Red Beech, Golden Guinea Tree

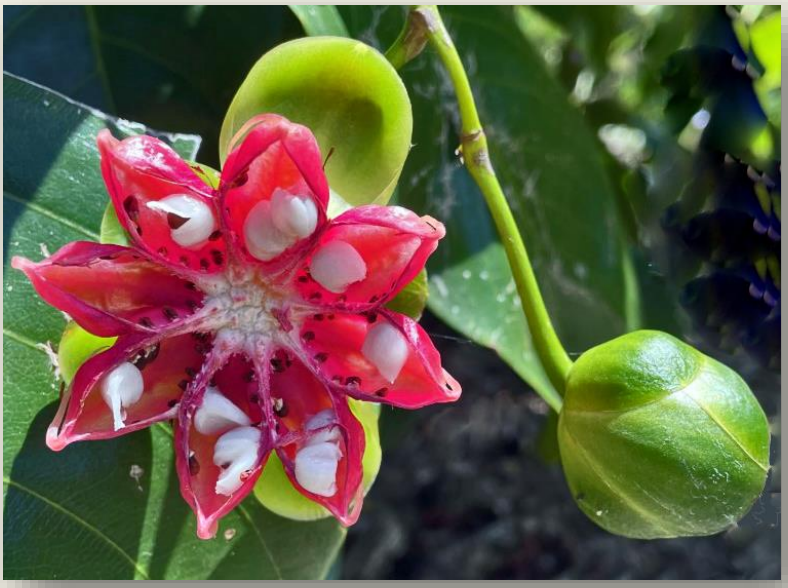
Dillenia alata

Dillenia alata – Red Beech
Photo: Rod Seppelt

On 11th June, 1770, Lieutenant James Cook's ship, Endeavour, ran aground on an offshore coral reef north east of Cape Tribulation in far north Queensland. The crew eventually manage to float it free from the reef, but it was essential to find a safe harbour where repairs could be made to the damaged and leaking hull. They sailed north and eventually, on 17th June, entered the Endeavour River and beached the Endeavour in the location we now refer to as Cooktown.

Repairs to the hull took 48 days, and during this time the ship's crew were variously involved sourcing and cutting suitable replacement timbers, forging new nails and other iron components, and fishing and hunting turtles for sustenance. This was fortuitous for botanists Joseph Banks and Daniel Solander who collected more than 200 plant species and illustrated 190. It was the largest collection of plants made during the three-year voyage of the Pacific.

Distribution of *Dillenia alata* in Australia and New Guinea
Map modified from Atlas of Living Australia



Fruit – shiny brown/black seeds and edible white arils of Red Beech. Photo: Rod Seppelt

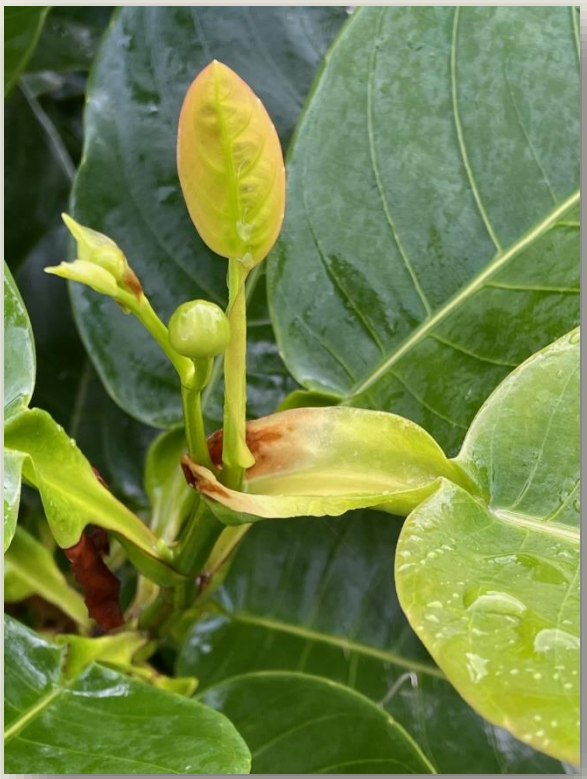
The Red Beech, or Golden Guinea Tree, *Dillenia alata*, was one of the plants collected by Banks and Solander at Cooktown, at Point Lookout above the Endeavour River. Red Beech grows as a tree or tall shrub in coastal

