Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 6, 2021, Pages. 7605 - 7613
Received 25 April 2021; Accepted 08 May 2021.

Number and Viability of Pollen Grains in a Single Flower and Pollen Grains in a Single Pollen in Interspecific F_1 Plants and Primary Sources

Nabieva Nargiza Nazirjonovna[1], Amanov Bakhtiyar Khushbakovich[2], Ashurov Qodirjon Komiljonovich[3]

Andijan Institute of Agriculture and Agrotechnology,
Chirchik Pedagogical Institute of Tashkent region
amanov.81@bk.ru

Annotation:
The high and low birth rates of hybrid cotyledons and cotyledons as a result of crossbreeding of cotton species depend on the phylogenetic proximity of the selected species and species diversity. The method of interspecific hybridization is the most important source of enriching the cotton gene pool with beneficial traits.
Key words: Cotton, cocoon, seed, variability, heredity, dust, pollen, genome, crossbreeding, generation, column, hybrid, heterosis, recombinant.

The fact that the viability of dust in cotton species belonging to the genus Gossypium L. is one of the factors ensuring their productivity has been stated in the scientific studies of many scientists [1], [9], [10], [2], [4]. In particular, Z.B. Kuryazov [10] studied the viability of pollen grains in different genomic cotton species and showed that in the obtained hybrids the pollen grains have high viability and F_1 plant yields.
In the scientific researches of Z.B.Kuryazov, S.M.Rizaeva A.A.Abdullaev [3], the study of the viability of pollen grains in different genomic diploid species allows to get a correct idea of the process of fertilization. F_1 hybrids obtained on the basis of cross-breeding of cotton species of different genomes (A_1-A_2, V_1-V_2-V_3, E_1, -E_4, D_5, F_1) showed high viability of pollen grains and some species of G.herbaceum L. and G.arboreum L. It was observed in the research that the viability of dust grains in F_1 hybrids obtained by cross-breeding of species G.anomalum and G.barbosanum was low.

H.A. Muminov noted that the F_1 hybrids obtained as a result of cross-hybridization of cotton species belonging to the genus G.herbaceum L. have high values of viability of dust grains and noted the phylogenetic similarity of the diversity of this species [3].

B.H.Amanov et al. [2] obtained that G. barbadense L. has high rates of viability of pollen grains in semi-wild, cultivated tropical and subtropical subspecies species and forms, and their phylogenetic similarity to each other. found that hybrid offspring had a higher yield potential.

G.hirsutum L., G.barbadense L. species species selected as the primary source and the number of pollen grains in the flower of the wild G.darwinii Watt species almost did not differ sharply from each other (117.5-125.5), including G. .hirsutum L. has a low number of pollen grains (117.5) in the form of wild subsp.mexicanum var.nervosum (Yukatan). A slightly higher index on this character is G hirsutum L. subsp. It was found that euhirsutum "Kelajak" differs from other species in terms of the number of pollen grains, ie the number of pollen grains is 125.5. While the semi-wild f.parnat (yellowish fibrous) showed a high rate of pollen count (122.0 pcs.), The cultural tropical subsp. vitifolium in the form of f.brasilense (red stem) was noted to be slightly lower on this mark (117.0 pcs.). An analogous situation was observed in terms of the number of pollen grains in the wild G.darwinii Watt species (see Table 3.3).

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 6, 2021, Pages. 7605 - 7613
Received 25 April 2021; Accepted 08 May 2021.

The number of pollen grains in F_1-plants obtained by hybridization of wild and semi-wild forms of G.hirsutum L., G.barbadense L. species is close, F_1 subsp.mexicanum var.nervosum (Yukatan) x subsp. in the combination of ruderale f.parnat retsiprok 121.8-128.8 units, the amplitude of variability was 110.0-140.0 units, and the coefficient of variation was 5.5-7.8%, respectively.

