



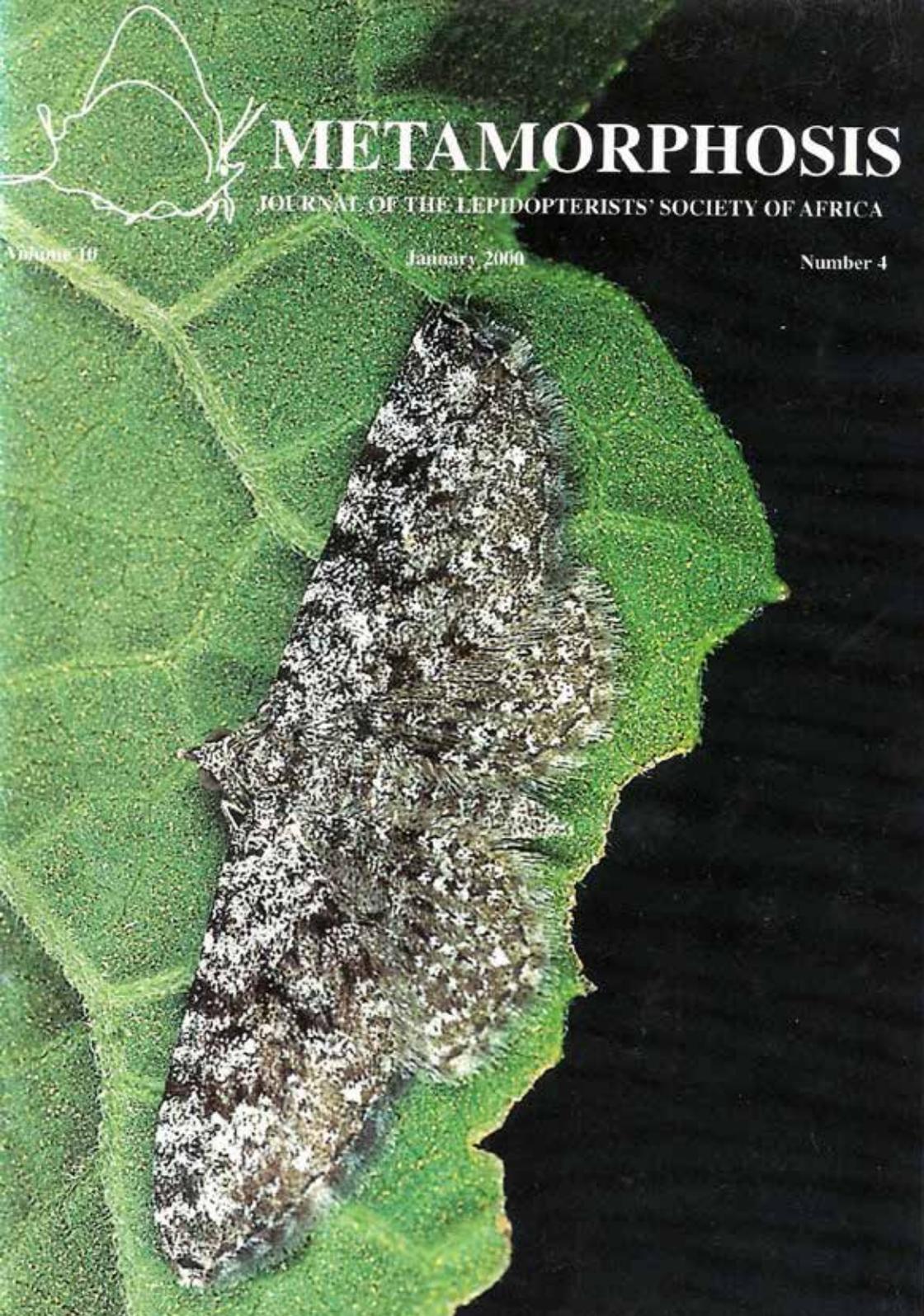
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Metamorphosis, which is the official journal of the Society, publishes original scientific papers as well as articles of a less technical nature.

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

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Covers: Front: *Eupithecia polylibades* Prout, 1916 photographed in situ,
Moteng pass, Lesotho [Photo H. S. Staude]
Back: Lesotho, Liqalaneng, 2900m, locality for *Eupithecia*
liqalaneng [Photo H. S. Staude]

Editorial

This is the last issue of *Metamorphosis* under my editorship. I cannot believe that five years have gone by so quickly - It's been fun! This is the time that one is allowed to sit back and review the evolution of our journal and highlight some significant contributions, which have influenced it's course. Over the years there were many people who have contributed in many different ways towards making the Journal grow into what it is today. I would like to use this opportunity to highlight and acknowledge some of these contributions, which are made just for the love of Lepidoptera with no remuneration.

It all started in August 1983 when Mark Williams send out the first newsletter of the then *Lepidoptera Study Group of Southern Africa* and called it *Metamorphosis* No. 1. I quote the first ever sentence written in *Metamorphosis*:

'It is my fondest hope that this first issue of "Metamorphosis" will live up to its name and progress in subsequent editions from an inconspicuous "ovum" to a beautiful "imago" that we can all enjoy.'

I wonder if Mark really expected at the time that his vision would still be on track seventeen years later.

Those first issues of *Metamorphosis* were copied on loose A4 pages, stapled in the corner. The issues were numbered chronologically. Even in these early issues many important articles were published and signs that *Metamorphosis* would become a formal journal rather than just a newsletter were apparent almost right from the start. It became clear that lepidopterists in southern Africa needed a vehicle through which they could publish their findings. Mark took the journal through those difficult years producing 14 issues on his own up to September 1985 when he recruited his wife June and together they produced another five issues. In 1988 they handed over the editorship to Nolan Owen-Johnston who produced another five issues until in 1990, he handed the editorship over to Bill Henning. Bill's first issue was No. 25. By now computer technology had progressed to the stage where it was available to individuals and No. 25 was produced on computer by Douglas Kroon. This vastly improved the technical quality of the journal and expedited the editorial process. (It must have been very frustrating, before then, when last minute errors were discovered and everything had to be re-typed to correct it.) This led to *Metamorphosis* No. 27 in December 1990, which took on an A5 format, centre stapled, Arial font and semi-hard cover (standards that are still upheld today). This was also the last of the chronologically numbered issues. It was decided at the 41st council meeting in January 1991 that *Metamorphosis* would henceforth be called a Journal and would appear in annual volumes consisting of four quarterly issues. *Metamorphosis* No's 1 to 27 would make up Volume 1. In March 1991 Volume 2 No. 1 appeared and *Metamorphosis* had emerged from its ovum. In November 1993 Andy Gray took over the technical handling of the journal from Doug Kroon, a position he still holds today. Technically the journal has changed instar a number of times since Vol. 2 No. 1 (such as gloss paper, colour covers and plates, a larger font size etc.), but in essence it has remained the same.

Bill Henning actively involved his two sons Stephen and Graham in the editorial process and together they encouraged the publication of the mixture of informal articles with more technical articles that was naturally evolving at the time. This daring blend in the nature of articles published made the journal essentially readable and even scientists proclaimed that this is one of the few journals that they actually read. In spite of some controversy this policy is essentially still in place today.

Towards the end of 1994 Bill stated that his failing health made it difficult to continue with the editorship of the journal, Stephen and Graham were very involved with other publications and they wanted to have someone else take over the responsibility of *Metamorphosis*. It was at about the same time that the question of how to handle scientific manuscripts, which were being submitted more frequently, was much debated at council level. Rolf Oberprieler insisted that the society had a responsibility towards science in general to ensure that scientific papers are subjected to scientific editorial procedures such as peer review etc. The council decided that perhaps it was time to spread the load of work involved in the production of the journal by appointing a number of editors to handle the various tasks. Mark Williams was to be the scientific editor, Bill Henning the language editor, Andy Gray as technical editor and myself as co-ordinating editor to oversee the whole process. A flow chart was drawn up, which stipulated the process that manuscripts were to follow prior to publication. The system worked but proved to be too cumbersome with the logistics involved (e-mail was still in it's infancy and not available to us at the time). We soon reverted back in essence to a single editor but with the added bonus that he now had committed people who were always willing to assist wherever possible. I shall never forget the many evenings that Andy Gray sat with me till after midnight to get the journal into shape, or the numerous times when both Stephen and Graham Henning had to burn the midnight oil as well in order to get proof read copies, drawings etc. back to us in time. Stephen Henning's excellent line drawings adorned the inner pages of many issues and were used on most of the covers up to the time he left South Africa to live in England. Thereafter we changed the covers to full colour and received beautiful images from John Joannou, Steve Woodhall and Jonathan Ball as well as slides of the late Arthur and Neville Duke from the Transvaal Museum.

Getting the scientific articles through the refereeing process proved to be difficult at first. Most of our members do not have a formal scientific background and are not familiar with scientific procedures in getting their manuscripts published. It soon became apparent that our scientific advisers had to not only adopt the role of referee but also that of mentor in many cases. Rolf Oberprieler, Mark Williams and Martin Krüger were called on to do most of this unselfish and infrequently acknowledged work, which they did with enthusiasm even when sometimes under pressure. This resulted in the publication of much new scientific information on African Lepidoptera over the past few years. Today, if you would search the primary literature for recently published papers on African Lepidoptera you will find *Metamorphosis* to be

one of the most quoted journals. This is in no small measure partly due to their dedicated work.

In 1996 Nohna and Pierre Du Toit took on the job of getting the journal ready for posting and for posting *Metamorphosis* to the members. Later Alf Curle and his family took over the task, which he still does today. This is another one of those often overlooked tasks that require many hours of work and are seldom acknowledged.

There are a number of our members who do so much work on African Lepidoptera that they have produced papers that are too large for our standard issue of *Metamorphosis*. This resulted in the creation of an occasional supplementary series. One of the problems of such a series is that there are no additional funds available from the membership fees for this. Authors who are mostly self funded find it hard to pick up the bill, so sponsorship and grants are the only option. We have to date published three issues in this series. We are grateful to Steve Collins and ABRI who has sponsored all three of these issues and there is a fourth one in progress also sponsored by ABRI.

We are grateful to our members and contributors for their unending support. It is only with a growing membership and continued interest from contributors that *Metamorphosis* can continue to live up to its name.

I am of the opinion that the journal has reached the pupal stage. Much of the groundwork has been put in place. What *Metamorphosis* needs now is for someone to smooth out the existing rough edges. Someone who is dedicated and meticulous and whose attention to detail will ensure that the resulting 'imago' will live up to the aspirations of the vision that was started seventeen years ago.

I think we have found such a person in Douglas Kroon. Doug of course is no stranger to our society. A past president of the society, Doug is one of only a handful of members who has been awarded honorary life membership of the society. Doug has been involved with the technical side of *Metamorphosis* before and he is author and co-author of a number of books on Lepidoptera. Doug's uncanny ability to spot even the tiniest of mistakes has always amazed me and I am proud to announce that Douglas Kroon will be the new editor that will take *Metamorphosis* into the new millennium.

Hermann Staude

**THE GENUS *EUPITHECIA* CURTIS IN LESOTHO (Lepidoptera,
Geometridae: Larentiinae)**

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Abstract: The eleven members of the larentiine genus *Eupithecia* presently known from Lesotho are described. In addition to *Eupithecia polylibades* Prout, 1916, which had been known previously to occur in Lesotho, *E. laticallis* Prout, 1922, *E. hypophasma* Prout, 1913 and *E. infectaria* (Guenée, 1857) are recorded for the first time. Seven species (*E. reginamontanum*, *E. altitudinis*, *E. pettyioides*, *E. monticola*, *E. maloti*, *E. angustiarum* and *E. liqalaneng*) are described as new.

Key words: Lepidoptera, Geometridae, Larentiinae, *Eupithecia*, Lesotho, new records, new species.

INTRODUCTION

The genus *Eupithecia* Curtis, members of which occur in all zoogeographic regions with the exception of Australia, comprises numerous species of often very similar habitus and genital structure. The larvae of most species are flower feeders, accounting for the generally small size of the moths.

