

Scientific Note

Successful reproduction of dragonflies in an artistic water fountain in Versailles, France

Reproducción exitosa de libélulas en una artística fuente de agua de Versalles, Francia

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<https://doi.org/10.35249/rche.46.2.20.25>**Abstract.** Exuvian records of two species of Anisoptera are presented in an urban setting of a megacity, Paris. This is the first record of successful breeding in standing water from a small, untreated fountain in the gardens of the Palace of Versailles (France).**Key words:** Artificial fountains, *Aeshna cyanea*, *Sympetrum striolatum*.**Resumen.** Se presentan registros de exuvias de dos especies de anisópteros en un entorno urbano de una metrópoli, París. Este es el primer registro de la reproducción exitosa en agua estancada de una pequeña fuente sin tratar en los jardines del Palacio de Versalles (Francia).**Palabras clave:** Fuentes artificiales, *Aeshna cyanea*, *Sympetrum striolatum*.

The knowledge of the dragonfly fauna from France is well known (Boudot and Dommange 2012). With more than 93 Odonate species, France has the greatest specific richness in Europe, just ahead of Italy (Kalkman *et al.* 2010; Houard *et al.* 2013). Currently, we must add a new species recently detected in the southernmost provinces (Polette 2017). It is also with Spain, the country with the highest number of endemic species (8 taxa). At present, seven genera of Libellulidae are present in France: *Crocothemis* Brauer, 1868, *Leucorrhinia* Brittinger, 1850, *Libellula* Linnaeus, 1758, *Orthetrum* Newman, 1833, *Sympetrum* Newman, 1833 and *Trithemis* Brauer, 1868. Aeshnidae contributes with *Aeshna* Fabricius, 1775, *Anax* Leach, 1815, *Boyeria* McLachlan, 1896 and *Brachytron* Evans, 1845 (Boudot and Dommange 2012; Dommange 2011).

On a visit to the gardens of Versailles (Paris, France), I observed the presence of exuviae in some artificial fountains. On August 24, 2014, a cloudy day with little rain, it was possible to collect two exuviae of Anisoptera in a single fountain located at "Salle des Marronniers" (Fig. 1). This area was completely remodeled in 1704, when the groves were replanted with horse chestnut trees (*Aesculus hippocastanum* L.). Unlike other small fountains, the sampled fountain was isolated and in need of maintenance.

Exuviae were transferred to ethanol (70%) and later identified using a Nikon SMZ800 binocular microscope according to the keys of Carchini (1983); Heideman and Seidenbusch (2002); Doucet (2011). The recorded species were *Aeshna cyanea* (O.F. Müller, 1764) and *Sympetrum striolatum* (Charpentier, 1840), both females (Figs. 2, 3).

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Figure 1. Artistic fountain in the Palace of Versailles, Paris, a breeding habitat for *Aeshna cyanea* and *Sympetrum striolatum*.

The region of Paris is highly populated, dense and the most urbanized region of France. This area is within the watershed of the Seine and has a temperate climate moderated by oceanic influences. Other similar studies have recorded Anisoptera of the region in the months of August and September, detecting common species like *Sympetrum striolatum* and *Aeshna cyanea* (Jeanmougin *et al.* 2014). *S. striolatum* has a delayed reproductive diapause and it is restricted to high altitude sites in North Africa (Samraoui *et al.* 1998). In Southern Spain, abundant autumnal reproductive activity have been recorded (Ferreras-Romero and Márquez-Rodríguez 2014). In North Africa, *A. cyanea* is restricted to mountain streams (Samraoui and Alfarhan 2015). While in Southern Spain *A. cyanea* emergence takes place since late August in small permanent streams, with deciduous trees along the banks; the populations known in north and central Europe are common in farm ponds, small lakes, reservoirs and canals (Ferreras-Romero and Puchol-Caballero 1995). We want to emphasize the need to continue studying artificial constructions (fountains, ponds, etc.), integrated into large gardens because of their importance as an essential resource widely used by common species.



Figure 2. *Sympetrum striolatum* (exuvia) in dorsal view.



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Figure 3. *Aeshna cyanea* in ventral view showing ovipositor.

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