Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 3, 2021, Pages. 3249 - 3253
Received 16 February 2021; Accepted 08 March 2021.

Quantity of Pigments in Leaves of Old Local Wheat Varieties of Uzbekistan under Irrigated Conditions

[1]Adilova Sh.Sh., [2]Kulmamatova D.E., [3]Babaev S.K., [4]Alloberganova Z.B., [5]Hodzhaniyozova B.H., [6]Allanazarov S.B.

[1] 2nd year doctoral student Institute of Genetics and Experimental Biology of Plants of Academy of Sciences of the Republic of Uzbekistan, Tashkent, Uzbekistan,

[2] PhD of Biological Sciences, Senior Research Fellow of Institute of Genetics and Experimental Biology of Plants of Academy of Sciences of the Republic of Uzbekistan, Tashkent, Uzbekistan,

[3] Doctor of Biological Sciences, Professor of Institute of Genetics and Experimental Biology of Plants , Tashkent, Uzbekistan,

[4]Candidate of Biological Sciences, Associate Professor of Biology cathedral of Urgench State University, Urgench, Uzbekistan

[5]Lecturer of Department of Agronomy and Biotechnology of Bukhara State University, Bukhara, Uzbekistan,

[6]Lecturer of Department of Biology of Urgench State University, Urgench, Uzbekistan.

Institute of Genetics and Experimental Biology of the Academy of Sciences of the Republic of Uzbekistan.

shokhi.adilova@mail.ru

ABSTRACT. The article presents the results of studying the amount of pigments in the leaves of plants of ancient local varieties of wheat under irrigated conditions. Compared to the Krasnodar-99 controls, the Tuyatish cultivars had high levels of chlorophylls “a” and “b” and total chlorophyll.

KEYWORDS: wheat, ancient variety, irrigated conditions, chlorophyll, minerals, gluten.

The ancient native wheat varieties (Landrace) were developed through millennia of cultivation under difficult climatic conditions, and these natural processes included the exchange of seeds by farmers during trade, as well as the adaptation of wheat populations to different environmental conditions. Landrace plants embody not only a variety of alleles and genotypes but also evolutionary processes such as gene flow between different populations [1,2].

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 3, 2021, Pages. 3249 - 3253
Received 16 February 2021; Accepted 08 March 2021.

Compared to modern commercial varieties, the ancient local varieties of Uzbekistan have a number of advantages, such as the high content of protein and minerals (Cu, Fe, Zn, Mg, Mn, Mb, P) in the grain. quality-level of gluten is much higher than that of modern varieties [3]. In this regard, it was necessary to conduct a deep study of these varieties in order to effectively use them in scientific agricultural programs to improve new varieties of wheat.

It is known that one of the factors of increase [4], that the future of detecting quantitative and qualitative traits of a plant is the analysis of the efficiency of photosynthesis.

In connection with the above, it is of interest to study the amount of pigments in the leaves of local wheat varieties and to determine the correlations between the amount of pigments and qualitative traits.

MATERIALS AND RESEARCH METHODS

In our research, we used the ancient local varieties “Kizil Bugdoy”, “Bukhor bobo”, “Okbugdoy”, “Boboki”, “Grekkum”, “Surkhak”, “Kora kiltik”, “Tuyatish”, “Pashmak”, “Khivit”, “ Muslimka ”,“ Kairoktosh ”,“ Kizilshark ”, and, as a control, commercial wheat variety“ Krasnodar-99 ”belonging to the T. aestium species, grown under irrigated conditions on the experimental field of the Institute of Genetics and Experimental Plant Biology. To determine the concentration of chlorophyll “a”, “b” and carotenoids, 3-4 leaves were taken from each cultivar. After washing them in tap water, weighed portions of 50 mg were taken from each leaf and placed in separate numbered tubes. In each tube was poured 5 ml of 95% ethyl alcohol and homogenization was carried out, after which it was centrifuged at a speed of 5000 rpm for 10 minutes. The content of chlorophylls “a” and “b” was determined on an AgilentCary 60UVI-VIS spectrophotometer at 663.2 nm and 646.8 nm. The amount of chlorophylls “a” and “b” was calculated using the corresponding equation [4].

