BUTTERFLIES AT AFI MOUNTAINS WILDLIFE SANCTUARY

Report of work progress July 2010
(Update of previous report, Feb 2009)

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Previous efforts

As far as I know the only published report of butterflies from Afi Mountains Wildlife Sanctuary is from a joint report on Cross River butterflies (Knoop & Warren 2005). In this report there is included at list of butterflies from Afi Mountains documented by Duke P. Knoop and Inaoyom Sunday Imong who collected within the sanctuary for some days (exact number not reported) and recorded 139 species. The species found in this survey are listed in Appendix 1. Some records have been deleted since new revisions in taxonomy/ phylogeography have made them obsolete (*Falcuna gitte, Euriphene veronica, Euriphene simplex*).

Survey efforts

I have surveyed butterflies at Afi Mountains Wildlife Sanctuary at four different occasions. The first two visits were just quick stops as tourist at Afi Drill Ranch and the "survey" consisted of visual identification and some photographic work and resulted in 101 recorded species. My initial experience of the region was positive and therefore two longer periods have now been spent (20 Nov-2 Dec 2008 and 11-25 Feb 2009) with the sole purpose of surveying the butterflies in the area. At both occasions Drill Ranch has been used as base for daily surveys but an additional five nights were recently spent at higher elevations (see special section). After this initial survey a first report was written (February 2009) and this report is an updated version of the previous report including new records from two visits made 25-27 Jun 2009 and 25-30 Mar 2010. The two later visits were made while doing sampling for a research project studying pheromone diversity in *Bicyclus* butterflies so the monitoring was less broadly targeted compared to the initial work, but still finding many new species.

Methods

Butterflies were surveyed using mostly hand netting and in the case of conspicuous species direct visual identification, sometimes aided by binoculars. Banana baited traps were used most of the days at the low level study and captured some species of *Charaxes* not encountered while netting. The area that was most intensively studied is the lowland forest lying immediately south of the Drill Ranch area (N 6.299 / E 8.997). Most days an eight kilometer transect (predominantly in forest with closed canopy) was surveyed at a slow walking pace and every butterfly species seen were recorded. Any specimen that could not be determined visually was captured and in cases when proper identification could not be made in the field the specimen was kept for later identification. Besides the work at low level I also spent five days (19-23 February 2009) collecting at higher altitudes close of the southern peak of Kibo-Utu (around 1200 meter above sea level). The base camp (N 6.316 / E8.976) was located at around 700 meters altitude and most work was performed at altitudes of 600-800m. One day was spent at elevation between 800-1160m. During the high elevation part of the survey the monitoring was unstandardized as the rugged terrain of the area made normal surveying methods impossible. Instead any location that was suitable for butterflies were surveyed for some time until no new species were seen and then I proceeded to a new area.

Results & Discussion

Total number of recorded species

In total I have so far identified 342 species of butterflies and including those reported by Knoop & Warren (2005) but not encountered in the present survey the total number of positively recorded butterflies from Afi Mountain Wildlife Sanctuary is 373. In the coming months several new species will be added to this list as some material could not be identified in the field and will have to be determined after preparation. The total species list generated from both the previous and the present study is presented as Appendix 1.

High elevation expedition

During the day spent at the highest altitudes south of the peak Kibo-Utu one butterfly species was encountered in large numbers in all areas above 1000 meters elevation. The species needs to be investigated in detail but it appears to be *Bicyclus smithi* (Aurivillius, 1899), a species normally found in eastern Africa and previously not encountered in Nigeria. Some older literature mentions the species from Nigeria but in the latest compilation of records (Larsen 2005) the species is not considered to occur in Nigeria. Many older records are often referring to other later determined species. Some east African butterflies have small isolated populations on montane areas in West Africa; relicts from colder climate periods that now have been isolated on high elevation areas. The total area at Afi Mountains with an elevation above 1000 meters is estimated to be around 10 km^2 and this is obviously large enough to sustain viable populations of montane butterflies. Even if only one day was spent at the location the finding of this butterfly shows that more work needs to be performed at montane areas in the region. To work efficiently a temporary camp needs to be made at the highest possible location that still has a permanent water source during the dry season enabling efficient work for some days at the whole high elevation area around the highest peaks. Apart from the area above 1000m the butterflies at moderately high levels appear to be similar to the lowland areas (about 150m).

