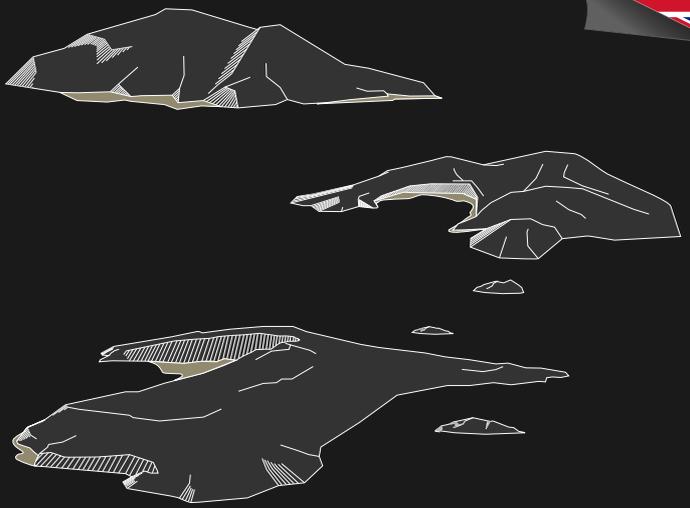




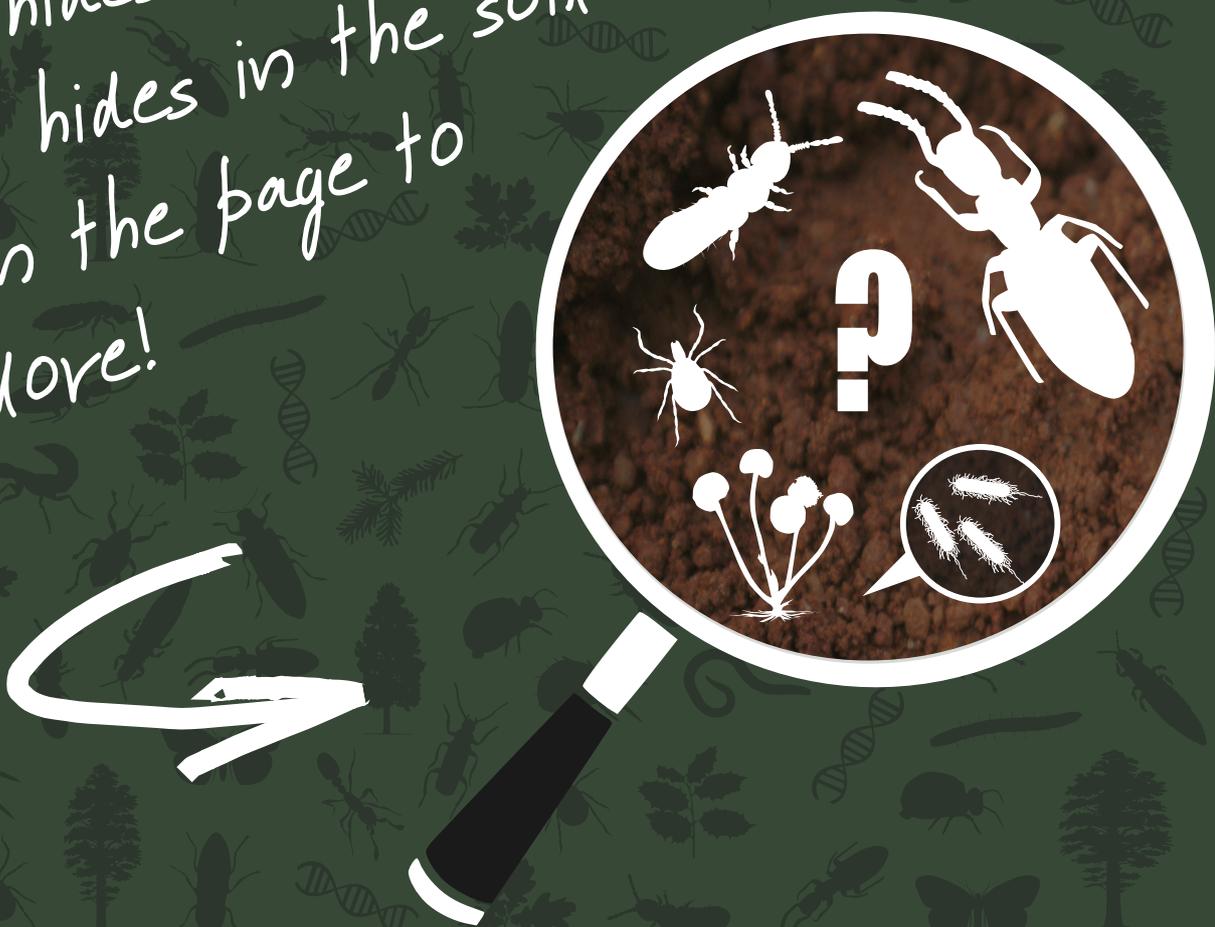
iBioGen
ISLAND BIODIVERSITY GENOMICS



EXPLORING HIDDEN BIODIVERSITY

THE UNKNOWN INHABITANTS OF OUR WORLD

What hides in plain sight in the forest?
What hides in the soil we step on?
Turn the page to
explore!



8,700,000 species exist on planet Earth



We have described about 1,300,000 species, while up to 7,400,000 are still unknown to us.

Every year we discover 15,000 to 20,000 species, while at the same time up to 800,000 of species, known or unknown to us, go extinct.

HIDDEN HEROES AND WHERE TO FIND THEM

Hidden biodiversity is those species we do not know they exist, but are still active parts of our ecosystems.

Despite being tiny or hidden in unreachable places, they keep our forests standing, shape the land we cultivate and recycle the building blocks of life.



Species that are found only in one place on Earth, are called *endemics*.

Islands, like Cyprus, host a high percentage of endemic species. This is why Cyprus' biodiversity is unique and deserves to be better understood and protected.



With tiny size, comes great responsibility

Digging through the soil you can find myriads of hidden organisms. *Earthworms* moving around and *ants* building their nests. *Beetles* of all sizes and shapes. Tiny *springtails* that you missed at a first glance. Even thousands of microorganisms, like *bacteria* and *fungi*, although most of them invisible to the naked eye. What are they doing there?

