

Evaluation of the shelf life of *in-vitro* antioxidant, anti-diabetic, and anti-obesity activities of a Sri Lankan "spice" mixture at different storage conditions used for treating obesity

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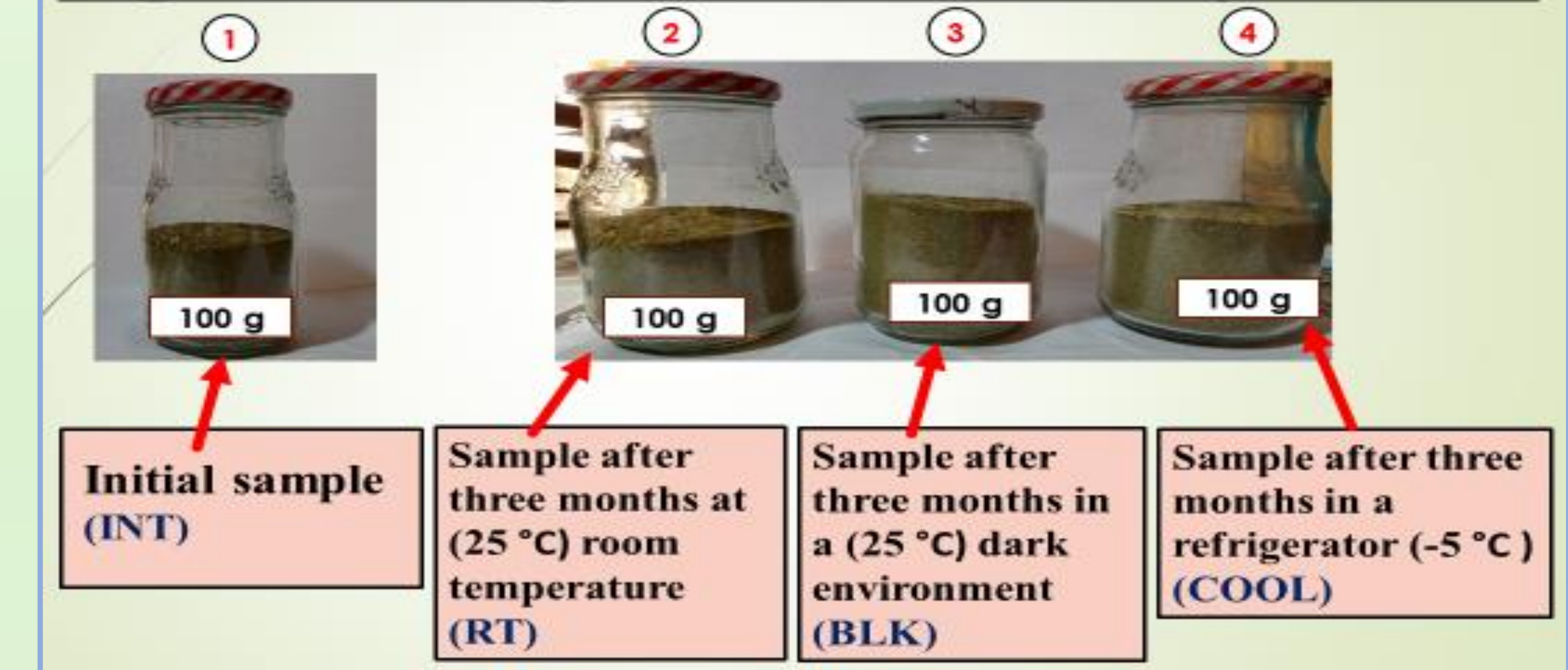
Introduction

What is this spice mixture?

This spice mixture contains 5 spices commonly used in Sri Lanka: *Cinnamon zeylanicum*, *Cumin cyminum*, *Piper nigrum*, *Murraya koenigii* (Curry leaves), and *Allium sativum* (Garlic).



