Bioassays to Evaluate the Physiological Functional Properties of Chlorogenic Acid and of an Instant Coffee Extract with High Levels of Chlorogenic Acids

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SUMMARY

Coffee is the major source of chlorogenic acid on human diet and *in vitro* studies show that this phenolic compound is a very specific inhibitor of glucose-6-phosphatase, a key enzyme of the two main hepatic metabolic ways that release glucose. Accordingly, for the first time, as much as we know, it was observed that an instant coffee extract with high levels of chlorogenic acids (37.8%), inhibited up to 50% glucose-6-phosphatase activity on microsomal fraction of hepatocytes. However, a lack of effect of chlorogenic acid on hepatic production of glucose from glycogenolysis and on glycogenolysis and glycolysis rates on liver perfusion was observed and could be explained by the fact that possibly this compound hasn't reached intracelular compatible levels with the inhibition of glucose-6-phosphatase. Intravenous or oral administration of the instant coffee extract also didn't imply in reduction of blood glucose levels, plasmatic concentration of total cholesterol and triacylglycerols. Chlorogenic acid, however, promoted a significant reduction (up to 21,76%) on 10 and 15 minutes of the glycemic peak after the oral glucose tolerance test, that characterizes it as a potential glycemic index reductor agent, possibly by attenuating the intestinal glucose absorption, highlighting it as a compound of interest to help in risk reduction of type 2 diabetes development.