Statistical analysis Analysis of the obtained digital data was carried out on a Pentium IV computer using the Excel 2010 and StatView 5.0 programs, and the analysis of variance was performed using the ANOVA method.

RESULTS OF STUDIES

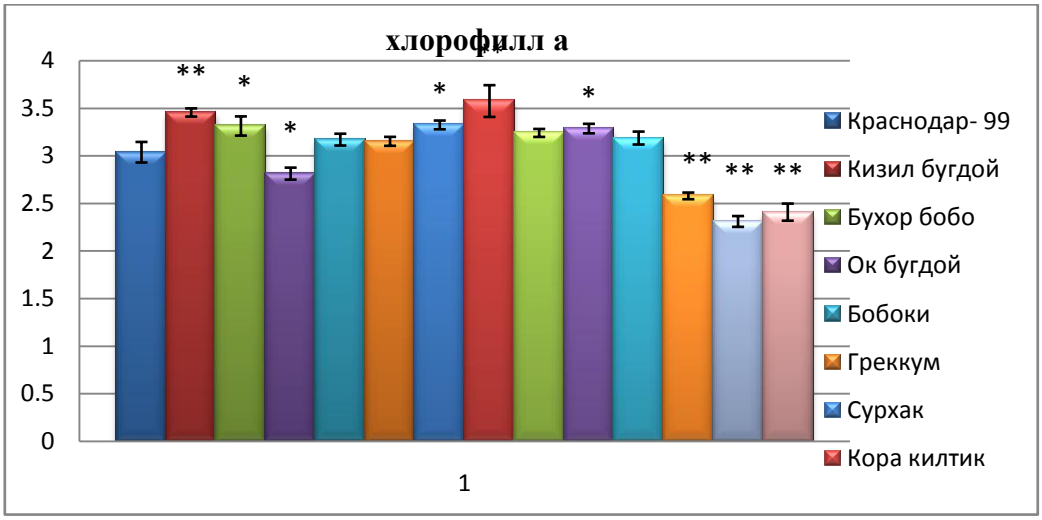
Analysis of the amount of chlorophylls. Analysis of variance of the research results showed significant differences in the content of chlorophyll “a”, chlorophyll “b” and total chlorophyll in plant leaves between the commercial variety “Krasnodar-99” and ancient local wheat varieties. The highest level of chlorophyll “a” was observed in the varieties “Korakiltik” 3.5 ± 0.16 mg / g, “Kizil bugdoy” 3.4 ± 0.04 mg / g, “Bukhor bobo” 3.3 ± 0.1 mg / gi, and the variety “Kairoktosh” had the

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 3, 2021, Pages. 3249 - 3253
Received 16 February 2021; Accepted 08 March 2021.

lowest indicator - 2.7 ± 0.01 mg / gi, in comparison with the control “Krasnodar-99” and other varieties 3.0 ± 0.1 mg / gi (Fig. 1.).

Figure 1

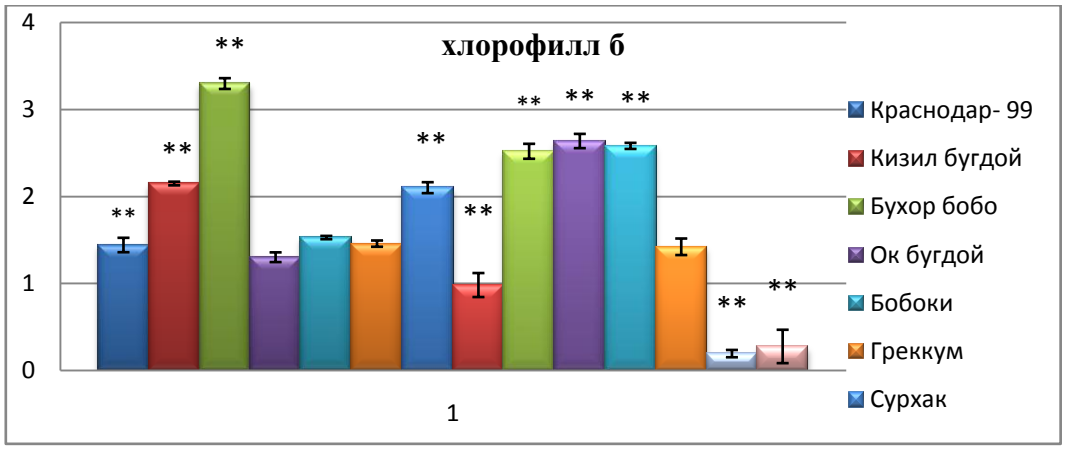
The content of chlorophyll "a" , in the leaves of plants of old and commercial wheat varieties



