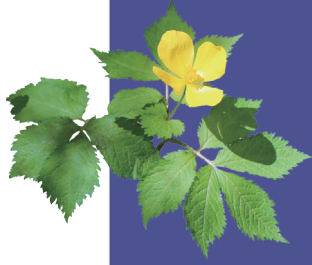
Important Plants of East Asia II

: Endemic Plant Stories



Published jointly by
Botanical Garden-Institute of the Far Eastern Branch of the Russian Academy of Sciences
Forestry and Forest Products Research Institute of Japan
Institute of Applied Ecology of the Chinese Academy of Sciences
Korea National Arboretum of the Korea Forest Service
National University of Mongolia
South China Botanical Garden of the Chinese Academy of Sciences

Edited by
East Asia Biodiversity Conservation Network (EABCN)

Sponsored by
Korea National Arboretum, Korea Forest Service

Edited and Designed by
GeoBook Publishing Co.

Citation:
East Asia Biodiversity Conservation Network (2015), Important Plants of East Asia Ⅱ:
Endemic Plant Stories. Korea National Arboretum, Pocheon, 232 pages.

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ISBN 978-89-97450-29-9 96480
Government Publications Registration Number 11-1400119-000240-01

Printed in the Republic of Korea

Important Plants of East Asia II

: Endemic Plant Stories

EABCN
EAST ASIA BIODIVERSITY CONSERVATION NETWORK

Preface

The floristic region of East Asia has one of the world's richest and most ancient floras. However, the value of which for humankind is not yet fully understood. Thus, the need for joint research and development at regional level of East Asia has been raised.

The East Asia Biodiversity Conservation Network (EABCN) has officially launched in 2014 during the CBD COP12 period held at Pyeongchang in the Republic of Korea for the implementation of Global Strategy for Plant Conservation (GSPC) 2020 in regional level of East Asia.

Six member institutions from five countries (Botanical Garden-Institute of Russia, FFPRI of Japan, Institute of Applied Ecology of China, South China Botanical Garden, National University of Mongolia, and Korea National Arboretum) expressed sympathy and joined into EABCN.

EABCN is expected to play an important roles in East Asia's biodiversity conservation based on the professionalism and research experiences of scientists from member institutions in a variety of areas.

This book, Important Plants of East Asia II: Endemic Plant Stories, is a second publication followed by 'Important Plants of East Asia: Plants tell stories' published in 2014. First publication is a kind of introduction of East Asian flora, while this second publication is more specialized to the endemic plants in East Asia.

This is a fruit of deep consideration and a lot of efforts of EABCN members for biodiversity conservation in East Asia. Thus, this book is expected to play as a stepping stone to complete the regional plant checklist and World Flora Online.

I am hopeful that the present book would help to foster an awareness of the native flora and their conservation in East Asia and contribute for the establishment of the regional Red List.

YOU MI LEE
Chairperson
East Asia Biodiversity Conservation Network

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© Ning Zulin

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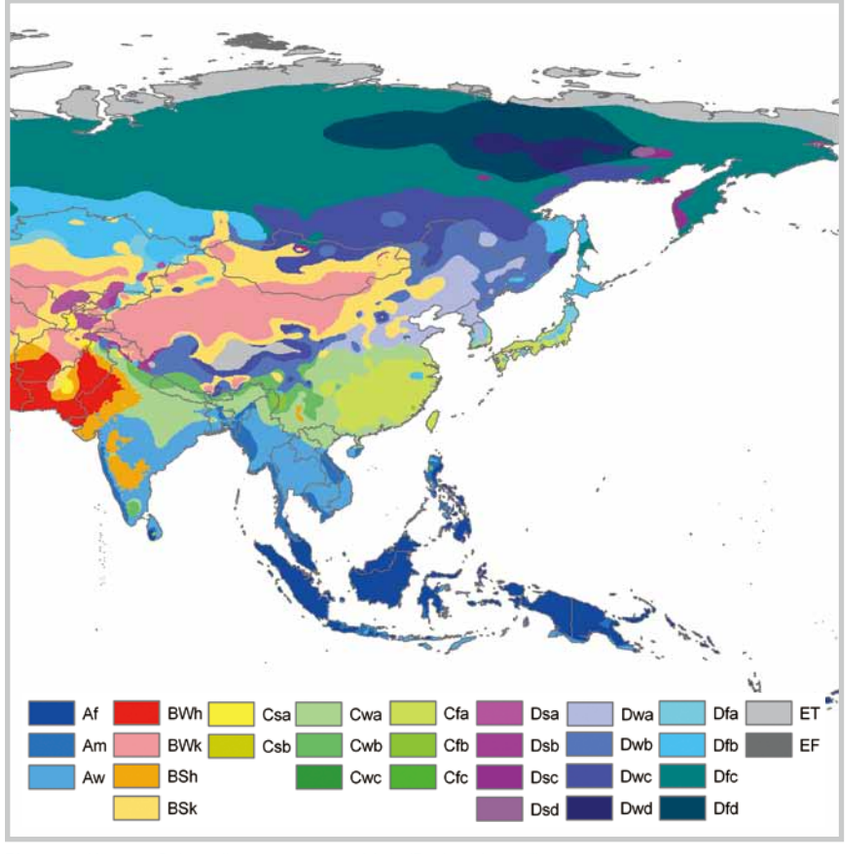
Introduction

East Asia Biodiversity Conservation Network (EABCN) is monitoring biodiversity affected by global climate change, including combined flora list covering East Asia and distribution maps especially for endangered plants. We have published the first EABCN book 'Important Plants of East Asia: Plants tell stories'.

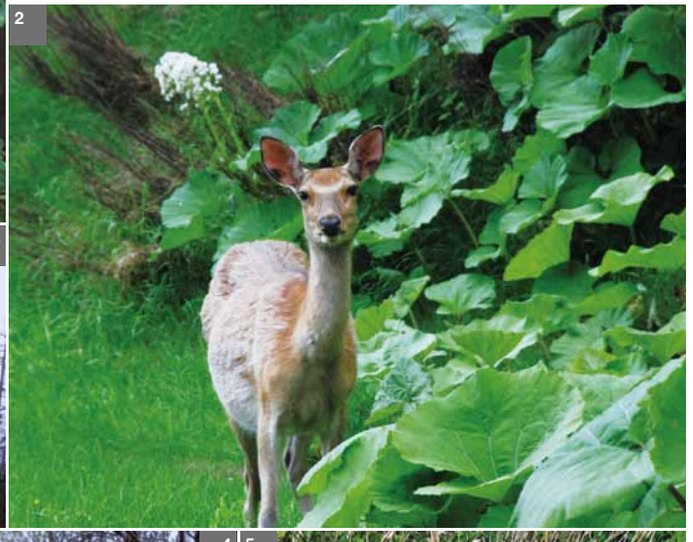
We planned a second publishing through collaboration of EABCN members to understand East Asian plants more deeply. Therefore we mainly selected plants that have distribution in more than one country. East Asia covers Russia (far east to east Siberia), Japan, Korea, Mongolia, Continental China, and Taiwan, with latitude roughly ranging from N20° to N80° and longitude ranging from E75° to E170°. Although East Asia is not a homogeneous unit from the natural point of view, they share geographical closeness and natural historical events. According to Köppen-Geiger climate classification depending on temperature and precipitation, East Asia has five major climate zones: polar and alpine, continental, temperate, dry, and tropical. Such wide variation in climate has contributed to biodiversity.

Good (1953) has classified the world flora into 37 provinces. East Asia has five of them: Arctic and sub-arctic, Euro-Siberian, Sino-Japanese, West and Central Asiatic, and Continental Southeast Asiatic provinces. This classification corresponds well to the upper climate one. Euro-siberian province located northernmost in East Asia is characterized by large scale coniferous forest and birches. Sino-japanese province is situated in the middle belt of East Asia. It covers Japan, Korea, middle part of continental China, and Himalaya. *Cercidiphyllum* and *Eupetalea* are endemic there. The distribution of *Tiarella polyphylla* includes Japan, Korea, China, and Nepal. West and Central province has little precipitation. It covers Mongolia and west part of China. Dry-tolerant plants are observed in steppe. The southern coastal region of continental China, Taiwan, and the southwestern islands in Japan belong to Southeast Asiatic province. *Barringtonia* or mangroves can be observed there.



Picture 1. Köppen-Geiger climate type map of Asia (Peel *et al*., 2007)

Another cause of biodiversity is natural historical events. As Pavel Krestov (2014) showed in the former EABCN book, repeating glacial events can lead to extinction, movement, isolation, or stay in refugia. Compared to Europe and North America, the coldness during the glacial period and the warmness during inter glacial period have affected the flora less because the mountains elongating north to south can give plants chance to escape southward or northward. The sea has eased climate change and supplied land bridges during the glacial period. It promoted isolation during interglacial period. On the other hand, inside the Eurasian Continent went on desertification and produced more dry-tolerant plants. As a result, speciation and endemism can characterize East Asia biodiversity.



Picture 1. *Rosa rugosa* flower.

Picture 2. Forest management change and decrease of hunter population lead the increase of Sika deers giving damage for plants.

Picture 3. Recent human activities lead high frequency of forest fire.

Picture 4. Climate change tends to decrease snow accumulation. As the result, dwarf bamboos are exposed in severe coldness and strong wind and the leaves and stems become dead.

Picture 5. Climate change tends to promote land dry which leads the invasion of tall grasses and dwarf bamboo.

Asa Gray, a famous American botanist in the 19th century, pointed out the similarity of floras between eastern North America and East Asia. They share genera. The distribution disjunction has been interest of botanists. *Stewartia*, *Liquidamber*, *Liliodendron*, and *Platanus* are distributed in both regions. The latter three plants have fossil records in Japan. However, they are extinct today. We have been sharing the same types of flora or plant species across countries due to natural historical events. People have been making use of such plants for a long time. They have developed unique culture with these plants. On the other hand, we have been also sharing cultures on ethnic use. For example, Japan has imported a great amount of knowledge on Chinese medicine. Ginkgo, plums, and bamboos have been imported from China with Chinese culture. After that, they have modified the culture and developed their own culture. It has been reported that the bamboo with the origin from China is introduced by a Japanese researcher. Name of plants can be affected by the culture of each country. For example, *Rosa rugosa* is called Roza in Russian with meaning of rose. It is called Hamanasu in Japanese with the meaning of coastal pear or Haedanghwa with meaning of coastal pear flower. It is called Meigui in Chinese with the meaning of red gem.

East Asian countries are also sharing problems concerning the conservation of biodiversity. Deforestation, development of agricultural field, desertification, and artificial constructions for slope, riverside, and seaside have been threats to biodiversity. Changes in life styles can also decrease biodiversity maintained by traditional sustainable actions such as wood fuel production, abundance of bamboo use, change of nutrient for agriculture from natural resources to chemicals. These are common problems in every country. Another new and more serious problem is global climate change. It affects biodiversity not only by increasing temperature directly, but also by increasing or decreasing local precipitations, decreasing snow fall, increasing herbivory and disease.

We hope that we can share knowledge on plants, cultures, and problems that threaten biodiversity conservation. We could learn the situation and background of each county in East Asia by collaborating with each other and publishing this book. Moreover, we can find solutions for various problems across these countries.

Written by Takayuki Kawahara

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Endemic Plant Stories of East Asia

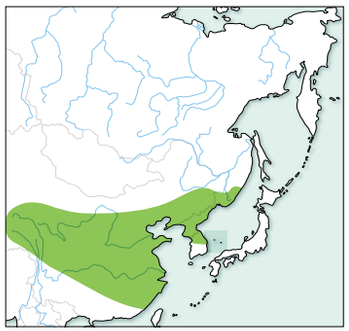
Abelia biflora Turcz.

Caprifoliaceae

- 六道木 [Liu dao mu]
- トウツクバネウツギ (唐衝羽根空木) [To-tsukubane-utsugi]
- 털댕강나무 [Teol-daeng-gang-na-mu]
- Абелия двуцветковая [Abeliya dvutcvetkovaya]

Description

Monoecious deciduous shrub, up to 3 m tall. In extreme conditions near the timberline in the mountains prostrate form is common. Leaves opposite, petiole 4–7 mm long, broadened at the base, sparsely hairy. Leaf blade narrowly to broadly ovate or obovate to lanceolate, rarely broadly lanceolate, simple, entire, 30–80 × 5–30 mm, coarsely toothedwith 1–6 pairs of teeth, abaxially glabrous but with stiff hairs mostly on central vein; base cuneate to obtuse, apex acute to long acuminate. Flowers clustered by two, sessile or with pedunculates 3–6 mm long, axillary, at branchlet tips. Flowers hermaphroditic, with double almost regular perianth, fragrant. Calyx corolla-shaped, tubular, with four sepals, with three ovate-lanceolate or obovatebracts at base of each ovary. Corolla 12–15 mm long, 4-lobed, yellowish-pink, white, sometimes tinged red in the upper part; lobes round in shape; tube hairy inside. Achene 1–1.5 cm, crowned with four persistent and slightly enlarged sepals. Fruits dry, leathery, oblong, 10 mm long, 4-ribbed longitudinally, bare, with sepal persistent at apex. One seed, oblong, flattened. Flowering in April-June, fruiting in August to September.



Turczaninow (1837) first was described this species from specimens in northern China. Nakai (1918) related Far Eastern specimens to species *Abelia coreana* Nakai. The latter name, Nakai, is accepted in Soviet and Russian taxonomy to date (Vorob'yev, 1968; Voroshilov, 1982; Nedolouzhko, 1987). According to Russian treatments, the genus *Abelia* belongs to the family Caprifoliaceae and related to the Linnaeeae Frietsch tribe. Rehder (1911) related *Abelia biflora* threaded as taxonomic complex to the section Zabelia inside of the genus *Abelia*. Makino studied the phylogeny of this group. Further, studies by Ikuse and Kurosawa (1954), and later by Fukuoka (1968) supported Makino's findings. Last, Makino (1948) segregated the genus *Zabelia* from *Abelia* and Hayashi (1954) based on pollen, wood anatomy, inflorescence structure, and karyology. The species is highly variable and represents a complicated taxonomic group that includes up to 11 different species (Nakai, 1937). Qiner *et al*. (2011) followed the concept of Makino (1948) in the treatment for China's Flora and suggested two species of *Zabelia* for China: *Zabelia biflora* and *Zabelia triflora*. First is considered as species complex and needed in further studies.

© Marina Koldaeva

Distribution and habitat

China (Anhui, Fujian, SE Gansu, Guizhou, Hebei, Henan, Hubei, Hunan, Jiangxi, Liaoning, Nei Mongol, S Ningxia, Shaanxi, Shanxi, Sichuan, Xizang, Yunnan, Zhejiang) (Qiner *et al*., 2011), Russia (Primorskii region) (Nedolouzhko, 1987; Koropachinskii, 2015), Korea (Hamgyeongbuk-do, Hamgyeongnam-do, Pyongannam-do, Jagang-do, Hwanghaebuk-do, Whanghaenam-do, Gangwon-do, Gyeonggi-do, Chungcheongbuk-do, Gyeongsangbuk-do). This species can be found in the upper mountain belt, in the transition zone between temperate deciduous and oroboreal conifer forests, as well as in Betula ermanii forests in the northern range of its distribution (Koropachinskii, 2015) in mesic moisture and nutrient sites within the canopy openings.

Conservation status

Currently, this species has no conservation status, but was recommended for protection by Kharkevich and Kachura (1981).

Ethnic use

The species is used in traditional medicine and as ornamental plants. It is broadly used in landscape architecture within the temperate zone of Eurasia and North America.

Written by Pavel V. Krestov

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Adenophora palustris Kom.

Campanulaceae

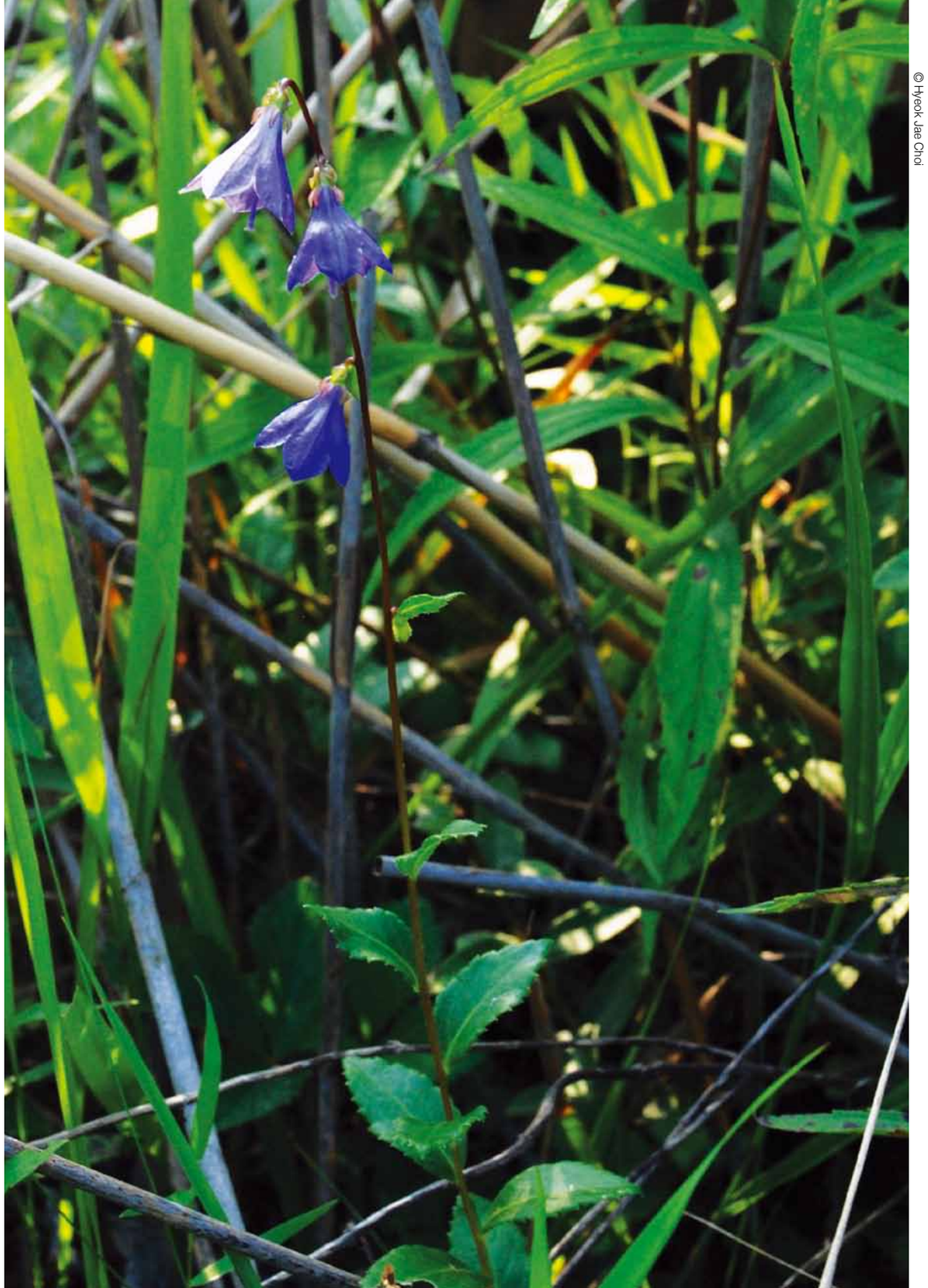
- 沼沙参
[Zhao sha shen]
- ヤチシャジン (谷地沙参)
[Yachi-shajin]
- 진퍼리잔대
[Jin-peo-ri-jan-dae]
- Бубенчик болотный
[Bubenchik bolotnyi]

Description

Perennial herbs, rhizomatous. Roots almost subglobose. Stems erect, up to ca. 1 m tall, simple, glabrous. Cauline leaves sessile; blade oblong or ovate-orbicular, 5–8 × 1.5–3 cm, lucid, glabrous, rounded or obtuse at base, crenate or irregularly serrate in margin, acute or rounded in apex. Several flowers form a compact pseudoraceme. Hypanthium glabrous; calyx lobes ovate-lanceolate, ca. 5.5 × 2 mm, nearly 2 × as broad at middle as at base, distinctly reticulate veined, margin entire, apex obtuse or acute. Corolla broadly campanulate, ca. 2 cm in diameter. Disk ca. 4 × 1.5 mm, glabrous. Style slightly longer than corolla. Capsule obovoid. Flowering in July to August. (adapted from Hong *et al*., 2011)

Distribution and habitat

Northeastern China (Jilin), Korea (North Korea, Gangwon, Jeonbuk, Jeonnam and Pusan) and Japan. In wet places in lowlands and mountains.



Recently, Masumoto *et al*. (2011) developed microsatellite markers for *A. palustris* in order to investigate its genetic status.

Conservation status

Adenophora palustris is an endangered wetland plant in East Asia (Northeastern China, Korea and Japan). This species is currently classified as "Critically Endangered" in the Japanese Red Data Book (Environment Agency of Japan, 2000) due to its extremely small population (Masumoto *et al*., 2011). The Rare Plant Data Book of Korea (Korea Forest Service, 2008) also categorizes this species as "Critically Endangered" at the national level, based on IUCN criteria. Its South Korean population shows a disjunctive distribution in a small number of wetlands.

Ethnic use

Many *Adenophora* species including *A. palustris* are considered as important edible, medicinal and ornamental resources in Korea.

Written by Hyeok Jae Choi

Allium condensatum Turcz.

Alliaceae

- 黄花韭 [Huang hua jiu]
- キバナラッキョウ (黄花辣韭) [Kibana-rakkyo]
- 노랑부추 [No-rang-bu-chu]
- Нягт сонгино [Nyagt songino]
- *Лук густой* [Luk gustoi]

Description

Perennial herbs, bulbiferous, with short rhizomes. Bulbs solitary or clustered, narrowly ovoid-cylindrical to subcylindric, with brown, lustrous, thin leathery, entire tunics. Stem straight, vertical, up to 80cm tall, covered with ¼ leaf sheaths, curved before flowering in the upper parts. Leaves 4–8; leaf blades to 0.7 mm wide, dark green, falcately curved, semicylindrical, grooved, and shorter than scape. Spathe 2-valved and persistent. Inflorescences umbellate, globose, densely many flowered. Flowers bisexual; perianth ovate-campanulate, yellow tepalspale, with a greenish vein, ovate, with rounded tip, inner tepals longer than outer ones; exserted filaments subulate and equal to 1.5 times longer than the perianth; anthers elliptical to oblong and yellowish; ovary obovoid, with concave nectaries covered by hoodlike projections at base and green; two ovules per locule; style terete and exserted. Capsule round and almost equal to the perianth. Seeds ear-shaped, with one side convex and the other flat. The whole plant has a special smell, different from other species of onions. Flowering in July to September.

Long stamens, exceeding perianth 1.5–2 times, characterize plants from the Russian Far East.

Distribution and habitat

Russia (South-Eastern Siberia, South of Far East), China (Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Shandong, Shanxi), North Korea and Mongolia (Eastern provinces). In sunny an dry habitats: on meadows, stony slopes, rock sand screes; near sea level to 2000 m (Vvedensky, 1935; Kitagawa, 1979; Barkalov, 1987, 2004; Friesen, 1987, 1988, 1995; Lee, 1996; Xu & Kamelin, 2000; Kovtonyuk *et al*., 2009; Choi & Oh, 2011).

Conservation status

Some populations at the northern border area in the south of Siberia are recommended for regional protection (Rare and Endangered Plants of Siberia, 1980; Red Book of Chitinskaya territory, 2002).

Ethnic use

The indigenous people of Southern Siberia use this onion for food (Grankina, 1990).

Written by Marina N. Koldaeva

Allium mongolicum Turcz. ex Regel

Alliaceae

- 蒙古韭 [Meng gu jiu]
- Монгол сонгино [Mongol songino]
  Хөмүүл [Khómuul]
- Нягт сонгино [Nyagt songino]
  Лук монгольский [Luk mongolskii]

Description

Perennial herbs, bulbiferous. Scape of 10–20 cm long, erect. Bulbs in a cluster of several, subcylindric, 0.5 cm thick. Tunics light brown, loosely fibrous. Leaf blades grayish green, thick, semicylindric, 2 mm wide. Inflorescence dense umbel, hemispherical to globose, many-flowered; pedicels equal or half as long as perianth; perianth wide open, segments of crateriform perianth pink to purple-red, 7–8.5 mm long; filaments longer 1/2–2/3 as long as perianth or sometimes subequal with the latter; style included. Fruit capsule shorter than perianth. Flowering and fruiting in July to September.

Distribution and habitat

Mongolia (south Khangai, Khovd, Mongolian Altai, Middle Khalkh, Eastern Mongolia, Depression of Great Lakes, Valley of Lakes, Eastern Gobi, Gobi Altai, Dzungarian Gobi, Transaltai Gobi, Alashan Gobi), Russia (Tuva), Kazakhstan, and China (Gansu, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Xinjiang). Habitats include pebble, stony and sandy desert steppes, debris, pediments, Haloxylon-woodlands, and Stipa splendens-lowlands (Freisen, 1995).

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Allium mongolicum, described from Eastern Mongolia, is subendemic to Mongolia (Urgamal *et al*., 2014).

Conservation status

Allium mongolicum has a conservation status of "Least Concerned" due to its widespread distribution across Mongolia and China. This species is one of the dominant species in desert steppe of Mongolia. However, it is included in Red Data Book of Kazakhstan (2006) with $2n = 16$ chromosome numbers (Xu and Kamelin, 2000).

