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Representative plant species in Kirigamine

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Representative plant species in Kirigamine. Kiyono FUJIMA¹, Yusuke TSUKADA¹, Daisuke SATO² and Koji SHIMANO^{*1} (*¹Faculty of Science, Shinshu University, Asahi 3-1-1, Matsumoto City, Japan. ²Graduate School of Science and Technology, Shinshu University, Japan). *Bulletin of the Institute of Nature Education in Shiga Heights, Shinshu University* 59 : 73-88 (2022).

Introduction

Kirigamine is a plateau located at an altitude of 1500–1900m above sea level in Suwa City, Chino City, and Shimo-suwa Town, Nagano Prefecture, and is designated as part of the Yatsugatake-Chushin kogen Quasi-National Park, Japan. Kirigamine has a variety of environments such as highland marsh, lowland marsh, semi-natural grassland, and *Larix* forests, where many plants adapted to these environments grow. In particular, the marshlands and grasslands are filled with the flowers of various plants unique to these environments, and many tourists come to see them in summer.

The presence of these plants in Kirigamine is well known, and there are many references to them, ranging from guidebooks for tourists to technical papers, but few of them have been introduced in English.

Therefore, we would like to introduce the typical plants of Kirigamine in English so that people all over the world can learn about the plants that grow in Kirigamine.

In this paper, we discuss the natural distribution of the species in Japan as well as its habitat in the field. The regions of Japan are, in order from north to south, Hokkaido, Tohoku, Kanto, Chubu, Kinki, Chugoku, Shikoku, Kyushu, and Okinawa, with colder temperatures in the north and warmer temperatures in the south. The term Honshu is used to refer to the Tohoku, Kanto, Chubu, Kinki, and Chugoku regions combined. For detailed place names in Kirigamine, please refer to other sources and maps shown in English.

Plant species names are given with the Japanese name

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first, followed by the scientific name in parentheses. The scientific name is based on YList (<http://ylist.info>).

Itemized discussion

Sphagnaceae

Ibomizugoke (*Sphagnum papillosum*)

This species is distributed throughout Japan, growing in forests and wetlands, especially in subalpine wetlands. It is a large moss with a height of 15–20 cm. This species is similar to *Sphagnum palustre*, but can be distinguished by the presence of warts on the sidewall of the cells. In Kirigamine, it can be seen in the high moors such as Yashimagahara Marsh, but it is difficult to see from the boardwalk.

Osmundaceae

Yamadorizenmai (*Osmundastrum cinnamomeum*)

This fern species is distributed from Hokkaido to Kyushu in Japan, and usually grows in mountainous wetlands. The leaves are pinnately compound, ovate-lanceolate with partite leaflets. Like Onizenmai (*Osmunda claytoniana*), it is found around and in marshlands.

Onizenmai (*Osmunda claytoniana*)

This fern species is distributed in the Chubu, Kanto, and southern Tohoku regions in Japan, and grows in sunny mountain meadows and marshes. Its height is 30–40 cm. The leaves are pinnately compound, oblong-ovate, not completely dimorphic, and the sporangia are attached in two to five pairs below the center of the leaf. It is common in Kirigamine around and in Yashimagahara Marsh.

Pinaceae

Karamatsu (*Larix kaempferi*)

The natural distribution of this species is limited to the

vicinity of the Japanese Alps and other mountains, mainly in Nagano Prefecture, and parts of the Tohoku region. It is about 30 m tall and is the only deciduous coniferous tree in Japan. It was planted on a large scale in Nagano Prefecture after the second world war, and also in Kirigamine in some grassland areas. The planted larch (*Larix*) is now causing problems such as forestation of grasslands.

Fagaceae

Mizunara (*Quercus crispula* Blume)

This species is distributed from Hokkaido to Kyushu in Japan, and is a common tree in mountainous areas. It is a typical component of temperate deciduous broad-leaved forests. The largest trees can reach a height of more than 30 meters. Obovate-oblong-elliptic leaves are 12 to 15 cm long, and coarsely serrated. Mizunara, *Quercus crispula* differs from Konara, *Quercus serrata* in the length of its petioles, those of *Quercus crispula* are very short.

Poaceae

Nogariyasu (*Calamagrostis arundinacea*)

This species is a perennial herb that grows in grasslands and other areas from Hokkaido to Kyushu in Japan. The height of the plant is 50 cm to 150 cm. The leaf blade is linear, 30–40 cm long and 0.5–1.2 cm wide, with the underside of the leaf facing upward. This is the most obvious feature.

Miyakozasa (*Sasa nipponica*)

This species is distributed on the forest floor and other parts of the forest from Hokkaido to Kyushu in Japan. It is 30 cm to 100 cm tall. Oblong-lanceolate leaves are 15–25 cm long, 2–5 cm wide, with 5–7 leaflets on each branch tip. The culms are unbranched, and the nodes are globose and swollen. This species is the most common *Sasa* in Kirigamine and often covers the boardwalk. It also contributes to the aridification of the wetlands.

Susuki (*Miscanthus sinensis*)

This species is distributed throughout Japan and is a perennial herb that grows in mountains, open spaces, and riverbeds. The stems are erect, and the plant is strong and large. The height of the plant is 100–200 cm. Its leaves are linear and 50–100 cm long.

Liliaceae

Ko-oniyuri (*Lilium leichtlinii* f. *pseudotigrinum*)

This species is a perennial herb that grows in mountainous grasslands from Hokkaido to Kyushu in Japan. It is 30–60 cm tall. Its leaves are 8–15 cm long, alternate, and linear-lanceolate. The flowers are reddish-orange with strongly recurved petals. This species is closely related to Oniyuri (*Lilium lancifolium*), which is larger than Ko-oniyuri, *Lilium leichtlinii* f. *pseudotigrinum* and grows in lowlands and produces propagules at the base of its leaves. This species is representative of the reddish-orange flowers in this area, and produces very conspicuous flowers.

Amaryllidaceae

Yamarakkyou (*Allium thunbergii*)

This species is distributed in Honshu, Shikoku and Kyushu in Japan. It is a perennial herb of mountain meadows. Leaves are cylindrical, 20–50 cm long, hairless, with 3 to 5 leaflets at the base. The flowers are reddish-purple in color and produced in globular umbels. The bulbous part can be eaten.

Asphodelaceae

Yusuge (*Hemerocallis citrina* var. *vespertina*)

This species is distributed from Honshu to Kyushu in Japan, and is a perennial herb growing in rather dry places such as mountain meadows. It is 100 to 150 cm tall. Its leaves are linear and 40 to 60 cm long. The flowers are trumpet-shaped and similar to those of Nikkokisuge (*Hemerocallis middendorffii* var. *esculenta*), but the color is a lighter pale yellow than that of Nikkokisuge. This species is found around Odoriba Marsh in Kirigamine.

Nikkokisuge (*Hemerocallis middendorffii* var. *esculenta*)

This species grows on subalpine plateaus and mountains, and is distributed from central Honshu northward to Hokkaido in Japan. The leaves are radical, 1.5 to 2.5 cm wide and about 60 cm long. The flowering season is July to early August, when it produces trumpet-shaped yellow flowers about 10 cm in diameter. In Kirigamine, there was a large community of this species around Mt. Kurumayama, and many tourists come to see it. However, in recent years, the number of plants growing has been greatly reduced due to feeding damage by deer, and they are rarely seen except inside electric fences and deer-proof fences.

Asparagaceae

Kobagiboushi (*Hosta sieboldii*)

This species is a perennial herb that grows in sunny, wet areas from Honshu to Kyushu in Japan. It is 30 cm to 45 cm tall. Its leaves are smaller than those of Obagiboushi (*Hosta sieboldiana*), 10 cm to 20 cm in diameter, and the base of the leaf narrows abruptly and flows into the petiole. Its flowering season is from late July to August. The flowers are white purple to dark purple and bloom obliquely downward. The flowers are narrow at the base and wider at the tip, resembling the "ornamental cap" that decorate bridges, which is called "giboushi" in Japanese, hence the Japanese name "kobagiboushi". "Ko" in Japanese means "small".

