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The Butterflies of Kyabobo National Park, Ghana, and those of the Volta Region

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EXECUTIVE SUMMARY

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This report constitutes an in-depth review of the butterfly (Lepidoptera: Rhopalocera) fauna of Kyabobo National Park (chapter 2) as well as an analysis of the composition of the butterfly fauna of the entire Volta Region (including the Togo Mountains). The Volta Region fauna is distinctly different from that of Ghana as a whole. The report is a companion to a larger report on the butterflies in Ghana as a whole (Larsen 2006).

Kyabobo National Park (chapter 2)
Kyabobo National Park is the most recent addition to Ghana's protected areas system, following a ten year gestation period. The park adjoins the Fazao-Malkafassa National Park in Togo. It is close to the German colonial station of Bismarckburg where significant documentation of natural history took place. More than 200 species of butterflies were listed by Karsch (1893). An analysis of these in appendix 2 shows that the present Kyabobo fauna matches the old material and that nothing indicates any extinction since then (all but 20 of the 200 species were recorded during the past ten years).

The park encompasses typical Guinea Savannah at the foot of the main ridge of mountains, succeeded by dense Guinea Savannah Woodland, characterized by a tree cover of 40-60%. In the lower parts of the mountains is a Savannah-Forest Transition zone and then stretches of Drier Forest in suitable areas. The final vegetation is tropical high forest of the Semi-Deciduous Forest type, resembling that in Ghana proper: this is mainly evident in the southern part of the park and is not extensive.

The butterfly analysis is based on the old Karsch data, material collected by the author and Paul Chambers in 1996, and extensive material collected by Richard Vorgas, Hein Boersma and the author as part of the present mission.

A total of 400 species have been positively identified from the park, and the estimated total is 500: this constitutes 80% of all the 641 butterfly species known from the entire Volta Region (the 400 positively recorded comprise 63%). The missing species of Kyabobo are mainly those adapted to wetter forest systems of the type found at Wli Falls Wildlife Sanctuary and elsewhere in the central mountains, forests that have been much degraded and even clear-felled in recent years. Only about 45% of known Volta species centered on the wet or moist forests are known from Kyabobo, while 84% of the more robust butterflies that are found in all types of forest are present. This is a consequence of the northern location of these forests, in fact the most northerly true forest anywhere in Ghana.

Many interesting and internationally rare butterflies have been found in the park, including 17 species described as new from the German colony, and two described by the author (*Iolaus (Etesiolaus) kyabobo* Larsen, 1996 was described from near Shiare and *Anthene starki* Larsen, 2005 from Koue).

With an estimated 500 species of butterflies – just under 80% of the Volta Region total – the park is a welcome addition to the protected areas system in Ghana. When hitherto unvisited patches of semi-deciduous forest are researched they will yield additional interesting species. And most of the park is relatively undisturbed with the vegetation in good condition.

The park is not likely to become a major area of ordinary tourist interest from within or outside Ghana. Though the mountains are very beautiful at a distance, they are rather remote and difficult of access. However, as a true wilderness it has some potential for hiking and places like the Pawa Satellite Camp provide a comfortable base for staying overnight in the forest – the same is true for those who can get camping equipment to the Laboum waterfalls. The report by Dowsett-Lemaire & Dowsett (2005) see "little future for birding

ecotourism in Kyabobo" since all birds can more easily been seen elsewhere. Probably Kyabobo will always be a somewhat specialist tourist goal.

Volta Region – ecology and biogeography (chapter 3)

The Volta Region as here defined is bordered to the south by the ocean, to the west by the Volta River (now Lake Volta), to the east by the dry zone of the Dahomey Gap, and to the north by the beginning of the main savannah zone just north of Kyabobo National Park. It is a rather small area with some most interesting special characteristics. Were it not for the mountain ridge of the Ghana/Togo Mountains, rising to 700-800m+, the entire region would be savannah of the type that constitutes the Dahomey Gap. The mountains, however, have to some extent created their own local climatic conditions, which have increased rainfall and provided the basis for forests, even during long spells of very dry conditions during the late Miocene till the late Pleistocene.

The Volta Region can be roughly divided into three zones: The southern zone from the coast to where the mountains start at the level of Ho. This is mainly open grasslands, savannah, and coastal bush, and often so dry than even Sudan Savannah elements penetrate. There are also patches of the southern and southeastern forest outlier types that have a significant amount of plant endemicity; this habitat allows some forest species to occur in unusually dry locations. At the northern limits of this area lies Kalakpa Resource Reserve (320 km^2), which is the only area where the butterflies have been studied (see Larsen 2006:section 4.1.9 for details). The northern parts of Kalakpa has considerable expanses of riverine forest along the vestiges of streams that originate from the central mountains – the forests are north of the riverine forest, whereas elsewhere in Ghana the savannah lies north of the forest zone, which is an unusual reversal of the normal pattern. Kalakpa has more forest butterflies than any other savannah locality in Ghana. The central mountains were largely covered by versions of semi-deciduous forest, ranging from moist to dry. Not surprisingly this area has a higher proportion of "wetter" flora and fauna than in the mountains further north around Kyabobo. The topography is very varied and the vegetation is as well. Within living memory the forests have been severely logged – often clear-felled – or degraded to the point where little of the original cover remains in good condition. Only one tiny locality, Wli Falls/Agumatsa Wildlife Sanctuary (3km^2) (see Larsen 2006:section 4.1.15 for details), is within the protected areas system. It seems that a few other forests are under some sort of community protection, but the overall situation seems unsatisfactory since there is no doubt that true forest butterflies are the most interesting component of the Volta Region fauna. The northern mountains commence somewhere north of the Jasikan area (the author is not familiar with the area). The northern mountains, as might be expected, have a less developed forest structure and less representation of dedicated forest species. The Kyabobo National Park (218km^2) is at the northern end of the mountain range, covering a wide range of ecotypes from Guinea savannah to dense woodland and patches of semi-deciduous forest, most of it in good condition. Its butterflies are covered in chapter 2 of this report.

Summary of the butterflies in the Volta Region

The butterflies of the Volta Region are better known than those practically anywhere else in tropical Africa. This is due to the early German collections, the activity of Father Theodor Maessen who collected assiduously during more than twenty years in the region, the author's own activities, and collecting on behalf of the African Butterfly Research Institute, Nairobi.

The main characteristics of the butterfly fauna may be summarized as follows:

- In all, 641 species have been positively recorded from the Volta Region, which is 70% of the 925 known from Ghana as a whole.
- Of the 641 butterfly species in the Volta Region, 474 have been found inside the three localities in the protected areas system, constituting 74% of the total. This is considerably less than for the forest region as a whole, where 80% of the larger number of species have been positively recorded.
- Of the species not found in the Volta Region, 150 are found mainly in the wetter forests of Africa west of the Dahomey Gap *as well as* in Nigeria and often far into equatorial Africa, but not in the Volta Region.
- A further 76 of the 93 species that are endemic to Africa west of the Dahomey Gap are missing from Volta, only 17 of the endemics being found east of the Volta River.
- Nearly all the missing species of both categories above are those associated with the wetter forest systems.
- Seven species are narrowly endemic to the Volta Region, being found neither in Ghana proper west of the Volta River, nor in Nigeria or further east.
- Fifteen species are known from Volta Region and then from further east to Nigeria and beyond, but have never managed to cross the Volta Region.

The biogeographical interpretation of the above data seems to reflect the fact that during the several periods of climatic change from the late Miocene through the Pliocene and the Pleistocene, the Volta River always remained a significant biogeographical barrier, even at times when the Dahomey Gap was wholly bridged by forest. However, in order for the endemic and eastern species to have survived in the Volta Region, the mountains must also have acted as forest refuges at least during the latest half of the Pliocene/Pleistocene period. The butterflies lend greater importance on the Volta Region as a major biogeographical feature than do some other previous studies.

Conservation priorities

The forests of the Volta Region, shared by Ghana and Togo, are one of the priority conservation areas in West Africa (Bakarr *et al*. 2001). It has a rich flora and fauna. The complex biogeography is the result of climatic change processes that stretch back over many million years. Close analysis of the butterflies, presented in this report for the first time, indicates that the patterns are more significant than the region has been given credit for in the past – though opinions have varied. New techniques, not least increased knowledge about West Africa as a whole and the use of molecular studies, will permit a deepening of our understanding. This will be possible only if the flora and fauna is preserved for the future.

Kalakpa Resource Reserve and Kyabobo National Park are well chosen and adequate to conserve the southern and northern parts of the Volta Region, especially savannah, woodland, and riverine forest. However, the most urgent conservation need is the forests of the central mountains, which are only protected by the tiny Wli Falls Wildlife Sanctuary. The largest of all African butterflies, *Papilio antimachus*, has almost certainly become extinct in the Region during the past 50 years due to the felling of forest in the Amedzofe area. It is urgent that what remains of semi-deciduous forest in reasonable condition be somehow tied together into a network of protected areas through collaboration between local communities, forestry, and wildlife. Ecotourism – in its widest sense – will increase in importance: this prospect might provide a glue to combine such conservation efforts.

ACKNOWLEDGEMENTS

The author would like to thank the Executive Director of the Wildlife Division, Forestry Commission (Y. Ofori-Frimpong) and the Regional Director of IUCN (I. Thiaw) for the invitation to undertake this assessment of the coverage by the protected areas system in Ghana through the means of the butterfly fauna. The Wildlife Division staff at headquarters in Accra continued a tradition of collaboration that dates back to 1993, when work was started on the recently published book *Butterflies of West Africa* (Larsen 2005). Also at headquarters much assistance was received from the IUCN/WDSP Project advisors, Peter Howard, Phil Marshall, and Peter Hartley. George Issaka was deputed to be the driver for the mission, a role which he fulfilled with efficiency, care, and a well-developed sense of humour. Only three times during two months of driving through most of Ghana was he obliged to admit: "I have never been here before".

As always Park Managers and their staff were welcoming and helpful. Many were old friends and colleagues in new settings. More than on previous occasions, junior staff with a considerable degree of knowledge concerning certain aspects of the parks or the flora and fauna were encountered – some of which now also have a degree of knowledge about butterflies.

Hein Boersma, a Dutch entomologist, joined the visits to the Volta Region and assisted in the data collecting. He also spent two weeks and Bobiri Butterfly Sanctuary and helped to lay the foundations for a full inventory of its butterfly fauna. Kwaku Aduse-Poko (Institute of Renewable Natural Resources, University of Science and Technology, Kumasi) provided data from his own butterfly research in Ghana as well as assisting with numerous practical issues. Finally Richard Vorgas, with his usual efficiency and ability to find good collecting sites, provided a profuse butterfly material from Kyabobo National Park, placing it among the best researched single localities anywhere in Africa.

Iolaus (Etesiolaus) kyabobo Larsen, 1996
(three times natural size)

1. INTRODUCTION

This report constitutes an in-depth review of the butterfly (Lepidoptera: Rhopalocera) fauna of Kyabobo National Park in Ghana's Volta Region. While the main aim is to study this fauna in its own right, butterflies – in a rough and ready manner – can also act as proxies for more general interpretations of overall biodiversity and biogeography (see discussion in the companion report on the butterflies of Ghana, chapter 2 (Larsen 2006)). Each species of butterfly acts as a proxy for 800 other organisms, mostly not scientifically described and about which we know practically nothing. The analysis of Kyabobo butterflies is then placed in the context of a review of the butterfly fauna of the entire Volta Region, including that of the Wli Falls/Agumatsa Wildlife Sanctuary and Kalakpa Resource Reserve.

The term "Volta Region" as used in this report refers to the forested hills and low mountains stretching from about the level of Ho to the northern limits of Kyabobo National Park. Neighbouring parts of Togo have similar vegetation and topographical features, especially the area around Kpalimé and the Fazao-Malfakassa National Park and are considered part of the Volta Region for the purposes of this paper.

To the west the region is delineated by the Volta River (now hugely enlarged by Lake Volta). To the east it is delineated by the beginnings of the dry savannah in the Dahomey Gap which covers most of Togo and Bénin, stretching south to the coast and even encroaching west onto the Accra Plains in Ghana.

The Volta Region is biogeographically distinct from the rest of Ghana – more so that it is often given credit for – as will be discussed later in the report. Faunistically and botanically the most diverse area seems to have been the central part of the region (Mt. Afadjato, Amedzofe area, Wli Falls, etc, and Kpalimé in Togo), where the broadleaf semi-deciduous evergreen forest (rainforest) is most in evidence. Its conservation importance was strongly emphasized in the conservation priority workshop for West Africa organized by Conservation International (Bakarr *et al*. 2001). However, very little such forest now remains in either Ghana or Togo owing to heavy agricultural exploitation and continued strong pressure on the land. The only entity that is part of the protected areas system administrated by the Wildlife Division is the tiny Wli Falls/Agumatsa Wildlife Sanctuary. There are a number of community conservation projects, but these are also very limited in size.

The butterflies of the central and southern parts of the Volta Region are exceptionally well-studied thanks especially to the efforts of Father Theodor Maessen who was resident in Ho, Kpandu, and Likpe/Mate for more than 20 years and who was an indefatigable collector (material now in the collections of the Allyn Museum in Florida). His conclusions are essentially validated by collectors from the African Butterfly Research Institute in Nairobi, though they have turned up a few real surprises (*Anthene wilsoni* Talbot, 1935, *Capys vorgasi* Collins & Larsen, 2004). The central area of the Volta Region constitutes the best researched major biogeographical zone in West Africa, or for that matter in tropical Africa as a whole. The material provides an unusually firm yardstick against which to judge the Kyabobo fauna. However, Maessen never collected in the area covered by the present Park.

The report will be in two parts: The first will deal with the butterfly fauna specifically of Kyabobo National Park (chapter 2). The second will deal with the butterflies of the Volta Region as a whole and the significant and under-appreciated biogeographical peculiarities of the Region (chapter 3).

2. KYABOBO NATIONAL PARK

2.1 Location and characteristics of Kyabobo National Park

Kyabobo National Park is further north than the central part of the Volta Region and has a somewhat impoverished forest fauna and flora. However, with 218 km^2 of forest, forest-savannah transition, and dense woodland in good condition it is an extremely welcome addition to Ghana's conservation programme (work on defining the Park began in the early 1990s and it was formally defined and gazetted only recently).

The National Park covers 218km^2 and takes its beginning just north of the small town of Nkwanta, which contains the Park Headquarters (currently being significantly upgraded under the IUCN/WDSP project). It then stretches north to the village of Koue. To the east the Park is contiguous with the Fazao-Malfakassa National Park in Togo, which has long been gazetted and which apparently has a rather strong mammal fauna by regional standards. As poaching and encroachment in Kyabobo diminishes, this may lead to a fast growth of the Kyabobo mammal fauna, which is at present almost invisible.

Kyabobo as such has not been subject to any in-depth flora or fauna studies, but in the period from 1888 onwards large numbers of plants and animals were collected out of German Togoland's northern headquarters at Bismarckburg, situated near the southeastern border of the present park. At the time all of what is now Kyabobo National Park was part of German Togoland. German military and civilian staff were tasked also with natural history collecting and large numbers of specimens were returned to Germany: much of this material must have been caught in or just a few kilometres from Kyabobo. When most of the insects were published in 1893 in a single volume, the introduction states that "Herr Dr. Karsch informs me that the small Adeli Region [roughly the mountains now part of Kyabobo and Fazao-Malfakassa in Togo], despite the few years available for its exploration, now probably has its fauna and flora better documented than anywhere else in tropical Africa" (Büttner, 1893). That is certainly true for butterflies, where Karsch (1893) documented more than 200 species (see appendix 2 for details).

Dowsett & Dowsett-Lemaire (2005) found 234 species of birds and remark on the richness of the forest bird fauna, commenting that practically all observations were "range extensions" to the north (this may require modification since they do not mention the large collections from Bismarckburg that were discussed in several detailed papers by A. Reichenow between 1891 and 1902).

2.1.1 Habitat types

Kyabobo has a number of distinct habitat types, the most important of which are Guinea Savannah (open woodland). Throughout, the level ground bordering the mountains is typical of this habitat, though much of it is now converted to farmbush. The butterfly fauna is also quite similar to that of the savannahs in the rest of Ghana.

As the mountains are approached more closely, the density of savannah trees increases and begin to form patches of Guinea Savannah Woodland, characterized by a tree cover of 40-60%, but with continual tall grasses where the sun can penetrate. The woodland is composed of typical savannah trees that are largely fire-resistant. Again the butterfly fauna is typical of

the savannah and only a few forest species penetrate even denser woodlands. This type of woodland is also characteristic of the drier parts of the mountain slopes, looking very like real forest from a distance.

Imperceptibly, and hardly evident to the untrained eye, the woodland gains an admixture of true forest trees in the Savannah-Forest Transition zone (e.g. *Albizia, Manilkara, Milicia, Cola, Bridelia, Spondias* – many of which butterfly host plants). Only the most hardy forest butterflies occur here.

Drier Forest (with *Anogeissus leiocarpus* dominating, but with many other trees) is found on waterlogged ground in the northern areas of Koue and along the Nazeni-Pawa trail (see Dowsett-Lemaire & Dowsett 2005). A fair amount of forest butterflies are found in these habitats, mostly rather hardy species. The overall composition is unpredictable – each little bit of forests will turn up butterflies not seen before.

Finally there are patches of Semi-Deciduous Forest, which resembles that in Ghana proper, though slightly less floristically diverse. The canopy is mostly closed, but in the rockier parts of the mountains, the may be significant gaps in the canopy. These forest elements are most evident in the southern half of the park, notably around the Laboum Waterfall and the Shiare Valley (outside the park proper). The butterfly material collected by R. Vorgas shows that somewhere in the Kyillinga area (also outside the final park limits) there is semi-deciduous forest of very good quality. The west-facing mountain slope at the Pawa Satellite Camp also constitutes forest with a diverse forest butterfly fauna. Doubtless many patches of good forest remain to be explored elsewhere in the park.

2.2 The butterflies of Kyabobo National Park

2.2.1 Material and methods

1) Karsch (1893) published a list of more than 220 butterfly species (some duplicate names) from “der Berglandschaft Adeli” in German Togo, mostly labelled Bismarckburg where the German administration was based. Bismarckburg is very close to Kyabobo – indeed much of the material must have been captured within the present Park. This was the most extensive local/regional list yet compiled from tropical Africa and a testimony to the fact that German colonial officers were obligated to study natural history and to forward specimens to Germany. About 200 of Karsch’s valid records are listed in appendix 2. Only 20 of these have not subsequently been recorded from Kyabobo: they are certain to occur there are and are included in the final list.

2) Larsen visited Shiare and Koue from 20 to 23 January 1996 to gather data on butterflies during the period when the first steps in converting the area into a national park were being taken. About 140 species were recorded. *Iolaus (Etesiolaus) kyabobo* Larsen, 1996 was described as new to science from Shiare (Larsen, 1996c). It has subsequently been found also in Guinea, Côte d’Ivoire, and Congo (Zaïre) (Collins & Larsen, 2004). *Anthene starki* Larsen, 2005 was described from Koue (where common on a river bank on the day) and appears to be a very rare butterfly throughout its range from Guinea and Burkina Faso to Côte d’Ivoire and the Central African Republic. Thus, there is none in the Natural History Museum, London and Father Maessen never caught it in the Volta Region.

3) Paul Chambers sent small collections of butterflies to Larsen from Nkwanta and Koue in March and April 1996, adding another 35 species to the Kyabobo list.

4) When the author was assigned to do an analysis of the Kyabobo butterfly fauna it was agreed that the experienced Ghanaian collector, Richard Vorgas, would be deputed to collect in Kyabobo and that the material would be deposited in the African Butterfly Research Institute, Nairobi after study by the author. He visited the southern fringes of the park (including Kyillinga and Laboum) for 14 days during June 2005. On this trip he collected also in parts of the area now excluded from the final demarcation of the Park (Shiare and Kyillinga): These are included as members of the Kyabobo fauna though they may just possibly be absent from the Park proper. Most probably reach their absolute northern distribution somewhere in the park. During this mission almost 250 species were collected, about half of which not on previous lists.

5) Vorgas continued his collecting mostly around Pawa and Keri for ten days during July 2005, collecting a total of 150 species, some 50 of which were new to Kyabobo – chiefly among the Hesperiidae.

6) Finally, Larsen paid a further visit from 20 to 25 August under the auspices of the IUCN/WDSP project, visiting Koue/Nazeni Camp, Pawa Satellite Camp, and the area around Odome and the Laboum Valley. He was accompanied by H. Boersma, a volunteer butterfly collector from the Netherlands. A total of 150 species were recorded, of which 25 were new to the Park.

These combined collecting activities have yielded a total just over 400 species which is adequate for characterizing the butterfly fauna as will be done in the sections to follow. The known species are all listed in appendix 1.

2.2.2 Analysis of the Kyabobo butterflies

The present status of the knowledge of the Kyabobo butterflies is given in table 2.2.2. Just over 400 species have been positively recorded and a total of nearly 500 are expected. Thanks to the rather extensive collecting activities listed in section 2.2.1, the actual figure is 81% of the estimated total, which lends support to the validity of that estimate.

