

**PLATYCYPHA CALIGATA (SELYS) AND A NEW LACUSTRINE
MORPH (ODONATA : CHLOROCYPHIDAE)**

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African Chlorocyphidae have hitherto been regarded as fluvial species, inhabiting streams or rivers in shaded surroundings. Populations of *Platycypha caligata* have recently been found on Lake Malawi adapted to lacustrine shade conditions. Morphological differences in the adult from typical material are slight but definite. A specimen collected from the lake shore nineteen years previously also shows the peculiarities of this lacustrine material, adding confirmation. Both subspecies of *caligata* are examined for comparisons. The new lake form is named *P. c. caligata* morph *lacus* nov.

An additional note is that the original reference normally quoted as 1928 for Fraser's genus *Chlorocypha* should be amended to 1934. A gazetteer is included.

INTRODUCTION

The nominotypical subspecies of *Platycypha caligata* is locally common and widely distributed between the South African Cape Province and equatorial Africa. The other subspecies, *angolensis*, is now known from several localities, but all in Angola.

Measurements for the two sexes in SELYS' original description (1853) of *caligata* were:

♂ abd. 22 mm, hindw. 23 mm; ♀ abd. 20 mm, hindw. 26 mm

This indicates that, as usual in this family, the female is normally larger in wing expanse, and shorter in abdomen. The male tibiae were said to be very dilated, outer surface red, inner surface white. This shows that the male described was mature, since in the immature condition the expansion is yellow.

Two of the characteristics of the genus *Platycypha* are firstly, like other Chlorocyphidae, they inhabit running streams or rivers under shade, and secondly, in this genus, the male tibiae are brightly

coloured and usually expanded. In at least some species of the genus the coloured tibiae are known to be employed in a courtship display, as will be briefly mentioned later.

It will further be realized that, in this paper, individual size in both sexes is an important consideration in relation to their ecology, and the width of the male tibial expansion must also be discussed in this aspect.

Size measurements for Odonata are conveniently recorded in terms of length of abdomen and of hindwing in both sexes. If the hind wings are both damaged or lost the forewing is employed since, except in the equatorial *Sapho* Selys of African Zygoptera, the fore- and hindwings are very similar. It is only necessary to state which wing has been measured.

For the present purpose, with only one species under consideration, it will be quite adequate to measure only the hindwing. This is a more reliable measurement than the abdomen, which may be subject, in dried material to slight distortions or occasional tendencies to segmental concertinaing at the folds. Moreover, odonatists frequently incorporate superior anal appendages into the abdominal length, generally without stating this. These appendages themselves exhibit considerable specific differences in some genera and they are not an integral part of the existing segmentation. Consequently, I have always excluded these posterior appendages in all of my specific descriptions.

In the comparative Table given here, hindwing measurements in millimetres are recorded for examples of *P. caligata* selected from a large number of localities.

SOME TAXONOMIC NOTES

SELYS' description of *caligata* was given in 1853 under the genus *Libellago* Selys (1840) from Port Natal, later known as Durban. He did not state the number of specimens of each sex available, nor were the types designated. His examples were from the collections of the British Museum (Natural History) and Stockholm Museum. The Selys collection in Brussels was also found to have a series of undesiguated males, when I examined the collection in 1964.

The African members of the genus were transferred from *Libellago* Selys, essentially an Oriental genus, to *Chlorocypha*. FRASER first used this name in 1928 and this date has since been accepted as the date of description. However, the name *Chlorocypha* was only mentioned briefly on page 684 of that paper without any description and

in order to find FRASER's first valid reference it is necessary to consult his dragonfly volume II of Fauna of British India (1934), page 55. The date for *Chlorocypha* should therefore be amended to 1934.

In the numerous species of typical *Chlorocypha*, however, the male tibiae are not expanded. They are either all black, or else black with the anterior surface white, cream or pruinose white. Consequently, FRASER erected the genus *Platycypha* in 1949 for species like *caligata* in which the tibiae are brightly coloured and expanded in the male. A survey of the African species of the whole family was made by PINHEY (1967), in which all known species of these two genera, as well as the equatorial one *Africocypha* Pinhey (1961), were all enumerated and distinguished. It was then found necessary to modify the diagnosis for *Platycypha*, since in certain species the male tibiae are brightly coloured but not expanded. Tibial expansion was not, therefore, a criterion for *Platycypha*.