Obagiboushi (*Hosta sieboldiana* var. *sieboldiana*)

This species is distributed widely from Hokkaido to Kyushu in Japan, and is a perennial herb found in mountain meadows and forest margins. The height of the plant is 60–100 cm. Its leaves are 30 cm to 40 cm long. The leaves are ovate with a heart-shaped base and a pointed tip. The flowering season is from late July to August, a little later than that of Kobagiboushi (*Hosta sieboldii*). The flowers are similar to those of *H. sieboldii*, but are often lighter in color than *H. sieboldii*, ranging from white to flame-purple. The sprouts are edible.

Melanthiaceae

Kobaikeisou (*Veratrum stamineum*)

This species is a perennial herb that grows in mountains, grasslands, and wetlands. It is 50 cm to 100 cm tall. Leaves are alternate, 10–20 cm long, 5–10 cm wide, broadly elliptic, hairless, with a leaf sheath at the base that encloses the stem. The flowering season is late June to mid-July. White panicle inflorescence is at the top of the stem. It is poisonous, and there have been cases of people dying from eating the sprouts, mistaking them for Obagiboushi (*Hosta sieboldiana* var. *sieboldiana*), a wild plant. Then, this species is not preferred by deer. This species is also representative of the white flowers found in the Kurumayama wetland.

Shurosou (*Veratrum maackii*)

This species is distributed in Hokkaido and Honshu in Japan, and is a perennial herb growing in forests and grasslands in mountainous areas. In Kirigamine, it is com-

mon in the Yashimagahara marshland. It is about 60 cm tall. Its flowers are conical, compound racemes with dense clusters of blackish purple flowers about 1 cm in diameter. It has three or four alternate leaves on the lower part. It does not grow in clusters, but its conspicuous flowers make it a plant with a strong presence.

Iridaceae

Ayame (*Iris sanguiea*)

This species is a perennial herb that grows in mountainous grasslands from Hokkaido to Kyushu in Japan. It is 30 cm to 60 cm tall. Its leaves are erect and 30 cm to 50 cm long. The flowering season is from mid-June to mid-July, and there are three to four purple flowers at the top of the stem. This species is similar to Nohanashobu (*Iris ensata* var. *spontanea*) and Kakitsubata (*Iris laevigata*), but can be distinguished from them by the pattern at the base of the outer perianth segments. The iris family is representative of the purple flowering plants found in the Yashimagahara Marsh.

Nohanashobu (*Iris ensata* var. *spontanea*)

This species is distributed from Hokkaido to Kyushu in Japan, and grows in slightly moist grasslands and wetlands. The height of the plant is 40 cm to 100 cm. Its leaves are smooth edged, sword-shaped, and 30 to 100 cm long. The leaves of this plant have midveins and are inflated. The flowering season is from mid-July to mid-August, and the flowers are reddish purple with yellow streaks on the shield at the base of the outer perianth segments. In Kirigamine, it is often found in Yashimagahara Marsh.

Kakitsubata (*Iris laevigata*)

This species is distributed from Hokkaido to Honshu in Japan, and is a perennial herb that grows in wetlands. The height of the plant is 40 cm to 70 cm. The leaves are 30 cm to 60 cm long and have no veins. Its flowering season is from mid-July to late July, and it is blue-violet in color with a shield of white streaks at the base of the outer perianth segments. This species is also found in Yashimagahara Marsh.

Polygonaceae

Ibukitorano-o (*Bistorta lapidosa*)

This species is distributed from Hokkaido to Kyushu in

Japan, and grows in mountainous to alpine grasslands. Its height is 50–80 cm. The radical leaves have long petioles and are ovate to oblong-ovate in shape, while the cauline leaves have no petioles and embrace the stem. The flowering season is July-August, and the color of the flowers is white. The flowers are white in color and are borne in spikes. The flowers have a peculiar fragrance. This species is distributed all over Kirigamine and is one of the most common plants with white flowers.

Mizosoba (*Persicaria thunbergii* var. *stolonifera*)

This species is distributed from Hokkaido to Kyushu in Japan, and is an annual herb that grows near water in the fields and mountains. It is 30 cm to 80 cm tall. Its leaves are ovate-halbered-shaped and hairy on both sides. Its flowering season is from July to October. The upper part of the flower is reddish purple and the lower part is white, and the flowers are borne in heads at the top of the stem.

Itadori (*Fallopia japonica*)

This species is distributed throughout Japan and is found everywhere, including sunny roadsides, banks and fields. The height of the plant is 30 cm to 150 cm. The leaves are alternate, ovate, 5 cm to 15 cm long, with hairs on both sides. The flowering season is from mid-July to August, and white cone-shaped flowers are produced in white color. It is known that rubbing the young leaves on bruises helps to relieve the pain. The Japanese name "Itadori" comes from the Japanese word for pain relief. This species is actually used as a crude drug.

Caryophyllaceae

Nanbanhakobe (*Silene baccifera* var. *japonica*)

This species is distributed from Hokkaido to Kyushu in Japan, and grows in the mountains and fields. Its stems grow horizontally and reach 150–170 cm in length. The leaves are smooth edged, 2–5 cm long, ovate, and thinly hairy on both sides. Its flowering season is in August. The flowers are white in color and are borne horizontally at the end of the stem. The petals are thin and separate from each other.

Ezokawaranadeshiko (*Dianthus superbus* Linn)

This species is distributed in Hokkaido and central Honshu of Japan, and is a perennial herb found throughout Kirigamine. It is 30–50 cm tall. Its flowers are pale

red with narrowly lobed edges. Its leaves are linear or linear-lanceolate, about 5 cm long.

Fushigurosen-nou (*Silene miqueliana*)

This species is distributed from Honshu to Kyushu in Japan, and is a perennial herb that grows in slightly sunny places such as forest floors. It is 40–80 cm tall. Oblong-lanceolate leaves are opposite. The flowering season is in August, with 5-petaled, reddish-orange color flowers that are 5 cm in diameter. The Japanese name "Hushigurosen-nou" is derived from a Japanese word meaning "black stem nodes". In Kirigamine, there are some colonies of this species along wooden paths in Yashimagahara marshland.

Oyamafusuma (*Arenaria lateriflora*)

This species is distributed from Honshu to Kyushu in Japan, and is a perennial herb growing in deciduous forests and grasslands. The height of the plant is about 10 cm. Leaves are opposite, smooth edged elliptic, with hairs on their edges and undersides. The flowering season is from June to July. The flowers are white, five-petaled, and about 1 cm in diameter.

Matsumotosen-nou (*Silene latifolia* subsp. *alba*)

This species is a perennial or biennial foreign herb distributed mainly from Hokkaido to Honshu. It is 30–60 cm tall. The leaves are opposite and lanceolate or oblong-ovate. Its flowering season is from June to September. It has white five-petaled flowers at the end of a short stalk. This species was introduced as an ornamental species during the Meiji era (late 1800s to early 1900s) and is native to western Asia and Europe. It can be found along roadsides in Kirigamine.

Ranunculaceae

Tsukubatorikabuto (*Aconitum japonicum* subsp. *maritimum*)

This species is distributed on the Pacific side of the southern Tohoku to Kanto regions and on the inland plateau of the Chubu region in Japan. It is 50–15 cm tall. The leaves are 9–20 cm long and wide, deeply 3-lobed, and more deeply lobed than those of Yamatorikabuto (*Aconitum japonicum* subsp. *japonicum*). The flowering season is from mid-August to September, and the color is bluish purple.