As shown in appendix 2, no less than 17 species were originally described by Karsch (1893) from the Bismarckburg area in Togo, which is effectively the same as Kyabobo. In addition *Iolaus (Etesiolaus) kyabobo* Larsen, 1996 was described from near Shiare and *Anthene starki* Larsen, 2005 from Koue. None of these species are endemic, however, and many have a wide African distribution.

Table 2.2.2. Summary of the number of the butterfly species known and estimated in Kyabobo National Park (based on a total of 925 Ghana species as enumerated in Appendix 1a (Larsen 2006)).

Estimated total butterfly species in Kyabobo National Park	**494**
Species that have been positively recorded and accepted	401
Species almost certain to occur 87 (75% included in estimate)	66
Species that possibly occur 103 (25% included in estimate)	27
Species that almost certainly do not occur 299 (none included)	0
% of estimated total positively recorded: 81%	

The total estimate of 500 Kyabobo species constitutes 80% of all the butterflies known from the Volta Region (the 400 positively recorded comprise 63%). It is clear that those missing are especially the group that is most linked to the wetter forest types found in the central mountains, well south of Kyabobo and still with higher annual rainfall. The most spectacular of those absent from Kyabobo is the giant African swallowtail, *Papilio antimachus* Drury, 1782, which is probably now extinct in the Volta Region since it needs relatively large, wetter forests in good condition. Some other absentee species from the central mountain area listed in appendix 1 are: *Pentila hewitsonii* Grose-Smith & Kirby, 1887, *Pseuderesia eleaza* Hewitson, 1873, *Kakumia otlauga* Grose-Smith & Kirby, 1890, *Spindasis crustaria* Holland, 1890, *Iolaus likpe* Collins & Larsen, 2004, *Iolaus theodori* Stempffer, 1979, *Deudorix kayonza ssp.*, *Anthene lysicles* Hewitson, 1874, *Neurellipes lusones* Hewitson, 1874, *Charaxes hildebrandti* Dewitz, 1879, *C. porthos* Grose-Smith, 1883, *Euriphene atossa* Hewitson, 1865, *Coeliades bixana* Evans, 1940, *Abantis leucogaster* Mabille, 1890, *Gorgyra afikpo* Druce, 1909, and *Ceratrichia argyrosticta* Plötz, 1879. But, in truth, the known fauna makes is rather difficult to be definitive about excluding that any butterfly from the central mountains is genuinely absent from Kyabobo.

The relative lack of species centred on the wetter forests is also well illustrated in the analysis of the ecological elements in the Volta Region butterfly fauna (table 2.2.3). Only one third of those centred on the wet evergreen forests (WEF) that are present in the Volta Region as a whole are found in Kyabobo: the Volta representation of this element in relation to Ghana as a whole is already low, so only 11% of all Ghana WEF species are present in Kyabobo. Even the representatives of the moist evergreen forests (MEF), that with almost 80% are well represented in the Volta Region as a whole, is under-represented in Kyabobo with just half of the Volta total.

Table 2.2.3. The ecological composition of the butterfly in Ghana, Volta Region, and Kyabobo National Park.

Ecological zone (from appendix 1)	Ghana total	Volta Region	Kyabobo actual	Volta as Ghana	Kyabobo % Volta
WEF – wet evergreen forest	245	77	28	31%	36%
MEF – moist evergreen forest	271	213	103	79%	48%
ALF – all forest types	172	160	135	93%	84%
DRF – dry forest specialists	68	55	35	81%	64%
GUI – Guinea Savannah*	82	81	56	98%	69%
SUD – Sudan Savannah	48	19	12	40%	63%
UBQ – ubiquitous species	33	33	32	100%	97%
??? – not assigned/error	6	3	n.a.	n.a.	n.a.
TOTAL	**925**	**641**	**401**	**70%**	**63%**

* includes 4 species of special habitats

The dearth of the wettest-adapted species also leads to an absence of all but two of the seven species that are endemic to the Volta Region (table 3.3.2a). Six of the just 17 endemics from Africa west of the Dahomey Gap that reach the Volta Region are missing (table 3.3.2b). About half of the interesting group of species that are in the Volta Region as well as in Nigeria and further to the east, but not crossing the Volta River into Ghana proper, is also missing from Kyabobo (table 3.3.3). It must be remembered that the above data are calculated on the 400 species positively recorded and not on the 500 estimated to be present.

However, the above analysis does not mean that Kyabobo National Park lacks rare and interesting species that are not often found in collections. *Graphium almansor carchedonius* Karsch, 1895 is a well-defined endemic subspecies of a rare species found in dry forests also in the northern parts of the main equatorial zone; it was recently collected also in the Fouta Djalon of Guinea, in what seems to be a distinct subspecies (Larsen 2005). *Aslauga ernesti* Karsch, 1893 is very poorly known from the Volta Region and Nigeria, but was recently caught on hill-tops near Likpe in the central mountains. *Aslauga imitans* Libert, 1994, *Spindasis avriko* Karsch, 1893, *Iolaus maesa* Hewitson, 1862, and *Pilodeudorix catori* Bethune-Baker, 1903 are generally rare in collections and not often met with in nature. *Neurellipes gemmifera* Neave, 1910 was not known from West Africa till Father Maessen caught some in the Likpe area, and the author found a few at water near Shiare. *Bicyclus campa* Karsch, 1893 is a species that is localized in hill tracts like Kyabobo and found only patchily between the Fouta Djalon in Guinea all the way to East Africa. *Henotesia elisi* Karsch, 1893 was described from the central mountains of Volta, but also occurs sparingly in Kyabobo; it is the only *Henotesia* in West Africa. *Sevenia umbrina* Karsch, 1892 is rather parallel with *B. campa* in distribution and rarity. One of the large *Euphaedra sp.* in the park remains uncertain – it appears to be related to local species found in the Kagoro Forest and Gashaka-Gumpti National Park in Nigeria, but more material is needed from all three

populations before conclusions can be drawn. *Acraea eugenia* Karsch, 1893 can be abundant at both Wli Falls and Kyabobo but seems very rare elsewhere: the only Nigerian record remains one taken in 1968 by the author's mother – completely by chance since she knew nothing about butterflies. *Eagris tigris liberti* Collins & Larsen, 2005 is a new subspecies that is always scarce, but occurs at both Wli Falls and in Kyabobo. *Abantis pseudonigeriana* Usher, 1984 and *Leona stoehri* Karsch, 1893 are very scarce skippers of which only a handful is found in collections.

2.2.3 Conservation value of Kyabobo National Park

With an estimated 500 species of butterflies – just under 80% of the Volta Region total – there is no doubt that the park is a welcome addition to the protected areas system in Ghana. It is likely that unvisited patches of semi-deciduous forest remain to be discovered, where collecting will yield additional interesting species. And most of the park is relatively undisturbed with the vegetation in good condition.

Dowsett-Lemaire & Dowsett (2005) also found a rich bird fauna and emphasize that "as the area had been virtually unexplored, all observations of forest birds represent range 'extensions', in some cases quite considerable." The forests of Kyabobo are indeed interesting as being among the northernmost in Ghana, though the above quotation overestimates the lack of exploration since the Bismarckburg data from the 1890s can effectively be considered part of the same habitat.

The linkage with the German researches in Bismarckburg gives both Kyabobo National Park and Fazao-Malfakassa National Park a historical link. The comparison of the present Kyabobo fauna with that listed by Karsch (1893) which is made in appendix 2 would be impossible almost anywhere else in Africa. Future researchers in Kyabobo National Park should be sure to check whether their group of interest was part of the extensive publications to result from the German research.

2.3 Ecotourism potential

During the rainy season the mountain ranges of Kyabobo are a beautiful sight from the distance. The dark woodland and forest of the mountain slopes contrasts with the lighter tall-grass savannah. As shown in fig. 2.3.1, the views can epitomize the desire for undisturbed wilderness. The reality of the ecotourism potential of the area is perhaps less rosy. There are a number of constraints.

- Even with the new roads, Kyabobo is rather far away from other tourist areas. Tourist facilities are nearly non-existent, though a few reasonable hotels were recently opened.
- Access to the most interesting parts of the park remains somewhat difficult, usually involving one or two hours' walk through various types of less interesting farmbush. The tall-grass savannah until about 09.30 retains sufficient morning dew to wet walkers to the skin.
- During some periods of the year biting insects can be a serious nuisance as described by Dowsett-Lemaire & Dowsett (2005), though the author did not find this a major issue in the months of January and August.

- Opportunities for seeing large animals of any type are almost absent, though the decrease in hunting may improve on this. However, because the savannah is mostly tall-grass in structure, animal viewing is largely limited to the dry season.
- There are few outstanding natural features of special beauty or other attraction, though the Laboum Waterfall (not personally visited) would probably qualify.

It is probably true to say that the park holds little attraction for ordinary tourists without special interests, except for its status as a genuine wilderness.

Dowsett-Lemaire & Dowsett (2005) see “little future for birding ecotourism in Kyabobo”. Most birders are fixated on seeing as many species as possible and are generally less interested in the ecology and behaviour of their study objects than are other naturalists. All the birds found in Kyabobo can be just as easily seen on the usual tourist destinations, such as Kakum, Atewa Range, Bobiri, Mole, etc.

Other naturalists, including butterfly collectors, could spend time in the park in a both pleasant and productive manner, but again practical difficulties are greater than would be the case in many other localities.

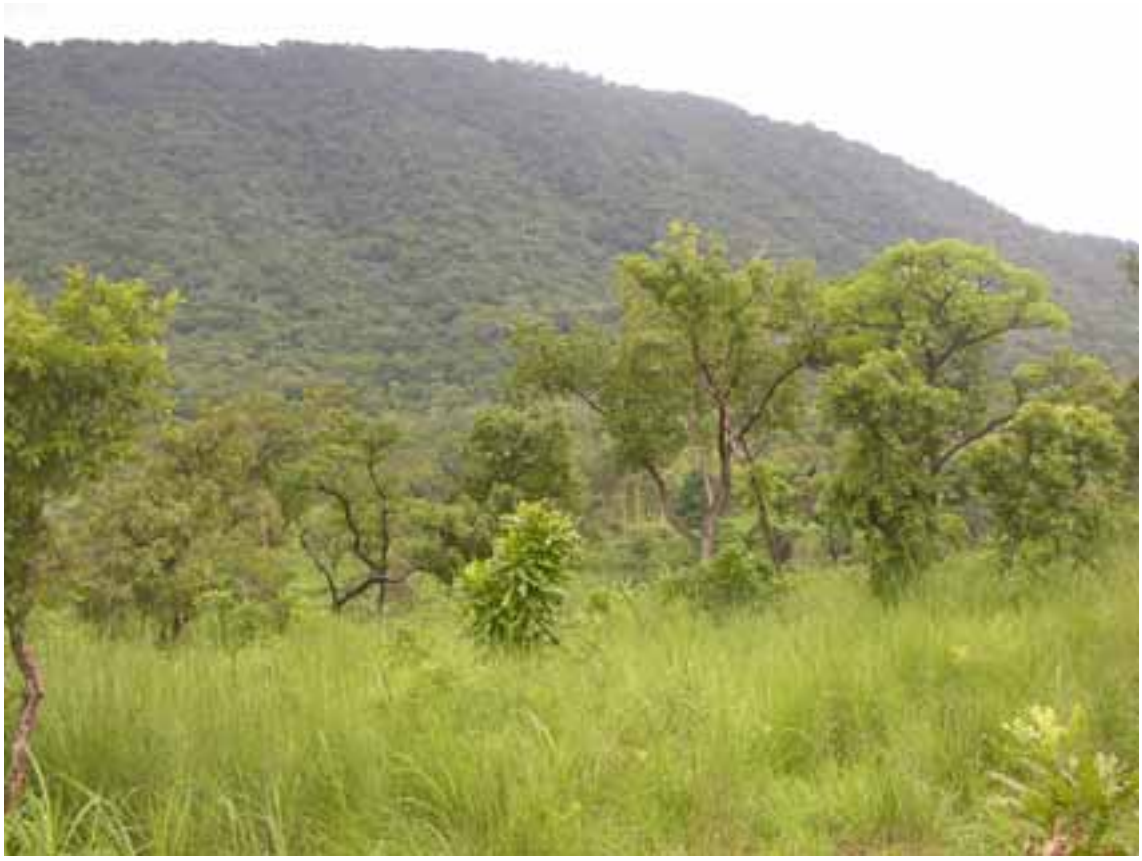

Fig. 2.3.1. Guinea Savannah with woodland-covered hills at the Laboum outpost in Kyabobo National Park.

The Pawa Satellite Camp has some potential for tourism. The access trek is not too long or difficult and the camp allows visitors to sleep in comfort in the middle of the forest. Camps such as Pawa could also be used for scientific research projects. The Pawa Camp is surrounded by a small area of now abandoned farmland, which is beginning to revert to secondary forest, right next to the semi-deciduous forest. Such a vegetation mix is often even more diverse than pristine forest. Butterflies are quite plentiful around the camp and it would be possible to plant good nectar plants and to improve slightly some of the paths, making the camp area more congenial to non-specialist visitors.

Hiking is another tourist possibility where Kyabobo would be suitable. The walk from Koue-Nazeni to Pawa is apparently just about right for a day's hike, and it should be possible to reach the Laboum area on a second day. The fact that such a hike could be undertaken without seeing other people at all along the way is a strong point. Some of the Wildlife Division staff seem genuinely knowledgeable even about unexpected aspects of nature and make good, cheerful walking companions (the author received surprisingly detailed information on several species of ants, their habits, and feeding strategies from one of the Pawa staff).

The possibility of cooperating with the authorities in Togo on the historical aspects of Bismarckburg might be investigated – this would certainly be an attraction for German tourists.

But, as mentioned in the main report, the importance of the protected areas system for tourism lies not just in the actual number of tourists that avail themselves of the possibilities. It is also a question of giving tourists the knowledge that such possibilities exist and are part of a wide range of choices facing the visitor.

3. THE VOLTA REGION

3.1 The Volta Region setting

The Volta Region in the sense used in this report is bounded to the west by the Lake Volta, which used to be a river edged by riverine forest. This forest was submerged by the lake and has generally not regenerated. To the south it is bounded by the sea. In the central parts are mountain ranges reaching 700-800m in places. The Volta Region as used in this report includes also the mountainous part of western Togo. The eastern border is rather diffuse: it lies along the line that divides the dense savannah woodland at the eastern foot of the mountains from the savannahs of the Dahomey Gap. The northern border runs along the level of latitude 8^{o} which is about that of the northern limits of Kyabobo National Park. Between 1883/84 and 1914 both the Ghana and Togo parts of the region were administered jointly by Germany.

The ecological zonation of the Volta Region differs from that of the rest of Ghana because of the presence of the mountains. Without the mountains the entire Volta Region would have been part of the Dahomey Gap, the tongue of savannah stretching through most of Togo and Bénin, connecting the main savannah zones directly with the sea, and in fact broadening near the sea, creating the Accra Plains and even allowing savannah elements to penetrate west to Cape Coast and beyond and east to the Lagos area. The mountains fall in a central range that stretches north from the level of Ho to Hohoe/Jesikan (the Misahöhe of German literature). The northern range (the "Adelihöhe" of German literature) begins south of Kyabobo National Park, but the bulk is within the park, extending into the Fazao-Malfakassa National Park in Togo. The mountains contain isolated eastern extensions of the West African forest zone that stretches from the Basse Casamance in Senegal to Ghana. Not only are these geographically isolated, they are also separated from the main forest zone by the savannah that more or less surrounds the forests. They have been isolated for sufficient periods of time to develop a flora and fauna that in many respects differ from those of the rest of the forest zone west of the Dahomey Gap. The butterfly fauna clearly illustrates that the Volta River has – probably during several pluvial periods – been a significant biogeographical feature; at the same time the butterflies illustrate that the mountains were, and still are, important, isolated refuge areas for the forest fauna – probably during several dry periods.

The southern zone: As mentioned, the southern part of the Volta Region is savannah country that forms part of the Dahomey Gap, which stretches from the coast north to the beginning of the central Volta mountains at the level of Ho. The bulk of the area is Guinea Savannah formations, but there are also areas with low grass and some Sudanian floral and faunal elements, as well as miscellaneous areas of scrubland. Locally, patches of the southern and southeastern forest outlier forest types that have a significant amount of plant endemicity may be found; this habitat allows some forest butterflies to occur in unusually dry locations, best known from the fauna of the Shai Hills, but otherwise seems not to contain any special butterflies. At the northern limits of this area lies Kalakpa Resource Reserve (320 km^2), which is the only area where the butterflies have been studied (see Larsen 2006:section 4.1.9 for details). The northern parts of Kalakpa has considerable expanses of riverine forest along the vestiges of streams that originate from the central mountains – the forests are to the north of the riverine forest, whereas elsewhere in Ghana the savannah lies north of the forest zone, which is an unusual reversal. With 75 species Kalakpa has more forest butterflies than any other savannah locality in Ghana.

The central mountains: These mountains were once largely covered by versions of semi-deciduous forest, ranging from moist to dry. Not surprisingly this area has a higher proportion of "wetter" flora and fauna than do the mountains further north around Kyabobo. The topography is very varied as is the vegetation. Within living memory the forests have been severely logged – often clear-felled – or degraded to the point where little of the original cover remains in good condition. Only one tiny locality, Wli Falls/Agumatsa Wildlife Sanctuary (3km^2) (see Larsen 2006:section 4.1.15 for details), is within the protected areas system. It seems that a few other forests are under some sort of community protection, but the overall situation seems unsatisfactory since there is no doubt that true forest butterflies and other faunal elements are the most interesting component of the Volta Region fauna.

The northern mountains: This area commences somewhere north of the Jasikan area (the author is not familiar with this area). The main mountains begin some way south of the small town of Nkwanta. The northern mountains, as might be expected in view of lower rainfall, have a less developed forest structure and less representation of dedicated forest species. The Kyabobo National Park (218km^2) is at the northern end of the mountain range, covering a wide range of ecotypes from Guinea savannah to dense woodland and patches of semi-deciduous forest, most of it in good condition. More detail is given in chapter 2 of this report.

3.2 History of butterfly collecting in the Volta Region

As discussed in Part I of this report and in appendix 2 on the collections published by Karsch (1893), the Volta Region was the subject of the most extensive butterfly collecting published from tropical Africa at the time, with more than 200 species recorded. From the 1950s to the 1970s Father Maessen was based variously in Ho and Anfoega, but especially in Likpe-Mate (10km from Wli Falls). He amassed a huge collection that was given to the Allyn Museum of Entomology in Sarasota, Florida (now housed in Gainesville) (studied by the author on two occasions). Most of his material is from the central mountain area. He did collect at Wli Falls, but most of his records are from forests that have since been degraded or have disappeared. Many interesting species were caught in the Amedzofe area, with Africa's largest butterfly, *Papilio antimachus* Drury, 1882, taking pride of place: the forests have since been much reduced in size as well as quality and the butterfly seems to be extinct in the Volta Region. Maessen's collecting in the Volta Region probably qualifies as the most intensive by any single individual in tropical Africa. The quality of his material was strongly improved by continued encouragement to collect various "difficult" groups by H. Stempffer, L.A. Berger, and L.D. Miller. From Kpalimé in Togo, West (1992) published a list of about 150 species that did not include any not found in Ghana. Between 1996 and now the African Butterfly Research Institute, Nairobi received a large number of butterflies from the Volta Region, all from the central mountain area; it was not possible for the author to screen all of these, but most species previously unknown from the region were probably intercepted. Finally the author collected several times at Wli Falls, once in Kyabobo, and in a number of other places between 1994 and 2000. On the present mission a few additional species were found at Wli Falls and in Kyabobo by the author and H. Boersma, but before that many additional species were added to the Kyabobo list by R. Vorgas, who was sent as part of the preparation for the present mission.

3.3 Review of the Volta Region butterfly fauna

3.3.1 Total butterfly fauna

As a result of all the activities mentioned in the previous section, the total number of butterflies known from the Volta Region is 641. This comprises 70% of all species known from Ghana. As shown in table 3.3.1 the bulk of the missing species are accounted for by two groups: 1) 150 "bi-regional species" that are found in the forests both west and east of the Volta Region, but which do not occur in the region itself; and 2) 76 endemics of the forest zone west of the Dahomey Gap that do not penetrate east of the Volta River (of the 100 endemics, 7 are Volta endemics). These two cases of absence are one of the major characteristics of the Volta fauna.

Table 3.3.1. The total Volta butterfly Fauna and an analysis of those missing.

