The occurrence of *Ischnura senegalensis* in the Canary Islands, Spain (Odonata: Coenagrionidae)

Fons Peels

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Abstract. The occurrence of *Ischnura senegalensis* in the Canary Islands is reported. In May 2014 a breeding population was observed in southern Tenerife, Spain, at a freshwater reservoir near Las Galletas. Characters are provided for discriminating between the two known *Ischnura* species on the islands, *I. senegalensis* and *I. saharensis*, from photographs.

Key words. Dragonfly, Zygoptera, *Ischnura senegalensis*, Canary Islands, Tenerife, Spain

Introduction

The first record of a zygopteran species from the Canary Islands was provided by Valle (1955) who reported on five »*Ischnura senegalensis* (Rambur, 1842)« specimens collected by the Finnish entomologist Lindberg in Gran Canaria in March 1949. Then Belle (1982) recorded *Ischnura saharensis* Aguesse, 1958 as new to the islands, based on specimens which he himself had collected in Gran Canaria in February 1981. Belle doubted the validity of Valle's identification. This prompted a rechecking of the 1949 specimens and it turned out that they too were in fact *I. saharensis* (Hämäläinen 1986). Since then *I. saharensis* has proved to be quite widespread in the Canary Islands and has been reported from six of the seven islands: Lanzarote, Fuerteventura, Gran Canaria, Tenerife, La Gomera, and La Palma; only from El Hierro in the south-west of the archipelago has the species never been reported (Weihrauch 2011). Since the mid-1980s it was generally believed that the only zygopteran species in the Canary Islands was *I. saharensis*, the only known exception being a single male *Platycnemis subdilatata* Selys, 1849 captured in Tenerife in 1971; an obvious accidental vagrant from the African continent (cf. Kalkman & Smit 2002).

However, as pointed out by Weihrauch (2011), preliminary, unpublished DNA studies by R.A. Sanchéz-Guillén and A. Cordero Rivera (University of Vigo) confirm that specimens collected by Sanchéz-Guillén near Taganana in Tenerife in May 2007 included *I. senegalensis*. J.-P. Boudot (pers. comm.) drew my attention to two photographs, published on the website Flickr, of a male and a female »*Ischnura saharensis*« taken by S. Rae in a small freshwater reservoir near Callao Salvaje, in the southern part of Tenerife (cf. Rae 2009). According to J.-P. Boudot (pers. comm.) these photographs show *I. senegalensis*. The number of individuals present at the time was very low, certainly not totalling more than five or six male and female individuals (S. Rae pers. comm.). In early 2014 I discovered a similar case of "mistaken

identity": a posting on the website miradanatural.es shows a photograph, taken in the Canary Islands, of a female *Ischnura* which again had been determined as *I. saharensis* (cf. Marrero Perdomo 2008). This determination seems incorrect; the immature female in question represents the *aurantiaca* colour phase, which to our current knowledge does not exist in *I. saharensis*. Unfortunately my attempts to contact the photographer for more detailed information failed. Finally, five more photographs of male and immature female »*Ischnura saharensis*«, taken near the town of Los Llanos de Aridane on the island of La Palma, were published on the websites Flickr and miradanatural.es (cf. Camacho Lorenzo 2011, 2012, 2014; Alomar i Berga 2014).

Study site and method

Data were obtained on 28-v-2014 and 29-v-2014 at a small freshwater reservoir near Las Galletas in the very south of the island of Tenerife. Other Odonata species found at the locality were *Sympetrum fonscolombii* (present in very high numbers), *Crocothemis erythraea* (numerous), *Anax imperator*, and a single immature male of *Zygonyx torridus*.

Results

An estimated number of 30–50 adults of *Ischnura senegalensis* were observed and documented photographically, including immature and mature males, teneral, immature and mature females, and about half a dozen pairs in copula. The present record confirms that *I. senegalensis* occurs and breeds in the Canary Islands, at least in Tenerife.

***Ischnura saharensis* and *I. senegalensis*: distinguishing characters**

Ischnura saharensis is structurally different from *I. senegalensis*; the shape of the male and female pronotum and of the male appendages and the average length of the female vulvar spine are useful features for the identification of these species (cf. Rambur 1842; Aguesse 1958; Schmidt 1967; Kalkman 2006). In addition, genetic differences have been evidenced by Dumont (2013). However, what is particularly useful for identification in the field is the difference in the shape of the black surface of the male's second abdominal segment, with a straight lower edge in *I. saharensis* and a bulging lower edge in *I. senegalensis* (cf. Fraser 1933; Grunwell 2010; Fig. 1). Such a bulging lower edge is also found in *Ischnura fountaineae* Morton, 1905 of the eremic belt ranging from Central Asia to the Sahara, but its thorax is whitish in immature males or blue in mature males, without a hint of green (Jödicke 2006).

Males

The numbers in the photographs below serve to highlight the following differences:

