



BIOLOGICAL FEATURES OF POPULUS ARIANA DODE L. IN THE CONDITIONS OF THE SOUTH ARAL SEA

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ABSTRACT

The article is devoted to the study of the biological characteristics of Populus ariana Dode in the conditions of the Southern Aral Sea region. The literature covers the issues of afforestation and increasing the productivity of forest stands, an important role is played by fast-growing species, in particular turangils. In recent works, a number of authors of the “Key to Central Asian Works” for Karakalpakia identified two types of turangil P. pruinosa and P. ariana Dode.

Turangils propagated by seeds and vegetative-root offspring, weakly stem and root cuttings. We carried out vegetative propagation of P. ariana Dode in the natural thickets of the Rook Grove in the experimental plots of the Nukus State Pedagogical Institute named after Ajiniyaz. Disclosure of anthers and dispersal of pollen begins at the lower flowers of the earring and continues on the flowers located in its middle and upper parts. In general, it blooms quite a long time, up to 20 days. The growth duration and length of the annual growth in different shoots varies greatly within the same plant. The most intense growth is observed during the hot season in the spring-summer period. With a decrease in temperature, the growth rate also decreases.

KEY WORDS: *growth and development, gardening, forest plantations, flowering and fruiting, lateral roots, aerial parts, lateral roots, branching, growth, generative shoot, leaves, branches, ovary, capsules, catkins, hairs, propagated by seeds and vegetative-root offspring, flowering and fruit setting.*

DISCUSSION

Afforestation, landscaping and expansion of forest stands is an important problem for the Central Asian republics, as well as for the Republic of Karakalpakstan. In solving issues of afforestation and increasing the productivity of forest stands, fast-growing species play an important role in the privacy of turangils [2], [8], [9], [10].

Turangils belong to the Salicaceae family of the genus Populus. In Uzbekistan it reads 17 species, in Karakalpakstan there are 4 species of poplar [3], [8]. Of these, two species found in Karakalpakstan are called turangils, these are P. ariana Dode and P. pruinosa Schrenk [4]. In recent works, a number of

authors of the «Central Asia Work Guide for Karakalpakia» identified two species of turangil P. pruinosa and P. euphratica, in fact, only P. ariana Dode grows (Fig-1).

Based on the flora of Uzbekistan, P. Ariana we took this species. Leaves of branches with 10-16 sharp curved teeth, naked ovary, capsules on a short stalk, axis of an earring and peduncle with long, straight hairs. The species is very similar to P. diversifolia. It differs from it mainly in a bare ovary. General distribution: Central Asia, Iran, Western China.



Figure 1: General view of P. Ariana

Phenological observations were carried out according to the method of S. Ya. Sokolov [6], which meets the requirements of the study of plants. For phenological observations were taken 10 bushes of Turangil, in the natural thickets of the Rook Grove in the experimental sections of the Nukus State Pedagogical Institute named after Ajiniyaz, near the Amphitheater, the city of Nukus.

The rhythm of kidney formation was studied according to the method proposed by I. G. Serebryakov [5], S.Ya. Sokolov [6] in all types of turangil. To establish the moment when the kidney study is laid from June to October. Materials for the study were taken from all objects simultaneously in the middle and upper parts of the lateral shoots of the same plants in June after 10 days, July after 10 days, August after 10 days, September once a month. 8-9 year old plants were analyzed. Samples were fixed in 70% alcohol.

Vegetative propagation was studied by cuttings: a) green shoots, b) year-old shoots. In the years of our research (2017,2018, 2019), the swelling of the kidneys in the species studied by us was noted from the second decade of March, from the first decade of April to the third decade of November. For three years of observation, the earliest leaf bloom was in 2019, the average in 2018, and the most recent in 2017.

Autumn coloring and color change of leaves in the studied species of Turangil occurs at the end of September. Leaf fall occurs in late October and early November. This phenomenon in *P. ariana* Dode begins earlier, and in *P. pruinosa* Schrenk later than other species. The duration of the leaf emergence period before deciduous fall is 232 days.

With an early onset of spring and a higher air temperature, the growth of turangil begins earlier and ends in a shorter time. The duration of the growing season in *P. ariana* Dode is 239-242, in *P. pruinosa* Schrenk 244- 249 days.

A study of the flowering and fruiting of Turangil shows that in Karakalpakstan *P. ariana* Dode begins to bloom and bear fruit in a 4-year-old age.

The development of inflorescences of turangil begins simultaneously with the blooming of leaves. The beginning of flowering depends on the type of turangil and meteorological conditions of the year. In the first days of disclosure, flowers on the earrings of female *P. ariana* specimens are not identical in maturity: the lower five to six are larger and thicker than the upper. Two to three days after the opening of the earrings, the lower flowers bloom. The flowers that opened in the first days make up 20% of the total number of them in the earring, the next two or three days, the same number of flowers is revealed as on the first day. Further disclosure in the same sequence. The duration of flowering in one earring is 8-10 days.

