

Microscopic Characterization and Phytochemical Screening of *Strobilanthes willisii*

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Background: *Strobilanthes* (Acanthaceae) is a genus with 497 species and *Strobilanthes willisii* is one of the 34 *Strobilanthes* spp. found in Sri Lanka. *S. willisii* is an endemic species and distributed only in Ritigala strict nature reserve. Its habitat and distribution have been mapped and reported. The genetic studies are being carried out for the plant. However, the microscopical and phytochemical studies have not been reported.

Objectives: To identify special microscopical characteristics and secondary metabolites present in *S. willisii*.

Methods: Anatomical characteristics of the plant leaf transverse section (TS) (microtome, 8 µm), upper and lower epidermal peels, and TS of the stem were examined under light microscope (x40). Plant stems were dried (incubator, 40 °C), ground, powdered (passing through 450 µm and 180 µm sieve sizes) and subjected to dry powder analysis. Dried plant leaves were ground and extracted to methanol using sonication. Solvent evaporated extract was screened for the presence of phytochemicals (alkaloids, coumarins, flavonoids, glycosides, phenols, quinones, resins, saponins, steroids, tannins, and terpenoids).

Results: Microscopic observations of the leaf TS showed thick prominent upper epidermal and palisade cell layers with equal thickness while spongy parenchyma and lower epidermal cell layers are comparatively thinner. The characteristically enlarged parenchyma tissue could be identified from lower to each vascular bundle. In the stem TS, common dichotomous stem tissues such as; central pith, xylem and phloem (radially lied around one centre not as bundle), cortex, collenchyma, and epidermis could be identified where some of the epidermal cells have filiform trichomes while cytoplasm of some of the cells of endodermis and central pith contain violet colour pigments. Many of the endodermal cells contain green colour pigment and the endodermis is observed as a chlorophyll layer. In powder microscopy, xylem, sclerenchyma and parenchyma cells, tracheid and lignified fibres could be observed. Results of the phytochemical screening revealed the presence of flavonoids, coumarin, and glycosides.

Conclusions: Prominent upper epidermal and palisade cell layers in the leaf TS, violet and green colour pigments in the stem TS and filiform trichomes in the stem and leaf epidermis are special anatomical features of *S. willisii* and can be used for plant identification. Presence of flavonoids, coumarin, and glycosides suggests the potential medicinal properties.

Keywords: *Phytochemical screening, Plant anatomy, Powder microscopy, Secondary metabolites, Strobilanthes willisii*