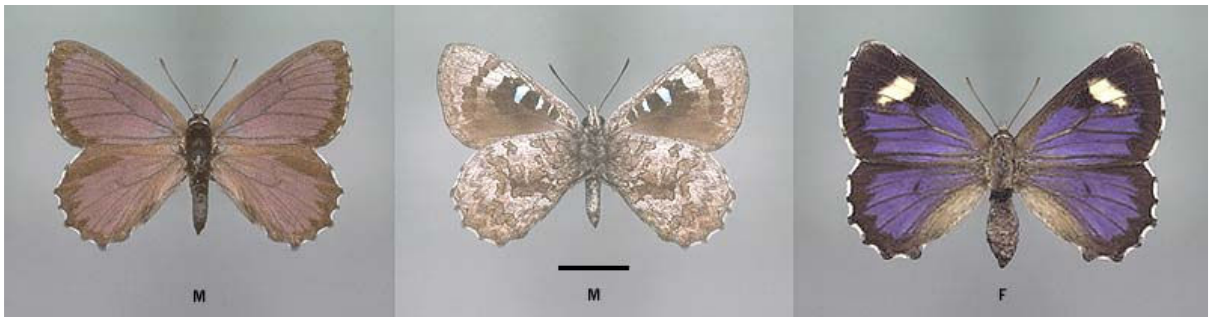
SOUTH AUSTRALIAN BUTTERFLIES
Data Sheet

Ogyris halmaturia (Tepper) (Eastern Large Bronze Azure)*



Interesting aspects: One of the rarest butterflies to occur in South Australia and is an icon for the state. It is a large magnificent Lycaenid, and one of the larger Lycaenids to be found in the world. Until recently, only 10 specimens were known to science from South Australia. It was one of the first butterflies to be noted by early European naturalists post-1836, who remarked on its large size and beauty. Unfortunately, with the spread of agriculture and urbanisation, this butterfly quickly disappeared from the local landscape. It had disappeared from near Adelaide by 1887 and was last seen on Kangaroo Island in 1934. Prior to 1995 the most recent historical sighting on the mainland was from the Upper Southeast in 1951. However, a recent concerted effort by local lepidopterists to rediscover this butterfly has resulted in three colonies being found. One in the Upper Southeast (1995) and two others on Eyre Peninsula (1998).

The illustrated male above is a very old Museum specimen that has faded. It is normally a dark purplish bronze colour. This butterfly, like all other *Ogyris* species, has cryptically marked undersides, which makes the butterflies indistinguishable from the rough bark of trees and bushes, or the ground, when they are settled with wings folded. 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. halmaturia* along with *O. otanes* and *O. subterrestris* (all found in South Australia) and *O. idmo* (from Western Australia) form the isolated *O. idmo* Species Subgroup within this group, as these four species have very similar adult morphology and early stages that associate only with *C. terebrans*. *O. halmaturia* is one of the more specialised species of the sub-group having larvae which are believed to be predatory on the immature stages of these ants, which would allow these species to overcome the adverse effects of the periodic loss of hostplant, particularly from bush-fires, from which *Ogyris otanes* suffers.

It is presumed these butterflies have evolved from *O. otanes* type butterflies. Larvae of the latter will often strip their hostplants bare, and as they are usually incapable of moving to another nearby hostplant bush, those larvae not big enough to pupate, will perish. It is a small step for these larvae to either feed on other larvae within the colony (carnivorous feeding), or feed on the immature stages of the ants (myrmecoxeny) or on coccids that also associate with the ants. Lycaenid larvae often eat their own kind when their food source

becomes insufficient to support all the larvae, and there are many Lycaenid species already known to practice myrmecoxeny. However, although it was probably a successful specialisation historically for *Ogyris* butterflies, it has not been very successful with the coming of European style habitation, as even though the ants are widespread and common, *Ogyris halmaturia* (and *O. subterrestris* the other myrmecoxenous butterfly in the sub-group occuring in South Australia) are more threatened than *O. otanes* and have not adjusted very well to agricultural and urban development.

