

# Mt. Apoi Geopark

Accredited in 2009

● Mt. Apoi is an accredited member of the Japanese Geoparks Network, an affiliated organization of the Global Geoparks Network. The Geoparks initiative, which began in Europe and is supported by UNESCO, aims at revitalizing local communities by using natural heritage sites with precious and beautiful geology and terrains for education and tourism purposes.

## Ape-o-i-nupuri (Mt. Apoi) – The bringer of deer

Once upon a time, there were no deer in this area. Deer were an important source of foodstuff for the Ainu, who held discussions and decided to pray to the gods of heaven to be bestowed with the animal. The Ainu chose the summit of what is currently Mt. Apoi as a religious site, and set up an altar and erected a forked tree, on which they placed their treasured swords. They piled up grass and made a big fire as if to burn the sky, created a large fireball, made offerings of inaw (prayer sticks) and sake, and prayed to the gods (kamuyomi) in earnest for their wishes to be granted.

Their efforts were rewarded. After the ceremony, the population of deer increased, improving their standard of living. The Ainu named the place ape-o-i-nupuri (ape = flame, o-i = place where there are many, nupuri = mountain). Ape-o-i-nupuri means a mountain where a big fire burned, and the name Apoi is derived from this Ainu word.



## For protecting flowers on Mt. Apoi

— To hikers —

- The Mt. Apoi alpine plant community is the property of all the people of Japan, and should be protected forever for future generations. Special natural monuments are nature's national treasures.
- The illegal digging-up of plants is an unforgivable criminal act. Such actions in designated natural monument areas violate the Cultural Assets Preservation Act, the Natural Parks Act, the Forest Act and prefectural ordinances, and are punishable under these laws. If you witness such a crime, please have the courage to report it to the police.
- The most serious damage to the alpine plant community is caused by being trampled on by careless hikers (those taking photos). Each hiker is requested to take care so as not to veer from the trails when walking on the mountain.
- In order to protect precious alpine plants, please wash the soles of your shoes in the stream near the trailhead, to prevent the infiltration of alien species.



Hidakaso (*Callianthemum miyabeaenum*)

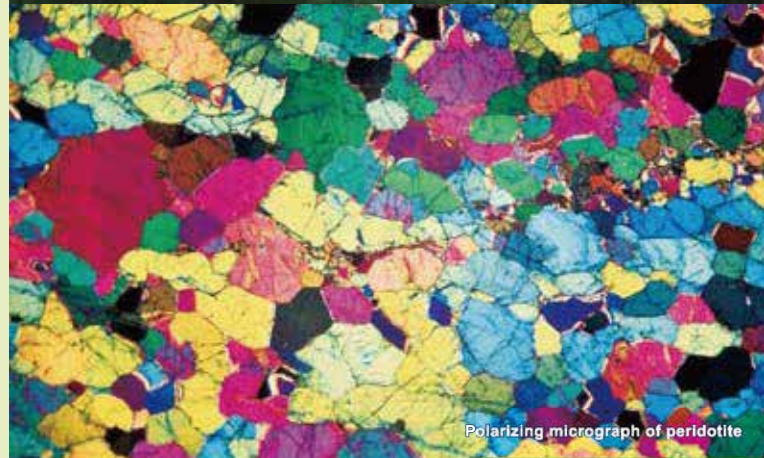
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# Mt. Apoi

Mt. APOI



Polarizing micrograph of peridotite

## Mt. Apoi Visitor Center

Hirau, Samani-cho Tel: 0146-36-3601

This 3D-map was made using Kashmir 3D. As the mountain trails and roads are outlined, their locations may not be exact.



● As a result of years of illegal digging up of plants and vegetation change probably caused by global warming, it is said that the Mt. Apoi alpine plants community has shrunk to less than one fifth of the scale at the time it was originally designated as a special natural monument half a century ago. The Mt. Apoi Fan Club and the Comback 1952 Mt. Apoi Regeneration Committee, which consists of researchers and administrative bodies, are working on nature regeneration experiments on the hillsides to restore the flower fields to their original states.

