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Article



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AEGILOS L. ONTOGENESIS OF GENUS REPRESENTATIVES

Abstract: The representatives of the group are a valuable source of genes for the wheat plant, which increase the yield or improve the quality, as well as reduce the use of pesticides, increase the tolerance of plants to the negative effects of the external environment in global conditions. The article describes the biomorphological characteristics of the representatives of the *Aegilops* L. genus in the stages of ontogenesis. In the studied species, 3 periods of ontogenesis were observed: latent, pregenerative, generative period and 5 stages: seed, grass, juvenile, virginal and generative age.

Key words: *Aegilops* L., *Ae. tauschii* Coss., *Ae. crassa* Boiss., *Ae. cylindrica* Host., *Ae. triuncialis* L.

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Introduction

Today, one of our tasks is to find plants of practical importance and to study them and apply them to science. In order to successfully carry out such a task, it is necessary to study in depth the biology of their individual development (ontogeny) and, in particular, its individual stages: latency period, virginal stage, generative and postgenerative periods.

Analysis of literature on the topic.

In Uzbekistan, the ontogenesis process of some perennial representatives of the wheat family was studied by V. Mahmudov (1986) [7], and some annual representatives by G. M. Khodjayeva (2008) [5]. Information on reproductive biology is given in the scientific works of A.A. Imirsinova (2019) [2,3]. However, since the features of the ontogenesis period of the representatives of the *Aegilos* L. (Kasmaldaq) group that we are studying are almost not studied, in our research, the ontogenesis periods of the species were studied in the conditions of the experimental field.

Research methodology.

Ontogenesis processes of plants according to the methods of T.A. Rabotnov (1950) [10], T.I. Serebryakova (1971) [11]; also used the literature of A.A. Uranov (1975) [12], L.A. Zhukova (1983), *Ontogeneticheskiy Atlas lekarstvennykh rasteniy* (1997), E.A. Kondratyeva - Melville (1979) [6]. Morphometric indicators (plant height, root length, leaf length) in the studied species at each stage of ontogenesis.

Research results and their analysis.

In these species, we observed the latent, pregenerative, generative period of ontogenesis and 5 stages: seed, grass, juvenile, virginal, and generative age.

Latent period.

This is the dormant period of the seeds. This period is represented by dormant seeds of species.

Ae. tauschii grain is short elliptic in shape, average length 5.7-7.1 mm, width 2.3-2.6 mm, thickness 0.5 mm. The weight of 1000 seeds is between 7.0 - 8.6 g.

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The grain of *Ae. crassa* is elliptical in shape, the average length is 5.0-7.3 mm, the width is 2.0-2.6 mm, and the thickness is 1.0 mm. 1000 seeds weigh 9.2 grams.

Ae. cylindrica grain shape is elliptical. Length 7.0 - 7.1 mm; and its width is between 2.2 - 2.8 mm. Spikes are very fragile and easily separated from each other. The weight of 1000 seeds was 8.2 - 8.7 g.

Grain of *ae. triuncialis* is elliptical in shape, length is 7.1 - 7.5 mm, width is 2.3 - 2.8 mm, thickness is 1.0 mm. The weight of 1000 seeds gave indicators in the range of 7.6 - 8.9 g.

Pregenerative (virginal) period of representatives of the genus *Aegilops* L.

This period includes grass (p), juvenile (j), immature (im), virginal (v) age stages. This period covers the stages from the appearance of grasses of plant species to the appearance of generative organs.

Grass (p). Under the studied conditions, seedlings germinated in the third decade of October (October 29, 2020). At first, caloriza came out in a flowing color. Caleorrhiza length of *Ae. tauschii* 3.1±0.1 cm, *Ae. crassa* 2.0±0.1 cm, *Ae. cylindrica* 2.6±0.1 cm, *Ae. triuncialis* was 2.4±0.01 cm.

Initially, coleoptile and choleorrhiza were seen at this stage. In the studied species, a coleoptile grew and a photosynthetic plant developed from it.