It has a strong poisonous substance called aconitine, which causes vomiting, diarrhea, respiratory distress, and even death if eaten by mistake. This species is not eaten by deer, so it tends to increase in areas without deer fences.

Kibananoyamaodamaki (*Aquilegia buergeriana* var. *buergeriana* f. *flavescens*)

This species is distributed from Hokkaido to Kyushu in Japan and is a perennial herb that grows in sunny mountains and at forest margins. It is 30–60 cm tall. The radical leaves has 2 times ternate leaf with petioles. The upper cauline leaves, on the other hand, are ternate leaf with no petiole. Its leaflets are wedge-shape, with two or three deep leaflets, and the leaflets have two or three additional partite leaflets. The flowering season is July-August, and the pale yellow flowers are borne downward. The red-dish-purple flowers are called Yamaodamaki (*Aquilegia buergeriana* var. *buergeriana*), which is also distributed in Kirigamine, but Kibananoyamaodamaki is by far the most common in this area.

Akagikinpouge (*Ranunculus japonicus* var. *akagiensis*)

This species is a perennial herb growing in sunny grasslands, found at Gumma Pref. Of Mt. Akagi and Nagano Pref. It is 30–80 cm tall. The leaves are 3 to 7 cm wide and partite or moderately lobed in three to five sections. Its cauline leaves are linear or oblong. Its flowering season is June to July, and it produces yellow five-petaled flowers about 2 cm in diameter. It is a variant of Umanashigata (*Ranunculus japonicus*) and can be distinguished by the downward lying hairs on the stem and petiole.

Karamatsusou (*Thalictrum aquilegifolium*)

This species is distributed throughout Japan, including Hokkaido, Honshu, Shikoku, and Kyushu, and is a perennial herb 90–150 cm tall growing in grasslands in mountainous areas. The flowers are whitish in color, and are borne in many like a compound corymb. The flowers resemble the leaves of the Japanese larch (Karamatsu, *Larix kaempferi*), hence the Japanese name "Karamatsusou". Japanese name "Sou" means herb plants. The leaves are pinnately compound, palmately lobed with three to five leaflets, and there is a large stipule part like a membranous at the middle of petiole.

Akikaramatsu (*Thalictrum minus* var. *hypoleucum* f. *contractum*)

This species is distributed from Hokkaido to Kyushu and is a perennial herb that grows in sunny, slightly moist grasslands in the mountains. It is 100–150 cm tall. The leaves are alternate, two to four times ternate leaves. The leaflets have two to four leaflets at the tips. Its flowering season is from mid-August to October, when it produces numerous small white to pale yellow flowers in panicle inflorescences. This species is similar to Karamatsusou (*Thalictrum aquilegifolium*), but can be distinguished by the different shape of the inflorescence. In addition, only *Thalictrum aquilegifolium* has large stipule part like a membranous at the base of the leaves.

Kinbaisou (*Trollius akiyamae*)

It is a perennial herb that grows in mountainous to sub-alpine grasslands in the Chubu and Kinki regions in Japan. It is 40–80 cm tall. Its leaves are partite with three to five leaflets. Its flowering season is from July to August, and it produces yellow 5-petaled flowers of about 4 cm in diameter. The Japanese name "Kinbaisou" means "golden Ume grass", and the yellow flowers resemble those of the plum tree (*Prunus mume*, "Ume" in Japanese name), hence the name.

Sarashinashoma (*Cimicifuga simplex*)

This species is distributed in Hokkaido, Honshu, Shikoku and Kyushu in Japan, and is a conspicuous large perennial herb growing in colonies in Yashimagahara Marsh. It is 60–120 cm tall and produces white, 20-cm spikes of flowers from August to October. The stems are erect, and the leaves are alternate, two or three times ternate leaves. It is also the representative flower of this region.

Kirinsou (*Phedimus aizoon* var. *floribundus*)

This species is distributed from Hokkaido to Kyushu in Japan, growing in grasslands and sunny rocky areas in the mountains. It is 10 cm to 30 cm tall. Its leaves are 2–4 cm long and thick-walled. The upper half of the leaves are serrated. Its flowering season is from late July to August. The flowers are arranged in a cymose inflorescence, with small yellow flowers in a dense flat cluster. Hosobakinbaisou (*Phedimus aizoon* var. *aizoon*) is closely related to this species, but Hosobakinbaisou has narrower leaves

with serrations to the base, and its flowers are more densely arranged than those of Kirinsou (*Phedimus aizoon* var. *floribundus*). The flowers are more densely arranged than those of Kirinsou. There are many species with yellow flowers in Kirigamine, and this is one of the most representative plants in Kirigamine, together with Nikkokisuge (*Hemerocallis middendorffii* var. *esculenta*).

Saxifragaceae

Chidakeshashi (*Astilbe microphylla*)

This species is distributed in Honshu, Shikoku and Kyushu, and is a perennial herb of 30–80 cm in height, growing in moist grassland in the mountains. The flowers are borne in compound racemes and are light pink in color. The leaves are pinnately divided two to four times, and the leaflets are ovate or oval. This plant is found around Yashimagahara Marsh and is representative flower of the summer season in Kirigamine. This species is one of the representative species with light pink flowers.

Hanachidakeshashi (*Astilbe thunbergia* var. *formosa*)

This species is a perennial herb similar to Chidakeshashi, *Astilbe microphylla* and is a variant of Akashoma, *Astilbe thunbergii* var. *thunbergii*. It is distributed in the central part of Honshu in Japan and grows in moist grassland in the mountains. Its flowers are white in color, and the tips of its leaves are more pointed and heavily serrated than those of Chidaketashi. Its leaves are red at the base and have three times ternate leaves. In the Kirigamine region, the two species share the same habitat and are easily mistaken for each other.

Hydrangeaceae

Noriutsugi (*Hydrangea paniculata*)

This species is distributed from Hokkaido to Kyushu in Japan, and is a deciduous shrub that grows at forest margins in mountainous areas. It reaches a maximum height of about 5 meters. Leaves are opposite, rarely whorl, elliptic to ovate, and pointed. It also has serrated leaf edges. The flowering season is in August and the flowers are white in color. The flowers are produced in panicle inflorescences with many bisexual flowers and a few ornamental flowers. The ornamental flowers have four white sepals that are enlarged and petal-like. Although it is a woody plant, the flowers are very conspicuous.

Celastraceae

Umebachiso (*Parnassia palustris* var. *multisetata*)

This species is distributed from Hokkaido to Kyushu in Japan and is a perennial herb that grows in moist grassland in mountainous areas. It is 10–50 cm tall. The leaves are heart-shaped and the radical leaves has a petiole. One leaf is also attached to the flower stalk, but it does not have a petiole and embraces the stem. The flowering season is from mid-August to October, and there is a single five-petaled white flower at the end of the flower stalk. This species is rare as a white flower that can also be seen in autumn.

Rosaceae

Kinmizuhiki (*Agrimonia pilosa*)

This species is a perennial herb found in mountainous and lowland areas from Hokkaido to Kyushu in Japan. It is about 50–100 cm tall. The leaves are pinnate compound with coarsely serrated stipules at the base of the petiole. The flowering season is from late July to August, and the five-petaled yellow flowers (less than 1 cm in diameter) are borne on the upper part of the stem. The seeds are epizoochore. In Kirigamine, seeds adhered to the clothes of tourists spread. Many flowers can be seen growing in clusters along the boardwalk in Yashimagahara Marsh. The yellow inflorescences growing densely are a beautiful sight.

