

The Butterfly Fauna of a Secondary Bush Locality in Nigeria

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Introduction

When the senior author first visited Nigeria in 1967 he did not have a driving license and therefore needed to find a good collecting ground within easy striking distance of Lagos. In early June, 1967 the first visit was paid to the locality covered in this paper and it was then collected regularly for the next three months. All three authors visited the locality regularly in the months of May to September 1969. By then son many interesting species had turned up and so many species had been recorded that after the departure of the senior author in September, the two other authors visited the locality on roughly a monthly basis for the following three years. By conservative estimate more than 50 visits have been made with a total input of well over 300 manhours. Records were made for each month in which a given species was seen, but no attempt was made to record relative density, etc.

Nonetheless, our investigations of the locality must be one of the most comprehensive ever directed at secondary bush in West Africa. The total number of species recorded, 376, comprises about half of all the species known to occur in southwestern Nigeria and is about 80% of the total number recorded in Liberia. For these reasons alone we think it worthwhile to publish our results, but we also hope it will give a picture of the diversity and interest of the fauna which can persist even in severely disturbed environments in Africa. Considering that the remaining West African rainforests are fast disappearing (those of southwestern Nigeria, Gambari, Ilaro and Olokemeji are close to being destroyed despite their designation as forest reserves) it is encouraging to see that disturbed habitats manage to support such a rich fauna.

From time to time many of our friends or relatives have participated in collecting trips to the locality. Some have brought picnics and iced beer to tired researchers; many contributed to the collection; all were

good company. *Abantis leucogaster* Mab. was first observed by Mr. Poul F. Larsen, whose description of this great rarity was greeted with disbelief till a specimen was finally caught the following week. We wish to thank all participants.

We also owe thanks to the local population which was friendly, helpful and never objected to our trespassing on their lands. On one occasion we narrowly avoided being drawn into serious discussion concerning the purchase of wives for unmarried members of the team. An old man brought a note of continuity into the project by describing an English collector who had been active in the area some 50 years earlier. This could only have been C.O. Farquharson, who was based at a nearby agricultural station and to whom we owe so much for his studies on the early stages of the Lycaenidae (Farquharson *et al.* 1922). We thought that our obvious persistence succeeded in transforming the local attitudes from puzzled amusement to grudging respect, but this may have been wishful thinking.

Description of the locality

Specimens from the locality in our collections are labelled 4 m. NW of Agege; Agege is a town immediately north of Lagos international airport. The locality itself is reached by taking the Agege Motor Road to a point seven kilometres north of the town where there is a prominent church on the left side of the main road. A dirt road on the left leads into the bush about 150 m past the church. One and a half kilometres along this dirt road is a crossroads. The area exploited in the survey lies a few kilometres to either side of the crossroads along the dirt road parallel to the Agege Motor Road.

Southern Nigeria is in the tropical rainforest zone and the original vegetation at Agege would have been tropical rainforest of the same nature as that in the Ilaro Forest Reserve some 50 km. further north. The original tree cover has long since disappeared, except for occasional traces, and has been replaced by plantations and agricultural land in fallow or in use. However, the intensity of agricultural exploitation is less than in most similar areas in the immediate vicinity of a large town. In some respects such an environment is ecologically more diverse than climax forest and this is undoubtedly a major factor in the richness of the fauna.

It is not possible to give a scientific description of the patchwork pattern of different habitats, but the following were prominent types:

Roads and open places: In many places the dirt road was bordered by a yellow composite which was a great favourite with many of the skippers, the Polyommataini, the Acraeidae and many Pierids and Nymphalids.

Many species caught on the flowers were never seen anywhere else. Species such as *Anthene* and *Eritis* used the road as a basking ground. It was also a major communication channel for the *Charaxes* which would often stop at suitable natural baits (four species were caught on a single fermenting oil-berry in half an hour).

Open fields: Open fields were usually planted with a mixture of cassava, maize and vegetables and were generally devoid of butterflies. Owing to similarity with savanna conditions, savanna invaders could sometimes be found here, especially apparently permanent populations of *Hamanumida daedalus* F.

Forest: In one place a small block of the original forest was partly conserved, as far as we could ascertain because it had magical ("juju") associations. Interesting and rare forest species still survived in this area, for example *Mimacraea darwini* Btl. It was also the foraging ground for driver ants, as we would often discover to our disadvantage since they prey on passing entomologists with gusto. It was always somewhat embarrassing to have to rush out to the road, to strip down and then proceed to pick off hundreds of biting ants to the great amusement of passers-by.

Kola plantation: The plantations mainly consisted of mature trees which were poorly tended. The crowns were full of parasitic *Loranthus* and many of our *Iolais*-group records came from this habitat. Kola trees are very shady and the undergrowth was not dense, consisting often of large leaved gingers, on whose leaves the less sun-loving skippers liked to sit.

Cocoa plantation: In this habitat the shade trees were either old forest trees or kola, but sufficient sunshine penetrated to allow a richer undergrowth which would be indifferently cleared from time to time by the farmers. The butterfly fauna was quite rich and diverse, but somewhat unpredictable.

Mixed secondary shrub: These blocks consisted of fallow agricultural land in various stages of regeneration. Once the shrub reaches an age of about 10 years it becomes good and diverse hunting ground as the forest species start re-establishing themselves. More sun penetrates than in primary forest and in consequence a number of skippers and Satyrids are found which would otherwise not have been present. Some of the best "ant-trees" (see later) were in this type of habitat.

Swamp forest: A rivulet at the northern edge of the area was bordered by a mixture of swamp forest and palm shrubbery. The edge of this seemed to act as a communication channel from real forests further

north (*Papilio hesperus* suddenly appeared here), but the swamp forest supported its own fauna of shade loving Nymphalidae and Satyridae, as well as some interesting colonies of *Epitola* and other Liptenini (infuriatingly out of reach). The palm shrubbery housed some of the large, scarce skippers (*Gamia*, *Gretna*, *Zophopetes*, etc.).