Preparation of samples for the different storage conditions

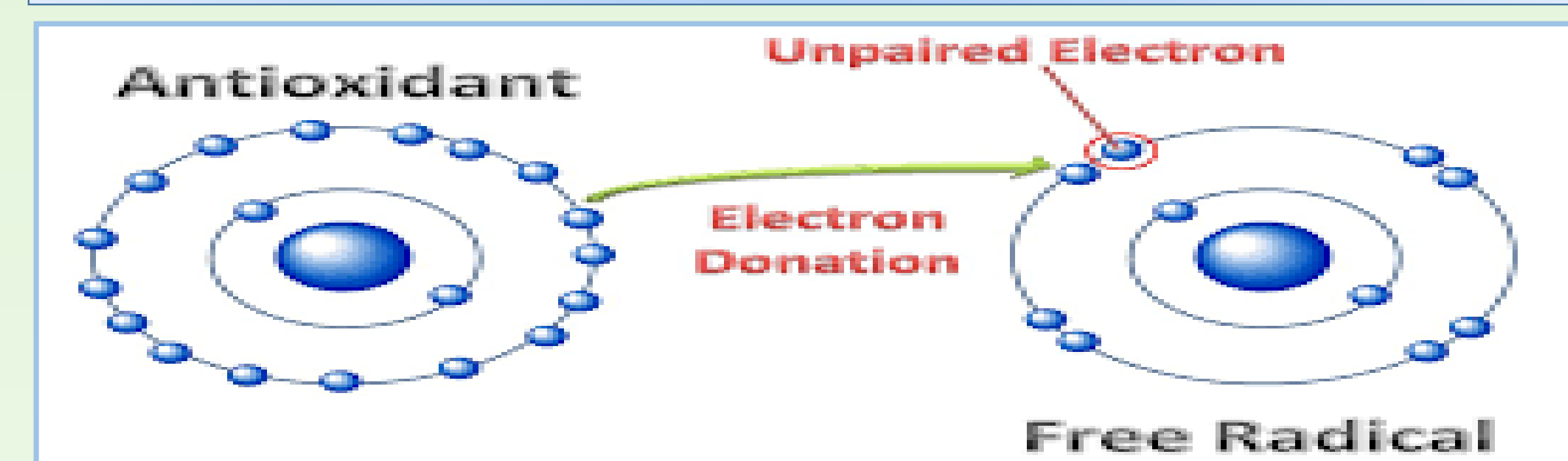


Method

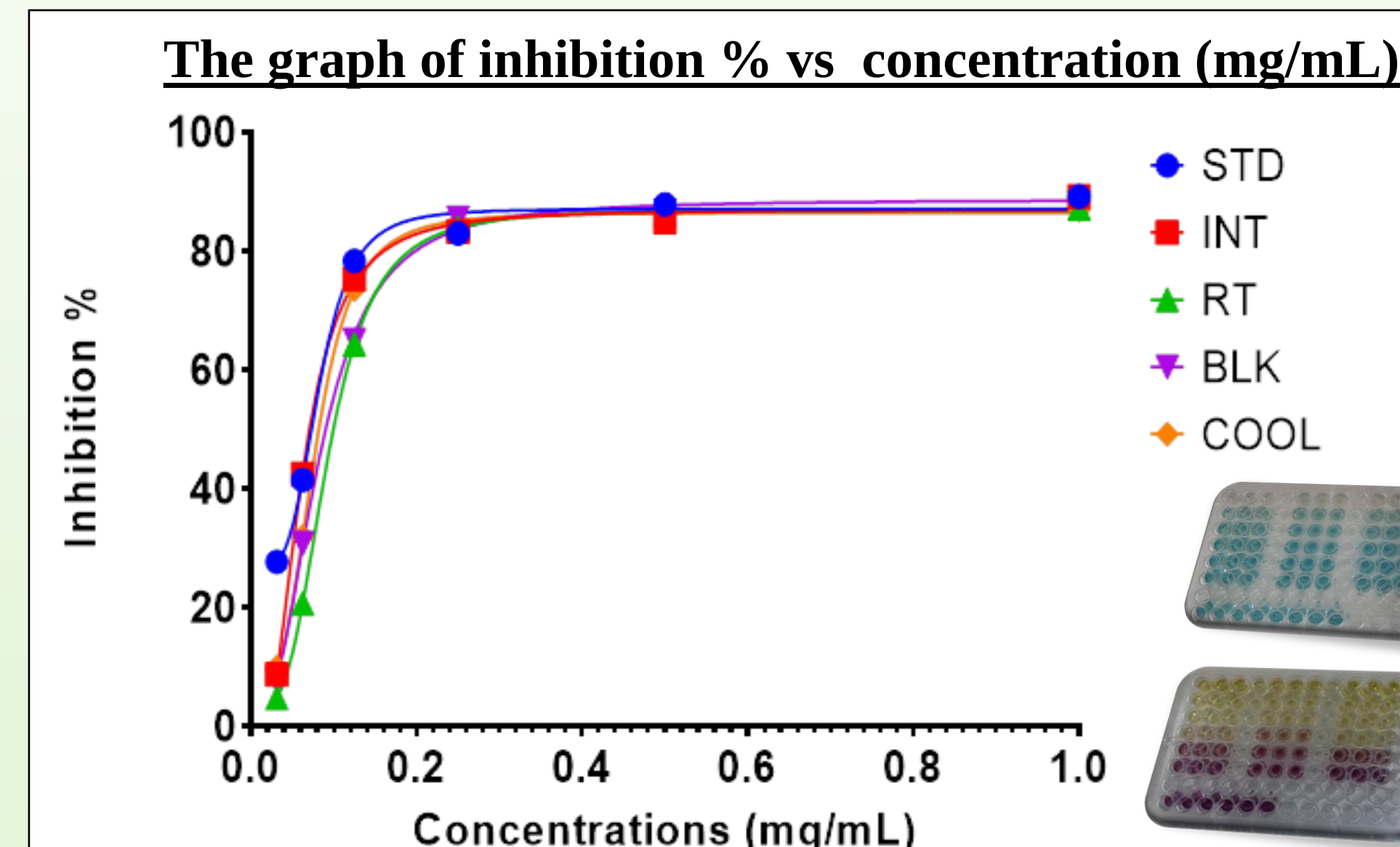
Prepared samples and the positive control (standard) concentration series (7.8215-1000 µg/mL)

Addition of each specific assay reagent separately (DPPH, ABTS, FRAP, α-amylase, lipase, & buffer reagent)

