

The Fruits of *Bakoa nakamotoi*

by Peter C. Boyce and Wong Sin Yeng

Peter C. Boyce
Pusat Pengajian Sains Kajihayat [School of Biological Sciences]
Universiti Sains Malaysia 11800 USM
Pulau Pinang, Malaysia
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

The infructescences and fruits of *Bakoa nakamotoi* S.Y. Wong are described and illustrated for the first time. The fruits are shown to be dehiscent berries, the first such recorded example for the Araceae.

Bakoa nakamotoi S.Y. Wong is a recently described obligate rheophyte endemic to West Kalimantan, Indonesian Borneo. In habitat *B. nakamotoi* occurs on vertical shale waterfalls, where for much of the year it is in the water stream (Fig. 1). The species is well-adapted to this ecology, with very narrow, tough, leathery pendent leaf blades, and an extensive root system securing the plants. Unlike many rheophytic Schismatoglottideae, species of *Bakoa* lack the ability to disarticulate the leafy shoot from the roots at periods of high water spate and appear instead to rely on very strongly adhering root systems.



Figure 1. *Bakoa nakamotoi* S.Y. Wong in habitat on a shale waterfall in West Kalimantan, Indonesian Borneo.

When *B. nakamotoi* was described the infructescence and fruits were unknown (Wong & Boyce, 2012). However, based on the morphology of the inflorescences it was speculated that these would closely resemble those of *Bakoa lucens* (Bogner) P.C. Boyce & S.Y. Wong (Boyce & Wong, 2008).

In the past few months several different clones of *B. nakamotoi* have flowered in cultivation (Figs. 2 & 2a) and been observed to have developing infructescences (Fig. 3). It was soon apparent that the developing infructescences differed from those of *B. lucens* by the spathe remaining white (the spathe of *B. lucens* turns green soon after successful pollination – Fig. 4), and by the slender shape. It was also noted that the peduncle remained declinate. Approximately four weeks after flowering several of the infructescences opened by reflexing of the adnate spadix, causing the spathe to split and reflex, effectively turning it inside-out to display the ripe fruits (Fig. 5). These movements are much in accordance with observations of *B. lucens*, but with two significant differences. First, the spathe of *B. nakamotoi* remained white even after opening, whereas as noted the spathe of *B. lucens* changes to green, and just prior to dehiscence turns brown (Fig. 6). Secondly, and remarkably, the berries of *B. nakamotoi* were observed to open from the base, with the pericarp of each berry tearing into several irregular segments that curl upwards to release the pericarp from the attachment point on the spadix. The shedding of the now star-shaped pericarp exposes the seeds attached to a basal annuliform

placenta (Fig. 7). This is in marked contrast to the ripe fruits of *B. lucens* in which the pericarp dries onto the seeds, with each fruit functioning as a (potentially wind-dispersed) caryopsis. (Fig. 8.)



Figure 2. Inflorescence of *Bakoa nakamotoi* S.Y. Wong at pistillate anthesis.



Figure 2a. The inflorescence in Figure 2a has had the spathe artificially removed to reveal the pistils.



Figure 3. Developing infructescence of *Bakoa nakamotoi* S.Y. Wong.



Figure 4. *Bakoa lucens* (Bogner) P.C. Boyce & S.Y. Wong. The white inflorescence is at staminate anthesis; the green one is a developing infructescence. Note that the spathe is much wider than is the infructescence spathe of *B. nakamotoi*.



Figure 5. Ripe infructescences of *Bakoa nakamotoi* S.Y.Wong open by reflexing of the adnate spadix, causing the spathe to split and reflex, effectively turning it inside-out to display the ripe fruits.



Figure 6. Ripening infructescence of *B. lucens* (Bogner) P.C.Boyce & S.Y.Wong. Note that the spathe is changing from green to brown.



Figure 7. Mature, open infructescence of *Bakoa nakamotoi* S.Y.Wong. Note the annuliform placentas visible along the middle of the spathe.



Figure 8. Open infructescence of *B. lucens* (Bogner) P.C.Boyce & S.Y.Wong. Note that the pericarp dries onto the seeds, with each fruit functioning as a caryopsis.

Schottarum and *Bakoa*, two new genera from Sarawak, Malaysian Borneo. *Botanical Studies (Taipei)* 49: 393 – 404.

Wong S.Y. & Boyce, P.C. 2012. The Araceae of Malesia III: *Bakoa* P.C. Boyce & S.Y. Wong. *Malayan Nature Journal* **: *** – *** (in press).

Conclusions

Bakoa, a genus of only three described species, provides two unique fruit morphologies for the Araceae. In *Bakoa lucens* ripe fruits are a caryopsis and there is the possibility of wind-dispersal; here newly recorded dehiscent berries of *B. nakamotoi* are recorded.

Literature Cited

Boyce, P.C. & Wong S.Y. 2008. Studies on Schismatoglottideae (Araceae) of Borneo VII: