MAIISG NEWSLETTER

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HI MAIISG MEMBERS

Welcome to the first newsletter of 2021.

In this issue, Rui Carvalho talks about the anthropogenic impacts of the tourism in local native ecosystems in the Azores, using the artrhopods as a proxy.

Vicky Wilkins calls your attention to the usage of DNA barcoding in invertebrates conservation at St Helena, one of the UK overseas territories.

We are also excited to share the news regarding the approval by the IUCN SSC of a conservation project addressing four Critically Endangered land molluscs from the Desertas Islands (Madeira, Portugal). This effort is lead by MAIISG in collaboration with IFCN IP-RAM and international partners.

Klaus Groh brings a short overview of the publications on recent and fossil Macaronesian terrestrial and freshwater snails for the past 10 years.

We hope you enjoy this first 2021 edition.

HELP RESCUING THE DESERTAS CRITICALLY ENDANGERED LAND MOLLUSCS SPECIES FROM EXTINCTION

By Dinarte Teixeira

The MAIISG project "*Help Rescuing the Desertas Critically Endangered Land Molluscs Species from Extinction*" was selected for funding in the fifth round of internal grants of the IUCN Species Specialist Group.

It targets four endemic land molluscs species, *Atlantica calathoides*, *Discula lyelliana*, *Geomitra coronula* and *Geomitra grabhami*, which were rediscovered in the last 12 years after decades without a live record. They share similar threats, namely restricted location (under 100 m^2), single populations (>50), predation by introduced species (mice), habitat loss and degradation due to the grazing goats; making them at the very brink of extinction! They all occur in a single location on the same island, Deserta Grande, a steep and dry 10 km^2 island, and the largest of three government-owned inhabited islands (Desertas islands, Madeira), a Key Biodiversity Area.

The project is a collaboration between IUCN SSC MAIISG, the Bristol Zoo Gardens (BZG), the Chester Zoo (CZ), the Mossy Earth (ME) and the Institute of Forest and Nature Conservation IP-RAM (Madeira Government, Portugal).

International partners will help rescue 4 Critically Endangered endemic land molluscs through a multispecies captive breeding rescue program, engaging stakeholders and resources on the Desertas Islands (Madeira); with a multistep conservation action program to initiate species recovery.

A phased plan for species management will be outlined in a collaborative workshop in Madeira. It will include habitat restoration, conservation actions implementation, Invase Alien Species control management measures and green listing to monitor species recovery. The IFCN IP-RAM (https://ifcn.madeira.gov.pt/) collaboration is vital to the plan's implementation. As they are responsible for the species and habitats management and

conservation in Madeira, and so they will ensure the species management plan's feasibility, in the mid-term period, in the Desertas.

"International partners will help rescue 4 Critically Endangered endemic land molluscs through a multispecies captive breeding rescue program, engaging stakeholders and resources on the Desertas Islands (Madeira); with a multistep conservation action program to initiate species recovery."

TOURISM AND ITS ANTHROPOGENIC IMPACT ON LOCAL NATIVE ECOSYSTEMS IN THE AZORES, NAMELY ON ARTHROPODS

By Rui M. Carvalho

Tourism has been an important economic activity in the Azores for several years, but they have been safe from the consequences of mass tourism until 2015. That year a substantial shift took place, and travel media attention increased dramatically, and the archipelago received various awards as the best nature destination. Simultaneously, the regional government allowed for two low-cost airline companies to fly to the Azorean airspace.

These new circumstances raised concerns about an anthropogenic disturbance on local native ecosystems through trail networks. In the Azores, as in many other temperate, semi-tropical and tropical islands, historical clearance patterns have typically resulted in lowland clearance. This meant that the last remnants of the pre-human pristine forest, covering the significant parts of oceanic volcanic islands, are in the mountains. With high touristic interest, these mountain forest communities are of critical importance for the protection of current island biodiversity, since they are home to many endemic species of the archipelago. They also provide various ecosystem services (e.g. water storage, erosion control, pollination, pest control, food supply, recreation and tourism), contributing to the local economy and welfare.

