NEW APPLE VARIETY: PIRAZIZ APPLE

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Abstract
This study has been carried out on an apple type known as the Piraziz apple species, which is grown in Piraziz District of Giresun, Turkey and which growing dates back centuries ago. Throughout history, it is known that during Ottoman Period this apple type was exported to Syria, Egypt, and Lebanon. People used to grow it widely, but today, there are only nearly 5000 trees, and they are mostly old - the youngest are of 60-70 years old.

Since a few years, it has been tried to prevent this local apple species from extinction, and improve its growing by inoculating it on dwarf rootstocks. In order to prevent the loss of seedling production, we made attempt this apple type to be grafted onto seedling rootstock clones and new gardens have been established. High quality Piraziz apple cultivars have been selected in the period of 2010 to 2014 in Piraziz region. The most important feature of this this clone is its late blooming. More precisely, this local species, starts blooming from 25th of April to 30th of May, full blooming days are starting from 6th of May to 6th of June, and harvest days are starting from 15th October till 15th November, which means that the period between full blooming to harvest is 160 days. Also, it can be stored in an ordinary storage room (temperature between 15 - 20 °C) for 5.5 - 6 months after harvest. One of the interesting facts is that people are believing that this apple have antidiabetic effects.

We consider that Piraziz Apple Species is a valuable local type and its antidiabetic properties have to be investigated. Officially registration procedures was initiated for the “Piraziz apple”.

Keywords: Piraziz, Piraziz apple, Local apple cv, Pomology.

1. Introduction
Thanks to its different climates and advantages provided by its soil conditions, Anatolia is rich in fruit species and varieties. That’s the reason why the apple gene center, which is one of the most important fruit species for this region, (Malus communis L.) is situated in Southern Caucasus (Özbek, [22]).

Existences of new local varieties have been accelerated by either basic selection or individual preferences (Brown, [4]). With more than 6,500 varieties worldwide, the apple has an important place in human nourishment, as it can be found fresh in every season thanks to its long period of growing season, and its developing techniques in storage (Özbek, [22]).

Today, fruit growing in different regions of our country is carried out with local fruit varieties in addition to culture (cultivation) varieties, and the apple is most probably the first one amongst them. In fact, the fruit obtained from local apple varieties will have fewer customers and less income. However, it is more useful to keep the local varieties for the plant breeders.

Lately, the apple and the other fruit gene sources has a great importance. To achieve this, thanks to improvement studies, highly attractive, resistible against illnesses and insects, high quality apples with long storage-life fruits can be obtained (Kaşka, [16]; Çorumlu, [6]; Osmanoğlu, [20]; Doğru, [8]).

Firstly, in 1937, Ülkümen [28], studied the pomological characteristics of apple, pear and apricot varieties grown in Malatya - Turkey. Later, in 1947, Özbek [21], defined the pomological characteristics of domestic and foreign apple varieties grown in Turkey, and then in 1972, Güleryüz studied the pomological characteristics of local apple and pear varieties grown in Erzincan - Turkey (Güleryüz,[13]). Studies on apple were carried out in Niğde (Eltez, [10]), Konya (Bolat, [3]), in Ahlat district (Şenet al., [25]) and Erciş - all in Turkey (Oğuz and Aşkin, [19]), and these studies brought out highly promising local varieties and species.

It is also known that in other countries, the same kind of studies were carried out and as a result of these, new apple types were brought out and added to culture (Way et al., [30]; Denardiet et al., [7]).
The efforts to add the apple genetic sources by following the improved varieties to national and world fruit growing is extremely important. The history of the Piraziz apple variety grown locally in Piraziz (Giresun) region dates back to ancient times (Küçüker, [17]), Tekeli, [26], Tekeli, [27]). Introduction of this local apple variety and the improvement of its potential in respect to apple gene sources of region is important. Also, it is thought that the characteristics of local variety studied, will be an important material for apple improvement and plant breeders.

