

METAMORPHOSIS

ISSN 1018-6409

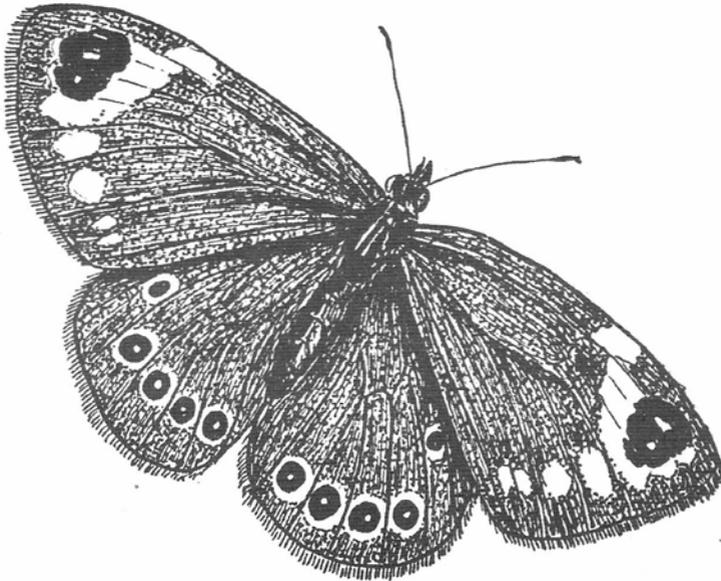


JOURNAL OF THE LEPIDOPTERISTS'
SOCIETY OF SOUTHERN AFRICA

Volume 7

December 1996

Number 4



Dingana dingana (Satyrinae) male

(Forewing length 27–30 mm)

LEPIDOPTERISTS' SOCIETY OF SOUTHERN AFRICA

EXECUTIVE COUNCIL

STEPHEN F. HENNING,	President	HERMANN STAUDE
GRAHAM A. HENNING,	Secretary	MARK C. WILLIAMS
ALF CURLE,	Treasurer	ROLF OBERPRIELER
LINDSAY DURHAM,	Social Secretary	MARTIN KRÜGER
ALAN HEATH,	Cape Branch	WILLIAM STEELE

EDITORIAL

HERMANN STAUDE	Editor
MARK C. WILLIAMS	Sub-Editor: Scientific articles
WILLIAM H. HENNING	Sub-Editor: Popular articles
ANDY GRAY	Sub-Editor: Technical
NOHNA DU TOIT	Distribution
NEVILLE CURLE	Colour Plates

The **aims** of the Lepidopterists' Society of Southern Africa are to promote the scientific study and conservation of Lepidoptera in Southern Africa; and to promote the publication of original scientific papers as well as articles of a less technical nature in the journal, *Metamorphosis*, or other publications of the Society.

Membership of the Society is open to all persons interested in the study of Lepidoptera. There is no geographical limit to membership.

There are three categories of membership:

	Local	Overseas	
Full members	R60,00 p.a.	US\$44,00 p.a.	UK £22
Junior members and Pensioners	R30,00 p.a.	US\$22,00 p.a.	UK £11
Affiliate members (Scientific Societies, museums, libraries, schools, etc.	R60,00 p.a.	US\$44,00 p.a.	UK £22

Persons may become **Life Members** by paying eight hundred and seventy five Rand (R875,00) locally and US\$660.00 overseas.

Membership fees are due on **1 April**. Overseas rates are higher due to increased postage.

CORRESPONDENCE

General -	The Hon. Secretary, P.O. Box 470, FLORIDA HILLS, 1716
<i>Metamorphosis</i> -	The Editor, P.O. Box 398, Magaliesburg, 2805
Membership fees -	The Hon. Treasurer, P.O. Box 477, Jukskei Park, 2153

All drawings, unless otherwise stated, are by S.F. Henning.

COMMENT BY THE PRESIDENT

The Brenton Blue, *Orachrysops niobe*, is again occupying our attention. With the approach of the flight period various plans have been put forward for its conservation. Two new important participants are the Endangered Wildlife Trust (EWT) and the Green Trust.

The Lepidopterists' Society has had negotiations with the EWT and other interested parties. Plans have now been put forward to establish the Brenton Blue Trust to take over the negotiations with the developer. This new Trust will be made up of representatives from all interested parties - Lepidopterists' Society, EWT, Green Trust, Wildlife Society, Brenton-on-Sea Town Council and so on.

The early stages of *O. niobe* have now been described (*Metamorphosis*, 7(3): 109-120). However their relationship with ants has still to be established. Since the larvae are phytophagous, if they are associated with ants, they probably use their nests as shelters.

Interestingly enough the discovery of the early stages of *O. niobe* follows closely the same sequence of events as the discovery of the life history of *Aloeides dentatis*. *A. dentatis* was the first butterfly species in Africa to have a reserve established for its protection. Initially, with *A. dentatis*, a pupa was discovered under a rock with two species of ant in attendance. We assumed at first that the larvae were probably carnivorous. Females were observed ovipositing on *Hermannia depressa* and eggs were sent to Charlie Dickson in Cape Town. He bred them through on a local *Hermannia* species without any ants (Tite & Dickson, 1973, *Bull. Br. Mus. nat. Hist. (Ent.)* 29: 274).

However, later discoveries showed that in the wild the larvae sheltered in an ants' nest during the day and left the nest at night to feed on the foodplants. Before leaving the nest, the *A. dentatis* larva always attracted the host ant, *Acantholepis* sp., by secreting a mimic of the ants' alarm pheromone. It then left the nest accompanied and protected by the ants (Henning, 1983, *J. ent. Soc. sth. Afr.* 46: 341-366). The foodplant of *A. dentatis* is widespread on the Witwatersrand while the distribution of *A. dentatis* is governed by the presence of the host ants.

This scenario was repeated with the vulnerable lycaenid species *Erikssonia acraeina* where the foodplant, *Gnidia kraussiana*, is widespread but the distribution is governed by the host ant, *Acantholepis* sp. (Henning, 1984, *J. ent. Soc. sth. Afr.* 42: 337).

The distribution of the isolated colonies of all *Orachrysops* species, including *O. niobe* is consistent with the distribution of all known myrmecophilous lycaenid genera and species (*Aloeides*, *Poecilmitis*, *Lepidochrysops*). This suggests that the restricted distributions of *O. niobe* and the other *Orachrysops* could be due to the presence or absence of ants. Therefore the next priority in the conservation of *O. niobe* is to establish, if it is myrmecophilous, and the identity of the host ant. Let's hope we have more success this season.

Stephen Henning

THE GREEK, THE GERMAN, AND MOTHING IN STYLE

By Hermann Staude

P. O. Box 398, Magaliesburg, 2805, South Africa.

"You know, there really is something special about cheating on a Monday..." said Jo as we were leaving the smog cloud of Gauteng for the rolling hills of Mpumalanga. My friend John Joannou and I were on our way to Mount Sheba, on the eastern escarpment, for a night of mothing on the twenty third of September 1996. This was our first trip in my brand new 'double cab', fiery-red and yet to be named. My trusty Sani was finally sold to a couple of pommies who had invested their life savings into a six month sojourn in the wilds of Africa. A fitting ending for a vehicle that served me so well, I thought. Although I must admit, as I was waving the cheerful two on their way, that I was a little bit worried about their experiencing a different kind of adventure.

Nestled on a small grassy plateau, completely surrounded by pristine montane mist forest on the eastern slope of Mount Sheba is a luxury hotel by the same name. Finding a more beautiful site for a country retreat would be very difficult. Like a spiders web hiking trails lead from several points on the plateau meandering into the forest. Numerous indigenous tree species are marked along the routes, giving the visitor an idea of the rich diversity of trees that these forests harbour. After booking into the hotel and confirming our pre-arranged permission to collect moths, granted by the management of the Mount Sheba Nature Reserve, we spent the rest of the afternoon finding suitable spots for our moth-attractors and generally getting a feel of the forest.

Finding the best site to erect a moth-attractor is not a matter to be taken idly. Many factors have to be taken into account before making the all important decision. First there is the diversity and the type of vegetation in the immediate vicinity of the prospective site that has to be considered. Secondly one has to see to it that the site is sufficiently open, so that the moths could see it from some distance, at the same time ensuring that the site is not in a wind tunnel which would adversely affect the number of moths that would come to the attractor. Thirdly the actual site must be reasonably level, not solid rock, and sufficiently vegetated with plants that would prove to be good backgrounds for photography in the event of moths choosing to settle on them. Chuck into that personal preferences and you can understand that finding the perfect site is much like the surfers eternal search for the perfect wave. We are often teased by the ignorant that all this rigmarole is nothing more than a ritual. Any site in the area will do and would attract just as many moths, they would say. I recall one evening in the Mkambati Nature Reserve last December when I reluctantly agreed to let such a group of unbelievers choose their "any old site" for one of my two attractors. The site of the other one was chosen carefully in accord with the normal "ritual". Before dawn the following morning we first visited the "any old site". Apart from a single gutsy hawk moth there was not a moth in sight on or around the bulging attractor that looked like one of those bags you find at airports. Next we visited the "ritual".

Much did I savour absorbing the expression on their faces when they first saw the moth-laden attractor.

That evening at Mount Sheba, after an enjoyable sundowner in the lounge, Jo and I sat down to a most exquisite dinner. The atmosphere was very upper-class and the tasty food well prepared and presented. I must admit though that upon being presented with the smallest slice of bread I have ever seen I remarked that it is really not sufficient for a German. "If that is not sufficient for a German then imagine how the poor Greek must be feeling" was JO's reply. A pertinent discussion with the waiter soon rectified the matter and we dug into enough of the tasty little stuff to satisfy even the Greek and the German. Some of the other stiff-upper-lip guests may not have been amused by all of this but we were too busy to notice. We did however compensate by treating many of them to their first experience of the world of UFO's, or so the receptionist reported to us the next morning.

After a refreshing shower later that evening, heated towels nogal, we were off for our first visit to the attractors. First stop was the one near the summit in *Protea* grassland. In spite of quite a chilly wind blowing, geometrids were arriving regularly. Many species of larentinae (as one would have suspected) were around as well as an undescribed species of *Mauna* that I had picked up before in the Natal Drakensberg. Most surprising however was a perfect specimen of *Dichroma equestralis*, a species I had previously thought to be restricted to the Cape fynbos. Jo was not so lucky, not a single 'furry-moth' around. The other four attractors were set up all around the forest and produced many, for me, interesting geometrids. The totally different geometrid fauna of the grassland to that of the forest, as always amazed me. It is like two worlds less than a kilometre apart. In the forest I was particularly happy to have been able to photograph the lovely *Rhodesia viridalbata*. The next morning we were at the first attractor just before dawn and finished with the last one at around eight thirty. In the end I came away with six species new to my collection. This is very good going, probably because this was my first visit to these forests in September. Jo was not so lucky, from all those attractors he only found a single *Desmeoacraea* sp. That was to his liking.

After a few hours of early morning mothing we really enjoyed the full English breakfast served in the pool-restaurant overlooking the lush forest. Soon we were on our way back to the rat race. On the way back we discussed and solved all the problems surrounding the naming of species, if only the taxonomists would listen to us. As we entered Gauteng I jokingly remarked that the single *Desmeoacraea* probably cost him more than five hundred bucks. "The money I saved on psychiatrists, pills, doctors etc. by replenishing my soul in this way more than offsets the cost." said Jo. Spoken like a true businessman thought I.

REGIONAL ROUNDUP

The first part of the season has been fairly active. In keeping with the increase in conservation in Lepidoptera research, there is a biological awareness apparent in articles and conversation about butterflies. This understanding of the behavioural and environmental requirements of our rarer species is the key to finding more colonies, and the preservation of existing ones. There is also much interest and debate about predators, and their effect on the appearance of butterflies. Of interest to me is the effect on isolated species and colonies.

The Brenton Blue Project and Karkloof Blue Project have received continued coverage, with good exposure by the Endangered Wildlife Trust. The Green Trust, run by Nedbank has also become involved, and it is hoped that this added pressure will result in the survival of the species. The project deadline has been further extended until the end of April 1997.

A female specimen of an *Orachrysops*, collected last year by Tony Brinkman on the Kammanassie Mountains, caused some consternation as it was thought it may represent another colony of *Orachrysops niobe*. A number of specimens, male and female, were collected this season, and it appears to represent a new species. Our congratulations to Tony and the other Cape collectors for their hard work. The discovery of this new *Orachrysops* was reported in the press. I received a phone call from Steve Woodhall a week or so after the new *Orachrysops* had been found. He used his cell phone from the top of the Kammanassie Mountains to ask me what the *Orachrysops* was that he had just collected. What a coincidence that he had decided to visit the locality at the right time, and also found specimens quite independently. He also described the scene before him, with the Kammanassie Mountains around him, and the majestic Swartberg in the distance, the joys of cell phones!

My own efforts have been concentrated on the Satyrines, particularly the genus *Dingana*. The restricted flight periods of this genus have led to many fruitless trips. It is fortunate that perseverance wins out in the end. One colony investigated near Stoffberg was visited by me six times during October with specimens only being recorded twice. One good thing is that one now knows that the flight period is only about ten days, and that specimens only appear to fly between nine and eleven o'clock in the morning, and mainly on west facing slopes. This information is very useful when searching for other colonies of these fascinating browns.

Alf Curle, a fellow *Dingana* enthusiast, visited the Lootsberg Pass near Graaff Reinet on a number of occasions early this season. He eventually managed to collect some more males of the large *Aloeides caledoni* that he had discovered there last year. He and his brother Neville, and later with Steve Woodhall, also collected *Tarsocera southeyi*, as well as *Aloeides mbuluensis* on the Witteberg.

Steve Woodhall, after gloating about the *Orachrysops*, has also recorded a number of other species in the Western Cape including *Poecilmitis balli* and *Aloeides pallida jonathoni* from the Kammanassie, and a number of species from the Swartberg.

GRAHAM HENNING

BUTTERFLY WORLD - A HISTORY OF DEVELOPMENT

By Esther van der Westhuizen
P. O. Box 41, Klampmuts, South Africa.

The Beginning

When my mother returned from Canada in 1992 telling me: "I have seen the most beautiful butterfly park, and I wish to open one here", I thought she was a little too ambitious. I was lecturing in Zoology at the University of the Western Cape at the time, and despite occasional campus unrest, was enjoying it enormously. My mother, Matty Pretorius, owned and managed a successful dried flower shop in the busy Tyger Valley Centre. So the idea was put on ice for a while.

During early 1995, campus unrest at UWC became severe and after nine years I started to question my future there. At the same time, my mother experienced boredom at a business that she built up from nothing to a great success over thirteen years. We decided together: "Go for it!" Two problems immediately faced us - where and how to get butterflies and, of course, where and how to get money!

My post-graduate studies involved small mammals in the coastal fynbos. At UWC I contemplated further studies in estuarine bio logy. So, back to books, journals and libraries for a frantic study in everything lepidopterist!

Planning

During 1995 we decided that if we want to build South Africa's largest butterfly park we had to see how butterfly parks operated. Financial restraints prohibited a journey to Canada or Europe, so we opted for Malaysia and Singapore. The parks in these countries are mind blowing. It seems as if they literally threw a lot of shade cloth over a piece of jungle, hacked paths out and created little pieces of paradise.

Visitors to these centres can, in their own time, view and admire butterflies closely, which, together with their nectar and larval food plants, form a refreshing and pleasing eco-tourist and education centre. At Penang, Malaysia, we saw their breeding facilities, but we did not get to the main breeding facility situated on mainland Malaysia.

Back home, the reality of wind-blown Western Cape set in and we carefully planned the direction of our local Butterfly World. We realised by now that the basic structure must be a (Cape!) weather proof green house of $\pm 1000\text{m}^2$, also creating a pest-proof and escape-proof habitat for the butterflies. The centre should include a craft shop, tea room, ablutions, staff room and office.

Location

To choose a location was an interesting exercise. After looking at tourist attractive places like Hout Bay and Stellenbosch (too expensive), the Waterfront (much too expensive) and West Coast (too windy), a perfect plot was found 10km west (Cape Town side) of Paarl, just off the N1 on Route 44. It is close to the little town

Klapmuts, where you still find persons who have never seen the sea before! The Stellenbosch and Paarl Wine Routes diverge at this spot, and with more than a million visitors yearly to these routes (and 8000 cars daily past our door step) this site is as perfect as we can get.

The plot had nothing on it, and we had to build everything from scratch. It is also at this time that butterflies went out of the proverbial back door to make place for building plans and other administrative duties. It was also mid-winter, and nothing was flying around.

The Structure of Butterfly World

The green house, built as the live butterfly exhibit, has a roof structure covered with polycarbonate cladding. The advice received from an Israeli company designing and building the green house, was to install insect proof netting as side walls instead of using solid walls. Solid walls necessitate an elaborate cooling system, which is not feasible in the case of 2 small green house such as this one. The netting has a wind resistance of less than 50%, which means that a natural breeze fans through the green house, and is preferable over an internal air circulating system. Since the butterfly species in the exhibit are not tropical, a tropical atmosphere does not have to be maintained.

One of the more pleasant tasks was landscaping the garden, and to acquire plants. The landscaping was done by ourselves, mainly to save costs. Pathways were designed as a series of limited spaces rather than a continuous path running through the landscape. Creating these spaces allows visitors to pause and observe butterflies undisturbed.

Money Matters

Banks were not keen on the idea of granting a loan to a business that is first of its kind in South Africa, and we finally managed to secure finances from the Small Business Development Corporation.

Butterflies

It was quite clear that we have to use South African butterflies to start with. It will be very nice to keep the lovely tropical birdwings and exotic swallowtails, but apart from problems with the Departments Agriculture and Nature Conservation, at more than R30 per pupa for these butterflies it will be a better investment to expand our South African collection.

The Cape Nature Conservation was kind in granting us all the relevant permits for our business, although they are reluctant in agreeing to permit any species which does not occur naturally in the region. Cape species are, in the eyes of the public, not the most spectacular - the most frequently asked question is: "Why don't we see butterflies anymore?"

There is a wealth of information on life cycles of our more common species, but there is very little written on how to handle a thousand caterpillars each of eight species, all at the last instar stage! To say that the learning curve is steep, is an understatement.

It seems an easy choice which butterflies to put into the exhibit, but our list has been changed numerous times, especially after talking to lepidopterists at the Annual Conference.

The following criteria were used in selecting butterfly species:

- ◆ the butterflies, as far as possible, must have a continuous breeding cycle through the year,
- ◆ their food plants must be readily available and easy to grow,
- ◆ common garden butterflies are included for information and educational purposes,
- ◆ the butterflies must be aesthetically pleasing, thus will be of various sizes and colours.

Up to now, butterflies are mating and laying eggs on the food plants provided in the green house, thus ensuring enough stock for the future. The host plants on which the eggs are laid are being checked daily and any eggs found are removed to the breeding room, where they are kept until the caterpillars hatch. Leaving the caterpillars on potted food plants until later (larger) stages before being handled, lessen the mortality rate considerably. The ideal situation is a "hands off" situation, but if this is not possible, any handling at any stage is kept to a minimum. In the breeding room, breeding boxes keep parasitic wasps out and prevent caterpillars from wandering away before pupation.

The initial stock of butterflies are collected in the egg or larval stadia in disturbed areas, such as gardens, farms, etc. For example, a citrus farm close to us provides enough citrus swallowtails (*Papilio demodocus*) for our needs.

The Melbourne Butterfly House in Australia estimates that to keep 800 butterflies flying at any one day of the year, at least 4000 caterpillars must be at various stages of their life cycle. With at least ten species breeding at any time, it will mean 400 caterpillars of each species. Given that some females may lay up to 200 eggs, it is not an impossible figure to maintain.

It must be kept in mind that 300+ caterpillars can be reared in a breeding cage of 1m³, thus space may not be a problem in rearing larvae, rather the availability of larval food. On the other hand, some caterpillars do not cope with overcrowding, so less will be kept in a breeding cage. Smaller butterfly species will be bred in larger numbers than the bigger species (i.e. the *Papilio* spp.), since the large butterflies' larvae eat enormous amounts of food. Territorial butterfly species' numbers will also be kept low.

Some butterfly species will be collected from various sites, i.e. the citrus swallowtail may be collected from citrus farms at Paarl as well as Citrusdal. Interbreeding of these butterflies will occur in Butterfly World. Since some species display striking forms from various localities, it would be unwise to contaminate these wild populations with released interbred butterflies. Therefore no butterflies will be released from Butterfly World.

The aim of Butterfly World is to display **live** butterflies in an open space (garden) for tourist and education purposes. It will be possible to utilise excess

butterflies bred on the premises for various commercial purposes, i.e. to block and frame butterflies to sell in the Butterfly World craft shop. Such a venture will be strictly controlled, and such products will only be sold by Butterfly World itself, and not to other retailers.