Ant trees: Special mention must be made of trees carrying the beehive shaped nests of Crematogasterine ants, which were dotted throughout the different habitats. Many of the most interesting Lycaenidae (Lipteninae) are associated with such trees where they feed on lichens on the tree trunk. Some species were virtually limited to a single tree. In one place we could be certain to pick up one or two *Micropentila dorothea* B.B.; *Pseuderesia eleaza* Hew. had one vantage point which was occupied time and time again by different specimens. Near ant nests it was often possible to find five or six individuals of three or four species sitting on a single dry twig.

Analysis of the fauna

As shown in table 1, we caught a total of 376 species during the six years of research. This constitutes about half the total known from southwestern Nigeria. It is as many as were recorded from Gambari Forest Reserve by Riley & Cornes (1970, 1971, 1972) during a similar survey from 1960 to 1969, though the Gambari records are not quite as comprehensive. It is about 80% of the species known to occur in Liberia (Fox, Lindsey, Clench & Miller 1965). Although we knew the area to be rich, none of us would have guessed at the outset that the total would rise to such a level.

Table 1

Breakdown by families of the butterflies known from Agege, Gambari Forest Reserve and Liberia

FAMILY	AGEGE		GAMBARI		LIBERIA	
	No.	%	No.	%	No.	%
Papilionidae	13	3.4	14	3.7	18	3.8
Pieridae	20	5.3	25	6.6	22	4.6
Danaidae	6	1.6	6	1.6	5	1.1
Satyridae	22	5.9	19	5.0	27	5.7
Charaxinae	16	4.3	29	7.7	17	3.6
Nymphalinae	77	20.6	95	24.9	110	23.2
Acraeinae	19	5.1	22	5.8	28	5.9
Libytheidae	1	—	1	—	1	—
Lycaenidae	115	30.7	95	24.9	138	29.1
Hesperiidae	87	23.1	75	19.8	109	22.9
Total	376	100	381	100	475	100

A glance at the table will show that compared to the Gambari list, the Nymphalinae and especially the Charaxinae at Agege are under-represented. This is because many of these species genuinely appear to be restricted to primary forest. The Hesperiiidae, on the other hand, are over-represented in the Agege sample. We think this is due to the fact that the Hesperiiidae prefer disturbed habitats to primary forest, though this is not universally true. The over-representation of Lycaenidae in the Agege sample is probably largely due to the fact that species were more easily collected in the disturbed habitat, while in a primary forest many of the scarcer species never descend from the canopy. The fact that we caught more species of Satyridae at Agege than in Gambari is probably not due to chance; they are all grass feeders and grass is not plentiful in climax forest. In Liberia Fox collected in all types of habitat and it is interesting to see that the percentage breakdown of the Liberian list matches that of Agege almost perfectly.

As shown in Table 2, the degree of overlap between the species collected in Gambari and at Agege is almost two thirds. The total number of species in these two selected localities is almost as high as the total recorded for Liberia.

Table 2
Degree of overlap in species caught in
Gambari Forest Reserve and at Agege

Locality	Number Caught	Percent
Agege only	87	18.6
Gambari only	92	19.7
Both localities	289	61.7
Total	468	100

The majority of the species caught at Agege are typical representatives of the rainforest fauna with a small element of ubiquitous species. All of these may be found also in the rainforest itself. The more open conditions do allow for some penetration of savanna elements which are unlikely to occur in primary forest. The savanna species are listed in table 3.

Table 3

Savanna species penetrating into the Agege locality

<i>Graphium pylades</i>	<i>Pseudonacaduba sichela</i>
<i>Graphium leonidas</i>	<i>Lepidochrysops quassi</i> *
<i>Colotis evippe</i> *	<i>Euchrysops malathana</i>
<i>Eurema brigitta</i>	<i>Eicochrysops hippocrates</i>
<i>Melanitis leda</i> *	<i>Zizeeria knysna</i> *
<i>Danaus chrysippus</i>	<i>Spialia ploetzi</i> *
<i>Hamanumida daedalus</i>	<i>Spialia spio</i>
<i>Neptis morosa</i>	<i>Spialia diomus</i>
<i>Precis oenone</i> *	<i>Gomalia elma</i>
<i>Precis chorimene</i>	<i>Fresna netopha</i> *
<i>Precis octavia</i>	<i>Fresna cojo</i>
<i>Phalanta phalanta</i>	<i>Fresna nyassae</i>
<i>Lipaphnaeus leonina</i>	<i>Borbo perobscura</i>
<i>Syntarucus babaulti</i>	<i>Borbo fanta</i>
<i>Syntarucus pirithous</i>	

* Species of savanna origin which have managed to adapt almost totally to forest conditions.

The savanna element comprises 30 species, 8 percent of the total. This is a relatively low number, compared for example to the fauna of the coastal strip and Ikoyi Island, and it may indicate that savanna species find penetration of the forest zone very difficult indeed.

Seasonal distribution

Southwestern Nigeria has a fairly pronounced dry season from November/December to February/March, though rainfall is never totally absent in any month. We were therefore interested in studying the effect of seasonality on the fauna. Data are given in table 4 below.

