

## NOTA / NOTE

## Contribution to the knowledge of *Lestes macrostigma* (Eversmann, 1836) (Odonata: Lestidae) in the metropolitan area of Seville, Southern Spain

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**Abstract:** *Lestes macrostigma* (Eversmann, 1836) is a species of Zygoptera (Odonata: Lestidae) that has a very fragmented distribution in the Iberian Peninsula. A rare colony was discovered in May 2024 in the metropolis of Seville, Southern Spain. Unlike other colonies known so far in the country, the species does not use *Bolboschoenus maritimus* (L.) to spawn, nor *Juncus maritimus* Lam. as it does in France. As a novelty, it has been located in a highly anthropized wetland in that metropolitan area, formed exclusively by *Thypha latifolia* L. as an emerging macrophyte. A photographic record of the species observed at the end of spring is attached.

**Key words:** Odonata, Lestidae, *Lestes macrostigma*, vulnerable species, Seville, Spain.

**Resumen:** Contribución al conocimiento de *Lestes macrostigma* (Eversmann, 1836) (Insecta: Odonata) en el área metropolitana de Sevilla, sur de España. *Lestes macrostigma* (Eversmann, 1836) es una especie de Zygoptera (Odonata: Lestidae) que tiene una distribución muy fragmentada en la Península Ibérica. Una rara población fue descubierta en mayo de 2024 en la metrópolis de Sevilla, sur de España. A diferencia de otras poblaciones conocidas hasta el momento en el país, la especie no utiliza *Bolboschoenus maritimus* (L.) para desovar, ni tampoco *Juncus maritimus* Lam. como hace en Francia. Como novedad, se la ha localizado en un humedal altamente antropizado en dicha área metropolitana, formado exclusivamente por *Typha latifolia* L. como macrófito emergente. Se acompaña un registro fotográfico de la especie observada al final de primavera.

**Palabras clave:** Odonata, Lestidae, *Lestes macrostigma*, especie vulnerable, Sevilla, España.

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*Lestes macrostigma* (Eversmann, 1836) (Odonata: Lestidae) occurs across the southern Palaearctic from the Atlantic coast as far east as Mongolia (Dijkstra & Lewington, 2006). It is locally common in the central part of its range but becomes increasingly rare in the western parts of the region (Kalkman *et al.*, 2010). Many of its coastal habitats are under threat and the species is listed as "endangered" in the European Red List (Sahlén *et al.*, 2004). It is also considered as "vulnerable" (VU) in both the European Red List of Odonates (Kalkman *et al.*, 2010) and the Red Book of Invertebrates of Spain (Torrallba-Burrial *et al.*, 2011), and is classified as "endangered" (EN) in the member states of the European Union (Muñoz & Ferreras-Romero, 2011). *Lestes macrostigma* has more recently been assessed for the IUCN Red List of Threatened Species in 2013 and listed as "least concern" (Kalkman, 2014).

Observations of the species in the province of Seville hardly provide confirmed records in scientific literature (Ferreras-Romero & Soler, 1979; Muñoz & Ferreras-Romero, 2011; Márquez-Rodríguez & Vega-Maqueda, 2016). Annual abundance is highly variable with large populations in one year but virtually disappearing the next (Borisov, 2005; Ferreras-Romero *et al.*, 2005; Lambret, 2010; Muñoz & Ferreras-Romero, 2011; Florencio & Díaz-Paniagua, 2012; Berquier & Andrei-Ruiz, 2019). The larval development lasts approximately two months (Montes *et al.*, 1982). *L. macrostigma* generally inhabits temporary brackish waters (Nielsen, 1954; Dijkstra & Lewington, 2006; Grand & Boudot, 2006).

Eggs in all Lestidae are laid endophytically (Nielsen, 1954). Although this species oviposits in various plant species, is closely associated with *Bolboschoenus maritimus* (L.) and, to a lesser extent,

with *Juncus acutus* L., *J. maritimus* Lam., *Phragmites australis* (Cav.) Trin. ex Steud., *Schoenoplectus lacustris* (L.) Palla, *Scirpus holoschoenus* L. and even *Tamarix gallica* L. (Ferrerías-Romero *et al.*, 2005; Florencio & Díaz-Paniagua, 2012; Desmots, 2013; Matushkina *et al.*, 2016; Lambret *et al.*, 2018).

