

The adult moth emerged on 5 February 2013 - pupal duration of around 30 days. The adult (Fig. 5) has a wing span of 38 - 40 mm and is active in the summer months.

Note: No ovipositing was recorded.



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New Distribution Records for Swallowtail Butterflies (Lepidoptera: Papilionidae) in Eastern Australia - *Kelvyn L. Dunn*

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Summary

This paper documents 29 new locations in eastern Australia for eight Swallowtail butterflies (namely, *Graphium sarpedon*, *G. eurypylus*, *G. macfarlanei*, *G. agamemnon*, *Papilio anactus*, *P. aegeus*, *P. ambrax*, and *Cressida cressida*), each record of which falls outside the boundaries of the species' distributions as indicated on the synoptic, range-filled maps provided by Braby (2000).

Introduction

Many keen insect enthusiasts who occasionally visit remote areas of Australia may think they need pay little attention to the Swallowtail butterflies these days, whose members are usually conspicuous on the wing and readily identified. Casual naturalists would likely photograph them often (and do), and regular observations have been forthcoming into databases from regions popularly visited by holidaymakers over the years. Although these larger insects can take up a lot of storage space in those expensive cabinets, the available statistics on historic holdings suggest that the collector's angle supports a good knowledge from take. As the facts stand, butterflies belonging to families that are characterised by conspicuous, large and colourful species (namely, the Papilionidae, Pieridae and Nymphalidae) are likely to find their way into a cabinet a little more often than not (Dunn 2010).

As with many showy members from other butterfly families, the main distributions of Swallowtails coincide with areas where extensive observations have taken place over



the many decades of collector activity – it is mostly the case, that the coastal or near coastal regions and the continent’s eastern shore board have been fairly well studied (Dunn & Dunn 2006, Dunn 2009). Yet, in spite of so much attention, the known distributions that Braby (2000) presented for some of the more widespread and common species in these groups are still patchy, fragmentary, and likely under-representative, particularly for those that regularly or seasonally disperse into the inland. During two lengthy field trips in inland New South Wales and outback Queensland (see Dunn 2013a for a map of sites visited), I routinely recorded Swallowtails (and all other butterflies) in order to help alleviate the knowledge imbalances that have been exposed of late (Dunn 2009, 2010); and I would encourage others to do likewise, if that interests them. An explorative approach has helped determine the extent of their occurrence in the inland and the extent of their continuity in some coastal areas where knowledge gaps in distributions have become evident; the many new locations for those species tabled provide ongoing evidence of that.

Methods

I identified most of the 30 swallowtail records listed (from the 29 new locations – one site was visited twice) without the requirement of handling; those twenty-seven (27) encounters (90%) recorded by ‘observation-only’ are marked (Obs.) to distinguish them from those that were photographed (Photo), captured and released (Rel.) and those that were retained as vouchers (KLD). For most observations (93%) the identifications were certain (Category 1) – in each case, I had seen sufficient characters to achieve that level of confidence. Two observations were to a level of almost certain (Category 2) as field circumstances sometimes did not permit sufficient time or closeness to identify the species to a level beyond reasonable doubt; these lower grade records are marked ‘C2’ (see Dunn 2011a for discussion of these and other categories of record acceptability). The means used to measure distances and define locations to precision of within a kilometre of the actual site, was described in a previous report (Dunn 2013b); extended discussion and other recommendations are available in Dunn (2013c).

Results and Discussion

Table 1 lists 29 new locations across four states in eastern Australia, arranged from north to south, where I found butterflies of this group; all sites fall outside the boundaries defined by Braby (2000) for the species concerned. One or more older records overlooked by Braby (2000) are reiterated and references to findings of other workers in the last decade or so are given, where their published new locations fall close to those found by me (and where my records become supportive). For *Papilio anactus* and *P. aegeus* the findings suggest that these two widespread species extend much farther inland in Queensland than was generally supposed; for the other species many of the extensions are minor, but still provide evidence of a broader occurrence than was known.



Table 1. Twenty-nine locations for species of Papilionidae from beyond their known ranges in Australia