Table 4

Number of species caught by family and month

FAMILY	MONTH OF CAPTURE											
	1	2	3	4	5	6	7	8	9	10	11	12
Papilionidae	7	8	7	10	7	5	4	7	7	3	8	6
Pieridae	12	9	6	6	12	10	8	14	8	10	8	12
Danaidae	3	4	2	2	1	1	1	3	2	4	4	3
Satyridae	10	9	5	9	11	10	13	16	6	8	7	10
Charaxinae	3	4	4	4	6	4	9	4	3	5	3	3
Nymphalinae	35	33	31	32	39	30	40	43	28	37	40	39
Acraeinae	9	7	4	1	6	1	3	7	6	8	11	14

Lycaenidae	44	56	47	51	47	49	38	45	33	43	65	51
Hesperiidae	18	20	20	17	35	32	47	50	33	33	31	27
TOTAL (376)	141	150	126	132	164	142	163	189	126	151	177	168
Percent of total	38%	40%	34%	35%	44%	38%	44%	50%	34%	40%	47%	44%

Although we made records of all species on a monthly basis, some extra problems occur in the monthly breakdown. We were able to identify most species on the wing, but in certain genera it is necessary to catch a specimen to be certain of its identity. This is true of the *Bicyclus*, the *Neptis*, certain skippers and above all blues from the *Epitola* and *Iolaus*-groups. Some of these are unfortunately also amongst the most elusive. The monthly totals are therefore clear underestimates, but the level of underestimation is probably the same from month to month. The table indicates that as far as the number of species is concerned, there are no significant peaks or troughs. The number of individuals on the wing is higher during the wet season. The savanna species, the Acraeidae and species such as *Graphium antheus* Cr. and *Lepidochrysops nigeriae* Stempffer are clearly most prominent during the dry season. The larger forest Nymphalidae (*Charaxes*, *Euphaedra*, *Euriphene* and *Bebearia*) prefer the wet season. Certainly seasonal patterns are less than might have been a priori expected.

The lack of defined seasonality does not mean that generational patterns could not be observed. For certain groups they were so pronounced as to provide the antidote to the boredom which would otherwise be involved in revisiting the same restricted locality so often. Every so often, after an absence of a fortnight we would find a new dominant group on the wing; a sudden preponderance of Pierids; mass eclosion of a few skippers we had rarely seen before; half a dozen *Acraea* which we had not seen for months. Quite often a species which we had never seen before would be present in some quantity. There is no doubt that part of the reason for this lies in the fact that there is significant displacement of species, even though we never say any active migrations. Accordingly, it might be expected that continued surveillance of the locality will continue to yield more species. It is quite likely, on the other hand, that some of the rarer ones we found may not turn up again.

Rarity

It is of some interest to list the species which we turned up on only one or two occasions during the research period, since such information will assist in assessing the degree to which species are resident and the degree of random displacement. A list of these rarities is given in table 5.

Table 5

Species which were noted only once or twice during the 1967-73 period

<i>Papilio cynorta</i>	<i>Diopetes deritas</i>
<i>Papilio hesperus</i>	<i>Virachola diomedes</i>
<i>Hallelesis asochis</i>	<i>Iolaphilus iulus</i>
<i>Euxanthe eurinome</i>	<i>Iolaphilus panaperata</i>
<i>Charaxes etisipe</i>	<i>Aphnaeus orcas</i>
<i>Euptera elabontas</i>	<i>Liaphnaeus leonina</i>
<i>Euphaedra eleus</i>	<i>Anthene crawshayi</i>
<i>Neptis nysiades</i>	<i>Neurypexina lyzianus</i>
<i>Neptis puella</i>	<i>Triclema lucretilis</i>
<i>Neptis strigata</i>	<i>Triclema obscura</i>
<i>Precis octavia</i>	<i>Gorgyra heterochrus</i>
<i>Acraea jodutta</i>	<i>Gorgyra diversata</i>
<i>Liptena septistrigata</i>	<i>Pardaleodes tibullus</i>
<i>Liptena similis</i>	<i>Semalea pulvina</i>
<i>Liptena rochei</i>	<i>Hypoleucis tripunctata</i>
<i>Eresina saundersi</i>	<i>Gamia buchholzi</i>
<i>Aslauga lamborni</i>	<i>Gamia shelleyi</i>
<i>Epitola crowleyi</i>	<i>Gretna waga</i>
<i>Epitola gordonii</i>	<i>Platylesches picanini</i>
<i>Epitola gerina</i>	<i>Borbo fanta</i>
<i>Epitola elissa</i>	<i>Borbo perobscura</i>
<i>Epitola sublustris</i>	<i>Borbo micans</i>
<i>Pilodeudorix cameronia</i>	

The list of real rarities comprises 45 species, or about 12 percent of the total. A scrutiny of table 5 will show that the majority are genuinely uncommon species which one would be extremely happy to capture anywhere (e.g. *E. elabontas*, *N. strigata*, *N. puella*, *E. saundersi*, most of the *Epitola*, *P. cameronia*, *D. deritas*, *A. orcas*, *L. leonina* and to a lesser extent some of the skippers). Some are obvious strays from primary forest (e.g. *P. hesperus*, *H. asochis*, *E. eleus* and *A. jodutta*). A few species are savanna invaders (e.g. *B. fanta*, *B. perobscura* and possibly *L. leonina*, though this is generally very rare). It would thus seem that the overwhelming majority of the 376 species in question are at least temporary residents of the locality.

Conversely it is worthwhile to consider briefly the most common species found in the locality. In fact, there were relatively few which were almost certainly present at any visit at any time of the year. These are listed in Table 6.

