

## Development of a Herbal Tea Beverage

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### Introduction

Across the globe, there are about 150 million people suffering from diabetes mellitus. Each of these people is at increased risk of developing a number of complications, each of which are associated with a reduction in quality of life and an increase in individual morbidity and mortality. However, despite these physiological implications, as well as the financial burden associated with the management of the disease, existing treatment options are costly, and have limited, palliative effects. One treatment that is emerging as a potential panacea for the management of diabetes is Masbedda (*Gymnema sylvestre*). The leaves are used in herbal medicine preparations. Herbal drinks have gained in popularity in recent years due to the health benefits. Today, ready to drink beverages products have huge demand in the export market. Because ready-to-drink tea is better than virtually every other packaged beverage for meeting the health and wellness requirements of consumers and the increasing desire for natural products combined with an obligatory convenience character. Although various herbal value added tea product are exported from Sri Lanka, still the availability of Ready-to-Drink herbal tea products for export market are not satisfactory. Therefore, tea exporters have to be involved in developing tea with herbs as value added products to earn more revenues in this competitive market. Therefore, this study was carried out to develop a ready to drink herbal tea beverage using Green tea with Masbedda, Cinnamon and Cardamom.

### Methodology

*Gymnema* leaves were selected and dried under room temperature and then grounded to get the required particle size. Ten experienced tea tasters conducted sensory analysis to find best recipe of *Gymnema sylvestre* and green tea ratio for herbal tea development. Cinnamon and Cardamom were separately blended with identified best recipe of *Gymnema sylvestre* and green tea ratio.

Table 1: Different Treatment Combinations for the Preparation of Final Herbal RTD Tea

Type of material	Treatments			
	656(T5)	767(T6)	878(T7)	989(T8)
<i>Gymnema Sylvestre</i>	360mg	345mg	352mg	360mg
Green tea	1640mg	1570mg	1600mg	1640mg
Spice(Cinnamon/ Cardamom)	250mg (Cinnamon)	335mg (Cinnamon)	294mg (Cardamom)	250mg (Cardamom)
Total weight	2250mg	2250mg	2250mg	2250mg

Combinations of these functional ingredients extracts were prepared by following Specific procedure

Hot water Extraction → Filtration → Cooling → Fine Filtration →  
 Masbedda, Cinnamon and Tea extract → Heating → Sterilization → Cooling →  
 Filling → Seaming → Cooling (below 40) (At 121 °C for 20 minutes)

Sensory Analysis was done by using Kruskal-Wallis Test in Minitab software. Conover-Inman Method equation was used to select best treatments. The microbial analysis test was carried out in order to evaluate the cleanliness of the product and identification of shelf life for finished products (herbal tea). pH value test were done for 2 months period to identify Physico-Chemical Qualities. Protein analysis was done for the final product and cost analysis was done to get economic feasibility of Herbal tea production.

### Results and Discussion

Sensory evaluation showed that there were significant differences between treatments with respects to colour, aroma, taste, Mouth feel and overall acceptability, which revealed that the formulated beverage with 250mg Cinnamon added Treatments T5 (656) was found to be superior in quality.

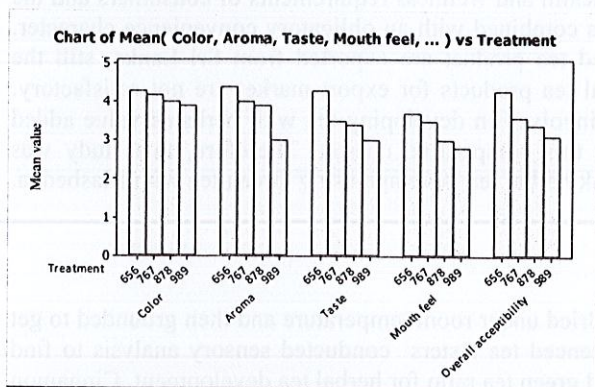


Figure 1: Mean values of Color, Aroma, Taste, Mouth Feel, and Overall Acceptability of different treatments

