

# METAMORPHOSIS



JOURNAL OF THE LEPIDOPTERISTS'  
SOCIETY OF SOUTHERN AFRICA

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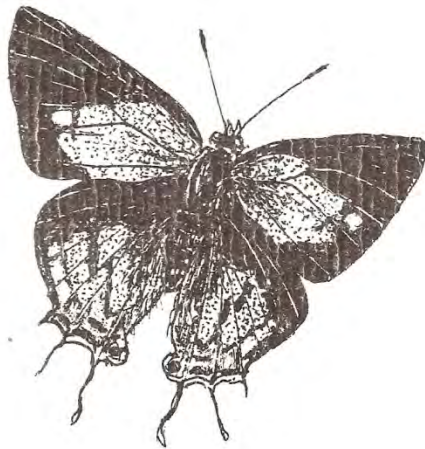
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Volume 4

June 1993

Number 2

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*lolaus* (*Pseudiolaus*) *lulus* (Lycaenidae) male  
(Forewing length 17.5–18 mm)

# LEPIDOPTERISTS' SOCIETY OF SOUTHERN AFRICA

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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.

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## CORRESPONDENCE

The Hon. Secretary, P.O. Box 470, FLORIDA HILLS, 1716

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

**EDITORIAL**

Well, hopefully here we have the best *Metamorphosis* yet - 48 pages long with a good mix of popular and scientific articles. In addition we have some beautiful colour plates by our Hong Kong member, James J. Young, who sponsored them and wrote a most interesting article on the life histories of skippers. It is now up to you to maintain the standard, so put pen to paper and send us a paper for the next issue.

The Society has now been going for ten years, so come and join the celebration at our dinner dance at Megawatt Park on Friday the 6th August. This is followed by our Conference and AGM on the 7-8 August, so I must call again for your participation to make it a success. Do not forget on Sunday the 8th August you can all be involved by bringing your own good captures, rarities, new net designs or whatever, in our open workshop. There is also still time to submit slides for the photographic competition or decide to present a paper. Remember the papers do not have to be scientific, we would love to hear about your trip to the Transkei, the Cape or other places of interest.

Our publication *A Practical Guide to Butterflies and Moths in Southern Africa* was a great success and sold out in no time at R 50 a copy. It is still available at most C. N. A. branches at about R 70 each, and even at that price it is well worth it.

W.H. Henning



*Lepidochrysops methymna* male underside

### COMMENT BY THE PRESIDENT

The Nature Club of Florida Park High School organised a clean-up of the Ruimsig Entomological Reserve on the 5th May 1993. The reserve had become overgrown with blackjacks, khakibos and the odd exotic tree such as syringa and mimosa. All this originated from the days before the reserve was established and fenced when certain citizens used the area to dump their garden refuse.

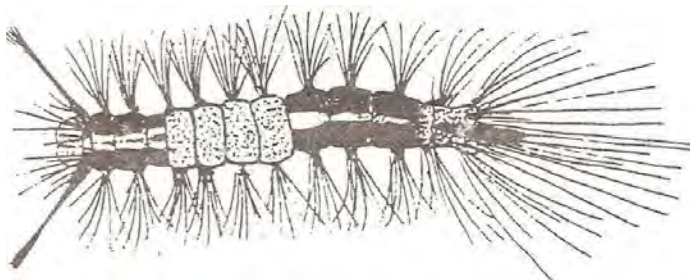
At the time of the clearing up operation, these plants had already gone to seed. We therefore had to be careful when uprooting them and putting them into the plastic refuse bags (donated by O.K.) to drop as few of these seeds as possible. Most people seemed to manage quite well and the vast majority of the seeds ended up in the bags along with the plants.

Graham Henning energetically sawed down the exotic trees and Steve Woodhall's bakkie was of great use in carting the branches and refuse bags of plants out of the reserve to the refuse 'skip'. The Parks Department of the Roodepoort City Council supplied a large refuse bin or skip for removing all the rubbish. Besides the exotic plants, tins, bottles, paper and even old rusty guttering had to be removed. Full marks must be given to the pupils of Florida Park High School for their initiative.

However, this will have to be followed up again next year before the plants have seeded themselves. Large numbers of the blackjacks and khakibos had already shed their seeds before we got there this year ensuring next year's crop. Next year, perhaps our Society could become more involved since the reserve was established mainly for the conservation of butterflies such as *Aloeides dentatis* Swierstra. Because of its small size the reserve has to be managed carefully if we do not want the ecology of the area totally destroyed. At the moment there are about 100 species recorded from the reserve of which 50 - 60 are resident and can be found every year.

This does highlight the problems of establishing small reserves to protect a particular butterfly or other insect species. Due to their small size and often close proximity to human habitation (probably the reason for establishing the reserve) they are likely to become rapidly overgrown with exotic plants. Responsible people must therefore be available to check on the reserves and implement remedial measures if necessary. In the case of Lepidoptera our Society should constantly monitor all areas set aside for the protection of rare species and report regularly to the authorities under whose jurisdiction they fall. It is only if we all play our part that the survival of our rare species can be ensured.

Stephen Henning



*Psalis pennatula* (Lymantriidae) larva

## REGIONAL ROUNDUP

In May 1992 Steve Woodhall claimed to have seen a *Fresna nyassae* (Hewitson) in northern Zululand. This claim was treated with considerable circumspection by those informed, myself included. The sighting was explained away as being *A. tettensis* Hopffer or merely over-enthusiasm. It was with great excitement that Clive Quickelberge collected *Fresna nyassae* in South Africa for the first time at the Tembe Elephant Reserve in Zululand during April 1993. Well done to Clive and Steve.

Amazing captures during May are of two *Tirumala petiverana* Doubleday & Hewitson being recorded within a week, the first in central Pietersburg by A. Wannenburg (confirmed by P. Krüger), and a second by Leo Thamm in his garden at Randburg. Perhaps there is a sparse migration on the go or perhaps these specimens came an accidentally from the north, if anyone has any further information please let me know.

Steve Woodhall and Nolan Owen-Johnston also had a great time in Zululand during April and May collecting a number of *A. rabbaiae* Ward and seeing many more. Chris Ficq and Alf Curle had similar luck with *rabbaiae* in Zululand and also found *Borbo ferruginea dondo* Evans. A very rare Geometrid moth *Venilloides inflammata* Warren was found in good numbers on the Lebombo Hills by Chris and Alf and later by Steve and Nolan. Herman Staude asked them to search for it and told them the locality. He was obviously delighted with the results.

Chris Ficq visited Durban and recorded some fine *C. erone* (Angas) and *C. anchises* (Gerstaecker), and also saw a *H. deceptor* (Trimen) on the Bluff.

Members of the Society visited Hazyview from the 8-12th April and Pieter Roos provided a list of 67 species. Interesting records included *C. castor flavifasciatus* Butler feeding on 'doggydoo' and lots of *L. labdaca laius* Trimen. Nonah du Toit gives a brief account of the trip: "LepSoc members Lindsay Durham, Peter and Keith Roos, my son Pierre and myself, accompanied by a few friends and family members spent an enjoyable long weekend over Easter on Mr Japie Lubbe's farm 'Brandwag', 10km out of Hazyview on the R536 to Sabie. In addition to the specimens caught (checklist provided) a few larvae were also taken home. In particular, a *P. demodocus* Esper fourth instar (which unfortunately harboured four bristle fly larvae which caused its untimely demise), an *Amauris echeria* Stoll final instar, which shortly after pupated into a lovely mother-of-pearl pupa, and four *P. nireus lyaeus* Doubleday, which were given to one of Mr Lubbe's sons, who has now started collecting. Peter got a bit wet when the bridge over the Sabaan River collapsed under him. Lindsay went 'hilltopping' with Peter, and subsequently found herself in blackjacks over her head while all the butterflies congregated along the river down below. We remember Lindsay's red hat bobbing along while she called plaintively 'Peter? Peter, where are you?'. Four monkey moths and three hawk moths were also caught.

Colin Walmsley from the Waterfall area of Durban writes that there was a great deal of butterfly activity during February and March with *P. (P.) demodocus* in great numbers during February and apparently migrating. *G. (A.) leonidas* (Fabricius) with pale blue and not the usual white markings were also recorded. A list of over thirty species mainly from his garden was also provided which included *C. druceanus cinadon* Hewitson and *C. ethalion ethalion* Boisduval.

An overseas member Curtis Callahan made a brief weekend visit to the Hennings at the end of May. He flew up from Maputo where he is briefly working. Curtis is a Neotropical Riodinid specialist but has worked sporadically in Africa over the last few years. He spent some time with Stephen and myself visiting the Ruimsig Entomological Reserve, Strubens Valley, Pienaars River and Warmbaths. While the first two localities were expected to produce nothing the latter two were amazingly devoid of butterflies. We can only attribute

this to the drought. It was a pleasure to spend time with Curtis who knows a number of our overseas members.

John Joannou is still recording the odd *Andronymus neander* (Plotz) in his garden at Krugersdorp.

Do let us know of your captures so that we may share your experiences with your fellow members. My phone number at home is (011) 768-1949 and during office hours is (011) 474-1466. I hope to hear from you.

Graham Henning



*Torynesis orangica* male underside

**PHYLOGENETIC NOTES ON THE AFRICAN SPECIES  
OF THE SUBFAMILY ACRAEINAE - PART 3**

**(Lepidoptera: Nymphalidae)**

By G.A. Henning

17 Sonderend Str., Helderkruijn, 1724.

**Abstract.** The subfamily Acraeinae is analysed and a phylogenetic arrangement of species is presented in an annotated list. The Subtribe Actinotina of Tribe Acraeini and Tribe Pardopsidini are dealt with as well as relevant notes on Acraeid mating behaviour and mimicry.

**Key Words:** *Acraea*; *Hyalites*; taxonomy; phylogeny; species group; mating; mimicry.

**Introduction**

In Parts 1 & 2 the Taxonomy of the subfamily has been discussed and a phylogenetic arrangement presented for subtribe Acraeina. This part details the phylogenetic relationships of the remaining taxa with notes on mating and mimicry.

**Method**

A detailed phylogenetic analysis of species is presented, annotated by taxonomic codes and codes to habitat and distribution. A discussion of the mating and mimicry considerations for the Acraeinae is also included.

**PHYLOGENETIC ANALYSIS OF THE ACRAEINAE IN AFRICA**

**Habitat and Distribution**

The codes used in Part 2 serve to annotate each species and indicates in many instances the isolating factors responsible for the development of the species.

**Taxonomic Code**

The codes used are those detailed in Part 2.

**Tribe ACRAEINI**

**Subtribe ACTINOTINA**

**Genus** *Actinote* Hübner  
(Pierre 1987 a - *Actinote* group 6c) South American

**Genus** *Hyalites* Doubleday  
**Subgenus** *Hyalites* Doubleday  
(Pierre 1987a - *Actinote* groups 3,4,5 & 6a + *Acraea* group 1)

A - Aedeagus moderately long and elongated but not narrow.

**SUPER-GROUP VII - *encedon***

- A - Aedeagus moderately long and elongated but not narrow.  
 B - Uncus comparatively short.  
 C - Valve elongate extending beyond tip of uncus, ventrally pronounced at the base.  
 H - Hindwing spots in an arrangement whereby the central row is joined to the row below the apex forming a curved or angled row of spots. ie 7 :2 configuration. (H3 + H4)

**SPECIES GROUP 17. *encedon* - (Van Son group 11) (H3 + H4)**

Male genitalia: Valve long and elongated and distally rounded.

Foodplants; Urticaceae, Fabaceae, Commelinaceae,

## Subgroup 17a.

Medium sized with subapical bar complete.

subgroup 17a1. - vinculum broad.

*H. (H.) esebria* (Hew. 1861) [F, SA + SC + EA]

*H. (H.) alciope* (Hew. 1852) [F, WA + WC + CA + NE]

*H. (H.) aurivillii* (St. 1896) [F, WC + CA + EA]

*H. (H.) masaris* (Ob. 1893) [F, Comores]

subgroup 17a2. - vinculum narrow.

*H. (H.) jodutta* (F. 1793) [F, WA + WC + CA + NE]

## Subgroup 17b.

subgroup 17b1. - small with rounded wingshape, subapical bar on forewing complete.

*H. (H.) disjuncta* (S. 1898) [F + H, CA + EA]

*H. (H.) alciopoides* U. & T. 1921) [F, CA]

subgroup 17b2. - small with angular wingshape, subapical bar on forewing broken into spots, large spot in cell of forewing.

*H. (H.) ansorgei* (S. 1898) [F + H, CA + EA]

*H. (H.) acuta* (Howarth 1969) [F + H, EA] Tanzania, Malawi & Zambia.

*H. (H.) conjuncta* (S. 1898) [F, EA]

subgroup 17b3. - medium size with elongate wingshape, subapical bar broken into spots, if spots confluent then resulting patch irregular in shape.

*H. (H.) johnstoni* (C. 1885) [F, NE + EA + SC]

*H. (H.) lycoa* (Gt. 1819) [F, WA + WC + CA + EA]

*H. (H.) butleri* (Aur. 1898) [F, CA] West Uganda and Kivu (Zaire).

Subgroup 17c. (revised Pierre 1985b)

'*Danaus chrysippus*' pattern.

*H. (H.) encedon* (L. 1758) [F + S, TH] East African origin.

*H. (H.) encedana* (Pierre 1976) [F, WA + WC + CA + EA] West African origin.

*H. (H.) necoda* (Hew. 1861) [F + H NE] Ethiopia.

*H. (H.) encoda* (Pierre 1981) [F, CA] Central African origin.



**SUPER-GROUP VIII - *bonasia***

A - Aedeagus elongated but not narrow.

B - Uncus short.

C - Valve short, not extending beyond tip of uncus.

D - Saccus short.

H - Hindwing spots in an arrangement whereby the central row is joined to the row below the apex forming a curved or angled row of spots. ie 7:2 configuration. (H3 + H4) Some species in subgroup 19 have the outer row irregular, the spot in M2 being placed basad.

**SPECIES GROUP 18. *bonasia* - (Van Son group 10) (H3+H4)**

Male genitalia: Valve short, broad, upturned distally to acute apex (sickle shape).

Female genitalia: Sterigma shield-shaped without prominent posterior ridge.

Foodplants: Convolvulaceae, Tiliaceae, Sterculiaceae, Malvaceae, Solanaceae, Caesalpinioideae, Rosaceae, Lythraceae, Convolvulaceae, Poaceae (*Zea*)

## Subgroup 18a.

Broad and complete basal area on hindwing underside.

*H. (H.) althoffi* (D. 1889) [F, WC+ CA]

*H. (H.) oberthueri* (B. 1895) [F, WC +CA]

*H. (H.) acerata* (Hew. 1874) [W +M, TH excl. SA]

*H. (H.) pseudopaea* (Dudgeon 1909) [F,WA]

## Subgroup 18b.

Small and complete basal area on hindwing underside.

