

# First report of *Parembia persica* (McLachlan 1877) from Cyprus and Europe (Insecta, Embioptera, Embiidae)

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## Abstract

The genus *Parembia* Davis 1939, composed of few species and widespread in the Indian subcontinent, in the Middle East, in the Arabian Peninsula and in Somalia, is reported here from Cyprus and Europe for the first time. The report is based on a male specimen of *Parembia persica* (McLachlan 1877) kept in the Paolo Fontana collection at the Rovereto Civic Museum Foundation. From the citizen science project iNaturalist.org it is clear that in Cyprus almost certainly additional species of Embioptera are present. However, the photographs, which accompany the records, do not allow identification at genus or species level. The record of *P. persica* based on collection material and those from iNaturalist.org suggest the need to make targeted collections on the island.

**Key words:** *Parembia*, Fauna Europaea, Cyprus.

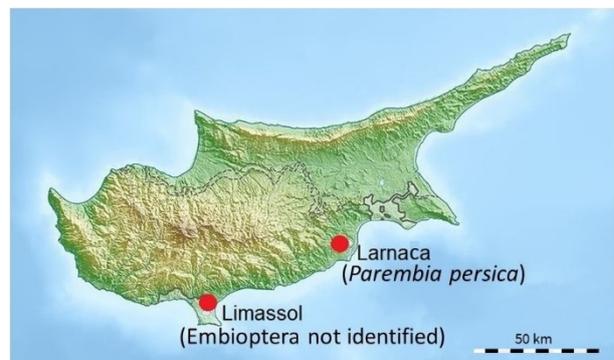
## Introduction

Embioptera or web spinners are a small order of Polyneoptera insects with interesting anatomical, biological and ethological characteristics. Their study is quite simple, both from the morphological and bio-ethological point of view, as they can be bred and therefore observed with great ease. In Europe and in the Mediterranean basin these insects are so little studied that, with the exception of the two new species described by Fontana (2001; 2002), all the others were first described prior to 1966, mainly by the USA entomologist Edward Shearman Ross (1915-2016) and by the Italian zoologist Renzo Stefani (1922-2007), author of numerous and in-depth studies on the biology and ethology of these insects and of the description of some Mediterranean species. The knowledge of the Mediterranean Embioptera, as previously mentioned, is mainly due to the numerous works by Stefani (1953; 1955; 1983) and to the monographic study by Ross (1966) relating to the European and Mediterranean species. Another work pertinent to the Mediterranean area is that of Ross (2006) concerning the species of north-eastern Africa and the Red Sea region.