The Afrotropical fauna was last revised by Prout (1937), who included 69 species. Four years earlier, Janse (1933) had revised the southern African fauna, then numbering 26 species. However, due to the inaccessibility of Basutoland, as Lesotho was then known, he listed only one species of *Eupithecia* (*E. polylibades* Prout) from this country. In recent years, this situation has changed, and collections carried out since 1990 in the Maloti Mountains have led to the discovery of a range of new moth taxa (Krüger, 1997a, b; 1998; 1999). This paper forms a further contribution to the knowledge of the highly specialized lepidopterous fauna of this country.

MATERIAL AND METHODS

This study is based on material from the collections of the Transvaal Museum, Pretoria, South Africa (TM) and Mr. H.S. Staude, Magaliesburg, South Africa (HSS). Slides of genitalia were prepared following Robinson (1976), stained in a weak alcoholic solution of mercurochrome and mounted in Euparal.

Label data of types are cited verbatim, but months are quoted in Roman numerals and the names of collectors placed in parentheses throughout.

'Forewing length' refers to the distance, to the nearest millimetre, between wing base and apex. The range given refers to the smallest and largest specimen in the series examined.

In cases where the distribution of a species is not limited to Lesotho, 'Material examined' refers to the study area only. The wider distribution is detailed under 'Distribution'.

'Further material' refers to specimens excluded from the type series on grounds of poor quality.

Key to the species of *Eupithecia* so far recorded from Lesotho

Determination of members of this genus based on adult habitus alone is notoriously difficult, especially when the specimens are worn. The species dealt with in this paper, however, may be conveniently classified using genitalic features of the males. The genitalia of the females, although providing good diagnostic characters to recognize species, do not generally support subdivisions at higher taxonomic levels.

1. Octavals absent (Figs 13-18). Female genitalia, where known, as in Figs 24-28; moths as in Figs 1-6..... 2
- Octavals present (Figs 19-23). Female genitalia, where known, as in Figs 29-31; moths as in Figs 7-12 7
- 2.(1) Valvae with sacculus developed to form a distinct tip, cleft (Figs 13, 14). Female genitalia, where known, as in Fig. 24; moths as in Figs 1, 2..... 3
- Valvae with sacculus not developed to form a distinct tip, entire (Figs 15-18). Female genitalia as in Figs 25-28; moths as in Figs 3-6..... 4
- 3.(2) Valvae elongated; saccus very slightly concave (Fig. 13). Female genitalia as in Fig. 24. Large moths, lines on forewing whitish, conspicuous; discal spots very small (Fig. 1).....1. *E. reginamontanum* sp. n.
- Valvae shorter; saccus more strongly concave (Fig. 14). Female unknown. Slightly smaller moths, lines on forewing not whitish, discal spots large (Fig. 2).....2. *E. altitudinis* sp. n.
- 4.(3) Termen of valvae more or less evenly rounded (Figs 15, 16). Female genitalia as in Figs 25, 26; moths as in Figs 3, 4..... 5
- Termen of valvae angled near middle (Figs 17, 18) . Female genitalia as in Figs 27, 28; moths as in Figs 5, 6..... 6

- 5.(4) Male genitalia (Fig. 15) with costa slightly concave and aedeagus short. Female genitalia (Fig. 25) with sterigma trough-like. Small, grey moths; forewings with discal spots distinct and apex rounded (Fig. 3) 3. *E. pettyioides* sp. n.
 - Male genitalia (Fig. 16) with costa convex below middle and aedeagus more elongated. Female genitalia (Fig. 26) with sterigma consisting of two elliptical flaps. Larger, greyish-brown moths; forewings with discal spots indistinct and apex more pointed (Fig. 4). Wing pattern very similar to *E. angustiarum* (Fig. 9), but postmedian line on forewing straight (not convex) near discal cell 4. *E. monticola* sp. n.
- 6.(4) Male genitalia (Fig. 18) with valvae narrower and tips of pseudognathos turned inwards. Female genitalia (Fig. 28) with papillae anales broad, setose; sterigma indistinct, not trough-like. Moths small, light reddish brown, irrorated with black scales along discal cell (Fig. 6) 6. *E. hypophasma* Prout
 - Male genitalia (Fig. 17) with valvae broader and tips of pseudognathos pointing outwards. Female genitalia (Fig. 27) with papillae anales angular, hardly setose, and sterigma resembling a narrow trough. Moths relatively large, with broad wings; postmedian line on both pairs of wings bordered by a series of short, blackish streaks (Fig. 5) 5. *E. polylibades* Prout
- 7.(1) Base of valvae bearing coremata (Figs 19, 20). Female genitalia, where known, as in Fig. 29. Adults as in Figs 7, 8..... 8
 - Base of valvae without coremata (hair pencils arising from sternite of A9 may be present but are not indicated in figures) (Figs 21-23). Female genitalia, where known, as in Figs 30, 31. Adults as in Figs 9-12.....9
- 8.(7) Valvae broad; tips of octavals truncated; vesica stout, bearing approximately 20 cornuti (Fig. 19). Female genitalia (Fig. 29) with broad, almost square sterigma. Forewings avellaneous, with indistinct markings (Fig. 7) 7. *E. laticallis* Prout
 - Valvae narrower; tips of octavals rounded; vesica more slender, bearing approximately 10 cornuti (Fig. 20). Female unknown. Forewings greyish, with well developed lines and discal spots, similar to *E. pettyioides* (Fig. 8) 8. *E. maloti* sp. n.
- 9.(7.) Adults very large, with prominent discal spots on forewings (Figs 11, 12). Male genitalia with broadly elliptical valvae; octavals sigmoid (Fig. 23). Female genitalia (Fig. 31) with corpus bursae sparsely instrate..... 11. *E. infectaria* (Guenée)
 - Adults smaller, discal spots on forewings less prominent (Figs 9, 10). Male genitalia (Figs 21, 22) with valvae more crescentic; octavals pincer-like. Female genitalia, where known, instrate only anteriorly (Fig. 30)..... 10

- 10.(9) Tips of octavals bearing small hooks; vesica with four cornuti (Fig. 21). Female unknown. Forewings narrow, pattern very similar to *E. monticola*, but postmedian line on forewing convex (not straight) near discal cell (Fig. 9) 9. *E. angustiarum* sp. n.
 - Tips of octavals recurved but apparently not hooked; vesica with at least ten cornuti (Fig. 22). Female genitalia with bursa copulatrix anteriorly ribbed and bearing a group of large spines (Fig. 30). Forewings slightly broader, pattern similar to *E. polylibades* but lacking series of short black streaks bordering postmedian line (Fig. 10) 10. *E. liqalaneng* sp. n.

Species descriptions

A. Octavals absent

I. Valvae cleft

1. *Eupithecia reginamontanum* sp. n., Figs 1, 13, 24

Type material. Holotype ♂, LESOTHO, Maloti Mtns, Oxbow, 2530m, 28.40E 28.45S [sic], 14.I.[19]92 (N.J. Duke); TM Lep[*idoptera*] Heter[*ocera*] Genitalia slide No. 13714.- (TM).

Paratypes (2♂, 3♀). LESOTHO: 1♂, same data as holotype; 1♂, 3♀, *ibidem*, dated 21.I.[19]90 (N.J. Duke) (♂ dissected, TM Lep. Heter. Genitalia slide No. 13684.- (TM)).

DESCRIPTION: adult (Fig. 1). Large. Labial palpi porrect and relatively long; approximately 1.5 times diameter of eyes. Forewings elongated, with pointed apex. Ground colour whitish, with markings composed of blackish and sepia scales, resulting in a grey overall appearance. Basal, median and postmedian lines present, whitish, but only postmedian fairly distinct. Subterminal whitish, very fine and discernible only in fresh specimens. Discal spots greyish, very small. Hind wings whitish, suffused with grey and with bases of lines visible only along inner margin. Discal spots minute. Termina of both pairs of wings finely dotted with black. Underside of forewings suffused with grey and with postmedian and subterminal lines showing through; discal spots elongated and quite prominent. Underside of hind wings whitish with well developed lines and round discal spots; venation finely dotted with black. Abdomen whitish, peppered with black; dorsally, a narrow black belt near base; laterally, two incomplete blackish lines present. Vestiture of body grey; abdomen with a narrow black belt around base and a middorsal line of raised whitish scales.

Fore wing length. 12-13mm (%)12-14mm (&)

Male genitalia (Fig. 13). Uncus terminating in a minute hook, base hooded. Pseudognathos prominent, calyx-like, consisting of two pointed, petal-shaped halves; subscaphium long, terminating in angled processes. Tegumen pointed, more or less triangular; vinculum broadly U-shaped. Valvae almost rectangular, but with shallow cleft between dorsal and ventral parts. Sacculus of almost

equal length to costa, produced to form a broadly rounded tip. Anellus with well-developed, curved labides. Aedeagus subcylindrical; vesica displaying some poorly defined, rod-like structures but lacking true cornuti.

Female genitalia (Fig. 24). Papillae anales rounded, very sparsely setose. Both pairs of apophyses stout, a. anteriores only about one-third length of a. posteriores. Sterigma of unusual shape, resembling the subset icon □, with a medial sclerotized band, as illustrated. Bursa copulatrix sclerotized throughout, widening greatly towards connection with corpus; the latter unevenly rounded. Bursal wall coarsely instrate except for anteriormost portion.

DIAGNOSIS. Similar in male genitalic structure to *E. altitudinis* below, but distinguished from it by the more strongly elongated valvae and slenderer uncus. The adults can be readily separated (compare Figs 1 and 2). *Eupithecia subscriptaria* Prout is another closely related species, but is not known to occur in Lesotho. The female genitalia differ markedly from all other *Eupithecia* species examined, although those of *E. altitudinis* remain unknown.

BIOLOGY. Unknown. This is probably the most common member of the genus in Lesotho. Adults have been collected in January and early February.

DISTRIBUTION. Lesotho, Maloti Mountains.

ETYMOLOGY. 'Queen of the mountains' - with exception of *E. infectaria*, this is the largest member of the genus in the Maloti mountains.

2. *Eupithecia altitudinis* sp. n., Figs 2, 14

Type material. Holotype ♂, LESOTHO: N[ea]r Pass of Guns, 3100m, 28.50E 29.55S [sic], 23.I.[19]90 (N.J. Duke); TM Lep. Heter. Genitalia slide No. 13716.- (TM).

Paratypes (3♂). LESOTHO: 1♂, Liqalaneng, 2700m, montane kloof, 29.04S 28.24E, 19.I.1996 (H.S. Staude) (dissected, HSS genitalia prep. No.13); 1♂, *ibidem*, 3120m, montane plateau; 1♂, *ibidem*, 2900m, montane plateau, 20.I.1996 (dissected, HSS genitalia prep. No. 12).- (TM, HSS).

DESCRIPTION: adult male (Fig. 2). A well-medium sized *Eupithecia* species with pointed forewings. Labial palpi porrect, about diameter of eyes. Ground colour of wings chalk white, suffused with grey; suffusion much lighter on hind wings. Forewings with basal, median and postmedian lines present, all angled

a short distance below costa and not clearly defined; postmedian line relatively most prominent. Subterminal whitish, very faint. Discal spots black, small to medium-sized. Cilia grey. Hind wings light grey. Basal and median line present but more or less distinct only along inner margin of wings, thereafter becoming very faint. Discal spots small and inconspicuous. Underside chalk white

suffused with grey, especially on forewings. Hind wings with basal, median and postmedian present as delicately dotted lines. Forewings with postmedian showing through, position of other lines marked by small, dark grey maculae along costa. Discal spots fairly prominent to indistinct. Vestiture of body dark grey on upper side, somewhat lighter on underside.

Fore wing length. 11-12mm (♂).