The second subspecies of *P. caligata* was described by LONGFIELD from Angola in 1959 as *angolense* (corrected to *angolensis* by PINHEY, 1975). It was from a solitary male collected in Ongueria in the Sa da Bandeira region of south west Angola. Hungueria, another spelling for the same place, is the locality for several of the Angola examples in the National Museum, recorded in Table I. This subspecies evidently ranges widely over the territory (PINHEY, 1975).

ECOLOGY

It has already been indicated that the brightly coloured vermilion (or scarlet) and white tibiae of male *caligata* have been observed in use during courtship displays. A number of observers have witnessed these starting with POULTON (1928). The display does not always, however, take place in the course of mating, possibly in crowded circumstances when there is too much competition (PINHEY, 1968). This point suggests that the evolution of coloured tibiae is more recent than the plain tibiae of true *Chlorocypha*.

Hitherto, it has been found that African Chlorocyphidae inhabit well-shaded streams or rivers which have a steady, often a swift current. Some generally prefer rocky or stony streams and *P. caligata* is one of these. Many others, in all three genera, are found in thick bush or forest over muddy, alluvial streams. In the few cases where larvae have been discovered, these are naturally in waters similar to those where the adults are found.

Wilson, at Senga Bay, has kindly and, I may say, enthusiastically sent many large consignments of Odonata, as well as Lepidoptera and

Table I

Platycypha caligata (Selys), measurements of the length of male and female hindwings and of male hindtibiae of specimens belonging to different populations (all measurements in mm)

Locality	Males			Hindtibia	Females	
	No.	Range	Average		No.	Hindwing
<i>caligata caligata</i>						
UGANDA						
Kigezi forest	2	21,5-22	21,7			
KENYA						
Kibwezi	1	21,5	21,5			
Mbuyuni	1	22	22		1	24
ZAIRE						
Kasongo	1	21,5	21,5			
(Shaba) Fizi	1	21,5	21,5		1	24
river nr Albertville	1	22	22		1	25
TANZANIA						
nr Manyara (end of lake)	1	22,5	22,5			
Morogoro					1	24
Lindi (? on river)	1	20,5	20,5		2	22; 24
ZAMBIA						
Mwinilunga Prov.	3	21-21,5	21,3		1	23,5
Chingola	6	21-21,5	21,4		2	24; 24,5
Ndola	4	21-22	21,5			
Kapiri Mposhi area	3	20,5-22	21,3	0,8		
Mufulira	1	22,3	22,3			
Kalungwishi River (nr Kabwel- uma Falls)	5	21-21,5	21,4			
Katombora rapids					1	22
Kasempa	1	21	21			
"Lake" Kashiba	1	21	21	0,8		
Mosi-oa-Tunya (Victoria Falls)					2	22; 23,5
MALAWI						
Rumphu (Kasitu River)	4	20-21	20,7		1	23
S. Nkhata Bay	5	21-22	21,5		1	24,5
Vipya escarp. (Kasitu River)	1	21	21		1	23,5
Mua	7	20-22	21	0,8	2	23,5; 25
Bua River	7	20-21	20,3	0,8	2	23,5; 23,5
Cholo	4	21-21,5	21		2	23,5; 25
Zomba	1	21,5	21,5		1	24
Mwanza (Lake Malawi)					1	23,5
Cape Maclear (R.C. Wood)	1	18	18	0,5		
Kambiri Point (Wilson)	3	18,5-19	18,7	0,5	2	20; 20
Mbenje Island (J. Wilson)	6	18-18,5	18,2	0,5	7	20; 20,5 21(4); 21,5

