MAIISG NEWSLETTER

Number 7, April 2022

HI MAIISG MEMBERS

Welcome to the first newsletter of 2022.

In this issue, Luís Crespo presents the recent taxonomic revision of the *Hognas* from Madeira archipelago.

Mário Boieiro and Paulo Borges share the new findings of introduced species in the Azores. At the same time, António Franquinho Aguiar brings the new paper of J. Claessens et al. regarding the pollination strategy of the *Gennaria diphylla* on the Canary and Madeira Islands.

Carla Rego et al. talk about the hoverflies from the Madeira archipelago, while Yeray Monasterio informs about the butterflies observation workshops which will take place at La Palma Island (Canaries Islands).

Dinarte Teixeira, Marco Neiber and Klaus Groh signal the start of a conservation project in Tenerife addressing five Critically Endangered endemic land snails.

Last but not least, we share the summary results of the MAIISG 2021 activities report.

We hope you enjoy this first newsletter edition of 2022.

Vicky, Paulo and Dinarte

HOW MANY *HOGNA* SPECIES ARE IN MADEIRA ARCHIPELAGO?

By Luís Crespo

The already well known *Hogna ingens* (Blackwall, 1857) is only one of seven distinct species of the genus *Hogna* that dwell in the Madeira archipelago. These species were recently revised in an integrative taxonomic revision published in Zookeys (https://zookeys.pensoft.net/article/68015/), where several novelties are reported.

We have made thorough efforts to find type materials resting in museum collections and went through old descriptions looking to detect helpful elements. Previous works left a trail of obscure information and lost or inaccessible materials, and our work does not stand close to perfection, but it is a major step forward the knowledge of this group. We also have used molecular data to backup our morphological analysis, searching for the potential origin of the Madeiran *Hogna* and to perform species delimitation methods. We identify two species that should be of conservation concern, given their poorly known distribution data.

Our taxonomic findings include the revalidation of H. blackwalli, three synonymies (*H. biscoitoi = H. insularum*, *H. schmitzi = H. maderiana* and *Arctosa maderana = H. ferox*), and the discovery of a new species from the Desertas, *H. isambertoi*, known from only 4 specimens collected by Isamberto Silva. However, the most notably strange discovery occurs with the species pair H. insularum and *H. maderiana*.

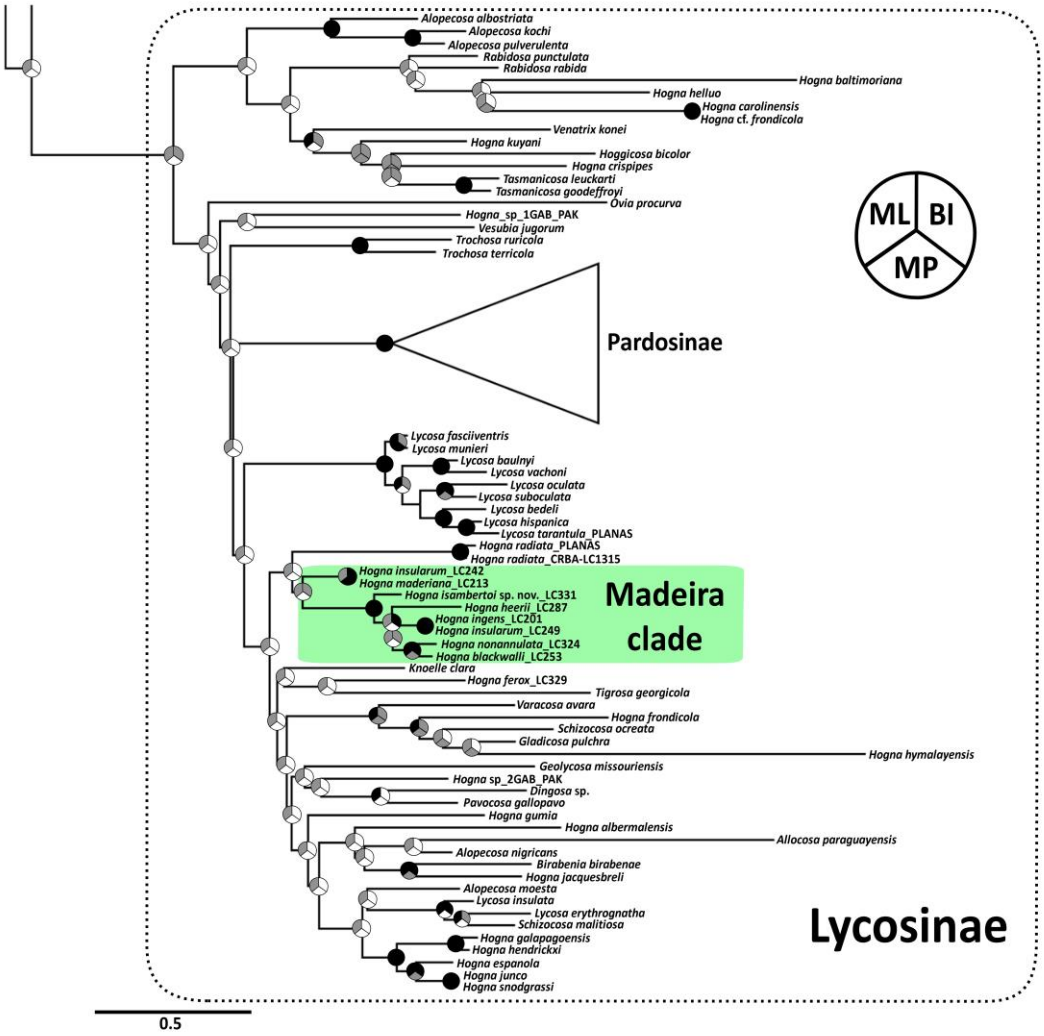
While the latter former is a small to medium-sized brown species occurring in the entire archipelago, the latter is a large species occurring only in Porto Santo and Ilhéu de Ferro, with striking leg coloration (see photo below).