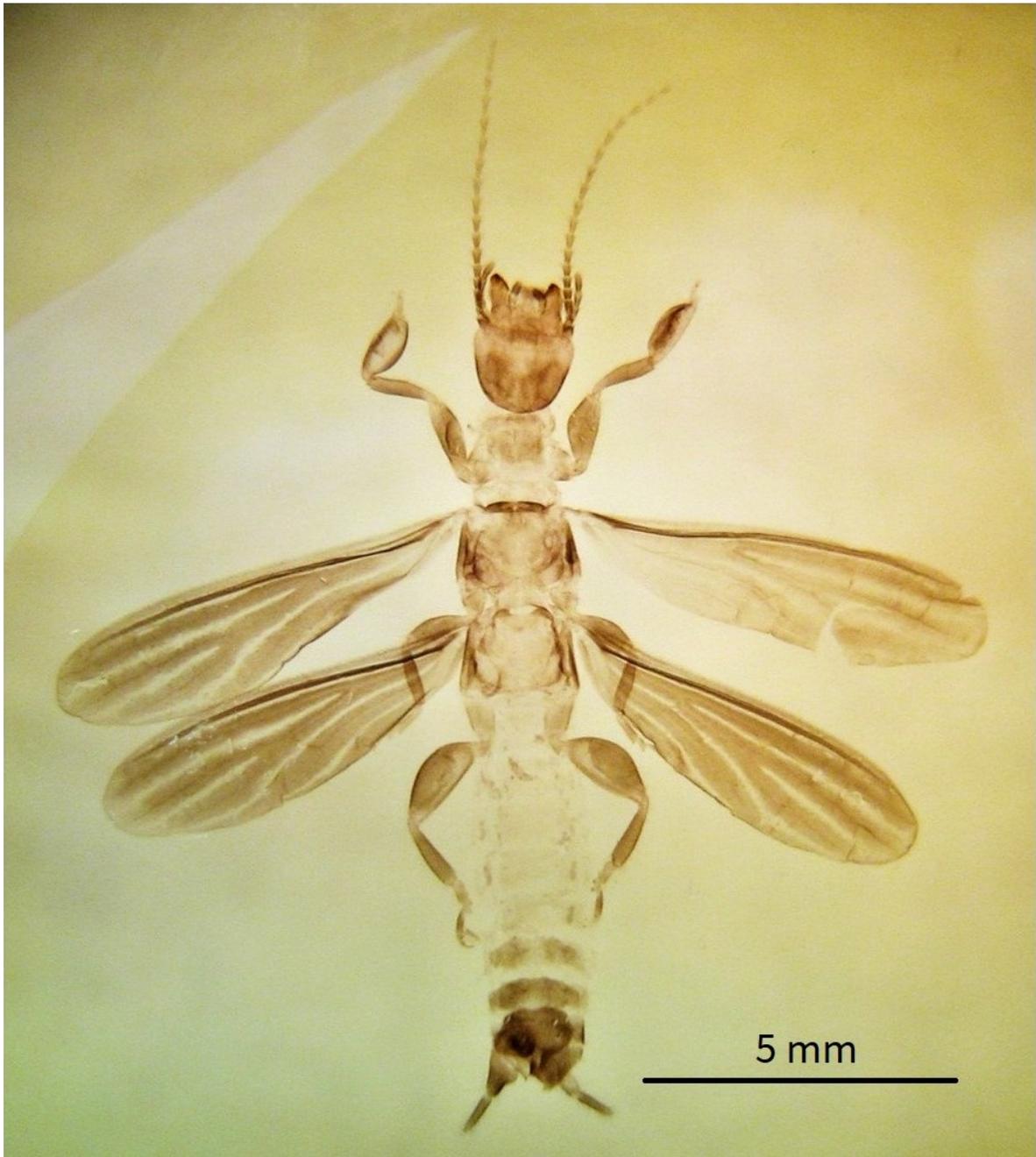
As far as Europe is concerned, for a long time the Embioptera were considered insects occurring only in Mediterranean climates and environments, mainly confined to the coast. In recent decades, however, populations or single individuals of Embioptera have also been found in Northern Italy (Fontana *et al.*, 2022a; 2022b). Therefore, it cannot be excluded that these insects can be found and therefore should be sought in the pre-Alpine belt, especially in xerothermic environments. Absolutely no recent work on the systematic and on the distribution of this group has been done in Europe. This information would have great ecological and biogeographic value. Knowledge on the presence of Embioptera in Europe is scarce and is summarized within the framework of the Fauna Europaea on line (Heller, 2013). Currently Fauna Europaea lists 2 families, 4 gen-

era (*Cleomia* Stefani 1953, *Embia* Latreille 1825, *Haploembia* Verhoeff 1904 and *Oligotoma* Westwood 1837) and 13 species of Embioptera. The areas covered by Fauna Europaea are the European mainland (Western Palearctic), the Macaronesian islands (excluding Cape Verde Islands), Cyprus, Franz Josef Land and Novaya Zemlya; Western Kazakhstan is excluded. According to the latest revision (Fontana, 2021), the checklist of the Embioptera in Italy counts 3 genera and 7 species, the highest number of species in all of Europe.

