

Systematic Significance of Midrib Vascular Bundles In Some *Schefflera* Spreng (Araliaceae) Species

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Abstract Anatomy study was undertaken on midrib vascular bundles of six *Schefflera* Spreng species, namely as *S. obovatilimba*, *S. borneensis*, *S. kinabaluensis*, *S. lineamentorum*, *S. opacus* and *S. petiolosa*. The genus *Schefflera* belongs to the family Araliaceae. The objective of this study is to determine variations in the midrib anatomical characteristics that can be used to identify species. Leaves samples were collected from various forest reserves in Sabah and Sarawak, Malaysia., were fixed in AA (Acetic acid: Alcohol, in a ratio of 1:3), the midrib parts then were sectioned using sliding microtome, were stained in Safranin and Alcian blue, been mounted in Eupharal and were observed under light microscope. Findings in this study have shown that all species have complex structure of vascular bundles. Each species has identical arrangement of vascular bundles and can be very useful for species identification. As a conclusion, variation in the midrib anatomical characteristics is outstanding and can has taxonomic value in the genus *Schefflera* respectively.

Keywords: *Schefflera*, midrib, vascular bundles, Araliaceae

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INTRODUCTION

Schefflera is the largest and most widely-ranging genus in Araliaceae and has been classified into 18 subgeneric groups with more than 800 species of tropical and warm temperate trees, shrubs, lianas and epiphytes worldwide [1]. However, previous studies have shown that the genus is broadly polyphyletic within Araliaceae, revealing at least five primary lineages associated with morphologically and geographically disparate parts of the family. There are five unrelated clades distributed throughout all the major lineages of Araliaceae and one of them is the Asian clade [2]. The Asian group is the largest clade with about 315 species and most of the species have potential to be commercialized due to their medicinal and ornamental values.

Schefflera is presently defined as aralids with palmately compound leaves. According to Henderson [3], the size and shape of the leaves of each species in the genus *Schefflera* is very similar and difficult to distinguish. This led to the difficulties to construct the dichotome identification key of species in the genus *Schefflera*. As a solution, recently anatomical characteristics have been used as alternative approach. There were very few studies on the leaf anatomy of *Schefflera*, the latest study was conducted by Aida [1]. She had studied leaf anatomical and morphological traits of *Schefflera* along an altitudinal gradient at Mount Kinabalu, Sabah. The results of her study have shown that cuticle, palisade mesophyll, leaf thickness and leaf morphology are most strongly correlated with elevation. The arrangement of vascular bundles varies between species and definitely has taxonomic value [4-6]. Therefore, it is suggested that midrib vascular bundles arrangement of some species in the genus *Schefflera* can be very useful in species identification.

MATERIALS AND METHODS

The six *Schefflera* species namely as *S. obovatilimba*, *S. borneensis*, *S. kinabaluensis*, *S. lineamentorum*, *S. opacus* and *S. petiolosa* were collected from various forest reserves in Sabah and Sarawak. Leaves specimens were collected in the field then were fixed in a mixture of ethanol and acetic acid (3:1), Sections of midrib were prepared