The hazelnut is considered as monoculture, and fruit trees are planted dispersedly in hazelnut fields, not as a close orchard, most of them are old and are cut down day by day. The same like hezelnuts and other fruit trees, the Piraziz apple face the same danger. The Piraziz apple, which number of trees are decreasing day by day, has an economic importance locally, and by increasing the number of this local variety trees, it has been tried to have a place on local and national fruit growing market.

2. Materials and Methods

In this study on the Piraziz apple grown in Piraziz region, the fruit has been evaluated phenologically and pomologically. The most efficient apple clone chosen as a result of this local species clone selection carried out from 2010 to 2014, has been named “Piraziz Apple”. So far this local variety is not officially registered, but the registration process has been initiated. Pomologically it were determined: fruit growth, fruit, size and length, TSS (Total Soluble Solid content), titratable acid, pH and hardness of fruit endocarp. During the evaluation periods, 10 apple samples taken from every single tree, have been measured with a precision weight scale (balance) TSS hand refractometer (%) and fruit endocarp hardness penetrometer (kg/cm$^2$). The measurements and analyses have been carried out at labs of Agricultural Faculty in Ordu University.

Fruit evaluation has been based on in the evaluation process of the fruit size and shape according Güleryüz [13]. We also took into account meteorological data for period 1975 - 2012 or more precisely: maximum, minimum, and average temperatures, and total rain average [1].

3. Results and Discussion

According Güleryüz [13] Piraziz apple is evaluated as (Table 1):

According these data, the climate data of the study region have been reported as follows; average temperature 14.5 ̊C, maximum temperature average 17.8 ̊C, minimum temperature average 12 ̊C, total rain average 1279.5 mm. According to 2011 - 2012 average parameters were as follows: average temperature 14.9 ̊C, maximum temperature average 18.3 ̊C, minimum temperature average 12.6 ̊C, total rain average 1460.2 mm (Anonymous, [1]).

The pomological value of the fruit harvested in the Piraziz Apples grown in Piraziz region has been determined and given in Table 2.

As it can be understood in Table 2, for the Piraziz apple, the fruit weight is 123.04 g, fruit size is 61.10 mm, and fruit length is 69.84 mm. The rates of fruit weight scale and size have been stated as follows: Şen et al. [25], 23.95-165.5 g, 43.50 - 79.10 mm, and 38.70 - 71.70 mm; Oğuz and Aşkin [19], 36.55 - 145.54 g, 52.05 - 70.72 mm.

### Table 1. The evaluation process of the fruit size and shape (Güleryüz, [13])

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Length / Width:</th>
<th>Width (Diameter):</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤0.80: Very flattened</td>
<td>≤50.9 mm: Very Small</td>
<td></td>
</tr>
<tr>
<td>0.81-0.92: Flattened</td>
<td>51.0 - 56.9 mm: Small</td>
<td></td>
</tr>
<tr>
<td>0.93-1.04: Roundish</td>
<td>57.0 - 62.9 mm: Medium size</td>
<td></td>
</tr>
<tr>
<td>1.05≥ ......: Long</td>
<td>63.0 - 68.9 mm: Large</td>
<td></td>
</tr>
<tr>
<td>69.0 ≥ ........: Very large</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Table 2. Characteristics of fruit apple varieties Piraziz

<table>
<thead>
<tr>
<th>Pomological parameters</th>
<th>Piraziz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fruit weight(g)</td>
<td>135.18</td>
</tr>
<tr>
<td>Fruit stalk length (mm)</td>
<td>9.77</td>
</tr>
<tr>
<td>Fruit stalk thickness (mm)</td>
<td>3.53</td>
</tr>
<tr>
<td>Flower pit width (mm)</td>
<td>19.38</td>
</tr>
<tr>
<td>Flower pit depth (mm)</td>
<td>7.45</td>
</tr>
<tr>
<td>Core house width (mm)</td>
<td>20.95</td>
</tr>
<tr>
<td>Core house size (mm)</td>
<td>22.16</td>
</tr>
<tr>
<td>Seed weight (g)</td>
<td>0.07</td>
</tr>
<tr>
<td>Number of seeds</td>
<td>3</td>
</tr>
<tr>
<td>Seed width (mm)</td>
<td>4.57</td>
</tr>
<tr>
<td>Seed length (mm)</td>
<td>10.92</td>
</tr>
</tbody>
</table>

