P-0427- WHITE TEA HAS BETTER ANTIOXIDATIVE, ANTIDIABETIC AND ANTI OBESOGENIC PROPERTIES THAN GREEN AND BLACK TEA

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INTRODUCTION

Diabetes mellitus (DM) is the most prevalent endocrine disorder in humans. Current anti-diabetic therapy is based on synthetic drugs that very often have side effects. Recently, natural products have become attractive alternatives to synthetic drugs. However, many cases, very little is known about the mechanism of action of these anti-diabetic plants. **Decrease in postprandial hyperglycemia by inhibition of intestinal glucose absorption** is a vital target in T2D therapy. This is achieved by inhibition of two key carbohydrate metabolizing enzymes α -amylase and α -glucosidase. Herbal teas are recognized for their **phenolic content**, which contributes to their anti-oxidant activities. These compounds present in tea reduce the risk of a variety of diseases (Yang *et al.*, 2009). Teas are a rich source of flavonoids, polyphenols and catechins, which all have **potential anti-oxidative free radical scavenging** and **anti-diabetic** activities (Sharangi, 2009).

METHODS

Aqueous extracts of the black, green and white teas were prepared and subsequently analyzed for their total phenolic contents; antioxidant activity vis-à-vis 2,2-diphenyl-1-picrylhydrazyl (DPPH) scavenging activity and ferric reducing ability (FRAP); inhibition of α -amylase and α -glucosidase enzymes activity in vitro. The extracts were also investigated for their role in the inhibition of intestinal glucose absorption in isolated rat jejunum and glucose uptake.

STATISTICAL ANALYSIS

All data are presented as mean $\pm$ SD. Data were analyzed using a statistical software package (SPSS for windows, USA), by using one-way ANOVA and Tukey's HSD post hoc test. Values were considered significantly different at $p < 0.05$. abc Different alphabets over the bars for a given concentration for each extract are significantly different from each other.

RESULTS

Table 1: Total Polyphenol Content as Gallic Acid equivalent (%)

Black Tea	84.57 $\pm$ 0.241 ^a
Green Tea	112.50 $\pm$ 0.029 ^b
White Tea	133.75 $\pm$ 0.034 ^c

Figure 1: DPPH activity of teas

RESULTS (Cont)

Figure 2: Ferric reducing antioxidant power of BT, GT, WT extracts and Standard

Figure 3: Graph showing the effect of BT, GT and WT on activities of alpha amylase enzyme in vitro.

Figure 4: Effects of different tea extracts on alpha glucosidase enzyme activity in vitro

Figure 5: Effect of different tea extracts on activity of lipase enzyme activity in vitro

Figure 6: Graph showing the effects of BT, GT and WT on glucose absorption in isolated rat jejunum.

Figure 6: Graph showing the effects of BT, GT and WT on glucose uptake in rat psoas muscle

CONCLUSION

Summary of results

ASSAY	BT	GT	WT
DPPH	3	2	1
FRAP	1	2	3
Amylase	1	2	3
Glucosidase	3	1	2
Lipase	1	2	3
Glucose absorption	1	2	3
Total SCORE:	10	11	15

IC₅₀ value = score WT > GT > BT

It is possible to conclude from this study that **white tea** has **higher antioxidant activity** that could be attributed to its **higher total phenol**. White tea also possessed **higher anti-diabetic properties**, followed by green tea and black tea, indicating potential anti-hyperglycemic properties. Green tea and white tea **showed strong inhibition of lipase**, therefore such beverages, could find use as natural therapy to control lipids levels and obesity.

REFERENCES

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