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RESEARCH ARTICLE

STUDYING OF REPRODUCTIVE BIOLOGY OF SOME TRIBE SPECIES *TRITICEAE* DUM. FAMILY *POACEAE* BARNH. IN DIFFERENT CONDITIONS OF UZBEKISTAN

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ABSTRACT

The article will address deals with some indexes of the flower dynamics and seed efficiency of *Aegilops* L. in conditions of Uzbekistan. Another aspect which will be covered is morphobiology features of some species of genus *Hordeum* L. are given in this article and *Triticumaestivum* L.

Keyword: *Poaceae*, *Hordeum* L., *Aegilops* L., *Triticum aestivum* L. introduction, phenological observations, flowering spike, morfobiology, spica, winter bread wheat, rhythm of development, type of flowering, mechanism of opening flowers, daily and seasonal dynamics, chasmogamous, half-open and cleistogamous flowering, acrobasiptally and round-the-clock flowering, seed efficiency, 1000 kernel weight.

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INTRODUCTION

At present time, there is a great interest in the issues of reproductive biology, which is explained by the decisive role of reproduction and reproduction processes in order to maintain the diversity of living nature. Reproductive plant biology is a special scientific problem, including a comprehensive study of the reproduction process and its interrelated ontogenesis stages: flower organogenesis, flowering, pollination, fertilization, embryogenesis, seed maturation, dissemination, etc. And since one of the most important criteria for the effectiveness of plant introductions is their ability to naturally resume in new growing conditions, knowledge of the above processes for each introduced species is extremely important. The introduction of plants is a branch of botany and plant growing, designed to help to enrich the plant resources of a geographical region. Also, the role of introductory research in the conservation of plant biological diversity is of great importance, when an increasing anthropogenic impact leads to the irretrievable disappearance of wild species and impoverishment of the flora. The development of scientific bases for the introduction of plants, the reproduction of useful, rare and endangered plants play an important role in the enrichment and rational use of plant resources.

MATERIALS AND METHODS

In connection with the foregoing, the purpose of this study is to study the geographical and ecological characteristics of some

Triticeae Dum. tribe species. Family *Poaceae* Barnh., which include species, in connection with the problem of rational conservation of their gene pool and use in breeding. The aim of our work is to study the morphological and biological features of the species under study. Phenological observations were carried out by the methods of Zaytsev (1973 & 1974) and the quality and weight of 1000 seeds are determined by the "International Rules" (Kolos, 1969), "Improving the method of qualitative evolution of seeds", "Methodological guidelines for seed production of introductions" [6], Bloom Biology in A. N. Ponomarev [8]. The materials obtained in the experiments were subjected to mathematical treatment by conventional methods (Armor, 1985) [1]. In the South Western Kyzylkum, where the material was collected for our investigations, fine-grained, finely pebbly, solonchak and sandy soils are widespread. In general, a prominent place is occupied by dense, strongly gypsumized lands of the Tertiary plateau. A small amount of precipitation, high temperatures, a constant dry wind causes dryness of the air. But, despite unfavourable conditions, Kyzylkum is characterized by a large variety of plants for any deserts in any season. Zh Saidov and Markova, Momotov in I.F 1975 in Kyzylkum found only *Aegilops squarrosa* L. [9], and *Ae.cylindrica* Host. they were not found. During the expedition trips in 2012 in the territory of the Kyzylkum Desert Station, three more species of this genus were discovered. Of these, *Ae.cylindrica* Host. has more extensive distribution. in which we have studied the seed production [7,12].

RESULTS

Studies have shown that in the irrigated conditions of the Kyzylkum Desert Station, *Ae.cylindrica* Host. the minimum number of spikelets is 7, the maximum number is 10. This species has an acrobatic type of flowering. In *Aegilops squarrosa* L. the minimum number of spikelets is 5, the maximum is -8. The results of the experiments showed that among the species listed in one spica, the number of ovules on average is 3-4, of which 2-3 seed lets form qualitative seeds. The reason for this is that not all ovules can pollinate, and even if they are pollinated, they do not have time to develop.As can be seen from Table, 1 of 27 pcs.

