



Macropus robustus Gould, 1841, subspecies *erubescens*, Euro, Denham, WA, Australia, 10 January 2018

international
BARCODE
OF LIFE



Application of DNA barcoding and meta-barcoding in conservation and sustainable use of biodiversity

GTI Forum, 3 December 2020

Donald Hobern, dhobern@ibol.org

An urgent need to understand biodiversity and its patterns

Convention on Biological Diversity

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Global Taxonomy Initiative

About Global Taxonomy Initiative

- What is Taxonomy?
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- What is the Problem?**
- What Needs to be Done?

Programme

- Background
- COP Decisions
- Programme of Work
- Taxonomic Needs

Implementation

- Partners
- Coordination Mechanism
- GTI National Focal Points
- Biodiversity Information Systems

What is the Problem?

The Taxonomic Impediment

Governments, through the Convention on Biological Diversity, have acknowledged the existence of a "taxonomic impediment" to the sound management of biodiversity. The purpose of the Global Taxonomic Initiative is to remove or reduce this taxonomic impediment - in other words, the knowledge gaps in our taxonomic system (including those associated with genetic systems), the shortage of trained taxonomists and curators, and the impact these deficiencies have on our ability to conserve, use and share the benefits of our biological diversity.

Identification of large, charismatic animals may be easy; however, the majority of organisms are insects, plants, fungi and microorganisms, which require expert skills for correct identification. Most of them have not been categorized or given formal scientific names. The inability to identify (or obtain identifications of) species is a major component of the taxonomic impediment. Simple-to-use identification guides for the non-taxonomist are rare and available for relatively few taxonomic groups and geographic areas. Taxonomic information is often in formats and languages that are not suitable or accessible in countries of origin, as specimens from developing countries are often studied in industrialized nations. There are millions of species still undescribed and there are far too few taxonomists to do the job, especially in biodiversity-rich but economically poorer countries. Most taxonomists work in industrialized countries, which typically have less diverse biota than in more tropical developing countries. Collection institutions in industrialized countries also hold most specimens from these developing countries, as well as associated taxonomic information.

Furthermore, although there is extensive taxonomic work on groups such as birds, mammals and higher plants, little is known of their distribution, biology, and genetics. It is estimated that only 10% of vertebrates remain to be described, but greater than 50% of terrestrial arthropods and up to 95% of protozoa are undescribed. At the most conservative estimate there are more unknown species than known ones on earth.