A total of sixteen species (not including *Bicyclus smithi*) have so far only been found at the moderately high areas, but these are not typical montane species and will probably be found at low elevations later. In general the butterflies observed on a daily basis is more or less the same all the way up until 900-1000m elevation when species numbers drop significantly (most likely due to drop in temperature and change in vegetation).

Non-montane species only found at semi-high elevation are: *Aphnaeus orcas, Iolaus sciophilus, Anthene sylvanus sylvanus, Anthene locuples, Cacyreus lingeus, Phlyaria cyara cyara, Azanus moriqua, Precis octavia octavia, Eurytela dryope dryope, Bebearia flaminia flaminia, Acraea excisa, Procampa rara, Ceratrichia clara clara, Osmodes thora, Osmodes costatus, Paracleros substrigata*

New species encountered since February 2009

A total of 28 species have been added to the list since the last report that was written in February 2009. Two of these were identified in material collected earlier but not properly identified until being prepared: *Neptis liberti* and *Euriphene artropurpurea*.
The remaining 26 species were found during the fieldwork and are now added to the total list (Appendix I): *Papilio plagiatus, Graphium leonidas, Euliphyra leucyania, Ornipholidotos nympha, Falcuna campinus, Iridana sp., Epitolina catori, Paradeudorix cobaltina, Anthene irumu, Charaxes mycerina/doubledayi, Junonia cymodoce, Sevenia occidentalium, Cymothoe 'sangaris', Neptis alta, Neptis seeldrayersi, Neptis liberti, Neptis nebrodes, Euriphene atropurpurea, Bebearia innocua, Acraea polis, Acraea pseudegina, Celaenorrhinus meditrina, Sarangesa tertullianus, Sarangesa brigida, Teniorhinus sp., Paronymus ligora, Andronymus gander, Platylesches galesa.*

Future project plans

The butterfly fauna at Afi Mountain Wildlife Sanctuary appears to be more diverse than expected; several species recorded from the area were previously only thought to occur in Nigeria in the areas south of the River Cross River. Several species also appear to be somewhat different in pattern than what I am used to see from other locations in Nigeria. If possible the study will be continued with more visits at both high and low levels and trapping with other baits than fruits should be tried out to further complete the list of butterfly species in the area. At present I have no more monitoring visits planned but in case I get an opportunity to revisit the site in the future I will continue this project.

Acknowledgements

Tony Bassey at the Forestry Commission in Calabar supported the project and gave me permission to work in the Wildlife Sanctuary. Wildlife officer Ibiang Issien gave me local advice and assigned me the excellent ranger Nyiamson Don who together with Livinus Abang assisted me during the work at higher elevations. Andrew Dunn (WCS) and Sam Ubi Ettah (Sanctuary Coordinator) gave valuable advice and the people at Drill Ranch (Peter D. Jenkins, Elizabeth L. Gadsby, Adeniyi Egbetade and Olatunji Olatundun) all assisted in making my work as easy as possible.

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References

Knoop, D. P. & Warren, R.D. 2005. The Butterflies of Cross River State with some Zoogeographical Notes (LEPIDOPTERA, RHOPALOCERA).

Larsen, T.B. 2005. *Butterflies of West Africa*. Apollo Books, Stenstrup, Denmark.

