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Determination The metabolites with Assessing Antioxidant and Antibacterial Activities of Different Bitter Almond (*Prunus amygdalus L.*) Pulp Extracts

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By

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Abstract

Bitter Almond pulp is a good important of bioactive compounds since it has been traditionally used for the treatment of various diseases. People with fatigue need to enhance their energy production, reduce oxidative stress-associated fatigue and microbial infection. In this study, metabolic, antioxidant, and antibactereial activities are evaluated by using aqueous, methanol, and ethanol extract of bitter almonds. Determination of the chemical compositions of the bitter almonds was in accordance with the procedure of the Association of Official Analytical Chemists (AOAC). Fatty acids and phenolic compounds were determined by GC , and HPLC, the extraction by using methanol 80%, ethanol 80%, and Aqueous extract. The antioxidant activity is determined using DPPH• radical scavenging activity and FRAP assay. The antimicrobial activity is evaluated in agar diffusion assay, while MIC and MBC are determined by using the microdilution broth assay.

The results show that bitter almonds are rich in lipid, protein, and carbohydrates. The percentages are 31.29 %, 30.37 % and 22.48% respectively. 17 fatty acids and 7 phenolic compounds. Phenolic compounds such as keamferol, apigenin, catechine, quercetin, isorhamnetin, vanillic acid, and hesperidin are identified as the phenolic compound with concentrations 2963.7, 1889.4, 316.1, 1292.5, 1211.2, 734.2, and 772.1 µg/gm respectively. The fatty acids were erucic eicosenoic , cisdocosadienoic , nrevonoic , arachidonic , elaidic, linolenic , arachidic , undecanoic , hepadecanoic, tricosanoic , butyric , stearic , myristic , palmatic, linoleic, and oleic . were identified as the phenolic compound with a concentration (0.020, 0.030, 0.060, 0.070, 0.10, 0.103, 0.60, 0.70, 0.80 , 0.90, 1.00, 1.5, 1.5, 2.8, 4.9, 20.30, and 68.13 g/ml) respectively.

Ethanol extract from bitter almonds showed high antioxidant activity by DPPH (IC_{50}) and FRAP methods with a standard equivalent of approximately 3.26 µg/ml and 16.45 mmol/g respectively. The higher antimicrobial activity percentage was found to be at 88.40 % against *Listeria. monocytogenes* for ethanol extract while the lowest activity was 85.40 % against *Escherichia coli*, the growth inhibition percentage towards *Listeria. monocytogenes*, *Escherichia coli, Staphylococcus aureus, and Pseudomonas. aeruginosa* were 95.33%, 93.47 %, 92.67, and 89.00%, respectively. In conclusion, bitter almonds are a good source of antioxidant and antibacterial agents since bitter almond contains metabolites (bioactive compounds). Thus, it is useful for fatigued and normal individuals who desire a more active and healthier lifestyle without oxidative stress and microbial infections.