Very little is known about the biology of this butterfly. They usually fly about head height, and are not particularly fast in flight unless disturbed. Males in the Southeast area are sometimes seen congregating in open lek areas (separate from the brood areas) where they are usually settled with closed wings on or near ground level, but sometimes single males will patrol the lek area. There are sometimes territorial battles in these areas by competing males, where they will fly in typical upward spiralling circles before breaking off. In other areas the males have been noticed flying about on their own, distal to known brood areas, probably looking for newly emerged females. The males are very timid and difficult to observe at close range. Similar to *O. otanes* on Kangaroo Island where their colonies can be large, the Southeast males can occur either in 'normal' form (wing expanse 50 mm) or 'dwarf' form (wing expanse 40 mm). The reason for this is speculative at this stage, but could mean the colony is robust and that the supply of larval food is limited causing some larvae to pupate prematurely. The females are usually seen flying within the brood areas, except early in the mornings when they venture into 'open' areas to warm up or to feed at flowers. They are much less timid than the males, particularly when they are preoccupied with egg laying. Both male and females can start flying very early in the morning, as early as 8.00 am CSDST if the weather is hot. The areal extent of individual colonies has not been established in South Australia, but it is also likely that both males and females will disperse considerable distances from their original breeding site, as both have been recorded in isolated situations. In this situation they may lead a partly nomadic existence with population numbers likely to be small leading to poor reproductive rates. In Western Australia, where the very similar *O. idmo* occurs, butterfly colonies can be very extensive. The butterflies have not been observed to utilise hill or dune tops in South Australia for lek purposes, but may patrol or over-fly these areas. A coordinated butterfly emergence sometimes occurs during periods of humid thundery weather, which have been noted in both the Upper Southeast and western Victoria. There once used to be a colony in the vicinity of Kiata near the Little Desert NP in Victoria, across the border from South Australia, where some 38 butterflies were seen flying during the flight season of 1939 by a K. Hateley in humid, thundery weather. This colony last gave up a butterfly in 1945 (also the last confirmed adult sighting in Victoria) from an exhumed pupa, but soon after the colony was destroyed by clearing for agriculture.

This butterfly sometimes occurs with colonies of *Ogyris otanes*, as both utilise the same species of attendant ant. Future new recordings of *O. halmaturia* habitation are likely to be documented in areas where *O. otanes* already occurs. Limited observation indicates the female *O. halmaturia* will not attempt to lay eggs at the base of a bush that is being used as foodplant by *O. otanes*. There may be a twofold reason for this, in that *O. otanes* larvae shelter in ant chambers that do not necessarily contain ant brood, and secondly the two butterflies may utilise different pheromones and thus a female *O. halmaturia* may be attacked and killed if she makes contact with guard ants at the entrance to a chamber containing *O. otanes* larvae. Similar to *O. otanes*, flying butterflies of *O. halmaturia* are irresistibly

attracted to low bushes of the white flowering *Pimelea glauca* and *P. octophylla* for nectar feeding purposes, but have also been seen to nectar-feed on *Calytrix* and other low plants.

The appearance and biology of this butterfly is very similar to the recent scientifically described *Ogyris subterrestris*. It is unlikely that the two butterflies would occur together, due to their different ecological requirements. The two are often difficult to differentiate, especially the females. The adult *O. halmaturia* butterflies differ from *O. subterrestris* mainly by being significantly larger. Flight period and location would also be important differentiation criteria. However, *O. halmaturia* will fly with *O. otanes*, and in the field, once settled the males of these two butterflies can be quickly differentiated by the morphology of the hindwing underside, which is a uniform brown in *O. otanes*, while *O. halmaturia* has a well developed grey pattern. The females however, are difficult to distinguish as the morphology of the hindwing undersides are similar, with the main difference being that the markings are grey coloured and are more sharper in *O. halmaturia*.

DNA phylogenetic studies initially undertaken at Griffith University in Brisbane (MBE 05 abstracts) indicate *O. halmaturia* is a full species in its own right, distinct from *Ogyris idmo* (found in Western Australia), with which *O. halmaturia* (until this work was undertaken) had been considered a subspecies (Schmidt 2005, *). Differences in adult wing shape and first instar larvae also help confirm its distinct identity.

Life History

Larval food-host: Theorised to initially be fed by the attendant ants, but later turning myrmecophagous and feeding on the early stages of the ants. However, the ants also farm coccids and there is a possibility that the *O. halmaturia* larvae may also feed on the immature stages of the coccids.

Larval attendant ant: In South Australia, larvae are known to spend their entire life period inside the nests of the large, sand dwelling sugar-ants ***Camponotus terebrans***. Interestingly, the butterfly associates only with the southern, dark coloured form of the ant. The nests of these ants are usually situated at the base of various trees and shrubs, and the ants will sometimes produce large byres of fragmented debris from dead vegetation beneath these trees. The ants are nocturnal, large, and in the case of this particular form of the ant, only moderately ferocious (but without a sting). *C. nigriceps* has historically been reported as an attendant ant from Kiata in west Victoria, although recent information by Braby & Douglas 2008 indicates this was a mis-identification of *C. terebrans*.