Ethnic use

This is a popular edible onion in the southern part of Mongolia. It can be used fresh, dried, or salted for meals as spices. This is a forage plant with high nutritional value. It is grazed well by sheep, goats and camels as supplements to other forage plants during the growth season. Meat and milk products of livestock with grazed *A. mongolicum* have special odor and flavor of onion.

Written by Indree Tuvshintogtokh & Dulamtseren Enkhbileg

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Allium ochotense Prokh.

Alliaceae

- 蒼葱 [Ge cong]
- ギョウジャニンニク (行者大蒜) [Gyoja-ninniku]
- 울릉산마늘 [Ul-leung-san-ma-neul]
- *Лук охотский, черемша* [Luk ochotskii, cheremsha]

Description

Perennial herbs, bulbiferous, with short rhizomes. Bulbs solitary or clustered, cylindrically conical, with reticulated tunics. Leaves 2 or 3; leaf blades elliptical to oval, pseudo-petiolate at base, obtuse to subrounded in apex. Scapes curved before flowering in the upper parts, up to 90 cm tall. Inflorescences umbellate, globose. Flowers bisexual; perianth campanulate, white or sometimes tinged reddish; inner tepals longer than outer ones, elliptical; outer tepals oblong; filaments exserted; anthers elliptical to oblong, yellowish; ovary obconical, green, ovules 1 per locule; style terete, exserted. Capsules cordiform, trigonous. Seeds globose or nearly so. Flowering in May to June.

Distribution and habitat

North America (Attu Island), eastern Russia (Far East including Sakhalin and Kuril Islands, Kamchatka, Khabarovsk and Primorye regions). China (Anhui, E Gansu, Hebei, Heilongjiang, Henan, Hubei, Jilin, Liaoning, Nei Mongol, Shaanxi, Shanxi, Sichuan, Zhejiang) (Xu, 1980), Korea (Ulleung Island) and Japan (Northern and central part). In shaded and wet forests.

Sometimes *A. ochotense* has been treated as a synonym of *A. victorialis* L. together with *A. latissimum* Prokh. and *A. microdictyon* Prokh. (Vvedensky, 1935; Yu *et al*., 1981; Xu & Kamelin, 2000). However, some authors recognize that there are two distinct types of *A. ochotense* and *A. microdictyon* in Eastern Asia in terms of external morphology as shown by numerical taxonomy (Friesen, 1987, 1995; Choi & Oh, 2011). Most recently Choi & Oh (2011) confirmed clear morphological differences, especially in the reproductive organs of these two entities, and concluded that the two related taxa must be treated as independent species rather than synonymous members, or as infraspecific taxa of *A. victorialis*, with *A. ochotense* becoming subsp. *platyphyllum* (in case of Japan; Kawano & Nagai, 2005). Consequently, an entity with relatively broad leaves and bigger whitish perianths is accurately and easily identified as *A. ochotense*, and the other taxon with narrower leaves and smaller yellowish perianth is recognized as *A. microdictyon*. Phytogeographically, *A. ochotense* is a forest species occurring from the Russian Far East to Attu Island of North America passing through Northeastern China; Ulleung Island, Korea and Japan (Hultén, 1927; Vvedensky, 1935; McNeal & Jacobsen, 2002; Kawano & Nagai, 2005; Kovtonyuk *et al*., 2009; Choi & Oh, 2011).

Conservation status

Although there is no conservation status for this useful *Allium* species, Korean populations, isolated in Ulleung Island, need to conserve it. Cytologically, the Ulleung Island population is diploid, $2n = 2x = 16$, whereas East Asian plants of the species are usually known to be tetraploid with $2n = 4x = 32$ chromosome numbers (Choi & Oh, 2011).

Ethnic use

This is one of the popular edible *Allium* species in the East Asian countries of Russia, China, Korea, and Japan.

Written by Hyeok Jae Choi

Arisaema heterophyllum Blume

Araceae

- 天南星
[Tian nan xing]
- マイヅルテンナンショウ (舞鶴天南星)
[Maizuru-tennansho]
- 두루미천남성
[Du-ru-mi-cheon-nam-seong]
- Однопокровница разнолистная
[Odnopokrovnitca raznolistnaya]

Description

Perennial herbs. Plants 50–80 cm tall. Tuber depressed globose, 2–6 cm in diameter. Leaf usually solitary; petiole glaucous, 30–60 cm; leaf blade pedate; leaflets 11–19 (–21), shortly petiolulate or sessile, pale greenish abaxially, dull green adaxially, variously shaped; central leaflet often much shorter than lateral leaflets and become gradually smaller to outermost leaflets. Spathe tube glaucous outside, whitish green inside. Spadix bisexual or male; small individuals become male, while large ones become bisexual. Appendix ascending, sigmoid, pale whitish, gradually tapering from sessile base to very acute apex, ca. 20 cm, 5–11 mm in diameter at base. Berries yellowish red or red, cylindric, ca. 5 mm. Seed usually 1, clavate; Flowering in April to May, fruiting in July to September.

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The genus *Arisaema* is well reviewed by Murata and his group (Murata, 1984, 2011). The species is located in the section *Flagellarisaema* based on morphology and molecular data. Diploid ($2n$ = 28) is recorded in Taiwan and China. Dodecaploid ($2n$ = 168) has been reported in Japan and Korea.

The Japanese name of this plant comes from the shape of its large extended leaves compared to dancing Japanese crane. Due to forest clearing, the wet conditions required by this species are becoming rare.

© Hyung Ho Yang

Distribution and habitat

Widely distributed in East Asia including China, Taiwan, Korea, and Japan. In Japan, this specie is discontinuously distributed from Kyushu to Honshu. This species is a perennial herb found in evergreen and deciduous riparian forest and deforested open sites, located in lowland flood plains along rivers. In Japan, it always seems to grow in areas where water deficiency hardly occurs. It is often found among grasses.

Conservation status

This species is likely to have lost a significant extent of suitable habitats over the last few years, particularly in China. It has been listed in the national plant Red Data Book (Muraoka *et al.*, 1997). Conversion of forest to farmland is occurring throughout the region. It is currently listed as VU in Red Data Book 2014 of Japan. Its decreasing ratio is 30% and the probability of extinction is estimated to be 79% after 100 years. Some local NPOs for conservation of this species or riparian plants are working on its conservation by clearing high bush.

Ethnic use

This species is an important ornamental. It is much esteemed in Japan for its appearance as well as its ease of culture. It has been used as a medicinal plant in China. Harvesting from the wild may be a threat for this species (eFloras, 2015). Written by Haruka Ohashi

Asteropyrum cavaleriei (H. Léveillé & Vaniot) J. R. Drummond & Hutchinson

Ranunculaceae

- 裂叶星果草
[Lie ye xing guo cao]
- Звездоплодник кавалера
[Zvezdoplodnik kavalera]

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Description

Perennial herbs. Leaves 2–7, all basal; leaf blades 5-sided in outline with repand margins and 3–5 lobes; lobes triangular, with acute apexes. Scapes 12–20 cm tall, glabrous or sparsely pubescent. Flowers white, 1.3–1.6 cm in diameter; sepals elliptic to obovate, and glabrous. Flowering in May to June, fruiting in June to July.

Distribution and habitat

China (N Guangxi, Guizhou, Hubei, Hunan, SW Sichuan, and E Yunnan). It grows in forests and shady areas by streams at altitudes of 1,000–1,100 m.

The genus *Asteropyrum* includes two species, *A. cavaleriei* and *A. peltatum* (Drumm & Hutch, 1920). *A. cavaleriei* had been named *Isopyrum cavaleriei* by H. Léveillé & Vaniot (Léveillé & Vaniot, 1904), and named *A. hederifolium* by Schipczinski. (Schipczinski, 1924). Presently *I. cavaleriei* and *A. hederifolium* are considered synonyms for *A. cavaleriei* (H. Léveillé & Vaniot) J. R. Drummond & Hutchinson (Fu & Orbélia, 2001).

Conservation status

Asteropyrum cavaleriei is endemic to China. It is classified as a national secondly protection species.

Ethnic use

Asteropyrum cavaleriei, because it is rich in alkaloids, is an important medicinal plant with a variety of medical uses. It sometimes is used as substitute for *Coptis chinensis* and its medicinal effect is better than that of *Coptis chinensis*.

Written by Ning Zulin

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Astragalus monophyllus Bunge

Fabaceae

- 长毛荚黄耆
[Chang mao jia huang qi]
- Ганцнавчит хунчир
[Gantsnavchit khunchir]
- Астрагал однолистный
[Astragal odnolistnyi]

Description

Perennial herbs. Plants 2–3 cm tall, acaulescent, with exception of fruit covered with subappressed with only white hairs of 2–3(–4) mm. Leaves 1.5–3 cm, 1-foliolate; stipules 6–8 mm, densely covered with asymmetrically bifurcate hairs, margins with basifixed hairs; petiole 0.3–1.5 cm, densely covered with medifixed hairs 1–2 mm; leaflets widely elliptic to rhombic-elliptic, 8–16 × 8–12 mm, both surfaces loosely covered with subappressed, medifixed hairs. Racemes 1- or 2-flowered; peduncle up to 1 cm, densely hairy; bracts 3–4 mm, ciliate with basifixed hairs; calyx 10–12 mm, loosely to rather densely hairy; teeth 5–6 mm; petals yellow, standard narrowly elliptic, ca. 21 × 5 mm, apex emarginate; wings ca. 16 mm; keel ca. 14 mm. Legumes 15–18 mm, ca. 6 mm high and ca. 4 mm wide, apex acuminate; valves very densely villous, with tangled, flexuous, ascending to spreading, asymmetrically to extremely asymmetrically bifurcate hairs 2–3 mm. Flowering and fruiting in July to August (Xu and Podliech, 2010).

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Distribution and habitat

Mongolia (Khovd, Mongolian Altai, Middle Khalkh, Eastern Mongolia, Depression of Great Lakes, Valley of Lakes, Eastern Gobi, Gobi Altai, Dzungarian Gobi, Transaltai Gobi, Alashan Gobi), China (Gansu, Nei Mongol, Qinghai, Shanxi, Xinjiang), and Russia (Siberia). Habitats include desert, desert-steppe debris, stony slopes, tailings, and rocks (Ulziikhutag, 2003).

Astragalus monophyllus Bunge is subendemic to Mongolia (Urgamal *et al*., 2014), described from Eastern Mongolia.

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Conservation status

Currently not listed in the Mongolian Red List (2011) or Mongolian Red Data Book (2013).

Ethnic use

Its taste is sweet with hot potency.
It has been used for treating light swelling, water swelling, phlegm, lung fever, oliguria, hemorrhoids, and wound-healing. It is also used to soothe purulent inflammation. It can improve physical energy and strength. It is an ingredient of a traditional prescription Jurur-6 (Dungerdorj, 1978).

Written by Magsar Urgamal

Begonia fimbristipula Hance

Begoniaceae

紫背天葵
[Zi bei tian kui]

Бегония нитещетинковая
[Begoniya niteshchetinkovaya]

The species was first named as *Begonia fimbristipula* Hance in 1883 (Hance, 1883), and named as *B. cyclophylla* Hook. f. for publication (Hook, 1887). Present *Begonia fimbristipula* Hance is a scientific name, and *B. cyclophylla* has been treated as a synonym of *B. fimbristipula* Hance (Gu *et al*., 2007).

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Description

Perennial, stemless herb. Rhizomes globose, 7–8 mm in diameter. Leaves solitary; stipules ovate-lanceolate; blades broadly ovate, nearly symmetric, rugulose, abaxially hairy, adaxially sparsely pubescent, with palmate venation, 7- or 8-veined, bases slightly oblique, cordate or deeply cordate, margins denticulate, and apexes acute or shortly acuminate. Inflorescences cymose and terminal; bracts oblong, apexes obtuse or acute. Staminate flowers 4, pale pink to purplish pink tepals glabrous the outer 2 broadly ovate, the inner 2 obovate-oblong. Pistillate flowers 3, pale pink to purplish pink tepals, labrous; the outer 2, oblate or orbicular, inner 1 oblanceolate; ovaries 3-loculed, glabrous; styles 3, free or fused halfway; stigmas U-shaped. Capsule pendulous, ovoid-oblong, and unequally 3-winged; the abaxial wing triangular. Flowering in May, fruiting in June.

Distribution and habitat

China (Fujian, Guangdong, Guangxi, Hainan, Hunan, Jiangxi, and Zhejiang). It grows in forest understories, on rocks or on the soil of slopes, at altitudes of 700–1,100 m.

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Conservation status

Begonia fimbristipula is a rare and endangered species in the Begoniaceae family. It is also a valuable medicinal herb in China. At present, Dinghu Mountain Nature Reserve has taken some protective measures for it, but without corresponding laws and regulations protection is not enough, and there are serious disruptions due to mining practices. Because of frequent human picking and destruction of its native environment, *Begonia fimbristipula* is becoming scarce.

Ethnic use

Begonia fimbristipula is an important folk medicinal herb. Its bulb and whole grass can be used as medicine, for example, the treatment of heatstroke, lymph tuberculosis, abdominal pain due to blood stasis, etc. It is also made into a variety of popular drinks.

Written by Ning Zulin

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Betula davurica Pallas

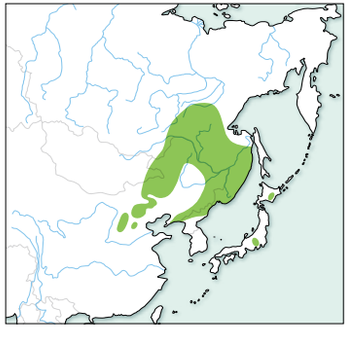
Betulaceae

- 黑桦
[Hei hua]
- ヤエガワカンバ (八重皮樺)
[Yaegawa-kanba]
- 물박달나무
[Mul-bak-dal-na-mu]
- Берёза даурская
[Beryoza daurskaya]

© Gyu Young Chung

Description

Deciduous trees reaching 20 m in height and 60 cm in diameter. Bark grayish brown to gray, exfoliating distinctly in shaggy paper-like flakes with age. Leaves 5-10 cm long, ovate to elliptic, dark green, irregular, doubly serrate margins and lateral veins in 6–9 pairs, and turn yellow in autumn. Small monoecious flowers containing drooping, brownish male catkins and smaller, upright, greenish female catkins, both of which appear in spring on the same tree. Cone-like fruits containing numerous winged seeds, oblong to narrowly oblong, erect and stalked, and ripen in autumn.



One variety, *B. davurica* var. *okuboi* Miyabe et Tatew. was found in Hidaka, Hokkaido, Japan. The characteristics of this variety is that the middle lobe of fruiting scales is conspicuously longer than lateral ones, but the mother species has equally long scales. Molecular analysis has shown that this species has a close relationship with *B. humilis*, *B. ermanii* and *B. costata* (Schnenk *et al*., 2008).

Betula davurica is widespread in northeastern Asian continent, but disjunctively distributed in two regions of Japan. In Asian continent, this species is a dominant species mixed with *Quercus mongolica*. It regenerates in large gaps after fires. It becomes dominant in secondary forests. It also regenerates in small gaps in late successional forests (Okitsu, 2006). The species might be widespread in Japan during the last glacial period (15,000 to 70,000 years BP). It has escaped to disjunctive regions following climate warming accompanied by humid climate.

Distribution and habitat

Mainly distributed in the south part of Russian Far East and Eastern Siberia (Zabaikaliye) (Koropachinskiy & Vstovskaya, 2002) as well as Northeast China and North Korea. It is distributed in two disjunctive regions of Japan. In Far East Russia, it occurs in pure stands or mixed with *Quercus mongolica* in the southern part and with white birch (*Betula costata*, *B. platyphylla*, *B. pendula*) in the northern part, and grows on dry well drained ridges, slopes, terraces, riverbanks, sandy crests and river valley (Komarov, 1936). In Japan, topographic habitats are gentle slopes with immature soil made by landslide or volcanic products (Ogawa & Okitsu, 2011).

Conservation status

This species is listed as Near Threatened species in the Red Data Book 2014 of Japan.

Ethnic use

The wood of *B. davurica* is stronger and yellower than that of white birch, and suitable for carriage construction and miscellaneous articles. This species is useful as indicator of good drainage for purposes of land reclamation (Komarov, 1936).

Written by Nobuyuki Tanaka & Takayuki Kawahara

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Bischofia javanica Blume

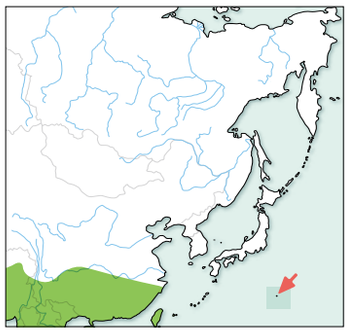
Phyllantaceae

- 秋枫 [Qiu feng]
- アカギ (赤木) [Akagi]
- Бишофия яванская [Bishofiya yavanskaya]

© Nobuyuki Tanaka

Description

Tropical tree reaching 30 m in height and 100 cm in diameter, usually evergreen in moist sites, but leafless in severe dry season and winter in some places. Bark nearly smooth, grayish brown to reddish brown, 1 cm thick, and containing a red milky sap. Leaves trifoliate with petiole 8–20 cm in length. Dioecious with unisexual flowers; small axillary flowers borne on dioecious panicles when new leaves appear, in March to May in northern India, and in January to April in Ogasawara (southern Japan islands); Grape-like fruits, each with 3 to 4 seeds of 5 mm in length, ripen in December to February in northern India, and in November to December in Ogasawara.



Bischofia is a monotypic genus in Euphorbiaceae. Its closest genus is *Spongianthus* (Wurdack *et al*., 2004) distributed in tropical Africa. These genera were traditionally located in Euphorbiaceae. However, recent molecular works on APGIII prefer to separate Phyllantaceae from Euphorbiaceae. Japanese name of the species means 'red tree'.

Bischofia javanica was reported as an invasive plant in Japan and US. It is listed as one of the 100 worst invasive alien species in Japan because it is a major problem in Ogasawara Islands located 1,000 km south of Tokyo. The islands were designated as the World Heritage in 2011 due to its unique terrestrial ecosystem with many endemic species. *B. javanica* was introduced to the islands before 1905 for fuel wood production. It was planted in a few small places. After the 1980's, *B. javanica* have rapidly increased on two major islands. It outcompeted native species by rapid propagation and growth. Native plant species were unable to coexist when this species became dominant. It also has negative impacts on endemic birds and invertebrates that depend on native flora. Methods of eradicating this invasive species have been developed based on ecological research. Eradication programs by injecting herbicide into stems have been implemented for restoring native forests since 2005 (Tanaka *et al*., 2010).

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Distribution and habitat

Its natural distribution extends through Taiwan, southern China, Philippines (Central Photo), Southeast Asia, India, and South Pacific islands such as Polynesia and Papua New Guinea. It does not dominate in forests of these native areas, where it is just one component among diverse canopy-tree species. This tree species do not tolerate cold winter with frost. This habit may explain why the northern limit of distribution is located at Okinawa (southern-western Japan islands) with rare frost. This tree species requires humid environments for sound growth. In native tropical regions, the trees occur at moist sites such as high lands, valley, river sides and wet lands. In Ogasawara, the trees invaded also into moist sites, which are almost every site at high elevation under cloud belt as well as valleys and wet lands at low elevation (Right Photo).

Conservation status

In contradiction to the Ogasawara case, this species has been conserved in Okinawa Islands, Japan. Big trees of the species in Okinawa have been designated as national natural monument.

Ethnic use

This species is locally used for timber, tannin, medicine, and avenue trees. In Okinawa, trees of the species are often planted in special holly places (Utaki), where local gods live.

Written by Nobuyuki Tanaka & Takayuki Kawahara

Brachanthemum gobicum Krasch.

Asteraceae

- 戈壁短舌菊 [Ge bi duan she ju]
- Говийн тост [Goviin tost]
- Брахантемум гобийский [Brakhantemum gobiiskii]

Description

Subshrubs up to 80 cm tall, indumentum glandular pubescent. Stems few from base, much branched, woody for most of length, bark yellowish white, sometimes spiny at the tip, glabrescent. Leaf blade spatulate to cuneate, 1–2 cm including rather long petiole, pinnatifid, with 1 to 3 segments on each side, puberulent or subglabrous, with sunken glands. Condensed lateral shoots with linear leaves sometimes present. Uppermost leaves linear, entire. Capitula solitary or few in ill-defined cyme on long slender peduncles; involucre narrowly campanulate, 8–10 mm long, 4–6 mm wide; phyllaries convex, abaxially more or less puberulent and prominently gland-dotted, margin white scarious, apex rounded, outer ones obovate, inner ones lanceolate; ray florets absent; disk florets tubular, bisexual, corolla with lower part greenish, sparsely pilose and glandular, upper part yellow. Achenes ca. 2 mm, 3-ribbed. Flowering and fruiting in May to July (Shi *et al*., 2011).

Distribution and habitat

Southern Mongolia (Eastern Gobi, Gobi-Altai and Alashan Gobi) and Northern China (Nei Mongol). Habitats include desert sands and debris-pebble deserts.

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Brachanthemum gobicum is subendemic to Mongolia (Urgamal *et al*., 2014), described from Gobi Altai phytogeographical region. The specimens from Nei Mongol appears to have more divaricate and apparently somewhat spinescent branching stems. Their homogamous capitula suggest that the generic placement of this species deserves a closer examination (Shi *et al*., 2011).

Conservation status

It has been listed as "Very Rare" in the Mongolian Red Book (1987, 1997) and Mongolian Law on Natural Plants (1995). It has been assessed as "Near Threatened" in the Nyambayar *et al*. (2011).

Ethnic use

Brachanthemum gobicum is used as livestock fodder and medicines as treatment for sheep parasites in Mongolia. Samples from different regions of Mongolia were investigated for the ether oil content and its composition. Watery extract of above ground part is effective against ectoparasites, belonging to the genus *Linognathus* (Ligaa *et al*., 2015).

Written by Dashzeveg Nyambayar

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Brachybotrys paridiformis Maximowicz ex Oliver

Boraginaceae

- 山茄子 [Shan qie zi]
- クロキソウ (黒木草) [Kuroki-so]
  トウサワルリソウ (唐澤瑠璃草) [Tosawaruri-so]
- 당개지치 [Dang-gae-ji-chi]
- Короткокистник воронеглазый [Korotkokistnik voroneglazyi]

Description

Rhizomes ca. 3 mm in diameter. Stems erect, not branched at apex, 30–40 cm tall, sparsely short strigose. Lower stem leaves scale like. Petiole of middle stem leaves 3–5 cm. Leaf blade obovate-oblong, 2–5 cm, abaxially villous, adaxially sparsely short strigose, narrowly winged. Upper 5 or 6 leaves pseudo-whorled, short petiolate, obovate to obovate-elliptic, 6–12 × 2–5 cm, abaxially sparsely short strigose, adaxially subglabrous, base cuneate, apex short acuminate. Inflorescences terminal, ca. 5 mm, densely short strigose, ca. 6-flowered, ebracteate. Pedicel 4–15 mm. Flowers crowded on the upper part of rachis. Calyx ca. 8 mm. Lobes subulate-lanceolate, ca. 1.1 cm in fruit. Corolla purple, ca. 1.1 cm. Tube ca. 1/2 as long as limb. Appendages tongue-shaped. Lobes ovate-oblong, ca. 6 mm. Stamens inserted below appendages. Filaments ca. 4 mm. Anthers excited, ca. 3 mm, apex mucronulate. Style ca. 1.7 mm. Nutlets 3–3.5 mm, abaxial surfaces triangular-ovate, attachment scar near base. Flowering in April to June.

Distribution and habitat

China (Heilongjiang, Jilin, Liaoning), Korea (Hamgyeongnam-do, Gangwon-do, Gyeonggi-do, Chungcheongbuk-do, Chungcheongnam-do, Gyeongsangbuk-do), and Russia (southern part of Primorskii Territory). Its habitat includes forests, hillside meadows, and field margins.

Ethnic use

Its tender stems and leaves growing in spring and summer are edible.

Written by Cao Wei

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Bupleurum euphorbioides Nakai

Apiaceae

- 大苞柴胡 [Da bao chai hu]
- タイゲキサイコ (大戟柴胡) [Taigeki-saiko]
- 등대시호 [Deung-dae-si-ho]
- Володушка молочайная [Volodoushka molochainaya]

Description

Perennial herbs, up to 40(60) cm tall, monocarpic. Taproot slender, not or slightly branchy. Stem simple solitary, 2–4 mm in diameter at the basis, hollow, bare, green, often tinged purple, slightly branched on top, base often covered with remnants of early basal leaves. Basal leaf blades lanceolate, 2–5(10) × 3–7 cm, with long petiole, 5–7-nerved. Cauline leaves 5–7, 5–8 cm long and up to 1 cm wide, narrowed or amplexicaulate at the basal end, apical ovate leaves. Umbels 2–3, 5–18 cm in diameter with 11–18 unevenly long rays; bracts 1–3 (5), ovate and acute on top, 12–30 × 3–12 mm; umbellules 6–2.5 cm in diameter, with 15–25 short rays, 16–24 flowers; bracteoles 4–7, broadly elliptic or obovate, green, 5–12 × 1.5–3 mm, acute apex, apiculate, with ample flowers and fruit. Petals yellow, purplish on leaf top, curved beneath the top. Fruits elliptic, ovoid-oblong, purplish-brown, 3.5–4 mm long, up to 2 mm wide; ribs fibrous, hardly prominent; mericarp pentagonal in cross section; vittae 3–4 (5) in each furrow, 4 on commissure. Flowering and fruiting in July to September.

