

Studies on Schismatoglottideae (Araceae) of Borneo XXIX—*Piptospatha manduensis*—The Ultimate Aroid Calciphile?

Peter C. Boyce
phymatarum@gmail.com

Wong Sin Yeng
Department of Plant Science & Environmental Ecology
Faculty of Resource Science & Technology
Universiti Malaysia Sarawak
94300 Kota Samarahan
Sarawak, Malaysia
sywong@frst.unimas.my

ABSTRACT

Piptospatha manduensis A. Hay & Bogner is highlighted as a truly calciphilous aroid obligated to travertine in north eastern Indonesian Borneo. Based on new collections and cultivated plants an updated description is offered. A brief overview of the other very few calciphilous aroids in Borneo is presented, and, together with *P. manduensis*, all are illustrated.

KEY WORDS

Araceae, *Piptospatha*, Schismatoglottideae, Geology, Limestone, Travertine, Borneo.

INTRODUCTION

Limestone obligation coupled with a highly localized distribution is a well established phenomenon for Araceae species (e.g. Bogner & Hay, 2000; Boyce & Wong, 2009; Gonçalves, 2010; Hay & Yuzammii, 2000; Kiew et al., 2004; Wong & Boyce, 2006; Wong & Boyce, 2007a, 2007b). However, our extensive field observations on Borneo have revealed that the majority of 'limestone species' actually grow in crevices or on ledges with significant deposits of organic material, the pH testing of which reveals as moderately to highly acidic (pH 5–4.2). Thus, although many aroids are indeed limestone obligated (we estimate about 100 species on

Borneo alone, many still to be described), primarily on forested karst formations, so far only three have been found that habitually grow directly on a limestone substrate.

These very few exceptions include *Schismatoglottis monoplacenta* M.Hotta from karst limestone riverside cliffs at Mulu N.P., NW Sarawak (Fig. 1), and *S. bauensis* A. Hay & Chi.C.Lee (Fig. 2), which occurs on drier limestone stacks at Bau, SW Sarawak. Leaf blades of both species are invariably coated in habitat with limestone powder or paste resulting from deposition of decomposed limestone by constant dripping of rock-percolated water (Figs. 1C & 2B). This limestone coating, however, is readily removed by rubbing.

A third and still yet more remarkable exception is *Piptospatha manduensis* A. Hay & Bogner, a highly localized rheophyte obligated to bare travertine stream beds and waterfalls in northeastern Indonesian Borneo (Kalimantan Timur) which is frequently encountered in habitat with much of the creeping rhizome and roots encased by mineralized limestone (Fig. 3A, B). The coating can only be removed by flexing the stems, at which time the limestone shatters into small pieces.

Described in 2000 based on a collection by 'Doc' Kostermans, *P. manduensis* has recently been re-found at the type locality, enabling recording of several additional

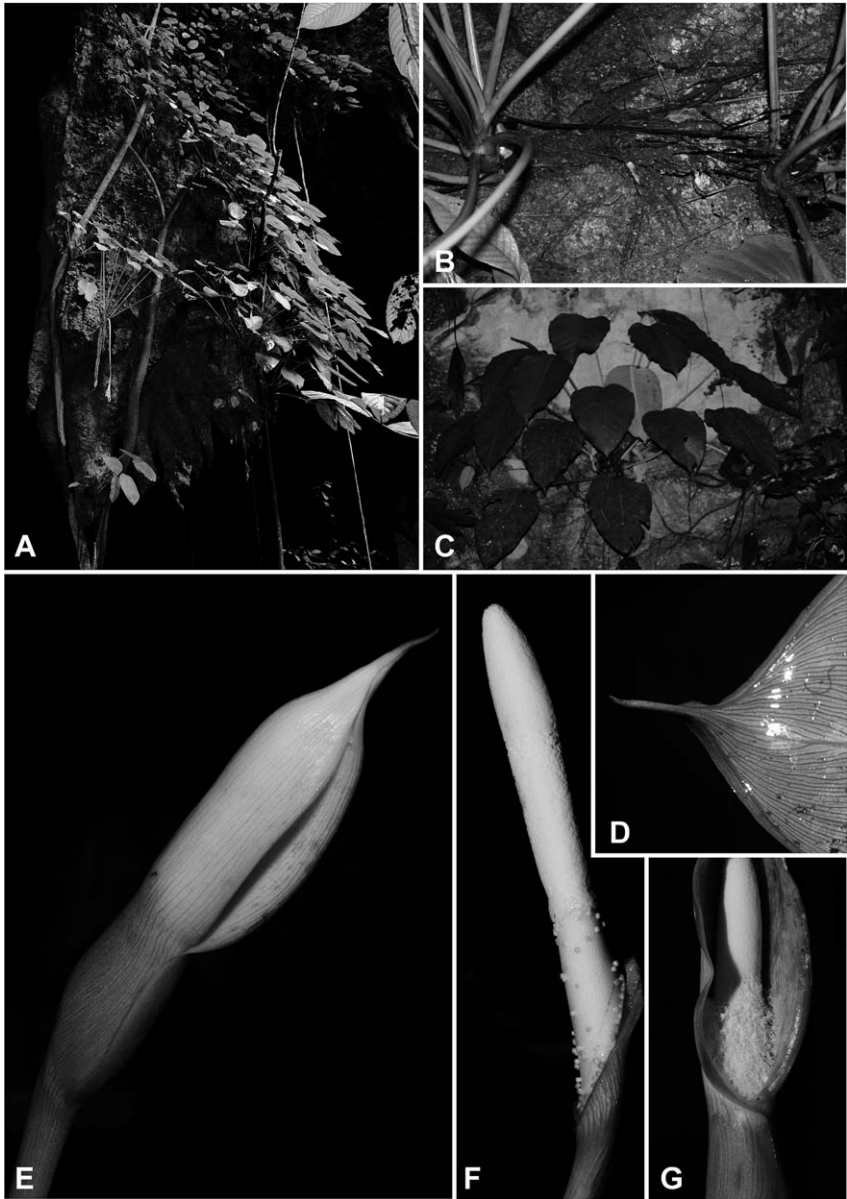


Fig. 1. *Schismatoglottis monoplocenta* M.Hotta. **A.** Plants in habitat on karst limestone formations en route to Clearwater Cave, Mulu N.P., Sarawak. **B.** Detail of plants growing on bare limestone. **C.** Limestone deposits (dark green leaf blades, owing to algae growing on the limestone coating) as compared with a newly expanded (bright green leaf blade, centre) leaf. Plants in cultivation retain bright green leaf blades. **D.** Detail of leaf tip (abaxial view), showing the pronounced drip-tip (ca. 1.5 cm long) and the conspicuous pellucid veins. **E.** Inflorescence at pistillate anthesis. **F.** Spadix at pistillate anthesis (spathe artificially removed). **G.** Inflorescence at staminate anthesis, just after pollen release. The strings of pollen are clearly visible on the fertile (staminate) portion of the spadix. Note that the spathe limb has discoloured by the onset of staminate anthesis. **C–G** from *P.C.Boyce et al. AR-1966*. All images © Peter C. Boyce.