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Notes on the life histories of *Chrysoritis* Butler, *Aloeides* Hübner and *Trimenia* Tite & Dickson (Lepidoptera: Lycaenidae: Aphnaeini)

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Abstract

New life-history observations of five taxa in the tribe Aphnaeini, *Chrysoritis thysbe whitei* (Dickson), *Chrysoritis midas* (Pennington), *Aloeides macmasteri* Tite & Dickson, *Trimenia argyroplaga argyroplaga* (Dickson), and *Trimenia macmasteri macmasteri* (Dickson) are presented.

*Chrysoritis thysbe whitei* (Dickson, 1994)

Clark & Dickson (1971) described and illustrated the juvenile stages of this insect, and identified the associated ant *Crematogaster peringueyi* Emery (Myrmicinae).
Their material was reared from eggs obtained from Port Elizabeth, they treated it as conspecific with *C. thysbe* (L.) whose coastal distribution included Cape Town and “….extending well up the coast north of the Cape Peninsula”. Later, Dickson (1994) in *Pennington's Butterflies* described this insect from Port Elizabeth as a species separate from nominate *thysbe*. It was later synonymized with *C. thysbe* by Heath (2001), who reduced it to subspecific status on the grounds that the two are very similar in morphology, ant-association and larval foodplant. However, its taxonomic status is still unclear and will be reviewed again, once a DNA study at Harvard University is completed. This taxon is currently known from one small locality at Skoenmakerskop south-west of Port Elizabeth, other populations of this vulnerable insect have been lost to building development (A.H., unpubl.). In view of this, Ernest Pringle (pers. comm.) suggested that we investigate its conservation needs as a matter of urgency. Dickson (1994) recorded the larval foodplant of *C. thysbe whitei* as *Zygophyllum* (Zygophyllaceae). *Chrysanthemoides monilifera* (L.) Norl. (Asteraceae) was recorded as a foodplant by Heath (1997). These mature plants were heavily infested by *C. peringueyi* ants at a site in Summerstrand where a building now stands.

Skoenmakerskop (34° 02.4’S: 25° 33.4’E) was visited on the 31st October 2009 and had recently suffered fire damage. The damage was particularly severe in the

![Fig. 2. Final instar larva of Chrysoritis thysbe whitei on Aspalathus spinosa](image-url)
depressed flat sandy areas between the ridges. Only fresh new growth was present in these areas and no surviving *Crematogaster peringueyi* carton nests were seen. There was unlikely to have been any safe refuge for larvae or pupae in these depressed areas. Several sandy ridges suffered less damage (Fig. 1) and the vegetation on two of these ridges was examined. Females of *C. t. whitei* showed interest in undamaged mature plants of *Aspalathus spinosa* L. (Fabaceae) and oviposition was observed on these. Several pupae and larvae were found in the leaf debris beneath this foodplant (Fig. 2), which was infested by *C. peringueyi* ants. A carton ant nest was adjacent to these *Aspalathus* plants. All larvae and pupae collected, later emerged as *C. t. whitei*. On a second ridge, larvae were found beneath another bush of *Aspalathus* and that also had a carton ant nest nearby. Larvae were also observed feeding on *Roepera maritima* (Eckl. & Zeyh.) Beier & Thulin (Zygophyllaceae) and *Thesium* sp. (Santalaceae) (Fig. 3) close to the ant nest. Scale insects were present on each of the plants infested by *C. peringueyi* ants. Stands of *C. monilifera* were also present in a few places at Skoenmakerskop but no *C. peringueyi* ants were observed on them, the foliage being immature and very fresh, perhaps due to the fire destroying the mature stems. A few males were

![Fig. 3. Fourth-instar larva of *Chrysoritis thysbe whitei* on *Thesium* sp. and attended by *Crematogaster peringueyi* ants](image-url)
observed to patrol sections of the ridges away from the females but greater numbers established their territories in some of the flat areas.

**Discussion**

Four plant families, represented by one genus each, are now recorded as foodplant for this butterfly, *Aspalathus* (Fabaceae), *Roepera* (Zygophyllaceae), *Thesium* (Santalaceae), and *Chrysanthemoides* (Asteraceae). The requirement for this butterfly to prosper appears to be the presence of these plants when infested with *C. peringueyi* ants. The ants need the scale insects as a source of food (see Heath & Pringle, 2007, p. 38), they in turn require mature healthy plants, undamaged by fire. Mature plants are also essential in providing the larvae with a safe refuge from predators and parasites in their foliage and leaf debris. Although fire is likely to be a natural component of the Skoenmakerskop habitat we feel that burning should be controlled, both in frequency and extent, maybe by burning different sections each year, bearing in mind that this is the only known locality for the butterfly. Note that males were observed patrolling flat areas, which is unusual behaviour for this species. Males in other subspecies of *C. thysbe* frequent prominences and are seldom found on flat areas (A.H., pers. obs.).

