

**AFROTROPICAL LIBELLULIDS IN THE LAKE DISTRICT OF
EL KALA, NE ALGERIA, WITH A REDISCOVERY OF
UROTHEMIS E. EDWARDSI (SELYS) AND *ACISOMA
PANORPOIDES ASCALAPHOIDES* (RAMBUR)
(ANISOPTERA: LIBELLULIDAE)**

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From the Early Holocene pluvial period until the middle of the 19th century, the El Kala lakes and wetlands had conserved an assemblage of at least 8 afrotropical libellulid spp. Today, 1 of these is lost. 2 of the others have very small extant relict populations, of which that of *U. edwardsi* represents the type population of its sp. Both are under severe risk of extinction, and steps should be taken to safeguard their breeding sites. — Some morphological data on the type population of *U. edwardsi* are given. Its hindwing spot is larger and less variable than in the continuous range of the sp. S of the Sahara, and contrasts with that of *U. e. hulae* Dumont from the Jordan R. valley, where this spot is strongly reduced.

INTRODUCTION

In the monumental "*Exploration scientifique de l'Algérie*" of Lucas (1849), SELYS-LONGCHAMPS (1849) gave the first account of Algerian dragonflies. It included the description of two new species, *Libellula separata*, later recognized conspecific with *Rhyothemis semihyalina* Desj., and *Libellula Edwardsi*, presently classified as *Urothemis edwardsi*. In all, 33 species were recorded, a number which was increased to 47 by SELYS (1865, 1866, 1871, 1887), and SELYS & HAGEN (1850). Most of these came from a coastal wetland area, rich in lakes and swamps, situated close to the city of El Kala (La Calle), on the Mediterranean coastal plain of the extreme North-East of Algeria. A biogeographical analysis of the Libellulidae in this zone [including *Orthetrum trinacria*, first recorded

from Annaba (=Bone) by SELYS (1866), but common in the whole coastal NE Algerian area], shows that 8 species are of afrotropical origin. Five of these (Tab. I) are more or less well established along the Mediterranean coast, on the Iberian peninsula, the islands of Corsica, Sardinia, and Sicily, and in the Levant.

However, three have been recorded from northern Africa at this site only. The objective of the present contribution is to determine the status of these species in the El Kala area after one and a half century.

SITES SEARCHED

Following occasional visits in May 1978 and July 1984 by one of us (HJD), to Lake Oubeira (loc. 1), which was found to be strongly eutrophied, an intensive survey was conducted of selected lakes during 1988-1992, involving more than 300 field trips.

Localities visited were:

- Loc. 2. - L a c N o i r (Black Lake): a small (1 ha) lake, fringed by *Carex* sp., *Phragmites australis*, and with floating *Nymphaea alba*.
- Loc. 3. - L a c d e s O i s e a u x (Bird's Lake): a shallow 70 ha lake, with stands of *Scirpus lacustris*, *Phragmites australis*, *Carex* sp.
- Loc. 4. - L a c B l e u (Blue Lake) (Fig. 1): 2 ha in size, with stands of *Phragmites australis*, *Scirpus lacustris*, *Lycopus europeus*, *Osmunda regalis*, *Nymphaea alba*.
- Loc. 5. - L a c T o n g a: 2,000 ha in size, with a vegetation of *Nymphaea alba*, *Iris pseudacorus*, *Scirpus lacustris*, *Phragmites communis*.



Fig. 1. Photograph of Lac Bleu (Blue Lake), with saline Lake Melah in the background; - July 5, 1990.

