

**MORPHOLOGICAL AND AGRONOMIC CHARACTERISTICS OF COTTON  
AMPHIDIPOID HYBRIDS**

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**ABSTRACT**

The results of research on studying of the morphobiologic and economically valuable traits of amphidiploids F<sub>1</sub> (cultivar «Kelajak» (*G.hirsutum subsp. euhirsutum*) x (*G.arboreum subsp. perenne* x *G.arboreum subsp. obtusifolium var. indicum*)) and F<sub>1</sub> (cultivar «Kelajak» (*G.hirsutum subsp. euhirsutum*) x (*G.arboreum subsp. obtusifolium var. indicum* x *G.herbaceum subsp. pseudoarboreum*)) obtained by use of vicarious cotton species.

**KEY WORDS:** cotton, species, sympodial, monopodial, photoperiod, nectary, anther, petal, fiber length, weight of one boll, anthocyan, weight of 1000 seeds.

**INTRODUCTION**

The concept of the vicariate is sometimes interpreted very narrowly or very large. In a very large interpretation, it includes not only genetically related taxa replacing each other, but also life forms. In the narrow interpretation, the vicariate understands the phenomenon of the replacement of the plant and the animal species in the fauna and flora of various continents or of spatially significantly remote territories of the same continent.

Vicarious species are called closely related to the species of the plants and the animals that occupy different areas of the distribution (*geographical vicariate*) or are found within the same range, but in different environmental conditions (*ecological vicariate*). One of the main criteria by the presence or absence of the vicariate is judged the relative position of the geographic areas of closely related species.

It is known that the boundaries of the ranges are mobile and depend on a complex of factors, the most important of that: climatic, soil-ground, biotic and historical. Depending on the history of the settlement and the current range, the species are assigned to a specific arealogical group.

The vicariate in plants is associated with the issues of the historical transformation of the vegetation cover and the interpretation of the biological concept of «species». The phenomenon of the vicarism in the genus *Gossypium* L. is mainly the result of the rupture, which were never uniform, areas were divided into parts, isolated by indefinite geographic barriers (*sea spaces*) during the long geological periods.

This circumstance associated with the profound changes in ecological conditions explains that all island species, inhabiting islands of the continental origin are vicar in relation to the species of the neighboring continent [4, 5, 6, 7, 11].

L.V. Semenikhina, L.I. Gurevich, A.E. Egamberdiev [1] under the action of a 0.1% solution of colchicine on the growing point, actively growing shoots of the interspecific sterile hybrid *G.hirsutum* x *G.trilobum* with the number of hromosome  $2n = 39$ , hexaploid amphidiploid with chromosome number  $2n = 78$  is induced.

In amphidiploid, the manifestation of 26 contrasting signs of the wild species *G.trilobum* and cultural *G.hirsutum* L. has been studied. Amphidiploid has polyploid capacity, fertility, natural leaf fall, disease resistance and can be used in breeding.

When studying hybrid progeny (*G.hirsutum* x *G.herbaceum*) x *G.harknessii*, H. Babamuratov [2] was able to identify individual genotypes with the high combinational value for the weight of one boll, yield and fiber length.

S.M. Rizayeva [8, 9, 10] obtained numerous unique amphidiploid and hexaploid forms with high economically valuable traits based on intergenomic hybridization of the remote cotton species.

Part of the germinated seeds of the triploid ( $2n = 39$ )  $F_0$  hybrids with the well developed roots of 0,5 cm were picked and laid out in Petri dishes on filter paper moistened with a 1% aqueous solution of the colchicine with an exposure of 24 hours. Then the seedlings were rinsed several times with the running water to remove traces of colchicine.

After that, both control and colchicine seedlings were planted in earth-sand paper cups. In the period of 2-3 true leaves of the plant were transplanted into Wagner's vessels and grown in greenhouse conditions. Plant care, phenological observations and description of morphobiological and economically valuable traits were carried out according to the generally accepted methods [3].

#### MATERIALS AND METHODS

The initial material for the research was  $F_1$  hybrids obtained by interspecific and intraspecific hybridization of the vicar species *G.herbaceum* L. and *G.arboreum* L.: *G.arboreum* subsp. *perenne* x *G.arboreum* subsp. *obtusifolium* var. *indicum*; *G.arboreum* subsp. *obtusifolium* var. *indicum* x *G.herbaceum* subsp. *pseudoarboreum*, as well as the regionalized variety Kelajak (*G.hirsutum* subsp. *euhirsutum*).

#### RESULTS

Below is a brief description of the amphidiploids  $F_1$  by morpho-biological and economically valuable traits, obtained as a result of the research conducted on the creation of valuable forms using the varieties of the cotton.

$F_1$  (*G.arboreum* subsp. *perenne* x *G.arboreum* subsp. *obtusifolium* var. *indicum*). Bush upright, compact, medium density. The height of the main stem is 50,0-55,0 cm, green; pubescence and anthocyan tan are average, the number of common nodes is 20-25 pcs. The branch is sympodial, the first sympodial branch is at 7-8 nodes, the number of monopodiae is 3-2 pcs., The number of sympodia is 13-17 pcs. The leaf is medium (9,5 x 9,0 cm), green, five to seven separate, slightly pubescent. Nectary is not available. The length of the leaf stalks is 7,0-8,0 cm, with a weakly anthocyanin tan. With the short pedicle, 0,5-0,6 cm. Petal medium, 5,0 x 4,5 cm, heart-shaped, with 8-10 teeth, with a light yellow color, with an anthocyanin stain at the base. Anthers and pollen are light yellow. The boll is small, cone-shaped with a sharp nose, with a non-smooth surface, the weight of one boll is 2,2-2,4 g, four-fold, with 5-6 seeds in each nest. The seeds are small, stony, the weight of 1000 seeds is 66,0-69,0 g. White fiber, short, 24,0-26,1 mm. Not photoperiodic, in the conditions of a short day, the first fertile branches are laid on 7-8 nodes. Symptodial branches of type I. Mid-season.

