

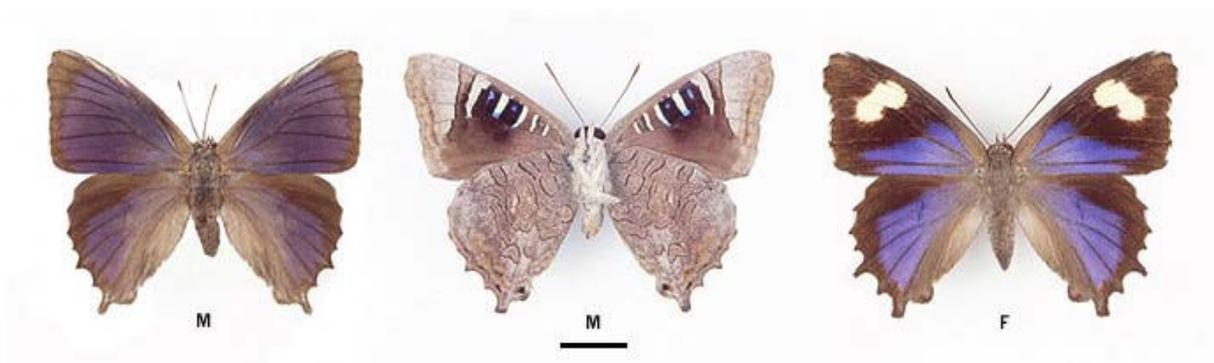
# SOUTH AUSTRALIAN BUTTERFLIES

## *Data Sheet*

*Ogyris zosine* (Hewitson) (Zosine Azure)



Female blue form



Museum specimens of male and female purple form

**Interesting aspects:** This is another large magnificent Australian Lycaenid. It is similar and closely related to *Ogyris genoveva*. The two species are difficult to differentiate, but this is

only likely to be a field problem in southeast Queensland where the two fly together. Elsewhere their distribution ranges do not overlap.

The butterfly belongs to the compact *O. genoveva*-*O. idmo* Species Group of interesting Lycaenid butterflies within the Ogyrini Tribe having very similar morphology and which are closely associated with the large *Camponotus* sugar-ants. *O. genoveva*, along with *O. zosine* form the isolated *O. genoveva* Species Subgroup within this group, as these two species have very similar adult morphology and early stages. The former flies in temperate areas, and takes over in distribution where *O. zosine* finishes. Some of the more specialised species of the group have larvae that are believed to be either predatory on the immature stages of these ants, or perhaps are fed by the ants at least when the larvae are very immature, which has allowed these species to overcome the adverse effects of the periodic loss of the hostplant, particularly from bush-fires, from which *O. genoveva* and *O. zosine* suffer.

Like all Lycaenids, the adults are sexually dimorphic in morphology on the wing uppersides, and in this species the difference is very obvious. The males are purple coloured above, which can vary from pale to dark purple to indigo-purple. Females occur in two main colour forms, having either bright metallic blue or purple uppersides with a large yellow patch in the apex of the forewing. The blue colour can also vary from sky blue to dark blue to purplish blue. The female colour is seasonally dependent with dry season (winter) forms being blue and wet season (summer) forms being purple. Both female colour forms can sometimes fly together. The areal extent of the blue and purple colour can also vary, with the larger areas generally occurring in females flying in more inland localities. Even the areal extent of the forewing yellow patch is variable.

A pair of binoculars is usually necessary to get a close look at this butterfly. Within known colonies, the butterflies are often seen in flight, particularly during peak periods of emergence. The male butterflies have a very rapid flight, and are usually active about the tops of the tall *Eucalyptus* mistletoe host trees some 5-20 m above the ground (mistletoe is the larva hostplant), but also spend a lot of their time settled with wings closed on a bare branch or twig near the top of the tree. There they will wait for newly emerged females to show up for mating. These butterflies often become 'invisible' when settled, as like all other *Ogyris* species, they have cryptically marked undersides that make the butterflies indistinguishable from the rough bark of trees and bushes when they are settled. Sometimes they imitate a blackened dead leaf still attached to the bare twigs. Periodically however, the males will fly off to patrol an area by circling a few different trees harbouring the mistletoe hostplant in a given area, then settle again for a while before repeating the patrol exercise. There are often territorial battles between rival males seeking a prime waiting position.

The males will also patrol or congregate on hilltops near the hostplant. Butterflies of many species use hilltops for mating purposes, particularly when either sex is in short supply. If either adult cannot find a mate near where they emerged from the pupa then they will fly to the nearest hilltop and settle and wait for an opposite sex companion to arrive to complete their courtship.

The females are slower in flight (unless disturbed), and when not feeding on the flowers of the mistletoe they spend much of their time searching for places to lay eggs on the mistletoes, walking all over the plant testing the stems (presumably for traces of ants) with their

ovipositor. In peak season within a major colony, many butterflies can be seen flying around a given host tree bearing mistletoe hostplant.

