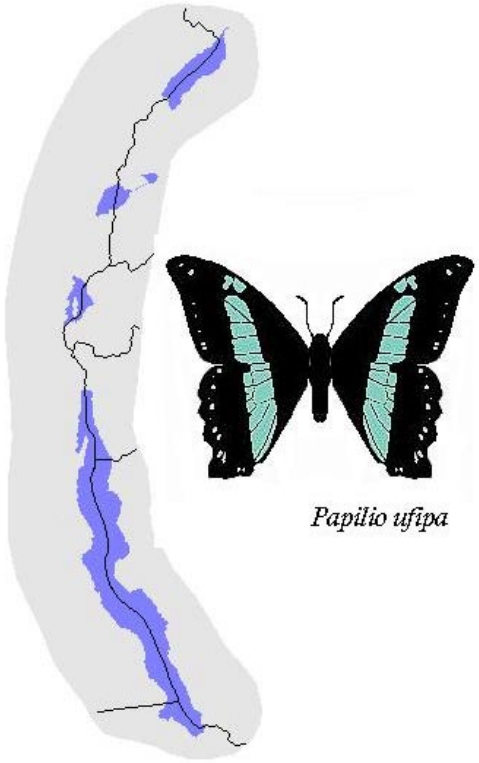
Endemic butterflies of the Albertine Rift

- an annotated checklist



Tim R.B. Davenport

Wildlife Conservation Society
PO Box 1475, Mbeya
Tanzania

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1. Introduction

This checklist of the endemic butterflies (Rhopalocera) of the Albertine Rift was compiled as part of a strategic planning process for the Wildlife Conservation Society's **Albertine Rift Programme**. Some 117 butterfly species are listed, all of which are found exclusively within the Albertine Rift. This represents the first checklist to document specifically the endemic butterflies of these parts of Uganda, Democratic Republic of Congo (DRC), Rwanda, Burundi, Tanzania and Zambia. Whilst no checklist of this nature can ever be considered comprehensive, it is hoped that the list is as complete and topical as current knowledge permits. Drawn from the available literature and personal observations, the document provides information on each endemic species including recorded localities, as well as broader details on the Albertine Rift itself.

2. Information sources and acknowledgements

Information has been drawn from a variety of sources including Carcasson (1961; 1975), D'Abrera (1980; 1997), Henning (1988), Kielland (1990), Larsen (1991), Ackery, et al. (1995), Davenport (1996), Howard & Davenport (1996), Congdon & Collins (1999), Congdon, Gardiner & Bampton (2001), as well as numerous workers from earlier parts of the last century (e.g. Butler, Carpenter, Evans, Heron, Jackson, Joicey, Neave, Rebel, Rogers, Stempffer, Talbot, van Someren). Additional information came from collections held at Makerere University Zoology Museum, Kampala and the National Museums of Kenya, Nairobi. Steve Collins (ABRI, Nairobi) provided considerable and invaluable information, and I am very grateful to Colin Congdon (Tanzania) and Alan Gardiner (Zambia) for very useful comments on an earlier draft.

3. Taxonomy

The higher classification of butterflies follows Kielland (1990) and Congdon and Collins (1999). Thus, four superfamilies (Papilionoidea, Lycaenoidea, Nymphaloidea and Hesperoidea) and nine families (Papilionidae, Pieridae, Lycaenidae, Riodinidae, Satyridae, Danaidae, Nymphalidae, Acraeidae and Hesperiidae) are recognised. Species are consistent, as far as possible, with Kielland (1990), Ackery *et al*., (1995) and Congdon and Collins (1999). The African distribution details and ecological affinities follow Davenport (1996).

4. Information provided

The list is arranged systematically to species level and alphabetically thereafter. As far as possible this conforms to the taxonomic sequences in the literature. The numbering system was designed for this checklist specifically. Species have not been provided with a common or colloquial name. The majority of taxa endemic to the Albertine Rift have never been endowed with one. The few that have are given in Davenport (1996).

Each species has been ascribed one of ten habitat types (although only five are associated with species in this list) based on the literature and personal observations in the field (Davenport, 1996; Howard and Davenport, 1996). These ecological affinities belong to three major categories, namely forest-dependent species (**F**-species), characteristic of closed canopy forest habitats; forest non-dependent species (**f-**species), which may be recorded in closed-canopy forest but are not necessarily dependent upon it, and are more often encountered in a variety of forest edge, degraded forest and woodland habitats including Miombo (*Brachystegia*) in Tanzania; and non-forest (open habitat) species include those characteristic of a range of open savannah, grassland and arid habitats (**O**).

