GENE EXPRESSION PROFILES IN HUMAN HEPG2 CELLS TREATED WITH METHANOL EXTRACT OF THE Tamarindus indica SEEDS

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Numerous studies have revealed the ability of phenolic antioxidants to intercept the oxidative damage caused by free radicals. Phenolics contain various biological activities including antioxidant, anti-inflammatory, anti-diabetic and anti-cancer activities. Tamarindus indica L. (T. indica) or locally known as asam jawa, belongs to the family Leguminosae. Our group had earlier shown that the methanol extracts of the T. indica seeds (TISM) have high radical scavenging activity and phenolic content. Studies have also shown that the seed extracts of T.indica had antihyperglycaemic and hypolipidemic effects in streptozotocin-induced diabetic rats. However, scientific data on the molecular mechanisms underlying the beneficial properties of the TISM are still lacking. In this study, we investigated the effects of the extracts on the expression of genes in cultured HepG2 cells using microarray technology. A non-toxic dose of the TISM was used for the gene expression analysis. The microarray analysis was performed on Affymetrix Human Genome 1.0 S.T arrays. Data generated were pre-analysed using the NetAffx Analysis Centre before further analysed using the Partek Genomics Suite software. Analysis of variance (ANOVA) was applied to determine differentially expressed sets of genes. P value less than 0.05 was considered statistically significant. Filtering criterion was set as a fold change ≥ 1.5. Verification of the microarray data was performed using quantitative RT-PCR. A total of 284 genes were up regulated and 78 genes were down-regulated. Amongst the significantly regulated genes were associated with antioxidant activity, insulin signaling and anti-obesity. These results indicate the potential of the TISM to act as antioxidants and antihyperglycaemic agents.