The Future

Butterfly World opened on 8 November 1996, from 0900 to 1700, seven days a week. It is a popular destination for tourist and school groups, old age homes, and garden clubs.

Butterflies, as a subject to the general public, is beautiful, mysterious and emotional. People want to see butterflies. However, they know almost nothing about the life cycle and basic biology of these insects. Posters are placed at various places answering the questions most frequently asked.

These are:

- ◆ How long does a butterfly live?
- ◆ What happens during the life cycle?
- ◆ What happens inside a pupa?
- ◆ How do you attract butterflies to your garden?
- ◆ What about pest control in Butterfly World?
- ◆ What are the differences between butterflies and moths?
- ◆ Why are some butterflies brown?
- ◆ What do butterflies eat?
- ◆ Are there any agricultural pest butterflies?
- ◆ The Large "Cabbage" White story. (on *Pieris brassicae*)

On a huge map depicting the biomes of southern Africa, butterflies are pinned where they were captured. I have to thank Martin Lunderstedt and Alan Heath for donating or loaning specimens for display.

My mother's dream is finally a reality, and we wish to invite all readers to visit us the next time they are in the Western Cape. Travelling from Cape Town to Paarl on the N1, take Exit 47 marked Klappmuts, Franschhoek and Wellington, turn right onto Route 44, and you'll find us on your right about 500m from the N1.

Acknowledgements

I would like to use this opportunity to thank all persons who gave us support and showed interest in our project, especially Alan Heath, Steve Woodhall, John Joannou and Bill Steele (for pamphlets on overseas parks).

A Last Word

As we are certainly not the first or the last butterfly park in southern Africa (count the parks in Oudtshoorn and a planned one in Zimbabwe), there should be some sort of control, and a Code of Conduct endorsed by the Lepidopterists' Society may be a good idea.

A REVIEW OF THE GENUS *DINGANA* VAN SON (LEPIDOPTERA):

**NYMPHALIDAE: SATYRINAE) WITH DESCRIPTIONS OF A NEW GENUS,
THREE NEW SPECIES AND THREE NEW SUBSPECIES**

By GA Henning and S.F. Henning
1 Harry Lawrence Street, Florida Park 1709, South Africa

Abstract: The genus *Dingana* is reviewed. A new genus *Serradinga* is described. Three new species, *Dingana alticola*, *Dingana angusta* and *Dingana fraterna*, and three new subspecies, *Serradinga clarki dracomontana*, *Serradinga clarki amissivallis* and *Serradinga clarki ogra*, are described. The status of *Dingana clara* van Son, *Serradinga clarki* van Son and *Serradinga kammanassiensis* S.F. & GA Henning is revised.

The Tribe Dirini is endemic to the temperate areas of southern Africa. It is characterized by the short forewing cell, which is always less than half the length of the wing. The forewing cell is also rounded. The eggs are scattered and not laid as in other tribes, except for the *Aeropetes* group of tribe Lethini.

KEY TO THE GENERA OF THE TRIBE DIRINI

1. Hindwing upper median vein anastomoses with Sc beyond origin of precostal spur to form an areole 2
Hindwing upper median vein does not form an areole 3
2. Antennal club gradual *Dira* Hübner
Antennal club abrupt *Tarsocera* Butler
3. Antennal club gradual 4
Antennal club abrupt *Torynesis* Butler
4. Hindwing median discocellular vein less than half length of lower discocellular *Serradinga* gen. n.
Hindwing median discocellular not less than half length of lower discocellular *Dingana* van Son

Genus *Dingana* van Son

Genus Dingana van Son 1955. *Transv. Mus. Mem.* 8:70.

Type species: *Leptoneura dingana* Trimen, by original designation.

A careful study of the characters used in the original description of this genus has led us to believe that the two groups classified under the genus would more correctly be classified as different genera. In order to do this the original description of *Dingana* is slightly modified as follows in order to conform with the type species.

Diagnosis. Adult nearest to *Dira* Hübner, from which it differs in the absence of an areole at base of hindwing, and details of both male and female genitalia: narrow and elongate aedeagus and strongly developed juxta in male, and absence of signa in female.

Characters. Antennae 39-41 jointed, club gradual, but well-defined, 14-jointed, palpi obliquely upturned, first joint rather large, almost half the length of the second, third joint elongate-ellipsoidal, one-third the length of the second. Eyes hairy. Anterior legs of both sexes strongly reduced and hidden among the hairs of thorax, tibiae only a little more than half length of femora, tarsi of male minute, fusiform, of female two-thirds the length of tibiae, four-jointed. Normal legs short and slender, tarsi with paronychia and pulvilli present. Wing-venation. Forewing. Sc not conspicuously swollen near base, but gradually tapered from base to its end, R₁ and R₂ from cell before upper angle, R₃-R₅ stalked from upper angle, upper discocellular oblique, half the length of median discocellular, the latter very little incurved, lower discocellular three times the length of median discocellular, slightly excurved, M₃ from lower angle, CuA₁ arises nearer to M₃ than to CuA₂. Hindwing. Upper median runs along Sc from about half the distance from base to origin of precostal spur, and is decurved from Sc at about the same distance beyond origin of precostal spur, without any anastomosis or connecting bar; R₅ from upper angle, upper discocellular more than half the length of median discocellular, oblique, median discocellular two-thirds the length of lower discocellular, both being incurved. M₃ from lower angle, CuA₁ from a little before lower angle. Genitalia. Male. Uncus about half the length of tegumen, straight, vertically forked at tip, scaphium long, straight, truncate distally, anal opening at tip of scaphium, falces short, valve elongate without processes, juxta strongly sclerotized, aedeagus narrow and elongate, saccus long. Female. Vestibulum shallow, asymmetrical, bursa without signa.

Early stages. Egg: dome-shaped, smooth, with a fine netting tracery; they are scattered in the grass. Larva: there are usually six, but sometimes five larval instars, larvae rather similar to those of *Dira*, but the setae of the final stage are pointed, not mucronate or sceptre-shaped as in that genus. Pupa: similar in shape to those of *Dira*.

There are seven species recognised in this study.

KEY TO GENUS *DINGANA*

1. Forewing upperside postdiscal patch bright ochre yellow, hindwing angled at M₁ *jerinae*
Forewing upperside postdiscal patch not bright ochre yellow, hindwing not angled at M₁ 2
2. Forewing upperside postdiscal patch largely white 6
Forewing upperside postdiscal patch not largely white 3
3. Forewing upperside postdiscal patch very broad *alaedeus*
Forewing upperside postdiscal patch not very broad 4

-
4. Discal line on underside just distad end of cell *alticola* sp. n.
 Discal line on underside well distad end of cell 5
5. Forewing postdiscal patch very narrow *angusta* sp. n.
 Forewing postdiscal patch not very narrow *dingana*
6. Hindwing upperside ocelli large and ovoid *clara* stat. n.
 Hindwing upperside ocelli small and round *fraterna* sp. n.

***Dingana dingana* (Trimen)** Plates 1 & 2: 1, 2. Fig. 1.

Leptoneura dingana Trimen, 1873. *Trans. ent. Soc. Lond.* **1873**: 102.

Type locality Malans Spruit, KwaZulu-Natal, South Africa.

Distribution and habits

Walter Morant collected a single specimen of this species in October 1868 in the Natal midlands and Trimen described it on this specimen. *D. dingana* is confined to the KwaZulu-Natal midlands where it inhabits Southern Tall Grassveld (Acocks, 1975). A common species along rocky ridges.

Remarks

This is a large sized brown with a fairly broad ochreous postdiscal band on the forewing upperside. The underside is brown with some silvery scaling distad to the black discal line which is fairly evenly curved. Female. Similar to the male but postdiscal patch may be slightly broader. The female has more elongate wings and is usually slightly smaller than the male with the abdomen short and stout.

Early stages by G.C. Clark in van Son, 1955; the eggs are pale yellow when first laid, changing to brown if fertile

Male genitalia. Uncus with a strongly bifid apex, valve narrow tapering distad to a rounded apex.

***Dingana angusta* sp.n.** Plates 3 & 4: 9, 10, 11, 12. Fig. 2.

Description

Male. Forewing-lengths 28,8–31,0 mm, mean 29,6 mm (n = 6); antenna-wing ratio 0,38–0,40, mean 0,39 (n = 6). Wings, upperside. Forewing dark brown with a black, subapical, double white-pupilled ocellus in areas R₅ and M₁; three separate creamy-yellow to orange-red postdiscal spots decreasing in size from M₃ to CuA₁; continuous creamy-yellow to orange-red band along lower and inner edge of ocellus extending from M₂ to costa; outer edge of ocellus with two small orange spots in R₄ and R₅ and a single darker marginal line present. Hindwing: with a postdiscal series of black, white-pupilled ocelli encircled with orange-red rings in areas CuA₁-R₅ Underside. Forewing subapical ocellate spot present and divided into two; postdiscal spots as on upperside but smaller; double dark marginal line. Hindwing with a subbasal dark spot edged with white in cell and area CuA₂, median dark line edged outwardly with whitish and strongly excurved on veins, from costa to a little inwards from vein 2A and intersecting cell just before origins

of veins R_5 and CuA_2 ; a broader dark discal line, edged with greyish-white on inner side and acutely angled outwards in area M_2 , from costa beyond middle to vein 2A at about one-fifth of that vein from wing margin; postdiscal series of small black ocelli with minute white pupils, much smaller than on upperside, without reddish rings, but encircled with narrow dark concentric rings; marginal line treble, the innermost broad, the other two linear. Genitalia. Valve convex ventrally along the basal half, convex dorsally about four-fifths of its length; narrower distally tapering to a fairly acute apex.

Female. Forewing lengths: 28,0–30,0 mm, mean 29,3 mm ($n = 6$); antenna-wing ratio 0,37–0,38 mean 0,38 ($n = 6$). Wings slightly more rounded and elongated than in male. Wings, upperside. Markings as in male but with postdiscal spots broader and usually paler, more yellow; ground colour slightly paler. Underside. Similar to male, but hindwing with slightly more extensive light markings and ground colour paler.

Material Examined

Types. Holotype ♂, SOUTH AFRICA: Mpumalanga, Lydenberg District, Long Tom Pass, 10.x.1993, H.C. Ficq. Paratypes 4♂ 4♀ with same data but 16.xi.1995, G.A. Henning; 1♂ same data but 1.xi.1981, G.A. Henning; 6♂ same data but 31.x.1993; 24♂ 6♀ same data but 27.x. 1996, G.A. Henning; 4♂ 5♀ same data but 28.x.1995, A.I. Curle; 5♂ same data but 28.x. 1995, N.I. Curle; 12♂ 7♀ same data but 16.xi.1995, A.I. Curle; 12♂ 5♀ same data but 27.x.1996, A.I. Curle; 4♂ 4♀ same data but 16.xi.1995, N.K. Owen-Johnston; 1♂ 2♀ Klipbankspruit, Sabie District, 31.x.1981, G.A. Henning. Holotype in the Transvaal Museum, Pretoria. Paratypes in the collections of W.H., S.F. & G.A. Henning, N.K. Owen-Johnston and A.I. & N.I. Curle.

Other material: Barberton, Nelshoogte, Kowyns Pass, Machadodorp (farm Bloemfontein), Mariepskop, Robbers Pass.

Distribution and habits

Inhabits North-Eastern Mountain Sourveld (Acocks, 1975). Specimens seem to prefer bushy areas alongside open grassy patches with rocks. The eggs are pale yellow when first laid darkening to brownish-pink if fertile. The distribution of this species is from Swaziland northwards along the escarpment to Mariepskop and up to the higher peaks on the Long Tom Pass above Sabie to Robbers Pass above Pilgrims Rest, Mpumalanga.

Remarks

A variable species with the postdiscal patch much narrower based to the ocellate subapical spots. While *D. dingana* and the other species of *Dingana* are fairly stable in the colour of the postdiscal patch, *D. angusta* is quite variable, some populations having the postdiscal markings entirely rufous while other colonies have these markings largely creamy-yellow. For example at Sheba Mine near Barberton most specimens appear to have rufous markings whereas on the Nelshoogte pass, 30 kilometres to the west, most specimens apparently have

creamy-white markings. Most colonies appear to have both creamy-white and rufous specimens, although rufous specimens have been recorded emerging slightly later in the season.

Male genitalia. Valve broader than *D. dingana*, convex ventrally along the basal half and convex dorsally along the distal half, narrowing distad to a more acute apex.

Etymology

The name is derived from the Latin for narrow, due to the narrow postdiscal markings on the forewing.

***Dingana clara* van Son stat. n.** Plates 3 & 4: 13, 14. Fig. 5

Dingana dingana clara van Son, 1940. *J. ent. Soc. sth. Afr.* 3:57.

Type Locality: Wolkberg, Northern Province, South Africa

Distribution and habits

Only found on the Wolkberg, Northern Province It in habits North-Eastern Mountain Sourveld (Acocks, 1975) north of the Olifants River Valley. It flies on high elevation Protea slopes. Specimens seem to prefer steep grassy areas alongside rocks.

Remarks

Formerly considered to be a subspecies of *D. dingana* but the following characters indicate specific distinction; all postdiscal markings are narrow and white, ground colour is dark shiny brown and not rich reddish -brown as in *D. dingana*. Differences were also noted in the larvae by Clark in van Son, 1955 between *D. dingana* and *D. clara*; the spines on the ridge in *D. dingana* are both watery white, whereas in *D. clara* one is dark, the other light; all seven spines on the proleg are black in *D. dingana*, whereas in *D. clara* there is only one black and six white spines. The eggs of *D. clara* are pale yellow when laid, later changing to orange-red if fertile; in *D. dingana* the eggs are pale yellow which changes to brown if fertile.

Male genitalia. Valves slightly shorter and broader than in *D. dingana*.

***Dingana fraterna* sp.n.** Plates 3 & 4: 15, 16. Fig. 6.

Description

Male. Forewing lengths: 27,0–29,3 mm, mean 28,3 mm (n = 9); antenna-wing ratio: 0,35–0,36, mean 0,353 (n = 9). Wings, upperside. Forewing dark brown with a black, subapical, double white-pupilled ocellus in areas R₅ and M₁; three separate white to ochre-orange postdiscal spots decreasing in size from M₃ to CuA₁; continuous white or ochre tinged band along lower and inner edge of ocellus extending from M₂ to costa; outer edge of ocellus with two small ochre spots in R₄ and R₅ and a single darker marginal line present. Hindwing with a postdiscal series of black, white-pupilled ocelli encircled with orange-red rings in

areas CuA₁-R₅ Underside. Forewing subapical ocellate spot present and divided into two;

postdiscal white to ochre spots as on upperside but smaller. Hindwing: with a subbasal dark spot edged with white in cell and area CuA₂; median dark line edged outwardly with whitish and strongly excurved on veins, from costa to a little inwards from vein 2A and intersecting cell just before origins of veins R₅ and CuA₂; a broader dark discal line, edged with greyish-white on inner side and acutely angled outwards in area M₂, from costa beyond middle to vein 2A at about one-fifth of that vein from wing margin; postdiscal series of small black ocelli with minute white pupils, much smaller than on upperside, without reddish rings, but encircled with narrow dark concentric rings; marginal line double. Genitalia. Uncus about half length of tegumen, straight, vertically forked at tip, falces distinctly lobed, valve broad and dorsally straight narrowing ventrally to a rounded apex, juxta strongly sclerotized and truncate, aedeagus narrow and elongate, saccus longer than valve. .

Female. Forewing length: 27,8 mm; antenna-wing ratio: 0,36. Wings slightly more rounded and elongated than in male. Wings, upperside. Markings as in male but with postdiscal spots slightly larger and ground colour slightly paler. Underside. Similar to male, but hindwing with slightly more extensive light markings and ground colour paler.

Material examined

Types. Holotype ♂, SOUTH AFRICA: Mpumalanga, Stoffberg, 13.x.1996, G.A. Henning. Paratypes 2♂ same data; 4♂ 1♀ same data but 19.x.1996; 4♂ 5♀ same data but 19.x. 1996, A.I. Curle; 2♂ same data but 18.x.1986, I.A. Coetzer; 1♂ same data but 7.x.1984, N.K. Owen-Johnston. Holotype in the Transvaal Museum, Pretoria. Paratypes in the collections of W.H., S.F. & G.A. Henning, I.A. Coetzer, A.I. & N.I. Curle and N.K. Owen-Johnston.

Distribution and habits

Inhabits North-Eastern Sandy Highveld (Acocks, 1975). Specimens fly on steep slopes at the base of a deep valley. They fly in grassy patches among Proteas, around large rocks and along small cliffs, and have only been recorded flying sparingly during the second and third week in October. They emerge at about 9.00 in the morning and are usually gone by 11.00 The eggs are yellow when laid darkening to bright pinkish-orange if fertile. It is only found in one small locality, at an altitude of about 1600 m, to the south-west of Stoffberg, Mpumalanga.

Remarks

Smaller than *D. clara* with a much shorter and more rounded wing shape. Outer margin of forewing often distinctly convex, usually straight or slightly convex in *D. clara*. Forewing postdiscal patch more yellowish, narrower and more regular than in *D. clara*. Hindwing postdiscal ocelli smaller, rounded and darker in colour than *D. clara*. Ground colour with a greenish sheen, golden in *D. clara*. Male genitalia. Valve much broader than *D. dingana* and also broader than *D. clara*,

dorsally straight narrowing ventrally to a rounded apex. It was brought to our attention by Izak Coetzer.

Etymology

The name is derived from the Latin for brothers, and is named after the Coetzer brothers, Curle brothers and the other brothers involved in African LepidopteroLOGY.

Dingana jerinae G.A. & S.F. Henning Plates 1 & 2: 7, 8. Fig. 7.

Dingana jerinae G.A. & S.F. Henning, 1996. *Metamorphosis* 7(1):20.

Type locality: Kransberg, Northern Province, South Africa.

Distribution and habits

D. jerinae has only been recorded from the Kransberg in the Northern Province of South Africa, at an altitude of between 1850 m and 2000 m. It inhabits a very steep area of North-Eastern Mountain Sourveld (Acocks, 1975), among fallen rocks below the cliffs of one of the highest peaks. Specimens fly around large rocks on a steep south-easterly facing slope.

Remarks

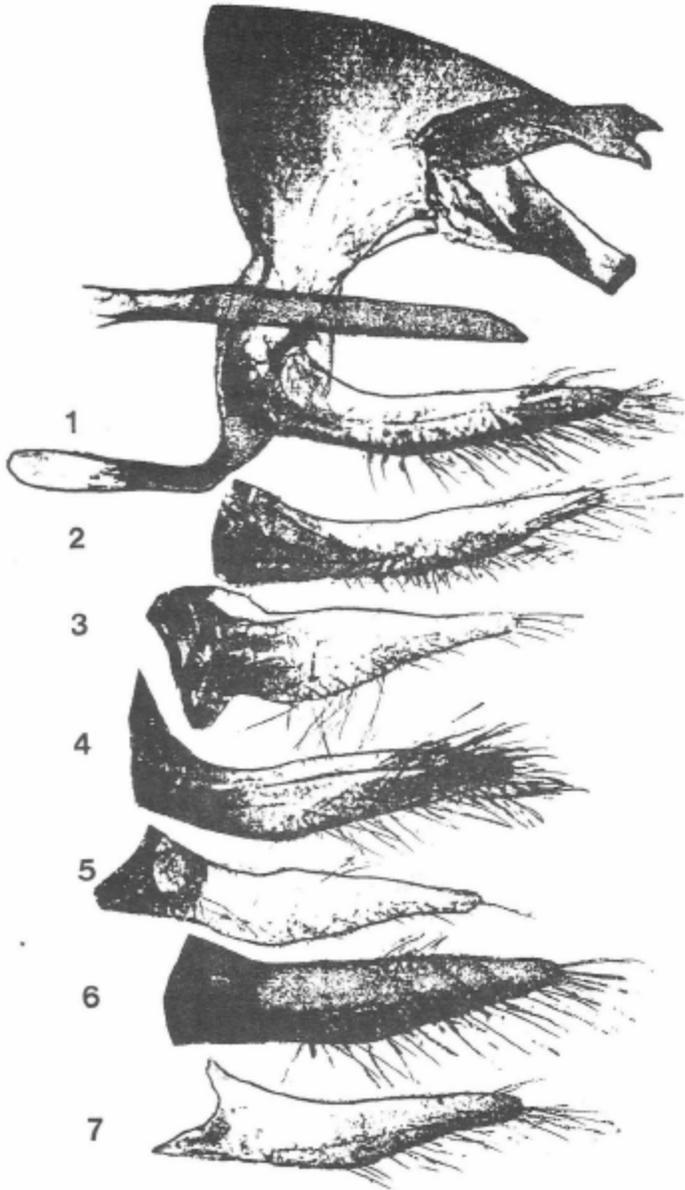
This species was discovered by Jan Coetzee on the upper slopes of the Kransberg in the Northern Province, South Africa. This is the most westerly species of the genus *Dingana*. It is the largest species in the genus, the upperside ground colour is darker and more blackish-brown with distinctive bright ochre postdiscal spots. Eggs pale creamy-yellow when first laid darkening to pale yellow.

