

THE GAMBIA: ADDITIONS TO THE LIST OF ODONATA, AND FURTHER DISTRIBUTION RECORDS.

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Abstract

As a result of the British Dragonfly Society visit to The Gambia in Oct/Nov 1996, 13 species of Odonata were added to the 62 previously recorded, and distribution records of species increased by over 60%.

Introduction

In Gambles et al. (1995), a list of 62 species and specimens of two other genera of dragonflies recorded in The Gambia up to the end of 1989, and their known distribution, was published. Most of the records were from within 50 km of the coast.

From 26 October to 7 November 1996 a small party from the British Dragonfly Society (BDS) visited The Gambia with the aim of filling in some of the gaps in the known distribution records, especially up-river, and to look for species previously unrecorded in the country. The rainy season usually lasts until the end of October, but in 1996 the rains were not only less than normal, but they also finished early. As a result, the country was drier than was to be expected, and many ricefields and watercourses contained little or no water. Whereas the sites visited by the previous BDS party in 1989 were mainly ricefields, on this occasion the party concentrated on other habitats.

After two days at Banjul, the party went 60 km up-river to Kemoto in the Kiang West National Park. As the country was so dry, only one night was spent here, followed by five at Georgetown on MacCarthy Island, another 150 km eastwards. This was used as a base for surveys in the Central Sector and, in the Upper Sector, to beyond Fatoto and nearly to the Senegal frontier, an area not previously visited by odonatologists, some 420 km by road and track from Banjul. The return journey from Georgetown was via the north bank and the Farafenni ferry on the Senegambia Highway, then Tendaba Camp on the river about 30 km west; with the final three days in the coastal area. The principal sites visited are listed below. The 10 km squares are numbered arbitrarily as in Gambles et al. (1995) (Fig. 1); also shown is the division of the country into three sectors.

