

## **PP70. Volatile compounds from different species of *Lycopodium* with anti-tuberculosis activity**

Aleksandra Dymek<sup>1\*</sup>, Jarosław Widelski<sup>1</sup>, Joanna Golus<sup>2</sup>, Gabriela Widelska<sup>3</sup>,  
Rafał Sawicki<sup>2</sup>, Grażyna Ginalska<sup>2</sup>, Krystyna Skalicka-Woźniak<sup>1</sup>, Tomasz Mroczek<sup>1</sup>

*Keywords:* *Lycopodium*, *Mycobacterium tuberculosis*, H37Ra

Different species belonging to the genus *Lycopodium* L. (Lycopodiaceae) were used in folk medicine due to their antibacterial, healing effects on wounds, and properties used in the treatment of mental diseases, like amnesia, schizophrenia and different types of dementia.

Extracts containing volatiles obtained from different *Lycopodium* species: *L. clavatum*, *L. annotinum*, and *Huperzia serrata* (syn. *Lycopodium serratum* Thunb.), were tested against *Mycobacterium tuberculosis*. Dichloromethane and petroleum ether extracts of the mentioned species collected in different geographical sites (in Poland and Ukraine) have shown interesting activities.

Minimal Inhibitory Concentrations (MIC) values for the extracts were determined by a 96-well microplate method with alamarBlue (Invitrogen). The inoculum of the reference strain of *Mycobacterium tuberculosis* H37Ra in Middlebrook 7H9 broth (Difco) was  $5 \times 10^5$  cfu/mL per well, according to CLSI standards. Serial twofold dilutions of the extracts ranged from 8 to 256  $\mu\text{g/mL}$ . As the internal control of the method, serial twofold dilutions of four first-line antibiotics dedicated to tuberculosis treatment: isoniazid (INH), rifampicin (RMP), ethambutol (EMB), and streptomycin (SM) were used [1,2].

### *References:*

- [1] Palomino, J.C. et al., 2002. Antimicrob. Agents Ch. 46, 2720–2722.  
[2] Wayne, P.A., 2011. Susceptibility Testing of Mycobacteria, Nocardiae, and Other Aerobic Actinomycetes; Approved Standard-Second Edition. CLSI document M24-A2, Clinical and Laboratory Standards Institute, USA.

*Acknowledgments:* The work was financed from the grant No. 4/POLTUR-1/2016.

---

<sup>1</sup>Department of Pharmacognosy with Medicinal Plant Laboratory, Medical University in Lublin, Chodźki 1, Poland; <sup>2</sup>Department of Biochemistry and Biotechnology, Faculty of Pharmacy, Medical University of Lublin, 1 Chodźki Street, 20-093 Lublin, Poland; <sup>3</sup>Department of Inorganic Chemistry, Medical University in Lublin, Chodźki 4a, Poland.

\*Corresponding author: [aleksandra.dymek91@interia.pl](mailto:aleksandra.dymek91@interia.pl)