Male genitalia. Falces larger than *D. dingana*. Valve broader than *D. dingana* curved upwards posteriorly creating a dorsal concavity, and curving downwards about four fifths of the way along its length, where it tapers distad to a fairly acute apex.

***Dingana alticola* sp.n.** Plates 1 & 2: 5, 6. Fig. 3.

Description

Male. Forewing lengths: 27,0–30,5 mm, mean 27,8 mm (n = 14); antenna-wing ratio: 0,38–0,40, mean 0,39 (n = 14). Wings, upperside. Forewing dark brown with a black, subapical, double white-pupilled ocellus in areas R₅ and M₁; three separate orange-red postdiscal spots decreasing in size from M₃ to CuA₁; continuous orange-red band along lower and inner edge of ocellus extending from M₂ to costa; outer edge of ocellus with two small reddish spots in R₄ and R₅ and a single darker marginal line present. Hindwing: with a postdiscal series of black, white-pupilled ocelli encircled with orange-red rings in areas CuA₁–R₅. Underside. Forewing: subapical ocellate spot present and divided into two; postdiscal orange-red spots as on upperside but smaller. Hindwing: with a subbasal dark spot edged with white in cell and area CuA₂; median dark line edged outwardly with whitish



Male genitalia; 1. *Dingana dingana*. Valves of the genus *Dingana*: 2. *D. angusta*, 3. *D. alticola*, 4. *D. alaedeus*, 5. *D. clara*, 6. *D. fraterna*, 7. *D. jerinae*.

and strongly excurved on veins, from costa to a little inwards from vein 2A and intersecting cell just before origins of veins R_5 and CuA_2 ; a broader dark discal line, edged with greyish-white on inner side and acutely angled outwards in area M_2 , from costa beyond middle to vein 2A at about one-fifth of that vein from wing margin; postdiscal series of small black ocelli with minute white pupils, much smaller than on upperside, v: without reddish rings, but encircled with narrow dark concentric rings; marginal line double.

Genitalia. Uncus less than half the length of tegumen, arched distally with a forked tip; scaphium hardly longer than uncus, distally truncate; falces short, subtriangular with the apex larger than in *D. dingana*; valves three times the length of the uncus, narrow and slightly curved upwards, of equal width until about 0.80 along its length where it tapers slightly distad to a distinctly rounded apex.

Female. Forewing lengths: 26,5–29,2 mm, mean 27,8 mm ($n = 9$); antenna-wing ratio: 0,36–0,40, mean 0,38 ($n = 9$). Wings slightly more rounded and elongated than in male. Wings, upperside. Markings as in male but with postdiscal spots broader and forming a continuous band on the forewing in some specimens; ground colour slightly paler. Underside. Similar to male, but hindwing with slightly more extensive light markings and ground colour paler.

Material examined

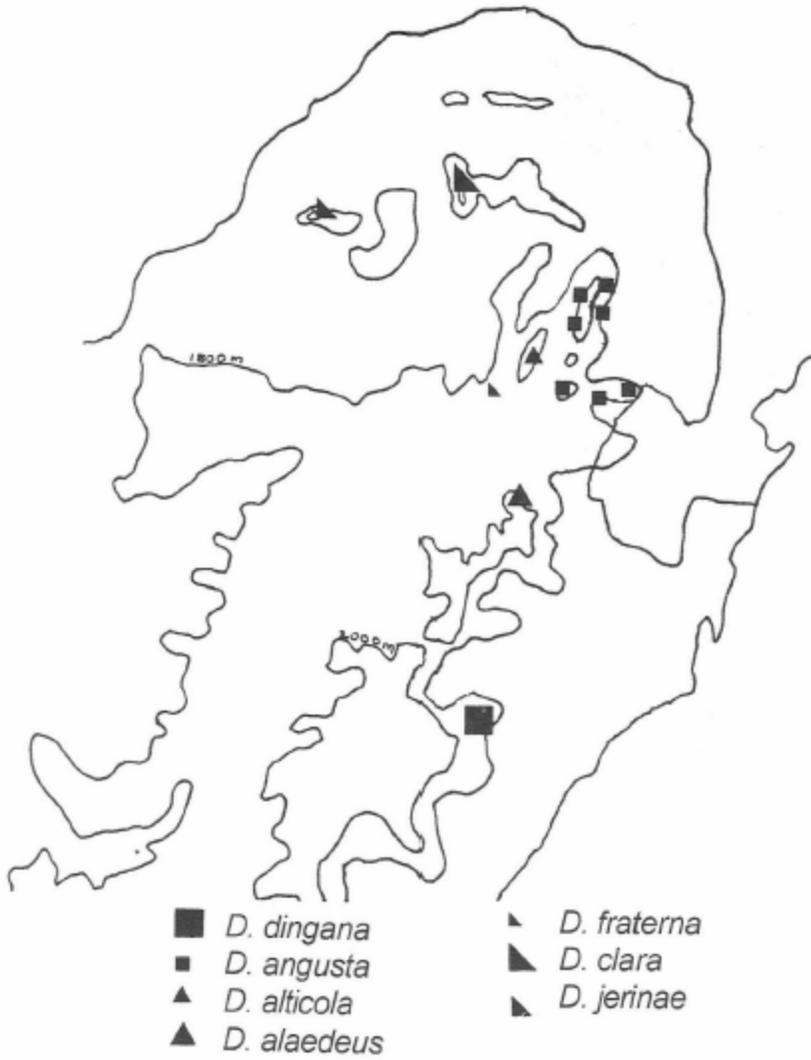
Types. Holotype ♂, SOUTH AFRICA Mpumalanga, Dullstroom, 22.x.1995, G.A. Henning. Paratypes 37♂ 15♀; same data; 1♂ same data but 9.xi.1992; 2♂ same data but 6.xi.1993; 9♂ 2♀ same data but 27.x.1996; 1♂ same data but 1.xi.1991; P.J. Sharland; 10♂ 5♀ same data but 22.x.1995, A.I. Curle; 2♂ 4♀ same data but 1.xi.95, A.I. Curle; 19♂ 2♀ same data but 27.x.1996, A.I. Curle. Holotype in the Transvaal Museum, Pretoria. Paratypes in the collections of W.H., S.F. & G.A. Henning, A.I. & N.I. Curle and P.J. Sharland.

Distribution and habits

Flies at high altitudes (1900–2200m) on the Steenkampsberge near Dullstroom in Mpumalanga where it inhabits rocky ridges in North-Eastern Sandy Highveld (Acocks, 1975).

Remarks

This species is smaller than *D. dingana* and *D. angusta*, with narrower wings. It is not as small as *D. alaedeus*. Male upperside postdiscal markings are variable from broad to very broad, nearly always broader than in *D. dingana* and generally narrower than in *D. alaedeus*. Markings deep orange-red in colour. The underside median line is more basad than *D. dingana* but not as basad as *D. alaedeus*. The brown ground colour is not as silky as in *D. alaedeus* and is more rufous, in this it resembles *D. dingana*. The female is similar to the male but with the postdiscal markings usually broader and occasionally very broad. Male genitalia with the distal portion of the uncus more slender than in *D. dingana*, the apex on the falces larger, the valve narrower than *D. dingana* and of even width along its length until



Distribution map of the genus *Dingana*

it tapers distad to a rounded apex, more rounded than in *D. dingana*. The egg is pale yellow when first laid darkening to pale purplish-pink if fertile.

Etymology

The name means that the species comes from high altitude.

***Dingana alaedeus* G.A. & S.F. Henning** Plates 1 & 2: 3, 4. Fig. 4.

Dingana alaedeus G.A. & S.F. Henning, 1984. *Durban Mus. Novit.* **13**:149.

Type locality: Wakkerstroom, Mpumalanga, South Africa.

Distribution and habits

High mountains to the east of Wakkerstroom in Mpumalanga, Hele mountain above 2000 m and Hlangampisi above Dirkiesdorp, and in KwaZulu-Natal on adjacent mountains. This species was discovered by G.A. Henning in December 1981 on the mountain peaks to the east of Wakkerstroom when he found a single worn male. It inhabits montane sourveld (Piet Retief Sourveld, Acocks, 1975). It can be seen at high elevation flying along steep grassy slopes below the rocky ridges of the escarpment

Remarks

Smaller than the other species of the genus Ground colour darker than in *D. dingana*, with the postdiscal markings developed into a broad orange-red forewing patch. The hindwing underside is much darker with the discal lines placed basad and sharply angled. Forewing lengths: Male 24,5–28,5mm: Female 25,5–28,0mm (n = 100+). Early stages in S.F. & G.A. Henning, 1989; the egg is pale yellow when first laid becoming pinkish-brown if fertile.

Male genitalia. Valves shorter than in *D. dingana*, broadening slightly distad from half way then tapering to a rounded apex.

Genus *Serradinga* gen. n.

Type species *Leptoneura bowkeri* Trimen, 1870, by present designation.

Diagnosis. Nearest to *Dingana* van Son from which it differs in legs, wing venation and genitalia. Major differences in male include: The midleg is shorter than the hind leg, in *Dingana* the midleg is longer (femur + tibia + tarsus). The midleg tibia is more strongly spined than *Dingana*, with a stout spine at the dorsal distal end, weakly developed in *Dingana*. Anterior leg with distal segments narrower and longer than *Dingana*. The base of hindwing with upper median further from subcostal than in *Dingana* and originating lower, and often joined beyond origin of subcostal vein. Forewing cell shorter in proportion to *Dingana*. Hindwing median discocellular is less than half the length of the lower discocellular, in *Dingana* the median discocellular is two-thirds the length of the lower discocellular. Valve with a large sclerotized process with rows of large teeth, not found in *Dingana*. Uncus distally acute, not forked as in *Dingana*. Aedeagus not tubular as *Dingana* but broader centrally tapering posteriorly. Other

differences in wing venation and genitalia are detailed in the following description.

Characters. Adult. Antennae with about 36–37 joints, club gradual but not as gradual as in *Dingana*, eleven-jointed. Pa pi obliquely upturned, first joint large, about a third the length of the second. Eyes hairy. Anterior legs of both sexes strongly reduced and hidden among hairs of thorax, tibiae more than half the length of femora, tarsi of male larger than *Dingana*, of female smaller than in *Dingana*. Walking legs short and slender, tarsi with paronychia and pulvilli. Midleg slightly shorter than hind-leg, mid-leg tibia strongly spined. Wing-venation, Forewing: Sc not conspicuously swollen near base, but gradually tapering, R₁ and R₂ from cell before upper angle, R₃–R₅ stalked. Upper discocellular very short, much less than half the length of median discocellular, the latter incurved, lower discocellular 4 times the length of median discocellular, slightly incurved (excurved in *Dingana*), M₃ from lower angle, CuA₁ arising nearer to M₃ than to CuA₂. Hindwing: Upper median runs along Sc from about one-third the distance from base to origin of the precostal spur, and is decurved from Sc opposite the origin of the precostal spur (well beyond the origin of precostal spur in *Dingana*), without any connection; R₅ from upper angle, upper discocellular less than half the length of median discocellular, obliquely angled, median discocellular less than half length of lower discocellular, both incurved. M₃ from lower angle, CuA₁ from a little before lower angle. Genitalia: Male, uncus about half the length of tegumen, straight, tapered at tip; scaphium long, straight, truncate distally; falces short; valve elongate with large, highly sclerotized, toothed process; juxta strongly sclerotized; aedeagus narrow and elongate tapering distally, saccus much shorter than valve (longer in *Dingana*). Female: Anal lobes very broad, posterior apophyses vestigial (not vestigial in *Dingana*) and rounded at the tip; ostium bursae merely a diagonal sclerotized band running from a transversely elongated raised ridge; ductus bursae funnel shaped and sclerotized, bursa without signa. Early stages. Egg: domed, not as high as wide, basally flattened, much lower dome than in *Dingana*. Larva: there are usually five larval instars, larva rather similar to *Dingana*, the setae of the final stage are pointed. Pupa: similar in shape to those of *Dira*.

There are three species recognised in this study.

KEY TO THE SPECIES OF *SERRADINGA*

1. Hindwing underside submarginal black line absent *kammanassiensis*
Hindwing underside submarginal black line present 2
2. White postdiscal markings fairly large and distinct, outer margin of forewing straight, valve elongate with large toothed sclerotized process *bowkeri*
White postdiscal markings small and not always distinct, outer margin of forewing convex, valve not elongated with small toothed sclerotized process *clarki*

***Serradinga bowkeri* (Trimen) comb. n.**

Leptoneura bowkeri Tri men, 1870. *Trans. ent. Soc. Lond.* **1870**:348.

Type Locality: "Basuto, Koro-Koro", Lesotho.

Can be separated into two subspecies.

***Serradinga bowkeri bowkeri* (Trimen) comb. n.** Plates 5 & 6: 17, 18, 19, 20. Fig. 8.

Distribution and habits

Described from western Lesotho, inhabiting the Thaba Putsoa and Maluti Ranges southwards to the Witteberge in the Eastern Cape, where the population is slightly smaller with smaller white forewing spots, and apparently westwards to the Camdeboo Mountains. It inhabits Alpine Veld (Acocks, 1975), where it flies in numbers along steep grassy hillsides.

Remarks

A fairly large species, forewing length above 25mm. Forewing upperside with fairly large distinct postdiscal white markings. Outer margin of forewing straight or slightly concave.

Male genitalia. Valve elongated, narrow with large prominent, large-toothed, sclerotized process narrowed centrally.

***Serradinga bowkeri bella* (van Son) comb. n.** Plates 5 & 6: 21, 22. Fig. 9.

Dingana bowkeri bella van Son, 1955. *Transv. Mus. Mem.* **8**:76.

Type Locality: Richmond, Northern Cape, South Africa.

This subspecies was discovered by Miss S. Viljoen near Richmond in the Cape Province in December 1908 when she collected a single specimen. Subsequently found at the Mountain Zebra National Park near Cradock. Currently considered to be a subspecies of *S. bowkeri* but specimens of *S. bowkeri bowkeri* have been found on the Camdeboo Mountains near Aberdeen by E. Pringle which may indicate a specific distinction.

Remarks

Much larger than the nominate subspecies, forewing length about 30mm, with postdiscal markings proportionately smaller and rounder. Ground colour lighter and the dark markings of the underside reduced.

***Serradinga clarki* (van Son) stat. n., comb. n.**

Dingana bowkeri clarki van Son, 1955. *Transv. Mus. Mem.* **8**:75.

Type locality: Somerset East, Eastern Cape, South Africa.

Remarks

This species is smaller than *S. bowkeri*, forewing length about 23mm, has more elongated wings, a rounder forewing outer margin and smaller postdiscal spots. Colonies of *S. bowkeri* are apparently found between colonies of *S. clarki* such as at Barkly East in the Eastern Cape. Described from Somerset East but it is now considered to have a much wider range through KwaZulu-Natal to Mpumalanga.

Male genitalia. Scaphium more pointed, juxta truncate anteriorly, its sides not strongly emarginate posteriorly, valve shorter and broader and saccus shorter than in *S. bowkeri* and arched. Toothed process with much smaller teeth and not narrowed centrally.

***Serradinga clarki clarki* (van Son) comb. n.** Plates 7 & 8: 25, 26. Fig. 10.

The nominate subspecies has the postdiscal spots reduced to four small white spots, the remainder being indicated by minute rusty-brown spots, or absent altogether.

Distribution and habits

Inhabits Highland Sourveld (Acocks, 1975) from Somerset East and the southern mountains of the Eastern Cape.

***Serradinga clarki dracomontana* ssp.n.** Plates 7 & 8: 27, 28. Fig. 11.

Description

Male. Forewing lengths: 22,9–25,5 mm, mean 23,9 mm (n = 6); antenna-wing ratio: 0,38–0,41, mean 0,39 (n = 6). Wings, upperside. Forewing dark brown with a strong coppery sheen; subapical area with a black ocellus in area R₅. a smaller ocellate spot in M₁; postdiscal spots small and creamy-white in colour; in some specimens becoming tinged with reddish in M₃-CuA₂; largest in R₅ being almost square, those in M₃, CuA₁ and CuA₂ smaller. Hindwing: with a postdiscal series of small black, white pupilled-ocelli encircled with indistinct orange-red rings in areas CuA₁-R₅. Underside. Forewing: subapical ocellate spots present; postdiscal spots as on upperside but slightly smaller. Hindwing: with a subbasal dark line edged outwardly with whitish and strongly excurved on veins, from costa to a little inwards from vein 2A and intersecting cell just before origins of veins R₅ and CuA₂; a broader dark discal line, edged with greyish-white on inner side and acutely angled outwards in area M₂, from costa beyond middle to vein 2A at about one-fifth of that vein from wing margin; postdiscal series of small black ocelli with minute white pupils, slightly smaller than on upperside, without reddish rings, but encircled with a narrow dark concentric ring; triple dark marginal lines, the innermost being broader but fainter.

Genitalia. Valve slightly broader than in nominate subspecies, saccus not as strongly arched.

Female. Forewing lengths: 22,0–26,2 mm, mean 23,9 mm (n = 9); antenna-wing ratio: 0,36–0,38, mean 0,37 (n = 9). Wings slightly more rounded and elongated than in male. Wings, upperside. Markings as in male but with postdiscal spots

broader; ground colour slightly paler. Underside. Similar to male, but hindwing with slightly more extensive light markings and ground colour paler.

Material examined

Types Holotype ♂, SOUTH AFRICA: KwaZulu-Natal, Bushmans Nek, 2600 m, 17.xi.1979, S.F. Henning. Paratypes 2♂ 6♀ with same data; 3♂ 3♀ same data but 18.xi.1979, G.A. Henning. Holotype in the Transvaal Museum, Pretoria. Paratypes in the collections of W.H., S.F. & G.A. Henning.

Distribution and habits

Inhabits Highland Sourveld (Acocks, 1975) along the KwaZulu-Natal Drakensberg to as far north as the mountains around Wakkerstroom, southwards to the northern mountains the Eastern Cape. It flies slowly along grassy slopes at high altitude.

Remarks

Postdiscal spots creamy-white, whiter and larger than in the nominate subspecies. Larger than the nominate subspecies with a more rounded wingshape. Male genitalia similar to nominate subspecies but with valve slightly broader and the saccus not as strongly arched.

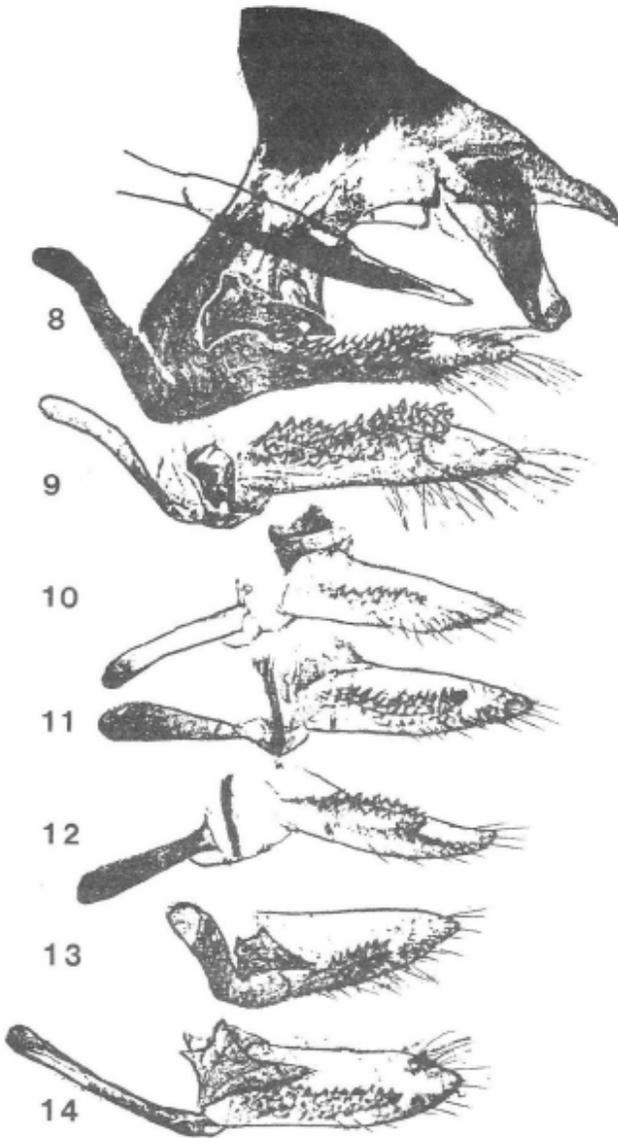
Etymology

The name means Dragon Mountain, named after the Drakensberg.