Each of these species lacks exclusive haplotypes in the studied genetic markers, and the discovery of intermediate forms may hint towards hybridisation phenomena, which already have been

reported in insular taxa in the genus. Given how inconclusive our data remains, we have decided to keep the present taxa definitions, leaving further taxonomic considerations to studies using novel genome wide screening methods.

The species origins are not yet well understood, given how poorly supported stands the overall phylogeny of the Lycosinae subfamily, but all signs point to a very close relationship among all Madeiran *Hogna*, with the pair *H. insularum* and *H. maderiana* forming a well-supported cluster and the group comprising the remaining species another well-supported cluster. Interestingly, and although with low support, the Madeiran species are also close to the type species of the genus, the Mediterranean *H. radiata*.

While *H. ingens* has already been the target of ongoing conservation efforts, we signal *H. isambertoi* and *H. nonannulata* as new targets, given how little is known about their distribution ranges and natural history.



B

'The species origins are not yet well understood, given how poorly supported stands the overall phylogeny of the Lycosinae subfamily, but all signs point to a very close relationship among all Madeiran Hogna, with the pair H. insularum and H. maderiana forming a well-supported cluster and the group comprising the remaining species another well-supported cluster.'

NEW FINDINGS OF INTRODUCED SPECIES IN AZORES UNVEILED BY A LONG-TERM MONITORING STUDY

By Mário Boieiro and Paulo Borges

Invertebrates face a variety of threats in island ecosystems (e.g., habitat destruction, invasive species, climate change) being critical the monitoring of changes in species abundance and distribution to inform nature conservation authorities and support decision-making.

The SLAM Project - Long Term Ecological Study of the Impacts of Climate Change in the Natural Forest of Azores – is being carried out in seven Azorean islands and aims to: 1) collect long-term ecological data on species distribution and abundance; 2) identify pathways impacting oceanic indigenous assemblages; 3) investigate species-environment relationships; 4) study the associations of diversity (taxonomic, functional and phylogenetic) and ecosystem functioning (see also http://gba.uac.pt/research/projects/ver.php?id=18).