Male genitalia (Fig. 14). Uncus with a small subapical hook, arising from broad base. Pseudognathos prominent, calyx-like, consisting of two pointed, petal-shaped halves; subscaphium moderately long, terminating in angled processes. Tegumen broadly triangular; vinculum broadly U-shaped, with slightly concave saccus. Valvae with basal two-thirds subrectangular, apical third with a shallow cleft at about 90 degrees between dorsal and ventral parts. Sacculus shorter than costa, produced to form a broadly rounded tip. Anellus with well-developed, curved labides. Aedeagus short, subcylindrical; vesica displaying some poorly defined, rod-like structures and microcornuti, but lacking true cornuti.

DIAGNOSIS. Close in male genitalia structure to *E. reginamontanum* above, but characterized by stouter uncus and shorter valvae. The female remains unknown. Adult habitus, in contrast, is not suggestive of close relationship.

BIOLOGY. Unknown. Adults have been collected in January.

DISTRIBUTION. Lesotho, Maloti mountains.

ETYMOLOGY. *Altitudinis*, of the heights.

II. Valvae not cleft

3. *Eupithecia pettyioides* sp. n., Figs 3, 15, 25

Type material. Holotype ♂, LESOTHO, Maloti Mtns, Oxbow, 2530m, 28.40E 28.45S [sic], 21.I.[19]90 (N.J. Duke); TM Lepid. Heter. Genitalia slide No. 13681.- (TM).

Paratypes (8♂, 1♀). LESOTHO: 1♂, 1♀, same data as holotype (♀ dissected, TM Lep. Heter. Genitalia slide No. 13715; 1♂ *ibidem*, dated 14.I.[19]92 (N.J. Duke); 2♂, Sehonghong Riv[er] Val[ley], 23 km S. of Thabang, 29.15E 29.27S [sic], 25.I.[19]90 (N.J. Duke), TM Lep. Heter. Genitalia slide No. 13687; 3♂, Liqalaneng, 2350-2700m, 29.04'S 28.23'E, montane kloof, 19.I.1996 (H.S. Staude) (1♂ dissected, HSS genitalia prep. No. 18); 1♂, Moteng Pass, *Rhus-Buddlea* [sic] interspersed grassland, 2350m, 28°46'S 28°35'E, 1.II.1997 (H.S. Staude).- (TM, HSS).

DESCRIPTION: adult (Fig. 3). Small. Labial palpi porrect, approximately diameter of eyes. Forewings elongated, but with well-rounded apex. Ground colour pure grey, mixed with blackish scales. Termen of both pairs of wings finely dotted with black. All lines present but only postmedian fairly well discernible. Discal spots blackish, prominent on forewings, smaller on hind wings. Underside similar, but inner portion of forewings largely devoid of markings, and hind wings with all lines and discal spots well developed. Vestiture of thorax and abdomen greyish, mixed with black scales; abdomen middorsally with a faint off-white line.

Fore wing length. 9-11mm (♂), 10mm (♀).

Male genitalia (Fig. 15). Uncus with subapical hook, base hooded. Pseudognathos as in preceding species, petal-shaped halves with setose inner margin; subscaphium long, terminating in angled processes. Tegumen broadly triangular; vinculum broadly U-shaped, with evenly rounded base. Valvae somewhat rhomboid, pointed. Anellus with well-developed, curved labides. Aedeagus almost cylindrical; vesica displaying densely packed, filamentous structures; true cornuti absent. - Base of valvae without coremata, but a group of scale-like hairs originating from sternite of A9 present.

Female genitalia (Fig. 25). Papillae anales rounded, sparsely setose. Both pairs of apophyses fairly thin, a. anteriores about two-thirds length of a. posteriores. Sterigma trough-shaped. Ductus bursae short, posterior section membranous, anterior section well sclerotized, forming a short colliculum, then widening abruptly into the rounded corpus bursae. Anterior two-thirds of bursal wall densely instrate, remainder membranous.

DIAGNOSIS. The smallest of the grey *Eupithecia* species from Lesotho. In male genitalic structure, it is closest to *E. monticola* (compare Figs 15 and 16), although the adults are quite distinct. By contrast, *E. pettyi* Prout (= *parallellaria* Janse, nomen praeocc.) is very similar in habitus, but distinguished in the male genitalia (see illustration in Janse, 1933: 42). A further similar species is *E. gradatilinea* Prout, in which the male genitalia have markedly more elongated valvae, as well as a single large cornutus present on the vesica, but which has not been recorded from Lesotho so far.

BIOLOGY. Unknown. Adults have been collected in January and early February.

DISTRIBUTION. Lesotho, Maloti Mountains.

ETYMOLOGY. The name refers to the similarity to *Eupithecia pettyi* Prout.

4. *Eupithecia monticola* sp. n., Figs 4, 16, 26

Type material. Holotype ♂, LESOTHO, Maloti Mtns, Oxbow, 2530 m, 28.40E 28.45S [sic], 14.I.[19]92 (N.J. Duke); TM Lep. Heter. Genitalia slide No. 13721.- (TM).

Paratypes (1♂, 5♀). LESOTHO: 4♀, same data as holotype; TM Lep. Heter. Genitalia slide No. 13688; 1♂, *ibidem*, dated 21.I.[19]90; TM Lep. Heter. Genitalia slide No. 13722; 1♀, Maluti Ski Chalet, *Themeda-Festuca* alpine veld, 3000m; 28°47'S 28°12'E, 15.I.1997 (Krüger, Dombrowsky), to U.V. light.- (TM).

DESCRIPTION: adult (Fig. 4). Medium-sized, with narrow and elongated, pointed forewings. Labial palpi porrect, elongated, between 1.5 and two times diameter of eyes. Ground colour of wings whitish. Forewings marked in dark grey, with avellaneous suffusion concentrated along inner margin and along a broad band delimited by median and postmedian lines. Basal line indistinct, median and postmedian somewhat clearer. Postmedian line almost straight up to discal cell, then acutely angled below costa (see diagnosis). Subterminal whitish, very fine and usually discernible in fresh specimens only. Discal spots dark grey, inconspicuous. Cilia on both pairs of wings indistinctly chequered white-and grey. Hind wings of ground colour, irrorated with grey scales, especially along inner margin and termen. Basal, median and postmedian lines present but well developed only along inner margin. Discal spots small but clearly discernible. Termina of both pairs of wings relatively boldly edged with black. Underside of both pairs of wings whitish, with basal, median and postmedian lines and discal spots well developed, except for a broad band above inner margin of forewing, which is suffused with grey and lacks all

markings. Thorax and abdomen dark greyish-brown; base of abdomen with an indistinct off-white belt; mid-dorsally, a fine whitish line present.

Fore wing length. 11mm (♂), 11-13mm (♀).

Male genitalia (Fig. 16). Uncus with subapical hook, arising from broad base. Pseudognathos as in preceding species, petal-shaped halves with setose inner margin; subscaphium relatively short and stout. Tegumen narrowly triangular, pointed; vinculum broadly U-shaped, with evenly rounded base. Valvae rhomboid or tear-shaped, pointed, with well-defined costa. Anellus with well-developed, curved labides. Aedeagus cylindrical posteriorly, tapering anteriorly; vesica displaying densely packed, rod-like structures; true cornuti absent.

Female genitalia (Fig. 26). General aspect elongated. Papillae anales rounded. Apophyses moderately robust; a. anteriores between half and two-thirds length of a. posteriores. Sterigma broadly trough-shaped, posterior margin deeply cleft medially. Ductus bursae with membranous posterior section, anteriorly forming a short, well-sclerotized colliculum. Corpus bursae rounded, anterior three-quarters of bursal wall densely instrate.

DIAGNOSIS. Although in habitus closest to *Eupithecia angustiarum* below, the male genitalia are most similar to those of *Eupithecia pettyioides* sp. n. above (compare Figs 4, 9 and 15, 16).

BIOLOGY. Unknown. Adults have been collected in January.

DISTRIBUTION. Lesotho, Maloti Mountains.

FURTHER MATERIAL. 1 ♂. 1 ♀ Magaliesburg (HSS). Localities. Liqalaneng.

ETYMOLOGY. *Monticola*, an inhabitant of mountains.

5. *Eupithecia polylibades* Prout, 1916, Figs 5, 17, 27

Eupithecia polylibades Prout, 1916: 168. Holotype ♀, [SOUTH AFRICA, Gauteng]: Pretoria, 20.3.'14 (A.J.T. Janse); *Eupithecia polylibades* Prout & type; *Eupithecia polylibades* Prout. Type No. 2146 (TM) [examined].-

Eupithecia polylibades Prout; Janse, 1933: 41; Prout, 1937: 104.

REDESCRIPTION: adult (Fig. 5). Labial palpi drooping, rostriform, slightly longer than diameter of eyes. Wings rather broad for the genus, apex of forewings rounded. Ground colour of wings greyish with faint greenish tinge (tilleuil-buff in Janse (1933)). Forewings with broad yet indistinct basal, median

and postmedian line and a very fine, zigzagging subterminal; postmedian bordered proximally by series of short, blackish streaks. Discal spots blackish, moderately conspicuous. Hind wings similar but lines less distinct. Underside whitish, suffused with grey. Postmedian and subterminal lines, as well as discal spots showing through, other elements absent or very faint. Cilia concolorous with respective sides of wings. Upper side of thorax and abdomen grey, peppered with black, underside off-white.

Fore wing length. 10-12mm (♂), 11mm (♀).

Male genitalia (Fig. 17). Uncus with small subapical hook, arising from broad base. Pseudognathos similar to that of preceding species; inner margin of petal-shaped halves not setose; subscaphium comparatively short and robust. Tegumen narrow, triangular; vinculum broadly U-shaped. Valvae almost semicircular, with straight costa and convex termen. Anellus with well-developed, curved labides. Aedeagus almost cylindrical; vesica showing rod-like internal structures but lacking true cornuti.

Female genitalia (Fig. 27). Papillae anales pointed. Both pairs of apophyses stout, a. anteriores about half length of a. posteriores. Sterigma trough-shaped. Ductus bursae rather long for the genus, posterior section membranous, anterior section well sclerotized, forming a short colliculum, then widening abruptly into the broadly elliptical corpus bursae. Anterior three-quarters of bursal wall densely instrate.

DIAGNOSIS. May be recognized without dissection of the genitalia by the series of short black streaks bordering the postmedian on both pairs of wings. *Eupithecia polylibades* has the broadest wings of the *Eupithecia* species thus far recorded from Lesotho. None of these species appear to be particularly closely related to *polylibades*, although *E. liqalaneng* below is similar in habitus.

BIOLOGY. Unknown. In South Africa, adults have been collected from January to March; the Lesotho records are from January and early February.

DISTRIBUTION. South Africa (Gauteng, KwaZulu-Natal, Eastern Cape); Swaziland; Lesotho.

MATERIAL EXAMINED. 9♂ (1 dissected, TM Lep. Heter. Genitalia slide No. 13718) and 3 ♀ (1 dissected, TM Lep. Heter. Genitalia slide No. 13719). 10 Pretoria (TM), 2 Magaliesburg (HSS).

Localities: 2♂, Moteng Pass; 2♂, near Maluti Ski Chalet, Mahlasela Hill Pass, 3000 m; 2♂, 2♀, Oxbow, 2530 m; 1♂, 1♀, Valley/Mt. Masoleng, 10km N. of Mafolaneng; 2♂, Sehonghong River Valley, 23 km S. of Thabang .- (TM).

6. *Eupithecia hypophasma* Prout, 1913, Figs 6, 18, 28

Eupithecia hypophasma Prout, 1913: 207. Holotype ♂, [SOUTH AFRICA, Northern Province]: Haenertsburg, 9.XII.1909 (C.J. Swierstra) (BMNH) [Not examined]. See below.

Paratypes: number not stated, deposited in BMNH and TM. TM types lost according to a note by Janse. The identity of the species was established from the description and material in the Transvaal Museum collection.

Eupithecia hypophasma Prout; Janse, 1933: 35; Prout, 1937: 105.