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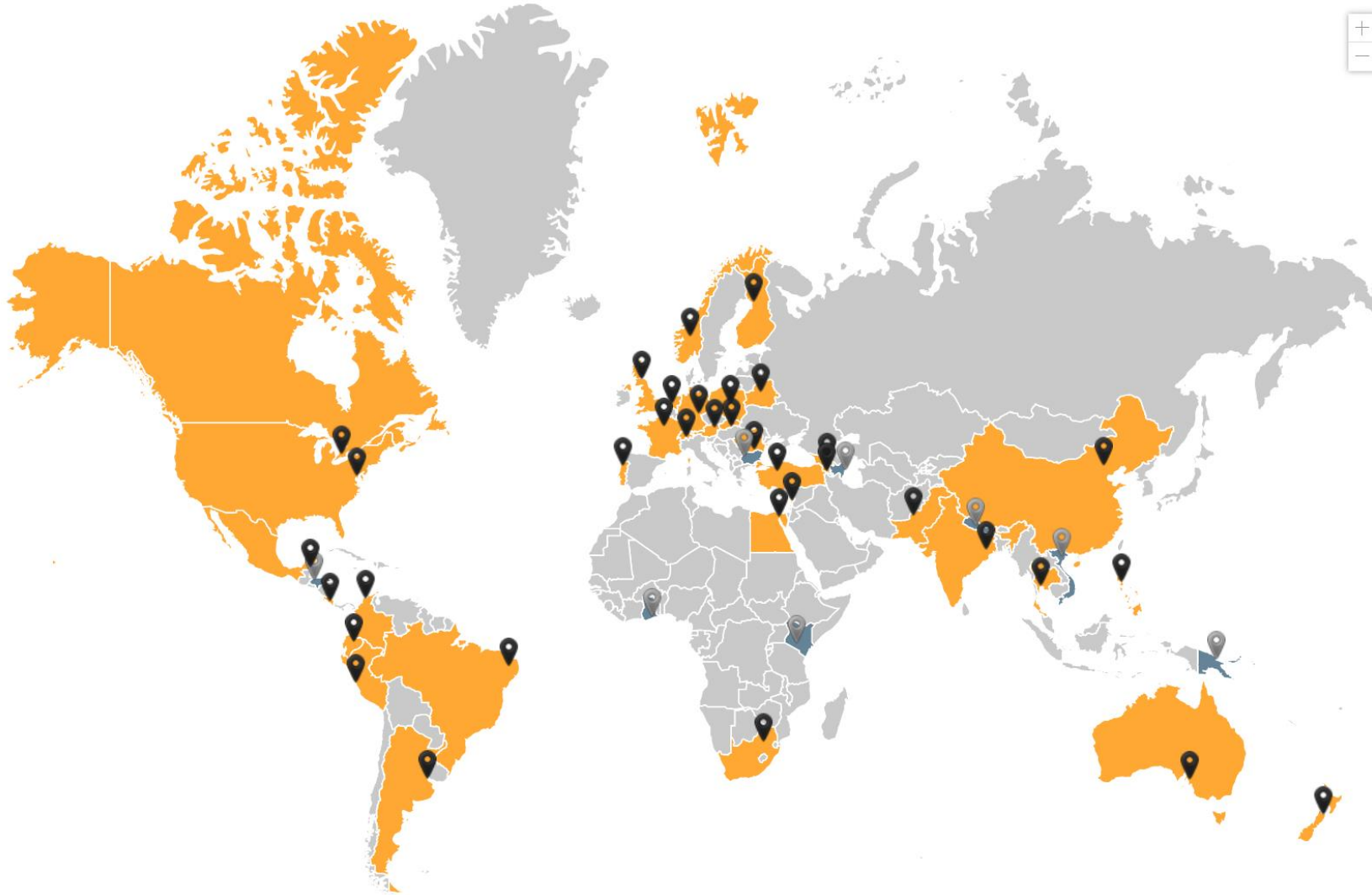
Media Release: Nature's Dangerous Decline 'Unprecedented'; Species Extinction Rates 'Accelerating'



Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES)

Media Release

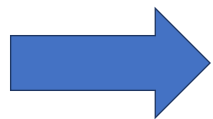
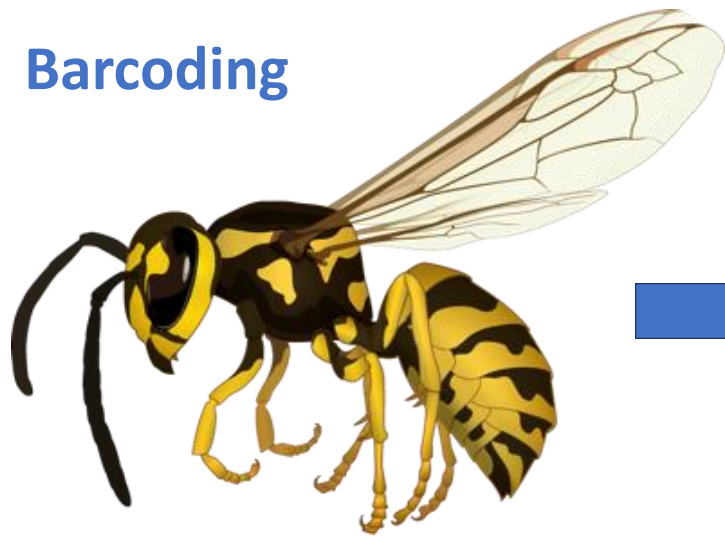
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MISSION: Implement an earth observation system for biodiversity

