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HERBA CITRALNOG HEMOTIPA PANONSKOG TIMIJANA KAO POTENCIJALNO NOVA BILJNA LEKOVITA SIROVINA

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Panonski timijan (Thymus pannonicus All. Lamiaceae) je rasprostranjen u srednjoj i istočnoj Evropi na sušnim livadama i kamenjarima. U Srbiji raste pretežno u Vojvodini. Literaturni podaci ukazuju na značajne razlike u sastavu etarskog ulja samoniklog panonskog timijana. Potvrđeno je postojanje hemotipova; npr. timolnog i citralnog. Stabilna populacija citralnog hemotipa locirana je u Srbiji samo na Vršačkim planinama. Herba ovog hemotipa se, u južnom Banatu, koristi za pripremanje čajnog napitka specifičnog i prijatnog mirisa koji podseća na limun, ali i protiv nekih respiratornih i digestivnih oboljenja. Ovo je bio i osnov za detaljnije ispitivanje ove biljne vrste sa područja Vršačkih planina.

Hromatografskom analizom (GC FID/MS; HPLC), ispitivana je polimorfnost samoniklih populacija citralnog hemotipa panonskog timijana i procenjivan uticaj ekoloških faktora na njihove morfološke, anatomske i hemijske karakteristike. Testirana je antimikrobna, antioksidantna, antitumorska i hepatoprotekivna aktivnost. Izvedeni su ogledi planskog gajenja i odabrane linije sa poželjnim osobinama. Utvrđeni su parametri kvaliteta herbe panonskog timijana, kao nove biljne sirovine.

Rezultati ukazuju da se panonski timijan sa Vršačkih planina može smatrati dobrim izvorom biljne sirovine bogate citralom. Najvažniji sastojci polarnih ekstrakata herbe samoniklog panonskog timijana bile su fenolske kiseline (rozmarinska, salvianolna) i flavonoidi (glukuronidi luteolina i apigenina). Vodeni ekstrakt je ispoljio umereni antioksidantni efekat in vivo, uz značajno smanjenje intenziteta lipidne peroksidacije i održavanje fizioloških koncentracija glutationa. Prema ćelijama Erlihovog ascitnog tumora kod miša, vodeni ekstrakt je delovao citotoksično, ispoljivši prooksidantni efekat kojim je indukovana apoptoza. Uočena je značajna antimikrobna aktivnost prema testiranim mikroorganizmima, a naročito prema Candida albicans. Etarsko ulje i metanolni ekstrakt ispoljili su izuzetnu inhibitornu aktivnost prema kliničkim izolatima Helicobacter pylori rezistentnim na metronidazol i klaritromicin. Oplemenjivanjem, dobijena je sorta željenih tehnoloških svojstava koja daje veći prinos biljne mase, veći i stabilniji sadržaj etarskog ulja u odnosu na samoniklu biljku.

Citralni hemotip panonskog timijana se pokazao kao izdašan biološki izvor droge Thymi pannonici herba. Zahvaljujući visokom sadržaju polifenolnih jedinjenja i etarskog ulja bogatog citralom, kao i ispoljenoj antioksidantnoj, antimikrobnoj i antitumorskoj aktivnosti, ona predstavlja potencijalno novu biljnu lekovitu sirovinu, koja bi se mogla primenjivati u savremenoj fitoterapiji.

Istraživanje je podržalo Ministarstvo prosvete, nauke i tehnološkog razvoja (Projekat TR 31089 I ON 173021).

THE HERB OF PANNONIAN THYME CITRAL CHEMOTYPE AS POTENTIALLY NEW HERBAL RAW MATERIAL WITH MEDICINAL PROPERTIES

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Panonian thyme (Thymus pannonicus All. Lamiaceae) is distributed in central and eastern Europe, over dry meadows, grasslands and rocks. In Serbia, it can be found mostly in Vojvodina province. Reference data reveals high variability in the composition of wild-growing pannonian thyme. A number of chemotypes (e.g. thymol and citral) were confirmed. In Serbia, a stable population of citral chemotype has been found at Mt. Vršačke planine only. In southern Banat, dried herb of this chemotype is used to make tasty and refreshing herbal teas with peculiar and pleasant lemon-like scent; also, against some respiratory and gastrointestinal disorders. This provided the ground for further and detailed investigations on this plant species from Mt. Vršačke planine.

By chromatographic analysis (GC FID/MS; HPLC), polymorphism within wild populations of this species was studied, as well as dominant ecological factors that influenced their morphologic, anatomic and chemical properties. Antimicrobial, antioxidant, antitumour and hepatoprotective activity were also tested. Planned cultivation was attempted and lines with desirable traits were chosen. Parameters of quality for pannonian thyme herb as a new herbal raw material were defined.

The results indicate that pannonian thyme from Mt. Vršačke planine could be considered as a pleniful source of herbal raw material rich in citral. Principal constituents of polar extracts of wild growing pannonian thyme were phenolic acids (rosmarinic, salvianolic) and flavonoids (luteolin and apigenin glucuronides). Aqueous extract expressed moderate antioxidant effect in vivo, along with a significant decrease of lipid peroxidation intensity and preservation of physiological levels of glutathione. Against Ehrlich ascites tumor cells in mice, aqueous extract expressed significant cytotoxic activity, through prooxidant effect that induced apoptosis. Significant antimicrobial activity against tested microorganisms was observed; in particular, against Candida albicans. Essential oil and methanolic extract expressed remarkable inhibitory activity against clinical strains of Helicobacter pylori resistant to metronidazol and claritromycine. Finally, a variety with desired technological characteristics was bred, yielding superior biomass quantity, as well as higher and more stabile essential oil contents in comparison to wild-growing plants.

Pannonian thyme citral chemotype appeared to be a plentiful biological source of herbal substance Thymi pannonici herba. Owing to high contents of polyphenols and essential oil rich in citral, as well as to expressed antioxidant, antimicrobial and antitumor activity, it is a potentially new herbal raw material that could be used in contemporary phytotherapy.

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