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Environmental DNA

What is Environmental DNA (eDNA)?

Most people are familiar with the term DNA, short for deoxyribose nucleic acid. It is the genetic building block of all forms of life, and the DNA pattern is different for every living creature, like an environmental fingerprint.

All organisms leave traces of their DNA in their environment. This DNA can come from faeces, urine, gametes, mucus, saliva, shed skin and hair, and also come from the decomposition of dead organisms. These traces are known as environmental DNA or eDNA. This allows detection of the organism in the environment regardless of its life stage or gender. It is also a useful way to detect an organism which may otherwise be difficult to find.

Limits of eDNA

Most eDNA tools target a type of DNA which is inherited from the mother. This means it cannot identify whether the organism was a hybrid or not. eDNA also cannot tell you how many individuals were present, their age, size or sex. However eDNA can be used as an indicator of an area to search further for an organism.

What can eDNA achieve?

eDNA lets scientists monitor the presence absence of organisms without actually collecting the organism. It enables the study of invasive, elusive or endangered species without stressing them with the presence of human beings. Currently eDNA is being used to study the location of threatened or endangered species across a range of environments.

Using faeces samples or scats, scientists can identify the presence of both native and introduced animals. By analysing the scat of a predator such as a fox or a cat, they can determine the DNA of the animals it has eaten.

Applications of eDNA

eDNA has been used to track the movement of feral pigs along with conventional DNA tests. These tests have shown that people have deliberately moved around pig populations for hunting purposes. In Tasmania, eDNA was used to monitor whether or not there were foxes within the state. In both cases, eDNA is an important biosecurity tool.



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