In terms of the amount of chlorophyll “b”, the highest indicators were in the varieties “Bukhor bobo” 3.3 ± 0.06 mg / g; in the variety “Pashmak” 2.6 ± 0.08 mg / g, respectively. The lowest values of the trait were noted in the variety “Kairoktosh "0.19 ± 0.04 mg / g. The control variety" Krasnodar-99 "had a value of 1.4 ± 0.08 mg / g.

Figure 2

The content of chlorophyll "b" in the leaves of plants of old and commercial wheat varieties



The highest content of total chlorophyll was noted in wheat varieties “Bukhor bobo” 6.66 ± 0.08 mg / g, “Pashmak” 5.9 ± 0.04 mg / g, “Tuyatish” 5.6 ± 0.16 mg / g, when for the control "Krasnodar-99" 4.4 ± 0.06 mg / g (Fig. 3).

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 3, 2021, Pages. 3249 - 3253
Received 16 February 2021; Accepted 08 March 2021.

Fig 3

The content of total chlorophyll in the leaves of plants of ancient and commercial varieties of wheat

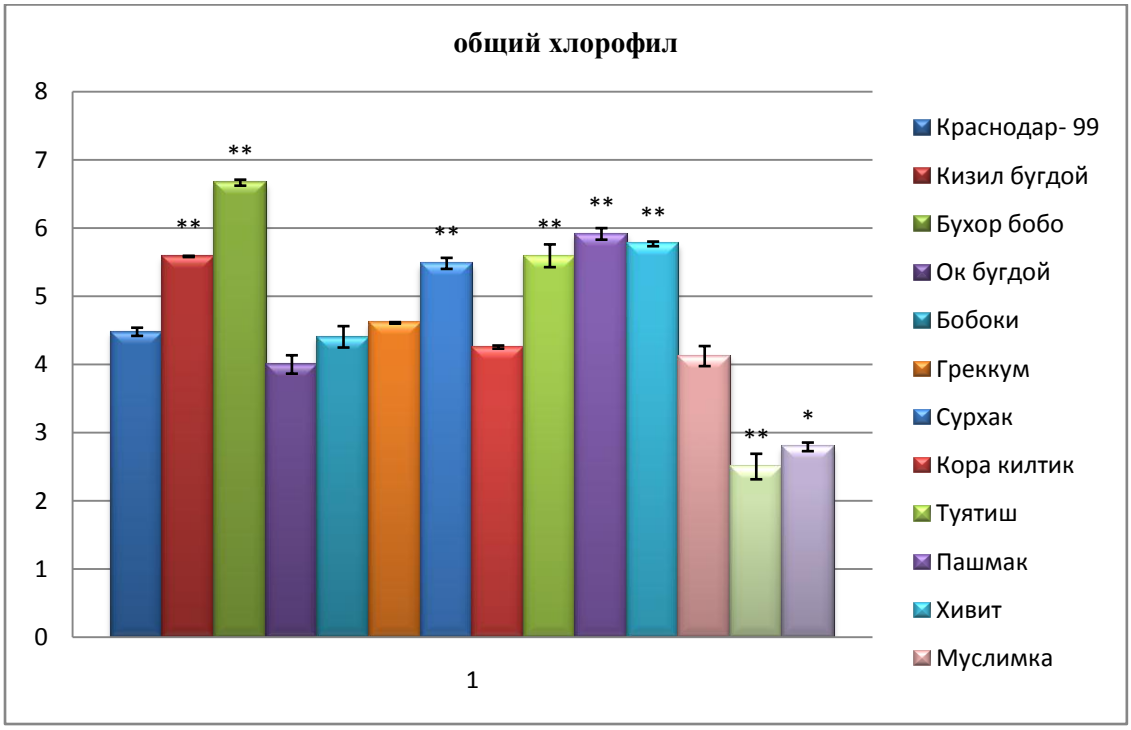


Table 1

Yield and Gluten Indicators for Ancient Local Wheat Varieties

№	Harvest index	Grain yield g / m2	Bio-weight g / m2	Number of spikelets in 1 / m2	Weight of 1000 grains g	Grain quantity / m2	Number of grains in an ear	Gluten%
1	0,26	358,4	1360,8	280	47,8	7497,9	26,7	55
2	0,31	270	876	300	42,5	6352,9	21,1	62
3	0,34	347,7	1003,2	285	38,8	9150	32,1	50
4	0,25	386,4	1540	280	45,8	8436,6	21,8	48
5	0,26	226,2	867,1	290	37,2	6080,6	26,5	46
6	0,31	397,12	1305,24	292	54,2	7326,9	25,0	32
7	0,31	455,6	1436,48	268	47	9693,6	36,1	60
8	0,17	298	1731,38	298	56,3	5293,0	17,7	38,8
9	0,17	203,9	1161,84	309	27,7	7553,3	24,4	55
10	0,15	226,44	1425,96	306	42,1	5391,4	17,6	48
11	0,22	294,72	1332,38	265	40,9	9436,5	35,6	46
12	0,27	325,6	1189,92	307	57,1	5161,4	16,8	45
13	0,24	319,68	1290,56	296	43,8	7433,7	25,1	46,6
X	**0,25**	**316,2**	**1270,8**	**290,4**	**44,7**	**7292,9**	**25,2**	**48,6**