The species' altitudinal range, if known or limited, has been given and expressed as metres above sea level. Each species has also been supplied with a list of countries in the Albertine Rift from which it has been recorded. Species that are endemic also to one of the six countries considered are marked accordingly. Finally, locality records are given for all butterflies where possible or known. In some instances, specific localities are not known and thus regions (such as north Kivu, western Uganda or Ufipa) are given.

There is confusion in the literature regarding distributions, particularly for the older records. Inevitably names and locations change with time and this is especially so in former colonies. For example in Uganda, Kibale has been referred to as Toro, Daro or Mpanga, the latter being problematical as there is also an Mpanga forest near Kampala. Bwindi Impenetrable has been termed as Kayonza or Kamengo (a name also given more usually to Semliki). As far as possible, the 'old names' have been changed to their currently used ones.

5.Why butterflies?

Being amongst the most colourful and conspicuous of invertebrate taxa, as well as diurnal in habit, more is known about the ecology and taxonomy of butterflies than any other major insect group. Whilst there remains a considerable amount to learn particularly about early stages, compared with most invertebrates much is understood about butterfly biology and ecology (Vane-Wright and Ackery, 1984). Often comprising distinct communities, suites of butterfly species may be specific to geographical sub-regions and diverse ecological conditions (Howard and Davenport, 1996). These traits contribute to the value of butterflies as biological indicators and much research has been carried out over the past decade to support this (Kremen, 1992; 1994; Sparrow *et al* 1994; Beccaloni and Gaston, 1995; Howard *et al.,* 1997; 1998).

The unequivocal environmental and dietary requirements of many species mean that their presence or absence can communicate much about a habitat and its health. Butterflies respond quickly to environmental changes and there is now considerable data on how particular species contend with alterations in land-use, and thus may play a valuable role in ecological monitoring (Daily and Ehrlich, 1995). The influence of seasonality on the presence or absence of adults of certain species, and on their morphology, as well as knowledge of species ecology must always be considered. However, the compilation of species lists may be used both qualitatively and quantitatively, to comment on a habitat (its condition and vegetation) and to identify conservation and monitoring needs. Increasingly, therefore, butterflies are being used as tools in ecological monitoring strategies (Pollard and Yates, 1993; Sparrow *et al.,* 1994).

6. The Albertine Rift

There is no clear-cut definition of the Albertine Rift. For the purposes of this document, endemic butterflies of the Albertine Rift are those found only within the geographical boundaries illustrated in Figure 1. This area begins north of Lake Albert between Arua and Pakwach (West Nile, Uganda) and extends southward including Lendu Plateau, the lower reaches of the Kibali and Ituri rivers (Orientale, DRC), the forests of western Uganda and Kigezi (Uganda), north and south Kivu (DRC), western Rwanda and Burundi, Itombwe to Marungu in western Katanga (DRC), western Tanzania (Kigoma and Mpanda regions) and a small part of north west Zambia. Parts of the Ufipa Plateau, including Mbizi and other highland areas of Rukwa region (Tanzania) are also included. Figures 2-4 illustrate some of these areas in more detail.

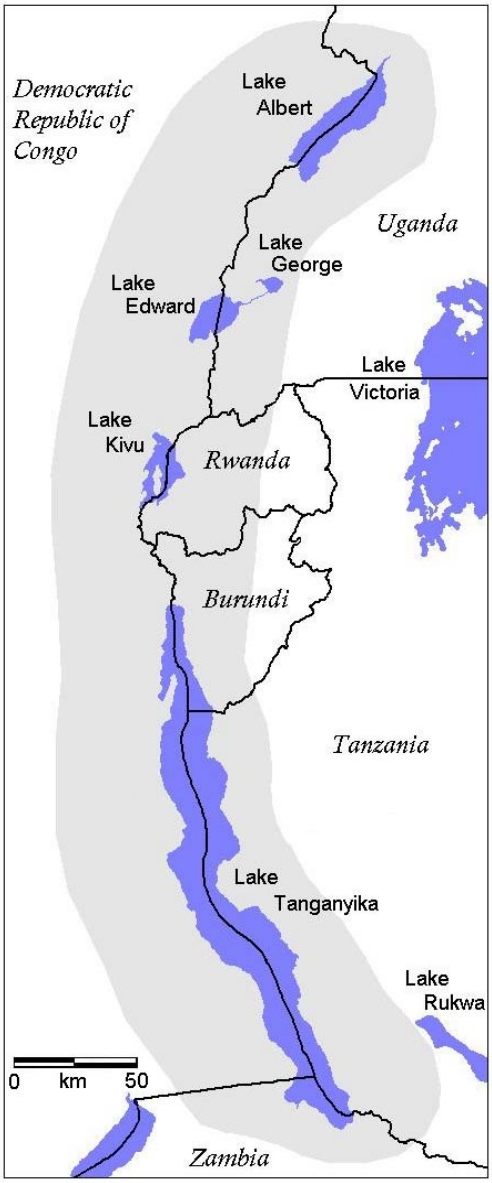

Figure 1. *Map of the Albertine Rift. All 123 species in the checklist are found exclusively within the shaded area of the map.*