The island of Cyprus (figure 1) is located in the eastern Mediterranean Sea, north of Egypt, east of Greece, south of Turkey, and west of Lebanon and Syria. It is geographically in Western Asia, but its cultural ties and geopolitics are overwhelmingly Southeastern Europe. Cyprus, officially the Republic of Cyprus, is a member country of European Union since 1<sup>st</sup> May 2004, despite joining the EU as a de facto divided island being the northeast portion of the island governed by the self-declared Turkish Republic of Northern Cyprus. It is the third-largest (9,251 km<sup>2</sup>) and third-most populous (904,705 in 2022) island in the Mediterranean.



**Figure 1.** The two localities where the two specimens, examined by the authors, were collected.



**Figure 2.** Adult male of *P. persica*; Republic of Cyprus, Larnaca, Salt Lake (Halla Sultan Tekke garden), 9.V.2008.

## Methods

For the taxonomic study of Embioptera, specimens must be mounted on slides (Fontana *et al.*, 2002; 2022a; 2022b). The specimens and the relative anatomical details here illustrated and studied were mounted on slides and photos were taken with a Nikon Coolpix 4500 on a stereomicroscope Optech EMX-210-2. All measurements were taken with a micrometric ocular on the same stereomicroscope. The nomenclature adopted for the different anatomical parts of the Embioptera follow Ross (1966). The specimens studied are those of the Paolo Fontana collection and preserved at the Fondazione Museo Civico di Rovereto (FMCR) in the entomological collections located in the Parolari Palace (Rovereto, Italy).