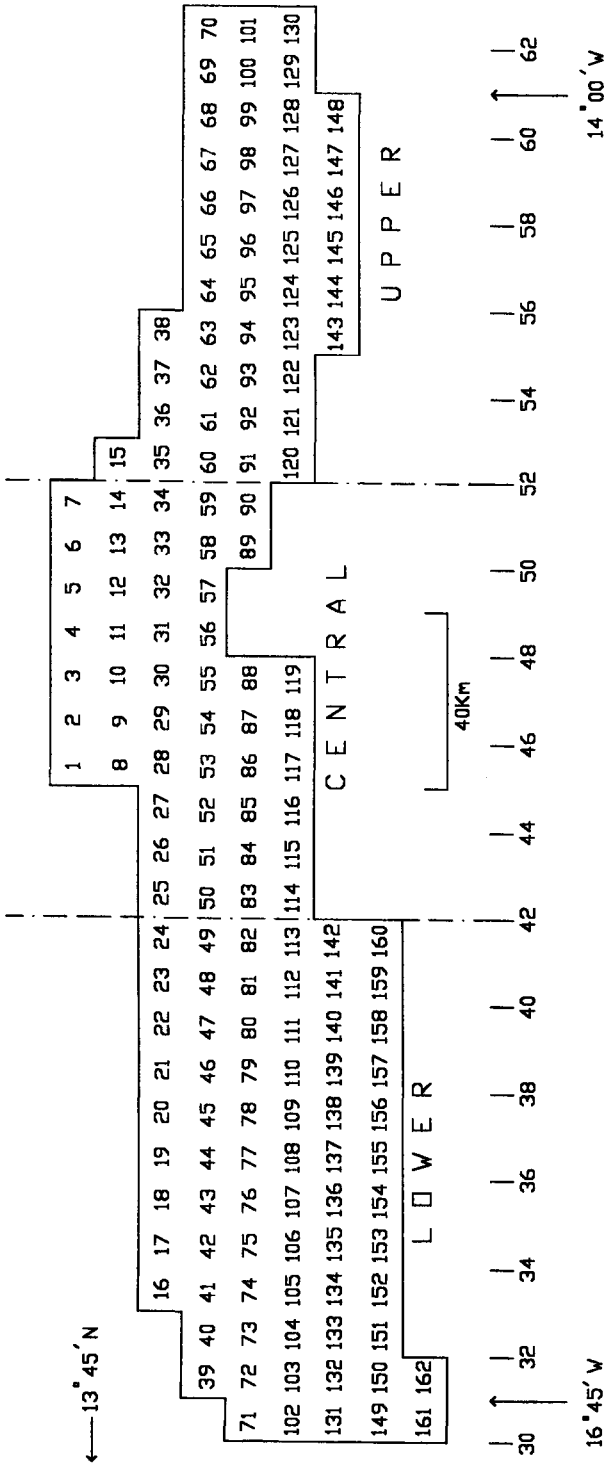


Figure 1. The Gambia. Arbitrarily numbered 10 km squares plotted against U.T.M. Zone 28 grid.

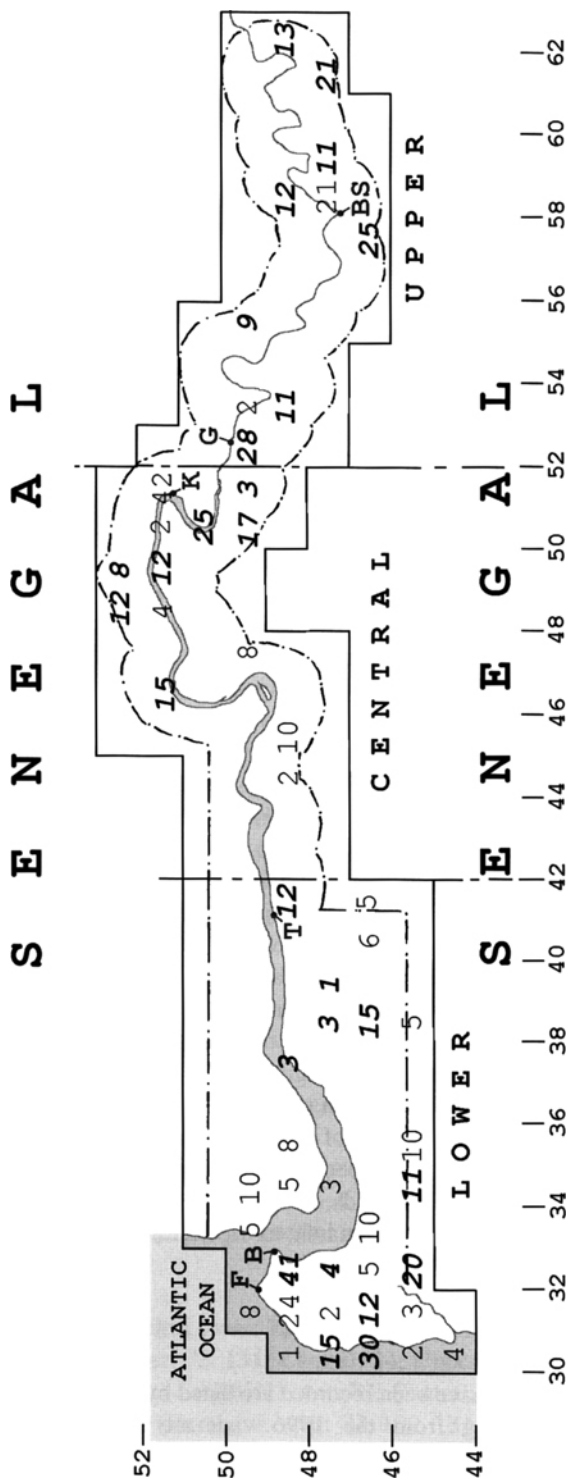


Figure 2. The Gambia. National boundaries, course of river, principal towns (B=Banjul, - BS=Basse Sante Su, - F=Fajara, - G=Georgetown, - K=Kuntaur, - T=Tendaba), and division into sectors; together with number of species of Odonata recorded in each 10 km square. Bold type indicates square visited in 1996; normal, square only visited prior to 1996.

Localities.

For each locality is given the date first visited, the square number, followed by the grid reference, site name and description. Square numbers in bold are those for which there were no previous records.