REDESCRIPTION: adult (Fig. 6). Labial palpi porrect, about 1.5 times diameter of eyes. Forewings moderately narrow, apex pointed, but not strongly so. Forewings, including cilia, light brown, mixed with black scales along cell and cubitus. Lines indistinct; postmedian relatively best developed but still faint, strongly curved a short distance below costa. Subterminal line whitish, extremely fine, broken or reduced in most specimens. Discal spots blackish, very small. Hind wings off-white, suffused with grey and with markings reduced along wing base and costa. Dark suffusion much more intense along inner margin and termen. Postmedian line more or less distinct; other lines discernible only along inner margin of wings. Underside light grey, irrorated with darker grey scales along position of lines. Postmedian line paler than ground colour and devoid of irroration, hence quite conspicuous. Discal spots larger than on upper side, grey. Vestiture of thorax and abdomen concolorous with wings.

Fore wing length. 10-11mm (♂), 11-12mm (♀).

Male genitalia (Fig. 18). Uncus with subapical hook fairly distinct, base slightly hooded. Pseudognathos massive, with tips curved inward; subscaphium long, not particularly stout. Genital capsule tear-shaped, base of vinculum broadly rounded. Valvae having termen distinctly angled medially. Anellus with well-developed, slender, curved labides. Aedeagus cylindrical, apical region finely scobinate; vesica lacking cornuti.

Female genitalia (Fig. 28). Papillae anales broadly rounded. Apophyses moderately stout, a. anteriores approximately two-thirds length of a. posteriores. Sterigma apparently not well defined, somewhat U-shaped, with one arm distinctly shorter. Ductus bursae narrow, fairly elongated, membranous posteriorly, forming a well-sclerotized colliculum anteriorly before widening abruptly into the large and rounded corpus. Anterior two-thirds of bursal wall densely instrate, remainder membranous.

DIAGNOSIS. Of the Lesotho species, most similar in habitus to *E. laticallis* below but males are readily separated from it by genitalic morphology (compare Figs 18, 19). In the original description, Prout gives the sharply marked underside as a distinguishing character; however, this occurs in other species as well.

BIOLOGY. Unknown. In South Africa, adults have been collected from September to January and March to May. The Lesotho records date from January.

DISTRIBUTION. South Africa (Northern Province, Mpumalanga, Eastern Cape, Free State); Lesotho. Prout (1937) mentions Suna, S. Kavirondo in Kenya as a possible further locality.

MATERIAL EXAMINED. 4 ♂ (2 dissected, TM Lep. Heter. Genitalia slide No. 13734; HSS genitalia slide No. 14) and 1 ♀ (dissected, TM Lep. Heter. Genitalia slide No. 13735). 3 Pretoria (TM), 2 Magaliesburg (HSS).

Localities: 2♂, Sehonghong River Valley, 23 km S. of Thabang; 1♀, Valley/Mt. Masoleng, 10 km N. of Mafolaneng; 2♀, Liqalaneng.

B. Octavals present

I. Base of valvae bearing coremata

7. *Eupithecia laticallis* Prout, 1922, Figs 7, 19, 29

Eupithecia laticallis Prout, 1922: 164. Holotype ♂, [SOUTH AFRICA, Western Cape]: Cape Town, May 1912 (Lord Gladstone); *Eupithecia laticallis* Prout ♂ type; *Eupithecia laticallis* Prout. Type No. 2798 ♂ (TM) [examined].

Eupithecia laticallis Prout; Janse, 1933: 42; Prout, 1937: 105.

REDESCRIPTION: adult (Fig. 7). Labial palpi porrect, slightly longer than diameter of eyes. Forewings moderately narrow, apex pointed, but not strongly so. Forewings including cilia avellaneous, mixed with grey in median area. Lines indistinct; postmedian relatively best developed, strongly curved a short distance below costa. Subterminal line whitish, extremely fine, reduced in some specimens. Discal spots blackish, small to minute. Hind wings pale ochreous, less well marked and usually only discal spots and postmedian line more or less distinct; other lines discernible only along inner margin. Underside cream,

suffused with grey; discal spots and postmedian line discernible in most specimens, other elements very faint or absent. Vestiture of thorax and abdomen avellaneous, abdomen finely dotted with black dorsally.

Fore wing length. 11-12mm (both sexes).

Male genitalia (Fig. 19). Uncus with subapical hook indistinct, base hooded. Pseudognathos as in preceding species, petal-shaped halves with setose inner margin; subscaphium relatively short and stout. Tegumen broadly triangular; vinculum angular, with concave sides and base. Valvae rhomboid or tear-shaped, pointed, with well-defined costa. Coremata bearing long hair-pencils arising from base of valvae. Anellus with well-developed, slender, curved labides. Aedeagus cylindrical; vesica with a dense patch of approximately 17 heavily sclerotized, nail-like cornuti. Octavals as illustrated. See also Remarks.

Female genitalia (Fig. 29). General aspect squat. Papillae anales broadly rounded, bearing long setae. Apophyses moderately stout, a. anteriores approximately two-thirds length of a. posteriores. Sterigma taking the shape of a deep parallel-sided trough with recurved rims. Dense scale pockets (not indicated in Fig.) present around ostium. Ductus bursae long, membranous posteriorly, forming a well-sclerotized colliculum anteriorly before widening abruptly into the broadly kidney-shaped corpus. Anterior two-thirds of bursal wall densely instrate.

DIAGNOSIS. The avellaneous forewings are characteristic. *Eupithecia monticola* and *E. angustiarum* are similar, but are more greyish and have the lines on the forewing much more distinct. In the male genitalia, the number and configuration of cornuti are characteristic.

BIOLOGY. Throughout its fairly wide South African range, adults have been collected from October-January, in March-May and July-August; the records from Lesotho date from January.

DISTRIBUTION. South Africa (KwaZulu-Natal, Western Cape, Northern Cape, Free State); Lesotho.

MATERIAL EXAMINED. 12 ♂ (2 dissected, TM Lep. Heter. Genitalia slide No. 13682; HSS genitalia prep. No. 16) and 5 ♀ (1 dissected, TM Lep. Heter. Genitalia slide No. 13683). 11 Pretoria (TM), 4 Magaliesburg (HSS).

Localities: 8♂, 1♀, Oxbow, 2530 m; 1♂, 3♀, Valley/Mt. Masoleng, 10km N. of Mafolaneng; 3♂, Moteng Pass; 1♀, Mahlasela Hill Pass near Maluti Ski Chalet.

REMARKS. Janse (1933: 43) states 'vesica probably with three cornuti', although this observation is not borne out by his illustration. I have compared a

preparation made from a topotypical specimen, and found it to be identical to the specimens from Lesotho.

8. *Eupithecia maloti* sp. n., Figs 8, 20

Type material. Holotype ♂, LESOTHO, Sehonghong Riv[er] Val[ley], 23km S. [of] Thabang, 29.15E 29.27S [sic], 25.I.[19]90 (N.J. Duke); TM Lep. Heter. Genitalia slide No. 13720.- (TM).

DESCRIPTION: adult male (Fig. 8). A medium-sized *Eupithecia*; forewings pointed, but not strongly so. Labial palpi porrect, slightly more than diameter of eyes. Forewings cream, densely suffused with dark grey. Basal, median and postmedian lines present, a little lighter than ground colour and rather wide, but only postmedian clearly distinguishable. Subterminal whitish, strongly zig-zagging and very fine. Discal spots black, well developed. Hind wings cream, with only very light grey suffusion. Discal spots black, smaller than on forewings but distinct. Basal and median lines visible only along inner margin of wings; postmedian present as a weak dotted line across wings. Termen of both pairs of wings finely dotted with black. Underside off-white suffused with grey, especially on forewings. Hind wings with discal spots and median and postmedian lines present (as fine, dotted lines); forewings with small discal spots and small blackish maculae indicating position of lines along costa. Vestiture of body dark grey on dorsal side; ventral side lighter.

Fore wing length. 11mm (holotype).

Male genitalia (Fig. 20). Uncus with subapical hook apparently absent, long, acutely pointed, arising from broad, hooded base. Pseudognathos with petal-shaped halves truncated, with setose inner margin; subscaphium relatively shorter and stouter than in the above species. Tegumen narrowly triangular; vinculum angular, with faintly concave sides and somewhat more strongly emarginate base. Valvae tongue-shaped, rounded, with well-defined costa. Coremata bearing long hair-pencils arising from base of valvae. Anellus with well-developed, slender, curved labides. Aedeagus cylindrical, gently tapering anteriorly; vesica bearing four large, slightly curved nail-like cornuti, as well as a group of about ten smaller such cornuti. Octavals as illustrated.

DIAGNOSIS. In habitus most similar to *E. pettyioides* above, but with very different genitalia, and in this respect closest to *Eupithecia laticallis* above, but characterized by the presence of cornuti of two distinct size classes.

BIOLOGY. Unknown. Apparently a rare species; the only specimen known was collected in January.

DISTRIBUTION. Lesotho, Maloti Mountains.

ETYMOLOGY. The species is named after the mountain range it inhabits.

II. Base of valvae without coremata

The three species grouped together here for ease of identification are not closely related; *Eupithecia infectaria* occupies an isolated position within the genus. When trying to identify these species, care must be taken not to confuse hairpencils arising from the sternite of A9 with coremata.

9. *Eupithecia angustiarum* sp. n., Figs 9, 21

Type material. Holotype ♂, LESOTHO, n[ea]r Pass of Guns, 3100m, 28.50E 29.55S [sic], 23.I.[19]90 (N.J. Duke); TM Lep. Heter. Genitalia slide No. 13685.- (TM).

Paratypes (9♂). LESOTHO: 4♂, same data as holotype; 3♂, Maloti M[oun]t[ai]ns, Oxbow, 2530m, 28.40E 28.45S [sic], 21.I.[19]90 (N.J. Duke); 1♂, N[ea]r Maluti Ski Chalet, Mahlasela Hill Pass, 3000m, 28.45E 28.50S [sic], 22.I.[19]90 (N.J. Duke); 1♂, Maluti Ski Chalet, *Themeda-Festuca* alpine veld, 3000m; 28°47'S 28°12'E, 14.I.1997 (Krüger, Dombrowsky), to U.V. light.- (TM).

DESCRIPTION: adult male (Fig. 9). Medium-sized, with narrow and elongated, pointed forewings. Labial palpi gently drooping, short, slightly more than diameter of eyes. Ground colour of wings whitish, but upper side evenly suffused with light grey. Forewings marked in dark grey, with avellaneous suffusion along upper and lower median and especially along postmedian line. All lines, including subterminal, fairly distinct. Postmedian line convex, acutely angled below costa (see diagnosis). Discal spots very small, dark grey. Hind wings light grey. Postmedian line faint but complete, other lines discernible only along inner margin. Discal spots minute. Termina of both pairs of wings thinly edged with black. Underside whitish-grey; forewings, except for area around apex, suffused with grey and without markings. Discal spots small but clearly visible; costa with a small black macula at one-third from apex, indicating position of postmedian. Hind wings with basal, median and submedian lines finely dotted in black. Discal spots slightly larger than on forewings. Termen of both pairs of wings thinly edged with black, cilia chequered white-and-grey. Vestiture of thorax and abdomen dark greyish-brown, abdomen with an indistinct off-white belt near base and a very fine, whitish middorsal line.

Fore wing length. 10-11mm (♂).

Male genitalia (Fig. 21). Uncus acutely pointed, with a rounded subapical tip. Pseudognathos with the two halves less regularly shaped than in all preceding species, with inner margin bearing scales; subscaphium relatively short and stout. Tegumen fairly broadly triangular; vinculum angular, with emarginate (concave) sides and base. Valvae rather semicircular, with well-defined, straight costa and rather evenly rounded termen. Anellus with well-developed, slender, curved labides. Aedeagus short, faintly spindle-shaped; vesica with a characteristic configuration of curved cornuti, arranged in decreasing size. Octavals as illustrated.