Two Analytical Paths

Barcoding



658bp sequence of COI



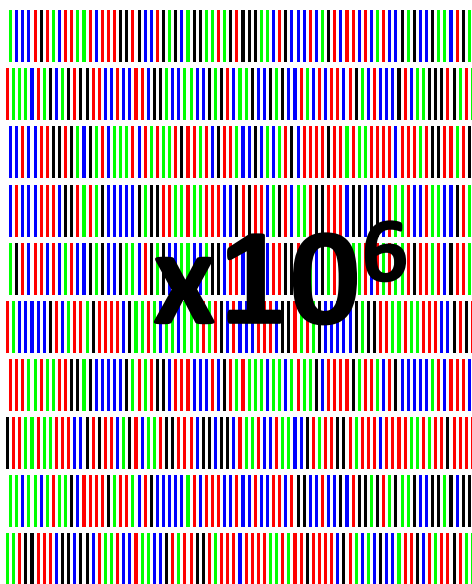
Applications

Reference Library
Specimen ID
Species Discovery
Species Abundance
Species Occurrence

Cost

€1

Metabarcoding



$\times 10^6$

Species Occurrence

€0.01

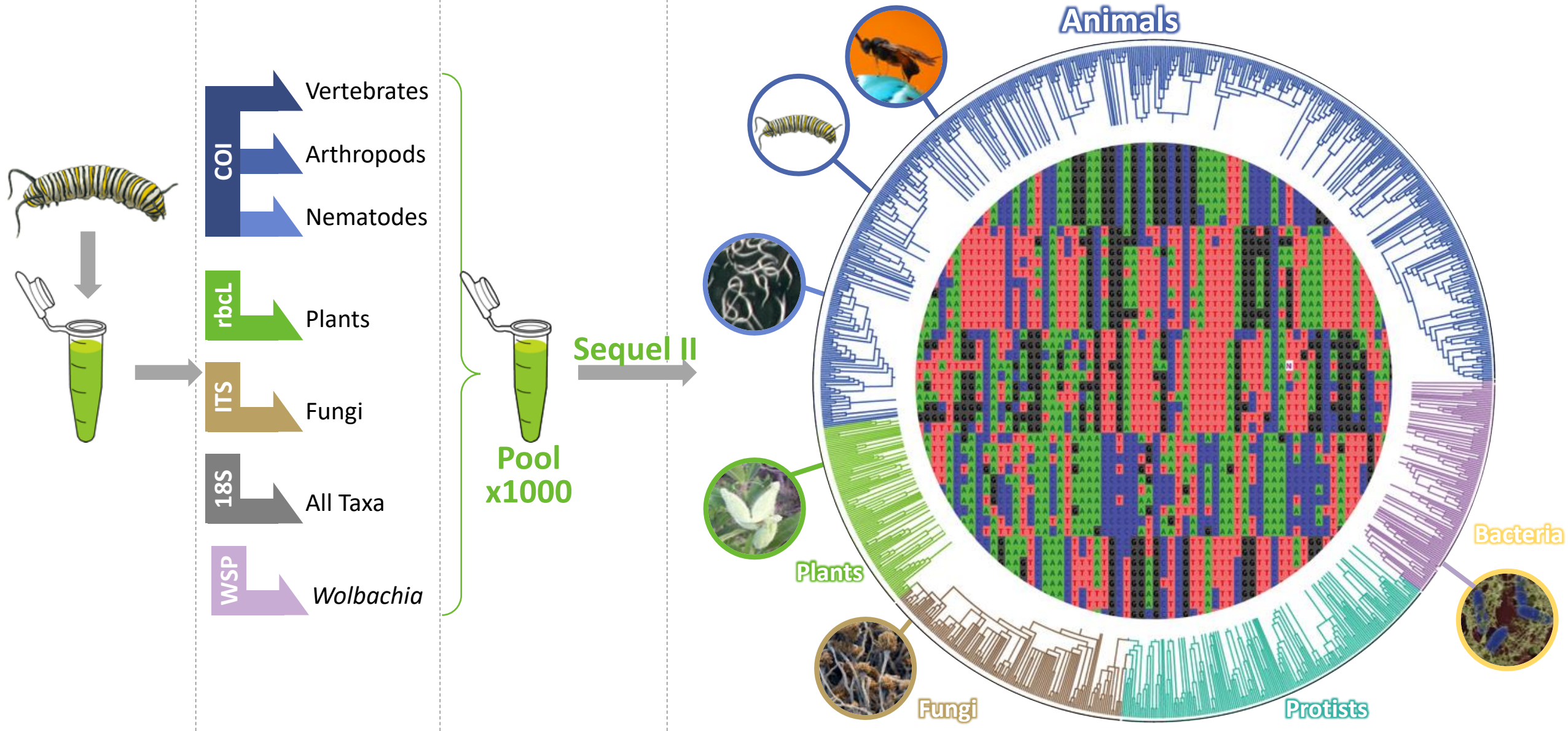
Species Interactions – A New Path

DNA Extract

PCR + UMI

Amplicon Pool

Specimen Symbiome