Hebi-ichigo (*Potentilla hebiichigo*)

This species is widely distributed throughout Japan and is a perennial herb that grows in slightly moist areas. Its stems crawl on the ground. The leaves are ternate leaf, and the small leaves are 2–3 cm long. Its flowering season is from April to June, and it produces five-petaled yellow flowers of about 1.5 cm in diameter. The strawberry part is a red sphere about 1.5 cm long and can be eaten, but is not so tasty.

Miyamanigaichigo (*Rubus subcrataegifolius*)

This species is distributed from the Tohoku to Kinki regions of Honshu, and is a small deciduous shrub that grows in sunny places in subalpine to alpine areas. It reaches a height of about 1 meter. The leaves are alternate and three-lobed, with a long central lobe. The leaves of this species have heavily serrated edges. The flowering season is from June to early July, when it produces white,

5-petaled flowers of about 2 cm in diameter. The clustered fruits are red, 1–1.5 cm in diameter, spherical, and edible. The branches and petioles have thorns, so care should be taken.

Shimotsukesou (*Filipendula multijuga*)

This species is a perennial herb that grows in mountainous grasslands in Honshu, Kanto and westward to Kyushu in Japan. It is 30 cm to 70 cm tall. The cauline leaves are alternate, the radical leaves and the lower ones are impari-pinnate compound leaves with the apex leaflets palmately lobed into 5–7 leaflets. The flowers are numerous and pale red in color on a cymose-corymb inflorescence. Akabanashimotsuke, *Filipendula multijuga* var. *ciliata* is a close relative of this species, but the color of the flowers is red, and is distributed in central Honshu and parts of Kanto in Japan.

Odaikonsou (*Geum aleppicum*)

This species is distributed from Hokkaido to central Honshu in Japan, and is a perennial herb that grows at forest margins and in mountain meadows. Its height is 30–80 cm. The radical leaves are impari-pinnate compound leaves with large terminal leaflets and sharply pointed tips. The cauline leaves are simple or ternate leaves. The leaf edges of this species are serrated. The flowering season is from July to September. The flowers are yellow and 5-petaled at the end of each stem. This species and the similar species, Daikonsou (*Geum japonicum*), are not widely distributed in Kirigamine. It can be distinguished from Odaikonsou by the fact that the tips of the apical terminal leaflets of the compound leaves are not pointed. The Japanese name "Odaikonsou" is derived from the shape of the radical leaf, which resembles a radish ("Daikon" in Japanese) leaf.

Zumi (*Malus toringo*)

This species is distributed from Hokkaido to Kyushu in Japan, and is a deciduous broad-leaved tree growing in marshes and sunny mountains. It reaches a height of about 10 meters. The leaves are alternate, oblong-ovate, serrate, and rarely lobed into three leaflets. Its flowering season is from April to June, and the flower buds are pinkish, but turn white when they bloom. The fruits are red, spherical, and hairless. This species is commonly found around marshlands and along grassland trails. But-

terflies such as *Minois dryas* and moths such as *Arichanna gaschkevitchii* are often seen visiting the site for nectar feeding.

Ezonokoringo (*Malus baccata*)

This species is distributed from Hokkaido to central Honshu and northwards in Japan, and is a deciduous broad-leaved tree that grows in moist mountains. It reaches a height of about 15 meters. Its leaves are alternate, oblong-ovate, and serrate. This species belongs to the same genus as Zumi, *Malus toringo* and is similar to it, but unlike Zumi, it lacks three-lobed leaves. The flowering season is from May to June, with white flowers. The flowers are slightly larger than those of Zumi, and the buds are white. It is less widespread than Zumi.

Waremokou (*Sanuisorba officinalis*)

This species is distributed in Hokkaido, Honshu and Kyushu in Japan and is a perennial herb growing in mountain meadows. This species is common throughout Kirigamine, including roadsides. It is about 70 cm tall. Leaves alternate, with impari-pinnate compound leaves ; - leaflets elliptic, with fine serrations. The flowers have no petals and are composed of many dark red sepals. It is easily distinguished from other plants by its unique leaf shape and its flowers. In addition, the flowers have a peculiar pungent odor.

Shimotsuke (*Spiraea japonica*)

This species is distributed throughout Japan and is a shrub that grows in sunny mountain meadows. It is about 1 m tall. The leaves are alternate, oblong-ovate, and serrate. Its flowering season is from May to August. The flowers are borne in compound corymb inflorescence and are dark red to light red in color. The Japanese name "Shimotsukesou" comes from the fact that it was first discovered in the "Shimotsuke district" (present-day Tochigi Prefecture). "Sou" in the end of the Japanese name means herb.

Fabaceae

Itachihagi (*Amorpha fruticosa*)

This species is a shrub distributed all over Japan, widely spreading along roadsides, riverbeds, and road side slopes. The leaves are alternate, impari-pinnate compound leaves with 5 to 10 pairs of leaflets that are oblong-elliptic

tic to ovate with smooth edge. The flowering season is from April to July, and several inflorescences 6–20 cm long grow at the tips of the branches. The flowers are dark purple in color and are densely covered with many small flowers. This is a non-native species from North America, and is listed as an invasive species requiring special attention. In Kirigamine, it is distributed mainly along roads.

Marubahagi (*Lespedeza cyrtobotrya*)

This species is distributed from Honshu to Kyushu in Japan and is a subshrubs growing in sunny mountainous areas. It reaches a height of about 2 meters. The leaves are alternate, ternate leaves. The leaflets are round or elliptic in shape and sometimes slightly concave at the tips. The name "Maruba" in the Japanese name "Marubahagi" means a round shaped leaf. The flowering season is from August to October and is reddish purple. The inflorescences are short, not longer than the leaves.

Nantenhagi (*Vicia unijuga*)

This species is distributed from Hokkaido to Kyushu in Japan, and is a perennial herb growing at the foot of mountains and in the wilderness. Its height is 60–120 cm. The leaves are alternate, with two leaflets 3–7 cm long. The leaves are acuminate in shape. It can be distinguished from other plants by its leaf characteristics. The flowers are 2–4 cm long and produced in a blue-purple racemes.

Kusafuji (*Vicia cracca*)

This species is distributed in Hokkaido, Honshu and Kyushu in Japan, and is a vine that grows in sunny fields and mountains. The flowers are bright purple, similar to those of the woody vine, Fuji (*Wisteria floribunda*). The leaves are pari-pinnate compound with a narrow elliptic shape. The number of leaflets is 18 to 24. This species is common in Kirigamine at Misayama and Yashimagahara Marsh. The vine grows to 80–150 cm in length.

Geraniaceae

Tachifu-uro (*Geranium krameri*)

This species is distributed from southern Tohoku to Kyushu in Japan, and grows in the mountains and fields. It is 30–80 cm tall. Its leaves are palmately lobed into 5–7 leaflets. The leaflets are lobed once or twice more. The flowering season is July–August, and the color is light

reddish purple with darker veins on the petals. The stems of this species are longer than those of other geranium species, which is a point of distinction from other *Geranium* species. The Japanese word "Hu-uro" means the species in genus *Geranium*.

Hakusanfu-uro (*Geranium yesoense* var. *nipponicum*)

This species is distributed in the Tohoku and Chubu regions of Japan, and is a perennial herb that grows in moist grasslands in mountainous areas. It is 30 cm to 50 cm tall. The leaves are partite with five leaflets, and the leaflets are further lobed. Its flowering season is from July to August. The five-petaled, light purple flowers are about 2 cm to 3 cm in diameter. This species is representative of the pink flowers that bloom in the Yashima Marsh, and is very beautiful when seen blooming in clusters.

Asamafu-uro (*Geranium soboliferum*)

This species is distributed in central Honshu in Japan, and mainly in the Yashimagahara marshland in Kirigamine area. It is a perennial herb, 20–40 cm tall. It produces flowers that are darker pink than other members of the family, such as Hakusanfu-uro (*Geranium yesoense* var. *nipponicum*) and Gun-naifu-uro (*Geranium onoei* var. *onoei* f. *onoei*). It is less widespread than Hakusanfu-uro, and its leaves are partite up to the base. The Japanese name "Asamahu-uro" comes from the fact that it is abundant in the foothills of Mt. Asama.