POLLINATORS

Insect pollinators, like *bees*, butterflies, moths or *beetles* are responsible to carry pollen between flowers and are necessary for the reproduction of the majority of flowering plants.



SOIL ENGINEERS

Soil engineers, such as *ants* and *earthworms*, help to mix the soil layers, providing food to organisms hidden deeper in the soil. They also increase soil's porosity and capacity to hold water, nutrients and oxygen, creating a healthy underground environment for plants to grow.



DECOMPOSERS

Decomposers, such as *springtails* and many *beetles*, feed on fallen leaves and other organic material, and convert it into simpler substances. Then free-living fungi and bacteria break them down to even simpler compounds, enriching the soil with nutrients and assisting plants' growth.



SYMBIOTIC MICROORGANISMS

Symbiotic *nitrogen-fixing bacteria* and *mycorrhizal fungi* colonize the roots of their host plant and play a crucial role in the plant's nutrition

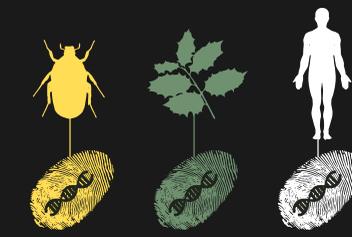


How to find a needle in a haystack

How can we find all these elusive organisms? Every living organism carries DNA as genetic material. Each species has a unique DNA fingerprint, or "DNA barcode". That allows us to identify species from the DNA they carry in their cells or the DNA they shed in the environment.

