Urine NMR metabolomic study on biochemical activities to investigate the effect of P. betle extract on obese rats

ABSTRACT

The present studies are to evaluate the ability of PB to induce weight loss and urine metabolite profile of Piper betle L. (PB) leaf extracts using metabolomics approach. Dried PB leaves were extracted with ethanol 70% and the studies were performed in different groups of rats fed with high fat (HFD) and normal diet (ND). Then, fed with the PB extract with 100, 300, and 500 mg/kg and two negative control groups given water (WTR). The body weights were monitored and evaluated. Urine was collected and 1H NMR-based metabolomics approach was used to detect the metabolite changes. Results showed that PB-treated group demonstrated inhibition of body weight gain. The trajectory of urine metabolites showed that PB-treated group gave the different distribution from week 12 to 16 compared with the control groups. In 1H NMR metabolomic approach analysis, the urine metabolites gave the best separation in principle component 1 and 3, with 40.0% and 9.56% of the total variation. Shared and unique structures (SUS) plot model showed that higher concentration PB-treated group was characterized by high level of indole-3-acetate, aspartate, methanol, histidine, and creatine, thus caused an increased the metabolic function and maintaining the body weight of the animals treated.

Keyword: Body weight; High-fat diet; Metabolomic; Piper betle; Urine