Categories		**Species numbers**	
Confirmed species from the Volta Region		641	70%
Categories of species absent from Volta Region			
Possible species and uncertain status	38		
Bi-regional species missing (2x2)	150		
WA endemics missing (ww)	53		
Ghana endemics missing (en)	23		
Savannah species missing (sav)	20		
Ghana species absent for Volta		284	30%
Total Ghana species		**925**	**100%**

Of the 150 bi-regional species that are absent from the Volta Region, but which occur in forests on both sides, 108 were classified as belonging to the wetter evergreen forests (WEF) in the annotations used by Larsen (1994): that is 72% of the missing total: in all 246 (26%) of Ghana's 925 butterflies are classified as WEF, but only 77 (12%) of the Volta Region's 641 species belong to this category. Even if the 1994 designations may need of revision, it is clear that the species missing from the Volta Region are heavily biased towards those of the wetter forests in good condition, and that also applies to the missing endemics. The presence of 77 species classified as MEF, on the other hand, does indicate that there may well in earlier times have been more than today, some of which have become locally extinct during dry climatic periods. Among conspicuous absentees are: *Graphium tynderaeus* Fabricius, 1793, *Appias phaola* Doubleday, 1847, all the *Ornipholidotos*, *Eresiomera isca occidentalis* Collins & Larsen, 1998, *Liptena similis* Kirby, 1890, all the *Falcuna*, *Neurellipes fulvus* Stempffer, 1962, *Bicyclus evadne* Cramer, 1779, *B. trilophus jacksoni* Condamin, 1961, *Charaxes hadrianus* Ward, 1871, *C. nobilis claudei* le Moult, 1933, *Vanessula milca* Hewitson, 1873, most of the *Cymothoe*, *Bebearia demetra* Godart, 1824, *B. cutteri* Hewitson, 1865, *Euphaedra eleus* Drury, 1782, *Acraea vesperalis* Grose-Smith, 1890, *Katreus johnstoni* Butler, 1888,

Celaenorrhinus meditrina Hewitson, 1877, *Osmodes costatus* Aurivillius, 1896, *O. banghaasi* Holland, 1896, *Pteroteinon iricolor* Holland, 1890, *P. laterculus* Holland, 1890, *Leona binoevatus* Mabille, 1891, and *Caenides dacenilla* Aurivillius, 1925.

Table 3.3.1 showed that only 70% – 641 species – of Ghana's butterflies are known from the Volta Region, and the previous paragraph demonstrates a conspicuous absence of the species belonging to the wettest habitats that are found in both Ghana proper and in Nigeria and further east. This pattern is confirmed by table 3.3.2, which shows that only a third of all Ghana's butterflies that are centred on the wet evergreen forest zone (WEF) are found there. More than 90% of the species that are distributed in all types forest are found in the Volta Region.

Table 3.3.2. The ecological composition of the butterfly in Ghana compared to the Volta Region.

Ecological zone (from appendix 1)	**Ghana total**	**Volta Region**	**Volta as % Ghana**
WEF – wet evergreen forest	246	77	31%
MEF – moist evergreen forest	271	213	79%
ALF – all forest types	172	160	93%
DRF – dry forest specialists	68	55	81%
GUI – Guinea Savannah*	82	81	98%
SUD – Sudan Savannah	48	19	40%
UBQ – ubiquitous species	33	33	100%
??? – not assigned/error	5	3	n.a.
TOTAL	**925**	**641**	**70%**

* includes 4 species of special habitats

Of the 641 butterfly species in the Volta Region, 474 have been found inside the three localities of the protected areas system, constituting 74% of the total. This is considerably less than for the forest region as a whole, where 80% have been positively recorded from the protected areas system, though total numbers there are considerably higher. The relatively low percentage is due mainly to the fact that the only location in the central mountain area is the tiny Wli Falls Wildlife Sanctuary. The protection of endemic species, and those not crossing the Volta River to the west, is even poorer, as shown in sections 3.3.2. and 3.3.3.

3.3.2 Endemics of Africa west of the Dahomey Gap

A total of 100 species in Ghana are endemics of Africa west of the Dahomey Gap (11%). They fall in three categories as follows:

- Endemics to West Africa as a whole 67 species
- Endemics to the Ghana subregion 26 species
- Endemics to the Ghana/Togo mts. 7 species
- TOTAL 100 species

Only 24 (24%) of these are known from the Volta Region, which includes the 7 that are strict Volta Region endemics. The strict endemics are listed in table 3.3.2a below, the remaining 17 in table 3.3.2b:

Table 3.3.2a. An annotated list of the butterflies endemic to the Volta Region.

Papilio nobicea Suffert, 1904 was described from "Togo" and is quite common in the Volta Region, with records from both Kyabobo and Wli Falls. It is just possibly that records from the Atewa Range are true, which would then match the distribution of *Acraea translucida* Eltringham, 1912. The species is commonly known as *P. maesseni* Berger, 1974, a junior synonym.
Telipna maesseni Stempffer, 1970 (TL Likpe) is quite common in the Volta Region and neighbouring Togo, including Kyabobo and Wli Falls.
Cephetola maesseni Libert, 1999 is so far known only from a small series from Likpe (TL), collected by Father Maessen.
Iolaus theodori Stempffer, 1970 is known from Ho, Likpe, Anfoega (TL), and Kpalimé in Togo from Father Maessen's collection and no new material has been found.
Iolaus likpe Collins & Larsen, 2004 is known from a single specimen bred from larva by Father Maessen from his Likpe (TL) garden.
Capys vorgasi Collins & Larsen, 2004 was collected in some numbers in the area around Likpe by R. Vorgas in 2000/2001. It feeds on *Protea* (Proteaceae).
Junonia hadrope Doubleday, 1847 is a remarkable butterfly that has "West Africa" as its type locality, but it is effectively a Volta Region endemic. It was found in 1995 near the Akosombo Dam but has otherwise proved very elusive (see fig.3.3.2).

Only *Papilio nobicea* and *Telipna maesseni* are known from within the protected areas system, or just a quarter of the seven. Again the reason is the absence of forest in the central mountains within the protected areas system. The endemic species testify to the forest in the Volta Region having been isolated during periods when savannah covered most of Ghana, the forest fauna having retrenched to small refuge areas around Ankasa/Assinie and on the Atewa Range.

In all, 17 of the remaining 93 species that are endemic to Africa west of the Dahomey Gap and are present in Ghana are found in the Volta Region. That is only 18% of the total endemics. Just three of these are among the 26 Ghana subregional endemics. The underlying reason must be that the endemics evolved in the narrow refuges that remained during very dry

climatic spells and that most became adapted to the wetter forest types that do not occur in the present Volta Region. These 17 species are listed in table 3.3.2b below.

Fig. 3.3.2. Left is the most distinctive endemic species of the Volta Region in the form of *Junonia hadrope*. To the right is its presumed closest relative in the form of *Junonia westermanni*, which is found throughout the African forest zone, including Volta Region. Their exact relationship and its timing will need DNA studies that can only be conducted if fresh material continues to be available. At present *J. hadrope* seems to be very rare.

Table 3.3.2b. An annotated list of the butterflies that are endemics to Africa west of the Dahomey Gap, including the Volta Region and their presence in the protected areas system.

Mylothris poppea Cramer, 1777	KYA	WLI	—
Pentila phidia Hewitson, 1874	KYA	wli	—
Stempfferia dorothea Bethune-Baker, 1904	—	WLI	—
Stempfferia leonina Staudinger, 1888	—	—	—
Hypolycaena clenchi Larsen, 1997	kya	WLI	—
Pilodeudorix aurivilliusi Stempffer, 1954	—	—	—
Lepidochrysops synchrematiza Bethune-Baker, 1923	kya	wli	—
Bicyclus maesseni Condamin, 1971	KYA	WLI	—
Henotesia elisi Karsch, 1893	KYA	—	—
Protogoniomorpha cytora Doubleday, 1847	KYA	WLI	—
Euphaedra phaetusa Butler, 1866	KYA	WLI	KAL
Euphaedra inanum Butler, 1873	—	—	—
Euphaedra eupalus Fabricius, 1781	—	—	—
Astictopterus anomoeus Plötz, 1879	—	—	—
Acleros bala Berger, mss.	—	—	—
Paracleros placidus Plötz, 1879	kya	WLI	—
Platylesches rossi Belcastro, 1986	—	—	—

The reason for the massive absence of the western endemic species is again that the bulk of these are adapted to the wettest habitat types. It is hardly surprising that species evolving in isolation might be less mobile than other species, but it is also quite likely that some additional endemics used to be in the Volta Region in more mesic climatic periods but have since retreated again.

3.3.3 Eastern species not found west of the Volta River

One of the most fascinating elements in the Volta Region butterfly fauna are the 15 species that occur in the region and extend eastwards to the Niger Delta, or to western Cameroun, and in some cases well into the equatorial forest zone, even as far as Uganda and Zambia. They never crossed the Volta River. The Volta populations of such species are now quite cut off the rest of their ranges by the Dahomey Gap and they are witnesses to two separate biogeographical facts: 1) they testify to climatic periods when forest bridged the Dahomey Gap sufficiently to allow faunal interchange with the east, and 2) they testify that the Volta River constituted a genuine and significant biogeographical barrier.

Table 3.3.3. An annotated list of the butterflies that in Ghana are limited to the Volta Region but that extend eastwards to Nigeria, Cameroun, or equatorial Africa.

Aslauga ernesti Karsch, 1995 (TL Misahöhe) was described from somewhere in the central parts of the Ghana/Togo Mountains and has been found at Kabba in western Nigeria. It was recently found in the Likpe area. It has not been recorded from within the protected areas system [it actually seems to have been collected at Bismarckburg].
Aslauga imitans Libert, 1994 (TL Amedzofe) has also been found in the Likpe area and the author collected a single male in Kyabobo National Park. The range extends to western Cameroun.
Mimacraea maesseni Libert, 2000 (TL Volta Region) is widespread and rather common in the Volta Region, where known from Wli Falls and Kyabobo. The range extends to western Nigeria.
Liptena pearmani Stempffer, Bennett & May, 1974 (TL Ubiaja, Benin) is widespread but rare in western Nigeria. A specimen of *L. decipiens* recorded from the Bismarckburg area by Karsch (1893) must be this species, described long after Karsch's list was made.
Larinopoda aspidos Druce, 1890 (TL Lagos) is common in the Volta Region but is wholly replaced by *L. eurema* Plötz west of the Volta River. It is known from Kyabobo and Wli Falls; it was interesting to see that it also represented the genus in Kalakpa. It is also found in eastern Nigeria, but not in the Cross River loop and Korup.
Iridana hypocala Eltringham, 1929 TL Uganda, Jinja) is found through much of equatorial Africa and was recently found somewhere in the Volta Region by collectors from ABRI.
Spindasis crustaria Holland, 1890 was once found at Likpe by Father Maessen and extends to much of equatorial Africa. It has not been found within the protected areas system.
Iolaus parasilanus maesseni Stempffer & Bennett, 1958 was described from Ho. The Ghana subspecies extends to Nigeria and other subspecies occur in much of equatorial Africa.
Iolaus fontainei Stempffer, 1956 (TL northeast Democratic Republic of Congo) is widespread in the equatorial Africa, but also known from SE Nigeria and Likpe and Amedzofe in the Volta Region.

Oboronia pseudopunctatus Strand, 1912 (TL Cameroun) is rather scarce but widely distributed in the Volta Region, including Wli Falls. Its range covers most of the equatorial Region.
Bicyclus italus Hewitson, 1865 (TL Old Calabar) is found in the Nigeria/Congo/Cameroun area but also in the Volta Region where it entirely replaces *B. zinebi* Hewitson, 1865, which replaces it west of the Volta River. It is recorded from Kyabobo, Wli Falls, and Kalakpa.
Bicyclus sylvicolus Condamin, 1865 (TL Cameroun) is found in the Volta Region, Nigeria, and the extreme west of Cameroun. It is replaced by *B. abnormis* Dudgeon, 1909 west of the Volta River, which as the name implies is rather different from other members of its group.
Neptis angusta Overlaet, 1855 (TL Sankuru, Democratic Republic of Congo) was found at Likpe in Ghana and identified by M. Condamin. It extends east to eastern parts of equatorial Africa.
Euphaedra ruspina Hewitson, 1865 (TL Old Calabar) has been found in several localities in the Volta Region and Togo and extends east to all of equatorial Africa. It is known from Wli Falls. That this large, powerful, and widely-distributed species has not been able to cross the Volta River is most amazing (photo in fig. 3.3.3).
Acraea eugenia Karsch, 1893 (TL near Bismarckburg) may be common at Wli Falls and Kyabobo. It has been found a few times in numbers in Cameroun, but otherwise there are just singles from Nigeria and various locations in equatorial Africa.

In addition to the species listed in the table, *Acraea translucida* Eltringham, 1912 is also on the Atewa Range one the other side of the Volta River, while stretching east to the Nigeria/Cameroun Mountains. Another species, *Bebearia cocalia continentalis* Hecq, 1988 occurs in the region in a form closer to the Nigerian than to the west of the Volta River.
Anthene wilsoni Talbot, 1935 was collected recently near Likpe, but this should probably be considered a Guinea Savannah butterfly – the nearest records are from dry zones in Uganda and Kenya. Of the 15 species listed in the table, 7 have been found in the protected areas system (47%).

Fig. 3.3.3. The large, powerful *Euphaedra ruspina* is found in the Volta Region and in most of the African forests, but has not managed to extend west across the Volta River.

3.4 Biogeographical summary

The role of the Volta River as a biogeographical barrier and the role of the Volta Region as an independent biogeographical feature has been the subject of a fair amount of discussion. In their in-depth investigations of the flora, Hall & Swaine (1976, 1981) do not pay much attention to this issue, seemingly treating the forests as a "poor relation" of those in Ghana proper; they devoted more attention to the southern and southeast outlier forests and some of their endemic elements. In his mammal studies, Booth (1954, 1958) found that both the Volta Rivers and the mountains had played an important role in the evolutionary processes of West Africa. In his detailed review of tree-frogs, Schiøtz (1967) found the similar patterns to those deduced by the author. On mammals, Grubb (1982) and Grubb *et al*. (2002) take a somewhat detached view of this issue. Biogeographical aspects do not seem to have been of particular interest to ornithologists, though the same patterns as in butterflies may well prevail.

The present composition of the Volta Region butterfly fauna is a snapshot reflecting processes of climatic and ecological changes that have taken place at least since the Pliocene and probably even since the late Miocene. The fauna represents the residual evidence of at least several million years. The large number of species found both to the west and to the east of the Region, which are at present absentees, indicates that the area was once wetter and better forested than it is today. Many – even most – of these were probably present in more mesic times. The endemic species indicate that during one or more dry periods, including the most recent, the mountains of the region retained forests while most of Ghana converted to savannah vegetation – at such times also the Atewa Range in Ghana and the Nimba Mountains in the Liberia subregion remained forested, isolated by savannah from the main Liberia and Ghana refuges. The endemic species as well as those that have a distribution stretching east without crossing the Volta River, testify to the role of the Volta River as a biogeographical barrier of some significance. The butterfly data seem impossible to reconcile with the statement by Rödel & Agyei (2003?) that "within the Volta region, there were no Pleistocene forest refugia at all (Rompaey 1993, Parren & De Graaf 1995).

As discussed in section 2.1 of the companion report (Larsen 2006), in a rough and ready manner every butterfly can act as a proxy for 800 other organisms about most of which we know practically nothing, using fairly conservative estimates. The 640 species recorded from the region would thus indicate a total of just over 500,000 different species, more than 90% of which remain undescribed. Given the complex biogeography of the area it is urgent to ensure that this biodiversity is preserved so that it can be used for future studies – not least those using dating through DNA studies, which may shed much light on evolutionary processes in West Africa.

3.5 Conservation priorities in the Volta Region

As emphasised in chapter 2 the new Kyabobo National Park should be adequate for the preservation of the existing butterfly fauna in the northern part of the region. Similarly, Kalakpa Resource Reserve should preserve the savannah and, especially, the largest extent of riverine forest in Ghana, except perhaps for Digya National Park. However, the best developed semi-deciduous rainforests on the central Volta Region Mountains are only formally protected by the tiny Wli Falls Wildlife Sanctuary. As a consequence of this, fewer of the most interesting, rare, and endemic butterflies are present within the protected areas system than anywhere in the rest of Ghana.

The major problem is that no large tracts of the semi-deciduous forest in good condition actually remain anywhere in the area – and yet its preservation for the future is urgent. There are a number of small community-based nature sanctuaries that have not been visited by the author due to lack of time (the Mt. Afadjato area was briefly visited in 1994). One visit was paid ten years ago to another small waterfall near Wli, but the flora was degraded and the fauna was poor. Other community based conservation projects are based on the sacred monkeys in the Tafi Atome Sanctuary and around the waterfalls of Tsatsadu and Tagbo (Liati-Wote). It would seem that to the extent possible all remaining tracts of forest in the central mountains should somehow be tied together to form a loose network of sanctuaries under local management by the forestry departments or local communities. It may well be too late create further formally protected areas. The mapping of such a network would need a considerable amount of field research. However, it would be a worthwhile effort given that the Volta Region has considerable potential for tourism development, where nature would have to play a major role. The tourism "carrying capacity" of Wli Falls is quite limited: but the Falls do show that conservation and tourism can be combined. The task of surveying potential localities, and tying them together to a coherent whole under a variety of management systems from government to local communities and private enterprise will not be easy. However, for conservation of the unique biodiversity of the Volta Region and as a basis for long-term tourism development, it is an urgent need.

In this respect it is worth quoting Rödel & Agyei (2003), based on herpetological studies, who mirror the author's own views:

> "We also could not find larger tracts of closed forests in the Volta region. This explains the lack of several primary forest specialists in our records. In fact most of the "forest" species we found prefer forest edges, natural disturbances within forests (e.g. tree fall gaps), or so called farmbush habitats (compare section 6). The high percentage of farmbush species in our list is a clear hint that the natural forest cover has been largely destroyed in many areas, probably for quite some time. However, since we could still find some true forest specialists (especially around Wli and Shiare) there seem to be some relict populations in those areas where at least smaller, well protected forest remnants are present. Those forests are not necessarily part of officially protected areas such as the new Kyabobo National Park. It seems that communally protected forests, including so called sacred groves (Decher 1997, Decher & Bahian 1999, Decher et al. 2000), might play at least an equal role in the maintenance of natural diversity within the Togo/Volta region.
>
> Future conservation efforts should encourage all local activities that are likely to preserve these forests. Additionally all larger remaining forest areas in the Volta region should be given highest conservation priority and efforts should be considered to link or buffer smaller forest remnants through reforestation efforts."

Finally it should be re-emphasized that in the workshop organized by Conservation International at Cape Coast in 1999 participants from several disciplines from Ghana, as well as Togo, and elsewhere made a strong plea for the importance of conserving the natural habitats of the Volta Region, not least from the biogeographical perspective (Bakarr *et al*. 2001).

3.6 Ecotourism

The Volta Region has a significant tourism appeal. The landscapes, vegetation, and agricultural patterns are pretty and varied. Some of the views from the higher parts of the central mountains are stunning (see fig. 3.6.1). The profusion of flowering trees, not least the frangipani in the cemeteries and the jacaranda and flame trees in the villages, are unique in the wetter African tropics. A number of small nature sanctuaries and cultural attractions are being managed by NGOs or local communities. Most of these are not major attractions, but they are pleasant and interesting diversions for visitors from Ghana as well as from abroad. Most visitors from abroad who visit Africa do wish to have experiences in nature, not as dedicated ecotourism but as part of a well-rounded total experience.

Ecotourism in its strictest sense is a limited, though fast-growing, sector of the tourist market. The largest sub-sector is definitely bird watching. Butterfly collecting and butterfly watching come much lower down the list with a potential of less than a tenth that of birds.

The three Volta localities of the protected areas system have differing appeals and different potential audiences:

Kalakpa Resource Reserve is not that far from Accra but rather difficult of access by public transport. The park affords beautiful views over Guinea Savannah with low scarps and ridges, especially in the north around Zitoe and Agodake. The reserve must be congratulated for a well-laid network of excellent nature trails, as well as a clean boundary line. These are just right for visitors, being genuinely wild and yet relatively easy to walk. The bird fauna of the riverine forest bands is considered “surprisingly rich” in forest elements by Dowsett-Lemaire & Dowsett (2005). During the dry season larger mammals can apparently be seen with relative ease. As with most of savannah habitats butterfly watching is usually not very good, though the Zitoe Camp clearing could be planted with the nectar plants for butterflies.

Kalakpa is best visited by private car and is perhaps best marketed towards residents of Accra, both Ghanaians and expatriates. The reserve is part of the Dahomey Gap, which is an interesting physical/visual feature as well as an important biogeographical boundary. The Dahomey Gap, its geological history and its present role, is a good attraction for visitors, as is also the case for the Shai Hills (it should be a major theme for the evolving museum there).

Wli Falls/Agumatsa Wildlife Sanctuary has all the elements of a good visitor site. It is beautifully situated in one of Ghana’s prime tourist areas and is readily accessible by public and private transport. The three kilometre track to the waterfall, crossing the small river on a dozen occasions, leads through a varied sample of forest in reasonable condition. The contrast between forest and degraded lands will immediately be evident to visitors. The waterfall – probably the tallest in Ghana – is of great beauty and the open space at its foot is excellent for relaxation and picnics. Swimming is possible, though the water is remarkably cold. The fruit bats colony to the left of the falls is an additional attraction (poaching must be stopped). The fact that uniformed guides are part of community participation is an added attraction for many visitors from abroad (half an hour was spent with guides and visitors and the guides seemed to do a good job). During the past few years three or four small hotels have been built providing paid employment for a number of workers.