$F_1$  (*G.arboreum* subsp. *obtusifolium* var. *indicum* x *G.herbaceum* subsp. *pseudoarboreum*). Bush compact, sredneopushenny, with a strong anthocyanin-tan. The branching is sympodial, the number of monopodia is 8-10, the sympodium is average. The height of the stem

is 75,0-80,0 cm, the number of common nodes is 35-38 pcs. The leaf is light green, medium, 10,5 x 10,5 cm, 5-7 split, slightly pubescent. Nectary is not available. The length of leaf stalks is 7,0-7,5 cm, with medium anthocyan tan. The flower is medium, with a short pedicel, 3,5 cm. The petal is medium, 5,4 x 4,5 cm, heart-shaped, with 8-9 teeth, with a yellow color, with an anthocyanin stain at the base. Anthers and pollen are light yellow. The stigma protrudes 0,2 cm above the stamina. The boll is small, oval, with a sharp nose, with a smooth surface, the weight of one boll is 2,0-2,2 g, 3-4-fold, with 4-5 seeds each nest. Seeds are small, weight is 1000 seeds - 54,0-56,0 g. White fiber, short, 24,5-26,0 mm. Not photoperiodic, in conditions of a short day, the first fertile branches are laid on 12-14 nodes. Sympodial branches, I-II type. Mid-season.

Cultivar «Kelajak» (*G.hirsutum* subsp. *euhiirsutum*). Spreading bush. The branch is sympodial, the number of monopodia is 1-2 pcs., The sympodium is short, weak. The height of the stem is 90-100 cm. The leaf is light green, medium, 11,0 x 10,0 cm, 3-5 - palmate, slightly pubescent. Nectary one. The length of the leaf stalks is 9,0-9,5 cm, with medium anthocyan tan. The flower is medium, with short pedicel, 1,5-2,0 cm. The petal is medium, 4,5 x 3,5 cm, heart-shaped, with 10-11 teeth, with a white color, there is no anthocyanin stain. Anthers and white pollen. The stigma protrudes 0,3 cm above the stamina. The boll is average, oval, the weight of one boll is 5,5-6,5 g, 4-5-fold, with 9-10 seeds in each nest. The seeds are small, the weight of 1000 seeds is 118,0-123,0 g. White fiber, short, 33,0-38,0 mm. Not photoperiodic, resistant to drought, salt and pests, the first fertile branches are laid on the 4-5 nodes. Simpodial branches of type II. Early.

F<sub>1</sub> (cultivar «Kelajak» (*G.hirsutum* subsp. *euhiirsutum*) x (*G.arboreum* subsp. *perenne* x *G.arboreum* subsp. *obtusifolium* var. *indicum*)). Bush compact, slightly pubescent, with a medium anthocyanin tan. The branch is sympodial. There are no monopods, the sympodium is short, weak. The height of the stem is 55,0 cm, the number of common nodes is 20 pcs. The leaf is light green, medium, 10,0 x 13,0 cm, 3-5-finger-blade, slightly pubescent. Nectarnik- 3, oval, colorless. Leaf with medium anthocyanin tan. The flower is medium, with short pedicel, 0,5-1,0 cm. Petal is medium, 4,0 x 3,8 cm, heart-shaped, with 8-10 teeth, with a light yellow color, there is no anthocyanin stain. Anthers and pollen are light yellow. The stigma protrudes 0,1 cm above the stamina. The boll is average, ovoid, the weight of one boll is 2,3-7,3 g, 4-5-fold. Seeds are average, weight is 1000 seeds - 152,0 g. White fiber, 32,0-38,0 mm. Not photoperiodic, the first fertile branches are laid on the 7 th node. Simpodial branches of type II.

F<sub>1</sub> (cultivar «Kelajak» (*G.hirsutum* subsp. *euhiirsutum*) x (*G.arboreum* subsp. *obtusifolium* var. *indicum* x *G.herbaceum* subsp. *pseudoarboreum*)). Bush compact, slightly pubescent, with an average anthocyanin tan. The branch is sympodial, there are no monopods, the sympodium is short, weak. The height of the stem is 60,0 cm, the number of common nodes is 13 pcs. The leaf is light-green, medium, 14,0 x 17,0 cm, palmate-lobed, slightly pubescent. Nectars- 3, oval, colorless. The color of the nerve node is red. Leaf petioles with medium anthocyanin tan. The flower is medium, with short pedicel, 0,7-1,0 cm, heart-shaped, 10-12 teeth. The boll is average, ovoid, the weight of one boll is 1,2-2,2 g, 4-5-folding. The seeds are small, the weight of 1000 seeds is 140,0 g. The fiber is light brown, medium, 30,0-37,0 mm. Not photoperiodic, the first fertile branches are laid on the 5th node. Simpodial branches of type II.

Thus, as a result of the research, unique forms of the cotton have been created using the vicar species of cotton *G.herbaceum* and *G.arboreum*, which have valuable economic

characteristics that are recommended to be used in further research programs and the selection process as a initial material.

### CONCLUSIONS

Consequently, the preservation, study, enrichment and efficiently use of the unique diversity of the genetic resources of the cotton genus *Gossypium* L. in the national economy is important. This valuable genetic fund is the basis of the basic and applied research, as well as the basis for the creation of new high-yielding and high-quality cotton varieties resistant to biotic and abiotic environmental factors that meet the needs of the national economy and are competitive in the global market.

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