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## A review of the research on Canary Islands praying mantises (Mantodea)

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### Abstract

For many years researchers studying the fauna of the Canary Islands have only sparsely treated the charismatic insect order of praying mantises (Mantodea). By studying the known literature it becomes obvious that there are several inconsistencies regarding mantodean taxonomy as well as the number of actual species and their distribution within the archipelago. In the present contribution, the literature treating the Canary Island Mantodea fauna is thoroughly reviewed, and the distribution of the ten known Mantodea species is presented with additional comments on the taxonomic problems. The taxonomy and distribution of the Canary Island Amelinae has been causing some confusion in the literature and is therefore discussed for a better understanding of the composition of this group. So far, seven species of Amelinae (two species of *Ameles* Burmeister and five species of *Pseudoyersinia* Kirby) are recognized for the Canary Islands. A careful survey of the taxonomic literature indicates that there is a substantial degree of variability in this group, which may have led to frequent misidentifications. This is reflected by the inconsistent literature data on the distribution of several *Pseudoyersinia* species within the archipelago. A crucial amendment and clarification is provided regarding the date of description (1838) of *Ameles gracilis* (Brullé) and *Ameles limbata* (Brullé) as it varies in the literature. Nomenclatural changes regarding the homonymy of *Mantis limbata* Brullé and *Mantis limbata* Hahn, previously proposed by Koçak & Kemal (2008), are rejected and discussed in detail. One of the Mantodea species, *Empusa pennata* (Thunberg), is frequently mentioned in the literature to be present on the Canary Islands, but after carefully reviewing the literature data it is evident that this species has never actually been found on any of the islands. The aim of this publication is to lay a basis for future research on the Mantodea fauna of the Canary Islands, their phylogenetic placement and history of dispersal. This is even more important as the archipelago is a European endemism hot spot for praying mantises and these basic parameters are crucial for implementing plans regarding conservation strategies on the islands.

**Key words:** Biogeography, Canary Islands, insects, literature, Mantodea, taxonomy.

### Introduction

The Canary Islands are a group of seven islands and several smaller islets situated in the Atlantic Ocean off the west coast of Africa (Fig. 1). They have a subtropical climate (Juan *et al.* 2000) and mark an active volcanic region with many eruptions in the last few centuries (e.g., Sobrado *et al.* 2011). The latest eruption near the coast of El Hierro, forming an undersea mount that nearly broke the sea surface in 2011, was an impressive example of the persistent volcanic activity in the Canary Islands and was ubiquitous in the worldwide media.

The archipelago has been the focus of many biogeographic studies due to the high degree of endemism of the biota within the archipelago and on individual islands (e.g., Juan *et al.* 1995, 1996, 2000; Emerson 2002; Moya *et al.* 2004; Fernández-Palacios & Whittaker 2008; Hochkirch & Görzig 2009; Greve *et al.* 2010). It provides an ideal stage for evolutionary processes as the islands are rather young and volcanism is still very active, which has frequently led to changing environments in the recent past. From west to east the archipelago encompasses the

problem”) makes it important to study the actual variability occurring within natural populations of these two genera, including elaborate comparisons of the male genitalia. A revision of *Pseudoyersinia* and *Ameles* is an important future task; it should include morphological data (as done by Agabiti *et al.* 2010) for a large sample of conspecific specimens as well as a molecular phylogeny encompassing Mediterranean, North African and Canary Island Amelinae focused on *Ameles* and *Pseudoyersinia*.

Studies from other invertebrate taxa of the Canary Islands have yielded valuable data. For example, Hochkirch and Görzig (2009) studied colonization and speciation events of the apterous acridid grasshopper genus *Arminda* Krauss, using two mitochondrial (12s rRNA and ND5) and two nuclear genes (28s rRNA and ITS2). Their results were in accordance with a stepping-stone colonization scenario for the Canary Islands, although alternative scenarios cannot be ruled out by their data (Hochkirch & Görzig 2009: 193). A similar pattern was found by Juan *et al.* (1996) in the tenebrionid beetle genus *Hegeter* Latreille based on COI data. However, a fundamentally different situation was discovered in the land snail genus *Theba* Risso by Greve *et al.* (2010), who analyzed COI and ITS1 data and whose results implied that the genus originated on the Canary Islands and only then colonized the African mainland (Morocco; Greve *et al.* 2010: 582). However, as the archipelago must have been initially colonized before re-colonization of the African mainland, the authors assumed a North African or Iberian origin of the genus (Greve *et al.* 2010: 582).

Here, only a thorough literature review of the publications treating the Canary Island Mantodea can be provided in order to lay the basis for future work on this group. However, future analysis of the Canary Island Amelinae may lead to a better understanding of the actual Mantodea fauna in the archipelago and may therefore enhance the understanding of the organismal composition of this extremely interesting group of islands. This is also an important aspect in relation to conservation strategies as the fauna of the Canary Islands exhibits a high degree of endemism and therefore represents a biodiversity hotspot within the European Mantodea fauna.

In conclusion, it becomes obvious that a combination of morphological and molecular data would greatly help to resolve the evolutionary history of the Canary Island Mantodea populations and to elucidate the species boundaries in uncertain cases.

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