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Discovery of a new locality in Sètoko (Republic of Benin)  
for the endangered damselfly *Ceriagrion citrinum*  
Campion, 1914 (Insecta: Odonata: Zygoptera:  
Coenagrionidae)

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**Cover picture:** *Ceriagrion citrinum* Campion, 1914 (photo © Séverin Tchibozo).

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**ABSTRACT**

A population of the endangered damselfly species *Ceriagrion citrinum* Champion, 1914 was recently discovered in a swamp forest area of Sètoko in southern Benin. Six female and 18 male individuals were encountered in about 2 hours of observation in the afternoon of 11/03/2024. This report extends the information that was provided by Tchibozo (2021) on *C. citrinum* occurring in the Lokoli swamp of southern Benin. Reasons that could possibly explain the observed male-biased sex ratio in *C. citrinum* are briefly discussed.

**KEY WORDS:** *Ceriagrion citrinum*, Endangered, Odonata, Damselfly, Sètoko, Benin.

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## RESUMEN

Descubrimiento de una nueva localidad en Sètoko (República de Benín) para el caballito del diablo *Ceriagrion citrinum* Champion, 1914 (Insecta: Odonata: Zygoptera: Coenagrionidae) .

Una población de la especie de caballito del diablo *Ceriagrion citrinum* Champion, 1914, en peligro de extinción, fue descubierta recientemente en una zona boscosa pantanosa de Sètoko, en el sur de Benín. Seis hembras y 18 machos fueron encontrados en aproximadamente 2 horas de observación en la tarde del 11/03/2024. Este informe amplía la información proporcionada por Tchibozo (2021) sobre *C. citrinum* que se encuentra en el pantano de Lokoli en el sur de Benín. Se discuten brevemente las razones que podrían explicar la proporción de sexos observada con sesgo masculino en *C. citrinum*.

**Palabras clave:** *Ceriagrion citrinum*, Especie en peligro, Odonata, Zygoptera, Sètoko, Benín.

## RESUMÉ

Découverte d'une nouvelle localité à Sètoko (République du Bénin) pour la demoiselle *Ceriagrion citrinum* Champion, 1914 (Insecta : Odonata : Zygoptères : Coenagrionidae).

Une population de l'espèce de demoiselle *Ceriagrion citrinum* Champion, 1914, en voie de disparition, a été récemment découverte dans une zone forestière marécageuse de Sètoko, dans le sud du Bénin. Six femelles et 18 mâles ont été rencontrés en environ 2 heures d'observation dans l'après-midi du 11/III/2024. Ce rapport complète les informations fournies par Tchibozo (2021) sur *C. citrinum* présent dans le marais de Lokoli au sud du Bénin. Les raisons qui pourraient expliquer le sex-ratio biaisé observé chez *C. citrinum* sont brièvement discutées.

**Mots clés:** *Ceriagrion citrinum*, espèce en danger, Odonata, Zygoptera, Sètoko, Benin.

## INTRODUCTION

Research on the critically endangered narrow-winged damselfly *Ceriagrion citrinum* Campion, 1914 in the Republic of Benin has been going on since 1999. Dragon- and damselflies, generally, are widely used as monitoring species for the conditions of a wetland's habitat's health. The Beninese part of the wetlands region has been quite well studied (Tchibozo & Dijkstra 2004; Tchibozo *et al.* 2008; Tchibozo 2021; Romera 2024). The only truly endemic species of the region is *Ceriagrion citrinum*, which inhabits swamp forests in southern Benin and neighbouring south-western Nigeria (Lieckweg & Niedringhaus 2005; Ekpah *et al.* 2021). Because of its conspicuous appearance the species is easily recognizable and although it might be expected to also occur in the scarcely studied Niger Delta region, no reports exist from there.

## METHODS

Visual observations and identification by sight were the methods of choice when specimens could not be caught and inventories were made by sight at different locations during short rests of *C. citrinum* on leaves and branches of shrubs, ferns and other aquatic plants.



Fig. 1. Sètoko swamp forest (N 06.58828, E 02.73890) in the south of Republic of Benin and between around Nigeria by watercourse.



## RESULTS AND DISCUSSION

In the Republic of Benin ongoing studies have been focusing on the species' preferred habitats of the Lokoli Swamp in the "Forêt Marécageuse" (07° 02'N; 02° 15'E). The species can regularly be observed in semi-degraded regions of the Forêt Marécageuse, where the vegetation consists primarily of *Raphia hookeri*, *Ficus congensis*, *Crinum jagus*, *Pistia stratiotes* and *Ipomea aquatica*.