- 26 Oct. 151. 321459; San Pedro Bridge; small slow-flowing stream, backwaters.
 132. 312468; Jambanjali; spoil pit, now an unclean waterhole.
 102. 309477; Tanji; narrow pools for c.300 m. in stream bed.
- 27 Oct. 73. 321481; Abuko Nature Reserve; crocodile pool in riverine forest.
 73. 321489; Camaloo Corner; ricefields on edge of brackish area.
- 28 Oct. 153. 349478; Sutu Sinjang; ricefields.
- 28 Oct. **139.** 380461; Kambong; ricefields.
111. 409475; Kiang Waterhole; dirty pond.
110. 382477; Manduar-West; dried-up ricefields.
78. 376484; Kemoto; swimming pool and ricefields.
- 29 Oct. **12.** 495511; Kundang; extensive flooded area; water-lilies, grass etc.
 60. 525495; Georgetown; ferry, river banks.
 60. 527496; Georgetown East; disused irrigation system.
- 30 Oct. **129.** 615479; Kusun; roadside stop, savannah.
101. 621482; Fatoto; large lagoon, surrounded by savannah.
129. 611477; Shima Simoo Bolon; fairly fast-flowing muddy stream.
127. 591472; Chamoi Bridge; slow-flowing muddy river.
- 31 Oct. **59.** 511498; Sapu Rice Scheme, East; river bank.
 58. 505498; Sapu Rice Scheme, South; ricefields and shallow pool
 33. 504500; Sapu Rice Scheme, North; irrigation ditches, 4 -5 m. wide.
 92. 538483; Bantanto, East of Bansang; muddy pool, high bunds, ricefields.
- 1 Nov. **145.** 574470; Sankuti Bolon; clear stream through rough meadows, trees.
- 2 Nov. **63.** 511498; Sami Wharf Town; wide muddy river, 30-40m. across.
97. 581483; Tuba Kuta Bolon; small muddy stagnant stream.
97. 583484; Yarobawal Road; roadside stop, savannah scrub and grass.
- 3 Nov. 14. 515511; Pallan Mandinka; large lagoons.
5. 498524; Nainimaron Bolon; large open lagoons, part of river.
 4. 485528; Patta Bolon; large lagoons with much Typha.
 9. 463514; Kau-Ur, West; large expanse of mud with some pools.
- 4 Nov. 82. 514483; Tendaba Airfield; shallow pool amidst grass.
 141. 406463; Arongkoli Kunda; ricefields.
- 6 Nov. 131. 307466; Sanyang Banko; shallow marsh, ex-ricefield.

Results

The 10 km squares in which species have been recorded are listed by sectors. New species and new square records emanating from the 1996 visit are in bold letters and figures.

LESTIDAE

Lestes ochraceus Selys: Lower: 39, 73

L. pallidus Rambur: Lower: 39, **132**, 133, **151**, 161; Central: 9; Upper: 126

PROTONEURIDAE

Elattoneura nigra Kimmins: Central: 33; Upper: 126

PLATYCNEMIDAE

Mesocnemis dupuyi Legrand: Central: 33; Upper: 126

Platycnemis congolensis Martin: Lower: 73

P. sikassoensis (Martin): Lower: 73; Central: 14; Upper: 126

COENAGRIONIDAE

Aciagrion attenuatum Fraser: Lower: 73, 142

Agriocnemis exilis Selys: Central: 14, 33; Upper: 126

A. maclachlani Selys: Lower: 73; Central: 14

A. victoria Fraser: Lower: 73; Upper: 126

A. zerafica Le Roi: Lower: 73, 150, **151**; Central: 14, **33**, 58; Upper: 60, **101**, **127**

Ceriagrion glabrum (Burm.): Lower: 42, 72, 73, 76, 82, 102, 106, 131, 134, **139**, 141, 150, 151, 154; Central: 86; Upper: **92**

C. moorei Longfield: Lower: 73, **102**, 132, **151**, **153**; Central: 4, 9, **12**, 14, 33; Upper: 60, 61, **101**

C. suave Ris: Lower: **131**, **151**; Central: **58**, **59**; Upper: **60**, **63**, **101**, **127**, **129**, **145**

Enallagma vansomereni Pinhey: Lower: 72, **131**

Ischnura senegalensis (Rambur): Lower: 39, 72, 73, **82**, 102, 131, 142, **151**, **153**, 161; Central: **5**, **9**, **12**, 14, 55, **58**, 82, 86; Upper: 60, **63**, **92**, **101**, **129**, **145**.