*Chrysoritis midas* (Pennington, 1962)

Described from the Nieuwveld Mountains, N.W. of Beaufort West, and later recorded from the Nama Karoo and the Roggeveld Escarpment (Woodhall, 2005) and the Lootsberg Pass in the Eastern Cape (A.H., unpubl.). Its foodplant and ant associate were recorded by Heath (1997) as *Diospiros austro-africana* De Winter (Ebanaceae) and *Crematogaster peringueyi*, respectively.

Four specimens were recorded flying around bushes of *Diospyros austro-africana* growing among rocky outcrops on the foothills of the Great Winterberg Mountain in the Eastern Cape Province (32° 21.2’S: 26° 22.5’E, 1832 m) (Fig. 4) on the 30th October 2009. These shrubs were infested with *C. peringueyi* ants.

**Discussion**

This is a further extension to the known range of this insect. The altitude of 1832 m is possibly the highest recorded for this insect; the lowest being 1500 m at Oukloofpoort (Pringle et al., 1994) and 1650 m at the Komsberg Pass (A.H.), whilst three other localities are at about 1790 m (A.H., pers. obs.). The darker underside and high altitude habitat separate *C. midas* from the closely related *C. chrysaor* (Trimen), whose larvae are not known to feed on *Diospyros* and whose ant-associate is *C. liengmei* For.
Aloeides macmasteri Tite & Dickson, 1973

Clark & Dickson (1971) described and illustrated the part life-history up to the penultimate (5th) instar of a species they described as “allied to A. almeida (Felder)” but which is now suspected to be A. henningi Tite & Dickson, a close relative of A. macmasteri. The part life-history referred to was derived from eggs from El Mirador, KwaZulu-Natal, and may be comparable to that of A. macmasteri.

Aloeides macmasteri was observed on a steep slope on the same foothill of the Great Winterberg as C. midas (centre distance, Fig. 4), also on 30th October. The vegetation on the slope was sparse and had been grazed very short by sheep. On several occasions a female was observed settling on the ground and walking around with its abdomen lowered, near a smallplant of Medicago liciniata (L.) Miller (Fabaceae). On two separate occasions a female was observed to lay a single egg on specimens of this plant. In this locality M. liciniata resembled a small flat grey-green mat 10-15 cm in diameter on a hard-packed substrate. The plant had ovoid (finely setose) silvery-grey leaves and a few of them had small yellow pea-like flowers. Two species of ant were present on the M. liciniata
plants with the eggs, *Meranoplus peringueyi* Emery (Myrmicinae) and *Lepisiota capensis* Mayr (Formicinae). The former was more conspicuous, being much larger and more numerous, but the latter is already a well-known associate of *Aloeides*, having been recorded with ten other taxa (Heath *et al*., 2008). We suspect *L. capensis* to be the ant associated with *A. macmasteri*. In the same locality, oviposition also occurred on an unidentified but similar “clover-like” species of plant. At the farm 'Middledrift', near Cathcart, *A. macmasteri* occurred on a similar slope with a similar plant (*Lotononis laxa* Eckl. & Zeyh. (Fabaceae)) present although oviposition was not studied.

**Discussion**

We feel the small mat-like *Medicago* and the unidentified plants could not provide adequate shelter for a late-instar *Aloeides* larva or pupa. Although it is possible that early instar larvae feed and rest on the plant, older larvae would need to shelter elsewhere, especially during daylight hours; perhaps in the ant nest, as done by *A. thyra* (L.) (see Claassens & Dickson, 1974, 1977). The possibility also exists that the larvae are aphytophagous.

*Trimenia argyroplaga argyroplaga* (Dickson, 1967) and *T. macmasteri macmasteri* (Dickson, 1968)

Clark & Dickson (1971) illustrated the egg and first instar larva of *T. a. argyroplaga*, *T. wallengrenii* (Trimen) and *T. malagrida malagrida* (Wallengren) [all three as *Phasis*]. Cottrell (1984) speculated that species of *Trimenia* were possibly aphytophagous. Early stages of both *T. malagrida maryae* (Dickson & Henning) and *T. a. argyroplaga* have since been retrieved from subterranean nests of the ant *Anoplolepis custodiens* (Smith) (Heath & Brinkman, 1995; Pringle *et al*., 1994). A penultimate instar larva of either *T. a. argyroplaga* or *T. m. macmasteri* was retrieved from a subterranean nest of *A. custodiens* at Huis River Pass, Calitzdorp (both of these *Trimenia* species occur there sympatrically). This larva was observed accepting ant regurgitations (trophallaxis) in captivity, but took no interest in either ant brood or eggs when they were offered (Heath & Claassens, 2000, 2003).

