



**Golden Mosquito,**  
*Coquillettidia xanthogaster.*  
Canon 600D, 100mm macro  
lens with +2 CU filter, 5184 x  
3456px cropped to 1330 x  
1000.

1.5 or a little more. With any of this equipment, our 5mm bug is 800px or more wide – a vast improvement on the 200px we started with – so we can achieve satisfactory shots of close subjects as small as 3-5mm (jumping spiders, small flies and the like) and great detail with 10-20mm subjects. But other technical limits already begin to intrude in the sub-10mm range and more specialised gear is needed for the tiniest critters so I will stop here.

Photos Malcolm Tattersall

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## **Field Notes: Major extensions to the known distribution of the Bright Purple Azure, *Ogyris barnardi* (Miskin 1890) in Queensland (Lepidoptera: Lycaenidae) - Kelvyn L. Dunn**

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During spring of 2011 and 2012, I investigated the distribution of the Bright Purple Azure butterfly, *Ogyris barnardi* in Queensland, in order to confirm the westernmost limits. I found that it extended much farther inland than currently believed. Prior to this investigation there had been relatively little survey of the butterfly fauna of western Queensland (see Dunn & Franklin 2010, online appendix), which by corollary raises the question as to the completeness of the limited distribution historically attributed to this species. Nonetheless, over many decades keen enthusiasts have regularly sought *Ogyris* (as a group) by determined searching, a selective process which might offset that inland knowledge deficit (for butterflies in general) to an extent. Indeed, given their general scarcity (and hard work required to obtain them) enhanced too by their brilliant hues, *Ogyris* butterflies have earned a status as gems among the Australian lycaenidae, with many rare species coveted and those reared for the cabinet proudly treasured. That the species, *O. barnardi*, was actually of limited and disjunct distribution in northern Australia, as generally thought, had hinged on published knowledge: Braby (2000) earlier presented a



synoptic range-fill map based on available records in museums and literature sources up to that time. All contributory factors considered then, the synoptic depiction was supposed to be reasonably accurate and thus likely inclusive of most of its distribution, approximating to the outer western limit of its occurrence.

*Ogyris barnardi* (Figure 1) inhabits mixed woodlands where the Grey Mistletoe, *Amyema quandang* (Loranthaceae) on which its larvae regularly feed, parasitises particular species of wattles (*Acacia*) (see Braby 2000 and references therein). The usual means of obtaining specimens of this uncommonly seen butterfly has been to rear adults from the juvenile stages (usually older larvae or pupae, found secreted in borer holes or under loose bark). Determined searching to this end has been responsible for most museum specimens collected to date and so less information is available about its seasonal flight period and the times of day that adults are active in those areas where it occurs. Encounters with the high-flying adults are often fleeting (making field identifications very difficult at best) and the regularity of their sighting in the field is a little unpredictable; on the balance then, those adults netted opportunistically are often in poor condition and so rendering them less suitable for retention. For this reason too, field sampling of adults is an infrequent practice as the lengthy time spent and labouring efforts made in the physically trying outback climate, where it lives, are not particularly rewarding to collectors.

In October and November, during the butterfly's spring appearance I systematically sampled mixed woodlands for evidence of the species whilst en route to the Gulf of Carpentaria in northern Australia, where I planned to seek out one or more other species. The butterfly is not readily found by random sampling: I examined numerous sites for various butterflies (not just this species) on my two trips (Figure 2), and of those inspected (Table 1), 22 locations (a rather small proportion by comparison) provided evidence of adults of *O. barnardi*. Where achievable, capture of one or more individuals was the means to confirm field identifications with certainty. That evidence obtained (Table 1) suggests that *O. barnardi* is widespread in the inland, albeit rather patchy in occurrence and confined to, and localised within, suitable habitat in western, central and northern Queensland. Indeed, the butterfly could extend farther west into the Northern Territory where Grey Mistletoe-infested woodland patches exist, and so, the remote border area could be the focus of those who wish to expand upon my study.