Could pedestrian tourism be endangering the Laurel Forests ecosystem's integrity? In response to this complex question, a PhD project was proposed. This scientific field is known as recreation ecology, commonly defined as studying the impacts of outdoor recreation and nature-based tourism activities in natural or semi-natural environments.

This project aims for a more ecosystem-oriented approach. The Azorean Biodiversity Group has assembled a complete standardized dataset for arthropods and plant species across a whole archipelago. For years this has been intensively used to test the strengths and weaknesses of various ecological theories.


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Because of this, it was possible to place the forest's ecological responses as a foundation for subsequent management decisions. It was also necessary to monitor the primary groups responsible for this ecosystem's stability. Most of the efforts were placed on sampling arthropods, using spiders as surrogate, and plants in general. We adapted already existing standardized protocols to increase sensitivity to the impacts of recreational activities, such as trampling.

Understanding the relation between touristic use and ecological response was the most critical question but insufficient by itself to inform optimal management options. Therefore, it was necessary to obtain more information about other aspects of touristic impact. In a manipulative experiment, we subjected patches of local vegetation to different periods and intensities of trampling, this allowed use to understand in finer detail trampling effects on local vegetation. In areas where chronic trail problems cause hikers to trample the surrounding vegetation to avoid mud, we used classical trail building construction methodologies to repair the sections and monitor the surrounding vegetation to evaluate the hiker's response. This will allow managers to know how much ecological damage can be avoided by investing in trail maintenance and which trail building techniques are more advantageous in these specific environments.

This protocol was built to be used in Macaronesian native forests, but it was designed to allow adaptation to other ecosystems. We believe this methodology is valid when the importance of an ecosystem justifies that maintaining its integrity should be the driver of the management actions.

This project team is composed of the PhD candidate Rui Carvalho, Paulo Borges, Pedro Cardoso, and Artur Gil.

" Understanding the relationship between touristic use and the ecological response was the most critical question but insufficient to inform optimal management options. It was necessary to obtain more information about other aspects of touristic impact."

DNA BARCODING – THE POSSIBILITIES FOR INCREASING CAPACITY FOR INVERTEBRATE CONSERVATION

By Vicky Wilkins

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As part of MAIISG's current work in the UK overseas territories, we are starting to look at the possibility of using DNA barcoding for invertebrates to help with survey work and increase capacity on the islands. With limited numbers of people (if any) available to identify invertebrates on some of the islands and the costs of external support very high, so new techniques are needed to help facilitate easy and accessible identification.

Currently, DNA barcoding technology is becoming increasingly cheap and more accessible. DNA metabarcoding can be used either directly on samples of invertebrate specimens collected or via environmental DNA (eDNA), where a sample of soil or water contains traces of an animal's DNA.

At the moment, we are looking at the possibility of using metabarcoding to process identifications in invertebrate specimen samples, but this relies on having all (or at least a lot of) invertebrate species DNA present in a reference library; and so, particularly for endemics, any missing species need to be DNA referenced from an accurately identified specimen.

We are currently starting the process of filling gaps in the DNA reference library for St Helena with a long-term aim of establishing metabarcoding. The project team are also looking to use DNA to exam the diet of invasive species in the current invasive invertebrate control project. In addition, we will look at similar process for Ascension Island and we are hoping that funding will allow this to start later this year. If you have any interest in this or would like to discuss it further, please contact me. vicky.wilkins@speciesrecoverytrust.org.uk.

" We are currently starting the process of filling gaps in the DNA reference library for St Helena with a long-term aim of establishing metabarcoding."

