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## ANTIBACTERIAL ACTIVITIES OF BEECH BARK (*Fagus sylvatica* L.) POLYPHENOLIC EXTRACT

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### Abstract

The study provides information about separation and identification of natural bioactive compounds from beech (*Fagus sylvatica* L.) bark with potential therapeutic applications such as antibacterial activity against human pathogens. Beech is a common material used in the wood industry, but its bark is separated from the wood and is considered a by-product. In this study, natural compounds with biological activity were obtained from beech bark by hot water extraction. The high-performance liquid chromatography (HPLC) was used to analyze the phenolic compounds in the beech bark extracts. Spectrophotometric methods were employed for the determination of total phenolic content. Microdilution technique was used for testing the antimicrobial activity of the extract. The following strains were tested: *Staphylococcus aureus*, *Methicillin-resistant Staphylococcus aureus*, *Klebsiella pneumoniae*, *Escherichia coli* and *Pseudomonas aeruginosa*. The yield of extracted polyphenols was of 22.952 mg gallic acid/g dry bark. The compounds identified by HPLC were vanilic acid, catechin, taxifolin and syringin. The extracts were active against *Staphylococcus aureus* and *Methicillin-resistant Staphylococcus aureus*. The effect of polyphenolic extract on Gram-negative bacteria was absent at a concentration of 30 mg/mL beech bark extract. Altogether, the use of pure water for extraction of polyphenols from beech bark proved to be an effective eco-friendly method. This method sustains the concept of “green” chemistry by involving the use of renewable plant resources and also by using water as solvent.

**Key words:** antibacterial, beech bark, green biotechnology, biorefinery, polyphenols

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