

Watkins Munro Martin Conservatory, Cairns Botanic Gardens, Queensland, Australia

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1. Front view
of the Watkins
Munro Martin
Conservatory,
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Watkins Munro Martin Conservatory in Cairns, Queensland, Australia, was opened in September 2015. The design of the structure uses a *Licuala ramsayi* leaf as its inspiration. The conservatory houses a substantial collection of rare plants featuring understory tropical palms, aroids, bromeliads, cycads, ferns, *Nepenthes*, pandans and orchids.

On 4 September 2015, the Watkins Munro Martin Conservatory (Fig. 1) at the Cairns Botanic Gardens, Queensland, Australia, was

officially opened by the Mayor of Cairns, Councilor Bob Manning OAM. The new conservatory replaces two adjoined structures,

which had previously occupied the site – the Munro Martin Fernery and the George Watkins Orchid House. Both of these structures were modest and inadequate to display the gardens' growing collection and provide the best experience to the increasing number of

visitors. After many cyclones, and the impact of tropical conditions on building materials, the orchid house and fernery were, by the late 1990s, starting to show signs of structural breakdown, which would necessitate their complete rebuilding. Their replacement was

2 (top). Internal view of the Watkins Munro Martin Conservatory, with *Licuala cordata* in the foreground. 3 (bottom). The roof is supported on steel girders, the longest to 20 m. The central pillar (in left of picture) is offset at an angle of about 5° to give the effect of a *Licuala* leaf.



Table 1. Palm species in the Watkins Munro Martin Conservatory, Cairns Botanic Gardens, Queensland, Australia, in September 2015.

<i>Arenga caudata</i>
<i>Arenga hookeriana</i>
<i>Calyptrocalyx hollrungii</i>
<i>Calyptrocalyx laxiflorus</i>
<i>Calyptrocalyx micholitzii</i>
<i>Calyptrocalyx multifidus</i>
<i>Calyptrocalyx pachystachys</i>
<i>Calyptrocalyx yamutumene</i>
<i>Calyptrogyne ghiesbreghtiana</i>
<i>Carpoxyton macrospermum</i> (at entrance outside)
<i>Drymophloeus</i> sp. 'Patipi'
<i>Dypsis pinnatifrons</i>
<i>Dypsis poivreana</i>
<i>Geonoma macrostachys</i> (as <i>G. atrovirens</i>)
<i>Geonoma epetiolata</i>
<i>Geonoma</i> sp. [0120127]
<i>Heterospathe trispatha</i>
<i>Hydriastele</i> sp. 'Halmahera'
<i>Hydriastele beguinii</i>
<i>Hydriastele cariosa</i>
<i>Iguanura</i> sp. [0140031]
<i>Iguanura spectabilis</i>
<i>Licuala cordata</i>
<i>Licuala mattanensis</i>
<i>Licuala orbicularis</i>
<i>Licuala platydactyla</i>
<i>Licuala ramsayi</i>
<i>Licuala sallehana</i>
<i>Licuala</i> sp. 'pre-ati'
<i>Licuala triphylla</i>
<i>Licula malajana</i>
<i>Linospadix albertisianus</i>
<i>Pinanga aristata</i>
<i>Pinanga chaiana</i>
<i>Pinanga disticha</i>
<i>Pinanga maculata</i>
<i>Pinanga ridleyana</i>
<i>Pinanga simplicifrons</i>
<i>Pinanga tomentella</i>
<i>Reinhardtia latisecta</i>
<i>Rhapis excelsa</i>
<i>Sommieria leucophylla</i>

first suggested by the Friends of the Botanic Gardens in 2001. A concept plan was developed and funded by the Friends; however, because of budget constraints, no action could be taken. A master plan for the Botanic Gardens precinct placed priority on the provision of infrastructure such as a new Visitor Centre; however, in 2013 the Conservatory was successful in securing funding in the capital works program and Cairns Regional Council called for design concepts. The brief was to build a structure on the same footprint as the existing fernery and orchid house with some encroachment allowable into the nursery area to increase the overall size and function. The Conservatory was designed by Queensland-based architects, Gordon Gould Ipsen.