The Bradt Guide (Briggs 2004) states that “the butterflies were dazzling”, and this view has spread (On Google the combination “Ghana Wli Butterfly” yields 140 hits). During the author’s several personal visits the average number of species recorded in a day was usually around 150 – more species than in most European countries. At times huge numbers come

mud-puddling at the edge of the stream and in the open space near the waterfall. Planting good nectar plants at the edges of the waterfall clearing could enhance butterfly watching, and possibly one or two permanent feeding stations for fruit-feeding butterflies could be set up. However, on the whole the butterflies are doing visitors proud without needing help. There is no reason why Wli Falls should not be marketed on its butterflies as well as the waterfall.

The main problem with Wli Falls is that it will soon reach the limits of its absorptive capacity for tourists. With just the one access path and with one open area at the waterfall visitor numbers cannot grow to much more than 50 at a time. It seems urgent to develop what may remain of good forests in the vicinity as alternative sites for birdwatchers and nature lovers that prefer a more private and intimate experience. The author has not had the opportunity of researching whether such sites still exist, but probably other close-by communities could become part of Wli Falls attraction – while at the same time assisting in the conservation of the remaining fragments of forest (see section 3.6).

Kyabobo National Park is of considerable conservation importance, but as discussed in section 2.3 above the tourism potential is perhaps rather limited. The author did not see the Laboum Waterfall area, but it evidently has some potential. Pawa Camp is an exciting location to spend a couple of nights for more intrepid visitors. One promising opportunity is hiking under circumstances where it is almost certain that no other human beings would be met with. The reader is referred to section 2.3 for details.

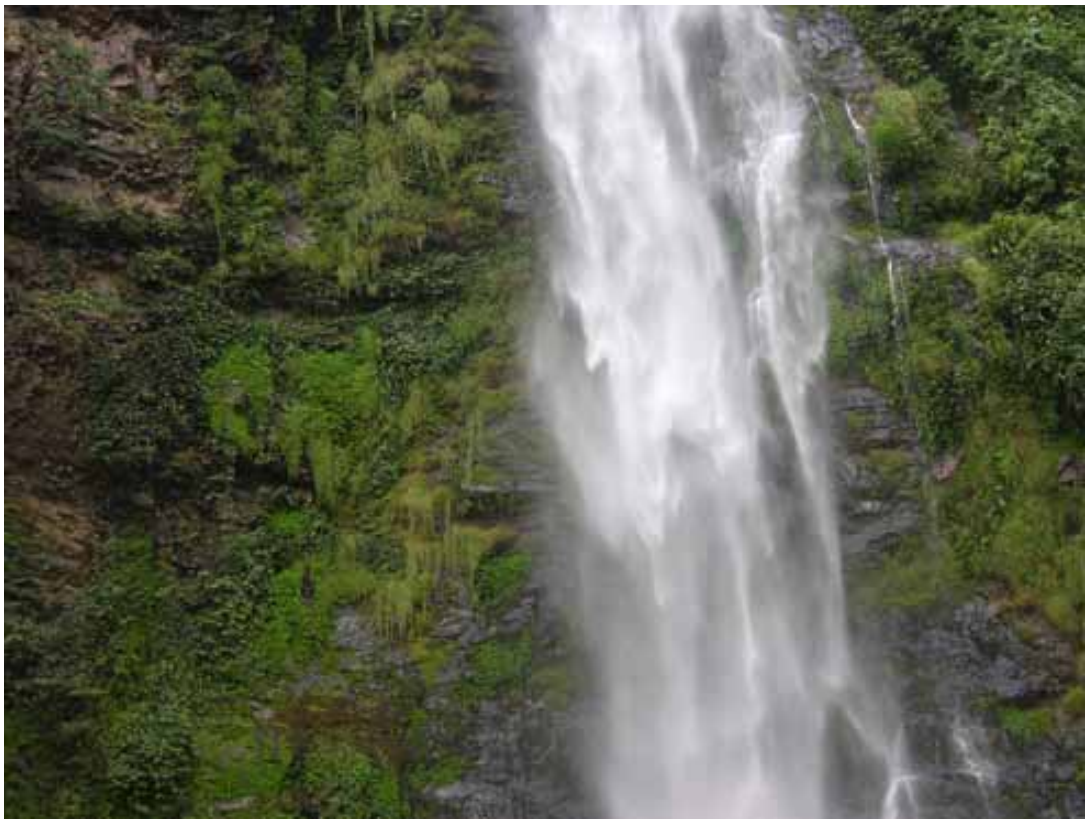

Fig. 3.6. A close-up of the beauty of Wli Falls.

4. CONCLUDING REMARKS

The forests of the Volta Region, shared by Ghana and Togo, are one of the priority conservation areas in West Africa (Bakarr *et al*. 2001). It has a rich flora and fauna. The complex biogeography of the species shows that the present status is the result of climatic change processes that stretch back over many million years. The close analysis of the butterflies, presented in this report for the first time, indicates that the patterns are more significant than they have been given credit for in the past – though opinions have varied. New techniques, not least increased knowledge about West Africa as a whole and the use of molecular studies, will permit a deepening of our understanding. This will be possible only if the flora and fauna is preserved.

Kalakpa Resource Reserve and Kyabobo National Park are well chosen and adequate to conserve the southern and northern parts of the Volta Region, especially savannah, woodland, and riverine forest. However, the most urgent conservation need is the forests of the central mountains, which are only protected by the tiny Wli Falls Wildlife Sanctuary. That largest of all African butterflies, *Papilio antimachus*, has almost certainly become extinct in the Region during the past 50 years due to the felling of forest in the Amedzofe area. It is very urgent that what remains of semi-deciduous forest in reasonable conditions be somehow tied together into a network of protected areas through collaboration between local communities, forestry, and wildlife. Ecotourism – in its widest sense – will increase in importance. This might provide a glue to combine such conservation efforts.

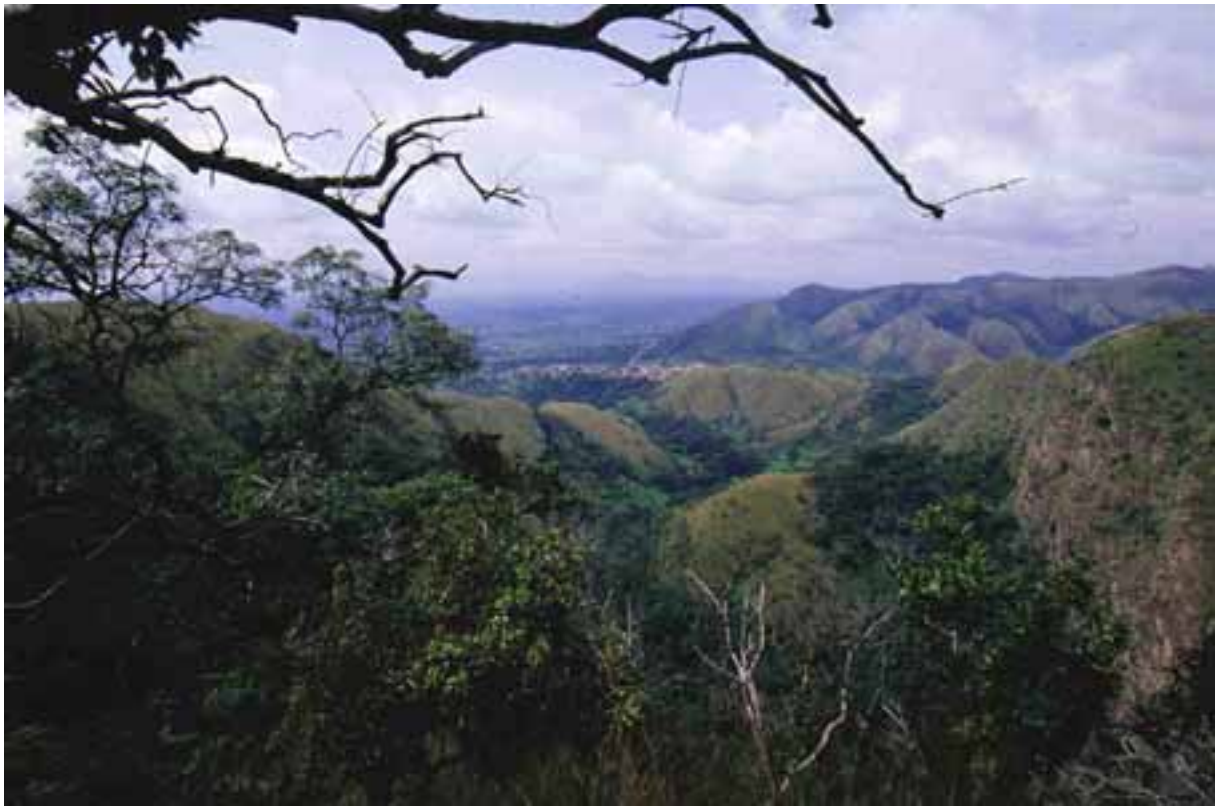

Fig. 3.6.1. A stunning view to the west from the central mountains of the Volta Region – but note the almost complete denudation of the forests habitats in what used to be well-wooded hills (Jan Decher photo).

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APPENDIX 1

THE BUTTERFLIES OF THE VOLTA REGION, KYABOBO, WLI FALLS, AND KALAKPA (VOL = positively recorded from Volta Region)

Torben B. Larsen
February 2006

Numbers: The numbering refers to the book *Butterflies of West Africa – origins, natural history, diversity, conservation* – missing number belong to West African species not found in Ghana.

Legends:

The following three-letter codes are used for the protected areas in Ghana:
KYA = Kyabobo National Park
WLI = Wli Falls Nature Sanctuary
KAL = Kalakpa National Park
VOL = Volta Region in its entirety

CAPITAL letters	imply that the species has been recorded from the locality e.g. KYA
lower case letters	imply that the species is almost certain to occur in the locality e.g. kya
ooo	implies that the species might occur in the locality ooo
—	implies that the species does not occur in the locality **—**

All species are roughly allocated to one main habitat type. Many butterflies are quite flexible in their requirements and the classification is still a rough guide (**HAB**)
WEF implies that the species is centered on Wet Evergreen Forest
MEF implies that the species is centered on Moist Forests
DRF implies that the species is centered on Drier Semi-deciduous and marginal forests
ALF implies that the species is found in any type of forest
GUI implies that the species is centered on the Guinea Savannah
SUD implies that the species is centered on the Sudan Savannah
SPE implies that the species is found in special habitats
UBQ species that are practically ubiquitous through all habitats in most of Africa

The species are roughly graded by rarity, though this is always a difficult call to make. Very rare species may one day be numerous in a single locality. Very common butterflies are sometimes absent. However, the following notations are used (**RA**):
VC = very common – species that are usually found on any visit to a suitable locality
CO = common – species that are usually found on 75% of visits to most suitable localities
NR = not rare – met with frequently but often not common
RA = rare – species that are found on less than 75% of visits to most suitable localities
VR = very rare – species that are usually found on less than 5% of visits to most suitable localities

The last column (**CAT**) indicates a number of distinct categories of the Ghana butterflies as related to the Volta Region

en = the species is endemic to the Ghana Subregion (Ghana and eastern Côte d'Ivoire), not extending to Volta Region
ww = the species is endemic to Africa west of the Dahomey Gap, not extending to Volta Region
ww+= the species is endemic to Africa west of the Dahomey Gap, extending to Volta Region (only two are limited to the Ghana Subregion)
veq = the species is found in the Volta Region without crossing the Volta River, the extending east to Nigeria or equatorial Africa
voe = species that are strictly endemic to the Volta Region
2x2 = species known from forests on both sides of the Dahomey Gap, but which do not occur in the Volta Region
sav = savannah butterflies of Ghana that have not been recorded from the Volta Region

yes = the species has been found inside the three protected areas (Wli, Kyabobo, Kalakpa)
no = the species is known from Volta Region but not from the three protected areas

NOTE: Subspecies, where applicable, are given in appendix 1b of the companion report on the butterflies of Ghana as a whole (Larsen 2006)
Authors and dates of description are found in Larsen (2005).

LEGENDS		HAB	RA	KYA	WLI	KAL	VOL	CAT
PAPILIONIDAE								
PAPILIO								
1	antimachus	WEF	VR	—	ooo	—	**VOL**	no
2	zalmoxis	WEF	VR	—	—	—	—	2x2
4	dardanus	ALF	NR	KYA	WLI	KAL	**VOL**	yes
5	phorcas	ALF	RA	ooo	WLI	—	**VOL**	yes
7	horribilis	WEF	NR	—	—	—	—	ww
9	chrapkowskoides	MEF	CO	kya	WLI	—	**VOL**	yes
10	sosia	ALF	NR	kya	WLI	—	**VOL**	yes
11	nireus	ALF	CO	KYA	WLI	KAL	**VOL**	yes
12	menestheus	WEF	CO	KYA	WLI	KAL	**VOL**	yes
13	demodocus	UBQ	VC	KYA	WLI	KAL	**VOL**	yes
15	cyproeofila	MEF	CO	???	???	—	???	???
16	zenobia	MEF	NR	—	—	—	—	2x2
17	nobicea	MEF	NR	KYA	WLI	—	**VOL**	yes voe
18	cynorta	MEF	NR	KYA	WLI	kal	**VOL**	yes
GRAPHIUM								
20	angolanus	GUI	CO	KYA	WLI	KAL	**VOL**	yes
22	tynderaeus	WEF	RA	—	—	—	—	2x2
23	latreillianus	WEF	NR	—	—	—	—	2x2
24	almansor	DRF	NR	KYA	WLI	—	**VOL**	yes
25	adamastor	DRF	NR	KYA	wli	kal	**VOL**	yes
26	agamedes	DRF	RA	kya	ooo	ooo	**VOL**	no
28	rileyi	WEF	RA	—	—	—	—	en
29	leonidas	UBQ	CO	KYA	WLI	kal	**VOL**	yes
30	illyris	WEF	NR	—	—	—	—	2x2
31	policenes	ALF	CO	KYA	WLI	kal	**VOL**	yes
32	liponesco	WEF	NR	kya	wli	KAL	**VOL**	yes
34	antheus	ALF	NR	KYA	WLI	ooo	**VOL**	yes
PIERIDAE								
PSEUDOPONTIINAE								
PSEUDOPONTIA								
35	paradoxa	WEF	NR	—	—	—	—	2x2
COLIADINAE								
CATOPSILIA								
36	florella	UBQ	VC	KYA	WLI	KAL	**VOL**	yes
EUREMA								
38	senegalensis	MEF	CO	KYA	WLI	—	**VOL**	yes
39	hecabe	UBQ	VC	KYA	WLI	KAL	**VOL**	yes
40	floricola	UBQ	NR	KYA	WLI	KAL	**VOL**	yes
41	hapale	SPE	VR	—	—	ooo	—	2x2
42	desjardinsii	UBQ	NR	KYA	WLI	KAL	**VOL**	yes
43	brigitta	GUI	NR	KYA	wli	KAL	**VOL**	yes
PIERINAE								
PINACOPTERYX								
44	eriphia	SUD	NR	—	—	—	—	sav
NEPHERONIA								
45	argia	ALF	CO	KYA	WLI	KAL	**VOL**	yes
46	thalassina	ALF	CO	kya	WLI	KAL	**VOL**	yes
47	pharis	ALF	CO	KYA	WLI	KAL	**VOL**	yes

COLOTIS								
54	vesta	SUD	NR	—	—	—	—	sav
57	celimene	SUD	RA	—	—	—	—	sav
58	ione	SUD	NR	—	—	—	—	sav
60	danae	SUD	NR	—	—	—	—	sav
61	aurora	SUD	NR	ooo	ooo	—	ooo	no
62	antevippe	SUD	NR	ooo	wli	ooo	ooo	no
63	euippe	UBQ	CO	KYA	WLI	KAL	**VOL**	yes
65	evagore	SUD	CO	kya	ooo	ooo	vol	no
BELENOIS								
68	aurota	SUD	CO	kya	WLI	kal	**VOL**	yes
69	creona	SUD	VC	kya	WLI	kal	**VOL**	yes
70	gidica	SUD	NR	—	—	—	—	sav
72	subeida	SUD	NR	—	—	—	—	sav
73	calypso	ALF	VC	kya	WLI	KAL	**VOL**	yes
74	theora	MEF	CO	ooo	WLI	ooo	**VOL**	yes
76	hedyle	DRF	NR	KYA	WLI	ooo	**VOL**	yes
DIXEIA								
78	doxo	SUD	NR	—	—	—	—	sav
79	orbona	SUD	NR	—	—	—	—	sav
80	cebron	DRF	NR	kya	wli	kal	**VOL**	no
81	capricornus	DRF	NR	ooo	ooo	—	**VOL**	no
APPIAS								
84	sylvia	ALF	CO	KYA	WLI	KAL	**VOL**	yes
85	phaola	WEF	NR	—	—	—	—	2x2
86	sabina	MEF	CO	KYA	WLI	—	**VOL**	yes
87	epaphia	UBQ	CO	KYA	WLI	kal	**VOL**	yes
LEPTOSIA								
88	alcesta	ALF	vc	KYA	WLI	KAL	**VOL**	yes
90	hybrida	ALF	CO	KYA	wli	ooo	**VOL**	yes
91	medusa	ALF	CO	ooo	ooo	kal	**VOL**	no
92	marginea	MEF	NR	KYA	WLI	ooo	**VOL**	yes
93	wigginsi	ALF	NR	KYA	WLI	KAL	**VOL**	yes
MYLOTHRIS								
95	chloris	UBQ	VC	KYA	WLI	KAL	**VOL**	yes
100	dimidiata	WEF	NR	—	—	—	—	ww
103	aburi	DRF	NR	KYA	wli	—	**VOL**	yes
106	poppea	MEF	NR	KYA	WLI	ooo	**VOL**	yes ww+
107	spica	MEF	NR	—	—	—	—	en
109	rhodope	ALF	CO	KYA	WLI	kal	**VOL**	yes
110	jaopura	ALF	CO	KYA	WLI	—	**VOL**	yes
111	schumanni	MEF	NR	KYA	WLI	—	**VOL**	yes
112	atewa	WEF	NR	—	—	—	—	en
LYCAENIDAE								
MILETINAE								
EULIPHYRA								
114	hewitsoni	MEF	RA	—	wli	—	**VOL**	no
115	mirifica	MEF	RA	—	—	—	???	
116	leucyania	WEF	RA	—	wli	—	**VOL**	no
ASLAUGA								
117	ernesti	DRF	VR	KYA	wli	—	**VOL**	no veq
118	marginalis	MEF	NR	KYA	wli	—	**VOL**	yes
121	lamborni	WEF	RA	—	—	—	—	ww
124	imitans	MEF	RA	KYA	wli	—	**VOL**	yes veq
MEGALOPALPUS								
127	zymna	ALF	CO	KYA	wli	—	**VOL**	yes
129	metaleucus	MEF	NR	KYA	wli	—	**VOL**	yes
SPALGIS								
130	lemolea	DRF	NR	KYA	WLI	kal	**VOL**	yes

LACHNOCNEMA								
131	vuattouxi	DRF	NR	kya	wli	kal	**VOL**	no
133	emperanus	DRF	NR	KYA	wli	KAL	**VOL**	yes
135	disrupta	MEF	RA	—	—	—	**VOL**	no
136	reutlingeri	MEF	RA	—	—	—	—	2x2
137	luna	WEF	RA	—	wli	—	**VOL**	no
139	albimacula	WEF	RA	—	—	—	—	2x2
LIPTENINAE								
PTELINA								
141	carnuta	MEF	NR	KYA	WLI	—	**VOL**	yes
PENTILA								
142	pauli	DRF	NR	KYA	WLI	KAL	**VOL**	yes
144	petreoides	WEF	VR	—	—	—	—	ww
147	petreia	MEF	CO	KYA	wli	—	**VOL**	yes
152	picena	MEF	NR	KYA	WLI	KAL	**VOL**	yes
155	phidia	MEF	NR	KYA	wli	—	**VOL**	yes ww+
157	hewitsonii	MEF	NR	—	ooo	—	**VOL**	no
TELIPNA								
159	acraea	WEF	NR	—	—	—	**VOL**	no
160	semirufa	WEF	NR	—	—	—	—	ww
161	maesseni	WEF	NR	KYA	WLI	—	**VOL**	yes voe
ORNIPHOLIDOTOS								
170	nigeriae	WEF	RA	—	—	—	—	2x2
171	onitshae	WEF	RA	—	—	—	—	2x2
172	irwini	WEF	RA	—	—	—	—	2x2
173	issia	WEF	RA	—	—	—	—	ww
174	tiassale	WEF	NR	—	—	—	—	ww
175	nympha	WEF	RA	—	—	—	—	2x2
TORBENIA								
177	wojtusiaki	WEF	RA	—	—	—	—	2x2
MIMACRAEA								
179	neurata	WEF	RA	KYA	WLI	—	**VOL**	yes
181	darwinia	WEF	NR	—	—	—	—	ww
182	maesseni	WEF	NR	kya	WLI	—	**VOL**	yes veq
MIMERESIA								
184	libentina	ALF	CO	KYA	WLI	KAL	**VOL**	yes
185	moyambina	WEF	VR	—	—	—	—	ww
186	debora	WEF	VR	—	—	—	—	2x2
187	semirufa	WEF	RA	—	—	—	—	en
190	cellularis	WEF	RA	—	wli	—	**VOL**	no
191	issia	WEF	RA	—	—	—	—	ww
PSEUDERESIA								
192	eleaza	WEF	NR	—	wli	—	**VOL**	no
ERESIOMERA								
193	bicolor	MEF	NR	KYA	WLI	—	**VOL**	yes
194	isca	WEF	RA	—	—	—	—	2x2
195	jacksoni	WEF	VR	—	—	—	—	en
197	petersi	WEF	RA	—	—	—	—	en
CITRINOPHILA								
199	marginalis	MEF	CO	KYA	WLI	—	**VOL**	yes
200	similis	MEF	CO	KYA	WLI	KAL	**VOL**	yes
202	erastus	WEF	NR	—	—	—	—	2x2
ERESINA								
204	maesseni	MEF	RA	—	—	ooo	**VOL**	no
206	pseudofusca	MEF	RA	kya	wli	—	**VOL**	no
210	saundersi	MEF	RA	—	—	—	vol	
212	theodori	MEF	RA	kya	wli	—	**VOL**	no
ARGYROCHEILA								
213	undifera	WEF	RA	—	—	—	—	2x2