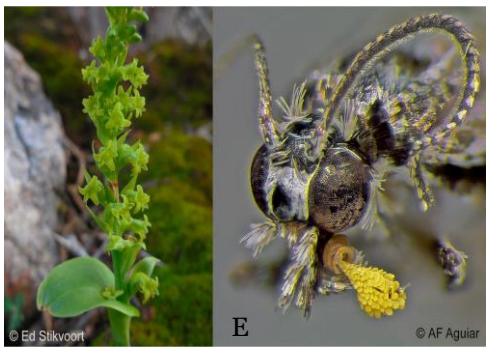
Some preliminary results from sampling native, exotic and mixed forest patches in four islands (Corvo, Flores, Terceira and Santa Maria) were recently published (Borges et al., 2022), showing that introduced species are well-represented in these habitats (125 species out of 249), particularly in exotic and mixed forests. Five species were reported for the first time from the archipelago (probably recent introductions) and 34 records of exotic species are novel at island-level. These findings clearly show the ongoing arrival of exotic species to Azores and their rapid spread between and within islands, being a matter of great concern for nature conservation managers. Furthermore, they reinforce the urgent need for invertebrate biodiversity monitoring in oceanic islands as an important strategy for early detection of invasive species that may have severe impacts on the environment, economy and human well-being. Finally, it is important to stress the finding of some rare endemic species in exotic and mixed forest fragments, as well as in small disturbed native forest patches, showing important the role of these areas as reservoirs of native biodiversity.

Reference: Borges, P.A.V., Lamelas-Lopez, L., Stüben, P.E., Ros-Prieto, A., Gabriel, R., Boieiro, M., Tsafack, N. & Ferreira, M.T. (2022) SLAM Project - Long Term Ecological Study of the Impacts of Climate Change in the Natural Forest of Azores: II - A survey of exotic arthropods in disturbed forest habitats. Biodiversity Data Journal, 10, e81410. DOI:10.3897/BDJ.10.e81410.

'Some preliminary results from sampling native, exotic and mixed forest patches in four islands (Corvo, Flores, Terceira and Santa Maria) were recently published (Borges et al., 2022), showing that introduced species are well-represented in these habitats (125 species out of 249), particularly in exotic and mixed forests.'

POLLINATION STRATEGY OF GENNARIA DIPHYLLA (ORCHIDACEAE) ON THE CANARY ISLANDS AND ON MADEIRA

By Jean Claessens, Antonio Franquinho Aguiar, Ole Karsholt, Juan José Bacallado, Reinout Heijungs and Barbara Gravendeel



The small green orchid *Gennaria diphylla* (Link) Parl. is a Mediterranean species which is native in Central Macaronesia (Canary Islands and Madeira). Knowledge about the biology of its pollination is almost non-existent, although there are mentions of autogamy and allogamy processes. The authors of this study investigated this issue in the two archipelagos and came to the conclusion that self-pollination, although it happens, is not as important as thought, with pollination by small moths, from three different families, being central to the fruiting of this orchid.
This study was published last March in the Journal Mediterranean Botany and as an open-source publication, it can be freely accessed on https://doi.org/10.5209/mbot.73718

> *'The authors of this study investigated this issue in the two archipelagos and came to the conclusion that self-pollination, although it happens, is not as important as thought, with pollination by small moths, from three different families, being central to the fruiting of this orchid.'*

THE HOVERFLIES (DIPTERA, SYRPHIDAE) OF MADEIRA ARCHIPELAGO

By Carla Rego, António Franquinho Aguiar & Mário Boieiro

Hoverflies are an important insect group, playing key roles in pollination and biological control. Twenty-six species are known to occur in Madeira archipelago, including four endemics: *Eumerus hispidus* Smit, Aguiar & Wakeham-Dawson, 2004; *Melanostoma wollastoni* Wakeham-Dawson, Aguiar, Smit, McCullough & Wyatt, 2004; *Myathropa usta* Wollaston, 1858 and *Xanthandrus babyssa* Walker, 1849. Most of these species can be found in Madeira Island (25 species) while Porto Santo (14 species) and Desertas islands (7 species) have fewer species.
Recently, a group of researchers provided a pictorial key for the identification of Madeira hoverflies, including photos of both males and females (in dorsal and lateral views).
The key and plates are a very useful resource to help identify these beautiful insects and aim to engage a broader audience of citizens in improving the knowledge on the distribution and ecology of Madeira hoverflies. The study was published in the Biodiversity Data Journal and is available online at https://bdj.pensoft.net/article/78518.

