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SEASONAL RHYTHM AND DEVELOPMENT OF BETULA PENDULA L. IN BRICHMULLIN STATE FORESTRY

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Abstract
On May 11, 2017, the President of Uzbekistan Shavkat Mirziyoyev signed a decree "On the creation of the State Committee of the Republic of Uzbekistan for Forestry." The State Forestry Committee is part of the Cabinet of Ministers complex for agriculture, processing of forestry products and consumer goods. The main objectives and areas of activity of the State Committee of the Republic of Uzbekistan for Forestry are mainly the implementation of a unified state policy in the field of forestry, aimed at the comprehensive expansion and rational use of forest resources.

Keywords: phenology, vegetation, flowering, fruiting, Brichmullinsky State Forestry, leaf fall, buds, factors, section Albae, B. pendula, air humidity, air temperature, self-seeding, seedlings, saplings, amplitude, etc.

Introduction

Uzbekistan is a low-forest republic. Therefore, extensive measures are being taken to preserve the biodiversity of natural thickets of one or another plant species. Among them, species of the birch genus deserve special attention.

The genus of birch (Betula L.) is one of the largest in terms of species and morph diversity among tree species; most birch species grow in the temperate zone of Euro-Asia and North America. This served as the basis for the fact that representatives of this genus have long been objects of introduction and culture in Uzbekistan. Targeted studies of the bioecological characteristics of natural birch thickets were carried out in the USA, Russia, Belarus and the Baltic states. In general, the available information about the bioecology of birch in natural conditions is incomplete or scarce.

Objects of research: The object of research is the natural thickets of birch of the Brichmullinsky state forestry enterprise.

Purpose of the study: Is to study the seasonal rhythm and development of Betula pendula L. in the Brichmullinsky state forestry enterprise.

Research objectives:

Monitoring studies of natural thickets, phenological observation and analysis of bioecological characteristics of plants.

Research methods

Observations were carried out on natural birch thickets of the Brichmullinsky state forestry enterprise.

The climatic conditions of the Brichmullinsky state forestry enterprise were determined based on data from the Charvak m/s.

The study of natural birch thickets on the territory of the Brichmullinsky state forestry enterprise was equipped with the method of floristic and geobotanical research. During the geobotanical description of natural thickets, the important location of their exposure in natural conditions was also recorded.

The bioecological and morphological characteristics of birch under natural conditions were studied using the method of .

The seasonal rhythm of plant development and the generative phases of birch development were studied by phenological observations.

The obtained data were processed using the variation statistics method.

Research results.

When studying a particular plant species under natural conditions, it is necessary to study the duration of its growing season, the time and duration of flowering, the timing of fruiting, as well as phenological dates.

The longest duration of the growing season of Betula pendula L. in the conditions of the Brichmullinsky state forestry enterprise is 185 – 210 days. On warm autumn days, trees stand for 20–23 days or more after the leaves have completely yellowed; leaf fall ends within 10–15 days. In early autumn with frosts in the mornings, the leaves fall without yellowing in one day. In the conditions of the Brichmullinsky State Forestry Plant, with above-zero air temperatures (March) and warmth in the soil and air, all phenophases of the species begin earlier in the spring and end later in the fall. And with a decrease in temperature, the phenophases of the species begin later in the spring and end earlier in the fall.

So, the duration of the growing season for plants directly depends on the climatic conditions of the given area. This can be considered a very positive factor in the process of accumulation of wood or other valuable substances and qualities of plant wood. According to long-term data, male catkins bloom earlier in birch species (late February, early March). In species of the Albae section, both male and female catkins bloom almost simultaneously, when small corrugated, not yet straightened, first leaves appear on the shoots. The initial phases of development in plants in the conditions of the Brichmullinsky state forestry enterprise take place much later compared to plants growing in the conditions of Tashkent (Table 1). The beginning and end of the growing season are closely related to weather conditions. In the conditions of the Brichmullinsky state forestry enterprise, the coldest winters are often

interrupted by thaws, which in January and February provoke dormancy of the vegetative and generative organs of some birch individuals. So, in January 2016, the minimum air temperature was -4°, at the end -8°, and the maximum in the middle of the month rose to +17.6°; February was also warm.

Timing of the onset of phenophases in different places where birch grows – B. Pendula

Table 1

Development phase	Vladivostok	Kyiv	Tashkent	Brichmullinsky state forestry enterprise
Swelling of leaf buds	30.IV	2-21.IV	6.III	16.III
Bud break (earliest)	3.V	26.IV	10.III	20.III
Bud break (at the latest)	23.V	4.V	12.IV	22.IV
Yellowing of leaves	1-19.IX	1-30.IX	14.IX	24.IX
Mass leaf fall	15-31.X	1-15.X	15.XI	25.XI
Length of growing season, days	150	173	210	210

He minimum air humidity during this period was not lower than 29%, the average was 64 – 77%. By the end of February, the male catkins on the fruiting specimens of B. pendula L. were dusty, and the leaf buds had completely burst. At the same time, in the school branch of the nursery of the Brichmullinsky State Forestry Enterprise, three-year-old seedlings were completely leafy. In the first ten days of March, the maximum air temperature rose to +23 - 24°C.

