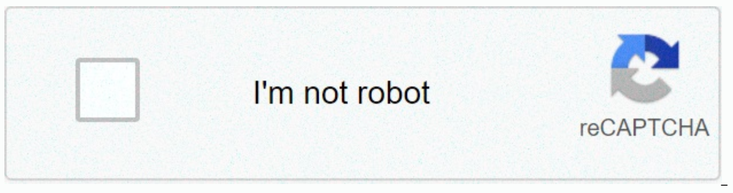

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Adaptation in desert animals information

 Updated April 17, 2018 By Laurie Brenner The ability to adapt to dry conditions can mean the difference between life or death for animals and plants that live in the desert. Some animals burrow deep underground in the heat of the day, lie in the shade until late evening or early evening, or have evolved salt glands that allow their bodies to secrete salt but not sweat so they retain water. Most deserts have a dry, dry climate with little or no rain, so every living organism that lives there must find a way to adapt, survive and thrive, or die. At night, the desert comes to life. The universal adaptation of life in the desert begins with an upside-down day. Instead of sleeping at night, nocturnal animals sleep in the hottest parts of the day, only to do their own food hunting business during the cemetery shift. Sleeping during the day, usually in the shade under the outcrop of rocks, in a burrow dug in a cool underground or under the shade of a creosote bush, they retain the water of their body. This applies to mammals, insects and desert reptiles. Native Americans familiar with the life of the desert can always find water when it can't be found on the ground, by slicing open a barrel of cactus or taking chunks of the flesh of a saguaro cactus and consuming it. The Sagua gigantea cactus can grow to more than 40 feet tall and live up to 150 years in conditions that will kill other plants. This tree, like a pillar cactus with weapons that shoot at 90-degree corners before growing vertically, and seen in many Western films of yesteryear, survives and thrives in the arid desert because it stores huge amounts of rainwater inside its thick, fleshy arms and body using it slowly. Many cacti expand markedly during the rainy season, which also helps them grow. The cactus saguaro also produces edible fruits, which some local tribes have made into a fermented drink for precipitation ceremonies. Camels evolved and physically adapted to hot desert days and cold desert nights in several ways. The camel's hump does not store water, as many people think; it stores fat. The thick hump provides the camel with a source of energy for long journeys through the desert. As fat is used, it creates water as a stolen product that adds water to the animal's blood flow. Camels don't sweat as much as humans, and at night, their metabolism slows down the way down to help save water as well. The heavy fur on their bodies acts as an insulator from the heat, and a blanket against winter cold desert. With extra-dry nasal passages and large nostrils closed and open by their will, will, condense moisture by cooling incoming air. Because of all the desert sand that gets blown off, camels have three eyelids, and long curly eyelashes that protect their eyes from the sand. Desert oily wood or creosote bush (Larrea tridentata), adapted to life in the desert so well that there is one in the Mojave Desert in California, which is almost 12,000 years old. The leaves contain a waxy substance that helps to keep protected from the ultraviolet rays of the sun and preserve water, but as soon as it rains, the wax material emits a scent that many desert dwellers forever associate with the smell of rain. When a stalk or branch of a plant dies, it sends a new clone that grows in the circle surrounding the parent plant. Each part of the plant has lived for about a century, but this cloning ability allows the entire structure of the plant to remain alive for centuries. About the author as a journalist and editor for several years, Laurie Brenner covers many topics in her writings, but science is one of her first loves. Her tenure as manager of the California State Mining and Mineral Museum in California's Golden Country served to deepen her interest in science, which she now performs by writing for online science websites. Brenner is also a science fiction author. She graduated from Coleman College in San Diego in 1972. In order to continue to use our website, we ask you to confirm your identity as a person. Thank you so much for your cooperation. Deserts are dry, dry areas that get very little rain. Deserts can be hot or cold. Most of the hot deserts are near the equator. How plants and animals adapt to physical conditions. The extreme nature of the desert environment means that plants and animals must adapt to survive. Plants and animals are regularly exposed to extreme temperatures and drought. They also have to cope with extensive water loss. Adaptation of desert plants - No leaves or small seasonal leaves that grow only after rain - it helps to reduce water