Pseudagrion angelicum Fraser: Lower: 73

P. glaucescens Selys: Upper: **129**

P. hamoni Fraser: Lower: **131**, **139**; Central: 14; Upper: 60, **129**, **145**

P. nubicum Selys: Central: 14, 33, 58; Upper: 60, 126, **129**

P. sjoestedti nigeriense Gambles: Lower: **139**; Central: 14; Upper: 60, 126, **129**

P. sublacteum (= pseudomassicum Pinhey): Upper: **129**, **145**

P. sudanicum Le Roi: Upper: 126, **145**

GOMPHIDAE

Gomphidia sp.: Central: 13

Neurogomphus featheri Pinhey: Upper: **92**

Neurogomphus sp. (? *featheri* Pinhey): Central: 13, 33; Upper: 60

Phyllogomphus aethiops Selys: coastal region (exact locality unrecorded)

AESHNIDAE

Anax imperator Leach: Lower: **73**, **131**, **151**; Central: **33**; Upper: **145**

A. tristis Hagen: Lower: 73, **131**; Central: 14; Upper: 92

Heliaeschna lanceolata Le Roi: Lower: 73; Central: 14

Hemianax ephippiger (Burm.): Lower: **73**, 102, 131, 151; Central: **5**, 14, **33**, 55

CORDULIIDAE

Macromia bifasciata (Martin): Central: 1,14

LIBELLULIDAE

Aethriamanta rezia Kirby: Lower: **139**; Central: 14, 33

Acisoma panorpoides inflatum Selys: Lower: 42, 72, 73, 76, **82, 102**, 131, 132, **139**, 150, 151, 153, 154; Central: 4, 5, 9, **12**, 14, **33**, 55, 58; Upper: 60, **63, 97, 101, 127, 129, 145**

A. trifidum Kirby: Lower: 73, 102

Brachythemis lacustris (Kirby): Central: 14, **59**; Upper: **127**

B. leucosticta (Burm.): Lower: 41, 72, **151**, 154; Central: 5, 11, **12**, 14, 33, 55, 58, **59**, 86; Upper: 60, **63, 101, 127, 129, 145**

Chalcostephia flavifrons Kirby: Lower 72, 73, 102, 131, 151; Central: 14, Upper: **60**; 126

Crocothemis erythraea (Brulle): Lower: 39, 41, 42, 71, 72, 73, 75, 76, **78**, 82, 102, 104, **110**, 131, 132, 134, **139**, 149, 151, 153, 154, 157; Central: **4, 5, 9, 12**, 14, **33**, 55, 58, 86; Upper: 60, 61, **63, 92, 97, 101**, 126, **129, 145**

Diplacodes lefebvrei (Rambur): Lower: 39, 41, 42, 72, 73, 76, **78**, 82, 102, 103, **110**, 131, 132, 134, 139, 141, 142, 149, 151, 153, 154; Central: 4, 9, **12**, 14, **33**, 55, 86; Upper: 60, **63, 101**, 126, **127, 129, 145**

Hemistigma albipuncta (Rambur): Lower: 39, 42, 72, 73, 76, 82, **102**, 131, 132, 141, 151, 154; Central: 4, 9, **12**, 14, 33, 58, 86; Upper: 60, **63, 92, 127**

Olpogastra lugubris Karsch: Central: 11, 14; Upper: **129**

Orthetrum africanum (Selys): Lower: 72; Central: 14

O. angustiventre (Rambur): Lower: 41, 72, 73, 103, 161; Central: 11, 14, 33; Upper: **60, 101**

O. brachiale (P.de Beauvois): Lower: 42, 72, 73, 131, 134, 141, 142, 154, 157; Central: 14, 33, **58**, 86; Upper: 60, 126, **127, 145**

