees containing genetically different character, so that it will be satisfied for many different people's taste and demands. Collecting lots of wild plant resource with diverse genes is necessary for plant breeding.

INTRODUCTION

As a representative temperate deciduous fruit tree, the pear tree is widely cultivated. It is cultivated in the whole southern area widely except for Jeju Island in Korea. The pear tree is a woody plant highly recognized for the beauty of flowers and fruit as a decorative plant as well as the edible value of the fruit. Like this, dozens of species of the plant grow naturally in Europe and some are in north Africa including Asia area. Among them, in Korea 5 species and 8 variations including *Pyrus ussuriensis* grow naturally. *Pyrus ussuriensis* is famous as a material for breeding of a pear tree. Also *Pyrus pyrifolia* is the basic species of widely known Japanese pear. The wild pear plants are

called as "*Pyrus pyrifolia*" compared with the agricultural species and in some areas it is used as decorative plant as well as a fruit tree. Moreover, we can often see that Silsangmyo is cultivated as the parent stock for grafting breeding of agricultural species due to its soundness. From old times, we grow Keumwha pear, Hamheung pear, Anbyon pear, Deungsan pear and *Pyrus ussuriensis* var. *macrostipes* as well as Kosil pear, *Pyrus ussuriensis* var. *ovoidea* and Whangsil pear as endemic species. However wild endemic pear genera are weeded out due to the fruit production and distribution of superior improved species so it is hard to find it.

It is expected that the cultivation area will be extended radically in the future as it is possible to

harvest pears early and it is relatively easy to cultivate it. Also the pear produced in Korea has large amount of sugar and moisture and rich fruit juice so it is possible to utilize it for processing. Especially, the pear harvested in Korea has superior quality so it has high possibility to export to southeast asia and western countries. However most agricultural species cultivated in Korea are the agricultural species of *Pyrus pyrifolia* breded in Japan. It becomes necessary to develop the species of effective resistance as the agricultural species has little resistance to plant disease and noxious insects including 'red star shape disease". Especially it is definitely needed to develop new species of new taste, smell and shape to meet consumer's tastes, which are rapidly changed. Like this, it is necessary to understand the distribution status and characteristics of various wild pear plant genera growing naturally in Korea for the breeding objective. In 21st century, we are facing keen competition of bioresources war era to secure the plant genetic resources. We would like to prepare the foundation for bioresources by breeding and developing the species after investigating and reviewing the distribution status and characteristics of plant genetic resources of pear plant genera growing all over the country.

**DISTRIBUTION STATUS AND
CHARACTERISTICS OF VARIOUS WILD
PEAR TREE GENUS**

① Classification of wild pear tree genus plants

The reference table of the characters on wilde pear tree genus distributed nationally is indicated as follows:

1. The fruit is yellow or (green) brown, liver brown or blackish brown and the pedicel ranges in 1.5-5cm.
2. The calyx remains lately and the fruit ripens yellow.....

1. *Pyrus Ussuriensis*

2. The fruit is oval-shaped.....
2. *Pyrus ussuriensis* var. *ovoidea*
2. The fruit has the red color on the portion to disclose to the sunlight
3. *Pyrus ussuriensis* var. *acidula*
2. Big flower.....
4. *Pyrus ussuriensis* var. *seoulensis*
2. The calyx falls early and the fruit is brow, green or blackish brown
3. Young leafstalk and pedicel have hair at first, which will be gradually removed. The style is 2-3 pieces.The fruit is greeny brown.....
5. *Pyrus calleryana* var. *fauriel*
3. Young leafstalk and pedicel have no hair. The style is 3-5 pieces. The fruit is black-blackish brown
4. The cortex is brown. The back of the leaf is ash-green. The fruit is liver brown
6. *Pyrus pyrifolia*
4. The cortex is blackish brown. The back of the leaf is green. the fruit is black-dark brown
7. Uibongbae tree
1. Soji is blackish brown. The fruit is yellowish brown. About 6 cm pedicel
8. Chambae

② Distribution of wild pear tree genus plant

It is surveyed that the wile pear tree genus plant distributes all over the country according to the species. It is rare that the pear tree genus plant in wild condition forms a colony but we will introduce the representative spots where large populations grow or old large trees grow wildly.