The Lagoh shopping center, in Seville (Spain), includes a 6,000 m<sup>2</sup> lake (37°20'32"N, 5°59'11"W, 7 m s.n.m.), and was built in 2019 (Fig. 1). This sampling site is located next to the Centenario Bridge, an infrastructure that facilitates the daily traffic of 100,000 vehicles along the SE-30 ring road over the Guadalquivir River basin (B.O.E., 2022). The artificial lake has a peripheral belt of *Typha latifolia* L. two meters wide. On a sunny day (25/V/2024), about fifty individuals of *L. macrostigma* with reproductive behaviour flying and perching on macrophytes (Fig. 2) were observed during an hour at 12 am. Two days later, half of the specimens were counted, with some females laying eggs alone. No adults were detected in the first week of June, indicating the dispersion of the species to other wetlands. Other less abundant species with reproductive behaviour were *Ischnura graellsii* (Rambur, 1842), *Crocothemis erythraea* (Brullé, 1832) or *Orthetrum cancellatum* (L., 1758). Isolated adults of *Anax parthenope* (Selys, 1839), *Trithemis annulata* (Pal. de Beauvois, 1805) and *T. kirbyi* Selys, 1891 were also identified. Three exuviae of *A. parthenope* were collected. Most species were identified through binoculars (Dijkstra & Lewington, 2006).

*Lestes macrostigma* has a reduced distribution in Europe (Sahlén *et al.*, 2004). Regarding the different threats to its biotopes, it clearly appears that this species needs to become a protected species at the European scale (Lambret *et al.*, 2009). According to Kalkman *et al.* (2018), it should be included in the Habitats Directive. In the province of Seville, it was first detected in the marsh (Ferrerías-Romero & Soler, 1979; Muñoz & Ferrerías-Romero, 2011), and later in a stream in the countryside in 2015 (Márquez-Rodríguez & Vega-Maqueda, 2016), 2017 and 2024 (personal observation). *Bolboschoenus maritimus* is abundant in both Sevillian habitats. Hence, has *L. macrostigma* moved to the artificial lagoon on its own? Obviously, this vulnerable species appears for the first time in it, a peripheral area of the city. The effects of globalization in Mediterranean cities such as Seville show the replacement of the original Odonata fauna with African eurytopic species (Ferrerías-Romero & Márquez-Rodríguez, 2024). However, the damselfly *L. macrostigma* is a stenotic species (Nielsen, 1954; Lambret, 2010). In our study carried out in a new metropolitan lagoon, each female visitor lays its eggs in a vertical line on *Typha latifolia* (Fig. 3). Males actively search out females and, once found, the females are held in tandem. The male then transfers sperm from the genital pore at the end of its abdomen to the bursa copulatrix. On completion, the male encourages the female to mate by curving its abdomen upward. If the female is ready, it will form the copula. Once copulation has been completed, oviposition commences immediately. The pair remains in tandem and searches out oviposition on leaves of *Typha latifolia*. In the site studied, oviposition always occurs at a height distance of approximately 30 to 50 cm above the surface. The observations were made at noon. The maximum temperature reached those days was 35°C. Although this damselfly species has few populations in the south of the Iberian Peninsula, against all odds, a modern artificial environment has been chosen given the large local population observed.

According to Chelmick & Lambret (2020), these results certify the important dispersal capacity of the species *L. macrostigma*. An aspect unknown to date is the ability of the species to colonize artificial lagoons and getting adapted to *Typha* plants for reproduction. Considering the scarce breeding populations in Spain (Torralba-Burrial *et al.*, 2011), it is recommended to immediately activate a protection program and keep the marsh vegetation without clearing and, at the same time, the creation of artificial ponds on the outskirts of the cities solely with *Typha* and studying possible breeding habitats for this rare species of odonate.

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Fig. 1. - Halophilic vegetation of sampling point.

Fig. 2. - *Lestes macrostigma* perched on *Typha latifolia*.

Fig. 3. - Tandem of *Lestes macrostigma* laying eggs on *Typha latifolia*.

