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# Effect of Medicinal Plant Extracts on Biofilm Formation in *Escherichia Coli* Strains Causing Avian Colibacillosis

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## ABSTRACT

*Avian Pathogenic Escherichia coli* (APEC) strains that cause avian colibacillosis are a serious problem for the poultry industry due to the high mortality rate of birds. Most bacteria in the intestine exist in the form of biofilms, which makes them less sensitive to antimicrobials than planktonic forms and reduces the efficiency of treatment. The use of plant extracts containing various biologically active compounds is a promising method of combating bacterial biofilms. The purpose of this work was to evaluate the effect of aqueous extracts obtained from *Urtica dioica* and *Chamerion angustifolium*, widely used in folk medicine, on biofilm formation of *E. coli*. The study used a non-pathogenic laboratory strain of *E. coli* BW25113 and a pathogenic bird strain APEC L-5876 isolated from birds with colibacillosis. The chemical composition of the extracts was studied by high performance liquid chromatography (HPLC), and the total content of polyphenols and radical binding activity were determined. We found out that pretreatment with aqueous extracts from *U. dioica* and *C. angustifolium* suppressed specific biofilm formation (SBF) in both strains to varying degrees. Extract from *U. dioica* inhibited SBF most effectively in both strains. It was also shown that treatment of mature biofilms with an aqueous extract of *C. angustifolium* for 24 hours contributed to an increase in biofilm density for both strains, while the extract of *U. dioica*, on the contrary, led to partial destruction of biofilms. The results obtained indicate the potential of using aqueous extracts of *U. dioica* and *C. angustifolium* against biofilms formed by *E. coli* strains pathogenic to birds. The study may contribute to the creation of a new strategy for the treatment of avian colibacillosis.

**Keywords:** biofilms, APEC strains, plant extracts

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