On the 13th November 2009 at the farm Huntly Glen (32° 24.507'S: 26° 06.108'E, 1080 m) near Bedford, Eastern Cape Province, a female of *T. a. argyroplaga* was observed ovipositing on the woody stem of *Felicia hirsuta* D.C. (Asteraceae). Examination of the stems revealed two batches of eggs; one batch of seven eggs (Fig. 5) and one of eight. Each egg had some dark setae or scales adhering to it; these were shed from a tuft of specialized setae at the distal end of the female...
abdomen during oviposition. Two days later at Huis River Pass (33° 29.800'S: 21° 39.140'E, 375 m), Western Cape Province, females were again observed ovipositing on woody stems of *Felicia hirsuta* (Fig. 6). Examination of other plants in the area
revealed batches of eggs on *Rosenia oppositifolia* (DC.) K.Bremer (Asteraceae) and *Walafria geniculata* Rolfe (Scrophulariaceae). Each of the plants on which eggs were laid had, either close by or directly beneath the plant, an entrance to a subterranean nest of *Anoplolepis custodiens*. Three older batches of eggs were collected from this locality together with some of the ants. A day later, in captivity at Pinelands, Cape Town, all the larvae hatched from one of the batches (Fig. 7). The larva ate a small exit hole but did not eat the remainder of the egg, nor were any setae eaten. The ants and larvae took no interest in one another. Each of the four larvae moved rapidly along the cut stem until it reached the end, then it moved to the other end. The larvae went back and forth along the stem (Fig. 8), taking no interest in either the ants or the foliage. It seemed that they were seeking a way down off the plant to where the ground would normally have been; possibly to the ant nest. A suitable ant nest could not be found and so the larvae eventually died. At Huntly Glen Farm, a batch of eggs was kept indoors by E. and A. Pringle, but after more than two months, none had hatched. Batches of eggs from *T. malagrinda paarlensis* (Dickson) and *T. m. maryae* (Dickson & Henning) kept in captivity indoors in Pinelands, were found to contain live larvae after three months (Heath & Claassens, 2000).
Discussion

Eggs were found on the woody stems of three unrelated plants and first instar larvae showed no interest in the foliage, also late instar larva have been recorded feeding by trophallaxis. These observations suggest early instars may also be aphytophagous, although it is still not known what they do feed on. We suspect the first instar larvae enter the ant nest without assistance, following ant trails. Two examples have now been recorded of Trimenia eggs remaining dormant for long periods. We think this was because conditions indoors were unfavourable, e.g., an absence of ants. This strategy would probably also be used in nature, should conditions be unfavourable.

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identifying the ants collected at De Hoek. Thanks go to Ernest Pringle, Alan Gardiner, Steve Woodhall and Andre Claassens for reading the manuscript and making constructive suggestions.

References


Research into the life history and ecology of *Chrysoritis dicksoni* (Gabriel) (Lepidoptera: Lycaenidae)

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**Introduction**

Dickson's Copper, *Chrysoritis dicksoni*, was originally discovered by Charles Dickson near Melkboschstrand and described by Gabriel as *Phasis dicksoni* (Gabriel, 1947). It has always been a scarce butterfly, and has a history of disappearing from its known habitats and then being rediscovered. *Chrysoritis dicksoni* has been accorded Critically Endangered Status in the latest revision of the South African Red Data Book for butterflies (Henning *et al.*, 2009). The reasons for its disappearance from its former localities on the west coast north of Cape Town are uncertain. Fortunately a metapopulation is known to occur in the Witsand area on the south coast. A programme of research similar to that conducted on the Brenton Blue butterfly is described for *C. dicksoni*, which will be followed by informed habitat management.

**IUCN Red-list Status**

Summary of current scientific knowledge

Type locality: Near Melkboschstrand (Gabriel, 1947).

Distribution: Historically found on the Cape west coast between Melkboschstrand and Mamre. Its previous last known population was near the Pella Research Site, where eight sub colonies were located over an area of 60 ha (Heath & Brinkman, 1995). It disappeared from these habitats in the mid nineties, for reasons unknown. The butterfly was found in small numbers in 1979 by Lou Schoeman and Brian Stuckenberg at Witsand, over 200 km from the type locality (Pringle, 1990). This population, which was near the town rubbish dump, also disappeared – probably due to alien encroachment and housing development. There are a number of connected populations in the area to the north of Witsand, [including the sites discovered by Pringle (1990) and the site described by Curle & Ficq (2009)], scattered over an area of some 80 ha. They are thought to form a metapopulation (Hanski & Gilpin, 1997), with regular migration between suitable habitat patches.

Habitat: The colony near Pella was on Atlantis Sand...
Fynbos, consisting of moderately undulating to flat sand plains with a dense, moderately tall ericoid shrubland and an open, short restioid stratum (FFd4 - Mucina & Rutherford, 2006). The populations near Witsand occur on Canca Limestone Fynbos (FFl3 - Mucina & Rutherford, 2006), on fairly level ground where limestone pavements outcrop. The vegetation is predominantly restioid with a sparse low shrub layer and patches of bare rock and sand, and there is light grazing by cattle and game.