The metallic blue colour of the females and other blue coloured *Ogyris* butterflies is affected by moisture, and if the blue wing scaling somehow gets wet, it irreversibly changes to green.

The early stages and habits are very similar to *Ogyris genoveva*.

## Life History

**Larval food-host:** Larvae feed on a wide variety of mistletoes. Those mistletoes found in South Australia include *Amyema maidenii* (pale-leaf mistletoe), *A. miquelii* (yellow box mistletoe), *A. pendula* (drooping mistletoe), *A. preissii* (wire-leaf mistletoe), *A. quandang* (grey mistletoe) and *A. sanguinea* (Loranthaceae). The hostplants for *A. maidenii*, *A. quandang* and *A. preissii* are usually *Acacia*; the hostplants for *A. miquelii* and *A. pendula* are usually *Eucalyptus*; while *A. sanguinea* will parasitise both *Eucalyptus* and *Melaleuca*. The preferred mistletoe seems to be *A. miquelii*. The larvae eat the flower buds, flowers, leaves and soft stem parts of the mistletoe, but are particularly fond of the flower buds.

**Larval attendant ant:** The larvae are attended by numerous large sugar-ants. Those species to be found in South Australia include *Camponotus (claripes group)* and *Camponotus nigriceps*. These ants prefer heavy loam soils to build their nests, although the latter also build satellite nests in tree hollows above the ground.

The ants are nocturnal, large, only moderately ferocious (but without a sting), although *C. nigriceps* can sometimes be aggressive. They have formed a symbiotic relationship with the butterfly, whereby the ants provide protection to the early stages of the butterfly from predators and parasitoids, and in return the ants receive sugary secretions from the median dorsal secretory organ (honey gland or Newcomer's organ) situated at the posterior end of the larvae. Adult ants are able to live off these secretions. Although never aggressively pursued by the ants, the butterflies often become agitated in the presence of the ants and will distance themselves from any unnecessary attention.

The ants essentially farm the larvae. They build separate chambers away from the ant nest to house the larvae. The ant chambers or galleries are specially constructed below ground around the base of the host tree by the attendant ants for sheltering the early stages of this butterfly. There can be multiple entrances, but they are always narrow and easily guarded by the large *Camponotus* ants. These chambers can be quite extensive, circling the base of the tree and extending along parts of the roots. The gallery space between the tree and the ground is usually not much wider than the mature larvae or pupae. Sometimes larvae will use hollowed out branches that are lying on the ground next to the base of the host tree or will use hollows within the host tree for use as a gallery. These ant chambers are usually widely separate from the actual ants' nests (or ant brood), but sometimes butterfly larvae will occur near the nest, but in this situation the ants construct a separate chamber adjacent to the nest to house these larvae which is separate from the ant brood.

The ants provide 24-hour protection, and when the larvae leave the chamber at night to feed on the mistletoe, they are guarded non-stop until they return to the chamber again before dawn.

*Camponotus* ants are harmless to humans, unless one is allergic to formic acid. They should not be confused with the large stinging and dangerous bull-ants, inch-ants or jumping ants. The latter group have highly visible, very large and long jaws projecting down from the head. In *Camponotus* the jaws are not highly visible.

**Eggs:** Large, hemispherical shape, strongly flattened top and bottom, the sides are very finely reticulated in a hexagonal pattern, with each reticulation intersection having a small raised blunt projection, the facets on the top of the egg are smaller and these continue to the small-depressed micropylar area at the apex of the egg. The basal half of the egg is greyish white, the top half is mostly dark brown with a greyish white ring near the outer dorsal edge, and the micropylar area is greyish white. The eggs are typical for the species-group. The larva emerges from the egg at night by eating out the dark brown coloured (central) dorsal area. (Parasitic wasps, one per egg, emerge from the egg by eating out a smaller circular area in the dorso-lateral region.)

The females prefer to lay where there is a strong residual smell of the attendant ants, and also prefer hostplant which is already being utilised by the early stages of the butterfly.

**Larvae:** The final instar grows about 30-32 mm long. They are mostly dull purplish brown coloured, with pale yellow dorsal chevron markings and other indistinct subdorsal markings, the chevrons on abdominal segment 6 are joined together to form a yellow triangular mark, the lateral and anterior extremities of the larvae are pale yellow, the prothoracic plate is dark grey with a yellow longitudinal dividing line, the anal plate is dark brown and yellow with a black longitudinal dividing line, and the spiracles are black. It is long onisciform shaped, with a thoracic dorsal furrow, the lateral edges are scalloped, the anterior and posterior areas are flattened, there are some short peripheral bristly hairs, and there are some short dorsal bristles on thoracic segment 3 and abdominal segments 1-6. The body is covered in dark coloured, minute secondary setae, which consist of a short simple pointed shaft set on a protuberant, angular and ridged base. The secondary setae impart a scabrous appearance to the larvae. The posterior dorso-lateral organs are well developed. The head is small, smooth, brown, hidden beneath the body.