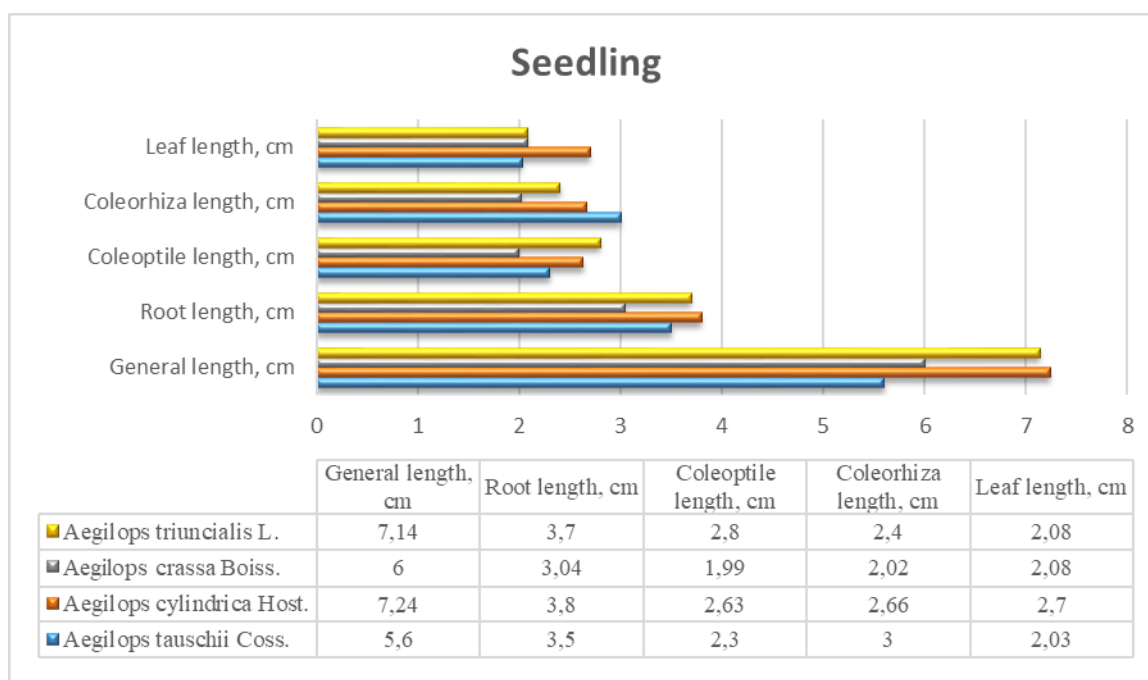
As soon as the choleorrhiza develops, the coleoptile also rises to the surface through its sharp tips. The lower part of the coleoptile is colorless, and the upper part is reddish. Coleoptile length of 2.4±0.01 cm in *Ae. tauschii*, *Ae. crassa* 2.0±0.0 cm, *Ae. cylindrica* 2.6±0.01 cm, *Ae. triuncialis* was 2.8±0.1 cm.

The length of grasses. 5.6±0.1 cm in *Ae. tauschii*, *Ae. crassa* 7.5±0.2 cm, *Ae. cylindrica* 7.2±0.2 cm and in *Ae. triuncialis* it reached 7.1±0.2 cm.

The length of the primary leaves of *Ae. tauschii* 2.0±0.04 cm, *Ae. crassa* 2.1±0.1 cm, *Ae. cylindrica* 2.7±0.04 cm, *Ae. triuncialis* was 2.1±0.04 cm. The width, in turn, is *Ae. tauschii* 1.5±0.03 mm, *Ae. crassa* 1.7±0.03 mm, *Ae. cylindrica* 1.9±0.02 mm, *Ae. triuncialis* had an indicator of 1.4±0.03 mm.

The root system is also progressing in length 3.5±0.03 cm in *Ae. tauschii*, 3.4±0.03 cm in *Ae. crassa*, *Ae. cylindrica* 3.8±0.03 cm, *Ae. triuncialis* reached 3.7±0.1 cm (fig 1).

