OP2. BIOLOGICAL ACTIVITIES OF THE SECONDARY METABOLITE OF ENDOPHYTIC FUNGI ISOLATED FROM THE MEDICINAL PLANT *HYSSOPUS OFFICINALIS*

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According to the World Health Organization, it is estimated that by 2050, drug- resistant infections could cause up to 10 million deaths annually. Therefore, finding a new generation of antibiotics is crucial. Natural compounds from endophytic fungi are considered a potential source of new-generation antibiotics. The antimicrobial and cytotoxic effects of ethyl acetate extracts of nine endophytic fungal isolates obtained from *Hyssopus officinalis* were investigated for bioassay-guided isolation of the natural compounds. Extract of isolate VII showed the highest antimicrobialactivities against Gram-positive bacteria *Bacillus subtilis* and *Staphylococcus aureus* (30.12±0.20 mm and 35.21±0.20 mm) and Gram-negative bacteria *Escherichia coli* and *Pseudomonas aeruginosa* (30.41±0.23 mm and 25.12±0.25 mm) among the tested extracts of isolates. Molecular identification of isolate VII confirmed it as *Chaetomium elatum* based on sequencing of its ITS genes, and it was discovered that this was thefirst time *C. elatum* had been isolated from *H. officinalis.* This isolate was cultured in a largescale for the isolation and identification of the active compound. Penicillic acid (Figure 1) was isolated for the first time from *C. elatum* and its chemical structure was established by the NMR spectroscopy. The penicillic acid showed strong antibacterial activities against *Bacillus subtilis* and *Staphylococcus aureus* with 20.68 mm and 25.51 mm inhibition zones respectively. In addition, MIC and MBC values and antibiofilm activities of penicillic acid were determined. It was found that penicillic acid reducedthe level of biofilms in proportion to antibacterial activity (Figure 2).

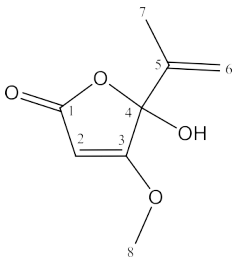

Figure 1. The chemical structure of thecompound 1 (penicillic acid)

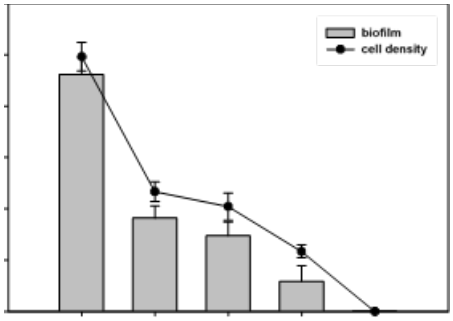

Figure 2. Biofilm formation of *E. coli* atdifferent concentrations of penicillic acid