loss during photosynthesis. These plants perform photosynthesis in their green stems. Plants can store water in stems or leaves, they are called succulents; Many plants have long root systems, widely distributed or deepened into the ground to absorb water; Short life cycle - some plants germinate in response to rain, grow, bloom and die within one year. Thus, these plants can avoid drought. Leaves with hair - they help to shade the plant, reducing the loss of water. Other plants have leaves that rotate throughout the day to expose a minimum surface area to heat. - spikes to prevent animals from eating plants for water; coating on stems and leaves - it helps to reduce water loss. Many plants grow more slowly - it requires less energy. Plants should not do so much food and therefore do not lose so much water. The cactus shown below, adapted for survival in the desert. They have many of the features listed above. Desert Cactus from Imartin6 (CC BY 3.0 (, via the adaptation of animals Wikimedia Commons Desert animals also have to cope in the desert, Using devices such as night or living underground to survive. Large, flat feet to spread their weight on the sand. to help keep the sand out of your eyes. NEXT TOPIC - Living World - Opportunities and Challenges - Peter Siminski Deserts Have You Ever Wonder How Animals Can Live in a Hostile Desert Environment? Water, so necessary for life processes, is often not enough. Temperatures, which range from freezing to more than 100 F (38 C), make maintaining a safe body temperature a constant problem. Add to this the catch-22 desert survival: the body's need for water increases as the temperature of the available water tends to decrease the hotter it gets. This may sound like an impossible situation, but as we will see, desert birds and mammals have developed many adaptive strategies to combat extreme temperatures and limited water. The main strategy to combat high desert temperatures is to avoid many mammals simply by avoiding high daytime temperatures by being night or crepuscular (twilight or dawn-active). A lynx, for example, is usually most active at dusk and dawn; javelina is never active during the day in summer, but it can be winter. Even the day birds are most active at cooler dawns. Many mammals, such as ringtails or kangaroo rats, are never active during the day. Microclimate and Burroughs Another avoidance strategy is to find a cool microclimate. Cactus wren can just rest quietly in the shade of jojoba; The prairie falcon will nest on the ledge of the cool northern cliff and avoid the hot south side. A cool, deep slit in a rock face can be a daytime hideaway of a pale bat, while a ringtail sleeps away a day in stirring rocks at the base of a cliff. Some mammals create their own microclimates. White-black Rat (or pack rat) builds a lair of desert litter-hall joints, spiky pear pads, sticks and stones in a cluster of prickly prickly prickly Cactus. It looks a bit like a garbage heap and can be three feet high and eight feet across. At the bottom of this heap is a series of tunnels leading to the nest of soft plant fibers. The pack rat spends its day in a soft nest, somewhat insulated from the external air temperature, which can be 110 F (43 C), with a surface temperature of 160 F (71 C). Any small mammals dig burrows in desert soil. Wednesday burrows are much more moderate than surface temperature, which can have annual fluctuations between 15 F (9.5 C) and 160 F (71 C). Many desert rodents spend all day in the soft environment of the burrow. (Merriam's kangaroo rat, for example, will come out to the desert in less than one hour every night!) White-tailed antelope proteins are mivenal rodents that feed for short periods of time on the hot day surface of the desert. When they search for seeds, fruits and insects, their chipmunk-sized bodies are heated, although their thick tails hang like umbrellas on their backs. Above ground, squirrels can often be seen tapping their bellies, with their legs spread out, against cool soil or even the tiles of a suburban patio in shady spots, allowing them to be supposed to heat their bodies to be held in cool ground or tiles. It has been suggested that squirrels use cool ground in burrows in a similar way when they retreat to them on hot days. Speculation made decades ago regarding the behavior of desert rodents in their burrows, and fluctuations in the temperature of rodents and their burrows in the height of the desert summer, have taken their own lives as facts. So there are generalizations about the temperatures in the burrows and the pack of rat nests, which were based on very limited measurements at altitudes and conditions, very different from our desert