● The area is under the special soil conditions of ultrabasic peridotite, and is significantly affected by sea fog and strong winds as it is close to the coast. Moreover, it has less snow during winter, and these conditions enable alpine plants to grow along the ridge line despite the low altitude, and many endemic plants including *hidakaso* (*Callianthemum miyabeaenum*), *ezokozorina* (*Hypochaeris crepidioides*) and *apokanba* (*Betula apoienis*) can be seen.

● *Himechamadaraseri*, an alpine butterfly that is not found anywhere in Japan except Mt. Apoi, black woodpeckers and Blakiston's fish owls inhabit this area, and all of them are designated as natural monuments. In addition, *Apoimimal*, a land snail endemic to the Apoi mountain mass, and Japanese pikas, a relict species from the Ice Age can also be seen there.

● Mt. Apoi (810.2 m) is situated at the southernmost tip of the Hidaka Mountains, near the coast to the west, and the mountain mass, which includes Mt. Pinneshiri (958.2 m) in the north and Mt. Horoman (685.4 m) in the southeast, is made up of the Horoman peridotite complex, which was pushed up from the upper mantle several 10 km deep under the ground when the Hidaka Mountains were formed approximately 13 million years ago.

Nationally-designated special natural monument  
 Mt. Apoi Alpine Plant Community  
 Designated in 1952

## Endemic plants of Mt. Apoi

<b>Endemic species</b>	<i>Apoiiazami</i>	<i>Cirsium apoiese</i>
	<i>Ezokozorina</i>	<i>Hypochoeris crepidioides</i>
	<i>Apoikanba</i>	<i>Betula apoensis</i>
	<i>Samaniotogiri</i>	<i>Hyericum samaniense</i>
	<i>Hidakaso</i>	<i>Callianthemum miyabeianum</i>
<b>Quasi-endemic species</b>	<i>Ezoinuohige</i>	<i>Eriocaulon perplexum</i>
	<i>Hidakaiwazakura</i>	<i>Primula hidakana</i>
	<i>Miyamahamodoki</i>	<i>Rhamnus isidae</i>
	<i>Samanikaramatsu</i>	<i>Thalictrum integrilobum</i>
	<i>Ezotakanenigana</i>	<i>Crepis gymnopus</i>
	<i>Apoitanukiran</i>	<i>Carex apoensis</i>
<b>Endemic subspecies</b>	<i>Hidakatohiren</i>	<i>Saussurea riederi</i> ssp. <i>kudoana</i>
<b>Quasi-endemic subspecies</b>	<i>Hosobotoki</i>	<i>Angelica acutiloba</i> ssp. <i>lineariloba</i>
<b>Endemic variant species</b>	<i>Apoiiazumagiku</i>	<i>Erigeron thunbergii</i> var. <i>angustifolius</i>
	<i>Samaniyukiwari</i>	<i>Primula modesta</i> var. <i>samanimontana</i>
	<i>Himeshiraneninjin</i>	<i>Tilingia ajanensis</i> var. <i>angustissima</i>
	<i>Apoiymabukishoma</i>	<i>Aruncus dioicus</i> var. <i>subrotundus</i>
	<i>Apoitsumekusa</i>	<i>Arenaria katoana</i> var. <i>lanceolata</i>
	<i>Apoimantema</i>	<i>Silene repens</i> var. <i>apoensis</i>
	<i>Apoikinbai</i>	<i>Potentilla matsumurae</i> var. <i>apoensis</i>
	<i>Apoikaramatsu</i>	<i>Thalictrum folitidum</i> var. <i>apoiese</i>
<b>Quasi-endemic variant species</b>	<i>Chaboyamahagi</i>	<i>Lespedeza bicolor</i> var. <i>nana</i>
	<i>Hidakatorikabuto</i>	<i>Aconitum yuparense</i> var. <i>apoiese</i>
	<i>Himeezonegi</i>	<i>Allium schoenoprasum</i> var. <i>yezomonticola</i>
	<i>Ezosaiko</i>	<i>Bupleurum nipponicum</i> var. <i>yezoense</i>
	<i>Ezokusumire</i>	<i>Viola brevistipulata</i> var. <i>hidakana</i>
	<i>Birodoezoshogama</i>	<i>Pedicularis yezoensis</i> var. <i>pubescens</i>
	<i>Apoizekisho</i>	<i>Tofieldia coccinea</i> var. <i>kondoii</i>
<b>Endemic varieties</b>	<i>Apoikuwagata</i>	<i>Veronica schmidtiana</i> var. <i>yezoalpina</i> f. <i>exigua</i>
	<i>Apoiuhahako</i>	<i>Anaphalis alpicola</i> f. <i>robusta</i>
	<i>Apoimisebaya</i>	<i>Hylotelephium caucolicolum</i> f. <i>montanum</i>
<b>Quasi-endemic varieties</b>	<i>Ezonohakusanbofu</i>	<i>Peucedanum multivittatum</i> f. <i>linearilobum</i>

