

Plant Biotechnology in Protection of Polish Flora

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Polish Flora includes about 2750 species growing in various environmental conditions. Their protection is described by Polish law and regulations of various international conventions. More than five hundred species are named on the list of endangered, threatened and protected plants. The reasons of decreasing of the number of the plant species in Polish flora is connected with degradation of environmental conditions or their natural decline. Tissue culture methods and biotechnology could serve as the tool for plant species protection in various aspects, however the most important are: *in vitro* vegetative propagation and protection of morphogenic potential of cultured cells, tissues and organs. The aim of presentation is to give the overview of tissue culture and biotechnology involvement in the Polish flora protection.

According to the taxonomical position of studied species, the tissue culture and biotechnological methods were involved in particular species protection. It is necessary to stress that some of species belonging to *Spermatophyta* appeared the model plants for studies of somatic embryogenesis for example gentians and others like *Tacus bacata* are the objective of studies with the employing transformation and phytochemical analysis of secondary metabolites produced in fermentors. Below, the different examples of various levels of biotechnology engagement of plant protection will be presented according to the taxonomical order.

In case of protected moss *Polytrichum commune* callus induction and gametophytes regeneration was studied. Cultures were initiated by sowing of the spores, from which protonema was developed. For vegetative propagation of the species callus and various elements of gametophytes were used. The best results of vegetative propagation were achieved when Knudson medium was employed.

The ferns represent not uniform group of plants with high polyploidy level and hybrid forms. Some of them, which are evergreen and grow in crevices of poor serpentine rocks, belong to *Asplenium* genera. Their gene bank has been developed with the help of collection and germination of spores on the relatively poor culture medium. After few months spores usually germinated giving rise filamentous gametophytes and seventeen months later sporophytes were achieved.

Among monocotyledonous plant the representatives of *Liliaceae* family are often included in the list of protected species, like: *Colchicum autumnale*, *Lilium martagon* or *Fitillaria meleagris*. The *Liliaceae* family proved the high morphogenetical potential in various systems of plant regeneration. Adventitious bud formation appeared to be the most effective system of vegetative propagation. Such type of culture was initiated by the bud scales or their fragments and developed with the help of liquid media. Various plant growth regulators were employed depending on the studied species what resulted in various affectivity of vegetative propagation.

Dicotyledonous plants dominate the Polish flora and the list of endangered species is in majority filled in by them. Since 1994 in our laboratory some species, including those protected by law of *Gentiana* genera have been selected for experiments concerning plant vegetative propagation. Discovered morphogenic potential of various explants originated from different stages of plant development resulted in creation of model plant regeneration system initiated by the single cell and its protoplasts. In the base of this plant regeneration system somatic embryogenesis was laid down. Multidisciplinary studies of this phenomena were undertaken to improve high morphogenetical potential of this group of plants.