

# Assessment of antibacterial activity of *Sempervivum tectorum* L. leaves extracts using HPTLC bioassays and chemometrics

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*Sempervivum tectorum* L. is a perennial plant with succulent leaves arranged in a rosette. Despite its wide use in traditional medicine for the treatment of various changes on the skin, nervousness, anxiety, menstrual ailments, etc., it still does not have a biography in the European Pharmacopoeia<sup>1</sup>. The antibacterial effect of juice squeezed from the leaves and tea made from dried leaves was tested against bacteria that cause inflammation of the ear and bladder<sup>2</sup>. Direct bioautography on HPTLC plates for the investigation of antibacterial activity of the houseleek leaves extracts was done for the first time. Four HPTLC bioassays were developed for gram-positive bacteria (*B. subtilis*, *M. lysodeikticus*, *MRSA*, and *S. aureus*), and two for gram-negative bacteria (*E. coli* and *K. pneumoniae*). Antibacterial activity of gram-positive bacteria comes from active compounds at  $R_F$  0.57 and 0.92. HPTLC bioassays show higher sensitivity for gram-negative bacteria, as numerous active bands were observed at  $R_F$  0.03, 0.38, 0.42, 0.56, 0.57, 0.86 and 0.92. By applying chemometrics and principal components analysis, the HPTLC bioassays of gram-positive bacteria were separated into two groups on the scores plot graphic along PC1 axis. The bioassays for *B. subtilis* and *M. lysodeikticus* form a less uniform group in the upper left quadrant, while the bioassays for *MRSA* and *S. aureus* form a homogeneous group in the lower right quadrant. Presence or absence of the active bands at  $R_F$  0.57 and 0.92 affect these separations. The bioassays for the two gram-negative bacteria are separated along both axes on the scores plot graphic from each other but also from the other bioassays for the gram-positive bacteria. This separation is influenced by the presence of numerous active bands. For further investigation it is necessary to identify compounds responsible for the antibacterial activity of the houseleek leaves extracts.

**References** - List references cited in the text as...

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