At the end of this stage, as I.V.Borisova and as K.P.Popova (1976) mentioned, with the appearance of assimilating leaves in our objects, the endosperm in the seeds was gradually consumed for the growth of the species, and the connection of the plant with the seed began to be broken [1].



1-fig. Morphological indicators of species in the grass (p) stage.

Juvenile (j) is an immature plant. This age stage is characterized by the formation of leaves and the development of second-order rhizomes in the root system. The species switched to full autotrophic nutrition. In the representatives of the category, the second leaves began to form in the second decade of

November (20.11.2020). At this stage of development, the species goes into hibernation. The leaves of the third order corresponded to the first decade of February (3.02.2021). Also, in the studied species, the withering of the coleoptile was observed

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at this age. The total length of the species at the end of this age state is:

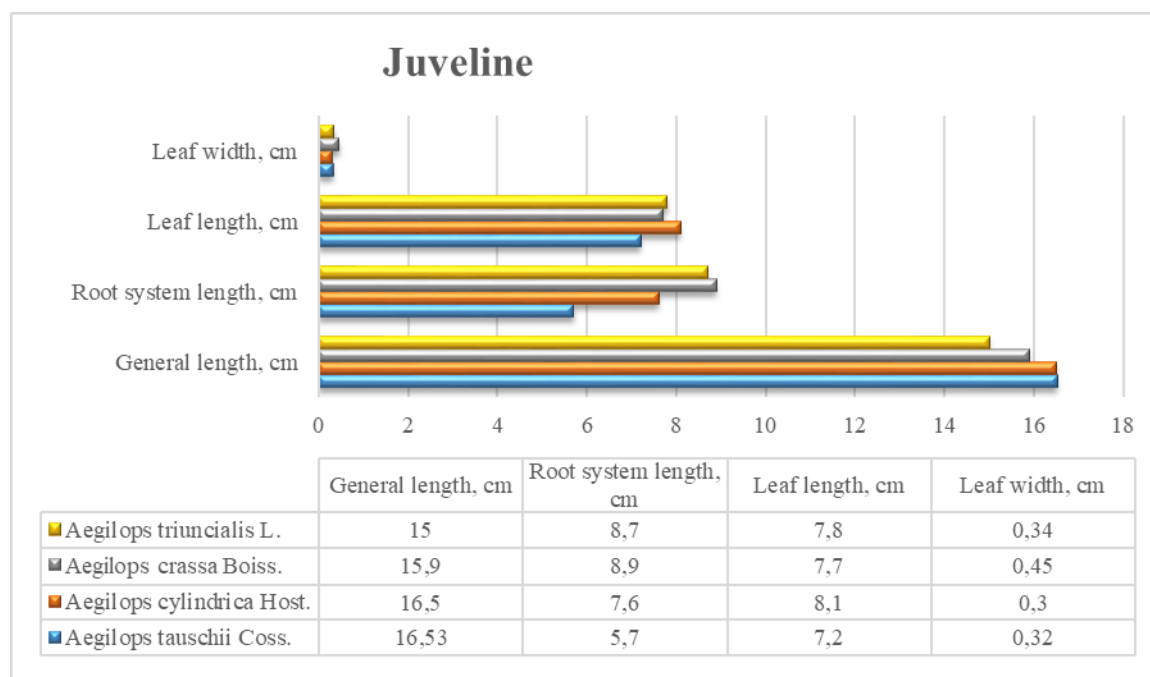
The total length of *Ae. tauschii* was 16.5 ± 0.1 cm, the number of leaves was 3-4. The average length of the leaves was 7.2 ± 0.1 cm, and the width was 3.2 ± 0.1 mm. The total length of the root system was 5.8 ± 0.1 cm.

Ae. cylindrica, the total length is 16.6 ± 0.1 cm on average, and the number of leaves at this age reached 4-5. Leaf length was 8.2 ± 0.1 cm, and leaf width was

3.0 ± 0.1 mm. The average length of the roots was 7.6 ± 0.1 cm.