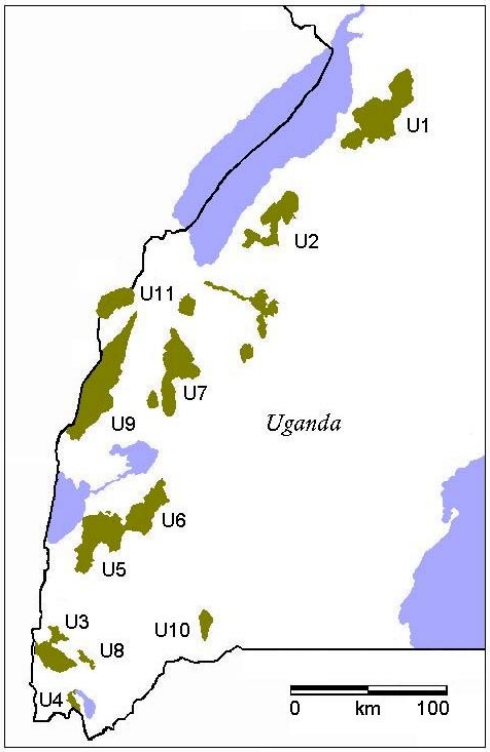

Figure 2. *Map of western Uganda, illustrating major forest localities mentioned in the checklist (coded) and other protected areas uncoded) For key, see page 12*

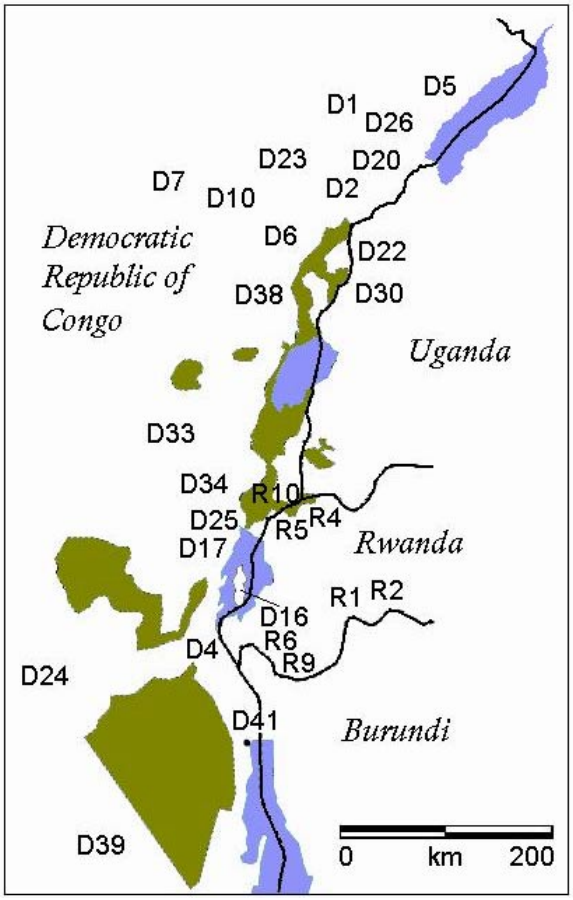

Figure 3. *Map of the central section of the Albertine Rift, illustrating major localities in the Democratic Republic of Congo and Rwanda mentioned in the checklist (coded). For key, see page 12*

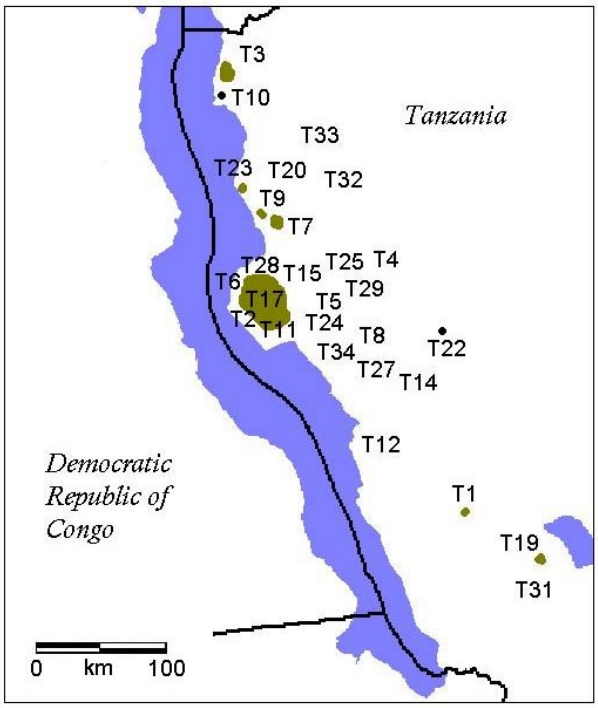

Figure 4. *Map of western Tanzania, illustrating major localities mentioned in the checklist (coded). For key, see page 12*