**Early stages:** The life history was originally described by Clark & Dickson (1971). Eggs are laid on a variety of substrates in response to cues from the host ant *Crematogaster peringueyi* Emery and possibly the presence of scale insect infestations on nearby shrubs. The 1\(^{st}\), 2\(^{nd}\) and final instar larvae are fed by the host ants by trophallaxis, and the host ants in turn appear to feed on scale insect secretions (Heath & Brinkman, 1995; Heath, 1998). Final instar larvae and pupae have been found both inside the carton nests and also at the base of plants (Clark & Dickson, 1971; Heath & Brinkman, 1995).

**Adult behaviour:** Valuable observations were made by Clark & Dickson (1971); Cottrell (1978); Heath & Brinkman (1995); Heath (1998); and Curle & Ficq (2009). The males congregate in what Curle & Ficq (2009) describe as “leks”, which females occasionally visit to get mated. The females are more widespread and seem to be mainly searching for suitable oviposition sites where they obtain cues from the host ants (Heath & Brinkman, 1995).
Conservation and threats

Possible contributory factors in the demise of the butterfly north of Cape Town on the west coast were changing agricultural practices, encroachment by alien vegetation, and too frequent man-made fires at the wrong time of the year (Henning et al., 2009; Heath & Brinkman, 1995).

The land where the colonies of the butterfly are found in the Witsand area straddles two properties. The northernmost property is owned by Mr P.S. Uys of Strandfontein. The southernmost property (Westfield) is owned by Stellenbosch University and leased to Mr L. van Deventer. The cooperation of both these landowners has been obtained. The current threat is mainly from the encroachment of alien vegetation on the Westfield property (see also Curle & Ficq, 2009), and this is being addressed as part of the research programme described below. Fortunately the northernmost property is being managed more carefully and there are no threats from alien vegetation except near the boundary fence.

Whilst neither property is part of a protected area, CapeNature have been informed of the presence of the butterfly and are being kept abreast of our research activities and progress.
Research programme

Witsand (2009)

1) Observe adult butterflies during their emergence in August/September 2009 and map their occurrence with GPS readings and marker pegs.
2) Estimate the total population of *C. dicksoni* at the Witsand sites.
3) Locate adult females and observe and record oviposition behaviour. Take samples of any associated ants and scale insects (Homoptera). Identify all ant and scale insect species collected.
4) Set out vegetation sample plots (10 m x 10 m) at the places where the males are found and conduct Braun-Banquet vegetation sampling, including species identifications and abundance. Also sample all plants occurring within 1 metre of each oviposition site. Assistance is being obtained from Ms Janet Naude, who curates the Stilbaai Herbarium.
5) Establish ant pitfall traps at the centre of each relevé and sample over 48-hour period. Identify and quantify all ant species taken in traps.

All the above work has been completed, except for the identification of the ants and scale insects, and some of the plant samples. An extensive photographic record and database was also compiled, for example to document evidence of nectar feeding and oviposition (Figure 1).

Pella (near Mamre) (2010)

At previous *C. dicksoni* sites (with assistance from Dr Jonathan Ball):

1) Conduct vegetation sampling using the same methods employed at Witsand.
2) Search for scale insects on *Phylica axillaris* plants.
3) Conduct ant pitfall trap sampling to enable a comparison with Witsand.

Witsand (2010)

1) Conduct survey of alien plant occurrence and review grazing practices in the areas where the butterfly is found (May 2010 - complete).
2) Hold discussions with the landowners about ecologically sound methods of alien eradication (May 2010 - complete).
3) Search for larval and pupal stages of *C. dicksoni* and possible homopteran symbionts during site visits in July 2010. This will be done carefully and in a non-intrusive fashion.
4) Repeat items 1, 2, 3 and 5 from 2009.
5) If new colonies are found, conduct vegetation sampling. Also sample and record plant species found within 1 metre of the oviposition sites.
6) Continue investigations to identify all plant and insect samples.

During the May site visit it was discovered that alien removal had already commenced at the Westfield site using mechanical means, and whilst this had been very effective in removing the tap roots of the *Acacia cyclops* (Rooikrans), the disturbance of the surface could be damaging to ant nests. Consequently the farmer who leases the land has been requested not to use this method in future. His \\textit{proposal to use} herbicides on the juvenile Rooikrans plants was also discouraged in favour of removal by hand.

\textbf{Looking for early stages of *Chrysoritis dicksoni*: R. F. Terblanche}

\textbf{Hazards of investigating oviposition sites: D. A. Edge}
Conclusions

The landowners at the Witsand sites have made it clear that all visits to these sites for research, photography or any other purpose need to be properly authorised by themselves. The authors of this paper have all the necessary contacts and will endeavour to facilitate such visits if requested by any LepSoc members who wish to contribute to the research efforts.

As a general comment, in order to conduct research aimed at the informed conservation of threatened butterflies in South Africa, close cooperation between all stakeholders is vital. Thorough and coordinated research and monitoring programmes are desirable at all the known localities of threatened butterfly species in South Africa, especially those that are critically endangered. Progress with such work is currently constrained by a shortage of suitably trained manpower and funding. LepSoc members without ecological skills can make a critical contribution by conducting exploration with the goal to find new localities of threatened species in the general vicinity of the known localities because the conservation of metapopulations is more sustainable and remains the ideal scenario. Collecting of critically endangered species as well as ecological research at their habitats should be conducted with great circumspection, in compliance with our Society's code of conduct, and by applying the precautionary principle*.