***Serradinga clarki amissivallis* ssp.n.** Plates 7 & 8: 31, 32. Fig. 12.

Description

Male. Forewing lengths 21,5–25,5 mm, mean 23,3 mm (n = 11); antenna-wing ratio: 0,37–0,40, mean 0,39 (n = 11). Wings, upperside. Forewing dark brown with a strong coppery sheen; subapical area with a black ocellus in area R₅, a smaller ocellate spot in M₁; postdiscal spots creamy-yellow and small, largest in R₅ being almost square, those in M₃, CuA₁ and CuA₂ much smaller and occasionally orange-red in colour. Hindwing with a postdiscal series of small black, white pupilled-ocelli encircled with indistinct orange-red rings in areas CuA₁–R₅. Underside. Forewing: subapical ocellate spots present; postdiscal spots as on upperside but slightly smaller. Hindwing with a subbasal dark line edged outwardly with whitish and strongly excurved on veins, from costa to a little inwards from vein 2A and intersecting cell just before origins of veins R₅ and CuA₂; a broader dark irregular discal line, edged with greyish-white on inner side and acutely angled outwards in area M₂, from costa beyond middle to vein 2A at about one-fifth of that vein from wing margin; postdiscal series of small black ocelli with minute white pupils, slightly smaller than on upperside, without reddish rings, but encircled with a narrow dark concentric ring; triple dark marginal lines, the innermost being broader but fainter.



Male genitalia: 8. *Serradinga bowkeri bowkeri*. Valves of the genus *Serradinga*: 9. *S. b. bella*, 10. *S. clarki clarki*, 11. *S. c. dracomontana*, 12. *S. c. amissivallis*, 13. *S. c. ogra*, 14. *S. kammanassiensis*.

Genitalia. Uncus broad and strongly arched; valves somewhat elongate, toothed process prominent with small teeth; saccus not strongly bulbous or arched.

Female. Forewing lengths: 24,5 mm ($n = 2$); antenna-wing ratio: 0,38–0,40, mean 0,39 ($n=2$). Wings slightly more rounded and elongated than in male. Wings, upperside Markings as in male but with postdiscal spots broader; ground colour slightly paler. Underside. Similar to male, but hindwing with slightly more extensive light markings and ground colour paler.

Material examined

Types Holotype ♀, SOUTH AFRICA Mpumalanga, Verlorenvlei 30°05'E, 25°18'S, 27.xi.1994, G.A Henning. Paratypes 8♂ 3♀ with same data; 1♂ same data but 15.xii.1990; 5♂ 5♀ same data but 26.xi.1988. R. Warren; 2♀ Verlorenvlei, 24.xi.1995, N. I. Curle. Holotype in the Transvaal Museum, Pretoria. Paratypes in the collections of W.H., S.F. & G.A. Henning, R. Warren and A.I. & N.I. Curle.

Distribution and habits

Verlorenvlei near Dullstroom, Mpumalanga. Inhabits the margins of marshes at high altitude in North-Eastern Sandy Highveld (Acocks, 1975).

Remarks

Postdiscal spots creamy-yellow and smaller than *S. c. dracomontana* but not as small as in the nominate subspecies. Ground colour dark in comparison to other races. Wingshape distinctly elongated. Uncus more robust than other subspecies, valves somewhat narrower than *S. c. dracomontana* and saccus not as bulbous or as arched.

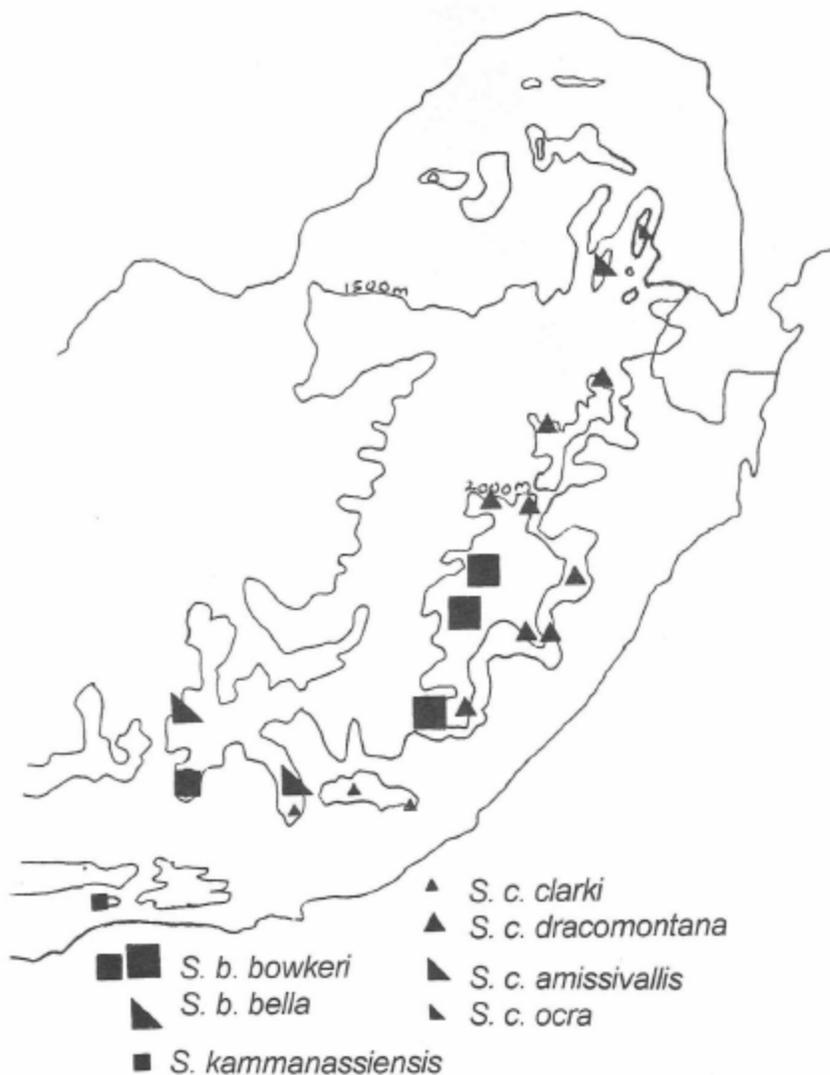
Etymology

The name is derived from a light-hearted translation of Verlorenvlei.

***Serradinga clarki oca* ssp.n.** Plates 7 & 8: 29, 30. Fig. 13.

Description

Male. Forewing lengths: 22,0–25,5 mm, mean 23,4 mm ($n = 9$); antenna-wing ratio: 0,37–0,41, mean 0,39 ($n = 9$). Wings, upperside. Forewing dark brown with a strong coppery sheen; subapical area with a black ocellus in area R_5 , a smaller ocellate spot in M_1 ; postdiscal spots small, largest in R_5 being almost square and creamy-white, those in M_3 , CuA_1 and CuA_2 smaller and orange-red in colour. Hindwing: with a postdiscal series of small black, white pupilled-ocelli encircled with indistinct orange-red rings in areas CuA_1 – R_5 . Underside. Forewing: subapical ocellate spots present; postdiscal spots as on upperside but slightly smaller. Hindwing with a subbasal dark line edged outwardly with whitish and strongly excurved on veins, from costa to a little inwards from vein 2A and intersecting cell just before origins of veins R_5 and CuA_2 ; a broader dark discal line, edged with greyish-white on inner side and acutely angled outwards in area M_2 , from costa



Distribution map of the genus *Serradinga*

beyond middle to vein 2A at about one-fifth of that vein from wing margin; postdiscal series of small black ocelli with minute white pupils, slightly smaller than on upperside, without reddish rings, but encircled with a narrow dark concentric ring; triple dark marginal lines, the innermost being broader but fainter.

Genitalia. Similar to nominate subspecies but valves very broad, toothed process not as prominent.

Female. Forewing lengths: 23,0–23,3 mm, mean 23,2 mm (n = 2); antenna-wing ratio: 0,39 (n = 2). Wings slightly more rounded and elongated than in male. Wings, upperside. Markings as in male but with postdiscal spots broader; ground colour slightly paler. Underside. Similar to male, but hindwing with slightly more extensive light markings and ground colour paler.

Material examined

Types Holotype ♂, SOUTH AFRICA: Mpumalanga, Long Tom Pass, 25°05' S - 30°32' E, 1900m, 16.xi.1995, A.I.Curle. Paratypes 15♂ 8♀ same data; 1♂ same data but 12.xii.965, G.A. Henning; 1♂ same data 31.x.1993, H.C. Ficq; 3♂ Klipbankspruit, Sabie District, 31.x.1981, G.A. Henning. Holotype in the Transvaal Museum, Pretoria. Paratypes in the collections of W.H., S.F. & G.A. Henning and A.I. & N.I. Curle.

Distribution and habits

Found at high elevation in North-Eastern Mountain Sourveld (Acocks, 1975) along the Mpumalanga Drakensberg where it flies slowly along steep grassy slopes.

Remarks

Postdiscal markings more rounded and the lower spots are larger than in other subspecies and distinctly orange-red in colour. The wingshape is distinctly more rounded than in other subspecies. The valve of the male genitalia is broader and shorter with a less prominent sclerotized process.

Etymology

The name is derived from the orange-red colour of the markings.

***Serradinga kammanassiensis* (S.F. & G.A. Henning) stat. n., comb. n.** Plates 5 & 6: 23, 24. Fig. 14.

Dingana bowkeri kammanassiensis S.F. & G.A. Henning, 1994. *Pennington's Butterflies*: 56.

Type locality: Mannnetjiesberg, Kammanassie Mountains, Western Cape, South Africa.

Distribution and habits

It flies on the upper elevations of the Kammanassie Mountains in the Western Cape. It inhabits False Macchia (Acocks, 1975).

Remarks

Described as a subspecies of *S. bowkeri* but the following characters indicate a specific distinction: Smaller than *S. bowkeri* with a more rounded forewing, wing shape characteristically angular. Male. Upperside. Postdiscal spots smaller, ground colour darker. Hindwing with ocellate spots less distinct with the orange rings even more reduced and in some specimens hardly visible at all. Underside. The hindwing underside markings are reduced and the submarginal dark line, found in all other species, is absent.

Male genitalia. Similar to *S. clarki clarki* but with uncus broader posteriorly, juxta anteriorly almost twice as broad and extended dorsally, valves slightly broader and narrowing abruptly distad to a point, saccus very narrow and not bulbous as in *S. clarki clarki*.

Acknowledgements

We thank the following for their assistance in the preparation of this paper; our father Bill Henning, Alf and Neville Curle, Chris Ficq, Jan Coetzee, Izak Coetzer, Nolan Owen-Johnston, Danie Rossouw, Peter Sharland, Bill Steele, Francois Swart, Richard Warren and Steve Woodhall.

References

- ACOCKS, J.P.H. 1975. Veld types of South Africa with accompanying veld type maps. (2nd edition). *Memoirs of the Botanical Survey of South Africa* **40**: 1–128.
- CURLE, A.I. & HENNING, G.A. 1996. Observations on apparent vertebrate predator damage in the genus *Dingana* (Lepidoptera: Nymphalidae: Satyrinae). *Metamorphosis* **7**(1): 24.
- HENNING, G.A. & HENNING, S.F. 1984. A new species of *Dingana* van Son (Lepidoptera: Satyridae) from the south-eastern Transvaal, South Africa. *Durban Museum Novitates* **13**: 14.
- HENNING, G.A. & HENNING, S.F. 1996. Notes on the *Dingana dingana* species group (Lepidoptera: Nymphalidae: Satyrinae), with description of a new species. *Metamorphosis* **7**(1): 20.
- HENNING, S.F. & HENNING, G.A. 1989. South African Red Data Book - Butterflies. *South African National Scientific Programmes* No. 158, Foundation for Research Development, CSIR, Pretoria.
- PRINGLE, E.L., HENNING, G.A. & BALL, J.B. (Eds.) 1994. *Pennington's Butterflies of Southern Africa*, 2nd edition. Struik-Winchester, Cape Town.
- VAN SON, G. 1955. The Butterflies of Southern Africa Part II, *Transvaal Museum Memoir* No. **8**, Pretoria.

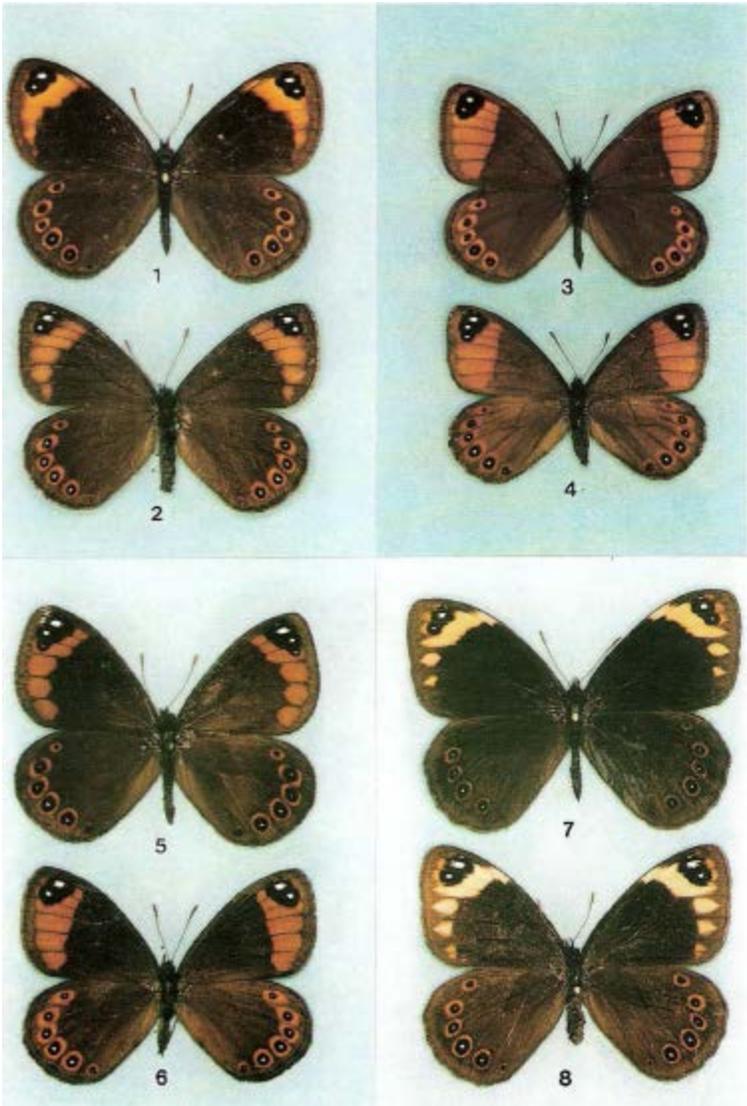


Plate 1. *Dingana* species, uppersides: *D dingana* 1. ♂, 2. ♀; *D alaedeus* 3. ♂, 4. ♀; *D alticola* 5. ♂ Holotype, 6. ♀ Paratype *D jerinae* 7. ♂, 8. ♀.

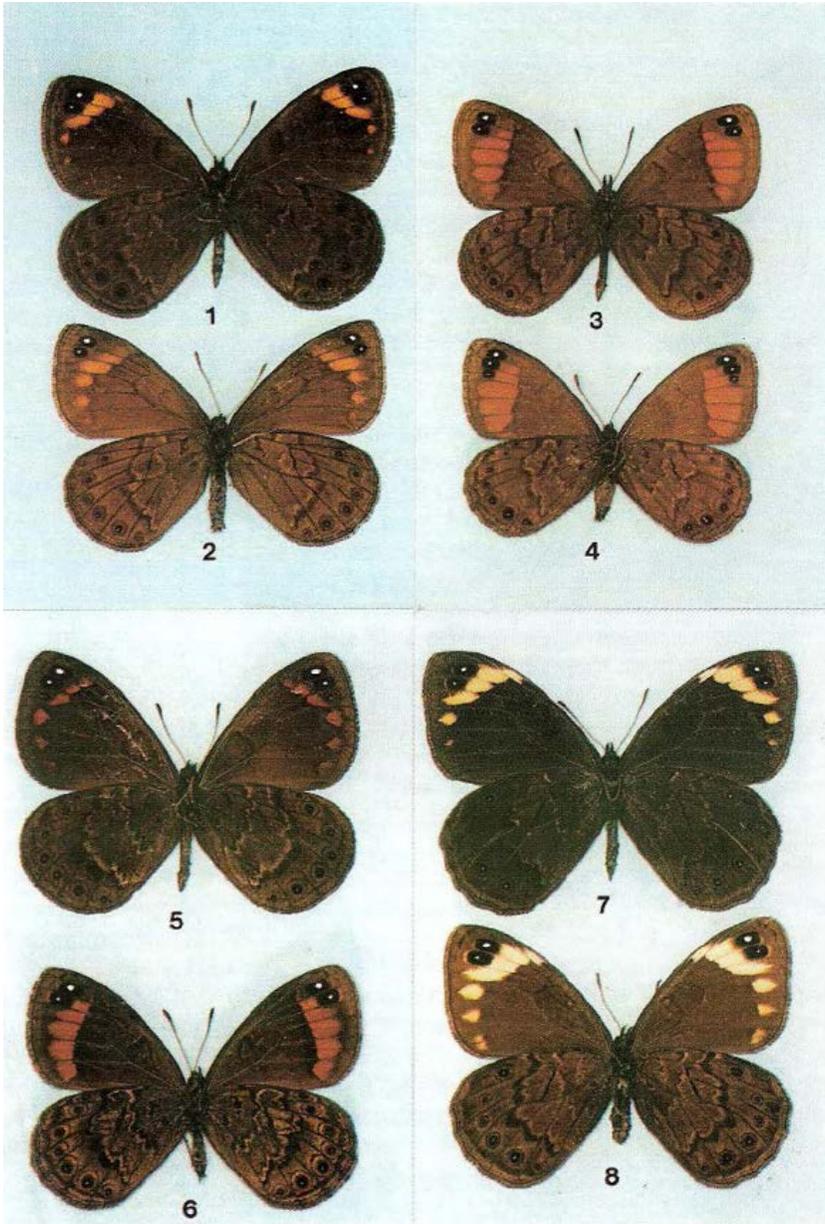


Plate 2. *Dingana* species, undersides of Plate 1. 1–8.

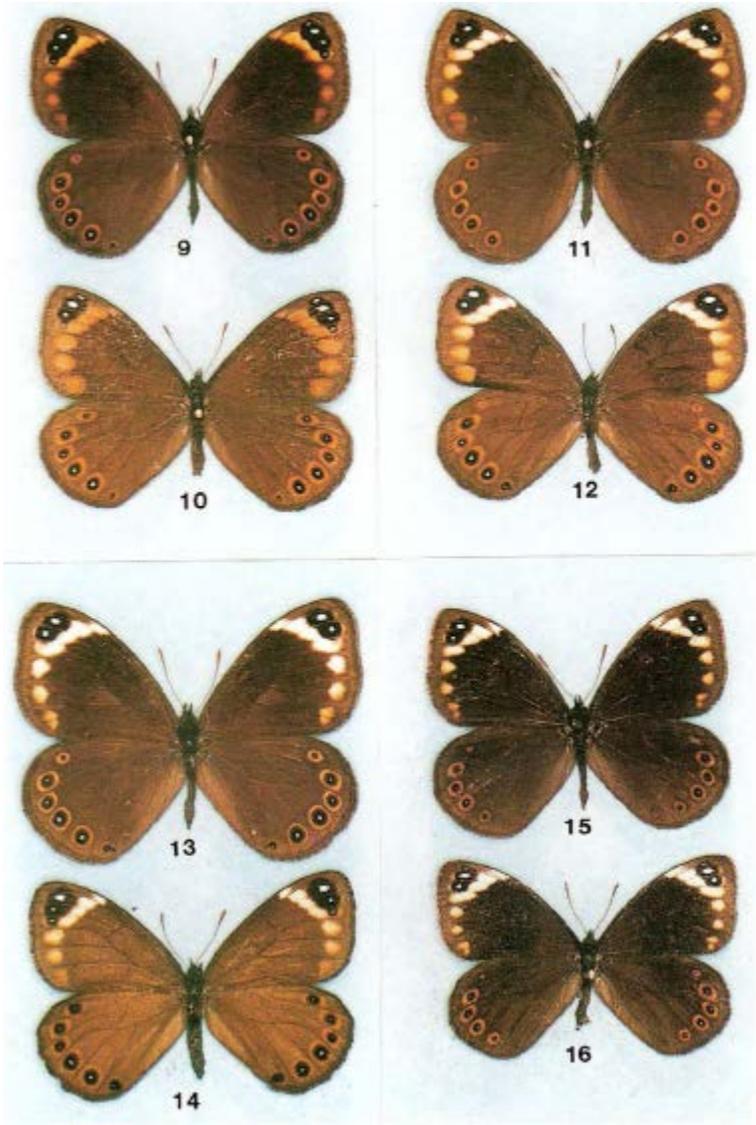


Plate 3. *Dingana* species, uppersides: *D. angusta* 9. ♂ Holotype, 10. ♀ Paratype; *D. angusta* 11. ♂ Paratype (light var.), 12. ♀ Paratype (light var.); *D. clara* 13. ♂, 14. ♀; *D. fraterna* 15. ♂ Holotype, 16. ♀ Paratype.