The buds of *P. ariana* Dode on the branches are arranged sequentially, pressed to the branch, the number of buds is from 6 to 12. The generative buds of the studied species of turangil *P. ariana* Dode are laid in June. In Turangil *P. ariana* Dode, buds with male flowers fully formed on July 10, and buds with female flowers on July 1. At the same time, the size of flower buds: length 4 mm, width 2 mm, in *P. pruinosa* Schrenk length 3 mm, width 2 mm. Flower buds are laid and develop on the shoots of the current year and differentiate before the vegetation of the next year. Thus, flower stalks are always biennial.

The flower is naked, has only stamens and pistils. Stamens in one flower range from 10 to 25 pieces (Fig-2). In female flowers, the number of pistils varies from 18 to 28 pieces. Pestle has an expanded ovary, stigma narrowed with several lobes [1].



Fig-2. P. ariana Dode single stamen flower



Disclosure of anthers and dispersal of pollen begins at the lower flowers of the earring and continues on the flowers located in its middle and upper parts. In general, it blooms quite a long time, up to 20 days. This is due to a delay in flowering on some parts of the crown, which is explained obviously by different shoot growth energy. Soon after pollination and fertilization, the stigmas of the flowers turn black and dry, and the walls of the ovary turn into a leaflet box. It forms seeds that ripen in July 105-120 days after fruit set. The number of seeds in one box varies from 60 to 151 [7].

The nature of the habitat also affects the duration of the earrings and flowering. In the Rook Grove area near the Doslik canal, we observed early flowering in the turangil *P. ariana* Dode growing in the dry kidneys of the valley. Later flowering occurs in trees sprouting in the flooded parts of the valley, where the groundwater level is high and the soil is moist. Here, flowering trees in groves can be found for a long time, which contributes to the pollination of most of the flowers in earrings and abundant fruit setting.

The flowering and tying of the fruits of the Turangil belonging to different species differ in a small deviation with the period of flowering and fruit setting.

In 2019, kidney swelling in the studied species of *P. ariana* Dode Turangil began on March 10, when the average air temperature was 8.00.

Massive opening of the kidneys was observed in *P. ariana* Dode on March 20-26. The highest growth of ten to twelve forest plants of Turangil occurs in May. *P. ariana* Dode during this period provided 55% of the annual growth of all shoots. Growth duration and length of annual growth in different shoots vary greatly within the same plant. The most intense growth is observed in the hot season, in the spring-summer period. With a decrease in temperature, growth rates also decrease.

Propagated by seeds and vegetative-root offspring, weakly stem and root cuttings. Seed propagation of Turangil *P. ariana* Dode is most common both in natural conditions and in culture. Turangil seeds ripen in 105-120 days. Opening the boxes is accompanied by full or partial yellowing. Seed propagation was observed in the Amu Darya floodplain, where seedlings grow in the form of a ribbon, i.e. the bank of the river favors the seed reproduction of turangil. A. Usmanova shows that in laboratory conditions 70% of the soil emerges in the soil [7].

We carried out vegetative propagation of *P. ariana* Dode in the natural thickets of the Rook Grove at the experimental site of the Nukus State Pedagogical Institute named after Ajiniyaz. In the spring of 2018-2019, we conducted an experiment

with stem cuttings. To do this, cut stems 35-40 cm long and planted along the canal in the amount of 100 pieces. It should be said that the reproduction is very low, totaling 16%. The broadest reproduction is propagation by root offspring. Root-offspring propagation mainly occurs in the valleys. So in the Jackal tugai of the Nukus forestry on an area of 8 m², 75 root offspring were recorded. *P. ariana* Dode is also found in household plots, among turangil thickets where melons and gourds are cultivated (Fig-3).



Fig-3. Root seedling *P. ariana* dode

In the conditions of Karakalpakstan, *P. ariana* Dode propagates by root branches in turangil groves, and also in the desert zones you can often see shoots emerging from the roots. The following example can be cited: currently, the eastern side of the Nukus Amphitheater is occupied by thickets of turangil. There are only 4 large trees that have grown over a period of 6-8 years on an area of 0.5 hectares, 279 seedlings, 4-5 year-old turangil bushes, in some places individual bushes sprouted through asphalt and grow on the banks of the canal.

CONCLUSIONS

1. Based on the foregoing, 2 species of turangil *P. ariana* Dode and *P. pruinosa* Schrenk grow in Karakalpakstan
2. The highest growth occurs in May. In this period, *P. ariana* Dode turangil provided 55% of the annual growth of all shoots, and *P. pruinosa* 50%.
3. The beginning of flowering depends on the meteorological conditions of the year. *P. ariana* Dode begins to bloom after the beginning of the opening of the earrings for 2-3 days and lasts up to 20 days.
4. Generation of generative kidneys in the studied species *P. ariana* Dode occurs during June.
5. *P. ariana* Dode are salt and dry resistant and resistant to moisture deficiencies.



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