The number of pollen grains of F_1-plants obtained by hybridization of wild x cultured tropical forms is averaged over F_1 subsp. mexicanum var.nervosum (Yukatan) x subsp.vitifolium f.brasilense (red stem) was observed in a combination of retsiprok. The number of pollinators was 115.0-121.6, the amplitude of variability was average (110.0-139.0), and the coefficient of variation was 5.1-6.2% (see Table 3.3).

The number of pollen grains of F_1-plants obtained by hybridization of wild and cultivated subtropical forms is close to each other, ie the number of pollen grains in interspecific F_1 subsp.mexicanum var.nervosum (Yukatan) x "Surkhan-9" reciprocal combinations is 120.4-124.3 , the amplitude of variability was averaged (110.0–124.0; 108.0–135.0 units), and the coefficient of variation was found to be 4.7–6.5–6.2%, respectively (see Table 3.3).

G.hirsutum L., G.barbadense L. The results of the analysis of the number of pollen in F1-plants belonging to the interspecific cultural tropical and semi-wild forms show that the highest indicator is subsp. paniculatum x subsp. in the ruderale f.parnath combination, the high index on pollen was 159.3 pcs, respectively, while the amplitude of variability 1 was 33.0–172, and the coefficient of variation was recorded at 8.0%. ruderale f.parnat x subsp. raniculatum found a slightly lower index of 129.6 pollen grains.

When analyzing the number of pollen grains in F_1 plants obtained by cross-breeding of interspecific cultural tropical forms, subsp.paniculatum x G.barbadense L. subsp. in the combination of vitifolium f.brasilense (red stem), this figure was found to be 123.5, while the coefficient of variation was 4.6%.

Table 3.3

Interspecific F_1 plants obtained on the basis of primary sources and their hybridization the number of pollen grains in a single flower

Primary sources and F1 generation combinations	Number of flowers analyzed	Number of pollen grains, pcs			
		±S χ	Lim	S	V%
G.hirsutum L. subsp.*mexicanum* var.*nervosum* (Yukatan)	10	117,5 ±2,1	108,0-126,0	6,8	5,8
G.hirsutum L. subsp. *punctatum*	10	123,3 ±1,9	113,0-130,0	6,2	5,0
G.hirsutum L. subsp. *paniculatum*	10	121,0 ±2,2	110,0-132,0	7,1	5,9
G hirsutum L. subsp. *euhirsutum* «Kelajak» sort	10	125,5±3,0	112,0-138,0	9,5	7,6
G.darwinii Watt	10	119,5±2,4	108,0-131,0	7,9	6,6
G.barbadense L. subsp. *ruderale* f.*parnat* (yellowish fibrous)	10	122,0±2,1	112,0-131,0	6,8	5,6
G.barbadense L. subsp. *vitifolium* f.*brasilense* (red stem)	10	117,0±2,3	107,0-127,0	7,5	6,4
G.barbadense L. subsp. *eubarbadense* «Surkhan-9» sort	10	118,6±2,4	108,0-135,0	7,7	6,5

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 6, 2021, Pages. 7605 - 7613
Received 25 April 2021; Accepted 08 May 2021.