7. Discussion

As far as can be ascertained there are 117 species of butterfly from 49 genera endemic to the Albertine Rift, amounting to approximately 3.2% of the total fauna for the continent including Madagascar. This figure is impressive, particularly when compared to the total of 78 species that are known to be endemic to the Eastern Arc Mountains of southern Kenya and Tanzania (Congdon, Gardiner & Bampton, 2001). Of these 117 species, 21 are endemic to Tanzania, 23 to DRC, 21 to Uganda, 2 to Rwanda and 1 to Zambia. The remaining 52 species are distributed amongst the six nations with 16 species records for Burundi, 43 for DRC, 28 for Rwanda, 9 for Tanzania, 44 for Uganda and I for Zambia.

Endemic taxa are consistently distributed across the families with 3 Papilionidae, 8 Pieridae, 50 Lycaenidae, 8 Satyridae, 28 Nymphalidae, 8 Acraeidae and 12 Hesperiidae represented. Only Riodinidae and Danaidae, the two smallest African families (represented by a total of 12 and 20 species respectively) are not present in this list. In terms of habitat preferences, 55 species are forest dependent (F), 1 forest lowland (FL) and 44 forest highland (FH), 11 species are forest non-dependent, 6 are from open habitats and 1 from open highland habitats. Thus 85.5% of the total are forest dependent, 9.4% forest non-dependent and 5.9% from open habitats.

This list is strictly limited to the area delineated in Figure 1. Had, for example, forests in the western shores of Lake Victoria (Sango Bay in Uganda and Minziro in Tanzania) been included, this list would approach 200 species. A considerable number of taxa are restricted to south west Uganda, eastern DRC and the lake Victoria shoreline. Indeed there are many similarities with the ecology of the lakeshore forests and the western highland forests (Howard & Davenport, 1996).

Similarly, the assumed boundary of the Albertine Rift cuts through eastern Ituri. If this were extended west to include more of this region, or north to include parts of southern Uele, a number of additional DRC endemics would be included. For example, *Argiolaus bergeri,* Stempffer 1953 (from Yindi and Kibali-Ituri), *Hypokopelates tenuivittata,* Stempffer 1951, (Epulu), *Cupidesthes minor,* Joicey & Talbot, 1921(Avakubi and Ituri river), *Euriphene (Euriphene) rotundata,* Holland 1920 (Medje), *Euphaedra intermedia,* Rebel 1914 (North Kivu, Uele and Itoa River), *Euphaedra sinuosa,* Hecq 1974 (Beni and Uele) are all forest DRC endemics that have been ommitted.

Undoubtedly there are gaps in this list, particularly in respect to localities. Inevitably a list of this nature is a reflection of collectors and their preferences and research projects. There is, for example, much less published literature available about the butterfly fauna of Burundi. Moreover, many parts of DRC have presumably never been sampled. That notwithstanding a total of 117 species represents a very significant number of endemic taxa, further illustrating the considerable significance of the region for conservation.

