

**THE PRESENT STATUS OF *NESCIOTHEMIS NIGERIENSIS* GAMBLES,  
1966 (ANISOPTERA: LIBELLULIDAE) IN NORTHERN NIGERIA**

M.J. PARR

Department of Biology, University of Salford, M5 4WT, England

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*N. nigeriensis*, previously known only from the type specimen taken in 1961, was found in large numbers in the Zaria region of Nigeria in 1971-1973. During a recent visit to Zaria a new large colony was found at an impoundment formed in 1974/1975 and the two original large colonies recorded in Zaria were still extant. Further observations on habitat requirements were made.

INTRODUCTION

The occurrence of two large colonies of *Nesciothemis nigeriensis* in Zaria, northern Nigeria, was reported by PARR & PARR (1972). This was noteworthy since the species was known hitherto only through the type specimen taken in 1961, much further south in Nigeria. In 1974 PARR & PARR gave an account of behaviour and ecology of *N. nigeriensis* in which its geographical distribution was described and discussed. The known distribution of *N. nigeriensis* was further discussed and up-dated by PARR (1974).

Up to August, 1973, *N. nigeriensis* was known to have been recorded from northern Zaire (as *Limnetothemis erythra* Pinhey (PINHEY, 1966)); Sierra Leone (also as *L. erythra*) (AGUESSE, 1968); and Nigeria, where it was known from three different areas. A large colony existed in 1973 at Agulu Lake, Awka, southern Nigeria, which is the type locality. A single male was taken by P.H. Ward at Lake Tatabu in west-central Nigeria in August, 1970, when the lake level was high. The third and main known concentration of *N. nigeriensis* in Nigeria in 1973 was the greater Zaria region in the north of the country. In the Zaria area it had been seen at Samaru (Bomo) and University Farm Lakes (where the main colonies existed), Giwa fadama, Maska Fish Farm and Mairuwa Lake. At this time, PARR (1974) suggested that the species could be expected to increase

its range as new potential habitats were created by damming streams and rivers in the Nigerian savanna.

#### OBSERVATIONS IN JULY 1977

The author revisited Nigeria in July, 1977 and observations were made in the Zaria area in order to assess the present status of *N. nigeriensis* there.

#### SAMARU LAKE (BOMO LAKE), ZARIA

*N. nigeriensis* was present in considerable numbers, but it was probably not as common as in the period 1971-1973. The territories of adult males were larger and less well defined than in 1971-1973 and the individuals seemed to spend more time actually flying.

It was evident that the gross ecology of the lake had changed since 1973. *Nymphaea* water lilies covered large areas of the water surface, where none had existed previously and there had been changes in the distribution and densities of three of the dominant grass species associated with the lake. *Echinochloa pyramidalis* Hitch. & Chase, which is an emergent grass growing in the swampy margins of the lake, had increased in extent and its decline was associated with an increase in the area covered by the much coarser and larger grass, *Pennisetum purpureum* Schum. The changes in the distribution of these grasses had resulted in the fragmentation of the colony on the southern margin of Samaru Lake, since *N. nigeriensis* avoids *P. purpureum* and favours *E. pyramidalis* as perches within its waterside territory. The tall grass *Andropogon schirensis* Hochst. and the scrubby vegetation, especially *Dicrostachys cinerea* (L.) and *Piliostigma thonningii* (Schlum.) which had previously occupied a large area to the south of the lake had been mostly cleared. This would have the effect of severely reducing the most favoured roosting sites of *N. nigeriensis* near to the lake, and would have contributed to the decline of the species.

The presence of two species of libellulid previously unknown at the lake margins was almost certainly associated with the changed ecology of the area. *Aethriamanta rezia* Kirby, previously known only from small lily-covered pools near to the lake, was now common in several areas around the lake itself. *Tetra-themis polleni* (Sélys), which had never been seen at Samaru Lake or its environs, was present on the southern side in the region of the creek supplying irrigation water to the tree nursery (see map in PARR & PARR, 1974). Apart from *Aethriamanta*, the numerically dominant species of Anisoptera at Samaru Lake in July, 1977 were *Urothemis edwardsi* (Sélys), *Brachythemis wilsoni* Pinhey, *Acisoma panorpoides* Rambur and *Rhyothemis semihyalina* (Desjardins).

## UNIVERSITY FARM LAKE, ZARIA

*N. nigeriensis* was common at this lake and was seen both at the water's edge and in roosting areas behind the dam wall. Unlike Samaru Lake, University Farm Lake seems little different from its condition in 1973, and is still evidently an important population centre for *N. nigeriensis*. The commonest anisopteran in July, 1977 was the libellulid *Brachythemis leucosticta* (Burm.), which was exceedingly numerous along the water's edge wherever any bare soil or sand existed.

## ZARIA LAKE (GALMA RIVER DAM)

This is a new impoundment created in 1974/1975 when the dam across the perennial Galma River was completed in December, 1974. Access to the lake is along a 5 km stretch of new road running northwards from the main Zaria-Jos road a few kilometres outside the Tudun Wada township of Zaria. The Zaria Lake covers approximately 728 ha, is about 19 km long and 640 metres wide, and has a storage capacity of  $159 \times 10^8$  l. The Galma River feeding into the lake has a flow rate varying from  $123 \times 10^6$  l to  $147 \times 10^8$  l/day. The new lake is the main water supply for the Zaria and Samaru urban areas. Except in the neighbourhood of the dam wall the edges of the lake are largely swampy with emergent *Echinochloa pyramidalis* and *Cyperus* sp. This swampy fringe is succeeded by rough bush, tall grass and cultivated fields of sorghum (*Sorghum bicolor* [L.]), sugar cane (*Saccharum officinarum* L.) and maize (*Zea mays* L.).

