

Streszczenie w języku angielskim i słowa kluczowe

In view of the steadily declining population of *Iris aphylla* L. in the Lublin region and Poland, and the classification of this species to the rank of vulnerable to extinction, an analysis of the reasons for this state was undertaken. In order to solve the research problem posed, the flowering biology of *I. aphylla* was traced, taking into account phenological periods, the role of visiting insects was determined, and the micromorphological features of the flowers were described. Pollination and fertilization in flowers as well as fruiting were analyzed, taking into account the biomechanical features of seeds and seed capsule. The study of phytohormones contained in the endosperm was performed and their role in breaking the physiological dormancy of *I. aphylla* seeds was determined.

Analysis of the results showed that no abnormalities in the generative reproduction of *Iris* were recorded. The pollen grain consisted of 3 cells: a vegetative cell and 2 sperm cells, and the tests conducted to assess their viability were within 58-69%. The megagametophyte in *I. aphylla* developed according to the Polygonum type. The long-term persistence of antipods and filamentous apparatus in the embryo sac was documented, which complements previous data on the persistence and presence of this structure in representatives of the genus *Iris*. The rate of germination, growth of the pollen tube and the various stages of the double fertilization process were described. The description of the structures involved in the process of double fertilization and the rate of embryo development in *I. aphylla* were described in my work for the first time.

Endosperm *Iris* seeds with a high viability rate of 72% failed to germinate despite the application of all ISTA-recommended pre-sowing treatments. Positive results were obtained by isolating the embryos from the seeds and placing them on a medium *in vitro*. After 2 weeks of the experiment, all embryos developed into young plants.

Based on the obtained results, it can be concluded that the reason for the limited germination of *Iris* seeds is related to the arrangement of hormonal profiles in the endosperm, especially the ratio of abscisic acid and gibberellins. Moreover, an additional endogenous inhibitor of *I. aphylla* seed germination is the high accumulation of salicylic acid. Therefore, isolation of embryos from seeds and further *in vitro* culture is the most effective method of propagating *I. aphylla*.

Keywords: *Iris aphylla*, flowering biology, seeds, germination, *in vitro*