

How scientists find plants, animals & fungi

First and foremost, scientists must be keen observers. They look at the whole scene, and they carefully look at the detail within that scene. However, plants, animals and fungi can be difficult to see easily — especially if they are very small, very shy or well camouflaged.

Hence scientists use a variety of tools and techniques to help find what they are looking for. Here are some...



Trees, shrubs, grasses, ferns & other plants

Scientists look at leaves and growth habit, which are often distinctive, but identifications may require examination of flowers, seeds, or roots. For ferns, which do not produce flowers, identification may depend on examination of spores.



Insects, spiders, mites, centipedes, snails & other invertebrates:

Specialists look in the right places during the day and at night, and also use pit traps, sweep nets, pooters (aspirators), Malaise traps, light traps or torches at night, Berlese funnels to get insects out of leaf litter and soil. Nets and traps are used to detect aquatic insects. Microscopes are essential for identifying small creatures.



Mosses liverworts & algae

Searchers look on damp soil, rocks, and tree trunks. Algae grow in similar places, and ponds and streams are also sampled. Identification usually requires a microscope.



Nematodes

These extremely tiny, worm-like animals have to be extracted from soil in a process that can take several days. Microscopes are essential for identification.



Fungi



'Fruiting bodies' such as mushrooms, brackets and puffballs can be found on trees, logs, litter, and soil. For micro-fungi, scientists search for symptoms of infection on living leaves, or they may try to grow out hidden fungi from wood, leaves, litter, and soil on sterile jelly medium (agar). Microscopes are often essential for identification.

Bacteria:

Scientists grow samples on sterile jelly medium (agar plates) for several days, then examine the cultures under a microscope.



Bats

These mammals are rare, nocturnal and difficult to even when present. However, scientists with 'bat detectors' can pick up their high-frequency calls if they are flying and feeding at night.

Lichens (fungi + algae)

Specialists search tree trunks, walls, posts, rocks and paths. Microscopes often important for identification.

Birds

Specialists look and listen during the day and at night. Early morning and evening are often the best time to find birds. Binoculars are useful.

Possums, hedgehogs, rats, cats, stoats

Vertebrate specialists search at night with torches, and also set cage traps. During the day, people also look for tracks, scats (poo), and maybe feeding signs. Tracker tunnels are sometimes used — any animal (including large insects) walking through will leave inky footprints on the paper outside the tunnel.

Fish

Scientists use specially designed nets and traps. Licensed operators may also use electric fishing equipment that temporarily stuns the fish. (Do not get in the water if you see scientists using this equipment.)

Skinks and geckos

Researchers may use pit traps and search likely habitats during the day and at night.

