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***In vitro* bioactivity of the Ayurvedic drug Ramabana Rasa in the Sri Lankan market**

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*Ramabana Rasa* is an Ayurvedic drug which is commonly used to treat rheumatism and digestive problems. For its preparation, Hg (*Parada*) and S (*Ghandaka*) are triturated into nanoparticles of black HgS (*Kajjali*) and combined with various plant ingredients. Though previous studies have assessed the bioactivity of the different plant ingredients and the responsible phytochemicals separately, similar bioactive properties may not be present in the prepared drug. Lack of proper manufacturing practices in Sri Lanka may have caused significant variations in the composition and bioactivity of the drugs available in the market. The present research was carried out to investigate the *in vitro* bioactivity of the Ayurvedic drug *Ramabana Rasa* available in the market in Sri Lanka and evaluate the brand-to-brand and batch-to-batch variations. Drug samples of three different batches from three different manufacturers were purchased, powdered, shaken with methanol and water separately at 150 rpm. for 24 hours, vacuum filtered, concentrated and freeze dried. The methanol and aqueous extracts of the drugs were screened for antioxidant activity by the  $\alpha, \alpha$ -diphenyl- $\beta$ -picrylhydrazyl (DPPH) free radical and 2,2'-azino-bis (3-ethylbenzothiazoline-6-sulfonic acid) (ABTS) cationic radical scavenging assays. Anti-inflammatory activity was determined by the human red blood cell membrane stabilization assay. Antibacterial activity was explored using the agar well diffusion method against *Escherichia coli*, *Staphylococcus aureus* and *Bacillus subtilis*. The IC<sub>50</sub> values were statistically analyzed using one-way analysis of variance (ANOVA) and Fisher's comparison test. Both methanol and aqueous extracts exhibited antioxidant and anti-inflammatory activities in a dose dependent manner and the activities were found to be higher in the methanol extracts than the aqueous extracts except in a few samples at certain concentrations. The lowest IC<sub>50</sub> reported for DPPH free radical scavenging activity was  $67 \pm 3$   $\mu$ g/ml for a methanol extract which was higher than the IC<sub>50</sub> of the standard antioxidant 2,6-di-tert-butyl-p-cresol (BHT) ( $23 \pm 2$   $\mu$ g/ml). The lowest IC<sub>50</sub> reported for ABTS cationic radical scavenging activity was  $24 \pm 3$   $\mu$ g/ml for an aqueous extract where as BHT showed an IC<sub>50</sub> of  $14 \pm 2$   $\mu$ g/ml. In the anti-inflammatory assay, the methanol extracts of several drug samples showed 50% inhibition at lower concentrations compared to the IC<sub>50</sub> of the standard anti-inflammatory drug aspirin ( $164 \pm 11$   $\mu$ g/ml). The lowest IC<sub>50</sub> reported for the methanol extract was  $124 \pm 8$   $\mu$ g/ml suggesting high anti-inflammatory activity. No antibacterial activity was observed against the organisms tested. The results revealed that *Ramabana Rasa* drugs in the Sri Lankan market have good antioxidant activity and strong anti-inflammatory activity, while there are significant differences ( $\alpha = 0.05$ ) in bioactivities between brands and batches of the same brand.

**Keywords:** Anti-inflammatory, Antioxidant, Ayurveda, *Kajjali*, *Rambana Rasa*