O. caffrum (Burm.): Upper: **145**

O. chryso stigma (Burm.): Lower: **73**, 75, 76, 104, **131**; Upper: **129, 145**

O. icteromelan Ris: Lower: 72, 73, 131, 132, **151**; Central: 4, 9, 14, 33, 55, **58, 59**; Upper: 60, 126, **145**

O. julia Kirby: Lower: **73**

O. kalai Longfield: Lower: 72, 73, 131, 133; Upper: 60

O. monardi Schmidt: Lower: 72, 73, **131**, 133, 134, **139, 153**, 154; Central: **9**, 58, 86; Upper: 60, 126, **127, 129, 145**

O. saegeri Pinhey: Central: **9**

O. trinacria (Selys): Lower: 72, 73, 131, 157; Central: **4, 5, 12**, 14, **33, 58**; Upper: **92, 129, 145**

Oxythemis phoeniscoscelis Ris: Upper: 126

Palpopleura deceptor (Calvert): Lower: 42, 72, 73, 75, 131, 133, 134, **139**, 141, **153**, 154, 157, 161; Central: **12**, 14, **33**, 58, 85; Upper: 60, **97**, 126, **127, 129, 145**

P. lucia (Drury): Lower: 72, 73, 131, 132, **139**, 151, 153; Central: 14, 58; Upper: 60, **129, 145**

P. portia (Drury): Lower: 42, 72, 73, 76, 82, 102, 104, 131, 132, 134, **139**, 141, 151, 153, 154, 157; Central 14, 58; Upper: 60, **92**, 126, **127, 129, 145**.

Pantala flavescens (Fabr.): Lower 41, 42, 72, 73, 75, 76, **78**, 82, 102, **104**, 106, **110, 111**, 131, **132**, 133, 134, **139**, 142, 151, **153**, Central: **4, 5, 9, 12**, 14, 58, 85, 86; Upper: **60, 63**,

92, 97, 129

Parazyxomma flavicans (Martin): Lower: 73; Central: 14

Philomonom luminans (Karsch): Lower: 75, 131, 134; Central: 14

Rhyothemis notata (Fabr.): Lower: 73; Central: 14

R. semihyalina (Desj.): Lower: 102, 131; Central: 4, 14, 33; Upper: 60, 97, 129, 145

Sympetrum fonscolombei (Selys): Lower: 102

S. navasi Lacroix: Central: 14

Tetrathemis bifida Fraser: Lower: 131.

Tholymis tillarga (Fabr.): Lower: 72, 73, 82, 132, 151; Central: 14, 58; Upper: 60, 92, 126

Tramea basilaris (P. de Beauvois): Lower: 42, 73, 82, 102, 131, 132, 134, 139, 151; Central: 12, 14, 33, 86; Upper: 60, 97, 101

T. limbata (Desj.): Upper: 97

Trithemis annulata (P. de Beauvois): Lower: 39, 72, 73, 82, 131, 139, 153; Central: 4, 5, 9, 12, 14, 33, 55, 59; Upper: 60, 63, 92, 101, 129, 145

T. arteriosa (Burm.): Lower: 72, 73, 131; Central: 4; Upper: 60, 97, 145

T. grouti Pinhey: Lower: 73, 131, 139; Central: 14

T. hecate Ris: Lower: 131

T. imitata Pinhey: Lower: 39; Central: 9; Upper: 97, 101, 145

T. kirbyi ardens Gerst.: Upper: 60, 145

Urothemis assignata (Selys): Lower: 73; Central: 14; Upper: 97

U. edwardsii (Selys): Lower: 72, 131; Central: 4, 9, 12, 14, 33, 58; Upper: 97, 101, 126, 145

Zygonyx torrida (Kirby): Upper: 145

New (in bold) and Notable Species found on the BDS tour

1. *Ceriagrion suave*. Likely to have been overlooked because of its resemblance to *C. moorei* and, superficially, *C. glabrum*. Of a collection of *Ceriagrion*, 41% were *glabrum*, 31% *suave* and 28% *moorei*. In the Lower Sector, *glabrum* was the most commonly recorded, with *suave* most frequent in the Upper Sector.

