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Full Length Research Paper

Extra- and intracellular antimycobacterial activity of *Arbutus unedo* L.

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This study aims to evaluate extra- and intracellullar antimycobacterial activity of *Arbutus unedo* L. leaves-extracts. We tested the aqueous and ethanol extracts of *Arbutus* leaves effect against three mycobacteria growth, and showed that aqueous extract and the part I of ethanol extract have a remarkable extracellular antimycobacterial activity. The MIC (Minimum inhibitory concentration) of the part I of ethanol extract is 5.59 ± 0.69 mg/ml for *Mycobacterium aurum* A + and 6.02 ± 0.76 mg/ ml for Mycobacterium smegmatis MC_2 and *Mycobacterium bovis* PPI. The part I *of arbutus* ethanol-extract, used at 6.02 ± 0.76 mg/ml, has a bactericidal effect on *M. smegmatis* MC_2 located within the rat peritoneal macrophages.

Key words: Antimycobacterial activity, *Arbutus unedo* L., rat peritoneal macrophages.

INTRODUCTION

The infectious disease tuberculosis is engendered by several species of *Mycobacteria* (Asgharzadeh and Kafil, 2007) including *Mycobacterium tuberculosis*, *Mycobacterium bovis*, *Mycobacterium africanum*, *Mycobacterium microti*, *Mycobacterium avium* and *Mycobacterium leprae* that are intracellular, Gram-positive, non-motile, rod-shaped, and obligate aerobic pathogens of higher vertebrates (Chakraborty, 2004).

Pathogenic mycobacteria agents are particularly ingenious, as they are able to survive, and even replicate within macrophages that are designed specifically to kill bacteria. They are exceptional in the duration and persistence of this interaction, seeing that the mycobacterial phagosome does not fuse with lysosomes (Armstrong and Hart, 1975; Frehel et al., 1986; Hart and Young, 1991). Latent infection as a main obstacle to controlling tuberculosis results from the survival of *M. teburculosis* in macrophage (Houben et al., 2006; Zahrt, 2003).

In addition to HIV-infection spreading, tuberculosis progress especially in countries with insuitable health care-systems providing an expensive and long-term treatment (World Health Organisation, 2008; Zager and McNerney, 2008). The emergence of multiple drug resistant (MDR) strains is a further crisis, including extremely drug resistant (XDR) *M. tuberculosis*-strains (Jones et al., 2008).

Even though the number of tuberculosis-related deaths appears to have stabilized at about 2 million per annum, the incidence of new infections increase largely because of HIV epidemic (Gutierrez-Lugo and Bewley, 2008). There would be many challenges to eradicate tuberculosis, including latency and drug resistance (Gutierrez-Lugo and Bewley, 2008). New purposes for novel anti-tuberculosis drugs need to be identified, as emergent MDR and XDR *M. tuberculosis*-strains. Although the complete genome sequences of *M. tuberculosis* H37Rv (Cole, 1998) and two other members

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