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Distribution and habitat

Russia (Primorskii and Khabarovskii Krai) (Pimenov, 1987; Pimenov & Ostroumova, 2012), China (Jilin: Antu, Changbai Shan, Fusong) (She *et al*., 2005), Korea (Hamgyeongbuk-do, Hamgyeongnam-do, Pyeonganbuk-do, Gangwon-do, Chungcheongbuk-do, Gyoengsangbuk-do, Jeollabuk-do) (Kitagawa, 1960; Im, 1998; Yoon, 2007). Forest margins, grassy places, mountain slopes at 1200–2500 m a.s.l. in NW China (Sheh *et al*., 2005); in rocky mountain tundras and in the openings of Pinus pumila thickets in the Russian part of range (Pimenov & Ostroumova, 2012).

Species was described by Nakai (1914) from specimens collected in "Korea, Provence Ham-Gyong: in monte Paiktusan. 10.08.1914. T. Nakai, 9199". The lectotype was revealed by M. Pimenov: "Korea, Provence. Kan-uon: in summo montis Kumgang-san. 08.1914. T. Mori, 41". Specimens from the Chinese range are larger than specimens from Russia and Korea.

Conservation status

Species is listed in the Red data book of Khabarovsk region (Voronov, 2008). Vulnerable species of Korea (Korea Forest Service, 2008)

Ethnic use

Roots of species are used in Korean traditional medicine for removing a fever in a number of disorders (Dongui Bogam, 1613).

Written by Pavel V. Krestov

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Callerya reticulata (Benth.) Schot

Fabaceae

网络鸡血藤
[Wang luo ji xue teng]

The species was first named *Millettia reticulata* by Benth (Benth, 1853) and *M. cognata* by Hance (Hance, 1880). Presently *M. reticulata* and *M. cognate* are considered synonyms of *C. reticulata* (Benth) Schot (Wei & Pedley, 2010). *C. reticulata* includes two varieties, *C. reticulata* var. *reticulate* and *C. reticulata* var. *stenophylla* (derived from *M. reticulata* var. *stenophylla*), which are distinguished by leaf blade appearance (Merrill & Chun, 1940). The leaf blade of *C. reticulata* var. *reticulate* is ovate-elliptic to oblong, 1.5–4 cm wide, with a round base; that of *C. reticulata* var. *stenophylla* is linear to narrowly lanceolate, 0.5–1.2 cm wide, with a tapering to cuneate base.

Description

A type of lina. Stems thick, branched. Leaves 5, 7, or 9–foliolate; rachis 10–20 cm; leaflet blades ovate-elliptic, oblong, papery; leaf bases rounded, tapering, or cuneate; apexes obtuse, acuminate, or retuse. Panicles terminal or axillary to the apexes of branchlets, 10–20 cm in length. Corollas purple, standard ovate-oblong, glabrous, without basal calluses, and with shortly clawed bases. Ovaries glabrous, with numerous ovules. Legumes linear, approximately 15 × 1–1.5 cm long, with a flat, thinly leathery texture; sutures not thickened; they blacken when dry. Each legume carries 3–6 black, oblong seeds. Flowering in April to August, fruiting in June to November.

Distribution and habitat

North Vietnam (North), China (Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hubei, Hunan, Jiangsu, Jiangxi, S Shaanxi, Sichuan, Taiwan, Yunnan, and Zhejiang). It grows in thickets by streams on slopes or in valleys, at altitudes of 100–1,200 m.

Conservation status

Asteropyrum cavaleriei is a widely distributed species in China. At present there is no conservation status regarding this useful *Asteropyrum* species; still, it has medicinal value and should be protected.

Ethnic use

Asteropyrum cavaleriei is an important medicinal plant used by the Miao nationality. It is also valued for its beautiful flowers, and is a good ornamental vine.

Written by Ning Zulin

Camellia azalea C. F. Wei

Theaceae

- 杜鹃红山茶 [Du juan hong shan cha]
- Камелия азалия [Kameliya azaliya]

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Description

Shrubs, about 1–2.5 m tall. Leaf blades obovate to long obovate, leathery, abaxially pale green or glaucescent, adaxially dark green, and glabrous on both surfaces. Flowers subterminal, solitary or in clusters of up to 5. Bracteoles and sepals 8–11; the outer 3–6 bracteoles and sepals semiorbicular to broadly ovate; inner 5 bracteoles and sepals ovate. Petals 6–9, red, obovate to long obovate, basally attenuate, and contain emarginated apexes. Ovaries ovoid, glabrous, 3– or 4–loculed; styles 3– or 4–parted. Capsules ovoid and 3–loculed with 2 seeds per locus. Flowering in October to December, fruiting in August to September.

Distribution and habitat

China (Yangchun in Guangdong). It grows in forests in hilly areas or among boulders by rivers at altitudes of 100–500 m.

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The species was named *Camellia azalea* by C. F. Wei in 1986 (Wei, 1986), and named *C. changii* when described in 1987 (Ye, 1987). *C. changii* is a synonym for *C. azalea* (Min & Bartholomew, 2007).

Conservation status

Camellia azalea is a rare and endangered plant. It is only found in the E'huangzhang Nature Reserve, Yangchun City, Guangdong Province, China. Because of human exploitation, a narrow distribution range, and deterioration of the ecological environment, the wild population of *Camellia azalea* is currently estimated to consist of only 1000 individuals. It is listed as a national first-order protected plant (Li *et al*., 2013).

Ethnic use

Under suitable conditions, *Camellia azalea* blossoms during all seasons, especially summer and autumn. Due to its big, bright red flowers and long flowering stage it has very high ornamental value.

Written by Ning Zulin

Camellia crapnelliana Tutch.

Theaceae

- 红皮糙果茶
[Hong pi cao guo cha]
- Камелия крапнеля
[Kameliya krapnelya]

The species was named *Camellia crapnelliana* (Tutch, 1904), Thea crapnelliana (Rehd, 1924), *C. gigantocarpa* (Hu & Huang, 1965) and *C. octopetala* (Hu, 1965). The name was revised in 2007. The species includes *C. gigantocarpa* (Hu & T. C. Huang), *C. latilimba* (Hu), *C. multibracteata* (Chang *et al.*, 1989), *C. octopetala* (Hu) and *Thea crapnelliana* (Tutcher), which are synonyms of *C. crapnelliana* (Min & Bartholomew, 2007).

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Description

Evergreen shrubs or trees. Year-old branchlets reddish brown. Leaves simple and alternate; leaf blades elliptic to oblong-elliptic, rigidly leathery, with cuneate to broadly cuneate bases, margins widely and obscurely denticulate, and bluntly cuspidate apexes. Flowers axillary or subterminal, solitary or paired; petals 6–8 cm, white, obovate to obovate-oblong; stamens very numerous; ovaries densely tomentose and 3–5-loculed. Capsules grayish brown, subglobose, 5–7 (or sometimes –12) cm in diamater; pericarps woody. Seeds brown and semiglobose. Flowering in December to January, fruiting in September to October.

Distribution and habitat

China (Fujian, Guangdong, S Guangxi, E Jiangxi and S Zhejiang, and on the island of Hong Kong). It grows in broadleaved forests at altitudes of 100–800 m.

Conservation status

Camellia crapnelliana is in danger because of habitat destruction. It is protected and has been listed in IUCN Plant Red Data Book and China Plant Red Data Book.

Ethnic use

Camellia crapnelliana is a rare landscape ornamental tree species. It is also an oil plant, as the seeds are rich in oil.

Written by Yu Qianxia

Caragana brachypoda Pojark.

Fabaceae

- 矮脚锦鸡儿
[Ai jiao jin ji er]
- Хойрог харгана
[Khoirog khargana]
- Карагана коротконожковая
[Karagana korotkonozhkovaya]

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Description

Shrubs up to 30 cm tall. Bark yellowish brown to grayish brown. Leaves digitate, 4-foliolate; petiole 4–10 mm and persistent on long branchlets, absent on short branchlets; leaflet blades oblanceolate, both surfaces pubescent, apex acute; Flowers solitary; calyx reddish purple to greenish brown, base gibbous; corolla yellow but with orange or purple at middle. Legume spindlelike, 2–3.5 cm, turgid, glabrous, apex acuminate. Flowering in May to July (Liu *et al*., 2010).

Distribution and habitat

Mongolia (Eastern Gobi (Mandal-Ovoo, Khaniin Hets, Sulinheer, Khutag mountain), Gobi-Altai (Baruun Tsokhio, Hurh mountain), and Alashan Gobi (Gashuun Sukhait)). Its habitats in Mongolia include desert debris and sandy steppes (Ulziikhutag, 2003).

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Caragana brachypoda is subendemic to Mongolia (Urgamal *et al*., 2014), described from Gobi Altai phytogeographical region.

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Conservation status

Listed as "Very Rare" in the Mongolian Law on Natural Plants (1995) and Mongolian Red Book (1997).

Ethnic use

This is one of the popular edible *Caragana*-species for livestock in Central Asian countries. This species does not grow in Russia and China. Written by Magsar Urgamal

Castanea crenata Siebold et Zucc.

Fagaceae

- クリ (栗) [Kuri]
- 밤나무 [Bam-na-mu]
- Каштан городчатый [Kashtan gorodchatyi]

© Tsutomu Yagihashi

Description

Large deciduous tree, up to 15–20 m tall, 40–80 cm in breast height diameter, with fissured bark. Leaves alternate, oblong lanceolate or narrowly oblong, 8–15 cm long and 3–4 cm wide, with acute teeth (15–20 pairs) on the margin. Flowers monoecious, pollinated by insects; Fruits brown with 2–3 nuts within the long subglabrous spines. Fruiting in September to October.

Distribution and habitat

It growns in warm and cool temperate zones in East Asia including Japan, Korea, and Taiwan. In Japan, this species mainly distributed in a secondary forests.

Castanea crenata has many cultivars. These cultivars are mainly different in nut traits (e.g. size), insect resistance and tree height.

The genera *Castanea* belonging to Fagaceae are deciduous tree species. About ten species are distributed in temperate regions of the Northern Hemisphere. In East Asia, *Castanea crenata* is mainly distributed in the transitional part between warm and cool temperate zones. It is partly extended into the warm temperate zone as a typical secondary forest element. *C. crenata* and their cultivars are also widely cultivated in Japan, Taiwan, and eastern China today. These anthropogenic uses of this species cause confusion in their natural distributions and cultivation areas, and the boundaries of the natural distributions are indistinct. Accordingly, current distribution of *C. crenata* reflects climatic factors and historical anthropogenic activities.

Ethnic use

Its seeds have been used as important source of food. Timbers have been used for construction and as fuel materials since about 2,800 years ago (the latter half of "Jomon period" in Japan).

Written by Katsuhiro Nakao

© Katsuhiro Nakao

Cephalotaxus harringtonii (Knight ex J. Forbes) K. Koch

Cephalotaxaceae

- イヌガヤ (犬萱) [Inugaya]
- 개비자나무 [Gae-bi-ja-na-mu]
- Головчатотис Харингтона [Golovchatotis haringtona]

Description

Evergreen trees, dioecious, up to 10 m tall. Bark grayish brown, longitudinally fissured, peels off. Branches dull brown, small branches green, running longitudinal stripes from the leaf bases. Leaves alternate, spiral on erect branches, pectinate on horizontal small branches, linear, sessile, with a soft short spins at apex, 2–4 cm long, 3–4 mm wide, dull green on upper surface, with two white stomate bands on both sides along a raised green midrib. Male strobili in leaf axils of the last year's shoots, on a peduncle; peduncles 1–4 mm long with a few scales; strobili globose, yellow; stamens 7–10, each stamen with 2–4 anthers. Female inflorescences 1 or 2, axillary on apex of the last year's shoots, ovoid, green, peduncles 6–8 mm long. Seeds ellipsoid, reddish purple, ca. 2 cm long. Flowering in March to April, and seeds ripen following year from August to October.

Distribution and habitat

Japan (Honshu, Shikoku, Kyushu) and Korea (central and southern part). In temperate, deciduous, relatively shaded, moist forests (Sun, 2007; Flora of Japan, www.foj.info).

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Among eleven *Cephalotaxus* species, one species is native to Korea. For the species, both *C. koreana* Nakai (1930) and *C. harringtonii* (Knight ex J. Forbes) K. Koch (1873) have been used (Lee, 1996; Lee, 2003; Park, 2007; Hao *et al*., 2008; Hong, 2014). However, *C. koreana* Nakai has been treated as the synonym of *C. harringtonii* (Knight ex J. Forbes) K. Koch (The Plant List, www.theplantlist.org, data supplied on 2012–03–26). This species is called *Cephalotaxus harringtonia* in Japan and has a variety called *C. harringtonia* var. *nana*. This variety only grows in the snowy region in Japan. *C. harringtonia* var. *nana* is prostrate and dwarf, only 3 m in height. On the other hand, *C. harringtonia* only grows in less-snowy regions in Japan (Comment from Matsui).

The family Cephalotaxaceae (*Amentotaxus*, *Cephalotaxus*, *Torreya*) is a small group with about 20 species restricted to East Asia (E. Himalaya, Indochina, China, Japan, and Korea) (Sun, 2007). The recent molecular investigations support that the family, Cephalotaxaceae shares the most recent ancestor with the yew family, Taxaceae (Quinn *et al*., 2002; Hao *et al*., 2010). Ghimire & Heo (2014) analyzed the morphological characters (female cones) of the genera in the two families and concluded that *Cephalotaxus* is within Taxaceae, which supports published molecular data.

The estimated time of *Cephalotaxus* speciation is in the Oligocene (ca. 35 million years ago) of the Tertiary period (Hao *et al*., 2008). Cephalotaxaceae fossils from the Miocene were found in the northern part of the Korean Peninsula (Kong, 1995). It is assumed that *C. harringtonii* had widely distributed in Korea, and then distribution areas decreased due to the cold climate after the glaciation (18,000 years ago) and species competition (Hong *et al*., 2014).

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Conservation status

No specific conservation status has been proposed for the species, but recent studies argue conservation efforts for the species. Hong *et al*. (2014) show the rarity of natural populations and the low genetic diversity of the natural populations; they propose in situ conservation actions for the species.

Ethnic use

It has been an ornamental plant, and seeds are edible (Lee, 1996). However, the trunk of *Euscaphis japonica* is not useful for timber due to its fragility.

Written by Kyong-Sook Chung

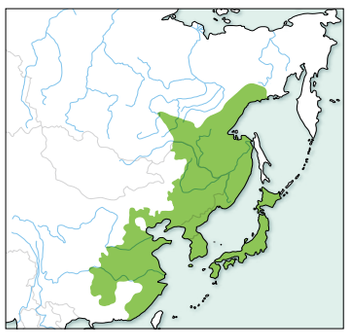
Codonopsis lanceolata (Sieb. & Zucc.) Trautv.

Campanulaceae

- 羊乳 [Yang ru]
- ツルニンジン (蔓人参) [Tsuru-ninjin]
- 더덕 [Deo-deok]
- Колокольник ланцетный [Kolokolnik lantcetnyi]

Description

Perennial herb. Plant glabrous throughout or occasionally sparsely villous on stems and leaves. Caudexes subcylindrical. Roots usually fusiform-thickened, 10–20 × 1–6 cm. Stems twining, yellow-green but with purplish shade, more than 100 cm, often branched. Leaves on main stems alternate, lanceolate, ovate, or elliptic, 8–14 × 3–7 mm. Leaves usually 2–4-fascicled on top of branchlets, subopposite or verticillate, petiole 1–5 mm. Blade abaxially gray-green, adaxially green, ovate, narrowly ovate, or elliptic, 3–12 × 1.3–5.5 cm, base attenuate or sometimes rounded, margin usually entire or sparsely sinuate, apex acute or obtuse. Flowers solitary or paired on top of branchlets. Pedicels 1–9 cm. Calyx adnate to ovary by half, tube hemispherical, lobes ovate or deltoid, 1–3 × 0.5–1 cm, entire, acute. Sinus between calyx lobes acute or gradually becoming broader after anthesis. Corolla broadly campanulate, 2–4 × 2–3.5 cm, shallowly lobed. Lobes yellow-green or milk-white, with purple spots, deltoid, 0.5–1 cm, revolute. Capsule hemispherical at base, rostrate toward apex, 1.6–3.5 cm in diameter. Seeds numerous, brown, winged, seed body oblong or ellipsoid. Flowering and fruiting in July and August.



Type specimens collected from Japan. *C. ussuriensis* (Rupr. et Maxim.) Hemsl. is very close to this species. Its roots is nearly globular. Its seeds are wingless. Type specimens are distributed in Jilin Province and Heilongjiang Province of China.

Distribution and habitat

China (Anhui, Fujian, Hebei, Henan, Hubei, Hunan, Jiangsu, Shandong, Shanxi, Zhejiang, Liaoning, Jilin, Heilongjiang), Japan (Hokkaido, Honshu, Shikoku, Kyushu), Korea (All provinces), and Russia (Primorskii and Khabarovskii Territories, Amur Region and Kunashir Island). Its habitat includes shrublands, broad-leaved forests at elevation of 200–1,500 m.

Conservation status

Currently this species is not included in the endangered list of China. With the increasing demand for *Codonopsis lanceolata*, wild resources acquisition cannot meet the demand of market. Although there are more wild resources of *Codonopsis lanceolata* in northeast China, those resources have almost dried up after years of excavation. Large area of cultivation for rapid breeding and breed improvement of *Codonopsis lanceolata* has started since the 1980s (Peng & Yu, 2009).

Ethnic use

Codonopsis lanceolata is edible. This species is rich in sugar, fat, protein, vitamins, amino acids, and many trace mineral elements. It contains crude protein 11.89 g, crude fat 3.83 g, carbohydrates 482 g per 100 g fresh root. Its root has been used as medicine (Peng & Yu, 2009).

Written by Jin Yonghuan

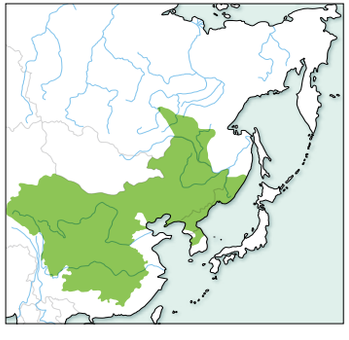
Codonopsis pilosula (Franch.) Nannf.

Campanulaceae

- 党参 [Dang shen]
- ヒカゲツルニンジン (日陰蔓人参) [Hikage-tsuru-ninjin]
- 만삼 [Man-sam]
- схийцэцэгт Хонхонцэцэг [Uskhiitsetsegt khonkhontsetseg]
- Колокольник волосистый [Kolokolnik volosistii]

Description

Roots carrot-shaped or fusiform-cylindrical, 15–30 × 1–3 cm, often branched. Stems twining, 1–2 m, glabrous, branched. Lateral branches 15–30 cm. Branchlets 1–5 cm, sterile or fertile. Leaves on main stems and branches alternate, those on branchlets opposite. Petiole 0.5–2.5 cm, sparsely and shortly setose. Blade abaxially gray-green, adaxially green, ovate or narrowly ovate, 1–7.3 × 0.8–5 cm, abaxially sparsely or densely appressed hirsute or villous, rarely glabrous, base subcordate, rounded, or truncate, margin crenulate, apex obtuse or acute. Flowers solitary and terminal on branches, pedicellate. Calyx adnate to ovary up to middle. Lobes broadly lanceolate or narrowly oblong, 10–23 × 6–8 mm, margin subentire or sinuate, apex obtuse or acute. Sinus between calyx lobes narrow and pointed. Corolla yellow-green, with purple spots inside, broadly campanulate, 1.8–2.3 × 1.8–2.5 cm, shallowly lobed. Lobes deltoid, apex acute. Capsule hemispheric at base, conical toward apex, 1–2.4 cm. Seeds numerous, red-brown to dark brown, oblong to ellipsoid, ca. 1 mm, smooth. Flowering and fruiting in July to October.



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Type specimens of *Codonopsis pilosula* is taken from Beijing. This species contains several varieties such as *Codonopsis pilosula* (Franch.) Nannf var. *pilosula*, *Codonopsis pilosula* var. *volubilis* (Nannf.) L. T. Shen, *Codonopsis pilosula* var. *handeliana* (Nannf.) L. T. Shen, and *Codonopsis pilosula* var. *modesta* (Nannf.) L. T. Shen.

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Distribution and habitat

China (Chongqing, Gansu, Guizhou, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan, Yunnan), Korea (Hamgyeongbuk-do Hamgyeongnam-do, Pyeonganbuk-do, Pyeongananm-do, Gangwon-do, Chungcheongbuk-do, Gyeongsangnam-do), Mongolia, and Russia (Primorskii Territory and Amur Region). This species occurs in dense thickets and forest margins, mountain road, and streams under shade.

Conservation status

Cultivation species accounts for a larger proportion than the wild species. It propagates by seed. It has been included in the Red Data Book of Primorskii Krai of Russia (2008).

Ethnic use

Its roots have been used as medicines in China, Korea, and Japan. The roots of *Codonopsis* roots as a composition of medicines can increase hemoglobin and reduce the damage of respiratory system disease such as cough. *Codonopsis* roots can cure tuberculosis, debilitating disease, anemia, and blood disease.

Written by Cao Wei

Coptis chinensis var. *brevisepala* W. T. Wang & P. K. Hsiao

Ranunculaceae

- 短萼黄连
[Duan e huang lian]
- Коптис китайский короткочашечный
[Koptis kitaickii korotkochashechnyi]

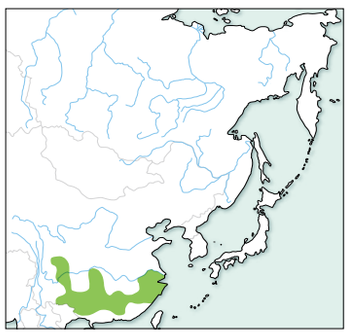
Coptis chinensis var. *brevisepala* is a variety of *Coptis chinensis* with sepals ca. 6.5 mm in length, slightly longer than its petals (Wang & Hsiao, 1965).

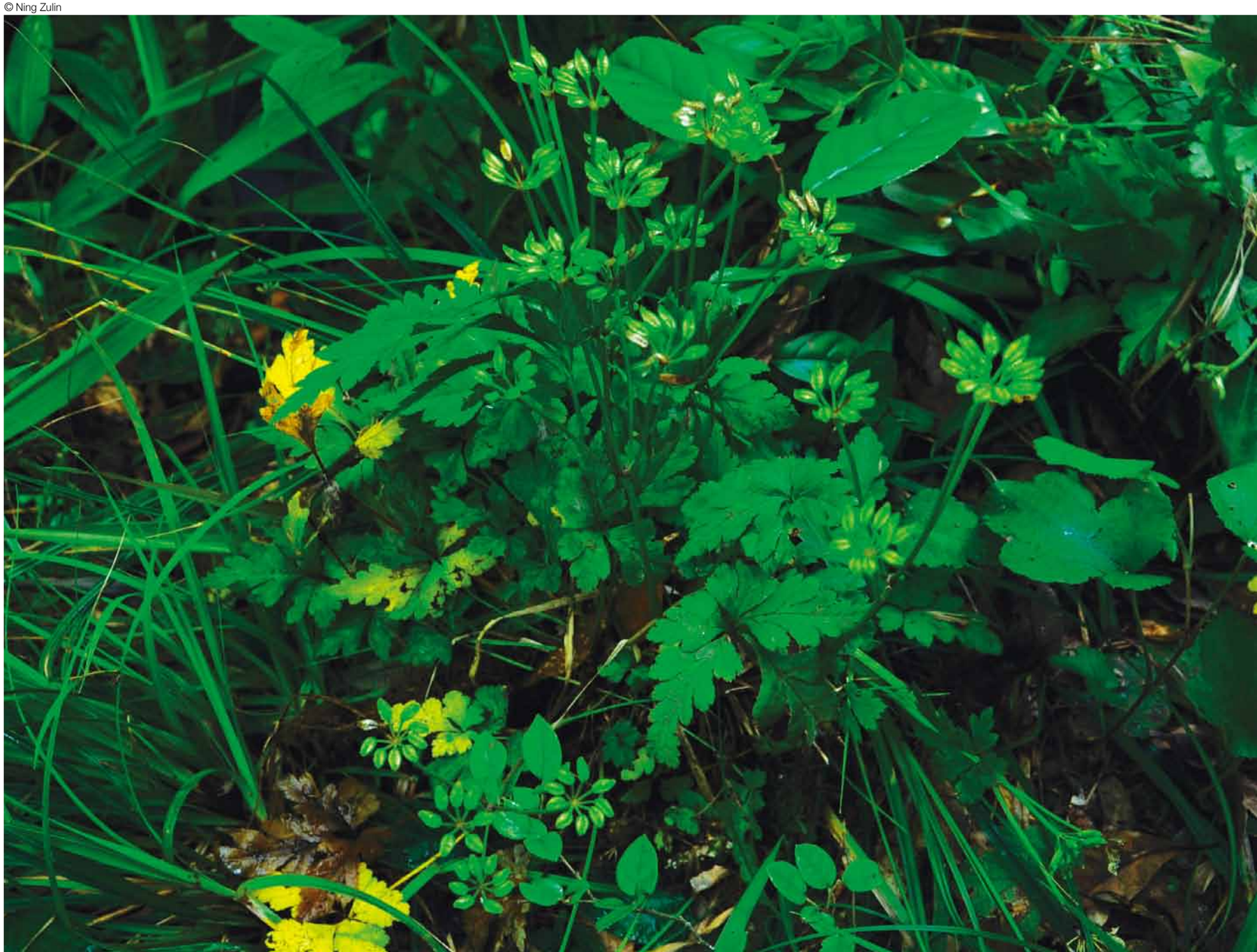
Description

Perennial herbs. Leaf blades ovate-triangular, papery to subleathery, with cordate bases; lateral segments slightly shorter than central ones and obliquely ovate and unequally bifurcated; central segments petiolulate, ovate-rhombic, deeply 3–5-lobed, with acute serrate ultimate lobe margins, and acute apexes. Inflorescences 3–8-flowered; bracts lanceolate and palmately divided. Sepals 5, greenish yellow, lanceolate, and about 6.5 mm long. Petals linear-lanceolate, 5–6.5 mm long. Stamens 3–6 mm; the outer ones slightly shorter than the petals. Pistils 8–12. Follicles stipes as long as follicles. Flowering in February to March, fruiting in April to June.

