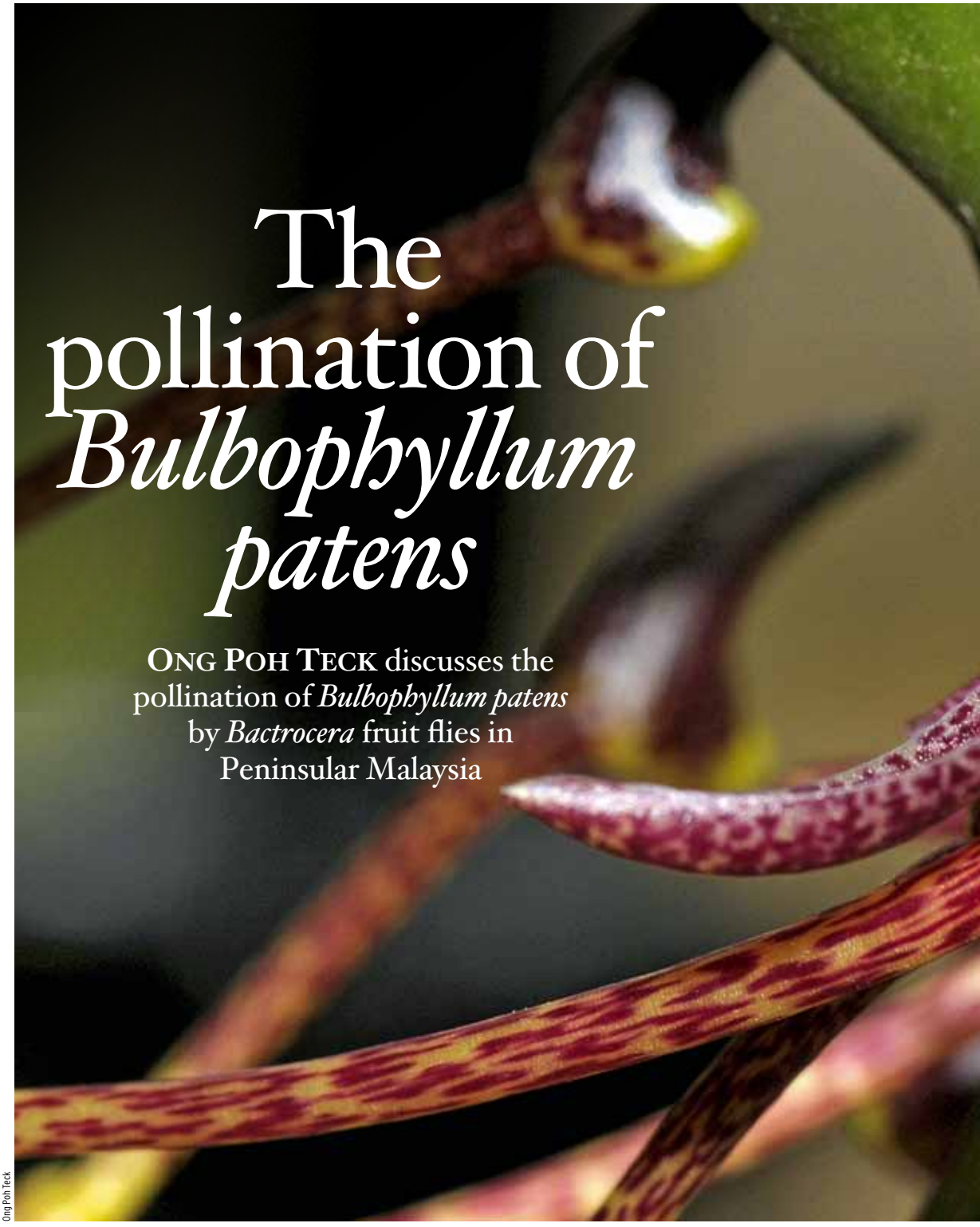
The pollination of *Bulbophyllum patens*

ONG POH TECK discusses the pollination of *Bulbophyllum patens* by *Bactrocera* fruit flies in Peninsular Malaysia



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I HAVE BEEN GROWING *Bulbophyllum patens* in my garden for some years now but only recently did I notice fruit flies removing pollinia from its flowers. Its solitary, non-resupinate flowers are creamy-yellow, heavily spotted purple and emit a spicy scent. They open widely and last for just a day.