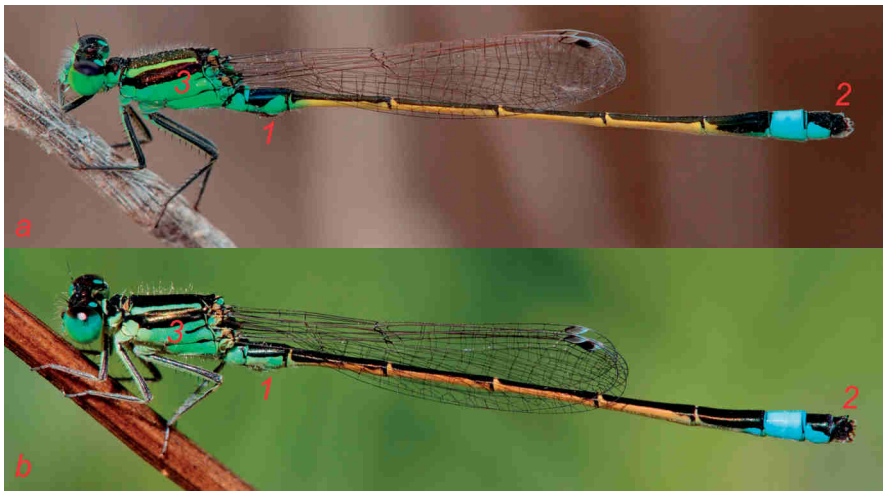

Fig. 1. Comparison between male *Ischnura senegalensis* (a) and *Ischnura saharensis* (b). Small freshwater reservoir near Las Galletas, Tenerife, Spain (29-v-2014) (a). Photo: FP. Pond at Visvique, Gran Canaria, Spain (02-vi-2014) (b). Photo: FP. See text for explanation of numbers.

Fig. 2. The two colour forms of female *Ischnura senegalensis* (a, b) and the five colour forms of *Ischnura saharensis* (c–g) observed in the Canary Islands, Spain: (a) immature, *aurantiaca*; (b) almost mature; (c) androchrome mature, *typica*; (d) androchrome immature, *violacea*; (e) gynochrome immature, *rufescens*; (f) androchrome mature, *infuscans*; and (g) gynochrome mature, *infuscans-obsoleta*. Small freshwater reservoir near Las Galletas, Tenerife, Spain (29-v-2014) (a) and (28-v-2014) (b). Photos: FP. Barranco de Ayagaures near Maspalomas, Gran Canaria, Spain (04-vi-2014) (c, e, f, g) and (07-vi-2014) (d). Photos: FP

1. Abdominal segment 2: in male *Ischnura senegalensis* the black upper portion of abdominal segment 2 shows a clear downward bulge along the margin between the black upper black part of the segment and the lower green (or, sometimes, blue) part. By contrast, in male *I. saharensis* the black upper and green lower sections are separated by a comparatively straight margin with no bulge.
2. Tubercle on S10: compared to the very modestly sized tubercle on the male's S10 in *Ischnura senegalensis*, male *I. saharensis* has a much larger, clearly visible tubercle on that segment.
3. Interpleural suture: compared to male *Ischnura senegalensis*, in which the black line on the interpleural suture tends to be very short and thin, in male *I. saharensis* this black line tends to be much thicker, longer and more clearly visible.

Females

Colour variability in female *I. saharensis* and *I. senegalensis* has been described extensively (Fraser 1933; Aguesse 1958; Schmidt 1967; Dumont 1972; Jödicke 2006). Androchrome and gynochrome females occur in both species. Gynochrome *I. senegalensis* has a bright orange thorax when immature (*aurantiaca*), becoming green with maturity, while androchrome females may have either a green or a light-blue thorax. *Ischnura saharensis* is closely related to *I. elegans* (Dumont 2013) and displays the same colour variability as the latter species (Aguesse 1958).
The two colour forms of female *I. senegalensis* found in Tenerife and the five colour forms of female *I. saharensis* recorded in Gran Canaria are shown in Fig. 2.

While both colour forms of female *Ischnura senegalensis* in Fig. 2 are characterized by the black colouration, dorsally, on abdominal segment 8, the five colour forms of female *I. saharensis* have either a light-blue (c, d, e) or a brown (f, g) colouration, dorsally, on abdominal segment 8. In the field this difference alone proved to be sufficient for a quick and reliable recognition of these two species.

However, two simplifying factors may have contributed to this comparative ease. Firstly, I did not find a single site where the two species co-occurred. Secondly, and perhaps more importantly, I did not see any females of the potentially confusing androchrome form of *Ischnura senegalensis*. This form can reportedly be quite common elsewhere and may even outnumber gynochrome females (Longfield 1936; Takahashi et al. 2011), but during this study all 15 or so female *Ischnura senegalensis* found in Tenerife were gynochrome, either of the immature orange form *aurantiaca*, or of the mature green form, or of some transitional phase in between. At any rate, their abdomens were invariably black dorsally on S8. A more detailed study would be required to assess how feasible it is to distinguish, from photographs alone, between the androchrome forms of *I. senegalensis* and *I. saharensis*.

Discussion

To arrive at a correct determination odonatologists have traditionally studied the morphological characteristics of the insect in the hand or under the microscope, while more recently, and as a complementary technique, DNA analysis has become widely used to refine determinations and to test existing classifications. What has not been used much by odonatologists for species determination is photographic evidence. The reasons for this seem clear: cameras and other photographic equipment which generate images of a sufficient quality are a relatively new development and while digital photography has helped overcome some of the practical limitations of film photography, taking high-quality images *in situ* still requires a great deal of time and skill. Moreover one species may be visually so similar to another that even the sharpest and most detailed image often cannot provide a reliable determination; a much higher degree of magnification would be required to render the necessary details sufficiently visible and those details would have to be recorded at the necessary angle for diagnosis. The question is, therefore, in what circumstances species can be identified on the basis of photographs alone. I propose that while photography could never obviate morphological and genetic analysis, photographs alone *can* be sufficient for a safe determination provided the number of candidate species is limited and well understood and the differences between them are relatively evident. As a case in point I propose that much of the recent *saharensis – senegalensis* confusion in the Canary Islands could have been avoided by a careful study of available photographic evidence, and that our understanding of the distribution of the two species in the Canary Islands and possibly elsewhere in Europe and North Africa could benefit greatly from such a study. For a more detailed discussion of the issues surrounding photographic evidence please refer to Feulner et al. (2007) and Reimer et al. (2009).

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