Locality	No.	Males		Hindtibia	Females	
		Range	Average		No.	Hindwing
NORTH MOÇAMBIQUE						
Vila Junqueiro (fast mountain stream)	2	20-21	20,9		2	23; 24,5
Molumbo	2	20,7-21	20,9		2	23; 24
Mocuba					1	23
Errego	3	20-21	20,5			
Mt. Milange	2	21-21,5	21,2		1	25,5
CAPRIVI STRIP						
Andara	2	20-20,5	20,2			
Popa rapids	1	21	21			
ZIMBABWE						
Victoria Falls						Supra
Penhalonga	4	20-22	21,2	0,6	1	25
Vumba Mountains	1	21	21		1	23
Burmah Valley	1	22	22		1	24
Bazeley Bridge	1	21,5	21,5	0,6	1	24,5
Melsetter district	3	20-21	20,7		1	24,5
Cashel, Thaba N'chu	1	22	22		1	25,5
Bindura	1	22	22			
Bikita	5	(20,5) -22	(21,7),22			
Chisumbanje (Sabi)	1	20,5	20,5			
Chitrapadzi (Limpopo)	1	21	21			
Belingwe	2	20,5-21	20,7			
Fort Victoria	1	20,5	20,5			
Que Que	1	21	21			
Mazoe	1	21	21		2	22; 23
Sawmills	1	21,5	21,5			
Umgusa River, Bulawayo	1	21	21			
Essexvale	1	21,5	21,5			
Stapleford	1	22	22			
SOUTH MOÇAMBIQUE						
Mount Gorongoza	1	21	21			
Vila Paiva d'Andrada	1	21,5	21,5			
Mussapa River	1	20	20	0,7		
Moribane	1	21	21			
TRANSVAAL						
Louis Trichardt to Entabeni	6	21-22	21,5		2	23; 24,5
Wylie's Poort	2	21	21		1	24
Krugersdorp	2	21,5-22	21,7	0,7		
Nelspruit					1	24
Vereeniging	1	21,5	21,5			
SWAZILAND						
Mantengu Falls	2	21	21			
NATAL (& ZULULAND)						
Hluhluwe					1	24
Nsuzi Valley	1	22	22			
Nqutu	1	22	22			

Locality	Males			Hindtibia	Females	
	No.	Range	Average		No.	Hindwing
Ladysmith					1	24
Nkandhla	1	21	21	0,8	1	23,5
Port Edward	1	22,5	22,5			
TRANSKEI						
Mapuzi River	1	21	21	0,5		
NORTH CAPE						
Vaalhart's Weir	1	21	21			
EAST CAPE						
East London					1	26
<i>caligata angolensis</i>						
ANGOLA						
Duque de Braganz Falls	1	22	22			
Zuimbango River	4	21-22	21,5			
Lucala	1	21	21	0,8	2	22,5; 23
Hungueria				0,8(6)	2	25,5; 26
Bandeira	9	21-23,5	23			
Total number of specimens	150			45	58	

other insects from Malawi, during the past two years. The Odonata have greatly augmented the Malawi check-list (PINHEY, 1966) and were one of the causes of a supplementary paper (1979), which has again overflowed with new records.

In his consignment of April, 1980, there were both sexes of a small *Platycypha* collected at Kambiri Point at the southern end of Senga Bay. The three males seemed at first to have unusual but rather consistent markings near the base of the abdomen, which at first sight suggested the possibility of a new taxon closely allied to *caligata*. Further examination and the receipt of more material, as well as photographs of living specimens, showed that these markings were only post-mortem discoloration changes. I had long expected a new member of the Chlorocyphidae from Malawi, a country suited by its montane forests to the ecology of this family. Apart from *P. caligata*, only a single species of *Chlorocypha* is known there, although neighbouring Zambia, with much less montane topography, has so far produced two species of *Platycypha* and three of *Chlorocypha*.

A map of Lake Malawi showed no river or stream at Kambiri Point. On enquiry, Wilson replied that there was, in fact, no river there and that the *Platycypha* were all taken at a point on the lake

where there were suitable conditions of rock and shade. Although the species concerned was *P. caligata* and not a new taxon, the fact that it occurred in numbers on the rocky shore, far from any fluvial conditions, was in itself quite remarkable. It indicated a distinctive change in ecology.