LIPTENA								
216	submacula	MEF	NR	ooo	WLI	—	**VOL**	yes
217	griveaudi	WEF	VR	—	—	—	—	en
218	simplicia	MEF	CO	ooo	wli	kal	**VOL**	no
222	tiassale	MEF	RA	—	—	—	—	en
224	albicans	WEF	RA	—	ooo	—	**VOL**	no
225	alluaudi	WEF	NR	KYA	wli	—	**VOL**	yes
226	fatima	???	VR	—	—	—	—	2x2
227	pearmani	WEF	VR	KYA	wli	—	**VOL**	yes veq
229	ferrymani	DRF	RA	ooo	ooo	kal	vol	
231	septistrigata	DRF	NR	ooo	ooo	ooo	**VOL**	no
232	evanescens	WEF	RA	—	—	—	—	2x2
234	xanthostola	WEF	RA	—	—	—	**VOL**	no
236	rochei	DRF	RA	—	WLI	—	**VOL**	yes
237	flavicans	MEF	RA	—	WLI	—	**VOL**	yes
239	seyboui	WEF	VR	—	—	—	—	en
240	similis	WEF	RA	—	—	—	—	2x2
242	helena	WEF	NR	—	—	—	—	ww
243	catalina	WEF	NR	—	—	—	—	2x2
KAKUMIA								
246	otlauga	WEF	NR	—	—	—	**VOL**	no
FALCUNA								
249	leonensis	MEF	CO	—	—	—	—	ww
252	campimus	WEF	NR	—	—	—	—	2x2
TETRARHANIS								
254	symplocus	MEF	CO	KYA	WLI	—	**VOL**	yes
255	baralingam	WEF	RA	—	—	—	—	ww
260	stempfferi	WEF	VR	—	—	—	—	2x2
LARINOPODA								
264	aspidos	MEF	NR	KYA	WLI	KAL	**VOL**	yes veq
265	eurema	MEF	CO	—	—	—	—	ww
MICROPENTILA								
266	adelgitha	MEF	CO	—	ooo	—	**VOL**	no
267	adelgunda	MEF	VR	—	ooo	—	**VOL**	no
268	dorothea	MEF	NR	—	ooo	—	**VOL**	no
270	brunnea	WEF	RA	—	—	—	—	2x2
275	mamfe	WEF	VR	—	—	—	—	en
IRIDANA								
278	incredibilis	ALF	RA	—	—	—	???	
279	ghanana	ALF	VR	—	—	—	???	
280	exquisuta	MEF	RA	—	—	—	vol	
281	nigeriana	ALF	RA	ooo	wli	—	**VOL**	no
282	hypocala	MEF	VR	ooo	ooo	—	**VOL**	no veq
HEWITSONIA								
283	boisduvalii	WEF	NR	—	—	—	—	2x2
284	occidentalis	MEF	RA	—	—	—	—	2x2
286	inexpectata	MEF	NR	ooo	WLI	—	**VOL**	yes
CERAUTOLA								
289	crowleyi	MEF	NR	KYA	wli	—	**VOL**	yes
291	ceraunia	MEF	NR	ooo	wli	—	**VOL**	no
EPITOLA								
294	posthumus	MEF	NR	KYA	WLI	—	**VOL**	yes
295	uranoides	MEF	RA	ooo	wli	—	**VOL**	no
296	urania	MEF	RA	KYA	wli	—	**VOL**	yes
CEPHETOLA								
297	cephena	MEF	NR	kya	WLI	—	**VOL**	yes
299	pinodes	MEF	RA	ooo	ooo	—	**VOL**	no
300	subcoerulea	MEF	RA	ooo	ooo	—	**VOL**	no
302	mercedes	MEF	RA	—	—	—	—	2x2
303	obscura	MEF	RA	ooo	ooo	—	**VOL**	no

305	sublustris	MEF	NR	ooo	ooo	—	**VOL**	no
306	maesseni	MEF	RA	ooo	wli	—	**VOL**	no voe
307	collinsi	MEF	VR	—	—	—	—	en
HYPOPHYTALA								
308	hyettoides	MEF	NR	kya	wli	—	**VOL**	no
310	hyettina	MEF	RA	KYA	wli	—	**VOL**	yes
311	henleyi	MEF	RA	—	—	—	???	
312	benitensis	WEF	RA	ooo	ooo	—	**VOL**	no
PHYTALA								
314	elais	WEF	RA	ooo	ooo	—	**VOL**	no
GERITOLA								
315	gerina	WEF	RA	ooo	ooo	—	**VOL**	no
320	virginea	WEF	RA	—	—	—	—	2x2
STEMPFFERIA								
322	cercene	WEF	RA	ooo	ooo	—	**VOL**	no
324	moyambina	WEF	NR	—	—	—	—	
326	dorothea	WEF	NR	ooo	WLI	—	**VOL**	yes ww+
330	leonina	MEF	NR	ooo	ooo	—	**VOL**	no ww+
334	ciconia	WEF	NR	—	—	—	???	
335	zelza	WEF	NR	ooo	wli	—	**VOL**	no
340	michelae	ALF	NR	—	—	—	???	
342	kholifa	WEF	NR	—	—	—	**VOL**	no
344	staudingeri	WEF	RA	—	—	—	???	
AETHIOPANA								
346	honorius	WEF	NR	KYA	wli	—	**VOL**	yes
EPITOLINA								
347	dispar	MEF	CO	KYA	WLI	—	**VOL**	yes
348	melissa	MEF	CO	—	—	—	—	
350	catori	WEF	NR	ooo	WLI	—	**VOL**	yes
NEAVEIA								
352	lamborni	MEF	RA	—	wli	—	**VOL**	no
THECLINAE								
MYRINA								
354	silenus	GUI	NR	KYA	wli	kal	**VOL**	yes
355	subornata	GUI	RA	kya	—	—	**VOL**	no
OXYLIDES								
356	faunus	MEF	CO	KYI	WLI	KAL	**VOL**	yes
DAPIDODIGMA								
359	hymen	MEF	NR	KYA	WLI	kal	**VOL**	yes
360	demeter	MEF	RA	kya	WLI	—	**VOL**	yes
APHNAEUS								
361	orcas	MEF	NR	KYA	WLI	ooo	**VOL**	yes
362	argyrocyclus	MEF	RA	—	—	—	—	2x2
363	asterius	MEF	RA	—	—	—	—	2x2
364	brahami	GUI	RA	kya	wli	kal	**VOL**	no
365	jefferyi	MEF	VR	—	—	—	—	2x2
366	charboneli	WEF	VR	—	—	—	—	2x2
367	gilloni	MEF	VR	—	wli	—	**VOL**	no
APHARITIS								
368	nilus	SUD	RA	—	—	—	—	sav
SPINDASIS								
369	mozambica	GUI	NR	KYA	wli	kal	**VOL**	yes
370	avriko	GUI	RA	KYA	ooo	ooo	**VOL**	yes
371	crustaria	MEF	RA	—	ooo	—	**VOL**	no veq
372	iza	MEF	RA	—	ooo	—	**VOL**	no
373	menelas	DRF	VR	ooo	wli	—	**VOL**	no
ZERITIS								
374	neriene	SUD	NR	KYA	ooo	ooo	**VOL**	yes

AXIOCERSES								
375	harpax	GUI	NR	KYA	wli	KAL	**VOL**	yes
377	amanga	SUD	RA	—	—	—	—	sav
LIPAPHNAEUS								
378	leonina	MEF	NR	—	wli	—	**VOL**	no
379	aderna	GUI	NR	ooo	WLI	—	**VOL**	yes
PSEUDALETIS								
380	agrippina	MEF	VR	—	wli	—	**VOL**	no
386	subangulata	MEF	VR	—	—	—	—	en
390	dardanella	MEF	VR	—	—	—	—	2x2
391	leonis	MEF	RA	ooo	wli	—	**VOL**	no
IOLAUS								
Subgenus Iolaus								
392	eurisus	ALF	NR	KYA	WLI	kal	**VOL**	yes
Subgenus Iolaphilus								
393	menas	SUD	NR	kya	ooo	ooo	**VOL**	no
395	carolinae	MEF	VR	—	—	—	—	en
397	iulus	MEF	NR	kya	WLI	—	**VOL**	yes
Subgenus Philiolaus								
398	ismenias	SUD	NR	KYA	wli	kal	**VOL**	yes
400	alcibiades	MEF	RA	—	wli	—	**VOL**	no
401	parasilanus	MEF	RA	—	WLI	—	**VOL**	yes veq
402	paneperata	MEF	NR	—	WLI	—	**VOL**	yes
403	lukabas	MEF	RA	—	—	—	vol	
404	mane	MEF	RA	—	—	—		ww
405	theodori	MEF	VR	—	wli	—	**VOL**	no voe
406	likpe	MEF	VR	—	wli	—	**VOL**	no voe
407	calisto	MEF	NR	KYA	wli	—	**VOL**	yes
408	laonides	WEF	RA	—	—	—	—	2x2
Subgenus Tanuetheira								
410	timon	MEF	RA	—	—	—	vol	
Subgenus Epamera								
411	alienus	SUD	RA	—	—	—	—	sav
414	scintillans	SUD	NR	kya	ooo	—	**VOL**	no
415	laon	MEF	NR	KYA	WLI	—	**VOL**	yes
418	banco	WEF	RA	—	—	—	—	ww
426	sappirus	WEF	RA	ooo	wli	—	**VOL**	no
428	bellina	MEF	NR	KYA	wli	—	**VOL**	yes
432	fontainei	WEF	RA	ooo	wli	—	**VOL**	no veq
434	aethria	MEF	RA	KYA	WLI	—	**VOL**	yes
435	farquharsoni	MEF	RA	ooo	wli	—	**VOL**	no
436	iasis	ALF	NR	KYA	WLI	kal	**VOL**	yes
437	maesa	MEF	RA	KYA	wli	—	**VOL**	yes
ETESIOLAUS								
439	catori	ALF	RA	—	—	—	—	2x2
440	kyabobo	DRF	RA	KYA	wli	—	**VOL**	yes
STUGETA								
441	marmoreus	SUD	NR	—	—	ooo	**VOL**	no
HYPOLYCAENA								
443	philippus	GUI	CO	KYA	WLI	KAL	**VOL**	yes
444	kadiskos	MEF	RA	—	—	—	—	2x2
445	liara	MEF	RA	ooo	wli	—	**VOL**	no
446	lebona	WEF	NR	KYA	WLI	—	**VOL**	yes
447	clenchi	WEF	RA	kya	WLI	—	**VOL**	yes ww+
449	scintillans	ALF	CO	KYA	WLI	KAL	**VOL**	yes
450	dubia	ALF	CO	KYA	WLI	KAL	**VOL**	yes
451	kakumi	MEF	CO	kya	WLI	—	**VOL**	yes
452	antifaunus	MEF	NR	KYA	WLI	—	**VOL**	yes
453	hatita	MEF	CO	KYA	WLI	—	**VOL**	yes
455	nigra	WEF	CO	kya	WLI	—	**VOL**	yes

PILODEUDORIX								
457	camerona	MEF	NR	kya	WLI	—	**VOL**	yes
458	diyllus	MEF	NR	KYA	WLI	—	**VOL**	yes
460	caerulea	GUI	NR	KYA	wli	kal	**VOL**	yes
461	zela	WEF	RA	—	—	—	???	
462	catori	DRF	RA	KYA	wli	—	**VOL**	yes
467	otraeda	MEF	NR	kya	wli	—	**VOL**	no
468	leonina	MEF	NR	kya	wli	—	**VOL**	no
469	virgata	MEF	RA	—	—	—	—	2x2
473	deritas	MEF	RA	ooo	ooo	—	**VOL**	no
474	aucta	MEF	RA	KYA	wli	—	**VOL**	yes
475	pseudoderitas	MEF	RA	kya	WLI	—	**VOL**	yes
476	laticlavia	MEF	RA	ooo	WLI	—	**VOL**	yes
477	aurivilliusi	WEF	RA	ooo	ooo	—	**VOL**	no ww+
478	kiellandi	WEF	RA	ooo	ooo	—	**VOL**	no
479	corruscans	WEF	VR	—	—	—	—	2x2
480	violetta	WEF	RA	—	—	—	**VOL**	no
481	fumata	WEF	VR	—	—	—	—	2x2
PARADEUDORIX								
484	eleala	ALF	NR	KYA	WLI	—	**VOL**	yes
487	moyambina	WEF	VR	—	—	—	—	2x2
HYPOMYRINA								
491	mimetica	MEF	RA	—	wli	—	**VOL**	no
492	nomion	DRF	NR	KYA	wli	kal	**VOL**	yes
DEUDORIX								
494	antalus	GUI	CO	KYA	wli	KAL	**VOL**	yes
495	livia	SUD	VR	—	—	—	—	sav
496	lorisona	ALF	NR	KYA	WLI	KAL	**VOL**	yes
497	kayonza	WEF	RA	—	ooo	—	**VOL**	no
498	dinochares	GUI	RA	KYA	ooo	ooo	**VOL**	yes
499	dinomenes	DRF	RA	ooo	WLI	—	**VOL**	yes
500	odana	ALF	NR	KYA	WLI	—	**VOL**	yes
501	galathea	ALF	NR	KYA	wli	—	**VOL**	yes
502	caliginosa	MEF	RA	KYA	wli	—	**VOL**	yes
CAPYS								
506	vorgasi	SPE	VR	—	—	—	**VOL**	no voe
POLYOMMATINAE								
ANTHENE								
507	rubricinctus	MEF	CO	KYA	WLI	—	**VOL**	yes
508	ligures	MEF	RA	ooo	WLI	—	**VOL**	yes
510	sylvanus	ALF	CO	kya	WLI	KAL	**VOL**	yes
512	liodes	ALF	NR	KYA	WLI	kal	**VOL**	yes
513	definita	GUI	NR	—	—	ooo	—	2x2
514	princeps	GUI	NR	kya	wli	kal	**VOL**	no
515	starki	GUI	RA	KYA	ooo	ooo	**VOL**	yes
516	amarah	SUD	NR	kya	ooo	KAL	**VOL**	yes
517	lunulata	GUI	CO	KYA	wli	kal	**VOL**	yes
518	kikuyu	GUI	RA	ooo	ooo	ooo	vol	
519	talboti	SUD	VR	—	—	—	—	
520	wilsoni	GUI	RA	kya	wli	—	**VOL**	no
521	levis	ALF	NR	KYA	wli	—	**VOL**	yes
522	irumu	ALF	NR	kya	wli	kal	**VOL**	no
523	larydas	ALF	CO	KYA	WLI	KAL	**VOL**	yes
524	crawshayi	GUI	NR	KYA	ooo	KAL	**VOL**	yes
525	lachares	MEF	NR	ooo	wli	—	**VOL**	no
527	lysicles	WEF	NR	—	wli	—	**VOL**	no
530	atewa	WEF	RA	—	—	—	—	en
532	radiata	WEF	VR	—	—	—	—	ww
534	locuples	WEF	RA	—	WLI	—	**VOL**	yes

537	scintillula	WEF	RA	—	ooo	—	**VOL**	no
538	helpsi	WEF	VR	—	—	—	—	en
539	juba	WEF	NR	—	—	—	—	2x2
NEURYPEXINA								
540	lyzanius	MEF	CO	KYA	WLI	—	**VOL**	yes
NEURELLIPES								
542	lusones	WEF	RA	—	wli	—	**VOL**	no
543	chryseostictus	WEF	NR	KYA	wli	—	**VOL**	yes
544	fulvus	WEF	VR	—	—	—	—	2x2
545	staudingeri	WEF	VR	—	—	—	—	2x2
546	gemmifera	DRF	RA	KYA	wli	ooo	**VOL**	yes
TRICLEMA								
547	rufoplagata	MEF	RA	—	ooo	—	**VOL**	no
548	lucretilis	MEF	NR	KYA	ooo	—	**VOL**	yes
549	lamias	ALF	NR	kya	WLI	kal	**VOL**	yes
550	fasciatus	WEF	NR	KYA	WLI	—	**VOL**	yes
551	obscura	WEF	RA	—	—	—	**VOL**	no
552	inconspicua	WEF	RA	—	—	—	—	2x2
554	hades	MEF	NR	KYA	WLI	kal	**VOL**	yes
555	phoenicis	DRF	RA	KYA	wli	kal	**VOL**	yes
556	nigeriae	GUI	NR	KYA	wli	kal	**VOL**	yes
CUPIDESTHES								
560	jacksoni	WEF	NR	—	—	—	—	en
561	mimetica	DRF	RA	ooo	ooo	—	**VOL**	no
562	lithas	MEF	NR	ooo	wli	—	**VOL**	no
564	leonina	MEF	NR	—	wli	—	**VOL**	no
564	pungusei	WEF	VR	—	—	—	—	en
PSEUDONACADUBA								
565	sichela	GUI	CO	KYA	WLI	kal	**VOL**	yes
LAMPIDES								
567	boeticus	UBQ	NR	KYA	wli	kal	**VOL**	yes
URANOTHAUMA								
568	falkensteini	ALF	CO	KYA	WLI	KAL	**VOL**	yes
PHLYARIA								
574	cyara	ALF	CO	KYA	WLI	—	**VOL**	yes
CACYREUS								
575	lingeus	UBQ	CO	KYA	WLI	KAL	**VOL**	yes
577	audeoudi	WEF	RA	ooo	wli	—	**VOL**	no
LEPTOTES								
578	pirithous	UBQ	CO	KYA	WLI	KAL	**VOL**	yes
579	babaulti	GUI	NR	KYA	wli	kal	**VOL**	yes
580	jeanneli	UBQ	CO	KYA	wli	kal	**VOL**	yes
581	brevidentatus	GUI	NR	kya	wli	kal	vol	no
582	pulchra	SPE	RA	ooo	ooo	ooo	ooo	no
TUXENTIUS								
583	cretosus	SUD	CO	—	—	—	—	
584	carana	ALF	CO	KYA	WLI	—	**VOL**	yes
TARUCUS								
586	ungemachi	SUD	NR	—	—	—	—	sav
588	rosacea	SUD	RA	—	—	—	—	sav
ACTIZERA								
592	lucida	GUI	EA	ooo	ooo	—	**VOL**	no
EICOCHRYSOPS								
593	hippocrates	SPE	CO	KYA	WLI	kal	**VOL**	yes
594	dudgeoni	GUI	NR	KYA	wli	kal	**VOL**	yes
CUPIDOPSIS								
595	jobates	SUD	RA	—	—	ooo	vol	
596	cissus	GUI	NR	kya	WLI	kal	**VOL**	yes