Cultivation

Bulbophyllum patens is a lowland species (Seidenfaden & Wood 1992), and is an easy-to-grow epiphytic orchid that flowers regularly. It is best to tie the plant onto a slab, which it can creep along as it grows. Propagation is easy – just cut off a piece of rhizome with several pseudobulbs. A mature plant will flower several times a year, producing a large number of 3cm-wide flowers on each occasion. In cultivation, plants of *Bulbophyllum patens* are occasionally pollinated without human intervention, resulting in the production of seed capsules.

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1. A *Bactrocera carambolae* fruit fly probes the lip of a *Bulbophyllum patens* flower
2. The fly's weight shifts, making the hinged lip tip over suddenly, hurling the fly against the pollinia
3. Another *Bactrocera* fruit fly with pollinia on its thorax lands on the lip
4. The lip flips over, resulting in the pollina being pushed into the flower's stigma

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Pollination

Bulbophyllum patens flowers attract male fruit flies as pollinators. Several species from the genus *Bactrocera* are involved. They are rewarded by feeding on zingerone, a chemical compound produced by the flower that boosts their pheromone system, making them more attractive to female fruit flies (Tan & Nishida 2000). In 2011 Ong *et al.* reported the case of a yellow form of *Bulbophyllum patens* being visited by *Bactrocera* fruit flies but on all occasions the pollinia had already been removed prior to the observation being made, so the fruit fly's role as a pollinator could not be confirmed.

The hinged, counter-balanced lip is crucial to this mode of pollination

My observations

However, more recently, on three separate occasions (20 February 2011 between 9am and 11am; 12 March 2011 between 8am and 12 noon; and 13 March between 8am and 12 noon), I observed four species of *Bactrocera* fruit flies (*B. carambolae*, *B. cucurbitae*, *B. hochii* and a species that is probably *B. perpusilla*), *Dacus vijayasegarani* and an unknown fly species visiting flowers of a *Bulbophyllum patens* plant that was being cultivated in a mixed fruit orchard in Kajang, Selangor, Peninsular Malaysia. The visiting fruit fly started by probing the sepals and petals of the flower. When it moved onto the lip and started probing, the see-saw lip mechanism was activated, and the lip suddenly tipped over, violently throwing the fly against the pollinia, which stuck to the fly's thorax.

When the fruit fly, laden with pollinia, moved to next flower and started probing the lip, the see-saw

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Above Natural pollination results in a seed capsule forming on a *Bulbophyllum patens* plant
Left *Bulbophyllum patens* produces flowers several times a year

mechanism was again triggered, and the fly was hurled against the column. This time the pollinia were transferred from the fly's thorax to the stigmatic surface on the column, completing the pollination process.

Pollination by fruit flies

Anyone who observes *Bulbophyllum patens* flowers for several minutes is likely to see *Bactrocera* fruit flies paying a visit. Most people would probably ignore the flies (or wave them away) without realising the role that they play. Several other *Bulbophyllum* species are pollinated by *Bactrocera* fruit flies, such as *B. apertum*, *B. baileyi*, *B. cheiri*, *B. elevatopunctatum*, *B. praetervisum* and *B. vinaceum* (Tan 2008; Ong *et al.* 2011).

The pollination mode of *B. patens* is similar to most other fly-pollinated *Bulbophyllum* species, in which a hinged, counter-balanced, see-saw lip throws the visiting fly against the column as a result of an imbalance. So, the next time you see flies on your *Bulbophyllum* flowers, watch carefully. If you are lucky, you may see pollination taking place. ■

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