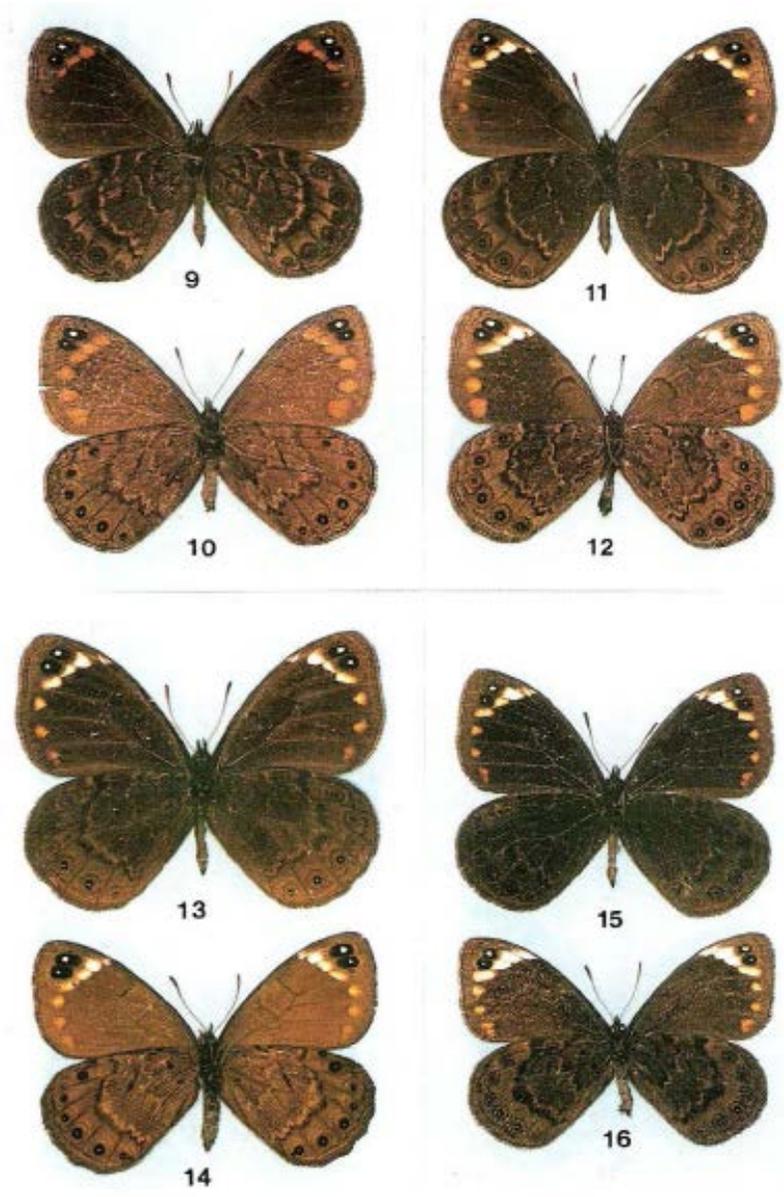


Plate 4. *Dingana* species, undersides of Plate 3. 9–16.

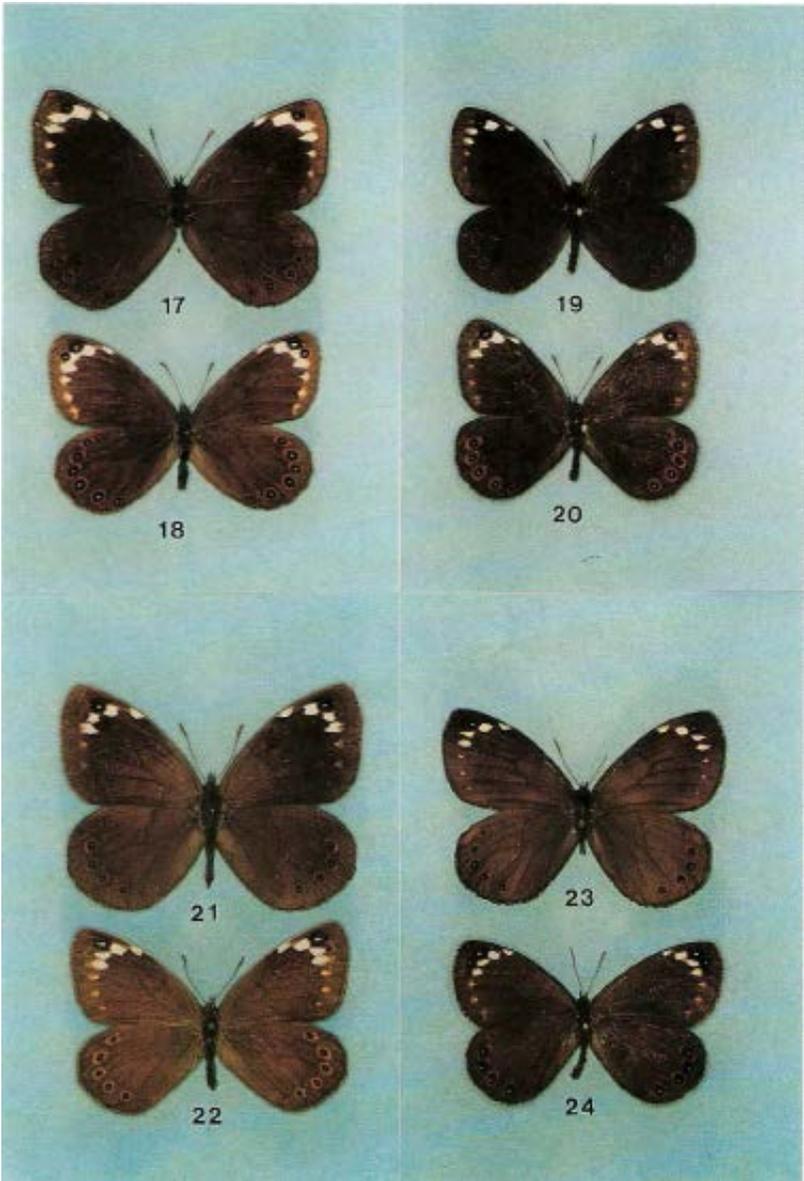


Plate 5. *Serradinga* species, uppersides: *S. b. bowkeri* 17. ♂, 18. ♀; *S. b. bowkeri* (southern pop.) 19. ♂, 20. ♀; *S. b. bella* 21. ♂, 22. ♀; *S. kammanassiensis* 23. ♂, 24. ♀

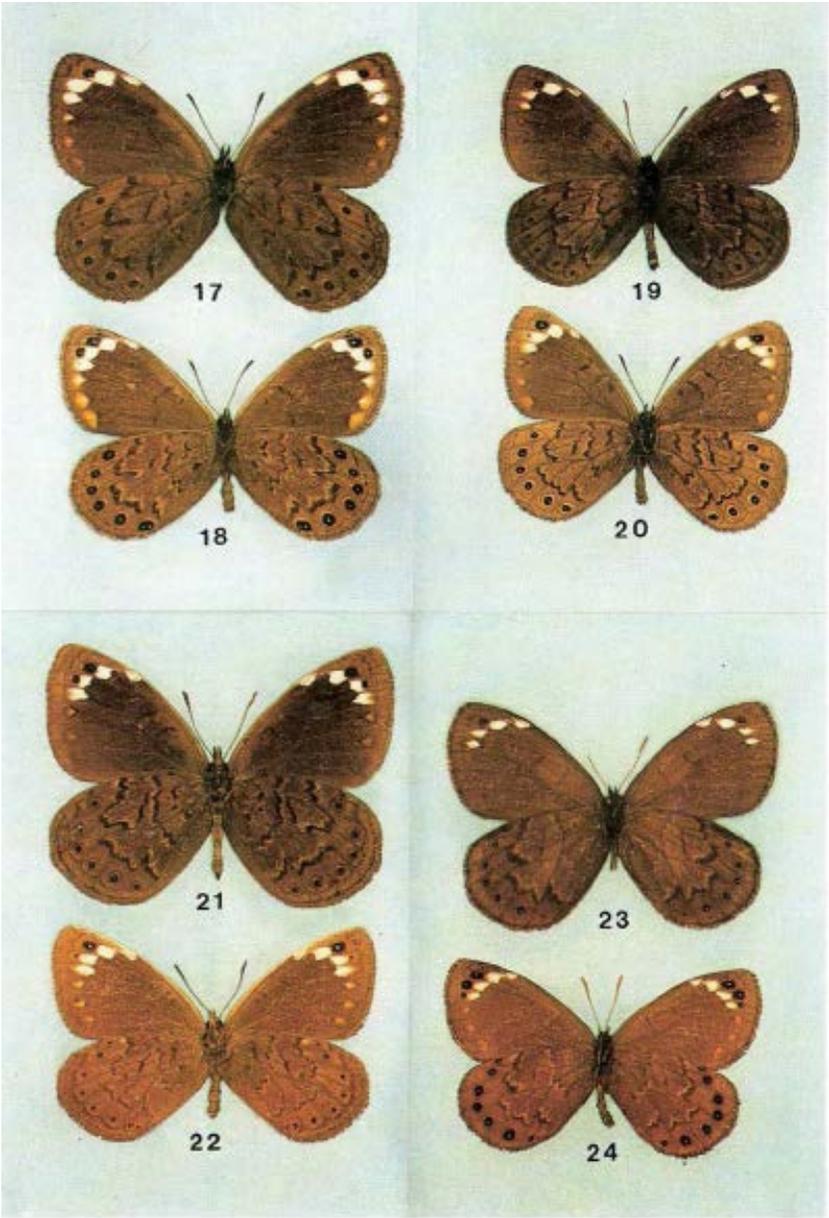


Plate 6. *Serradinga* species, undersides of Plate 5. 17–24.

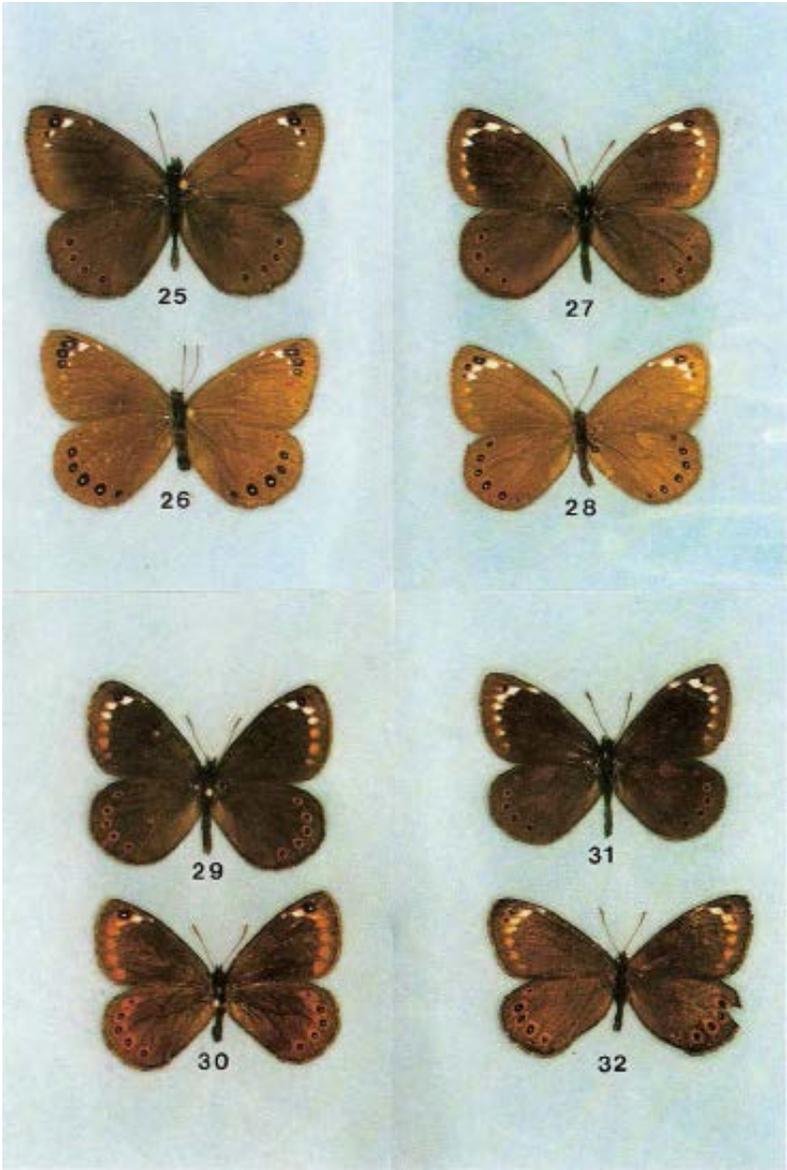


Plate 7. *Serradinga* species, uppersides: *S. c. clarki* 25. ♂, 26. ♀; *S. c. dracomontana* 27. ♂ Holotype, 28. ♀ Paratype; *S. c. ocrea* 29. ♂ Holotype, 30. ♀ Paratype; *S. c. amissivallis* 31. ♂ Holotype, 32. ♀ Paratype.

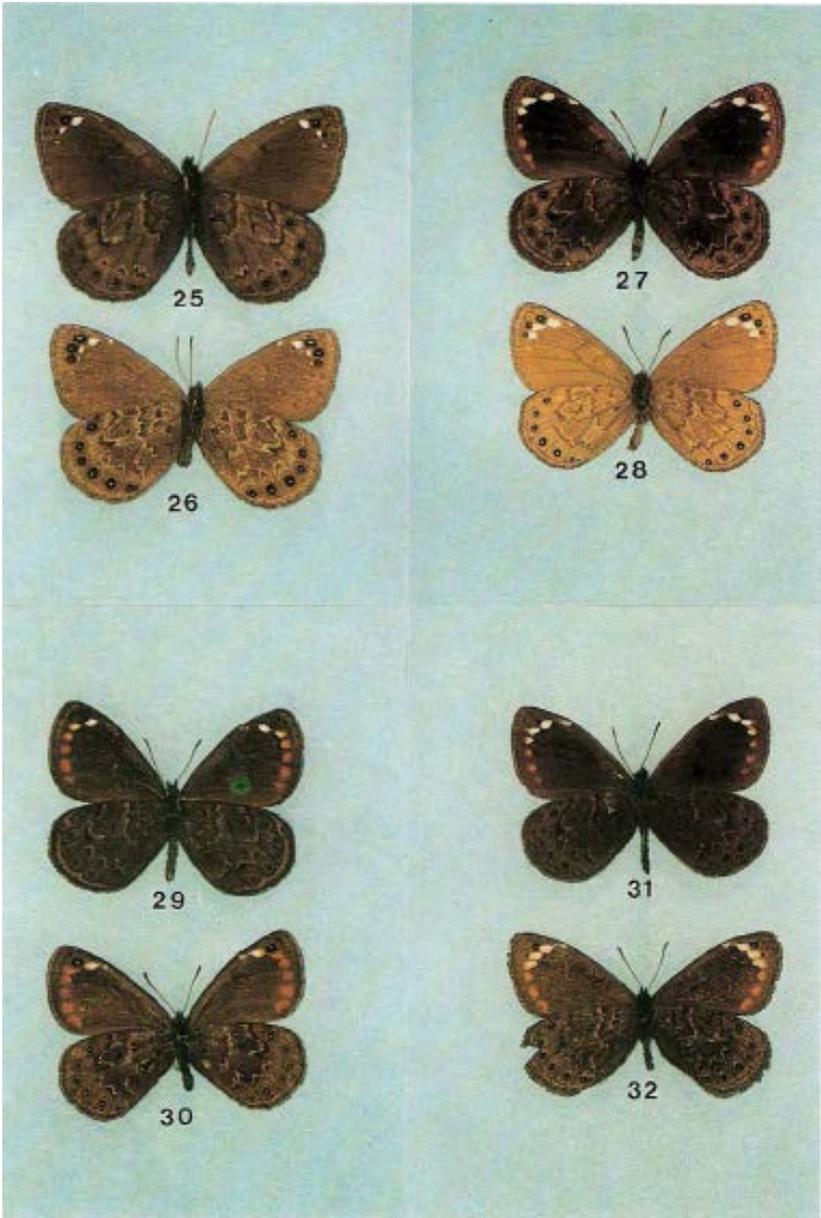


Plate 8. *Serradinga* species, undersides of Plate 7. 25–32.

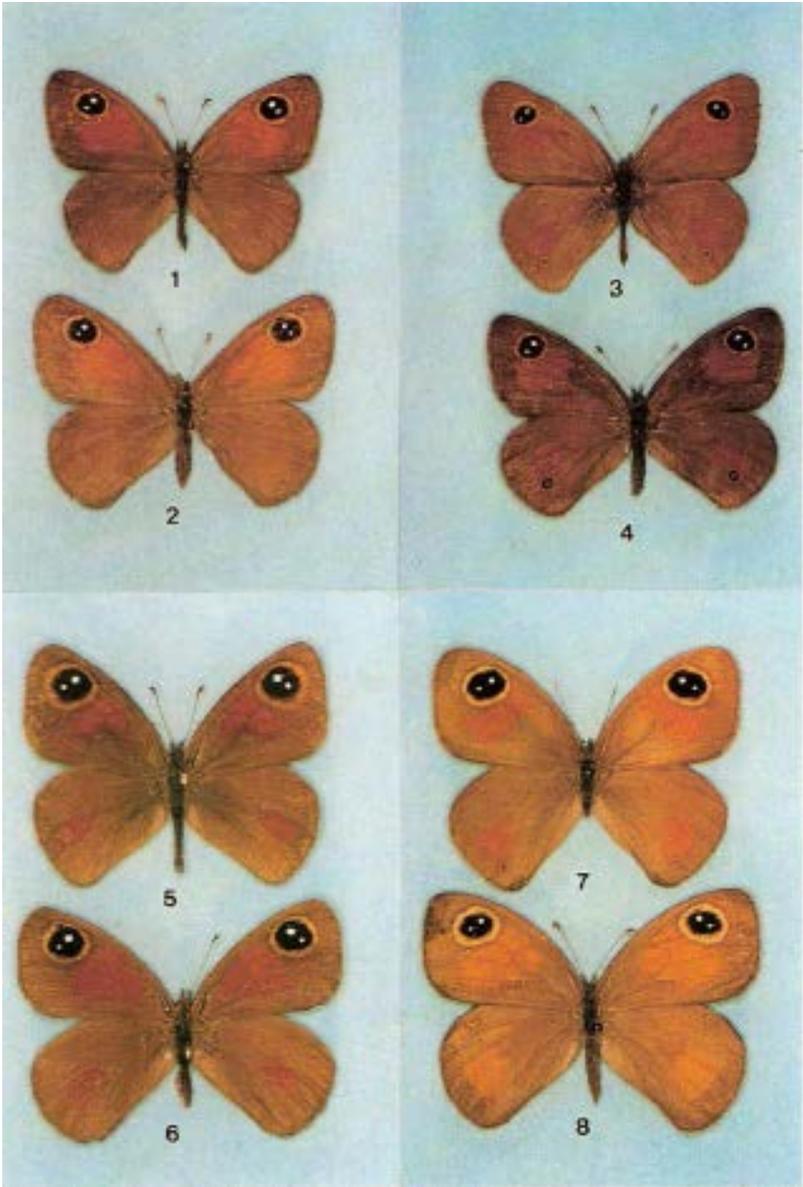


Plate 9. *Stygionympha* species, uppersides. *S. robertsoni* 1. ♂, 2. ♀; *S. vansoni* 3. ♂, 4. ♀; *S. curlei* 5. ♂ Holotype, 6. ♀ Paratype; *S. w. wichgrafi* 7. ♂, 8. ♀.