EUCHRYSOPS								
598	albistriata	GUI	NR	kya	wli	KAL	**VOL**	yes
600	reducta	SUD	NR	KYA	ooo	ooo	**VOL**	yes
601	malathana	UBQ	CO	KYA	WLI	kal	**VOL**	yes
604	osiris	GUI	CO	KYA	wli	KAL	**VOL**	yes
605	barkeri	GUI	NR	KYA	wli	kal	**VOL**	yes
606	sahelianus	SUD	NR	—	—	ooo	—	sav
LEPIDOCHRYSOPS								
607	victoriae	GUI	RA	KYA	wli	ooo	**VOL**	yes
608	parsimon	GUI	RA	KYA	wli	—	**VOL**	yes
611	synchrematiza	GUI	RA	kya	wli	—	**VOL**	no ww+
615	quassi	GUI	NR	kya	wli	—	**VOL**	no
THERMONIPHAS								
617	micylus	MEF	CO	KYA	WLI	KAL	**VOL**	yes
OBORONIA								
622	punctatus	MEF	CO	KYA	WLI	kal	**VOL**	yes
623	liberiana	WEF	NR	—	—	—	—	ww
624	pseudopunctatus	MEF	NR	kya	WLI	—	**VOL**	yes veq
625	guessfeldti	DRF	NR	KYA	WLI	kal	**VOL**	yes
626	ornata	ALF	CO	KYA	WLI	KAL	**VOL**	yes
AZANUS								
627	ubaldus	SUD	RA	—	—	—	—	sav
628	jesous	SUD	RA	ooo	ooo	—	**VOL**	no
629	moriqua	SUD	NR	KYA	ooo	—	**VOL**	yes
630	mirza	UBQ	CO	KYA	WLI	KAL	**VOL**	yes
631	natalensis	GUI	RA	kya	wli	KAL	**VOL**	yes
632	isis	ALF	CO	KYA	WLI	kal	**VOL**	yes
CHILADES								
633	eleusis	SUD	RA	—	—	—	—	sav
634	trochylus	GUI	NR	kya	wli	ooo	**VOL**	no
ZIZEERIA								
635	knysna	UBQ	CO	KYA	WLI	KAL	**VOL**	yes
ZIZINA								
636	antanossa	GUI	NR	kya	wli	kal	**VOL**	no
ZIZULA								
637	hylax	UBQ	CO	KYA	WLI	KAL	**VOL**	yes
RIODINIDAE								
ABISARA								
638	intermedia	WEF	VR	—	—	—	—	2x2
639	tantalus	WEF	VR	—	—	—	—	2x2
642	gerontes	WEF	RA	—	—	—	—	2x2
NYMPHALIDAE								
LIBYTHEINAE								
LIBYTHEA								
646	labdaca	ALF	CO	KYA	WLI	ooo	**VOL**	yes
DANAINAE								
DANAUS								
647	chrysippus	UBQ	VC	KYA	WLI	KAL	**VOL**	yes
TIRUMALA								
648	petiverana	GUI	CO	KYA	WLI	kal	**VOL**	yes
AMAURIS								
650	niavius	GUI	CO	KYA	WLI	KAL	**VOL**	yes
651	tartarea	ALF	NR	KYA	WLI	kal	**VOL**	yes
652	hecate	MEF	NR	KYA	wli	ooo	**VOL**	yes
653	damocles	DRF	CO	KYA	WLI	KAL	**VOL**	yes

SATYRINAE								
GNOPHODES								
656	betsimena	ALF	CO	KYA	WLI	kal	**VOL**	yes
657	chelys	ALF	CO	KYA	WLI	kal	**VOL**	yes
MELANITIS								
658	leda	UBQ	CO	KYA	WLI	KAL	**VOL**	yes
659	libya	UBQ	NR	kya	wli	kal	**VOL**	no
ELYMNIOPSIS								
661	bammakoo	ALF	CO	KYA	WLI	ooo	**VOL**	yes
BICYCLUS								
663	xeneas	ALF	NR	KYA	WLI	—	**VOL**	yes
665	evadne	WEF	NR	—	—	—	—	2x2
669	ephorus	WEF	RA	—	—	—	—	2x2
672	italus	WEF	NR	KYA	WLI	KAL	**VOL**	yes veq
673	zinebi	ALF	NR	—	—	—	—	ww
674	uniformis	WEF	RA	KYA	wli	—	**VOL**	yes
678	procora	WEF	NR	KYA	wli	—	**VOL**	yes
679	pavonis	GUI	CO	KYA	—	—	**VOL**	yes
680	milyas	GUI	NR	KYA	—	—	**VOL**	yes
681	trilophus	WEF	RA	—	—	—	—	2x2
682	ignobilis	ALF	RA	—	—	—	—	2x2
683	maesseni	ALF	NR	KYA	WLI	—	**VOL**	yes ww+
684	nobilis	WEF	RA	—	—	—	—	2x2
687	taenias	MEF	CO	KYA	WLI	—	**VOL**	yes
690	vulgaris	ALF	VC	KYA	WLI	KAL	**VOL**	yes
691	dorothea	ALF	VC	KYA	WLI	—	**VOL**	yes
692	sandace	ALF	VC	KYA	WLI	KAL	**VOL**	yes
693	sambulos	WEF	NR	—	—	—	—	2x2
694	sangmelinae	WEF	NR	KYA	wli	—	**VOL**	yes
695	mandanes	DRF	NR	KYA	WLI	kal	**VOL**	yes
696	auricruda	MEF	RA	KYA	wli	—	**VOL**	yes
697	campa	GUI	NR	KYA	wli	ooo	**VOL**	yes
698	angulosa	GUI	CO	KYA	ooo	KAL	**VOL**	yes
699	sylvicolus	WEF	NR	KYA	wli	—	**VOL**	yes veq
700	abnormis	WEF	NR	—	—	—	—	ww
701	safitza	GUI	NR	KYA	WLI	KAL	**VOL**	yes
702	funebris	DRF	CO	KYA	WLI	kal	**VOL**	yes
704	dekeyseri	WEF	RA	—	—	—	—	ww
705	istaris	WEF	NR	KYA	WLI	—	**VOL**	yes
707	madetes	MEF	NR	KYA	WLI	ooo	**VOL**	yes
709	martius	MEF	CO	KYA	WLI	KAL	**VOL**	yes
HALLELESIS								
712	halyma	WEF	NR	—	—	—	—	ww
HENOTESIA								
713	elisi	DRF	RA	KYA	ooo	—	**VOL**	yes ww+
HETEROPSIS								
714	peitho	WEF	RA	—	—	—	—	2x2
YPTHIMA								
715	asterope	SUD	RA	—	—	—	—	sav
716	condamini	GUI	CO	kya	ooo	ooo	**VOL**	no
717	antennata	ALF	NR	—	—	kal	—	sav
718	vuattouxi	DRF	NR	—	—	kal	—	ww
719	doleta	ALF	VC	KYA	WLI	KAL	**VOL**	yes
721	pupillaris	GUI	NR	kya	ooo	KAL	**VOL**	yes
722	impura	GUI	RA	—	—	ooo	**VOL**	no
YPTHIMOMORPHA								
724	itonia	SPE	NR	KYA	wli	KAL	**VOL**	yes

CHARAXINAE

CHARAXES								
725	varanes	GUI	CO	KYA	WLI	kal	**VOL**	yes
726	fulvescens	ALF	NR	KYA	wli	ooo	**VOL**	yes
728	candiope	GUI	RA	kya	wli	kal	**VOL**	no
729	protoclea	ALF	CO	KYA	WLI	KAL	**VOL**	yes
730	boueti	DRF	NR	kya	wli	kal	**VOL**	no
731	cynthia	ALF	CO	KYA	wli	—	**VOL**	yes
732	lucretius	ALF	CO	KYA	WLI	—	**VOL**	yes
733	lactetinctus	GUI	RA	KYA	ooo	ooo	**VOL**	yes
734	epijasius	GUI	CO	KYA	ooo	kal	**VOL**	yes
736	castor	DRF	NR	KYA	WLI	ooo	**VOL**	yes
737	brutus	MEF	CO	KYA	wli	kal	**VOL**	yes
738	pollux	MEF	RA	—	—	—	—	2x2
740	eudoxus	ALF	VR	—	—	—	—	2x2
741	tiridates	ALF	CO	KYA	WLI	ooo	**VOL**	yes
742	bipunctatus	WEF	NR	—	—	—	—	2x2
743	numenes	ALF	NR	kya	wli	—	**VOL**	no
744	smaragdalis	ALF	NR	—	—	—	—	2x2
745	imperialis	ALF	RA	kya	wli	—	**VOL**	no
746	ameliae	ALF	NR	KYA	wli	—	**VOL**	yes
747	pythodoris	DRF	VR	—	—	—	—	2x2
748	hadrianus	WEF	RA	—	—	—	—	2x2
750	nobilis	WEF	VR	—	—	—	—	2x2
752	fournierae	WEF	VR	—	—	—	—	2x2
753	zingha	MEF	NR	KYA	WLI	—	**VOL**	yes
754	etesipe	DRF	NR	KYA	WLI	—	**VOL**	yes
755	achaemenes	GUI	CO	KYA	WLI	kal	**VOL**	yes
756	eupale	ALF	VC	KYA	WLI	—	**VOL**	yes
757	subornatus	WEF	RA	KYA	WLI	—	**VOL**	yes
758	anticlea	ALF	NR	kya	wli	—	**VOL**	no
759	hildebrandti	MEF	RA	—	—	—	**VOL**	no
760	etheocles	ALF	CO	kya	wli	KAL	**VOL**	yes
762	petersi	MEF	VR	—	—	—	—	ww
765	bocqueti	WEF	VR	—	—	—	—	2x2
767	virilis	MEF	NR	kya	wli	kal	**VOL**	no
768	cedreatis	MEF	NR	kya	WLI	kal	**VOL**	yes
769	plantroui	DRF	RA	kya	ooo	—	???	ww
770	viola	SUD	CO	KYA	ooo	kal	**VOL**	yes
771	northcotti	GUI	RA	kya	wli	—	**VOL**	no
772	pleione	ALF	CO	kya	WLI	—	**VOL**	yes
773	paphianus	WEF	NR	KYA	wli	—	**VOL**	yes
774	nichetes	DRF	RA	kya	wli	kal	**VOL**	no
775	porthos	MEF	RA	—	wli	—	**VOL**	no
776	zelica	WEF	RA	ooo	—	—	**VOL**	no
777	lycurgus	ALF	CO	KYA	WLI	—	**VOL**	yes
778	mycerina	WEF	RA	—	—	—	—	2x2
779	doubledayi	WEF	RA	KYA	WLI	—	**VOL**	yes
EUXANTHE								
780	eurinome	MEF	NR	KYA	wli	—	**VOL**	yes
PALLA								
783	violinitens	MEF	NR	ooo	wli	—	**VOL**	no
784	decius	MEF	NR	ooo	WLI	—	**VOL**	yes
785	ussheri	ALF	CO	ooo	wli	—	**VOL**	no
786	publius	MEF	NR	—	—	—	—	2x2

APATURINAE

APATUROPSIS								
786a	cleochares	MEF	RA	ooo	wli	—	**VOL**	no

NYMPHALINAE									
KALLIMOIDES									
787	rumia	ALF	CO	KYA	WLI	—	**VOL**	yes	
VANESSULA									
788	milca	WEF	RA	—	—	—	—	2x2	
ANTANARTIA									
789	delius	MEF	CO	ooo	WLI	—	**VOL**	yes	
VANESSA									
791	cardui	UBQ	NR	KYA	wli	kal	**VOL**	yes	
PRECIS									
792	octavia	GUI	NR	KYA	wli	KAL	**VOL**	yes	
793	antilope	GUI	NR	KYA	WLI	kal	**VOL**	yes	
796	ceryne	SPE	NR	KYA	ooo	—	**VOL**	yes	
797	pelarga	ALF	NR	KYA	WLI	KAL	**VOL**	yes	
798	sinuata	WEF	RA	—	—	—	—	2x2	
HYPOLIMNAS									
801	misippus	UBQ	CO	KYA	WLI	kal	**VOL**	yes	
802	anthedon	ALF	CO	KYA	WLI	kal	**VOL**	yes	
803	dinarcha	WEF	NR	ooo	WLI	—	**VOL**	yes	
806	salmacis	MEF	CO	KYA	WLI	—	**VOL**	yes	
SALAMIS									
808	cacta	MEF	CO	KYA	WLI	—	**VOL**	yes	
PROTOGONIOMORPHA									
809	cytora	MEF	NR	KYA	WLI	—	**VOL**	yes	ww+
811	parhassus	MEF	CO	KYA	WLI	kal	**VOL**	yes	
812	anacardii	DRF	NR	KYA	WLI	KAL	**VOL**	yes	
JUNONIA									
813	orithya	SUD	CO	KYA	WLI	ooo	**VOL**	yes	
814	oenone	UBQ	VC	KYA	WLI	KAL	**VOL**	yes	
815	hierta	SUD	CO	KYA	wli	ooo	**VOL**	yes	
816	cymodoce	MEF	NR	KYA	WLI	—	**VOL**	yes	
817	westermanni	DRF	NR	ooo	ooo	—	**VOL**	no	
818	hadrope	DRF	RA	ooo	ooo	—	**VOL**	no voe	
819	sophia	ALF	CO	KYA	WLI	kal	**VOL**	yes	
820	stygia	ALF	CO	KYA	WLI	ooo	**VOL**	yes	
822	chorimene	GUI	CO	KYA	WLI	kal	**VOL**	yes	
823	terea	ALF	VC	KYA	WLI	KAL	**VOL**	yes	
CATACROPTERA									
824	cloanthe	GUI	NR	KYA	wli	KAL	**VOL**	yes	
CYRESTINAE									
CYRESTIS									
825	camillus	ALF	CO	KYA	WLI	—	**VOL**	yes	
BIBLIDINAE									
BYBLIA									
826	anvatara	UBQ	CO	KYA	WLI	KAL	**VOL**	yes	
827	ilithyia	SUD	RA	—	—	—	—	sav	
MESOXANTHA									
828	ethosea	MEF	NR	KYA	WLI	—	**VOL**	yes	
ARIADNE									
829	enotrea	ALF	VC	KYA	WLI	kal	**VOL**	yes	
830	albifascia	ALF	NR	KYA	WLI	KAL	**VOL**	yes	
NEPIDOPSIS									
833	ophione	ALF	CO	KYA	WLI	—	**VOL**	yes	
EURYTELA									
834	dryope	DRF	NR	KYA	WLI	KAL	**VOL**	yes	
836	hiarbas	MEF	CO	KYA	WLI	—	**VOL**	yes	

SEVENIA								
837	occidentalium	ALF	NR	ooo	ooo	—	**VOL**	no
838	boisduvali	ALF	NR	KYA	wli	—	**VOL**	yes
839	umbrina	DRF	NR	KYA	wli	—	**VOL**	yes
LIMENITIDINAE								
HARMA								
843	theobene	MEF	CO	KYA	wli	—	**VOL**	yes
CYMOTHOE								
846	fumana	MEF	CO	—	—	—	—	2x2
851	egesta	MEF	CO	—	ooo	—	**VOL**	no
853	lurida	WEF	VR	—	—	—	—	2x2
858	aubergeri	MEF	NR	—	—	—	—	en
859	herminia	MEF	RA	—	—	—	—	2x2
860	weymeri	WEF	RA	—	—	—	—	2x2
863	caenis	ALF	CO	KYA	WLI	kal	**VOL**	yes
866	althea	MEF	NR	—	—	—	—	2x2
868	jodutta	WEF	CO	—	—	—	—	2x2
872	coccinata	MEF	NR	KYA	WLI	—	**VOL**	yes
873	mabillei	MEF	CO	—	—	—	—	ww
878	‘sangaris’	WEF	NR	—	—	—	—	2x2
PSEUDONEPTIS								
879	bugandensis	ALF	CO	KYA	WLI	—	**VOL**	yes
PSEUDACRAEA								
880	eurytus	ALF	CO	KYA	WLI	KAL	**VOL**	yes
884	boisduvalii	DRF	NR	kya	WLI	—	**VOL**	yes
887	lucretia	ALF	CO	KYA	WLI	KAL	**VOL**	yes
888	warburgi	MEF	NR	—	—	—	—	2x2
889	hostilia	WEF	RA	—	—	—	—	ww
900	semire	ALF	CO	KYA	WLI	ooo	**VOL**	yes
NEPTIS								
901	nemetes	ALF	CO	KYA	WLI	—	**VOL**	yes
903	metella	ALF	CO	KYA	WLI	—	**VOL**	yes
905	serena	DRF	NR	KYA	wli	kal	**VOL**	yes
906	kiriakoffi	GUI	NR	KYA	wli	kal	**VOL**	yes
907	morosa	GUI	CO	KYA	WLI	KAL	**VOL**	yes
908	loma	MEF	RA	ooo	ooo	—	**VOL**	no
910	angusta	MEF	VR	ooo	ooo	—	**VOL**	no veq
911	alta	MEF	NR	KYA	WLI	—	**VOL**	yes
912	seeldrayersi	MEF	RA	KYA	ooo	ooo	**VOL**	yes
913	puella	MEF	NR	KYA	WLI	—	**VOL**	yes
914	conspicua	MEF	RA	ooo	ooo	—	ooo	
915	najo	MEF	RA	KYA	wli	ooo	**VOL**	yes
916	metanira	MEF	RA	ooo	ooo	—	ooo	
917	continuata	MEF	???	ooo	ooo	—	ooo	
918	nysiades	MEF	NR	KYA	WLI	—	**VOL**	yes
921	nicomedes	MEF	RA	KYA	wli	—	**VOL**	yes
922	quintilla	MEF	RA	ooo	wli	—	**VOL**	no
926	paula	WEF	RA	—	—	—	—	2x2
927	strigata	MEF	RA	—	—	—	—	2x2
929	nicoteles	MEF	CO	KYA	WLI	KAL	**VOL**	yes
930	nicobule	MEF	NR	—	—	—	—	2x2
931	mixophyes	WEF	RA	—	—	—	—	2x2
933	nebrodes	MEF	NR	KYA	WLI	—	**VOL**	yes
934	trigonophora	MEF	NR	KYA	WLI	—	**VOL**	yes
936	agouale	ALF	VC	KYA	WLI	kal	**VOL**	yes
937	melicerta	MEF	CO	KYA	WLI	KAL	**VOL**	yes
938	troundi	MEF	CO	KYL	wli	—	**VOL**	yes

CATUNA								
941	crithea	ALF	VC	KYA	WLI	KAL	**VOL**	yes
942	niji	WEF	RA	—	—	—	—	
943	oberthueri	ALF	CO	???	???	—	**VOL**	no
944	angustatum	MEF	CO	KYA	WLI	KAL	**VOL**	yes
EURYPHURA								
946	togoensis	MEF	NR	—	—	—	—	2x2
948	chalcis	ALF	CO	KYA	WLI	KAL	**VOL**	yes
HAMANUMIDA								
951	daedalus	GUI	CO	KYA	WLI	KAL	**VOL**	yes
ATERICA								
953	galene	ALF	CO	KYA	WLI	KAL	**VOL**	yes
CYNANDRA								
954	opis	MEF	NR	KYA	WLI	—	**VOL**	yes
EURIPHENE								
959	incerta	WEF	RA	ooo	ooo	—	**VOL**	no
960	barombina	ALF	VC	KYA	WLI	kal	**VOL**	yes
961	veronica	WEF	CO	—	—	—	—	ww
964	grosesmithi	MEF	RA	—	—	—	—	2x2
968	simplex	WEF	NR	—	—	—	—	ww
974	amicia	MEF	NR	KYA	WLI	—	**VOL**	yes
976	aridatha	MEF	NR	KYA	wli	—	**VOL**	yes
978	coerulea	WEF	CO	—	—	—	—	2x2
985	ernestibaumanni	WEF	RA	ooo	wli	—	**VOL**	no
986	gambiae	ALF	CO	—	—	—	—	2x2
987	ampedusa	ALF	NR	KYA	WLI	KAL	**VOL**	yes
988	leonis	WEF	VR	—	—	—	—	ww
989	atossa	MEF	NR	—	ooo	—	**VOL**	no
990	doriclea	MEF	NR	—	—	—	—	2x2
BEBEARIA								
994	lucayensis	MEF	RA	KYA	wli	—	**VOL**	yes
995	tentyris	MEF	CO	KYA	WLI	—	**VOL**	yes
996	osyris	WEF	NR	—	—	—	—	ww
998	carshena	MEF	NR	ooo	wli	—	**VOL**	no
999	absolon	ALF	CO	KYA	WLI	—	**VOL**	yes
1001	zonara	MEF	CO	ooo	WLI	—	**VOL**	yes
1002	mandinga	ALF	CO	KYA	WLI	—	**VOL**	yes
1003	oxione	MEF	NR	ooo	WLI	—	**VOL**	yes
1004	abesa	MEF	NR	ooo	ooo	—	**VOL**	no
1006	barce	WEF	RA	—	—	—	—	2x2
1008	mardania	ALF	CO	KYA	WLI	—	**VOL**	yes
1011	cocalia	ALF	CO	KYA	WLI	KAL	**VOL**	yes
1012	paludicola	MEF	NR	—	—	—	—	2x2
1014	sophus	ALF	CO	KYA	WLI	kal	**VOL**	no
1017	arcadius	WEF	RA	—	—	—	—	ww
1021	laetitia	WEF	CO	—	—	—	—	2x2
1027	phantasina	ALF	CO	KYA	WLI	—	**VOL**	yes
1029	demetra	MEF	RA	ooo	ooo	—	**VOL**	no
1033	maledicta	WEF	VR	—	—	—	—	2x2
1035	ashantina	WEF	RA	—	—	—	—	en
1037	cutteri	WEF	RA	—	—	—	—	2x2
EUPHAEDRA								
Subgenus Medoniana								
1046	medon	ALF	CO	KYA	WLI	KAL	**VOL**	yes
Subgenus Gausapia								
1047	gausape	WEF	NR	—	—	—	—	ww
1047	mariaechristinae	WEF	NR	—	—	—	—	en
Subgenus Xypetana								
1055	xypete	MEF	CO	KYA	wli	—	**VOL**	yes
1057	hebes	WEF	NR	—	—	—	—	2x2