*The precautionary principle states that “if an action or policy has a suspected risk of causing harm to the environment, in the absence of scientific consensus that the action or policy is harmful, the burden of proof that it is not harmful falls on those taking the action”.

Acknowledgements

Mr P. Uys, Stellenbosch University and Mr Lood Van Deventer for kind permission to conduct this research on their properties. CapeNature for their enthusiastic support of the research programme and conservation objectives. Mr Ernest Pringle for kindly directing us to the habitat of C. dicksoni on Mr Uys's farm and facilitating access to conduct research. Mr Rudolph Swart for taking the trouble to show us the localities for C. dicksoni on the Westfield Farm.

References


SABCA – perspectives from a citizen scientist

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My involvement with the South African Butterfly Conservation Assessment (SABCA) Project as a contributor started in December 2007 when I had spent some time at Mountain Sanctuary Park in the Magaliesberg. I had spent a few days there with my family and photographed several butterflies that were flying around. Later that same month I spent a day hiking in Suikerbosrand Nature Reserve and having photographed what I thought was (and later confirmed) the Roodepoort Copper *Aloeides dentatis dentatis* I submitted these photographs to SABCA's virtual museum for the first time. With the SABCA Project having started in May 2007, I was a late starter to contributing towards the project.
Now, as I write this article in May 2010, and having submitted more than 2 500 records (moths and butterflies) representing 240 butterfly species and sub-species from over 160 South African quarter-degree grid squares to SABCA's virtual museum, I wanted to document formally what the project has meant to me over the past two-and-a-half years. Whilst I was formally trained in botany, zoology and conservation biology at well-respected South African universities, somehow butterfly identification was never emphasised in any of the curricula. So although I am officially qualified as a scientist, when it comes to the world of butterflies I still regard myself very much as an amateur and 'citizen scientist'. Prior to December 2007 my focus for the past 17 years had been largely on plants. When I started contributing to SABCA I did not even know what an African Monarch Danaus chrysippus orientis, Painted Lady Vanessa cardui, Yellow Pansy Junonia hierta cebrene or even Guinea Fowl Hamanumida daedalus were or even looked like, let alone the more difficult butterflies. I had spent many hours in the field all around southern Africa, but had, in truth, not even noticed butterflies. Now, having developed a search image for butterflies, I regret all the missed opportunities to photograph, document and record butterflies from areas I had visited in my earlier working career. It is remarkable how by focussing one's attention on a particular group of organisms, one can actually blot out other groups in the process.

Emporer Swallowtail (Papilio ophidicephalus entabeni), Soutpansberg: C. Willis

Thus, by spending more and more time in the field, almost every weekend, and using Steve Woodhall's field guide and a couple of other references, my knowledge of butterflies and their identification grew. As South Africans we are very privileged to
have access to such good literature on butterflies that has been published thanks to the dedication of both amateur and professional lepidopterists over the last 150 years past – champions such as Trimen, Clark, van Son, Pennington, Swanepoel and Dickson, to mention just a few of those past giants upon whose shoulders we stand today. It is a pity though that Pennington's Butterflies (2nd edition) is out of print and not available to the general public. It's akin to having all the South African bird and mammal field guides available but no access to the comprehensive Roberts' Birds of South Africa or Smithers' Mammals of Southern Africa.

As my knowledge of butterflies grew during the course of 2008, thanks to SABCA's virtual museum and Steve Woodhall's comprehensive field guide, I realised that the understanding of butterfly diversity in most of our national botanical gardens in South Africa was very sparse, and in some cases non-existent. I decided that as our organisation, the South African National Biodiversity Institute (or SANBI) was focussed on documenting and monitoring the status of biodiversity of this country, I should use these newly acquired skills to start compiling an inventory of the butterflies of our national botanical gardens, with the ultimate aim of hopefully publishing an illustrated checklist that could be made available to the public. Butterflies, after birds, are after all probably the animals that visitors to our gardens are most frequently exposed to and likely to see. Having had preliminary discussions with Hermann Staude as the then President of the Lepidopterists' Society of Africa's (LepSoc) Council, I started the project. I was very fortunate to have received survey lists of Kirstenbosch from Jonathan Ball and both the Pretoria and Walter Sisulu National Botanical Gardens from Bennie and André Coetzer. The generosity and
willingness of LepSoc members throughout the country to provide information and support has been much appreciated. With sponsorship committed by Sappi, Steve Woodhall and I are in the process of finalising the annotated national botanical gardens butterfly checklist, fully illustrated, which we hope to publish in SANBI's in-house *SANBI Biodiversity Series* by September 2010. SANBI's Gardens have in fact featured quite regularly in SABCA's quarterly newsletters over the past couple of years. This has included the formal launch of the project in Pretoria (14 May 2007), SABCA/LepSoc's participation in biodiversity exhibitions held at the Walter Sisulu and Kirstenbosch National Botanical Gardens, presentations and surveying in the Harold Porter NBG, involvement in Kirstenbosch summer sunset concerts, as well as SABCA evenings available to the public held in both the Walter Sisulu-(Roodepoort / Mogale City) and KwaZulu-Natal (Pietermaritzburg) National Botanical Gardens.