Species	Older records	Present study	Comments
Fam. Papilionidae (16)			
Papilio dardanus dardanus	✓	✓	
Papilio phorcas phorcas	✓	✓	
Papilio hesperus hesperus	✓	✓	
Papilio chrapkowskoides nurettini	✓		
Papilio sosia sosia	✓	✓	
Papilio nireus nireus	✓	✓	
Papilio menestheus menestheus	✓	✓	
Papilio demodocus demodocus	✓	✓	
Papilio cyproeofila praecyola	✓	✓	
Papilio zenobia	✓		
Papilio cynorta cynorta	✓	✓	
Papilio plagiatus		✓	Caught at low elevation which is rare in Nigeria
Graphium ridleyanus	✓		
Graphium latreillianus theorini	✓	✓	
Graphium leonidas leonidas		✓	
Graphium policenes	✓	✓	
Fam. Pieridae (30)			
Pseudopontia paradoxa paradoxa	✓	✓	
Catopsilia florella	✓		
Eurema senegalensis	✓	✓	
Eurema hecabe solifera	✓	✓	
Eurema floricola leonis	✓	✓	
Eurema hapale	✓		
Eurema brigitta brigitta	✓		
Nepheronia argia argia		✓	
Nepheronia thalassina thalassina	✓	✓	
Nepheronia pharis pharis	✓	✓	
Belenois calypso calypso	✓		
Belenois theora theora		✓	
Belenois theuszi	✓		
Appias sylvia sylvia	✓	✓	
Appias phaola phaola	✓	✓	
Appias sabina sabina	✓	✓	
Appias epaphia epaphia	✓		
Leptosia alcesta alcesta	✓	✓	
Leptosia nupta nupta	✓		
Leptosia hybrida hybrida	✓	✓	
Leptosia medusa		✓	Previously not recorded west of Niger river
Leptosia marginea	✓	✓	
Leptosia wigginsi pseudalcesta	✓		
Mylothris chloris chloris		✓	

Mylothris sulphurea		✓	
Mylothris hilara hilara		✓	Lowland record, normally montane species
Mylothris asphodelus		✓	
Mylothris rhodope	✓	✓	
Mylothris jaopura	✓	✓	
Mylothris schumanni schumanni	✓		

Fam. Lycaenidae (81)

Euliphyra leucyania		✓	
Megalopalpus zymna		✓	
Megalopalpus metaleucus	✓	✓	
Ptelina carnuta	✓	✓	
Pentila pseudorotha		✓	
Pentila petreia		✓	Previously not recorded west of Niger river
Pentila maculata maculata	✓	✓	
Pentila phidia	✓		Previously not recorded west of Niger river
Pentila hewitsoni hewitsoni		✓	
Telipna acraea acraea	✓	✓	
Ornipholidotos nigeriae nigeriae		✓	
Ornipholidotos onitshae		✓	
Ornipholidotos nympha		✓	
Mimacraea neurata		✓	
Mimacraea apicalis apicalis	✓	✓	
Mimeresia libentina		✓	
Citrinophila similis		✓	
Toxochitona gerda		✓	
Liptena titei		✓	
Liptena modesta		✓	
Liptena orubrum orubrum		✓	
Liptena despecta		✓	
Falcuna libyssa libyssa		✓	
Falcuna campimus		✓	
Tetrarhanis simplex		✓	
Tetrarhanis ogojae	✓		
Larinopoda lircaea	✓	✓	
Larinopoda aspidos		✓	
Micropentila adelgitha		✓	
Iridana incredibilis		✓	Identified from forewing found on ground
Hewitsonia boisduvalii		✓	
Cerautola ceraunia		✓	
Epitola posthumus	✓		
Stempfferia cercene		✓	
Epitolina dispar		✓	
Epitolina melissa		✓	
Epitolina catori catori		✓	
Oxylides faunus faunus	✓	✓	