8. The checklist

No	Species	Author	Date	Hab	Altitude	Country	Localities
	PAPILIONOIDEA						
	PAPILIONIDAE (SWALLOWTAILS)						
	Papilioninae (Swallowtails)						
1	*Papilio leucotaenia*	Rothschild	1908	**FH**	2100-2300	B, DC, R, U	Bx Dx R8 U3
2	*Papilio ufipa*	Carcasson	1961	**FH**	> 2000	T*	T19
3	*Graphium gudenusi*	Rebel	1911	**FH**	1900-2100	B, DC, R, U	Bx D12 Rx U3
	PIERIDAE (YELLOWS & WHITES)						
	Pierinae (Whites)						
4	*Mylothris alberici*	Dufrane	1940	**FH**	> 1800	DC, R, U	D9 D25 Rx U8
5	*Mylothris croceus*	Butler	1896	**FH**	> 1800	DC, R, U	D7 D13 Rx U3 U7 U8 U9
6	*Mylothris celisi*	Berger	1981	**F**		DC*	D21
7	*Mylothris mafuga*	Berger	1981	**F**	> 1600	DC, U	D4 U3 U8
8	*Mylothris ochrea*	Berger	1981	**F**		DC*	D8 D37
9	*Mylothris polychroma*	Berger	1981	**F**		B, DC, R	Bx D37 Rx
10	*Mylothris ruandana*	Strand	1909	**FH**	> 1600	B, DC, R, U	Bx D13 R9 U3
11	*Mylothris schoutedeni*	Berger	1952	**F**		DC*	D8
	LYCAENOIDEA						
	LYCAENIDAE (BLUES, COPPERS, HAIRSTREAKS)						
	Lipteninae (Liptenids)						
12	*Alaena bjornstadi*	Kielland	1973	**O**	1400-1700	T*	T32 T33
13	*Alaena kiellandi*	Carcasson	1965	**O**	1000-1700	T*	T10 T22 T27 T31
14	*Telipna kayonza*	Jackson	1969	**F**	1400-2400	U*	U3
15	*Telipna sheffieldi*	Bethune-Baker	1926	**F**	1300-2000	U*	U7
16	*Telipna plagiata*	Joicey & Talbot	1921	**F**		DC*	D20
17	*Ornipholidotos kigoma*	Kielland	1983	**F**	900-1300	T*	T9 T15 T21
18	*Mimacraea paragora*	Rebel	1911	**F**		DC*	D39
19	*Toxochitona ankole*	Stempffer	1967	**F**	1200-2000	U*	U5 U7
20	*Toxochitona vansomereni*	Stempffer	1954	**FH**	1600-2600	U*	U3
21	*Liptena subsuffusa*	Hawker-Smith	1933	**FH**	1500-2000	DC*	D19
22	*Falcuna iturina*	Stempffer & Bennett	1963	**F**		DC, U	D7 D33 U11
23	*Falcuna semliki*	Stempffer & Bennett	1963	**F**		DC*	D2
24	*Micropentila bunyoro*	Stempffer & Bennett	1965	**F**		DC, T, U	D33 Tx U1
25	*Iridana bwamba*	Stempffer	1964	**F**	600-800	U*	U11
26	*Iridana obscura*	Stempffer	1964	**F**	600-800	U*	U7 U11
27	*Epitola bwamba*	Jackson	1964	**F**	600-800	U*	U11
28	*Epitola cyanea*	Jackson	1964	**F**	600-800	U*	U11
29	*Epitola mittoni*	Jackson	1964	**F**	600-800	U*	U7 U11
30	*Epitola pulverulenta*	Dufrane	1953	**F**		DC*	D34
	Miletinae (Harvesters & Woolly Legs)						
31	*Spalgis jacksoni*	Stempffer	1967	**f**	600-800	T, U	T7 T9 U11

