

The Development and the Growth Features of Sprouts of *Malus Orientalis* Uglitzk. Species Introduced in Absheron

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Abstract: Apple is cultivated in most of the temperate regions due to the fruit's quality, its easiness to propagate, and its natural aptitude to bear. *Malus* classifications differ primarily in the taxonomic level at which infrageneric groupings of species are recognized. Object of the study was oriental apple (*Malus orientalis* Uglitzk) from Azerbaijan flora which was introduced to Absheron. The conducted experiments showed that the first sprouts of the seeds of the *Malus orientalis* sown in autumn were observed in the third decade of March. The first embryo roots which gives start to the main roots begin growth in germinal period before the ontogenesis. Thus, experiments have shown that *Malus orientalis* specie have normal growth in the ontogenesis initial development - germinal stage and it can be used as a perspective species for greening of Absheron.

Key Words: *Malus orientalis*, Absheron, Taxon, Embryo

1. Introduction

The genus *Malus* Mill. comprises 25–47 species, depending upon the rank given to several taxa and the acceptance of putative hybrids. Robinson et al. (2001) explained that the number of species in genus *Malus* depends upon the rank given to several taxa, species being subspecies and putative hybrids, and the nomenclature of the taxa is complex [1]. The genus *Malus* consists of about thirty wild species and thousands of domesticated cultivars. *Malus* classifications differ primarily in the taxonomic level at which infrageneric groupings of species are recognized. Rehder (1920, 1927, and 1949) proposed a classification system which is nowadays well accepted [2-4]. Newer reports divided the genus *Malus* in six [5] or even in seven sections [6]. *Malus orientalis* is distributed in the Caucasus, the south of Russia, the north of Anatolia, Azerbaijan, the east of Georgia, in Turkey, the mountainous belt in the northern part of Iran [7-11] as well as in the west, east and centre of Iran [7, 12]. Apple is cultivated in most of the temperate regions due to the fruit's quality, its easiness to propagate, and its natural aptitude to bear. Apples are considered a healthy fruit, as the saying goes 'an apple a day keeps the doctor away'. An apple tree can reach up to 10 m height above its own roots, having a

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globose canopy and the longevity between 60 and 100 years. *Malus orientalis* was described by a lower diversity of fruit quality, but due to the high variability in populations *M. orientalis* could have contributed to the domestication of apple by introgression of some traits [13]. *Malus orientalis* from the East, Asia and Central Asia may be an early ancestor of the domesticated apples. The domesticated apple is one of the most important fruit crops of the colder and temperate parts of the world [14] (Stephen, 2002).

Investigation of the biomorphological features of the introduced species sprouts are main factors which show their adaptation to the new soil-climate condition. Oriental apple is the widespread wild apple species in Caucasus. Bioecological features of the oriental apple which distributed in Azerbaijan forests were investigated by many scientists.

2. Material and Methods

Object of the study was oriental apple (*Malus orientalis* Uglitzk.) from Azerbaijan flora which was introduced to Absheron. Experiments were carried out in Central Botanical Garden of the Azerbaijan National Academy of Science. Biomorphological features of the species sprouts were carried out according N.T. Vasilchenkoy [15], growth and development features according to Najafova J.N. and Jacson J. E. methods and Central Botanical Garden general concepts [16, 17].

3. Results and Discussion

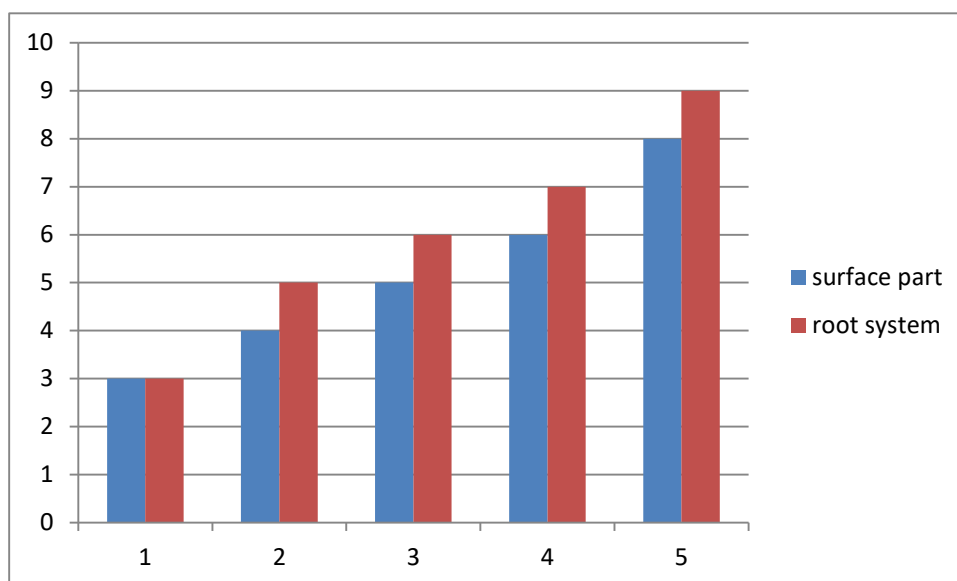
The conducted experiments showed that the first sprouts of the seeds of the *Malus orientalis* sown in autumn were observed in the third decade of March. The first embryo roots which gives start to the main roots begin growth in germinal period before the ontogenesis. The lateral roots and the lobe leaves begin to growth. The cotyledon elbow length was 35-45 mm, width 1 mm, the top surface was green, the bottom surface was reddish. Cotyledon was in 10-12 mm length and 5-8 mm width. On the contrary, oval or egg-shape, naked, green, fleshy, bright, stalk is short. The first leaves are egg-shaped, Uneven and double toothy, basis is wedge shaped, the length of the stalk equal to half length of the leaf. The upper surface is dark green, the bottom surface is pale green, the vascularization is net-shaped, the internode distance is 5-6 mm (Pic 1).