Table 1. Biometric parameters of genus *Aegilops* L.

Sample name	Shoot height, cm	Spike length,cm	Spikes on the spika, pcs	Ovules in the spikelets, pcs. (CAP)	Number of seeds in the spikelet, pcs. (CPR)	PCB,%	1000 seeds, gr
1 <i>Aegilops cylindrica</i> Host.	45,8	11,0	8,0	27,0	14,7	54,4	3,5
2 <i>Aegilops squarrosa</i> L.	38,0	9,0	6,0	15,0	9,7	64,6	4,5
3 <i>Hordeum spontaneum</i> C.Koch.	95,0	20,5	22,0	58,8	30,1	51,2	28,9
4 <i>Hordeum bulbosum</i> L.	110,0	170,0	20,0	54,5	24,0	44,0	25,0
5 <i>Hordeum vulgare</i> L.	90,0	18,0	46,0	81,0	44,2	54,6	32,3

Ovules in the spike form seeds - 14.7 pcs., and in *Ae.squarrosa* L. the ovules in the spike form seeds - 9.7. This *Ae.cylindrica* Host. by the nature of the daily rhythm, the midday cereal. The average duration of the flowering period of the population varies from 5 to 7 days. The coefficient of seed productivity is 54.4%. *Ae.squarrosa* L. also by the nature of the daily rhythm of the midday cereal. The average duration of the flowering period of the population varies from 4 to 6 days. The coefficient of seed production is 64.6%. The following observations were carried out under conditions of the natural growth of *Ae.cylindrica* Host. and *Ae.squarrosa* L. in the mountain Angren, as well as the experimental section of the Andizhan State University, during 2014-2016. Collected in May of the year 2014 in the mountainous areas of Angren *Aegilops cylindrica* Host. is a seven-root, cylindrical, one-year plant, the length of which varies between 20-50 cm. The leaves of the plant are smooth. In May and June, the seeds bloom. It grows among plants of mountains and mountainous areas. Grain is yellow, medium in size, form-oval. Maturation of grains in the investigated species occurs not in one, but at the opposite time, because they bloom in acrobazepetal type. The results of the studies showed the following: average length of the spica of *Aegilops cylindrica* Host. is 11.2-11.3 cm. The number of small spikelets is between 4.0 and 4.7 pieces. The seed length of the head is 4.3-6.1 cm. In *Ae.squarrosa* L., respectively, the average length of the spica is *Aegilops cylindrica* Host. is 7.1-9.3 cm. The number of small spikelets is between 3.0 and 3.7. The head seed length is 2.4-4.3 cm. It is known that the quality of seeds depends on their maturation. So when measuring the length of small heads together with a branch, the results were given in *Aegilops cylindrica* Host. - 2.3 cm; 2.7 cm; 3.4 cm; 3.5 cm; 6.4 cm. Repeated measurement: 3.4 cm; 3.8 cm; 4.6 cm; 7.2 cm; 7 cm. The length of the seed along with the skin covering it was 5 to 9 mm, which indicates the quality of the seeds. The length of the seeds already collected and peeled from the skin was 10-12 mm. Flora of Uzbekistan is rich in various useful species, among which a special place is occupied by wild relatives of cultivated plants, among which species of genera *Hordeum* L. can be attributed. It is known that at present one of the most important world problems is the problem of biodiversity conservation, including phytorrhage. To such valuable plants,

the representatives of the *Roaceae* family, including species of the genus *Hordeum* L., can be included with good reason, many of which are often used both as medicinal and as fodder. The purpose of this work was to identify the specific features of the formation of generative structures, flowering, pollination and the ability of this species to seed and multiply in conditions of its natural range. The present work aims to study the biological characteristics of wild barley species in relation to selection tasks, to identify economically valuable traits and properties, and to recommend the best samples of a collection of wild species for solving the most important breeding problems (winter hardiness, drought resistance, immunity to diseases).

