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Evaluation of anti-obesity, anti-inflammatory and anti-oxidant activities of oleoresins and essential oil of cinnamon bark and leaf of *Cinnamomum zeylanicum*

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It is known that various chronic metabolic disorders such as coronary heart diseases, diabetes type 2, atherosclerosis, metabolic syndrome, stroke and cancers are arising due to the obesity and inflammation. Anti-oxidant property of phenolic and flavonoid compounds is responsible for anti-obesity and anti-inflammatory activities of a plant extract. There is much interest in search of plant-based remedies with the potential of curing of these diseases. *Cinnamomum zeylanicum* (Ceylon cinnamon) is an endemic plant to Sri Lanka and previous research has revealed that the bark and leaf of cinnamon contains medicinal properties. The present study focused on anti-inflammatory, anti-obesity and anti-oxidant activities of cinnamon bark oleoresins, and essential oil of cinnamon bark and leaf of *Cinnamomum zeylanicum*.

The extracts used in the present study were cinnamon bark oleoresins obtained from supercritical extraction method (A), cinnamon bark oleoresins from Soxhlet extraction method (B), powdered cinnamon bark (C), water extract of cinnamon bark (D), essential oil of cinnamon bark, essential oil of cinnamon leaf and cinnamon powder. Cinnamaldehyde and eugenol was used as the authentic samples. Human red blood cell membrane stabilization method was used to conduct anti-inflammatory assay and aspirin was used as the positive control. Pancreatic lipase enzyme inhibition method was used to proceed anti-obesity assay and orlistat was used as the standard drug. The DPPH (2,2-diphenyl-1-picrylhydrazyl) was used for anti-oxidant assay and BHT (Butyl hydroxy Toluene) was used as the standard.

Super critical extraction of cinnamon bark oleoresins and eugenol showed highest percentage inhibition of 85.57% and 85.69%, respectively at a concentration of 0.18 mg/mL while the standard showed an inhibition of 80.72% at the same concentration. All the extracts showed higher activity than the standard drug Orlistat.

The Soxhlet extract of cinnamon bark oleoresins showed the highest inhibition of lipase enzyme with 68.60% percentage inhibition at a concentration of 200 µg/mL while the standard drug showed 50.30%. The highest percentage radical scavenging activity was obtained in essential oil of leaf (90.54%) at a concentration of 0.8 mg/mL while the standard BHT showed 90.82% at the same concentration.

These results reveal that cinnamon bark oleoresins and essential oil of cinnamon bark and leaf of *Cinnamomum zeylanicum* have the potential to combat the diseases arise due to obesity and inflammations.

References

1. Abeysekera, W. P. K. M., Arachchige, S. P. G., & Ratnasooriya, W. D., 2017, *Evidence-Based Complementary and Alternative Medicine*, 2017.
2. Karthiga, T., Venkatalakshmi, P., Vadivel, V., & Brindha, P., 2016, *International Journal of Toxicological and Pharmacological Research*, **8**(5), 332–340.
3. Arulselvan, P., Fard, M. T., Tan, W. S., Gothai, S., Fakurazi, S., Norhaizan, M. E., & Kumar, S. S., 2016, *Oxidative Medicine and Cellular Longevity*, **2016**, 1-15.
4. Simão, A. A., Marques, T. R., Marcussi, S., & Corrêa, A. D., 2017, *An Acad Bras Cienc.*, **89**, 2155–2165.