Gun-naifu-uro (*Geranium eriostemon* var. *reinii*)

This species is distributed from Hokkaido to central Honshu, and is a perennial herb found in grasslands in the lower to subalpine zones. Its height is 30–50 cm. Its leaves are 6–12 cm long, palmately lobed with 5–7 partite leaflets, and hairy on the underside. The flowering season is from June to July, and the color is usually reddish purple, but rarely white. The flowers are 2.5 to 3 cm in diameter, and the petals are often recurved. The flowers are borne in clusters downward or sideways on the stem tips. The Japanese name "Gun-nai" is an old name for a region of Yamanashi Prefecture in Japan.

Gen-noshoko (*Geranium thunbergii*)

This species is a perennial herb that is distributed in Japan from Hokkaido to Kyushu. The herb is about 30 cm to 50 cm tall. The leaves and stems are hairy, and the

leaves are palmately lobed with 3 to 5 partite leaflets. Its flowering season is from July to August, and it produces white flowers about 1–1.5 cm in diameter (but red-purple flowers in Western Japan). This species is used as a medicinal herb for its antidiarrheal effect. The size of the flowers is smaller than other species of *Geranium* and can be missed if we are not careful.

Euphorbiaceae

Takatodai (*Euphorbia lasiocaula*)

This species is distributed in Honshu and the southwards of Japan, and is a perennial herb growing in grassland and light forest floor. It grows to a height of 40–100 cm. Leaves are alternate, without stipules, and have no or few petioles. The leaves are basically elliptic, but rarely lanceolate and 3–7 cm long. The flowers are yellow in July and August, and are borne on the stem apex in a cymose inflorescence. The ovary of the flowers has projections on the surface. Todaigusa (*Euphorbia helioscopia*), a closely related species, does not have protuberances.

Balsaminaceae

Tsurifunesou (*Impatiens textorii*)

This species is distributed in Hokkaido, Honshu, Shikoku and Kyushu in Japan, and is an annual herb growing in wetlands. It is about 50 cm tall. The leaves are alternate, rhombic-ovate. The flowers are reddish purple and have three petals. The Japanese name of this species, "Tsurihunesou", is derived from the shape of the flower, which looks like a hanging sailing boat. Japanese words "tsuri" means hanging, "hune" does a boat, and "Sou" does herb. The a closely related species with yellow flowers is called Kitsurifune (the Japanese name is "Kitsurihune" meaning "yellow Tsurifunesou"). The "Ki" in Japanese means "yellow".

Hypericaceae

Otogirisou (*Hypericum erectum*)

This species is distributed throughout Japan, including Hokkaido, Honshu, Shikoku and Kyushu, and grows in grasslands and roadsides in mountainous areas. Its height is 20–60 cm. The flowers are yellow and numerous in cone-shaped inflorescences. It is characterized by red spots on the stems and leaves. The part of Japanese name "Otogiri" means "to cut off his brother," and it is said that the red spots on Otogirisou are the spray of the blood of

the brother who was cut to death by his brother for revealing the existence of the secret medicine effect of this species to others. The red spots of *Hypericum perforatum* were named after a legend from the Heian period (AC794–1185).

Onagraceae

Akabana (*Epilobium pyrricholophum*)

This species is distributed from Hokkaido to Kyushu in Japan, and is a perennial herb that grows in marshy areas in the fields and mountains. The height is ranging from 15–70 cm. The leaves are opposite, ovate to ovate-elliptic. Its flowering season is from July to September. The flowers are light reddish purple to reddish purple in color and about 1 cm in diameter. The Japanese name "Akabana" means "red flower" in English. Iwa-akabana, *Epilobium amurense* subsp. *cephalostigma* a closely related species, has spherical column heads.

Arechimitsuyoigusa (*Oenothera parviflora*)

This species is a naturalized plant of European origin, distributed almost throughout Japan, growing mainly in open spaces and along roadsides. It is often found along roadsides in Kirigamine. Its height is about 50 cm. The flowers are obovate and yellow. Its leaves are oblong-lanceolate. Mematsuyoigusa, *Oenothera biennis* is similar to this species, but can be distinguished from Mematsuyoigusa by the absence of a gap between the petals.

Yanagiran (*Chamerion angustifolium*)

This species is distributed from Hokkaido to Honshu in Japan, growing in sunny places in the montane to subalpine zones. It is about 1–1.5 m tall. Its leaves are alternate and lanceolate. Its flowering season is in August. It produces dark pink racemes at the tops of its stems. The flowers are tall and conspicuous and herald summer in this region. In Kirigamine, this species grows in colonies in Yashimagahara Marsh and other areas.

Plantaginaceae

Kugaisou (*Veronicastrum japonicum*)

This species is distributed in Honshu and grows in sunny grassland at high altitude in Japan. The height of the plant is 50–50 cm. The leaves are four to eight and in whorls. Flowering season is from July to August, and racemes are borne at the tops of stems. The flowers are pur-

ple in color. The flowers are delicate and beautiful. The flowers are similar to those of Yamatorano-o (*Veronica rotunda*), but the leaves of Yamatorano-o are opposite. The leaves are not arranged in a circle. It was classified as a member of the Gomannophyceae in past.

Scrophulariaceae

Yamatorano-o (*Veronica rotunda* var. *subintegra*)

This species is distributed from the Kanto district to Kyushu in Japan, and is a perennial herb that grows in grasslands in mountainous areas. It is 40–90 cm tall. The leaves are wide lanceolate and opposite. The flowering season is from August to September, and racemes are borne at the tops of stems. The flowers are purple in color. The flowers are similar to those of Kugaisou (*Veronicastrum japonicum* var. *japonicum*), but the leaves of Kugaisou are whorls. Both produce beautiful purple flowers at the end of summer.

Araliaceae

Udo (*Aralia codata*)

This species is distributed in Hokkaido, Honshu, Shikoku and Kyushu in Japan, and is a perennial herb growing in lowland to mountainous areas. This species, Udo is well known as a wild vegetable; its young leaves, buds, shoots and stems are edible. The height of the plant is 150 cm. Its leaves are pinnate compound leaves with fine hairs. It is common in Kirigamine at Enchi site near Kurumayama wetland. Its flowering season is August, when it produces green flowers.

Apiaceae

Nodake (*Cimicifuga simplex*)

This species is distributed in Honshu, Shikoku and Kyushu in Japan, and is a perennial herb growing in sunny grassland. It is about 1.5 m tall. It is found in Kirigamine at Enchi and Yashimagahara Marsh. The flowers are white and scattered in an inflorescence. Its flowers and height are similar to those of other tall-stemmed herbs such as Shishiudo (*Angelica pubescens*) and Okasamochi (*Pleurospermum uralense*), but Nodake is characterized by its inflated petioles.

Shishiudo (*Angelica pubescens*)

This species is distributed in Honshu, Shikoku and Kyushu, and is a perennial herb growing in grasslands, road-

sides and open valleys. It is 1–2 m tall. The leaves are two- or three times ternate leaves. Its flowering season is from mid-July to August, and it produces multiple white sporadic inflorescences at the tips of the stems, the entire inflorescence being 15–30 cm in diameter. The dried root is used as a medicine for colds and swelling. It is a favorite plant of deer, and we often see individuals being eaten by them. The large white flowers are very conspicuous and are representative of the white flowers in Kirigamine.