## *Paremibia persica* (McLachlan 1877)

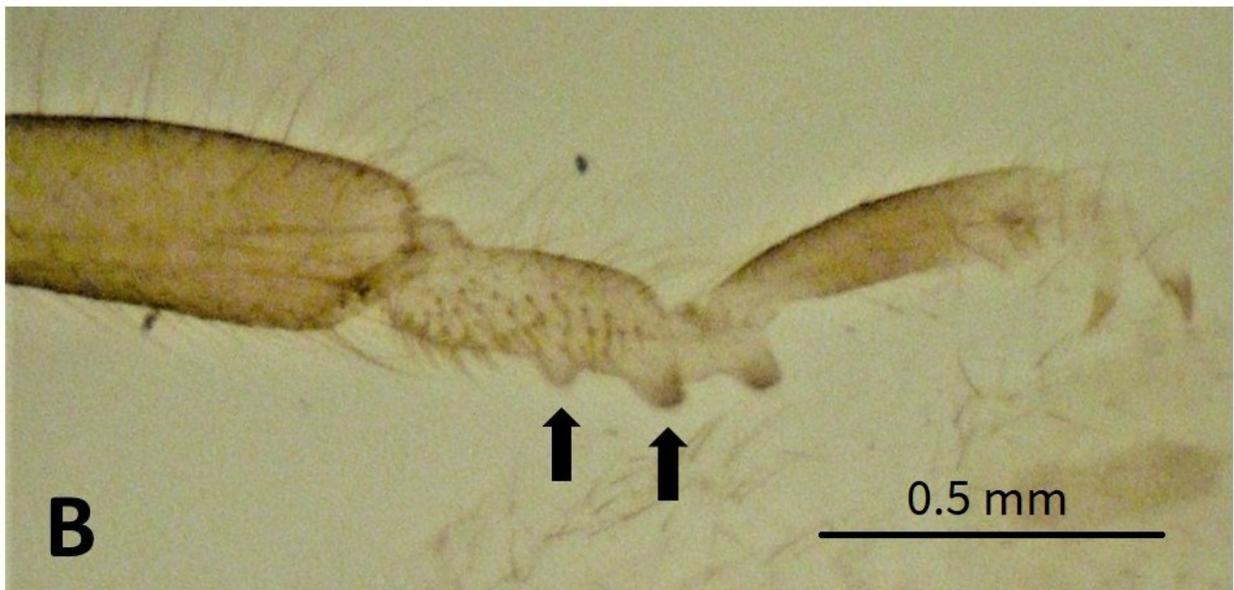
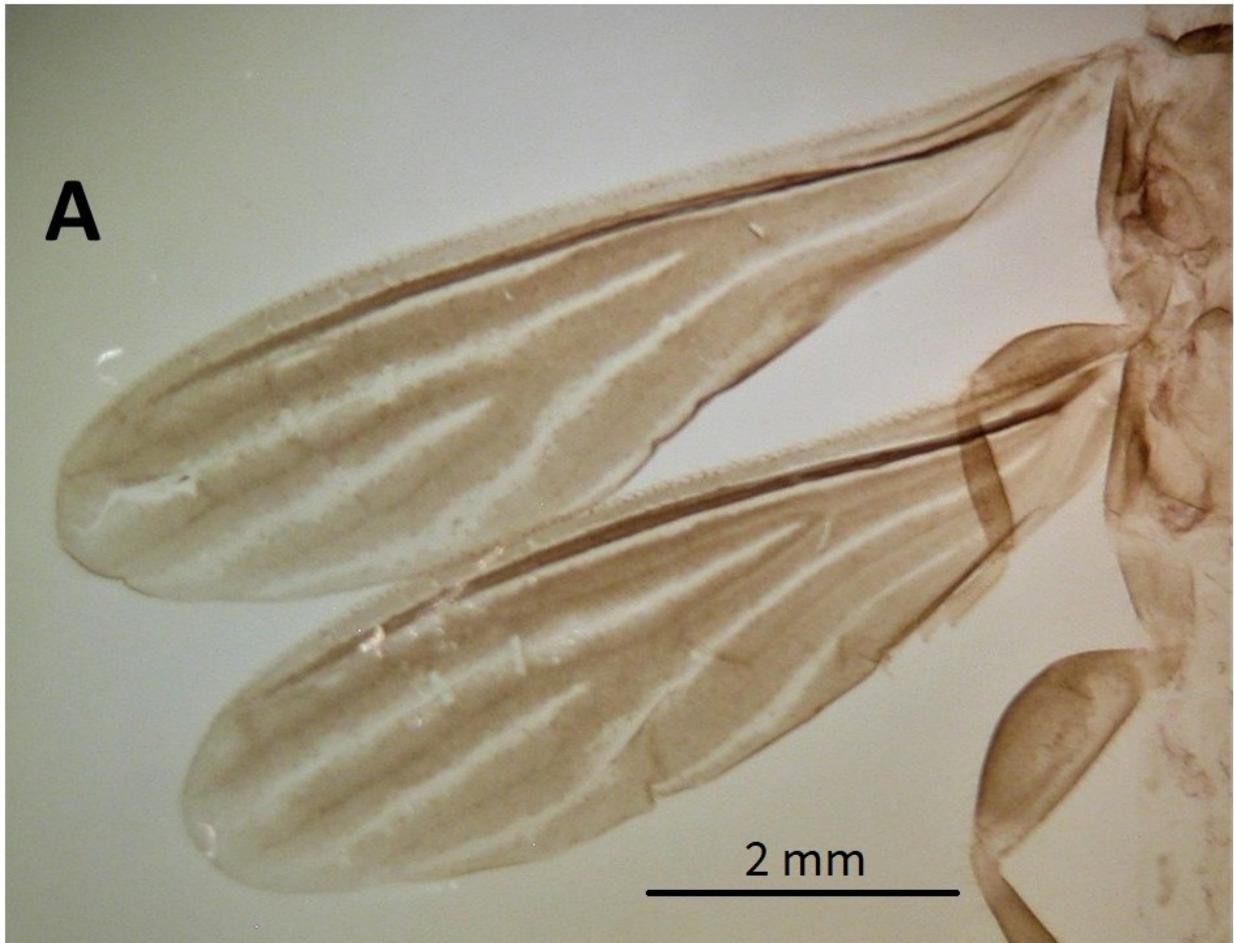
*Embia persica* McLachlan 1877. Journal of the Linnean Society of London, Zoology, 13: 382.