*H. (H.) viviana* (St. 1896) [F, WC+ CA]

*H. (H.) cabira* (Hop. 1855) [F + W, SA+ SC+ EA]

*H. (H.) sotikensis* (Sh. 1891) [F, NE+ EA+ CA+ WC]

## Subgroup 18c.

Basal area on hindwing underside incomplete.

*H. (H.) burgessi* (Jackson 1956) [F+H, CA]

*H. (H.) excelsior* (Sh. 1891) [F + H, EA]

*H. (H.) goetzei* (Thur. 1903) [F + H, SC +EA] ,

## Subgroup 18d.

Basal area of hindwing underside consists of a line of subbasal marks.

*H. (H.) uvui* (S. 1890) [F+H, WC+CA+EA]

*H. (H.) lumiri* (BB 1908) [F, WC+ CA]

*H. (H.) bonasia* (f. 1775) [F+W, WA+WC+CA+NE+EA]

*H. (H.) alicia* (Sh. 1890) [F + H, WC+ CA+ EA]

## Subgroup 18e.

Subbasal spots on hindwing underside forming double lines with reddish between.

*H. (H.) ventura* (Hew. 1877) [M + W, SC +EA]

*H. (H.) rangatana* (Elt. 1912) [M + H, NE+EA]

- H. (H.) ochrascens* (Sh. 1902) [M, CA]  
*H. (H.) bettiana* (Talbot 1921) [H + F, CA]  
*H. (H.) pierrei* (Berger 1981) [H, CA] North Kivu, Zaire.  
*H. (H.) hecgui* (Berger 1981) [H, CA] South Kivu, Zaire.  
*H. (H.) maji* (Carp. 1935) [H, NE]

Subgroup 18f.

Subbasal area of hindwing underside with separate spots.

- H. (H.) eponina* (Cr. 1780) [M + W, TH]

**SPECIES GROUP 19. obeira** - (Van Son group 9) (H3)

Male genitalia: Very similar to subgroup 117.

Female genitalia: Sterigma shield shaped with prominent posterior ridge.

Pupa: Some species have tiny protuberances (spines) in the dorsal and dorso-lateral spots of the abdomen. This character is present in *Actinote*. Recorded in *obeira* and *pentapolis*.

Foodplants: Moraceae, Cecropiaceae, Compositaceae, Urticaceae, Asteraceae

Subgroup 19a.

Forewing upperside largely red.

- H. (H.) buschbecki* (D. 1889) [F, WC +CA]

Subgroup 19b.

Forewing upperside dark veined, red medially and white subapically. Hindwing spots restricted basally.

- H. (H.) fornax* (B. 1879) [MA]  
*H. (H.) grosvenori* (Eit. 1912) [F + H, CA]  
*H. (H.) peneleos* (W. 1871) [F, WC+ CA+ NE]  
*H. (H.) pelopeia* (St. 1896) [F, WA+ WC+ CA]

Subgroup 19c.

Forewing upperside dark veined hyaline, hindwing ochreous.

- H. (H.) circeis* (Dr. 1782) [F, WA+ WC]

Subgroup 19d.

Base of hindwing upperside with a broad black coalesced patch.

- H. (H.) amicitiae* (Heron 1909) [F + H, CA]  
*H. (H.) baxteri* (Sh. 1902) [F + H, EA]

Subgroup 19e.

Forewing spotted and not hyaline. Hindwing spots irregular.

- H. (H.) pharsalus* (W. 1871) [F, WA+WC+CA+EA+SC]  
*H. (H.) vuilloti* (M. 1888) [F + H, EA]  
*H. (H.) insularis* (Sh. 1893) [Sao Thome]

Subgroup 19f.

Forewing semi-hyaline, hindwing series of spots evenly curved.

- H. (H.) orestia* (Hew. 1874) [F, WC+CA]  
*H. (H.) strattipocles* (Ob. 1893) [MA]  
*H. (H.) masamba* (W. 1872) [MA]

*H. (H.) sambavae* (W. 1873) [MA]

Subgroup 19g.

Forewing semi-hyaline without spots. Central spot of hindwing distal series (M2) placed basad.

*H. (H.) obeira* (Hew. 1863) (W, MA+SC+SW)

The population on Madagascar probably originated from the mainland.

*H. (H.) lia* (M. 1879) [MA]

*H. (H.) iturina* (S. 1890) [F, WC+ CA]

*H. (H.) rileyi* (Le Doux 1931) [F, CA +EA] Eastern Zaire and Western Tanzania.

*H. (H.) kakana* (Elt. 1911) [F, NE]

*H. (H.) humilis* (Sh. 1897) [F, EA] Uganda and Western Kenya.

*H. (H.) kalinzu* (Carp. 1936) [F + H, CA] Western Uganda and adjoining Zaire.

Subgroup 19h.

Forewing semi-hyaline with black markings. Hindwing without distinct distal row of spots on margin.

*H. (H.) pentapolis* (W. 1871) [F, WA+WC+CA+EA+SC]

*H. (H.) vesperalis* (S. 1890) [F, WA+ WC+ CA]

#### **SUPER-GROUP IX - *cerasa***

A - Aedeagus moderately long, narrowing distally, flattened and wide.

B - Uncus comparatively short, distally bifid.

C - Valve narrow for distal half, basal half broadly rounded; extends to tip of uncus, dorsally pronounced at the base; inner edge of valve with small teeth.

H - Hindwing spots in an arrangement whereby the central row is joined to the row below the apex forming a curved or angled row of spots. i.e. 7:2 configuration. (H3)

There are distinctive differences in the scales and the sphragium. (Pierre 1987a)

Larva: The spines on the first four segments are considerably longer than those posteriorly. They also only possess a terminal bristle. The larva when disturbed has the habit of arching the front segments and throwing forward these long spines into a bunch over the head (van Someren & Rogers 1925). Movable spines are only recorded in the genus *Pardopsis*.

Pupa: As with species group 19 there are short protuberances emanating from the centres of the dorsal and dorso-lateral spots on the abdomen. The pupa is also rather squat and distinctly curved.

This group was allocated to subgenus *Acraea* by Pierre 1987a. The apparent groove in the claw is not as pronounced as in others of subgenus *Acraea*, and is not considered the same character. The claws are also not as asymmetrical as compared to the other species in subgenus *Acraea*. The aedeagus and spot configuration align it with subgenus *Hyalites*. The pupa also has tiny protuberances from the dorsal spots which also aligns it with *obeira* and *pentapolis* of *Hyalites*.

It is possible that the different larva and pupa along with the other peculiar characteristics of these two butterflies indicate that they represent a different genus or subgenus. The distinctive characteristics of this group were noted by Pierre 1987a. Further research is required before a conclusion can be reached.

**SPECIES GROUP 20** - *cerasa* (Van Son group 4) (H3)

Male genitalia: Valve broad basally narrowing distally with small teeth on the inner edge of the valve.

Foodplants: Flacourtiaceae, Violaceae, Euphorbiaceae

*H. (H.) cerasa* (Hew. 1861) [F + H, SA+SC +EA]

*H. (H.) kraka* (Aur. 1893) [F + H, WC +CA]

Subgenus *Auracraea* Henning

(Pierre 1987a - *Actinote* group 6b)

A - Aedeagus moderately long, narrowing distally, elongate but not narrow.

**SUPER-GROUP X** - *rahira*

A -Aedeagus moderately long, narrowing distally, elongate but not narrow.

B - Uncus moderately long.

C - Valve broad, upturned distally, does not reach end of uncus.

H - Hindwing spots in an arrangement whereby the central row is joined to the row below the apex forming a curved or angled row of spots. i.e. 7:2 configuration. (H3)

Foodplants: Rosaceae, Fabaceae, [Passifloraceae?], Turneraceae, Polygonaceae

**SPECIES GROUP 21** - *rahira*

Subgroup 21a.

Hindwing upperside without distinctly spotted marginal band. Labial palps ochreous.

*H. (A) guichardi* (Gabriel 1949) [NE]

*H. (A) rahira* (Boisd. 1833) [M, SA +SC+ SW+ EA]

*H. (A.) zitja* (Boisd. 1833) [W, MA]

*H. (A) calida* (Butler 1878) [W, MA]

This subgroup could have developed on Madagascar and subsequently invaded the mainland, a return invasion by *rahira* could have resulted in *calida*.

Subgroup 21 b.

Hindwing upperside with distinctly spotted marginal band. Labial palps ochreous.

This entire subgroup has very similar genitalia, even those taxa which are clearly distinct. For this reason most of the species have been lumped into one species, namely *anacreon*. From a study of many specimens it is clear that *anacreon* only occurs in South Africa and eastern Zimbabwe and that many of the so-called subspecies are not geographically isolated but retain their distinctive characters.

*H. (A) anacreon* (T. 1868) [M + G + H, SA]

Only found in South Africa and the eastern highlands of Zimbabwe. No specimens conforming to true *anacreon* have been found in any of the material examined from north of Inyanga. Sympatric with *bomba* and *induna* in eastern Zimbabwe.

*H. (A) bomba* (S. 1889) stat. rev. [W, EA+ SC]

The original description states; 'Upperside. Both wings bright brown. Anterior wing with apex broadly dark brown'. The apical patch is generally smaller than that of *induna*, and often spotted, ground colour browner than *induna* with which it was previously confused, the distal portion of the male abdomen is unspotted. The basal dark area of the hindwing upperside generally absent.

These characters and its generally smaller size serve to distinguish it from *induna*. The type locality is Namoule, East Africa. Photographs of type examined.

*H. (A.) induna* (T. 1895) stat. rev. [W, SC +SA]

Closer to *bomba* than to *anacreon*, the current opinion expressed recently by Hancock and others is that *induna* is a species distinct from *bomba*. It is distinguishable by the very broad black apical area, the brighter orange colouring and the spotted distal portion of the male abdomen. The type locality is Mashunaland, Zimbabwe.

*H. (A.) lusinga* (Ovit. 1955) stat. rev. [W, CA +SC]

Described from Zaire and formerly thought to be a northern race of *anacreon*. Populations have now been located in western Zambia where there are no geographic barriers between it, *bomba*, or *speciosa*. Each retains its individual characteristics and Heath (unpublished checklist of Zambian Butterflies) comments that in some cases each population favours its own individual habitat type be it grassland or Miombo woodland. The dark apical area and darkened veins with clear subapical spots on the upperside identify this species.

*H. (A.) speciosa* (Wich. 1908) stat. rev. [W, WC+ CA+ SC]

Described from Angola and formerly considered to be the western race of *anacreon*. Populations have now been found in Zaire and western Zambia which are not geographically isolated from the related taxa but the insect retains its described characteristics. The apical patch is generally absent and the veins of the forewing upperside are heavily darkened from the margin to the cell.

- *H. (A.) speciosa occidentalis* (BB. 1926) comb. nov. [W, WC]

Appears similar to *anacreontica* but does not have the restricted row of curved spots on the hindwing. Quite distinctly coloured but apical area and configuration of hindwing spots allies this insect with *speciosa*, and is apparently the northern race of it.

*H. (A.) anacreontica* (S. 1898) stat. nov. [W, EA]

Formerly considered to be a race of *anacreon* but the configuration of the hindwing spots of this insect clearly indicate specific distinction. This being the case then the following race belongs to this species and not to *anacreon*. The hindwing spots are much closer to the base than other related species.

- *H. (A.) anacreontica chyulu* (v. Som. 1939) comb. nov. [W, EA]

*H. (A.) wigginsi* (N. 1904) stat. rev. [W, WC +CA]

Considered by Berger 1981 to be a distinct species. It was sunk to a synonym of *anacreontica* by Carcasson 1981. Separate populations of *wigginsi* have been found in Cameroon and Zaire which indicate that it is not merely a form of *anacreontica* (Berger 1981). Pierre 1987a does not list *wigginsi* as a species.

Subgroup 21 c.

Hindwing of upperside without distinctly spotted marginal band. Labial palps dark

brown, club of antenna strongly spatulate.

*H. (A.) mirifica* (Lathy 1906) [C + M, SW +SC]

Subgenus *Alacria* Henning

(Pierre 1987a -*Actinote* groups 1 & 2)

A - Aedeagus short and broad, distally truncate, basally bulbous.

**SUPER GROUP X - *parrhasia***

A - Aedeagus short and broad.

B - Uncus small.

C - Valves broadly elongate, ventrally pronounced.

H - Hindwing spot arrangement whereby the row below the apex is joined to the central row creating an erratic arrangement of spots. i.e. 7:2 configuration. Spots restricted to the basal area of the hindwing (H2).

**SPECIES GROUP 22 - *parrhasia*** (Van Son group 8) (H2)

Male genitalia; Valves elongate extending beyond the tip of the short uncus.

Foodplants; Urticaceae, Moraceae, [Passifloraceae?], Dioscoreaceae

Subgroup 22a.

Forewing upperside basally red without broadly darkened veins.

*H. (A.) quirinalis* (S. 1900) [F, CA]

*H. (A.) igola* (T. 1889) [F, EA+ SC+ SA] Extends as far north as the Usambara Mountains in Tanzania.

*H. (A.) aubyni* (Elt. 1912) [F, EA] Kenya coast and northern Tanzania.

*H. (A.) simulata* (Le Doux 1923) [F, EA] Sesse island in Lake Victoria.

Subgroup 22b.

subgroup 22b1.

Hindwing red, forewing markings split into two distinct patches.

*H. (A.) conradti* (Ob. 1893) [F, EA]

*H. (A.) vumbui* (Stevenson 1934) [F + H, SC] stat. nov.

Described as a subspecies of *conradti* this taxon is considered a distinct species.

The male genitalia differ slightly, the valve of *vumbui* being more acute apically, the aedeagus is broader anteriorly. The females are somewhat similar but the males are clearly distinct. Material studied by Van Son 1963 and myself show no integration between *conradti* and *vumbui* in the populations from Zimbabwe and Malawi This integration was one of the primary reasons for the subspecific classification by Stevenson. It must be assumed that he identified some females as males.

*H. (A.) ungemachi* (Le Cerf 1927) [F + H, N E]

subgroup 22 b2.

Hindwing markings red, forewing markings generally a continuous band.

*H. (A.) penelope* (St. 1896) [F, WC + CA]

*H. (A.) newtoni* Sh. 1893) [F, Sao Thome]

subgroup 22b3.

Cell-of forewing upperside largely red, forewing veins broadly darkened.

- H. (A) orina* (Hew. 1874) [F, WA+WC]  
*H. (A) orinata* (Ob. 1893) [F, CA]  
*H. (A) parrhasia* (F. 1793) [F, WA+WC+CA]

subgroup 22b5.

