

Screening of *Monascus* spp. on water-soluble adipogenesis inhibitory activity

Indika Pradeep Wanninaika¹, Perumpuli Arachchige Buddhika Niroshie², M.N. Kaumal^{1*},
Chamari Hettiarachchi¹

¹ Department of Chemistry, University of Colombo, Sri Lanka.

² Department of Food Science and Technology, University of Ruhuna, Matara, Sri Lanka.

Monascus-fermented rice, which is known as red mold rice has been used as Chinese herbal medicine for treating hyperlipidemia for many years. Monacolin K and citrinin, showing adipogenesis inhibitory activity, are water-insoluble secondary metabolites of *Monascus* spp. However, less attention has been paid regarding water-soluble adipogenesis inhibitors from *Monascus* spp. Thus, the current study was conducted to screen *Monascus* fungi for their water-soluble adipogenesis inhibitors. A total of 25 strains of *Monascus* fungi were used in screening for water-soluble adipogenesis inhibitors. *Monascus* strains were maintained on potato dextrose agar (PDA) medium at 30 °C for 7 and 10 days, and the spores of these strains were collected and stored separately at 4 °C until further use. Each strain was cultivated on steamed rice (RMR) and barley (RMB) separately at 30 °C and 35 °C for 7 and 14 days, and their respective water extracts were prepared. Cell viability was determined by MTT assay, and the accumulation of triglycerides in adipocytes was examined by oil red O staining using mouse 3T3-L1 cells. Results of MTT assay confirmed that all tested samples do not affect the viability of 3T3-L1 cells, and this confirmed that the reduction of lipid accumulation is not due to any cell death, but due to a secondary metabolite/s produced during the production of RMR or RMB. Moreover, TLC results revealed that water-soluble fractions of both RMR and RMB are free from lovastatin and citrinin. According to the obtained results, it can be concluded that the water extracts of RMR showed a higher adipogenesis inhibitory activity than that of RMB. Further, since it showed a significantly low lipid accumulation percentage (61.86% ± 3.6) *M. pilosus* NBRC4507 grown at 30 °C for 14 days was selected as the best strain and the cultivation condition respectively, in production of RMR with higher adipogenesis inhibitory activity.

Keywords: Adipogenesis inhibitors, Genus *Monascus*, lipid accumulation inhibition, red mold rice, water-soluble

*mnkaumal@sci.cmb.ac.lk