In January 2009 I had the privilege of joining a SANBI biodiversity expedition to south western Angola in order to survey butterflies in this remote and unexplored region of southern Africa. The support received from Mark Williams in particular was amazing, and I am very grateful to both him, Max Clarke and Martin Krüger, for
their support provided, both prior to, and following the expedition. This was my first experience in catching butterflies, as opposed to just photographing them. The results of this expedition have been formally documented and published in the September 2009 edition (Vol. 20, No. 3) of *Metamorphosis*.

Pearl-spotted Emperor (*Charaxes jahlusa*), Farm Little Leigh, Western Soutpansberg: C. Willis

The highlight of my participation in SABCA so far must be the honour of being invited, along with several other amateur lepidopterists, in July 2009 on to SABCA's virtual museum ID panel. The aim of this recruitment of additional ID panel members was to try and relieve the pressure from a few dedicated LepSoc members, especially Steve Woodhall and André Coetzer who had, until then, done the lion's share of the IDs for SABCA's virtual museum.

My strategy used to photograph butterflies has varied over the past couple of years. Initially it was to sample butterflies from as wide an area in South Africa as possible, using opportunities when travelling for business to photograph butterflies, especially in our national botanical gardens. Certain areas were, however, sampled in a much 'deeper' way. Living in Gauteng, the areas in Pretoria I have sampled most
during the atlassing period were Moreleta Kloof Nature Reserve, Faerie Glen Nature Reserve and the Pretoria National Botanical Garden. Being close to home, these areas could be sampled in a few hours with minimal time having to be spent driving to and from the sampling site. At one stage I combined photographing butterflies with day hikes on private land and in provincial reserves in Gauteng, North West, Limpopo and Mpumalanga. When the global recession hit in late 2008/early 2009 and the cost of fuel increased, thereby limiting long-distance trips, I was forced to change my strategy and aimed to sample grid squares closer to home and within a couple of hours' drive from home. Having acquired an electronic set of 1:250 000 maps of South Africa, I decided systematically to sample as many grids close to home as possible. A typical Saturday during this period would involve driving on remote gravel roads, using a hand-held GPS together with a hard copy printout of a map of the area, to determine when I was in or out of a particular grid square, and stopping at specific points along the road to photograph butterflies either settled on the road near mud puddles or flying amongst road verge vegetation. This resulted in many new grid squares being sampled, but relatively few records sampled per grid square – a typical 'wide' sampling strategy versus a 'deep' sampling strategy. The greatest number of different grid squares I have managed to sample on a single day using this 'road sampling' technique is 10, sampled in the Dullstroom/Mashishing (Lydenburg)/Groblersdal/Roossenekal and Stoffberg areas of Mpumalanga in February 2010.

Early in 2010 I also attempted to sample as many grid squares in the Gauteng Province as possible. Despite my best efforts I have not as yet sampled all the

![Zebra Whites (Pinacopteryx eriphia eriphia), and Brown-veined Whites (Belenois aurota aurota) and an Orange Tip (Colotis sp.), Zaagkuildrift Road: C. Willis](image-url)
province's quarter-degree grid squares, with only a few unsampled grid squares left to survey in both south-western (Randfontein, Westonaria and Vanderbijlpark/Vereeniging) and southern Gauteng (Vaal Dam area). One of the most useful publications I have come across in attempting to survey different areas of Gauteng has been *The Chamberlain Guide to Birding Gauteng* by Etienne Marais and Faansie Peacock (2008). This publication provides a relatively comprehensive coverage of 101 prime birding sites in and around Johannesburg and Pretoria. As a general rule, if a site is good for birding it will be good for butterflies.

At some stage the SABCA coverage map on the virtual museum showed a large number of grid squares surveyed in the greater Gauteng area as well as the Mpumalanga/south eastern Limpopo area, with a gap in between. I then deliberately set about linking the two blocks by sampling grid squares in between, as well as nearby grids not yet sampled for SABCA, such as in the intensely farmed areas of the Springbokvlakte in the Limpopo Province.

There are still so many areas in South Africa that I would like to visit to photograph butterflies – my 'bucket list' includes areas such as Witsand Nature Reserve, northern KwaZulu-Natal up to Ndumo, KZN Midlands, Cederberg, Wakkerstroom, Golden Gate Highlands National Park and the eastern parts of the Limpopo Province, amongst many others. Large gaps in our knowledge of butterfly distribution are still very evident in the Northern Cape, as well as parts of the Free State, Limpopo and North West Provinces, and will require some dedicated and targeted sampling in years to come.
One of the great aspects of atlassing projects such as the reptile and butterfly atlasses (and more recently SABAP 2) is the involvement of citizen scientists in conservation assessments. It focuses people's attention and provides opportunities for them to become involved in meaningful conservation initiatives during their spare time, leisure activities and family holidays (ours are now largely guided by missing SABCA grid squares!). In the process, it provides opportunities for members of the general public to learn more about the subject and broaden their natural history knowledge and understanding.