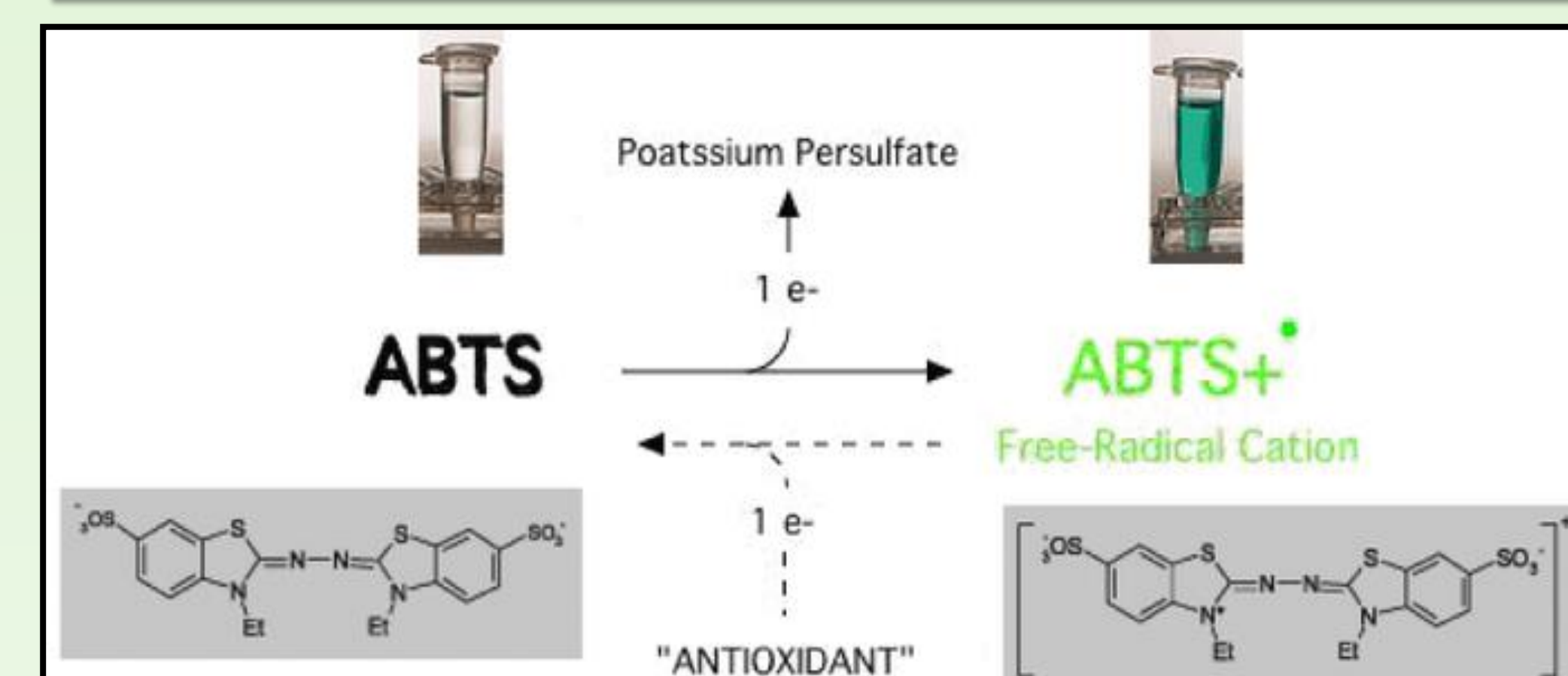
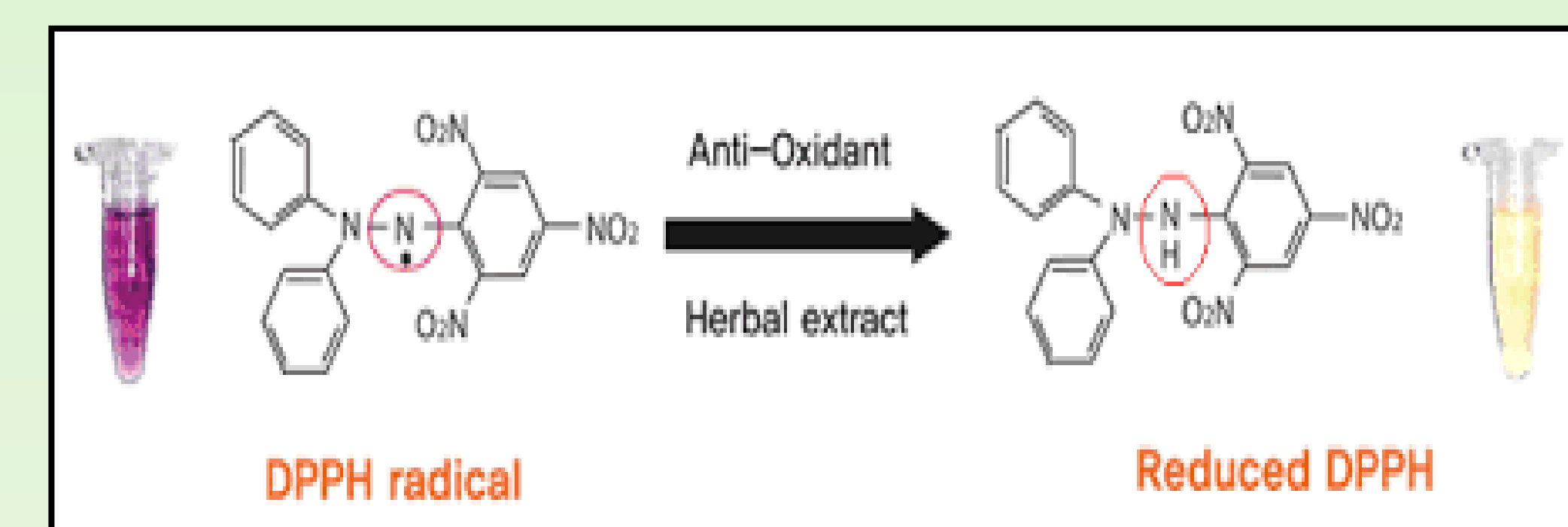
Each wavelength (nm) associated with an assay was used to measure absorbance.