Ae. crassa 15.9 ± 0.1 cm, the number of leaves is up to 3-5, length 7.7 ± 0.1 cm, width 4.0 ± 0.1 mm. The root system penetrated the soil layers with roots 8.9 ± 0.1 cm long.

Ae. triuncialis reached 15.0 ± 0.2 cm, number of leaves 4.0 ± 0.1 pieces, length 7.8 ± 0.1 cm, width 3.4 ± 0.04 mm. The total length of the root system was 8.7 ± 0.08 cm (fig 2).



2-fig. Morphological indicators of the species in the yuvinel (j) stage.

Virginil (v) - this age stage is characterized by the accumulation of species. This stage coincided with the second decade of March (13-20.03.2020). The root system has also improved, and young pubic roots have begun to develop in new shoots.

Ae. tauschii, the average number of bushes is 16.9 ± 0.3 , *Ae. cylindrica* 13.5 ± 0.1 pieces, and 12.9 ± 0.2 pieces in *Ae. crassa*, *Ae. triuncialis* was 14.2 ± 0.1 pieces.

The total length of the representatives of the category is much higher than that of young *Ae. tauschii* 25.8 ± 0.4 cm, 25.4 ± 0.4 cm in *Ae. cylindrica*, and 24.7 ± 0.4 cm in *Ae. crassa*, and in *Ae. triuncialis* it reached 28.4 ± 0.2 cm.

The root system has also improved, and the roots of the third order have developed. The root length of *Ae.* 8.9 ± 0.1 cm in *tauschii*, *Ae.* 7.7 ± 0.1 cm in *cylindrica*, *Ae. crassa* 9.1 ± 0.1 cm, *Ae. triuncialis* was 9.3 ± 0.1 cm.

At this age, morphological indicators of the species have increased. The total leaf length of *Ae.*

tauschii 7.8 ± 0.1 cm, *Ae. cylindrica* 8.8 ± 0.1 cm, *Ae. crassa* 8.1 ± 0.03 cm, *Ae. triuncialis* has 4.1 ± 0.1 cm, and the width of *Ae. tauschii* 3.0 ± 0.1 mm, *Ae. cylindrica* 3.9 ± 0.1 mm, *Ae. crassa* 5.2 ± 0.1 mm, *Ae. triuncialis* had an indicator of 2.1 ± 0.03 mm. The number of leaves on the main stem *Ae. tauschii* 5.0 ± 0.1 , *Ae. cylindrica* 4.4 ± 0.1 units, *Ae. crassa* 5.0 ± 0.04 units, *Ae. triuncialis* got 4.5 ± 0.1 grains (fig 3).

Generative period of representatives of the genus *Aegilops* L. The beginning of the tuber stage in cereal plants means that these species have entered the generative period. The initial stem grows and forms a spike.

