

## The Effect of Arbutin Powder and *Arctostaphylos uvaursi* Aqueous Leaf Extract on Synthesis of Melanin by *Madurella mycetomatis*

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**Abstract :** *Arctostaphylos uvaursi* is a plant of the family Ericaceae, it's used in skin care products mostly for its depigmenting action, due to the presence of hydroquinones that are well known inhibitors of tyrosinase, an enzyme involved in melanin biosynthesis in humans. The main hydroquinone found within the *A. uvaursi* is arbutin, which is found with varying percentage within the plant depending on the season, and area from which the plant is harvested. An in vitro experiment has shown that the arbutin found within the bearberry leaf extract inhibited the biosynthesis of melanin in human melanoma cells and in three-dimensional human skin model. *Madurella mycetomatis* is filamentous fungus that causes the fungal form of mycetoma known as eumycetoma, with existing anti-fungals and surgery, only 35% of people living eumycetoma are treated, *M. mycetomatis* has been found to shield itself against the antifungal therapy through the production of melanin decreasing the effectiveness of the therapy, therefore there is a need for a new and more effective therapy. The aim of the study was to investigate and compare the effect of arbutin powder and aqueous extract of *A. uvaursi* containing arbutin on the biosynthesis of melanin by *M. mycetomatis*. The experiment was carried out by culturing *M. mycetomatis* on minimal media composed of 2% agar, 15 mM glucose, 10 mM MgSO<sub>4</sub>, 29.4 mM KH<sub>2</sub>PO<sub>4</sub>, 13 mM glycine and 80mg/l gentamicin, the media was supplied with different concentration of arbutin solution (5, 25 50, and 75mg) and aqueous extract of *A. uvaursi* to contain arbutin with concentrations (5, 25 50, and 75mg), the plates were incubated for two month and the result was observed by the naked eye. The results revealed that the arbutin powder had an inhibitory effect on melanin synthesis by *M. mycetomatis* that correlated with its established inhibitory effect on melanin synthesis in humans. The inhibitory effect of arbutin on melanin synthesis by *M. mycetomatis* was found to be dose dependent. *A. uvaursi* aqueous leaf extract containing arbutin was also found to decrease melanin production by *M. mycetomatis*, however plates containing high concentrations of aqueous extract couldn't be assessed for its melanin inhibitory effect due to the high content of carbohydrates in the extract that promoted the growth of fungi *Asperigillus niger* rendering the plates unsuitable for visual inspection. In conclusion inhibition of melanin synthesis was observed on the arbutin powder as well as the aqueous extract containing arbutin. *A. uvaursi* is known to exhibit anti-inflammatory activity, which can aid in wound healing that is beneficial in the chronic inflammation caused by *M. mycetomatis*.

**Keywords :** arbutin, *arctostaphylos*, *Madurella*, melanin

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