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## Exploring the diverse selected bioactivities of *Terminalia catappa* L., *Plectranthus amboinicus*, and *Cedrus deodara* plants extracts

J.M.P.A. Jayesekara<sup>1</sup>, Y.G.A.D.K. Bandara<sup>1</sup>, N.P. Piyasena<sup>1</sup>, J.M.N. Marikkar<sup>1</sup>,  
N.K.B Adikaram<sup>1</sup>, L. Jayasinghe<sup>1\*</sup>

<sup>1</sup>National Institute of Fundamental Studies, Kandy, Sri Lanka

\*ulbj2003@yahoo.com

Sri Lanka possesses vast biodiversity, which encompasses a range of natural resources and medicinal plants with several therapeutic potentials. In this study, methanol extracts from *Cedrus deodara* (dewadara in Sinhala), *Plectranthus amboinicus* (kapparawalliya in Sinhala), and *Terminalia catappa* L. (kottamba in Sinhala) were screened for bioactivities. Fresh mature leaves of these plants were collected from the central province of Sri Lanka, then air-dried, powdered, and extracted into methanol by sonication. The crude extracts were assessed for antioxidant activity using 1,1-diphenyl-2-picrylhydrazyl (DPPH) radical scavenging activity, ferric reducing antioxidant power (FRAP) assay, antidiabetic activity by  $\alpha$ -amylase inhibitory assay, phytotoxicity using lettuce seed germination assay, and their cytotoxicity was screened by a log concentration series (1000 mgL<sup>-1</sup>- 31.25 mgL<sup>-1</sup>) brine shrimp lethality assay. In the DPPH radical scavenging assay, *Terminalia catappa* L. demonstrated exceptional antioxidant potential, with an IC<sub>50</sub> value of  $7.36 \pm 0.24$  mgL<sup>-1</sup>. This performance is noteworthy when compared to the IC<sub>50</sub> value of the positive control, Ascorbic acid, which stands at  $1.97 \pm 0.06$  mgL<sup>-1</sup>. Meanwhile, *Cedrus deodara*, *Plectranthus amboinicus* showed IC<sub>50</sub> values of  $47.36 \pm 18.62$  mgL<sup>-1</sup> and  $227.04 \pm 72.52$  mgL<sup>-1</sup>, respectively. In the FRAP assay positive control; Trolox ( $12.07 \pm 0.30$   $\mu$ mol FeSO<sub>4</sub>/mg) and FRAP values of *Cedrus deodara*, *Plectranthus amboinicus*, and *Terminalia catappa* L. were  $0.977$   $\mu$ mol dm<sup>-3</sup> of FeSO<sub>4</sub>,  $0.239$   $\mu$ mol dm<sup>-3</sup> of FeSO<sub>4</sub>, and  $1.025$   $\mu$ mol dm<sup>-3</sup> of FeSO<sub>4</sub>, respectively. In the  $\alpha$ -amylase inhibitory assay, the extract of *Terminalia catappa* L. leaves exhibited high anti-diabetic activity with an IC<sub>50</sub> of  $391.11 \pm 4.34$  mgL<sup>-1</sup> compared to other extracts, while the positive control: Acarbose had an IC<sub>50</sub> of  $45.991 \pm 3.97$  mgL<sup>-1</sup>. According to the root inhibition, selected plant extracts displayed weak root inhibition properties. In the phytotoxicity assay, only *P. amboinicus* displayed a shoot inhibition with an IC<sub>50</sub> value of  $15.07$  mgL<sup>-1</sup> compared to the positive control, Absciscic acid ( $0.25$  mgL<sup>-1</sup>). In the brine shrimp lethality assay, only *Plectranthus amboinicus* exhibited toxicity, with an LC<sub>50</sub> value of  $68.92$  mgL<sup>-1</sup>. This was markedly higher than the LC<sub>50</sub> of the positive control, K<sub>2</sub>Cr<sub>2</sub>O<sub>7</sub>, which stood at  $35.16$  mgL<sup>-1</sup>. The findings resulted in the crude extract of *Terminalia catappa* L. having remarkable antioxidant qualities, while the leaves of *Plectranthus amboinicus* have a high potential for suppressing shoot growth.

**Keywords:**  $\alpha$ -Amylase, cytotoxicity, DPPH, FRAP, phytotoxicity