DIAGNOSIS. Similar to *E. monticola* but slightly smaller, with narrower, less pointed forewings. In the present species the postmedian line on the forewing is convex near the discal cell, whereas it is straight in *E. monticola*.

BIOLOGY. Unknown. Adults have been collected in January.

DISTRIBUTION. Lesotho, Maloti Mountains.

ETYMOLOGY. From Latin *angustiae* (-arum), a narrowness, a mountain pass: the reference is to the type locality.

10. *Eupithecia liqalaneng* sp. n., Figs 10, 22, 30

Type material. Holotype ♂, LESOTHO, Maloti mountains, Liqalaneng, 2700m, montane kloof, 29.04'S 28.24'E, 19.I.1996 (H.S. Staude).- (TM).

Paratypes (5♂, 2♀). LESOTHO: 2♂, same data as holotype (dissected, HSS genitalia prep. Nos. 17, 20); 1♀, Sehonghong R[iver]Vall[ey], 23km S. [of] Thabang, 29.15E 29.27S [sic], 25.I.[19]90 (N.J. Duke); 1♂, 1♀, Maloti M[oun]t[ai]ns, Oxbow, 2530m, 28.40E 28.45S [sic], 14.I.[19]92 (N.J. Duke); 2♂, Valley/Mt. Masoleng, 10km N. [of] Mafolaneng, 28.52E 29.10S [sic], 24.I.[19]90 (N.J. Duke).- (TM, HSS).

DESCRIPTION: adult (Fig. 10). A medium-sized *Eupithecia*. Labial palpi correct, short, about diameter of eyes. Forewings fairly narrow and pointed. Ground colour off-white, pattern composed of grey to brownish-grey scales, resulting in a variegated appearance. Basal, median and postmedian lines present, broad, mostly of ground colour, but with darker centre. Subterminal line whitish, extremely fine. Discal spots black, very small. Hind wings light grey, without markings near base and along costa. Postmedian line well developed, marked with whitish along veins; other lines discernible only along inner margin of wings. Discal spots dark grey, minute. Cilia on both pairs of

wings indistinctly chequered off-white and grey. Underside off-white, lightly suffused with grey on forewings. Hind wings with small discal spots and median and postmedian lines delicately marked with grey along veins; on forewings, lines indistinct but their position marked by small grey maculae along costa. Discal spots grey, very small. Vestiture of body composed of brownish-grey scales mixed with off-white, more heavily so on ventral side.

Forewing length. 10-12mm (♂), 11-12mm (♀).

Male genitalia (Fig. 22). Uncus pointed, subapical tip small, with strongly rounded head. The two parts of the pseudognathos baton-like, approximately parallel-sided, ciliate rather than setose; subscaphium of moderate proportions. Tegumen trapezoidal or bell-shaped, base wider than vinculum; the latter somewhat angular, with markedly convex sides. Valvae fairly narrow, pointed. Labides slender. Aedeagus spindle-shaped, vesica bearing in excess of ten needle- or nail-like cornuti of approximately equal length but greatly varying thickness.- Coremata are absent, but the sternite of A9 bears hair pencils (not indicated in figure).

Female genitalia (Fig. 30). Papillae anales pointed, from broad bases. Apophyses sturdy, a. anteriores rather more than two-thirds length of a. posteriores. Sterigma not modified. Bursa copulatrix pear-shaped, with very short membranous ductus. Corpus bursae with bursal wall instrate anteriorly, displaying longitudinal grooves posteriorly; a group of prominent spines present on one side.

DIAGNOSIS. Fairly easily recognized by the contrast between the broad, pale lines on the forewings and the darker areas in between. *Eupithecia polylibades* above is similar in habitus but characterized by a series of short blackish streaks in the postmedian area of both pairs of wings. In the male genitalia, the configuration of cornuti on the vesica affords the safest means of identification. It should be noted that whereas coremata are absent, the species displays hairpencils arising from the sternite of A9.

BIOLOGY. Unknown.

DISTRIBUTION. Lesotho, Maloti Mountains.

FURTHER MATERIAL (2♂). 2 Magaliesburg (HSS). Localities: Liqalaneng (2).

ETYMOLOGY. Named after one of the type localities.

11. *Eupithecia infectaria* (Guenée, 1857), Figs 11, 12, 23, 31

Lepiodes infectaria Guenée, 1857: 359, pl. 22, fig. 7. Syntypes: 1♂, 1♀, [SOUTH AFRICA, Western Cape]: Cap de Bonne Espérance (MNHN) [not examined]. The identity of the species was established using the illustration in Guenée (1857) and the description in Janse (1933).

Eupithecia infectaria (Guenée); Janse, 1933: 49; Prout, 1937: 108.

DESCRIPTION: adult (Figs 11, 12). The largest *Eupithecia* in southern Africa, resembling *Eccymatoge melanoterma* Prout in habitus (Janse, 1933), but termen of hind wings not crenulated.- Antennae of male strongly ciliate. Labial palpi porrect, slightly longer than diameter of eyes. Forewings pointed in males, broader, with more rounded apex in females. Ground colour fairly dark grey, becoming more brownish in older specimens. Basal, median and postmedian lines present, double, and lighter than ground colour, but indistinct except for postmedian. Subterminal whitish, extremely fine. In females, median area of wing bordering discal cell occupied by a paler elliptical blotch. Discal spots blackish, prominent, composed of raised scales. Hind wings off-white, lightly suffused with grey and lacking markings except for traces of lines along inner margin. In strongly marked females, median and postmedian just discernible across wings. Discal spots very small. Underside off-white suffused with grey, in some specimens more strongly so on forewings. Lines moderately well (males) to well (females) developed, fine; discal spots also clearly marked. Vestiture of body dark greyish-brown on dorsal, light ochreous on ventral side, resulting in a marked contrast.

Forewing length. 13-14mm (♂), 14-15mm (♀).

Male genitalia (Fig. 23). Uncus fairly short, acutely pointed; subapical tip fairly well developed. Pseudognathos well developed, petal-like; subscaphium also well developed. Tegumen narrow, bell-shaped; vinculum much larger, angular. Valvae almost elliptical, with evenly curved termen and curvature of base equalling that of apex. Anellus well developed, with long and slender labides. Aedeagus straight, fairly stout; vesica apically with three large, strongly sclerotized cornuti; much of apical portion of vesica scobinate. Octavals less heavily sclerotized than in other species, with a characteristic sigmoid shape.

Female genitalia (Fig. 31). Papillae anales large, setose, with parallel sides. Apophyses comparatively slender for the size of the abdomen; a. anteriores about half the length of a. posteriores. Sterigma not particularly modified, extending as a broad, crescentic band over most of segment. Ductus bursae short and wide-mouthed. Corpus bursae large, elliptical and sclerotized throughout; bursal wall loosely intrate. Unlike in other *Eupithecia* species, the spines become easily detached.

DIAGNOSIS. This is the largest species of *Eupithecia* known from southern Africa. As stated, confusion is likely only with *Eccymatoge melanoterma*. In the latter species, however, the hind wing termen is markedly crenulated, and the antennae of the male not ciliate. The structure of the female genitalia in particular suggests that *E. infectaria* occupies an isolated position within the genus.

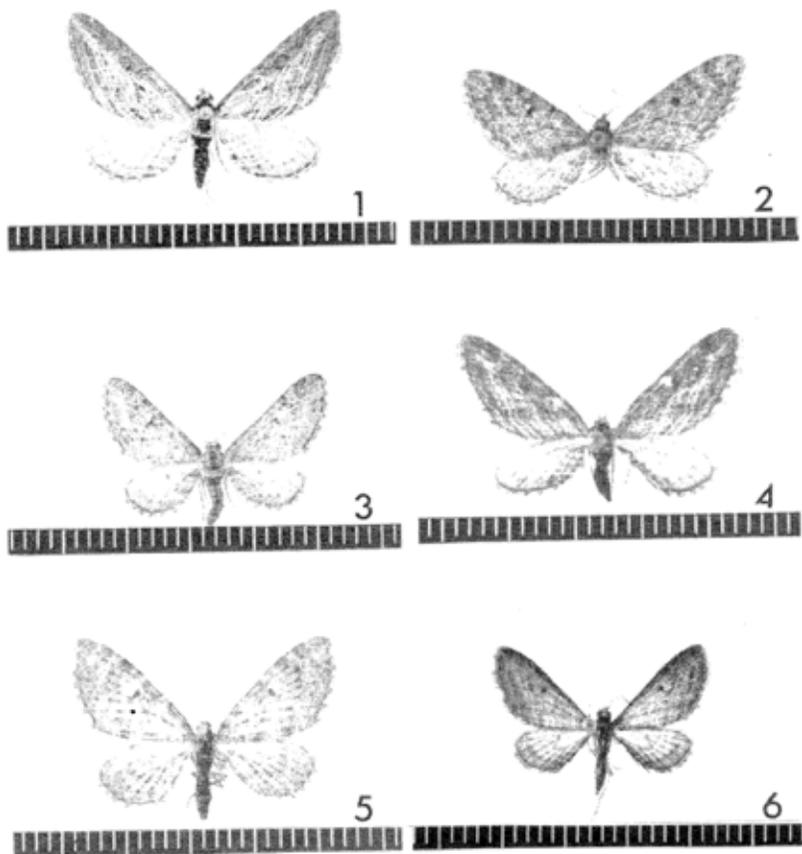
BIOLOGY. Throughout the wide range of the species, which occurs from near sea-level to above 2500m, adults have been collected in November, January-February and April-May; the single record from Lesotho dates from February. N.J. Duke reared larvae of this species from Transkei on *Buddleja salviifolia* (L.) Lam. FP.

DISTRIBUTION. South Africa (Western Cape, Eastern Cape (Transkei), KwaZulu-Natal, Northern Province, Mpumalanga); Lesotho.

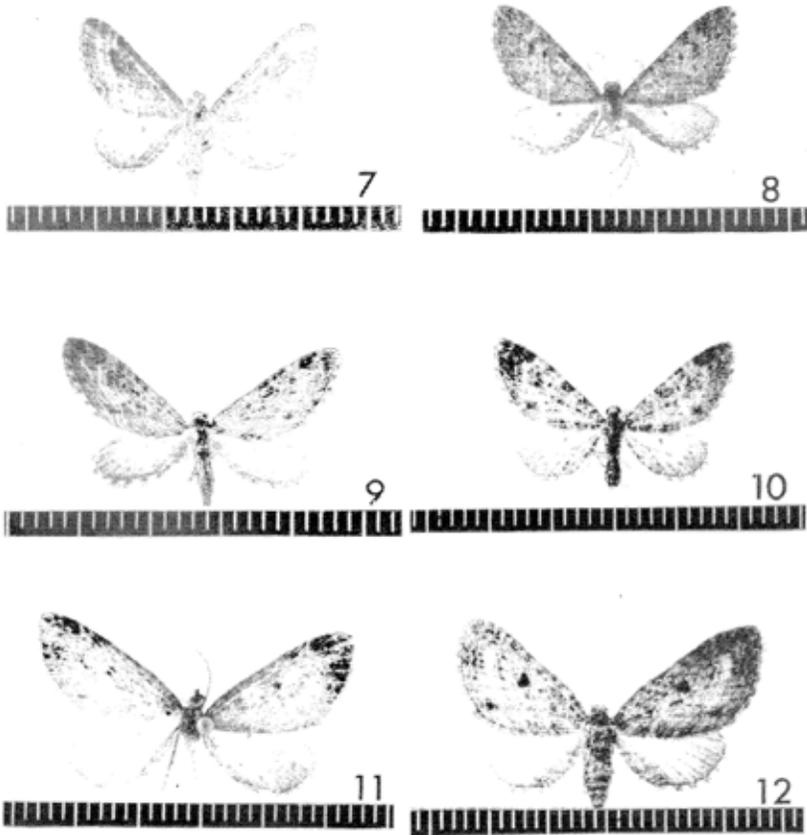
MATERIAL EXAMINED. 1♂ (dissected, HSS genitalia slide No. 19). 1 Magaliesburg (HSS). Localities: Oxbow Lodge (1).