The table includes the number of sightings of male and female *C. citrinum* along two transects of 1250 metres in length in northerly (N) and easterly (E) direction.

<i>C. citrinum</i> number by sex by transect		N	E	Habitat
Female	Male			
1	1	06.58828	02.73890	Swampy degraded forest
1	2	06.53811	02.73947	Swampy degraded forest
	1	06.58822	02.73945	Swampy degraded forest
2	4	06.58836	02.73951	Swampy degraded forest
1	2	06.58867	02.73951	Swampy degraded forest
	2	06.58924	02.73887	Swampy degraded forest
	1	06.58947	02.73874	Swampy degraded forest
1	3	06.59027	02.73819	Swampy degraded forest
	2	06.59080	02.73857	Swampy degraded forest
<b>6</b>	<b>18</b>			

With three times as many *C. citrinum* males as females, the former dominated over the females, but whether this means there are indeed more males than females or whether females are more cryptic than males or less active is something that still needs to be investigated. It is known from some species of damselflies that up to one third of the females display male characters and are, thus, andromorph, although still being true females physiologically. If such female-linked polymorphism exists in *C. citrinum*, it could explain the higher number of males seen in the field. Females looking like males are thought to be less harassed by males when flying around (Gossum *et al.* 2008). Male dragonflies, generally, when searching for females, fly around more often than females during the reproductive season and in some species exhibit mate guarding behaviour (Cardé & Resh 2012). However, whether this also applies to *C. citrinum*, and holds true for the entire year or only the mating season, is unknown.

Overall, despite the interest in this endangered species and the research that to date has been devoted to this species, there is still a great gap of knowledge on habitat requirements of the species and next to nothing is known on oviposition sites, vegetation and plant species that are used for egg

deposition. Furthermore, if the females remain submerged while attaching their eggs to plants below the water surface (as is the habit of some odonatan species Lawler 1999) is also unknown. Sites of courtship and copulation, larval development and maturation, the main food of both larvae and adults (all damselflies are predatory) as well as the species' principal predators are all still inadequately known.

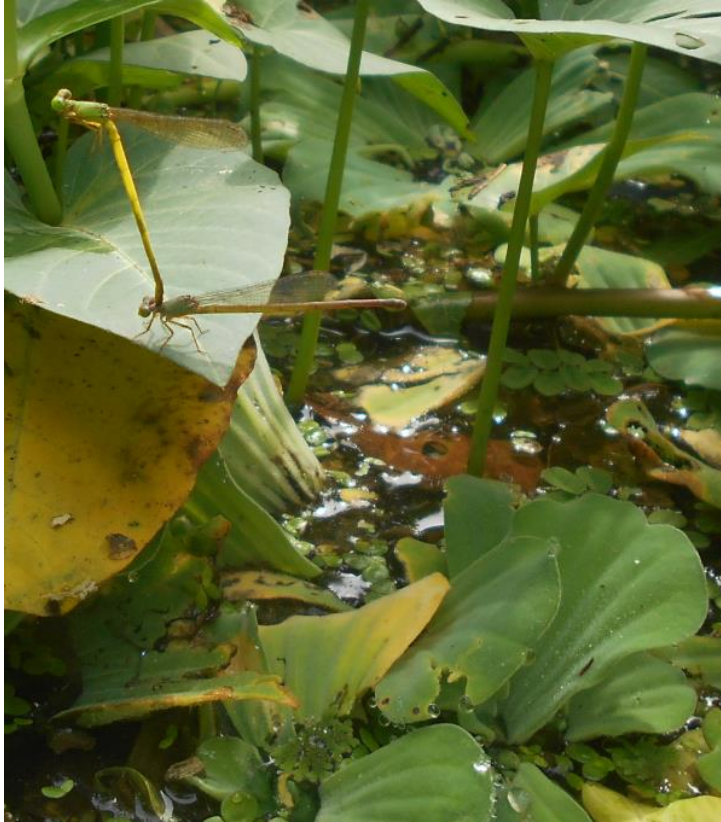


Fig. 2. *Ceriagrion citrinum* in tandem position above stagnant water

## CONCLUSION

What is known, is that the main threats in the Sètoko habitat for *C. citrinum* come from the traffic along the watercourse from Benin to Nigeria and vice versa. Other worries are the increasing deforestation affecting mainly *Raphia hookeri* and *Ficus congensis* trees. We therefore urgently require a thorough re-evaluation of the status of *Ceriagrion citrinum* and a change from endangered (as listed by the IUCN) to critically endangered (CR) species. Any additional information on the biology of the species or on new sightings of the larvae as well as the adults will widen our knowledge of the ecological requirements of this beautiful species.

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