

**ANTIBACTERIAL ACTIVITY OF KOMBUHA BEVERAGE FROM HYSSOP
(*Hyssopus officinalis* L.) WASTE MATERIAL**

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Kombucha is a fermented tea beverage which is traditionally obtained during fermentation (with consortium of acetic acid bacteria and yeasts - tea fungus) of sweetened black and green tea leaves (*Camellia sinensis* L.). Apart from the traditional ones, kombucha is also grown on alternative substrates, different medicinal and spicy plants. Different types of such plants are grown in large quantities on the territory of Serbia. After distillation of medicinal plants during the production of essential oils a significant amount of solid (solid plant waste mass) and liquid (liquid plant waste and hydrolates) by-products remains. The potential of these waste can be directed towards obtaining kombucha beverage with functional and health benefits.

This paper introduces obtaining kombucha beverages from waste materials remain after distillation of hyssop (*Hyssopus officinalis* L.) (solid plant waste, in amount 10g/l and liquid plant waste, diluted in a ratio of 1:50) and determination of its antimicrobial activity.

During seven days of fermentation, chemical (pH and titratable acidity) and microbiological (number of yeasts and acetic acid bacteria) parameters were determined. Antibacterial activity of kombucha beverages and control samples (acetic acid solutions, uninoculated plant waste substrates and neutralized Kombucha beverages) was determined by agar-well diffusion method. Tested strains were: Gram-negative (*Escherichia coli* ATCC25922, *Salmonella* Typhimurium ATCC14028, *Pseudomonas aeruginosa* ATCC27853) and Gram-positive bacteria (*Listeria monocytogenes* ATCC35152, *Bacillus cereus* ATCC11778, *Staphylococcus aureus* ATCC 25923).

The results indicate a high potential of hyssop waste material as a substrate for kombucha fermentation. Using both liquid and solid waste, obtained beverages reach optimal acidity after 5 and 7 days, respectively. Also, the number of yeasts and acetic acid bacteria shows a typical growth curve for kombucha fermentation. Both beverages possess expressive antibacterial activity against all tested strains as well as acetic acid solution. Beverage from liquid waste has higher activity due to higher acetic acid concentration. Uninoculated substrate and neutralized Kombucha beverage did not show any activity. Commercialization of beverages obtained from waste material, could contribute to solving the problem of accumulated waste material, which would have a significant environmental contribution.

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