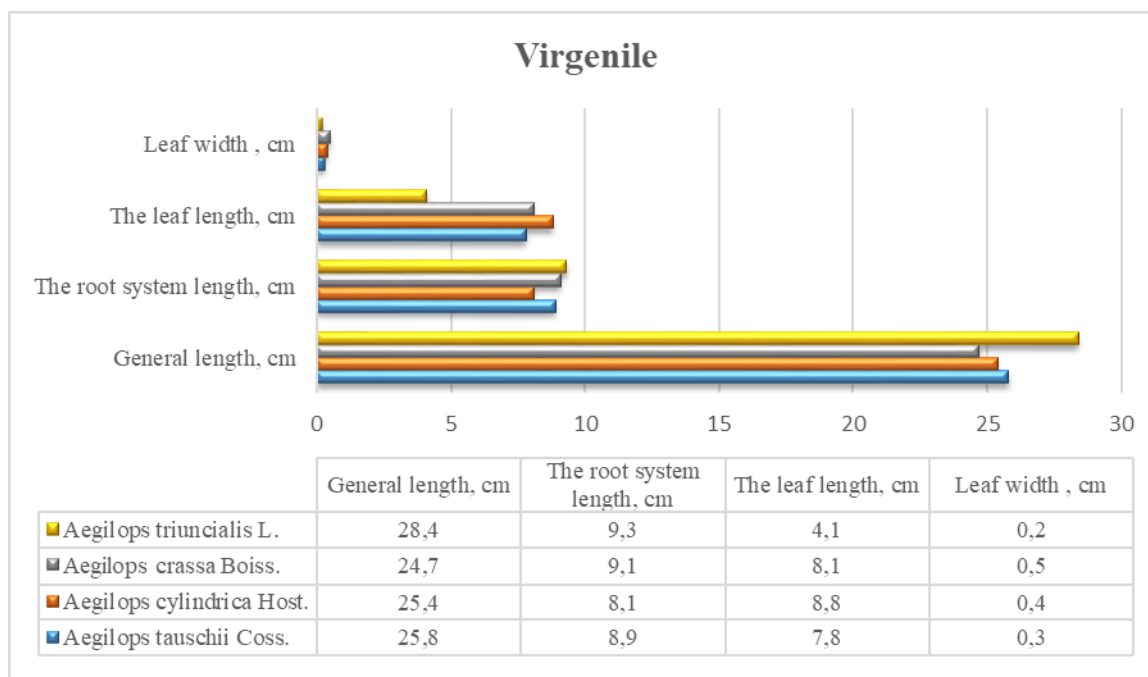
As noted by O. Yakubjonov (2009), the growth process in the studied species also stopped at the end of the flowering period, when the grain began to form [14].

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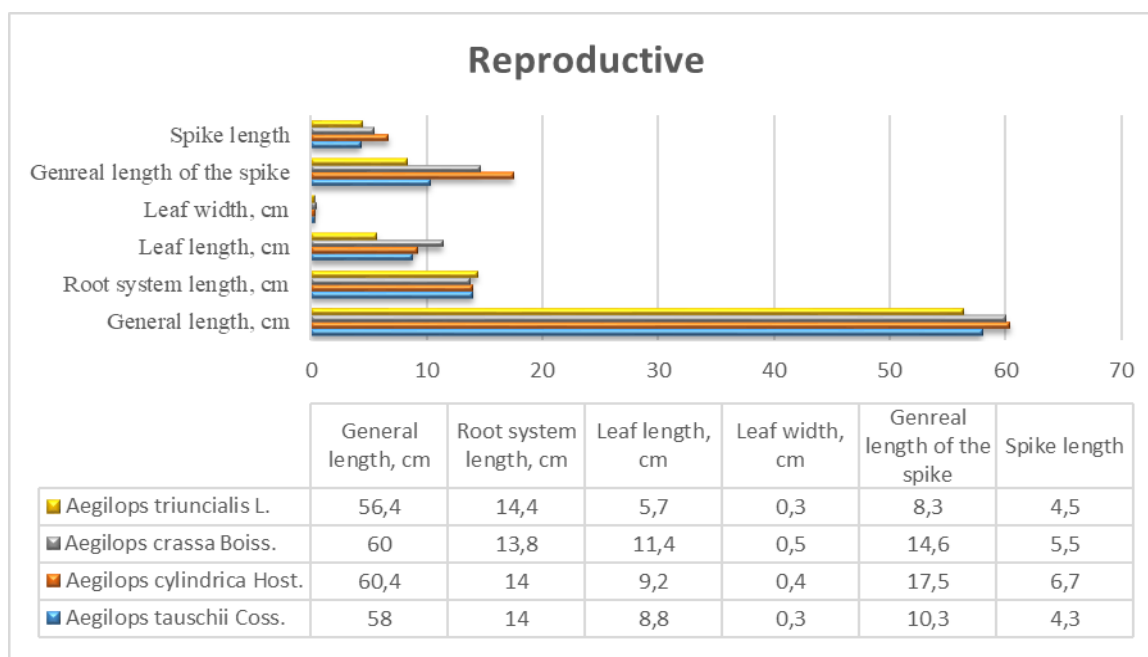
3-fig. Morphological indicators of the species at the virginal (v) stage.

