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RESTORATION AND SUSTAINABLE USE OF MEDICINAL PLANTS WITH BIODIVERSITY CONSERVATION: MODELS FOR SUSTAINABLE HARVESTING AND CULTIVATION

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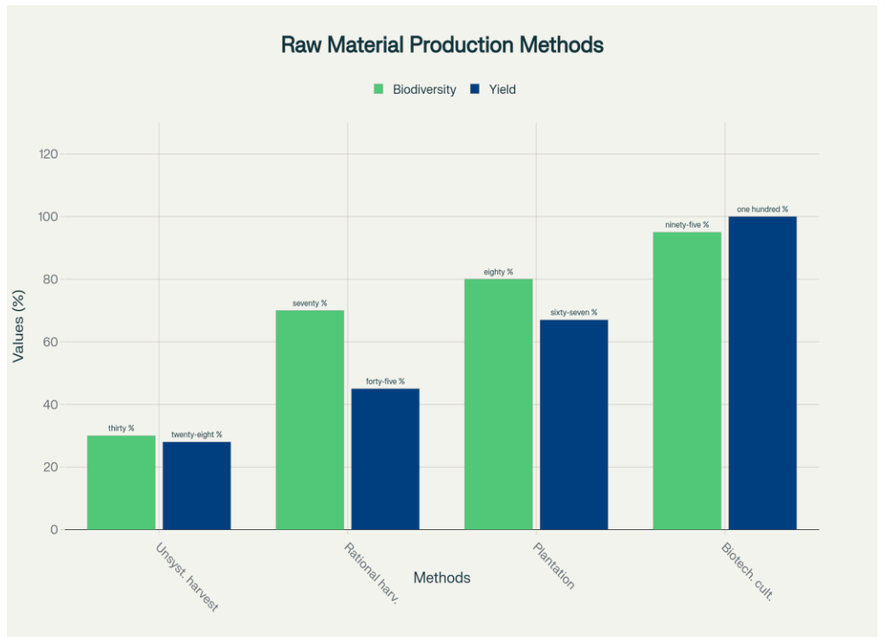
Introduction. In the face of depleting natural resources and increasing demand for medicinal plants, the development of effective methods for their restoration and sustainable use is becoming critically important. The relevance is driven by the need to preserve biodiversity, promote environmentally sound agriculture, and ensure the pharmaceutical industry has access to high-quality raw materials. The article examines models for rational harvesting, cultivation, conservation of medicinal plants, and the creation of gene banks.

The goal of the work is to identify and justify modern approaches to the restoration and sustainable use of medicinal plants, taking into account biodiversity conservation.



Research Objectives.

- Analyze models of sustainable harvesting of medicinal plants;
- Study cultivation methods and the creation of gene banks as tools for species conservation;
- Evaluate the effectiveness of biotechnological methods for the reproduction of medicinal plants;
- Investigate the pharmacological potential of wild species.

Materials and methods.

Analysis of scientific publications in the RSCI and Scopus databases, using critical literature analysis and data systematization. The use of biotechnological in vitro cultivation methods, and the study of the functionality of gene banks.

Biotechnology in pharmaceutical production

Advantage	Description
Higher quality control	Homogeneous material free of pathogens
Reduced environmental impact	No harvesting of wild plants
High production efficiency	Microclonal propagation and cell culture
Possibility to obtain rare species	Propagation of rare and endangered species
Increased yield of active substances	Content of active substances up to 50–70%

Conclusion.

1. Rational harvesting reduces the negative impact on wild populations by up to 70% compared to unsystematic harvesting.
2. The use of cultivation technologies and gene banks contributes to the conservation of genetic diversity and reduces anthropogenic pressure.
3. Biotechnological methods ensure the production of high-quality raw materials and enhance the production and quality of medicinal plant preparations.
4. Wild plants of the Sochi Black Sea region demonstrate high pharmacological potential, including antibacterial activity up to 90%.