A *Ceriagrion male* in tandem with a *Pseudagrion female* was collected but both were unfortunately too damaged for specific identification. A *Ceriagrion female* from Abuko (Sq. 73) structurally, but not in colouration, resembles *C. sakeji* (Pinhey 1963) but it would be unsafe, without further evidence, to assign it to this species.

2. *Pseudagrion glaucescens* and *P. sublacteum* (= *pseudomassicum*, in Pinhey 1984) These new species for The Gambia were both found about 10 km west of Fatoto (Sq. 129) by the Shima Simoo Bolon, a narrow fairly fast-flowing muddy stream, with scattered bushes along its banks; where, inter alia, *P. nubicum* and *P. sjoestedti* also occurred. *P. sublacteum* was also found by the Sankuti Bolon (Sq. 145), another of the faster flowing streams- a typical species habitat. A further *Pseudagrion male*, from the Sankuti Bolon (Sq. 145), as yet still unidentified, may possibly be of an undescribed species; as may a female from Sapu ricefields (Sq. 33).

3. *Neurogomphus featheri*. Dr Roger Cammaerts, Brussels University, had asked that a particular look-out should be kept for *Neurogomphids*, as he was working on a revision of the genus. None of the specimens from The Gambia provisionally identified as "*Neurogomphus sp.*" (= *featheri* Pinhey) still exists, so there is no certainty as to their identity.

Four specimens- three males, and a female- were collected near Bantanto, just south of Bansang (Sq. 92) and subsequently identified by Cammaerts as *N. featheri*, the first confirmed record for The Gambia. Apart from one male from each of Kenya and Nigeria, there are no other known specimens (Cammaerts, in press).

4. *Anax imperator*. It is difficult to imagine how this conspicuous species, which was found at five locations and in all three sectors, could have been overlooked if it had been present during previous visits by odonatologists, but there were no prior records. The abdomen of the only female caught, at Sanyang Banko (Sq. 131), was pale sky blue, instead of the more normal greenish blue.

5. *Anax tristis*. Apart from two males found dead at the Atlantic Hotel, Banjul and inside the warden's house at Abuko Nature Reserve, this was only encountered at Sanyang Banko (Sq. 131). On 6 Nov. 97, a dying male was found floating in the middle of the shallow marsh. On the next day, another male was patrolling the marsh, flying about two metres up, with forays sideways, up or down to catch food, or see off other Anisoptera, including *Anax imperator* and *Hemianax ephippiger*. Its patrol area was the extent of the marsh, about 150 m by 100 m. Its huge size together with the conspicuous pale creamy segment 3 rendered it readily recognizable as it flew nearby.

6. *Hemianax ephippiger*. Common at Sanyang Banko (Sq. 131) with up to 10 in flight at a time, including one or two pairs in tandem; and also common at Nainimaron Bolon lagoon (Sq. 5) in the Central Sector, but not recorded further up-river.

7. *Crocothemis erythraea*. At a large lagoon, Lake Fatoto (Sq.101), in the extreme east of the country, where this species was common, a pair was observed ovipositing. They flew around in tandem about 50 cm above the water and would periodically dip down to about 10-20 cm, whereupon the male would drop the female. She would then swing to a near-vertical position to release eggs into the water; whereupon the male would swoop down to seize her by the head again- in a noticeably clean pick-up- to repeat the performance a few metres away.

8. *Orthetrum cafferum*, *O. julia*, *O. saegeri*. Whilst *O. julia* was represented by two males, only one female of each of the other two species was collected. Males of these are required to confirm identifications.

9. *Sympetrum fonscolombi*. Though common in most parts of Africa, two females from the Tanji Bird Reserve (Sq. 102) are the first records for The Gambia.