F_{1-} plants					
1. Interspecific hybrids (*G.hirsutum* L. x *G.barbadense* L.)					
wild x semi-wild					
subsp.*mexicanum* var.*nervosum* (Yukatan) x subsp. *ruderale* f.*parnat*	10	121,8 ± 3,0	110,0-140,0	9,5	7,8
subsp.*ruderale* f.parnat x subsp.*mexicanum* var.*nervosum* (Yukatan)	10	128,8 ± 2,25	120,0-138,0	7,1	5,5
wild x cultural tropics					
subsp. *mexicanum* var.*nervosum* (Yukatan) x subsp.*vitifolium* f.*brasilense* (red stem)	10	121,6 ± 2,3	115,0-139,0	7,5	6,2
subsp. *vitifolium* f.*brasilense* (red fibrous) x subsp.*mexicanum* var.*nervosum* (yukatan)	10	115,0 ± 1,8	110,0-124,0	5,9	5,1
wild x cultural subtropical					
subsp.*mexicanum* var.*nervosum* (Yukatan) x «Surkhan-9» sort	10	120,4±1,7	110,0-124,0	5,6	4,7
«Surkhan-9» sort x subsp.*mexicanum* var.*nervosum* (Yukatan)	10	124,3±2,5	108,0-135,0	8,1	6,5
semi-wild x semi-wild					
subsp. *punctatum* x subsp.*ruderale* f.*parnat*	10	135,1±2,5	122,0-143,0	7,9	5,85
subsp.*ruderale* f.*parnat* x subsp.*punctatum*	10	144,39±2,26	136,0-175,0	7,16	4,96
semi-wild x cultural subtropical					
subsp.*ruderale* f.*parnat* x subsp. *euhirsutum* «Kelajak» sort	10	139,1±5,7	95,0-162,0	18,0	13,0
subsp. *euhirsutum* «Kelajak» sort x subsp. *ruderale f parnat*	10	143,1±5,8	108,0-163,0	18,4	12,9
semi-wild x cultural subtropical					
subsp. *punctatum* x subsp. *eubarbadense* « Surkhan-9» sort	10	123,5±2,7	108,0-134,0	8,8	7,1
subsp. *eubarbadense* «Surkhan-9» sort x subsp. *punctatum*	10	121,5±2,2	113,0-136,0	7,1	5,9
cultural tropical x semi-wild					
subsp. *paniculatum* x subsp. *ruderale* f.*parnat*	10	150,3±3,8	172,0-133,0	12,1	8,0
subsp. *ruderale* f.*parnat* x subsp. *paniculatum*	10	129,6±2,9	146,0-119,0	9,2	7,1
cultural tropics x cultural tropics					
subsp.*paniculatum* x *G.barbadense* L. subsp. *vitifolium* f.*brasilense* (red stem)	10	123,5±1,8	118,0-134,0	5,7	4,6
cultural tropical x cultural subtropical					
subsp.*paniculatum* x subsp. *eubarbadense* « Surkhan-9» sort	10	131,8±2,8	119,0-145,0	8,9	6,7
subsp. *eubarbadense* « Surkhan-9» sort x subsp. *paniculatum*	10	141,3±2,3	132,0-159,0	7,5	5,3
cultural subtropical x cultural subtropical					
subsp. *euhirsutum* «Kelajak» sort x subsp. *eubarbadense* «Surkhan-9» sort	10	141,3±5,1	124,0-180,0	16,1	11,4

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 6, 2021, Pages. 7605 - 7613
Received 25 April 2021; Accepted 08 May 2021.

subsp. *eubarbadense* «Surkhon-9» sort x subsp. *euhirsutum* «Kelajak» sort	10	143,6±3,3	130,0-167,0	10,7	7,4
***G.hirsutum* L. x *G.darwinii* Watt**					
subsp.*mexicanum* var.*nervosum* (Yukatan) x *G.darwinii Watt*	10	134,6 ± 2,4	121,0-146,0	7,8	5,8
G.darwinii Watt x subsp. *mexicanum* var.*nervosum* (Yukatan)	10	126,9 ± 3,1	110,0-144,0	9,9	7,8
wild x wild					
subsp. *paniculatum* x *G.darwinii* Watt	10	144,8±1,9	135,0-152,0	6,1	4,2
G.darwinii Watt x subsp. *paniculatum*	10	150,1±3,0	133,0-163,0	9,5	6,3
cultural subtropical x G.darwinii Watt					
subsp. *euhirsutum* «Kelajak» sort x *G.darwinii* Watt	10	123,5±4,4	105,0-141,0	14,0	11,3
G.darwinii Watt x subsp. *euhirsutum* «Kelajak» sort	10	127,5±2,6	115,0-138,0	8,5	6,67

The number of pollen grains of F_1-plants obtained by hybridization of the cultured tropical form of G.hirsutum L. turichi and the subtropical sample of G.barbadense L. is close to each other, i.e. interspecific F_1 subsp.paniculatum x subsp. eubarbadense The number of pollen grains in the "Surkhan-9" reciprocal combination is 131.8-141.3, the average amplitude of variability is 119.0-145.0; The presence of 132.0–159.0 pollen grains was detected (see Table 3.3).