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Appendix 1 - Species list

Aphnaeus orcas		✓	
Iolaus laonides		✓	
Iolaus timon timon		✓	
Iolaus longicauda longicauda		✓	
Iolaus bellina bellina		✓	
Iolaus sciophilus		✓	
Iolaus agnes		✓	
Iolaus aethria		✓	
Iolaus iasis iasis		✓	
Hypolycaena liara liara	✓	✓	
Hypolycaena coerulea		✓	
Hypolycaena dubia		✓	
Hypolycaena antifaunus antifaunus		✓	
Hypolycaena hatita hatita		✓	
Hypolycaena nigra		✓	
Pilodeudorix otraeda genuba	✓		
Paradeudorix cobaltina		✓	
Anthene ligures		✓	
Anthene sylvanus sylvanus		✓	
Anthene irumu		✓	
Anthene larydas		✓	
Anthene lachares lachares		✓	
Anthene lysicles		✓	
Anthene locuples		✓	
Neurellipes lusoneslusones		✓	
Neurellipes chryseostictus		✓	
Triclema sp.			Species to be determined but at least two
Triclema sp.			Species to be determined but at least two
Uranothauma falkensteini	✓	✓	
Phylaria cyara cyara		✓	
Cacyreus lingeus		✓	
Leptotes pirithous	✓	✓	New ones not checked, can be other species
Leptotes pulchra	✓		
Tuxentius carana kontu	✓	✓	
Eicochrysops hippocrates	✓	✓	
Euchrysops malathana	✓		
Thermoniphas alberici	✓	✓	
Oboronia punctatus		✓	
Oboronia pseudopunctatus	✓	✓	
Oboronia ornata ornata		✓	
Azanus moriqua		✓	
Azanus mirza		✓	

Fam. Nymphalidae (207)

Libythea labdaca labdaca	✓	✓	
Danaus chrysippus chrysippus	✓	✓	
Tirumala petiverana	✓	✓	
Amauris niavius niavius		✓	
Amauris hecate hecate	✓		
Amauris damocles damocles		✓	
Gnophodes betsimena parmeno		✓	
Melanitis leda	✓	✓	
Elymniopsis bammakoo bammakoo	✓	✓	
Bicyclus xeneas occidentalis		✓	
Bicyclus xeneoides		✓	
Bicyclus evadne elionas	✓		
Bicyclus medontias	✓	✓	
Bicyclus italus		✓	
Bicyclus sciathis		✓	
Bicyclus ignobilis eurini	✓	✓	
Bicyclus technatis	✓	✓	
Bicyclus vulgaris		✓	
Bicyclus dorothea dorothea	✓	✓	
Bicyclus auricruda fulgida		✓	
Bicyclus angulosa angulosa	✓		
Bicyclus sylvicolus	✓	✓	
Bicyclus funebris	✓	✓	
Bicyclus madetes madetes		✓	
Bicyclus 'smithi'		✓	Potentially new undescribed species
Bicyclus martius martius		✓	
Ypthima doleta	✓	✓	
Charaxes protoclea protoclea		✓	
Charaxes cynthia cynthia		✓	
Charaxes lucretius lucretius	✓	✓	
Charaxes castor castor		✓	
Charaxes brutus brutus	✓	✓	
Charaxes tiridates tiridates		✓	
Charaxes numenes numenes		✓	
Charaxes zingha		✓	
Charaxes etesipe etesipe	✓	✓	
Charaxes eupale eupale	✓	✓	
Charaxes subornatus subornatus	✓	✓	
Charaxes anticlea proadusta	✓	✓	
Charaxes etheocles etheocles		✓	
Charaxes catachrous		✓	
Charaxes virilis virilis		✓	
Charaxes cedreatis		✓	
Charaxes pleione congoensis		✓	
Charaxes paphianus falcata	✓	✓	