The butterfly looks drab in flight and, at such times, can be confused easily with other members of that genus. In general appearance, it closely resembles the Broad-margined Azure, *O. olane*, a species that is similarly sized and coloured, but one that seems absent from the acacia-dominated woodlands in the outback where *O. barnardi* exists. Importantly, *O. olane* does not utilise the Grey Mistletoe as a larval host in the wild, although a captive larva, proffered foliage, consumed this in one trial (Dunn 1997) and so an ancestral tolerance of a broader diet remains. Indeed, current evidence suggests the two species are host (and habitat) segregated, an adaptive



strategy that reduces competition for resources and one that probably drove their speciation eons ago. Yet, this divergence from its closest ally does not assure sole use of the larval host by that particular member of the genus. In fact, there is another species of *Ogyris*, but one more distantly related (unlike these two species, it has a differently shaped antennal club), that shares the same woodland habitat with *O. barnardi* and, at times, shares too that same mistletoe species as a host (but perhaps not the same individual plant). Hence, in some places in western Queensland, the species is sympatric with the Satin Azure, *O. amaryllis*, and where this situation arises, it represents an additional factor that confounds field identifications, short of handling. The latter species is a more widespread butterfly (its broader host range has enabled this) and one that looks very similar in flight (when in silhouette), albeit often (but not always) slightly larger. Obviously, the glistening azure blue upper-wings of *O. amaryllis* readily distinguish it from others but this telltale sign is rarely seen from below (the observers' usual position), and small males, when perched in shade with closed wings (the usual stance adopted), could easily be mistaken for an *O. barnardi* on *prima facie* evidence.

A helpful clue is the fact that adults of *O. barnardi* differ slightly in behaviour compared with *O. amaryllis*, which the trained eye may detect. They tend to patrol more locally and tenaciously perch on older wattle trees – especially favoured are those with many dead branches projecting into the canopy. Disturbing these may reveal a settled male, which otherwise could remain undetected during a passing inspection of habitat. From these high vantage points, the males dart out briefly to defend an aerial flight space, particularly one that overlooks one or more larval host plants. At such times, they may rapidly encircle those Grey Mistletoes growing nearby to seek out newly emerged females or to intercept visiting females inspecting the larval hosts for egg laying purposes and, particularly at certain times of day – late afternoon seems favoured – may pause to feed briefly at the mistletoe's flowers (when available and nectar enriched). During feeding bouts, which seemed loosely synchronised, I observed that several adults in succession would frequent one or two individual flowers, leaving other flowers close by on the same plant unattended. Much of the time though, adults did not feed but perched for lengthy periods, or routinely patrolled their haunts when intruding adults strayed into their airspace. At such times, a flurry of activity involving three or more adults could result and which often drew my attention to the presence of members of the genus at a location.

Provision of high quality identifications is paramount for rigour, yet at some locations, all adults evaded capture. Common reasons for this were (1) their sustained height in the canopy, (2) their rapid and evasive flight, and (3) the regularity of sightings at individual locations. In particular, a low abundance at the time or hour of my visit(s) sometimes made encounters infrequent and reduced opportunities to net passing adults. At the best of times, when adults were common and opportunities to net were duly increased, the quantity of snags (dead branches) on the older wattles



(the butterfly particularly favours these for perch sites) and festoons of creeping *Capparis*, equipped with net-hitching spines, often hindered the successful manoeuvring of a deep hoop-net attached to long poles. Those who have attempted to capture adults of *Ogyris* on a regular basis (not just occasionally) will recall that this is a time consuming task and, indeed, often a difficult one – particularly during midday hours when the sun is directly overhead – hence, an expectation of success at all sites is unrealistic. The inclusion of observations then (see Table 1) may raise doubt in the minds of some, as the species in this group can look very similar to the novice or advanced observer, even when equipped with field glasses. Nonetheless, I am experienced with this and other related species in Queensland, largely from survey work conducted on the Darling Downs as part of employment in the early 1990s (see fieldwork detailed in Dunn & Kitching 1994). On this accreditation, those field identifications deemed reliable comprise ‘expert opinion’ which is categorically ‘almost certain’ and a legitimate (albeit arguable) substitute, short of capture. These are marked ‘Obs-only’ to distinguish them from those verified (evidence-based) records (captures); I appreciate too that others may wish to gather more evidence at those sites concerned (where specimens were not obtained) and would encourage this. The 22 locations where I found the species on my two most recent field trips are listed from north to south (Table 1); those marked with an asterisk (\*) are considerably beyond the range indicated by Braby (2000) and so now enrich the knowledge base. All distances were measured by road from the Post Office of the nearest township, and were calculated by vehicle odometer usually from the closest road marker (where these were available) to reduce instrumental error, and so are considered precise but variably accurate. GPS coordinates (and elevations) were obtained at each site with a hand-held trekking device, and the measured road distances to each were checked later on Google Earth ([www.google.com/earth/index.html](http://www.google.com/earth/index.html)) to ensure agreement (that is, to within a kilometre) – there was minor disagreement for some though where large road distances were involved. Most locations were widely separated, often by hundreds of kilometres, but occasionally juxtaposed sites (variably within one kilometre of the other) received attention as well. For each of the juxtaposed locations the habitat was continuous and likely, the butterfly too. The GPS coordinates to the nearest minute are included (Table 1), but in all cases, the specimens are labelled more finely, whether that is to seconds or to one decimal place of a minute, as accuracy needs for each location dictated. Finally, the elevations inhabited by the butterfly ranged from about 70m to 540m, and all specimens examined corresponded with the geographically closest populations, namely the nominate subspecies to the east.

