Taxonomy and classification

Our planet has life on it, and for that reason, it may be unique in the universe. Ironically enough, we know much more about some of the planets floating thousands of kilometres away than we do about most of the species living right here on Earth.



Deepsea jellyfish
A beautiful jellyfish photographed during a deepwater expedition to the Marianas Islands. Scientists have placed it in the genus *Crossota*. Image courtesy of NOAA Office of Ocean Exploration and Research, 2016 Deepwater Exploration of the Marianas.

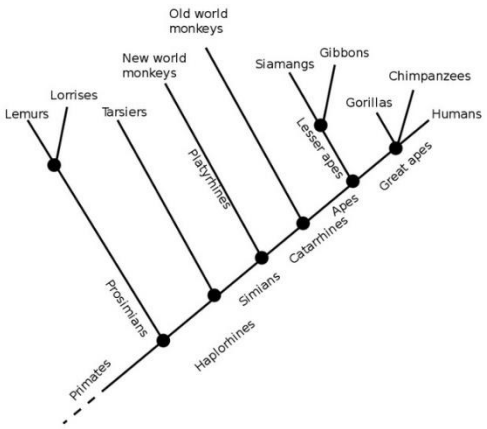
The science of discovery

So far, we've catalogued 1.9 million kinds of plants, animals and microbes. But this is only the tip of the iceberg. There are probably more than 10 million species sharing our planet, which means we only know about 20% of them.

The scientific discipline dedicated to describing, classifying and making sense of the biodiversity all around us is called taxonomy.

Taxonomists describe and classify new species by comparing characteristics shared by groups of organisms, which may be anatomical, behavioural or even molecular. For example, the exquisitely detailed claw of a crab, the reproductive behaviour of a bird or the DNA inside each cell of a plant are all characteristics that can be used to compare and classify different species.

When building their classifications, taxonomists try to piece together the evolutionary relationships between different taxa. Since all life is descended from a common ancestor, it's possible to show how species have branched out into the diversity we now see all around us. This can be visualised with a cladogram, which is a diagram showing how different species or groups are thought to be related to each other.



Primate cladogram
This diagram shows the evolutionary relationships between members of the primate family.

Taxonomy is also concerned with the bigger questions, such as how species are even defined in the first place.

Taxonomic expertise is built up over many years and represents a very specialised form of knowledge, particularly for people who are experts in certain taxa. Describing and classifying biodiversity is the foundation upon which all the life sciences rest. The ability to communicate clearly about different species or higher groups is only possible when they have an unambiguous name and confident classification.