1059	diffusa	DRF	NR	KYA	wli	KAL	**VOL**	yes
1060	crossei	DRF	RA	—	—	—	—	2x2
1061	crockeri	MEF	NR	—	—	—	—	ww
Subgenus Radia								
1062	eusemoides	WEF	VR	—	—	—	—	ww
Subgenus Euphaedra								
1064	cyparissa	DRF	NR	ooo	ooo	—	**VOL**	no
1065	sarcoptera	MEF	NR	ooo	ooo	—	**VOL**	no
Subgenus Euphaedrana								
1066	themis	DRF	NR	KYA	WLI	KAL	**VOL**	yes
1067	laboureana	WEF	RA	—	—	—	—	ww
1071	minuta	WEF	RA	—	—	—	—	ww
1072	modesta	WEF	NR	—	—	—	—	ww
1075	janetta	ALF	CO	KYA	WLI	KAL	**VOL**	yes
1076	splendens	WEF	RA	—	—	—	—	2x2
1077	aberrans	WEF	VR	—	—	—	—	ww
1078	vetusta	WEF	VR	—	—	—	—	ww
1083	ceres	ALF	CO	KYA	WLI	KAL	**VOL**	yes
1085	phaethusa	ALF	CO	KYA	WLI	KAL	**VOL**	yes ww+
1086	inanum	MEF	RA	ooo	ooo	—	**VOL**	no ww+
1096	ignota	WEF	VR	—	—	—	—	en
1106	francina	WEF	NR	—	—	—	—	ww
1108	eleus	WEF	NR	—	—	—	—	2x2
1112	zampa	WEF	NR	—	—	—	—	ww
1115	edwardsii	ALF	CO	KYA	WLI	—	**VOL**	yes
1116	ruspina	WEF	NR	ooo	WLI	—	**VOL**	yes veq
1117	perseis	WEF	NR	—	—	—	—	ww
1118	harpalyce	ALF	VC	KYA	WLI	KAL	**VOL**	yes
1119	eupalus	WEF	RA	ooo	ooo	—	**VOL**	no ww+
EUPTERA								
1121	crowleyi	ALF	RA	ooo	ooo	—	**VOL**	no
1122	elabontas	ALF	NR	KYA	WLI	—	**VOL**	yes
1123	dorothea	MEF	VR	—	—	—	—	ww
1124	zowa	ALF	NR	KYA	WLI	—	**VOL**	yes
PSEUDATHYMA								
1133	falcata	MEF	RA	ooo	WLI	—	**VOL**	yes
1134	sibyllina	MEF	RA	—	—	—	—	2x2

HELICONIINAE

ACRAEA

Subgenus Actinote

1139	perenna	MEF	NR	ooo	WLI	—	**VOL**	yes
1144	circeis	ALF	CO	KYA	wli	—	**VOL**	yes
1147	translucida	MEF	NR	ooo	WLI	—	**VOL**	yes
1148	peneleos	ALF	NR	KYA	WLI	—	**VOL**	yes
1149	parrhasia	MEF	NR	ooo	WLI	—	**VOL**	yes
1150	orina	MEF	RA	KYA	WLI	—	**VOL**	yes
1152	pharsalus	ALF	CO	KYA	WLI	kal	**VOL**	yes
1153	encedon	UBQ	CO	KYA	wli	kal	**VOL**	yes
1154	encedana	SPE	NR	kya	ooo	ooo	**VOL**	no
1155	alciope	ALF	VC	KYA	WLI	KAL	**VOL**	yes
1156	aurivillii	ALF	NR	ooo	ooo	—	**VOL**	no
1157	jodutta	ALF	CO	KYA	WLI	KAL	**VOL**	yes
1158	lycoa	ALF	CO	KYA	WLI	KAL	**VOL**	yes
1159	serena	UBQ	CO	KYA	WLI	KAL	**VOL**	yes
1160	acerata	ALF	NR	KYA	wli	KAL	**VOL**	yes
1161	pseudepaea	WEF	RA	—	—	—	—	2x2
1165	bonasia	ALF	CO	KYA	WLI	KAL	**VOL**	yes
1167	orestia	MEF	RA	kya	wli	—	**VOL**	no
1168	polis	MEF	NR	KYA	WLI	—	**VOL**	yes

1169	vesperalis	WEF	VR	—	—	—	—	2x2
Subgenus Acraea								
1172	kraka	WEF	RA	—	—	—	—	2x2
1173	rogersi	WEF	NR	ooo	WLI	—	**VOL**	yes
1174	abdera	MEF	RA	ooo	WLI	—	**VOL**	yes
1176	egina	ALF	CO	kya	WLI	KAL	**VOL**	yes
1178	pseudegina	UBQ	CO	KYA	WLI	KAL	**VOL**	yes
1179	caecilia	SUD	CO	KYA	wli	kal	**VOL**	yes
1180	zetes	DRF	NR	KYA	WLI	kal	**VOL**	yes
1181	endoscota	ALF	RA	KYA	WLI	—	**VOL**	yes
1182	leucographa	MEF	NR	—	—	—	—	2x2
1184	quirina	ALF	CO	KYA	WLI	kal	**VOL**	yes
1185	neobule	UBQ	CO	KYA	WLI	KAL	**VOL**	yes
1186	eugenia	DRF	NR	KYA	WLI	—	**VOL**	yes veq
1187	camaena	DRF	RA	—	—	—	—	2x2
1188	vestalis	ALF	NR	KYA	WLI	—	**VOL**	yes
1189	macaria	WEF	RA	—	—	—	—	ww
1190	umbra	MEF	NR	kya	WLI	KAL	**VOL**	yes
1191	alcinoe	MEF	CO	KYA	WLI	—	**VOL**	yes
1192	consanguinea	WEF	RA	—	—	—	—	2x2
1196	epaea	ALF	CO	KYA	WLI	KAL	**VOL**	yes
LACHNOPTERA								
1199	anticlia	MEF	CO	kya	WLI	—	**VOL**	yes
PHALANTA								
1200	phalantha	UBQ	CO	KYA	WLI	KAL	**VOL**	yes
1201	eurytis	MEF	CO	KYA	WLI	—	**VOL**	yes

HESPERIIDAE
COLIADINAE

COELIADES								
1203	chalybe	ALF	CO	KYA	WLI	—	**VOL**	yes
1204	bixana	MEF	RA	—	ooo	—	**VOL**	no
1206	libeon	ALF	NR	kya	wli	—	**VOL**	no
1207	forestan	UBQ	CO	KYA	WLI	KAL	**VOL**	yes
1208	pisistratus	ALF	CO	KYA	WLI	kal	**VOL**	yes
1209	hanno	MEF	NR	KYA	WLI	—	**VOL**	yes
PYRRHIADES								
1210	lucagus	DRF	CO	—	—	—	—	en
PYRRHOCHALCIA								
1211	iphis	ALF	CO	kya	wli	KAL	**VOL**	yes

PYRGINAE

LOXOLEXIS								
1212	holocausta	WEF	VR	—	—	—	—	2x2
1213	dimidia	WEF	VR	—	—	—	—	2x2
1214	hollandi	WEF	RA	—	—	—	—	2x2
KATREUS								
1215	johnstonii	WEF	RA	—	—	—	—	2x2
CELAENORRHINUS								
1216	rutilans	WEF	RA	—	—	—	**VOL**	no
1217	sagamase	WEF	VR	—	—	—	—	en
1219	leona	WEF	RA	—	—	—	—	ww
1223	ankasa	WEF	VR	—	—	—	—	en
1224	galenus	ALF	CO	KYA	WLI	KAL	**VOL**	yes
1225	cf galenus	WEF	RA	—	—	—	—	2x2
1226	meditrina	WEF	RA	—	—	—	—	2x2
1227	ovalis	WEF	RA	—	—	—	—	2x2
1230	proxima	ALF	CO	KYA	WLI	—	**VOL**	yes
1231	plagiatus	MEF	NR	KYA	WLI	—	**VOL**	yes

TAGIADES								
1232	flesus	ALF	CO	KYA	WLI	KAL	**VOL**	yes
EAGRIS								
1233	denuba	ALF	CO	KYA	WLI	kal	**VOL**	yes
1234	decastigma	WEF	RA	—	—	—	—	2x2
1235	tigris	WEF	RA	KYA	WLI	—	**VOL**	yes
1236	subalbida	WEF	RA	—	—	—	—	2x2
1237	hereus	MEF	NR	ooo	wli	—	**VOL**	no
1238	tetrastigma	MEF	NR	kya	WLI	—	**VOL**	yes
CALLEAGRIS								
1239	lacteus	WEF	NR	—	—	—	—	2x2
PROCAMPTA								
1241	rara	MEF	NR	KYA	wli	—	**VOL**	yes
ERETIS								
1242	lugens	GUI	CO	KYA	wli	ooo	**VOL**	yes
1243	plistonicus	ALF	NR	KYA	WLI	kal	**VOL**	yes
1244	melania	DRF	NR	KYA	WLI	KAL	**VOL**	yes
SARANGESA								
1245	laelius	GUI	NR	KYA	—	shh	**VOL**	yes
1246	phidyle	SUD	NR	—	—	—	—	
1247	tertullianus	MEF	NR	kya	WLI	—	**VOL**	yes
1248	majorella	MEF	NR	KYA	WLI	—	**VOL**	yes
1249	tricerata	MEF	NR	KYA	wli	—	**VOL**	yes
1250	thecla	ALF	CO	KYA	WLI	KAL	**VOL**	yes
1251	bouvieri	DRF	CO	KYA	WLI	kal	**VOL**	yes
1252	brigida	MEF	NR	KYA	WLI	—	**VOL**	yes
CAPRONA								
1253	adelica	GUI	RA	KYA	ooo	kal	**VOL**	yes
1254	pillaana	SUD	VR	—	—	—	—	
NETROBALANE								
1255	canopus	GUI	RA	ooo	—	—	**VOL**	no
ABANTIS								
1256	bismarcki	GUI	RA	KYA	ooo	ooo	**VOL**	yes
1257	leucogaster	WEF	RA	—	ooo	—	**VOL**	no
1258	nigeriana	GUI	NR	KYA	ooo	kal	**VOL**	yes
1259	pseudonigeriana	SUD	RA	KYA	ooo	kal	**VOL**	yes
1261	lucretia	MEF	RA	KYA	WLI	—	**VOL**	yes
1262	elegantula	DRF	RA	KYA	ooo	—	**VOL**	yes
1263	ja	WEF	VR	—	—	—	—	2x2
1263	tanobia	WEF	VR	—	—	—	—	en
SPIALIA								
1265	spio	SUD	CO	KYA	WLI	kal	**VOL**	yes
1267	diomus	SUD	NR	KYA	wli	kal	**VOL**	yes
1268	dromus	GUI	NR	KYA	wli	kal	**VOL**	yes
1269	ploetzi	ALF	NR	KYA	WLI	KAL	**VOL**	yes
GOMALIA								
1270	elma	DRF	NR	KYA	WLI	kal	**VOL**	yes
HESPERIIDAE								
ASTICTOPTERUS								
1276	anomoeus	WEF	NR	—	—	—	**VOL**	no ww+
1277	abjecta	GUI	CO	KYA	WLI	KAL	**VOL**	yes
PROSOPALPUS								
1278	debilis	MEF	RA	ooo	ooo	KAL	**VOL**	yes
1279	styla	DRF	NR	ooo	WLI	—	**VOL**	yes
1280	saga	WEF	RA	—	—	—	—	2x2
KEDESTES								
1282	protensa	GUI	VR	—	—	—	—	sav

GORGYRA									
1284	aretina	ALF	NR	KYA	wli	—	**VOL**	yes	
1285	heterochrus	MEF	NR	ooo	wli	—	**VOL**	no	
1286	mocquerysii	ALF	NR	KYA	wli	KAL	**VOL**	yes	
1287	aburae	WEF	RA	—	wli	—	**VOL**	no	
1289	bina	MEF	NR	—	wli	—	**VOL**	no	
1290	sola	MEF	RA	—	—	—	—	2x2	
1291	afikpo	MEF	VR	—	wli	—	**VOL**	no	
1292	diversata	MEF	NR	ooo	wli	KAL	**VOL**	yes	
1293	bule	MEF	RA	ooo	wli	—	**VOL**	no	
1294	minima	DRF	NR	KYA	wli	kal	**VOL**	yes	
1295	sara	ALF	NR	KYA	WLI	—	**VOL**	yes	
1296	subfacatus	ALF	NR	KYA	wli	KAL	**VOL**	yes	
1297	pali	MEF	RA	ooo	wli	—	**VOL**		
GYROGRA									
1299	subnotata	ALF	NR	KYA	WLI	KAL	**VOL**	yes	
CERATRICHIA									
1301	phocion	MEF	CO	—	—	—	—	2x2	
1302	semilutea	MEF	RA	—	wli	—	**VOL**	no	
1303	clara	WEF	NR	—	—	—	—	2x2	
1305	crowleyi	WEF	RA	—	—	—	—	ww	
1306	nothus	WEF	NR	KYA	WLI	—	**VOL**	yes	
1307	argyrosticta	WEF	NR	—	wli	—	**VOL**	no	
1308	maesseni	WEF	RA	—	—	—	—	en	
TENIORHINUS									
1309	watsoni	MEF	RA	—	—	—	—	2x2	
1310	ignita	MEF	NR	—	—	—	—	2x2	
PARDALEODES									
1311	incerta	GUI	CO	KYA	wli	KAL	**VOL**	yes	
1312	edipus	ALF	VC	KYA	WLI	kal	**VOL**	yes	
1313	sator	MEF	NR	KYA	WLI	ooo	**VOL**	yes	
1314	tibullus	MEF	NR	KYA	wli	—	**VOL**	yes	
1315	xanthopeplus	WEF	VR	—	—	—	—	2x2	
XANTHODISCA									
1317	rega	ALF	NR	KYA	wli	—	**VOL**	yes	
1318	astrape	MEF	NR	KYA	WLI	—	**VOL**	yes	
PAROSMODES									
1320	morantii	SUD	RA	KYA	—	—	**VOL**	yes	
1321	lentiginosa	ALF	RA	KYA	WLI	kal	**VOL**	yes	
RHABDOMANTIS									
1322	galatia	MEF	NR	KYA	wli	—	**VOL**	yes	
1323	sosia	MEF	NR	KYA	WLI	—	**VOL**	yes	
OSMODES									
1324	laronia	ALF	CO	KYA	WLI	—	**VOL**	yes	
1325	omar	DRF	NR	KYA	WLI	KAL	**VOL**	yes	
1326	lux	WEF	NR	KYA	wli	—	**VOL**	yes	
1328	thora	ALF	CO	KYA	WLI	kal	**VOL**	yes	
1329	distincta	WEF	RA	—	—	—	—	2x2	
1330	adon	WEF	RA	KYA	WLI	—	**VOL**	yes	
1332	adosus	WEF	RA	—	—	—	—	2x2	
1333	lindseyi	MEF	NR	KYA	WLI	—	**VOL**	yes	
1334	costatus	WEF	RA	—	—	—	—	2x2	
1335	banghaasi	WEF	RA	—	—	—	—	2x2	
OSPHANTES									
1336	ogowena	WEF	VR	—	—	—	—	2x2	
PARACLEROS									
1337	placidus	MEF	NR	kya	WLI	kal	**VOL**	yes	ww+
1338	biguttulus	ALF	CO	KYA	WLI	kal	**VOL**	yes	
1339	substrigata	MEF	RA	KYA	wli	—	**VOL**	yes	
1340	maesseni	MEF	NR	kya	wli	—	**VOL**	no	

ACLEROS								
1341	ploetzi	ALF	CO	KYA	WLI	kal	**VOL**	yes
1342	mackenii	ALF	CO	KYA	WLI	KAL	**VOL**	yes
1343	nigrapex	MEF	NR	ooo	wli	—	**VOL**	no
1344	bala	MEF	RA	—	wli	—	**VOL**	no ww+
SEMALEA								
1345	pulvina	ALF	CO	KYA	WLI	kal	**VOL**	yes
1346	sextilis	WEF	NR	—	wli	—	**VOL**	no
1347	atrio	WEF	RA	—	—	—	—	2x2
1349	arela	DRF	NR	KYA	wli	kal	**VOL**	yes
HYPOLEUCIS								
1350	ophiusa	ALF	CO	KYA	WLI	kal	**VOL**	yes
1351	tripunctata	MEF	NR	KYA	WLI	—	**VOL**	yes
1352	sophia	WEF	RA	—	—	—	—	2x2
MEZA								
1353	indusiata	MEF	NR	KYA	wli	ooo	**VOL**	yes
1354	meza	ALF	VC	KYA	WLI	KAL	**VOL**	yes
1355	mabea	MEF	VR	—	—	—	—	2x2
1356	leucophaea	MEF	NR	kya	wli	—	**VOL**	no
1357	elba	MEF	RA	kya	wli	—	**VOL**	no
1358	mabillei	WEF	RA	—	—	—	—	2x2
1359	cybeutes	ALF	NR	KYA	wli	—	**VOL**	yes
PARONYMUS								
1361	xanthias	WEF	RA	—	—	—	—	2x2
1363	ligora	MEF	NR	ooo	WLI	ooo	**VOL**	yes
1364	nevea	WEF	VR	—	—	—	—	2x2
ANDRONYMUS								
1365	neander	ALF	NR	KYA	wli	kal	**VOL**	yes
1367	caesar	ALF	CO	KYA	wli	KAL	**VOL**	yes
1368	hero	MEF	NR	KYA	WLI	—	**VOL**	yes
1369	helles	MEF	NR	kya	wli	—	**VOL**	no
1370	evander	MEF	NR	KYA	WLI	—	**VOL**	yes
ZOPHOPETES								
1373	ganda	DRF	RA	—	ooo	—	**VOL**	no
1374	cerymica	ALF	NR	KYA	wli	kal	**VOL**	yes
1376	quaternata	DRF	RA	—	—	—	ooo	
GAMIA								
1377	buchholzi	WEF	NR	KYA	WLI	—	**VOL**	yes
1378	shelleyi	WEF	NR	kya	WLI	—	**VOL**	yes
ARTITROPA								
1379	comus	MEF	NR	KYA	wli	—	**VOL**	yes
MOPALA								
1380	orma	MEF	RA	KYA	wli	—	**VOL**	yes
GRETNA								
1381	waga	ALF	CO	KYA	WLI	kal	**VOL**	yes
1383	cylinda	ALF	NR	KYA	wli	—	**VOL**	yes
1386	balenge	MEF	RA	ooo	ooo	—	**VOL**	no
PTEROTEINON								
1387	laufella	ALF	CO	KYA	WLI	KAL	**VOL**	yes
1388	iricolor	WEF	RA	—	—	—	—	2x2
1389	laterculus	WEF	RA	—	—	—	—	2x2
1390	capronnieri	WEF	VR	—	—	—	—	2x2
1391	caenira	ALF	CO	KYA	WLI	—	**VOL**	yes
1392	ceucaenira	WEF	RA	ooo	WLI	—	**VOL**	yes
1393	concaenira	WEF	RA	—	—	—	—	2x2
1394	pruna	WEF	RA	ooo	ooo	—	**VOL**	no
LEONA								
1395	binoevatus	WEF	RA	—	—	—	—	2x2
1397	lota	WEF	VR	—	—	—	—	2x2
1399	leonora	WEF	RA	KYA	wli	—	**VOL**	yes

