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# FRUIT AND TREE CHARACTERISTICS OF WILD PEAR (*Pyrus elaeagrifolia* Pall.) COLLECTED FROM ISPARTA PROVINCE

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***Abstract***
*Wild Pear (Pyrus elaeagrifolia Pall.) is among the pear species that have found a wide distribution area in the region starting from Southeastern Europe to Anatolia, the Caucasus and Crimea, and have adapted very well to arid and unfavorable conditions. The most important feature of the species is its tolerance to many biotic and abiotic conditions. On the other hand, the rootstock potential in pear production is high. Since it is a species that reproduces by seeds in nature, it has a wide range of diversity. In this study, fruit some fruit and tree characteristics of different wild pear genotypes collected from Isparta province of Türkiye were determined. Accordingly, a wide variation was identified in terms of the examined characteristics. Fruit weight among the genotypes varied between 6.72-33.74 g, and genotype 16 had the largest fruits. Fruit lengths were found to be between 19.87-32.21 mm, and fruit widths were found to be between 23.39-41.56 mm. Fruit pedicel lengths varied between 13.82-27.73 mm. In the genotypes examined, the fruit shape was determined as round or flat-round. The tree form has changed from upright, upright to spreading and spreading. Leaf color in the genotypes generally was determined as blue-grey or green-grey. The results obtained show that there is wide variation in fruit and tree characteristics among wild pears in nature. It is important to preserve this richness and use it in breeding studies.*

*Keywords: Genetic resources, Pyrus spp, Wild pear*

## 1. INTRODUCTION

Wild pear (*Pyrus elaeagrifolia* Pall.), native to Anatolia, is one of the 22 Pyrus species and is distributed in Southeastern Europe, Russia and Türkiye. It is widely found especially in the central parts of Türkiye. The trees are medium sized, have round crowns, dense branches and thorns. The fruits are small, ball-shaped and very sandy. Wild pear is well adapted to arid climate conditions, has deep roots, is completely xerophytic and has been stated as a rootstock that can be used in pear cultivation (Özbek, 1978; Bell et al., 1996; Özçağıran et al., 2005).

Wild pears, which have been growing spontaneously and openly pollinated in nature for many years, reproduce by seeds. For this reason, a wide range of genetic variation has occurred among wild pears over the years, with the mixture of many genotypes with different genetic structures. It shows that there is also genetic diversity in the different morphological characteristics (differences in leaf size and color, differences in tree crown width, differences in fruit size and ripening periods, etc.) determined based on observations among wild pears. This situation was also revealed by the molecular marker study conducted on wild pear genotypes collected from Türkiye (Uzun et al. 2022). Ahlat is densely found in nature, especially in the central parts of Türkiye, and there is no


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clear information about the number of trees. However, the wild pear population is in danger due to the destruction caused to clear land, especially in rural areas, and its use as wood. In addition, in some regions, by grafting pears with cultivated pear varieties, some pear populations become unworkable and our natural genetic structure shrinks.
Collecting wild fruit species in the world, protecting them and determining their diversity levels are considered priority issues. Keulemans et al. (2006) carried out extensive studies to collect, characterize and preserve wild apple (*M. sylvestris*) genotypes, which are found in Belgium and are in danger due to environmental and human pressure. One of the studies carried out on this subject is the collection, preservation and characterization of genetic resources of *P. ussuriensis*, a pear species that grows wild in Japan (Katayama et al., 2007).
In this study, some fruit characteristics of pear genotypes selected from Isparta province of Türkiye were determined. Thus, the variation in fruit characteristics among wild pears growing naturally in the region was revealed.

## 2. MATERIALS AND METHODS

Wild pear trees growing naturally in Isparta province were used as material in the study. Studies were carried out on ten genotypes with different tree and fruit forms determined from the population here. Fruit samples, 25 from each tree, were taken from the determined trees at the beginning of October and brought to the laboratory, and the following measurements and analyzes were made.
Fruit weight (g): Measurements were made with a precision scale sensitive to 0.01 grams.
Fruit length and width (mm): Measured for each fruit using a digital caliper.
Pedicel length (mm): The pedicel length of each fruit was determined with a digital caliper.
Tree form and leaf color characteristics were determined visually.
The results obtained are given together with the standard deviation values obtained in the Excel program.

