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CHEMICAL COMPOSITION AND ANTI-DPPH ACTIVITY OF ESSENTIAL OIL OBTAINED FROM COMMERCIAL SAMPLE OF CRETAN DITTANY HERB, *ORIGANI DICTAMNI HERBA*

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Cretan dittany, *Origanum dictamnus* L. (Lamiaceae), is an endemic species from the Greek island of Crete. The Committee on Herbal Medicinal Products of the European Medicines Agency (EMA/HMPC) adopted EU monograph on traditional use of Cretan dittany herb, *Origani dictamni herba*. According to this monograph, comminuted herb is used orally as herbal tea (infusion) for the relief of cough associated with cold and for mild gastrointestinal disorders, as well as cutaneously as infusion or decoction for the treatment of minor skin inflammations and bruises. European Pharmacopoeia (Ph. Eur.) monographs for this herbal drug and its essential oil do not exist for now.

The aim of this work was to investigate chemical composition of the essential oil obtained from a commercial sample of Cretan dittany herb and to evaluate its antiradical activity.

The essential oil was isolated from the herb by hydrodistillation in a Clevenger-type apparatus, according to procedure given in Ph. Eur. The yield was 1.51% *V/w*, i.e. 1.46% *w/w*. Chemical composition of the essential oil was analyzed by gas chromatography with FID and MS detection (GC-FID and GC-MS). A total of 42 components were identified, comprising 94.6% of the composition of the essential oil. The dominant were oxygenated monoterpenes (58.8%; 9 compounds), followed by monoterpene hydrocarbons (27.4%; 12 compounds), sesquiterpene hydrocarbons (5.6%; 12 compounds) and oxygenated sesquiterpenes (2.3%; 6 compounds). The main component of the essential oil was monoterpene phenol carvacrol (51.4%), followed by monoterpene hydrocarbons *p*-cymene (14.3%) and *γ*-terpinene (9.3%). Obtained results were in accordance with the literature data; it should be noted that in the case of the sample analyzed in this work, the essential oil yield was higher than previously published values (1, 2).

The antiradical activity of the essential oil was investigated by spectrophotometric DPPH test. The percentage of antiradical activity increased linearly with the increase of essential oil concentration. The concentration at which the essential oil inhibited 50% DPPH radicals (SC_{50}) was 141.77 μg/mL. Significant anti-DPPH potential of the essential oil of Cretan dittany herb can be at least partly explained by the presence of high quantity of carvacrol, which antiradical potential was demonstrated previously (3).

The results of performed chemical investigations may be important for defining pharmaceutical quality parameters of the herbal drug *Origani dictamni herba* and its essential oil in the future.

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HEMIJSKI SASTAV I ANTI-DPPH AKTIVNOST ETARSKOG ULJA KOMERCIJALNOG UZORKA HERBE KRITSKOG ORIGANA, *ORIGANI DICTAMNI HERBA*

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Kritski origano, *Origanum dictamnus* L. (Lamiaceae), je endemična biljka grčkog ostrva Krit. Komitet za biljne lekovite proizvode Evropske agencije za lekove (*EMA/HMPC*) izdao je EU monografiju za tradicionalnu primenu herbe kritskog origana, *Origani dictamni herba*. Prema ovoj monografiji usitnjena herba se koristi oralno u obliku čaja (infuza) za ublažavanje kašlja povezanog sa prehladom i za simptomatsko ublažavanje blagog gastrointestinalnog diskomfora, kao i dermalno u obliku infuza ili dekokta za tretman manjih inflamacija kože i modrica. U Evropskoj farmakopeji (Ph. Eur.) za sada ne postoje monografije za ovu biljnu drogu i njeno etarsko ulje.

Cilj ovog rada bio je ispitivanje hemijskog sastava etarskog ulja izolovanog iz komercijalnog uzorka herbe kritskog origana poreklom iz Grčke, kao i procena njegove antiradikalske aktivnosti.

Etarsko ulje je izolovano iz herbe destilacijom vodenom parom u aparaturi po *Clevenger*-u, prema postupku Ph. Eur. Prinos etarskog ulja iznosio je 1,51% *V/m*, tj. 1,46% *m/m*. Hemijski sastav etarskog ulja analiziran je gasnom hromatografijom sa FID i MS detekcijom (GC-FID i GC-MS). Identifikovane su 42 komponente, koje su činile 94,6% sastava etarskog ulja. Procentualno najveći udeo u etarskom ulju činili su oksidovani monoterpeni (58,8%; 9 jedinjenja), a sledili su monoterpenski ugljovodonici (27,4%; 12 jedinjenja), seskviterpenski ugljovodonici (5,6%; 12 jedinjenja) i oksidovani seskviterpeni (2,3%; 6 jedinjenja). Glavna komponenta etarskog ulja bio je monoterpenski fenol karvakrol (51,4%), dok su po količini sledili monoterpenski ugljovodonici *p*-cimen (14,3%) i *γ*-terpinen (9,3%). Dobijeni rezultati bili su u skladu sa literaturnim podacima, pri čemu je u slučaju uzorka analiziranog u ovom radu, prinos etarskog ulja bio veći od prethodno publikovanih vrednosti (1, 2).

Antiradikalska aktivnost izolovanog etarskog ulja ispitana je spektrofotometrijskim DPPH testom. Stepen antiradikalske aktivnosti je rastao linearno sa povećanjem koncentracije etarskog ulja, pri čemu je koncentracija u kojoj je etarsko ulje inhibiralo 50% DPPH radikala (SC_{50}) iznosila 141,77 μg/mL. Značajan anti-DPPH potencijal etarskog ulja herbe kritskog origana može se barem delom objasniti velikim udelom karvakrola, čiji je antiradikalski potencijal ranije pokazan (3).

Rezultati sprovedenih hemijskih ispitivanja mogu biti od značaja za buduće definisanje parametara farmaceutskog kvaliteta droge *Origani dictamni herba* i njenog etarskog ulja.

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