**BIOTECHNOLOGY OF CALLUS BIOMASS OF PLANTS AS AN ALTERNATIVE METHOD FOR THE PRODUCTION OF PLANT RAW MATERIAL**

Petrina Romana, Khomiyak Semen, Krvavych Anna, Lupiy Khrystyna,

Ilkiv Bohdan-Volodymyr, Konechna Roksolana, Hamada Vira, Novikov Volodymyr

*Lviv Polytechnic National University, Department of Technology of Biologically Active Substances, Pharmacy and Biotechnology, Lviv, Ukraine*

Medicinal plants are an important raw material base for drugs of traditional systems of medicine, modern medicines, nutraceuticals, food supplements, folk medicines, pharmaceutical intermediates and chemical entities for synthetic drugs, because they contain many biologically active compounds, some of which cannot be obtained by chemical synthesis. To preserve the natural reserves of plants, especially plants that are rare, on the verge of extinction or listed in the Red Book, and to provide quality, environmentally friendly plant materials, the biotechnological method of growing in vitro is used. The method has many advantages; biomass is obtained irrespective of weather and season, in large quantities, it does not contain toxic substances and contains biologically active compounds present in the parent plant.

The aim of the work is to obtain the callus biomass of some family plants *Asteraceae* and *Ranunculaceae* (*Arnica montana, Calendula officinalis, Stevia rebaudiana,* *Caltha palustris, Adonis vernalis, Delphinium elatum*) and identification of biologically active substances in them. Callus biomass of *Arnica montana, Calendula officinalis, Stevia rebaudiana,* *Caltha palustris, Adonis vernalis, Delphinium elatum* in medium Murasige-Skuga were obtained and impact on growth callus biomas of temperature (15оС and 23оС), illumination (darkness and illumination 2000 lux) and the concentration of phytohormones in the medium were investigated. Phytohormones β-indolylacetic acid (IAA), α-naphthylacetic acid (NAA), benzylaminopurne (BAP), 2,4-dychlorphenoxyacetic acid (2,4-D) and kinetin (K) were used. The best growth indicators for *Adonis vernalis* when added to the environment ІАА, НАА and K in a concentration of 2,0 мг/л, 1,0 mg/l, 0,1 mg/l respectively; for *Arnica montana* and *Caltha palustris* - IAA, NAA, кінетин - 2,0 mg/l, 0,1 mg/l, 0,5 mg/l respectively; for *Calendula officinalis -* 2,4-D, NAA, K - 2,0 mg/l, 0,2 mg/l, 0,2 mg/l respectively*;* for *Stevia rebaudiana -* NAA, 2,4-D, K - 0,5 mg/l, 0,5 mg/l, 1,0 mg/l respectively; for *Delphinium elatum* - ІАА, NAA, кінетин, BAP, 2,4-D - 2,0 mg/l, 0,5 mg/l, 0,5 mg/l, 1,0 mg/l, 1 mg/l respectively. Duration of cultivation was up to 50 days, obtained from 10.8 to 23.5 g/l of dry weight. All experiments were carried out 3 times and the results were processed statistically.

Water and water-ethanol extracts of callus biomass were obtained and qualitative and quantitative reactions on presence of amino acids, glycosides, flavonoids, common phenols, alkaloids were determinated. For qualitative identification - qualitative colour reactions are used, for quantitative identefication - spectral photometric methods and TLC. Phytochemical studies of callus biomass of *Arnica montana, Calendula officinalis, Caltha palustris, Stevia rebaudiana,* *Adonis vernalis, Delphinium elatum* confirm the presence of phenolic compounds, amino acids, flavonoids and other, identical to biologically active substances in the parent plants. So in the long run callus biomass of investigated plants can replace the natural sources of medical plants.