Under natural self-seeding conditions, seedlings and saplings, as well as adult specimens of B. pendula, were completely defoliated at the end of March. But on March 25, the air temperature dropped sharply during the day. On the night of March 26, snow fell, and the minimum air temperature dropped to -8.4°C, and on the soil surface to -16°C. Young leaves on plants froze. The leafy crowns were broken from the weight of the snow that had settled on them. The shoots on adult specimens were damaged; their crowns were almost bare all summer. Most of the self-sowing plants, as well as seedlings and saplings planted in the nurseries of the Brichmullinsky state forestry enterprise, did not produce leaves over the summer and fell out by the end of the growing season. The weather conditions of the sharply continental climate have such a severe and catastrophic effect on the natural regeneration and cultivation of birch species.

Formation of birch leaves. Table 2

Genus, species	Observation point	Kidney swelling	Appearance		Normal leaf shape	Sheet of norms. quantities
			Cone sheet	sheet		
B.pendula	Brichmullinsky state forestry enterprise	18.III	25.III	30.III	27.IV	27.IV
B.pendula	Tashkent	10.III	20.III	25.III	20.IV	20.IV
B.pendula	Moscow	1.IV	20.IV	25.IV	3.V	15.X

The weather conditions in 2017 were somewhat different. In February there was little precipitation, the minimum air temperature was -13.2°, the maximum was +13.7°, relative humidity 39%, snow depth 2–6 cm, sometimes there was no snow at all. The last ten days of February were the warmest, which caused a shift in the growth processes of resting organs, especially in male catkins.

In mid-March they began to enlarge, and pollen began to fall out of the anthers. However, at the end of the third decade of March, the minimum air temperature dropped to -7.6°, air humidity was 44%. Most of the male flowers, leaf buds were frozen, and the shoots dried out. The crowns of the trees stood without leaves for a long time. The crown subsequently resumed. On many trees the leaves were yellow, chloride, and with the onset of summer heat (June, July) they died.

Table 3 Duration of the growing season

View	Age, years	The leaves begin to bloom	Complete leafing	Beginning of flowering		End of flowering		Fruit ripening	Beginning of yellowing of leaves	Leaf fall	Number of days of growing season
				Men's	Women's	Men's	Women's				
2015r											
B. pendula	13	25.III	22.IV	20.III	23.III	27.III	3.IV	23.VI	15.IX	10.XI	244
2016r											
B. pendula	16	1.IV	20.IV	5.IV	10.IV	10.IV	15.IV	25.VI	15.IX	10.XI	190
2017r											
B. pendula	17	20.III	1.IV	20.III	25.III	1.IV	5.IV	25.VI	10.IX	10.XI	220

It should be noted that specimens of the same species of different ages react differently to the same meteorological factors. Young birch trees are more sensitive to winter thaws. Older adults react to a lesser extent (Table 3). The amplitude of fluctuations between the extreme dates of the beginning of a particular phenophase in our conditions sometimes reaches a significant value - 15 - 35 days or more. However, the duration of flowering and the timing of seed ripening fluctuate little during annual observations. Consequently, if the plants bloom and bear fruit normally, then we can assume that they are developing well and self-sowing annually in the conditions of the Brichmullinsky state forestry enterprise. In the conditions of the sharply continental climate of the Brichmullinsky state forestry enterprise, the same types of birch bloom in different years at different times. This depends on the location of the exhibition. Fluctuations range from 15 to 25 days (Table 4)

Table 4. Fluctuations in flowering times

Genus, species	Deadlines		Range of annual fluctuations in flowering time, days
	The earliest	Latest	
B. pendula	18.III	5.IV	17

Weeping birch trees begin to bloom from mid to late March. This sequence of birch flowering in the Brichmullinsky district, regardless of the weather conditions of the year, almost does not change. The timing of the beginning of flowering, of course, depends on the location of the exposure. Species with the smallest range of annual fluctuations in flowering dates, according to our data, have the most southern exposure. Birches from the Albae section (B. pendula and B. tianschanica) can be classified as early flowering. The timing of flowering of birch trees at different exposure locations can be judged from the following data. The bulk of birch species bloom in late March and early April. In other years, with the warming in March, her men's earrings begin to gather dust.

The flowering period also depends on the age of the fruiting specimen. Young plants bloom slightly earlier than older plants.

Table 5 Birch flowering period in the Brichmullinsky state forestry enterprise

Location	**Flowering of the species**		**Flowering amplitude period, days**
	first	last	
Southern exposure	18.III	28.III	10
Eastern exposure	24.III	07.IV	14
Northern exposure	26.III	15.IV	20

Thus, the duration of the growing season of plants directly depends on the climatic conditions of the given area. This can be considered a very positive factor in the process of accumulation of wood or other valuable substances and qualities of plant wood.

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