Amanu (*Angelica edulis*)

This species is a perennial herb that grows in the mountains and wilderness. It is about 100 cm tall. It is similar to Shishiudo (*Angelica pubescens*), but its leaves are more rounded and shallowly lobed than those of Shishiudo. The leaves are alternate, ternate leaf, and the apex of the leaf has 3 leaflets. The flowers are white in a diffuse inflorescence. The abundance of this species in Kirigamine is lower than that of other Apiaceae species introduced in this paper.

Okasamochi (*Pleurospermum uralense*)

This species is distributed in the subalpine to alpine zones of central and northern Japan. It is 1–1.5 m tall. The leaves are 1–3 times 3-veined pinnate compound leaves. The flowering season is July–August, and the flowers are white, produced in dense clusters at the tips of the stems. This species is common in Kirigamine, such as Yashimagahara Marsh. The large white inflorescences are very impressive.

Ibukiboufu (*Libanotis ugoensis* var. *japonica*)

This species is a perennial herb that grows in mountains and grasslands. In Kirigamine, it is found in Enchi and Kurumayama. The flowers are white and borne in compound inflorescences. The leaves are 2–3 times pinnate, similar to those of Ezobofu (*Aegopodium alpestre*), but Ezobofu does not have involucre scales.

Ericaceae

Yamatsutsuji (*Rhododendron kaempferi*)

This species is distributed from southern Hokkaido to Kyushu, growing at forest margins and in sunny grasslands. It is 1–3 m tall. The leaves are alternate and clustered at the ends of branches. The flowering season is from May to June, and the flowers have red spots on the

upper surface. This species is very similar to Rengetsutsuji (*Rhododendron molle* subsp. *japonicum*), which is also found in Kirigamine, but the leaves of Yamatsutsuji are not wrinkled and are slightly smaller than those of Rengetsutsuji.

Rengetsutsuji (*Rhododendron japonicum*)

The distribution range of this species is from southern Hokkaido to Kyushu in Japan, and it grows naturally in sunny grasslands. It grows to a height of about 1–2 m. Its leaves are alternate, oblong-ovate. The leaves are wrinkled, unlike those of the yamatsutsuji (*Rhododendron kaempferi*). Its flowering season is from May to June, and the flowers are vermilion in color. Deer basically do not eat this species because it is poisonous. In Kirigamine, this species grows in clusters in the grasslands around the Kurumayama wetland, and many tourist come to see it during the flowering season. The vivid vermilion flowers are very conspicuous.

Primulaceae

Okatorano-o (*Lysimachia clethroides*)

This species is distributed from Hokkaido, Honshu, Shikoku and Kyushu in Japan, and is a perennial herb growing in sunny mountainous areas. Flowers are white and in inflorescences. Its leaves are alternate, oblong-elliptic, and reproduce by underground stems. This species is similar to Ibukitorano-o (*Bistorta officinalis* subsp. *japonica*), but Okatorano-o is characterized by its longer, drooping inflorescences.

Kusaredama (*Lysimachia vulgaris* subsp. *davurica*)

This species is a perennial herb that grows in the mountains of Hokkaido, Honshu and Kyushu in Japan. It is 40–80 cm tall. It has many yellow flowers in panicle inflorescences. The leaves are lanceolate with three or four leaflets whorl. The Japanese name "Kusaredama" is derived from the fact that it resembles the shrub "Redama". "Kusa" means herb in Japanese.

Kurinsou (*Primula japonica*)

This species is distributed in Hokkaido, Kyushu, and Shikoku, and is a perennial herb that grows naturally in mountainous wetlands. The height of the plant is 15–50 cm. In Kirigamine, it grows in clusters around Misayama Shrine, and flowers in July and August. Its leaves are radi-

cal, ovate, and elliptic. The flowers are reddish-purple in color and are arranged whorls on the flower axils.

Gentianaceae

Rindo (*Gentiana scabra* var. *buergeri*)

This species is distributed from Honshu to Kyushu in Japan, and is a perennial herb that grows in bright grasslands in mountainous areas. It is 20–100 cm tall. The leaves are opposite, ovate-lanceolate, with three prominent veins. Its flowering season is from September to October. The corolla has five leaflets and the blue-purple flowers are borne upward. A similar species is Ezorindou (*Gentiana triflora*), which is taller and has many flowers in a staircase pattern.

Lamiaceae

Kebukatsurukakosou (*Ajuga shikotanensis* var. *hirsute*)

This species grows in grasslands in the mountains. In Kirigamine, it grows mostly on the road from the ski resort to the Odoriba marsh. The height of the plant is 10–30 cm. It has more hairs than Tsurukakosou (*Ajuga shikotanensis*), and white hairs on the stem, leaves and sepals. The flowers are purple, lip-shaped, and several in a whorl. Its leaves are soft and long ovate.

Kurumabana (*Clinopodium chinense* subsp. *grandiflorum* var. *urticifolium*)

This species is distributed from Hokkaido to Kyushu in Japan, and is a perennial herb found in grasslands. It is about 20–80 cm tall. The flowers are produced in verticillaster and are light red in color. The leaves are opposite and egg-shaped. Because it is a member of Lamiaceae, the cross section of the stem is square.

Yamahakka (*Isodon inflexus*)

This species is distributed from Hokkaido to Kyushu and is a perennial herb growing in the mountains. In Kirigamine, this species is common in the Yashimagahara marshland. Its stems are quadrangular, and its flowers are small, purple, and borne in several tiers. Its leaves are ovate with coarse serrations. This species is similar to Hakka (*Mentha canadensis*), but does not have the odor of mint.

Utsubogusa (*Prunella vulgaris* subsp. *asiatica*)

This species is distributed throughout Japan and is a

widespread perennial herb from lowland plateaus to highlands. It is 10–30 cm tall. Oblong-lanceolate leaves are opposite, 2–5 cm long and slightly serrate. Its flowering season is July–August, and it produces 3–5 cm purple flowers. In Kirigamine, it is common throughout.

Ibukijakousou (*Thymus quinquecostatus* var. *ibukiensis*)

This species is distributed from Hokkaido to Kyushu, and is a small shrub growing on sunny, rocky soil. It is 3–15 cm tall. Its leaves are ovate to narrowly ovate and smooth edged. Its flowers have a unique fragrance. Its flowering season is from July to August. It bears reddish purple flowers in spikes at the tips of its branches. In Kirigamine, it grows on the rocks of the Kurumayama trail and in cracks in the asphalt of roads.

Inugoma (*Stachys aspera* var. *hispidula*)

This species is distributed in Hokkaido, Honshu, Shikoku and Kyushu, and is a perennial herb of slightly marshy habitats. The height of it is 30–70 cm. It has a slender underground stem. The flowers are pale red lip-shaped in several layers on a verticillaster inflorescence. The leaves are opposite and lanceolate, 4 to 8 cm long.

Rubiaceae

Kawaramatsuba (*Galium verum*)

This species is distributed throughout Japan, and is a perennial herb that grows in dry grasslands. The Japanese name "Kawaramatsuba" is derived from the Japanese word "Matsuba", which means "pine leaf", because the leaves of this species look like pine needles. It is 30–80 cm tall. It has white flowers that bloom from late July to August. Kirigamine also has a yellow-flowered species called Kibanano Kawaramatsuba (*Galium verum* subsp. *asiaticum*). "Kibana" means yellow flowers.

Valerianaceae

Ominaeshi (*Patrinia scabiosifolia*)

This species is distributed from Hokkaido to Kyushu, and is a perennial herb that grows in sunny mountain areas. It is 60–100 cm tall. Its leaves are opposite and pinnatifid. Its flowering season is from August to early September, when many yellow flowers (about 3 mm in diameter) bloom in flat clusters at the top of the stems. Not only the flowers but also the upper part of the stems turn yellow. As one of the seven flowers of autumn, it has

been popular in Japan for a long time.