The larvae are gregarious, living in colonies of variable size, with up to 250 individuals being reported in the eastern states. However, numbers are usually much less. During the day the larvae hide from predators by remaining usually below the ground surface in the ant chambers, with the ants actively guarding the entrances to the chambers. Colonies usually occur in the ant chambers, but in wet areas larvae will also shelter under dry debris above ground or beneath the bark of the mistletoe host tree.

Larvae feed only during the night, accompanied by large numbers of attendant ants, and return to the ant chamber before dawn. Larvae usually feed on warm nights. Presence of larvae on a hostplant is readily discernible by larval eat marks on the mistletoe leaves, and they feed independently on the mistletoe (not gregariously). Large colonies can sometimes defoliate the mistletoe hostplant.

**Pupae:** Long cylindrical, rounded anteriorly and posteriorly, about 18-20 mm long, dark brown to brownish black, with a few very short lateral hairs on the abdomen. The surface of the pupa bears a very fine reticulated pattern (similar to the eggs) that produces a scabrous appearance. The larvae are strongly attached to the silked substrate by anal hooks and a central girdle, usually to any non-earthen surface where they were resting when larvae, such as below ground level within the ant chamber, under debris above ground or beneath loose bark of the mistletoe host tree. The larvae pupate gregariously together, and sometimes very large numbers of pupae can occur.

The butterflies usually emerge during the morning. The empty pupa shells are not destroyed by the ants. The pupae are not known to audibly stridulate, although interestingly like *O. genoveva* the prepupae can stridulate, making a series of audible clicks, which are believed used as a means of communicating with the attendant ants.

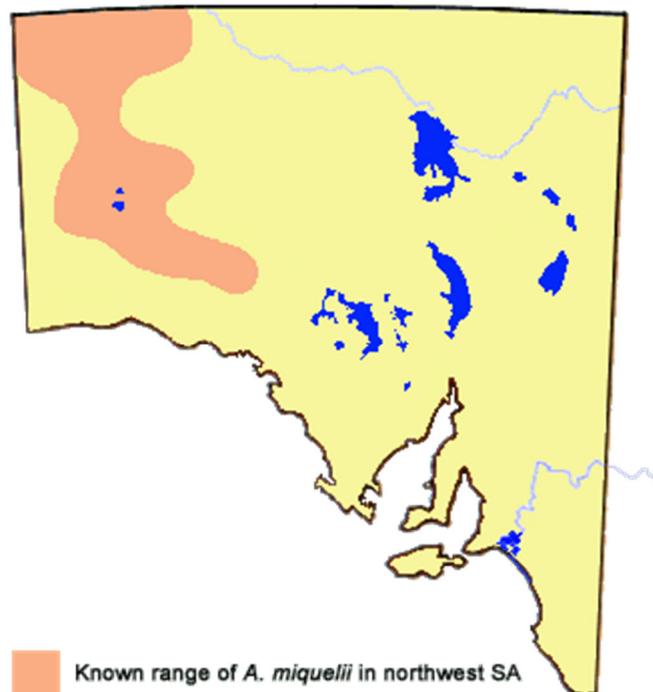
The pupa period varies from 12-24 days in Queensland depending on the time of the year.

**Flight period:** The butterfly flies throughout the year in the northernmost parts of its Australian range but tends to be more common at the end of the wet season. In south and central Queensland it tends to fly during the warm spring-summer-autumn months where at least two broods are completed and the butterfly over-winters as larvae. In central W.A. it is reported flying from late July to February.



**Distribution:** The butterfly occurs in tropical and subtropical latitude areas wherever the habitat is suitable. It has been recorded in the Alice Springs area immediately to the north of S.A. and there is an unsubstantiated report of the butterfly occurring in the arid portion of southeast Western Australia. It has yet to be found in S.A. but suitable habitat and hostplants occur in the Mann-Tomkinson-Musgrave-Everard Ranges group in the Far Northwest Region of the state and it is possible that this butterfly will one day be found in that area. If the W.A. report is correct then the butterfly may also eventually be found in adjacent western areas of S.A. in the Great Victoria Desert, although recent efforts to find the butterfly in the Maralinga area have been unsuccessful. The butterfly also occurs in Papua. It is biologically unsuited to temperate areas.

In the Alice Springs area it has a tendency to fly in the rocky range areas where the adults have access to pinnacle hill tops and nearby larval hostplants. *A. maidenii* is a very common mistletoe in S.A. but the butterfly is yet to be found, perhaps suggesting the latter requires *A. miquelii* as a stimulant presence before it will use *A. maidenii*.



**Habitat:** The butterfly prefers open moist woodland habitat that includes hills or rocky outliers, but can tolerate semi-arid conditions. The obligate attendant ants are widespread, with the recorded types associating usually with heavy loam soils, although *C. nigriceps* can also inhabit sandy soils through the use of satellite nests in hollow branches above ground.

**Conservation Status:** The butterfly is usually rare in its occurrence, but widely distributed. It can sometimes be locally common where it is well established in undisturbed colonies.

**Threats:** Threats in Central Australia are likely to be from drought, fires and burrowing animals.

**Conservation Strategy:**

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