

## Insects of Dewa Sanzan

Dewa Sanzan, and particularly Mt. Gassan, has a broad diversity of insect species. This abundance is attributed to its deep snow accumulation, wetland habitats, and rich biodiversity.

Numerous species have been discovered on Mt. Gassan (1,984 m) that have not been found on Mt. Haguro (414 m), Mt. Yudono (1,500 m), or even on nearby mountains of a similar altitude, such as Mt. Chokaizan (2,236 m), just 60 kilometers away (from peak to peak). These species include the small whiteface dragonfly (*Leucorrhinia dubia orientalis*) found at around 700 meters, and *Acilius japonicus*, a diving beetle common at around 1,400 meters.

The region's heavy snowfall provides a hospitable environment for *Scopura longa*, a primitive, wingless aquatic insect considered a living fossil. This species lives in Mt. Gassan's valley, where the snowmelt keeps the river's headwaters very cold, around 10°C, even in summer. It also lives only in clean water, so it is considered a natural gauge of the aquatic environment.

Mt. Gassan is one of the most important breeding grounds in the country for the great diving beetle (*Dytiscus marginalis czerski*), which is rarely seen elsewhere in the region. This beetle grows to around 3.5 centimeters but is hard to spot because it burrows into the mud.

The severe climate of Mt. Gassan's upper reaches (above 1,200 meters) attracts alpine insects. *Aeshna nigroflava* is a large dragonfly that spends two to three years in ponds and marshes as a nymph, surviving the harsh Mt. Gassan winters, before metamorphosing into a dragonfly.

*Erebia niphonica* is Yamagata's only alpine butterfly species. It lives on mountain plateaus above 1,000 meters and has been seen on Mt. Gassan and some other nearby mountains.