The leadership and guidance shown by Silvia Mecenero, the SABCA Project Coordinator, throughout the project is much appreciated. She has provided consistent and clear communication to all those involved in different aspects of the project, from field surveys, databasing, managing the SABCA web site and virtual museum to implementing initiatives such as the annual competitions, the 350.org climate action campaign as well as the first Butterfly Census Weekend. The support provided by the LepSoc Council members and the SABCA Steering Committee are also greatly appreciated.

Finally, as the SABCA Project nears its end, I hope to continue to explore unsampled areas of our beautiful country, improve my knowledge and understanding of butterflies and their conservation, share this with others and continue to indulge in my newly acquired passion for many years to come. My thanks go to the sponsors and organisers of the SABCA Project for the opportunity provided to citizen scientists to learn about and contribute towards the conservation of one small but vital component of southern Africa's rich natural heritage.

Further reading

The discovery of a remarkable sex-limited polymorphism in the rare African lycaenid, *Cooksonia trimeni* Druce (Lepidoptera: Lycaenidae: Lipteninae)

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As far as I am aware *Cooksonia trimeni* Druce, 1905 was previously only known from two female specimens caught in the present-day Democratic Republic of the Congo (DRC, previously Zaire) and possibly one from Angola. The locality for the first specimen, *C. trimeni trimeni* (Plate no. 2, Fig. 1), was given by Druce (1905) as North-West Rhodesia. Cookson (1954), who collected the specimen in October 1903, made a correction to this, suggesting the specimen came from southern Zaire (Shaba Province of DRC). The second specimen was described as a subspecies of *C. trimeni* by Talbot in 1935 as *Cooksonia trimeni terpsichore* (Plate no. 2, Fig. 2). *Cooksonia trimeni terpsichore* was caught at the Lufira River, near Likasi Copper Mine (Shaba Province of DRC), at 4 000 ft on the 30.x.1918 by T.A. Barns. Talbot states “This specimen is so unlike typical trimeni that it is more probably a race than a female form.” Unknown to Talbot he was dealing with a polymorphic species and in fact a slight variation of one of the female forms. Collins & Larsen (2008) correctly suggest *C. trimeni terpsichore* should be a junior subjective synonym of *C. trimeni*.

In 2002 I discovered *Erikssonia cooksoni* in North-Western Zambia (Gardiner & Terblanche, 2010). The fact that Cookson captured *E. cooksoni* as well as *C. trimeni* in the DRC spurred my search, the following year, for *C. trimeni* in North-Western Zambia.

I arrived there after two days of driving from Harare. Having had experience searching for and capturing *C. aliciae* Talbot, 1935, in Malawi, and *C. neavei rhodesiae* Pinhey, 1962 from numerous localities in Zimbabwe, I looked for a woodland likely to be inhabited by *Cooksonia* and set up camp. The following morning after a cup of tea I went for a short wander into the woodland without my net. To my amazement I spotted a *Cooksonia* sitting in the characteristic way a few metres up on a twig. I knew from the habits of the genus that if I did not disturb it, it was not going anywhere. So I went back to camp, got my net, returned to the spot and captured the specimen. Initially I was under the illusion I had caught something new. This male was not referable to *C. neavei rhodesiae* and did not
look like the illustration of the female *C. trimeni* in Druce's paper (this female is also pictured in D'Abrera, 1980). I realized I would have to capture a female to solve the problem. For the rest of the day all I turned up was a few more males. As this was a short collecting trip I only had a further three days to try and obtain the female. After another two days and many kilometres of walking all I had obtained were males (Plate no. 1, Figs 1-4). On my last day I set off once more in the hopes of a female and by afternoon I thought it was all over when I spotted a butterfly with the distinctive pattern of the illustrated *C. trimeni* female a few metres up, fluttering around the remains of a dead tree. Despite my excitement I decided to wait and fortunately she came lower and into a perfect sweeping position. Finally I had obtained a female which fitted the illustrations I had seen (Plate no. 2, Fig. 3). I returned from this trip with a great feeling but little did I know this was just the beginning of my adventures with this insect.

A few years later I returned to N.W. Zambia with the intention of finding more *C. trimeni* and seeing if I could find further localities. I first went back to my original locality where I obtained some males and another female. I then decided to widen my search. It took many more stops, and a rather strained neck, before I found another population. First I caught some males, then came a surprise when I caught a pair in copula and the female looked very similar to the male (Plate no. 3, Fig. 2). The thought crossed my mind that possibly there were two species, but after spending two days at this locality I managed to collect a number of females and realized that I was dealing with an amazing case of polymorphism.

