

## Desert junior

A desert is a habitat characterised by scarce rainfall. In many deserts, the annual precipitation is less than 50 mm, but it can even be zero. In this ecosystem, the scarcity of water is the key ecological factor that influences both plant and animal life.

Deserts can be cold or hot. Cold deserts can be found at high altitudes, where the temperature in winter can drop below zero, like in the Gobi Desert.

In hot deserts, diurnal atmospheric temperature can reach 50°C, while that of the surface sand can rise to 90°C. During the night, the soil and air cool rapidly with decreases in temperature of over 20°C.

In such an inhospitable environment, all living creatures have to be highly specialised: to be able to survive with little or no water, very different types of adaptations have evolved. **Biodiversity** in deserts, however, is low, because in 150,000 km<sup>2</sup> (a surface area equal to half of Italy's) a minimum of 20 and a maximum of 400 plant species can be found.

Deserts extend from 20° North to 20° South latitude. Desert plants include different species:

- annual, which complete their life cycle in less than a year;
- ephemeral, which are born only after the rare rains and reproduce and die before the new drought;
- perennial, which have coriaceous leaves, covered by a waxy membrane and closed **stomata** to reduce transpiration and evaporation.

Many desert plants have very small leaves, or else their leaves have been modified into spines, mainly to avoid the loss of liquids (but also to have a protection against possible herbivores). These particular plants have the capacity of storing great quantities of reserve liquids within their tissues: such is the case of **fat plants or succulents**, represented by American cacti (Cactaceae) and Afro-Asian euphorbias (Euphorbiaceae). In both these cases, the plants have transformed their leaves into spines and photosynthesis has been transferred to the tissue of the trunk that, for this reason, has the green colour of the photosynthetic pigment.

Even in the animal world there are surprising adaptations to this inhospitable habitat. During the summer or in periods of prolonged drought, some of them go into "aestivation", that is, they reduce their activities, finding shelter under rocks or in the subsoil, just like in winter, at temperate latitudes, many animals hibernate.

Among the animals that aestivate there are, for example, some species of reptiles and desert snails, which are active only just after the rains: when the humidity diminishes, they withdraw into their shell and wait for the next rainfall in a state of torpor that can last five years.

Even butterflies, beetles and cockroaches of the desert synchronise their life cycles with the rainy season: their larvae emerge from the eggs only when, thanks to the rain, the availability of food increases.