10. *Tramea limbata*. Several specimens were found in a roadside area of dry savannah with thorn bushes and scattered trees, some 5 km from the nearest water, near Yarobawal (Sq. 97). They were dispersed thinly, mainly sunning themselves on the tops of bushes, together with *Rhyothemis semihyalina*, *Trithemis arteriosa*, *T imitata*, *Urothemis assignata* and *U. edwardsii*

11. *Trithemis hecate*, *T. kirbyi ardens*. The former was from the productive marsh at Sanyang Banko (Sq. 131), the latter from two species-typical sites with expanses of concrete; abandoned irrigation works on MacCarthy Island (Sq. 60) and the sides of a pool on the Sankuti Bolon (Sq. 145). In spite of similar apparently suitable sites further down-river, it was only found at these two sites in the Upper Sector.

12. *Zygonyx torrida*. It was unexpected to find this species in a country where there are no rapid rivers or waterfalls. However, on a short stretch of the Sankuti Bolon (Sq. 145), below the road bridge, where it flows through a narrow flat meadow of coarse grass bordered by tall trees, it was not uncommon. The stream is about 2 m wide, about 50 cm deep

with a medium flow, a bit muddy with a gravelly bottom in places. *Zygonyx torrida* was the most conspicuous of the 25 species recorded, with males patrolling beside a stretch of stream with a rather slow flight. There were at least 8 or 10 insects present on 1 Nov., including a pair in tandem; and 3 on a second visit later in the day on 2 Nov.

Discussion

The BDS tour to The Gambia in 1996 resulted in the identification of 13 species not previously recorded and in an overall increase of over 60% in the number of species/10 km squares. In addition, a so-far unidentified zygopteran is possibly an undescribed species. Table 1 shows the squares visited in 1996 and, for each, the number of new species found, previous (if any) and total records. Table 2 summarises the position.

Even after this visit there are records from only 53 out of the 162 squares in the country, and many of these have been only superficially covered due to the limited duration of this, and most previous, visits (Gambles et. al., 1995). The average number of species per square is ten. By contrast, during his three months visit in 1948, Moore found, in one square, 42 different species. Many of the squares from which there are no records have no running or standing fresh water, but there are many other apparently suitable areas within The Gambia, which have not yet been explored, especially in the Upper Sector. The majority of the newly-discovered species came from this sector. Beyond this, across the border into Senegal, the terrain changes and the river becomes faster-flowing with rapids, which should result in differences in the dragonfly fauna. A brief list of Senegal odonate studies is to be found in Dumont (1978).

Table1. Number of Species in 10 km Squares visited by BDS Tour 1996.

Sector Square	Lower			Central				Upper			
	a.	b.	c.	Square	a.	b.	c.	Square	a.	b.	c.
73	5	36	41	4	7	5	12	60	9	19	28
78	3	-	3	5	8	-	8	63	9	-	9
82	3	9	12	9	6	9	15	92	10	1	11
102	4	11	15	12	12	-	12	97	12	-	12
104	1	3	4	33	12	13	25	101	13	-	13
110	3	-	3	58	6	11	17	127	11	-	11
111	1	-	1	59	3	-	3	129	21	-	21
131	9	21	30					145	25	-	25
132	3	-	12								
139	15	-	15								
151	9	11	20								
153	6	5	11								
Total	62	105	167		54	38	92		110	20	130

Notes. a. New records from tour, in bold, b. Pre-tour records, c. Total number of species recorded in square.

Table 2. Summary of Number of Species per 10 km Square by Sectors.

Sectors	Lower		Central	Upper	Total
	a.	b.			
Records in Gambles (1995)	190	31	106	43	370
New records. BDS Tour 1996	62	-	54	110	226
TOTAL RECORDS	252	31	160	153	596
Percentage increase in records	33		50	256	61

Note. In the Lower Sector, "a" is the land south of the river; and "b" the land on the north bank, which was not visited in 1996.

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Dr M.J. Parr has been invaluable in identifying specimens and Dr. R.Cammaerts kindly identified the *Neurogomphus featheri* specimens. Kevin Jay skilfully composed and computed Figs 1 and 2.

Finally, as leader of the BDS party, I am grateful to the other members, each of whom contributed in their own way to the success of the visit, not least by showing tolerance of often uncomfortable conditions and maintaining their sense of humour throughout.

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