Results of the DPPH & ABTS radical scavenging activity

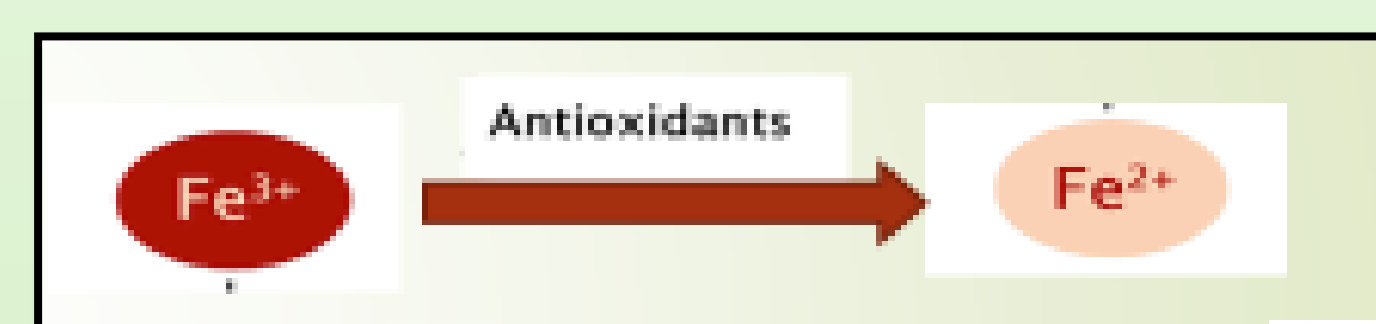
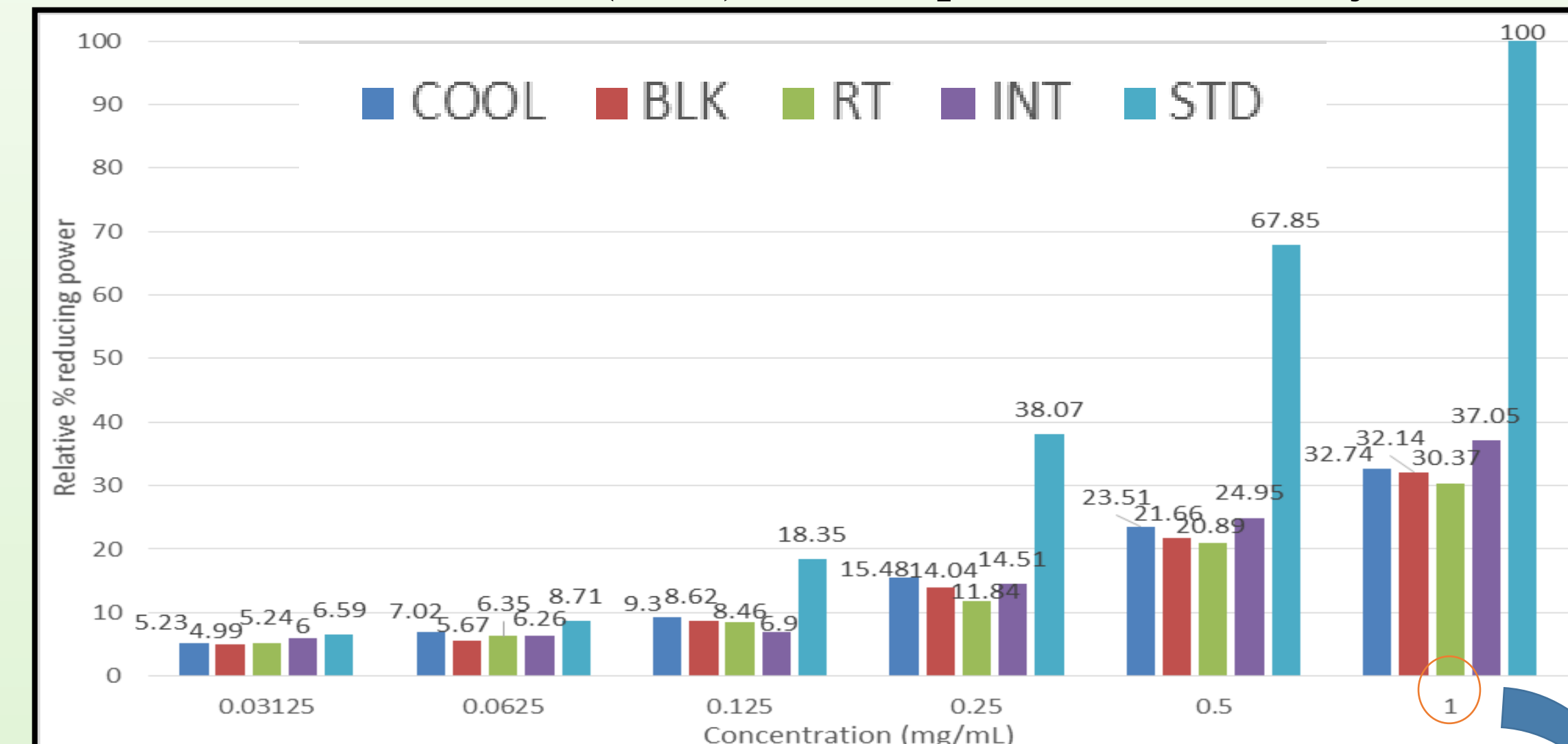


