ABSTRACT

Obesity is one of the major health problems in the world that can be caused by many aspects and its prevalence keep increasing throughout the year. Obesity could also cause many other non-communicable diseases. Tamarind (*Tamarindus indica*) is a multi-purpose plant that provides many health benefits. In Indonesia, it is often used as a food component in many local foods. Recent *in-vivo* study proved that tamarind can reduce the risk of obesity by reducing the body weight of the rats. To further investigate the anti-obesity effect of tamarind, *in-vitro* study using 3T3-L1 cells was conducted. During differentiation, 3T3-L1 cells synthesize and accumulate lipid in the form of triglycerides within cells' cytoplasm. Tamarind extract (water and ethanol extract) were utilized during the differentiation stage. Prior to this, cell viability assay was done to determine the samples concentrations for the study. Oil red O staining assay was used to measure the total lipid accumulated. Results showed that tamarind water extract exhibit non-cytotoxic effect with the concentration until ≤12.5 mg/mL and tamarind ethanol extract showed no cytotoxicity effect up to 1.0 mg/mL. Oil red O assay showed that tamarind water extract at 10.0 mg/mL decrease the total lipid accumulated significantly to 80.5% compared to control, while tamarind ethanol extract showed no effect in any of the concentrations tested. This study showed that tamarind water extract has a potential to reduce the lipid accumulation, thus showing an anti-obesity effect. Further investigation on the mechanism of action to reduce the lipid accumulation could be done for further understanding.

***Keyword**: Tamarindus indica, 3T3-L1, anti-obesity, lipid accumulation, WST-8 assay, Oil red O assay*