Later, Wilson sent another series of both sexes collected at an island, situated about 20 km out in the lake to the north-east of Senge which is at the northern end of the bay. Wilson, who by now was well acquainted with the normal habits of typical *caligata*, confirmed that these lake populations had become adapted to lacustrine conditions and behaviour. It was evident that these atypical lake breeders had become modified, at least in adult and larval biology and behaviour, if not in morphology, by adaptation to intermittent wave motion in place of the steady currents of rivers.

In correspondence, Wilson supplied some details of the general habitats. Kambiri Point, where the earlier specimens were collected, has rocks, sand and reeds; also "rather lush vegetation" including *Acacia albida*, an *Albizia* and the Baobab, *Adansonia digitata*. The first example of the *Platycypha* was a female on 18th November, 1979, but when this was sent to Bulawayo I merely recorded this as *P. caligata* without comment. The next specimens were of both sexes from Kambiri Point collected on 24th February and 16th April, 1980. Then, on 8th May the longer series was discovered on Mbenje Island out in the lake. In a letter dated 17th April, 1980, he recorded further impressions: "This species is clearly adapted to living in the lake but retains its preference for rocks and shade, both found at Kambiri, but not very widespread on the shore of Lake Malawi, much of which is sand, and the rest swamp. Kambiri is a rather exposed point to the north of a hill in a part of the lakeshore characterized by large rocks and overhanging shade but a fairly wave-washed part of the shore." After visiting Mbenje Island he noted further that there were numerous specimens of both sexes in the same type of habitat, an exposed rocky shore with dense vegetation. There were "no streams whatever on Mbenje Island."

To the naked eye it was apparent that all Wilson's lake specimens, both sexes, were smaller individually than normal. It was also noticed that the tibial expansions were definitely narrower than usual.

Examination showed that in other respects the lake population did not differ in morphology from *Platycypha caligata*. Large numbers of males out of the general collection were examined from many parts of Africa and the wing-lengths measured (Table I). It was discovered that

a single male collected by the late R.C. Wood was also taken on the lake shore at Cape Maclear as long ago as 4th August 1961. At the time I had merely considered it to be a small individual of *caligata*, but from the present investigation it soon transpired that this example was quite similar to Wilson's lacustrine population in adult characters. This was useful supplementary evidence.

COMPARISONS OF FLUVIAL AND LACUSTRINE POPULATIONS

Table I gives the ranges and mean sizes for a total of 150 males from a wide selection of localities, from Cape Province to Uganda. Hindwing measurements are given for nominotypical *caligata*, and a small number also for the Angola race *angolensis*.

SELYS, as shown above, recorded a length of 23 mm for the hindwing of a male from Durban. From the sizes given in the table, it seems that this may have been unusually large. Our Natal examples have a range from 21 to 22,5 mm. It is quite clear from the table that Malawi lake-shore or insular populations record a constantly lower size, 18 to 19 mm, than all the others, with an average nearer 18 mm. Terrestrial populations, breeding in streams or rivers, have an average of 21 mm, varying from 20 to 22, rarely 22,5 mm, except in the Hungueria series of subsp. *angolensis*. This topotypical Angola series varies from 21 to 23,5 mm, but an individual analysis is pertinent:

1 ♂ = 21 mm, 2 ♂ = 22,5 mm, 6 ♂ = 23 - 23,5 mm.

This suggests that male *caligata angolensis* from this montane region are unusually large on average.

Incidentally, amongst the Zimbabwe series one of the Bikita values (20,5) is bracketed. This is because the measurement is for a single male, the other four are each 22 mm, the overall average being 21,7 mm.

In column 4, 45 males, selected from both subspecies were compared for tibial expansion, the hind tibiae measured transversely across the middle. In *Platycypha* the hindleg, or this and the mesothoracic leg, show more expansion than the foreleg in species which have expanded tibiae.

It is obvious that there is some variation in maximum width of hind tibiae, from 0,6 to 0,8 mm for fluvial populations, but with a single Transkei example having the low value of 0,5, which is the same value as the narrow tibiae for all the Malawi lake males. The hindwing of this specimen, however, measures 21 mm; considerably above the

largest specimen of the lake morph, and well into the range of the riverine forms. Widest expansions in the series were from streams or rivers of Zambia, Malawi, Natal and Angola.

