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Lipase inhibition effects of four pure compounds isolated from an endolichenic fungus *Xylaria psidii*

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Obesity caused by long-term energy imbalance is an epidemic disease in developed and developing countries. The prevalence of obesity is increasing at an alarming rate, but, unfortunately, only a few medications are currently on the market. Obesity is primarily regarded as a disorder of lipid metabolism and the enzymes involved in this process could be selectively targeted to develop anti-obesity drugs. Therefore, researchers try to introduce novel pharmaceutical drugs. Scientists have trended natural products based on drug development because it has become attractive area in the modern word. There are different kinds of natural sources such as folk medicinal plants, marine organisms, sea weeds, *etc* used to treat for diseases. Endolichenic fungi are also attractive natural source belonging bioactive compounds according to available literature review. The endolichenic fungi existing in the mangrove environments are expected to synthesize specialized secondary metabolites. Secondary metabolites ensure their survival in the ecosystem against all the challenges by the harsh conditions of the surrounding. They may carry unique properties that would be of potential advantage in biomedical applications. In this study, endolichenic fungi inhabiting in Puttalam lagoon were selected to screen their bioactivities.

Endolichenic fungus was isolated and molecular identification was carried out using standard procedure described by Ceni, 1999 with slight modification. Fungal strain had 99% similarity to the *Xylaria psidii* in the GenBank sequences and based on morphology and sequence data it was identified as *X. psidii*. Sequence was deposited in the GenBank (MF773655). Secondary metabolites of isolated endolichenic fungi were extracted with ethyl acetate. As the preliminary screening, crude extract was evaluated for the anti-obesity. The lipase assay was carried out in a flat bottom 96-well microtiter plate, according to the method described by Abubakar et al., 2013 with slight modifications. According to the results of anti-lipase assay crude extract of *X. psidii* showed activity with IC_{50} value of 20.06. Orlistat was used as the positive control the IC_{50} value of orlistat was 68.54. Compare to the standard ethylacetate crude of *X. psidii* showed the highest activity. Therefore compounds of ethylacetate extracts were isolated using silica gel column chromatography and preparative thin layer chromatography (PTLC). Anti-lipase assay was carried out for isolated pure compounds. Out of isolated compounds four compounds showed significant anti-obesity activity. The IC_{50} values of isolates were PP/SS/02/27/12 (30.99µg/mL), PP/SS/02/30/04 (25.23 µg/mL), PP/SS/02/30/05 (30.40 µg/mL) and PP/SS/02/30/07 (72.11 µg/mL). Three isolates (PP/SS/02/30/04, PP/SS/02/30/05 and PP/SS/02/27/12) exhibited high anti-obesity activity compared to the positive control. PP/SS/02/30/04 showed the highest activity out of four isolates tested, giving promising results to find new pharmaceutical drug and further studies on structure elucidation is ongoing.

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