F_1 subsp.ruderale f.parnat x subsp, obtained on the basis of interbreeding of interspecific semi-wild and cultural subtropical samples. euhirsutum The number of dust grains in the combination "Kelajak" averaged 139.1-143.1 grains, and the amplitude of variability was 95.0-162.0; 108.0-163.0 units, respectively, and the coefficient of variation was 12.9-13.0%.

The average number of pollen grains in the "Kelajak" x "Surkhan-9" reciprocal combinations obtained as a result of cross-hybridization of G. hirsutum L., G. barbadense L. varieties was 141.3-143.6, and the coefficient of variation was 7, respectively. 4-11.4%.

The number of pollens in F_1 plants obtained based on the results of cross-hybridization of G. hirsutum L. species with wild G.darwinii Watt species was analyzed. The species was divided into wild x wild, cultured tropical x wild, wild x cultured subtropical groups. In particular, in the combination of wild x wild subsp.mexicanum var.nervosum (Yukatan) x G.darwinii reciprocal, the average number of pollen grains is 126.9-134.6, the amplitude of variability is 121.0-146.0; 110.0-144.0 units and the coefficient of variation was found to be 5.8-7.8%. Analogous cases were observed in the remaining groups.

Thus, the results obtained on the analyzed indicators showed that they differed in both primary sources and interspecific hybrids. In the subtropical G.hirsutum L. Kelajak and G.barbadense L. Surkhan-9 cultivars, the number of pollen grains was found to be almost indistinguishable from the studied species diversity. It was observed that the number of pollen grains in interspecific F_1-plants was in an intermediate or heterozygous state relative to the primary sources. A strong heterosis condition was determined on the basis of the number of pollen grains in hybrid plants obtained on the basis of cross-breeding of G. hirsutum L. species diversity in the wild G.darwinii Watt species.

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 6, 2021, Pages. 7605 - 7613
Received 25 April 2021; Accepted 08 May 2021.

The viability of dust grains. It is known that dust survival in cotton species belonging to the Gossypium L. family is one of the main factors ensuring productivity in many scientific studies [5], [8], [6].

L.P. Shevchuk [7] studied hybrids based on cross-breeding of G.herbaceum var.africanum (Watt) Mauer and G.arboreum L. According to the results of the study, these species were easily crossed and the viability of F1-plants was high, while in the F2-joint cytologically inert and medium-sprouted plants appeared.

B.Kh.Amanov Z.A.Ernazarova A.A.Abdullaev [8] noted that G.barbadense L. species species and the species obtained by cross-breeding with G.darwinii Watt type and interspecies F_1, F_2 and F_1B_1 It was found that the viability of pollen in plants is high and the obtained hybrids are phylogenetically close, have high yields.

F.U.Rafieva, B.Kh.Amanov, S.M.Rizaeva [6] Representatives of G.Mustelinum and G.darwinii species, G.hirsutum and G.barbadense species species and their interspecific hybrids F_1 and F_2 observed that the viability of the grains is high. Despite the high viability of pollen grains, the relatively low birth rate of whole seeds in the cocoon in hybrid combinations showed that not only the viability of pollen grains but also the maternal cytoplasm is important in the process of macrosporagenesis.

The diversity of G.hirsutum L. and G.barbadense L., as well as the viability of pollen grains in the flower of the genus G.darwinii Watt, are high, ranging from 93.9 to 96.9%. The highest index of viability of pollen grains in plants is 96.9% in the future variety, the relatively low index (93.9%) is G.barbadense L ssp. vitifolium *f*. brasilense (red stem). In the wild G.darwinii Watt species, dust viability was also found to be high, i.e. -94.8% (see Table 3.4).