SHORT OVERVIEW OF PUBLICATIONS ON RECENT AND FOSSIL MACARONESIAN TERRESTRIAL AND FRESHWATER SNAILS IN THE YEARS 2011 TO 2020

By Klaus Groh

This compilation focuses on the Archipelagos of Madeira and the Canaries. Undoubtedly, it is not complete for those two groups of islands, missing probably many conference papers, thesis, posters, and data available on the internet.

All additional contributions to this file are highly welcome and much appreciated. For sure, this listing should be enriched in the future not only by actual works but also should date back, best to the 2000s to add new knowledge after the publication of a quite complete bibliography on strictly Macaronesian archipelagos in Bank, Groh & Ripken (2002) and the Cape Verde Islands by GROH (2012).

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ALONSO, M. R. & IBÁÑEZ, M. (2015a): El material tipo de las especies de moluscos terrestres de Canarias: Familia Vitrinidae FITZINGER, 1833 (Mollusca, Gastropoda, Stylommatophora). – Vieraea, **43**: 115-126; Santa Cruz de Tenerife, Canary Islands, Spain.

ALONSO, M. R. & IBÁÑEZ, M. (2015b): Las especies de la Familia Canariellidae SCHILEYKO, 1991 (Mollusca, Gastropoda, Stylommatophora, Helicoidea) de las islas Canarias. – Vieraea, **43**: 127-152; Santa Cruz de Tenerife, Canary Islands, Spain.

ALONSO, M. R. & IBÁÑEZ, M. (2015c): Las especies de la familia Enidae B. B. WOODWARD, 1903(1880) (Mollusca, Gastropoda, Stylommatophora) de las islas Canarias: el género Napaeus Albers, 1850. – Vieraea, **43**: 153-188; Santa Cruz de Tenerife, Canary Islands, Spain.

ALVES, F., RODRIGUES, J., MONTES, R., MENEZES, D., OLIVEIRA, P. & SILVA, V. (2015): Ilhéus do Porto Santo: um tesouro a preservar - Islets of Porto Santo: a treasure to be preserved. 100 pp.; Funchal, Ilha da Madeira (Serviço do Parque Natural da Madeira).

BROZZO, A., DE MATTIA, W., WALTHER, F., TEIXEIRA, D., GROH, K., HARL, J., GLAUBRECHT, M., HAUSDORF, B. & NEIBER, M. T. (2019): [Abstract Poster] Molekulare Phylogenie und Merkmalsevolution madeirensischer Landschnecken: Radiation der Geomitrini (Pulmonata: Helicoidea: Geomitridae). – In: WIESE, V.: Zusammenfassungen der Tagungsbeiträge anlässlich der Jubiläumstagung zum 150-jährigen Bestehen der DMG vom 18. bis 21. Mai 2018 in Cismar.– Mitteilungen der deutschen malakozoologischen Gesellschaft, **101**: 26; Frankfurt a. M.

BROZZO, A., HARL, J., DE MATTIA, W., TEIXEIRA, D., WALTHER, F., GROH, K., PALL-GERGELY, B., GLAUBRECHT, M., HAUSDORF, B. & NEIBER, N. T. (2020): Molecular phylogeny and trait evolution of Madeiran land snails: radiation of the Geomitrini (Stylommatophora: Helicoidea: Geomitridae). – Cladistics, **2020**: 1-23, 1 tab., 8 figs; Disctrict of Columbia, NY, USA. DOI: 10.1111/cla.12440.

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CAMERON, R. A. D. & TEIXEIRA, D. (2013): One up, one down, all change: the status and identity of two critically endangered Madeiran land snails. – Tentacle, **21**: 20-21.

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CARO, A., NEIBER, M. T., GÓMEZ, B. & MORAES MADEIRA, M. O. (2019): Molecular phylogeny and biogeography of the land snail subfamily Leptaxinae (Gastropoda: Hygromiidae). – Molecular Phylogenetics and Evolution, **139**: 106570. DOI: 10.1016/j.ympev.2019.106570.