Sx	**0,017**	**20,1**	**251,4**	**3,9**	**2,2**	**439,7**	**1,7**	**2,2**

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 3, 2021, Pages. 3249 - 3253
Received 16 February 2021; Accepted 08 March 2021.

Thus, there are statistically significant varietal differences in the content of chlorophyll “a” and “b” and in the total content of chlorophyll under irrigated conditions. The higher value of total chlorophyll in the local cultivars Bukhor bobo and Tuyatish, as well as a positive correlation with gluten indicators, indicate the possibility of zoning these cultivars from their original habitat in new irrigated regions. In the future, local ancient varieties can be used as initial forms during hybridization in order to obtain new genotypes with rays of quality indicators and other economically valuable traits.

REFERENCES

1. Abdullah. A. Wheat Landraces. Genetic Resources for Sustenance and Sustainability. USDA-ARS, 803 Iowa Ave., Morris, MN 56267 USA.
2. Konvalina, P., Capouchová I., Stehno.Z., Jan. M.'Agronomic characteristics of the spring forms of the wheatlandraces (einkorn, emmer, spelt, intermediate bread wheat) grown in organic farming '. J Agrobiol2010. V.27 (1), P. 9-17.
3. Baboev S. K., Morgounov A. I., Muminjanov H. Wheat landraces in farmers' fields in Uzbekistan. National survey, collection, and conservation, Food and agriculture organization of the united nations / Ankara. 2010-2015.
4. Zhu Xin-G, Long SP, Ort DR Improving photosynthetic efficiency for greater yield. Annual Rev Plant Biol. 2010. V.61.P. 235-261.
5. Nayek.S. Spectrophotometric Analysis of Chlorophylls and Carotenoids from Commonly Grown Ferm Species by Using Various Extracting Solvents. Nayek Sumanta, Choudhury Imranul Haque, Jaishee Nishika et al. International Science Congrees. Journal of Chemical Sciences. 2014.V 63-69 .P.16-24.