Eggs: Large, hemispherical shape, base flattened, with a very fine reticulated pattern. The reticulations are hexagonal. Usually dark grey-brown, with a white ring dorsally and a white micropylar area. Some eggs are uniformly dark grey-brown, while others may be a washed out white or grey colour, particularly when the female is near the end of her egg laying abilities. The eggs are typical for the species-group. In captivity, eggs start hatching after 9 days.

Females actively seek out ant nests of *Camponotus terebrans*, and probably prefer those nests harbouring existing early stages of the butterfly since the butterfly is colonistic. She does this by flying around at about head height, using her sensory organs (situated on her antennae and head palpi) to locate nests of the ant. (The sensory power has not been investigated, but observation indicates a detection distance of at least 10 m). Once located, she will

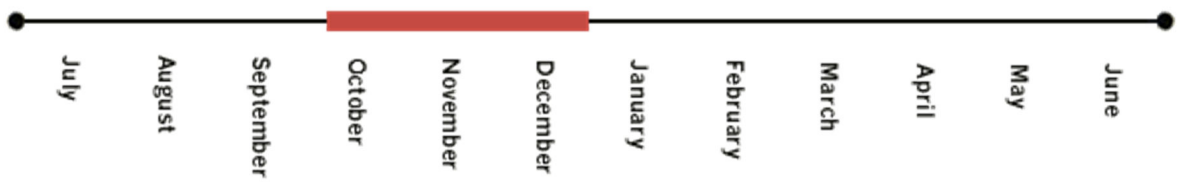
immediately alter course to the ant nest, flutter about over the nest, then land either on the ground near the nest or on the foliage of the plant adjacent to the nest. The ant nest is usually located at the base of a tree or bush, but sometimes the ant nest entrance can be in the open. If she lands on the ground, then she will walk over to the nest to seek out the entrance, then back her abdomen into the entrance to lay eggs. If she lands on the foliage then she will slowly work her way down to the nest entrance, all the time slowly moving her folded wings in a scissor-like movement indicating her highly agitated state, as the large sugar ants guarding the ant nest entrance will often attack any quick moving intruder. The eggs are often received directly by the ants, which then take them below ground into the nest. Eggs have also been reported to be laid about the ant nest entrance, and the ants must collect these eggs as no egg batches remain. Egg laying occurs during the heat of the day when the ants are inactive above ground.

Larvae: The first instar is about 2 mm long when newly hatched from egg, pinkish to yellowish grey, long onisciform shape, with moderately long bristly secondary setae set on very short, smooth protuberant bases. Very long lateral and dorsal hairs are absent. There is a large brownish yellow smooth dorsal area anteriorly (prothoracic plate) behind the head, containing a few bristly hairs, and a smaller similar area at the posterior end (anal plate). The head is large, smooth, yellowish with large black eye areas, hidden beneath the body. The mouth parts are specially modified. The many bristly (simple) secondary setae differentiate it from larvae of *O. idmo* whose larvae have short papillose secondary setae. First instar larvae of *Ogyris subterrestris* differ by having some very long dorsal setae.

Later instars have not been described.

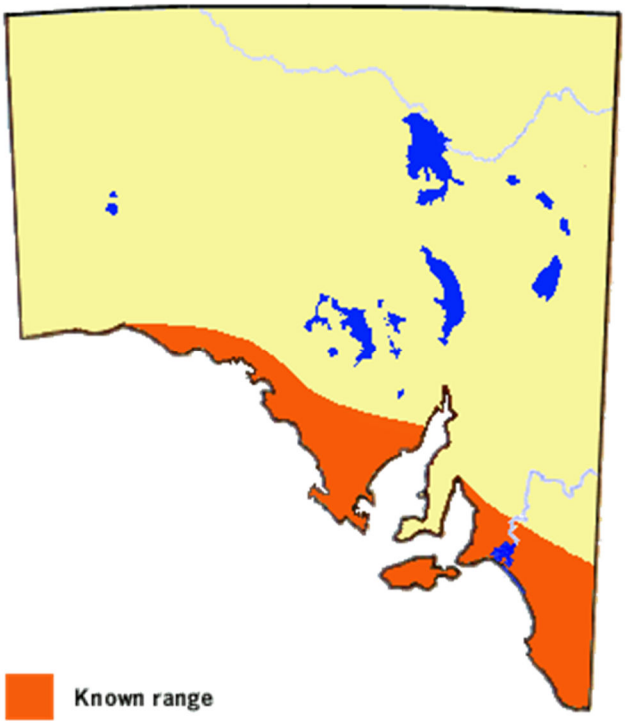
Pupae: A pupa and an empty pupal shell were recovered by M. Mules in November 1945 from a *Camponotus terebrans* ant nest at Kiata in western Victoria. They were situated underground in a gallery just inside an entrance to the nest near the base of a mallee eucalypt. A female eclosed from the pupa later the same day, that incidentally was the last confirmable sighting of the butterfly from Victoria. The pupa was pale brown, about 21mm long, smooth, with the abdomen arched, broad, and the cremaster flat and broadly rounded. It is very similar in shape to the pupa of *O. otanes*, but differs by being darker like *O. subterrestris* and was without a white bloom. A silk girdle was not been reported about the pupae.