Distribution and habitat

China (S Anhui, Fujian, N Guangdong, N Guangxi, and Zhejiang). It grows in forests or shady valleys at altitudes of 600–1,600 m.





Conservation status

Coptis chinensis var. *brevisepala* is nearly extinct and is classified as a national third-order protected species. Wild plants are scattered in Anhui, Zhejiang, Fujian and other parts of southeast China. Due to excessive exploitation, digging, and tourism development, its natural habitat has been destroyed, and the wild populations of *Coptis chinensis* var. *brevisepala* are extremely scarce and on the verge of extinction.

Ethnic use

Coptis chinensis var. *brevisepala* has a variety of medicinal uses because of its high alkaloids.

Written by Ning Zulin

Cornus elliptica (Pojarkova) Q. Y. Xiang & Boufford

Cornaceae

尖叶四照花
[Jian ye si zhao hua]

© Ning Zulin

Description

Evergreen trees or shrubs. Young branches, abaxial leaves, and bracts all pubescent with white, appressed, fine trichomes. Leaves opposite; leaf blades oblong-elliptic or obovate-elliptic to lanceolate, thinly to thickly leathery, with 3 or 4 veins, cuneate to broadly cuneate bases, and acuminate-caudate apexes. Cymes globose; bracts yellowish, almost white, and narrowly ovate to obovate; flowers 4 petals; infructescence globose and red at maturity. Flowering in June to July, fruiting in October to November.

Distribution and habitat

China (Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, and Sichuan). It grows in forests, on slopes or beside streams at altitudes of 300–2,200 m.

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Cornus angustata (Chun) T. R. Dudley (Dudley, 1995) was based on *C. kousa* var. *angustata* Chun (Chun, 1934), not on the earliest available name, *Cynoxylon ellipticum* (Pojarkova). The combination *Dendrobenthamia elliptica* (Pojarkova) (Yu, 2006) was made after publication of the family treatment for the Flora of China. Presently, *Cornus elliptica* (Pojarkova) is the scientific name (Xiang & Boufford, 2005).

Conservation status

Cornus elliptica is easily propagated by seed, summer cuttings, and plant tissue culture.

Ethnic use

The sweet, ripe fruit is edible. The flower is very beautiful. It is a good ornamental plant.

Written by Yu Qianxia

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Cypripedium macranthos Sw.

Orchidaceae

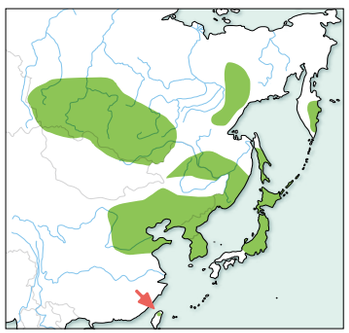
- 大花杓兰
[Da hua shao lan]
- アツモリソウ (敦盛草)
[Atsumoriso]
- 복주머니란
[Bok-ju-meo-ni-ran]
- Томцэцэгт Саадган цэцэг
[Tomtsetseg saadgan tsetseg]
- Венерин башмачок крупноцветковый
[Venerin bashmachok krupnotcvetkovyi]

Description

Perennial herb in open meadow or sunny understory in deciduous forest, 20–40 cm tall. Rhizomes short. Stems, erect, usually pubescent. Leaves 3–4 in fertile stage, elliptic or elliptic-ovate, pubescent, 8–20 cm long, 5–8 cm wide. Inflorescence 1, rarely 2 at the terminal of stem. Dorsal sepal sub-erect, ovate, 4–5 cm long. The lateral sepals marged, shorter than the dorsal. The lateral petals lanceolate, not twisted. Labellums, large, flat globular, 3.5–5 cm wide. Seed length is approx. 40 μm like dusts. Flowering in late May to June. Fruiting in late September to October.

Distribution and habitat

Russia (Kamchtsuka to west Siberia and east Europe), Japan, Korea (all provinces except for Ulleung-do and Jeju-do), northeast China, Taiwan, and Mongolia. The habitat is grassland, forest margin, or forest understory. The species prefer mesic and sunny condition.



Cypripedium macranthos was originally described by Swarz in 1800. The epithet macranthos is a neutral form of macranthon with the meaning of large flower in Greek. Some botanists (Pfitzer, 1903, Schlechter, 1919, Eccarius, 2009, etc) preferred *C. macranthum* with a latinized suffix, while other botanists (Lindley, 1840, Cribb, 1997, etc) preferred *C. macranthos*. Here, we choose *C. macranthos* according to Cribb (1997). This species has quite large floral color variations, including dark purple, purple, reddish purple, pink, white, and greenish white or cream. It also has shape and size variation of lips. Therefore, a dozen of intraspecific taxa have been described. Recent monogarphs (Cribb 1997, Eccarius, 2009) did not recognize them at all. Natural hybrids are known as *C.* × *ventricosum* (*C. macranthos* × *C. calceolus*) and *C.* × *catherinae* (*C. macranthos* × *C. shanxiense*). In Japan, the following three varieties are generally recognized: var. *speciosum* (Rolf) Koidz with pink to purple lips; var. *hotei-atsumorianum* Sadovsky with dark red to dark purple lips with rounder shape; and var. *rebunense* (Kudo) Miyabe et Kudo with cream lips that is endemic in Rebun Island, Hokkaido.

Its Japanese name is derived from a classic battle story Heike-monogatari (平家物語). Atsumoriso was from the name of a famous young samurai general on Heike side, Taira-no-atsumori (平敦盛) who lived in the late 12 century. The round lip of *C. macranthos* was used as guard item made of cloth and as his air cushion from arrows. The red color from the lip of *C. macranthos* is a symbolic color of his family. On the other hand, his rival general, old Kumagai-naozane (熊谷直実) was on the enemy side Genji. He also wore a similar guard item. His team color was white. Therefore, *C. japonicum* with paler and larger lip is called Kumagaiso in Japanese. Taira-no-atsumori was killed by Kumagai-naozane. The Heike 平家 clan (the family Taira 平) was terminated in 1185. The reddish lip of *C. macranthos* was said to be due to blood from killed Taira-no-atsumori. Such kind of tragedy story tends to promote its popularity in horticultural use of these species.

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Conservation status

In Japan, *C. macranthos* var. *rebunense* (EN), var. *hotei-atsumorianum* (EN), and var. *speciosa* (VU) are listed in Red Data Book 2014. Major threat is the collection of them for horticultural use. Recent new threat is herbivory by increasing Sika deer. Acceleration of invasion of tall grass such as dwarf bamboo (*Sasa* spp.) and *Miscanthus sinensis* into their habitat due to land use change and on-going climate change might have reduced their numbers. The Ministry of Environment, Japan, is working on their conservation and propagation through collabolation with researchers. Shimura and Koda (2004, 2005) developed a propagation method without symbiotic fungi in 2004. They also developed a propation method for var. *sebunense* in 2005. Sugiura *et al.* (2002) clarified that the queen of bumble bee *Bombus pseudobicalensis*, their only pollinator, is effectively related to their breeding success. They proposed mimic hypothesis that *C. macranthos* var. *rebunense* without nector in the flower could deceit pollinators by resembling white flowers of *Pedicularis schistostegia* (Orobanchaceae). Kosaka *et al.* (2014) indicated that the safe site for recuruiting var. *rebunense* is dominated by short and narrow leaved Poaceae or *Carex* species. Sometimes they have moss covers, which tend to supply moderate moisture and light condition for this species. Its experimental restoration has been carried out since 2011. Total conservation of ecosytem surrounding var. *rebunense* is important. In Russia, *C. macranthons* was included in the Probatova (2008) and in the Red Data Book of Russian Federation (2008). The main limiting factors are high recreational load, picking flowers, and digging adults.

Ethnic use

Cypripedium spp. are generally popular with horticultural uses.

Written by Takayuki Kawahara

Damnacanthus indicus C. F. Gaertn.

Rubiaceae

- 虎刺 [Hu ci]
- アリドオシ (蟻通) [Aridoshi]
- 호자나무 [Ho-ja-na-mu]
- *Димнакантус индийский* [Dimnakantus indiiskii]

Description

Evergreen shrubs. Stems terete, sometimes 4-angled, with dense up curved short pubescent hairs, branching sympodially, terminating in two opposite spines at apex, node with large and small alternating leaves. Leaves opposite, blade drying stiffly papery to leathery and discolorous, ovate, apex acuminate, prickly, base rounded or cuneate, entire, glabrous on both surfaces or abaxially sparsely hirtellous to strigillose along veins, midrib thinly prominulous adaxially, secondary veins 2 or 3 (or 4) pairs. Flowers 1 or 2, on terminal branchlets. Peduncles and Pedicels very short. Calyx campanulate, shallow with four deltoid lobes, acuminate. Corolla salverform, white, glabrous outside, villous in throat, four lobes, ovate, and subacute. Four stamens. Style filiform with four dilated lobes at apex. Fruit drupaceous, red, and globose. Seed surrounded by hard endocarp, compressed orbiculate, and white. Flowering in April to July, fruiting in July to October.

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Damnacanthus C. F. Gaertn. is an East Asian genus with six taxa, two species of the genus are native to Korea (Satake *et al*., 1996; Mabberley, 1997; Ruan, 1999; Lee *et al*., 2007). The species *D. indicus* is distinguished from *D. indicus* subsp. major (Siebold et Zucc.) T. Yamaz. by 1 cm long spines and shorter leaves (1/2–1/4, half to quarter), as well as living in habits in islands in the south Korean ocean, such as Jeju-do (Lee, W.T., 1996; Lee *et al*., 2007). *D. indicus*, the most widely distributed species in the genus and is quite large in leaf variation. The taxonomy of the varieties within *D. indicus* has been based only on the combination of leaf size and spine length (Makino, 1904; Koidzumi, 1933; Yamazaki, 1987, 1993). In *D. indicus*, leaves from the tetraploid populations tend to be larger than those from diploid populations. Populations of tetraploid *D. indicus* are distributed in more northern areas than those of the diploid. Three types of sympatric distribution were found for the varieties of *D. indicus* in Japan: diploid and tetraploid, two diploids, and two tetraploids. Therefore, based on the chromosome number study, the taxonomy of the varieties of *D. indicus* should be revised (Naiki & Nagamasu, 2004).

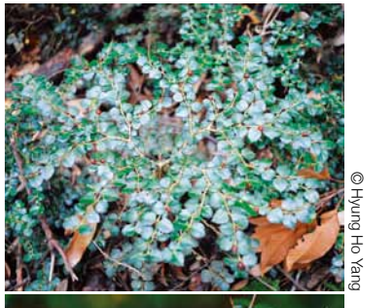
Distribution and habitat

Vietnam, Laos, Myanmar, Assam, India (North and Northeast), China (Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangsu, Jiangxi, Sichuan, Xizang, Yunnan, Zhejiang), Taiwan, Japan (Honshu, Shikoku, Kyushu), Korea (Hong Island of Jellanam-do, Jeju-do, and Ulleung Island). Sparse or dense in lowlands of evergreen forests.

Ethnic use

D. indicus has ornamental uses. Whole plants and roots also have medicinal uses.

Written by Gyu Young Chung



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Davidia involucrata Baillon

Nyssaceae

- 珙桐 [Gong tong]
- ハンカチノキ (手巾木) [Hankachi-no-ki]
- Давидия обёрточная [Davidiya obyortochnaya]

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Description

Deciduous tree, up to 20 m tall, with ascending bark. Leaf blades adaxially bright green, broadly ovate, glabrous; abaxial densely silky pubescent, strongly veined; bases cordate; margins dentate-serrate with acuminate teeth; apexes acuminate. Flower heads terminal with 2 or 3 bracts, opposite, ovate to oblong-obovate, with entire or serrate margins; some up to 16 cm long, while others about half as long. Fruits usually solitary, green with purple blossoms, and pear-shaped. Flowering in April, fruiting in October.

Distribution and habitat

China (Guizhou, W Hubei, W Hunan, Sichuan, N Yunnan). Growing in montane mixed forests, altitude 1,100–2,600 m.

The genus *Davidia* has only one species, *D. involucrate* (Baillon, 1871). Based on a different indumentum of the leaf blade, Dode described a new species named *D. vilmoriniana* in 1908, in which the leaf blade is abaxially glabrous or scarcely pubescent when young, and sometimes abaxially glaucous. *D. vilmoriniana* has been treated as a variety of *D. involucrata* named *D. involucrata* var. *vilmoriniana* (Wanger, 1910).

Conservation status

Davidia involucrata Baill, the only species in the family Davidiaceae, is a rare and endangered plant endemic to China. It is a relic from the Tertiary period. It is listed in the China Plant Red Data Book under first-order state protection. At present many natural populations of *Davidia involucrata* are located in nature reserves, Yuan Jia Wan Davidia Nature Reserve of Yunnan Province and Nayong Dove Tree Nuture Reserve of Guizhou Province, China (Chen & Su, 2011).

Ethnic use

Davidia involucrata is a famous precious ornamental tree. It is often planted near pools, hotels and exhibition halls. It signifies peace. Its wood is sturdy and can be made into furniture and sculptures.

Written by Ning Zulin

© Ning Zulin

Dicentra peregrina (J. Rudolph) Makino

Fumariaceae

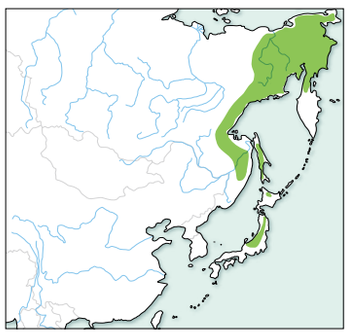
- コマクサ 駒草 [Koma-kusa]
- Дицентра иноземная (бродяжная) [Ditcentra inozemnaya (brodyazhnaya)]

Description

Perennial herbs, up to 35 cm tall, with a vertical rhizome and numerous adventitious roots deepened in the loose substrate. Leaves gray-green, rosette, with long scapes, 2–3-pinnate; leaflets linear to acicular. Stalks thin and in 2–3 times longer than leaves, in the upper part with a few bracts membranous and 2–5 flowers. Flowers bisexual with four violet-pink or pink petals and two tiny sepals. Outer petals pouched at the base and strongly arcuate bent at the ends. Inner petals long and protruding, ribbon-like, rounded at the apex, connected at the end. Bifid stigma. Capsule oblong, thin filmy, taper length. Seeds oblong, kidney-shaped, with a small appendage-elaiosome. Myrmecochorous species (Komatsu *et al*., 2015). Flowering in June to July.

Distribution and habitat

Russia (Eastern Siberia (Yakutia-Aldanskiy and Kolymskiy Districts), Far East (from Chukotka to Northern part of Primorskiy Kray, Sakhalin Island, Southern Kuril Islands)), Japan (Hokkaido-Kamikawa; Honshu, including Akita, Miyagi, Fukushima, Gunma, Nagano, Toyama). Grows in alpine zones up to 3,350 m, in tundra, on gravelly scree, on rocky outcrops and in sand.



Initially, the plants from Japan have been described as an independent species, *Dicentra pusilla* by Siebold and Zuccarini in 1845. Later, Makino listed it as a synonym of *Dicentra peregrina* in 1908 (Stern, 1961). However, Dicentra peregrina was indicated as endemic species for the Russian Far East (Popov, 1937). Currently, most authors suggest one species for the Russian Far East and Japan - *Dicentra peregrina* (Bezdeleva, 1987; Lidén *et al*., 1997). Comparison of pollen of plants from Russian Far East and Japan showed differences in exine sculpture, which is a species feature (Tarasevich, 2014). There are two geographic center of diversity of *Dicentra* – Southeast Asia and Northern America (Berg, 1969). *Dicentra peregrina* is the one of tree species from Southeast Asia and it has more primitive features than North American species (Tarasevich, 2014). This suggests that the genus Dicentra origin, most likely, is from the Asian continent, North America is a secondary center of evolution of the genus.

Conservation status

There is no conservation status for *Dicentra peregrina*. However, populations from Primorskii Kray of Russia and Japan are on the southern limit of their distribution and need to be monitored and conserved.

Ethnic use

"Koma-kusa" is named after the shape of the flowers that look like a horse (Horses were called "koma" in the old days of Japan). Koma-kusa is also known as "the queen of alpine plants" for its beautiful flowers. It is very popular alpine ornamental plant in Japan especially in mountain regions where it grows.
There are several hybrid cultivars, cultivated as ornamental plants, involving *Dicentra peregrina* and others species.

Written by Elena A. Pimenova

Distylium racemosum Siebold & Zucc.

Hamamelidaceae

- 蚊母樹 [Wen mu shu]
- イスノキ (柞) [Isunoki]
- 조록나무 [Jo-rok-na-mu]
- Двупестичник кистевидный [Dvupestichnik kistevidnyi]

© Katsuhiro Nakao

Description

Large evergreen tree, up to 10–20 m tall, 80–100 cm in breast height diameter. Leaves alternate, coriaceous, elliptic to obovate-oblong, 3–7 cm long and 1.5–3 cm wide. Insect galls on the leaves usually formed by some aphids as their microhabitats. Flowers monoecious, red-anther, pollinated by wind. Fruits oblong, 10 mm long. Flowering from April to May in Japan.

Distribution and habitat

Subtropical and warm temperate zones in East Asia including Japan, Korea (Jeju-do), Taiwan, and China.

The genus *Distylium* is mainly distributed in the eastern and southeastern Asia. It contains approximately 18 spp.

Distylium racemosum is one of the major components of evergreen broad-leaved forests in the southern parts of Japan to Ryukyu Islands. Although the species is rare in Taiwan, it is mainly distributed in central part of Taiwan and offshore island such as Ludao and Lanyu. The number of species with similar functional types is higher in Taiwan than in Japan. Niche differentiation and resource partitioning in space and time are generally induced by increased fundamental niche overlaps with other species. Accordingly, the realised niche width of *D. racemosum* in Taiwan is thought to be limited by competition with other species (Nakao *et al*., 2014). In addition, species distribution models incorporating future climate scenarios showed that the the potential habitats of *D. racemosum* in Taiwan would decrease under future climate conditions.

Ethnic use

The species has been used as furniture materials, stick and roadside tree.

Written by Katsuhiro Nakao

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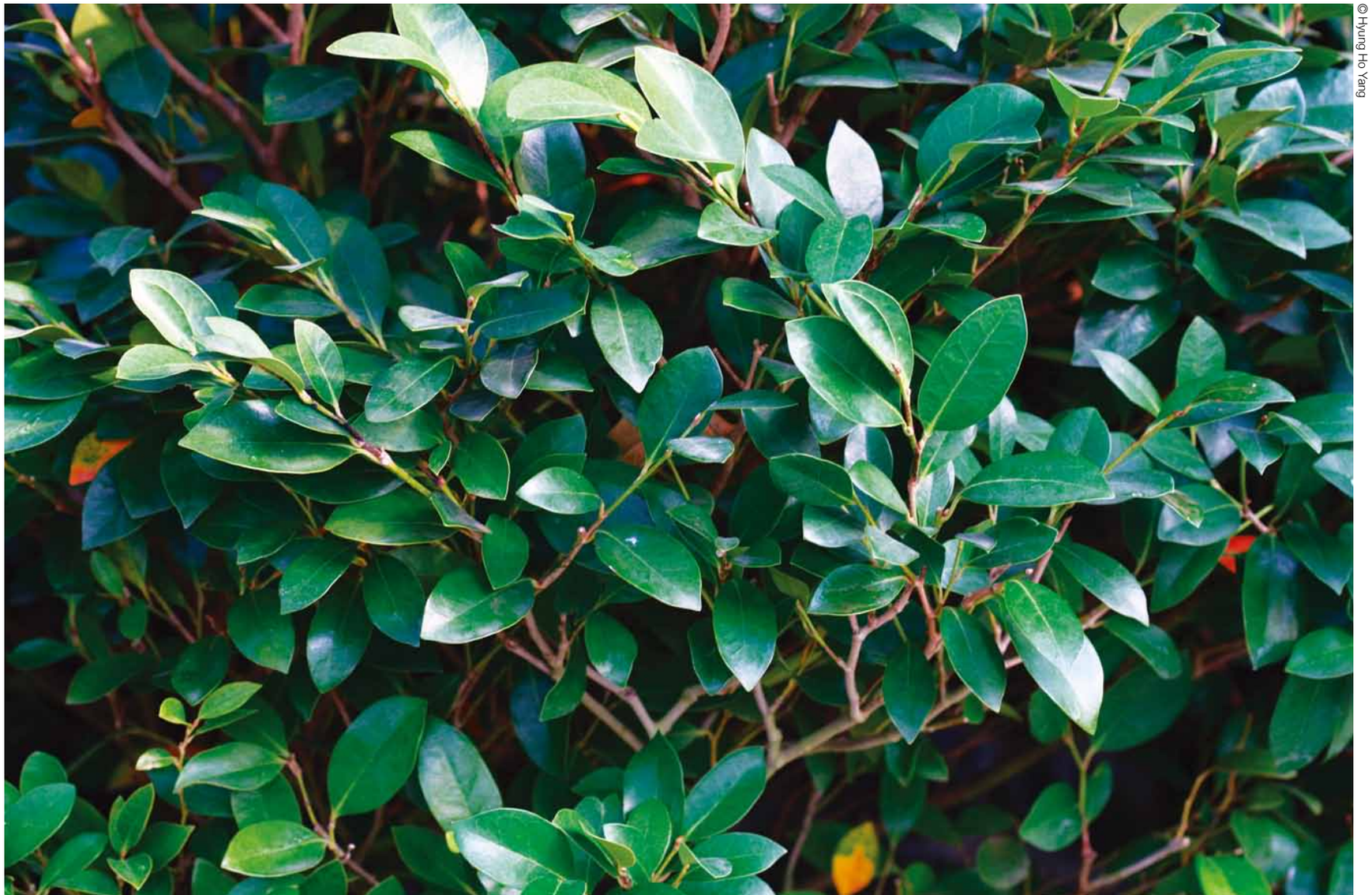

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Dontostemon elegans Maxim.

Brassicaceae

- 扭果花旗杆
[Niu guo hua qi gan]
- Гоолиг багдай
[Goolig bagdai]
- Донтостемон изящный
[Dontostemon izyashchnyi]

Description

Perennial herbs, 15–50 cm tall, eglandular, with whitish woody base. Stems ascending, branched basally, glabrous. Middle cauline leaves sessile, linear to oblanceolate-linear, 2–5 cm × 3–5 mm, somewhat fleshy, subleathery, glabrous or sparsely pilose with simple trichomes to 1 mm, base attenuate, margin entire, apex obtuse to subacute. Fruiting pedicels divaricate, straight or slightly recurved, thick, 3–6 mm, glabrous. Sepals oblong or oblong-linear, 5–6 × 1–1.5 mm, sparsely pubescent with simple trichomes. Petals lilac, obovate, 9–12 × 2.5–4 mm, apex obtuse; claw 5–7 mm. Filaments of median stamens 6–8 mm, united, filaments of lateral stamens 4–6 mm, anthers oblong, 1.2–1.8 mm, apiculate. Ovules 32–60 per ovary. Fruit 3–5 cm × 2–2.5 mm, glabrous, strongly twisted, torulose, flattened, midvein prominent, style up to 0.5 mm, stigma lobed. Seeds brown, oblong, ca. 1.5–1.9 × 0.9–1.1 mm, margined, cotyledons accumbent. Flowering in May to July, fruiting in June to August (Cheo *et al.*, 2001).

© Batlai Oyuntsetseg

Distribution and habitat

Mongolia (Khovd, Mongolian Altai, Depression of Great Lakes, Valley of Lakes, Gobi Altai, Dzungarian Gobi, Transaltai Gobi, Alashan Gobi), China (Gansu, Nei Mongol, Xinjiang), and Russia (Siberia). Habitats include slopes and bottom of stony lowlands, sandy debris tailings of mountains and hills (Grubov 2001).

Dontostemon elegans Maxim. is subendemic to Mongolia (Urgamal *et al.*, 2014), described from Chinese Dzungaria and SW Mongolia; lectotype from Mongolian Altai at the border with Transaltai Gobi phytogeographical region (Buzunova, 2000).

Ethnic use

Primary forage for camels in summer (Ulziikhutag, 1985).

Written by Batlai Oyuntsetseg & Badamdorj Bayartogtokh

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Dystaenia takesimana (Nakai) Kitag.