According Güleryüz [13] Piraziz apple was evaluated as (Table 1):
mm, and 43.68 - 63.74 mm, Çorumlu [6], 49.62 - 304.41 g; Özkân and Celеп [23], 89.26 - 255.67 g; Osmanoğlu [20], 102.94 - 175.74 g; Doğru [8], 102.94 - 175.74 g; Lei et al. [18], around 135 g; Fischer and Fischer [11], 130 - 150 g; Serdaret et al. [24], 54.3 - 206.0 g; and Warmund [29], between 115 - 167 g on the different rootstocks of Red Fuji apple; Yılmaz [31], in Yomra apple, established 72.19 - 113.39 g; Balta and Kaya [2], in Cebegirmez type established 155 - 310 g and in Bey type, between 121.21 - 133 g. As it can be understood, the values we measured in our clones are compatible with the above mentioned studies.

Sugar, acid, and aroma substances are determining apple taste. The TSS rate of the Piraziz apple species is 12.13%. This rate has been reported as follows: Bolat [3], 10.35 - 15.56%; Güleryüz [13], 13.75 - 16.53%; Şen et al., [25], 9.23 - 14.70%; Karadeniz et al., [14], 10.0 - 17.2%; Çorumlu [6], 9.3 - 16.65%; Doğru [8], 10.65 - 15.00%; Karildağ and Eşitken [15], 9.10 - 13.80%; Osmanoğlu [20], 9.3 - 16.65%; Doğru [8], 10.65 - 15.00%; Karlıdağ and Eşitken [15], 9.10 - 13.80%; Osmanoğlu [20], 8.6 - 14.2%; Goffreda et al., [12], 13 - 14.8%; Lei et al., [18], 13.3 - 13.8%; Fischer and Fischer [11], 13.0 - 15.4%; Serdar et al., [24], 8.5 - 13.7%; Cripps et al., [5], 12.5% in Pink Lady species. The values we measured are compatible with these research data.

Value of determined treatable acid is 2.9%. These rates have been reported as follows: Doğru [8], 13.0 - 0.35%; Osmanoğlu [20], 0.24 - 1.30%; Yılmaz [31], 3.58 - 8.20% in Yomra Apple species; Cripps et al., [5], 0.71 - 0.9 % in Pink Lady Apple species. These data imply that seedling germination of local fruit types may show different characteristics over the time in a different region and ecologies.

The pH value in the Piraziz apple species is 3.99. This parameter has been determined as follows: Oğuz and Aşkin [19], 3.01 - 4.80; Şen et al., [25], 3.42 - 3.89; Özkân and Celep, [23], 2.92 - 3.38; Osmanoğlu [20], 4.26 - 5.80; Doğru [8], 4.26 - 5.80. The pH values we determined in our types are in line with the similar studies.

The fruit pulp hardness in the Piraziz apple species has been determined as 9.65 kg/cm². This value has been given as follows: Doğru [8], 8.40 - 11.66 Lb; Osmanoğlu [20], 8.40 - 11.66 Lb; Yılmaz [31], 5.60 - 9.30 Lb in the Yomra apple species. These values showed that there are different genotypes as a result of selection studies conducted in the different part of Turkey. These genotypes have also different characteristics.

No illnesses or harmful position has been observed in the tree taken as a sample.

4. Conclusions

- Piraziz apple has an important population in Piraziz region.
- It has been tried to increase amount of the “Piraziz apple” varieties that so far decreased annually, and to disseminate it from region to region, and to add it to the national apple variety.
- It has also been tried to include this variety, whose history dates back to centuries ago, in the national fruit growing again. It is clear that it will contribute a lot to introduce a new variety of apple to our country’s fruit growing.

5. References