## References

- Braby, M.F. 2000. *Butterflies of Australia: their identification, biology and distribution*. CSIRO Publishing, Collingwood Vic.
- Dunn, K.L. 1997. Biological notes on some eastern Australian Butterflies, Part II. *Victorian Entomologist* 27(6): 114-118.



Dunn, K.L. & Franklin, D.C. 2010. Exploring the adequacy of representation of butterfly species' distributions in a more accessible portion of northern Australia. *Northern Territory Naturalist* 22: 88-94 (& online appendix: <http://sites.google.com/site/ntfieldnaturalists/journal>).

Dunn, K. L. & Kitching, R. L. 1994. *Distribution, status and management of the Piceatus Jewel butterfly on the Darling Downs, Queensland*. A report to the Queensland Department of Environment and Heritage, Conservation Strategy Branch. (May 1994). 46 pp + tables and appendices.



**Figure 1. *O. barnardi* male at mistletoe flowers of *Amyema quandang*, 25km NW of Tambo, 02 Oct 2012.** The arrangement of the eight black-edged, often smoky brown-tinged segments of the post-median band (which extends from the dorsum to the costa of the hind-wing, and which comprises five joined segments, with one (variably disjunct) segment at the dorsum and two more-or-less upright (disjunct) segments towards the costa) suggests the species involved. (In contrast, three or four slanted markings, situated increasingly distally along the hind-wing costa towards the apex, more abruptly end the continuation of the five joined segments of the post-median band in *O. olane*, the species it is most similar to). Although I offer this means as a useful guideline to help observers identify this species from field-gained photographs (and with a good probability of correctness too), I remind that the subsequent capture and examination of this adult confirmed its identification (KLDC).

Photo Kelvyn Dunn

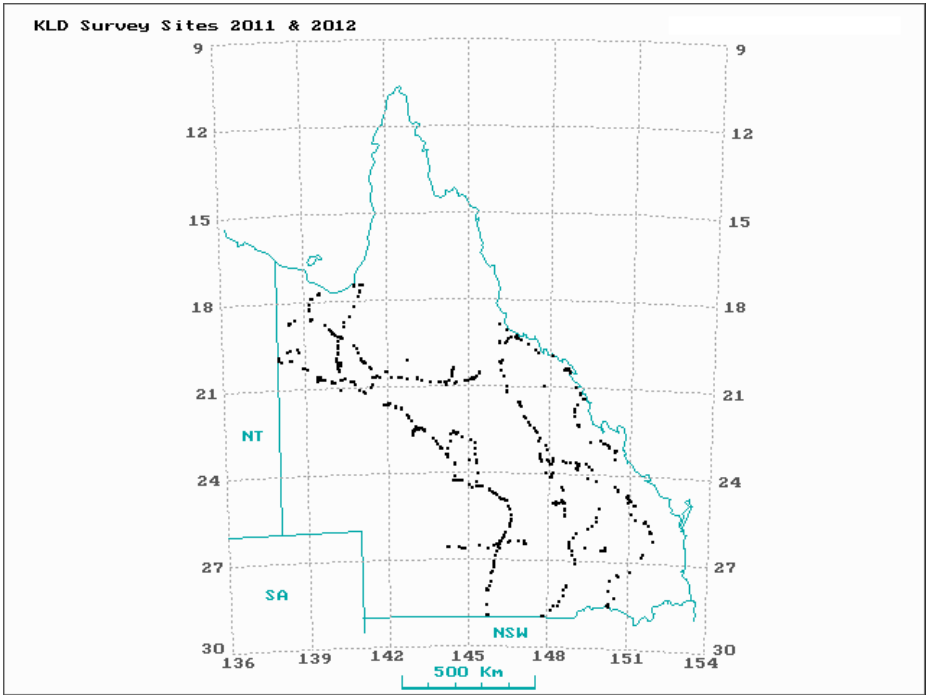


Table 1. The 22 author locations for *O. barnardi* in Queensland and associated information