A COMPARISON BETWEEN 1845-1870 AND 1978-1992

Table I compares the situation of the 19th century with that of the 20th century. "Lake Oubeira" in the 19th century literature included many small ponds and marshes around the lake proper, but Lake Tonga was explicitly singled out. The overall situation today is surprisingly positive (Fig. 2), in light of the fact that MARTIN (1910) and DUMONT (1977) did not find back most of the African species around Lake Oubeira and the north-western Tunesian coastal area adjacent to El Kala area, respectively. However, this result may now be ascribed to an insufficient collecting effort. About three hundred field trips allowed us to establish the presence of breeding colonies of the elusive *Acisoma panorpoides* on Lakes Tonga and Blue, and sightings of specimens at Lac des Oiseaux and at Lake Oubeira. Recently (1992), this last species was also recorded for the first time outside the El Kala area, in Guerbes near Skikda.

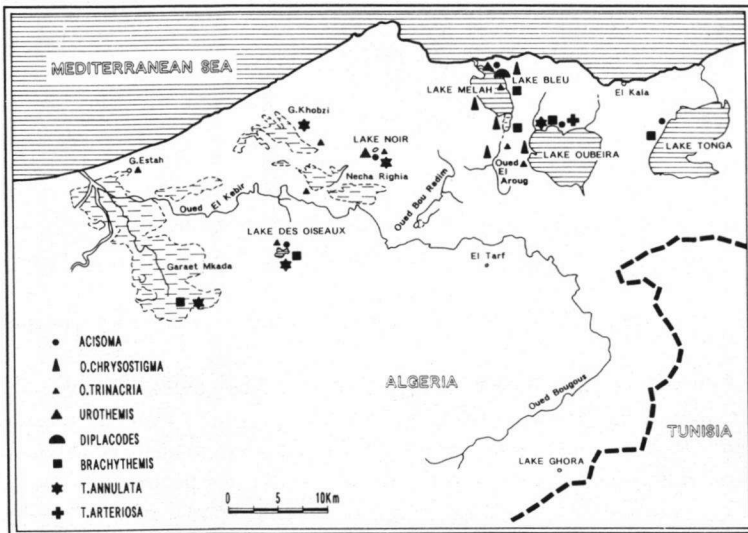


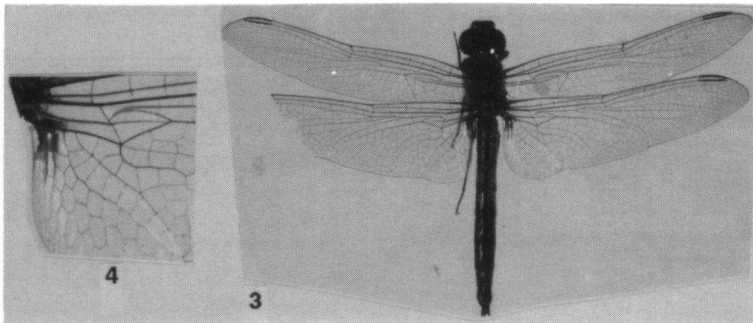
Fig. 2. Distribution records of Afrotropical libellulid species in the wetlands of El Kala.

Urothemis edwardsi, of which only a single female had been captured in the 19th century, was found in two sites: Lac Noir (1990 only), and Lac Bleu, with a small breeding population, consisting of not more than forty individuals, restricted to a small sector of the lakes.

THE STATUS OF *UROTHEMIS EDWARDSI*

Since *U. edwardsi* was described on a single female and its range has since been shown to lie predominantly south of the Sahara, encompassing most of tropical Africa except the equatorial lowlands, it is of considerable importance to (1) safeguard the type population and, — (2) determine its relationship to populations elsewhere.