Acknowledgements

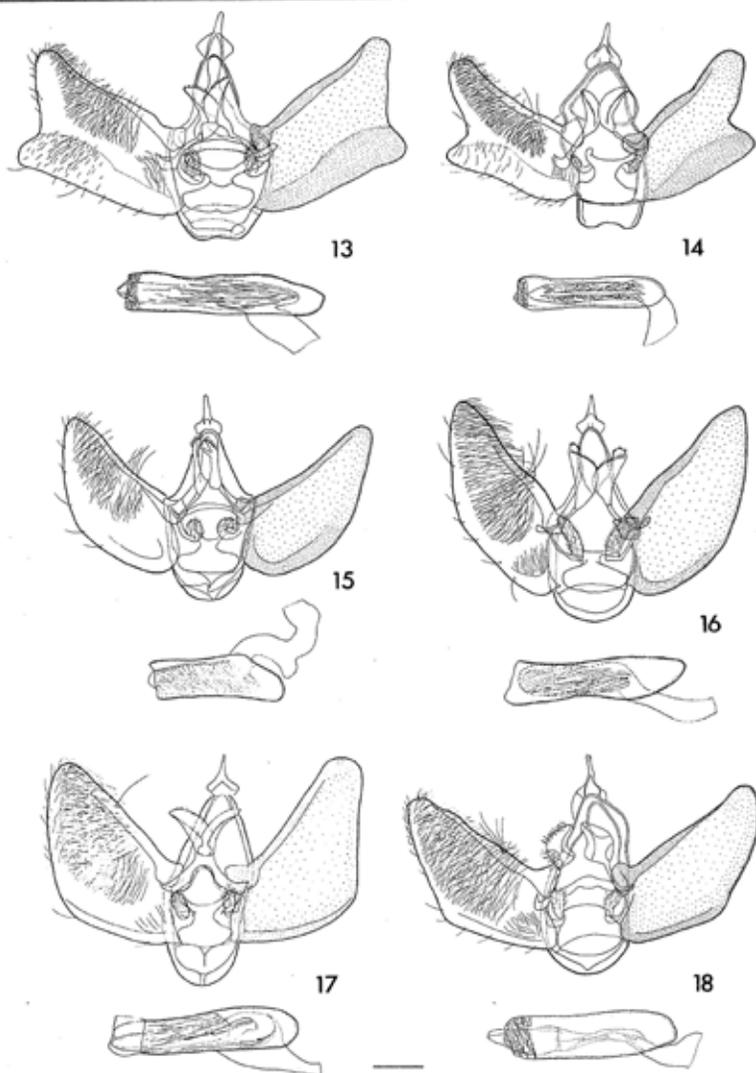
H.S. Staude, Magaliesburg, South Africa, is thanked for the loan of specimens from his collection.



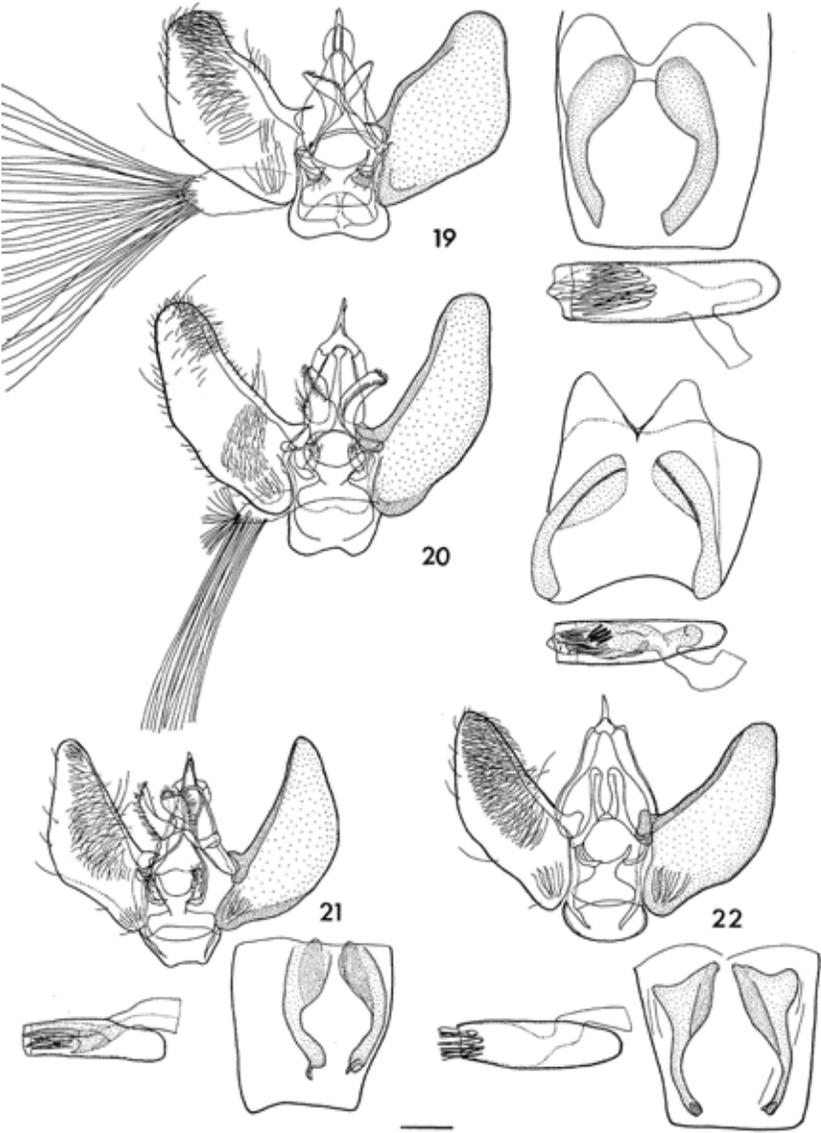
Figs 1-6, adults. 1, *Eupithecia reginamontanum* sp. n.; 2, *E. altitudinis* sp. n.; 3, *E. pettyioides* sp. n.; 4, *E. monticola* sp. n.; 5, *E. polylibades* Prout; 6, *E. hypophasma* Prout. Scale bars inmm.



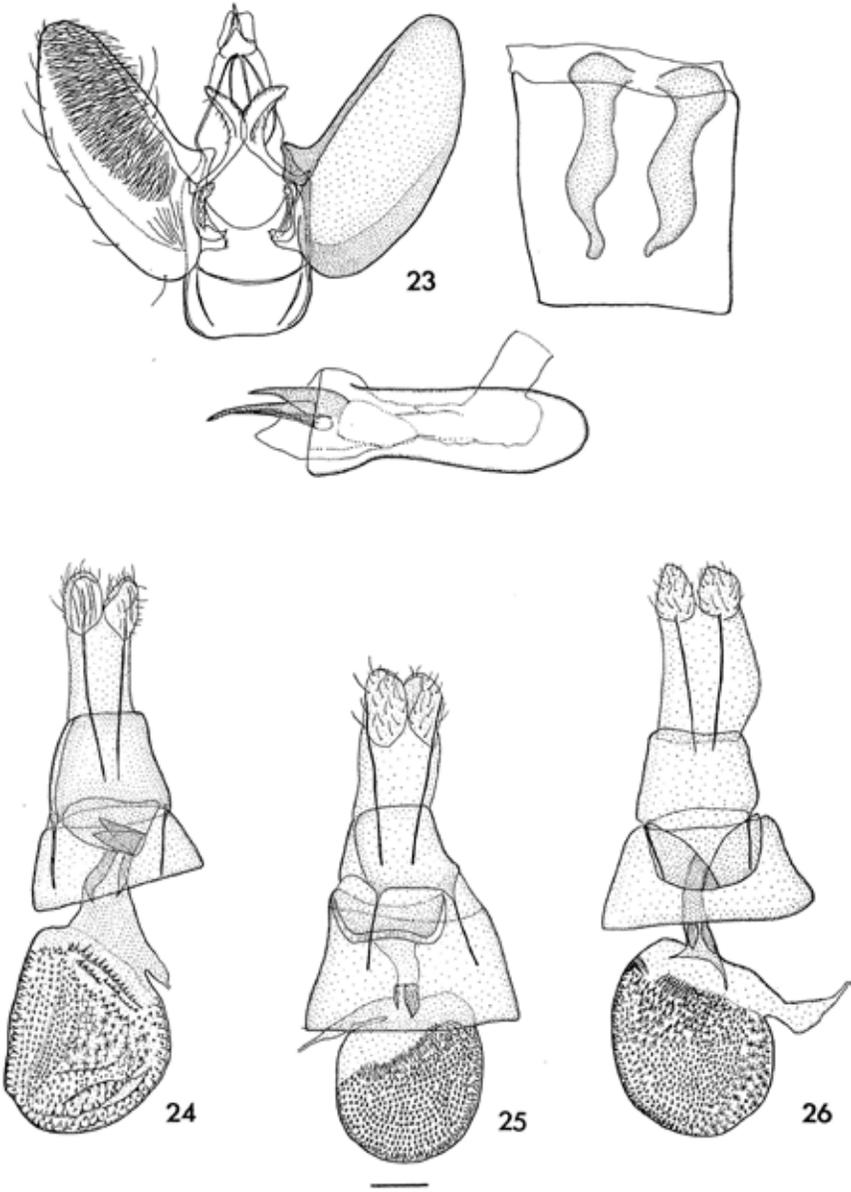
Figs 7-12, adults. 7, *Eupithecia laticallis* (Prout); 8, *E. maloti* sp. n.; 9, *E. angustiarum* sp. n.; 10, *E. liqalaneng*; 11, 12, *E. infectaria* (Guenée). Scale bars in mm.



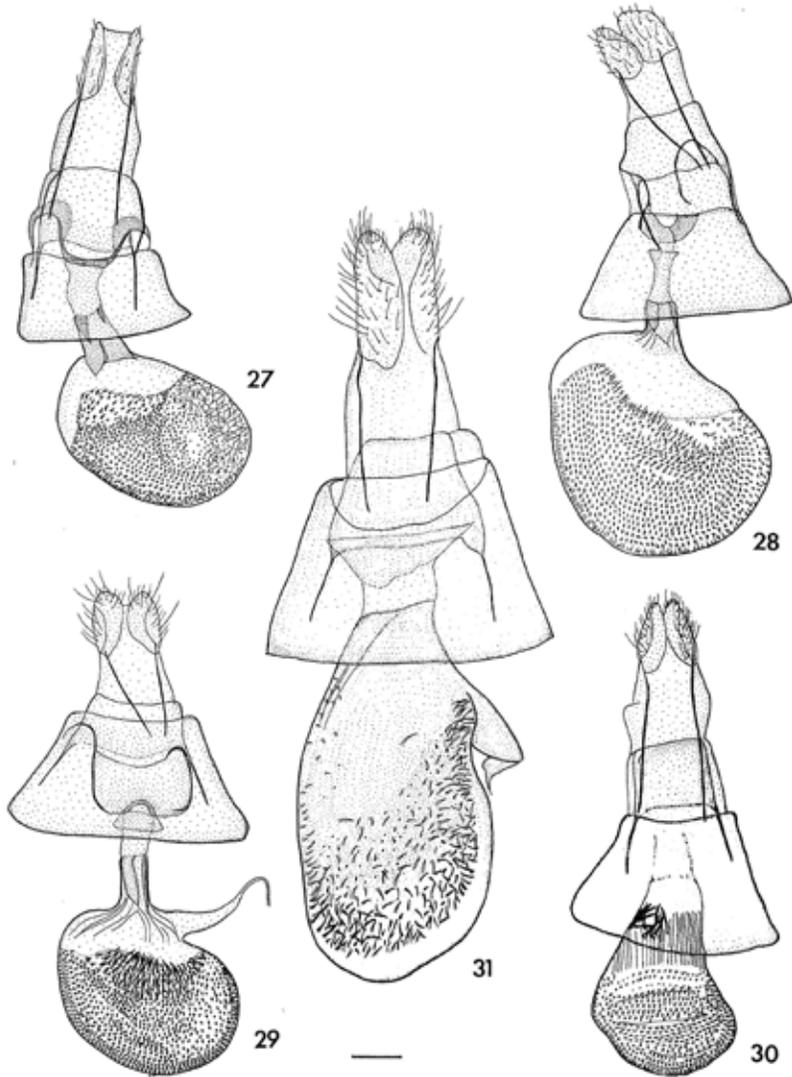
Figs 13-18, male genitalia. 13, *Eupithecia reginamontanum* sp. n.; 14, *E. altitudinis* sp. n.; 15, *E. pettyioides* sp. n.; 16, *E. monticola* sp. n.; 17, *E. polylibades* Prout; 18, *E. hypophasma* Prout. Scale bar = 0.3mm.