*Embia persica* Hagen 1885. The Canadian Entomologist, 17 (10): 192.

*Paremibia persica* Davis 1939. Proceedings of the Linnean Society of New South Wales, 64: 480.

*Paremibia persica* Ross 1981. Fauna of Saudi Arabia, 3: 202.

*Paremibia persica* Ross 2006. Fauna of Saudi Arabia, 22: 329.



**Figure 3.** Adult male of *P. persica* from Cyprus: **A)** detail of the left mesothoracic and metathoracic wings; **B)** the two relatively large ventral papillae on the first segment of the hind tarsi (indicated by the black arrows).

Synonyms:

*Embia valida* Hagen 1885 (Ambala, India).

*Embia tartara* Saussure 1896 (Turkestan).

*Embia scotti* Esben-Petersen 1929 (Baghdad, Iraq).

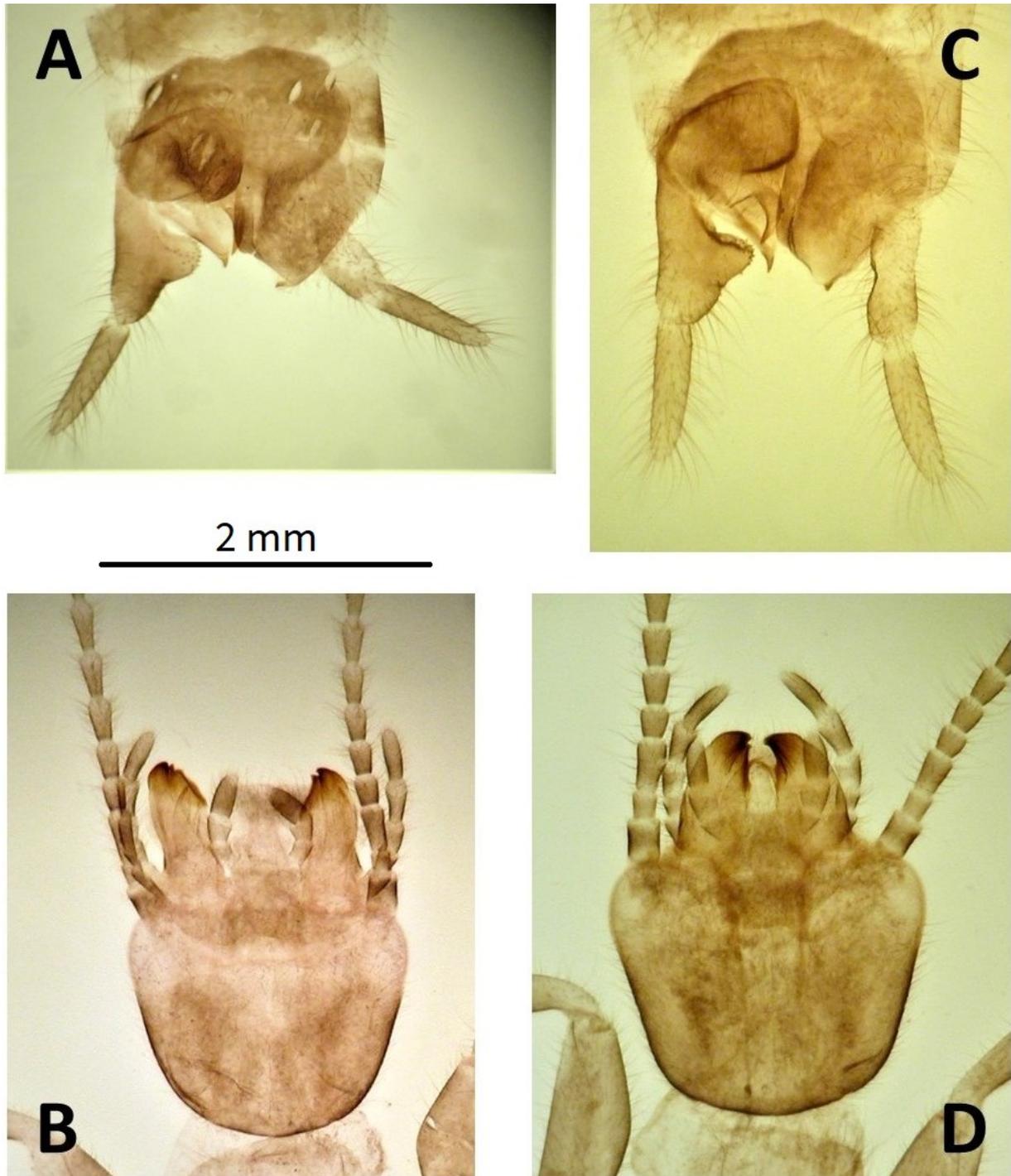
*Embia producta* Davis 1940 (Mogadischu, Somalia).

