

INTRODUCTION

Fireflies are well known to present a range of defensive mechanisms to avoid predation.

Among them, some species possess the ability to reflex bleed when disturbed by emitting droplets of hemolymph, usually from the elytra or the pronotum.

The knowledge about defensive eversible organs in larvae has been expanded by Tyler (2001), who described them in *Lampyrus noctiluca* Linnaeus 1767 and subsequently by Trice, Tyler and Day (2004), who compared the larvae of three genera of fireflies (*L. noctiluca*, *Luciola cruciata* Motschulsky 1854 and a *Nyctophila* species from Amol forest, in Iran) and by Fu et al (2009), who studied these organs in *Luciola cruciata*, *L. lateralis* Motschulsky 1860, *L. leii* Fu et Ballantyne 2006, *Lampyrus noctiluca* Linnaeus 1767, *Pyrocoelia analis* Fabricius 1801, *Pyrocoelia pectoralis* Oliver 1883, *Pyrocoelia* sp. and two *Diaphanes* species.

METHODS

Two collaborators of the Spanish photo-biodiversity database “Biodiversidad Virtual” have registered larvae of *Nyctophila reichii* and *N. heydeni* with eversible organs, that has been identified by the Spanish glow-worm survey team (“¿Has visto una luciérnaga?”, www.gusanosdeluz.com)

See images in:

<http://www.biodiversidadvirtual.org/insectarium/Nyctophila-reichii-img424576.html>

<http://www.biodiversidadvirtual.org/insectarium/Nyctophila-heydeni-img791656.html>

RESULTS

We prove the presence of such defence mechanisms in two different species of the genus *Nyctophila* from Spain: *Nyctophila reichii* (Jacquelin du Val, 1859) and *N. heydeni* (Olivier, 1884).

As suggested by several cited studies, eversible organs may be widespread in *Lampyrid* larvae as a mechanism in strategies to be distasteful to vertebrate and invertebrate predators (Day, 2011).

However, there are relevant questions to be answered as to identify the substances released by the organs and the mechanism by which the organ is everted and retracted (Fu et al., 2009).

REFERENCES

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Trice, E.; Tyler, J.; Day, J.C. 2004. Description of pleural defensive organs in three species of firefly larvae (Coleoptera, Lampyridae). *Zootaxa*, 768:1-11

Tyler, J., Trice, E. 2001. A description of a possible defensive organ in the larvae of the European glow-worm *Lampyrus noctiluca* (Linnaeus) (Lampyridae). *Coleopterist*, 10:75-78



Map 1. Distribution of *Nyctophila reichii* in Spain.



Image 1. *Nyctophila reichii*, larva
Photo: Ferran Turmo



Image 2. *Nyctophila reichii*, female
Photo: José Ramón Guzmán Álvarez



Image 3. *Nyctophila reichii*, male
Photo: José Ramón Guzmán Álvarez



Figure 4. Larva of *Nyctophila reichii* with eversible organs (Almería, Almería, Spain, 28/10/2013)
Photo: Francisco Rodríguez Luque, www.biodiversidadvirtual.org



Map 2. Distribution of *Nyctophila heydeni* in Spain.



Figure 6. *Nyctophila heydeni*, larva.
Photo: Jordi



Figure 5. *Nyctophila heydeni*, larva.
Photo: Ben Mitchell



Figure 7. *Nyctophila heydeni*, male.
Photo: José Ramón Guzmán Álvarez

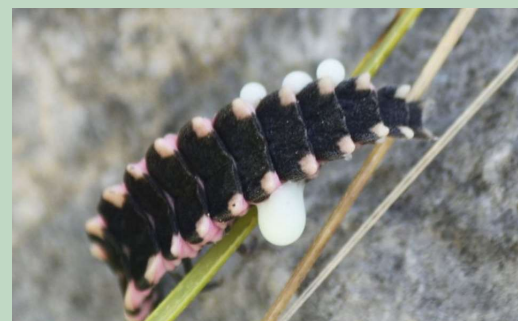


Figure 8. Larva of *Nyctophila heydeni* showing reflex bleeding from eversible organs (Pollença, Balears, Spain, 11/10/2016)
Photo: Matilde Martínez, www.biodiversidadvirtual.org

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