Apiaceae

- 섬바디 [Seom-ba-di]
- Дистения Такесима [Disteniya takesima]

© Hyung Ho Yang

Description

Perennial herbs. Stem erect, upwardly branched, stout, striate. Leaves alternate, twice ternately pinnate, ultimate segments widely lanceolate, toothed or tri-lobed, widely lanceolate. Inflorescences compound umbels, terminal, rays 10–20, bracts absent, bracteoles 10–20, filiform-linear, margin scabrous, slightly longer than pedicels. Calyx teeth conspicuous and acute. Five white petals and incurved. Style slender, reflexed, longer than depressed stylopodium. Fruits broadly ellipsoid, mericarps compressed dorsally, three dorsal ridges, winged, two lateral ridges, more broadly winged than dorsal ones, numerous below and between ridges. Flowering in July.

Distribution and habitat

Korea (Ulleung Island).

Dystaenia Kitag. only occurs in Japan and Korea (Ulleung Island), one species each. Makino in 1902, and then Kitagawa (1939) who treated the species in the new genus reported the type species in the genus, *D. ibukiensis*, in Angelica. *D. ibukiensis* occurs along the East sea in Honshu, Japan (Ohwi, 1984; Sun *et al*., 1997). Stuessy *et al*. (2014) use the species as an example to deal with different modes of speciation in the interpretation of patterns of genetic variation in endemic plant species of oceanic islands. The molecular data suggests that after a founder-effect reduction of genetic variation, anagenetic speciation may have occurred in *D. takesimana* by gradual morphological divergence accompanied by accumulation of genetic variation through mutation, recombination and drift (Sun *et al*., 1998; Pfosser *et al*., 2006).

Like the other species in Ulleung Island, *D. takesimana* are morphologically larger than it's relative, *D. ibukiensis*.

Conservation status

Although the species is endemic to Korea, the species do not need conservation status due to their wide distribution in Ulleung Island.

Ethnic use

In Ulleung Island, leaves are used as feedstuff.

Written by Gyu Young Chung

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Euchresta japonica Hook. f. & Regel

Fabaceae

- 山豆根 [Shan dou gen]
- ミヤマトベラ (深山海桐) [Miyama-tobera]
- 만년콩 [Man-nyeon-kong]
- Эухреста японская [Euchresta yaponskaya]

Description

Small evergreen subshrubs or shrubs with a tuber-like thick rootstock, up to 80 cm tall. Stems single or rarely two, erect or decumbent, simple or branched, green and densely short pilose in young parts, later woody, glabrescent. Leaves pinnately trifoliolate; leaflets elliptic or obovate, entire, 5–9 × 3–5 cm, apex obtuse, upper surface glabrous, deep green and lustrous, lower surface densely appressed grayish short pilose. Inflorescences racemose, terminal and often axillary, erect, short pilose. Calyx funnel-shaped, equal to base, ca. 3 mm long, penta-toothed; teeth undulate, densely appressed pubescent. Petals white, glabrous. Fruits fleshy, indehiscent, ellipsoid, uni-seeded, dark bluish purple; pericarp membranaceous. Flowering in June to July.

Distribution and habitat

Southern China, Korea (Jeju-do) and Southwestern Japan. In valleys, mountain slopes and dense forests.

Based on Choi *et al*. (2013), the ecological status of critically endangered Korean *E. japonica* can be summarized as follows: (1) it is a narrow habitat specialist, restricted to moist and shady areas of broad-leaved evergreen forest dominated by *Castanopsis cuspidata* (Thunb.) Schottky var. *siboldii* (Makino) Nakai, *Camelia japonica* L., and *Arachniodes aristata* (G. Forst.) Tindale; (2) it has an extremely small geographical range on Jeju-do, occurring within an area of ca. 175.5 m2, with an inclination of ca. 35–45 degrees; and (3) the individuals are linearly scattered along the Donnaeko Valley, with a mean distance of 20.53 m among individuals (minimum, 3.65 m; maximum, 53.47 m).

Conservation status

Although no global conservation status has been recommended to date, *E. japonica* is designated and protected as a locally endangered species throughout its geographic range (Fu and Jin. 1992; Korea Forest Service, 2008: Hama *et al*., 2009; Song *et al*., 2012). This species is considered one of the most threatened plant species in the world, with a noticeably small population at the national level, particularly in Korea (Kim, 2006; Korea Forest Service, 2008; Choi *et al*., 2013). The Wildlife Protection Act of Korea (Ministry of Environment, 2005) designates this species as one of the eight most endangered (category I) plant species. The Rare Plant Data Book of Korea (Korea Forest Service, 2008) also categorizes this species as “Critically Endangered” at the national level, based on IUCN criteria.

Ethnic use

This species is considered as a medicinal and ornamental resource in Korea.

Written by Hyeok Jae Choi

Eupatorium makinoi T. Kawahara & T. Yahara

Asteraceae

- 白头婆
[Bai tou po]
- ヒヨドリバナ (鵯花)
[Hiyodoribana]
- 벌등골나물
[Beol-deung-gol-na-mul]
- Посконник Макино
[Poskonnik makino]

Description

Perennial herb up to 20–100 cm. Leaves opposite, petiolate, simple or sometimes tripartated or dissected. Leaf blades obovate to lanceolate, serrate, apex acute, base obtuse, 4–13 cm long, 1–4 cm wide. Inflorescence compound corymb. A head composed of 5 tube flowerets. Floret corolla white or pinkish, fragrant, 2.5–4 mm long. Involucral bracts 3–5mm. Puppi 2.5–4.5 cm long. The flowers pollinated by butterfly, bee and small beetle. Flowering in July to October, fruiting in September to October.

Distribution and habitat

Russia (Sakhalin), Japan (excluding Okinawa), Korea, and China. Its habitat include forest edge, understory, or open land.

The genus *Eupatorium* s. str. occurs in North America (approx. 25 spp.), East Asia (approx. 25 spp.), and Europe (1 sp.). Its taxonomy is very complicated due to ploidy variation, hybridization, and agamospermous breeding system. Especially the *E. chinense* L. complex includes several taxa, including the nominated taxon which used to be treated as var. *oppositifolium* (Koidz.) Murata et H. Koyama or var. *simplicifolium* (Makino) Kitam.

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Watanabe *et al.* (1982) reported athe strong relationship between ploidy level (diploid and polyploid) and reproduction mode (sexual and agamospermous). Kawahara *et al.* (1989) found limited and discontinuous geographic distribution and clear morphological difference among sexual diploid plants and concluded that they should be treated as independent species; i.e. *E. chinense* (Guandung, Guanxi. Hainan in China); *E. makinoi* (Southwestern part except Ryukyu of Japan, Mt. Lushan in Jiangxi and Mt. Tianwushan in Fujian of China); *E. glehnii* Fr. Schm. (mainly Japan Sea side of Honshu, Hokkaido in Japan, Sakchalin in Russia); and *E. tozanense* Hayata (Taiwan). Yahara *et al.* (1995) have given the nominated taxon species a rank name, such as *E. makinoi* var. *makinoi* for diploid type (Left Photo) and var. *oppositifolium* for polyploid type (Right Photo). In China, it used to be treated as *E. japonocumm* Thunb (Lin *et al.*, 1985).

The distribution of sexual diploids (*E. makinoi* var. *makinoi*) is restricted to southwestern part of Japan and east of China (Mts. Lu-shan and Tianwu-shan). The diploid plant is shorter. It prefers less disturbed mountain slope in the forest. The polyploids (*E. makinoi* var. *oppositifolium*) are widely distributed. They prefer disturbed land such as roadside or plantation. The polyploids may easily hybridize with other species and fix their progenies through agamospermous breeding system. It is the reason why intermediate types often occur, making taxonomy difficult. The following hybrids are known: *E.* × *tripartitum* Makino (*E. lindleyanum* DC. × *E. makinoi*); *E.* × *laciniatum* (*E. variabile* Makino × *E. makinoi*) (Murata & Koyama, 1982). They are all triploid or tetraploid. Some other polyploid types of *E. glehni* Fr.Schm., *E. chinense* L., and *E. heterophyllum* DC. may include the genome of *E. makinoi* partly through hybridization (Kawahara *et al.*, 1989). The Japanese name of Hiyodori-bana is derived from the seasonal event that these flowers come out when Hiyodori, a middle-sized migrant bird *Hypsipetes amaurotis* comes down to village in autumn. Korean name means spinal column herb. Chinese one means a white-haired old woman.

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Conservation status

It is currently listed as Common Species in the Red Data Book 2014 of Japan.

Ethnic use

Sometimes it is used as ornamentals in tea ceremony.

Written by Takayuki Kawahara

Euscaphis japonica (Thunb.) Kanitz

Staphyleaceae

- 野鸦椿 [Ye ya chun]
- ゴンズイ (権萃) [Gonzui]
- 말오줌때 [Mal-o-jum-ttae]
- Эускафис японский [Euskafis yaponskii]

Description

Small deciduous trees or shrubs, usually 3–8 m tall. Bark grayish brown, striped. Twigs and buds dark purple. Branches glabrescent. Leaves with pale green rachis, 10–30 cm; stipule linear, pilose, base broad, tapering to tip; 5–11leaflets, with an unpleasant odor when crushed; petiolule 1–2 mm, glabrescent; leaflet blades elliptic to oblong-ovate or sometimes oblong-lanceolate, rarely ovate, 4–9 × 2–4 cm, papery, glabrous or pilose along veins, adaxially green, abaxially pale, main vein impressed adaxially and prominent abaxially, lateral veins 8–11, conspicuous on both surfaces, base broadly cuneate to rounded, margin sparsely serrulate with glandular teeth, apex acuminate. Inflorescence a terminal panicle, up to 21 cm. Flower small, yellowish white, 4–5 mm in diameter; pedicel ca. 2 mm. Sepals oval, ca. 2 mm, base united, margin ciliate, apex obtuse. Petals yellowish green, obovate, slightly longer than sepals. Stamens shorter than petals; anthers oval. Ovary ovoid; three carpels, free or base slightly united. Follicle 1–2 cm, 1–3-locular; pericarp softly leathery, red-brown with irregular ribs. Seeds shiny black, subglobose, ca. 5 mm in diameter; arils fleshy. Flowering in April to June, fruiting in August to November.

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Distribution and habitat

China (Most provinces except North western regions), Korea (Islands of Gyeonsangnam-do, Jeollabuk-do, Jeollanam-do, and Jeju-do), Japan (South of Honshu), Taiwan and Vietnam. In valleys, open forests and thickets of low mountains.

Ethnic use

In Korea, some parts of *Euscaphis japonica* are used as traditional medicines from the stems and fruits. Also used for natural dyes for “Sky Blue” color from the fruits, and edible resources from the stems and young leaves (Korea National Arboretum, 2013). In China, the wood is used for making furniture, oil from the seeds is used for making soap, and tannin is extracted from the bark (Li *et al*., 2008). The roots and dry fruits are used medicinally (Li *et al*., 2008). This species is grown as an ornamental in China and Korea (Li *et al*., 2008; Korea National Arboretum, 2013). In Japan, the trunk of this species is not useful for timber due to its fragility.

Written by Hyeok Jae Choi

Gymnocarpos przewalskii Bunge & Maxim.

Caryophyllaceae

- 裸果木 [Luo guo mu]
- Пржевальскийн чармай [Przewalskiin charmai]
- Голоплодник Пржевальского [Goloplodnik przhevalskogo]

Gymnocarpos przewalskii Bunge & Maxim. is endemic to Mongolia (Urgamal *et al*., 2014), described from Southern Mongolia.

© Dagdan Suran

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Description

Shrubs 25–40 cm tall, much branched from base. Bark dark gray, tenderbranches reddish. Stipules membranous. Leaves often fascicled; leaf blade linear-subulate, 5–20 mm long, 1–1.5 mm wide. Inflorescence glomerules, axillary, bracts membranous. Glomerules 7–15 flowered. Sepals 5, scarious, connate at base; lobes oblanceolate, 3–4 mm. Petals absent. Stamens 10, 2-whorled; outer 5 staminodes; inner 5 opposite sepals. Seeds brown, oblong, ca. 1.6 mm. Flowering in June, fruiting in July to September (Grubov, 1982).

Distribution and habitat

Dzungarian Gobi (northern foot of Baitag Bogd mountain range; northern foot of Khalzan mountain), Alashan Gobi (Borzon Gobi), China (Gansu, western part of Nei Mongol, Ningxia, northern Qinghai, Xinjiang). Its habitats in Mongolia include slopes of dry river beds in stony deserts and pebbles.

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Conservation status

It is listed as “Very Rare” in the Mongolian Law on Natural Plants (1995) and “Very Rare” in the Mongolian Red Book (1997). In China it was defined as a rare species in the second rank of conservation priority by the China Plant Red Data Book. In the past few decades, increasing human activities in its natural habitats have resulted in a serious loss of individuals, and caused habitat fragmentation and population isolation (Ma *et al*., 2012).

Ethnic use

Primary forage for camels, which graze it yearround (Ulziikhutag, 1985).

Written by Radnaakhan Tungalag & Dagdan Suran

© Jadambaa Sanjid

Hemiptelea davidii (Hance) Planchon

Ulmaceae

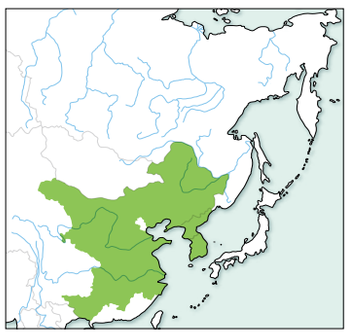
- 刺榆 [Ci yu]
- ハリゲヤキ [Hari-keyaki]
- 시무나무 [Si-mu-na-mu]
- Гемиптелея Давида [Gemipteleya Davida]

Description

Shrubs or trees, up to 10 m tall. Bark dark gray to grayish brown. Branch grayish brown to brownish purple, pubescent. Spines 2–10 cm. Winter buds ovate, usually 3-clustered in leaf axil. Stipules oblong to lanceolate, 3–4 mm. Petiole 3–5 mm, pubescent. Leaf blade elliptic, elliptic-oblong, or rarely obovate-elliptic,4–7 × 1.5–3 cm, base cordate to rounded, margin with teeth obtuse, apex acute to obtuse. Secondary veins 8–12 on each side of midvein. Fruit asymmetric, yellowish green, ovoid, 5–7 mm, winged only on one side. Seed elongate and curved. Stalk slender, 2–4 mm. Flowering in April to May, fruiting in September to October.

Distribution and habitat

China (Anhui, Gansu, Guangxi, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Ningxia, Shaanxi, Shandong, Shanxi, Zhejiang), Korea (all provinces), Europe, and North American. Its habitat includes hill slopes, trail sides, around houses, and below elevation of 2,000 m.



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The genus of *Hemiptelea* has only one species. Sand -fixation performance is good. Most of them live in fixed sand dune slopes with some growth in bushes. It can grow up to 10 m tall. Branch hairy, reddish brown with a solid branch spines. Leaves elliptic or oblong, apex acute 1–5 cm long, margin with single blade, hairy, above the lower back or hairy, petiole 1–5 mm. Flowers are hermaphrodite and leaves at the same time open. Fruit wings, mature seeds in mid-October.

Conservation status

Currently this species is not included in the endangered list of China. This species in Nei Mongol left HouQi region has a long history. Tuen name is named after *Hemiptelea dividii* (Hance) Planchon and lineage today. Such as the east spread all commune is the chariot, west tuen, etc. In the 1950s, a lot of these local places still have 400–500 years old of ancient *Hemiptelea davidii* (Hance) Planchon. However, there were not much left in the 1980s.

Ethnic use

Its hard wood has been used for utensils. Its bark fiber has been used for manufacturing staple rayon and sacks. Its tender leaves can be sued to make good beverage. In addition, oil can be extracted from its seeds.

Written by Cao Wei

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Houttuynia cordata Thunb.

Saururaceae

- 蕺菜 [Ji cai]
- ドクダミ (蕺) [Dokudami]
- 약모밀 [Yak-mo-mil]
- Хауттюния сердцелистная [Hauttyuniya serdtcelistnaya]

Houttuynia is a genus of single species and it belongs to *Saururaceae*. *Saururaceae* consists of four genera and six species. *Saururus* contains two species, *S. chinensis* distributes in eastern Asia and *S. cernuus* distributes in America. *Anemopsis* contains only one species *A. californica* distributing in North America. *Gymnotheca* has two species, *G. chinensis* and *G. involucrate*, both grow in China.

Native distribution range of *H. cordata* is wide in East and Southeast Asia and the distribution is still expanding with anthropogenic introduction. *H. cordata* is an alien species in Australasia-Pacific region and North America. Its invasiveness is supported by its high reproductive ability. *H. cordata* can spread not only from rhizome fragments but also from parthenogenetic seeds. Cytomixis and meiotic abnormalities during microsporogenesis are found in this species and these characters are the origin of the intraspecific polyploidy and parthenogenetic seeds (Guan *et al.*, 2012). *H. cordata* also has allelopathy that prevents growth of other plants (Lin *et al.*, 2006). These characteristics can increase the invasiveness of this species.

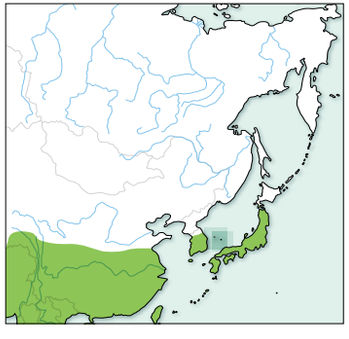
© Dai Koide

Description

Perennial broad-leaved herb, 15–30 cm tall. Stems green to red. Leaves alternate, cordate, entire margin, about 5 cm long, and caudate apex. Flowering in June to July on the top of the stem, greenish-yellow on terminal spike 2–3 cm long with petal-like four white basal bracts. Fruits ripen in July to August. Seeds parthenogenesis and about 0.5 mm long, fruiting in August. This species also has adventitious roots connecting ramets. Adventitious roots and rhizomatic reproduce from fragments enables a high vegetative growth rate.

Distribution and habitat

China (mainland), Korea (Cultivated), Japan (Honshu, Shikoku, Kyushu, Okinawa), Taiwan Islands, Vietnam, Laos, Thailand, and Myanmar. Its habitats include shaded and moist places.



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Ethnic use

In Japan, the dried leaves are often used as medical tea. They are called 'ju-yaku' with the meaning of 'ten medicines' and have the effects for detoxin, body-worming, diuresis, and decrease of blood pressure. The herb is effective for fever, eczema, or swelling as lotion. In Korea, it is known that rhizomes have medicinal uses. *Houttuynia cordata* has a characteristic smell. The smell occurs from bruised tissues and the smell is like that of fish or rotten-fish. Despite of its unpleasant smell, its leaves, stems, and roots are eaten raw or cooked in several countries. *H. cordata* is often used in fish dishes in Vietnam. Roots are used in salad with chili pepper dressing in southwestern China.

Written by Dai Koide

Hylomecon vernalis Maxim.

Papaveraceae

荷青花 [He qing hua]

피나물 [Pi-na-mul]

Лесной мак весенний [Lesnoi mak vesennii]

Description

Perennial herbs, yellow lactiferous, sparsely pubescent, glabrous with age. Rootstock oblique, white, at fruiting orange, fleshy, with brown membranous scales. Stems erect, green to red or purple, simple, herbaceous, striate, glabrous. Few basal leaves, long petiolate, pinnately lobed, two or three pairs of lobes, both surfaces glabrous, margins irregularly crenate or biserrate, sometimes parted or incised, or pinnatipartite and lobes irregularly incised again. Cauline leaves usually two, rarely three. Inflorescences terminal, sometimes axillary, 1- or 2(or 3)-flowered. Pedicel erect, tenuous. Flower buds oval, glabrous or sparsely hairy. Two sepals ovate, scattered floccose or abaxially glabrous, and imbricate in bud. Four petals, obovate or suborbicular, imbricate in bud, suddenly inflated at flowering, basally shortly clawed. Stamens yellow, anthers orbicular or oblong. Uni-locular ovary, oblong, styles very short, stigmas bi-lobed. Capsule glabrous, bi-valvate, with one persistent style. Seeds ovoid, many, small. Flowering in April to July.

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Hylomecon Maxim. comprises of two species in the temperate regions of the East Asia, and one species is native to the Korean peninsula (Kim, 2007). Mingli & Christopher (2008) treated *H. vernalis* as the synonym of *H. japonica* and reported its distribution in Japan, China, Russia, and Korea. Popov (1970) distinguished *H. vernalis* from *H. japonica* by leaf and floral characteristics and treats two species independently. Akiyama (2006) argues that *H. japonica* habitats are in Japan and China. The some variants have been recognized, but Grey-Wilson notes that they do not appear to be of great significance and numerous intermediates can be found in the wild. Therefore, taxonomic status of the two *Hylomecon* need clarification.

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Distribution and habitat

China (Anhui, Hebei, Heilongjiang, Henan, Hubei, Jiangsu, Jilin, Liaoning, Shaanxi, Shandong, Shanxi, NE. Sichuan, Zhejiang), Russia (Primorskiy Krai and South of Khabarovskiy Krai) and Korea (all provinces except Jeju-do). Forest understories, forest margins, ditch sides, and shaded habitats

Ethnic use

Although *Hylomecon* Maxim. is toxic, young shoots are edible and whole plants have medicinal uses.

Written by Gyu Young Chung

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Illicium anisatum L.

Schisandraceae

- シキミ (樒) [Shikimi]
- 붓순나무 [But-sun-na-mu]
- Бадьян анисовый [Badyan anisovyi]

© Dai Koide

Description

Evergreen trees, up to 10 m tall, 30 cm in diameter. Bark dark gray–brown with vertical line of lenticels. Leaves 5–10 cm long, entire margin, dark green, and elliptic to obtuse shape. Flowers white to cream-colored, 2–3 cm long, appears in March to April at axils. Fruits aggregated eight follicles, shaping like a star. Fruits ripen in September. This plant is poisonous and inedible, especially its fruits.

Distribution and habitat

China (mainland), Korea (Jindo Island and Wando Island of Jeollanam-do, Jeju-do), Japan (Honshu, Shikoku, Kyushu, Okinawa), Taiwan, and Philippines. Habitat of this species is in mountainous forest usually growing with *Abies firma*.

Illicium contains several species distributing mainly around East and Southeast Asian region, but one species distributes in North America. *I. verum* is a popular Chinese star anise. *I. tashiroi* grows on Yaeyama islands of Japan and Taiwan. *I. philippinense* is distributed on Taiwan and the Philippines. *I. arborescens* has a characteristic red flower. *I. floridanum* also has red flower and it grows in Florida, America.

The typical characteristic of *Illicium anisatum* is deadly poisons in whole parts of the plant. These poisons are called anisatin, shikimin, and sikimitoxin. They cause vomiting, stomachache, diarrhea, convulsion, consciousness disorder, and even death. These poisons are not only toxic to humans, but also to other mammals such as Sika deer (*Cervus nippon*). *I. anisatum* increased its dominance due to recent expansion of deer in Japan. Fruits of *I. anisatum* are very similar to that of its Chinese relative *I. verum*. Fruits of *I. verum* are edible and very popular cooking spice that is called star anise. This high morphologic and phylogenic similarity between poisonous *I. anisatum* and edible *I. verum* (Hao *et al*., 2000) has caused accidental ingestion of *I. anisatum* and subsequent poisoning. However, leaves and twigs of *I. anisatum* have refreshing fragrance and are popular for incense in religious ceremonies. Therefore, in spite of the poisons, *I. anisatum* is an important species for Buddhism and Shintoism.

Ethnic use

This species is often planted in cemetery. Its twigs are often served for tombs as holly ornamentals. It is said to avoid access of beasts so they will not touch to the buried dead body. In this purpose, wild trees are collected or planted for commercial use in local villages.

Written by Dai Koide

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Iris potaninii Maxim.

Iridaceae

- 卷鞘鸢尾
[Juan qiao yuan wei]
- Потанины цахилдаг
[Potaniny tsakhildag]
- Ирис Потанина
[Iris potanina]

Description

Rhizomes erect, short, tough. Roots thick. Leaves linear, 4–16 cm × 2–4 mm at anthesis, ca. 20 cm × 3–4 mm in fruit, base surrounded by dense, strongly curled fibers, apex rather abruptly contracted, subacute. Flowering stems not emerging above ground, spathes 2, narrowly lanceolate, 4–4.5 cm, membranous, 1-flowered. Flowers yellow, dark violet, or purplish blue, 3.5–5 cm in diameter. Perianth tube 1.5–3.7 cm, outer segments strongly marked around yellow, dense beard, obovate, 3–4 × 1.2–1.5 cm, apex retuse. Inner segments erect, oblanceolate, 2.5–3 × 8–10 mm, apex retuse. Stamens ca. 1.5 cm, anthers purple. Ovary ca. 7 mm. Style branches ca. 2.8 cm × 6 mm. Capsule broadly ellipsoid, 2.5–3 × 1.3–1.6 cm, apex shortly beaked; valves remaining united apically. Seeds pyriform, ca. 3 mm in diameter, arillate. Flowering in May to June, fruiting in July to September (Zhao *et al.*, 2000).

Iris potaninii Maxim. is subendemic to Mongolia (Urgamal *et al.*, 2014).