Observations were carried out under conditions of the natural growth of *H.brevisubulatum* Link., *H.bulbosum* L., *H.leporinum* Link. and *H.spontaneum* C.Koch., in the mountain Angren, as well as the experimental section of the Andijan State University, during 2015-2016. *H.spontaneum* C.Koch., according to literature data (Tsvelev, 1976) and our observations, a long term cereal. Stems 70-100 cm high, thick, straight. The lower flower scales of the middle flower are broadly elliptical, glabrous, with awns 7-15 cm long. It blooms in Angren from April to June. Anemophilus [11]. *H.bulbosum* L., according to literature data (Tsvelev, 1976) and our observations, a long-term cereal. Stems 60-110 cm high, at the base tuberiformly thickened. Spikelets of the middle spike are narrow-lanceolate, with awn 1,2-1,8 cm in length; the inferior flower scales of the middle spikelet with awn 2-3.6 cm in length, the lateral spikelets are fleecy or shortly owned. It blooms in May-June. Anemophilus. Flowering spike passed in the acrobasispetal type.



Figure 1. Ear length of *Aegilops cylindrica* Host.

The duration of the flowering of the spica in the experiments varied from 4 to 5 days with the greatest intensity on the second day. Flowering begins at 6 o'clock, reaching its peak mainly in the morning (8.00-8.30) and evening (18.30-19.30) hours. Thus, in the morning hours at a temperature of 10-19°C and a relative humidity of 80-90% in the spike *H.spontaneum* C.Koch. 43.1% of the flower usually blossoms. At 14-16 hours

in all studied species, relatively few flowers bloom, since at this time there are the highest temperature (24°C) and the lowest relative air humidity of 70-80 %. At this time, in the spica of the studied species, 11.2; 16.0; 17.2; 15.6; 5.0; 16.7% of blooming flowers are observed. Thus, the species of the genera *Hordeum* L. although bloom during the day, but confirm higher adaptability to the changing factors: temperature and humidity. This indicates less fitness for cross-pollination. By weight of 1000 grains, the species under study are distinguished by an exceptional variety. Within each species, especially *H.bulbosum* L. and *H.spontaneum* C.Koch., The seed size varies considerably, depending on the growth conditions and the geographical origin of the samples. The largest grains (weight 1000 grains 32-48 g) differ in the types of the section Crithe Doell, which includes the wild-growing double-barley barley *H.spontaneum* C.Koch. The rest of the wild-growing barley species has a small grain size (weight 1000 grains 2.1-14 g). A total of 28 samples of different geographical origin were studied. As a result of our observations, we identified a number of additional morphological features that are not indicated in the literature, which facilitate the recognition of some species that are similar in appearance to wild species. *H.spontaneum* C.Koch. differ not only in the length of the spikelet scales, but also in the presence or absence of omission on the leaves, in the size and shape of flowering scales and the size of the seeds, and so on. By weight of 1000 grains, the species under study are distinguished by an exceptional variety. Within each species, especially *H.bulbosum* L. and *H.spontaneum* C.Koch., the seed size varies considerably, depending on the growth conditions and the geographical origin of the samples. The largest grains (weight 1000 grains 32-48 g.) are distinguished species of the section Crithe Doell, which includes the wild-growing double-barley barley *H.spontaneum* C.Koch. The rest of the wild-growing species of barley has the largest grain size (weight 1000 grains, 2.1-14 g.).