32	*Lachnocnema disrupta*	Talbot	1935	**f**		Za, U	U3	Z1							
33	*Lachnocnema inexpectata*	Libert	1996	**f**		T*	T14								
	Theclinae (Strong Blues)														
34	*Spindasis dufranei*	Bouyer	1991	**F**		DC*	D10	D13	D23						
35	*Spindasis tanganyikae*	Kielland	1990	**f**	900-2000	T*	T10	T22	T31						
36	*Epamera mongiro*	Stempffer	1969	**F**	600-800	U*	U11								
37	*Epamera pseudofrater*	Stempffer	1962	**FH**	1400-2600	U*	U3								
38	*Epamera pseudopollux*	Stempffer	1962	**FH**	1400-2600	T, U	T4	T5	T29	U3					
39	*Iolaphilus henryi*	Stempffer	1961	**F**	1400-2600	U*	U3								
40	*Argiolaus kayonza*	Stempffer & Bennett	1958	**FH**	1400-2600	U*	U3								
41	*Argiolaus montana*	Kielland	1978	**f**	1450-2200	T*	T5	T17	T30	T32	T34				
42	*Argiolaus sp. nr. iturensis*	Joicey & Talbot	1921	**FH**	> 2000	T*	T19								
43	*Hypolycaena jacksoni*	Bethune-Baker	1906	**FH**	1400-2600	B, DC, R, U	Bx	D11	D13	Rx	U3	U4	U7	U9	
44	*Pilodeudorix ankoleensis*	Stempffer	1953	**F**	1500	U*	U5								
45	*Pilodeudorix zelomina*	Rebel	1914	**FH**	1200-2600	B, DC, R, U	Bx	D14	Rx	U3	U4	U8			
46	*Virachola edwardsi*	Gabriel	1939	**FH**	1400-2800	DC, U	D38	U9							
47	*Virachola ufipa*	Kielland	1978	**f**	1600-2200	T*	T1								
48	*Leptomyrina makala*	Bethune-Baker	1908	**F**		DC, U	D13	U12							
	Polyommatinae (Weak Blues)														
49	*Anthene rufomarginata*	Bethune-Baker	1910	**F**		DC*	D22								
50	*Anthene ruwenzoricus*	Grünberg	1911	**FH**	1500-3000	DC, U	D38	U9							
51	*Uranothauma lunifer*	Rebel	1914	**FH**	1400-2800	DC, R, T, U	D13	Rx	T17	U3	U4	U8			
52	*Harpendyreus argenteostriata**	Stempffer	1961	**FH**	1800-2400	DC, R, U	D29	R6	U4						
53	*Harpendyreus kisaba*	Joicey & Talbot	1921	**FH**	2100-2450	DC, R	D36	R3	R7						
54	*Harpendyreus reginaldi*	Heron	1909	**OH**		DC, R, U	D13	D38	Rx	U3	U9				
55	*Harpendyreus marlieri*	Stempffer	1961	**FH**	2800	DC*	D29								
56	*Lepidochrysops carsoni*	Butler	1901	**O**		Z*	Z2								
57	*Lepidochrysops chala*	Kielland	1981	**O**	2000-2200	T*	T1	T19							
58	*Lepidochrysops mpanda*	Tite	1961	**O**	1700-2000	T*	T24	T29							
59	*Thermoniphas albocaerulea*	Stempffer	1956	**FH**	1400-2600	U*	U3								
60	*Thermoniphas caerula*	Stempffer	1956	**FH**	1400-2600	U*	U3								
61	*Thermoniphas kigezi*	Stempffer	1956	**F**	1400-2600	U*	U3	U4							
	NYMPHALOIDEA														
	SATYRIDAE (BROWNS & RINGLETS)														
	Biinae														
62	*Gnophodes grogani*	Sharpe	1901	**FH**	1400-2600	DC, U	D31	U3	U4	U8					
	Elymniinae														
63	*Bicyclus aurivillii*	Butler	1896	**FH**	> 1500	B, DC, R, U	Bx	D17	D38	R5	U4	U8	U9	U10	
64	*Bicyclus mahale*	Congdon, et al.	1999	**F**	900	T*	T6								
65	*Bicyclus matuta*	Karsch	1894	**FH**	1400-2600	B, DC, R, U	Bx	D13	D16	Rx	U3	U8	U9		
66	*Bicyclus neustetteri*	Rebel	1914	**FH**	1400-2600	DC, U	D13	D24	U3						
67	*Bicyclus persimilis*	Joicey & Talbot	1921	**FH**	1400-2600	B, DC, R, U	Bx	D38	Rx	U9					
68	*Bicyclus similis*	Condamin	1963	**FH**	1600-2300	T*	T11								