Forewing markings split. Hindwing yellow with base of upperside broadly black.

- H. (A.) safie* (Fld. 1867) [F + H, NE]  
*H. (A.) ntebiae* (Sh. 1897) [F, CA +WC]  
*H. (A.) melanoxantha* (Sh. 1891) [F + H, EA]

subgroup 22b6.

Base of hindwing upperside yellow.

- H. (A.) oreas* (Sh. 1891) [F + H, CA+ EA]  
*H. (A) servona* (Gt. 1819) [F, WC+ CA+ EA]

subgroup 22b7.

Forewing and apical parts of hindwing transparent, hindwing yellow.

- H. (A.) semivitreata* (Aur. 1895) [F, CA + WC]

Subgroup 22c.

Forewing transparent, hindwing colouration very dark red to dark greyish brown.

- H. (A.) cinerea* (N. 1904) [F, CA +EA+ NE]

**SPECIES GROUP 23 - *perenna* (H2)**

Male genitalia; Valve long and elongated with inner margin irregular.

Forewing spotted. Hindwing with submarginal spots.

Foodplants; Euphorbiaceae, Passifloraceae, Menispermaceae, Asteraceae

- H. (A.) perenna* (Dbl. & Hew. 1847) [F, WC+CA+EA+NE]

**SUBGENUS INDETERMINATE - *actinotina***

A little known species which may be a genus or subgenus on its own. No genitalia description is available, no descriptions of legs is available, wing venation incomplete. Provisionally not placed in a subgenus until material available but from the original drawing of the type it appears that the anal vein 3 may be present.

The species *actinotina* (Lathy 1903) was originally described from Nigeria as a *Telipna* (Lepidoptera: Lycaenidae) by Lathy 1903. According to Carcasson 1981 and Pierre 1987a, it is an Acraeid.

Its venation as described and figured in the original paper is as follows: Venation as in *Hyalites* with vein 7 (M1) arising from radial stalk (vein 6) (RS) about 15% of the way along its length. In the description of the species Lathy states; 'The neuration of hindwing resembles that of the genus *Mimacraea*, inasmuch as the subcostal nervules are on a long stalk, but the presence of the praecostal nervure serves to separate it from that genus. It is very curious that this species should bear such a strong superficial resemblance to *Actinote*, a South American genus of the Acraeinae.'

The general wingshape is very rounded, particularly the forewing outer margin, unlike the more elongate wingshapes of the other Acraeids. The hindwing is a semi-transparent brown with darkened veins, unspotted except for seven small black spots right at the wing base. At present no material is available for study so no conclusions can be drawn regarding this species.

- Hyalites actinotina* (Lathy 1903) [F, WA]

## TRIBE PARDOPSIDINI

Genus *Pardopsis* Trimen

A - Aedeagus short and broad flattened dorso-ventrally, expanded and upturned at the tip.

*P. punctatissima* (Boisd. 1833) [F, SA+SC+EA+NE+MA]

### NOTES ON MATING BEHAVIOUR IN THE ACRAEINAE

Mating is the most important aspect of species development and any characteristics related to this function are therefore of phylogenetic importance. Unfortunately the present knowledge of Acraeid mating behaviour is very limited and a concerted effort is needed to fill this void. The following notes are therefore obviously incomplete but will hopefully give some insight into the complexities of the Acraeinae.

#### Courtship and Mating

Mating and courtship has seldom been recorded by previous authors. Marshall 1902 (Eltringham 1912) records that the courtship of Acraeas is a "marriage by capture", the male seizing the female in the air. Another record is by De Vreis 1987 on the genus *Actinote* which apparently describes typical offer and acceptance.

From these two widely differing accounts it is apparent that two quite clearly defined methods of courtship are involved.

#### 1. Capture technique

From personal experience I have recorded the 'capture technique' only in the genus *Acraea*. The male in the following account was apparently attracted to the virgin female from quite some distance away and pursued and attacked her without hesitation. Sight probably plays an important part in the mating of Acraeids but I doubt if the presence or absence of the sphragium is detectable at a distance or would be a strong enough stimulus to provoke such an explosive reaction. The female obviously releases strong pheromones to indicate she is available to mate.

Strong female pheromones are apparently also found in the closely related South American subfamily Heliconiinae where mating is sometimes attempted while the female is still in the pupal case. The following observation was made at Haenertsburg in the northern Transvaal, late into the afternoon.

The male *Acraea* (*Acraea*) *acara* approached the female at speed from behind and slightly to one side. The female was flying in a leisurely fashion up the slope of a grassy hill. The male attacked the female much as a raptor would attack its prey in flight. The male hit the female at full speed with his legs, striking her on the side of the body at the base of the hindwing underside. The female was grasped tightly by the male preventing her from flying and the pair spiralled to the ground. The male held the female tightly to the ground with her head pressed into the base of a tuft of grass. The male then curved his abdomen around until he managed, with difficulty, to engage his genitalia with that of the female. Almost instantly on penetration the male became comatose and slowly, with wings folded, fell sideways to the ground.



The female extricated herself from beneath the male and out of the tuft of grass. After a brief breather she flew away with her mate hanging down behind.

Other species recorded in the genus *Acraea* include *horta*, *satis* and *aglaonice* (Woodhall).

Species of the genus *Hyalites* have also been recorded in similar mating behaviour by various researchers (pers. comm.). Species include *H. (H.) obeira* and *H. (H.) pentapolis* (Bampton & Owen-Johnston).

From the above account several characteristics would hypothetically be required.

a) Both parties would need to be able to easily survive such a violent encounter.

- The *Acraeids* are renowned for their tough integumen and for their ability to take rough handling.

b) The male would require some specialized predatory modifications in order to capture and subdue an insect generally slightly larger than himself.

- The males of the genus *Acraea* have conspicuously asymmetrical claws, the external one being particularly large with a longitudinal furrow on the inner surface, a strengthening design similar to that of a raptor's claw. The four pterothoracic legs are strong and with the large predatory claws they would operate like the talons of a raptor. Symmetrical claws are found in the females and in both sexes of the subgenus *Alacria* of *Hyalites*. The genus *Hyalites* generally have claws that are not all as strongly asymmetrical as that of the genus *Acraea* and they also lack the strengthening furrow in the claw.

c) The male would need to strike the female accurately to enable him to subdue her. If he strikes at her wings she is likely to merely shake him off. The place to strike is the side of her thorax at the base of the hindwing underside, this incapacitates her flight and allows the male to mate on the ground without losing his grip.

- The base of the hindwing in the subgenus *Acraea* have a darkened patch which incorporates white spots reminiscent of the body markings. This apparent extension of the body markings may possibly give the male a larger target to aim at. All the species of the genera *Acraea* and *Hyalites*, as well as *Bematistes*, have spots on the base of the hindwing underside. These spots are absent in the genus *Actinote* which apparently has a different mating behaviour. In addition the marginal spots on the hindwing underside are large and clear and centrally light in colour. These spots possibly serve as markers for the male to home in on the hindwing underside and will possibly also assist the male in assessing the wingbeat rate of the female.

## 2. Courtship

The genus *Actinote* has a courtship which is fairly standard among many butterflies, that of offer and acceptance. De Vreis 1987:185 states "Courtship usually takes place at Inga flowers in the canopy, where at times hundreds of individuals swarm over the blossoms. Males hover over a female and the female responds by either fluttering about in a dance with the male, or by closing her wings, dropping through the air, and escaping his courtship."

This genus lacks the black basal spotting on the hindwing underside and the marginal light spots.

Obviously more observations must be made to substantiate these hypothetical conclusions. It is hoped that these comments may stimulate research in this regard.

## Pheromones

There is evidence that the strong female pheromones are released from the genital area and that the sphragium inhibits the release of these pheromones. I observed a male *horta* attacking a female on the ground. She had a sphragium which, upon investigation, was not firmly placed or had been half torn off. The male would not release her but also could not mate because of the half-attached sphragium. Other females at the same time with intact sphragia were ignored.

## NOTES ON MIMICRY IN THE ACRAEINAE

Mimicry is a phenomenon based on unpalatable species taking on aposematic (warning) colours. Those unpalatable species that resemble each other then converge to present a common pattern to predators - Müllerian mimicry. Palatable species which resemble these aposematic patterns evolve until they too fit into the protective ring - Batesian mimicry. (De Vreis 1987, Turner 1984).

The population of the model in the mimicry ring must be large enough to protect the populations of the mimics. In the Acraeinae there are a number of Müllerian mimics which reinforce the mimicry rings. If the ring had to rely on only one model species then it will lose efficiency. The selective advantage belongs to the more populous morph.

The efficacy of Batesian mimicry is largely dependent on population density. Most large Batesian mimicry rings are therefore confined to the tropical forests of the world where the population density and diversity gives the system the quantities necessary to make it effective. The exception is the *Danaus chrysippus* mimics which are found in open habitats where the model is so common.

The model is obviously disadvantaged by the mimic and would normally evolve away from it. However in mimicry rings with strong Müllerian mimics it would not be practical for all the Müllerian mimics to evolve in unison to prevent the Batesian model from invading their ring.

Müllerian mimicry is a slow process which involves convergence to a mutually beneficial intermediate pattern (Turner, 1984). Müllerian mimicry rings with very few Batesian mimics have formed in the large unpalatable subfamily of the Acraeinae.

Batesian mimicry usually evolves in two stages. The first stage being a major modification towards a similar pattern to that of the model, but a poor mimic. The second stage involves the selection of genes which refine the resemblance of the mimic to the model (Turner, 1984).

In the Acraeinae there appears to be six distinct mimicry rings in the Afrotropical region, two are initiated by Acraeid models and involve extensive Batesian mimicry, two involve Müllerian mimics of Danaids, and two are apparently extensive Müllerian mimicry rings within the Acraeids. Similarities in wing colour and patterns can therefore often be phylogenetically misleading.

These mimicry rings can be listed as follows:

1. *Acraea zetes/acara* mimicry complex.
2. *Bematistes* mimicry complex.
3. *Danaus chrysippus* mimics.
4. *Amauris* mimics.
5. Orange with black spots complex.
6. Clear winged complex.

The first two are major mimicry complexes in the Acraeinae and they support a wide variety of Mullerian and Batesian mimics. Both complexes consist of a number of species from more than one Acraeid genus or subgenus. This is an unusual parallel development of species from different genera and subgenera within the same unpalatable subfamily. The original model in these cases is often difficult to find as the species have developed in parallel. In the first of the two complexes the model is more apparent than in the second. Neither of the first two mimicry complexes are present in the tropical forests of Madagascar. The genus *Bematistes* is absent from Madagascar.

### 1. *Acraea zetes/acara* mimicry complex

In the two genera *Acraea* and *Hyalites*, there is a parallel development in each of the subgenera which presents itself as an effective model in the *zetes/acara* mimicry complex. The major participant in each case is listed below although other species may be involved. *Acraea zetes/acara* is considered the primary model as it has similar members of its species group in areas where no mimicry rings exist. The other species are all forest species and involved in the mimicry ring. *Acraea zetes* represents the western aggregate of the mimicry ring and *Acraea acara* the eastern aggregate.

The western aggregate has darker forewings than the redder eastern aggregate. The two aggregates overlap to a certain extent in western Tanzania and western Malawi.

The mimics listed are the most conspicuous ones, there are other mimics in the mimicry ring. Only butterfly mimics are included, there will probably be mimics among other superfamilies.

#### Primary Model

- *Acraea (Acraea) zetes/acara* (Species group 3)

#### Müllerian Mimics

- *Acraea (Rubraea) egina* (Species group 10)
- *Acraea (Rubraea) abdera* (Species group 13)
  
- *Acraea (Stephenie) rogersi* (Species group 14)
- *Acraea (Stephenie) asboloplintha* (Species group 15)
  
- *Hyalites (Hyalites) pharsalus* (Species group 19)
  
- *Hyalites (Auracraea) wigginsii* (Species group 21)
  
- *Hyalites (Alacria) parrhasia* (Species group 22)
- *Hyalites (Alacria) perenna* (Species group 23)

## Batesian Mimics

- *Papilio antimachus* Dr. (Papilionidae)  
(inconclusive evidence indicates that *antimachus* may be unpalatable)
- *Graphium ridleyanus* (White) (Papilionidae)
- *Telipna acraeoides* (S. & K) (Lycaenidae: Lipteninae)
- *Charaxes acraeoides* Druce (Nymphalidae: Charaxinae)
- *Cymothoe aramis* Hew. (Nymphalidae: Nymphalinae) Female only.
- *Euptera sirene* Staudinger (Nymphalidae: Nymphalinae)
- *Euriphene porphyron* W. (Nymphalidae: Nymphalinae)
- *Pseudacraea clarki* B. & R. (Nymphalidae: Nymphalinae)
- *Pseudacraea boisduvali* (Obi.) (Nymphalidae: Nymphalinae)

**2. *Bematistes* mimicry complex.**

This complex includes the genera *Bematistes* and *Hyalites*. Most species in the representative groups participate in the mimicry ring. The similar genus *Actinote* form their own ring in South America and will not be included in this review. The primary model species cannot be ascertained but the genus *Bematistes* as the predominant participant is assumed to be the primary model.

## Primary model

- *Bematistes* (Species group 16)

## Müllerian Mimics

- *Hyalites (Hyalites) esebria* (Species group 17a)
- *Hyalites (Hyalites) althoffi* (Species group 18)
- *Hyalites (Alacria) vumbui* (Species group 22)

## Batesian Mimics

- *Papilio dardanus* Brown (Papilionidae) Females only.
- *Papilio echerioides* T. (Papilionidae) Underside only.
- *Papilio cynorta* Fab. (Papilionidae) Females only.
  
- *Telipna* spp. (Lycaenidae: Lipteninae)
- *Mimacraea* spp. (Lycaenidae: Lipteninae)
- *Ornipholidotos* spp. (Lycaenidae: Lipteninae)
  
- *Charaxes fournierae* Le Moulton (Nymphalidae: Charaxinae)
  
- *Euphaedra adonina* (Hew.) (Nymphalidae: Nymphalinae)
- *Pseudacraea eurytus* (L.) (Nymphalidae: Nymphalinae)
- *Pseudacraea kuenowi* D. (Nymphalidae: Nymphalinae)
- *Neptis ochracea* N. (Nymphalidae: Nymphalinae)
  
- *Elymnias bammakoo* (Obi.) (Satyridae)

### 3. *Danaus chrysippus* mimics

In the case of the model *Danaus chrysippus* it is so common that it can virtually support the mimicry ring on its own. But even in this case it is given support by the forms of the common Acraeid *Hyalites* (*H.*) *encedon* and its relatives (Species group 17). *Chrysippus* mimics are also found in the Genus *Acraea*: *Acraea* (*Stephenia*) *rhodesiana*. The *chrysippus* mimics are found in open habitats.

