Acarbose are used in the management of type 2 diabetes and act by inhibiting α-amylase and α-glucosidases. However, it has side effects which are diarrhea and abdominal discomfort by a large amount of the undigested starch degraded products. Hence, phenolic compounds have received great attention as a natural inhibitor of α-amylase activities. Therefore, in this study, the inhibitory effects of eight phenolic compounds were investigated and their structures were compared to the inhibition of α-amylase. This study provides insight on structural factors of phenolic compounds that relate to their inhibition of α-amylase activity.

Materials and Methods

- **Enzyme concentration and reaction time**
  Enzyme concentration and reaction time were determined by using different enzyme concentrations (0.1, 0.25, 0.5, 1.0, and 1.5 U/mL), and assay mixtures were incubated for different times (0, 3, 6, 9, 12, and 15 min). The linearity of plots of absorbance at 540 nm was assessed.

- **α-Amylase inhibition assay**
  Stock corn starch solution (10 mg/mL, 1%) was prepared in water by heating at 90 °C on a hot plate for 15 min. α-Amylase from porcine pancreas stock solution (2.5 U/mL) was prepared in sodium phosphate buffer (10 mM, pH 6.9). The enzyme stock solution and the assay mixture containing the inhibitor (1 mM), buffer, and substrate were pre-incubated at 37 °C in a water bath for 10 min, and the reaction was started by adding the enzyme to the assay solution. The reaction was carried out at 37 °C for 10 min with α-amylase at 0.25 U/mL, substrate at 1 mg/mL, and 100 μM of phenolic compounds. The reaction was stopped by placing the samples in a water bath at 100 °C for 10 min. To the resulting sample, 1 mL of the DNS reagent was added and heated at 100 °C for 10 min. After cooling to room temperature, 250 μL from each sample was placed in a 96 well plate and the absorbance was recorded at 540 nm.

**DISCUSSION**

- The inhibition of α-amylase activity can be considered as a key approach for reducing the peak of postprandial glucose in healthy and type 2 diabetic subjects. This study provides insight on structural factors of phenolic compounds that relate to their inhibition properties against α-amylase activity.

**REFERENCES**