1401	stoehri	WEF	RA	KYA	ooo	—	**VOL**	yes
1402	meloui	WEF	RA	—	—	—	—	2x2
1403	halma	WEF	???	—	—	—	—	2x2
1405	luehderi	WEF	RA	—	—	—	—	2x2
CAENIDES								
1406	soritia	WEF	RA	KYA	WLI	—	**VOL**	yes
1407	kangvensis	MEF	NR	KYA	WLI	—	**VOL**	yes
1408	xychus	MEF	RA	—	—	—	**VOL**	no
1409	benga	WEF	RA	—	—	—	—	2x2
1410	otilia	WEF	RA	—	—	—	—	2x2
1411	dacenilla	MEF	RA	—	—	—	—	2x2
1412	dacela	ALF	CO	KYA	WLI	kal	**VOL**	yes
1413	hidarioides	WEF	RA	—	—	—	—	2x2
1414	dacena	MEF	CO	KYA	WLI	—	**VOL**	yes
MONZA								
1415	alberti	ALF	VC	kya	WLI	—	**VOL**	yes
1416	cretacea	ALF	CO	KYA	WLI	KAL	**VOL**	yes
MELPHINA								
1417	noctula	WEF	RA	KYA	wli	—	**VOL**	yes
1419	unistriga	WEF	NR	KYA	WLI	—	**VOL**	yes
1420	tarace	MEF	RA	ooo	ooo	—	**VOL**	no
1421	flavina	MEF	RA	KYA	wli	—	**VOL**	yes
1422	statirides	MEF	NR	kya	wli	—	**VOL**	no
1423	statira	WEF	RA	—	—	—	—	2x2
1425	malthina	WEF	RA	—	—	—	—	2x2
1426	maximiliani	MEF	RA	—	—	—	—	ww
FRESNA								
1427	netopha	DRF	NR	KYA	WLI	kal	**VOL**	yes
1428	maesseni	MEF	RA	kya	wli	—	**VOL**	no
1429	nyassae	DRF	RA	kya	wli	kal	**VOL**	no
1430	cojo	ALF	NR	KYA	wli	—	**VOL**	yes
1431	carlo	MEF	VR	—	—	—	—	2x2
PLATYLESCHES								
1432	galesa	ALF	NR	kya	wli	kal	**VOL**	no
1434	moritili	GUI	NR	KYA	wli	kal	**VOL**	yes
1435	rossi	DRF	VR	ooo	wli	—	**VOL**	no ww+
1437	picanini	ALF	NR	kya	wil	kal	**VOL**	no
1438	lamba	MEF	RA	—	—	—	—	2x2
1439	affinissima	GUI	NR	—	—	ooo	vol	
1440	chamaeleon	GUI	NR	ooo	ooo	ooo	**VOL**	no
1441	batangae	GUI	RA	—	—	—	vol	
PELOPIDAS								
1444	mathias	UBQ	CO	KYA	wli	kal	**VOL**	yes
1445	thrax	UBQ	CO	KYA	wli	kal	**VOL**	yes
BORBO								
1446	fallax	GUI	NR	KYA	wli	kal	**VOL**	yes
1447	fanta	GUI	NR	kya	WLI	kal	**VOL**	yes
1448	perobscura	GUI	NR	KYA	WLI	KAL	**VOL**	yes
1449	micans	SPE	RA	ooo	WLI	kal	**VOL**	yes
1450	borbonica	GUI	NR	KYA	wli	ooo	**VOL**	yes
1451	gemella	GUI	NR	KYA	WLI	kal	**VOL**	yes
1452	binga	WEF	RA	—	—	—	—	2x2
1453	fatuellus	UBQ	CO	KYA	WLI	KAL	**VOL**	yes
1454	holtzi	GUI	NR	kya	wli	kal	**VOL**	no
PARNARA								
1456	monasi	GUI	RA	kya	wli	kal	**VOL**	no
GEGENES								
1457	‘pumilio’	SUD	NR	—	—	—	—	sav
1459	niso	GUI	NR	kya	ooo	kal	**VOL**	no
1460	hottentota	GUI	NR	KYA	wli	ooo	**VOL**	yes

APPENDIX 2

BUTTERFLIES RECORDED BY KARSCH (1893) FROM THE "ADELI MOUNTAINS", GERMAN TOGOLAND IN 1893

Torben B. Larsen, February 2006

A NOTE ON THE KARSCH MATERIAL

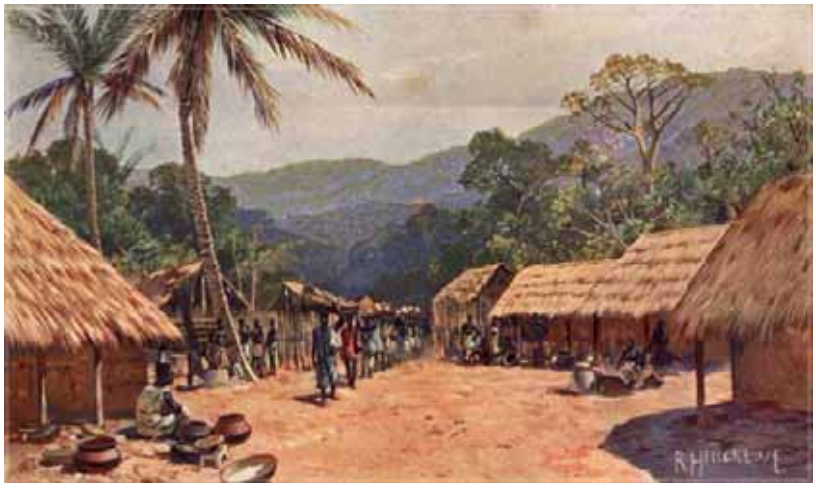
"On June 2 1888, Regimental Medical Officer Dr. L. Wolf raised the German flag on the Adado Mountain in the Adeli Region of inner Togo, where no white man had ever set foot, and began establishing a settlement that was later to become known as Bismarckburg." (Büttner, 1893 – translated from the German by the author). This was part of the implementation of a German Colonial Empire where the Conference of Berlin (1884–85) had "allocated" Togo to Germany. German "Togoland" included most of what is now the Volta Region of Ghana. Bismarckburg, of which little remains, was close to the southeastern border of the present Kyabobo National Park.

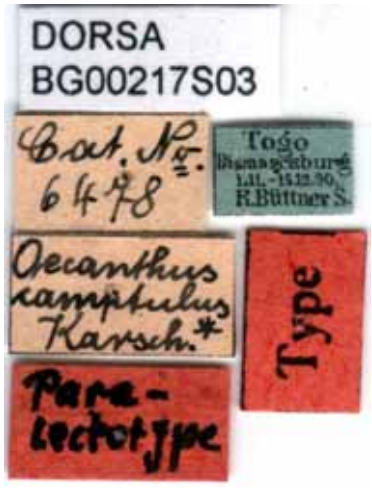
The German colonial authorities gave high priority to anthropological, ethnological, and natural history research. The six or seven early German officials spent much of their time collecting all manner of fauna and flora. Especially R. Büttner, E. Kling, and the mechanic Stöhr collected the many insects described in the 1893 volume of the *Berliner entomologische Zeitschrift* by F. Karsch. In this foreword to this volume, Büttner can hardly suppress his pride when he says that "Herr Dr. Karsch informs me that the small Adeli Region, despite the few years available for its exploration, is now probably has its fauna and flora better documented than anywhere else in tropical Africa" (Büttner, 1893). Several of the European collectors died within a few years of first reaching Bismarckburg, some in Togo, others after being repatriated to Germany. Büttner survived to study butterflies also in German East Africa (Tanzania) where he collected many new species.

The butterflies certainly indicate a degree of thoroughness not yet seen in Africa. No less than 220 species are recorded in the account of the material collected by Kling (1888 and 1889) and Büttner (1890 and 1991). Some of the species are not valid but due to seasonal variation or sexual dimorphism, and a few cannot be identified with certainty. But 202 valid species are included in the paper by Karsch (1893) – though in many cases under names that are not today valid. Of these 17 are valid new species currently recognized with Karsch as the author, as well as one subspecies (listed in the table below).

This was the largest number of butterflies recorded from any single tropical African locality at the time – and accurately recorded at that. It was only in the 1970s that Hopkins (1970) recorded about 300 species from Olokemeji Forest, Riley & Cornes (1971) about the same in Gambari Forest, and Larsen, Cornes & Riley (1980) 285 in a secondary forest area at Agege near Lagos (all in western Nigeria).

Karsch's excellent list provides an interesting opportunity for comparison with the collecting that took place between 1996 and 2006. The total number of species currently known from the Kyabobo area is just over 400, or twice that recorded by Karsch. His list is shown in the table below, with the nomenclature updated; also shown are which species were re-recorded during recent collecting and which species are known from the Wli Falls further south:





Left: A view towards Kyabobo National Park from the main street in Bismarckburg around 1905. In his foreword to Karsch (1893) Büttner waxes lyrical about its beauty.
Right: The labels under one of Büttner's types, not a butterfly but a tree-cricket (Orthoptera).

THE BUTTERFLIES RECORDED BY KARSCH

	FAMILY Species	Karsch 1893	Kyabobo 1994/2005	Wli Falls
PAPILIONIDAE				
4	Papilio dardanus	Karsch	KYA	WLI
9	Papilio chrapkowskoides	Karsch	NO	WLI
11	Papilio nireus	Karsch	KYA	WLI
12	Papilio menestheus	Karsch	KYA	WLI
13	Papilio demodocus	Karsch	KYA	WLI
17	Papilio nobicea	Karsch	KYA	WLI
18	Papilio cynorta	Karsch	KYA	WLI
20	Graphium angolanus	Karsch	KYA	WLI
25	Graphium adamastor	Karsch	KYA	wli
29	Graphium leonidas	Karsch	KYA	WLI
31	Graphium policenes	Karsch	KYA	WLI
PIERIDAE				
36	Catopsilia florella	Karsch	KYA	WLI
38	Eurema senegalensis	Karsch	KYA	WLI
39	Eurema hecabe	Karsch	KYA	WLI
40	Eurema floricola	Karsch	NO	wli
42	Eurema desjardinsii	Karsch	KYA	WLI
43	Eurema brigitta	Karsch	KYA	wli
45	Nepheronia argia	Karsch	KYA	WLI
73	Belenois calypso	Karsch	KYA	WLI
84	Appias sylvia	Karsch	KYA	WLI
88	Leptosia alcesta	Karsch	KYA	WLI
95	Mylothris chloris	Karsch	KYA	WLI
106	Mylothris poppea	Karsch	KYA	WLI
109	Mylothris rhodope	Karsch	KYA	WLI
110	Mylothris jaopura TYPE	Karsch	KYA	WLI

LYCAENIDAE

127	Megalopalpus zymna	Karsch	KYA	wli
129	Megalo. metaleucus TYPE	Karsch	KYA	wli
133	Lachnocnema emperanus	Karsch	NO	wli
141	Ptelina carnuta	Karsch	KYA	WLI
155	Pentila phidia	Karsch	KYA	wli
225	Liptena alluaudi	Karsch	NO	wli
227	Liptena pearmani	Karsch	NO	wli
254	Tetrarhanis symplocus	Karsch	KYA	WLI
264	Larinopoda aspidos	Karsch	KYA	WLI
296	Epitola urania	Karsch	NO	wli
354	Myrina silenus	Karsch	KYA	wli
369	Spindasis mozambica	Karsch	KYA	wli
370	Spindasis avriko TYPE	Karsch	NO	wli
375	Axiocerses harpax	Karsch	KYA	wli
415	Iolaus laon	Karsch	KYA	WLI
434	Iolaus aethria TYPE	Karsch	KYA	wli
437	Iolaus maesa	Karsch	NO	wli
445	Hypolycaena liara	Karsch	KYA	wli
446	Hypolycaena ?lebona	Karsch	KYA	WLI
452	Hypolycaena antifaunus	Karsch	KYA	WLI
453	Hypolycaena hatita	Karsch	KYA	WLI
473	Pilodeudorix aucta TYPE	Karsch	NO	wli
492	Hypomyrina nomion	Karsch	KYA	wli
494	Deudorix antalus	Karsch	KYA	wli
510	Anthene sylvanus	Karsch	NO	WLI
523	Anthene larydas	Karsch	KYA	WLI
555	Triclema phoenicis TYPE	Karsch	KYA	wli
565	Pseudonacaduba sichela	Karsch	KYA	WLI
568	Uranothauma falkensteini	Karsch	KYA	WLI
575	Cacyreus lingeus	Karsch	KYA	WLI
578	Leptotes pirithous	Karsch	KYA	WLI
584	Tuxentius carana TYPE ssp	Karsch	KYA	WLI
593	Eicochrysops hippocrates	Karsch	KYA	WLI
601	Euchrysops malathana	Karsch	KYA	WLI
604	Euchrysops osiris	Karsch	KYA	wli
617	Thermoniphas micylus	Karsch	KYA	WLI
622	Oboronia punctatus	Karsch	KYA	WLI
626	Oboronia ornata	Karsch	KYA	WLI
632	Azanus isis	Karsch	KYA	WLI
635	Zizeeria knysna	Karsch	KYA	WLI
637	Zizula hylax	Karsch	KYA	WLI

NYMPHALIDAE

646	Libythea labdaca	Karsch	KYA	WLI
647	Danaus chrysippus	Karsch	KYA	WLI
648	Tirumala petiverana	Karsch	KYA	WLI
651	Amauris tartarea	Karsch	KYA	WLI
652	Amauris hecate	Karsch	KYA	wli
653	Amauris damocles	Karsch	KYA	WLI
656	Gnophodes betsimena	Karsch	KYA	WLI
657	Gnophodes chelys	Karsch	KYA	WLI
661	Elymniopsis bammakoo	Karsch	KYA	WLI
672	Bicyclus italus	Karsch	KYA	WLI
678	Bicyclus procora TYPE	Karsch	KYA	wli
680	Bicyclus milyas	Karsch	NO	ooo
682	Bicyclus taenias	Karsch	KYA	WLI
690	Bicyclus vulgaris	Karsch	KYA	WLI
691	Bicyclus dorothea	Karsch	KYA	WLI
697	Bicyclus campa TYPE	Karsch	KYA	ooo

701	Bicyclus safitza	Karsch	KYA	WLI
702	Bicyclus funebris	Karsch	KYA	WLI
705	Bicyclus istaris	Karsch	KYA	ooo
707	Bicyclus madetes	Karsch	KYA	WLI
709	Bicyclus martius	Karsch	KYA	WLI
713	Henotesia elisi	Karsch	KYA	wli
726	Charaxes fulvescens	Karsch	KYA	wli
729	Charaxes protoclea	Karsch	KYA	WLI
732	Charaxes lucretius	Karsch	KYA	WLI
733	Charaxes lactetinctus TYPE	Karsch	KYA	wli
734	Charaxes epijasius	Karsch	KYA	wli
736	Charaxes castor	Karsch	KYA	wli
737	Charaxes brutus	Karsch	KYA	wli
741	Charaxes tiridates	Karsch	KYA	WLI
746	Charaxes ameliae	Karsch	NO	ooo
756	Charaxes eupale	Karsch	KYA	WLI
770	Charaxes viola	Karsch	NO	ooo
773	Charaxes paphianus	Karsch	KYA	wli
779	Charaxes doubledayi	Karsch	KYA	WLI
791	Vanessa cardui	Karsch	NO	wli
792	Precis octavia	Karsch	KYA	wli
797	Precis pelarga	Karsch	KYA	WLI
801	Hypolimnas misippus	Karsch	KYA	WLI
802	Hypolimnas anthedon	Karsch	KYA	WLI
809	Protogoniomorpha cytora	Karsch	KYA	WLI
812	Protogoniomorpha anacardii	Karsch	KYA	WLI
814	Junonia oenone	Karsch	KYA	WLI
815	Junonia hierta	Karsch	NO	wli
822	Junonia chorimene	Karsch	KYA	WLI
823	Junonia terea	Karsch	KYA	WLI
824	Catacroptera cloanthe	Karsch	KYA	wli
825	Cyrestis camillus	Karsch	KYA	WLI
826	Byblia anvatara	Karsch	KYA	WLI
828	Mesoxantha ethosea	Karsch	KYA	WLI
829	Ariadne enotrea	Karsch	KYA	WLI
833	Neptidopsis ophione	Karsch	KYA	WLI
834	Eurytela dryope	Karsch	KYA	WLI
836	Eurytela hiarbas	Karsch	KYA	WLI
839	Sevenia umbrina TYPE	Karsch	KYA	wli
863	Cymothoe caenis	Karsch	KYA	WLI
879	Pseudoneptis bugandensis	Karsch	KYA	WLI
887	Pseudacraea lucretia	Karsch	KYA	WLI
900	Pseudacraea semire	Karsch	KYA	wli
901	Neptis nemetes	Karsch	KYA	WLI
915	Neptis najo TYPE	Karsch	NO	wli
937	Neptis melicerta	Karsch	KYA	WLI
941	Catuna crithea	Karsch	KYA	WLI
944	Catuna angustatum	Karsch	KYA	WLI
951	Hamanumida daedalus	Karsch	KYA	WLI
953	Aterica galene	Karsch	KYA	WLI
954	Cynandra opis	Karsch	KYA	WLI
960	Euriphene barombina	Karsch	KYA	WLI
995	Bebearia tentyris	Karsch	KYA	WLI
1002	Bebearia mandinga	Karsch	KYA	WLI
1011	Bebearia cocalia	Karsch	KYA	WLI
1014	Bebearia sophus	Karsch	KYA	WLI
1027	Bebearia phantasina	Karsch	NO	WLI
1046	Euphaedra medon	Karsch	KYA	WLI
1075	Euphaedra janetta	Karsch	KYA	WLI
1083	Euphaedra ceres	Karsch	KYA	WLI

1115	Euphaedra edwardsii	Karsch	KYA	WLI
1152	Acraea pharsalus	Karsch	KYA	WLI
1153	Acraea encedon	Karsch	KYA	wli
1155	Acraea alciope	Karsch	KYA	WLI
1159	Acraea serena	Karsch	KYA	WLI
1160	Acraea acerata	Karsch	KYA	wli
1165	Acraea bonasia	Karsch	KYA	WLI
1176	Acraea egina	Karsch	NO	WLI
1178	Acraea pseudegina	Karsch	KYA	WLI
1179	Acraea caecilia	Karsch	NO	wli
1180	Acraea zetes	Karsch	KYA	wli
1184	Acraea quirina	Karsch	KYA	WLI
1185	Acraea neobule	Karsch	KYA	WLI
1186	Acraea eugenia TYPE	Karsch	KYA	WLI
1191	Acraea alcinoe	Karsch	KYA	WLI
1196	Acraea epaea	Karsch	KYA	WLI
1200	Phalanta phalantha	Karsch	KYA	WLI
HESPERIIDAE				
1203	Coeliades chalybe	Karsch	KYA	WLI
1207	Coeliades forestan	Karsch	KYA	WLI
1208	Coeliades pisistratus	Karsch	KYA	WLI
1209	Coeliades hanno	Karsch	KYA	WLI
1224	Celaenorrhinus galenus	Karsch	KYA	WLI
1230	Celaenorrhinus proxima	Karsch	KYA	WLI
1232	Tagiades flesus	Karsch	KYA	WLI
1233	Eagris denuba	Karsch	KYA	WLI
1244	Eretis melania	Karsch	KYA	WLI
1245	Sarangesa laelius	Karsch	NO	ooo
1248	Sarangesa majorella	Karsch	KYA	WLI
1250	Sarangesa thecla	Karsch	KYA	WLI
1253	Caprona adelica TYPE	Karsch	KYA	ooo
1256	Abantis bismarcki TYPE	Karsch	KYA	ooo
1269	Spialia ploetzi	Karsch	KYA	WLI
1277	Astictopterus abjecta	Karsch	KYA	WLI
1284	Gorgyra aretina	Karsch	KYA	WLI
1306	Ceratrichia nothus TYPE ssp	Karsch	KYA	WLI
1312	Pardaleodes edipus	Karsch	KYA	WLI
1313	Pardaleodes sator	Karsch	KYA	WLI
1314	Pardaleodes tibullus	Karsch	KYA	wli
1318	Xanthodisca astrape	Karsch	KYA	WLI
1328	Osmodes thora	Karsch	KYA	WLI
1338	Paracleros biguttulus	Karsch	KYA	WLI
1342	Acleros mackenii	Karsch	KYA	WLI
1345	Semalea pulvina	Karsch	KYA	WLI
1350	Hypoleucis ophiusa	Karsch	KYA	WLI
1351	Hypoleucis tripunctata	Karsch	KYA	WLI
1354	Meza meza	Karsch	KYA	WLI
1367	Andronymus caesar	Karsch	KYA	wli
1374	Zophopetes cerymica	Karsch	NO	wli
1379	Artitropa comus	Karsch	NO	wli
1381	Gretna waga	Karsch	KYA	WLI
1387	Pteroteinon laufella	Karsch	KYA	WLI
1391	Pteroteinon caenira	Karsch	KYA	WLI
1399	Leona leonora	Karsch	KYA	wli
1401	Leona stoehri TYPE	Karsch	NO	wli
1416	Monza cretacea	Karsch	KYA	WLI
1430	Fresna cojo TYPE	Karsch	KYA	wli
1434	Platylesches moritili	Karsch	KYA	wli
1445	Pelopidas thrax	Karsch	KYA	wli

1450	Borbo borbonica	Karsch	NO	wli
1453	Borbo fatuellus	Karsch	KYA	WLI

During the collecting over the past ten years, 177 of Karsch's butterflies were recaptured. Only 25 of Karsch's records were missed. Some of these are savannah butterflies that were probably caught at the fringes of the Dahomey Gap. A few are rare and/or unpredictable species and some just happen not to be around during our visits. The recent collections thus include about 375 species for a positively recorded total of 400. The fact that recent collecting missed 25 of Karsch's records also accords quite well with the estimated total of 500 species in Kyabobo. When recent collecting missed just over 10% of the 200 Karsch species already known, the 375 probably do not account for more than 80% of those present; it is after all the last species than are the difficult ones to find.

Finally it should be emphasized that the comparative figures give no suggestions that extinction has taken place during the 110 years in between to the sets of observations.

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