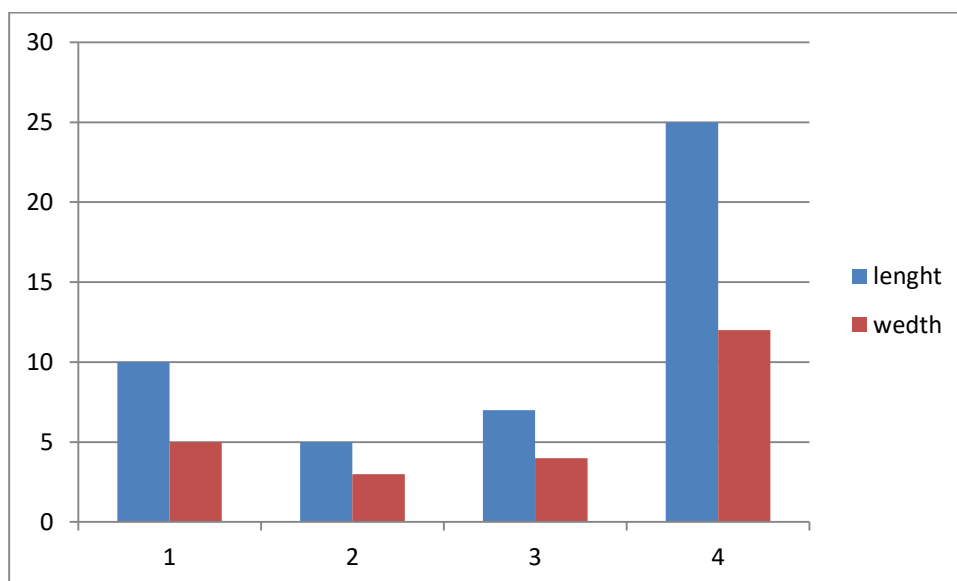
Picture 1. The initial development stages of sprouts of *Malus orientalis*.

- 1) seed, 2) beginning of the third decade of March, 3) end of the third decade of March,
- 4) the first decade of April, 5) the second decade of April, 6) the third decade of April,
- 7) the first decade of May

During juvenile period at the end of the third decade of March the diameter of the sprouts root was 2 mm, the length of main root 3cm, the surface part was 3cm. In the first decade of April the diameter of root was 2 mm, the length of main root 5 cm and the surface part was 4 cm. In the virginal period of the growth in second decade were formed true leaves. The roots diameter was 3 mm, the length of main root 6 cm, surface part 5 cm, the length of first leaves 5 mm, the width 3 mm. The third decade of April, formed the second true leaves, root length was 7 cm, above-ground part 6 cm, cotyledon length 10 mm, width 5 mm, diameter of the root 3 mm, the first leaf length 7 mm, a width 4 mm, and the second true leaf width 3 mm and a length 4 mm. in the first decade of May cotyledon started to fall gradually. Root diameter was 4 mm, the main root length 9 cm, above-ground part 8 cm, the first leaf length 25 mm, width 12 mm, the second leaf length 15 mm, a width of 8 mm (Pic. 2, 3, 4).



Picture 2. The biometric indicators of the Height and the root system of *Malus orientalis* sprout. 1) and of the third decade of March, 2) the first decade of April, 3) the second decade of April, 4) the third decade of April, 5) the first decade of May



Picture 3. The size and growth indicators of the *Malus orientalis* species leaves. 1) The first decade of April 2) the second decade of April 3) the third decade of April 4) the first decade of May



Picture 4. The formation of the cotyledon; (1) and the true leaves, (2) of *Malus orientalis*

Thus, experiments have shown that *Malus orientalis* specie have normal growth in the ontogenesis initial development - germinal stage and it can be used as a perspective species for greening of Absheron.

4. References

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