

## ■ Reading

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### Biology Cave Species

Speleology is the study of caves. It includes topics such as the structure and physical properties of caves, as well as the processes by which they form and change over time. Because caves vary so greatly, they offer a diverse range of habitats for life. One subset of speleology, called biospeleology, distinguishes four different categories of species that can be found in caves.

Troglobites, or cave dwellers, are plant or animal species that are specialized for inhabiting the darkest parts of caves. These species don't depend on energy from the sun, but rather on other sources such as chemical energy from limestone. Although some troglobites can leave caves for brief periods or even a part of their lifecycle, they are unable to spend a full lifetime outside a cave ecosystem. This is because they have developed evolutionary traits, such as blindness and slowed metabolism to cope with the scarce food and low oxygen levels in caves. For example, the Texas blind salamander, found only in Hays County, Texas, reaches 13cm in length and survives on prey such as shrimp and snails that only inhabit caves.

Troglophiles, often referred to as cave lovers, are species that can spend their entire lives either inside or outside a cave environment. They tend to maintain some eyesight and skin pigmentation, although evolution has prioritized senses such as hearing, touch, and smell. One type of troglophiles, cave crickets, has very large hind legs and long slender antennae. These antennae, on which they rely heavily in their lightless habitat, appear next to each other on the head and allow a significant reach. Cave crickets are always wingless, and the bodies of their babies tend to appear translucent. This species can exist in damp environments outside caves, such as in rotten logs, under leaves, or under stones. In urban environments, they can be found in drains, sewers, and even the basements of homes.

Trogloxenes, commonly known as cave guests, vary in their dependence on caves, but none can live a whole life inside a cave. Some trogloxenes frequent caves while others need caves for a period of their lifecycles. However, all must return to the surface at some time. For example, the cave swallow, belonging to the same genus as the cliff swallow of North America, nests and roosts in caves, sinkholes, or similar man-made structures. They tend to forage for insects both inside and outside their cave shelters.

If one bird has been successful at finding food, it will be followed from the cave by less successful roost-mates to the food source.

The final category is the troglophage, or cave hater. They are sometimes referred to as "accidental trogloxenes." For instance, if an animal trips and falls into a cavern, its survival depends on escaping from the cave. Also, weather phenomena such as flash floods occasionally force non-cave species into a cave environment. When researchers discover

these species or their remains in caves, they discover that animals have no survival tools for this environment. In fact, these creatures are generally incapable of cave survival for an extended period of time.

Q1. What can be inferred about the Texas blind salamander?

- a) It doesn't spend a lot of time outside of caves.
- b) It lives on the chemical energy from Texas limestone.
- c) It has developed key traits that classify it as a troglolophobe.
- d) It is the only species of troglolophite in Texas.

Q2. What does the author imply about the cave swallow?

- a) They only leave the cave once all the insects have been eaten.
- b) Roost-mates steal food from each other's nests.
- c) Some of them spend more time in caves than others.
- d) They compete with cliff swallows for roosts in caves.

## ■ Key Sentence

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### Key Sentence:

These species don't depend on energy from the sun, but rather on other sources such as chemical energy from limestone.

### Pattern:

(Subject) don't/doesn't (verb) (object phrase), but rather ((verb) object phrase).

**Write your sentence.**