



***e-biom** works for biodiversity conservation thanks in particular to a scientific innovation allowing to detect DNA traces in the environment (environmental DNA). In recent months, this young spin-off from the University of Namur (Belgium) has been involved in the fight against the coronavirus, analysing the presence of SARS-CoV-2 in wastewater.*

TAKE CONCRETE ACTION FOR THE CONSERVATION OF BIODIVERSITY

e-biom was born from the meeting of scientists, with complementary profiles, wishing to provide concrete solutions to the major societal challenges facing our society: sustainable development, climate crisis, extinction of biodiversity, resilience, ...

Ecologist, molecular biologist, bioinformatician and microbiologist, **e-biom** scientists share their common goal of putting their expertise at the service of ecological transition and actively contributing to biodiversity conservation and environmental protection.

Their idea? To offer to public services, businesses, and individuals the use of state-of-the-art genetic methods to solve environmental problems.

Long considered to be the prerogative of research laboratories, these tools nonetheless allow for rapidly obtain accurate data on flora and fauna, on the presence of protected species or even pathogens.

After three years of Research and Development carried out at the University of Namur and supported by the Public Service of Wallonia, Jonathan Marescaux and Karine Van Doninck co-founded **e-biom** in February 2019.

STUDIES FACILITATED BY THE USE OF GENETICS

e-biom innovation is based on the study of environmental DNA. This scientific method makes it possible to detect the presence of animal, plant or micro-organism species from DNA traces contained in environmental samples (water, soil, faeces, honey) rather than from a living organism.

All living organisms, from the smallest bacterium to the largest mammal, leave DNA traces in their environment. This DNA contains the genetic information of living beings and therefore

allow the identification of species (viruses, bacteria, plants, animals, ...) present in an ecosystem.

e-biom's job is to collect these DNA traces and identify them by comparing them to those listed in international databased that contain all publicly available DNA sequences. **e-biom** is also developing its own genetic database.



BIODIVERSITY CRISIS

According to the IPBES' 2019 Global Assessment Report on Biodiversity and Ecosystem Services, around one million animal and plant species are threatened with extinction, many within decades, more than ever before in human history.

And the problem is not new. 27 years ago, during the Rio Convention in 1992, 168 countries ratified the Convention on Biological Diversity ... a convention which already stipulated at this time that *"the conservation of biological diversity is a common concern of humankind"*, that *"biological diversity is being significantly reduced by certain human activities"* and *"it is vital to anticipate, prevent and attack the causes of significant reduction or loss of biological diversity"*.

It is therefore necessary to exploit natural resources in a sustainable way and to reduce our impact on the environment, including our impact on biodiversity. To assess our impact on biodiversity, it is necessary to carry out assessments based mainly on species inventories that require considerable time, significant financial resources and the intervention of various experts: a specialist for birds, an amphibian specialist, a bat specialist, ... In addition, these inventories require observing and sometimes capturing living organisms, which can lead to stress and mortality.

Environmental DNA fills all the difficulties encountered in traditional biological inventories: the method is fast to implement in the field, more economically advantageous and has no impact on the environment. Negative effects such as stress, decreased immunity because of capture and disturbance of protected species during the breeding season are avoided.

e-biom can thus supports its partners in integrating the preservation of biodiversity into numerous projects.

e-biom

5 AXES OF WORK

e-biom's services are based on five thematic axes:

1. Preserve biodiversity in natural areas by providing support to public services, NGOs, and environmental associations
2. Enhance biodiversity in urban areas by advising public authorities, architects, and landscapers
3. Integrating biodiversity into business strategies by objectively quantifying their environmental impacts and offering them courses of action
4. Provide scientific and technical support in the development of new tools and methods related to genetics and bioinformatics
5. Monitor and quantify the presence of pathogens in the environment

PROMISING STARTS

As the unique private provider to offer the method of environmental DNA in Belgium, **e-biom** has quickly established itself as a trusted partner in nature conservation: collaboration with Natagora and the Public Service of Wallonia, with the Pairi Daiza Foundation, ...

One of the first projects that the **e-biom** team has joined is to carry out one of the largest European environmental DNA sampling campaigns.

Co-funded by the European Commission, this project aimed to detect two endangered amphibian species by collecting water in 1,000 ponds in Wallonia.



At present, discussions are being held to export the know-how of **e-biom**: a project aiming to develop sustainable fishing in Africa, biological inventories of endemic species in France or the follow-up of commercial fish species in Qatar!

FIGHT AGAINST THE CORONAVIRUS

The Covid-19 has allowed **e-biom** to put its skills at the service of the community. In March, the entire team mobilized to offer its support to University of Namur in the implementation of diagnostics of the disease, in support of the reference laboratories.

e-biom

By combining DNA sampling methods with the newly acquired skills during human diagnosis, **e-biom** was very quickly able to respond to the request of the Water Management Public Society (SPGE) to detect traces of SARS-CoV-2 in Walloon wastewater treatment plants.

The results of this pilot study led to the establishment of epidemiological monitoring to quantify the coronavirus in wastewater allowing to have an early warning system in Wallonia. **e-biom** is also collaborating on the implementation of this tool at the national level.

KEY FIGURES - 18 MONTHS AFTER THE CREATION OF E-BIOM



- 5 scientists including 3 PhD, 1 Master and 1 Bachelor
- Several thousand samples collected and analyzed as part of our R&D projects
- 1,566 samples analyzed for our partners
 - More than 370 analyses of wastewater
 - Nearly 150 kg of soil sampled, and more than 1,700 liters of water filtered
 - More than 910 million DNA sequences generated and analyzed