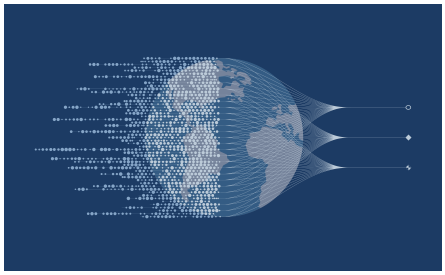

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on the Wind: eDNA Profiles from CTBTO Air Filters to Monitor Biodiversity

The CTBTO maintains a global network of monitoring stations with air filtering equipment to detect radionucleotide signatures. These air filters also pick up plant, animal and microbial DNA that has been scattered on the wind. This environmental DNA (eDNA) can be profiled to catalogue species, providing the opportunity to monitor ecosystem changes and track biodiversity at an unprecedented scale, including the presence/absence of invasive, pest and endangered species.

Twenty-one daily air samples were collected on filters on the rooftop of the CTBTO building in Vienna. Here, we describe optimisation of laboratory methods to extract and amplify DNA from these filters and then catalogue biodiversity via high-throughput sequencing.

We detected eDNA from a wide range of species including plants, arthropods, mammals and birds. This included many species expected to be present in the wider Vienna region, but not in New Zealand where the laboratory work was conducted, validating that the eDNA profiles were recovered from the air filters themselves.

To the best of our knowledge, this is the first time that CTBTO air filters have been used for eDNA profiling and demonstrates that they offer a valuable resource for biodiversity monitoring across large geographic and temporal scales.

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