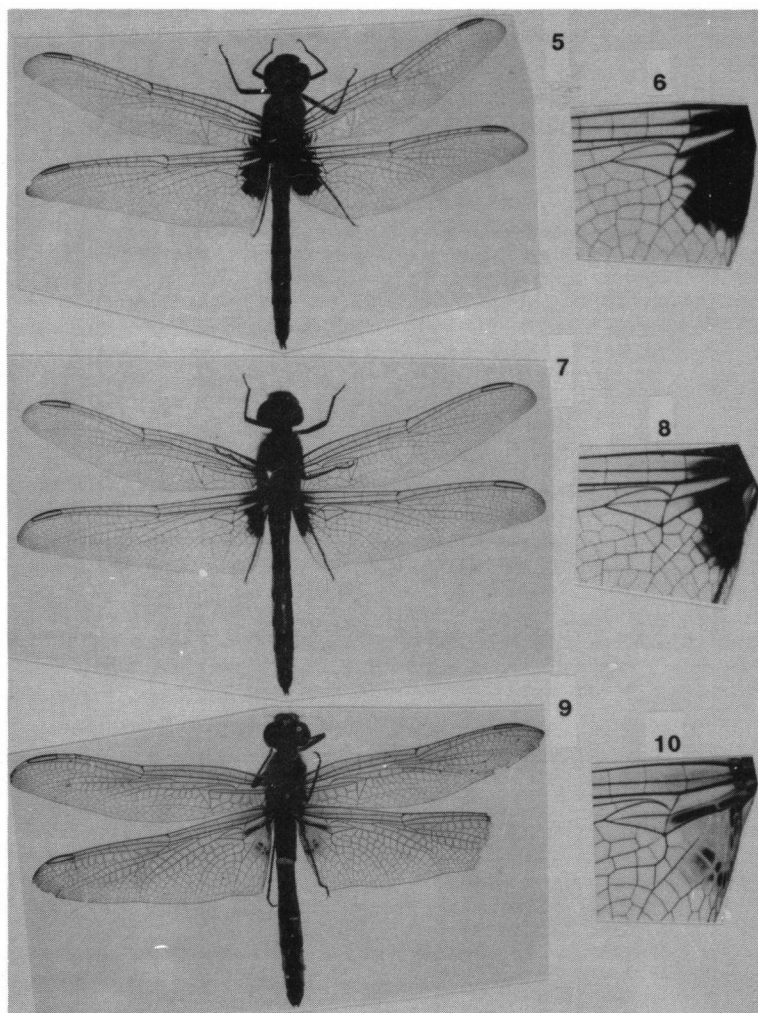
Although the published figure in SELYS (1849) shows an animal with a large coloured basal spot on the hindwings, a typical character distinguishing the nominate subspecies from *O. e. hulae* (Figs 3-4) from the upper Jordan valley, it was useful to obtain topotypical males. These (Figs 5-10) can now be confirmed to be closer to populations south of the Sahara (comparisons were made with specimens from Niger, Ivory Coast and from Okavango, Botswana) (Figs 11-20). The hindwing spot is even more strongly developed than in these, but adult males display the typical blue-and-black abdominal marking pattern of the species.



Figs 3-4. *Urothemis edwardsi hulae* (♂, type): (3) whole animal; — (4) hindwing spot, enlarged.

A population from Lake Guiers in North Senegal, showed considerable variation in the extent of the basal hindwing spot, some specimens even coming near to *U. e. hulae* (Fig. 18). A similar variation in wing spot extent also occurs elsewhere in sub-saharan Africa. Apart from the (now extinct) subspecies from the Jordan valley, one site outside Africa has recently become known where *U. edwardsi* is plentiful: the coastal wetlands at the foot of the Qara mountains near Salalah, Dhofar, southern Oman (Figs 13, 15, 17, 20) (WATERSTON & PITTAWAY, 1990). Here, a number of spring-fed pools (e.g. Ain Arzaat, Wadi Darbaat pools) and various short sections of rivers of varying salinity, called Khors, occur. *U. edwardsi* is common here. It shows some, if not very serious, variation in hindwing spot size (Figs 13, 15, 17, 20).