Samples	DPPH IC ₅₀ values (mg/mL)	ABTS IC ₅₀ values (mg/mL)
STD (BHT)	0.07 ± 0.01 ^a	0.36 ± 0.02 ^a
INT	0.08 ± 0.01 ^b	0.17 ± 0.01 ^b
COOL	0.09 ± 0.01 ^e	0.38 ± 0.01 ^a
BLK	0.09 ± 0.01 ^d	0.47 ± 0.02 ^a
RT	0.10 ± 0.01 ^c	0.52 ± 0.01 ^c



Results of Ferric reducing antioxidant power (FRAP) activity

The graph of Relative reducing power % vs concentration (mg/mL) of standard (BHT) and samples for FRAP assay



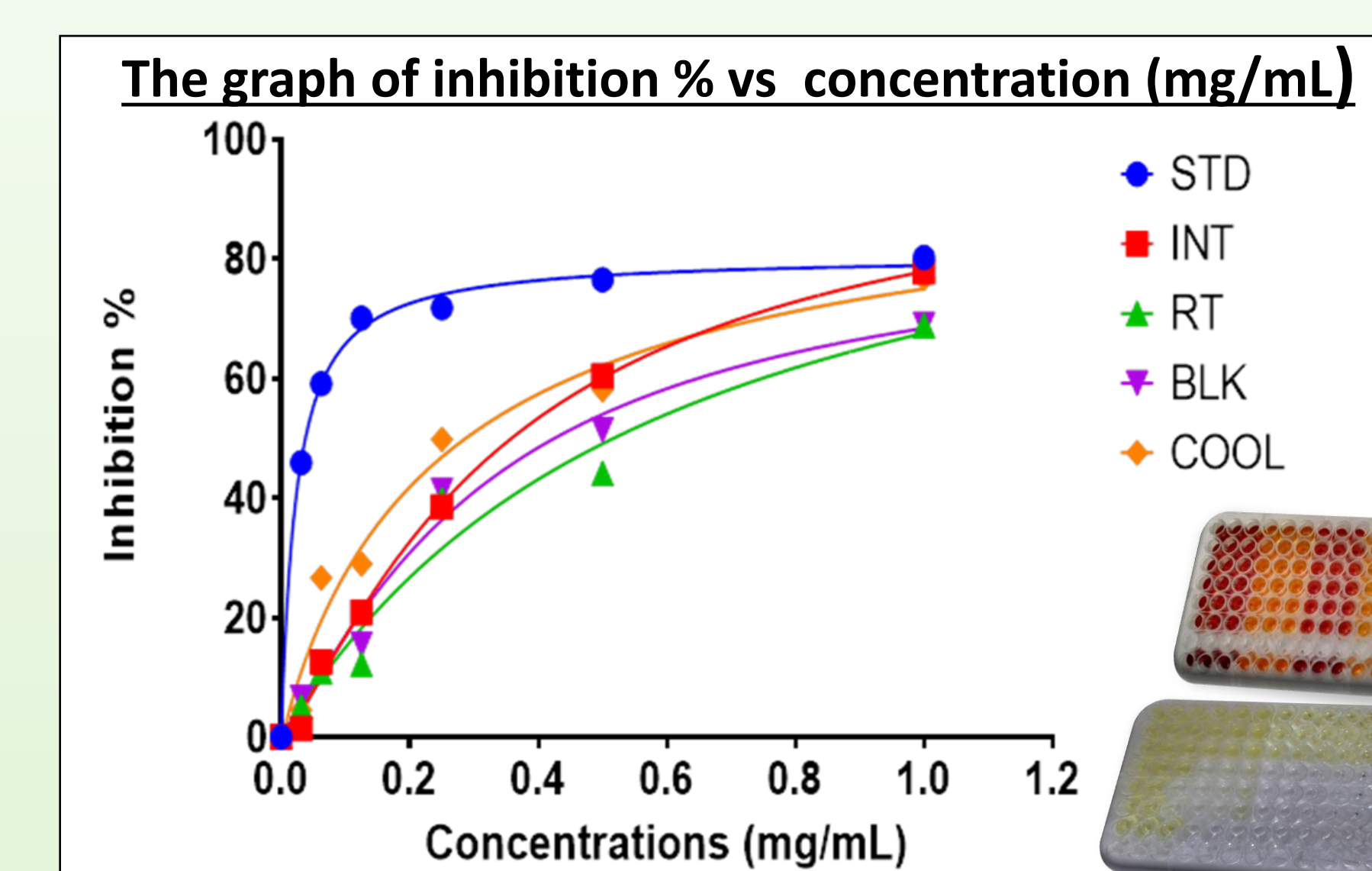
Samples (1.0 mg/mL)	FRAP Relative reducing power %
RT	30.37
BLK	32.14
COOL	32.74
INT	37.05