Table 6**Species present at almost all visits paid to the locality**

<i>Papilio dardanus</i>	<i>Precis sophia</i>
<i>Papilio demodocus</i>	<i>Precis terea</i>
<i>Appias sylvia</i>	<i>Precis oenone</i>
<i>Belenois calypso</i>	<i>Hypolimnas salmacis</i>
<i>Leptosia hybrida</i>	<i>Mimeresia libentina</i>
<i>Colotis evippe</i>	<i>Citrinophila marginalis</i>
<i>Eurema hecabe</i>	<i>Oxylides faunas</i>
<i>Bicyclus dorothea</i>	<i>Thermoniphas micylus</i>
<i>Ypthima doleta</i>	<i>Tagiades fesus</i>
<i>Bebearia theognis</i>	<i>Pardaleodes edipus</i>
<i>Euphaedra medon</i>	<i>Pteroteinon caenire</i>
<i>Pseudoneptis ianthe</i>	
<i>Neptis melicerta</i>	
<i>Ariadne enotrea</i>	

Only 25 species, or about 6.6 percent of the total are included in the group of most common species. Probably another 15 species also belong to the group. An evaluation of the relative frequency of the species may be supplemented by a listing of all species according to the number of months in which records were made. The data are summarized in table 7.

Table 7**Number of months in which each species was recorded during the period of investigation**

Months	Number	Percent
11-12 months	47	12.5
9-10 months	32	8.5
7- 8 months	39	10.4
5- 6 months	43	11.4
3- 4 months	77	20.5
1- 2 months	138	36.7
Total	376	100

Conclusion

In retrospect we regret that we did not maintain a detailed diary of observations, but at the time we were involved in the cataloguing of the Nigerian Rhopalocera as a whole. After Larsen's departure, Riley and Cornes started work on the Diptera and Heterocera (Cornes 1969,

1971; Cornes, Riley & St. Leger no date; Riley 1971 a & b). Nevertheless, the primary objectives of the investigation were achieved.

In February 1978 Larsen and Riley had the opportunity of revisiting the locality for half an hour and it is a pleasure to be able to report that it has survived beautifully the environmental degradation which is going on apace in southwestern Nigeria. We observed more than 50 species of butterfly, including one species not on the list, *Asterope occidentalis* Mab.

The richness of the fauna in this locality may have implications for conservation strategies. Most forests in Nigeria, Benin, Togo and Ghana seem destined to disappear in the foreseeable future, despite their classification as forest reserves. It therefore becomes important, and probably more manageable, to conserve areas with a mixture of plantations and shifting agriculture with long fallow periods. Attention must also be paid to the juju woods which are threatened as the modernisation process breaks down traditional taboos. If an interlocking network of such areas remains, then a significant proportion of the insect fauna will survive the destruction of primary forest. Whether this will happen is far from certain; large stretches of land between Accra and Kumasi in Ghana have been converted to cassava monoculture in the course of just six years. Mobilisation of the combination of political will and administrative skill to implement a conservation strategy in West African countries is going to be a very difficult task. For this reason alone, faunal surveys such as the present paper are urgently needed before these resources are irrevocably destroyed.

Systematic list and monthly records

FAMILY AND SPECIES	MONTH											
	1	2	3	4	5	6	7	8	9	10	11	12
PAPILIONIDAE												
<i>Papilio dardanus</i> Brown	X	X	X	X	X	X	X	X	X	X	X	X
<i>Papilio cynorta</i> F.				X								
<i>Papilio zenobius</i> Gt.	X	X	X	X	X	X	X	X	X		X	X
<i>Papilio hesperus</i> West			X									
<i>Papilio sosia</i> R. & J.		X						X				
<i>Papilio nireus</i> L.	X	X			X				X		X	X
<i>Papilio bromius</i> Dbl.	X			X	X	X					X	
<i>Papilio demodocus</i> Esp.	X	X	X	X	X	X	X	X	X		X	X
<i>Papilio menestheus</i> Drury	X	X	X	X	X		X	X	X	X	X	X
<i>Graphium pylades</i> F.				X								
<i>Graphium leonidas</i> F.		X		X				X	X		X	
<i>Graphium antheus</i> Cr.		X	X	X		X						
<i>Graphium polices</i> Cr.	X	X	X	X	X			X	X	X	X	X
PIERIDAE												
<i>Appias sylvia</i> F.	X	X	X	X	X	X	X	X	X	X	X	X
<i>Appias sabina</i> Fld.						X						
<i>Appias epaphia</i> Cr.									X	X		
<i>Belenois calypso</i> Dr.	X	X	X	X	X	X	X	X	X	X	X	X
<i>Belenois theora</i> Dbl.	X											X
<i>Mylothris chloris</i> F.	X	X	X					X		X		X
<i>Mylothris rhodope</i> F.*	X				X			X			X	X
<i>Leptosia marginea</i> Mab.		X				X	X	X	X			
<i>Leptosia medusa</i> Cr.					X			X				
<i>Leptosia alceste</i> Cr.	X	X			X	X	X	X	X	X	X	X
<i>Leptosia hybrida</i> Bern.	X	X	X	X	X	X	X	X	X	X	X	X
<i>Colotis evippe</i> L.	X	X	X	X	X	X	X	X		X	X	X
<i>Nepheronia thalassina</i> Bdv.					X	X		X	X			
<i>Nepheronia argia</i> F.								X				
<i>Nepheronia pharis</i> Bdv.								X				
<i>Catopsilia florella</i> F.	X			X	X	X	X	X		X	X	X
<i>Eurema brenda</i> Dbl.	X							X				X
<i>Eurema brigitta</i> Cr.	X	X			X							X
<i>Eurema hapale</i> Mab.									X	X		
<i>Eurema hecabe</i> L.	X	X	X	X	X	X	X	X	X	X	X	X
DANAIDAE												
<i>Danaus chrysippus</i> L.	X	X	X	X						X	X	X
<i>Danaus limniace</i> Cr.											X	
<i>Amauris tartarea</i> Mab.		X	X									
<i>Amauris hecate</i> Btl.								X		X		
<i>Amauris niavius</i> L.	X	X			X			X	X	X	X	X
<i>Amauris hyalites</i> Btl.	X	X		X		X	X	X	X	X	X	X