Flight period in S.A.: October to December, with the main flight during late October and early November. They start to fly earlier in the hotter northern areas. Only a single annual brood is known in South Australia. Some colonies of *O. idmo* in Western Australia are reported to also have an autumn brood.



Distribution: Originally recorded only from the higher rainfall, southern temperate parts of the state, including Kangaroo Island. It has yet to be reported from Yorke Peninsula, although suitable habitat is still present. Its range is similar to that of *Ogyris otanes*. Also

recorded from western Victoria. The very similar *O. idmo* occurs in south-west Western Australia. The butterfly may be restricted to the distribution of its host ant, the southern dark coloured form of *Camponotus terebrans*, which occurs in coastal and sub-coastal areas of southern Australia, and is particularly common in South and Western Australia.



Habitat: In South Australia this butterfly has usually been found in open mallee/woodland and banksia-titree heath sand areas having annual rainfall more than about 300 mm, but has sometimes been seen in relatively dense mallee. It can occur adjacent to the coast or further inland. (The closely related *Ogyris subterrestris* has evolved its adaptation to the inland temperate arid areas having annual rainfall less than about 300 mm, and to its association with the northern pale coloured form of *Camponotus terebrans*). The obligate host ants only associate with sandy soils.

Conservation Status in S.A.: Critically endangered. No lepidoptera has protection status in South Australia, as politicians, entrepreneurs and vested self interest groups consider this to be an imposition to economic development. Presently only known from three small areas on Eyre Peninsula and the Upper Southeast. These colonies are believed to be unstable. Recent repeated attempts to find the butterfly on Kangaroo Island have not been successful, even though suitable habitat would appear to be still present. Since 1945, only unsubstantiated visual sightings have been made in Victoria, the last being very recently (2005 - a possible male) in the western part of Little Desert NP. The Upper Southeast colony, originally thought to be substantial, has been decimated by recent bushfires (2005-2006) and by over-collecting, and the butterfly has not been seen or documented since 2007.

Threats: Known colonies in South Australia are associated with large pristine areas of undisturbed vegetation. Assuming the likely restriction of the butterfly to conserved areas, then bushfires, prescribed burns and butterfly collecting would be the primary threats. The

Ngarkat Conservation Park has been under incessant prescribed and nonprescribed burns over the past 10 years. As the ant brood chambers are deep below ground level, the colonies are able to survive fires in the first instance. However, the ants also have to forage to live, so there may be a subsequent downsizing of butterfly numbers in subsequent years as the ants recover. The ant colonies are also known to suffer periodic, biological collapses, contributing to a downsizing or loss of the butterfly colony. Small colonies could be disrupted by the diggings of large burrowing animals, particularly rabbits, but also bandicoots and echidnas. Males in the Upper Southeast have been noted to require a reasonably open lek area adjacent to the breeding colony in which they can aggregate for mating purposes. This area would need to remain undisturbed. **Undocumented colonies may be affected by the new heavy-mineral sand mining ventures in the Murray Mallee and Yellabinna-Ceduna areas.**

Conservation Strategy: It is apparent this butterfly requires large areas of pristine habitat, far removed from the disturbances of agricultural, mining and urban development, and therefore not a lot can be done for the butterfly except for the conservation of such habitat. Unfortunately, appropriate **Environmental Impact Studies are not enforced** by the relevant Authorities regarding new mining ventures and any large-scale land clearance. Known remaining habitat is prone to bushfires, both natural (lightning strikes), but more often man-made. In the former case, lightning conductors could be considered for the tops of some prominent dune/hill tops. Unauthorised, indiscriminate collecting of the butterfly should be discouraged, and a moratorium on collecting should be considered as occurs in Victoria.

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Last update June 2013.