In this new habitat, *N. nigeriensis* was found to be numerous, with territory-holding males present in all suitable areas along the lake shore. It was noticeable that the insects selected sites where *Echinochloa* was present and tended to avoid other emergent vegetation types unless mixed with the favoured grass. The other species of Anisoptera which were numerically dominant were *Urothemis edwardsi*, *Crocothemis erythraea* (Brullé) and *Ictinogomphus ferox* (Rambur).

## KUBANI LAKE, AHMADU BELLO UNIVERSITY, ZARIA

The dam across the Kubani River which created this impoundment was completed in 1975. When the site was visited in July, 1977 the lake had very little fringing vegetation and was very turbid. The Kubani River system is an area of severe erosion (with gullies 6 to 10 metres deep) and is liable to flash flooding (OLOGE, 1972).

The lake did not appear to be a suitable habitat for *N. nigeriensis* and none was seen there. The main Anisoptera present were *Pantala flavescens* (Fabricius), *Nesciothemis farinosa* (Foerster), *Trithemis annulata* (Palisot de Beauvois), *Icti-*

*nogomphus ferox* and *Brachythemis leucosticta*.

#### "FUNTUA POOL"

This pool is situated immediately adjacent to the south-west side of the main Zaria-Sokoto road, a few kilometres south of Funtua, 40 km north of Samaru-Zaria. The edges of the pool, which is marshy and evidently shallow, are fringed with *Cyperus* sp.; tall grasses are almost totally absent.

*Nesciothemis farinosa* and *Trithemis annulata* were very common but no *N. nigeriensis* were seen.

#### MAIRUWA LAKE, near FUNTUA

Contrary to expectation, Mairuwa Lake has not developed ecologically into a body of water which is very similar to University Farm Lake, Zaria. The fringing and emergent vegetation is nearly all *Cyperus* sp., with some dense clumps of *Typha* sp. A few plants of *Echinochloa* were noted, but nowhere are grasses dominant around the lake perimeter. The lake, therefore, seems unsuitable for colonisation by *N. nigeriensis* because of the lack of emergent grasses and, in fact, no specimens were seen in 1977. The single male seen at Mairuwa Lake in 1973 was probably merely a wanderer and not the ancestor of an established colony at that site. The most common anisopterans were *Ictinogomphus ferox*, *Trithemis annulata*, *Brachythemis leucosticta* and *B. lacustris* Kirby.

Unfortunately, there was insufficient time to visit Maska Fish Farm where a population of *N. nigeriensis* had established itself by August, 1973.

A brief visit to Bagauda Lake, near Kano and about 136 km from Zaria, on 28 July, 1977, did not reveal any *N. nigeriensis* although the habitat looked to be suitable for the species. Emergent grasses were common in sheltered areas of the lake shore and in the region of the Bagauda Lake Hotel no *Cyperus* or *Typha* existed. The weather at the time of this visit was cool, overcast and windy, which is most unusual in the Kano area, and would have been sufficient to cause *N. nigeriensis* to withdraw from the water. However, searches in vegetation away from water also failed to produce the species; it is therefore uncertain whether or not *N. nigeriensis* occurs at Bagauda Lake. Bagauda Lake lies within the Sudan Savanna belt and the future discovery of *N. nigeriensis* there would considerably extend its range northwards into the semi-arid zone. Despite the dull weather conditions when Bagauda was visited, six anisopterans were numerous and flying actively: *Trithemis annulata*, *Brachythemis leucosticta*, *Ictinogomphus ferox*, *Hemianax ephippiger* (Burmeister), *Pantala flavescens* and *Crocothemis erythraea*.

## DISCUSSION

The recent observations recorded here, confirm in part, that *N. nigeriensis* may be expected to establish new colonies in the Nigerian savanna as new reservoirs are created. The colony of *N. nigeriensis* at the new Zaria Lake (Galma River Dam) is evidently a very large one and should provide a steady supply of individuals to colonise other suitable habitats in that general area. However, the absence of *N. nigeriensis* from other large and medium sized bodies of water such as Mairuwa Lake, Kubani Lake and "Funta Pool" would appear to be related to the absence of suitable waterside and emergent vegetation. At Samaru and University Farm Lakes the adult males virtually always perch on emergent grasses, especially *Echinochloa pyramidalis* (and ignore other vegetation), when at their waterside territories. This normal behaviour pattern would presumably result in potential male colonisers avoiding lakes lacking suitable grasses.

The prediction of whether or not *N. nigeriensis* will colonise a particular newly created lake is, therefore, rather a difficult exercise since this event seems to depend on the types of waterside and emergent vegetation. Information is needed on what factors are involved in the establishment of *Cyperus*, *Typha*, *Echinochloa* or *Pennisetum* as dominants in the early development of the lake flora, before accurate predictions may be made about the presence of *N. nigeriensis*.

Another factor which must be important in the establishment of colonies of *N. nigeriensis* in new and relatively young lakes is the suitability of the aquatic environment for the larval stages. It may be that the larva of this species is tolerant of a wide range of ecological conditions or it may require very specific conditions, but since the larva of *N. nigeriensis* has not been reared or described it is not profitable at present to elaborate further on this possibility.

In summary, it may be said that the recent observations confirm that *N. nigeriensis* requires lakes with a good growth of medium sized emergent grasses, especially *Echinochloa pyramidalis* (PARR, 1974) and that coarser large grasses such as *Pennisetum purpureum*, sedges (*Cyperus*) and *Typha* will not substitute for the *Echinochloa* and similar grasses.

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