A full list of *chrysippus* mimics is beyond the scope of this paper.

### 4. *Amauris* mimics

Similarly *Hyalites* (*H.*) *johnstoni* and related species support the mimicry ring surrounding the yellow hindwing members of the Danaid genus *Amauris*.

### 5. Orange with black spots complex

One common aposematic colour pattern found in the Acraeids is the bright orange ground colour with black spots. Many species in the Genus *Acraea* (all subgenera) participate in the mimicry ring as well as the *Hyalites* subgenus *Auracraea* and the genus *Pardopsis*. Most of these species are not forest dwellers and have not apparently attracted many Batesian mimics into the ring. Some members of the lycaenid genus *Pentila* may be considered Batesian mimics.

### 6. Clear winged complex

Clear patches on forewings are a feature of *Acraea* subgenus *Acraea* and *Hyalites* subgenus *Hyalites* with a few examples in subgenus *Alacria*. Some species have clear margins on the hindwings as well. This mimicry ring is particularly conspicuous on Madagascar. A feature of some of the Madagascan species is also the coalescing of the hindwing spots. There does not appear to be any Batesian mimics among the butterflies. In South America there is a distinct mimicry ring of clear winged species involving both Müllerian and Batesian mimics (De Vreis 1987). The clear winged complex incorporates both forest and open habitats.

## Discussion

The phylogenetics presented in this paper will hopefully add to our understanding of the Acraeinae. There will obviously be disagreements and this will possibly stimulate research. The papers by Pierre have made a major contribution towards this work. There is still much to be done on mating behaviour and I hope more research will solve some of the outstanding questions. Both the mating behaviour and mimicry sections are extremely important to the understanding of the subfamily and while the conclusions reached are fairly hypothetical they will serve to stimulate more interest.

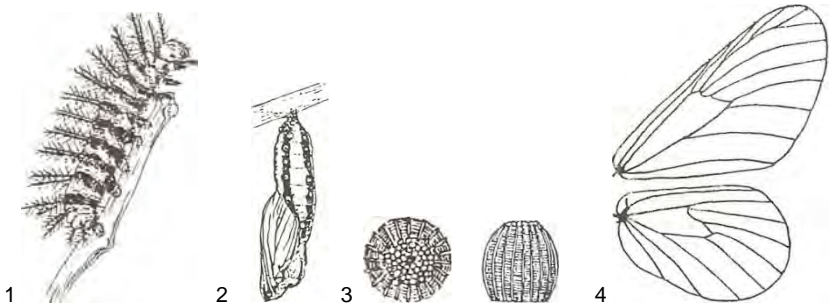
## Acknowledgments

My thanks to my brother Stephen Henning for his assistance, and to Steve Collins and Alan Heath for their generous help. My thanks also to my father Bill Henning, Prof. A. Koçak and Ivan Bampton for advice.

AUTHORS' ABBREVIATIONS - As used by Carcasson 1981.

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Family Acraeinae. 1. Typical final instar larva. 2. Typical pupa. 3. Typical egg top and side view. 4. Typical wing-shape and venation.

## PETERS' MOUNTAIN RINGLET

By Colin Congdon

P.O. Box 40, Mufindi, Tanzania

Ivan Bampton didn't really arrive; he seemed to materialise, complete with pockets, pouches, polybags and pillboxes. This time he had a young Frenchman with him, Emanuel, who was training to be a butterfly breeder. At the same time Dot Steane was passing through with her travelling companion, Jan. Dot is an enchanting young Tasmanian botanist, on a Rhodes scholarship to Oxford.

So on the Sunday morning we all bundled into the Patrol and set off for the mountains. The first two hours are down the Great North Road towards Mbeya, and then, if you know where to look, there is an insignificant track to the left, leading off through a village. The track runs along the Ndumbi River for a while, at about 1 200m, before forking left again into the hills. Here it runs up a knife-edged ridge through *Brachystegia* woodland, with some truly horrifying drops on either side, before emerging onto a wide, cultivated ledge at about 2 000m. It runs across this for half an hour, crossing several small rivers on what only an optimist could call bridges. Then at last the final climb up onto the north east flank of Mtorwi Mountain.

We parked where the track cuts through a tongue of forest at 2 400m, and all piled out in search of trophies.

To be honest it wasn't much of a day. Very little sun and very little flying. Ivan and I searched all the usual foodplants. I was hoping for more *Charaxes ansorgei levicki* on the *Bersama*, having found two earlier in the year. And of course we searched all the *Proteas* for *Capys* larvae. Too early. Try again in May. There are at least three *Capys* here, hardly surprising as there must be half a dozen species of *Protea*.

I thought I would try the *P. wentzeli*, whose pink flowers and silver foliage I could see further up the mountain on a small rocky outcrop. No *Capys*. Only a scruffy little brown thing flitting above the grass and in among the aptly named *Moraea callista*. It was Peters' Mountain Ringlet (*Neocoenyra petersi* Kielland 1990) rediscovered 41 years to the day from the original capture on 24th January, 1952.

We were at 2 550m.

Ivan and I took all we could find in this little patch of short grass, and then went on to search the slopes above, but without success as the weather was closing in. Just as we turned back at about 2 700m Ivan collected a handful of a beautiful purple heather. We would need it for the Club later that evening. It was Burns Night. .

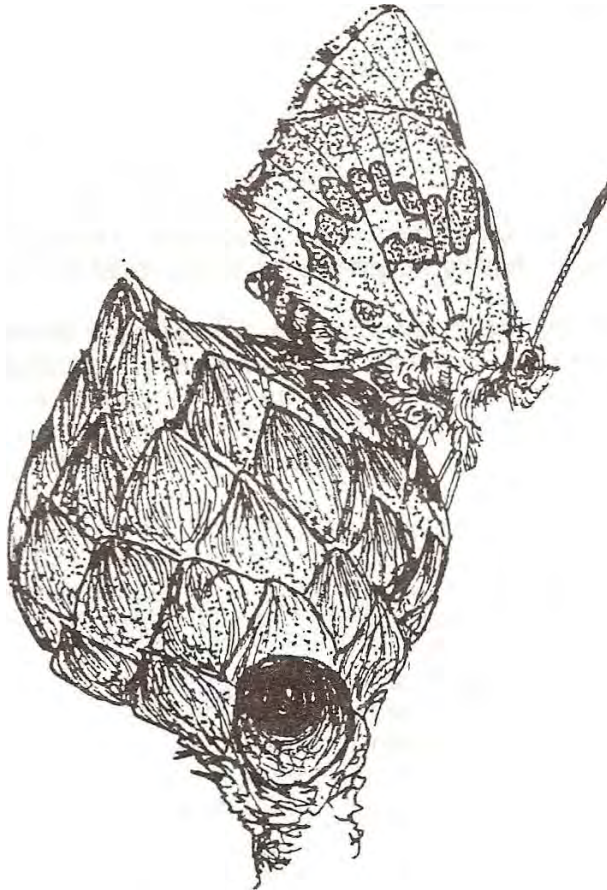
The next Sunday I went back alone, through endless sheeting rain, ground my way up the knife-edged ridge, slithered and crabbed across the ledge before the final soggy assault on the mountain. Eventually the rain eased to a fine drizzle, the sky lightened a little, and the world began to steam gently. I bumped out and squelched around, and took another eight Ringlets in the few minutes before the downpour resumed, picking up one or two with my fingers.

The next Sunday dawned clear, bright, still and cloudless. Too good to last. By the time I got back to Mtorwi the clouds were already heaping on the mountain, but this time there were sunny gaps. I went back onto the higher slopes Ivan and I had searched unsuccessfully two weeks earlier. Ringlets everywhere. I followed them right up to the hilltop at 2 800m. The highest point, 2 960m, is a couple of miles to the west, and I set off towards it. Before long thunder was rumbling round the hills, the wind began to blow chill and cloud enveloped the mountain. Time to head back.

Looking through the specimens, two things are clear. The male: female ratio is close to 10:1 and on average the females are smaller than the males. On these high, windswept slopes of snort grass a large wing area could be a liability. The males may need it to find the females, but the females aren't going anywhere much.

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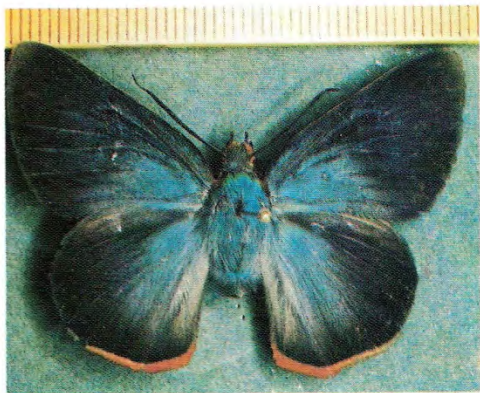
*Capys penningtoni*, freshly emerged male on Protea head.



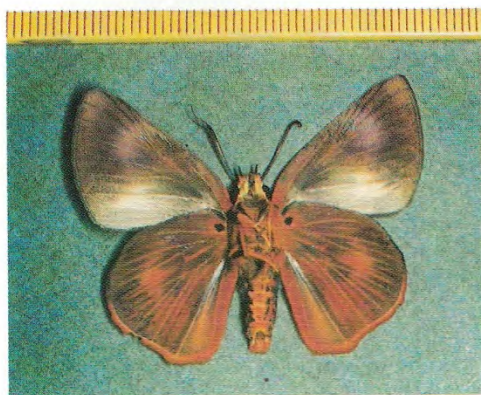
PLATE A



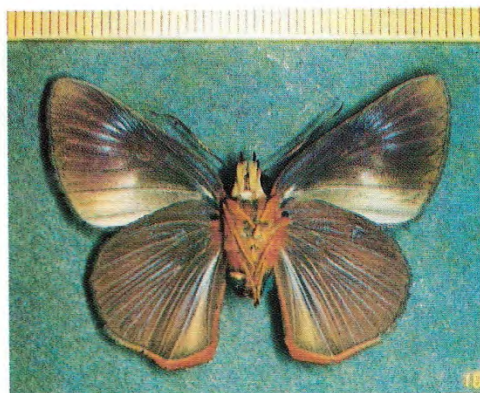
(1)



(2)



(3)



(4)

HESPERIIDAE -

A *Bibasis oedipodea belesis*

1 adult female (upperside)

3 adult female (underside)

N.B. Measurement 1 space= 1 mm

B *Bibasis tuckeri*

2 adult female (ups)

4 adult female (uns)

PLATE B



1 ST



2 ND



3 RD



4 TH



5 TH



6 TH



7 TH



HESPERIIDAE

*Bibasis oedipodea belesis* – 1<sup>st</sup> to final instar larvae head capsules with fully grown larvae and pupae. N.B. measurement 1 space = 1 mm

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## IDENTIFYING SKIPPERS AT LARVAL STAGE (LEPIDOPTERA: HESPERIIDAE)

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**Abstract:** Currently, skippers, members of the HesperIIDae family, are usually identified by dissecting their genitalia. It is suggested that skippers can be readily identified by examining the colouration and pattern on the head capsules of larvae. This paper explores the characteristics on the colouration and pattern on head capsules of larvae as an alternative tool for identifying skippers.

**Keywords:** Skippers; HesperIIDae; identification; genitalia; larval stage; life history; sexual dimorphism.

### Introduction

Skippers, species belonging to the family of HesperIIDae, are generally difficult to identify due to their similarity in colouration and wing patterns. Traditionally, academics dissect their genitalia to identify them as their genitalia is the least susceptible to change during their evolution. However, it is suggested that different species can be easily distinguished by observing the head capsules of larvae.

### Larval characteristics

All larvae of the HesperIIDae family during their larval stages appear simple and similar having the same setal arrangement with very large and rounded heads, and their prothoraxes are narrowed in forming a distinct "neck". The bodies are sometimes covered with tiny hairs, some even having "anal plates" at the end of their abdomen, but the colour pattern on the head capsules vary depending on each particular species. These differences in colouration and pattern can be easily recognised even by amateurs. Different colour forms within a species are at the same time not evident, and many species have specific foodplants which restrict genetic divergence. This is further supported by the fact that skippers do not fly far from their hostplants and few species migrate. As a result, the colouration and pattern on the head capsules can be used as another tool for identification purposes.

### Observation

From repeated rearing of offspring collected in the wild, it is shown that the colouration and pattern on the head capsule is constant over generations of the same species. The colouration and patterns are unique for each species. Some species may even show distinct sexual dimorphism on their head capsules rather than the slight difference in body size and colouration on their abdomens; the colour of the female larvae generally is paler when compared to the male. The head capsules of the subspecies of the same species may even resemble each other.

However, this is the only result from the limited rearings on several species from Hong Kong and Malaysia including *Telicota ohara* and *Astictopterus jama*. The HesperIIDae in the South East Asia area is divided into three subfamilies - Coeliadinae, Pyrginae and Hesperinae.

The Hesperinae is the only subfamily of skippers that feeds on monocotyledons, and identification of members of this subfamily is usually a problem for amateurs without resorting to dissection of their genitalia due to the similarity in wing patterns.

Two female *Bibasis* adults of the Coeliadinae group are illustrated in plate A; one was collected in Hong Kong and the other from the Cameron Highlands in Malaysia. They are the most colourful of the Hesperidae family and identification of the adult generally creates no specific problem. The colouration and the pattern on the illustrated adult females of *Bibasis oedipodea* and *Bibasis turkeri* are so similar that they are hard to identify. However, they differ tremendously in appearance during their larval stages. Their larvae in their final instar stage and respective pupal forms are also illustrated with their head capsules of the first instar to the final mature larvae in plate B and C. The male and female larvae are similar with no apparent difference. They all feed on the same foodplant (*Hiptage benghalensis*- Malpighiaceae) found both in Hong Kong and in Malaysia.

Two larvae of *Hasora vitta* are shown in plate D. These two larvae were reared from the same batch collected in the field. They resemble each other until their final instar stage. The female forehead then will turn red after turning into its fourth instar stage of the final instar while the forehead of the male will remain brownish black in colour.

Three different fully grown *Telicota* and *Pelopidas* larvae in their final instar stage belonging to the Hesperinae group are illustrated in plate E for ease of comparison without referring to their earlier instar stages. The fact is that the difference in colouration in the first and second instar stages in certain species may not be distinct enough to separate them clearly as they are usually very small in size and their head capsules are in shades of black. The difference in colouration and pattern in the head capsules of the six illustrated species can be readily distinguishable. Plate E and F also show several other species with their distinctive foreheads.

## Conclusion

The difference in colouration and pattern on the head capsule of larvae can be a useful tool for the purpose of identification. However, one may note that the difference in colouration and pattern on foreheads in the early instar stages of several subfamilies may not clearly separate them into different species as they are usually black in colour. The differences are more evident when they grow older.