> *'The surveys on coastal regions of Madeira Island, within areas with endemic bushes, valleys and gorges, has identified more than 80 species, although without any records of the target species.'*

LEARNING HOW TO OBSERVE BUTTERFLIES ON THE ISLAND OF LA PALMA (CANARY ISLANDS)

By Yeray Monasterio

The Asociación ZERYNTHIA and the council of La Palma are organizing workshops where volunteers can learn where and how to observe butterflies on the Island of La Palma (Canary Islands).

These workshops will be held on the 4th, 5th and 6th of June under the framework of 'World Environment Day'.

> *'The Asociación ZERYNTHIA and the council of La Palma are organizing workshops where volunteers can learn where and how to observe butterflies on the Island of La Palma (Canary Islands).'*

CONSERVATION OF 5 CRITICALLY ENDANGERED ENDEMIC LAND MOLLUSCS FROM TENERIFE

By Dinarte Teixeira, Marco Neiber & Klaus Groh


H


I

A project aiming to conserve 5 Critically Endangered endemic land snails from Tenerife (Canary Islands) has been ongoing since October 2021. The main goal is to collect accurate information on the species distribution and their conservation status, which are known to have very small distribution areas. The project has the finantial support of the Loro Parque Fundación (Tenerife) and the Tenerife Council, and has been implemented with the direct cooperation of the Faculdad de Biologia Animal, Edafologia y Geologia of the Universidad de La Laguna and the Faculdad de Ciencias de la Comunicación y Trabajo Social and its students.

An extensive survey covering 25 sites was done in February 2022, with the participation of three members of MAIISG: Klaus Groh, Marco Neiber and Dinarte Teixeira. As a result, a report is being prepared, which evaluates the area of occupancy and extent of occurrence of the target species, the habitat characterization, and ecological information that would be fundamental for the Species Conservation Strategy to be developed.

This study can be seen as a pilot project for similar studies of land molluscs on other Canarian Islands and other Critically Endangered Plants or Animals in the archipelago. In addition to the faunistic and nature conservation aspect, the focus is on improving the knowledge of little-known animals and plants in the general public, especially among schoolchildren.

‘The main goal is to collect accurate information on the species distribution and their conservation status, which are know to have very small distribution areas.'

IUCN SSC MID-ATLANTIC ISLANDS INVERTEBRATE SPECIALIST GROUP – 2021 REPORT

By Vicky Wilkins, Paulo Borges and Dinarte Teixeira

The IUCN SSC has produced a report assessing the goals and targets of the MAIISG for 2021. These include different targets such as Assessments, Plans, Actions, Assessments, Networking and Communication.

We are glad to report that most of the targets are on track (65%), having already achieved 11%. We count on implementing the other 24%, which have not been initiated yet.

The full summary report will be attached to the newsletter.

'We are glad to report that most of the targets are on track (65%), having already achieved 11%.'

FINAL REMARKS

We wish to thank the members who contributed to April's 2022 newsletter.

There are many ongoing projects in different latitudes addressing distinct groups of invertebrates. We encourage you to let us know what you are doing, and we look forward to hearing news from those in the following newsletters issues.

Until next time.

Vicky, Paulo and Dinarte

Image credits:

A. *Hogna maderiana* (Photo by Pedro Cardoso).

B. A passive flight interception SLAM trap (Sea, Land and Air Malaise trap) used in the monitoring project (Photo by Paulo A.V. Borges).

C. The critically endangered beetle Tarphius_rufonodulosus, endemic to Santa Maria island, was found in a mixed forest remnant (photo by Erno-Endre Gergely, Azorean Biodiversity Group).

D. The endemic hoverfly *Eumerus hispidus* resting on *Euphorbia piscatoria* (Photo by Carla Rego).

E. Small green orchid *Gennaria diphylla (Link),* on the left (Photo by Ed Stikvoort). On the right, *Eudonia angustea (Crambidae)* (Photo by António Franquinho Aguiar).

F. The endemic hoverfly *Eumerus hispidus* resting on *Euphorbia piscatoria* (Photo by Carla Rego).

G. Field work activities developed in Canary Islands by Associacion Zerynthia.

H. *Hemicycla plicaria*, one of the target Critically Endangered species (Photo by Dinarte Teixeira).

I. Overview of San Pedro path, towards Garachico, at Tenerife (Photo by Dinarte Teixeira).