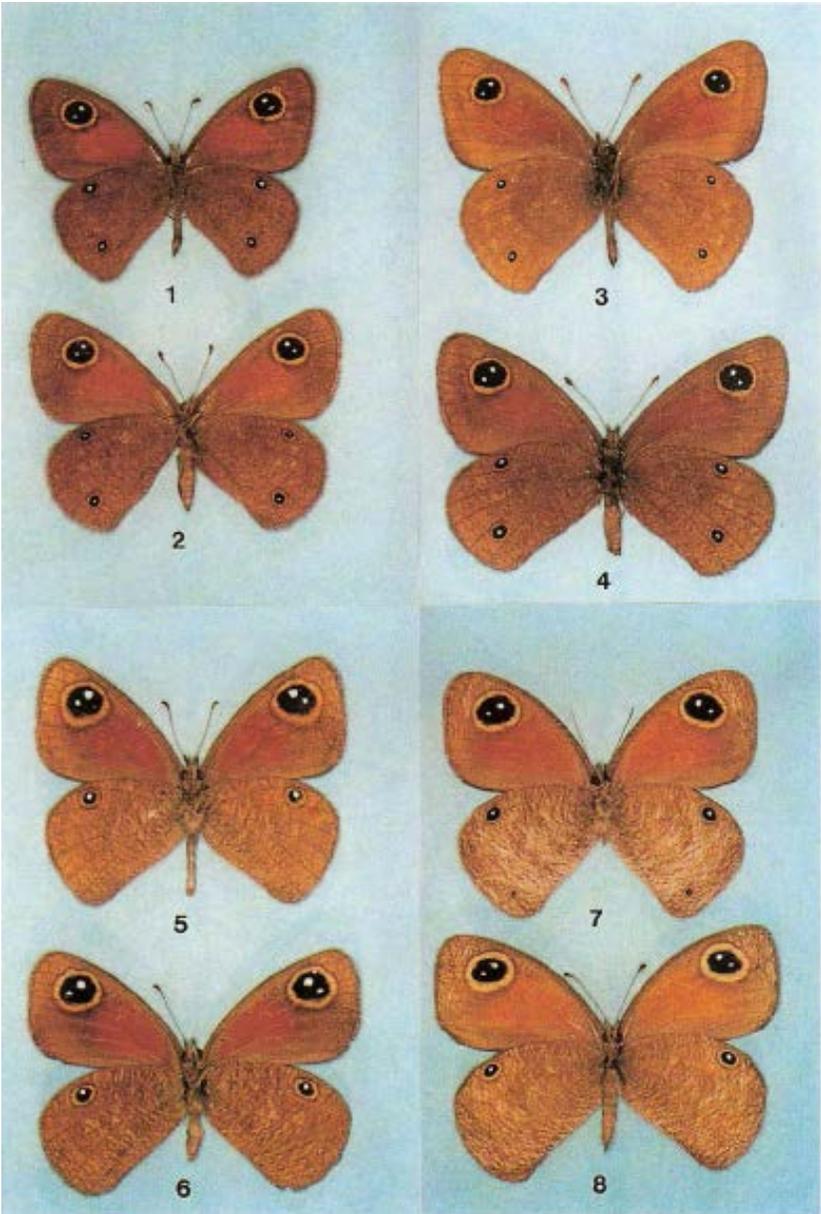


Plate 10. *Stygionympha* species, undersides of Plate 9. 1–8.

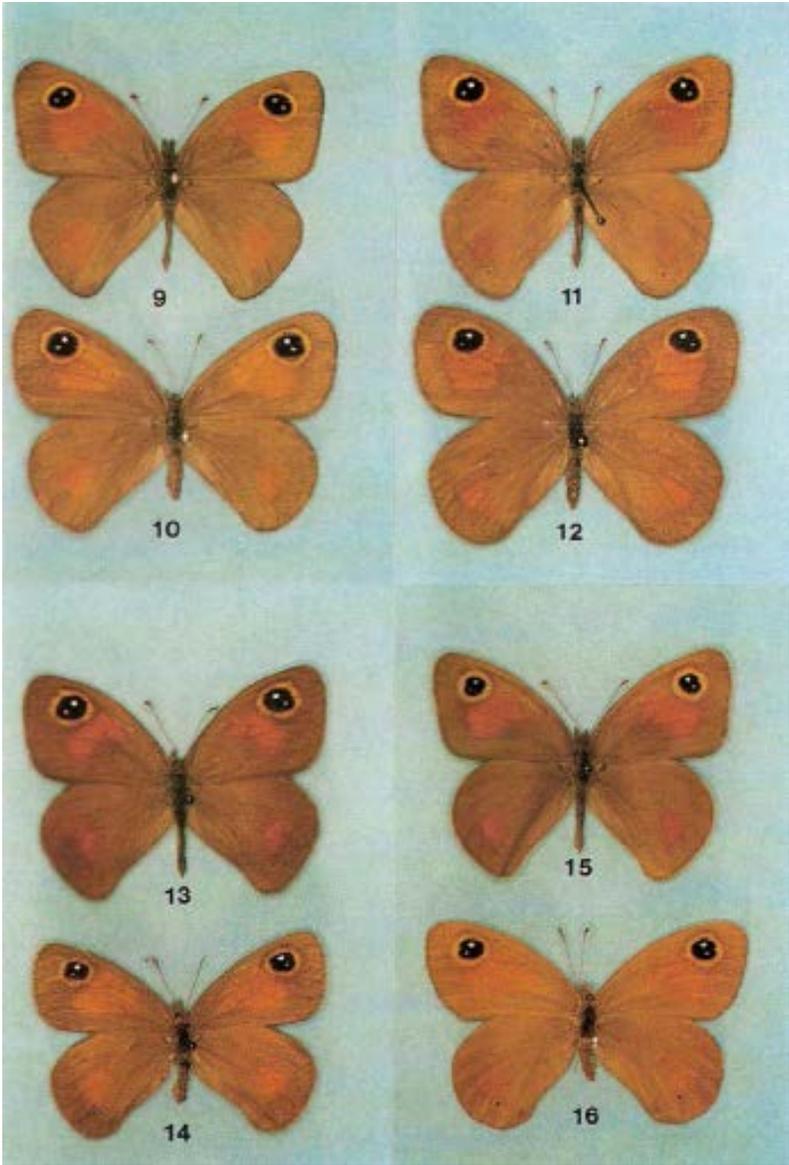


Plate 11. *Stygionympha* species, uppersides. *S. w. wichgrafi* (Witwatersrand pop.) 9. ♂, 10. ♀; *S. w. lannini* 11. ♂, 12. ♀; *S. w. williamsi* 13. ♂ Holotype, 14. ♀ Paratype; *S. w. grisea* 15. ♂ Holotype, 16. ♀ Paratype.

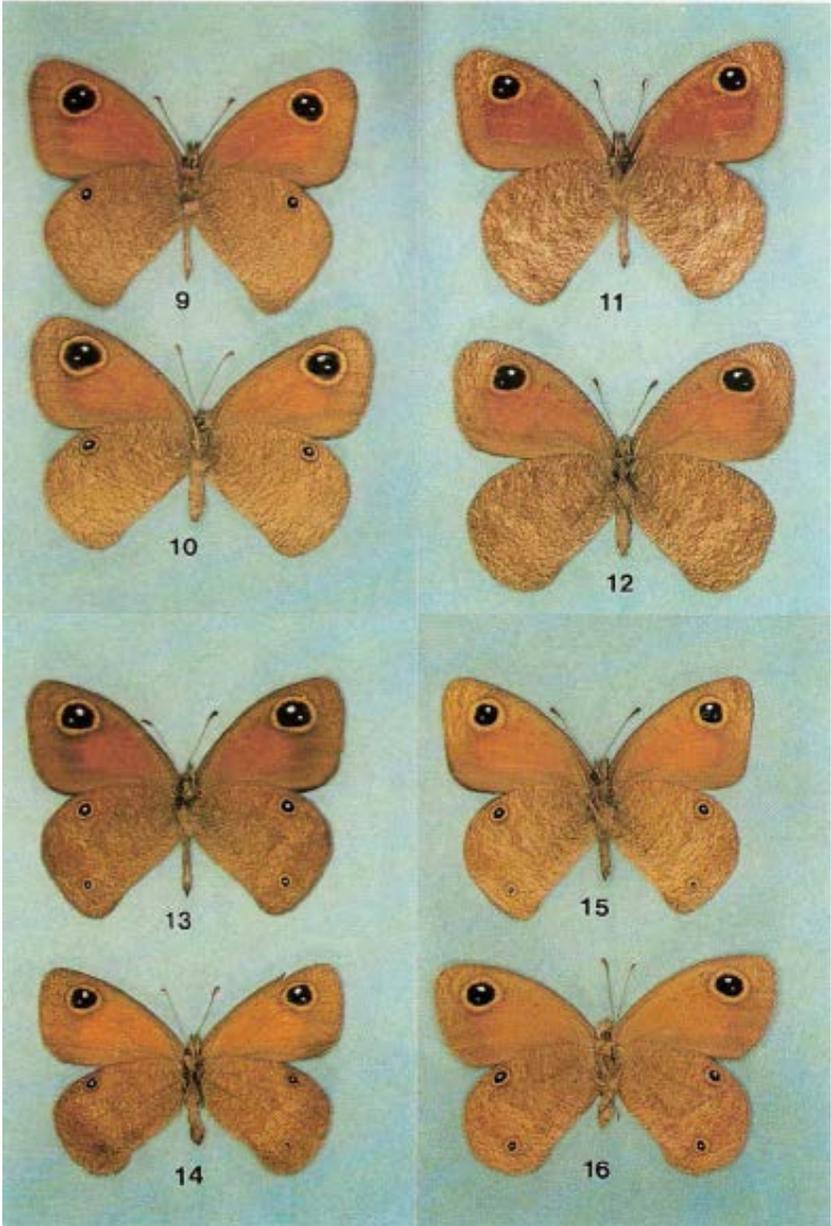


Plate 12. *Stygionympha* species, undersides of Plate 11. 9–16.

**A REVIEW OF THE *STYGIONYMPHA ROBERTSONI* SPECIES GROUP
(NYMPHALIDAE: SATYRINAE) WITH DESCRIPTIONS OF A NEW SPECIES
AND TWO NEW SUBSPECIES.**

By S.F. Henning & G.A. Henning
1 Harry Lawrence Street, Florida Park 1709, South Africa.

Abstract: A key to the species groups of the genus *Stygionympha* van Son is given. The *Stygionympha robertsoni* species group is reviewed. A new species, *S. curlei*, is described as well as two new subspecies, *S. wichgrafi williami* and *S. wichgrafi grisea*.

Genus *Stygionympha* van Son, 1955.

Transv. Mus. Mem. 8: 137.

A genus endemic to southern Africa. Members of the genus are medium sized grassveld browns closest to *Pseudonympha* Wallengren from which they differ in the longer third joint of the palpi, the much longer lower discocellular vein of the forewing and the extreme reduction of the anterior legs in both sexes. In the male genitalia of *Stygionympha* there is an apical spine on the valve.

KEY TO THE SPECIES GROUPS OF *STYGIONYMPHA*

1. Hindwing underside ocellate spot in M₁ present *robertsoni* species group
Hindwing underside ocellate spot in M₁ absent 2
2. Hindwing underside with small yellow submarginal dots between the veins
..... *irrorata* species group
Hindwing underside without small yellow submarginal dots between the veins
..... *vigilans* species group

***ROBERTSONI* SPECIES GROUP**

KEY TO THE *ROBERTSONI* SPECIES GROUP

1. Hindwing upperside rufous area not present *robertsoni*
Hindwing upperside rufous area present 2
2. Palpi below, thorax and legs dark brown *vansoni*
Palpi below, thorax and legs light greyish-brown 3
3. Forewing underside basal rufous patch dark red and not extending to ocellus
..... *curlei*
Forewing underside basal rufous patch not dark red and extending to ocellus
..... *wichgrafi*

***Stygionympha robertsoni* (Riley)** Plates 9 & 10: 1, 2. Figs 1, 7, 11.
Pseudonympha vigilans robertsoni Riley, 1932. *Entomologist* **65**: 148.
Type locality: Kimberley, Northern Cape, South Africa.

Diagnosis

On the upperside it has a rufous patch on the forewing but not on the hindwing. The hindwing underside is faintly irrorated with brown and there are two ocellate spots, one near the apex and one near the anal angle. In some specimens these ocelli may be small or even absent.

Forewing lengths: 18–22mm.

Distribution and habits

Inhabits karroid areas. The species frequents flat, open grassland as well as hills and mountains. It is seldom found in any great numbers and individuals are scattered over a very wide area. It has a rapid bobbing flight, usually not very fast but if disturbed it is capable of rapid acceleration. In the arid areas that they inhabit *S. robertsoni* is usually found near wetter depressions where the grass is slightly more lush. The males establish territories around the grassy depressions. Its flight period is throughout the summer months. It is distributed from the Northern Cape, southern Free State and northern parts of the Western Cape and Eastern Cape to Namibia.

***Stygionympha vansoni* (Pennington)** Plates 9 & 10: 3, 4. Figs 2, 8, 12.
Melampias vansoni Pennington, 1953. *J. ent. Soc. sth. Afr.* **16**:100.
Type locality: Kamiesberg Mts, Namaqualand, South Africa.

Diagnosis

The species is characterized by its elongated forewings. The upperside is somewhat darker than the other species in this group. Palpi below, thorax and legs are light greyish-brown in *S. wichgrafi* but dark brown in *S. vansoni*. The underside is dark brown and finely irrorated. There are two ocellate spots as in *S. robertsoni*

Forewing lengths 21–28mm.

Distribution and habits

Inhabits Namaqualand broken veld. The species can be found in the arid mountainous regions. In favourable seasons it may be quite common. It flies with a fairly rapid bobbing flight. When disturbed it has the habit of flying straight up to some height where it will usually be swept to safety by the wind. Males prefer to patrol areas along rocky ridges or around large rocks. The species flies during September and October, but may emerge at the end of August. Only found in the mountains of Namaqualand, Northern Cape.

***Stygionympha curlei* sp. n** Plates 9 & 10: 5, 6. Figs 3, 9, 13.

Description

Male. Forewing lengths: 21,0–23,5 mm, mean 22,2 mm ($n = 4$); antenna-wing ratios: 0,42–0,43, mean 0,426 ($n = 4$). Wings, upperside. Forewing: ground colour dark grey-brown; middiscal rufous patch extends from subcostal area to vein CuA_2 , and from origin of vein CuA_1 to postdiscal area; subapical spot black enclosing two bluish-white marks and ringed with ochre. Hindwing: ground colour dark greyish-brown; postdiscal area with a roughly oval rufous patch in areas M_2 and M_3 . Underside. Forewing: ground colour dark greyish-brown with whitish striations at apex and along costal margin; subapical ocellate spot as on upperside; rufous patch extends from subbasal to postdiscal area and from subcostal to area CuA_2 . Hindwing: ground colour dark greyish-brown with dense whitish striations and irrorations; subapical spot in area R_5 black with a bluish-white centre spot placed anteriorly, ringed with ochre. Genitalia. Uncus 50% to 60% longer than tegumen, strongly arched and tapering to an acute tip. The valves are angular and broad basally, narrowing somewhat distally, slightly convex dorsally, dorsal margin slightly shorter than uncus. The apical spine on the dorsal apex of the valve is about half the length of falces and fairly upright. Aedeagus as long as ventral portion of valve.

Female. Forewing length: 22,5 mm; antenna-wing ratio 0,42. Wings, upperside. Similar to male but ground colour paler brown and rufous patch of forewing extends from subbasal to postdiscal area and from subcosta to vein CuA_2 . Hindwing with a subapical white-centred black spot ringed with ochre in area R_5 . Underside. Similar to male but ground colour is paler. Genitalia. The bands of signa on the corpus bursae is slightly less than half the length of the bursae and parallel. Ductus bursae a third the length of corpus bursae, corpus bursae ovoid. Ostium bursae broad with a narrow deep central cleft.

Material examined

Types. Holotype ♂ South Africa: KwaZulu-Natal, Qudeni, 27.i.1990, A.I. Curle. Paratypes: 6♂ 2♀ same data, 5♂ 3♀ same data but N.I. Curle; 1♂ Normandien, 4.xii.1980, E.E. Malherbe. Holotype in Transvaal Museum, Pretoria. Paratypes in collections of A.I. & N.I. Curle and W.H., S.F. & G.A. Henning. Other material examined. Mpumalanga: Wakkerstroom, Hlangampisi, Whisky Spruit, Verlorenvlei.

Habitat and habits

A local high altitude grassveld species found near marshes or marshy areas. Both *S. wichgrafi* and *S. curlei* can be found in the same localities but usually in different habitats, *S. curlei* preferring the wet marshy areas. It is distributed through the montane areas of northern KwaZulu-Natal and Mpumalanga.



Male genitalia (valves, 3 & 4 with tegumen & uncus) of the *S. robertsoni* species group 1. *S. robertsoni*, 2. *S. vansoni*, 3. *S. curlei*, 4. *S. wichgrafi wichgrafi*, 5. *S. wichgrafi williamsi*, 6. *S. wichgrafi grisea*, 7. *S. wichgrafi lannini*.

Remarks

Upperside ground colour dark brown, darker than *S. wichgrafi*. The ocellate spot is ringed with light fawn encircled by dark fuscous brown. The discal patch is small and dark rufous, the hindwing dark rufous patch is very small and angular.

It can be distinguished from *S. wichgrafi* on the underside by the restricted dark rufous basal patch which does not extend as far as the ocellus. The hindwing underside is very strongly and evenly striated which does not develop into discal or post discal bands as in *S. wichgrafi*. There is a single very large ocellus near the apex which has a large white off-centre white spot, this spot in *S. wichgrafi* is placed centrally.

In the male genitalia the uncus is longer than in *S. wichgrafi*, uncus 50% to 60% longer than tegumen, in *S. wichgrafi* 10% to 40% longer than tegumen. Valves slightly shorter, more angular and broader than *S. wichgrafi*, somewhat between *S. wichgrafi* and *S. vansoni*. The apical spine is more upright, that of *S. wichgrafi* pointing more distad.

The female genitalia has the bands of signa on the corpus bursae half again as long as *S. wichgrafi* and parallel, they are characteristically short and converging anteriorly in *S. wichgrafi*. Ductus bursae not as short as in *S. wichgrafi* and corpus bursae not as rounded. Ostium bursae resembles that of *S. robertsoni* rather than *S. wichgrafi*.

Etymology

This species is named after Alf and Neville Curle.

Stygionympha wichgrafi van Son

Stygionympha wichgrafi van Son, 1955. *Transv. Mus. Mem.* 8:140, pl.36.

Type locality: Mountain Inn, Louis Trichardt, Northern Province.

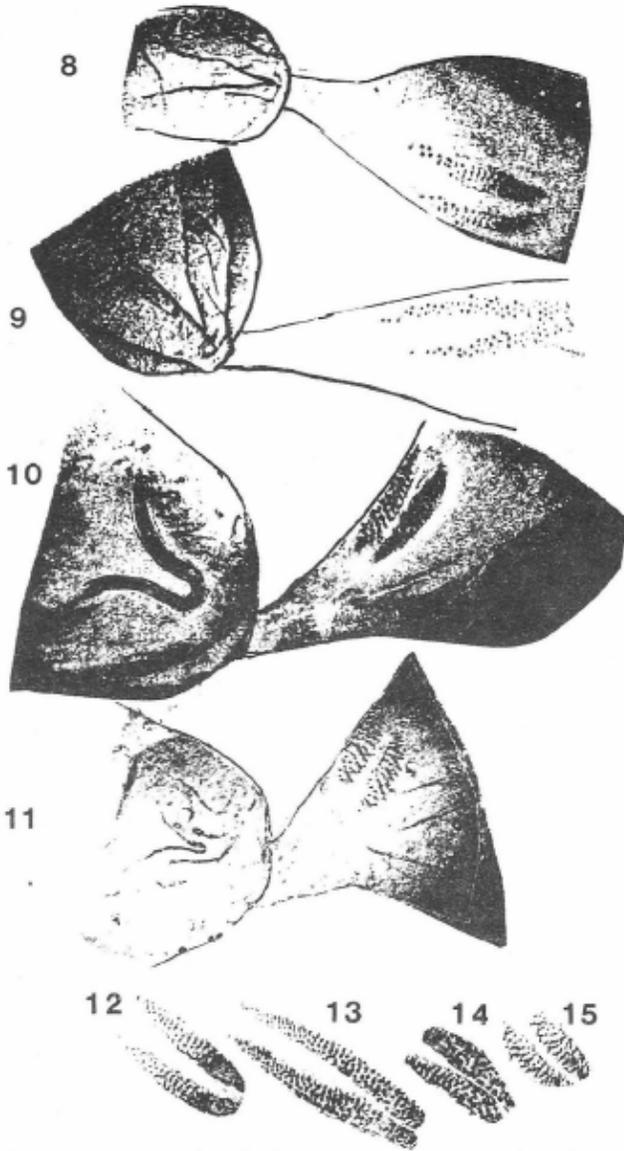
Distribution and habits

This species inhabits rocky ridges in montane grassveld down the eastern montane regions of southern Africa from The eastern highlands of Zimbabwe to the Western Cape. Its flight is very similar, but slower, than that of most species of *Pseudonympha*. Although normally inhabiting the grassy peaks it may be encountered in grassy patches among fairly densely forested areas. It is particularly fond of rocky outcrops where males establish territories near the peaks, they patrol back and forth, ever vigilant for passing females. It has a rapid, jerky flight and it settles on the ground or rocks. The flight period is November to April but it may even be encountered as early as the end of September in suitable areas. It is separated into four subspecies.