There is no apparent difference in the different sexes on the colouration on their foreheads for larvae of some species. The colouration on the head capsule of both male and female of the same species resembles each other, while, other species show distinct sexual dimorphism on their foreheads.

The colour and pattern of subspecies of the same species may also resemble each other. Further study is needed to provide a comprehensive key for identification for skippers at their larval stages. Keeping in mind the different foodplants the larvae feed on and the different colouration and pattern of their head capsules, one will be able to distinguish and identify them.



1 ST



2 ND



3RD



4TH



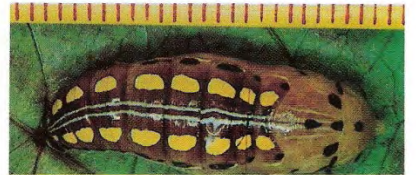
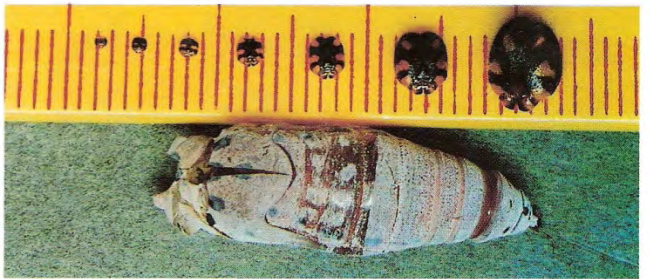
5TH



6TH



7TH



## HESPERIIDAE

*Bibasis tuckeri* - 1st to final instar larvae  
head capsules with emptied pupa case;  
fully grown larva and pupa.

N.B. measurement 1 space = 1 mm



(1)



(2)



(3)



(4)



(5)



(6)

HESPERIIDAE - *Hasora vitta indica*

1 Larva - male's forehead

2 Larva - female's forehead

3 Final instar male larva

4 Final instar female larva

5 Adult male

6 Adult female

N.B. Measurement 1 space = 1 mm



(1)



(2)



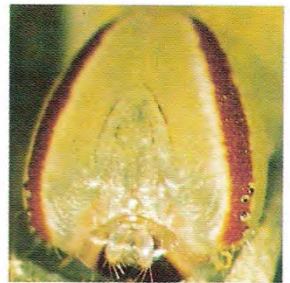
(3)



(4)



(5)



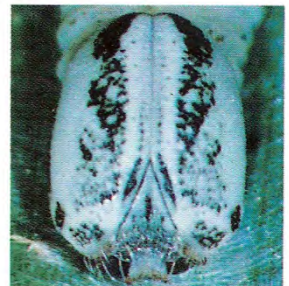
(6)



(7)



(8)



(9)

## HESPERIIDAE

colouration and pattern of foreheads of final instar larva

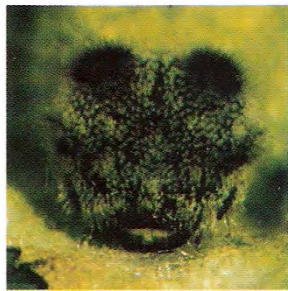
- |   |                                       |
|---|---------------------------------------|
| 1. <i>Telicota ancilla horisha</i>        | 2. <i>Telicota colon stinga</i>       |
| 3. <i>Telicota chara formosana</i>        | 4. <i>Pelopidas assamensis</i>        |
| 5. <i>Pelopidas conjunctus conjunctus</i> | 6. <i>Pelopidas agna agna</i>         |
| 7. <i>Polytrems lubricans lubricans</i>   | 8. <i>Potanthus trachala trachala</i> |
| 9. <i>Suastus gremius gremius</i>         |                                       |



(1)



(2)



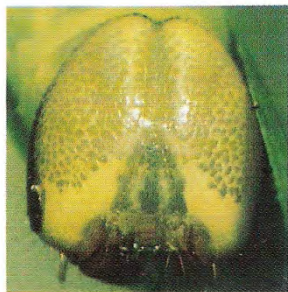
(3)



(4)



(5)



(6)



(7)



(8)



(9)

## HESPERIIDAE

colouration and pattern of foreheads of final instar larva

1. *Borbo cinnara*
2. *Odontoptilum angulatum angulatum*
3. *Abraximorpha davidii*
4. *Bibasis gomata gomata*
5. *Astictopterus jama chinensis*
6. *Caltoris bromus bromus*
7. *Hasora chromus chromus*
8. *Notocrypta curvifascia curvifascia*
9. *Psoolos fuligo fuligo*



**BIOLOGICAL NOTES ON THE EGGAR MOTH *SCHAUSINNA REGIA*  
(GRÜNBERG) (LEPIDOPTERA: LASIOCAMPIDAE)**

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**Abstract.** The taxonomy, distribution and immature stages of the eggar moth *Schausinna regia* (Grünberg) are briefly discussed. This moth has a restricted distribution in south-western Africa, but related species occur in West and East Africa and in Madagascar. The taxonomic status and phylogeny of the species of *Schausinna* is poorly understood, and a revisionary study of the genus is needed. *S. regia* has two apparently distinct populations and colour forms in Namibia; the pale southern one is illustrated for the first time. The larva, pupa and cocoon of *S. regia* are also illustrated in colour for the first time, and the larval foodplants identified. A short account of the life cycle of *S. regia* is given, and its larval and pupal defences are briefly commented on.

### Introduction

Despite its relatively large size and attractiveness (Figs 1-4), *Schausinna regia* is rare in collections, and nothing has been published about its life history. This is largely due to it having a restricted distribution in the arid south-western parts of Africa, occurring mainly in Namibia. In these areas, however, the moth is not at all uncommon, and its characteristic cocoons (Fig. 8) can often be found in fairly large numbers in certain years. To most people, these cocoons are far more familiar than the moth itself, but few know what caterpillar spins these cocoons and what moth hatches out of them. Field observations and breeding experiments over the past few years have enabled me to collect a fair amount of biological information on this beautiful eggar moth, and it is the purpose of this short paper to give a preliminary account of its life history.

### Taxonomy

*Schausinna regia* was described by Grünberg (1910) as *Lasiocampa regia* from five specimens collected in Windhoek and Outjo at the beginning of this century, and illustrated in both sexes. Strand (1912) transferred the species to the genus *Schausinna*, which Aurivillius (1909) had erected shortly before for the slightly larger *Metanastria clementsi* Schaus, 1897 from Sierra Leone. Strand (1912) also treated *regia* as a variety of the similar *S. clementsi* and distinguished both these taxa in a key from the larger and darker *S. affinis* Aurivillius, 1910 from Tanzania and its 'variety' *signata* Strand, 1912 from Ethiopia. Aurivillius (1930) and Collier (1936), however, retained *S. regia* as a species distinct from *S. clementsi*. Aurivillius (1930) and Pinhey ("1975) illustrated the male of *S. regia* in colour, and the latter author also coined the popular name 'Regal Pearl Lappet' for the species.

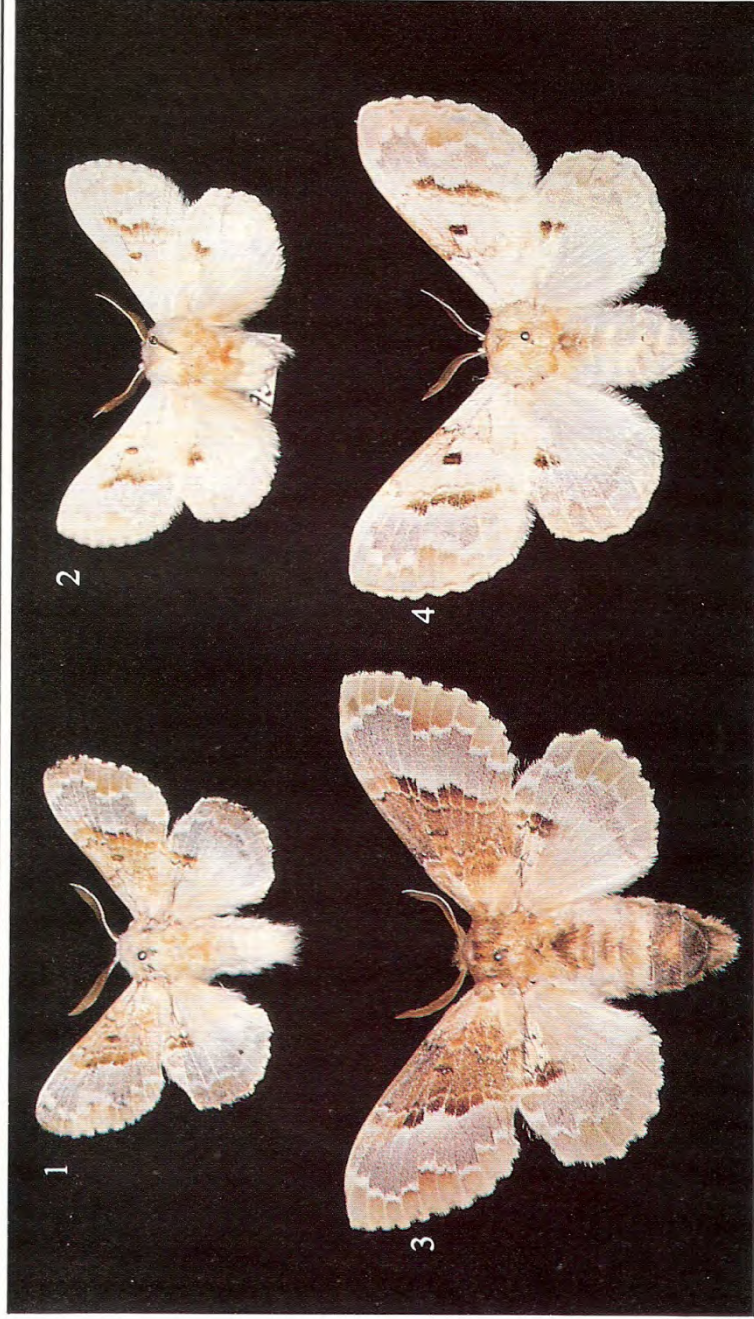
No thorough taxonomic study has been undertaken of the genus *Schausinna* in recent times, but in the interim it seems appropriate to treat *S. clementsi* and *S. regia* as two distinct species because of the differences in their wing markings (Figs 1-5) and their apparent geographical separation. However, the status of the south-central African populations (northern Zambia (fig. 5), Zaire: Katanga) remains to be clarified: these are different from *S. regia* in Namibia and also from proper *S. clementsi* from West Africa.

The distribution and variation range of *S. clements* needs urgent attention; it appears to be a case similar to that of *Epiphora bauhiniae* (Guérin-Ménéville) (Saturniidae), where the Namibian form (*damarensis*) is more similar to the West African one (*bauhiniae*) than either is to the East African populations (Oberprieler 1992). And like a darker species of *Schausinna* occurs in Kenya and Ethiopia (*S. affinis*), so does a darker species of *Epiphora*, *E. atbarina* Butler, in exactly the same region. It thus appears that *Schausinna clements/regia* and *Epiphora bauhiniae* have a very similar range of variation and distribution and probably also a similar zoogeographical and evolutionary history, and a careful taxonomic and phylogenetic comparison of these two taxa promises to be very interesting. Another species of *Schausinna*, *S. goliath*, was described by Viette (1962) from Madagascar, but it is not yet clear now this is related to the continental species.

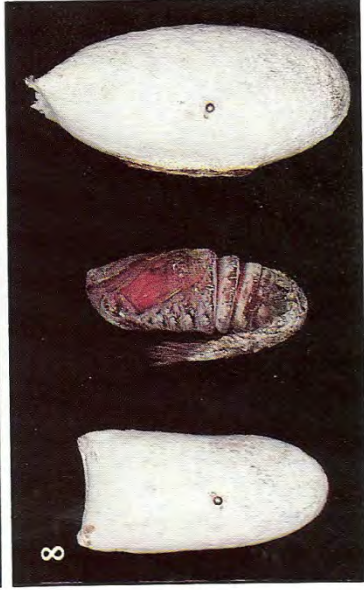
*Schausinna* is placed in the nominate subfamily Lasiocampinae and most closely related to the genera *Eucaera* Tams and *Trichopisthia* Aurivillius, which have a very similar wing venation and agree most conspicuously in the long black scales on the base of the hindwing costa. The larvae of all three of these genera are also similar, having long, soft hairs but no urticating bristles or thoracic tumours of irritating setae, and all feed predominantly on Anacardiaceae. The cocoon of *Eucaera* is very similar to that of *Schausinna*, being smooth with a linear emergence aperture, while that of *Trichopisthia* is more elliptical or round without such a characteristic slit-like opening. *Eucaera* and *Trichopisthia* occur in more tropical to savanna habitats, not in arid regions as *Schausinna* does predominantly.

### Distribution

*Schausinna regia* has so far only been known to occur in the northern central regions of Namibia, having been recorded from Windhoek, Otjiwarongo, Outjo, Otavi, Tsumeb and Grootfontein, but an apparently isolated population of much paler individuals (Figs 2,4, and see below) occurs in the south in the hilly terrain on both sides of the big bend of the Orange River near its mouth, around Rosh Pinah in Namibia and in the Richtersveld in South Africa. It is possible, however, that the species is continuously distributed from the Orange River northwards across the Huib Plateau, the Tiras and Naukluft Mountains and the Khomas-Hochland west of Windhoek to its main distribution range in the north. Its main foodplant, *Ozoroa crassinervia* (see below), has a more or less continuous distribution along this southern escarpment in Namibia, and the Anomalous Emperor Moth, *Imbrasia belina* (Westwood) (Saturniidae), which feeds on the same plant in the southern and central parts of Namibia, also occurs from the Naukluft through the Khomas-Hochland into the north-central parts of the country (Oberprieler 1990). It would be revealing to discover geographically intermediate populations of *S. regia* (e.g. in the Naukluft) and whether these belong to the dark northern or the pale southern colour form, or to an intermediate one. Judging from the distribution ranges of Namibian emperor moths that occur in the same region as *S. regia*, it also seems likely that this egg moth extends its range to the Kavango area in the north-east of the country.