Species/Location	State	Geocode	Date	Format
<i>Graphium sarpedon</i>				
Myrtle Creek, 3km NNE of Proserpine	Qld	20°23'S, 148°36'E	03 Nov 2012	Obs
<i>G. eurypylus</i>				
Little Laura River, 12km WNW of Laura	Qld	15°32'S, 144°21'E	11 Jan 2001	Obs
<i>G. macfarlanei</i>				
Pax Piel Bridge, at Myall Creek, 55km ESE of Weipa	Qld	12°39'S, 142°16'E	07 Jan 2002	Obs
Coen River, 3km N of Coen	Qld	13°55'S, 143°11'E	08 Jan 2002	Obs (C2)
Mt White, Coen	Qld	13°58'S, 143°11'E	06 Jan 2002	Obs
<i>G. agamemnon</i>				
Pax Piel Bridge, at Myall Creek, 55km ESE of Weipa	Qld	12°39'S, 142°16'E	07 Jan 2002	Obs
Little Laura River, 12km WNW of Laura	Qld	15°32'S, 144°21'E	09 Jan 2002	Obs
<i>Papilio anactus</i>				
Chillagoe	Qld	17°09'S, 144°31'E	12 Jan 2002	Obs
1km E of Cloncurry, at van park	Qld	20°42'S, 140°31'E	22 Oct 2012	Voucher
Boot Hill Creek 62km SW by S of Sarina	Qld	21°50'S, 148°56'E	04 Nov 2012	Obs
16km NE by N of St George	Qld	27°57'S, 148°42'E	16 Nov 2011	Obs ^{Note 1}
Neagles Lookout, Clare	SA	33°50'S, 138°38'E	26 Oct 2007	Obs
Bega	NSW	36°41'S, 149°51'E	02 Mar 2008	Obs
<i>P. aegeus</i>				
Bottle Tree Lookout, 58km NE of Hughenden	Qld	20°28'S, 144°24'E	28 Oct 2011	Photo (see Figs 1-3)
Torrens Creek	Qld	20°46'S, 145°01'E	28 Oct 2012	Obs ^{Note 2}
24km NW (by rd) of Tambo	Qld	24°45'S, 146°06'E	26 Oct 2011	Obs
Tambo	Qld	24°53'S, 146°15'E	25 Oct 2011	Obs
			26 Oct 2011	Obs
Warrego River, 42km NNE of Charleville	Qld	26°05'S, 146°25'E	25 Oct 2011	Obs
41km NNE of Charleville	Qld	26°06'S, 146°25'E	01 Oct 2012	Obs
28km NNE of Charleville	Qld	26°12'S, 146°21'E	01 Oct 2012	Obs
Charleville nr showgrounds	Qld	26°24'S, 146°15'E	25 Oct 2011	Rel
11km S by W of Charleville	Qld	26°29'S, 146°13'E	25 Oct 2011	Obs
16km NE by N of St George	Qld	27°57'S, 148°42'E	16 Nov 2011	Obs ^{Note 3}
3km E of Cunnamulla	Qld	28°04'S, 145°43'E	27 Sep 2012	Obs
1km S of Cunnamulla	Qld	28°05'S, 145°41'E	27 Sep 2012	Obs
Moonlight Creek picnic ground, Mt Worth State Park	Vic	38°17'S, 146°01'E	27 Jan 2011	Obs ^{Note 4}



Species/Location	State	Geocode	Date	Format
<i>P. ambrax</i> 2km NW of Isabella Falls	Qld	15°17'S, 145°00'E	10 Jan 2001	Obs (C2) Note 5
<i>Cressida cressida</i> Pentland	Qld	20°32'S, 145°24'E	05 Nov 2011	Obs
Burra Range Lookout	Qld	20°43'S, 145°13'E	13 Feb 1994	Obs Note 6

Key:

Note 1. Valentine & Johnson (2000: 60) broadly recorded *P. anactus* as present “between St George and Cunnamulla.” It is implicit in that statement that the butterfly was present at both end-point towns and that they had seen the species at a number of other places, so circumscribed, as their evidence of a more or less continuous range across that part of inland southern Queensland. My record from near St George is just beyond the distribution provided by Braby (2000) and is adjunctive to the updated and enlarged distribution given by Valentine & Johnson (2000) from their own encounter data set.

Note 2. Atkins *et al.* (2003) had earlier recorded *P. aegaeus* in the White Mountains National Park, a region located to the north of Torrens Creek township that is also outside the range given by Braby (2000).

Note 3. Dr John Moss, who kindly reviewed this paper prior to publication, has advised that he had photographed *P. aegaeus* along the Balonne River at St George on 28 Sep. 2010 and, on the following day, saw others farther west along the Balonne Highway at Thrushton National Park, just NE of Bollon. Edwards (1948) recorded the species at Mitchell (to the north-northwest of St George), which is on the boundary of the contemporary distribution in that region. As the new records are very recent (2010 & 2011) and are coincident with unusually wet seasons, one might suppose a novel range expansion has occurred. However, the butterfly’s continuity into the St George area of the Warrego region would seem unexceptional (given historic knowledge from Mitchell); earlier workers have probably overlooked the butterfly’s presence there.

Note 4. Dunn (2011b) reported that 37 encounter records of *P. aegaeus* were made in Victoria during the unusually wet season of 2010-11, a time that saw additional species of butterfly enter that state. The Mt Worth encounter (at about 295m asl) provides the southernmost record from Victoria, and was the only one of those 37 compiled that lay outside of the arbitrary boundary of irregular presence, which Braby (2000) defined from earlier migratory events into the state. The faded brownish male sporting yellowed hind wing patches (which are white in newly emerged adults) was seen twice patrolling a circuit (1-2m above ground) in the grassy picnic ground at 1640h DST (1540h AEST). It swooped down to just above the grass during its second circuit to challenge a male of *Heteronympha merope* that had entered the picnic area. It fluttered above the intruder briefly before departing the area and was unseen thereafter.