Figs 19-22, male genitalia. 19, *Eupithecia laticallis* Prout; 20, *E. maloti* sp. n.; 21, *E. angustiarum* sp. n.; 22, *E. liqalaneng* sp. n.; Scale bar = 0.3mm.



Figs 23-26, female genitalia. 23, *E. infectaria* (Guenée). 24, *Eupithecia reginamontanum* sp. n.; 25, *E. pettyioides* sp. n.; 26, *E. monticola* sp. n.; Scale bar = 0.3mm.



Figs 27-31, female genitalia. 27, *E. polylibades* Prout, 28, *Eupithecia hypophasma* Prout; 29, *E. laticallis* Prout; 30, *E. liqalaneng* sp. n.; 31, *E. infectaria* (Guenée). Scale bar = 0.3mm.

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BUTTERFLIES OF THE EAST RAND, SOUTH AFRICA

By

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The East Rand area is characterised by sparse *Cymbopogon-Themeda* tufted veld (Acocks 1988). Altitude is approximately 1600m a.s.l.. Rainfall varies between 500 – 700mm p.a. falling in summer, and frost occurs in winter. Large residential and industrial areas cover the region. This article aims to provide a species list of the butterflies collected on the East Rand (eastern region of the Witwatersrand, South Africa) by the author.

Most collecting was done in the Boksburg and Benoni areas. Collecting was conducted during the following months: December/January and June 1995; 1996; 1997; and for a full year from November 1998 to October 1999. However Springs, Brakpan and Germiston were also visited during December/January 1996 and 1997.

Most species were seen numerous times. However, some species were collected rarely (denoted by *). This species list is by no means complete, but nevertheless contributes to the distributions of the species dealt with. Further collecting is still in progress. Using Pringle, *et al.* (1994) and Henning, *et al.* (1997) the family, sub-family, species (and common names) and sub-species (where applicable) taxons are listed. Forty species have been collected so far and are listed as follows:

NYMPHALIDAE

DANAINAE

Danaus (Anosia) chrysippus aegyptius (Schreber) African Monarch

SATYRINAE

Melanitis leda helena (Westwood) Common Evening Brown

ACRAEINAE

Acraea (Acraea) horta (L.) Garden Acraea
Acraea (Acraea) neobule neobule Doubleday * Wandering Donkey Acraea
Acraea (Stephenia) natalica natalica De Boisduval Natal Acraea
Hyalites (Auracraea) rahira rahira (de Boisduval) Marsh Acraea

CHARAXINAE

Charaxes jasius saturnus Butler * Foxy Charaxes

NYMPHALINAE

Byblia ilithyia (Drury) Spotted Joker
Hypolimnas misippus (L.) Common Diadem
Catacroptera cloanthe cloanthe (Stoll) * Pirate
Precis (Precis) archesia Cramer * Garden Commodore

<i>Precis (Junonia) hierta cebrene</i> (Trimen)	Yellow Pansy
<i>Precis (Junonia) oenone oenone</i> (L.)	Blue Pansy
<i>Precis (Junonia) orithya madagascariensis</i> Guenée	Eyed Pansy
<i>Vanessa (Cynthia) cardui</i> (L.)	Painted Lady
<i>Phalanta phalantha aethiopica</i> (Rothschild & Jordan)	African Leopard

LYCAENIDAE

POLYOMMATINAE

<i>Anthene definita definita</i> (Butler)	Common Hairtail
<i>Uranotauma nubifer</i> (Trimen) *	Black Heart
<i>Cacyreus palemon palemon</i> (Stoll)	Water Blue
<i>Cacyreus marshalli</i> Butler	Common Geranium Bronze
<i>Leptotes pirithous</i> (L.)	Common Blue
<i>Lampides boeticus</i> (L.)	Long-tailed Blue
<i>Cupidopsis jobates jobates</i> (Hopffer)	Tailed Meadow Blue
<i>Zizeeria knysna</i> (Trimen)	Sooty Blue
<i>Zizula hylax</i> (Fabricius)	Gaika Blue

PIERIDAE

COLIADINAE

<i>Colias electo electo</i> (L.)	African Clouded Yellow
<i>Catopsilia florella</i> (Fabricius)	African Migrant
<i>Eurema (Maiva) brigitta brigitta</i> (Stoll)	Broad-bordered Grass Yellow

PIERINAE

<i>Belenois (Anaphaeis) aurota</i> (Fabricius)	Brown-veined White
<i>Pontia (Pontia) helice helice</i> (L.)	Meadow White
<i>Mylothris rueppellii haemus</i> (Trimen) *	Twin Dotted Border
<i>Mylothris agathina</i> (Cramer) *	Common Dotted Border

PAPILIONIDAE

PAPILIONINAE

<i>Papilio demodocus demodocus</i> Esper	Citrus Swallowtail
<i>Papilio nireus lyaeus</i> Doubleday *	Green-banded Swallowtail

HESPERIIDAE

COELIADINAE

<i>Coeliades forestan forestan</i> (Stoll)	Striped Policeman
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PYRGINAE

Spialia asterodia (Trimen) *

Star Sandman

Spialia diomus ferax (Wallengren) *

Common Sandman

HESPERIINAE

Metisella meninx (Trimen)

Marsh Sylph

Borbo fallax (Gaede) *

False Swift

Gegenes niso niso (L.)

Common Hottentot Skipper

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HAZARDS OF BUTTERFLY COLLECTING - Anybody there? - Botswana 1991

By Torben Larsen

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The Kalahari really is a most amazing place. It is usually referred to as the Kalahari Desert, but that is technically incorrect. Except for the extreme southwest it gets much too much rainfall to qualify for desert, and it is mostly quite dense dry savannah country. The reason that it is known as a desert is that there is hardly any surface water, even during the rainy season. This is due to the fact that the Kalahari is the surface of the largest piles of sand anywhere in the world - up to 700 metres deep. The only people living here used to be the San peoples, somewhat demeaningly known as bushmen. Their field craft allowed them to eke out sufficient water from tubers and melons, as well as their prey animals, which get their own moisture from the morning dew. One of the most surprising sights in the Kalahari is that of the few resident lions cracking open wild melons (closely related to our watermelons) in order to get at their moisture. This kind of place is obviously not butterfly country par excellence, but those that are present are of great ecological interest, forming a transition between the usual savannah fauna and that of the South African Karoo. An interesting example is the common Citrus Butterfly, *Papilio demodocus* Esper. The Citrus Butterfly is fascinating since it is an essentially forest butterfly which pushes out to the very limits of its ecological capacity. The wonderful thing is that it does so in two radically different ways. Its normal host plants are wide-leaved Rutaceae; cultivated Citrus - not indigenous to Africa - is now its most frequent host plant, which means it can now live well outside of the forest belt that was once its natural home. Citrus gets planted right out on the edge of the desert, be it in Burkina Faso, Niger, Botswana, or Arabia. The butterfly opportunistically establishes itself far into what was previously an impossible habitat. In such areas, with Citrus as host plant, the larva is a dark green with some brown adornments, as it is all over the rainforest zone. But in Arabia and in the extreme southwest of Africa, the Kalahari and Namaqualand, *P. demodocus* has established itself in a very different, and less opportunistic, manner. It has managed to adapt to more unusual subdesert host plants, with small leaves. In Arabia it is mainly *Haplophyllum* (Rutaceae), in the southern Kalahari/Namib it is *Deverra* (Umbelliferae). Both have small leaves, and in fact the larva mainly feeds on the cortex of the plant stems. It has a completely different, variegated pattern that renders it well camouflaged on these plants. Looking at the two different larva, it is difficult to believe they belong to the same species. But I have been unable to find any differences between the adult butterflies. It seems that the patterns have developed as differential camouflage on their very different host plants. I did publish a small paper in South Africa suggesting that a closer study of this might be a good topic for a MSc (or even PhD), but it seems there have been no takers. I had been two

weeks away from home, and for six days I had seen no other human being (how many human beings did you see during the past six days?). I headed back towards Gaborone. Suddenly, as I crossed the crest of a small hill, two gleaming Toyota Land-Cruisers came into view. I wound my way down in my rather less up-market Toyota Hi-Lux: 'Hi how are you doing want a cold beer?' said the man, with a typical South African accent. THAT went without saying, and I clambered into the Land-Cruiser, equipped with fridge, sleeping quarters, and air-conditioning. The two men were geologists doing a transect survey for the de Beers Mining Company; the other Land-Cruiser was full of all sorts of sophisticated electronic equipment and bristling with so many antennae as to make even the best equipped member of the Coleoptera deeply jealous. We chatted for a while. This was not a place where you usually meet other people. 'You wanna talk to your wife?', one of them asked, as he uncorked another round of beer. I had told them I lived in Gabs (as we old Africa hands call Gaborone). 'No, that won't be possible, she's in London', I said. 'No problem!'. He fiddled with the antennae, directing them at the most suitable satellite, and pretty soon I was dialing our London number, not without a little excitement. The usual ringing tone of London was soon there. I waited with bated breath, only to hear my own voice: 'Neither Nancy Fee nor Torben Larsen are available at the moment; you may send a fax or leave a message after the beep'. I freely admit this was a letdown. In fact, it was so much of a letdown that I managed to leave only a somewhat garbled message on the ansaphone! Shame - as we say in southern Africa.

BOOK REVIEW - ISBN 0-620-24916-1**LEPIDOPTERA OF SOUTHERN AFRICA:
HOST-PLANTS & OTHER ASSOCIATIONS BY D. M. KROON**

The late 20th century has seen a quite phenomenal expansion of computing capacity, fully justifying the futurist Alvin Toffler's speculations regarding the role of the computer in his predicted information revolution. As an academic scientist the possibilities created by these developments are, for me, exciting, to say the least.

Douglas Kroon, the author of this 160 page volume, is a meticulous gatherer of information and a stickler for detailed accuracy. He is therefore, temperamentally speaking, the ideal person for the compilation of such a work. His knowledge of, and expertise in using, computer data bases has allowed him to assemble and collate an awe-inspiring wealth of data. The information is given in five query-generated lists. The most important of these lists, from the lepidopterists' point of view, is the main list of 84 pages. Entries in this list are given as lepidopteran species, genus and family, followed by the plant genus, species and family. The final part of the entry is the reference for the data.

Because lepidopteran taxonomy rests mainly on characters of the adult insect, and because it is solely the adults that are collected by most lepidopterists, comparatively little is known about the early stages. This is an unhealthy state of affairs as there is no doubt that the larval stages of Lepidoptera are the most important determinants of the ecology for each taxon. Douglas Kroon's catalogue represents a major contribution towards redressing this imbalance and belongs on the bookshelf of every lepidopterist and botanist, as well as those biologists interested in plant-herbivore interactions.

The catalogue may be ordered from the Honorary Secretary of the Lepidopterists' Society of Africa (address on inside cover of *Metamorphosis*).

