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COMPARISON OF SECONDARY METABOLITES OF TWO MULLEIN SPECIES

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Mullein flower, leaf, and root are used in the traditional medicine of different countries to treat numerous disorders (1, 2). Various pharmacological properties have been proven in several *Verbascum* species: anti-inflammatory, antioxidant, antimicrobial, antiviral, antitussive, etc. Previous phytochemical studies revealed the presence of different classes of secondary metabolites, such as iridoids, phenylethanoid glycosides, flavonoids, saponins, etc. (1). The present study aimed to identify and compare the constituents of ethanol extracts of *Verbascum phlomoides* and *V. speciosum* flowers and leaves. The plant material was collected in the vicinity of Bosilegrad, and the extracts were prepared by percolation. RP-HPLC coupled with DAD detection was employed for detection and quantification. Identification of all components was performed using standards, and chromatograms were recorded under the same conditions. The results are presented in mg/g of dry extract. All samples had a high content of phenylethanoid glycoside verbascoside (1.46 - 43.49), a significant amount of iridoids aucubin (18.82 - 101.13) and catalpol (26.48 - 59.13), flavonoids, and phenolic acids. Some flavonoids and phenolic acids were present in both species and plant organs, while others were reserved for leaves/flowers or one of the examined species i.e. leaf extract of *V. speciosum* contained luteolin-7-*O*-glucoside (8.27); leaf extract of *V. phlomoides* chrysoeriol (0.22); flower extract of *V. phlomoides* cinnamic acid (9.87); and flower extract of *V. speciosum* apigenin (0.84). In conclusion, these extracts are rich in secondary metabolites, and further studies of pharmacological activities and new potential applications are needed.

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OPTIMIZATION OF REVERSED-PHASE CONDITIONS FOR SEPARATION OF SEROTONIN RECEPTOR LIGANDS IN LIQUID CHROMATOGRAPHY

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The serotonin receptor ligands, such as structurally related arylpiperazine and benzothiazepine derivatives, are most commonly used in the treatment of schizophrenia, depression, and manic disorders. (1). Due to emphasized lipophilicity, their retention can be successfully defined under the reversed-phase (RP) chromatographic conditions. Using the experimental design methodology (2), the retention of selected serotonin receptor ligands (aripiprazole, ziprasidone, risperidone, olanzapine, quetiapine, mirtazapine) was tested on RP stationary phases, in order to define differences in their retention mechanisms and ensure the further optimization of separation conditions. The silica modified, C8 and pentafluorophenylpropyl (PFP) columns were used as stationary phases, while the mobile phase was a mixture of acetonitrile and ammonium acetate. The experimental plan was defined according to the central composite design varying the following factors: ammonium acetate concentration (15-25 mM), volume fraction of acetonitrile (40-50% *v*/*v*), and column temperature (20-30°C). The differences between retention on C8 and PFP columns were presented by using the radar plots and principal component analysis. The obtained differences are especially visible in the case of ziprasidone, olanzapine, quetiapine and mirtazapine, which may explain the occurrence of inversions in their elution order. On C8 phase the separation of structurally related arylpiperazine or benzothiazepine derivatives was achieved, while the PFP phase showed more successful applicability in the separation of all tested ligands. The slightly higher values of the selectivity parameter were obtained for 40% of acetonitrile in the mobile phase. In further optimization of the separation conditions, the PFP bonded stationary phase can be successfully applied.

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