FAMILY AND SPECIES	MONTH											
	1	2	3	4	5	6	7	8	9	10	11	12
SATYRIDAE												
<i>Elymnias phegea</i> F.	X				X	X				X		
<i>Elymnias bamakoo</i> West.	X	X	X	X	X	X	X	X			X	X
<i>Melanitis leda</i> Dr.		X										X
<i>Melanitis parmeno</i> Dbl.	X	X						X				X
<i>Melanitis chelys</i> F.								X				
<i>Bicyclus italus</i> Hew.							X	X				
<i>Bicyclus xeneas</i> Hew.					X		X	X		X		
<i>Bicyclus taenias</i> Hew.							X	X				
<i>Bicyclus ignobilis</i> Btl.	X	X			X		X	X		X	X	X
<i>Bicyclus evadne</i> Stgr.		X				X						
<i>Bicyclus madetes</i> Hew.	X		X		X	X	X	X	X	X	X	X
<i>Bicyclus mandanes</i> Hew.								X				
<i>Bicyclus auricruda</i> Btl.							X					
<i>Bicyclus sandace</i> Hew.						X	X	X				
<i>Bicyclus technatis</i> Hew.						X	X	X	X			
<i>Bicyclus uniformis</i> B.B.	X	X										X
<i>Bicyclus dorothea</i> Cr.	X	X		X	X	X	X	X	X	X	X	X
<i>Bicyclus vulgaris</i> Btl.	X	X	X		X	X	X	X	X	X	X	X
<i>Bicyclus funebris</i> Guen.					X			X				
<i>Bicyclus sanaos</i> Hew.	X	X	X	X	X	X	X	X	X	X	X	X
<i>Hallelesis asochis</i> Hew.					X							
<i>Ypthima doleta</i> Kby.	X	X	X	X	X	X	X	X	X	X	X	X
NYMPHALIDAE												
Charaxinae												
<i>Euxanthe eurinome</i> Cr.							X					
<i>Stonehamia varanes</i> Cr.			X		X		X	X				
<i>Stonehamia fulvescens</i> Aur.	X					X	X			X	X	
<i>Charaxes protoclea</i> Feist.				X		X				X		
<i>Charaxes boueti</i> Feist.	X							X				X
<i>Charaxes cynthia</i> Btl.							X			X	X	
<i>Charaxes lucretius</i> Cr.		X	X	X	X		X					
<i>Charaxes castor</i> Cr.							X					
<i>Charaxes brutus</i> Cr.			X									
<i>Charaxes numenes</i> Hew.									X			
<i>Charaxes tiridates</i> Cr.		X		X	X	X		X	X	X	X	
<i>Charaxes eupale</i> Drury	X				X		X	X	X		X	X
<i>Charaxes etisipe</i> Gt.			X									
<i>Charaxes anticlea</i> Drury					X		X			X		
<i>Charaxes etheocles</i> Cr.						X						
<i>Charaxes laodice</i> Drury		X		X	X		X					

FAMILY AND SPECIES	MONTH											
	1	2	3	4	5	6	7	8	9	10	11	12
Nymphalinae												
<i>Cymothoe egesta</i> Cr.				X								
<i>Cymothoe caenis</i> Drury						X	X					
<i>Cymothoe coccinata</i> Hew.				X	X		X					
<i>Euptera elabontas</i> Hew.							X					
<i>Euryphura chalcis</i> Feld.			X		X							
<i>Euryphura plautilla</i> Hew.					X	X	X	X				
<i>Euriphene tadema</i> Hew.		X					X		X	X	X	X
<i>Euriphene barombina</i> Aur.								X				
<i>Euriphene doriclea</i> Drury							X					
<i>Euriphene ampedusa</i> Hew.											X	
<i>Euriphene atossa</i> Hew.								X	X			
<i>Bebearia tentyrus</i> Hew.	X				X		X	X				X
<i>Bebearia absolon</i> F.					X		X	X			X	
<i>Bebearia zonora</i> Btl.					X	X		X	X			
<i>Bebearia mandinga</i> Fld.							X	X				
<i>Bebearia oxione</i> Hew.						X	X	X				
<i>Bebearia mardania</i> F.					X	X				X		
<i>Bebearia theognis</i> Hew.	X	X	X	X	X	X	X	X	X	X	X	X
<i>Bebearia plistonax</i> Hew.			X		X	X	X	X		X		
<i>Euphaedra wardi</i> Druce	X	X		X	X		X	X		X	X	
<i>Euphaedra harpalyce</i> Cr.	X	X	X	X	X	X	X	X		X	X	X
<i>Euphaedra medon</i> L.	X	X	X	X	X	X	X	X	X	X	X	X
<i>Euphaedra xypete</i> Hew.					X					X	X	
<i>Euphaedra themis</i> Hub.	X	X				X	X	X	X	X	X	X
<i>Euphaedra janetta</i> Btl.	X	X	X	X	X	X	X	X	X	X	X	X
<i>Euphaedra ceres</i> F.	X	X			X		X		X	X	X	X
<i>Euphaedra edwardsi</i> Hoev.	X									X		
<i>Euphaedra ruspina</i> Hew.					X			X				
<i>Euphaedra eleus</i> Drury							X					
<i>Hamanumida daedalus</i> F.		X	X	X		X					X	X
<i>Aterica galene</i> F.	X	X			X	X	X	X	X	X	X	X
<i>Cynandra opis</i> Drury	X				X		X	X	X	X	X	X
<i>Catuna oberthueri</i> Karsch	X		X	X				X				
<i>Catuna crithea</i> Drury		X						X	X	X	X	X
<i>Catuna angustata</i> Fld.	X							X		X	X	X
<i>Pseudoneptis ianthe</i> Cr.	X	X	X	X	X	X	X	X	X	X	X	X
<i>Pseudacraea semire</i> Cr.	X	X	X	X	X	X	X	X	X	X	X	X
<i>Pseudacraea warburgi</i> Aur.		X		X		X	X	X		X	X	
<i>Pseudacraea eurytus</i> L.					X							
<i>Pseudacraea striata</i> Btl.			X					X				
<i>Pseudacraea lucretia</i> Cr.	X				X	X	X			X		X

