# Project summary

The main objectives of the project "Investigation on medicinal potential of plants: morphological, chemical and pharmacological characterization" are the research of genetic, metabolic and morphological diversity, mainly of plant species represented in the flora of the Balkan Peninsula. Such research is working in order to examine different levels of diversity in natural populations of known and confirmed medicinal and aromatic plants, their biological history, today's distribution and insights into presumed phylogenetic connections. In addition, a similar approach would be apply to the study of under-studied and less well-known herbs in order for fully understand and justification of their application. It also can be apply to the study of rare, endemic and endangered species in order to examine their medicinal potential and possibilities of rational and sustainable use. The methodology of this research involves the use of different molecular markers (nuclear and plastid genome), determination profile of metabolites, pharmacological screening and methods of micro and macro-morphology. This kind of research can bring the data about polymorphism and about regulatory adaptation mechanisms in natural populations and give the possibilities for consideration of the connection of these phenomena with the production of certain secondary metabolites and the intensity of pharmacological activity. Considering diversity also has practical significance in creating the basis for selection directed towards the plants of the desired characteristics, but also for taking measures of monitoring and protection of the wild growing populations. Chemical and pharmacological research can lead to the definition of activity, the connection between the chemical structure / activity and the potential proposal for therapeutic application. This can be the basis for the development of the technology for the production of pharmaceutically active substances, new biological materials and drugs for the application in the prevention and treatment of certain conditions and diseases, and based on this, represent a segment of the possibilities for strategic development of Serbia.

## Keywords: Balkan Peninsula; Traditional medicinal and aromatic plants; Rare and endemic plant species; Genetic, morphological, chemical and pharmacological diversity, Possibilities of use

# Sažetak projekta

Suštinski ciljevi projekta “Ispitivanje lekovitog potencija biljaka: morfološka, hemijska I farmakološka karakterizacija” jesu istraživanje genetičke, metaboličke i morfološke raznovrsnosti, uglavnom, biljnih vrsta zastupljenih u flori Balkanskog poluostrva. Ovakva istraživanja rade se u cilju sagledavanja različitih nivoa diverziteta u prirodnim populacijama poznatih i potvrđenih lekovitih i aromatičnih biljaka, njihove biološke istorije, današnje distribucije i uvida u pretpostavljene filogenetske veze. Sličan pristup se primenjuje i za istraživanje nedovoljno proučenih i manje poznatih lekovitih biljaka u cilju potpunijeg sagledavanja opravdanosti njihove primene. Takođe, koristi se i za proučavanje retkih, endemičnih i ugroženih vrste radi sagledavanje njihovog lekovitog potencijala, mogućnosti racionalnog i održivog korišćenja. Metodologija ovakvih istraživanja obuhvata upotrebu različitih molekularnih markera (genoma jedra i plastida), određivanje profila metabolita, farmakološki skrining i metode mikro i makromorfologije. Ispitivanje omogućava otkrivanje polimorfizma i regulatornih mehanizama adaptacije u prirodnim populacijama i sagledavanje povezanosti ovih fenomena sa produkcijom određenih sekundarnih metabolita i intenzitetom farmakološke aktivnosti. Sagledavanje diverziteta ima i praktični značaj u stvaranju osnove za selekciju usmerenu ka biljkama željenih karakteristika, ali i za preuzimanje mera monitoringa i zaštite samoniklih populacija. Hemijska i farmakološka istraživanja mogu dovesti do definisanja aktivnosti, povezanosti hemijska struktura/aktivnost i potencijalnog predloga terapijske primene. To može biti osnov za razvoj tehnologije proizvodnje farmaceutski aktivnih supstanci, novih bioloških materijala i lekova za primenu u prevenciji i terapiji određenih stanja i oboljenja, a na osnovu svega ovog predstavlja jedan segment I mogućnost za strateški razvoj Srbije.

## Ključne reči: Balkansko poluostrvo; Tradiconalne lekovite i aromatične biljne vrste; Retke i endemične biljne vrste; Genetički, morfološki, hemijski i farmakološki diverzitet, Mogućnosti korišćenja.