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Charaxes lycurgus lycurgus	✓	✓	
Charaxes mycerina/doubledayi		✓	Field identification
Euxanthe eurinome eurinome	✓		
Euxanthe trajanus trajanus		✓	
Palla violinitens violinitens	✓		
Palla decius		✓	
Palla ussheri ussheri		✓	
Kallimoides rumia jadyae	✓	✓	
Vanessula milca buchneri	✓	✓	
Antanartia delius delius	✓	✓	
Precis octavia octavia		✓	
Precis antilope		✓	
Hypolimnas misippus		✓	
Hypolimnas anthedon anthedon		✓	
Hypolimnas dinarcha dinarcha		✓	
Hypolimnas chapmani		✓	
Hypolimnas salmacis salmacis		✓	
Salamis cactacacta		✓	
Protogoniomorpha temora temora		✓	
Protogoniomorpha parhassus		✓	
Junonia oenone oenone		✓	
Junonia cymodoce cymodoce		✓	
Junonia sophia sophia		✓	
Junonia stygia		✓	
Junonia chorimene		✓	
Junonia terea terea		✓	
Cyrestis camillus camillus		✓	
Mesoxantha ethosea ethoseoides		✓	
Neptidopsis ophione ophione		✓	
Eurytela dryope dryope		✓	
Eurytela hiarbas hiarbas		✓	
Sevenia occidentalium occidentalium		✓	
Harma theobene theobene	✓	✓	
Cymothoe oemilius oemilius		✓	
Cymothoe beckeri beckeri		✓	
Cymothoe fumana balluca	✓	✓	
Cymothoe egesta egesta	✓	✓	
Cymothoe caenis	✓	✓	
Cymothoe anitorgis		✓	
Cymothoe coccinata coccinata	✓	✓	
Cymothoe excelsa excelsa		✓	
Cymothoe 'sangaris'		✓	
Pseudoneptis bugandensis ianthe	✓	✓	
Pseudacraea eurytus	✓	✓	
Pseudacraea boisduvalii boisduvalii		✓	
Pseudacraea lucretia lucretia	✓	✓	

Pseudacraea warburgi	✓	✓
Pseudacraea semire		✓
Neptis nemetes nemetes		✓
Neptis metella metella		✓
Neptis alta		✓
Neptis seeldrayersi		✓
Neptis puella		✓
Neptis conspicua		✓
Neptis continuata		✓
Neptis nysiades		✓
Neptis biafra		✓
Neptis quintilla		✓
Neptis liberti		✓
Neptis strigata strigata		✓
Neptis nicoteles		✓
Neptis nicobule		✓
Neptis mixophyes		✓
Neptis neobrodes		✓
Neptis trigonophora melicertula		✓
Neptis agouale agouale		✓
Neptis melicerta		✓
Catuna crithea	✓	✓
Catuna oberthueri	✓	✓
Catuna angustatum	✓	✓
Euryphura chalcis		✓
Aterica galene galene	✓	✓
Cynandra opis opis	✓	✓
Euriphene mundula	✓	✓
Euriphene obtusangula		✓
Euriphene incerta incerta	✓	✓
Euriphene barombina		✓
Euriphene tadema tadema	✓	✓
Euriphene grosesmithi grosesmithi	✓	✓
Euriphene milnei	✓	✓
Euriphene amicia amicia	✓	✓
Euriphene aridatha aridatha		✓
Euriphene karschi		✓
Euriphene atropurpurea		✓
Euriphene gambiae gabonica	✓	✓
Euriphene atossa atossa	✓	✓
Euriphene lysandra		✓
Bebearia lucayensis		✓
Bebearia tentyris	✓	✓
Bebearia carshena		✓
Bebearia absolonabsolon		✓
Bebearia zonara	✓	✓

