

Ways of Developing Plants in Interspecific Hybridization of Cotton

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It is known, that there are various barriers to fertilization, development of embryos, and endosperm because of different number of chromosomes in parents in the interspecific hybridization of cotton. Thus the factors providing normal cell fission of a germ and endosperm are necessary. It is necessary to culture embryos in vitro on the artificial environments containing various phytohormones, or to treat buds after pollination with exogenous phytohormones. Wild forms of *Gossypium* are divided into six genomic groups. Therefore early problems are observed in hybridization of *G. hirsutum* with representatives of the other genomic groups that infringe on embryogenesis. Barriers to interspecific hybridization of cotton also can be observed in embryogenesis, i. e. at penetration of sperm to the ovule and the central cell and the absence of normal fusion. Even in normal fusion of the sperm with the ovule and the central cell the impregnated cells sometimes will not develop. In homologous chromosomes, received in merge of gametes of various kinds, probably, synchronization in functioning is broken, that breaks an induction of primary division of ovule and the central cell. The disturbed process of cell division can be restored, using exogenous regulators. We investigated the influence of exogenous phytohormones in various concentrations on development of embryos in interspecific hybridization. It appears that exogenous phytohormones (gibberellic acid) promote the further development impregnated seed buds in vivo in hybridization. In separate combinations of hybrids, seeds appear. Hence, exogenous phytohormones can participate in regulation of division of zygotic cells and endosperm. This process increases the chance to obtain triploid seeds in cross combinations of *G. hirsutum* × *G. raimondii*, *G. hirsutum* × *G. thurberi*, *G. hirsutum* × *G. sturtii*, *G. hirsutum* × *G. davidsonii*. In other combinations, treatment of phytohormones in vivo the unripe germs differentiated only axial bodies (*G. hirsutum* × *G. bickii*, *G. hirsutum* × *G. klotzschianum*, *G. hirsutum* × *G. anomalum*) were developed. Here the differentiation of germs was accompanied by normal fusion of sperm with the ovule, but formation of endosperm was not observed, because of the further development of a germ were stopped. It is known by the nature of immature embryos of cotton that their growth is based on a nutrient medium without phytohormones. In the environments with high concentration of macrocells and saccharoses they also do not grow. In the environment offered by us germs in all combinations of crossing passed the path of growth. In nature of germs the degree of differentiation is important. Only in the case of embryos differentiated with cotyledonous leaves and radices do normal hybrid seedlings develop. In hybridization of *G. arboreum* × *G. hirsutum*, *G. herbaceum* × *G. hirsutum*, *G. arboreum* × *G. barbadense*, *G. herbaceum* × *G. barbadense* by means of cultivation of 3-6-days impregnated seed buds, with the subsequent isolation and *G. arboreum* × *G. barbadense*, *G. herbaceum* × *G. barbadense* by means of cultivation of 3-6-days fertilized seed buds, with the subsequent isolation and cultivation of unripe germs in vitro, adult plants have been received.