FAMILY AND SPECIES	MONTE											
	1	2	3	4	5	6	7	8	9	10	11	12
<i>Neptis nemetes</i> Hew.	X	X	X			X		X		X		X
<i>Neptis morosa</i> Over.*		X										X
<i>Neptis nysiades</i> Hew.			X					X				
<i>Neptis puella</i> Aur.											X	
<i>Neptis ricomedes</i> Hew.					X							
<i>Neptis strigata</i> Aur.			X									
<i>Neptis paula</i> Stgr.	X	X	X								X	X
<i>Neptis nicoteles</i> Hew.					X						X	
<i>Neptis nicobule</i> Holl.	X				X							
<i>Neptis nebrodes</i> Hew.		X	X	X				X	X		X	X
<i>Neptis intermedia</i> Sch.				X			X	X				
<i>Neptis melicerta</i> Drury*	X	X	X	X	X	X	X	X	X	X	X	X
<i>Cyrestis camillus</i> F.		X	X	X	X		X	X			X	
<i>Byblia acheloia</i> Wall.	X			X					X			X
<i>Mesoxanthe ethosea</i> Drury	X				X							
<i>Ariadne enotrea</i> Cr.	X	X	X	X	X	X	X	X	X	X	X	X
<i>Eurytela hiarbas</i> Drury	X	X	X	X	X	X		X	X	X	X	X
<i>Eurytela dryope</i> Cr.						X						
<i>Kallima rumia</i> Dbl.	X	X		X	X	X	X	X	X	X	X	X
<i>Kallima cymodoce</i> Cr.			X	X			X	X	X	X	X	
<i>Salamis cacta</i> F.	X											
<i>Hypolimnias salmactis</i> Drury		X	X	X	X	X	X	X	X	X	X	
<i>Hypolimnias misippus</i> L.	X	X	X						X	X	X	X
<i>Hypolimnias dinarcha</i> Hew.				X	X							
<i>Hypolimnias dubius</i> de B.	X	X		X	X	X	X	X	X	X	X	X
<i>Precis chorimene</i> Guerin			X									X
<i>Precis stygia</i> Aur.	X	X	X	X	X	X	X	X	X	X	X	X
<i>Precis terea</i> Drury	X	X	X	X	X	X	X	X	X	X	X	X
<i>Precis pelarga</i> F.	X	X	X	X						X	X	X
<i>Precis ocavia</i> Cr.												X
<i>Precis sophia</i> F.	X	X	X	X	X	X	X	X	X	X	X	X
<i>Precis oenone</i> L.	X	X	X	X	X	X	X	X	X	X	X	X
<i>Antanartia delius</i> Drury				X			X	X	X	X	X	X
<i>Phalanta eurytis</i> Drury	X	X	X	X	X		X		X	X	X	X
<i>Phalanta phalanta</i> Drury						X	X					
ACRAEINAE												
<i>Bematistes vestalis</i> Fld.									X		X	
<i>Bematistes alcinoe</i> Fld.											X	
<i>Bematistes umbra</i> Drury										X		X
<i>Bematistes consanguinea</i> Aur.											X	X
<i>Bematistes epaea</i> Cr.	X	X	X		X			X	X	X	X	X

FAMILY AND SPECIES	MONTH											
	1	2	3	4	5	6	7	8	9	10	11	12
<i>Acraea quirina</i> F.	X	X	X		X						X	X
<i>Acraea admatha</i> Hew.	X	X			X	X	X		X			X
<i>Acraea zetes</i> L.	X	X		X	X	X			X	X	X	
<i>Acraea egina</i> Cr.	X		X					X				X
<i>Acraea lycia</i> F.	X				X			X				X
<i>Acraea bonasia</i> F.		X						X	X	X	X	X
<i>Acraea oberthueri</i> Btl.	X	X										X
<i>Acraea peneleos</i> W.							X	X	X	X		
<i>Acraea parrhasia</i> F.							X					X
<i>Acraea eponina</i> Cr.			X					X	X	X	X	X
<i>Acraea orestia</i> Hew.										X		X
<i>Acraea alciope</i> Hew.	X									X	X	
<i>Acraea jodutta</i> F.											X	
<i>Acraea lycoa</i> Gt.	X	X			X						X	X
LIBYTHEIDAE												
<i>Libythea labdaca</i> W.		X		X	X			X		X	X	X
LYCAENIDAE												
<i>Telipna acraea</i> Dbl. & Hew.	X	X				X	X	X				
<i>Telipna rothi</i> G.-S.	X						X	X	X		X	X
<i>Ptelina carnuta</i> Hew.	X	X		X	X	X	X			X	X	X
<i>Pentila petreia</i> Hew.				X			X	X			X	
<i>Pentila nigeriana</i> St. & Ben.					X				X			
<i>Pentila abraxas</i> Dbl. & Hew.					X		X	X		X	X	
<i>Mimacraea darwini</i> Btl.	X				X		X		X	X	X	X
<i>Mimeresia libentina</i> He.	X	X	X	X	X	X	X	X	X	X	X	X
<i>Pseuderesia eleaza</i> Hew.	X		X	X	X	X	X	X			X	
<i>Eresiomera isca</i> Hew.	X	X		X	X	X		X	X	X	X	X
<i>Citrinophila erastus</i> Hew.		X	X	X	X	X				X	X	X
<i>Citrinophila marginalis</i> Ky.	X	X	X	X	X	X	X	X	X	X	X	X
<i>Larinopoda aspidos</i> H.H. Dr.	X	X	X		X	X	X	X	X	X	X	X
<i>Falcuna gitte</i> Bennet	X											X
<i>Liptena submacula</i> Lathy	X	X	X	X	X	X	X	X		X	X	X
<i>Liptena allaudi</i> Mab.*						X		X				
<i>Liptena august</i> Suff.*			X	X						X		
<i>Liptena septistrigata</i> B.B.	X											
<i>Liptena flavicans</i> S.&K.	X	X	X	X	X	X	X	X	X	X	X	X
<i>Liptena similis</i> Ky.							X					
<i>Liptena rochei</i> Stempf.												
<i>Liptena otlauga</i> S.&K.		X	X	X							X	X
<i>Tetrarhanis simplex</i> Aur.	X	X	X		X	X	X	X	X	X	X	X
<i>Tetrarhanis stempfferi</i> Ber.	X	X		X		X	X			X	X	X