- *Pyrus ussuriensis*: Distributed broadly in the whole area of middle northen area of Korea peninsula. Forming small colony in the whole are of Mt. Jeombong to be 600-750 m above sea level

including Jindong valley, Injaekun, Kangwondo.

- *Pyrus ussuriensis* var. *acidula*: Growing commonly in Mongolian oak forest in the whole area of Mt. Hambae and Mt. Daedeok, Kangwondo to be 1,200 above sea level. About 200-year old large tree in Ansongun, Kyonggido
- *Pyrus ussuriensis* var. *ovoidea*: Growing naturally in the princincts of Buseoksa and neiboring private houses in Buseokmyon Yongjukun, Kyongsangbukdo
- *Pyrus ussuriensis* var. *seoulensis*: In the yard of Forestry Institute in Hongreung, Seoul
- *Pyrus ussuriensis* var. *nakalensis*: Hillock in the area of Keumsan Chungnam and southern sea
- *Pyrus pyrifolia*: Large old trees forming small colony around 700m above sea level of Mt. Kaya in Hapcheon, Kyongsangnamdo and in the sluice area of Haeinsa
- *Pyrus ussuriensis* var. *macrostipes*: 100-year old tree in front of the village in Keundeokmyon Samcheokkun Kangwondo, Vestiges of agriculture as a fruit tree in old times
- *Pyrus calleryana* var. *fauriel*: Forming small colony in the second forest of hillrock in the area of Ansan city, Kyonggido

③ Habitat status of wild pear tree genus plant

It is possible to classify the habitats of pear tree genus plant into three types as follows

- Around woods: Small trees growing naturally from the seeds delivered by birds or small animals around *Pyrus pyrifolia* including *Pyrus ussuriensis*, which become large and old, form small colony. It grows naturally mainly outskirts of miscellaneous small trees basking in the sun or in the vicinity of roads. It grows with herbs of composite plants such as goldenrods and asters

and shrubs suchas Amur maples and briers and it is usually discovered with naturalized plants such as 미국가락사리 and 개망초and pioneering species such as mugworts. High possibility to be weeded out as aggressive winders such as *Actinidia arguta* including tall trees such as Mongolian oak and ash trees grow actively in the neighborhood. It grows naturally in sunny southeast direction and the 식피율 of herbs in the habitat is 60% or more but the 식피율 of arbor to block the sunlight is 10-50%.

- Around private houses: There still remain pear tree genus plants, which have been cultivated as fruit trees such as *Pyrus pyrifolia* and *Pyrus ussuriensis* var. *seoulensis*. Most of them are large old trees, which are damaged by people. Some have the trace of sawing.
- In the precints of temples or in the neighborhood of ruins: Those which have been cultivated as fruit trees or garden trees in temples have been preserved wellll and remain until now.
- Nursery: Rarely remaining the agricultural species, which have been distributed as fruit trees before or some species produced as parent stocks. Relatively it has detailed record on the characteristics of the species.

CONCLUSION

Above all, it is necessary to study species in detail for the exact classification to be utilized as a material for development and breeding of wild pear tree genus plants in the future. As pear tree genus plants of $2n=34$ chromosome are easily hybridized in the natural condition, it may be difficult to trace the species. However, it might be easy to utilize this property for breeding new species. Also it should be followed by understanding the distribution and status of the pear tree

genus plants and managing them properly. As shown in this survey, the neighborhood of the habitat of some wild pear tree genus plants faces with the serious condition due to the artificial damages by people as well as natural 천이 phenomenon. Many wild pear tree genus plants are cut to be utilized as wood in the condition of old and large tree and they are removed as people do not realize their value in the forest management policy. It is necessary to arrange the characteristics of individuals with superior character in data base, to record them systematically and to maintain the genetic resources in the long term. As for the genetic resources of superior plants, it is necessary to preserve them and to develop new species through 실생

breeding not to mention nutrition breeding such as organic culture or grafting. Most of these pears or affiliated plants preserving the species in the wild condition for a long term, have excellent environmental adaptation including resistance against the damage by blight and harmful insects.

The systematic management of the genetic resources of wild pear tree genus plants is not only the breeding material of new kind for various tastes and quality improvement of fruits but also can be utilized for breeding new kind of excellent resistance against the damage by blight and harmful insect.