At this stage of development, the total length of the species *Ae. tauschii* 58.01±0.4 cm, *Ae. cylindrica* 60.4±0.3 cm, *Ae. crassa* reached 60.0±0.3 cm, *Ae. triuncialis* reached 56.4±0.2 cm.

The total length of *Ae. tauschii* is 14.0 ± 0.1 cm with improved root system, *Ae. cylindrica* 14.0±0.1 cm, *Ae. crassa* 13.8±0.1, *Ae. triuncialis* was 14.4±0.1 cm.

The total leaf length of the species at this age is *Ae. tauschii* 8.8±0.1 cm, *Ae. cylindrica* 9.2±0.1 cm,

Ae. crassa 11.4±0.1 cm, *Ae. triuncialis* has 5.7±0.02 cm, and the width of *Ae. tauschii* 3.8±0.04 mm, *Ae. cylindrica* 4.4±0.02 mm, *Ae. crassa* 4.9±0.01 mm, *Ae. triuncialis* was 3±0.01 mm. In the studied species, the number of flowers was 29.8±0.2 pieces in *Ae. tauschii*, *Ae. cylindrica* 23.4±0.3 units, 25.0±0.3 units in *Ae. crassa*, *Ae. triuncialis* produced 14.7±0.2 flowers (fig 4).



4- fig. Morphological indicators of species in the generative (g) stage.

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In the studied species, the flowering process of *Ae. tauschii* species on May 10, 2021, *Ae. triuncialis* on May 14, *Ae. cylindrica* on May 16, and in *Ae. crassa*, it started at the latest, on May 17.

M.A. Pavlova (2012) noted in her work that the duration of flowering in plant species depends on the number of its lateral generative shoots, and they, in turn, are determined by the density of plant placement [9].

The lifespan of plant flowers is different and can vary from several tens of minutes to several weeks (E.A.Tikhmenev, 2002) [13]. In the species we studied, the flowering process, i.e., the special

flowering period, lasted from 3-5 (*Ae. triuncialis*) to 5-8 (*Ae. cylindrica*, *Ae. tauschii*, *Ae. crassa*) days. The main time of flowers opened during the day was 6:30-9:00. The flowering process of plants is closely related to many environmental factors, temperature, light regime, mineral nutrition processes. During the observation period, the average air temperature during flowering was +23° C and the maximum was +36° C, air humidity was 6.9% on average, and the maximum wind speed was 13 points. The flowering process of species under natural conditions is given below (Fig. 5).



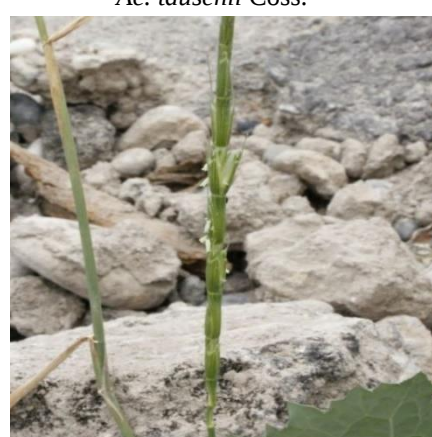
Ae. triuncialis L.



Ae. tauschii Coss.



Ae. crassa Boiss.



Ae. cylindrica Host.

Figure 5. Flowering process of *Aegilops* L. species in the Fergana Valley

The development stages of the studied species ended with the generative period. We can observe that these results correspond to the data of the literature (R.M. Grigorevich, 2000; Ontogeneticheskyy atlas, 1997) [4,8]. During the studies, the generative period of representatives of the genus *Aegilops* L. lasted from 77 to 105 days.

Summary.

In conclusion, we can say that the duration of the development phases and ontogenesis processes of the

studied species depends on the species biological characteristics, diversity and climatic conditions. In favorable environmental conditions (23 ± 10 C), seed germination was higher than in natural conditions. The process of ontogenesis is not complete, the postgenerative period was not observed in them. Also, the state of immature age was not significantly different in the studied species.

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