FAMILY AND SPECIES	MONTH											
	1	2	3	4	5	6	7	8	9	10	11	12
<i>Micropentila dorothea</i> B.B.	X	X		X		X	X	X	X	X	X	X
<i>Eresina saundersi</i> Stempf.					X							
<i>Eresina pseudofusca</i> Stempf.			X	X								
<i>Aslauga lamborni</i> B.B.										X		
<i>Aslauga vininga</i> Hew.	X	X			X			X		X	X	X
<i>Euliphyra leucyanea</i> Hew.			X		X							
<i>Neaveia lamborni</i> H.H. Druce								X				
<i>Epitolina dispar</i> Ky.	X	X	X	X	X	X	X	X		X	X	X
<i>Epitolina catori</i> B.B.	X	X	X	X	X	X			X	X	X	X
<i>Epitola posthumus</i> F.		X	X	X		X	X	X	X	X	X	X
<i>Epitola crowleyi</i> Sharpe								X				
<i>Epitola katherinae</i> Poul.		X								X	X	X
<i>Epitola gordonii</i> H.H. Druce											X	
<i>Epitola gerina</i> Hew.									X			
<i>Epitola elissa</i> S.									X			
<i>Epitola ikoya</i> Roche		X	X	X	X			X	X	X	X	
<i>Epitola congoana</i> Aur.	X	X	X	X	X	X	X	X	X	X	X	X
<i>Epitola carcina</i> Hew.											X	X
<i>Epitola sublustris</i> Btl.						X						
<i>Phytala hyettoides</i> Aur.			X								X	X
<i>Phytala henleyi</i> Ky.					X						X	X
<i>Aethiopana honorius</i> F.	X		X	X	X			X	X	X		
<i>Hewitsonia boisduvali</i> Hew.							X		X		X	X
<i>Hewitsonia similis</i> Aur	X		X	X		X				X		
<i>Megalopalpus metaleucus</i> K.					X							
<i>Megalopalpus zymna</i> West.					X			X				X
<i>Lachnocnema brimo</i> Karsch	X		X	X	X		X	X		X	X	
<i>Hypokopelates viridis</i> Stf.	X	X	X			X				X		
<i>Pilodeudorix cameroni</i> Pl.								X				
<i>Diopetes deritas</i> Hew.											X	
<i>Deudorix odana</i> H.H. Druce						X		X			X	
<i>Deudorix lorisona</i> Hew.			X			X	X					
<i>Deudorix diomedes</i> Jack.		X										
<i>Oxylides faunas</i> Drury	X	X	X	X		X	X	X	X	X	X	X
<i>Hypolycaena hatita</i> Hew.		X				X	X				X	
<i>Hypolycaena nigra</i> Btl.	X			X								
<i>Hypolycaena antifaunus</i> West.	X	X	X		X	X		X			X	
<i>Hypolycaena lebona</i> Hew.	X	X	X			X		X	X	X	X	X
<i>Hypolycaena dubia</i> Aur.		X	X	X								
<i>Hypolycaena philippus</i> F.		X	X	X	X	X						
<i>Dapidodigma hymen</i> F.	X	X	X	X	X	X			X	X	X	X
<i>Taneutheria timon</i> F.	X	X	X	X	X	X		X		X	X	X
<i>Philolaus parasilanus</i> Rebel		X								X	X	X
<i>Iolaphilus alcibiades</i> Ky.				X				X				