69	*Bicyclus tanzanicus*	Condamin	1983	**f**	1500-2300	T*	T5	T17	T28	T29				
	NYMPHALIDAE (BRUSHFOOTED BUTTERFLIES)													
	Charaxinae (Charaxes)													
70	*Charaxes alticola*	Grünberg	1911	**FH**	1400-2700	DC, R, U	D13	R4	U3	U4				
71	*Charaxes gerdae*	Rydon	1989	**f**	900-1400	T*	T10	T27						
72	*Charaxes grahamei*	van Someren	1969	**F**	800-1500	T*	T6	T7	T17	T20	T25			
73	*Charaxes mafuga*	van Someren	1969	**FH**	1400-2600	B, R, U	Bx	Rx	U3	U8				
74	*Charaxes montis*	Jackson	1956	**FH**	1400-2600	DC, U	D13	U3	U8	U9				
75	*Charaxes opinatus*	Heron	1909	**FH**	1400-2600	B, DC, R, U	Bx	D13	Rx	U3	U9			
76	*Charaxes schiltzei*	Bouyer	1991	**FH**	1400-2600	B, R, U	Bx	R6	U3					
77	*Charaxes turlini*	Minig & Plantrou	1978	**FH**		R*	R1	R2						
	Nymphalinae (Nymphalids)													
78	*Cymothoe collarti*	Overlaet	1942	**F**	1800	DC, R	D5	R6						
79	*Cymothoe howarthi*	Rydon	1981	**F**		DC*	D13							
80	*Cymothoe ochreata*	Grose-Smith	1890	**F**		DC, U	D1	D7	D13	D18	U1	U2	U11	
81	*Pseudathyma debruynei*	Hecq	1990	**F**		DC*	D26							
82	*Kumothales inexpecta*	Overlaet	1940	**F**	> 1400	DC, R, U	D15	Rx	U3	U4	U8			
83	*Euriphene (Euriphene) alberici*	Dufrane	1945	**F**	1050	DC*	D28							
84	*Euriphene (Euriphene) excelsior*	Rebel	1911	**F**		B, DC, R, U	Bx	D13	Rx	U3				
85	*Euriphene (Euriphene) ituriensis*	Jackson & Howarth	1957	**F**		DC*	D7	D33						
86	*Bebearia hargreavesi*	D'Abrera	1980	**FH**	>1500	DC*	D25							
87	*Euphaedra barnsi*	Joicey & Talbot	1922	**FH**	1300-1600	DC, R	D13	Rx						
88	*Euphaedra christyi*	Sharpe	1904	**F**		U*	U3	U5	U6	U7				
89	*Euphaedra confina*	Hecq	1992	**F**		T*	T26							
90	*Euphaedra cottoni*	Sharpe	1907	**F**	650-1000	DC*	D6							
91	*Euphaedra ducarmei*	Hecq	1977	**F**		DC*	D33							
92	*Euphaedra graueri*	Rothschild	1918	**FH**		DC*	D33							
93	*Euphaedra margueriteae*	Hecq	1978	**FH**	1400-2600	DC, R, U	D8	Rx	U3					
94	*Euphaedra olivacea*	Grünberg	1908	**F**		U*	U3							
95	*Euphaedra phosphor*	Joicey & Talbot	1921	**F**	800-1200	B, DC, T	Bx	D40	T3	T10	T17			
96	*Euphaedra xerophila*	Hecq	1974	**F**		DC*	D41							
97	*Neptis lugubris*	Rebel	1914	**FH**	1400-2600	DC, U	Dx	U3						
	ACRAEIDAE (ACRAEAS)													
98	*Acraea (Acraea) hamata*	Joicey & Talbot	1922	**FH**	> 2000	DC, R, T, U	D13	R7	Tx	U3	U4	U8		
99	*Acraea (Acraea) kia*	Pierre	1990	**F**	1000	T*	T23							
100	*Acraea (Acraea) turlini*	Pierre	1979	**F**	2500	R*	R6							
101	*Acraea (Actinote) amicitiae*	Heron	1909	**FH**	1400-2600	B, DC, R, T, U	Bx	Dx	Rx	Tx	U3	U4	U8	U9
102	*Acraea (Actinote) burgessi*	Jackson	1956	**FH**		DC, U	D33	U3	U4	U8	U9			
103	*Acraea (Actinote) grosvenori*	Eltringham	1912	**FL**	< 1600	DC, U	D33	U3	U4	U8				
104	*Acraea (Actinote) hecqui*	Berger	1981	**F**		DC*	D32							
105	*Acraea (Actinote) pierre*	Berger	1981	**F**		DC*	D30							

HESPEROIDEA

HESPERIIDAE (SKIPPERS)

Pyrginae (Flats & Grizzled Skippers)

106	*Celaenorrhinus hecqui*	Berger	1976	**F**		DC*	D27					
107	*Celaenorrhinus kivuensis*	Joicey & Talbot	1921	**F**	> 1400	DC, U	D35	U3				

Hesperiinae (Grass Skippers)

108	*Metisella alticola*	Aurivillius	1925	**FH**	1200-2600	DC, R, U	Dx	R10	U3	U9		
109	*Astictopterus bruno*	Evans	1937	**O**		T*	T13	T16	T18			
110	*Parosmodes onza*	Evans	1956	**F**		U*	U3					
111	*Acleros neavei*	Evans	1937	**F**	< 1400	DC, T, U	D7	D40	Tx	U2	U11	
112	*Andronymus bjornstadi*	Congdon, et al.	1999	**F**	1100	T*	T30					
113	*Chondrolepis cynthia*	Evans	1936	**FH**	1200-2400	DC, U	D3	U3				
114	*Gretna bugoma*	Evans	1947	**F**		U*	U2					
115	*Platylesches fosta*	Evans	1937	**f**		T, U	T12	U7				
116	*Platylesches larseni*	Kielland	1992	**f**	1000	T*	T8					
117	*Zenonia crasta*	Evans	1937	**f**		B, DC, R, U	Bx	Dx	Rx	U3	U4	U9

9. Key

	Country
B	Burundi
DC	Democratic Rep. Congo
R	Rwanda
T	Tanzania
U	Uganda
Za	Zambia
*	National endemic

	Tanzania
T1	Chala
T2	Kahoko
T3	Gombe
T4	Ipumba
T5	Kampisa
T6	Kasoge
T7	Kasye
T8	Katuma river
T9	Kefu
T10	Kigoma
T11	Kungwe
T12	Lake Tanganyika shore
T13	Lindi river
T14	Longerengene
T15	Lubalizi
T16	Luluvia river
T17	Mahale
T18	Marungu
T19	Mbizi
T20	Mihumu
T21	Mishamu
T22	Mpanda
T23	Mukuyu
T24	Mweze
T25	Ntakatta
T26	Nyakanazi
T27	Sibwesa
T28	Sisaga
T29	Sitebi Mt
T30	Tubira
T31	Ufipa
T32	Usondo
T33	Uvinza
T34	Wanzizi
Tx	Unspecified locality