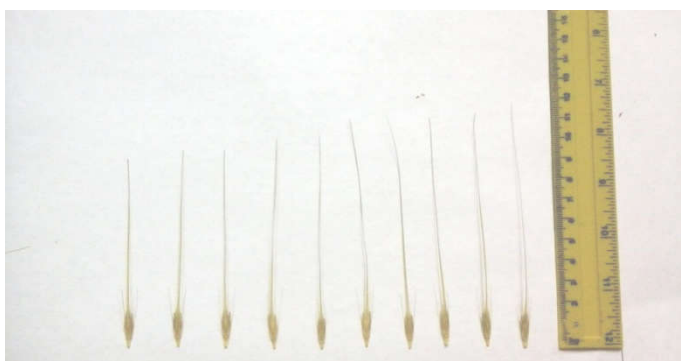


Figure 2. The length of spikelets in the ear *H.spontaneum* C.Koch.

All species studied by us had a spike with a strongly brittle awn. The length of the spica varies from 5 to 20 cm. View *H.leporinum* Link. has an spica of only 3-6 cm, while in *H.bulbosum* L. it reaches 20 cm in length. Wild species have a two-row spica. On each segment of the spine rod, there are three spikelets, of which the middle is fertile, and lateral rudimentary or anthers. Thus, as a result of studying the collection of barley, it was found that wild barley is very diverse in its productivity and its individual elements: bushiness, length of spica, the weight of 1000 grains. The bushiest (up to 170 stalks) and larger coarse species are species *H.bulbosum* L. (10-46 g) and *H.spontaneum* C.Koch. (32-48 g). The percentage of seminification (44.0) has *Hordeum bulbosum* L., maximum (64.6) - *Aegilops squarrosa* L.,

intermediate (51.2; 54.4 and 54.6 respectively) - *Hordeum spontaneum* C.Koch., *Aegilops cylindrica* Host. and *Hordeum vulgare* L. Flowering and pollination of cereals are studied in different ecological and geographical conditions (Imirsinova, 2004). We have identified daily and seasonal rhythm and ecology of flowering cereals in the irrigated zone of Uzbekistan, depending on the weather conditions. When studying the dynamics of flowering plants (seasonal and diurnal), different goals are pursued. The biology of flowering and intrapopulation differences in its ecology and rhythm, on the one hand, helps to identify the ways of form and speciation, and on the other - is of great interest for plant breeding [4].

Conclusion

Studies have shown that the minimum number of spikelets in the spica (19) is the Scythian variety, the maximum (25) grade of Kupava, the intermediate (20, 20, 21 and 22, respectively) Marzon, Yuna, Yongbosh and Umanka. The flowering of the spica was carried out in acrobispetal type, i.e. began with the middle, and the order of opening the flowers in the spikelets - according to the passage of morphogenesis. The duration of the flowering of the spica in the experiments varied from 4 to 5 days with the greatest intensity on the second day. Flowering begins at 6 a.m, with a decrease in temperature and an increase in the relative humidity of the air, the number of blossoming and correspondingly opened flowers gradually increases, reaching its peak mainly in the morning (8.00-8.30) and evening (6.30-7.30 p.m) hours. Thus, in the morning hours at a temperature of 10-19°C and a relative humidity of 80-90% in the spica of the local Yongbosh variety, 43.1% of the flower usually dissolves, in the other varieties it is 38; 34.4; 48.7; 49.0%. At 14-16 hours in all studied varieties, relatively few flowers bloom, since at this time the highest temperature (24°C) and the lowest relative air humidity of 70-80% are recorded. At this time in the ear of the studied varieties, there is a corresponding 11.2; 16.0; 17.2; 15.6; 5.0; 16.7% of blooming flowers. Thus, introduced and local varieties of winter soft wheat (*T.aestivum* L.), although bloom during the day, but confirm higher adaptability to changing factors: temperature and humidity. This indicates less fitness for cross-pollination. Species of the general *Hordeum* L. although they bloom during the day, however, they confirm a higher adaptability to changing factors: temperature and humidity. This indicates less adaptability to cross-pollination.

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