Charles Univerzity in Prague, Faculty of Pharmacy in Hradec Králové
Department of Pharmaceutical Botany and Ecology

Degree work term: Pharrnacognostic study of *Alnus spp.*
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Abstract

The degree work *Pharmacognostic study of radix Alnus spp.* consists of theoretical and experimental part. Theoretical part contains botanical characteristic of the three home species of Czech Republic (*Alnus glutinosa*, *Alnus incana*, *Alnus rugosa*), phytochemical review of the compounds of the genus *Alnus* and their biological acivities. Experimental part deals with phytochemical and biological study of the roots of *Alnus glutinosa*.

Dried roots of the black alder (*Alnus glutinosa*) were extracted with Me_2CO-H_2O (7:3). Final extract was chromatographed over test silica gel colum using a MeOH- $CHCl_3$ gradient (0, 1, 2, 4, 8, 16, 32, 100 %). Elution gave 36 fractions. All the separations were analysed by TLC (hexane-EtOAc MeOH, 2:2:1). The sterols were detected in the fraction No. 7 by TLC, melting point and GC-MS. Major present sterols were β-sitosterol, β-sitostanol, minor sterols campestanol, campesterol. Fractions No. 10 and 19 were analysed by HPLC. Antioxidant activity of the fraction No. 19 was measured with DPPH radical and was low (EC_{50} 0.32 mg/mL).

Test silica gel colum experience were used in analysis on silica gel column using a EtOH- $CHCl_3$ gradient elution (0, 1, 2, 4, 8, 16, 32, 50, 100 %). Elution gave 42 fractions. All the separations were analysed by TLC (hexane-EtOAc MeOH, 2:2:1). Fraction No. 6 has interesting retention data and quantity suitable for further study. This fraction was analysed by HPLC with curcumin as an external standard. The head peak of the fraction No. 6 and curcumin had similar retention times (fraction No. 6 Rt = 19.33 min., curcumin Rt = 19.47 min.) and absorption spectrums. Fraction No. 6 was divided by HPLC into 6 subfractions. Subfraction No. 4 (containing compound with retention time 19,33 min.) was sent to identification to the Department of clinical biochemistry of Faculty hospital in Hradec Králové.

Diarylheptanoids weren´t still detected in the roots of *Alnus glutinosa*, so different metod was tested: extraction by diethylether and evaporation by nitrogen. Similar retention data as in fraction No. 6 were detected in the diethylether extract by TLC and HPLC. Antioxidant activity of diethylether extract was measured and compared with trolox and curcumin with FRAP method and DPPH radical. Antioxidant activity of diethylether extract was low, but curcumin confirmed antioxidant activity. This study didn´t show presence of diarylheptanoids in roots of *Alnus glutinosa*.