Note 5. King (2012) illustrated a female of *P. ambrax* captured about 6km S of Cooktown; his specimen provides the northernmost authenticated record in the Wet Tropics. My observation, from north of Cooktown, was made in late afternoon (around 1630-1700h AEST) through the windscreen of a slow moving vehicle, and is a lower grade encounter event because of this. Peter Fox and I made an immediate search at the site but the female, which had slowly crossed the road in front of us, quickly vanished into dense rainforest, probably alarmed by the approaching vehicle. Although almost certainly this species in my opinion, it requires confirmation by a closer encounter when that opportunity presents itself. The only differential diagnosis could have been a large female of *Atrophaneura polydorus*, which has similar wings markings and coloration, but the standard *Papilio* flight-pattern did not match with that Troidine species and my field notes record that no red on the abdomen was noticeable as it flew only metres in front of us.

Note 6. This record of *C. cressida* is certainly not the first from this area but is additional evidence of the species presence; an earlier one from 'Burra Range' was made during June and July 1981 (Johnston 1984). My encounter event from many years ago, noted during a joint field trip with Michael Braby, seems outside of the western coverage of the species' range-filled map nonetheless (see Braby 2000). Subsequently, Atkins *et al.* (2003) included the species in a list from the Warang Homestead area and nearby gorges of the White Mountains National Park. Atkins personally surveyed during a scientific expedition in April 2000, but that paper includes records of this species (attributed to three other workers), which came from either the gorge area or Burra Range, or both.

Figures 1-3

Temperatures in outback Queensland can be very high for long periods from late October. Those butterflies that are more attuned to humid areas, where nectar or water may be more available to replenish fluid loss, may adapt accordingly to limit dehydration by reduced physical exertion at certain times of the day. At Bottle Tree Lookout, 58km NE of Hughenden (one of the locations listed in Table 1) I saw several species of butterfly, including a female of *P. aegeus*, fly across the basalt ridge about midday (between 1200-1220h), the latter provided the new record listed. However, by mid-afternoon, when temperatures were higher, very few butterflies of any species were active; most had likely sought shade as males of *P. aegeus* were seen to do at this site.

Figures 1 and 2 show two males of *P. aegeus* roosting on deeply shaded basalt at ground level beneath a large tree in woodland, during very hot weather (c. 37°C between 1400-1430h AEST). My very close presence did not alarm them unless my movements were rapid. They would fly back and forth in front of these rocks at such times, usually keeping within shade though, and settled on the rock surface repeatedly and sometimes on leaf litter (both relatively cool substrates but each potentially risky due to predation by spiders, lizards or other predators that lurk in deep shade).





Figure 3 shows the position of the males (in close proximity) as they roosted simultaneously on rock surface and on leaf litter (marked by arrows). These compromises in behaviour perhaps outweigh the risks of desiccation from hot winds when roosting higher up on tree foliage.



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The genus *Acraea* (Lepidoptera : Nymphalidae) - Peter Hendry

With the recent migration to Australia of the Tawny Coster (*Acraea terpsicore* (Linnaeus, 1758)), (see Creature Feature this issue), I thought it might be timely to take a look at the genus worldwide. It must be noted that due to a misidentification *A. terpsicore* had long been known as *A. violae* and many references in the literature and on the web refer to it as *A. violae*. As with much of the Lepidoptera the genus is in a state of flux, and has long been split into the subgenera *Acraea* (*Acraea*) and *Acraea* (*Actinote*). The genus is placed in the tribe Acraeini and until Harvey (1991) placed it in the subfamily Heliconiinae it was listed in the subfamily Acraeinae. Recent molecular work has made changes and a current listing of the tribe Acraeini, by Niklas Wahlberg, is available at <http://www.nymphalidae.net/Classification/Acraeini.htm>. It shows members of the old subgenus *Acraea* (*Actinote*) being placed in the genus *Actinote*, and the old subgenus *Acraea* (*Acraea*) becoming the genus *Acraea* with a subgenus *Acraea* (*Bematistes*). It also lists several *Acraea* as unplaced. This may further change as some believe the subgenus *Acraea* (*Bematistes*) will move to the genus *Bematistes*.

The genus is primarily Afrotropical with only four species occurring outside this region, these being, *Acraea andromacha* (Fig. 1) *A. meyeri* (Fig. 10) *A. moluccana* and *A. terpsicore*. A fifth species the Yellow Coster *Acraea* (*Actinote*) *issorica* is now referred to the genus *Actinote*. Like many of the Nymphalidae the larvae feed on plants which contain cyanogens making the larvae and adults poisonous to predators. This has led to them often being mimicked by more palatable species. During mating the males secrete a mating plug known as a sphragis which blocks the entrance to the