## 3. RESULTS AND DISCUSSIONS

Variations in fruit characteristics were obtained in the nine pear genotypes used in the study. Fruit weight of the genotypes varied between 33.74 g (genotype no. 16) and 6.72 g (genotype no. 17) (Table 1). Fruit weight was one of the parameters with the most variation. Large-fruited genotypes are important in the region because they have different uses such as fresh consumption, drying and pickling. In the study conducted in the Kayseri region, Yılmaz et al., (2015) determined the highest fruit weight in genotype no. 38-AK-003 (27.09 g) and the lowest in genotype no. 38-TA-002 (4.71 g). Researchers have determined a high level of variation in wild pear genotypes in terms of fruit weight, similar to our study. Keçeci (2017), in his study in the Hakkari region, determined the fruit weight of wild pear genotypes between 55.04 g and 18.49 g. On the other hand, Bozhüyük (2021) found the fruit weight in wild pear genotypes to be between 8.36-16.11 g. It is predicted that the differences in fruit weight between studies are due to the different genotypes used and environmental conditions. Karataş and Ercişli (2021), determined the fruit weight in wild pear genotypes as 6.19-21.04 g.Variations were detected in wild pear genotypes in terms of fruit size, although not as high as fruit weight. The highest fruit length (32.21 mm) and fruit width (41.56 mm) values were obtained in genotype 16, which had the highest fruit weight. Similarly, the lowest fruit length (19.87 mm) and fruit width (23.39 mm) values were found in genotype 17, which has the smallest fruits. Yilmaz et al. (2015) on pear genotypes, the highest fruit length was 36.14 mm


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and the lowest was 17.26 mm; The highest fruit width was determined as 36.55 mm and the lowest was 20.82 mm.

Fruit pedicel length varied among genotypes. This value ranged between 27.73 mm (genotype no. 8) and 13.82 mm (genotype no. 12). In the study carried out in the Kayseri region, pedicel length values varied between 24.23-6.89 mm (Yılmaz et al. 2015). On the other hand, in the study conducted in Kars province, pedicel length was determined between 9.13 and 16.32 mm (Bozhüyük, 2021). In another study, pedicel length values were found to be 7.11-18.56 mm (Karataş and Ercişli, 2021).

***Table 1. Fruit characteristics obtained in the pear genotypes used in the study***

| Genotype | Fruit Weight (g) | Fruit Lenght (mm) | Fruit Width (mm) | Pedicel Lenght (mm) |
|---|---|---|---|---|
| 6 | 11.12±1.37 | 22.60±1.15 | 27.56±0.91 | 17.91±3.39 |
| 7 | 10.29±1.51 | 21.73±2.13 | 28.19±2.22 | 15.88±2.59 |
| 8 | 10.25±2.07 | 22.89±1.29 | 26.91±2.15 | 27.73±2.76 |
| 10 | 8.72±1.21 | 21.57±1.22 | 26.30±1.09 | 27.35±2.42 |
| 12 | 23.23±2.86 | 27.81±2.16 | 35.66±2.11 | 13.82±4.91 |
| 13 | 10.76±1.37 | 22.24±0.70 | 27.31±0.65 | 24.55±4.05 |
| 14 | 8.97±1.70 | 21.13±1.59 | 27.16±1.53 | 22.79±2.11 |
| 15 | 10.04±1.45 | 20.85±0.84 | 27.28±1.12 | 19.49±2.75 |
| 16 | 33.74±14.84 | 32.21±4.09 | 41.56±5.87 | 16.37±2.50 |
| 17 | 6.72±0.81 | 19.87±1.54 | 23.39±1.89 | 26.67±4.05 |

The tree form has changed from upright, upright to spreading and spreading. Leaf color in the genotypes was determined as blue-grey or green-grey (Table 2).

The tree form was found as upright in eight genotypes (genotypes 6, 8, 10, 12, 14, 15, 16, 17), spreading in one genotype (7), and upright-spreading in one genotype (13). Bozhüyük (2021), determined the tree form in wild pear genotypes as upright, semi-upright and spreading, similar to our study.Variation in leaf color was also observed among genotypes. Accordingly, the leaf color of five genotypes (6, 7, 8, 13, and 15) was determined as blue-grey, 4 genotypes (10, 12, 14, 17) were determined as green-grey, and one genotype (16) was determined as green.