***Stygionympha wichgrafi wichgrafi* van Son** Plates 9–12: 7, 8, 9, 10. Figs 4, 10, 14.

Diagnosis

Upperside ground colour fairly light brown. The ocellate spot is ringed with light fawn encircled by dark fuscous brown. The underside can be distinguished by its strongly striated hindwing underside often forming discal and post discal bands.



Female genitalia of the *S. robertsoni* species group (Ostium & ductus bursae): 8. *S. robertsoni*, 9. *S. vansoni*, 10. *S. curlei*, 11. *S. wichgrafi*; signa: 12. *S. robertsoni*, 13. *S. vansoni*, 14. *S. curlei*, 15. *S. wichgrafi*.

This subspecies is larger than *S. wichgrafi williami* but smaller than *S. wichgrafi lannini*, *S. wichgrafi grisea* from the southern coast of KwaZulu-Natal is the smallest subspecies. A certain amount of variation does exist as regards populations, specimens from higher altitudes, or wetter habitats, become darker on the upperside and more greyish-brown, the hindwing undersides can have distinct reddish discal and postdiscal bands. This variability prevented van Son from determining other subspecies. More material has become available from many additional localities and it is apparent that at least three subspecies are present in South Africa.

Forewing lengths: 22–25mm.

Distribution and habits

Widespread grassveld species in the Northern Province, North West Province, Gauteng and Mpumalanga.

Stygionympha wichgrafi lannini van Son Plates 11 & 12: 11, 12. Fig. 7.

Stygionympha wichgrafi lannini van Son, 1966. *Transv. Mus. Mem.* 25: 89.

Diagnosis

The Zimbabwe subspecies is characterized by the intrusion of the large orange/red patch into the yellow ring surrounding the ocellus. The hindwing underside is more darkly and densely striated.

Forewing lengths: 24–26mm.

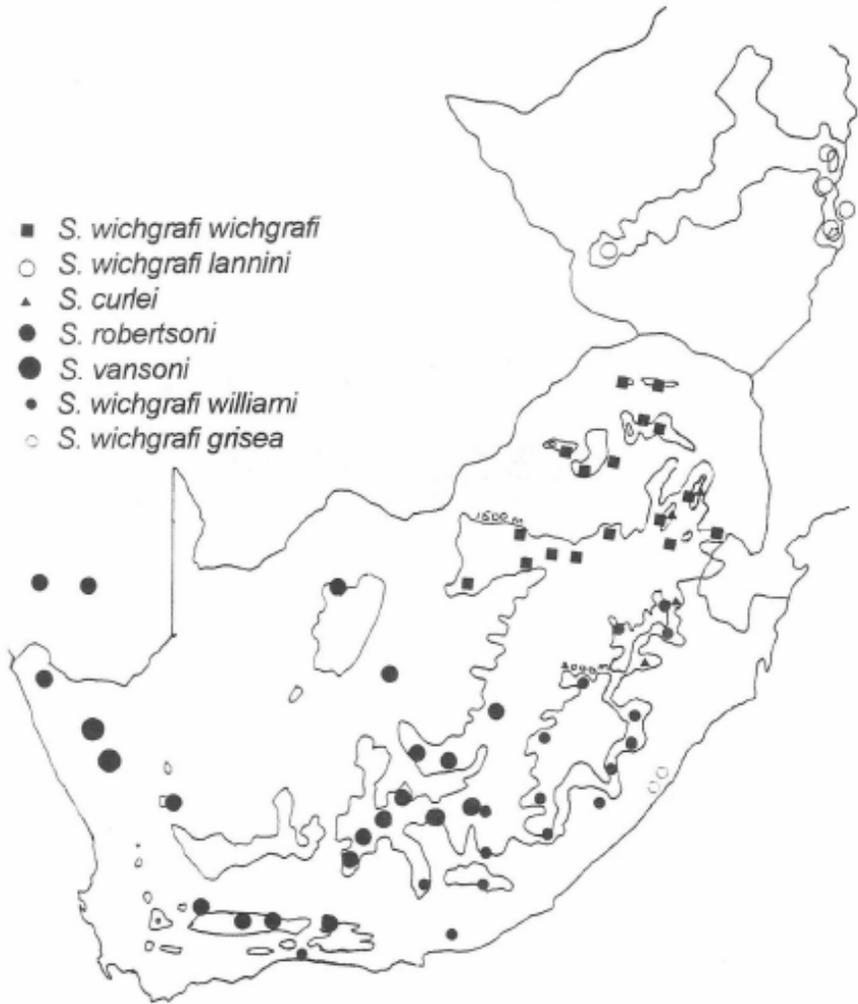
Distribution and habits

Montane grassveld on the eastern border of Zimbabwe and adjacent Mozambique, westwards to Bulawayo.

Stygionympha wichgrafi williami ssp. n. Plates 11 & 12: 13, 14. Fig. 5.

Description

Male. Forewing lengths: 20,5–22,0 mm, mean 21,1 mm (n = 9); antenna-wing ratios: 0,40–0,42; mean 0,41 (n = 9). Wings, upperside. Forewing: ground colour dark greyish-brown; middiscal rufous patch extends from mid cell and origin of vein CuA₁ to postdiscal area, and from subcosta into area CuA₂; subapical spot black with two small bluish-white central spots and ringed with ochre. Hindwing: dark greyish-brown with a roughly circular postdiscal rufous patch extending from area M₂ to CuA₁. Underside. Forewing: ground colour dark greyish-brown with whitish striations at apex and along costal margin; subapical ocellate spot as on upperside; rufous patch extends from subbasal to postdiscal areas and from subcostal to area CuA₂. Hindwing: dark greyish-brown with dense whitish striations and irroration; subapical spot in area R₅ is black with a bluish-white centre spot and ringed with ochre; occasionally a similar but smaller ocellate spot occurs postdiscally in area CuA₁.



Distribution map of the *S. robertsoni* species group.

Female. Forewing length: 20,5mm; antenna-wing ratio: 0,41. Wings, upperside. Ground colour paler, more greyish than male; rufous patch extends from subbasal to postdiscal areas and from subcosta to area CuA₂. Underside. Similar to male.

Material examined

Types. Holotype ♂, SOUTH AFRICA: KwaZulu-Natal, Bushmans Nek, 2400 m, 18.xi.1979, S.F. Henning. Paratypes: 4♂ same data, 2♂ same data but G.A. Henning; 1♂ 1♀ same data but 15.xii.1979, S.F. Henning, 1♂ same data but 15.xii.1979, G.A. Henning. Holotype in Transvaal Museum, Pretoria. Paratypes in collection of W.H., S.F. & G.A. Henning.

Other material examined. KwaZulu-Natal: Loteni, Vryheid. Mpumalanga: Wakkerstroom, Hlangampisi. Eastern Cape: Bosberg, Elandsberg. Free State: Golden Gate Highlands National Park, Mt. Pierre.

Distribution and habits.

An inhabitant of montane grassveld south of Piet Retief. It is distributed through the eastern parts of the Western Cape through Eastern Cape, KwaZulu-Natal, Lesotho, eastern Free State and south-eastern Mpumalanga.

Remarks

The southern subspecies differs from nominate *S. wichgrafi* by its dark brown ground colour, deeper, and usually smaller, red patches and the ocellate spots ringed with greyish-ochre without an encircling ring. The hindwing underside is more closely striated giving a darker appearance. It is generally smaller than either of the two northern subspecies.

Etymology

This subspecies is named after our father William H. Henning.

***Stygionympha wichgrafi grisea* ssp. n.** Plates 11 & 12: 15, 16. Fig. 6.

Description

Male. Forewing length: 19,5–21,0mm; antenna-wing ratios: 0,42. Antenna pale reddish-brown. Wings, upperside. Forewing: ground colour greyish-brown; middiscal rufous patch extends from mid cell and origin of vein CuA₁ to postdiscal area, and from subcosta into area CuA₂; subapical spot black with two small bluish-white central spots and ringed with ochre. Hindwing: dark greyish-brown with a roughly circular postdiscal rufous patch extending from area M₂ to CuA₁. Underside. Forewing: ground colour greyish-brown with whitish striations at apex and along costal margin; subapical ocellate spot as on upperside; rufous patch extends from subbasal to discal areas and from subcostal to area CuA₂. Hindwing: dark greyish-brown with dense whitish striations and irroration, and some reddish-brown marks; subapical spot in area R₅ is black with a bluish-white centre spot and ringed with ochre; occasionally a similar but smaller ocellate spot occurs postdiscally in area CuA₁.

Female. Forewing length: 20,5–22,0 mm; antenna-wing ratio: 0,41. Wingshape very rounded. Wings, upperside. Ground colour paler more greyish than male; rufous patch extends from subbasal to postdiscal areas and from subcosta to area CuA₂. Underside. Similar to male.

Material examined

Types. Holotype ♂, South Africa KwaZulu-Natal, Margate, 5.xii.1988, H.C. Ficq. Paratypes: 1♂ same data; 2♂ Margate, Feb. 1980, G.A. Henning; 2♀ Oribi Gorge, 4.iv.1969, A.I. Curle. Holotype in Transvaal Museum, Pretoria. Paratypes in collection of W.H., S.F. & G.A. Henning and A.I. & N.I. Curle.

Distribution and habits

Inhabits the southern sub-coastal grassveld areas of KwaZulu-Natal from Margate to Oribi Gorge. Flies on grassy areas around rocky ridges with an erratic bobbing flight.

Remarks

The coastal subspecies differs from nominate *S. wichgrafi*, and the other subspecies, by its pale greyish-brown ground colour, smaller red patches and the irregular ocellate spots broadly ringed with pale greyish-ochre. The hindwing underside is also paler with distinct bands. The antennae are pale reddish-brown unlike the dark antennae of the other subspecies. It is also smaller with a more angular wing-shape than the other subspecies.

Acknowledgements

We thank our father W.H. Henning, Alf and Neville Curle, Jan Coetzee, Izak Coetzer, Chris Ficq, Steve Woodhall, Johan Greyling, Andrew Mayer, Nolan Owen-Johnston, Francois Swart, Hermann Staude, Martin Kruger and the Transvaal Museum.

References

VAN SON, G. 1955. The Butterflies of Southern Africa, Part II. *Transvaal Museum Memoir* No. 8, Pretoria.

BIOGEOGRAPHY OF AFROMONTANE EMPEROR MOTHS (LEPIDOPTERA: SATURNIIDAE): AN INTRODUCTION

Rolf Oberprieler
Biosystematics Division
Plant Protection Research Institute
Private Bag X134, Pretoria 0001, South Africa

Abstract: The geographical distribution range of the Zigzag Emperor Moth, *Imbrasia tyrrhea* (Cramer), in South Africa is compared with several ecological parameters and biogeographical zonations to determine a possible cause for its unusually large range. With none of these parameters any significant correlation is evident, but the inclusion of its two closest relatives, *I. hoehnelii* (Rogenhofer) and *I. fletcheri* (Rougeot) from eastern Africa, in the analysis and the comparison of the distribution of this entire species complex with that of the Afromontane Region or Biome yields a remarkable congruence in range and also in the fragmentation of the latter into seven isolated islands. Six other saturniid species complexes show a very similar distribution and correlation with that of the Afromontane Region, so that a definite Afromontane faunal element can be identified in the family Saturniidae. The various species occurring on these islands of the Afromontane Biome are indicated to be geographically and thus reproductively isolated from each other and to represent distinct species.

Introduction

The geographical distribution ranges of the 48 species of Saturniidae occurring in southern Africa (South Africa, Namibia and Botswana) show certain patterns that identify a number of distinct faunal elements, as was demonstrated for the Namibian fauna by Oberprieler (1995). In South Africa, several more such faunal elements are indicated, but the factors that determine these are as yet largely unknown. Also, some South African saturniid species have very large, apparently anomalous ranges that obscure these patterns and suggest the existence of a much greater ecological tolerance in such species, as compared with those having smaller and ecologically more homogeneous ranges.

Generally these wide-spread and euryoecious species also have a broader host-plant spectrum and often utilize exotic plant species, including man's crops to become of economic importance in agriculture and forestry. Particularly for such injurious species, a knowledge of the factors that determine their geographical ranges is vital for predicting their possible further spread and/or introduction into new areas, and the damage they may cause to crops in these. One such species is the endemic South African *Imbrasia tyrrhea* (Cramer), the Zigzag Emperor, whose sporadic population outbreaks and subsequent defoliation of plantations and fruit orchards have caused significant crop losses in forestry and agriculture in the past (Hardenberg 1912, Tooke 1935, Webb 1964, 1974).

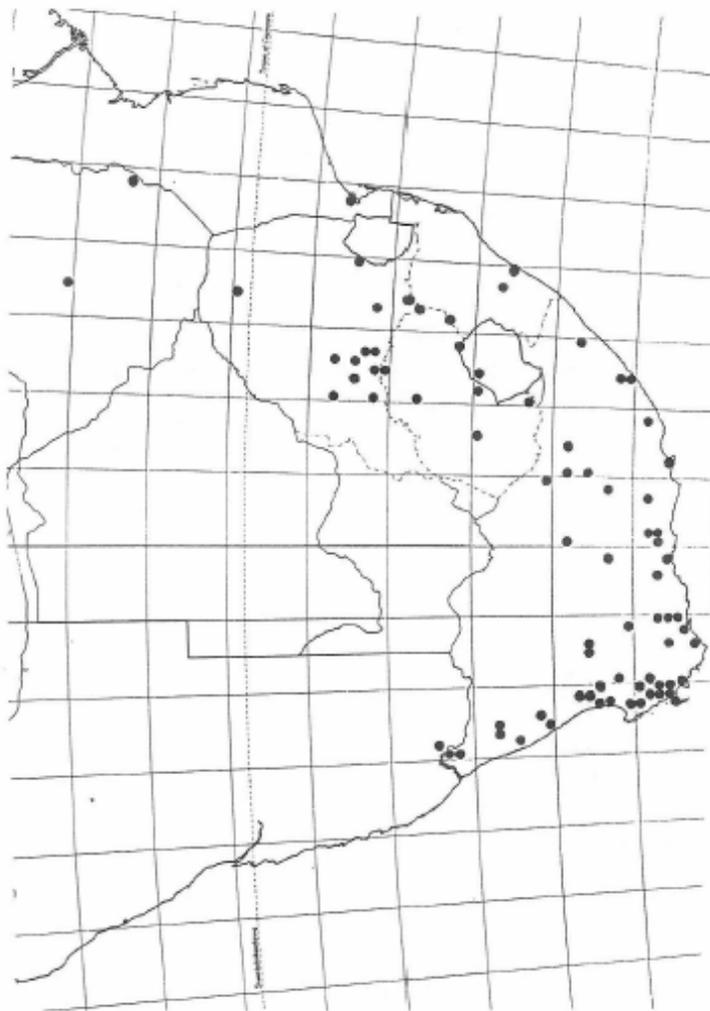


Fig. 1. Distribution of the Zigzag Emperor, *Imbrasia tyrnhea* (Cramer).

In the present study, an attempt was made to assess the factors that determine the geographical range of this species in South Africa, and whether other saturniid species display similar distribution patterns. This investigation is not yet complete, and the results presented herein are therefore only of a preliminary nature but intended to stimulate similar studies involving other groups of southern African Lepidoptera.

Material and Methods

Locality records of *I. tyrrhea* and other South African saturniid species were gathered over several years from all collections of Saturniidae in southern Africa, as well as from certain overseas museums (mainly the Natural History Museum in London, England). These localities were plotted as quarter-degree squares to generate a distribution map for each species occurring in the country.

The range of *I. tyrrhea* (Fig. 1), which stretches mainly from the Gauteng Highveld along the Drakensberg foothills into the Western Cape and along the west coast north to the Richtersveld, was compared with several ecological and geographical parameters to assess whether its unusually wide range is correlated with any of these. These parameters included the ranges of its main natural larval food plants, *Diospyros lycioides* (Ebenaceae) and *Acacia karroo* (Mimosaceae), patterns of annual rainfall and temperatures, and seemingly critical altitudes such as the 1500m isohypse, which largely delimits the Gauteng Highveld. In addition, the distribution range of *I. tyrrhea* was compared with a number of biogeographical zonations of the country, namely veld types (Acocks 1988), vegetation types (White 1978), phytogeographical divisions (Werger 1978), biomes (Rutherford & Westfall 1986), and zoogeographical regions based on Coleoptera (Endrödy-Younga 1978). Furthermore, its range was plotted on a larger scale together with those of its closest relatives, *I. hoehnelii* (Rogenhofer) from Kenya and *I. fletcheri* (Rougeot) from Ethiopia, on the distribution of the Afromontane Region after White (1978).

Subsequently, the approximate ranges of five other saturniid species complexes occurring in more or less the same regions were compared with the distribution of the Afromontane Region as well, namely that of *Imbrasia cytherea* (Fabricius), *I. gueinzii* (Staudinger), *Epiphora antinorii* (Oberthur), *Epiphora pelosoma* Rothschild, and the genus *Ubaena* Karsch.

Results

None of the distributions of any of the ecological and geographical parameters used in this study show any correlation with the range of *I. tyrrhea* in South Africa. Those of its two main larval foodplants encompass its range but are considerably larger, and those of the climatic and altitudinal parameters tested do not match it at all. Among the phytogeographical parameters, the veld types after Acocks (1988) show a very rough correlation in the eastern half of the country with the types collectively referred to as Sour Grassveld, and in the western half with karroid veld types, but no single veld type or group of similar types shows a distribution matching that of *I. tyrrhea*. The same applies to all of the vegetation types after White (1978) and the phytogeographical divisions after Werger (1978).

On a map of the biomes after Rutherford & Westfall (1986), most locality records of *I. tyrrhea* fall into the Grassland, Succulent Karroo and Fynbos biomes but again show no proper correlation with either or all of these. A slightly better congruence is evident with the biogeographical zonations based on Coleoptera after Endrödy-Younga (1978), most of the locality records of *I. tyrrhea* coinciding with his Cape and Transvaal-Highveld Transition zones. However, the records from the Richtersveld and Karroo fall outside these zones. Thus, none of the ecological and biogeographical zonations of southern Africa compared here can be used to explain the distribution of *I. tyrrhea*.

A map of the available locality records of the closely related *I. hoehnelii* in Kenya and *I. fletcheri* in Ethiopia, however, yields a remarkably good correlation with the fragmented distribution of the Afromontane Biome in eastern Africa after Bonnefil (1985), all of them originating from pockets of Afromontane vegetation on high-lying areas. The comparison of the entire Afromontane Region after White (1978), which forms an archipelago of seven isolated regions (islands) of Afromontane vegetation on the African continent, with that of the *I. tyrrhea* species complex (comprising in its narrowest sense only these three species) (Fig. 2) indicates that the northern *I. fletcheri* occurs only on the Ethiopian Afromontane island, *I. hoehnelii* on the Imatongs-Usambara island to the south of it, and *I. tyrrhea* on the southernmost Drakensberg island. A single and somewhat aberrant specimen of *I. hoehnelii* is also known from the Kivu-Ruwenzori island, but its exact distribution and relationships to the other members of the *I. tyrrhea* complex remain to be investigated. On a continental (rather than regional) level of biomes and of species groups (rather than single species), therefore, a pattern of distribution is indeed emerging, and the *I. tyrrhea* complex must on this account be regarded as an Afromontane faunal element. The discrepancy of distribution in the western Cape, which is not part of the Drakensberg Afromontane island according to White but does harbour *I. tyrrhea* as well, appears to be ascribable either to a recent colonization of the Fynbos Biome by *I. tyrrhea* or to a previously wider distribution in line with the former extension of the Afromontane region into the Cape Peninsula.