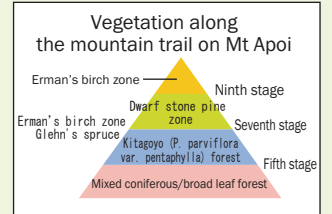
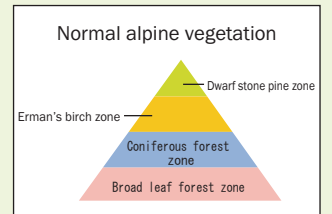
## Mysterious vegetation of Mt. Apoi

### Abnormal vertical distribution of Erman's birch forest at the summit

Mountain vegetation in Hokkaido usually changes as altitude increases: broad leaf forest zone → coniferous forest zone → Erman's birch zone → dwarf stone pine zone. On Mt. Apoi, however, there are Erman's birch forests in the area from the ninth stage to the summit, despite the area being at a higher altitude than the dwarf stone pine forest zone. Weaker winds are considered to be one reason, but the underbrush includes plants that usually grow at the foot of mountains, such as lilies of the valley and *ezoosakuraso* (*Primula jesoana* var. *pubescens*), which only adds to the mystery.



Erman's birch forest immediately below the summit

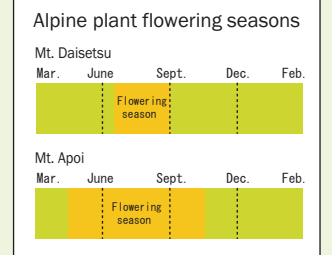


### Dwarf stone pines that grow from an altitude of approximately 300 m

Dwarf stone pine zones or alpine zones usually appear at altitudes of at least 2,500 m in the central Honshu region and 1,000 m or more in Hokkaido. On Mt. Apoi, however, alpine plants can be seen from the fifth stage (approx. 350 m), and dwarf stone pine communities can be found at an altitude of 300 m depending on the area. Climatic conditions can be considered, but what is more predominant is that the special soil conditions of peridotite are considered to hinder normal vegetation and bring about the same effects as those found in colder climates at the same altitude.

### Can Alpine flowers here be enjoyed from the earliest and for the longest periods of anywhere in Japan?

The blooming period of alpine plants depends on when the snow melts. On Mt. Apoi, the winter snowfall is far less than normal mountains with alpine vegetation. Most of the snow disappears by mid-April, and *hidakaso* (*Callianthemum miyabeianum*) and *samaniyukiwari* (*Primula modesta* var. *sanimontana*) begin to bloom in early May. As the mountain is relatively low, the first snow of the season comes late, resulting in the unusually long flower season of nearly half a year to October, when *kohamagiku* (*Chrysanthemum yezoense* Maek.) are in bloom.



## Himechamadaraseleri *Pyrgus malvae*

Nationally-designated natural monument (designated in 1975)

*Himechamadaraseleri* (*Hesperidae* family) is a small butterfly with a wingspan of 2.5 cm. This brownish-red butterfly with white spots is distributed mainly in northern areas including Russia and Mongolia, and in Japan it is found only at the alpine zone of Mt. Apoi. The butterfly was discovered on Mt. Apoi in 1973 by students of the Hokkaido University Insect Research Group, and its biology was clarified by the group the following year. The butterflies in their larval stage consume shrubby cinquefoils, an alpine plant, and adult butterflies are seen only during a period of approximately one month from early May to early June. *Himechamadaraseleri* were widely distributed in the Ice Age, but are considered to have remained here on Mt. Apoi by chance as global warming spread.