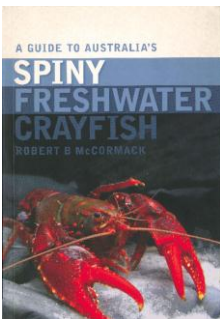
Location	Geocode	Approx. Elev. (m)	Date	Time (AEST)	Abundance
Hazel Creek, 3.6km SSW Burke & Willis Roadhouse	19°15'S, 140°20'E	71	* 26 Oct 2012	0950-1045h	Many
58km NE of Camooweal	19°38'S, 138°31'E	238	* 20 Oct 2012	1210-1240h	Few (Obs only)
57km NE of Camooweal	19°39'S, 138°30'E	280	* 20 Oct 2012	1125-1200h	Few
48km E by S of Camooweal	20°00'S, 138°34'E	338	* 20 Oct 2012	1525-1600h	Few (Obs only)
47km E by S of Camooweal	20°00'S, 138°33'E	326	* 19 Oct 2012	1430-1445h	One
84km NNW of Cloncurry	20°03'S, 140°13'E	180	* 16 Oct 2012	1540-1640h	Few
Buckley River, 90km NW of Mount Isa	20°14'S, 138°57'E	312	* 20 Oct 2012	1330-1350h	Few
84km NW of Mt Isa	20°15'S, 139°01'E	329	* 19 Oct 2012	1655-1755h	Many
George Creek, 18km E of Mt Isa	20°42'S, 139°39'E	335	* 02 Nov 2011	1200-1300h	Few
1km WSW of Burra Range Lookout	20°43'S, 145°13'E	543	05 Nov 2011	1300-1315h	One (Obs only)
2km E by N of Prairie	20°52'S, 144°37'E	436	04 Nov 2011	0955-1005h	One (Obs only)
Mt Walker Road, 11km S by E of Hughenden	20°56'S, 144°13'E	369	* 28 Oct 2012	1545-1635h	Few
7km S of Sapphire, at Gnech Rd	23°31'S, 147°44'E	268	09 Nov 2011	1100-1110h	Few
3km E of Anakie	23°33'S, 147°46'E	264	10 Nov 2011	1400-1500h	Few (Obs only)
54km N by W of Blackall	24°01'S, 145°21'E	278	10 Nov 2011	1115-1145h	One
39km E of Isisford	24°16'S, 144°48'E	239	* 26 Oct 2012	1115-1145h	One (Obs only)
16km W by S of Blackall	24°27'S, 145°20'E	290	* 03 Oct 2012	1435-1455h	One
24km NW of Tambo	24°45'S, 146°06'E	395	* 03 Oct 2012	1300-1320h	One (Obs only)
25km NW of Tambo	24°45'S, 146°06'E	397	* 26 Oct 2011	1030-1200h	Many
24km SE of Tambo, at Ivanhoe Station Rd	25°01'S, 146°26'E	476	* 02 Oct 2012	0920-1110h	Many (Obs only)
'Highest point on range', 25km SE of Tambo	25°01'S, 146°26'E	477	* 02 Oct 2012	1400-1425h	Few
28km SW by S of Taroom	25°48'S, 149°38'E	239	* 01 Oct 2012	1250-1350h	Many
			02 Oct 2012	1620-1635h	One (Obs only)
			14 Nov 2011	1530-1620h	Few
				1030-1130h	Many
				1240-1320h	Few (Obs only)



Figure 2. Author's butterfly survey sites in Queensland, spring 2011 and 2012



BOOK REVIEWS



**McCormack, Robert B. 2012. *A guide to Australia's spiny freshwater crayfish*. CSIRO Publishing, Collingwood. Octavo, paperback, 235 pp. colour photographs, line drawings. \$59.95 from the publisher.**

*Reviewed by Jonathan Marshall*

I have long held a fascination and admiration for freshwater crayfish, particularly spiny crayfish from the genus *Euastacus* covered by Robert McCormack's new book. Australia is a hot-spot for world freshwater crayfish biodiversity and yet this diverse and endemic fauna is not recognised or appreciated by most Australians. The main reason for this, I am sure, is that there has been a conspicuous absence of natural history books about these animals to inform and intrigue the nation's many nature lovers. Until now,