tropical rainforest and monsoon forests of North Queensland, the Northern Territory, New Guinea and the Moluccas. It is a species with great horticultural potential, dark, glossy green leaves with winged petioles (leaf stalks) that clasp the stems, attractive reddish-brown paper bark and glorious yellow flowers that have an abundance of yellow stamens and pinkish red styles. The fruits, too, are eye catching, scarlet red, opening to show off shiny brown/black seeds immersed in white arils. Petals, seeds and arils are edible.

Yellow stamens and pink carpels clearly visible in this photo from Hong Kong Botanic Gardens. 厚葉黃花樹 *Dillenia alata* -香港動植物公園 Hong Kong Botanical Garden- (9216085036)

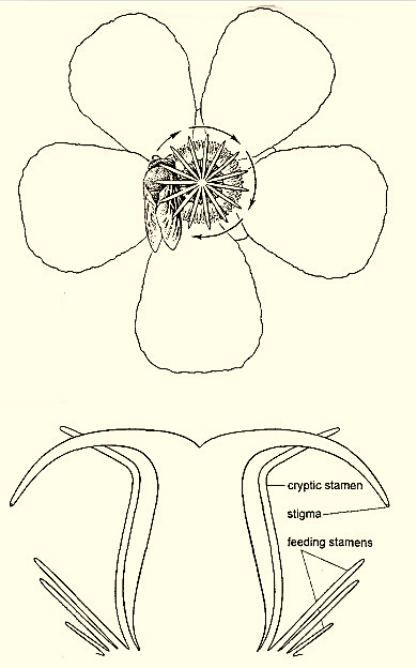
You may wonder why *Dillenia alata* seems so familiar until you realise that it is closely related to the very similar, golden-flowered *Hibbertia* species, both belong in the plant family Dilleniaceae; one difference being that there are almost 400 species of *Hibbertia* in Australia, but only one *Dillenia* – *Dillenia alata*. Mind you, there are about sixty species of *Dillenia* elsewhere in the world. In 1816, Swiss botanist *Augustin Pyramus de Candolle* formally described *Dillenia alata*, based on the original plant material collected by Joseph Banks at Cooktown.

A young tree in the Gold Coast Botanic Gardens. Photo: Rod Seppelt



Leaves of Red Beech have curiously *winged* leaf stalks that enclose the stem. Photo: Rod Seppelt

There is something else unusual about the flowers of *Dillenia*; they are pollinated by *buzz pollination*. Buzz pollinated flowers are different from those of other flowers, in that the anthers are completely closed off, except for a tiny pore at the top, only just large enough for pollen to escape. Buzz pollination, sometimes known as *sonication*, is a means by which solitary bees (i.e., species of bees that don't live in colonies) can access pollen which is locked up in the anthers. To release the pollen, solitary bees grasp the flower and rapidly move their thoracic flight muscles, rather like a hummingbird. In response, anthers vibrate, dislodging the pollen. In *Dillenia alata*, a pollinating bee will clutch some of the numerous styles, moving around the flower to make a number of stops to buzz and each time pollen is sprayed onto the side and back of the bee from the anthers of the inner stamens. Vibration occurs at a specific 'buzz frequency'.



Floral architecture typical of *Dillenia alata*. Endress 1977.

Red papery bark *Dillenia alata* – Red Beech. Photo: Rod Seppelt

Atlas of Living Australia: https://bie.ala.org.au/species/https://id.biodiversity.org.au/node/apni/2901433
Atlas of Living Australia: https://biocache.ala.org.au/occurrences/search?q=lsid:https://id.biodiversity.org.au/node/apni/2901433#tab_mapView
Endress P K. 1997. Relationship between floral organization, architecture, and pollination mode in *Dillenia* (Dilleniaceae). *Plant Systematics and Evolution* 206: 99-118.
Wikipedia: https://en.wikipedia.org/wiki/Buzz_pollination
Wikipedia: https://en.wikipedia.org/wiki/HMS_Endeavour

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