## **Geological Wonders of Daisetsuzan National Park**

Daisetsuzan is a highly active volcanic region located on the Kurile arc of the Pacific Ring of Fire. The park's dramatic landscapes have been shaped by millennia of volcanic and tectonic activity. Smoldering volcanoes, gorges with striking columnar rock formations, and vast calderas are among the geological features that define the region.

## Calderas and volcanoes in Omote-Taisetsu

At the heart of the Omote-Taisetsu area in the north of the park is Ohachidaira Caldera, an enormous 2-kilometer-wide depression created by an eruption 30,000 years ago. It is encircled by volcanic peaks collectively known as the Daisetsuzan volcanic group. Mt. Asahidake (2,291 m), the tallest of these volcanoes, has barren slopes punctuated with steamy volcanic vents and neon-yellow sulfur deposits. It is still active, and a smaller volcano (Mt. Ushiro-Asahi) has recently formed on its southeast slope.

## Plate tectonics and volcanic activity in Higashi-Taisetsu

The mountains and landforms of the Higashi-Taisetsu area were created both by volcanic events and the collision of tectonic plates. The steep, rugged Ishikari mountain range that stretches across the area was formed by tectonic plate collisions beginning more than 10 million years ago. These mountains flank the Tokachi-Mitsumata Caldera, a basin formed by an eruption one million years ago. Today, the basin is filled with a thick forest of conifers and broadleaf trees. Mt. Maruyama (1,692 m) is the only active volcano in the Higashi-Taisetsu area. It is known for dome-shaped mineral deposits on its slopes called sinter cones, which are a rarity in Japan. Further evidence of past volcanic activity can be seen in the large quantities of obsidian found in this part of the park.

### Volcanic activity in Tokachi

The Tokachi volcanic group looms over the southwest section of the park. The highest peak is Mt. Tokachi (2,077 m), an active volcano that has erupted repeatedly over the years. Craters of various sizes spread out along its slopes.

# Hot springs

The Daisetsuzan region has several hot-spring hamlets, including Sounkyo Onsen, Nukabira Onsen, and Tokachidake Onsen. Many of the hot-spring baths at these resorts contain volcanic minerals like magnesium, calcium, and sulfate.

# Columnar jointing

The towering cliffs of Sounkyo and Tenninkyo gorges are made up of thousands of geometric columns of rock that fit together like the cells in a honeycomb when viewed from above. This type of geological structure is called columnar jointing. It forms when molten lava cools at different rates, fracturing as it solidifies into rock. The columnar jointing in Sounkyo stretches for about 24 kilometers, with sections of the cliffs veiled by gushing waterfalls such as Ryusei (shooting star) Falls and Ginga (Milky Way) Falls.

#### Permafrost and windholes

Daisetsuzan has an extremely cold climate, which gives rise to phenomena usually observed in arctic regions. Permafrost—permanently frozen soil—can be found even at low elevations in some parts of Higashi-Taisetsu. The oldest sections are believed to be about 4,000 years old. The permafrost cools the surrounding air, which fills crevices on the mountain slopes. In summer, rising warm air pushes the cold air out. Over time, the wind erodes the crevices into holes or small caves. The northern pika, a small mammal that is a species surviving from the Ice Age, inhabits these windholes.