# A pharmacognostical standardization of *Justicia adhatoda* Linn (Acanthaceae) used in Ayurveda and traditional medicinal system of Sri Lanka

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*Justicia adhatoda* Linn. (Acanthaceae), commonly known as *Adathoda* in Sri Lanka (*Vasa* in Sanskrit), is a medicinal plant widely used in Ayurveda and traditional medicine in Sri Lanka for its respiratory benefits. It is well known for its expectorant and anti-asthmatic properties, helping to relieve coughs, colds, bronchitis, and asthma. Hence in this study an attempt was made to standardize the whole plant parts (*Panchangaya*) of *Justicia adhatoda* based on different parameters. To achieve this objective, pharmacognostical, physico-chemical, and phytochemical studies were conducted according to the guidelines mentioned in World Health Organization and Ayurveda Pharmacopea of India for herbal drug standardization. Macroscopical and microscopical characteristics of leaves, roots and stems of *Justicia adhatoda* plant were comparable with the features mentioned in Ayurveda Pharmacopea of India. Physico-chemical tests were done collectively for the *Panchangaya* and results revealed acceptable total ash (2.74 % $\pm$ 0.0), water-soluble ash (1.6 % $\pm$ 0.05), acid-insoluble ash (1.6 % $\pm$ 0.05), moisture (6.06 % $\pm$ 0.16) and foreign matter (1.2%) levels. Hot water extractive values (8.5**%**$\pm$ 0.1) were the same as cold-water extractive value (8.5**%**$\pm$ 0.1), Cold methanol extractive values (5.4**%**$\pm$ 0.2) were lower than hot methanol extractive values (7.3**%**$\pm$ 0.1). Heavy metals were analyzed via ICP-MS and results revealed Pb (0.18) and Hg (0.09) were in permissible limits and not detected for As and Cd for the *Panchangaya*. Phytochemical screening confirmed the presence of Saponins, phenols, tannins, terpenoids, steroids, flavonoids and cardiac glycosides. HPTLC profiles presented clear and consistent fingerprint patterns for methanolic extract of *Justicia adhatoda* leaves, roots and stems with the Chloroform: Methanol: Cyclohexane- 4.5: 0.7: 2.5 solvent system. These findings may contribute significantly to the identification and standardization of crude drugs, which are essential steps in ensuring quality assurance in the production of herbal medicines.

**Keywords:** *Justicia adhatoda, Ayurveda, Traditional medicine, Standardization*