Cairns Botanic Gardens are situated about 5 km north-west from the city center in the suburb of Edge Hill, and are administered and funded by Cairns Regional Council which is a local government entity. The area was originally developed as a recreation reserve in the 1870s, and the first ornamental gardens were created on the site in the 1890s (Dowe 2015). Since being officially designated as a Botanic Garden in the 1960s, the Gardens have grown into Australia's premier tropical public garden (Dowe 2011). The Gardens are among the most visited places in the city of Cairns, receiving about 300,000 visitors per annum, and are a major hub for cultural events in the city's calendar. There are a number of discreet gardens within the precinct, including Flecker Gardens (named after Hugo Flecker [1884–1957], surgeon, radiologist and naturalist in Cairns) in which the new conservatory is sited, the Fitzalan Garden (named after the gardener, Eugene Fitzalan [1830–1911], who originally developed the site in the 1890s), Centenary Lakes (established in 1975 to celebrate the Cairns City Council centenary), and the Gondwanan Heritage Garden (which has an emphasis on the flora of Australia's Wet Tropics). Flecker Gardens is listed as a State Heritage Place on the Queensland State Heritage Register because of its historic, aesthetic and social values (EHP 2015). Approval was therefore required from the Queensland Department of Environment and Heritage Protection for the demolition of the fernery and orchid house and the construction of the new Conservatory.

The Munro Martin Fernery was constructed around 1968 after the Munro and Martin families donated money and a fern collection



4. Group of mature *Sommieria leucophylla*.

to the Gardens. The fernery was designed by Vince Winkle who was then the Director of Parks and Gardens 1967–82 (George 2009). A small pond at the entry and a circular pathway through a spectacular display of tropical plants was the highlight and memory of the Munro Martin Fernery for many people. The George Watkins Orchid House was constructed in 1991 and named in memory of George Ernest Watkins, a local businessman and orchid fancier. The Watkins' family donated his collection of orchids and anthuriums and the

orchid house was built on part of the nursery space to showcase the orchid collection. Until this time orchids were also displayed in the Munro Martin Fernery, which was rapidly filling with rare plants as the collection grew.

The Cairns climate is tropical-monsoonal, with an annual rainfall of about 2000 mm (80 inches), and average temperature range 21–29°C (70–85°F) (Weatherzone 2015). The Conservatory, therefore, does not require any heating but has an internal irrigation system



5. One of the group of flowering *Licuala sallehana*, with *Iguanura spectabilis* in the upper left.

that supplements natural rainfall. The area covered by the conservatory is about 650 m², the lowest roof point is at 4 m, the highest roof point to about 8 m and the internal

volume is about 3900 m³. The Conservatory structure is based on the outline of the leaf of *Licuala ramsayi*, when viewed from above, and is almost circular (Fig. 2). A central pillar (the



6. *Licuala mattanensis*.

petiole) is off-set at an angle of about 5°, and supports 17 roof sections (the leaflets). Apart from the central pillar, the internal space is otherwise pillar-free. The primary roof supports

are long metal girders, the longest to 20 m (Fig. 3). The roof is composed of three types of materials: 1) perforated aluminum panels with a shade rating of ca 50%; these act as



7. *Geonoma atrovirens*, a name now placed in synonymy with *G. macrostachys* (Henderson 2011).

walkways for maintenance, 2) tensioned shade-cloth with a shade rating of ca. 75%, and 3) a semi-clear waterproof membrane, Hiraoka PVDF 11, which was installed to

enable controlled watering of the *Nepenthes*, tassel ferns and orchid collections, which are situated beneath these particular roof sections. The external walls are held on outward sloping



8. *Calatryogyne ghiesbreghtiana*.

piles, which support the roof girders, and wall sections are covered with tensioned shade-cloth. The plantings are arranged in more or less discreet plant groups, including understory

palms (Figs. 4–9; Table 1), aroids, bromeliads, ferns, *Nepenthes* and orchids, amongst others. A winding pathway loops through the garden beds and there is a 20 m² pond, almost in a



9. *Licuala orbicularis* (front) and *Hydriastele beguinii* (back).

central position, that displays emergent aquatic aroids and submerged plants. Plant name signage is unobtrusive, mainly limited to the species name but there are a few

elaborate signs that include information such as geographical origin and family, and a few interpretive panels about the individual plant groups and butterflies. Local butterfly species

are an additional feature; the pupae are purchased from certified breeders in the area and released upon emergence into the Conservatory.

Funding for the Conservatory was provided by Cairns Regional Council, in conjunction with a significant donation from the Friends of the Botanic Gardens which is an active community-based volunteer group, the members of which are variously engaged in gardening and propagation within the Gardens, and associated social and educational activities. Through sustained fund-raising during the last 25 years, the Friends have made considerable donations toward the Gardens' infrastructure, such as seating and interpretation materials.

The Watkins Munro Martin Conservatory is a major national contribution to the cultivation and display of rare tropical plants. In particular, the management protocol allows for regular rotation and additions to the display of understory tropical palms, of which the Cairns Botanic Gardens holds a globally significant collection.

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