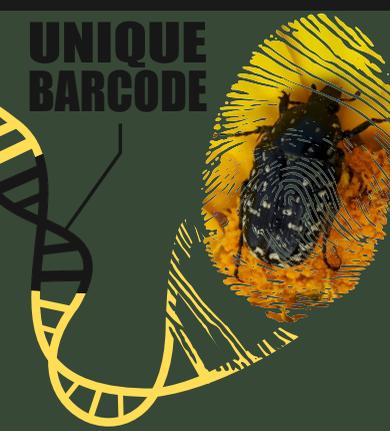


DNA
MOLECULAR
FINGERPRINT



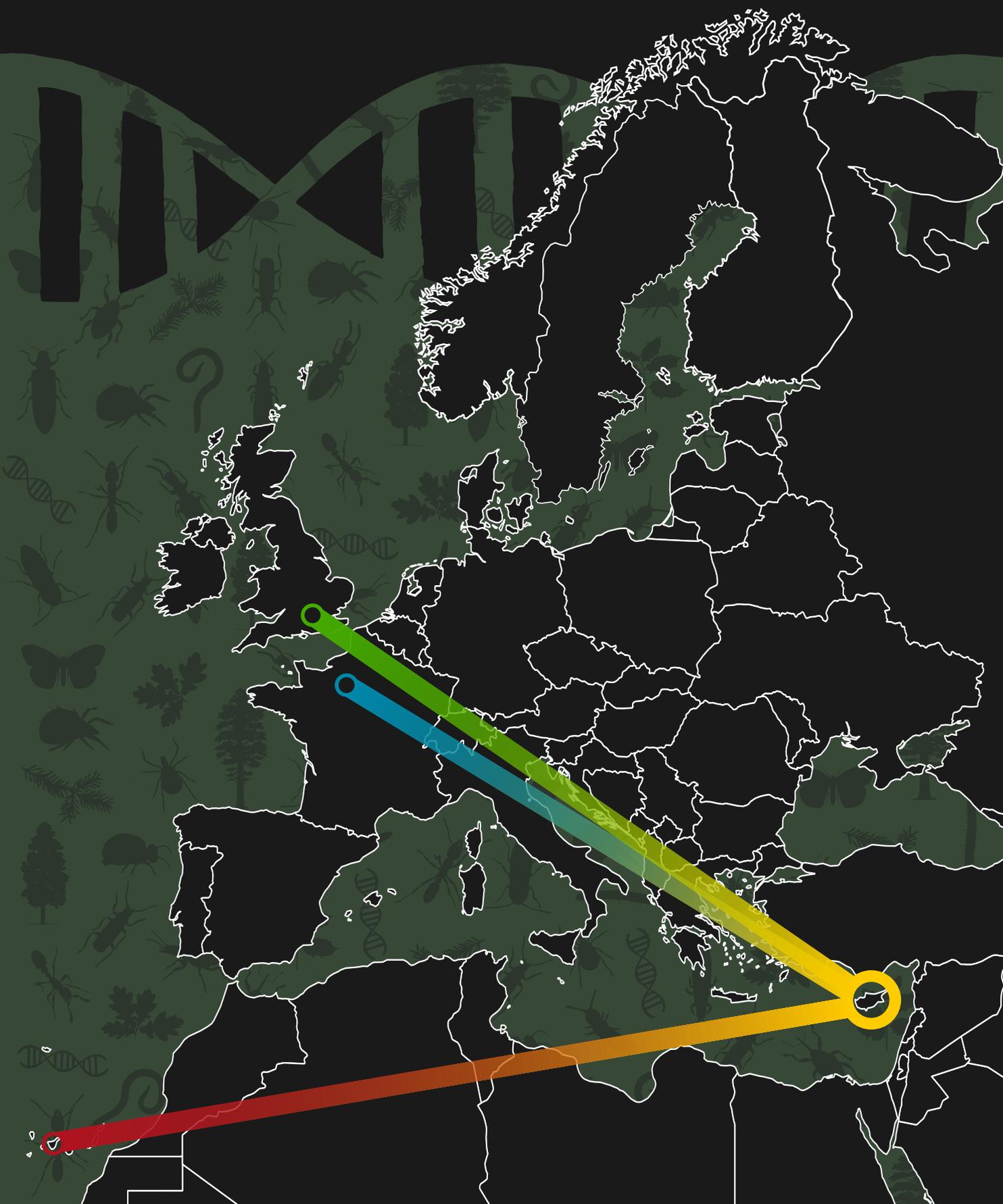
UNIQUE
BARCODE

If we extract DNA from a soil sample next to a tree we can "read" the DNA barcodes of all the fungi, bacteria, insects or worms associated with this tree. By comparing these DNA barcodes to databases we can identify previously known species or discover new ones. Similarly, if we extract DNA from a flower we can identify DNA traces of the insects that pollinate it. This is how DNA helps us to discover the unknown inhabitants of Earth and their role in the ecosystems.





By the **IBIOGEN TEAM**
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