

# TAXONOMY & ECOLOGY

*Beyond Classical Approaches*

Edited by

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## DIVERSITY OF THE GENUS *COSTUS* (COSTACEAE) IN SARAWAK: SPECIES COMPARISON WITHIN THE SUBGENUS *PARACOSTUS*

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### ABSTRACT

The genus *Costus* or locally known as setawar hutan or spiral gingers was previously classified under the family Zingiberaceae. It has now been separated as a distinct family known as Costaceae, which comprises of four genera; *Costus*, *Dimerocostus*, *Monocostus* and *Tapeinochilos*. The genus *Costus* is widely distributed throughout Sarawak and formerly only referred to one species vis. *C.speciosus*. Members of subgenus *Paracostus* are usually found in moderate to big population patches, rarely in solitary clumps compared to other members of *Costus*. Five *Paracostus* species that recently described were found in Sarawak, namely, *C.bullatus*, *C.eburneus*, *C.muluensis*, *C.paradoxus*, and *C.sp.nov.* They are frequently found growing in shady and damp areas near small streams or rivers. This study focused on the comparison of morphological characteristics within the subgenus *Paracostus*. Observations and measurements were made on fresh collections and herbarium specimens. Vegetative and floral morphology were described and compared among the five *Paracostus* species. Distinct characters can be observed from the colour and texture of the leaves, labellum, corolla lobe and number of inflorescence per plant. The subgenus *Paracostus*, clearly differed by its inflorescence emerging from the node of rhizomes or from the upper part below the first leaf, with flowers that are solitary or in cluster of 2 to 5. Due to inadequate study as well as lack of field information of this particular subgenus and the emergence of new *Costus* species in Sarawak, it is important that the findings of this study will provide additional information to the existing knowledge of this subgenus. A field key is also provided in order to assist in the species identification.

**Keywords:** *Costus*, Costaceae, subgenus *Paracostus*,

### INTRODUCTION

Costaceae is one of the most easily recognizable groups within the order Zingiberales. It is distinguished from other families in the order including bananas (Musaceae) and gingers (Zingiberaceae) by its well-developed and sometimes branched aerial shoots that have a characteristic spiral monostichous (one-sided) phyllotaxy (Kirchoff and Rutishauser 1990). The Costaceae has a unique floral structure in that only a single fertile stamen develops while the remaining five infertile stamens fused together to form a large, petaloid labellum that dominates the floral display (Kirchoff 1988).

The Costaceae presently comprises of four genera: *Costus* L. (ca. 95 spp., pantropical), *Monocostus* K. Schum. (1 sp., Peru), *Dimerocostus* O.Kuntz (3–5 spp., neotropical), and *Tapeinochilos* Miq. (18 spp., Melanesia). Schumann (1904) divided the genus *Costus* into five subgenera (*Costus*, *Epicostus*, *Metacostus*, *Paracostus*,

and *Cadalvena*) based upon general characteristics of overall floral morphology.

For subgenus *Paracostus*, five species have been recorded in Sarawak, namely, *Costus bullatus*, *C. eburneus*, *C. muluensis*, *C. paradoxus*, and *C. sp. nov.* The subgenus *Paracostus* is characterized by smaller plants (< 1.5m), prostrate stems with few leaves, and inflorescences with few flowers supported by inconspicuous bracts (Poulsen and Specht, 2010). Unlike the other members of *Costus* that are usually found in solitary clumps, the *Paracostus* species are frequently found in moderate to big population patches. They appear to be more successful in producing suckers, therefore eventually forming big clumps. Members of subgenus *Paracostus* are usually found growing in shady, wet or damp areas of limestone foothills, Mixed Dipterocarp and Kerangas forest (Meekiong *et. al.*, 2006).

Morphological study of the species within subgenus *Paracostus* is essential so that better descriptions can be formed. This is to