Figs 1-4. *Schausinna regia* (Grünberg). 1 - male of dark northern colour form (Windhoek, February 1993); 2 - male of pale southern colour form (Rosh Pinah, April 1968); 3 - female of dark northern colour form (Windhoek, February 1993); 4 - female of pale southern colour form (Richtersveld; Tatasberg, March 1993). [Magnification  $\pm 0,8X$ ]



Figs 5-8. *Schausinna ? clementsi* (Schaus) and immature stages of *S. regia* (Grünberg). 5 - male of *S. clementsi* (northern Zambia, Kitwe, December 1954); 6 - larva of *S. regia*, 6th instar, lateral view (Windhoek, March 1990); 7 - same larva, dorsal view; 8 - cocoons and pupa of *S. regia* (Windhoek, April 1990); left - male cocoon in front view, middle - male pupa with attached larval skin in lateral view, right - female cocoon in lateral view. [Magnification:  $\pm 0,8X$ ]

## Variation

*Schausinna regia* is fairly uniform in its coloration and wing markings in the northern parts of Namibia, varying a little in darkness but hardly in the extent and development of the various components of the wing pattern. The males (fig. 1) are on average distinctly paler than the females (Fig. 3), but there are relatively dark males and relatively pale females that have the same colour intensity. In some males, the brown median band of the forewing is rather faint and diffused. The females generally have the dorsum of the three apical abdominal segments distinctly darker than the other segments, but in paler specimens this difference is not always that apparent.

In southern Namibia and the Richtersveld, the individuals are much paler than in the north. The males (Fig. 2) have almost white wings and the intricate pattern nearly completely obliterated, except for the dark spots on the wing cells and the irregular, dark median forewing band. The females (fig. 4) are again darker than the males and still have the entire wing pattern preserved, albeit in a much paler version than that in the north. Their body, however, is pure white without darker apical segments. At least the females also vary somewhat in the darkness of their wing pattern, but as this pale southern colour form of *S. regia* is so far only known from five specimens, its entire variability is not yet assessable. The taxonomic distinctness of these two forms of *S. regia* is at the moment difficult to determine, because the southern form is only known from very few specimens and its larva not at all, and because it is unknown whether geographically and morphologically intermediate populations exist between these forms. If constant, nonintergrading morphological differences (including genitalic and larval characters) can be demonstrated in the two forms, whether they are allopatric or overlapping in distribution, a case could perhaps be made for treating them as two distinct species. However, with the little material available at present and since the wing pattern of the two forms is identical except for its darkness and the male genitalia are virtually the same, it is more appropriate to regard these populations merely as colour forms or ecotypes, as the difference in colour intensity is probably environmentally induced by the extremely harsh and arid climate prevailing in the distribution range of the southern form. The third taxonomic alternative, that of treating the two forms as subspecies, is the least attractive and satisfactory one, both because of the poor conceptual basis of the subspecies category (see Wilson & Brown (1953) for a critique) and because of the undesirable constraints that a formal classification and nomenclature of subspecies places on our understanding of the variability and evolution of species, especially in cases such as this one where so few individuals and information about distribution and immature stages are available.

## Food plants

The assessment of the natural foodplants of *S. regia* is complicated by the fact that the larvae leave their foodplants when mature and spin their cocoons on other bushes and trees up to 30m away. In the Windhoek area, for example, the characteristic cocoons of *S. regia* are mostly found on the common thorn-tree *Acacia mellifera*, on which the larvae do not feed at all. In that area, they have so far only been found to feed on *Ozoroa crassinervia* (Namibian Resin Tree) and on *Rhus marlothii* (Bitter Karree) (both Anacardiaceae), and in the Richtersveld they feed on the very similar Green Resin Tree, *O. concolor*, as indicated by frass and larval exuviae found beneath such trees and by cocoons in the immediate vicinity. In captivity the larvae refuse to feed on most other species of *Ozoroa* and *Rhus*, such as *R. lancea*, which also grows around Windhoek, but there may be a few other species of *Ozoroa* and *Rhus* closely related to

*O. crassinervia* and *R. marlothii* that are acceptable as foodplants, either in nature or captivity or both.

Interestingly, *Schausinna regia* can also be reared successfully on the exotic *Schinus terebinthifolius* (Brazilian Pepper Tree) but not on the common Pepper Tree *Schinus molle* (also Anacardiaceae). *Schinus terebinthifolius* is planted extensively in gardens and along streets in Windhoek and other Namibian towns, but it is not known whether *S. regia* naturally feeds on this tree in these urban areas. The moths regularly come to lights even in large cities such as Windhoek, and since the larvae feed on the leaves of *S. terebinthifolius* very readily, it is to be expected that they will indeed naturally utilize this tree as food.

The fact that all the larval foodplants of *S. regia* so far known belong to the Anacardiaceae supports the relationship of *Schausinna* to *Trichopisthia* and *Eucraera*. In South Africa, *Trichopisthia monteiroi* (Druce) and *Eucraera salambo* (Vuillot) feed on the Marula Tree (*Sclerocarya birrea*) and *E. gemmata* (Distant) on *Lannea*, all belonging to the same family. The host records of *Brachystegia* and *Julbernardia* (both Caesalpinaceae) for the latter species of *Eucraera* given by Pinhey (1975) appear to need confirmation.

### Immature stages and life cycle

The females of *S. regia* lay round, bright yellow eggs of about 2.5mm diameter in small clusters onto twigs and leaves of the larval foodplants. The young larvae are gregarious at first and spin a flimsy silken web around the leaves on which they feed, but from about the fourth instar they become solitary. In the early instars they usually feed on the surface of the leaves, 'skeletonizing' these (especially the thick and hard ones of *Ozoroa*), but later they feed from the leaf edges in the usual manner of free-living lepidopteran larvae. There are six larval instars that differ very little from each other, and in the final one the caterpillars can reach a length of 90mm. The final-instar larva (Figs 6-7) is black with only the abdominal prolegs dark brown and with three yellow spots arranged laterally on each segment around the spiracles, and on the dorsum each segment bears three transverse bands of dense, soft, long hairs, the anterior and posterior bands with whitish and the median one with black hairs. Similar hairs occur on the sides of each segment, partially concentrated on slightly elevated areas but on proper tubercles on the thoracic segments. The prothoracic segment has a very pronounced, setiferous tubercle on each side. The head is dark brown with numerous small black spots, the frons black and the clypeus yellowish-white. The larvae in all stages are very mobile and quickly react to disturbances by dropping to the ground, where they crawl away rapidly and do not curl up in defence.

Upon maturity the larvae leave their foodplant and wander off, often for a considerable distance (up to 30m), and finally spin a cocoon in another tree or shrub. The cocoon is constructed within a framework of rather brittle, brownish silk strands, which wear away soon to leave the hard and smooth cocoon firmly attached to a twig along its side. The emergence aperture at the head-end of the cocoon is characteristically transversely linear (Fig. 8), with the lip of the hind edge (the attachment side of the cocoon) shortly folded over the front edge. Underneath this lip, the mouth of the cocoon is densely clothed with short dark hairs that dislodge easily and cause an itching sensation on human skin. The cocoon is at first greyish in colour but becomes bright white with age and develops a characteristic, powdery outside. Other than the short hairs around the aperture of the cocoon, the long hairs of the larva are not spun into the walls of the cocoon, but remain attached to the larval skin when this is shed during pupation. This

old larval skin remains firmly attached with its head-end to the rear of the pupa, becomes strongly flattened and folds over the back of the pupa with its ventral side to the outside and a tuft of hairs at the apex, giving the pupa the appearance of having a bushy 'tail' held up like that of a squirrel (Fig. 8). The function of this flattened and attached larval skin (instead of the compressed and loose one of other lasiocampids) is unclear; it may serve as a cushion for the pupa. The pupa itself is pinkish-brown, slightly depressed and also lightly covered with a fine, white powder.

The pitch-black colour of the larva with the contrasting bright yellow spots along the sides appears to be an aposematic coloration, and particularly in the later (larger) instars the larvae are very conspicuous on their foodplants when they have partially defoliated these. It is not quite clear what their defence against predators such as birds is. Partially it may be the long sensitive hairs on the back and the quick reaction to drop off the plant, but it seems unlikely that this on its own will offer sufficient protection to the larvae. Although not possessing definite urticating bristles, the larvae do have short irritant hairs that cause an unpleasant and persisting itch on the human skin. It is also these hairs that line the mouth of the cocoon, and they are probably more freely dislodged during the spinning process of the cocoon, as this retains the itching properties of the larva for a considerable time after its formation, until the outer supporting strands have worn away and the cocoon becomes hard and white. It is also possible that the larvae are aposematically coloured because of emetic properties they may gain from chemical compounds in their foodplants.

The cocoon is of an extremely tough and hard texture and very difficult to pierce or cut, and evidently well suited to protect the pupa from predators and inclement weather during the long, dry winter season of its environment. It usually stays on the tree for several years after the moth has hatched, so that only a small proportion of the cocoons found in an area still contain viable pupae. Little is known about parasitism of the larvae of *S. regia*, but the holes found in some cocoons suggest that the larvae are parasitized by tachinid flies, which are able to escape from the tough cocoon after the caterpillar has pupated.

The life cycle of *S. regia* is only imperfectly known. In the northern form the moths usually eclose from the cocoons in December and January (the onset of the summer rains), and the larvae are fully grown in about March, but the moths may fly as late as March and the larvae pupate only in May. In the southern form the adults eclose even later (March to April, about the beginning of the wet season in the winter rainfall area), and their larvae are presumably fully grown only in August or September. It appears that *S. regia* generally has only one generation per annum, and it may be double-brooded only in the north-eastern regions of Namibia (Otavi Mountains, Kavango) where the rainy season is longer.

Very little is published about the immature stages of the other species of *Schausinna*. The larva of *S. affinis* is also black and strongly hairy (Strand 1912) and presumably spins a very similar cocoon and it is to be expected that the immature stages of *S. clemetsi* and *S. goliath* are again similar. As mentioned above, *Eucaera* and *Trichopisthia* also have similar (albeit more colourful) larvae with long hairs but no strong urticating spines, and *Eucaera* constructs a very similar cocoon and also has the last larval skin attached to its pupa in the 'squirrel-tail' fashion described above. No details of the life cycles of these genera have been published either.

## Acknowledgements

I thank Joe and Hiltrut Walter (Windhoek) for supplying some eggs of *S. regia* for breeding experiments, Stefan and Otilie Nesor (Prant Protection Research Institute, Pretoria) for collecting cocoons in the Richtersveld, Neville Duke (Mbabane, Swaziland) for information and helpful discussions on *Schausinna* and related genera, and Martin Krüger (Transvaal Museum, Pretoria) for lending specimens for photography.

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**COLLECTING LEPIDOPTERA IN NAMAQUALAND SEPTEMBER, 1992**

By Andre Claassens

263 High Level Road, Sea Point, Cape Town 2001

Gordon Fraser-Grant and I, started from Cape Town in sunny weather on 7th Sept. and enjoyed the most glorious weather for another eight days until the end of our memorable collecting trip on 15 Sept. Thanks to Jill and Belfy for allowing their handymen off for all that time. Thanks to Betty also for the delicious homemade, wholesome, everlasting cookies, we had some every day. Thanks to Jill for organising padkos for the first day. Following is an account of what we saw, did or did not catch, where and how we camped and what we ate and drank.

Starting with the last item, we do not wish to divulge much detail. We ate and drank well, tried the various kinds of *Westcoast boerewors* and *chops namaquana*. for our daily braais and we enjoyed our English breakfasts of bacon and eggs, toast and marmalade. We thought we needed the extra energy to make it through the hot, tiring collecting days. However, although we worked hard every day and returned to base hungry and dirty every evening, we both put on a few pounds in weight much to the disgust of our spouses who had been trying hard to make us keep our weight down. I was the cook and Gordon the dish washer. For Charles Wykeham's information it should be stated that I cut the squashes in half before boiling them so that they did not explode as they did in September 1980 during another trip to Namaqualand, when I boiled them whole with disastrous results.

In the evenings, time and light permitting, we spent some time setting specimens. Gordon was particularly well prepared for that tedious job. He had made himself a very suitable setting board carrier in which set specimens could be stored and transported safely. He used the model described in a *Practical guide to butterflies and moths in Southern Africa*.

Our first destination was Yserfontyn where we collected the following species; *Melampias huebneri huebneri*; *Gonatomyrina Jara*; *Phasis thero*; *Aloeioes thyra*; *Poecilmitis chrysaor*; *P. pan*; *P. pyroeis pyroeis*, *P. thysbe thysbe*, *P. thysbe osbecki* and *P. thysbe* intermediates between *thysbe* and *osbecki* judging by the markings on the hindwing underside of a few specimens.

That night we stayed at Velddrif where Gordon owns a lovely cottage right above the river and with access to the water's edge. The ideal place for bird watching, fishing, and other water sports. The peppertrees (*Schinus molle*, the common fine leaved peppertree and *S. terebenthifolius*, Brazilian peppertree) in the garden serve as larval food plants for the large and beautiful Emperor moths *Gonimbrasia tyrreha*, the Zigzag Emperor, which occasionally becomes a pest in the area by defoliating the trees. On our arrival large larvae of the moth were seen feeding on the leaves of the highest thin branches of *G. molle* which bent under their weight. Pinhey in Emperor moths of South and South-Central Africa, and in Moths of Southern Africa does not list the peppertrees as larval food-plants of the Zigzag Emperor, but mentions *Acacia* and in captivity the leaves of apple and willow. Poplar is also mentioned. From material collected the previous year it appears that pupation of the larvae takes place during August-September and the imagines emerge about six months later in March-April, when ovipositing would take place.

The next morning on our way to Vanrhynsdorp we collected in:

1. The Banghoek mountains. Never have two pensioners walked so far and high and caught as little as we did there. We met *Melampias huebneri huebneri* and a smallish

moth flying between lichen covered rocks. It was hardly distinguishable from lichen when settled, the forewings closely resembling the colour of green lichen. No doubt the larvae of this moth are lichen feeders. We each caught one imago.

Thanks to Mr. Pike for allowing us to collect on his property.

2. Clanwilliam above the dam. The following species were caught (we include at this point also a few species which we actually caught on 15th Sept.) *Tylopaedia sardonys peringueyi*; *Melampias huebneri huebneri*; *Tarsocera namaquensis*, or was it *T. imitator*? *Argyraspodes argyraspis*; *Phasis clavum*; *Gonatomyrina lara*; *Aloeides vansoni* presumably; *A. aridus*; *Cacyreus* near *dicksoni*, the specimens being quite worn, a definite identification was not possible. I have caught *dicksoni* at Citrusdal and it is now known to occur further north.

3. Vanrhyns pass. We had time to spend a few hours on the higher grounds along the pass and netted the following: *Aloeides thyra*; *Oraidium barbarae*; *Poecilmitis psyche* and *Lepidochrysops australis*. A moth with the fore- and hindwings almost completely hyaline was also caught. The forewings measure 19mm each and the hindwings only 11 mm. The thorax is covered with long light grey hair and the brownish abdomen bears short grey hair. The antennae are dark, 11 mm long and bipectinate. It could be a species of *Zeuzerops* - Cossinae), but it differs from *Z. hyalinipennis* depicted in Pinhey's Moths of Southern Africa.