Table 3.4

G.hirsutum L. x G.barbadense L. Dust survival in interspecific parent and F_1 plants

Primary sources and F1 generation combinations	**Number of dust particles studied, pcs**	χ **±S** χ	**Lim**	**S**	**V%**
G.hirsutum L. subsp.*mexicanum* var.*nervosum* (Yukatan)	1637,4	95,9 ± 0,35	79,4-100	1,12	1,16
G.hirsutum L. subsp. *punctatum*	1567,4	95,8 ± 0,47	73,3-100	1,5	1,56
G.hirsutum L. subsp. *paniculatum*	1776,9	96,5 ± 0,27	77,4-100	0,87	0,9
G hirsutum L. subsp. *euhirsutum* «Kelajak» sort	1929,9	96,9 ± 0,25	84,0-100	0,81	0,83
G.darwinii Watt	1886,2	95,1 ± 0,36	80,0-100	1,14	1,19
G.barbadense L. subsp. *ruderale* f.*parnat* (yellowish fibrous)	1384,3	93,9 ± 0,34	77,7-100	1,09	1,16
G.barbadense L. subsp. *vitifolium* f.*brasilense* (red stem)	1544,2	95,5 ± 0,12	84,1-100	0,39	0,40
G.barbadense L. subsp. *eubarbadense* «Surkhan-9»	1743,0	94,8 ± 0,31	81,1-100	1,0	1,13

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 6, 2021, Pages. 7605 - 7613
Received 25 April 2021; Accepted 08 May 2021.

sort					
F_1-plants					
1. Interspecific hybrids (*G.hirsutum* L. x *G.barbadense* L.)					
wild x semi-wild					
subsp.*mexicanum* var.*nervosum* (Yukatan)x subsp. *ruderale* f.*parnat*	1342	89,4 ± 2,9	70,8-100	9,4	10,5
subsp.*ruderale* f.parnat x subsp.*mexicanum* var.*nervosum* (Yukatan)	1255	89,0 ± 3,0	72,0-100	9,5	11,3
wild x cultural tropics					
subsp. *mexicanum* var.*nervosum* (Yukatan)x subsp.*vitifolium* f.*brasilense* (red stem)	1357	78,7±4,8	52,0-100	15,3	19,5
subsp. *vitifolium* f.*brasilense* (red stem) x subsp.*mexicanum* var.*nervosum* (Yukatan)	1350	76,7±4,7	59,0-100	14,6	19,1
wild x cultural subtropical					
subsp.*mexicanum* var.*nervosum* (Yukatan)x «Surkhan-9» sort	1263	83,6±3,7	64,7-100	11,7	14,1
«Surkhan-9» sort x subsp.*mexicanum* var.*nervosum* (Yukatan)	1378	84,2±4,2	60,0-100	13,4	16,0
semi-wild x semi-wild					
subsp. *punctatum* x subsp.*ruderale* f.*parnat*	1365	83,3±2,6	75,0-100	8,2	9,9
subsp.*ruderale* f.*parnat* x subsp.*punctatum*	1346	84,2±3,5	67,0-100	11,2	14,4
semi-wild x cultural subtropical					
subsp.*ruderale* f.*parnat* x subsp. *euhirsutum* «Kelajak» sort	1250	77,5±1,0	60,0-100	14,5	18,8
subsp. *euhirsutum* «Kelajak» sort x subsp. *ruderale ƒ parnat*	1450	76,3±4,7	58,0-100	14,9	19,5
semi-wild x cultural subtropical					
subsp. *punctatum* x subsp. *eubarbadense* «Surkhan-9» sort	1022	94.3±0.50	77.1-100	1.58	1.67
subsp. *eubarbadense* «Surkhan-9» sort x subsp. *punctatum*	1056	97.1 ± 0.19	85.4-100	0.61	0.63
cultural tropical x semi-wild					
subsp. *paniculatum* x subsp. *ruderale* f.*parnat*	1247	94.1 ± 0.52	70.0-100	1.66	1.76