***Table 2. Tree form and leaf color characteristics obtained in genotypes***

| Genotype | Tree Form | Leaf Color |
|---|---|---|
| **6** | Upright | Blue-Grey |
| **7** | Spreading | Blue-Grey |
| 8 | Upright | Blue-Grey |
| 10 | Upright | Green-Grey |
| 12 | Upright | Green-Grey |
| 13 | Up-Sprading | Blue-Grey |
| 14 | Upright | Green-Grey |
| 15 | Upright | Blue-Grey |
| 16 | Upright | Green |
| 17 | Upright | Green-Grey |


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## 4. CONCLUSIONS

This study reveals that there is a high level of variation in fruit characteristics even among wild pear genotypes grown under approximately similar ecological conditions. The main reason for this can be explained by the open pollination of wild pears and the fact that the genotypes are largely propagated by seeds. This rich diversity among wild pears, which grow widely especially in the inner parts of Türkiye, should be evaluated for purposes such as rootstock breeding, use of their fruits in different ways and arid afforestation.

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## 6. REFERENCES

Bell, R.L., Quamme, H.A., Layne, R.E.C., Skirvin, R.M. (1996). Pears, In: Fruit Breeding Volume I. *Tree and Tropical Fruits*, Editor: Janick, J. and Moore, J.N. New York, John Wiley and Sons. Inc., 441-513.

Bozhüyük, M.R. (2021). Morphological Diversity of Pyrus elaeagrifolia Pall. Ecotypes in Eastern Anatolia Region. *International Journal of Agriculture and Wildlife Science (IJAWS) 7(3)*, 368 – 372.

Karatas, N., Ercisli, S. (2021). Fruit characteristics of Pyrus elaeagrifolia Pall. genotypes in Eastern Türkiye. *Proceedings of X International Symposium on Agricultural Sciences*, 24-32.

Katayama, H., Adachi, S., Yamamoto, T., Uematsu, C. (2007). A wide range of genetic diversity in pear (*Pyrus ussuriensis* var. aromatica) genetic resources from Iwate, Japan revealed by SSR and chloroplast DNA. *Genet Res. Crop. Evol, 54*,1573–1585.

Keçeci, L.D. (2017). Hakkari Yöresi Üstün Nitelikli Ahlat (*Pyrus elaeagrifolia* L.) Genotiplerinin Bazı Özelliklerinin Belirlenmesi [Determination of Some Characteristics of Superior Quality Pear (*Pyrus elaeagrifolia* L.) Genotypes from Hakkari Region] Adnan Menderes Üniversitesi Fen Bilimleri Enstitüsü, Yüksek Lisan Tezi, 53 p.

Keulemans, W., Roldan-Ruiz, I., Lateur, M. (2006). Studying apple biodiversity: opportunities for conservation and sustainable use of genetic resources. Final Report, No: EV/28. (For Global change, Ecosystems and Biodiversity Program, Part II), Brussels, Belgium, 105 p.

Özbek, S. (1978). Özel Meyvecilik (Kışın Yaprağını Döken Meyve Türleri [*Deciduous Fruit Species*). Ç.Ü. Ziraat Fak. Yayınları No: *128*, 485 p.

Özçağıran, R., Ünal, A., Özeker, E., İsfendiyaroğlu, M. (2005). Ilıman İklim Meyve Türleri [*Temperate Zone Fruits*] (Yumuşak Çekirdekli Meyveler Cilt II [*Pome Fruits, Volume II*]), Ege Üniversitesi Basımevi, Yayın No: 556, İzmir, 200 s.

Uzun A.,Pinar, H., Yaman, M., Yigit, M.A., Cakiroglu, Y., Karakaya, A., Uysal, M., Ozturk, G., Yilmaz, K.U., Gurcan, K., Ercisli, S. (2022). Identification of genetic diversity in wild pear (*Pyrus elaeagrifolia* pall.) genotypes collected from different regions of Turkey with SSR marker system. *Genetika, 54:1*, 109-118.

Yilmaz. K.U., Uzun, A., Cam, M., Ercisli, S. (2015). Some morphological and fruit characteristics of naturally grown *Pyrus elaeagrifolia* Pall. of Kayseri Province (Central Anatolia, Turkey). *Genet Resour Crop Evol*. *62*, 711–720.


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