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Gynura tambuyukonensis (Asteraceae), an obligate ultramafic species endemic to Mount Tambuyukon (Kinabalu Park, Sabah, Malaysia)

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Abstract

A new endemic species of *Gynura* is described and illustrated. *Gynura tambuyukonensis* is found exclusively ('obligate') on ultramafic soils between bare peridotite bedrock at 2450–2550 m above sea level on Mount Tambuyukon (Kinabalu Park) in Sabah (Malaysia) on Borneo Island. On the basis of the morphological features, this new taxon appears to be related to *G. sundaiaca* F.G. Davies of the Lesser Sunda Islands and Timor. The diagnostic morphological characters are discussed and information about its habitat, ecology and distribution is provided.

Key words: Compositae, Endemic, Mount Tambuyukon, Senecioneae, Ultramafic

Introduction

The genus *Gynura* Cassini comprises of 44 species in total (Vanijajiva & Kadereit 2011). It is largely palaeotropical in distribution, with the main center of diversity and endemism in Southeast Asia. The genus has been placed within the tribe Senecioneae of the Daisy family (Asteraceae) because it has one series of involucral bracts with usually homogamous disciform capitula, often yellow corollas and mostly long and exserted style arms (Nordenstam 2007).

Mount Tambuyukon, in Sabah on Borneo Island, is Malaysia's third highest mountain at 2579 m above sea level after Mount Kinabalu (4095 m above sea level) and Mount Trus Madi (2642 m above sea level) and the mountain lies entirely in Kinabalu Park, a World Heritage Site. Kinabalu Park is renowned for harboring what is perhaps the highest plant diversity per unit area globally with in excess of 5000 species in less than 1200 km^2 (Beaman 2005). To date, relatively little research effort has been devoted to Mount Tambuyukon, but it is clear from recent studies by the first author that its vegetation is exceptionally species-rich.

The geology of Mount Tambuyukon is dominated by ultramafic bedrock, mainly peridotite. Soils derived from ultramafic (also called 'serpentine') geology are widely known for hosting endemic floras (Brooks 1987, Boyd *et al.* 2009, Harrison & Rajakaruna 2011). This can be partly explained by the unusual chemical properties of ultramafic soils, which includes nutrient deficiencies, cation imbalance and metal toxicities (Proctor 1999, 2003). In Kinabalu Park, where ultramafic soils occur as insular features, such habitats have been associated by high levels of species-richness and endemism (Beaman & Beaman 1990). Typical for tropical ultramafic mountains in the region, it is that the altitudinal sequence of vegetation zonation is compressed, as reported from Mount Silam (884 m above sea level) on Sabah's east coast (Proctor *et al.* 1988, Bruijnzeel *et al.* 1993). As Mount Tambuyukon is the highest ultramafic mountain on the island of Borneo, this compression is much more pronounced than on Mount Silam and manifests itself in graminoid shrub vegetation with several endemic plant species (Van der Ent 2011, Van der Ent & Wood 2012).

As part of fieldwork undertaken in 2011–2013, a new species of *Gynura* was found on the main summit ridge of Mount Tambuyukon.

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