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 6, 2021, Pages. 7605 - 7613
Received 25 April 2021; Accepted 08 May 2021.

subsp. *ruderale* f.*parnat* x subsp. *paniculatum*	1252	94.7 ± 0.73	70.8-100	2.31	2.44
cultural tropics x cultural tropics					
subsp.*paniculatum* x *G.barbadense* L. subsp. *vitifolium* f.*brasilense* (red stem)	1533	92.9±0.30	71.4-100	0.96	1.0
cultural tropical x cultural subtropical					
subsp.*paniculatum* x subsp. *eubarbadense* «Surkhan-9» sort	1426	97,2±0,28	86,8-100	0,90	0,92
subsp. *eubarbadense* «Surkhan-9» sort x subsp. *paniculatum*	1545	96,7±0,13	84,6-100	0,43	0,45
semi-wild x cultural subtropical					
subsp.*ruderale* f.*parnat* x subsp. *euhirsutum* «Kelajak» sort		94,8±0,83	79.1-100	2.62	2.76
subsp. *euhirsutum* «Kelajak» sort x subsp. *ruderale f parnat*		95,5 ± 0,48	83.3-100	1.5	1.59
cultural sub tropics x cultural sub tropics					
subsp. *euhirsutum* «Kelajak» sort x subsp. *eubarbadense* «Surkhan-9» sort		95,7±0,35	75,8-100	1,11	1,16
subsp. *eubarbadense* «Surkhan-9» sort x subsp. *euhirsutum* «Kelajak» sort		95,6±0,34	80,0-100	1,0	1,14
***G.hirsutum* L. x *G.darwinii* Watt**					
wild x wild					
subsp.*mexicanum* var.*nervosum* (Yukatan) x *G.darwinii* Watt	1356	91,7±2,7	75,0-100	1,2	1,2
G.darwinii Watt x subsp. *mexicanum* var.*nervosum* (Yukatan)	1456	87,7±2,6	71,4-100	8,5	9,7
cultural tropical x wild					
subsp. *paniculatum* x *G.darwinii* Watt	1247	95.9 ± 0.27	81.5-100	0.87	0.90
G.darwinii Watt x subsp. *paniculatum*	1252	94.5 ± 0.43	73.3-100	1.37	1.44
cultural subtropical x wild					
subsp. *euhirsutum* «Kelajak» sort x *G.darwinii* Watt	1356	94.8 ± 0.47	70.1-100	1.5	1.58
G.darwinii Watt x subsp. *euhirsutum* «Kelajak» sort	1320	79,3 ± 4,0	68,0-100	12,7	16,0

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 6, 2021, Pages. 7605 - 7613
Received 25 April 2021; Accepted 08 May 2021.

When analyzing the viability of dust grains in F_1-plants obtained by cross-breeding of interspecific wild and semi-wild varieties, the results are almost close to each other, i.e., F_1 subsp.mexicanum var.nervosum (Yukatan) x subsp. ruderale f.parnat (n.t-li) in the combination of retsiprok 89.0-89.4%, variability amplitude 70.8-100.0%; 72.0-100.0%, and the coefficient of variation was 10.5-11.3%, respectively.

In the analysis of wild x cultured tropical, wild x subtropical, semi-wild x semi-wild, semi-wild x cultured tropical, semi-wild x cultured subtropical cultured subtropical x cultured subtropical groups F_1-plants in the combination of pollen grain viability 76.3-97.1% formed. In particular, Surkhan-9 variety x ssp, which belongs to the semi-wild x cultural subtropical group. ssp.vitifolium *f* belonging to the semi-wild x cultural tropical group was observed in the runctatum combination with the highest index of viability of pollen grains 97.1%, variability amplitude 85.4-100.0%, respectively coefficient of variation 0.63%. brasilense (red stem) x G.hirsutum L ssp. In the runctatum hybrid combination, a relatively low index was recorded at 76.3%, a variable amplitude of 58.0–100.0%, and a coefficient of variation of 19.5%.