Using the fascinating and eloquent words of Ross (1981): “[*Parembia*] *persica* is apparently a «weed» species, spread about during centuries of caravan traffic”. The winged males of this species are strongly attracted to lights and are easily collected. According to Ross (2006)

*P. persica* ranges into the Red Sea and Middle East regions and it is likely to occur wherever there is human activity.

Examined material (specimens mounted on slides):

Republic of Cyprus, Larnaca, Salt Lake (Hala Sultan Tekke garden), 9.V.2008, 1 adult winged male, leg. J. M. Lemaire (Fontana collection at FMCR); Limassol, Laneia (cavity of 800 years old oak tree), 15.V.2008, 1 adult female, leg. J. M. Lemaire (Fontana collection at FMCR).



**Figure 4.** Terminalia (A, C) and head (B, D) of two males of *P. persica*: (A, B) Republic of Cyprus, Larnaca, Salt Lake (Hala Sultan Tekke garden), 9.V.2008; (C, D) UAE, Sharjah, Khor Kalba, near tunnel, 31.V-7.VI.2006 (light traps).

UAE, Sharjah, Khor Kalba, near tunnel (24.59N 56.09E), 31.V-7.VI.2006 (light traps), 2 adult winged males (Fontana collection at FMCR), leg. A. van Harten.

The identification of the single adult, winged male from Larnaca (figures 2 and 3) was based both on the comparison with descriptions and illustrations present in the bibliography (Davis, 1939; Ross, 1981; 2006) and on the comparison with some specimens from the United Arab Emirates (figure 4), unmistakably identifiable as *P. persica*. In particular, the identification had taken in account the presence of the two hind basitarsal papillae (figure 3B) and the shape of basal segment of left cercus (figure 4A) not markedly channelled longitudinally; within the range of the species are the length of body (head-apex terminalia) and the length of the right mesothoracic wing and right metathoracic wings, respectively (measures expressed in mm) 12.96 - 6.88 - 6.56 for the Cypriot male specimen, 14.4 - 8.00 - 7.68 and 13.28 - 7.68 - 7.36 for the two males from United Arab Emirates. Instead, the identification of the female collected in Lissassol is currently not possible.

The two specimens collected in Cyprus confirm the presence of the order Embioptera on the island, while the single adult winged male from Larnaca is the first record of the genus *Parembia* in Europe and it also represents actually the westernmost record of *P. persica*.

To date, in scientific literature, there have been no reports of Embioptera from Cyprus (Ross, 1966; 2006) but recently several reports of specimens belonging to the order Embioptera have been uploaded on the citizen science project iNaturalist (2023) for the island. The images accompanying the reports on iNaturalist web site do not allow us to ascertain whether these individuals belong to the genus *Parembia* and even less to *P. persica*, but some of them allow us to strongly hypothesize the presence in Cyprus of species other than the one mentioned here. From these data, coming from a typical citizen science activity, it is clear that collections of specimens are needed to allow certain identifications at the species level. Citizen science is a powerful source of information, but we would like to emphasize the relevance of improving the museal collections in order to facilitate the access to physical specimens for taxonomist.

## Acknowledgements

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