

# Physico-chemical and Stabilization Effect of Lemon Grass (*Cymbopogon citratus* Stapf) Tea for Diabetes Management

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## ABSTRACT

Diabetes mellitus is a condition defined by persistently high levels of sugar (glucose) in the blood affecting the population of both developed and developing countries. This has two types but the most widespread type is Type II which may be correlated with the stress, sedentary lifestyle and unhealthy food consumption. This ailment is being treated with synthetic agents but causes many side effects. That is the reason why herbal tea are widely used up-to-date to aid against various diseases like diabetes mellitus for the reason that they contain helpful active chemical constituents.

The present study aimed to investigate the physico-chemical and stabilization effect of Lemon Grass (*Cymbopogon citratus* Stapf) aqueous extract on glucose-induced Sprague Dawley rats compared to distilled water as the negative control and glibenclamide as the positive control using OECD no. 23 and oral glucose tolerance test (OGTT). CCAE were prepared based on how tea is consumed and administered orally to SD rats. The blood glucose level reading in the three treatments were done by puncturing the SD rats tail vein in -30, 0, 10, 30, 60, 120 and 240 minutes. A single dose of 2,000 mg/kg body weight CCAE during the 14-day observation period did not exert any abnormal physical sign or symptom and death. The blood glucose level of SD rats in CCAE treated group was within the normal range at 30, 60, 120 and 240 minutes while for distilled water treated group, it was observed at 60, 120 and 240 minutes. For glibenclamide treated group, the glucose blood level is within the normal range at all time. From this, it could be concluded that CCAE is safe for consumption and it stabilizes glucose-induced hyperglycemic SD rats in 30 minutes after ingestion. It is further recommended for other clinical studies to confirm the claim that could be helpful for the management of type II diabetes.

**Keywords:** *Cymbopogon citratus*; Diabetes mellitus; Infusion; Physico-chemical; Oral glucose tolerance test

## CONCLUSION AND RECOMMENDATIONS

The study shows that at single dose of 2000 mg/kg dose CCAE does not cause mortality and changes in the behaviour of the SD rats within the 14-day observation period. From the result of OGTT, CCAE at 250 mg/kg concentration has lowered the glucose blood level of hyperglycemic SD rats in 30 minutes after ingestion since the blood glucose level in this time is within the normal range. Therefore, CCAE is safe at 2000 mg/kg as a therapeutic dosage and lowers blood glucose level.

From the result, CCAE is recommended for phytochemical analysis especially on the presence of flavonoid, phenolic, alkaloid, saponin and tannin which has an effect on lowering blood glucose level. Furthermore, other clinical study must be done to confirm its stabilization effect when consumed as a tea. Maybe, evaluating

also the nutritional importance of this herb can lead to a better understanding of the value of the plant.

## REFERENCES

1. Adeneye AA, Agbaje EO. Hypoglycemic and hypolipidemic effects of fresh leaf aqueous extract of *Cymbopogon citratus* Stapf. in rats. J Ethnopharmacology, 2007; 112 (3): 440-444.
2. Akande IS, Samuel TA, Agbazue U, Olowolagba BL. Comparative proximate analysis of ethanolic and water extracts of *Cymbopogon citratus* (lemon grass) and four tea brands. Plant Sci Res 2011; 3(4): 29-35.
3. Barau A, Acharya J, Ghaskadbi S, Goel P. The relationship between fasting plasma glucose and hba1c during intensive periods of glucose control in antidiabetic therapy. J Theories Biology 2000; 363: 158-163.

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4. Bnouham M, Ziyat A, Mckhfi A, Tahiri A, Legssyer A. Medicinal plants with potential antidiabetic activity. *Int J Diabetes Metab* 2006; 14:1-25.
5. Brower M, Grace M, Kotz CM, Koya V. Comparative analysis of growth characteristics of Sprague Dawley rats obtained from different sources. *Laboratory Animal Res*, 2015; 31(4): 166-173.