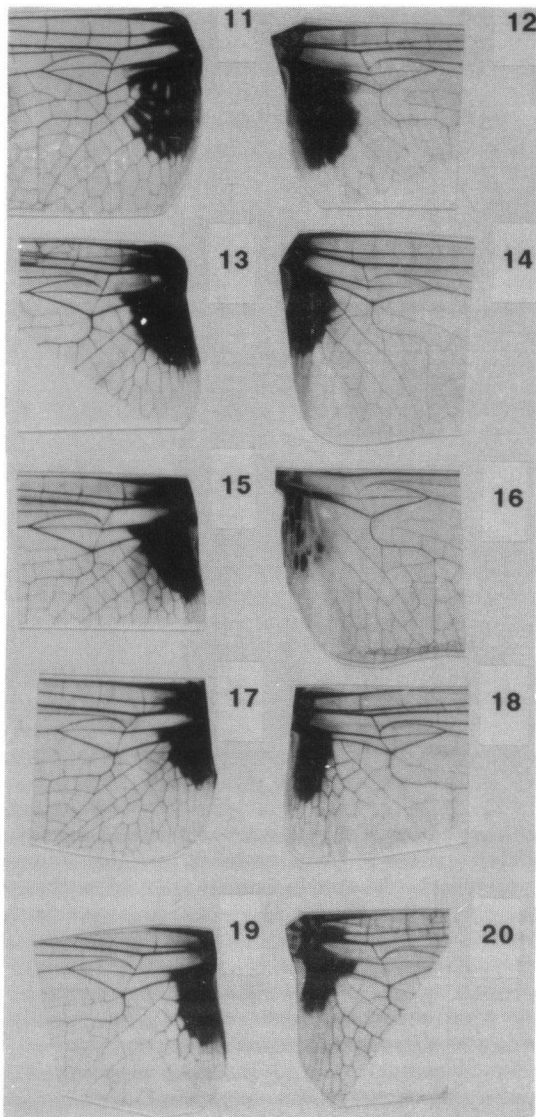
A typical association of libellulids at these sites, as recorded by one of us (HJD) in March 1990, would consist of *U. e. edwardsi*, *Acisoma panorpoides*



Figs 5-10. *Urothemis edwardsi edwardsi* (type population from El Kala area): (5) male with extensive hindwing spot and basal wing spot on forewing (rare in African specimens) (Lac Bleu, 31-VII-1990); – (6) base of hindwing of (5), enlarged; – (7) male with relatively small wing spot (Lac Bleu, 10-VII-1990); – (8) hindwing base of (7), enlarged; – (9) female (Lac Bleu, 14-VI-1991); – (10) hindwing base of (9), enlarged.

ascalaphoides, *Rhyothemis semihyalina*, and all the other libellulids cited in Table I (except *O. trinacria*). We, therefore, have in all three relict pockets of extremely similar faunal composition. This suggests that their faunas were formed during one and the same moist Holocene spell, probably the Early Holocene pluvial

phase (ca 12,500-10,000 BP). The great difference in wing spot, and lack of variability between the Algerian and Hula populations suggest that both originated from small propagules, hence are narrow excerpts from the species' gene pool. That the Dhofar populations, which are more plentiful and much closer, spacewise, to the present continuous range of *U. edwardsi*, show more variation than the other two, is in keeping with logic.



CONSERVATION PRIORITIES

The fact that we failed to find *R. semihyalina* probably means that, like the former Jordan valley population, it has now become extinct. But also *Acisoma ascalaphoides* and, evidently, the type population of *U. e. edwardsi* are under grave danger of extinction. As indicated, the populations are small, and the area where they are found is under heavy agricultural pressure. Wetland drainage has occurred in the past, and is a threat

