

Diversity of Life 1

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10.5 Archaea

Once considered a group of funny-looking bacteria, **archaea** (“OUR-kee-uh”) are now recognized as a distinct domain of prokaryotic organisms more closely related to eukaryotes than to bacteria. Some features of archaean genetics in particular link archaea to eukaryotes—their ribosomes are like those of eukaryotes, their genes contain introns like those of eukaryotes, and their DNA is associated with histone proteins, like that of eukaryotes.

Many archaea are adapted to extreme environments, such as very salty ponds or the scalding waters of hot springs and hydrothermal vents (Figure 10.6). These archaea are called “extremophiles”—lovers of the extreme. Biologists are interested in extremophiles because they live in conditions that are similar, in some ways, to those found on the young Earth. Because of this, extremophiles may provide clues about what the earliest living organisms were like. For example, certain archaea thrive in hydrothermal vent habitats deep in the oceans, where life may have first evolved. These archaea obtain energy from a chemical that is abundant there, hydrogen sulfide, and form the basis of remarkable vent communities that are entirely independent of sunlight.



FIGURE 10.6

Large colonies of extremophile archaea—the orange and yellow layers—live in the scalding waters of this Nevada geyser.

Not all archaea are extremophiles, though—many live in more familiar places. Some are found in the open ocean, and others live in the digestive tracts of termites, cows, and other herbivores. These archaea help their hosts digest plant material, and they release methane as a waste product.

In fact, because methane is a powerful greenhouse gas, raising large numbers of cows, sheep, and other livestock contributes significantly to global warming.



READING CHECK

Why are some archaea described as “extremophiles”?

CHECK YOUR ANSWER

They live in extreme environments, such as very salty or very hot habitats.

You can read more about Archaea here:

<https://ucmp.berkeley.edu/archaea/archaea.html>