## Apoimaimai *Paraegista apoensis*

*Apoimaimai* is a snail endemic to the Apoi mountain mass and its surroundings, as well as the area along the Horoman River (registered as a new species in 1970). This snail is a species related to *takahidemaimai* of the *Himemaimai* genus that inhabits Hokkaido, and lives in cracks among piles of peridotite rocks. The shell of an adult snail measures approximately 1 cm and is characterized by the stiff, thin hairs on its surface.



## Japanese pika *Ochotona hyperborea*

The Japanese pika is a kind of hare well known as a relict species from the Ice Age. The brown animal, which measures approximately 15 cm in length, has rounded ears and gives off a high-pitched warning call. It inhabits central Hokkaido and the alpine zone of the Hidaka Mountains. The southern part of Hidaka is almost the southernmost limit of pika's habitat in the world, and the animal is distributed there at very low altitudes. It is found not only in the upper part of the Apoi mountain mass but also in a 50-m-high conglomerate area along the Horoman River.



## Other animals on Mt. Apoi



## Peridotite

### A message from the mantle

Mt. Apoi is formed of a rare rock known as peridotite. The rock, the specific gravity (3.3 g/cm<sup>3</sup>) of which is the heaviest on earth, is high in magnesium and iron, and is classified as ultramafic (ultrabasic) rock with low silica content, in which plants tend to develop special properties. One of major minerals of peridotite is olivine, and the word olivine is derived from its color, which is similar to that of olives. When a slice of peridotite is observed under a polarizing microscope, it looks like beautiful stained glass (see the front cover). The picture on the front page looks like a garden of colorful flowers spreading under the alpine plant community. A large crystal of olivine is known as peridot, and is used as a gemstone (the birthstone of August).



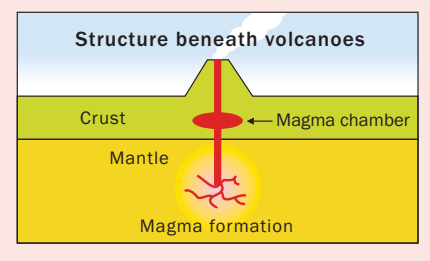
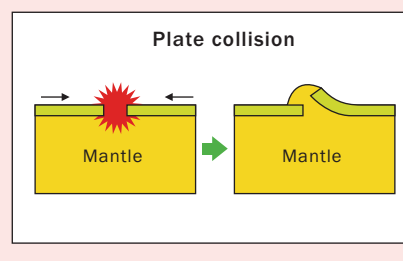
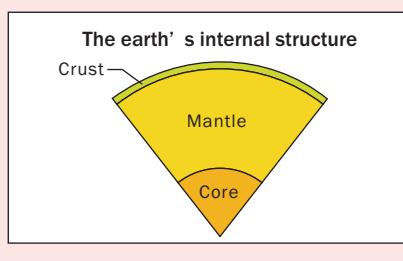
Peridotite



Peridot

### Mantle appearing on the surface of the earth

The earth consists of the core in the center, a thin surface layer known as the crust, and the substance between the core and the crust that is known as mantle, which accounts for approximately 80 % of the earth's volume. In fact, peridotite is a rock that forms the upper part of the mantle, and only exists several 10 km deep under the ground. Its exposure on the surface is related to the formation of the Hidaka Mountains. That is, when the plate of the east collided with the plate to the west, part of the mantle under the colliding plates was pushed up and appeared on the ground surface.



### The home of magma [Horoman peridotite]

It is known that the magma (molten rock) spewed out by a volcano, oozes from the upper mantle, or peridotite. The Horoman peridotite complex, which forms Mt. Apoi, consists of various types of peridotite, from parts containing much magma components to parts without magma. In addition, as the freshness of the peridotite exposed on the surface is so rare, the area attracts worldwide attention in the field of geosciences, as a precious place where incidences occurring in the mantle can be observed from the ground.