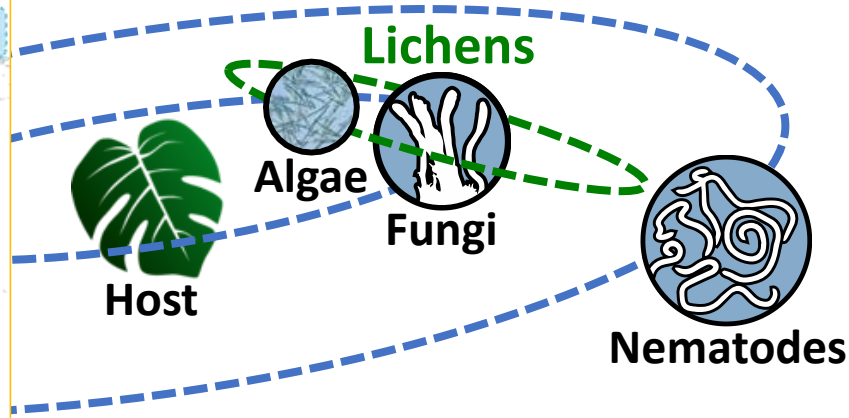


Species Discovery



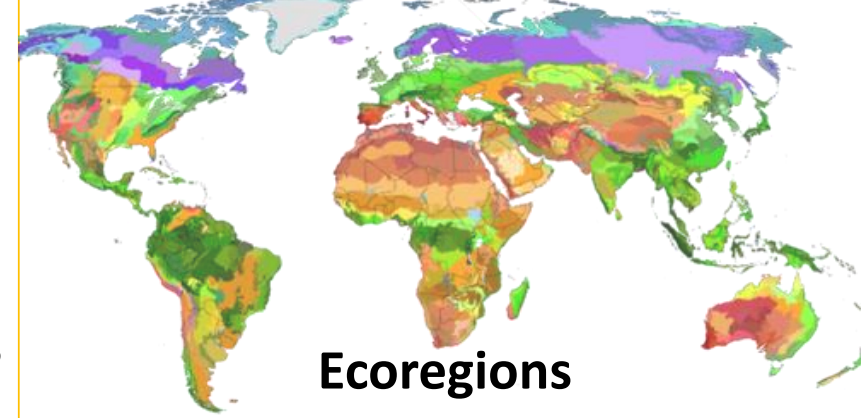
10 Million Specimens

Species Interactions



5 Million Specimens

Species Dynamics



100,000 Bulk Samples

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2019 – 2025

BIOSCAN

Towards an Earth Observing System for Species

Delivering biodiversity knowledge for society





Thank you

Donald Hobern
dhobern@ibol.org