

A new species, a new invader, or an old neighbour? The history of the aphid *Longicaudinus corydalisicola* (Tao, 1963)

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Introduction

Determining the geographical origin of species is usually a difficult matter.

Citizen science helps recording and monitoring them, while molecular analysis aids with their identification. In this work, we present a clear example of these difficulties, introducing the curious story of an aphid which was detected in different localities of the Iberian Peninsula at the same time.

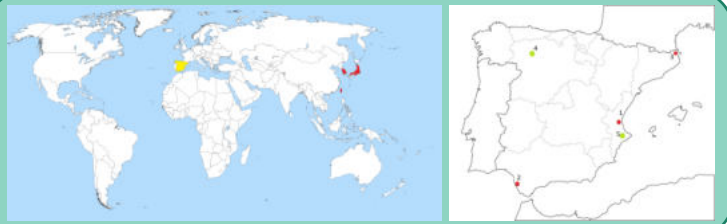
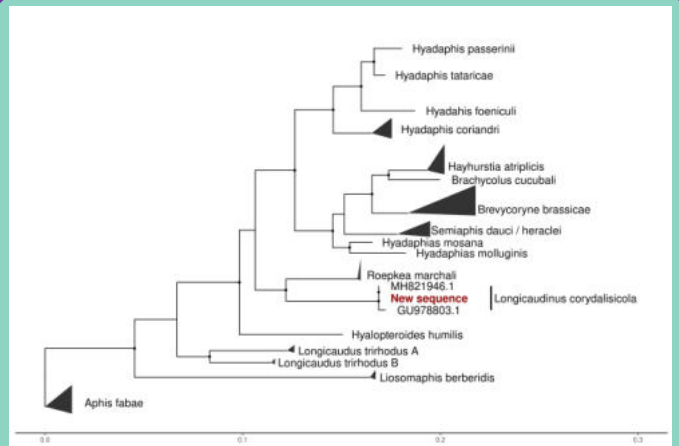


Material & Methods

In May 2022, a colony was detected on *Fumaria officinalis* in León. It was monitored until it disappeared in June of the same year. Later, research on iNaturalist and Biodiversidad Virtual helped to find more photos from three Spanish localities (table). Samples were used in the molecular analysis of the cytochrome oxidase I gene (COI), as well as in a morphological analysis.

Results

The molecular sequence of COI and its comparison with the sequences deposited in the NCBI database allowed us to assign the aphid a specific name: *Longicaudinus corydalisicola* (Tao, 1963). This is a species reported from Taiwan and Japan, living on *Corydalis* spp. The morphological studies seemed to sustain the proximity with this Asian species.



Reference	Locality and province	Date	Leg.	Host Plant
1	Albalat dels Sorells (Valencia)	08/01/2022	Juan Ramón Vázquez	<i>Fumaria capreolata</i>
2	Jerez de la Frontera (Cádiz)	13/03/2022	Iñigo Sánchez	<i>Fumaria agraria</i>
3	La Selva de Mar (Girona)	15/04/2022	Eduard Marquès	no host plant
4	León (León)	15/05/2022	Nicolás Pérez Hidalgo	<i>Fumaria officinalis</i>
5	Pego (Alicante)	16/05/2022	Alice Casiraghi	<i>Fumaria capreolata</i>

A new species?

Even if unlikely, it may be a new species, promoted by an allopatric speciation event: *L. corydalisicola* from Asia lives on *Corydalis*, while populations from the Spain have been recorded only on *Fumaria* spp. Molecular analyses with different genes and comparison with the Asian specimens are required in the future.

A new invader?

Our species may have reached Europe through the commercialization of their host plant, *Corydalis*, which is sometimes used in ornamental gardening, and gone unnoticed because of its host preference.

An old neighbour?

The most probable hypothesis. Aphidologists could not notice it because i) it is a cryptic species, which goes unnoticed; ii) their host plants are considered weeds of crops with little interest. Given the aphid distribution in the Iberian Peninsula, we expect its presence to be wide in Europe.