The results show that there is a strong tendency for lake breeders to have narrower tibiae in the males but that this is a variable factor and riverine populations can also sometimes have narrow tibiae. Perhaps further investigation might show a more definite relationship between habitat and male tibiae.

The last column gives hindwing lengths of 58 females from a similarly wide range to that for the males. Their size is, of course, larger than for males, as indicated earlier. The usual size is about 23 to 24 mm for fluvials, with an East London example measuring 26 mm. This compares with Selys' Durban female. Again, the Hungarian examples of subspecies *angolensis* are distinctly large, 25 - 26 mm, as in the males. For the Malawi lake-bred lacustrines, however, the wing-size varies from 20 to 21,5 mm, with an average of 20,9 mm. This, like the male, is distinctly lower than for fluvials.

No other difference between fluvial and lacustrine populations have been found, except that female cerci in Kambiri and Mbenje specimens vary in thickness.

Before concluding the comparisons it is necessary to point out that lake-breeding Chlorocyphidae have not to my knowledge been recorded elsewhere in Africa except these from Malawi. There is a species of *Platycypha* which was actually named *lacustris* by FORSTER in 1914 from Entebbe on the northern shore of the huge Lake Victoria. *P. lacustris* is a true forest species, in my experience, found over muddy forest streams in many parts of Uganda and elsewhere but only in forests. Although the forest nearly reached the lake-shore on my visits to Entebbe in the early 1950s I only found *lacustris* in forest surroundings and I do not think it likely that it would have flown out over the open lake at Entebbe.

In the Table there is a record of a single Zambian male *caligata* said to have been collected at Lake Kashiba. From searches conducted on maps it appeared to be a very small lake, unlikely to be disturbed by distinct wave action. This male is a typical *caligata* and I suspect its actual capture might have been on a stream near the lake.

Alan Heath (6th August 1980) provided a detailed answer to this problem. There appears to be more than one small lake by this name in northern or central Zambia and the word Kashiba in Bemba tongue just means "small lake". The Lake Kashiba in question is in the Mpongwe area, 50-70 km southwest of Luanshya (according to Heath, from memory). It lies in a limestone formation, in flat ter-

rain, the surface smooth, only rippled by strong winds. It has no surface outlet or drainage, but there are subterranean sources, resulting in seasonal rising of the water level. The lake is deep, probably over 70 m in parts, and about 250 m in diameter. The lake is in miombo woodlands, with a few trees and shrubs near the lake.

The edges of the lake are built steeply of large rocks and the surface itself shows little or no aquatic vegetation, only traces of scum. This description seems quite unfavourable to any *Platycypha caligata*, even the lacustrine morph, particularly in its quiet, unshaded surface and great depth.

However, Heath said that about 500-600 m away there is a mshitu or heavily wooded stream, which has to be passed on a rustic bridge by anyone before visiting the lake; with dry bush in between. It is to this mshitu that entomologists have normally confined their insect collecting. This would seem to be an ideal place for the single record of *caligata* from the locality vaguely called "Lake Kashiba". Heath remarked that "any records from Lake Kashiba, Mpongwe, would almost certainly not be distinguished from this locality," i.e. the mshitu.

DESCRIPTION OF LAKE MORPH

PLATYCYPHA CALIGATA CALIGATA (Selys) morph *LACUS* nov. (or "of a lake")

H o l o t y p e, mature ♂ (Mbenje Island). Face and head all jet black; except for the usual blue-green occipital fascia, excised laterally, and produced anteriorly on vertex between ocelli and orbits.

Thorax black with normal green to bluish patterns, somewhat stained brown from post-mortem changes: prothorax with anterior collar, posterior lobe and lateral fasciae on middle lobe all of this pale tint. Synthorax black in upper half with greener pale markings of normal form including the mid-dorsal carinal line and "fish-hook" on mesepisternum; sides mainly pale, with short black line on first suture, a broad continuous band on second suture and a slender curved line on mesepimeron. Sternites pale, with black transverse bars.