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CASTRO, J. M., YANES, Y., GARCIA, R., ALONSO, M. & IBÁÑEZ, M. (2015): A new species of *Janulus* (Gastropoda: Pulmonata: Gastrodontidae) from La Palma Island (Canary Archipelago). – Journal of Conchology, **41** (6): 743-747; London.

DE MATTIA, W., NEIBER, M. & GROH, K. (2018a): Revision of the genus-group *Hystricella* R. T. LOWE, 1855 from Porto Santo (Madeira Archipelago), with descriptions of new recent and fossil taxa (Gastropoda: Helicoidea: Geomitridae). – ZooKeys, **732**: 1-125; Sofia. https://doi.org/10.3897/zookeys.732.21677

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FRIAS MARTINS, A. M. DE, BRITO, C. P. & BACKELJAU, T. (2013): *Oxychilus* (*Drouetia*) *viridescens* (Gastropoda: Pulmonata: Oxychilidae), a new species from Santa Maria, Açores, and a review of the subgenus. – Zootaxa, **3619** (3): 343-368; Sofia.

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[GROH, K.] (2014): Capo Verde. – In T. COSSIGNANI, African Landshells: 9-14, 55 figs, 1 map; Ancona, Italy (L'Informatore Piceno).

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GROH, K. & HENKEL, H. (2019): Description of a new *Ferussacia* from Fuerteventura, Canary Islands, Spain (Gastropoda, Pulmonata: Ferussaciidae). – Conchylia, **50** (1-4): 117-124, 1 tab, 4figs, 1 map, 1 pl.; Öhringen, Germany.

GROH, K., TEIXEIRA, D., CAMERON, R. A. D., SILVA, I., SANTANA-BENITEZ, J. (†), DE MATTIA, W. & NEIBER, M. (2020): The genus *Geomitra* s.l. on the Madeiran Archipelago. – In: RENKER, C.: Zusammenfassungen der Tagungsbeiträge der 58. Frühjahrstagung der DMG vom 7. bis 10. Juni 2019 in Hoppstädten-Weiersbach. – Mitteilungen der deutschen malakozoologischen Gesellschaft, **102**: 43-44; Frankfurt a. M.

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HUTTERER, R. & GROH, K. (2014): A new species of *Amphorella* (Gastropoda, Pulmonata, Ferussaciidae) from a Pliocene freshwater deposit on Gran Canaria, Canary Islands. – Vieraea, **42**: 35-45, 4 text-figs, 1 tab.; Santa Cruz de Tenerife, Canary Islands, Spain.

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"This compilation focuses on the Archipelagos of Madeira and the Canaries. Undoubtedly, it is not complete for those two groups of islands, missing probably many conference papers, thesis, posters, and data available on the internet."

FINAL REMARKS

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

We look forward to more news and developments about the ongoing projects in which most of you are currently involved, and we would love to include those contributions in the August 2021 newsletter.

Until then, stay safe.

Vicky, Paulo and Dinarte

Image credits:

A. *Adult individual of Atlantica calathoides (Lowe, 1863), a critically endangered endemic land snail from the Deserta Grande* (© Dinarte Teixeira).

B. *Adult individual of Discula lyelliana (Lowe, 1852), a critically endangered endemic land snail from the Deserta Grande* (© Dinarte Teixeira).

C. *Adult individual of Geomitra coronula (Lowe, 1852), a critically endangered endemic land snail from the Deserta Grande* (© Dinarte Teixeira).

D. *Adult individual of Geomitra grabhami (Wollaston, 1878), a critically endangered endemic land snail from the Deserta Grande* (© Fábio Teixeira)

E. *Overview to Santa Bárbara calderon, Terceira Island* (© *Rui M. Carvalho*).

F. *Trail damage due to poor trail building quality* (© *Rui M. Carvalho*).

G. *Manipulative protocol - measuring trampling impacts on vegetation* (© *Rui M. Carvalho*).

H. *Common wasp Vespula vulgaris eating an endemic hoverfly* (© *Liz Fowler*).