extremes. The truth is, we have a lot to learn about the temperature tolerances of these animals and their strategies to avoid overheating. It is to be hoped that current and future research, conducted with the help of modern technology, will give us more complete answers. Large mammals are not burrows to escape the heat of the desert. The fox kit, however, is an exception. Unlike any other North American canida, the fox kit uses burrows all year round. Burroughs help him thrive in the hot, dry desert valleys of a desert environment that is too challenging for other canids. Other large mammals, such as bighorn sheep and mule deer, look for shady spots throughout the day and remain inactive. The large body size actually has its advantages in a hot desert environment: a large body heats up more slowly than a small body. This phenomenon is called thermal inertia. He can buy enough time to go through a blistering summer day. Heat and radiation birds or mammals can carry heat from their bodies to the environment, reducing the value of feathers or fur. On a hot day thrasher smooth feathers that creates a thin insulating layer. Coyotes lose their thick winter coats in late spring; their early summer coats are relatively thin. Bighorn sheep also sheds its winter wool in spring, but it sheds it in stages. During the June heat, the abdomen and shaded parts of the legs shed first, providing an area from which to lose body heat; The back, however, remains covered with thick woolly fur, which insulates and shades a large sheep from the hot sun over its head. Birds have some advantages over mammals in the fight against heat. The normal body temperature of birds is usually higher than in mammals. This higher body temperature means that Gambel's quail, for example, with a body temperature of 107 F (42 C), can continue to carry heat into the air until the ambient temperature reaches 107 F. (Coyote, by comparison, has a body temperature of 102 F.) Also, by dilationing blood vessels going to its bare scaly legs, the bird can dump excess heat into the body's environment. The bird's foot temperature can increase by 15 F (9.5 C) after the blood vessels are dilated. Thus, the hot bird has smooth feathers and stands tall to expose his feet in the air. Mammals also have radiators. Long jackrabbit ears can transmit excess heat into the air through the dilation of blood vessels in the ear. This works best when the air temperature is below normal body temperature jackrabbit (104 F/40 C), or after the jackrabbit has been active. The evaporative cooling of the main method of cooling a hot bird or mammal is to evaporate. When water evaporates from the surface, it cools that surface. When coyote pants, it rhythmically moves the air over the wet surfaces of the mouth, throat and tongue. The water evaporates and these surfaces cool. The abundant dilated blood vessels are located near these surfaces and are cooled by them. The resulting chilled blood then circulates throughout the body. The hot owl will flap loose skin under the throat to move the air over the mouth. It is called gular fluttering and achieves the same result as panting. Panting and gular fluttering are energy efficient movements that produce very little heat themselves. Brains are very sensitive to heat. In sheep, as well as in members or families of dogs and cats, the evaporative cooling of nasal passages leads to the cooling of a special network of blood vessels to the brain. The brain carrying dogs, for example, is colder than the rest of its body. Vultures use evaporative cooling in an interesting way. The vulture urinates on its feet if the daytime temperature is over 70 F (21 C). The urine will evaporate, cooling the feet and drawing more heat from the body of the hot vulture. That's why when daytime temperatures are constantly around 70 the vulture's feet are white, but when the temperature below 70 F, the legs of the black vulture are gray, and the legs of the turkey vulture are red. Water Income and water costs birds and mammals have a great need for water. Water serves as the primary vehicle for nutrients, and it is an environment for diluting and disposing of the body's waste. Water functions in most chemical reactions of the living process, and as we have seen, water is the body's main cool fluid. Balancing the water and budget balances of desert animals is compared to balancing a bank account: there are water revenues and water costs. No wonder it's always a tight budget for desert animals. Stored water is usually limited to what can be placed in the intestines or crops. Debts are unacceptable. 