Conover-Inman Method equation was used to select best treatments. The *t* table was used for the analysis (Conover,1999)

$$\Delta R_c (crt) = t_{N-k, \alpha, 2} \sqrt{\frac{N \cdot (N + 1)(N - 1 - H)}{12(N - k)}} \cdot \sqrt{\frac{1}{n_i} + \frac{1}{n_j}}$$

N=40,k=4,H=11.63,  
 ni=10, nj=10  
 ΔR (crt) =9.092

Table 2: Ascending order of average rank values of the treatment tested

TC	T8	T7	T6	T5
Average Rank	13.7	17.8	20.9	29.8

According to the Conover-Inman method the differences of the average ranks of the treatment combinations decision rule as follows, if the differences of average ranks more than Critical Conover-Inman value (9.092), there is a significant difference in treatment combination.

Table 3: Differences between average ranks

TC	T8	T7	T6
T7	4.1		
T6	7.1	3	
T5			

The shaded cells are indicating that differences of average ranked higher values comparing with critical Conover-Inman value (9.092). Therefore, treatment combination T5 is significantly different in Color, Aroma, Taste, Mouthfeel, Overall Acceptability of Herbal tea.

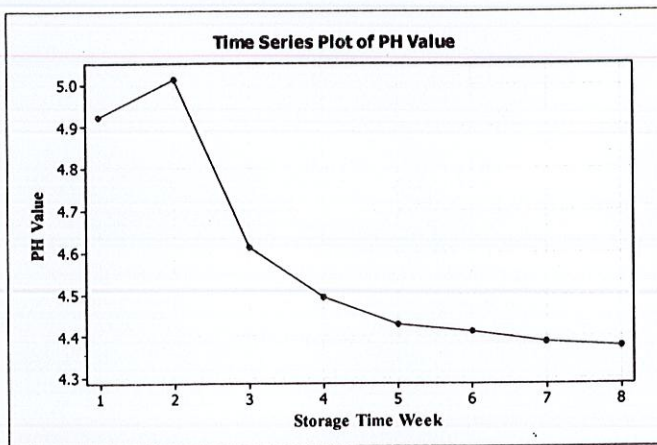


Figure 2: Changes in pH of selected herbal tea sample with the storage time

The pH of the final herbal tea tested ranged from 4.0 to 5.1 in 2 months period. Tested pH change is not harmful for the consumption compared with values of 2.5 (0.05) for Coca-Cola and  $6.7 \pm 0.00$  for distilled water. (Oncag, 2005)

### Conclusion

This study showed that the combination of *Gymnema sylvestre*, Green tea(360mg), Cinnamon(250 mg) added treatments is the best treatment to develop a herbal tea beverage and the formulation of Herbal RTD beverage is an economically feasible method which enables the consumers to purchase healthy products with lower price.

### References

Conover, W.T. 1999. Practical Nonparametric Statistics(3<sup>rd</sup> Edition), 291p.

Oncag, G., Tunee, A, and Tousm Y.S. 2005. Acidic Soft drinks effects on the shear bond strength of orthodontic brackets and a scanning electron microscopy of the enamel. *Angel Orthodontist* 75:243-249

Table 3: Differences between average ranks

Treatment	Control	Herbal	Herbal + Zinc Oxide
T1	4.1	3.1	3.1
T2	3.1	3.1	3.1
T3	3.1	3.1	3.1

The shaded cells are indicating that differences of average ranked higher values comparing with critical Conover-Inman value (0.002), therefore, treatment combination T2 is significantly different in Color, Aroma, Taste, Mouthfeel, Overall Acceptability of Herbal.



Figure 2: Changes in pH of reconstituted herbal tea sample with the storage time

The pH of the final herbal tea tested ranged from 4.0 to 5.1 in 2 months period. Tested pH change is not harmful for the consumption compared with values of 2.5 (0.02) for Coca-Cola and 3.7 ± 0.00 for distilled water (Oncag, 2007).

#### Conclusion

This study showed that the combination of *Cymbopogon sylvesteri* (Green tea) (200mg), *Cinnamomum* (250 mg) added treatments is the best treatment to develop a herbal tea beverage and the formulation of herbal RTD beverage is an economically feasible method which enables the consumers to purchase healthy product with lower price.

#### References

Conover, W. T. 1998. *Practical Nonparametric Statistics*, 1<sup>st</sup> Edition, 201p.