Distribution and habitat

Mongolia (Khövsgól, Khentii, Khangai, Mongolian Dauria, Khovd, Mongolian Altai, Middle Khalkh, Depression of Great Lakes, Valley of Lakes, Gobi Altai), China (Gansu, Sichuan, Nei Mongol, Xinjiang), and Russia (Southern Siberia). Habitats include steppe debris, stony slopes, and rocks (Enkhtuya, 2009).

Ethnic use

Its taste is warm with cool potency. It has been used for worm and poisoning diseases, wound healing, and when eyes become yellow. It dries lymph disease. It has been used to treats stomach and large intestine fever. It is an ingredient of the following traditional prescriptions: Jidag-7, Ruda-11, Pagaril-4, and Namjildorj [5–7] (Boldsaikhan, 2004). Written by Magsar Urgamal

© Batlai Oyuntsetseg

Juniperus rigida Siebold & Zucc.

Cupressaceae

- 杜松 [Du song]
- ネズミサシ
(杜松) [Nezu], (鼠刺) [Nezumi-sashi]
- 노간주나무 [No-gan-ju-na-mu]
- Можжевельник твердый
[Mozhzhevelnik tvyerdyi]

Juniperus rigida subsp. *rigida* occurs in China, Korea and Russia (continental part of Primorskii Krai); subsp. *conferta* (Parl.) Kitamura (*J. conferta* Parl.) is a decumbent, coastal shrub that occurs in Japan and East Russia (Sakhalin). On the seacoasts of the southeast of Primorskii Krai, it is identified with a creeping or shrub-like subspecies: *J. rigida* ssp. *litoralis* Urusov (Urusov *et al*., 2007). Sometimes an intermediate type between these two subspecies is observed. It has ascendant stem. There are two hypotheses for the type; ecotypic variation of subsp. *rigida* adapted to coastal habitat; hybrid origin of these two subspecies.

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Description

Erect shrubs or 9 m small trees (there are individuals up to 15 m high in Japan), with a pyramidal or cylindrical crown, ascending branches. Branchlets pendulous, trianglular when young. Leaves in whorls of three, green abaxially, linear-needlelike, thick, "V"-shaped in cross section, 1.1–2.5 cm × ca. 1 mm, rigid, deeply grooved with a narrow, white stomatal band adaxially. Pollen cones axillary, ellipsoid or subglobose, 3–5 mm. 9–12 microsporophylls (or more), in whorls of three, each with 4–6 pollen sacs. Seed cones axillary, light brownish blue or bluish black when ripe, usually glaucous, globose or ovate, 4–9 mm in diameter, ripen on the 2nd or 3rd year after pollination. Seeds often subovoid, ca. 5 mm, indistinctly 4-ridged, apex obtuse or rounded.

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Distribution and habitat

China (Gansu, N Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shanxi), Japan (Honshu (southward from Iwate Pref.), North Shikoku, North and Central Kyushu, Russia (S Primorskii Krai), Korea (all provinces). Grows in dry mountain areas in sunny and stony places, and often in limestone areas; below 2,200 m.

Conservation status

The species is included into the Red-data book of the Russian Federation (2008) and the Red-data book of Primorskii Krai (2008).

Ethnic use

Very decorative plants cultivated in botanical gardens. The Japanese name means spine against rats. It is called the twigs have been put on the passway of rats to interfere the invasion. The wood is rather hard and has high gravity, so it was used for ornamentals or scraptures. The seeds oils are extracted for medicine and fuel. The seeds are exported to Europe as materials to make gin.

Written by Roman V. Doudkin

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Kalopanax septemlobus (Thunb.) Koidz.

Araliaceae

- 刺楸 [Ci qiu]
- ハリギリ [Hari-giri]
- 음나무 [Eum-na-mu]
- Калопанакс семилопастной [Kalopanaks semilopastnoi], диморфант [dimorfant]

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Description

Trees, up to 30 m tall. Trunk up to ca. 1 m in diameter. Branches stout with numerous prickles. Petiole glabrous, 8–50 cm. Leaf blade suborbicular, 9–25(–35) cm wide, papery, abaxially dark green and glabrous or nearly so, adaxially light green and usually slightly pubescent when young, 5–7-lobed. Lobes broadly triangular-ovate to oblong-ovate, base cordate or rounded to nearly truncate, margin serrate, apex acuminate. Inflorescence 18–25 × 20–30 cm. Peduncle 2–6 cm. Umbels 1–2.5 cm in diameter. Pedicels 5–10 mm, glabrous or slightly pubescent. Corolla white or yellowish green. Fruit dark blue at maturity, 3–5 mm in diameter. Styles 2, united below, apical branches recurved. Flowering in July to August, fruiting in September to October.

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Distribution and habitat

China (Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Liaoning, Shaanxi, Shandong, Shanxi, Sichuan, Yunnan, Zhejiang), Japan (South Kuriles, Hokkaido, Honshu, Shikoku, Kyushu), Korea (all provinces), and Russia (southern part of Primorskii Territory, southern part of Sakhalin Island, and South Kuril Islands). Its habitat includes forests at elevation of 2,500 m.

Two varieties (*Kalopanax septemlobus* var. *septemlobus* and var. *magnificus*) sometimes can be distinguished based on minor leaf characters. However, they were not retained in the most recent authoritative assignment for the genus (Ohashi, 1994).

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Conservation status

This species has been included in the Red Data book of Russian Federation and Red Data Book of Primorskii Krai (2008).

Ethnic use

This species has been used as timber. It has medicinal usage. It is also an ornamental tree. Its sprout is a very popular edible vegetable in Korea. Written by Jin Yonghuan

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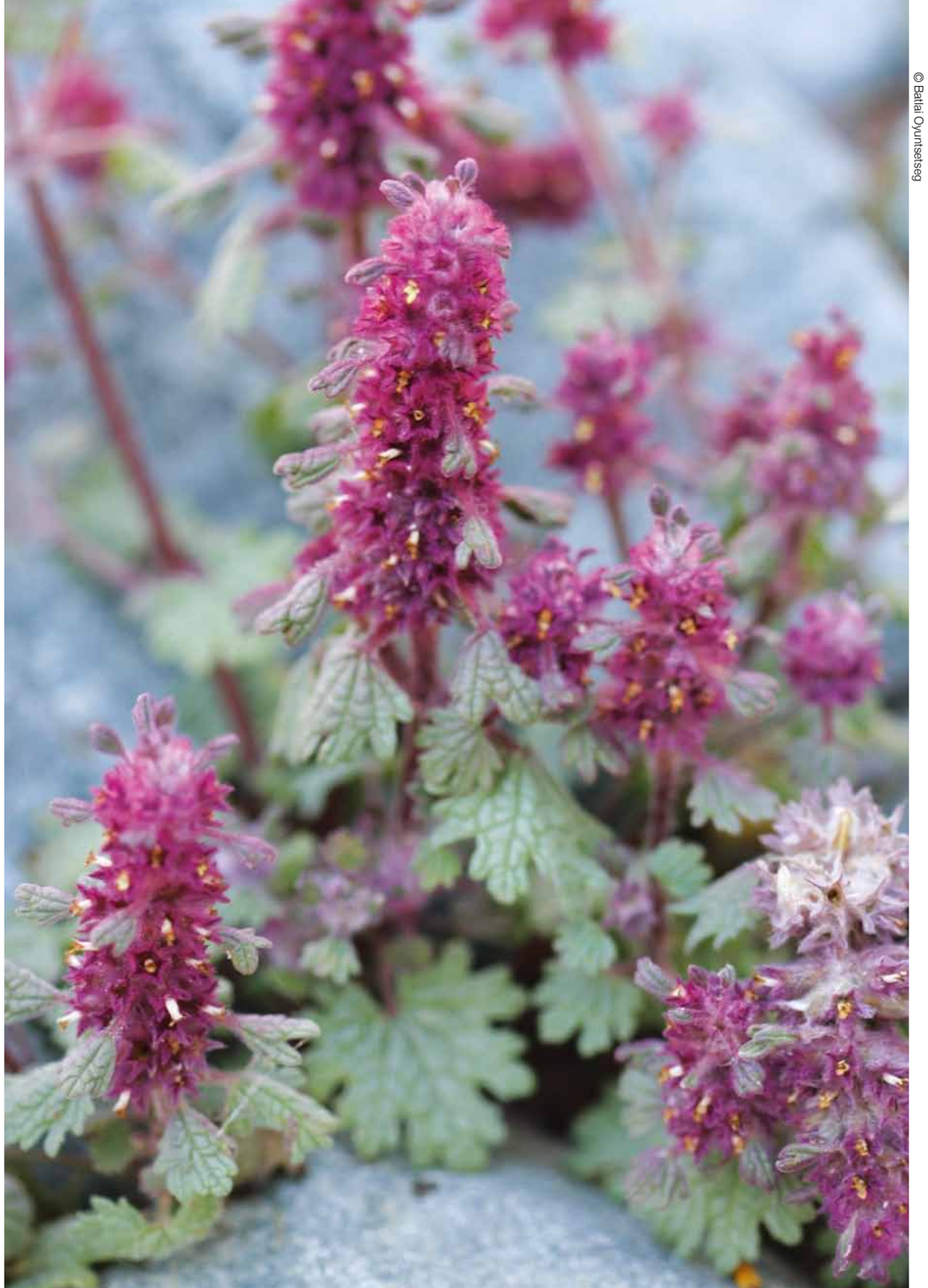
Lagopsis darwiniana Pjak.

Lamiaceae

- 夏至草属 [Xia zhi cao shu]
- Дарвины туулайн-уруул [Darvinii tuulain-uruul]
- Лагопсис Дарвина [Lagopsis darvina]

Description

Stems purple, erect, slightly branched from base, 25–30 cm tall, with or without floccose-lanate. Petiole 2–4 cm basally, less than 1 cm upward. Leaf blade reniform-orbicular, 2.5–3 × 3–4 cm, palmately divided, lobes ovate to broadly elliptic, adaxially villous, abaxially pilose and glandular, base cordate, margin 1- or 2-crenate, apex rounded. Verticillasters many flowered, in terminal, oblong-ovoid, densely white lanate spikes, 1 or 2 basal spikes widely spaced. Floral leaves 3-lobed. Bracteoles needlelike, ca. 5 mm, densely lanate. Pedicel absent. Calyx tubular-campanulate, ca. 1 cm, densely lanate, 5-veined, veins distinct in fruit; teeth 3–4 mm, triangular, apically spiny, subequal, 2 slightly longer. Corolla brown-purple, ca. 8 mm, villous; tube ca. 6 × 1.5 mm, upper lip ovate almost as long as lower lip, middle lobe of lower lip broadly ovate, apex emarginate, lateral lobes elliptic. Immature nutlets triquetrous, ovoid. Flowering in June to July, fruiting in July to August (Pyak *et al*., 2007).



A new species of *Lagopsis*, *L. darwiniana* Pjak, is described and illustrated. "A speciebus affinis *L. marrubiastrum* (Stephan) Ikonn.-Gal., *L. eriostachya* (Benth.) Ikonn.-Gal., *L. flava* Kar. & Kir. inflorescentia pubescentibus roseus et pilis breves intra corolla tube praesentiae bene differt. A speciebus *L. marrubiastrum* et *L. eriostachya* corollae flava (non aquilus vel brunneopurpureus) differt." Typus: Mongolia, Hovd aimag, inter jugi Jargalant Hayrhan et Boombat Hayrhan, 1641 m, 47023′26.5″, 093012′40.5″, 19 June 2004, A. I. Pyak s.n. (holotypus TK!, isotypi NS!). Paleo-endemic to Mongolia (Pyak *et al*., 2007, Urgamal *et al*., 2014).

Distribution and habitat

Mongolia (Mongolian Altai, Jargalant Khairkhan mountain) (Pyak *et al*., 2007; Olonova & Beket, 2010; Urgamal *et al*., 2014). Its habitats include dry stream beds, gravel areas beside rivers, stony slopes, and scree (1,600–2,700 m a.s.l.).

Conservation status

Currently it has no statutory protection. IUCN status for conservation was proposed for this newly-identified species.

Written by Batlai Oyuntsetseg & Nyam-Osor Batkhuu

Lilium buschianum Lodd.

Liliaceae

- 有斑百合
[You ban bai he]
- ヒメユリ (姫百合)
[Hime-yuri]
- 하늘나리
[Ha-neul-na-ri]
- Бушийн Сараана
[Bushiyn saraana]
- *Лилия* Буша
[Liliya busha]

Description

Perennial herbs, bulbiferous. Bulbs solitary, ovoid, dense, with a few, white, fleshy scales. Stem erect, thin, leafy, up to 1 m tall. Leaves alternate, sessile, linear-lanceolate, apex acuta. Flowers 1–6(12), star-shaped, reddish-orange, rare yellow, inside spotted; inner tepals wider than outer ones, lanceolate. Ovary 3-loculed. Stamens 6, with subulate filaments; dorsofixed anthers, 6–9 mm long, linear. Style elongate, slender, 5–9 mm long. Capsule oblong-ovoid, up to 2 cm long, 1.5 cm width. Flowering in June to July.

Distribution and habitat

Russia (E Siberia and Far East), NE Mongolia, N and NE China (Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Shandong, Shanxi), Korea (all provinces), Japan. In meadows, steppe, oak forest, and thickets.

© Vyacheslav Yu. Barkalov

In countries of Eastern Asia (China, Korea and Japan) *Lilium bushianum* has been treated as *L. concolor* Salisb. var. *pulchellum* (Fisch.) Regel (Liang and Tamura, 2000; Lee, 2007). However, Russian botanists accept this taxon at the species rank - *L. bushianum* Lodd. (Grubov, 1982; Barkalov, 1987; Vlassova, 1987, 2012; Cherepanov, 1995). This species is different from *L. concolor* by spotted tepals, larger bulbs and broader leaves. Further study is needed on the relationship between *L. bushianum* and *L. concolor*. Japanese plant is sometimes separated as var. *partheneion* (Sieb. et De Vries) Baker from continental plant because the former stem is glabrous.

Conservation status

There is no conservation status of this plant except. The number of individuals in Russia species populations is declining noticeably due to the use of *Lilium bushianum* meadows beneath farmland. Some populations need to be conserved.

Ethnic use

The bulbs are medicinal and edible in East Asian countries (China, Korea and Japan). The cultivars are commercially used in horticulture and ornamentals.

Written by Vyacheslav Yu. Barkalov

© Vyacheslav Yu. Barkalov

Lonicera praeflorens Batal.

Caprifoliaceae

- 早花忍冬 [Zao hua ren dong]
- ハヤザキヒョウタンボク (早咲瓢箪木) [Hayazaki-hyotanboku]
- 올괴불나무 [Ol-goe-bul-na-mu]
- Жимолость раннецветущая [Zhimolost rannetcvetuczaya]

Description

Deciduous shrubs, up to 2–2.5 m tall. Winter buds with a pair of acute, cartilaginous outer scales covering membranous inner scales. Young branches usually with long spreading hairs. Petiole 3–5 mm, densely villous. Leaf blade broadly ovate, 1–7.5 × 0.9–4.5 cm, both surfaces densely appressed pubescent, base broadly cuneate to rounded, margin ciliate, apex acute to apiculate. Inflorescences axillary paired flowers and at base of new shoots, flowers opening early in season; peduncle very short, usually concealed by bud scales at anthesis, to 1.2 cm at fruiting stage, usually glabrous; bracts broadly lanceolate, 3–7 mm, margin often ciliate and glandular; bracteoles absent. Paired ovaries free, suborbicular and usually glabrous. Calyx cupular, sometimes shallowly lobed, ciliate. Corolla yellowish white to pink, sub-regular, funnelform, ca. 1 cm, outside glabrous, deeply lobed; lobes erect to recurved, oblong, 6–7 mm, apex obtuse. Carpels globular-ellipsoid, 5–11 mm long, 4–8 mm in diameter, orange-red, with a bluish waxy coating. Red berries, globose, 6–8 mm in diameter; seeds brownish, oblong, ca. 4.5 mm, smooth. Flowering in April, fruiting in May to June.

L. praeflorens was included to subsect. *Praeflorents* (Nakai) Nedoluzh (Nedolouzhko, 1984; Sheiko, 2007). Hsu and Wang (1988) included *L. praeflorens* in subsect. Fragrantissimae. *L. praeflorens* is characterized with a 2-flowered dichasium and flowers in spring when leafless, corolla with a shot tub and almost right round dissected limb sticking out about 1.5 times longer than the tube (Nedolouzhko, 1984). Japanese plant is recognized as var. *japonica* Hara because its young twigs are glabrous while continental plant's ones are pubescent and has glandular hairs. Japanese plants prefer calcareous habitat.

Distribution and habitat

Russia (South of Primorskii Krai), China (Heilongjiang, Jilin, Liaoning), Korea (all provinces except Jeju-do), and Japan (Nedolouzhko, 1987; Yang *et al*., 2011). In fir-broad-leaved forest, pine-broad-leaved forest Korea; below 200–600 m in China (Yang *et al*., 2011), and to 2,200 m in Japan (Sheiko, 2007).

Conservation status

There is no conservation status of *L. praeflorens*. Referred to as honey-suckle edible-fruit in the USA in 1925 (USDA, ARS, National Genetic Resources Program [Online Database]).

Ethnic use

The species is decorative, successfully cultivated (Petukhova *et al*., 2011; Belaeva and Grishin, 2014) and recommended in landscape design (Malysheva, 2008, 2011). Therefore, it is necessary to pay attention to conservation of this species in natural habitats.

Written by Valentina A. Kalinkina

Maackia amurensis Rupr. & Maxim

Fabaceae

- 朝鲜槐 [Chao xian huai]
  山槐 [Shan huai]
  高丽槐 [Gao li huai]
- イヌエンジュ (犬槐) [Inu-enjyu]
- 다릅나무
  [Da-reup-na-mu]
- Маакия амурская
  [Maakiya amurskaya]

Description

Deciduous trees, up to 15 m tall and 60 cm in diameter. Bark green-brown, scaly. Branches purple-brown, lenticellate, hairy when young, then glabrous. Buds glabrous. Leaves 15–23 cm; leaflets 7–9(–11); petiolule 3–6 mm; leaflet blades ovate to obovate-elliptic, 3.5–6.8(–9.7) × (1–)2–3.5(–5) cm, papery, densely hairy when young, becoming glabrate, rarely sparsely villous near main vein abaxially, base broadly cuneate or cuneate, apex acute to acuminate. Racemes 5–9 cm. Rachis densely brown hairy. Flowers 0.8–1.2 cm. Pedicel (3.2–)4–6(–10) mm. Calyx campanulate, 2.1–4 mm, teeth short, densely yellow-brown appressed pubescent. Corolla white, 7–11 mm. Standard obovate, apex emarginate, narrowing to claw at base. Wings oblong, 2-auriculate at base. Ovary linear, densely yellow-brown hairy. Legumes dark brown, linear, 3–7 × 1–1.2 cm, pubescent or subglabrous, wing 0.4–1.2 mm. Stalk 5–10 mm. Seeds 1–4, yellow to yellow-brown, long elliptic, 6–8 mm. Flowering in June to July, fruiting in September to October.

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Distribution and habitat

China (Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Shandong), Japan (Hokkaido, Honshu, Shikoku, Kyushu), Korea (all provinces), and Russia (Primorskii Territory, Khabarovskii Territory, and Amur Region). This species occurs in wetlands along fertile river and broad-leaved forest on hill slopes (300–900 m).

It has been recorded that *M. amurensis* subsp. *buergeri* (Maxim.) C. K. Schneid has been discovered in Russia, North Korean, and Japan. Specimens of this species have not been announced in these countries. In flora of Manchuria plants, this species is considered as the only characteristic species of Fabaceae.

© Jin Yonghuan

Ethnic use

In China, *Maackia amurensis* has been used in buildings, equipment, and tools. Its bark has medicinal uses. For example, *Maackia amurensis* is effective for treating liver diseases and cholecystitis. In addition, its barks can diminish inflammation and analgesia, increase appetite, and control bleeding and tanning. The bark fiber can make paper or spun rayon material. According to northeast resource plant manual, the bark account for a proportion of 11–15% tannins. Bark collection shall be carried out when combining with the logging. The collection of leaves should be carried out in summer or in autumn. It propagates by either seed or root.

Written by Cao Wei

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Manglietia patungensis Hu

Magnoliaceae

巴东木莲
[Ba dong mu lian]

Манглиетия замечательная
[Manglietiya zamechatelbnaya]

The species *Manglietia patungensis* was described in 1951 (Hu, 1951), and has no other name.

Conservation status

The distribution area of *Manglietia patungensis* is narrow. Natural reproduction is declining due to human activities. The species is facing extinction.because the number of wild plants is decreasing. It is classified as a national second-order protected species, indicating a rare and endangered plant. The unchecked utilization of *Manglietia patungensis* by human beings and habitat fragmentation are the main causes of its endangered status; also, much of the existing population cannot naturally regenerate (Li *et al.*, 2004; Li & Guo, 2014).


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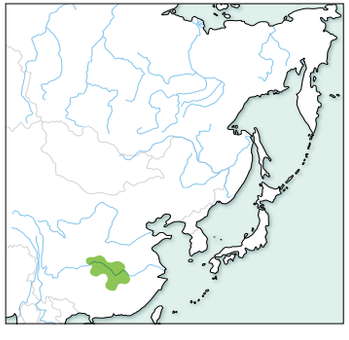
Description

Trees, grows up to 25 m tall. Bark pale, grayish brown or reddish in color. Twigs grayish brown. Leaf blades obovate-elliptic, thinly leathery, with both surfaces glabrous; the abaxial surface pale green; the adaxial surface green and glossy; midveins abaxially prominent; bases cuneate; apexes caudate-acuminate. Flowers 8.5–11 cm in diamater, quite fragrant. Petals 9, white; the outer petals 3, narrowly oblong, nearly leathery, with obtuse apexes; the middle and inner tepals obovate and fleshy. Anthers purplish red, exserted, forming a ca. 1 mm mucro; thecae adnate at base; apexes slightly free. Gynoecium conic; carpels not abaxially furrowed; ovules 4–8 per carpel. Fruit pale purplish red, terete-ellipsoid; mature carpels dotted on exposed side. Flowering in May to June, fruiting in July to October.

Distribution and habitat

China (Chongqing, W Hubei, NW Hunan, and E Sichuan). It grows in forests.
The geographical distribution range of *Manglietia patungensis* is between 28°47′10″and 30°51′53″N latitude, and between 107°9′and 110°38′9″E longitude; it grows at altitudes of 374–1,029 m.

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Ethnic use

Manglietia patungensis is a rare ornamental landscape tree species. It is also a useful afforestation species because of its fast growth, straight trunk, sturdy material, and easy processing. Its bark is used medicinally as a substitute for *Magnolia officinalis*.

Written by Ning Zulin

Meehania urticifolia (Miq.) Makino

Lamiaceae

- 荨麻叶龙头草
[Qian ma ye long tou cao]
- ラショウモンカズラ (羅生門蔓)
[Rashomon-kazura]
- 벌깨덩굴
[Beol-kkae-deong-gul]
- Михения крапиволистная
[Mikhenia krapivolistnaya]

Description

Perennial herbs with lodge stems up to 35 cm tall. Short rhizome and creeping, long whip-like shoots, able to take root at nodes. Leaves opposite, petioles 2–5 cm long; leaf blades up to 5 cm long and 3.5 cm wide, cordate-ovate, base truncated or rounded at the apex acute, crenate, bottom with scattered soft hairs. Flowers 2-5, usually at the beams, placed at the top of generative shoot, large and bluish purple, sitting on short stalks. Bracts up to 15 mm long, ovate or ovate-lanceolate, large, leaf-shaped, slightly serrated and fringed, hairy. Calyx ca. 1 cm long, narrow at first, later expanding the top, bell-shaped, obliquely cut, somewhat membranous, light green, with short blunt teeth unequal, ending with soft spines softly pubescent on veins, drip-glandular. Corolla two-lipped, 3–5 cm long, bluish purple, with dark stripes on the lower lip, outside slightly pubescent. Fruits 1–3 mm long, ovoid, and slightly pubescent. Flowers in May and June, fruiting in July and August.

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Distribution and habitat

Russia (only Southern part of Primorskii Krai), Northeast China (Jilin, Liaoning), Korea, and Japan (Honshu). In Russia it grows in damp coniferous, mixed and deciduous mountain forests, on wet rocks (Probatova, 1995). In China in mossy areas of mixed and coniferous forests (Li and Hedge, 1994).

Conservation status

This is very rare species in the Southern part of the Primorskii Krai (Russia) located on the northern boundary and known only from the some locations. *M. urticifolia* has been included in the Red Data book of Primorskii Krai (2008).

Various authors have identified this species under different names: *Dracocephalum urticifolium* Miquel, *Cedronella urticifolia* (Miquel) Maximowicz; *Glechoma urticifolia* (Miquel) Makino (Li and Hedge, 1994; Probatova, 1995).

Ethnic use

Plants are very decorative. It has being successfully cultivated in the Botanical Garden-Institute (Primorskii Krai, Russia) since 1950. The Japanese name, rashomon-kazura is derived from an old story that a Samurai master, Watanabe-no-tsuna, lived in the tenth century, cut off the arm of devil at Rashomon Gate of the palace. The flower shape symbolizes the arm. Kazura means vine in Japanese.