I found a further population in a previously fairly well collected area, the Mundwiji Plains, some 120-140 km from my original population. It became clear that this, like *C. neavei* Druce, 1912, is a widespread species. Due to its typical *Cooksonia* habit of sitting on the ends of twigs, like dead leaves, for long periods of time and its fairly short period of emergence it had remained relatively undetected. This cryptic behaviour and camouflage (Gardiner, in prep.) make *Cooksonia* rare in collections and accounts for the recent descriptions of further species in this genus: *Cooksonia abri* Collins & Larsen, 2008 from northern Cameroon and *C. ginettae* Collins & Larsen, 2008 from the Kivu Province of the DRC. The third species, *Cooksonia nozolinoi* Mendes & Bivar de Sousa, 2007, described from a single female from central Angola, looks like it is probably a form or subspecies of *C. trimeni* (Plate no. 3, Fig. 4). Although this specimen was collected a fair distance from the Mundwiji Plains (about 800 km) it is likely to have been collected in the same vegetation type (Wet Zambezian Woodland). In addition, little collecting has been done in the intervening area and more populations may be present there. Until further material becomes available its specific status is questionable.

Although the white female form (Plate no. 2, Figs 3, 4 & Plate no. 3, Fig. 1), alba f. nov., appears to be much more variable (e.g. Plate no. 3, Fig. 1 where the white
extends into the median umbral area) than the black form (Plate no. 3, Figs 2&3), nigra f. nov., the two forms are quite distinctive. Not only did the females vary, the males also differed from one another in their wing pattern, shape and the intensity of the colours (Plate no. 1, Figs 1-4). There is a possibility of members of the genus Acraea (Plate no. 4, Figs 1-4) being models for C. trimeni (Gardiner, in prep.).

Acknowledgements

I would like to thank The Natural History Museum, London (formerly British Museum (Natural History)), in particular Blanca Huertas, for sending me photographs of the type specimens. Nolan Owen-Johnston kindly provided me with locality information for C. aliciae. Torben Larsen assisted with information on two of the newly described Cooksonia species while L.F. Mendes and A. Bivar de Sousa kindly provided me with photographs and feedback on C. nozolinoi.

References


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Any member can volunteer to become a sponsor member on an annual basis and make a contribution of R600. As the Society does need all the financial support it can get it is hoped that more members will elect to become sponsor members in the future. Donations to the Society will also be most welcome.
Cooksonia trimeni & C. nozolinoi and some possible Acraea models - PLATE NO. 1

Fig. 1 Cooksonia trimeni ♂ upperside & underside

Fig. 2 Cooksonia trimeni ♂ upperside & underside

Fig. 3 Cooksonia trimeni ♂ upperside & underside

Fig. 4 Cooksonia trimeni ♂ upperside & underside
Fig. 1 *Cooksonia trimeni* ♀ type upperside & underside

Fig. 2 *Cooksonia trimeni* f. *terpsichore* ♀ type upperside & underside

Fig. 3 *Cooksonia trimeni* f. *alba* ♀ upperside & underside

Fig. 4 *Cooksonia trimeni* f. *alba* ♀ upperside & underside
Fig. 1 *Cooksonia trimeni* f. *alba* ♀ upperside & underside

Fig. 2 *Cooksonia trimeni* f. *nigra* ♀ upperside & underside

Fig. 3 *Cooksonia trimeni* f. *nigra* ♀ upperside & underside

Fig. 4 *Cooksonia nozolinoi* ♀ type upperside & underside
PLATE NO. 4 - *Cooksonia trimeni* & *C. nozolinoi* and some possible *Acraea* models

Fig. 1 *Acraea encedana* ♂ upperside

Fig. 2 *Acraea encedon* ♂ underside

Fig. 3 *Acraea chaeribula* ♂ light form upperside & underside

Fig. 4 *Acraea chaeribula* ♂ dark form upperside & underside
Figure 1. Wallengren's Ranger (*Kedestes wallengrenii wallengrenii*), Moreleta Kloof Nature Reserve: C. Willis

Figure 2. Marsh Sylph (*Metisella meninx*), Moreleta Kloof Nature Reserve: C. Willis
Figure 1. Deceptive Diadem (*Hypolimnas deceptor deceptor*), Kwelera Nature Reserve: C. Willis

Figure 2. Soutpansberg Acraea (*Telchinia induna salmontana*), western Soutpansberg: C. Willis
Figure 1. McGregor's Blue (*Lepidochrysops mcgregori*), Hantam National Botanical Garden: C. Willis

Figure 2. Warren's Blue (*Orachrysops warreni*), Verlorenvallei Nature Reserve: C. Willis
Figure 1. Roodepoort Copper (*Aloeides dentatis dentatis*), Suikerbosrand: C. Willis

Figure 2. Northern Short-tailed Admiral (*Antanartia dimorphica dimorphica*), Woodbush Forest: C. Willis