	DRC
D1	Aruwimi river
D2	Boga
D3	Bugoi
D4	Bukavu-Shabundo
D5	Djuga
D6	Irumu-Mawambwi-Beni
D7	Ituri
D8	Kahusha
D9	Kamuhima
D10	Kibali-Ituri
D11	Kisaba
D12	Kitembo
D13	Kivu
D14	Kivu Mts
D15	Kivu-Rwenzori
D16	Kwidjwe Island
D17	Lake Kivu
D18	Lesse
D19	Lowa valley
D20	Lower Batahu river
D21	Lubero-Mulo
D22	Makala
D23	Mambasa
D24	Maniema
D25	Masisi
D26	Mongbwalu
D27	Mt Hoyot
D28	Mt Kele
D29	Mt Muhi
D30	Mukandwe
D31	Mushari
D32	Musisi-Kahusi
D33	N. Kivu
D34	Nakele river
D35	Niragongo
D36	NW Kivu
D37	Nyamununye
D38	Rwenzori
D39	South Kivu
D40	Lake Tanganyika shores
D41	Uvira
Dx	Unspecified locality

	Rwanda
R1	Bugesera
R2	Karama
R3	Kisaba
R4	Mt Karissimbi
R5	Mt Sabinio
R6	Nyungwe
R7	Rugege
R8	Rugoge
R9	SW Rwanda
R10	Virunga
Rx	Unspecified locality

	Zambia
Z1	Kasama
Z2	Fwambo
Z3	NW Zambia

	Burundi
Bx	Unspecified locality

	Uganda
U1	Budongo
U2	Bugoma
U3	Bwindi*
U4	Echuya
U5	Kalinzu-Maramagambo
U6	Kasyoha-Kitomi
U7	Kibale*
U8	Mafuga
U9	Mt Rwenzori*
U10	Rwoho
U11	Semliki*
U12	Western Uganda

	Habitat Types
F	Forest dependent
FL	Lowland forest dependent
FH	Highland forest dependent
f	Forest non-dependent
O	Open habitats
OH	Highland open habitats

10. References

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Appendix 1. Gazetteer of localities for Tanzania and DRC

DRC		**Tanzania**	
Aruwimi river	Eastern Ituri	Chala	Ufipa, Rukwa region
Beni	North Kivu	Gombe	NP, Kigoma region
Boga	North of Beni	Ipumba	Mahale NP
Bugoi forest	East Kivu	Kampisa	Mahale NP
Bukavu-Shabundo	East Kivu	Kasoge	Mahale NP
Djuga	Eastern Ituri	Kasye	Kigoma region
Irumu-Mawambwi-Beni	Eastern Ituri	Katuma river	Mpanda region
Kahusha	Kivu	Kefu forest	Kigoma region
Kamuhima	Kivu	Kungwe	Mahale NP
Kibali	River in Ituri	Longerengene	Mpanda region
Kisaba	Kivu	Lubalizi forest	Kigoma region
Kitembo	Kivu	Luluvia river	Kigoma region
Kwidjwe Island	Lake Kivu	Marungu	Mpanda region
Lesse	Kivu	Mbizi	Ufipa, Rukwa region
Lowa valley	North Kivu	Mihumu	Kigoma region
Lower Batahu River	Semliki Valley	Mishamu	Mpanda region
Lubero-Mulo	North Kivu	Mukuyu	Kigoma region
Makala	North of Lake Edward	Mweze	Mahale NP
Mambasa	North Kivu	Ntakatta	Mpanda region
Maniema	North Kivu	Nyakanazi	Biharamulo district
Masisi	North west of Lake Kivu	Sibwesa	Mpanda region
Mongbwalu	East Ituri near Bunia	Sisaga	Mahale NP
Mt Hoyot	Ituri	Sitebi Mt	Mpanda region
Mt Kele	Kivu	Tubira	Kigoma region
Mt Muhi	Kivu	Ufipa	Rukwa region
Mukandwe	Ruwenzori	Usondo	55km south of Uvinza
Mushari	Kivu	Uvinza	Kigoma region
Musisi-Kahusi	South Kivu	Wanzizi	South east of Mahale
Nakele river	Masisi		
Niragongo	North East Kivu		
Nyamununye	Kivu		
Uvira	South Kivu		