Femora black. Expanded tibiae white anteriorly, vermilion posteriorly.

Venation and pterostigma black; a trace of basal amber. Forewing with 10 Ax, 15-16 Px. Quadrilaterals all with one cross-vein.

Abdominal segment 1 red with black dorsal band: 2-4 black dorsally, enclosing the usual paired blue central fasciae, red laterally. Segments 5-10 pale blue, finely edged with black, segment 5 with thick black fused posterior capstans.

Anal appendages black and typical.

Abd. (without appendages) 17 mm, hindw. 18,5 mm.

P a r a t y p e ♂ similar but in one example the curved greenish line on mesepimeron is broken at dorsal end on both sides.

A l l o t y p e ♀ mature (Mbenje Island). Typical in markings.

Abd. 15,5 mm, hindw. 21 mm.

P a r a t y p e ♀ similar. Very slight variation in thickness of cerci.

CONCLUSIONS

The survey has shown that the lake material of *Platycypha caligata caligata* collected by R.C. Wood and J.G.M. Wilson represents a distinctive, small lacustrine morph adapted to wave motion instead of a steady river current. This morph is distinctly smaller in both sexes than typical *caligata* and tends to have narrow tibiae in the male. Inconsistencies in values for tibial expansions in *caligata* may be a further sign of recent origin. This is, perhaps, emphasized by the fact that in certain species of *Platycypha* the male tibiae are not expanded at all, as mentioned in the taxonomic notes.

It may be surmised that lake-shore or insular colonies may have started sometime in the past when ovipositing females found quiet lakeshore pools or channels under shady branches which suited their purpose. Some larvae survived in the new conditions. Perhaps the apparently uniform small adult size is due to the altered aquatic conditions which eventually resulted in new mutants. It seems less likely that food availability or its capture is less than in fluvial conditions causing a rather constant tendency to dwarfness of adults. Lake Malawi is known to be rich in food value (FRYER & ILES, 1972).

The range of localities in the comparative Table is very similar to the general distribution of *P. caligata*:

Subsp. *caligata*, eastern and northern Cape, Transkei and Natal; Swaziland, Transvaal and southern Moçambique to Zimbabwe; northern Moçambique, Malawi, Zambia to Shaba (Katanga); Zaire, Tanzania, Kenya and Uganda.

No examples are at present available from Botswana, but we have found it in the Chobe region in north-east of that territory.

Lacustrine morph *lacus*, type series:

Cape Maclear, 1 ♂, 4 Aug. 1961 (R.C. Wood):

Kambiri Point 1 ♀, 18 Nov. 1979, 2 ♂, 24 Febr. 1980, 1 ♂

1 ♀, 16 Apr 1980; Mbenje Island, 6 ♂ (including holotype)

7 ♀, 8 May 1980 (all J.G.M. Wilson).

Subsp. *angolensis*, from S.W. Angola northwards to the Lucala River of northern Angola.

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GAZETTEER

Abbreviations: A. = Angola; Cape = Cape Province; C.S. = Caprivi strip; K. = Kenya; Ma. = Malawi; MoN, MoS. = Moçambique (North or South); N. = Natal; S. = Swaziland; Ta. = Tanzania; Tk. = Transkei; Tv. = Transvaal; U. = Uganda; Zai. = Zaire; Zam. = Zambia; Zim. = Zimbabwe

Albertville	Zai	6° 0'S, 29°10'E	Bazeley bridge	Zim	19°20'S, 32°33'E
Andara	C.S	18°10'S, 21°11'E	Belingwe	Zim	20°29'S, 29°52'E
			Bikita	Zim	20° 6'S, 31°38'E

