EFFECT OF TEMPERATURE AND DURATION TIME OF BREWING BLACK TEA (*Camellia sinensis*) ALSO DIGESTION PROCESS IN VITRO CONCERNING INHIBITION OF ALPHA AMYLASE AND ALPHA GLUCOSIDASE ACTIVITY IN VITRO

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ABSTRACT

Diabetes is a chronic disease that occurs either when the pancreas does not produce enough insulin or when the body cannot effectively use the insulin. Natural alpha amylase and alpha glucosidase inhibitors from food-grade plants offer an attractive strategy to eather manage or prevent type 2 diabetes by controlling of starch breakdown and intestinal glucose absorption. Black tea is the second most widely consumed beverage in the world after water. A lot of researches about bioactive compounds in tea related have been done. In this study, six extracts treated with different combination of temperature and brewing time were investigated for alpha amylase and alpha glucosidase inhibitory potential. Furthermore, the influence of the digestion condition in vitro to the activity of the enzymes was also performed in this study. The enzymes inhibitory and total phenol was measured by spectrophotometric while tannin content was measured by gravimetric method. Results showed that tea brewed by 70°C 15 minutes, 70°C 30 minutes, 100°C 5 minutes, 100°C 15 minutes can optimally inhibit amylase at initial extract (as an estimation of salivary alpha amylase), 70°C 15 minutes and 100°C 5 minutes can optimally inhibit pH digestion-controlled extract (pancreatic amylase), 70°C 30 minutes and 100°C 30 minutes can optimally inhibit alpha glucosidase at initial extract, also 70°C 15 minutes, 100°C 15 minutes, and 100°C 30 minutes can optimally inhibit at pH digestion-controlled extract. Alpha amylase inhibitory has a positive correlation with tannin content but not with total phenol. While alpha glucosidase inhibitory showed no correlation with tannin and showed a negative correlation with total phenol.

Keywords: alpha amylase, alpha glucosidase, black tea, diabetes, inhibitory