That night and the following night we stayed at Vanrhynsdorp Caravan park. We pitched Gordon's 2x3m tent and reorganised his Mazda bakkie. I slept in the tent which was also our pantry and general store and Gordon slept in the bakkie ingeniously converted into a camper. The fridge running on electricity while in the camps, remained in the bakkie during the day and operating off the alternator stayed cold enough to keep us supplied with fresh sandwiches and cold drinks on our daily collecting trips. The bakkie-camper arrangement can be fitted onto the back of the tent by a system of zips so that the tent and the bakkie become two interleaving apartments with the floor of the bakkie well above the ground, convenient for somebody afraid of night adders, creepy-crawlies or evil little men. We did not, however, avail ourselves of this facility. During our stay at Vanrhynsdorp we collected in the following places:

1. *Nieuwoudtville*. We visited Mr. Neil McGregor's farm. *Lepidochrysops mcgregori* was out in full force. The colony seemed as strong as in September 1980 when Charles Wykeham and I collected in Namaqualand. The following species were caught: *Lepidochrysops mcgregori*, *Colias electo f. aurivillius*, *Pseudonympha trimenii*. The specimens of *Pseudonympha* were very worn and could have represented either the race *namaquana*, or the Nieuwoudtville race referred to in Penningtons. In the local nature reserve we recorded *P. clavum* and *Poecilmitis 'wykehami*. In the local caravan park, we visited out of curiosity, we recorded *Tarsocera namaquensis*. We wish to thank Mrs. McGregor for allowing us on the farm to take a few specimens of *mcgregori*. I left a photograph taken by Charles Wykeham in Sept. 1980 of her little son armed with a large butterfly net standing next to me. The boy was then about 10 years old and I, the old man, 12 years younger than I am now.

2. *Nuwerus*. We had already caught *Tarsocera namaquensis* in various places, but found them fast flying and evasive in the open veld. However we noticed how plentiful *namaquensis* was along a road near Nuwerus village. Fortunately we met a farmer, Mr. H. van Wyk, who after discussing in detail the politics of the day, permitted us to walk over his farm and collect butterflies.



Gordon Fraser-Grant setting the day's captures

The farmer also noticed how plentiful they were on his side of the fence. Sorry we had to disappoint him when he suggested that we also collect for him the numerous moth caterpillars defoliating certain bushes liked by his sheep. The following species fell prey to our nets:- *T. namaquensis* plenty and in mint condition *Argyraspodes argyraspis*, *Melampias huebneri steniptera* and *Cacyreus dicksoni*. Not having checked the *Tarsocera* male genitalia, we could not be definite in our identification. We have good reason to believe that some of our material from the different localities, not necessarily from Nuwerus actually represents *T. imitator*. On 10th September we arrived in Springbok, too late for any further collecting as on the way from Nuwerus we had spent hours looking for the Figtree Blue, *Myrina silenus penningtoni*. We searched many fig trees and creeping figs some in precarious positions, but no luck and we found no early

stages either. Gordon is convinced that he saw one imago fly past but failed to net it. Hard luck, he wanted one so badly. We kept looking for the beautiful insects in many suitable places for the next four days and still no luck. Were we too late? The apparent scarcity of this exquisite butterfly was surprising as during the visit to Namaqualand in 1980, already alluded to, Charles Wykeham and I had no trouble finding the butterfly and its early stages. Several collectors after that time have recorded easy captures of the insect. We stayed in Springbok's Kokerboom Caravan Park for three nights and visited the following places:

1. *In and around Springbok.* We thank Mrs. Mostert for allowing us to walk over her farm and collect butterflies. It is surprising how obliging most farm owners are, if you ask for their permission. We climbed the mountains on the farm and soon met *Aloeides barklyi* in good numbers. They were not easy to catch, but Gordon found a corridor between some rocky outcrops, where they flew past regularly. We positioned ourselves strategically and managed to net a small series each of this unusually beautiful *Aloeides*. *Phasis clavum* was also there encircling a small leaved *Rhus* species.

2. *O'Kiep.* I was lucky to secure a fairly fresh specimen of *Iolaus bowkeri subinfuscata*.

3. *Kleinzee.* We collected at various places on the Kleinzee road between Springbok and Kleinzee almost as far as Kleinzee itself. We caught the following species: *Tarsocera namaquensis*; *Aloeides damarensis*, very plentiful in places; *A. bamptoni*; *A. pierus* and *Colotis agoye bowkeri*. The latter species was seen on the wing in various places (Kleinzee, Spektakel and Springbok). All were in very worn condition, indicating that they may have been migrants from further north, perhaps Namibia.

4. *Garies.* Gordon collected *Ypthima asterope hereroica*. Other species caught were *Gonatomyrina lara*; *Poecilmitis aridus*; *Phasis clavum* and *T. namaquensis*.

5. *Kamieskroon and environs.* We secured *Aloeides margaretae*, *A. thyra*; *Phasis clavum*, *Poecilmitis chrysaor* and *Alenia namaqua*. That night, 14th Sept. we stayed in the caravan park of Garies, a small park, but neat and quiet. The next morning we were on our way back home via Clanwilliam. We spent most of the day on the Gifberg near Vanrhynsdorp, where the following were collected: *Melampias huebneri steniptera*, *M. huebneri huebneri* (rather unexpected we thought); *Pseudonympha trimenii namaquana*; *Stygionympha vansoni*, *Lepidochrysops puncticilia* and *Tsitana tulbagha*. The latter two species were a bonus as it got a little late and we were ready to pack our nets away and go on to Clanwilliam. As we stopped to turn we found a strong colony of *L. puncticilia* with *Tsitana tulbagha* flying amongst them. That night we stayed at Clanwilliam caravan park as Gordon was keen on securing a few more specimens of *Tylopaedia sardonyx peringueyi*. However, although a few more specimens were seen, the next morning, they were too fast and evasive for us. Other species caught there that morning and earlier during the trip are listed under Clanwilliam, 8th Sept.

Well tanned, tired, a lot wiser and more experienced and a fair number of specimens richer we arrived home on 15th Sept. Our last words were "We must do it again next year. Yes, indeed we must go back for the Fig Tree Blue, *Trimenia argyropлага*, *Spindasis namaqua* and so many other Namaqualand species we missed.

## SOME NEW RECORDS OF LYCAENIDAE FROM KENYA

By Haydon Warren-Gash

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In butterfly terms Kenya must be one of the most heavily "collected" areas in Africa north of the Zambezi. Eminent collectors and students were collecting and publishing material in local journals as early as the 1920s. Canon Rogers, van Someren, Jackson, Stoneham, Carcasson, the Sevastopoulos and others left few stones unturned. Steve Collins leads the field today, with his truly remarkable collection.

So when I returned to Nairobi a couple of years ago, after many years absence, I wondered whether there was much more to be said, at least as far as the adult insects were concerned. Or was Torben Larsen's just published book the last word? But there is always something new. Among the Lycaenids, I have turned up some new records for Kenya which can be added to Larsen's checklists; also some significant extensions of range within Kenya which are noteworthy. One or two may turn out to be new species. But I make no special claims here. My purpose, rather, is to share what I have found, and to offer some reflections.

For ease of reference, I have followed the arrangement of the Lycaenidae as set out in Larsen (1992). *Butterflies of Kenya and their Natural History*.

### Pentilini

*Alaena* sp. nr *ngonga* Jackson) This is a difficult group at the best of times. Typical *ngonga* comes from dry savannah hillsides near Nairobi, with a very limited known distribution. I have a series from near Isiolo (200 miles north of any currently known locality and the other side of Mt Kenya) which superficially resembles it, but differs in a number of particulars. The white postcellular markings on both wings in *ngonga* are broadly continuous. In the Isiolo specimens, they are disjunct, with the hindwing band in particular clearly divided into two. On the underside, the hind wing in *ngonga* has a characteristic 'spider's web' appearance - generally pale, with a filigree of darker lines. In the Isiolo specimens, the pale area is reduced, and the submarginal row of spots replaced by a thin dotted line. Sexes are similar, but with the hindwing band reduced in the female (unlike typical *ngonga*). May is the month for it.

*Alaena picata* ssp. This is a small subspecies with the subapical band separate from the other paler markings in both sexes. It comes from Fourteen Falls near Thika, east of Nairobi. I drew its existence to Steve Collins' attention and he is now breeding it. He has commented that it matches the population from Emali, on the Mombasa road.

*Baliochila* sp. near *fragilis* (Stempffer & Bennett). The Nairobi museum has a good series of *Baliochila* sp., which have been tentatively arranged (by Clifton?) in a way which suggests that a number of undescribed, but superficially similar, species in the '*fragilis*' group fly in Kenya. Those from the Ngong Hills stand out in particular with their apical markings generally mid to pale brown as opposed to the black of typical *fragilis*. They are also noticeably smaller, with less prominent black and white chequered fringes. In the series I have, the dark post-discal markings on the male f.w. upperside tend to be less pronounced than typical *fragilis*, but, as usual with *Baliochila*, the extent of the markings is variable.

### Lachnocnemini

*Lachnocnema* sp. nr *durbani* (Trimen) The *Lachnocnema* species flying in the driest savannah areas of Central Kenya has a much more falcate wingshape in the male f.w. than either *durbani* or *bibulus*, and is intermediate in colour between them. The female pattern is different to both, though closer to *durbani*. The cilia of the female is strongly chequered. The h.w. underside discal band is straight, pronounced, and of roughly even width.

I have another short series from Kakamega, which appears different again: small, unicolorous in both sexes (grey /dark brown) with long narrow rounded wings. It is time the genus was revised (as I understand is in fact happening).

### Aphnaeini

*Aphnaeus neavei* B-B. I took a couple of males near Voi in SE Kenya in August 92. This is a considerable extension south of its known distribution, though the very arid acacia scrub in the Voi area matches its known habitat.

*Spindasis* sp. nr *trimeni* (Neave). Recorded simply as '*Spindasis* Species' by Larsen. I have a female from Kibwezi (Steve Collins has caught a number there) and a fresh male from the Arabuko-Sokoke forest on the Kenya Coast. Like Larsen, I too wonder whether this is true *trimeni*. But it is now firmly established that a *Spindasis* of that group flies in Kenya, and while obviously a scarce insect, has quite a wide distribution.

*Desmolycaena* sp. nr *mazoensis* Trimén. A surprising butterfly for Kenya. It is nothing like *D. rogersi*, the only known member of the genus so far known from Kenya. The underside pattern of the single female I have caught - in the dry scrub country at the foot of the Ngong Hills - approximately matches that of *D. mazoensis*. On the upperside, it is a uniform coppery brown, with a darker mark at the end of the f.w. cell. It flies with *Azanus* sp which infest every thorn tree in the area at the right time of year and, looking much the same in flight, may have been overlooked to date on that account.

*Virachola* sp near *penningtoni* (van Someren). I have 2 males and 1 female from the Ngong Hills which approach *penningtoni*. The overall appearance of both sexes on the upperside is not unlike *V. antalus*. But the verso markings do not match exactly, and the males have a distinct orange-copper reflection in the centre of the f.w. recto. Conceivably only dwarf *antalus* (which are common in the area); but distinct enough in appearance to be worth mentioning in case others have material to match.

### Lycaenesthini

*Anthene rhodesiana* (Stempffer). Larsen refers to records of *A. minima/rhodesiana* from Kenya as due to misidentification of *A. contrastata*. I must disagree. Both *contrastata* and *A. rhodesiana* (or a closely allied species of that group) fly in the dry scrub country beyond the Ngong Hills.

The latter however is much the scarcer of the two. Another *Anthene* flying in the same area is *A. wilsoni* (Talbot), though whether the insect truly belongs to *wilsoni* is open to question. My series is very different from those (from Ugancfa) in the Nairobi Museum. It will be interesting to see what Cottrell has to say on the group, which I understand he is revising.

*Triclema kimboza* (Kielland). Previously known from a single worn male from Tanzania, I have a series of both sexes from the Arabuko-Sokoke forest near Malindi on the Kenya Coast I have subsequently found a number of males in the Nairobi Museum, from the same locality misplaced under *Neurellipes gemmifera* (Neave), which does not occur in Eastern Kenya. It was reasonably plentiful (but very localised) in December, and on the wing but in much smaller numbers in August. The male is a warm deep coppery brown above. The female is darker blackish brown, with a fine white hind wing marginal band and two black spots (occasionally three) at an angle on the hind wing recto. The underside is distinctive, being quite unlike that of other *Triclema* sp (in, some ways closer to that of *Anthene amaran*). It is the same in both sexes. Full details of the male are in Kielland's original description.

### Polyommataini

*Lepidochrysops budama* van Someren. Originally described from Uganda, I have 2 males and 1 female from near Migori, in the extreme South West of Kenya bordering Lake Victoria and the Tanzanian frontier. It is not surprising for a species from the grasslands of Eastern Uganda to turn up there, though odd that it does not appear to have done so, to date, in any other suitable locality in between.

### Discussion

I would offer a few general reflections. First, all the above species, apart from *Triclema kimboza* (and to some extent *Alaena picata*) are scrub/savannah species. None are localised liptenids tied to heavy forest, which one might have expected to provide the richest source of new records. Most of the above can be expected to have quite a wide distribution within the arid thorn scrub characteristic of tracts of Central and Southern Kenya.

Second, it is a reminder of what can still be turned up even in well-known collecting areas. The Ngong Hills are close to Nairobi, and the scrub country on this far side stretching down into the Rift Valley has been known to, and regularly visited by, prominent entomologists for many years. For much of the year, it is dry and few insects fly. But there is nearly always something. *Charaxes hansali* and *Ch. kirki* fly there, as does *Junonia limnoria taveta*. Dry country *Acraea* include *A. chilo* and *A. braesia*. There are interesting Pierids.

But unusual Lycaenidae provide the richest seam. Several species of *Lepidochrysops* fly there, including *L. jansei*, which is known from almost nowhere else, though I have taken a male in Northern Tanzania. *Epamera iacksoni* occurs (as do other more usual 'bush sapphires'). I have one example of *Deloneura ochrascens littoralis* Talbot and a good series of *Chloroselas tytleri* from the same area. It is a classic locality for *Desmolycaena rogersi*.

There are bound to be more, as yet unrecorded, species flying there. However, and this brings me to my third and final reflection, time is running out. The scrub in southern and central Kenya is predominantly Maasai country. The Maasai are nomadic

pastoralists, and their mode of life such that, unlike in so many other parts of the country, the open spaces have remained open and, broadly speaking, in their natural state. But population pressures can no longer be resisted. Land consolidation, with the introduction of the (to the Maasai) new and strange concept of individual title is under way. Barbed wire fences are springing up round the newly defined plots at an alarming rate. Even thorn trees are not immune from the axe. No doubt other sites will remain. But they will continue to exist precisely because they are inaccessible, and therefore of less interest for development. The wide variety of game which can still be found here, and which adds such interest to a day out with the net, will surely disappear. I very much doubt whether future generations will find anything like the same richness and variety as exists there now.

