F02 Water-soluble palm fruit extract: Potential anti-diabetic mechanisms

***Leow SS*[1], *Nawi NM*[1,2], *Fairus S*[1] *and Sambanthamurthi R*[1,3]**

[1]*Malaysian Palm Oil Board, No. 6, Persiaran Institusi, Bandar Baru Bangi, Kajang, Selangor, Malaysia*
[2]*Present affiliation: University College London, 5, University Street London, WC1E 6JF, United Kingdom*
[3]*Present affiliation: Academy of Sciences Malaysia, Level 20, West Wing, MATRADE Tower, Kuala Lumpur, Malaysia*

Rising physical inactivity, obesity and consumption of energy-dense diets have resulted in an unprecedented increase in the incidence and prevalence of type 2 diabetes mellitus. A phenolic acid-rich extract obtained from the aqueous vegetation liquor of oil palm (*Elaeis guineensis*) fruit milling, termed Water-Soluble Palm Fruit Extract (WSPFE), has potential anti-diabetic effects but the related mechanisms were unknown. In addition, different drying methods may have effects on the biological activities of polyphenols. In the present study, we investigated the potential effects of WSPFE samples on glucose uptake and enzymes involved in carbohydrate hydrolysis and incretin degradation. Glucose uptake assays were performed using spray dried (SD) WSPFE, freeze dried (FD) WSPFE, WSPFE ethyl acetate fraction (EAF) and seven individual WSPFE fractions (F1 to F7) obtained from WSPFE EAF on everted mouse intestinal sacs *ex vivo* and Caco-2 cell monolayers *in vitro*. α-glucosidase, α-amylase and dipeptidyl peptidase-4 (DPPIV) enzymatic assays were performed *in vitro*. Glucose uptake assays revealed that all the WSPFE samples tested did not inhibit glucose absorption. However, WSPFE EAF consistently had stronger inhibitory effects on α-glucosidase, α-amylase and DPPIV enzymes compared to SD WSPFE and FD WSPFE. SD WSPFE inhibited α-amylase better than FD WSPFE. In terms of individual fractions, F2 demonstrated the strongest inhibitory effects against α-glucosidase and DPPIV. Hence, although WSPFE samples did not inhibit glucose uptake, they showed inhibitory effects on the three enzymes tested, especially WSPFE EAF and F2. Further studies to investigate their effects on carbohydrate digestion and postprandial hyperglycaemia are warranted.