10 to 15 percent of body weight loss due to water loss can impair the animal's ability to recover; A 20 percent loss often means death. Loss of water can occur quickly on a hot day in the desert, from one to two liters per hour in humans. What are the sources of water revenue and water costs? Income from water can come from three sources: Free water (e.g. Bighorn drinks in a water hole) Water in food, for example, Phainopepla eats juicy mistletoe berries) Water oxidizer (water produced by all animals when they digest food) Water costs can come from: Evaporative cooling dilution and the release of toxic waste body eggs or some rodents, such as Rat kangaroos are probably the most famous of them. It feeds mainly on dry, highly vegful seeds; one gram of herb seed produces half a gram of water oxidation. Seeds high in fat or high in protein are avoided: the former produce too much heat, which may have to be lost as a result of evaporative cooling; the latter require too much water to dilute the waste. A kangaroo rat can live on

the water produced when food is metabolized, but that's only part of its arsenal of survival strategies in the desert. Additional water is available from dry seeds, which, when stored in a burrow, absorb up to 30 percent of their weight in water from the increased humidity in the burrow. The evaporative loss from the kangaroo rat is low, as the animal has no sweat glands and little water is passively lost through the skin. The loss of respiratory water is reduced by the nasal cooling system, which extracts water from the air as it passes through the nasal chambers as it exhales - a cooling system is now known to be shared with other rodents and most other mammals. A kangaroo rat can produce twice as much seawater and feces as five times drier than a lab rat's litter. It retains moisture further, being nightly. Finally, kangaroo rats usually breed only when green vegetation or insects are available in addition to its water balance. Other rodents that do not have regular access to free water consume consume animals and succulent plants and their fruits. Pack rats and cactus mice are good examples of this feeding strategy. In June, the driest month of the year, a flock of rats can survive on cholla and prickly pear; Cactus mice can survive on the fruits of cactus and insects. There are many other animals besides rodents that get most of their water from food. Elven seams survive on katydidas and scorpions. Pronghorns can survive on water in cholla fruit. Whale foxes can meet their water needs with water in their diet of kangaroo rats, mice and rabbits, as well as a small amount of plant material. Other desert dwellers, such as coyotes, deer mules and Bighorn sheep, require periodic free water. In fact their home ranges revolve around water holes. Such animals, including us humans, are only where there is free water, or where it can be transported. People in a hot, arid environment people physiologically very well keep cool but quite poor in preserving water. Sweating is the main method of cooling the body; the evaporation of this sweat from all over the body cools the bare skin. During a really hot day in the desert, however, a person will lose as much as 12 liters (just over 3 gallons) of water through sweat. People have a special mechanism for cooling their large brain: blood is cooled by the evaporation of sweat on the face and head penetrating the skull through the tiny veins of the emissary, thereby delivering freshly cooled blood to the brain. This cranial radiator is unique among primates. People's upright, bipedal positions also provide some benefits for keeping cool. When the sun is directly above the head, only the head and shoulders are in full sunlight-the four-legged animal has all the back, shoulders and head exposed to the sun. Therefore, people get much less radiant heat than four-legged animals. In addition, standing upright, most of the body rises above the hot floor of the desert; this means that the rate of increase of human heat from the desert surface is much less than that of four-legged people. Being upright also exposes more body to cool air currents, and thus body heat can be lost as a result of convection. Nudity is also an advantage. Without insulating fur, heat can be lost more easily through convection, and sweat can be more easily evaporated. And this patch of thick hair on top of the head is more than just decoration-it shades of the head and its heat-sensitive brain from the sun. Unlike other desert mammals, humans have come up with many cultural and technological adaptations to the heat and aridity of the desert. Imagine yourself on a typical summer day in the Sonoran Desert. What methods and devices do you use to keep cool and hydrated? Hydrated?

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