FAMILY AND SPECIES	MONTH											
	1	2	3	4	5	6	7	8	9	10	11	12
<i>Iolaphilus julus</i> Hew.		X										
<i>Iolaphilus paneperata</i> H.H. Dr.											X	
<i>Epamera iasis</i> Hew.	X					X			X			
<i>Epamera maesa</i> Hew.			X			X						
<i>Epamera laon</i> Hew.	X	X				X						
<i>Epamera bellina</i> Plotz		X			X				X	X	X	
<i>Epamera sapphirinus</i> Aur.		X		X		X				X		
<i>Epamera aethria</i> Karsch		X					X			X	X	
<i>Iolaus eurus</i> Cr.		X	X	X		X	X					
<i>Aphnaeus orcas</i> Drury			X									
<i>Spindasis menelas</i> H.H. Druce					X	X						
<i>Lipaphnaeus leonina</i> Sh.		X										
<i>Axiocerces harpax</i> F.		X	X			X						
<i>Spalgis lemolea</i> H.H. Druce					X							
<i>Anthene rubricincta</i> Holl			X									
<i>Anthene liodes</i> Hew.				X		X	X					
<i>Anthene lunulata</i> Tr.			X	X	X	X						
<i>Anthene sylvanus</i> Drury	X	X	X	X	X	X		X	X	X	X	X
<i>Anthene larydas</i> Cr.	X	X	X	X	X	X				X	X	X
<i>Anthene crawshayi</i> Btl.			X									
<i>Anthene lachares</i> Hew.	X	X										X
<i>Anthene locuples</i> GS.						X	X	X		X		
<i>Anthene flavomaculatus</i> S.&K.			X	X	X	X						
<i>Neurypexina lyzianus</i> Hew.											X	
<i>Triclema lamias</i> Hew.								X			X	
<i>Triclema lucretilis</i> Hew.												X
<i>Triclema lacides</i> Hew.	X	X						X				
<i>Triclema obscura</i> H.H. Druce												X
<i>Phlyaria cyara</i> Hew.				X	X	X	X	X	X		X	
<i>Uranothauma falkensteini</i> Btl.		X										
<i>Cacyreus lingeus</i> Cr.								X		X	X	X
<i>Cacyreus audeoudi</i> Stempf.				X	X	X	X	X	X	X	X	X
<i>Castalius carana</i> Hew.				X	X		X	X	X	X	X	
<i>Syntarucus babaulti</i> Stempf.	X	X	X	X								
<i>Syntarucus pirithous</i> L.	X	X	X	X								
<i>Azanus isis</i> Drury			X	X						X		
<i>Azanus mirza</i> Plotz	X		X	X							X	X
<i>Pseudonacaduba sichela</i> Wlk.	X			X			X				X	
<i>Lepidochrysops quassi</i> Karsch							X	X	X		X	
<i>Lepidochrysops nigeriae</i> St.	X	X	X	X	X						X	X
<i>Euchrysops malathana</i> Bdv.	X	X						X	X			
<i>Eicochrysops hippocrates</i> F.	X	X	X	X	X	X		X	X	X	X	X

[illegible]

FAMILY AND SPECIES	MONTH											
	1	2	3	4	5	6	7	8	9	10	11	12
<i>Pardaleodes sator</i> West				X			X	X	X	X		
<i>Pardaleodes tibullus</i> F.		X										
<i>Xanthodisca vibius</i> Hew.										X	X	X
<i>Xanthodisca astrape</i> Holl	X	X			X	X		X		X		
<i>Rhabdomantis galatia</i> Hew.			X					X			X	
<i>Rhabdomantis sosia</i> Mab.			X	X	X	X	X	X	X	X		X
<i>Osmodes lux</i> Holl.							X	X				
<i>Osmodes thora</i> Plotz			X		X	X	X	X	X	X	X	
<i>Osmodes costatus</i> Aur.		X						X				
<i>Osphantes ogawena</i> Mab.					X	X						X
<i>Acleros placidus</i> Plotz		X			X	X	X	X	X	X	X	X
<i>Acleros mackeni</i> Trim.					X	X	X	X				
<i>Acleros ploetzi</i> Mab.	X	X				X	X	X	X			X
<i>Acleros nigrapex</i> Stgr.									X	X		X
<i>Semalea pulvina</i> Plotz											X	
<i>Hypoleucis tripunctata</i> Mab.			X									
<i>Hypoleucis ophiusa</i> Hew.	X	X	X	X	X	X	X	X				
<i>Meza meza</i> Hew.	X		X			X	X	X	X	X	X	X
<i>Meza elba</i> Ev.					X	X		X				
<i>Meza cybeutes</i> Holl.							X	X	X	X	X	
<i>Andronymus neander</i> Plotz							X					
<i>Andronymus caesar</i> F.							X	X			X	
<i>Andronymus hero</i> Ev.							X			X		
<i>Andronymus helles</i> Ev.							X					
<i>Andronymus evander</i> Mab.					X		X	X	X			X
<i>Zophopetes ganda</i> Ev								X				
<i>Zophopetes cerymica</i> Hew.						X	X		X			
<i>Gamia buchholzi</i> Plotz					X							
<i>Gamia shelleyi</i> Sharpe												
<i>Gamia shelleyi</i> Sharpe							X					
<i>Gretna waga</i> Plotz							X					
<i>Gretna cylinda</i> Hew.			X				X				X	X
<i>Pteroteinon laufella</i> Hew.	X			X	X	X	X	X	X	X	X	X
<i>Pteroteinon caenira</i> Hew.	X	X	X	X	X	X	X	X	X	X	X	X
<i>Pteroteinon pruna</i> Ev.					X	X		X				
<i>Caenides dacela</i> Hew	X	X	X	X	X	X	X	X	X	X	X	X
<i>Caenides kangvensis</i> Holl.					X	X		X		X		
<i>Caeides dacena</i> Hew.								X			X	
<i>Monza cretacea</i> Snel.									X			X
<i>Monza alberti</i> Holl.			X		X		X	X	X	X		
<i>Melphina unistriga</i> Holl.			X	X		X		X		X		X
<i>Melphina statirides</i> Holl.				X		X			X	X	X	
<i>Fresna netopha</i> Hew.	X	X	X	X	X		X	X	X	X	X	

FAMILY AND SPECIES	MONTH											
	1	2	3	4	5	6	7	8	9	10	11	12
<i>Fresna nyassae</i> Hew.							X					
<i>Fresna cojo</i> Karsch											X	X
<i>Platylesches picanini</i> Holl.							X					
<i>Bacris fatuellus</i> Hopf.	X	X			X	X	X	X		X		X
<i>Pelopidas thrax</i> Hub.					X		X	X	X		X	
<i>Borbo fanta</i> Ev.							X					
<i>Borbo perobscura</i> H.H. Druce												X
<i>Borbo micans</i> Holl.								X				
<i>Borbo gemella</i> Mab.						X	X	X				

*Observations may cover more than one taxon.

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