Written by Elena A. Pimenova

Michelia guangdongensis Y.H. Yan, Q.W. Zeng & F.W. Xing

Magnoliaceae

广东含笑
[Guang dong han xiao]

Михелия длиннозаострённая
[Miheliya dlinnozaostryonnaya]

Description

Shrubs or small trees. Bark grayish brown. Young twigs and buds densely reddish brown, appressed, and pubescent. Petioles densely reddish brown and villous, without a stipular scar. Leaf blades obovate-elliptic to obovate, leathery, abaxially reddish brown, appressed, and villous, adaxially dark green and glabrous, with bases rounded to broadly cuneate, margins slightly revolute, and apexes rounded to shortly acute. Flower buds oblong, densely reddish brown, appressed, and villous. Flowers fragrant. Tepals 9-12, white with greenish bases; the outer 3–5, ovate-elliptic; the middle 3 or 4, elliptic to obovate-elliptic; the inner 3, elliptic. Stamens 50-70, pale green with purplish red filaments. Gynophores green and puberulous; the gynoecium green, terete, reddish brown, and pubescent; styles purplish red, 1–3 mm long, and curved outward. Flowering in March.

Distribution and habitat

China (Yingde of Guangdong). It grows in in thickets or moss forests at the peak of Mulongding at altitudes of 1,200–1,400 m.

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The species *Michelia guangdongensis* was described in 2004 (Yan *et al*., 2004), and has no other name.

Conservation status

Michelia guangdongensis is only found in Yingde city, Guangdong, China. At present it is still in a wild state. There is no conservation status regarding this useful *Michelia* species.

Ethnic use

Leaf blades are abaxially reddish brown, appressed, and villous, with a rusty gloss, and the plant flower white with a delicate fragrance. Thus, this is a rare ornamental landscape species.

Written by Ning Zulin

Micromeles alnifolia (Siebold & Zucc.) Koehne

Rosaceae

- 水榆花楸 [Shui yu hua qiu]
  原变种 [Yuan bian zhong]
- アズキナシ (小豆梨) [Azuki-nashi]
- 팥배나무 [Pat-bae-na-mu]
- Мелкоплодник ольхолистный [Melkoplodnik olholistnyi]

Description

Trees up to 20–25 m tall. Branchlets dark reddish brown and puberulent when young, dark grayish brown and glabrous when old, terete, with white lenticels; buds ovoid, 2.5–5 mm, spherical or ovoid, brown, naked, at the very top of the slightly hairy; scales several, dark reddish brown, glabrous. Leaves simple; petiole 10–12(30) cm, glabrous or slightly puberulent; leaf blade 5–10(11) × 3.5–7.5 cm, ovate, ovate-elliptic or oblong-elliptic, pointed, base rounded or wedge-shaped, sometimes heart-shaped, serrated or shallowly toothed, dark-green, shiny, naked and only on the main veins puberulent, slightly hairy to hairless; lateral veins of leaf have 6–10(–14) pairs, nearly parallel and terminating in marginal teeth, raised abaxially; both surfaces glabrous or abaxially puberulent along veins, base broadly cuneate to rounded. Bracteoles 2–4 mm long, linear-subulate, with long-white puberulent, falling. Sepals 2 mm long, triangular, white-tomentose inside, outside, velvety, falling after flowering. Corolla up to 8 mm in diameter. Petals ovate or oblong-ovate, obtuse or notched, with nails, white, inside white puberulent.

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Stamens 4–6(7) mm long; anthers yellow. Carpels 8–12 mm long, oblong to almost spherical, red with a thick glaucous and scattered pale brown lenticels; styles 2, not exceeding stamens, glabrous, connate basally; stigmas expanded and hairy; ovaries 2-loculed. Fruit red, oblong, ovoid-oblong, or globose, 1–1.4 cm × 7–10 mm, without or with few minute lenticels, caducous sepals, leaving a small annular scar; seeds pale brownish orange, linear-oblong. Flowering in May, fruiting from September to October.

Distribution and habitat

Russia (South of Primorskii Krai, Southern part of Sakhalin Island, Southern Kuril Islands), China (Anhui, Fujian, Gansu, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Zhejiang), Japan (Hokkaido, Honshu, Kyushu, Shikoku) and Korea (all provinces) (Ohwi, 1965; Yakubov *et al*., 1996; Lu and Spongberg, 2003). Growing solitary or in small groups with *Abies holophylla* Maxim. Others live in woods, specifically, in the slopes, gullies, and thickets of coniferous-broad-leaved forests; 500–2,300 m.

Conservation status

There is no conservation status of *M. alnifolia*. The species is decorative and successfully cultivated. Therefore, it is necessary to pay attention to conservation of this species in natural habitats.

Ethnic use

Wood can be used for building, fruits are edible.

Written by Valentina A. Kalinkina

M. alnifolia has previously been attributed to the genus *Crataegus* L. as a *Crataegus alnifolia* (Siebold & Zuccarini), to genus *Aria* as *Aria alnifolia* (Siebold & Zuccarini) Decaisne or *A. tiliaefolia* Decaisne (Render, 1916) to genus *Pyrus* L. as a *Pyrus alnifolia* (Sibold & Zuccarini) Franchet & Savier (Lu and Spongberg, 2003), and *P. miyabie* Sargent (Rende, 1916). There are two forms of *M. alnifolia* in the USSR flora (Pojarkova, 1939). *M. alnifolia* f. *typical* C.K. Schn is with leaves that are ovate shot pointed or oval with a rounded wedge-shaped base. *M. alnifolia* var. *tillifolia* (Decne.) (C. K. Schn.) has leaves with a heart-shaped base. Now, *M. alnifolia* has been categorized as *Sorbus alnifolia* (Siebold & Zucc.) (C. Koch) (Cherepanov, 1981) or *Sorbus alnifolia* var. *alnifolia* (Lu and Spongberg, 2003). However, some authors consider this a different species and adds *M. alnifolia* to the genus *Micromeles* (Yakubov *et al*., 1996) which have the same morphological characteristics as our structure. The main morphological features of *M. alnifolia* are ovate to elliptic-ovate leaf blades, margin of leaf usually not-lobed, irregularly sharply doubly serrate. Fruit oblong or ovoidoblong, rarely subglobose. $2n = 32$ (Rudyka, 1990). According to ITS sequence (Li *et al*., 2012) *Micromeles* is polyphyletically situated in *Aria* clade and distinctly separated from *Sorbus* s. str.

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Mucuna birdwoodiana Tutch.

Fabaceae

- 白花油麻藤 [Bai hua you ma teng]
- Мукуна Бердвуда [Mukuna berdwuda]

© Ning Zulin

Description

Large woody vines. Leaves pinnately 3-foliolate; leaflets almost leathery; terminal leaflets ovate, elliptic, or slightly obovate. Inflorescences seen on old branches or axillary; flowers zygomorphic, large, and beautiful; calyx campanulate and hairy; corollas white or greenish white. Legumes linear but markedly constricted between seeds, woody, densely pubescent, with both margins having narrow marginal wings. Seeds almost reniform. Flowering in April to June, fruiting in June to November.

Distribution and habitat

China (native to southern; Fujian, Guangdong, Guangxi, Guizhou, Jiangxi, and Sichuan). It grows in dense or open woodlands, rocky areas, moist hillsides and valleys at altitudes of 800–2,500 m.

The species *Mucuna birdwoodiana* was described in 1904 (Tutcher, 2004), and has no other name. *M. birdwoodiana* is readily distinguished from other species of the genus *Mucuna* by its narrow, leathery, glossy, often glabrous leaves that lack persistent stipels, white flowers, often drying pale green, with conspicuously pubescent margins at their apexes, and large, woody, narrowly linear, velvety, pubescent legumes with narrow marginal wings. It is not easily confused with any other species.

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Conservation status

Distribution region and density tend to decrease with decreasing vegetation density and increasing altitude. Potential distribution estimation indicated that *M. birdwoodiana* may grow in Guangdong, Guangxi, Fujian, Hong Kong, Macao, Yunnan, Hainan, Jiangxi, Sichuan, Guizhou, Xizhang, Hunan, and Zhejiang provinces. Preserving and utilizing germplasm resources should be considered in the regions where this species is found.

Ethnic use

Mucuna birdwoodiana has long been used as a traditional Chinese medicine called "ji-xue-teng." The vine stems of this plant are effective in promoting blood circulation or relieving stasis and have been used to treat pain or numbness of the wrists, knees or other joints and irregular menstruation. It is also an ornamental vine; some artistic descriptions liken its flowers to hundreds and thousands of birds flying in crowds.

Written by Yu Qianxia

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Mukdenia rossii (Oliv.) Koidz.

Saxifragaceae

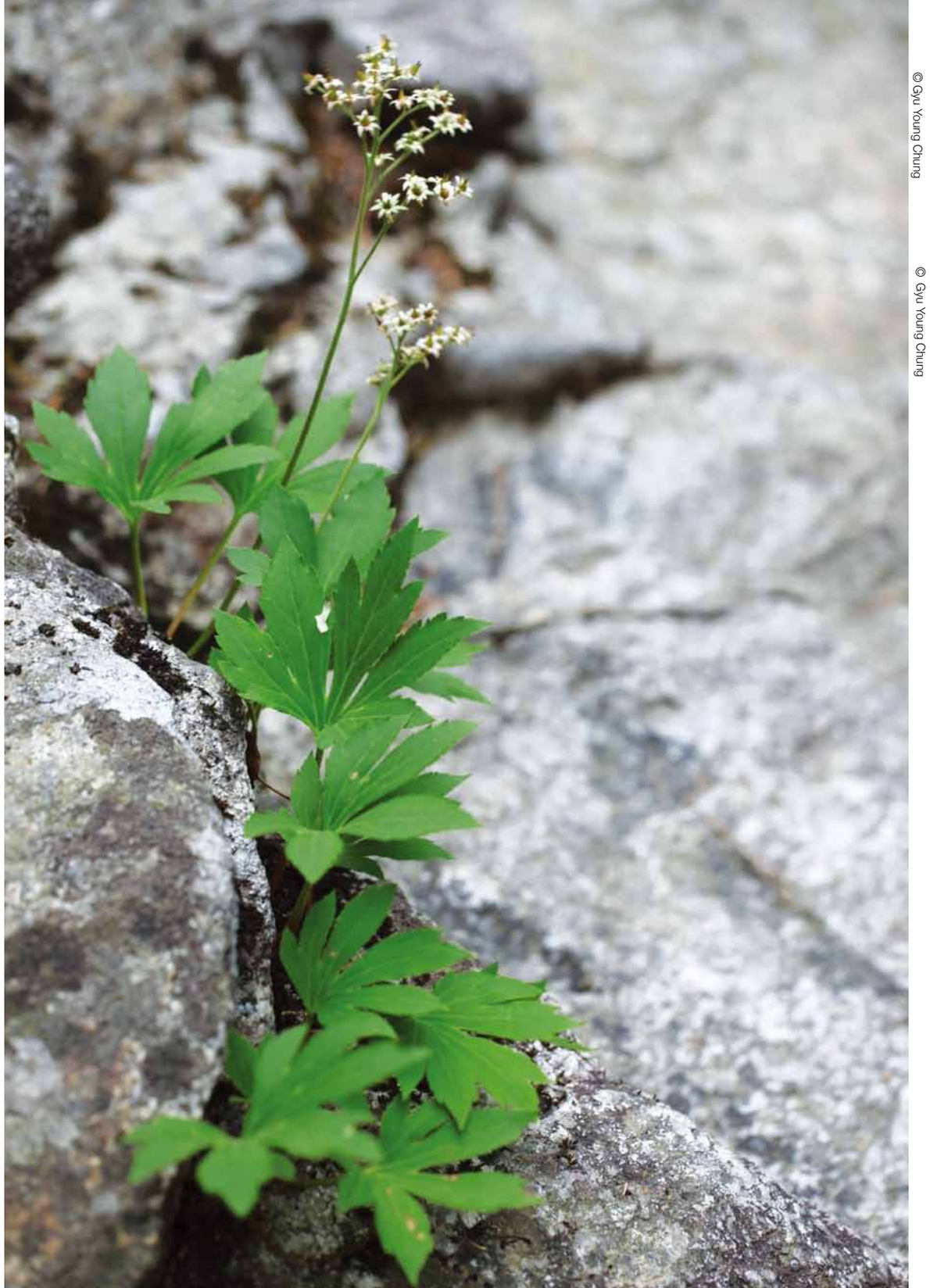
- 槭叶草 [Qi ye cao]
- イワヤツデ (岩八手) [Iwa-yatsude]
- 돌단풍 [Dol-dan-pung]
- Клёнолистник Росса [Klyonolistnik rossa]

Description

Perennial herbs. Rhizomes tuberous root, thick, dark brown, scaly. Leaves all basal, broadly ovate to orbicular, palmately cleft or lobed, base cordate, margins incised or serrate, long petiolate, surface shiny, younger leaf sometimes red-brown, base truncate, cordate, acute, acute apex. Cymose inflorescences, panicle or panicle-cyme, scape glandular hairy, thick, pedicels glandular and hairy. Flowers bisexual, white, sepals and petals 5–6, stamens shorter than petals, carpels 2, half-inferior ovary, styles 2, many ovules. Fruit capsules recurved, bi-valve and ovate. Flowering in April to June.

Distribution and habitat

China (North and Northeast) and Korea (Gyeonggi-do, Gangwon-do, Chungcheongbuk-do, Chungcheongnam-do, Gyeongsangbuk-do, Gyeongsangnam-do, Jellabuk-do, Pyeonganbuk-do). Wet cliffs and rock crevices.



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Mukdenia Koidz. is endemic to Northeast Asia, only occurring in China and Korea. Natural populations of two species have been reported in Korea (Qian *et al*., 2003). The floristic elements of forests from Northeast to Southwest China are regarded as the birthplace of the family Saxifragaceae. The genus (or family) grow in Shengyang, up to the border of North Korea (Wu *et al*., 2007). The analysis of matK sequences and cpDNA restriction sites reveal similar patterns of relationships within the *Darmera* genera. In both analyses, *Mukdenia* and *Bergenia* are the closest associates and are the sister group to a clade comprising *Rodgersia*, *Darmera*, and *Astilboides* (Johnson & Soltis, 1994). *M. rossii* exhibits high morphological variation in plant size and leaf shapes. Pan & Soltis (2001) report vague species delimitation between the species and the Korean endemic *M. acanthifolia* (leaf margins not cleft).

Ethnic use

It is used as an ornamental plant in Korea.

Written by Gyu Young Chung

Oplopanax elatus (Nakai) Nakai

Araliaceae

- 刺参 [Ci shen]
- チョウセンハリブキ(朝鮮針蕗) [Chosen-haribuki]
- 땃두릅나무 [Ttat-du-reup-na-mu]
- Заманиха высокая [Zamanikha vysokaya]

Description

Deciduous shrubs grow to 1 m tall, and sometimes even up to 2–3 m tall, hermaphroditic. Stout branches prostrate and rooting. Old plant branches few prickles, with light gray bark, whereas young plants dense yellow-orange prickles 3–10 mm length. Petiole 3–10 cm, densely setose. Leaf blade suborbicular to oblate, 15–30(–44) cm wide, both surfaces pubescent or setose on veins, 5–7-lobed; lobes triangular or broadly triangular, base cordate, margin irregularly serrate, apex acute to slightly acuminate. Inflorescence terminal, a raceme of umbels, 8–25 cm, densely setose toward base, stiffly pubescent throughout; umbels 0.9–1.3 cm in diam., 6–12-flowered; proximal peduncles ca. 2.5 cm, distal ones short or flowers borne directly on primary axis. 5-toothed glabrous calyx. Petals yellowish-green, lanceolate. Styles united to middle, slender, apically recurved. Fruit yellow-red at maturity, obovoid, sometimes globose, 0.4–1.2 cm, slightly compressed in the dry state, with longitudinal grooves and two flat yellow seeds. Flowering in June to July, fruiting in September.

Oplopanax (Torr. & A. Gray) Miq. is a small genus with a disjunctive area. It is a member of the ancient angiosperm plant family Araliaceae. It includes three species: *Oplopanax horridus* (Sm.) Miq., *Oplopanax japonicus* Nakai, and *Oplopanax elatus* (Nakai) Nakai. *O. horridus* is distributed throughout the Pacific Northwest of North America, while *O. japonicus* is endemic to Japan, including Hokkaido, Honshu and Sikoku (Cholina *et al*., 2012; Shikov *et al*., 2014). *O. elatus* is priority name for a species common in the south of Primorye (Russia), in Korea and China (Eastern Jilin) (Nakai, 1927; Klyuykov and Tichomirov, 1987; Xiang and Lowry, 2007).

Genetic and genotypic variation of Russian populations of *Oplopanax elatus* was studied. The value of genetic variation indices was shown to be low and comparable with the data reported for rare plant species and the representatives of the family Araliaceae. The main factors responsible for the polymorphism level are the evolutionary history of the species and genetic drift. The level within the inter-population genetic variability is substantially higher, compared to the values reported for species with vegetative reproduction. These results suggest a certain contribution of seed propagation in species formation (Reunova *et al*., 2010; Kholina *et al*., 2010; Kholina *et al*., 2012).

Distribution and habitat

Russia (Far East (Southern and Eastern part of Primorskii Krai)), Korean Peninsula (Hamgyeongbuk-do, Hamgyeongnam-do, Gangwon-do, Ggyeongsangnam-do, Jeollabuk-do, Jeollanam-do), China (Eastern part of Jilin Province). In mixed, dark-coniferous and stone birch forests, from 500 to 1,600 m, mainly on the northern slopes, on rocky scree, and sometimes along streams in the upper reaches.

Conservation status

Oplopanax elatus is rare endangered species in the Russian Far East and has been included in the Red Data Book of Russian Federation (2008) and Red Data Book of Primorskii Krai (2008). This species is conserved in The Land of the Leopard National Park, Lazovskii, Ussuriyskii and Sikhote-Alin Reserves. The main limiting factors of species distribution and survival are low seed regeneration, mass harvesting and fires. In Korea, *Oplopanax elatus* is an endangered species (Korea Forest Service, 2008.) due to damaged habitats being destroyed by weather changes. The survey of habitats and *in situ* and *ex situ* conservation of genetic resources are needed.

Ethnic use

Oplopanax elatus is used for the treatment of different disorders in the medicine systems of China, Russia, and Korea, and was designated in Russia as a classical adaptogen. The plant is a potential source of saponins, flavonoids, anthraquinones, terpenes, and other active compounds. Experimental studies and clinical applications have indicated that *O. elatus* possesses a number of pharmacological activities, including adaptogenic, anti-convulsant, anti-diabetic, anti-fungal, anti-inflammatory, anti-oxidant, blood pressure modulating, and effects in reproductive functions (Shikov *et al*., 2014).

Written by Elena A. Pimenova

Panzerina canescens (Bunge) Sojak

Lamiaceae

- 灰白脓疮草
[Hui bai nong chuang cao]
- Орогдуу нохойн-хэл
[Orogduu nokhoin-khel]
- Панцерина сероватая
[Pantserina serovataya]

Description

Perennial herbs with woody taproots. Stems many, 30–35 cm, sparsely villous. Petiole 2–4.5 cm. Leaf blade broadly ovate, 3–4 cm wide; stem leaves palmately 5-partite from 1/2 its length nearly to base, villous, abaxially with scattered yellowish glands; verticillasters 8–14-flowered, in long terminal spikes; floral leaves 1–3 cm wide, 3-partite; bracteoles rigid, linear-subulate, spreading, ca. 1 cm, spinescent. Calyx tubular-campanulate, ca. 1.6 cm, sparsely pubescent, tube ca. 1.1 cm; teeth narrowly triangular, apex long spinescent, anterior teeth 6.5–7.5 mm, posterior teeth ca. 4.5 mm. Corolla 2.5–3 cm, long villous; tube ca. 1.1 cm, upper lip straight, oblong, galeate, lower lip oblong, subpatent, middle lobe larger, obcordate, 2-lobulate, lateral lobes ovate. Nutlet black, 2.5–2.8 mm. Flowering in July, fruiting in July to August (Li and Hedge, 1994).

Distribution and habitat

Mongolia (Khovd, Mongolian Altai, Middle Khalkh, Depression of Great Lakes, Gobi Altai), China (Xinjiang), Russia (Southern part of Siberia). Locus classicus is in Eastern Altai. Its habitats include waterside pebbles, rocks, screes in mountain-steppe, and desert-steppe (Grubov, 2001).

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Panzerina canescens (Bunge) Sojak, is subendemic to Mongolia *Panzeria canescens* Bunge is considered as its synonym (Urgamal *et al*., 2014).

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Ethnic use

Its taste is sweet with oily potency. It has been used as a diuretic. It has been used to treat dysmenorrhia, epilepsy, rheumatism, podagra, eye diseases, ulcers, and inflammation of the uterus. It has also been used for liver, stomach, heart, and intestinal diseases. It is an ingredient of the following traditional prescription: Lider-3 (Ligaa *et al*., 2015).

Written by Baltai Oyuntsetseg and Bazarragchaa Badamtsetseg

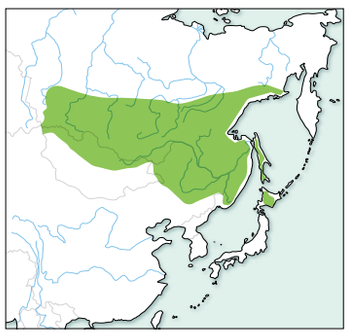
Patrinia sibirica (L.) Juss.

Valerianaceae

- 西伯利亚败酱 [Xi bo li ya bai jiang]
- チシマキンレイカ (千島金鈴花) [Chishima-kinreika]
- Сибир Сэрхэлэг [Sibir serkheleg]
- Патрэния сибирская [Patrenia sibirskaya]

Description

Perennial herbs, 5–30 cm tall. Taproot clavate, 1.5 cm in diameter. Caudies brown, simple or branching. Stems leafless or with a single leaf pair, pubescent, hairs in bilateral rows. Radical leaves and the leaves of sterile shoots stemmed from narrow linear, edged to spatulate-gear and pinnatifid orpinnatisect, glabrous or sparsely villous. Stem leaves sessile, 1.5–6 cm, and pinnatifid. Branches of inflorescence glandular pubescent. Corymbiform inflorescence, 1.5–4 cm in diameter at anthesis. Calyx five lobes to 0.2–1.8 mm long. Corolla yellow, 5–6 mm in diameter, regular, funnel form to campanulate, with a five-blade contour. Tube 2.5–3.2 mm, 2.5–3.2 mm in diameter distally. Stamens 4; longer filaments ca. 4.5 mm, shorter filaments ca. 4 mm; anthers oblong, ca. 1.5 mm. Ovary inferior, ovoid-oblong, 0.5–1.5 mm; style 3.3–3.7 mm; stigma obliquely capitate, ca. 0.6 mm in diameter. Achenes narrowly ovoid, 3–4(–6) mm, sterile locules glabrous or hispidulous distally, fertile locule densely hispidulous on margin and proximally; bracteoles rounded or three-blade, 1.5–2 times as long as the fruit. Flowering in May to June (Hong *et al*., 2011).



The morphology of this species is different between Russian and Japanese plants; Japanese one has more narrow, deeply dissected and thick leaves.

Distribution and habitat

Russia (from European part to Far East), Northeastern China (Heilongjiang, Nei Mongol, NW Xinjiang and N Xinjiang), Mongolia (Northern provinces) and Japan (Hokkaido) (Ohwi, 1965; Wild flowers of Hokkaido, 1985). *Patrinia sibirica* grows in steppe and meadow rocky and stony mountain slopes, stone fields, screes, rocks, pebble banks of brooks, larch forests, forest-steppe and alpine belts; 1,700–2,000 m.

Conservation status

This species is no conservation status in Russia but categorized as “EN” in Japanese Red Data Book.

Ethnic use

Patrinia sibirica is used in folk medicine as a soothing, regenerating, anti-fungal, and cleansing agent to address liver and kidneys problems, fever, and tuberculosis.

Written by Marina N. Koldaeva

Philadelphus tenuifolius Rupr. & Maxim.

Hydrangeaceae

- 薄叶山梅花
[Bo ye shan mei hua]
- ウスババイカウツギ (薄葉梅花空木)
[Usuba-baika-utsugi]
- 얇은잎고광나무
[Yal-beun-ip-go-gwang-na-mu]
- Чубушник тонколистный
[Chubushnik tonkolistnyi]

Description

Shrubs, up to 1–3 m tall. Branchlets from previous year gray-brown; those of the current year brownish, pubescent. Leaves opposite, top with sunken veins below with sharply prominent veins; petiole 3–8 mm; leaf blade ovate or ovate-elliptic, 3–11 × 2–6 cm, abaxially usually villous along veins, base subrounded or broadly cuneate, margin remotely serrate or dentate, apex acute or acuminate; leaf blade on flowering shoots ovate or ovate-elliptic, 3–6 × 2–3 cm, base rounded or obtuse, margin subentire, apex acuminate. Racemes 3–7(–9) flowered; rachis 3–5 cm, sparsely hairy; pedicels 3–10 cm. Calyx tube yellowish green when dry, sparsely villous; lobes ovate, ca. 5 mm. Corolla discoid; petals 4–5, white, ovate-oblong or suborbicular, 1–1.5 × 0.6–1.3 cm, apex rounded, slightly 2-lobed. Four bulging capsules of fruits, dehiscent by partitions obconical, 4–7 × 4–6 mm. Seeds numerous, light brown, 2.5–3 mm, shortly tailed. Flowering in June to July, fruiting in September to October (Kharkevich, 1991; Shumei *et al.*, 2001).