Figs 11-20. *U. edwardsi* from various parts of Africa and South Arabia, illustrating the variability of the hindwing spot (specimens arranged in order of decreasing spot size): (11) Maun, Botswana, 8-I-1970, ♂; - (12) Lake Guiers, Senegal, 22-V-1978, ♀; - (13) Wadi Darbaat, Dhofar, 24-III-1990, ♂; - (14) Lake Guiers, Senegal, 22-V-1975, ♀; - (15) Khor al Balid, Dhofar, 24-III-1990, ♂; - (16) Niamey, Niger, 21-II-1977, ♂; - (17) Wadi Darbaat, Dhofar, 24-III-1990, ♂; - (18) Lac de Guiers, Senegal, 22-V-1975, ♂; - (19) Bouaké, Ivory Coast, May 1980, ♂; - (20) Khor al Balid, Dhofar, 24-III-1990, ♂.

for the future as well (SAMRAOUI et al., 1992). Lake Oubeira has been repeatedly stocked with carp and other exotics which may threaten larval dragonfly popula-

Table I
Comparison of the libellulid occurrence in the periods
1845-1870 [1] and 1978-1992 [2]

Species	Locality and period											
	L. Oubeira		L. Noir		L. Oiseaux				L. Bleu		L. Tonga	
	1	2	1	2	1	2	1	2	1	2		
<i>Urothemis edwardsi</i>	+	-		+		-			+		-	
<i>Acisoma panorpoides</i>	+	+		+		+2♂			+		+	
<i>Rhyothemis semihyalina</i>	+	-	-	-	-	-	-	-	-	-	-	
<i>Diplacodes lefebvrei</i>	+	+		+		+			+	+	+	
<i>Brachythemis leucosticta</i>	+	+			+	+					+	
<i>Trithemis annulata</i>	+	+		+		+			+			
<i>T. arteriosa</i>	+									+		
<i>Orthetrum chrysostigma</i>	+	+							+	+	+	
<i>O. trinacria</i>	+	+		+	+	+			+			

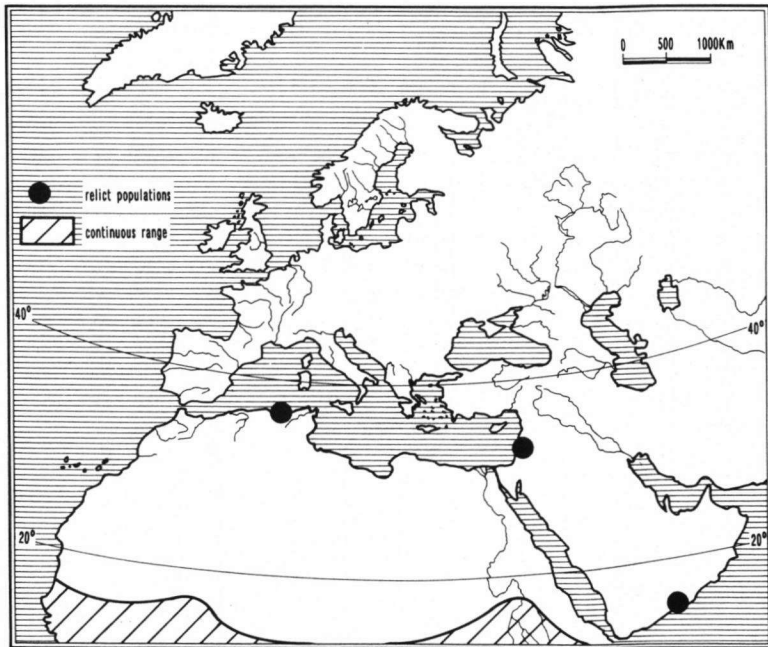


Fig. 21. Map of the occurrence of relict pockets of *U. edwardsi* (and other Afrotropical libellulids) in North Africa, the Levant, and South Arabia.

tions and deteriorate water quality. Shortly after the 1990 sighting of *U. edwardsi* and *A. panorpoides* at Lac Noir, the lake was drained and its dry vegetation set on fire (De Belair et al., in prep.). Because Lake Oubeira area is rich in tropical relicts, not only in dragonflies, but also in many other groups, and in plants (DE BELAIR, 1990), a concerted effort at conservation of this unique site, preferably with international support, should be implemented without delay.

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