



Figure 1. *Hapaline appendiculata* Ridl. Plants in habitat on basalt at Nanga Perom, Betong Division, Sarawak.

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#### ABSTRACT

Mature infructescences of *Hapaline appendiculata* Ridl., are described and illustrated for the first time.

#### INTRODUCTION

*Hapaline* Schott is a genus of eight species of terrestrial, usually deciduous geophytes occurring from Myanmar through SW China to Borneo. With the exception of the rather widespread *H. benthaminana* Schott, *Hapaline* species are all locally restricted; most species are associated with forested Karst limestone, although one, *H. celatrix* P.C.Boyce, occurs only on shales while another, *H. appendiculata* occurs on both limestone and basalt.

*Hapaline* species are seldom collected, possibly owing to their small stature and periodic dormancy (plants usually deciduous). Another factor maybe their often highly localized occurrence; paradoxically, however, where they do occur plants are often locally abundant [as noted by Burkill (1912)].

When the first author revised the genus (Boyce, 1996) he was fortunate to have access to living collections of three of the seven then-recognized species. This enabled accurate observation of the tiny but complex flowers. However, despite several attempts at pollination mature fruit were never produced; fruit descriptions given in Boyce (1996) are without exception based on preserved (pressed) material.

Two *Hapaline* species occur on Borneo: *H. appendiculata* Ridl. (Ridley, 1908), described from Kampung Puak, Bau, Kuching Division, Sarawak, where it is associated with Karst limestone, but extending as far east as the Belaga drainages (Kapit Division), where it occurs on basalt, and shale-obligated *H. celatrix* P.C.Boyce, described from Brunei, but also occurring in adjacent Miri and Limbang Divisions, Sarawak (Boyce & Wong, 2008). Since 2002 fieldwork by the authors has located a significant population of *H. appendiculata* at Tringgus, Bau (Boyce, et al., 2005), and further smaller populations close to the Kuching – Kalimantan border; all on karst limestone. Most recently a population on basalt was located in Nanga Perom, Betong Division and proved of particular interest since many plants were carrying ripe infructescences (Figure 1).



Figure 3. *Hapaline appendiculata* Ridl. Submature infructescence with the fruit forcing open the lower spathe. Note the green, opaque pericarp.

# The Infructescences of *Hapaline appendiculata* Ridl.

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Figure 2. *Hapaline appendiculata* Ridl. Young infructescences. Note the spathe limb, and all spent portions of the spadix are already shed (brown scar), and that the persistent lower spathe partially envelops the developing fruits. Note that the stigma is uppermost on the berry.

Developing (submature) infructescences consist of the persistent lower spathe and associated fruit. The spathe limb, and all spent portions of the spadix are already shed, and the lower spathe partially envelops the developing fruits, which are turned to present the stigma uppermost (Figure 2). As the fruits continue to grow their increase in size forces open the lower spathe (Figure 3). It was observed that while younger infructescences often have two, rarely even three berries, none of the later stage infructescences have more than one. Once the fruit has reached full maturity the spathe quite suddenly reflexes, in a matter of a few minutes, to 'display' the ripe berry. At this point the pericarp also rapidly turns from opaque green to semi-transparent white, allowing the large bright green seed to be visible (Figures 4 & 5). It was noticed that once the spathe reflexed the berry became only loosely attached to the spadix, dislodging at a touch. The pericarp of fallen fruits is readily damaged, and sticky once so. It is speculated that the fruits/seeds are dispersed by foraging ants but observations are required to confirm this.

One further observation possible from this newly found site is that the plants appear to retain their

leaves for some time, as witnessed by the abundance of epicuticular cryptogams on the leaf blades (**Figure 6**). This is in contrast to the plants in west Sarawak (Kuching Division), which become dormant (deciduous) during extended periods of low rainfall.

## REFERENCES

Boyce, P.C. 1996. *Hapaline* (Araceae: Aroideae: Caladieae). *Kew Bull.* 51(1): 63–82.

\_\_\_\_\_ [et al., 2005], Jeland ak Kisai & Jipom ak Tisai. 2005. *Hapaline appendiculata* (Araceae: Caladieae) Rediscovered. *Gard. Bull. Singapore* 57(1): 13–18 2005.

\_\_\_\_\_ & Wong S.Y. 2008. *Hapaline celatrix* (Araceae: Caladieae) – A New Record for Sarawak, Malaysian Borneo. *Gard. Bull. Singapore* 60(1): 31–36.

Burkill, I.H. 1912. *Hapaline appendiculata*. *Gard. Bull. Straits Settlem.* 1: 192.

Ridley, H.N. 1908 '1907'. New or rare Malayan plants. III. *J. Straits Branch Roy. Asiat. Soc.* 49: 11–52.



**Figure 4.** *Hapaline appendiculata* Ridl. Fruit at full maturity – lateral view. Note that the spathe has reflexed to 'display' the ripe berry. Note that the pericarp is now semi-transparent white, allowing the large bright green seed to be visible.



**Figure 5.** *Hapaline appendiculata* Ridl. Fruit at full maturity – ventral view. Note that the spathe has reflexed to 'display' the ripe berry. Note that the pericarp is now semi-transparent white, allowing the large bright green seed to be visible.



**Figure 6.** *Hapaline appendiculata* Ridl. The presence epicuticular cryptogams on the leaf blades suggest that the leaves are long-lived.