Caprifoliaceae

Matsumusisou (*Scabiosa japonica*)

This species is distributed from Hokkaido to Kyushu, and is a perennial herb growing in mountain meadows. Its height is 30–50 cm. Its leaves are opposite and pinnately lobed, with the leaflets further lobed. Its flowering season is from late August to September, and its color is light purple to purple. The inflorescence is a calyx of many flowers, each about 5 cm in diameter. This species is one of the representative purple flowers of autumn in Kirigamine, and many tourists come to enjoy it.

Campanulaceae

Tsuriganeninjin (*Adenophora triphylla* var. *japonica*)

This species is distributed from Hokkaido to Kyushu, and is a perennial herb growing in bright grasslands in mountainous areas. Its height ranges from 40–100 cm. Leaves are generally three to five and in whorls, but rarely opposite or alternate. The flowering season is from July to mid-August, and the pale purple flowers (1 cm to 2 cm in diameter) hang in whorls, resembling a bell. The Japanese name "Tsuriganeninjin" comes from the resemblance of the root to Tyousen-ninjin (*Panax ginseng*).

Yamahotarubukuro (*Campanula punctata* subsp. *hondoensis*)

This perennial herb is distributed from the Tohoku to Kinki regions, growing in mountainous to subalpine zones. It is 30–60 cm tall. Its leaves are alternate, triangular-ovate, and 5–8 cm long. It has toothed leaf margins. The flowering season is from mid-July to August, and the flowers are about 5 cm long and bloom downward. The flowers are mostly reddish-purple in color, but rarely white or dark purple. This species is closely related to Hotarubukuro (*Campanula punctata* var. *punctata*), which grows in lowland grasslands and along roadsides, and can be distinguished from Hotarubukuro because Hotarubukuro does not have floating sepals, while Yamahotarubukuro has floating sepals.

Sawagikyō (*Lobelia sessilifolia*)

This species is distributed from Hokkaido to Kyushu, and is a perennial herb that grows in wetlands in the mountains. It is 50–100 cm tall. Its leaves are alternate,

lanceolate, and 4–7 cm long. It does not have petioles, and its leaf edges are finely serrated. The flowering season is in August, and the color is purple. It has five deeply lobed, dark purple, lip-shaped flowers in racemes at the top of the stem. This species is not widely distributed in Kirigamine, but is rarely found in the marshland.

Kikyō (*Platycodon grandiflorus*)

This species is distributed throughout Japan and grows in sunny places in the mountains and fields. Its height is up to 100 cm. Its leaves are ovate and 4–7 cm long. It has no petiole, and the leaf tips are pointed and serrated. The leaves are usually alternate, but sometimes three or four leaves are arranged in a whorl. The flowering season is from June to September. Its distribution in Kirigamine is not so large.

Ba-asobu (*Codonopsis ussuriensis*)

This species is distributed throughout Japan, including Hokkaido, Honshu, Shikoku and Kyushu, and is a herbaceous vine that grows in mountain meadows. The flowers are bell-shaped, dark purple, and smaller than those of Yamahotarubukuro (*Campanula punctata* subsp. *hondoensis*) in Campanulaceae. It has three or four leaves on short branches, all of which have white hairs.

Asteraceae

Nokogirisou (*Achillea sibirica*)

This species is distributed in central Honshu to Hokkaido in Japan, and is a perennial herb that grows at high altitudes. Its height is 50–70 cm. Its flowers are white and densely corymb inflorescence. The leaves are pinnatipartite and sharply serrated. The leaves of Seiyounokogirisou (*Achillea millefolium*) are pinnatipartite with two leaflets, while those of Nokogirisou are pinnatipartite with one lobe.

Yamahahako (*Anaphalis margaritacea*)

This species is distributed from Hokkaido to north-eastern Honshu in Japan, and is a perennial herb that grows in dry, sunny grassland in mountainous areas to high mountains. Its height is 30–50 cm. Its leaves have three veins, and white downy hairs grow on the stem and underside of the leaves. Its flowering season is from August to September, when it produces corymb of pale yellow capitulum flowers at the top of the stems. The white

bracts look like petals are involucral segments. This species can be found all over Kirigamine, but is especially common along the trail of Mt. Kurumayama.

Yamayomogi (*Artemisia montana*)

This species is a perennial herb that grows in mountainous areas in Honshu (north of the Kinki region) and Hokkaido where there is a lot of snow. It has many small pale yellow capitulum flowers in a panicle inflorescence. The leaves are white on the underside, alternate, and partite in a pinnate pattern, and are common throughout Kirigamine.

Gomana (*Aster glehnii* var. *hondoensis*)

This species is distributed in Honshu and grows in wetlands. It is common in Kirigamine and Yashimagahara marshland. This species is similar to Shirayamagiku (*Aster scaber*) in Kirigamine, but Gomana is distinguishable by its smaller and denser flowers. The flowers are white and 1 to 2 cm in size, and are located at the apex of the stem. The leaves are alternate and coarsely serrated. The sprouts are sometimes used as food in the Tohoku region, Japan.

Shirayamagiku (*Aster scaber*)

This species is distributed in Hokkaido and Honshu in Japan, and is a perennial herb that grows in mountainous areas. Its flowers are white and 3–4 cm in size. Its leaves are heart-shaped and serrated. Gomana (*Aster glehnii* var. *hondoensis*) and this species are similar, but this species can be distinguished from Gomana by its larger flowers and the fact that it tends to have fewer flowers. It can also be distinguished from Yugagiku (*Aster iinumae*) by its brownish stem.

Himejo-on (*Erigeron annuus*)

This species is an exotic plant native to North America and is distributed throughout Japan. The height of the plant is 30–60 cm. The leaves are lanceolate and alternate. Each capitulum flowers of a central yellow tubular flower and a white, elongated ligulate flower. This species is very similar to Harujion (*Erigeron philadelphicus*), but can be distinguished from that because the buds of Himejo-on are erect instead of nodding, and Harujion has leaves that embrace the stem.

Herabahimejo-on (*Phalacrolooma strigosum*)

This species is distributed all over Japan. It differs from Himejo-on (*Erigeron annuus*) in its leaves. Herabahimejo-on has indistinct serrations on the cauline leaves, and the radical leaves are spatulate with long petioles.

Noazami (*Cirsium japonicum*)

This species is distributed in Honshu, Shikoku and Kyushu, and is a perennial herb growing in the mountains. It is a perennial herb growing in the mountains. Its involucre segments are sticky. Its height is 60–100 cm. Its leaves are alternate, deeply lobed, and thorny. The flowers are red or white and are borne singly at the ends of branches. The radical leaves are also present during the flowering period. This species is the most abundant of the thistle species in Kirigamine.

Nohara-azami (*Cirsium oligophyllum*)

This species is distributed in northern and central Honshu and is a perennial herb growing in dry grassland. It is 60–100 cm tall. It produces two or three purple-red flowers at the tips of stems from late summer to autumn. This species is distinguished from Noazami (*Cirsium japonicum*) by its two or three flowers and the thick stems. In Kirigamine, the number of individuals is smaller than that of Noazami.

Kiseruazami (*Cirsium sieboldii*)

This species is distributed in Honshu, Shikoku and northern Kyushu in Japan, and is a perennial herb growing in wetlands. It is 60–100 cm tall. It differs from other thistles in that its flowers bloom horizontally or downward. Its leaves are sparsely alternate, with narrow leaflets and thorns on the edges. The flowers are purple-red and 3 to 4 cm long. This species is scarce in Kirigamine and is rarely seen.

