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METABOLOMIC ANALYSIS AND BIOLOGICAL ACTIVITIES OF DIFFERENT VARIETIES *PHOENIX DACTYLIFERA***Faridah Abas^{*1,2}, Nur Ashikin Abdul Hamid¹, Intan Safinar Ismail¹, Khozirah Shaari¹, Nordin Hj Lajis¹**¹Laboratory of Natural Products, Institute of Bioscience, Universiti Putra Malaysia, 43400 Serdang, Malaysia.²Department of Food Science, Faculty of Food Science and Technology, Universiti Putra Malaysia, 43400 Serdang, Malaysia.*Corresponding author: faridah_abas@upm.edu.my

The aim of this study was to examine the variation in metabolite constituents of five commercial varieties of date fruits (Ajwa, Safawi, Ambar, Bam and Deglet Noor) from various environmental conditions. The correlation between antioxidant and nitric oxide (NO) inhibitory activities with metabolite variation was also determined. The differences of metabolome were investigated using ¹H NMR spectroscopy combined with chemometric tools including principal component analysis (PCA) and partial least squares projections to latent structures (PLS). The PCA and PLS showed fairly distinct clusters between the date palm fruits. The PLS loading score plot suggested that beta glucose (binned at 4.56 ppm) and alpha glucose (5.18 ppm) were among the metabolites that was related to the higher biological activities displayed by Ajwa. Further analysis on different grades of Ajwa, revealed that Ajwa grade 1 from Al-Aliah farm exhibited more than 90% NO inhibitory activity compared to the other grade. Data analyses demonstrated the differences were associated with factors for example types of variety and the contrasting agricultural conditions. The results also demonstrated that Ajwa dates might have different metabolite composition and possessed different range of biological activities based on the classified grades.

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SCREENING OF VARIOUS PARTS OF *PHALERIA MACROCARPA* PLANTS FOR α -GLUCOSIDASE INHIBITORY ACTIVITY**Sabina Easmin¹, Md. Zaidul Islam Sarker^{*1}, Kashif Ghafoor², Fahad Y. Al-Juhaimi², Alfi Khatib², Sahena Ferdosh³**¹Faculty of Pharmacy, International Islamic University Malaysia, Kuantan Campus, 25200 Kuantan, Pahang, Malaysia.²Department of Food Science and Nutrition, King Saud University, Riyadh 11451, Saudi Arabia.³Faculty of Science, International Islamic University Malaysia, Kuantan Campus, 25200 Kuantan, Pahang, Malaysia.*Corresponding author: zaidul@iiu.edu.my

Phaleria macrocarpa (Scheff.) Boerl (Thymelaceae family) is commonly known as Mahkota Dewa, pau or God's crown. It is a popular medicinal plant for many diseases in south Asian countries. *Phaleria macrocarpa* is used traditionally to control diabetes mellitus in Malaysia. Every part of this plant from leaves to roots is used for the prevention of diseases with some good results. Alpha-glucosidase inhibitory activity of three parts (flesh, leaves and stem) of this plants has been evaluated by *in vitro* enzyme assay. Both polar and non-polar solvents,



methanol and n-hexane have been used for screening of alpha-glucosidase inhibitory activity of three parts. Extraction yields of methanol and n-hexane extracts of flesh were 27.47% and 2.46%, respectively. Similarly, extraction yields of methanol and n-hexane from leaves were 21.50% and 2.30%, and from stem were 20.78% and 0.88%, respectively. The highest yield was found from the flesh in methanol extract. Methanol extracts of flesh, stem and leaves displayed the IC_{50} value of $1.4701\mu\text{g/ml}\pm 0.201979$, $9.9364\mu\text{g/ml}\pm 0.557122$ and $10.8839\mu\text{g/ml}\pm 2.860417$ and n-hexane extracts of $1.901167\mu\text{g/ml}\pm 0.79918$, $0.828767\mu\text{g/ml}\pm 0.557122$ and $1.8509\mu\text{g/ml}\pm 0.805912$, respectively. The n-hexane extract of *P. macrocarpa* stem is highly effective against α -glucosidase activity. The following compounds identified from GC-MS data according to their similarity index of >80% which might be responsible for α -glucosidase inhibitory activity. Methanol extracts of flesh contains 9,12-octadecadienoic acid, hexadecanoic acid, 1,3-bis[2-(trimethylsiloxy)phenyl]-2-propen-1-one, β -sitosterol and dl-16 β -hydroxy-norgestrel-methyloxime. N-Hexane extract of flesh contains propanoic acid, butanedioic acid, L-asparagine, xylitol, arabitol and hydrocinnamic acid. On the other hand, methanol extract of stem contains propanoic acid, butanedioic acid, erythritol, glutamine, hydrocinnamic acid, tetracosanoic acid, D-galactose, D-gluconic acid, 1,5-dioxo-8,11-diazacyclotridecane-7,12-dione, stapelogenin, catechol and 9,12-octadecadienoic acid. Similarly, n-hexane extract of stem contains 9,12-octadecadienoic acid, eicosanoic acid, β -sitosterol, 29-norlanost-9(11)-en-3-one and α -tocopherol. Whereas the methanol extract of leaves contains butanedioic acid, propanoic acid, erythritol, oleic acid, α -linolenic acid, D-mannitol, D-mannopyranose, 1,4-methanoazulen-9-ol. Similarly, n-hexane extract of leaves contains 9,12-octadecadienoic acid, α -linolenic acid, eicosanoic acid, Di-n-octyl phthalate, β -Sitosterol, O-methyl-13-benzoyldehydroalamaridine squalene and 8-acetoxy-6-benzenesulfonyl-2-thia-6-aza-adamantan-4-yl ester. From the enzyme assay, it could be concluded that every parts of *P. macrocarpa* contain potential alpha-glucosidase inhibitors that can be exploited for its use in the treatment of diabetes.

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IMPACT OF GIBBERLIN AND DENSITY ON WHEAT FOR MANAGING OF ENVIRONMENTAL POLLUTION

Mohammad Reza Yavarzadeh*

Islamic Azad University Bam Branch, Bam, Iran

*Corresponding author: yavar75@yahoo.co.in

Gibberellins (GAs) control a wide range of physiological functions in plants from germination to flowering. The present investigation was carried out by conducting field experiments on wheat during winter seasons of 1391 at Farm in Bam City for managing of Environmental pollution. Experiments were laid in split plot design at Block Random with three replications. Gibberlic acid as a B factor include: 0 200 400 ppm and three levels of plant density as a factor include: 200, 400 and 500 plant per meters to wheat crop. The influence of these treatments on growth and yield of wheat was studied in detail. In this experiment, the traits including grain yield, biological weight, thousand grain weight, plant height and flag leaf area, were measured. The result of this study indicated that the effect of density and hormone was only significantly on the plant height and the density has positive effect on the spikelet length and the area of flag leaf so that the highest spikelet length was observed in the density of 500 plants per m^2 . The density had no meaningful effect on the other traits and effect of gibberlic acid on the height was meaningful and the maximum