- ✓ Samples showed significant antioxidant activity compared to the positive control (BHT)
- ✓ The IC₅₀ value increased in the order of INT < COOL < BLK < RT respectively

The inhibition percentage is calculated by equation below,

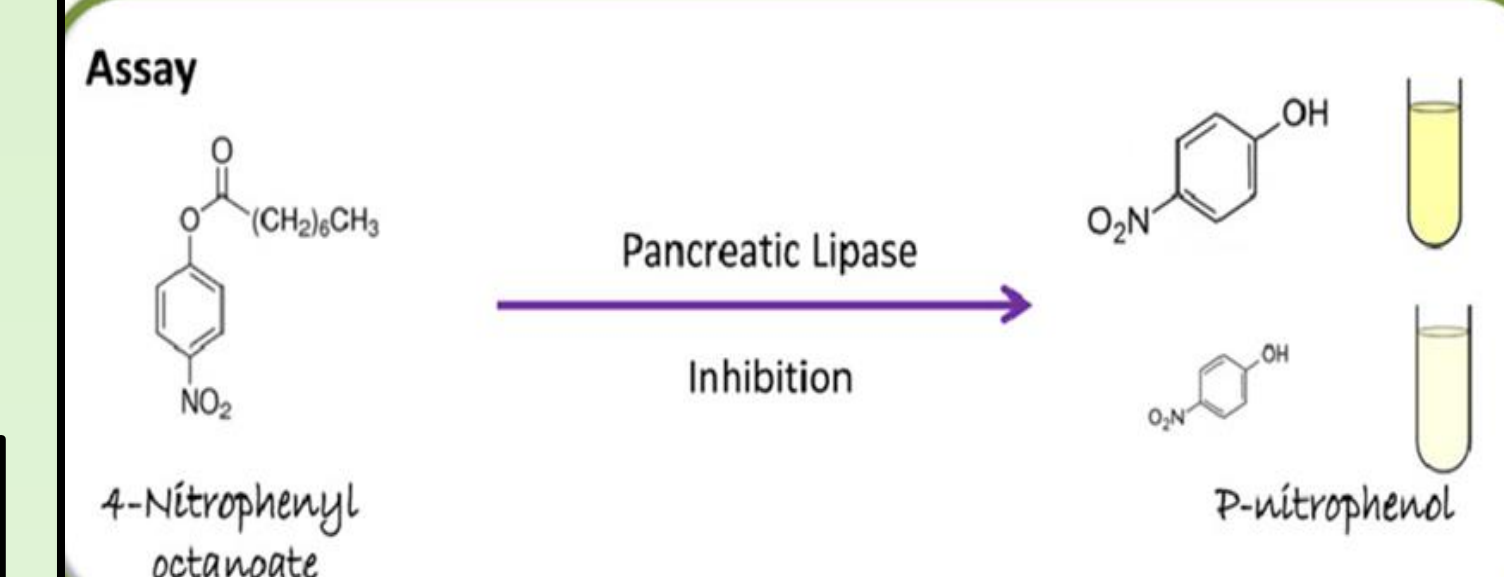
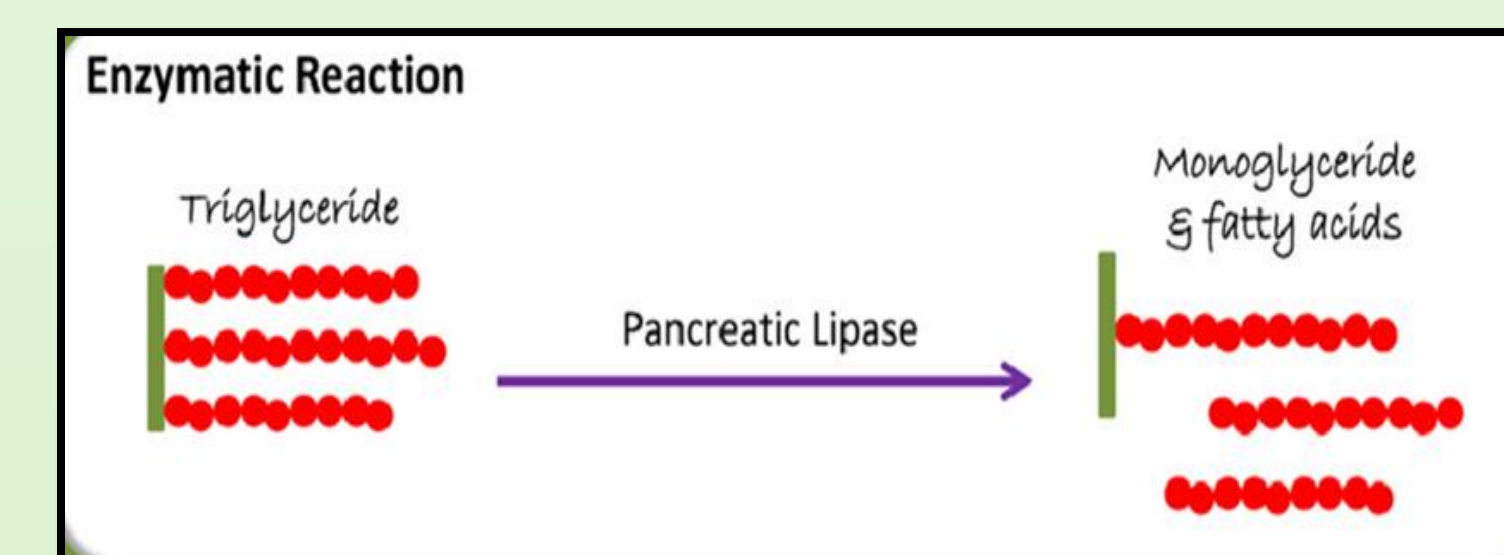
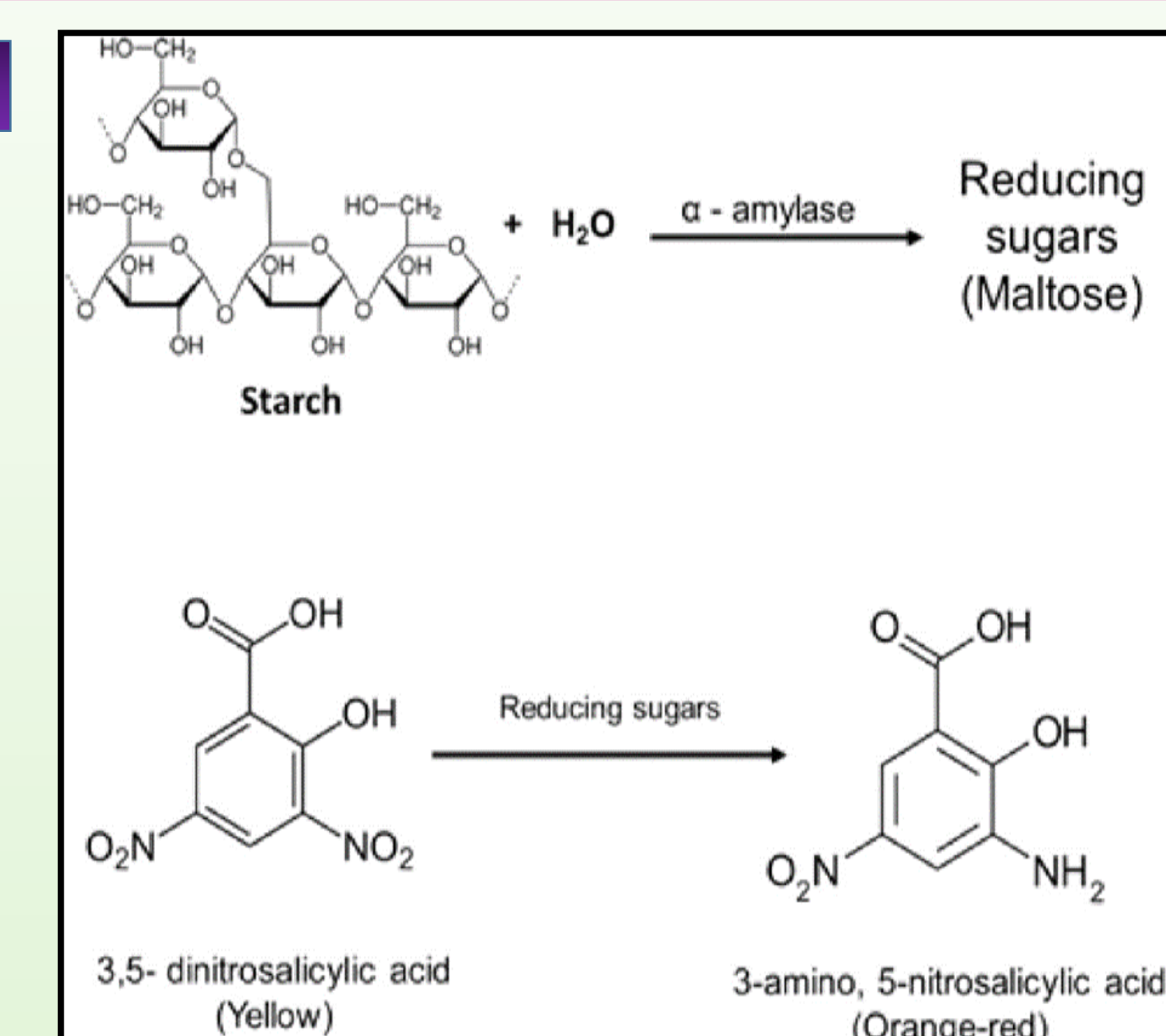
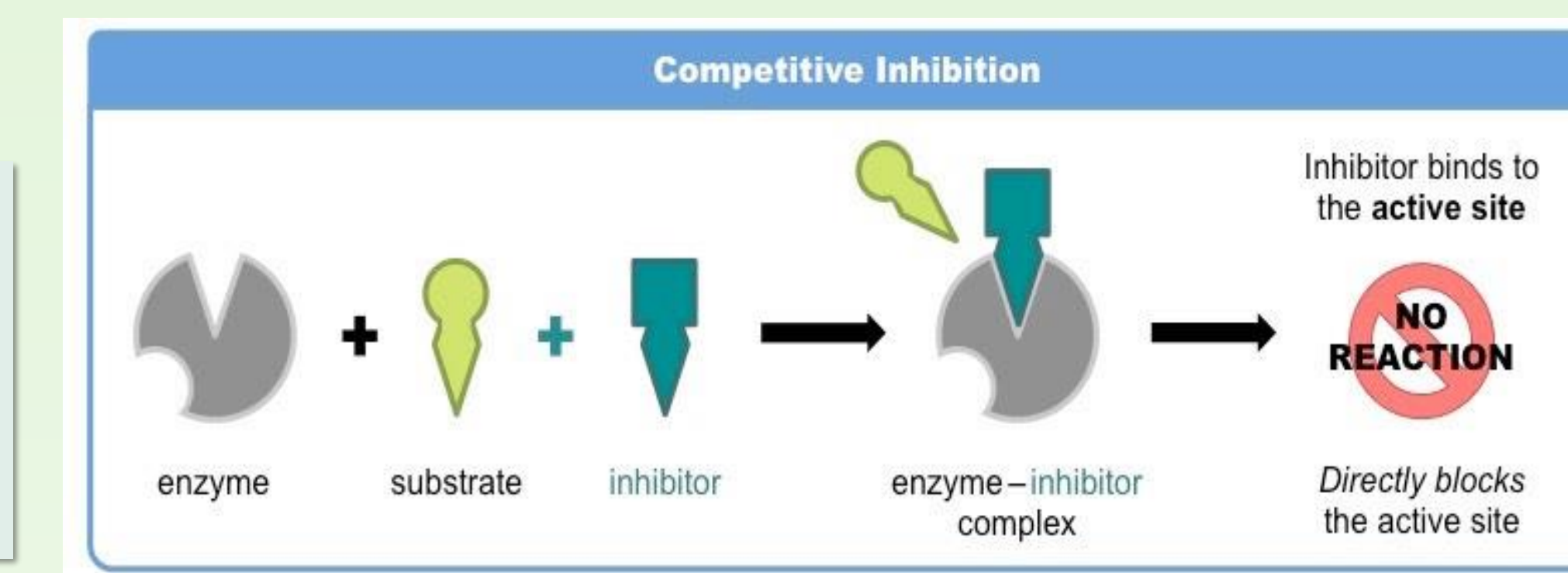
$$\% \text{ inhibition} = \frac{A_{\text{control}} - A_{\text{sample}}}{A_{\text{control}}} \times 100 \%$$