Bindura	Zim	17°16'S, 31°12'E	Mbenje Isl.	Ma	13°26'S, 34°30'E
Braganz Falls	A	9° 3'S, 16° 0'E	Mocuba	MoN	16°59'S, 36°59'E
Bua river	Ma	12°40'S, 34°25'E	Molumbo	MoN	15°36'S, 36°25'E
Burmah Valley	Zim	19° 3'S, 32°45'E	Moribane	MoS	19°55'S, 33°25'E
Cape Maclear	Ma	14° 5'S, 34°55'E	Mosi-oa-Tunya	Zam	17°50'S, 25°50'E
Cashel	Zim	19°35'S, 32°47'E	Mount Gorongoza	MoS	18°25'S, 34° 0'E
Chingola	Zam	12°31'S, 27°50'E	Mount Milange	MoN	16° 3'S, 36°15'E
Chisumbanje	Zim	20°47'S, 32°15'E	Mua	Ma	14°15'S, 35°20'E
Chiturapadzi	Zim	22°15'S, 30°55'E	Mufulira	Zam	12°30'S, 28°15'E
Cholo	Ma	16° 0'S, 35° 5'E	Mussapa river	MoS	19°33'S, 32°45'E
East London	Cape	33° 1'S, 27°55'E	Mwanza	Ma	15°32'S, 34°29'E
Entabeni forest	Tv	23°30'S, 0°15'E	Mwinilunga Prov.	Zam	11° 0'S, 24° 0'E
Errego	MoN	16° 20'S, 37°15'E		to	11°40'S, 25°12'E
Essexvale	Zim	20°16'S, 28°45'E	Ndola	Zam	13° 0'S, 28°33'E
Fizi	Zai	4°14'S, 28°58'E	Nelspruit	Tv	25°27'S, 30°58'E
Fort Victoria	Zim	20° 0'S, 30°58'E	Nkandhla	N	28°37'S, 31° 6'E
Hluhluwe	N	28° 2'S, 32°15'E	Nkhata Bay	Ma	11°31'S, 34°14'E
Hungueria	A	15°20'S, 13°40'E	Nqutu	N	28°14'S, 30°40'E
Kalungwishi river	Zam	9° 2'S, 29° 0'E	Nsuzi(e)	N	28°30'S, 30°57'E
Kambiri Point	Ma	13°55'S, 34°33'E	Ongueria	A	15°20'S, 13°40'E
Kapiri M'poshi	Zam	13°58'S, 28°43'E	Penhalonga	Zim	18°59'S, 32°30'E
Kasempa	Zam	13°20'S, 25°44'E	Popa Falls Bagani	C.S	18°59'S, 21°30'E
Kasongo	Zai	4°31'S, 26°34'E	Port Edward	N	31° 2'S, 30°13'E
Kibwezi	K	2°24'S, 37°57'E	Que Que	Zim	19° 0'S, 29°45'E
Kigezi forest	U	1°20'S, 29°40'E	Rumphi	Ma	11° 0'S, 33°47'E
Krugersdorp	Tv	26° 7'S, 27°45'E	Sawmills	Zim	19°29'S, 28° 3'E
Ladysmith	N	28°34'S, 29°46'E	Umgusa river	Zim	20° 3'S, 28°22'E
Lake Kashiba			Vaalhart's Weir ca	Cape	28° 7'S, 24°30'E
Mpongwe	Zam	13°27'S, 27°55'E	Vereeniging	Tv	26°40'S, 27°53'E
Lindi	Ta	9°59'S, 39°35'E	Victoria Falls	Zim	17°50'S, 25°50'E
Louis Trichardt	Tv	23° 0'S, 29°55'E	Vila Junqueiro	MoN	15°35'S, 37° 0'E
Lucala	A	7°15'S, 15°12'E	Vila Paiva		
Mantengu Falls	S	26°18'S, 31° 7'E	d'Andrada	MoS	18°35'S, 34°20'E
Manyara	Ta	3°30'S, 35°50'E	Vipya escarp. ca	Ma	11°50'S, 33°30'E
Mapuzi river	Tk	31°56'S, 29°14'E	Vumba Mts	Zim	19° 3'S, 33° 0'E
Mazoe	Zim	17°30'S, 30°58'E	to	19°12'S, 32°13'E	
Mbuyuni	K	3°25'S, 37°57'E	Wylie's Poort	Tv	22°53'S, 29°56'E
Melsetter distr.	Zim	19°34'S, 32°40'E	Zomba	Ma	15°26'S, 35°15'E
	to	20°20'S, 32°50'E	Zuimbango river ca	A	10° 0'S, 18°20'E