Yotsubahiyodori (*Eupatorium chinense* subsp. *sachalinense* var. *hakonense*)

This species is a perennial herb that grows in mountain meadows and lowland moist grasslands in Hokkaido to Honshu. It is about 1 m tall with an unbranched stem. Its leaves are 10–15 cm long with three or four leaflets in a whorl. The flowering season is from August to September, and white to pink corymb inflorescences are clustered at the top of the stems. The nectar of the flowers

contains alkaloidal poisons, and the Asahimadara (a butterfly, *Parantica sita*) comes here to suck the nectar. There is another species similar to this one, the Hiyodoribana (*Eupatorium makinoi*), but it has opposite leaves.

Nigana (*Ixeridium dentatum*)

This species is distributed throughout Japan and is a perennial herb that grows in light grassland. Its height is 10–40 cm. The leaves are broadly lanceolate to ovate-oblong elliptic, and their bases embrace the stems. Its flowering season is from late June to August. It bears yellow capitulum flowers about 1.5 cm in diameter at the tips of its branches. The ligulate flowers are usually five in number. The Japanese name "Nigana" comes from the Japanese word "nigai" which means bitterness, and the stems and leaves are bitter when we eat them.

A variant of Nigana with a larger overall size and a larger number of white ligulate flowers (7 to 12) is called Shirobananigana (*Ixeridium dentatum* subsp. *nipponicum* var. *albiflorum*). The yellow ligulate flowers of Shirobananigana are called Hananigana (*Ixeridium dentatum* subsp. *nipponicum* var. *albiflorum* f. *amplifolium*).

Yugagiku (*Aster incisus* var. *pinnatifidus*)

This species is distributed in Honshu north of the Kinki region in Japan and is a perennial herb that grows in mountainous areas. It is 40–150 cm tall. It has a characteristic appearance with long stems that grow horizontally and vertically. Its leaves are 7 cm to 8 cm long and shallowly lobed in three or four pairs. Its flowering season is from August to October, and the color is white. The crown hairs are very short, about 0.3 cm. Its Japanese name "Yuugagiku" means "Yuzu-scented chrysanthemum," but it does not actually have a Yuzu scent. The scientific name of Yuzu is *Citrus junos*, which came from China more than 1,000 years ago.

Usuyukisou (*Leontopodium japonicum* var. *spathulatum*)

This species is distributed from Hokkaido to Kyushu, and grows in clusters in mountainous areas. It is 20–40 cm tall. The leaves are lanceolate and 4–6 cm long. The flowering season is from late July to October, with several small white capitulum flowers on white involucre leaves. This species is widely distributed in Kirigamine along the Kurumayama trail. It is a close relative of the

Edelweiss, and in Japan this species is sometimes called Edelweiss. Along with the Yamahahaako (*Anaphalis margaritacea* var. *margaritacea*), it is a representative of the white flowers found along the trail on Mt. Kurumayana.

Metakarakou (*Ligularia stenocephala*)

This species is distributed from Honshu to Kyushu, growing in moist grasslands and along rivers in mountainous to subalpine zones. It is 60–100 cm tall. The leaves are 10–25 cm long and spade-shaped at the end of a long petiole. The leaf edges have sharp serrations. The flowering season is from June to September, when it produces many yellow capitulum flowers in racemes at the top of the stem. Its ligulate flowers are one to four in number. This species is very similar to Otakarakou (*Ligularia fischeri*), but Otakarakou is larger and has 5 to 9 ligulate flowers.

Marubadakebuki (*Ligularia dentata*)

This species is distributed in Honshu and Shikoku in Japan, and is a perennial herb that grows naturally in slightly moist areas of mountains and grasslands. It is about 50–120 cm tall. The radical leaves have a long petiole. The leaves are elliptic with serrations and reach about 40 cm in diameter. The flowering season is July–August, and several yellow flowers about 8 cm in diameter are produced at the tip of the stem. This species is not preferred by deer, so is often found outside deer fences and electric fences in Kirigamine.

Kouzorina (*Picris japonica*)

This species is a biennial herb distributed throughout Japan, growing in mountains and along roadsides. The capitulum flower is yellow, similar to a dandelion, and small, 1–2 cm in diameter. It is most notable for its stiffly hairy stems. It hurts when you touch it, so we should be careful. Its height is 60–90 cm and it is common throughout Kirigamine.

Habayamabokuchi (*Synurus excelsus*)

This species is distributed in Honshu, Shikoku and Kyushu in Japan, and is a large perennial herb that grows in sunny mountain areas. Its flowers are 4–5 cm in diameter and purple, similar to thistles. The lower surface of the leaves is characterized by a dense coat of hairs. It is a

large and conspicuous plant, with a height of 1 to 2 meters and a leaf length of more than 20 cm.

Hangonsou (*Senecio cannabifolius*)

This species is distributed from Hokkaido to Honshu in Japan. It is a perennial herb that grows in moist grasslands at forest margins and in mountains. It is 1–2 m tall. The leaves are alternate, palmately compound with fine serrations. Its flowering season is from mid-August to September, when it produces dense clusters of yellow capitulum flowers at the tops of stems in corymb inflorescence. The ligulate flowers are five to seven in number. Ohangonsou (*Rudbeckia laciniata*) is an invasive species, but Hangonsou is a native species in Japan.

Kion (*Senecio nemorensis*)

This species is a perennial herb that grows in sunny mountains and grasslands. It is 30–80 cm tall. The ligulate flowers are yellow and appear from early July to September. It is a flower that can be seen even after the height of summer. The flowers are small, 2–2.5 cm in diameter. The leaves are 5–15 cm long and alternate, broadly lanceolate with shallowly serrated edges.

Korinka (*Tephrosia flammea* subsp. *glabrifolia*)

This species is distributed in the temperate zone of Honshu and grows in sunny, moist grasslands in the mountains. It grows in moist, sunny grasslands in mountainous areas. Its height is 50 cm to 60 cm. Its leaves are alternate, broadly lanceolate, and 10–16 cm long. The flowers are dark vermilion with a drooping 2 cm ligulate. This species is listed as Critically Endangered (Vulnerable, VU) by the Ministry of the Environment Japan. It can be found growing in clusters in Washigamine.

Sawagiku (*Nemosenecio nikoensis*)

This species is distributed from Hokkaido to Kyushu, and is found in damp places such as along streams in mountains and forests. It is 30–90 cm tall. Its leaves are alternate, thin, and pinnatipartite. The flowering season is from June to August. The capitulum flowers are yellow and numerous in sporadic clusters. In Kirigamine, it is often found near rivers such as Sawatari.

Tamurasou (*Serratula koreana*)

This species is distributed from Honshu to Kyushu,

and is a perennial herb that grows in mountain meadows. Its height is 30–140 cm. Its leaves are alternate and pinnatifid. Its flowering season is August, and it is reddish purple. The flowers of this species are very similar to those of Nozami (*Cirsium japonicum*), but the involucre are less sticky and thornless. The leaf shape is also different between this species and Nozami.

Akinokirinsou (*Solidago japonica*)

This species is distributed from Hokkaido to Kyushu, and grows in sunny mountainous areas. It is 30–80 cm tall. The leaves are ovate to ovate-elliptic, and the petiole is winged. Its flowering season is from mid-August to September. Its yellow in color and has numerous capitulum flowers in spike. It is similar to Kirinsou, but Kirinsou belongs to the family Crassulaceae. The leaves are thick and fleshy, and the flowers are produced in planes. The yellow flowers are one of the representative flowers of autumn in Kirigamine.

Ohangonsou (*Rudbeckia laciniata*)

This species is a specified exotic perennial herb native to North America. It was introduced to Japan in the mid-Meiji period as an ornamental plant. Its height is 50–

300 cm. Its leaves are 5–7 partite with coarse acute serrations. The flowering season is from August to September, and the yellow flowers are about 5 to 10 cm in diameter. In Kirigamine, it is mainly found in ski resorts and Odoriba wetland, and extermination activities are still underway.

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