The viability of pollen grains in F_1 plants obtained on the basis of cross-breeding of G. hirsutum L. species with wild G.darwinii Watt species was analyzed and they were divided into several groups (wild x wild, wild x cultured, wild x cultured subtropical). In the studied F_1-plants, 79.3-95.9% were recorded in combinations of pollen grain viability. For example, G.hir L ssp, which belongs to the cultural tropical x wild group. raniculatum x G.darwinii Watt In the combination of retsiprok, the highest rate of dust grain viability was 95.9%, the variability amplitude was 81.5-100.0%, and the coefficient of variation was 0.90%, while the wild x cultural subtropical G.darwinii Watt x In the future combination, the low rate was found to be 79.3%, the amplitude of variability (68.0-100.0%), and the coefficient of variation to 16.0%.

The analysis of the obtained results showed that the primary sources had high indicators of the viability of pollen grains in interspecific F_1-plants, ie the species studied showed phylogenetic similarity of species diversity, and the obtained hybrids in solving theoretical and practical problems of selection, especially cultural and allows varieties to use wild, semi-wild, cultivated tropical forms in useful cross-breeding, cross-breeding.

References:

1. Abdullaev A.A., Lazareva O.N. Viability and size of pollen grains in interspecific hybrids of cotton // Uzbek Biological Journal. - Tashkent, 1970. - № 5. - P. 57-59.
2. Amanov B.X., Ernazarova Z.A., Rizaeva S.M., Abdiev F.R. Genetic diversity of G. barbadense L. species, forms and dust viability in F1 plants // Uzb. biol. jurn. - Tashkent .: Fan, 2012. - №6. - B. 41-44.
3. Kuryazov Z.B., Rizaeva S.M, Abdullaev A.A. A-genome cotton species and their interaction with the viability of pollen grains in F1 plants // Lectures of the Academy of Sciences of the Republic of Uzbekistan.- Tashkent: Science, 2007.- № 3.- B. 72-74.
4. Muminov X.A. G.herbaceum L. turichi forms and F1 plant pollen viability // Uzb. biol. jurn. - Tashkent .: Fan, 2012.- №2. - B. 41-43.
5. Muminov X.A. Types of G.herbaceum L. and G.arboreum L. cotton species and interspecific phylogenetic relations.//Journal of Biology of Uzbekistan.- Tashkent. 2017. - №4.- B. 41-44.
6. Rafieva F.U., Amanov B.X., Rizaeva S.M. Polyploid cotton species, species diversity and their dust life in F1 plants // Journal of Biology of Uzbekistan.- Tashkent: Science, 2015.- № 1.- B 41-44 (03.00.00; № 5).

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 6, 2021, Pages. 7605 - 7613
Received 25 April 2021; Accepted 08 May 2021.

7. Shevchuk L. P. Morphobiological features of interspecific intragenomic hybrids of Zi-Hua (G. arboreum L.) and G. herbaceum var. africanum (Watt) Mauer // Uzbek. biol. zhurn. - Tashkent: Fan, 1983. - No. 5. - S. 49-53.
8. Amanov B.X., Ernazarova Z.A., Abdullaev A.A. Type diversity of Peruvian cotton species and powder viability of F1, F2, F1B1 hybrid generations // Plant Introduction: Problems and Prospects: IV resp. il.-amal. konf. mat. - Tashkent. 2009. - Б. 65-66.
9. Ernazarova Z.A. Jiznesposobnost pyltsevyx zeren vnutri- i mejgenomnyx hybridov xlopchatnika // Biologicheskie osnovy optimizatsii skorospelosti i produktivnosti rasteniy: Mat. mejd. nauch. konf. - Tashkent, 1996. - 27 p.
10. Kuryazov Z.B. Mutual genetic brotherhood of Afro-Asian cotton species and American cotton G.raimondi Ulbr. phylogenetic relationship with .: Autoref. dis. ... cand. biol. science. - Tashkent: O'z R FA G and O'EBI. 2002. - Б. 12-13.