Mark Williams

BRANCH NEWS

Thanks for reading this first report concerning recent events within branches of the Lepidopterists' Society of Africa since it also serves as an invitation to all the branches to submit news. If news consists of one sentence or an essay - it doesn't matter. This is an ideal column to include some interesting Lepidoptera records. The news can be sent to the following e-mail address: drkrft@puknet.puk.ac.za.

We're glad to report the historical first meetings of both the North West Branch and the Gauteng Branch which took place in September and November 1999 respectively. Though some of the branches of Lepsoc have been running for quite a while now one can't avoid sensing that there are some new dynamics involved. It is especially significant that the Gauteng Branch started off very well; this emphasises the fact that the branches are not functioning merely because its members are far away from Gauteng (where the council and most of the activities of Lepsoc are based). The proper functioning of branches will enhance a broader discussion base and involvement.

The minutes of the Gauteng Branch meeting makes for exiting reading – but considering the names on their membership list, one could not have expected otherwise. The Gauteng Branch council consists of Steve Woodhall as the chairman, Dennis Crocker as the treasurer and Richard Stephen as the secretary. Steve Woodhall outlined the purpose of their meetings as being informal and participative and requested suggestions (fun, contact and “helpmekaar” – assisting each other). Furthermore their meetings are to be politics-free (take note!), and are to be held bi-monthly. Guest speakers and trips for members will be arranged. So if you are in Gauteng and on the verge of belonging to the corner for the lonesome please join/attend one or two meetings/talks or a trip to some place!

The following trips have been proposed (Gauteng Branch):

Lesotho : 7-9 January 2000

Mariepskop : March 2000

Saltpan : April/May 2000

Projects undertaken by members of the Gauteng Branch include Lepidoptera posters (Steve Woodhall and John Joannou) and the Heidelberg Copper project (contact Graham Henning/ Peter Roos). A lot of trips were undertaken including those of John Joannou and Herman Staude's with Drs Boppré and Fischer to Cape Vidal resulting in some interesting records such as the recording of some unfamiliar Arctiidae (Tiger moths).

A wonderful idea of the Gauteng Branch is to establish a branch repository of accurate locality information (maps). Another important matter which has also been addressed at the first meeting of the North West Branch is

that of an instant contact list. Members in their areas should make their addresses or a change in address known to their council.

The first meeting of the brand new North West Branch was historical: the fear that this branch would only consist of one or two members was allayed by the attendance of eight members! It was decided that Reinier Terblanche should stay on as the representative – a function that will later be incorporated into the job description of the chairman. The North West council consists of William Weeks (presently from the Agricultural Research Institute) as the chairman while Etienne Terblanche was elected as the secretary. Something to look forward to is the growing number of student Lepsoc members from the Potchefstroom University and hopefully later some Unisa students (Unisa Life Sciences being based at Potchefstroom).

The possibilities of using a database in order to cross-stitch information - a topic often discussed among Lepsoc members during the late nineties – were discussed during the first meeting, as well as a atlas and website. William Weeks mentioned the importance of integrated/holistic approaches for projects and fieldwork. Reinier Terblanche felt that good quality labelled specimens and not quantity is priority in modern times. Projects are mainly aimed at areas within the borders of the North West Province under the slogan “charity begins at home”.

Though the North West is not on the short list with regard to the highest degree of butterfly endemism/biodiversity it was felt that the biodiversity in the province is probably underestimated and there are huge gaps in the information of the butterflies from this province. Torben Larsen once mentioned the total lack on butterfly distributions south of Botswana – the North West Branch took note! The Vredefort Dome (hilly area close to the Vaal River caused by a meteor in past) was earmarked as a very important area for Lepidoptera research. Reinier and Etienne Terblanche wrote a letter to mining authorities about the interesting Lepidoptera so far recorded at the Vredefort Dome since mining activities are planned in the Vredefort Dome. Four students, namely Jan-Albert Wessels, Bernie Peters, André Laas and Carina Harman, did a project concerning *Charaxes* restaurants and hilltopping behaviour in the course of their second year ethology studies and gave a report to the owner of Thabela Thabeng (Johannes van der Merwe) in the Vredefort Dome. The owner and his wife have been very helpfull in the research endeavours at the Vredefort Dome.

Two interesting butterfly records made by members of North West Branch, are noted. Etienne Terblanche picked up a perfect dead specimen of *Turimala petiverana* at Boys High School Potchefstroom that confirms the amazing migratory abilities of this species. Jan-Albert Wessels who visits the

Vredefort Dome often these days made an interesting new record for the area by collecting *Sarangesa seineri* subsp. *seineri* there, at least 150 km from its known distribution.

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Letters to the Editor

To Whom it May Concern:

I am a Graduate Student at Calpoly State University in San Luis Obispo, CA. I'm doing my thesis work on the protozoan *Ophryocystis elektroscirrha* that infects the Monarch butterfly (*Danaus plexippus*). am in desperate need of various species of Danaid butterflies for my research. If it is possible, I need 25 of each species, but any number would be appreciated. I need these butterflies individually wrapped, and labeled as to species and location that they were caught. I can be contacted at: awatkins@juno.com. Specimens can be sent to my professor: Dr. Kingston Leong, California Polytechnic, State University 1 Grand Avenue, San Luis Obispo, CA 93407 United States

Sincerely yours,

Angela Watkins

INSTRUCTIONS TO AUTHORS OF SCIENTIFIC PAPERS

Metamorphosis publishes short scientific papers in lepidopterology, with special emphasis on biological systematic and faunistic studies of the lepidopteran fauna of Africa. Only papers in English and reporting on original research are published, and submission of a manuscript is taken to imply that the work reported has not been published previously and is not being considered for publication elsewhere. Papers exceeding 20 printed pages are usually not considered, unless the author contributes towards the costs. Colour plates will usually only be printed at cost to the author(s). On publication of an article copyright of the text and figures is transferred to the society.

Editorial procedure

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

Presentation of manuscripts

Three copies of the manuscript and all tables and illustrations must be submitted to the Editor. The original of illustrations and the computer diskette will only be required once the manuscript has been accepted. The text should be typed on A4-size paper, with double line spacing and on one side of the page only, leaving a margin of at least 2cm on all sides. The pages should be numbered consecutively, beginning with the title page and including those carrying references, tables and legends to figures. All figures and tables must be referred to in the text. If a computer diskette is not available then tables are to be typed on A5, exactly as found in the printed journal. Tables done on the computer should already be formatted to fit on an A5 page.

Figures must be boldly drawn in black, waterproof ink and arranged in clear and logical plates of sties, white, preferably A4-sized board. All the figures must be numbered in a common sequence in Arabic numerals, irrespective of whether they are line drawings, photographs, diagrams, graphs or maps. Magnifications should be indicated by scale bars on the figures. Lettering on illustrations must be clear and legible and allow a reduction of plates to A5 size. Figure legends must be typed on a separate page, and each

plate must have its own legend, which must be concise but completely explanatory of the figure without the need to refer to the text.

Tables should be typed on separate sheets and in consistent style and letter type, and also numbered consecutively in Arabic numerals. Each table should be provided with a concise but fully explanatory title or caption above. The same data should not be presented in both graph and table form.

Manuscript format

Manuscripts must be arranged in the standard format of scientific papers: title, name(s) and address(es) of author(s), abstract, introduction, material and methods, results, discussion, conclusion, acknowledgements, literature references. In cases where these exact headings are not appropriate (e.g. taxonomic papers, short observations), the paper should be structured in a similar, logical fashion and divided into suitable sections with or without headings.

The title should be succinct and include suitable attribution to the order and family of the genus or species treated but not the names of any new taxon. The full names and addresses of all authors should appear underneath each of them.

The abstract should be concise (not exceeding 250 words) but complete and intelligible without reference to the text. It should cover the main results of the study, including (in taxonomic papers) all nomenclatorial changes or proposals of new taxa.

The introduction should include the aim and objectives of the study and a concise summary of the relevant previous work on the subject (unless this follows under a separate heading).

The material and methods should fully explain all abbreviations, except the standard taxonomic ones and those of measurements, for which the International System of Units (SI) must be used. In experimental and purely descriptive work, the deposition of voucher specimens must be stated.

The acknowledgements should be concise and simple.

The literature references must be in alphabetical order and adhere to the following format, with multiple authors linked by an ampersand (&) and the journal names in full and unabbreviated:

SMITH, J.K. & BROWN, A.B. 1985. New species of *Papilio* from southern Africa (Lepidoptera: Papilionidae). *Journal of the Entomological Society of Southern Africa* 72:112-123

VAN DER MERWE, P.P.J. 1986. *The Swallowtails of Africa*. Bushveld Press, Pretoria.

SMITH, J.K., BROWN, A.B. & VAN DER MERWE, P.P.J. 1991. Migratory patterns of Pieridae in southern Africa. In: Black C. & Miller F. (Eds) *Butterfly Behaviour*. Bushveld Press, Pretoria. pp. 234 – 256.

Citation of references in the text is compulsory and should appear in the following form: Smith (1990), Smith & Brown (1985), (Smith *et al.* 1991) for more than two authors; (Smith 1985a, 1987; Brown 1986, 1991) in chronological order for multiple references. References to unpublished sources should be cited as: Smith (in press), Miller (unpubl.); or Brown (pers. comm.) only the first two of these are to be included in the reference list.

Taxonomic papers

Papers should constitute a comprehensive treatment of a group delimited taxonomic, geographic, ecological or other biologically meaningful criteria. Papers dealing with miscellaneous species having no such natural association or simply describing a single new species will only be accepted under special circumstances. The names of new taxa should not appear in the title, but all nomenclatorial changes must be listed in the abstract. Authors must fully comply with the 3rd edition of the International Code of Zoological Nomenclature (ICZN) and its recommendations and with the published opinions of the International Commission.

Headings of taxonomic categories above the species group should be centred and preceded by the name of the category (e.g. genus, family). When used as taxonomic headings and with their first citation in the text, all genus and species group names should be cited with their author in unabbreviated form. Nomenclatorial changes should be indicated by the standardised abbreviations gen. n., sp. n., stat. n., comb. n., nom. n. as recommended by the ICZN; all other abbreviations should be avoided or, if really necessary, explained in the section 'Material and Methods'. Under each taxon heading at least the most important references to the taxon must be stated, i.e. its original description, revisions, keys synonymies; such references must be included in the bibliography at the end of the manuscript. With genera, the type-species with its author and date must be listed after the synonymy.

Descriptions of taxa should be furnished consistently in telegram style (i.e. without active verbs), and should be followed by a section indicating the main diagnostic characters of the taxon and giving a comparison with its closest relatives and other similar taxa. A formal diagnosis should normally not be given *in addition* to a description, but rather in its place when a full description or re-description is unnecessary. Descriptions of species should be based on the entire type-series, not only on the holotype, and new species should not be described from single specimens without some justification (e.g. stating the steps taken to locate/collect more). Names given to new taxa should be simple and euphonic, and species names based on geographic entities with complicated local names (e.g. *townbushensis*, *skoorsteenkopensis*) should be avoided.

All nomenclatorial and taxonomic changes (synonymies, type designations, generic transfers, changes in status, replacement of names, etc.) must be briefly justified, and nomenclatorial ambiguities and interpretation must be fully explained. If a type cannot be traced, an account should be given of the steps taken to ascertain its whereabouts.

Type designations must be done in accordance with the ICZN, and types not recognised by the ICZN (homotype, metalotype, etc.) are not acceptable. The designation of allotypes should be avoided. Primary types (holotypes, lectotypes, neotypes) must be deposited in recognised public taxonomic institutions (not private collections) and, if at all possible, in the country of origin of the species.

All Specimens examined should be included in a section 'Material examined', citing all specimens and their depositories. The data on the specimen labels should be cited *verbatim* in the case of types but standardised for all other specimens examined, arranging the localities in alphabetical order within countries or provinces. Obscure localities should be identified by means of map co-ordinates.

EDITORIAL POLICY

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

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

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

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

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