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Bebearia abesa abesa		✓
Bebearia barce maculata	✓	✓
Bebearia comus comus	✓	✓
Bebearia cocalia continentalis		✓
Bebearia sophus sophus		✓
Bebearia plistonax		✓
Bebearia phranza phranza		✓
Bebearia laetitia laetitia		✓
Bebearia flaminia flaminia		✓
Bebearia maximiana		✓
Bebearia nivaria nivaria		✓
Bebearia phantasia phantasia		✓
Bebearia phantasiella		✓
Bebearia cutteri cutteri		✓
Bebearia innocua		✓
Bebearia octogramma		✓
Euphaedra fucora		✓
Euphaedra medon medon	✓	✓
Euphaedra extensa		✓
Euphaedra hewitsoni sumptuosa		✓
Euphaedra acuta		✓
Euphaedra hebes		✓
Euphaedra diffusa diffusa		✓
Euphaedra cyparissa cyparissa		✓
Euphaedra sarcoptera sarcoptera		✓
Euphaedra permixtum diva		✓
Euphaedra aureola		✓
Euphaedra janetta janetta		✓
Euphaedra adonina adonina		✓
Euphaedra ravola		✓
Euphaedra margaritifera		✓
Euphaedra proserpina		✓
Euphaedra vicina longiqua		✓
Euphaedra eleus eleus	✓	
Euphaedra edwardsii	✓	✓
Euphaedra ruspina	✓	✓
Euphaedra harpalyce harpalyce		✓
Euphaedra losinga wardi	✓	✓
Pseudathyma neptidina neptidina		✓

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Acraea circeis	✓		
Acraea penelope penelope	✓		Submontane, probably at low elevation
Acraea translucida		✓	
Acraea peneleos peneleos	✓	✓	
Acraea parrhasia parrhasia	✓	✓	
Acraea pharsalus pharsalus	✓		
Acraea encedana		✓	
Acraea alciope	✓	✓	Some might be *A. aurivillii*, not checked yet
Acraea aurivillii aurivillii	✓		
Acraea jodutta jodutta	✓	✓	
Acraea lycoa	✓	✓	
Acraea serena		✓	
Acraea acerata	✓		
Acraea oberthueri	✓	✓	
Acraea bonasia bonasia	✓	✓	
Acraea polis		✓	
Acraea egina egina	✓	✓	
Acraea pseudegina		✓	
Acraea zetes zetes	✓	✓	
Acraea quirina quirina		✓	
Acraea vestalis vestalis		✓	
Acraea umbra umbra	✓		
Acraea alcinoe alcinoe	✓		
Acraea consanguinea consanguinea	✓	✓	
Acraea excisa		✓	
Acraea elongata		✓	
Acraea epaea epaea	✓	✓	
Acraea epiprotea	✓	✓	
Lachnoptera anticlia	✓	✓	
Phalanta phalantha aethiopica	✓	✓	
Phalanta eurytis eurytis	✓	✓	

Fam. Hesperidae (39)			
Coeliades chalybe chalybe		✓	
Coeliades libeon		✓	
Coeliades forestan forestan		✓	
Celaenorrhinus boadicea boadicea		✓	
Celaenorrhinus medirina		✓	
Celaenorrhinus plagiatus		✓	
Tagiades flesus	✓	✓	
Calleagris lacteus dannatti		✓	
Procampta rara		✓	
Sarangesa tertullianus		✓	
Sarangesa brigida brigida		✓	
Gorgyra afikpo		✓	
Ceratrichia clara clara		✓	
Ceratrichia maesseni		✓	
Teniorhinus sp.		✓	Field observation only
Pardaleodes incerta murcia		✓	
Pardaleodes edipus		✓	
Pardaleodes sator sator		✓	
Xanthodisca rega		✓	
Acada annulifer		✓	
Osmodes thora		✓	
Osmodes costatus		✓	
Paracleros sp.		✓	
Paracleros substrigata		✓	
Acleros mackenii olaus		✓	
Meza cybeutes volta		✓	
Paronymus ligora		✓	
Andronymus neander neander		✓	
Andronymus gander		✓	
Andronymus evander		✓	
Gretna waga		✓	
Gretna balenge balenge		✓	
Caenides kangvensis		✓	
Caenides benga		✓	
Melphina tarace		✓	
Fresna nyassae		✓	
Platylesches galesa		✓	
Borbo fallax		✓	
Borbo perobscura		✓	
TOTAL	**139**	**342**	**Both studies combined: 373 species**