### References

Larsen, T.B. 1992. *Butterflies of Kenya and their Natural History*. Oxford University Press.



*Mimacraea marshalli* male (Lycaenidae) upperside.



## BREEDER'S CATALOGUE

By Hermann S. Staude & John G. Joannou

Over the years, we have, through chance discussion with fellow society members, obtained valuable information on life histories and food ~references of various Lepidoptera. This has led us to suspect that there exists much more such informal, but no less valuable, information which is at serious risk of never coming to light.

Most of us have at one time or another, collected an unknown larva and reared it through to the adult stage - thereby ascertaining a foodplant or defining the immature stages. But having done that, and perhaps even taken the odd photograph, the information is filed away somewhere, or worse still, never recorded, and to the lepidopterist interested in that group, such information is simply not available.

We would like to suggest a way to address the problem - and here we would stress that it is the existence of this information and **how to contact its author**, rather than the information itself, that is important. To this end, we would propose that a tabular précis of available information, perhaps entitled **BREEDER'S CATALOGUE**, be published once a year in *Metamorphosis*. This could be a specified issue, say the first or last in each volume, which in time will become known as a regular source of unpublished observations. We are convinced that such an inclusion would substantially enhance the value of *Metamorphosis*.

We envisage tables that will be kept simple, as indicated below, but which may change somewhat as the project develops. The abbreviations F, L and H stand for foodplant, life history and habits respectively while X under one of these headings would indicate where information was available. The catalogue will be presented in approximate taxonomic sequence while the abbreviations under SOURCE may be cross-referenced to a separate, alphabetic, schedule of authors with their relevant details.

### EXAMPLE:

FAMILY	SPECIES	F	L	H	SOURCE
Geometridae	<i>Centrochria deprensa</i> Prout	X	X		HSS
Pieridae	<i>Colotis subinfasciatus</i> (Swainson)	X	X	X	JGJ

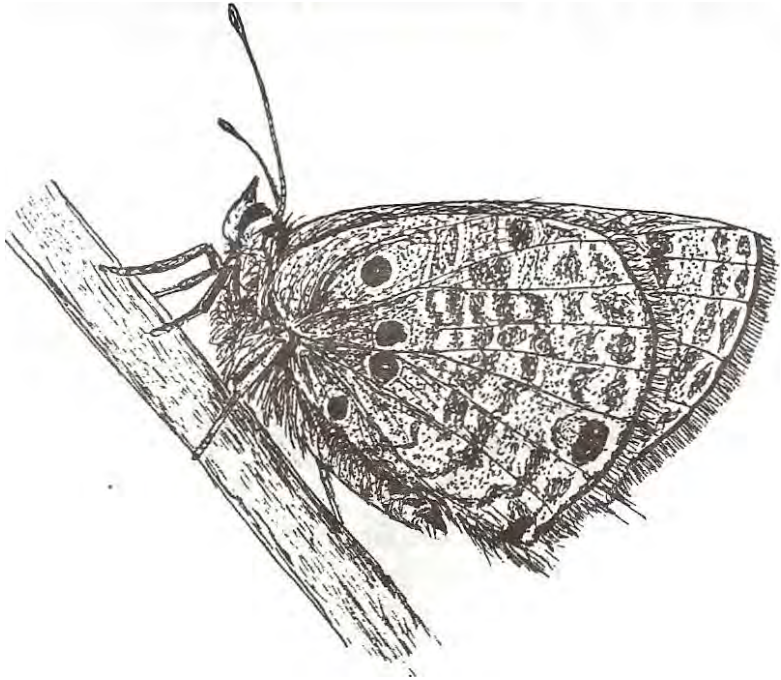
SOURCE	NAME	TEL. BUSINESS	TEL. RESIDENCE	TELEFAX	POSTAL ADDRESS
HSS	H.S.STAUDE	011 9531168	0142 771547	011 9534812	BOX 5021 KRUGERSDORP, 1742
JGJ	J.G.JOANNOU	011 7625551	011 7625550	011 7625550	BOX 894 KRUGERSDORP, 1742

Despite this being an easy way for someone to get his name in print, we see two main factors which could hamper contribution to such a project. The first is that the end result cannot be identified by the breeder, and being unable to attach a name to these observations, are simply discarded. To those people we would say think again – there

are plenty of individuals or institutions that can help and failing that, they can approach us and we will attend to the identification of any specimens. The second factor is that the information is often of a partial nature and the breeder only intends publishing his findings at some time in the future when observations are more complete. In using the proposed format the information itself is not made public - only the source. In this way interested parties can communicate with each other and the originator of the information can stipulate under what conditions it may be used.

It is not our intention to restrict qualification for entry to previously unpublished topics. There are many instances where additional information, or variances, are observed in life histories of species that may already have been previously covered. We feel that although some duplication will occur, this type of information is sufficiently important to warrant inclusion.

May we then appeal to members to start forwarding any such information to either of the authors, at the postal/electronic addresses indicated in the example.



*Anthene minima* male underside.

## HAZARDS OF BUTTERFLY COLLECTING - THE MAGIC OF TSODILO -

Botswana, 1990

By Torben B. Larsen

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The road to the Tsodilo Hills in the extreme northwest of Botswana is by far the most difficult I have ever had to negotiate, but it is worth making the effort. It is only some 50 kilometres from what counts as a main secondary road in Botswana, roughly one with more than five vehicle movements (most days) a day and usable by two-wheel drive cars with exceptionally high clearance (most of the time), but the Tsodilo Road crosses diagonally a range of 'fossil dunes'.

These fossil dunes are now clad in dense forest, while the intervening depressions are open, lush grasslands, the grass sometimes so tall that the view is obscured. One hardly dares imagine the richness of wildlife here before cattle were introduced. We had received instructions about what to do, namely to engage low four /wheel drive when approaching the sandy slope of each dune. It was only at the crossing of the sixth dune that I began to feel confident that we would not get inextricably bogged down. .

The first 45 kilometres took nearly three hours, then the steep, rounded shapes of granite that are the Tsodilo Hills came into view. After nearly a thousand kilometres of Kalahari driving, the sight of anything higher than twenty metres or so cannot help but impress. It should come as no surprise that the San peoples (Bushmen) consider the hills sacred and have left on them thousands of beautiful rock paintings, as evocative as those of Lascaux and Altamira. It is a place of pure magic.

We quickly found a campsite in the dense, tall woodland in between two of the hills. The spot was exceptionally pretty, and while setting up lunch we discovered that a little cave a few metres away contained the famous rhinoceros panel, perhaps the finest of the rock paintings on the hills, but also sadly emphasizing that these animals have long since disappeared from the area. It was still much too hot to begin pitching camp, so after the picnic I set out with the net. Butterflies were everywhere and, to my delighted surprise, one of these was the beautiful Lycaenid, *Hemiolaus caeculus tsodiloensis*, of which to my knowledge only two previous records exist. Its status as a true subspecies is beyond doubt, since I collected the normal form a few weeks later in the northeast of the country.

Mornings and afternoons were spent taking in our fill of rock paintings, and the hotter hours of the day in butterfly collecting. The total came to more than 70 species, several of them new to Botswana. We were so amused at seeing *Charaxes jasius saturnus* try unsuccessfully to balance on the rim of a glass of beer that we gave it a can of its own; we thought it looked grateful, and it was definitely much more dignified on the flat top of the can.

We left by another road (Hobson's choice, really!, someone had remarked when we asked which road was the better one). A deeply rutted sand-track so straight that you could engage in the ultimate hands- and feet-off driving for kilometres on end. A small knob on the dashboard could set the rpm's at a constant speed and the ruts would keep the wheels aligned. An old-timer in the tourist trade told us that he used to disconcert his customers by actually leaving the cab and walking next to the truck, reviewing next day's programme. We were still a little too green to try this.

The next day, from a camp on the edge of the Okavango River, where hippos would wander round camp at night, our friend and his bade-up vehicle left. He took with him the expedition's only serving spoon. The type of black, three legged, almost spherical, cast-iron cooking pots (which the Afrikaners call *potjies*) is excellent for camping, but almost impossible to manipulate and to pour from. Our discomfort was aided by the fact that a passing bull had eaten all our dishcloths which would have made the attempts easier. What do you do when your best friend runs off with your serving spoon?

Fortunately we were passing Maun, the only real township in the Kalahari, and we replaced both items. The dishcloths posed no problem, but no-one seemed to have a serving spoon. Eventually, with that wonderful lack of logic of all frontier towns, we were told that the only serving spoons in town were at Northern Electricals! As indeed they were.

PS1 In the interest of equity I must emphasise that the serving spoon actually did belong to our friend.

PS2 We spent New Year's Eve 1991 /1992 in the hills, our last long expedition in southern Africa. It was as ever magic, reinforced by the fact that the few people living there were already stoned out of their minds, so we saw no other human being for three days. We live in London now -how we miss those open spaces!



*Charaxes jasius saturnus* male feeding.

## GETTING TO KNOW MOTHS - PROMINENTS -

By Stephen Henning

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The prominents belong to the family Notodontidae (Superfamily Notodontoidea). This family of mostly small to medium-sized moths have moderately stout bodies and rather elongate forewings. They usually have well-defined labial palpi and haustellum (proboscis). The common name, prominent, is derived from a prominence which shows on the back of the moths when they are resting. The inner margin of the forewing sometimes has a lobe and at rest, with wings roof-like, tucked down and well back, the lobe projects above the body. The moths are usually dull-coloured, to match tree trunks or dead leaves on which they rest.

The larvae are exceptionally diverse, often smooth, sometimes thinly haired, at times fantastically shaped to inflict fear in attackers by adopting some frightening attitude (fig. 2). For instance, the larva of the European lobster moth, *Stauropus fagi*, has extraordinarily long thoracic legs, not the usual short ones. These legs quiver and shake when held up, whilst the general shape of its humped body adds to the disturbing appearance. Larvae of the puss moth group, *Afrocerura*, *Cenirina* and others, have camouflaged leafy colours but if disturbed, the head is retracted into a frame provided with false eyes and red tinges to frighten an attacker. A pair of red, dangling threads issues from the forked tail end to add to the unreality. Both the lobster and puss larvae are said to eject formic acid from glands below the prothorax. The larvae of prominents are mostly arboreal feeders. Some are considered to have a rather obnoxious smell. They frequently lack the anal prolegs and the last segment is raised up to effect the deceptions practised in defence. Some have dorsal processes, even branched horns like antlers, or humps to add to the picture.

The adults are exclusively nocturnal, and are often attracted to light, otherwise the various species are usually only found as larvae.

This is a large family of about 180 species in southern Africa belonging to 2 subfamilies.

These are the Notodontinae with 150 species in 79 genera and the Desmeocraerinae with 23 species in 3 genera.

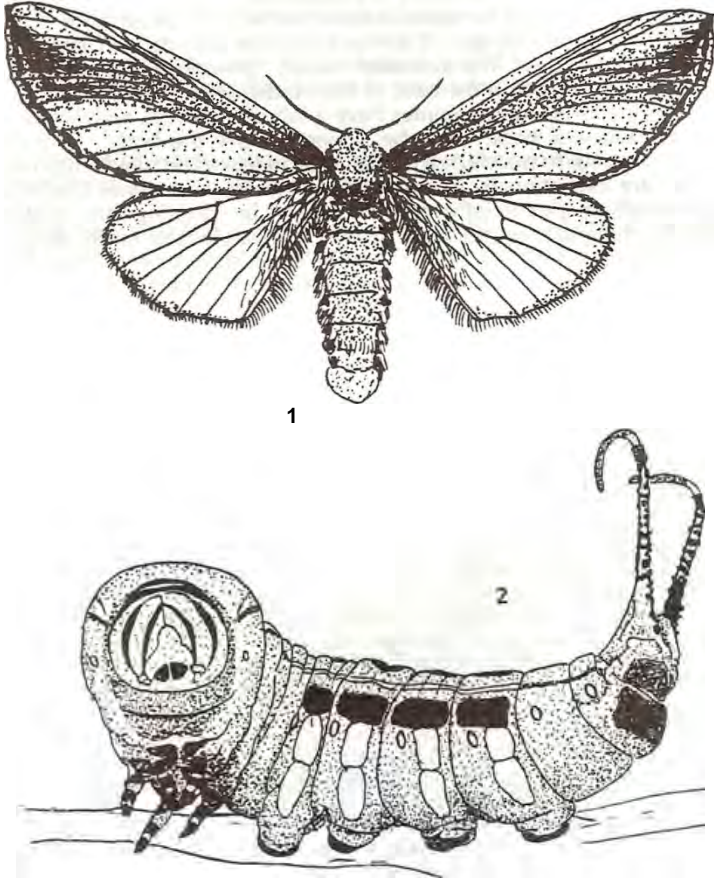
For more information see Henning (1985), Janse (1920), Kiriakoff (1958, 1962, 1963, 1964, 1967), Pinhey (1975) and Vári and Kroon (1986).

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Prominents (Notodontidae) - 1. *Antheria woerdeni* female. 2. *Notocerura spiritalis*, larva in alarm pose.

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# METAMORPHOSIS

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Volume 4

Number 2

June 1993

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## CONTENTS

EDITORIAL	49
COMMENT BY THE PRESIDENT	50
REGIONAL ROUNDUP. Compiled by Graham A. Henning	51
PHYLOGENETIC NOTES ON THE AFRICAN SPECIES OF THE SUBFAMILY ACRAEINAE (LEPIDOPTERA: NYMPHALIDAE) (PART 3). G.A. Henning	53
PETER'S MOUNTAIN RINGLET. Colin Congdon	69
IDENTIFYING SKIPPERS AT THE LARVAL STAGE (LEPIDOPTERA: HESPERIIDAE). James J. Young	71
BIOLOGICAL NOTES ON THE EGGAR MOTH <i>SCHAUSINNA</i> <i>REGIA</i> (GRUNBERG). R.G. Oberprieler	73
COLLECTING LEPIDOPTERA IN NAMAQUALAND, SEPTEMBER, 1992 André Claassens	79
SOME NEW RECORDS OF LYCAENIDAE FROM KENYA Haydon Warren-Gash	83
BREEDER'S CATALOGUE. H.S. Staude & J.G. Joannou	87
HAZARDS OF BUTTERFLY COLLECTING - THE MAGIC OF TSODILO - BOTSWANA, 1990. Torben B. Larsen	89
GETTING TO KNOW MOTHS - PROMINENTS. Stephen Henning	91
NEW MEMBERS	93
OBITUARY	93
FORTHCOMING EVENTS	93
ADVERTISEMENTS	94
DONATIONS SINCE 13/3/93	96