Results of the α-amylase & lipase inhibitory activity



Samples	α-amylase IC ₅₀ values (mg/mL)	Lipase IC ₅₀ values (mg/mL)
STD	0.06 ± 0.01 ^a	0.36 ± 0.01 ^a
INT	0.29 ± 0.02 ^b	0.17 ± 0.01 ^b
COOL	0.36 ± 0.01 ^e	0.37 ± 0.01 ^a
BLK	0.43 ± 0.03 ^d	0.45 ± 0.01 ^a
RT	0.54 ± 0.02 ^c	0.52 ± 0.03 ^c

- ✓ Samples of the spice mixture has the potential to inhibit α-amylase & lipase enzyme activity
- ✓ Spice mixture can be used as dietary supplements to regulate blood sugar levels or as anti-obesity drugs
- ✓ The IC₅₀ value increased in the order of INT < COOL < BLK < RT, respectively



Conclusions

- The spice mixture used to reduce obesity has a significant amount of anti-oxidant potential
- The lipase inhibition assay concluded that the consumption of the right amount of spices daily would work for weight reduction in obesity
- At different storage conditions, all assay activity was negatively correlated with light intensity, and temperature

Future works

- To advance our understanding, future studies should focus on the further purification and identification of the phenolic compounds present in the 'spice' mixture
- Investigate spice mixture can be used to treat other conditions besides obesity and diabetes Ex: Anti-inflammation, anti-cancer properties

References

- Ambady R, Chamukuttan S. Rising Burden of Obesity in Asia. *Journal of Obesity*. 2010; 21:821-848
- MI Manuha, PA Paranagama, BM Nageeb, NZ Iqbal. Assessment of antioxidant potential using total phenolic content and DPPH assay of a Sri Lankan 'spice' mixture used to impair obesity. 2017; 34-36