

By: Sachin 2008, Science Editor

4 Desert Records

The largest, the driest, the hottest

1. World's largest desert is Sahara, covering most of northern Africa, from the Red Sea and the Mediterranean coasts to the outskirts of the Atlantic ocean. Sahara has an intermittent history of 3 million years. Erratic dunes (called ergs) can vary in height with 180 m (160 ft). The ergs may be punctuated by rugged rocks (hamada) and mountains up to 3,400 m (11,000 feet) high, all in 8.8 million square km (3.3 million square mi) (wider than Australia!), with less than 100 mm of rainfall annually. Modest bursts of life in the desert are called oases. Sahara means "desert" in Arabic. Niger River once originated in Sahara. In the last 40,000 years, the borders of the desert moved some times southwards and other times northwards and, in particular periods, the desert disappeared completely, the sand dunes being replaced by savanna. 6,000-8,000 years ago, the rainfall was abundant, and in Sahara emerged the Neolithic culture which left the rock paintings in Tassili n'Ajjer Mountains and in other areas. These images depicted crocodiles, ostriches, rhinos, giraffes, buffaloes, hippopotamus and elephants (all found today only in Africa, south of Sahara), but also oryx antelopes and gazelles. 5,000 years ago, the region turned into the modern arid desert. Some Saharan mountains still have some savanna elements, like crocodiles, hyraxes and shrub species. In the underground of Sahara, at a depth of 800 m (2500 ft), there is a subterranean sea of fossil freshwater, with a volume of 620,000 cubic km (150,000 cubic mi), over a surface of 6.5 million square km (2.3 million square mi). This water was exploited by the Garamante civilization, which existed between 500 BC to 500 AD, till the desert weather turned too harsh.

2. Sahara is a tropical desert, but the largest desert in the temperate area is Gobi, between China and Mongolia. Gobi means "gravel-covered plain" in Mongolian. It covers an area of 3 million square km (1.2 million square mi). During violent storms, Gobi desert is winnowed to heights up to 1 km (0.6 mi) and Beijing is often affected by these sand storms during the spring. Gobi abounds in saline lakes, the most important being Djaratai Dabassu, on whose surroundings, natural deposits of salt, often thicker than 2 m (6.6 ft), are found on a range of 45 km (28 mi).

3. The Atacama Desert is the driest on Earth: the average annual rainfall is about 1 in (25 mm) and, in some mid-deserts spots, rain has never been recorded. Atacama gets its name from the native Atacama Indians, still inhabiting the area. It spreads in northern Chile and a small area of southern Peru (South America), going up to 3,200 m (10,670 ft) in altitude over an area of 181,300 square km (72,500 square mi), like a narrow belt between the Pacific Ocean and the Andes, 960 km (600 mi) long, on the both sides of the Tropic of Capricorn. Atacama has strong contrasts: stony hills, volcanic rocks and sand dunes. A high pressure cell over the Pacific impedes the arrival of oceanic moisture from the west, while the mountains stop the clouds from the Amazon Basin in the east. The cold waters of the Humboldt Current coming from Antarctica cool down the desert air, chasing away the rain clouds. Atacama harbors one of the largest astronomic observatories, the Very Large Telescope, as this is one of the areas on Earth with the clearest sky, thus favorable to observing the stars. The air is so dry that metal objects never oxidize and nothing rots: the meat left for long on open air preserves for unlimited time. During summer the drought and heat is so severe that hair and beard crumble and fall and the nails chap. Even 6,885 m (22,590 ft) tall mountains lack glaciers. On the coastal areas, a dense fog called camanchaca flows thick. When the stable high-pressure cell offshore traps cool ocean air against the hillsides, the air condenses it into low-lying clouds. The chamanchaca does not bring rainfall, but an opportunistic ecosystem takes advantage of it: moss-covered cacti, shrubs, certain rodents and foxes. 1 million people live in coastal cities, mining settlements, fishing villages and oasis towns. Even farming is practiced in Atacama, using the water of the aquifers, which are fueled by snow melt from the Andes. Atacama is famous because of its enormous deposits of Chile saltpeter (sodium nitrate), the largest in the world (ancient Egyptians embalmed the mummies with it).

4. The Death Valley, located in eastern California and western Nevada, is the driest, lowest and hottest land in North America. It has a length of 225 km (140 mi) and a width of 8-24 km (5-15 mi). At Furnace Creek, the air temperature registered the record of North America: 57°C and that of the soil 94°C, with just 6°C under the water boiling point. This value was overcome just in Libya (58°C); still, the average summer temperature is higher in the Death Valley, this being the hottest point of the planet. The

average annual rainfall is under 50 mm but, in some years, it may not rain at all. This is the lowest point in the Western Hemisphere, 86 m (290 ft) under the sea level at the place of the salty Badwater Lake. Mount Whitney, located 140 km (88 mi) away, 4,418 m (14,730 ft) tall, is the second highest in North America. In 1850, small amounts of gold were found at Salt Spring. Silver, copper and lead were encountered too. Mining towns boomed, but after the deposits were depleted, these cities turned into ghost towns. In 1880, borax, a chemical used for making soap and other products, was discovered here. Till 1888, crews made of 18 mules and 2 horses made the 270 km (170 mi) till the Mojave Town each draging two wagons, 5 m (17 ft) long, loaded with borax. The unsupportable heat stopped transport from June to September. In 1933, the Death Valley was declared national monument and today The Death Valley National Park covers 1.3 million hectares. Despite its name, the area is inhabited by desert bighorn sheep (*Ovis canadensis nelsoni*), pumas, badgers, bats, bobcats, coyotes, swift foxes (*Vulpes velox*), skunks, porcupines, rabbits, poached mice, bewildered donkeys, lizards, snakes, tortoises and many birds. The native poached mice can live all their life without drinking a droplet of water. They get the necessary water by burning the starch and fats extracted from the dry seeds they consume. Their urine is five times more concentrated than the humans'. There are four species of pupfish (*Cyprinodon*) in the Death Valley. During winter, these 6 cm (2.5 in) long creatures doze in the mud of the springs and water ponds. During spring, they start spawning, but during the summer heat most of the water pools turn dry and the desert pupfish die massively. The survivors live in a water which is extremely salty and with a temperature up to 44°C.