The comparison of this Afromontane archipelago of vegetation with the distribution patterns of the other five saturniid species complexes studied here yields very similar results. The constituent species of these complexes are distributed from north to south over the seven Afromontane islands as follows:

The *I. cytherea* complex - *I. krucki* (Hering) on the Imatongs-Usambara island, *I. macrops* (Rebel) on the Kivu-Ruwenzori and Uluguru-Mlanje islands, *I. lucida* Rothschild on the Uluguru-Mlanje island, *I. carnegiei* (Janse) on the Chimanimani island, and *I. cytherea* on the Drakensberg island (with a similar discrepancy in the western Cape);

The *I. gueinzii* complex - *I. ungemachti* (Bouvier) and *I. zaodeae* Rougeot on the Ethiopian island (their precise relationships to the other members of this group still uncertain), *I. capdevillei* Rougeot on the Imatongs-Usambara island, *I. deoris* Jordan on the Kivu-Ruwenzori island (its relationships to the

other species to be confirmed), *I. murphyi* (Darge) (a close relative of *I. cleoris*), *I. perscitus* (Darge) and *I. nyassana* Rothschild (the relationships between these last two and some other previously named forms yet to be established) on the Uluguru-Mlanje island, *I. perscitus* on the Chimanimani island, and *I. gueinzii* (Staudinger) on the Drakensberg island;

The *E. antinorii* complex - *E. antinorii* (Oberthür) and *E. elianae* Rougeot on the Ethiopian island, *E. magdalena* (Grunberg) (the oldest available name for this taxon but its nomenclature still confused) on the Imatongs-Usambara island, *E. marginimacula* Joicey & Talbot on the Kivu-Ruwenzori island, and *E. imperator* Rougeot (the name threatened by a subjective homonymy with the older *E. imperator* Stoneham!) on the Uluguru-Mlanje island;

The *E. pelsoma* complex - *E. pelosoma* Rothschild on the ImatongsUsambara island, a form of uncertain name on the Kivu-Ruwenzori island, *E. manowensis* (Gschwandner) on the Uluguru-Mlanje island, and a similar but unnamed form on the Chimanimani island;

The genus *Ubaena* - the four currently recognized species all occurring on the Uluguru-Mlanje island from the Uluguru to the Muchinga Mountains in a northeast-southwest cline of *U. lequeuxi* Darge & Terral, *U. fuelleborniana* Karsch, *U. dolabella* (Druce) and *U. periculosa* Darge & Terral.

Discussion and Conclusion

It is evident from this analysis of the distribution patterns of these six species complexes of African Saturniidae that all of them inhabit the Afromontane Region or Biome and show a largely congruent fragmentation of their ranges into the seven islands of the Afromontane archipelago. In all of them there is considerable taxonomic evidence (differences in wing, genital and larval characters and also often in foodplants and habitats) that the various taxa of each complex inhabiting different Afromontane islands represent different species that are not only geographically but also reproductively isolated from each other. This indicates that their isolation from each other has been maintained for an evolutionarily significant period of time. On the other hand, named forms occurring on the same biogeographical island are generally most likely not to represent distinct species but only recent geographical isolates displaying some minor differences. This is particularly evident in *Ubaena*, of which apparently only two (rather than four) different but variable species occur, in the *I. gueinzii* complex, in which several forms of doubtful taxonomic standing have been named from the Uluguru-Mlanje island, and in the *E. antinorii* complex, in which a similar taxonomic chaos prevails regarding the Imatongs-Usambara taxon here referred to as *E. magdalena*. However, speciation within a biogeographical island may have occurred in some instances, such as between *E. antinorii* and *E. elianae* in the Ethiopian island, in response to major breaks in such an island (such as the Great Rift Valley in Ethiopia and Kenya). Such relationships and evolutionary scenarios can

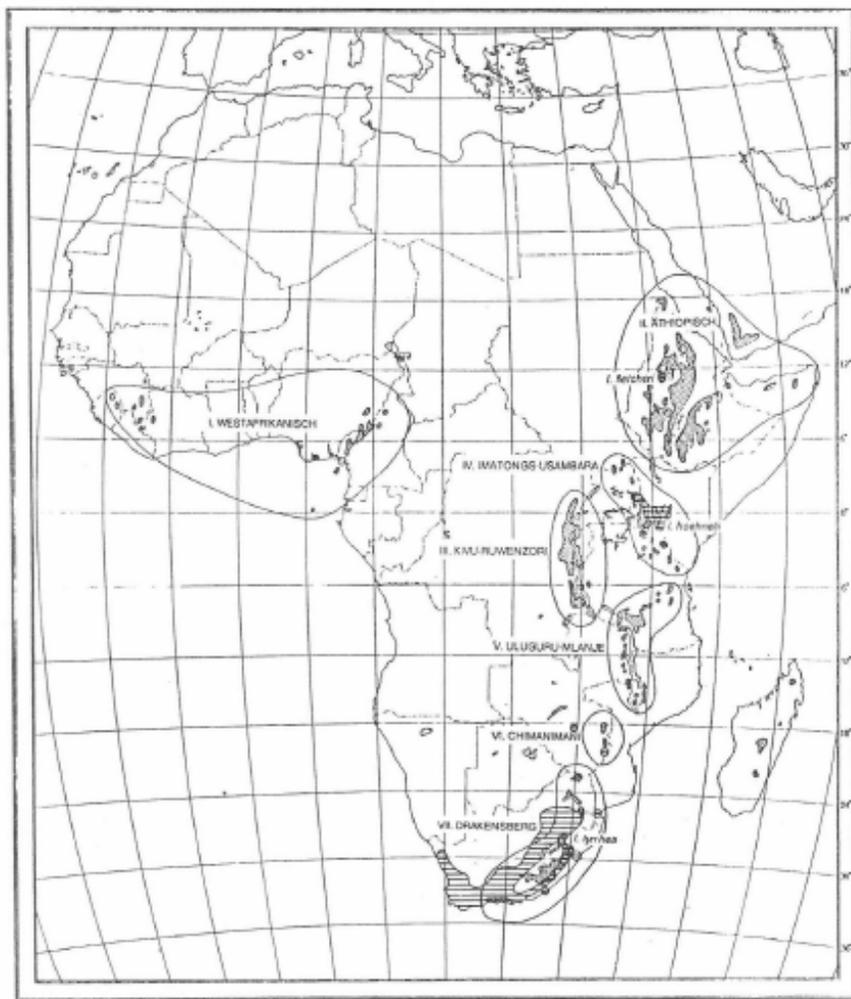


Fig. 2. Distribution of *I. tyrroha* species complex compared with the distribution of Afromontane Regions after White (1978).

unfortunately not be properly assessed until the systematics and phylogeny of the various species complexes has been clarified.

The existence of a distinct Afromontane faunal element of Saturniidae comprised of six different species complexes suggests that the Afromontane Biome was colonized at least six times independently by saturniids. At least in the *I. tyrrhea* complex, the most primitive species occurs in the north, indicating that this colonization probably commenced on the Ethiopian highlands and spread from there southwards, before being broken up along with the Afromontane Biome into seven major fragments that subsequently speciated or seemingly disappeared. In the other Afromontane species complexes, the phylogenetic relationships among its constituent species are not established well enough as yet to speculate on the likely origin and direction of their colonization of the Afromontane Region, but at least in the *E. pelosoma* complex this colonization probably occurred from the forest region of its closest relative, the *E. vacuna* complex of the Central and West African rainforests, rather than from the arid Ethiopian highlands. All these colonizations do not, however, appear not to have reached the isolated West African biogeographical island. Careful taxonomic and phylogenetic studies of these complexes and of their relationships to others are needed to further investigate these matters.

Particularly from the analysis of the distribution pattern of *I. tyrrhea* in South Africa it is evident that fine-tuned regional biogeographical zonations based more or less entirely on plants or vegetation types do not necessarily adequately describe zonations for animals as well, at least not for saturniid moths. A similar conclusion was reached from an analysis of the faunal elements of Namibian emperor moths (Oberprieler 1995). On a continental scale, however, it appears that the biome concept does explain the distribution of saturniids to a considerable degree, not only of the Afromontane element but also of others such as those of the arid savanna or tropical forests. Detailed analyses of these faunal elements are yet to be conducted.

Lastly, the identification of *I. tyrrhea* as an Afromontane faunal element allows certain predictions to be made about its likely establishment (and possible pest status) in areas of introduction. It is, for example, extremely likely to become established also in the other major regions of the Afromontane Biome, as well as in other regions of the world with comparable climates and vegetation. Similarly, species from other Afromontane islands may establish in parts of South Africa if introduced or imported there by chance. While the exact environmental tolerances and limiting factors of *I. tyrrhea* are still largely unknown (but necessary for more precise predictions), this coarse analysis of its distribution pattern should provide a framework for undertaking more detailed ecological studies of this and other species.

References

- ACOCKS, J.P.H. 1988. Veld types of South Africa. *Memoirs of the Botanical Survey of South Africa* No. 57: 1–146.
- BONNEFIL, R 1985. Evolution of the continental vegetation: the palaeobotanical record from East Africa. *South African Journal, of Science* 81(5): 267–270.

- ENDRÖDY-YOUNGA, S. 1978. Coleoptera. In: WERGER, M.JA (Eds). *Biogeography and Ecology of Southern Africa* 2: 797–821. Dr W. Junk Publishers, The Hague.
- HARDENBERG, C.B. 1912. The willow tree caterpillar (*Angelica tyrreha* Cramer. Lepidoptera; Saturniidae) A destructive pest in forest plantations. *The Agricultural Journal of the Union of South Africa* 4: 397-418.
- OBERPRIELER, R.G. 1995. *The Emperor Moths of Namibia*. Ekogilde, Pretoria, 91 pp.
- RUTHERFORD, M.C. & WESTFALL, R.H. 1986. Biomes of Southern Africa - an objective. (July 1961). Technical Communication. Department of Agricultural Technical Services. Republic of South Africa 1244-5 1.
- WEBB, van V, D. 1974. Forest and timber entomology in the Republic of South Africa. *Entomology Memoir. Department of Agricultural Technical Services. Republic of South Africa* 34: 1-21.
- WERGER, M.J.A 1978. Biogeographical division of southern Africa. In: WERGER, M.J.A. (eds) *Biogeography and Ecology of Southern Africa* 1: 145–170. Dr W. Junk Publishers, The Hague.
- WHITE, F. 1978. The Afromontane Region. In: WERGER, M.J.A. (eds). *Biogeography and Ecology of Southern Africa* 1463-513. Dr W. Junk Publishers, The Hague.



Rolf Oberprieler (drawn by Nona du Toit)

IN MEMORIAM
ROBERT DUNDONALD PARÉ (1946 -1995)

By J. R. Parker
3 Godfrey Street Campbell, Australian Capital Territory 2612

As a new member of the society, I thought it appropriate to make a small contribution to *Metamorphosis* and pay my respects to a very dear friend who was tragically killed in an air accident on 16 March 1995. Despite his death early last year, the timing of my contribution seems entirely consistent with the recent decision to name *Hyalites (Auracraea) parei* after the late Robert Dundonald Paré. Rob Pare and I grew up together. We were in the same class at the local high school, Ellis Robins, in Harare, to which we cycled together each morning from our respective homes in the nearby suburb of Marlborough. Rob introduced me to butterfly collecting in 1960 and we collected together as schoolboys until he left school at the end of 1963 to go farming. I lost touch with him until 1969 when he turned up, quite suddenly and unheralded, at my home and the friendship resumed as if his absence had not occurred. He was best man at my wedding in the same year and I returned the favour when Rob married Claire. I am happy to say that in 1969, I was able to enliven his then dormant interest in collecting and, we shared our mutual interest as adult amateur collectors until his death. We actively collected together until I emigrated to Australia in 1981. We corresponded regularly between 1981 and the date of his death; coincidentally, the day after his death, I received his last letter to me exhorting me to visit Zimbabwe for a collecting trip; the last time we had collected together was in August/September 1991 when I last visited Zimbabwe.

In his early years of collecting, Rob housed, with a great deal of pride, a small collection of butterflies and moths in a converted five drawer stationery cabinet. I distinctly remember his pride and joy was a rather battered female specimen of *Charaxes xiphares vumbui* taken by him in the Vumba Mountains south east of Mutare. At that time, the Vumba conjured up everything that was desirable to schoolboy collectors. We would pore over Pinhey's 1949 edition of the Butterflies of Rhodesia speculating upon the possibility of collecting butterflies about which we were only able to dream. We would fantasise over encountering those species depicted in the frontispiece of the book rather dramatically entitled "Gems of the Eastern Border" (*Euphaedra neophron neophron*, *Charaxes protoclea azota*, *Crenidomimas concordia*, *Salamis cacta eileenae*, *Precis touhilimasa*, *Acraea saxis*, *Myrina dermaptera nyassae* and *Lepidochrysops gigantea*).

Later, in our adulthood we were to realise those goals and more. Rob went on to far greater heights in the development of his knowledge of butterflies, their habits and their food sources.

Rob and I shared many memorable collecting moments, exciting, hilarious and some just plain depressing. We had to suffer the shameful destruction of the great Mozambique forests at Dondo and the Amatongas at the hands of charcoal burners and watch the slow but inexorable encroachment of banana plantations

upon some of our favourite haunts in the Burma Valley below the Vumba along the Mozambique border.

After the Amatongas ceased to be an attractive collecting destination, Rob and I discovered to our joy that central Mozambique continued to be a collectors' bonanza. All manner of species were still to be found there including such prizes as *Graphium junodi* and *Acraea cuva cuva*. Together he and I experienced the adrenaline rush when the vibrant pink males of *A. cuva cuva* seemingly floated out of the bush in front of us as soon as the sun had energised them. We were fortunate enough each to net a good series of the species and had the pleasure of comparing the bright males with their buff coloured females and to discover, in the dry season following, that the hyaline tips to the forewings of the males had been replaced by solid pink scales, and that the female had changed from buff to brick red.

In 1980, we shared the excitement of confirming the existence of a strong colony of *Kedestes lema linka* in the Chipinge district in south-eastern Zimbabwe; the species was known in Zimbabwe from a few isolated specimens taken in 1947. Together, we speculated whether *Kedestes michaeli* taken at the same locality in November 1980 was a new species of *Kedestes* - not yet named when it was taken - with the rather drab depiction of the underside of this species in the colour-plate in Pennington's second edition belying the richness of the contrasting colours in a fresh specimen.

Whether we were discussing particular features, or perceived deficiencies in our individual collections, we tended to regard our two collections as one, despite the fact that each of us coveted certain specimens in the others collection at that time. (*Graphium junodi* and *Aslauga marshalli*, for example, in mine and *Iolais lalos*, *Euthecta cooksoni* and a superb yellow female form *xanthosana* of *Colotis ione*, for example, in Rob's - like Topsy, however, the list in Rob's collection "just grewed" after I had left Zimbabwe). We enthusiastically discussed each other's collecting milestones without envy, each providing the other, where possible, with specimens of desired species. (In this respect Rob was extraordinarily generous, particularly after my departure from Zimbabwe, after which, he also kept me informed with up to date information on new species, localities, food plants and general collecting news).

We shared in the bounties offered up by new localities previously untried by us or by previously well-stamped collecting grounds where the discovery of the more obscure habits of certain species had caused difficulty in their location; whether it was finding local species such as *Lepidochrysops chittyi* or *Cooksonia neavei rhodesiae* or even the recently discovered *Aloeides mullini* for the first time or finding a species hitherto regarded by us to be relatively scarce to be particularly plentiful such as *Bicyclus angulosus selousi*, *Bicyclus cottrelli*, *Precis actia*, *Deloneura subfusca*, *Deloneura sheppardi*, or *Tirumala petiverana*.

Collectively, we gave new meaning to whirlwind collecting trips, undertaking day trips as far afield as the Amatongas, in central Mozambique or Gungunyana forest in south-eastern Zimbabwe, leaving for the particular destination at 03h00 in the morning, and returning at 10h00 the same night. The real lunacy was in

setting our respective catches into the early hours of the morning immediately following our return.

Rob had a lasting and enthusiastic appreciation of Zimbabwe, its bush and natural history. As a zealous amateur collector, he had extensive knowledge of the butterflies of Zimbabwe and was always prepared to share that knowledge with his peers and with those with just a commencing interest in the pursuit of Lepidoptery. He had a well-developed sense of humour and, many a time, caught me out with his butterfly practical jokes, whether by strategically placing well-crafted cardboard replicas of particular *Charaxes* over bait in butterfly traps, or with plausible stories of capturing particular species close to my Harare home; e.g. *Lepidochrysois variabilis* in the hills around Helensvale, where other species of *Lepidochrysois* and all manner of Hesperiiids including *Abantis bamptoni* were to be taken - it did not seem such a silly idea at the time. *L. variabilis* was henceforth always known by us as *Lepidochrysois hoaxi*. I should say Rob always confessed his sins and sheepishly owned up to all 'leg-pulls'.

Rob Paré represented many things to a wide cross section of people. He was a loving husband to Claire and a fine father to Kate and Jonathon; he was a good Christian and greatly loved by all of his fellowship; he was an excellent farmer, well respected by those in the same field; he was a knowledgeable butterfly collector (and naturalist, generally) whose expertise was always valued and whose views were sought after and respected; he was a good friend, always giving of himself; above all he was a fine human being whom most who came in contact with him could call a good friend. He is, and will continue to be, sadly missed!

R.I.P.

EDITORIAL POLICY

Manuscripts dealing with any aspect of the study of Afrotropical Lepidoptera will be considered.

Manuscripts not conforming to the instructions below may be rejected and returned to the author. All manuscripts of scientific papers will be evaluated by at least one reviewer. Proofs will be returned to the author if necessary, and only printer's errors may be corrected. Ten (10) offprints are provided free to the author or senior author on request, and only if the manuscript has been submitted on computer diskette in a word processing format that the editors are able to convert. Authors should contact the technical editor to enquire if the software that they are using can be converted by the editors, as the situation changes constantly. Additional offprint numbers can be ordered, at cost, at the proof stage.

A hard copy of the manuscript, and the originals of illustrations, and the computer diskette must be submitted to the editor. The text should be printed on A4 paper, with double lined spacing, and a margin of at least 2cm on each side. The pages should be numbered consecutively, beginning with the title page, and including those carrying references, tables, and legends to figures. All figures and tables must be referred to in the text. If a computer diskette is not available, then tables are to be typed on A5 paper, exactly as found in the printed journal.

Figures must be boldly drawn in black waterproof ink, and arranged in clear and logical plates on stiff, white, preferably A4-sized board. All the figures must be numbered in a common sequence in Arabic numerals, irrespective of whether they are line drawings, photographs, diagrams, graphs or maps. Magnifications should be indicated by scale bars on the figures.

Any opinions expressed in this journal are those of the contributors and not of the Editor or the Lepidopterists' Society of Africa.

Design & Layout by

Sixgee's

(011) 672-0624

METAMORPHOSIS

Volume 7

Number 4

December 1996

CONTENTS

COMMENT BY THE PRESIDENT.	145
THE GREEK, THE GERMAN, AND NOTHING IN STYLE.	146
REGIONAL ROUND UP. G.A. Henning	148
BUTTERFLY WORLD – A HISTORY OF DEVELOPMENT. Esther van der Westhuizen.	149
A REVIEW OF THE GENUS <i>DINGANA</i> VAN SON (LEPIDOPTERA: NYMPHALIDAE: SATYRINAE) WITH DESCRIPTIONS OF A NEW GENUS, THREE NEW SPECIES AND THREE NEW SUBSPECIES. G.A. Henning and S.F. Henning.	153
A REVIEW OF THE <i>STYGIONYMPHA ROBERTSONI</i> SPECIES GROUP (NYMPHALIDAE: SATYRINAE) WITH DESCRIPTIONS OF A NEW SPECIES AND TWO NEW SUBSPECIES. S.F. Henning and G.A. Henning.	173
BIOGEOGRAPHY OF AFROMONTANE EMPEROR MOTHS (LEPIDOPTERA: SATURNIIDAE) : AND INTRODUCTION. Rolf Oberprieler.	183
IN MEMORIAM ROBERT DUNDONALD PARÉ (1946–1995). J.R. Parker.	191
INSTRUCTIONS TO AUTHORS OF SCIENTIFIC PAPERS.	194
INAUGURAL A. B. R. I. CONFERENCE ON AFRICAN LEPIDOPTERA.	197
NEW MEMBERS.	198
CHANGE OF ADDRESS.	198
FORTHCOMING EVENTS.	199
ADVERTISEMENTS.	199