

## PRELIMINARY STUDY ON MORPHOLOGICAL CHARACTERISTICS OF ARACEAE SPECIES USING PHENETIC APPROACH

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### Abstract

Araceae is a large family consisting Aroids or Arums. It is a monocot plants characterised by the inflorescence consisting of spadix subtending a spathe. The aim of the study was to determine the relationship of 13 species from seven genera of Araceae using phenetic approach. The seven genera are *Anthurium*, *Spathyphyllum*, *Monstera*, *Philodendron*, *Syngonium*, *Alocasia* and *Caladium*. A cluster analysis was performed using the Multivariate Statistical Procedures Version 2.2 (MVSP) on 22 morphological characters of selected species. Based on the similarity of morphological characters, these 13 species are clustered into three groups: (1) *Anthurium forgerii* and *A. leuconeurum*, (2) *M. oblique expilata*, *P. scandens* *oxycardium* and *Monstera* sp. 1 and, (3) *M. deliciosa*, *P. scandens* and *Philodendron* sp. 1. The cluster analysis indicates *Caladium* sp. 1 had the lowest similarities (5.6%) compared to other 12 species. Meanwhile, *M. deliciosa* and *P. scandens* exhibit the highest similarity (68.4%) for both analyses.

**Keyword:** Araceae, MVSP, phenetic approach.

### Introduction

Phenetics also recognized as taxometrics, is an approach of classifying organisms based on overall similarity, generally in morphology or other observable traits, without regarding to their phylogeny or evolutionary relation (Sneath and Sokal, 1973; Sokal, 1986). Araceae, or aroids, are plants which are very familiar to everyone but paradoxically little known. This family is one of the common monocotyledon plants and also a monophyletic family comprising about 117 genera and 3790 species (Boyce and Croat, 2011). The Araceae is one of the largest plant families in the world that comes after orchids, grasses and also been acknowledged as the seventh largest of all flowering plants after Asteraceae, Fabaceae, Rubiaceae, and Lamiaceae (Mayo, Bogner and Boyce, 1997). This family has worldwide distribution extending from tropical dry to pluvial rainforest. It also has a wide range of climate tolerance but many species will not tolerate to any degree frost or cold such as *Anthurium brownie* (Croat, 1988). There are approximately 23 genera with 123 species of Araceae have been recorded in Peninsular Malaysia (Suhiman and Mansor, 2001). The Araceae abundance basically depends on availability of water and atmospheric humidity (Orphan, Marod, Thanompun, 2018). Most species in this family are utilized for cooking especially the native dishes, as medicinal uses and as ornamental plants. *Monstera deliciosa*, *Philodendron scandens*, *Dieffenbachia maculata* and *Agaonema commutatum* may be counted as among the world's most popular house plants. Morphological characteristics are fundamental for species identification. The family of Araceae is most readily defined by characters of the inflorescence: small flowers borne on a fleshy axis (the spadix) subtended by a modified leaf (the spathe) (Boyce and Wong, 2012), flower and leaf shape (Klimko, Wawrzyńska and Wiland-Szymański, 2014). However, due to the unequal distribution of

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