Life history notes on the Macleay's Swallowtail, *Graphium macleayanum* (Leach, 1814) Lepidoptera: Papilionidae

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Introduction

The well-known Macleay's Swallowtail (Fig. 1) is a handsomely coloured butterfly with two subspecies in Australia.

The nominate subspecies is distributed sporadically from north-eastern Queensland to southern New South Wales and *G. m. moganna* occurs from the montane region of southern New South Wales into Victoria and Tasmania (Braby, 2000 & 2016). It is primarily a montane species along the Great Dividing Range, but is also known from lower altitudes in some coastal and subcoastal areas.

Fig. 1. Resting adult

Adults of this exquisite species can be observed in a variety of habitats including rainforest, wet sclerophyll forest, eucalypt open forest and suburban gardens adjacent to suitable habitat where host trees are established. They are rapid fliers and typically males can be observed hilltopping or flying continuously above high tree tops and across mountain summits. Females can be seen busily flying around the host trees. When hilltopping together with male *G. choredon* (Blue Triangle butterflies) individuals are often seen constantly chasing one another around for long periods.

Both sexes, with wings vibrating rapidly, feed momentarily at a variety of small native and exotic flowers; a typical flight behaviour of the swallowtail genera. They find the flowers of the exotic Lantana (*Lantana camara*) and Balloon Cotton Bush (*Gomphocarpus physocarpus*) particularly attractive. They frequently fly close to the ground whilst foraging for flowers. Similarly ovipositing females may also be observed close to ground level if fresh shoots are available.

Within the nominate subspecies there is minor variation in the size of the greenish-white area on the upperside, the width of the black terminal band and the size of the green costal spots on the forewing upperside. The subcostal spots on

the hindwing upperside may sometimes be absent. The underside hindwing markings also show slight variation in their size and shape and some females may have a lilac tinge on the terminal band. The green colouration tends to fade to yellowish-green on specimens that have been retained in collections for many years. Specimens reared indoors will also result with pale yellowish-green markings, rather than the strong green coloration.

The sexes are very similar in appearance. Males can be separated by the presence of long, fine, brown and white, sex hairs, in a fold dorsally along the inner margin of the hindwing. The inner margin is also coloured dark brown which in the female is only the pale ground colour. The female abdomen is also shorter and wider. The wingspans of the males and females pictured are 55 mm and 60 mm respectively (Figs 2–5).

Fig. 2. Male upper **Fig. 3.** Female upper **Fig. 4.** Male under **Fig. 5.** Female under

Life history

The life history of *G. macleayanum* has been documented by several authors (Common & Waterhouse, 1981; Braby, 2000). Most recently Sankowsky (2020) gives a particularly thorough and well illustrated account.

Larvae have been recorded feeding on host plants within the Lauraceae, Monimiaceae, Rutaceae and Winteraceae families, by various authors (cited in Braby 2000).

In January 2018 a female was observed laying several eggs on *Daphnandra apetala* growing in the rainforest understory at 'Bindarrabi', a private property in the montane region of the Queensland /New South Wales Border Ranges. She typically fluttered busily around the host plant. Once a suitable spot was located, she lightly balanced on the host plant, and with wings beating rapidly, curled her abdomen below a leaf, ovipositing a single egg. Most eggs were laid on fresh shoots but one egg was laid on the underside of a mature leaf. Six eggs were collected and raised to adults on a known native host tree, Brown (or Three-veined) Laurel (*Cryptocarya triplinervis*).

Eggs were pale green, smooth, spherical, and approximately 1.2 mm in diameter. (See egg day three, Fig. 6).

Fig. 6. Egg day three

Larvae consumed the eggshells when they hatched. They later chewed from the outer edge of the leaves and rested openly on a silk pad on the upperside of the host leaves (similarly recorded by P. Couper and R.P. Mayo in Braby 2000) and chiefly fed during the night. Occasionally they were also observed feeding at dusk and during the day. As in other Papilionidae the larvae have a strongly pungent-scented fleshy osmeterium (Crossley & Waterhouse, 1969) that they evert from behind the head to deter predators when disturbed. The larvae completed five distinctly patterned instars with the largest larva attaining a length of 32 mm (Figs 7–11).

The pale green pupae (the largest specimen measuring 25 mm) were located below leaves of the host plant and were attached with silk by the cremaster and a central silk girdle (Figs 12, 13).

The first adult to emerge had an egg duration of 5 days, larval duration 31 days and pupal duration of 11 days. The last adult to emerge had a similar egg and larval duration and emerged 12 days later. Within the boundary of the Scenic Rim Regional Shire, south of Brisbane, I have adult records from September through to May, but excluding January and March. Adults are most likely on the wing during these two unrecorded months in this region. There are at least two or more generations per year in this area.

Fig. 7. First instar larva **Fig. 8.** Second instar larva **Fig. 9.** Third instar larva **Fig. 10.** Fourth instar larva **Fig. 11.** Fifth instar larva **Fig. 12.** Pupa (lateral view) **Fig. 13.** Pupa (dorsal view)

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