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Some botanists accept *Philadelphus schrenkii* Rupr. et Maxim. or *P. tenuifolius* var. *schrenkii* (Rupr. et Maxim.) Ja. Vass. (Poyarkova, 1939; Kharkevich, 1991). However, this taxon is very close morphologically to *P. tenuifolius*, differing only in the dense leaves and larger flowers. Perhaps it is a form of *P. tenuifolius* inhabiting open spaces (Vorob'yev, 1968). Cherepanov (1995) did not accept *P. schrenkii* as a separate species.

Distribution and habitat

Russia (Far East (Primorskii Krai, South of Khabarovskii Krai, East of Amurskaya Oblast and South of Sakhalin Island)), Korea (all provinces), China (Heilongjiang, Jilin, Liaoning, Nei Mongol). It grows in Korean-pine-broadleaved forest valleys, rocky slopes, shaded rocks, and thickets; 100-900 m above sea level.

Ethnic use

P. tenuifolius have high ornamental value. This species is cultivated in many botanical gardens of the world and widely used in landscaping.

Written by Elena A. Pimenova

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Phtheirospermum japonicum (Thunb.) Kanitz

Scrophulariaceae

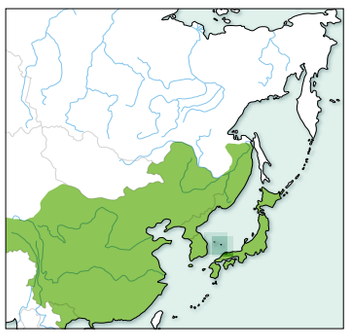
- 松蒿 [Song hao]
- コシオガマ (小塩竈) [Ko-shiogama]
- 나도송이풀 [Na-do-song-i-pul]
- Вшивосемянник японский [Vshivosemyannik yaponskii]

Description

Herbs annual, hemiparasite, 20–100 cm tall. Stems erect or curved and ascending, usually branched. Leaves opposite; petioles 0.5–2 cm, narrowly winged; leaf blades narrowly triangular-ovate, 1.5–5.5 × 0.8–3 cm, pinnately parted to feather-like segregations; pinnae narrowly ovate to ovate-orbicular, 4–10 × 2–5 mm, bases suboblique, margins double serrate or parted. Pedicels 2–7 mm. Calyxes 4–10 mm; lobes lanceolate, 2–6 × 1–3 mm, leaf-like, pinnately parted. Corolla pale red to purple-red, 0.8–2.5 cm, outside villous; lower lobes obtuse; upper lobes triangular-ovate. Stamen filaments basally pilose. Fruits (capsules) 6–10 mm. Seeds flattened, ca. 1.2 mm. Flowering in August to September.

Distribution and habitat

China (throughout China except Xinjiang), Japan (Hokkaido, Honshu, Shikoku, and Kyushu), Korea (All provinces), and Russia (southern continental part of Far East). Sunny meadows or shady places in thickets on mountain slopes, sometimes grow like weeds near roads (Park, 2007; Flora of China, www.eFloras.org).



Phtheirospermum japonicum (Thunb.) Kanitz (1878) is native to East Asia, and *P. chinense* Bunge is a synonym of the species (The Plant List, www.theplantlist.org; Flora of China, www.eFloras.org). However, this species is accepted as *P. chinense* Bunge in Russia (Ivanina, 1991; Cherepanov, 1995). The white flower form has been named *P. japonicum* f. *albiflorum* (Honda) Hara (Flora of Japan, www.foj.info). The genus has three species, occurring in East Asia, and *P. japonicum* (Thunb.) Kanitz is a species of this genus (Flora of China, www.eFloras.org). Molecular phylogeny of Orobanchaceae showed that *Phtheirospermum japonicum* has phylogenetically close relationships with *Pedicularis sylvatica*, *Castilleja*, *Triphysaria*, *Orthocarpus*, *Cordylanthus*, *Agalinis*, *Esterhazya*, *Macranthera*, *Seymeria*, *Aureolaria*, and *Lamourouxia* (McNeal *et al*., 2013). Molecular data also revealed that *Phtheirospermum* is not monophyletic and suggests *P. muliense*, *P. parishii*, and *P. tenuisectum* may be included in *Pterygiella* Oliver (1896), an endemic Chinese genus (McNeal *et al*., 2013).

Written by Kyong-Sook Chung

Phyllostachys pubescens Mazel ex Houzeau de Lehaie

Poaceae

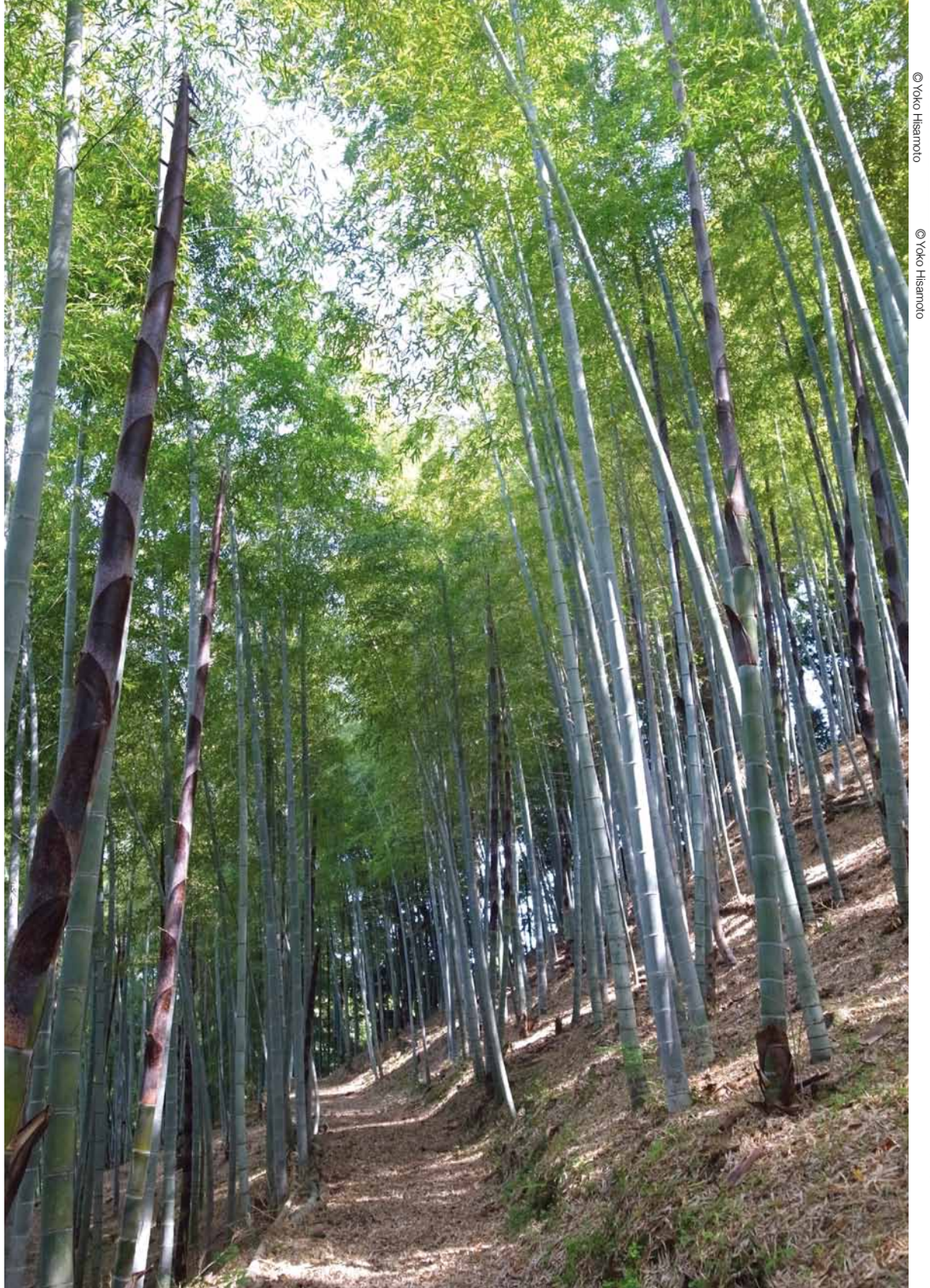
- モウソウチク (孟宗竹) [Mouso-chiku]
- 죽순대 [Juk-sun-dae]
- *Листоколосник опушенный* [Listokolosnik opushyonny]

Description

Culms up to 25 m long, 24 cm in diameter. Culm-sheaths coriaceous, blackly spotted, many-nerved, densely pilose with long brown hairs, rounded above and conical, 2–3 cm wide. Leaves lanceolate to narrowly lanceolate, rounded or obtuse at the base, acuminate at the apex, 6–10 cm long, 8–10 mm wide, glabrous above, puberulous with minute hairs near the base beneath. Spikes lanceolate, 5–7 cm long; spikelets usually 1-flowered, glumes one or two. Anthers 9 mm long. Ovary cylindrical, 2.5–3 mm long; style long, stigmas 3, filiform or rather feathery. Flowering in May and August by intervals of 67 years.

Distribution and habitat

China (Anhui, Fujian Guangdong, Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Sichuan, Taiwan, Yunnan, Zhejiang), Japan (from Kyushu to southern Hokkaido), Korea (cultivated). The species mainly grows on terrace and hilly areas near villages in Japan.



The species belongs to Bambusoideae of Poaceae, and the scientific name is synonym of *Phyllostachys edulis* (Carrière) J. Houzeau in China. The bamboo is composed of only one clone and somatic mutants.

Phyllostachys pubescens is native to China. It was introduced into Kagoshima Prefecture, southern Kyushu of Japan in 1746 (Suzuki, 1978). This species grows in a sunny and fertile place with gentle wind. It mainly propagates vegetatively from rhizomes. It had been determined that it would flower in May and August by intervals of 67 years (Watanabe *et al*., 1982). However, a molecular ecological study showed that a community originated from a single flowering event has multiple genets which have their own flowering time, causing a mixture of flowering and nonflowering culms in the community (Isagi *et al*., 2004). Abandoned forest of this species has been increased due to recent increases of importation of low-price foreign bamboos. Rapid expansion of *P. pubescens* forest negatively affects not only native plants, but also planted trees because this species grows tall and shades other plant species with long rhizome web.

Ethnic use

The species has been commonly cultivated throughout Japan as ornamentals, edibles, and bamboo materials. Young shoots of *P. pubescens* are popular edible plants not only for human but also for animals (e.g. wild boars) as a forage in spring.

Written by Ikutaro Tsuyama

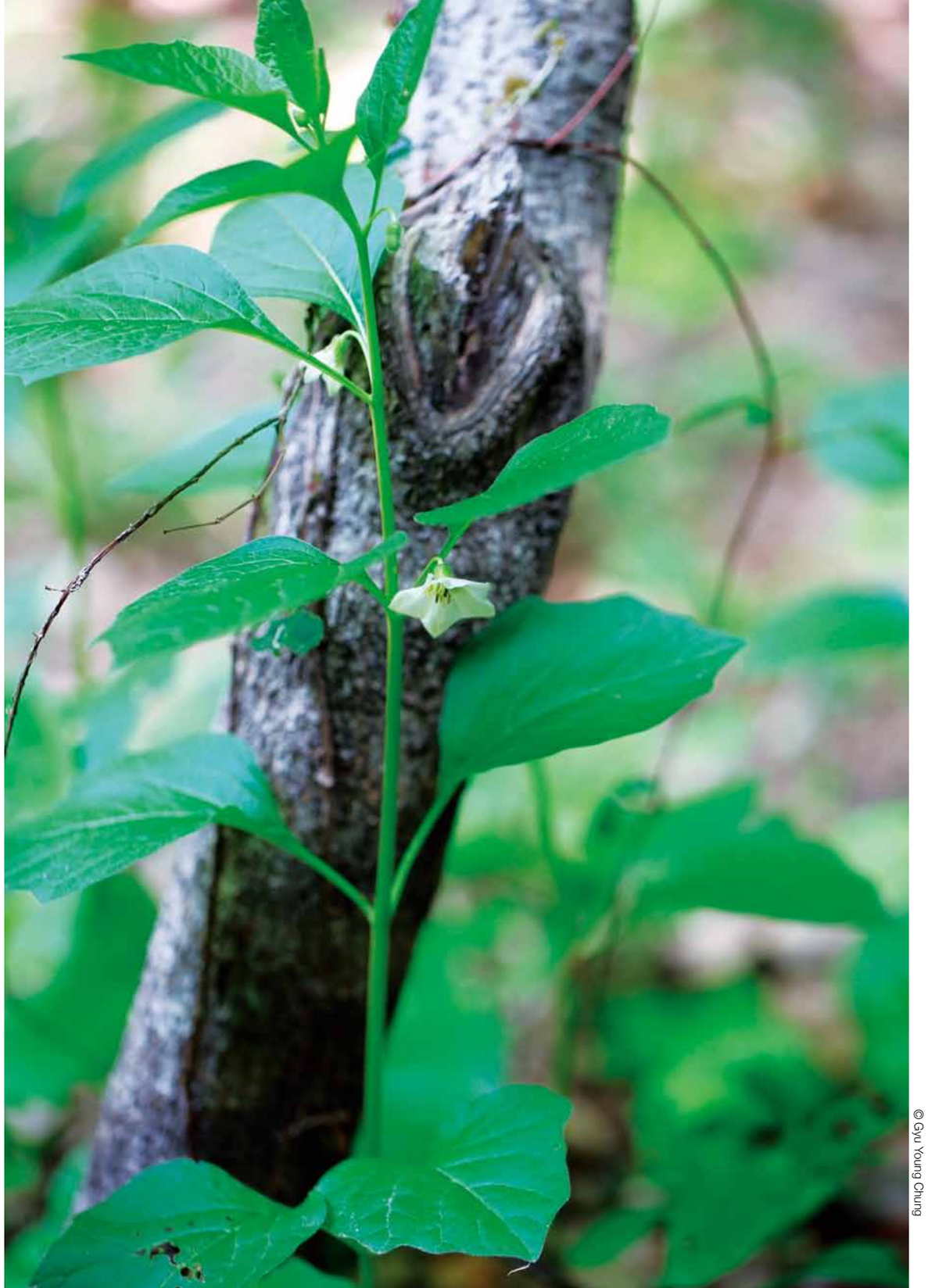
Physaliastrum japonicum (Franch. & Sav.) Honda

Solanaceae

- 日本散血丹 [Ri ben san xue dan]
- イガホオズキ (毬酸漿) [Iga-hozuki]
- 가시꽈리 [Ga-si-kkwa-ri]
- Физалиаструм японский [Fizaliastrum yaponskii]

Description

Perennial herbs, 30–70 cm tall. Stems erect, striate, glabrous or sparsely pubescent. Leaves alternate, membranae-like; petioles 0.5–3 cm long, sparsely pubescent; leaf blades oblong, 5–10 × 2–5 cm, apex acuminate, base acute, attenuate into petioles, margins entire, pilose, upper surface sparsely pubescent, lower surface sparsely pubescent on nerves, with a slightly raised midrib and 3–5 pairs of anastomosing slender lateral nerves. Flowers 1–3 in a fascicle at apex on node of sympodially branching stems, pendulous. Pedicels slender, 1–2 cm long, glabrous or sparsely pubescent. Calyxes ca. 4 mm long, 5 mm across, sparsely pubescent, shallowly 5-lobed; lobes widely deltoid, ca. 1 × 2 mm, short pubescent on margin. Corolla greenish white, ca. 15 × 20 mm, punctate outside, with 5 one-paired glands at middle of tube inside, shallowly 5-lobed; lobes widely triangular-ovate, obtuse, ca. 4 × 6 mm. Stamens 5, inserted near base of corolla tube, ca. 10 mm long. Fruit berry, ellipsoid, rarely globose, ca. 10 × 7 mm, enclosed by aging calyxes, green. Seeds compressed, broadly ellipsoid, ca. 1.5 mm long. Flowering in June to August, fruiting in August to September.



Physaliastrum Makino (1914) is composed of nine taxa distributed in Asia (Hong, 2007). *P. japonicum* (Franch. & Sav.) Honda occurs only in East Asia and *Leucophysalis japonica* (Franch. & Sav.) Averett and *P. japonicum* var. *occultibaccum* X.H. Guo & S.B. Zhou are synonyms of the species (The Plant List, www.theplantlist.org; Flora of China, www.eFloras.org). Lu (2008) noticed that *Physaliastrum echinatum* (Yatabe) Makino was treated in Japan as *Physaliastrum japonicum* (Franchet & Savatier) Honda, which is a different species. *Physaliastrum* was originally segregated from *Chamaesaracha* and has two species (*P. echinatum* and *P. savatieri*) distributed in Japan (Makino, 1914). Molecular data have not supported the genetic status of *Archiphysalis* and *Physaliastrum* (Axelius, 1996; Li *et al*., 2013). The genetic results indicate that *Physaliastrum* is not derived from a common ancestor (non-monophyletic group). Neither *Physaliastrum* nor *Archiphysalis* are members of *Leucophysalis*, *Chamaesaracha* or other genera, as had been suggested by previous several studies (Li *et al*., 2013).

Distribution and habitat

China (Hebei, Heilongjiang, Jilin, Liaoning, Shandong, Zhejiang), Japan (Honshu and Shikoku), Korea (all provinces), and Russia (Southern part of Primorskiy Krai). Grassy slopes and somewhat shady and wet forests (Lee, 1996; Hong, 2007).

Conservation status

In Japan, the species is in VU conservation status and considered as an endemic (Global Red List of Japanese Threatened Plants).

Written by Kyong-Sook Chung

© Gyu Young Chung

Picea jezoensis (Siebold & Zucc.) Carrière var. *jezoensis*

Pinaceae

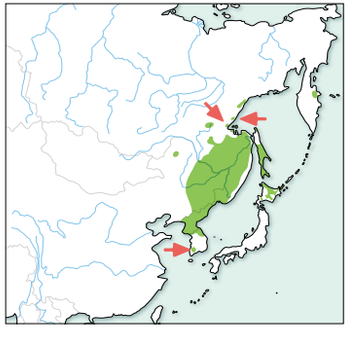
- 卵果鱼鳞云杉
[Luan guo yu lin yun shan]
- エゾマツ (蝦夷松)
[Ezo-matsu]
- 가문비나무
[Ga-mun-bi-na-mu]
- Ель иезская
[Yel uezskaya]

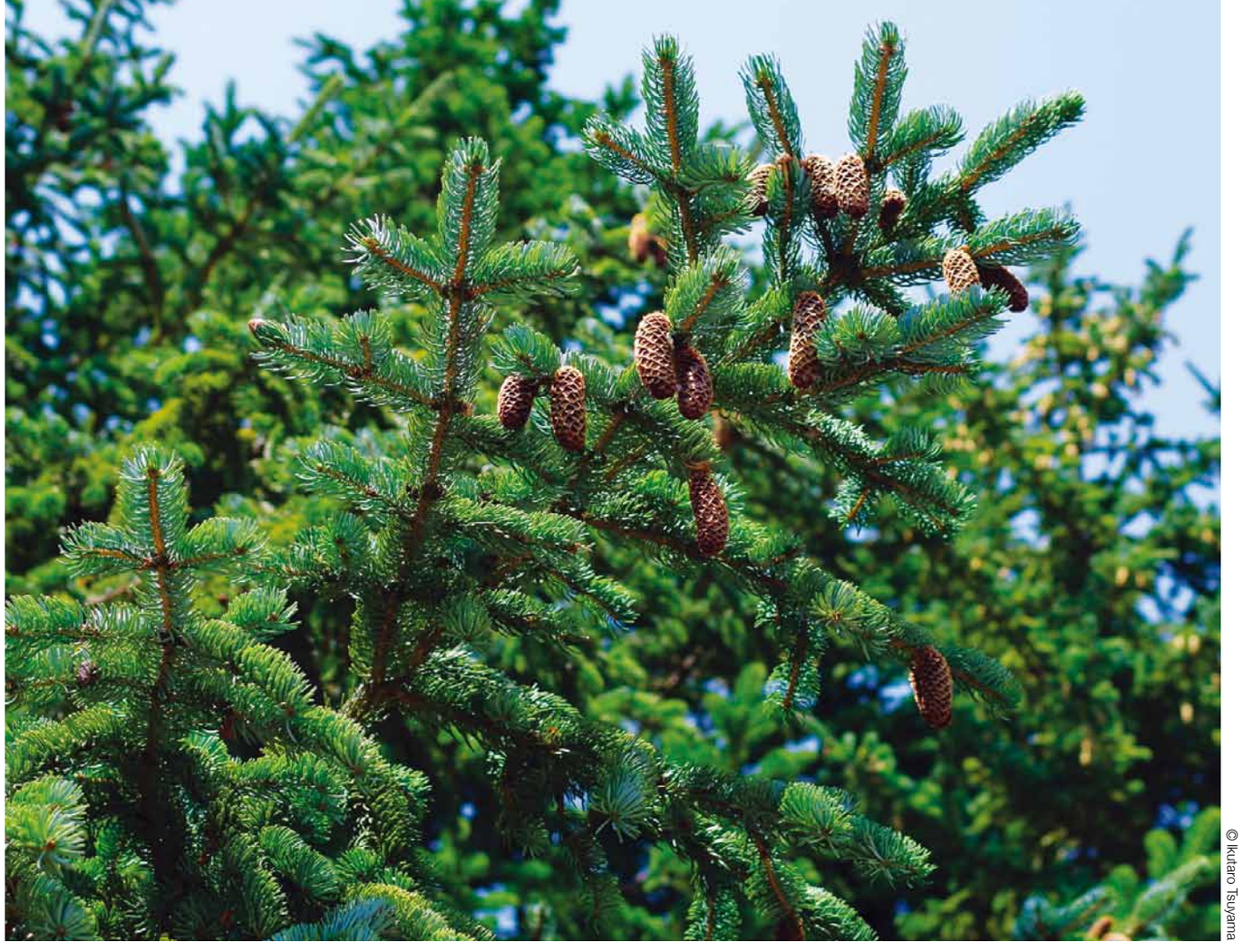
Description

Evergreen coniferous tree, up to 30–40 m tall and 100 cm in diameter. Fresh bark dark brown in color, weathering to gray. Leaves flat and slightly keeled, 1.0–2.5 cm long and 1.5 mm wide, shiny dark green with two white stomatal bands adaxially. Male strobili arecylindric and red-brown at 15–20 mm long and 6 mm across with numerous stamens. Female cones cylindrical, brown, and pendant at 40–80 mm long and 20 mm across, maturing from green to light yellowish-brown.

Distribution and habitat

Russia (Kamchatka, Sakhalin and maritime areas of Far East), Japan (Hokkaido), China (Heilongjiang, Jilin, Nei Mongol), Korea (North part, Gangwon-do, Jirisan of Jeollanam-do) (Krestov & Nakamura, 2002). Shallow root system with low nutrient demand enables the species to grow in large range of environment.





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Picea jezoensis var. *jezoensis* is one of three infraspecific taxa of *Picea jezoensis*, which consists of var. *jezoensis* (Yezo spruce), var. *hondoensis* (Hondo spruce), and var. *koreana* (Chosen spruce).

Picea jezoensis var. *jezoensis* is a dominant forest component in Hokkaido. It is associated with *Abies sachalinensis* and *Picea glehnii*. *P. jezoensis* var. *jezoensis* is likely to have spread from the Asian continent via Sakhalin through land bridges, whereas *P. jezoensis* var. *hondoensis*, which only grows in central Honshu of Japan might have colonized the area from the Asian continent via the Korean peninsula before early Pleistocene (Aizawa *et al.* 2007). The species broadly occurs in Hokkaido (from lowland to 1,500 m). The establishment of this species depends on non-ground microsites (e.g., fallen logs and buttresses) because fungus injury would interfere the establishment of this species on the ground. This characteristic makes the species difficult to regenerate after logging in natural forest. *Picea. jezonensis* var. *jezonensis* now only grows in the north of Hokkaido. Distribution of macro-fossil records of species suggests that *P. jezoensis* var. *jezoensis* was distributed in Honshu and Kyushu, which is the southernmost main islands of Japanese Archiperago in the last glacial maximum (21,000 years ago, Sohma & Tsuji 1987). These facts suggest that the distribution pattern of this species has been dramatically changed due to climate change.

Conservation status

It is listed as Least Concern in the IUCN Red List. It is abundant in Hokkaido except the southwestern part.

Ethnic use

The species has been used as building materials, furniture materials, pulpwood, ship construction, sound board for piano, and deck for violin. Ainu, indigenous people in Hokkaido, have used its bark as roof or wall cover, wood as arrows, steamed needles vapor as cold medicine, and its lesin as ointment. There is an Ainu myth about the goddess of Ezomatsu who made a couple once killed by a bear revive using this species.

Written by Ikutaro Tsuyama

Pinus densiflora Siebold & Zucc.

Pinaceae

- 赤松 [Chi song]
- アカマツ (赤松) [Aka-matsu]
- 소나무 [So-na-mu]
- Сосна густоцветковая [Sosna gustotcvetkovaya]

Description

Evergreen coniferous tree, up to 25–30 m, and 80 cm in diameter. Leaves are needle-like at 8–12 cm long with two per fascicle. Cones 4–7 cm long. Bark color is reddish.

Distribution and habitat

Japan, Korea, China (E and S Heilongjiang, NE Jiangsu, SE Jilin, Liaoning, E and N Shandong), and Russian Far East (Southern part of Primorskiy Krai). According to the IUCN, *Pinus densiflora* occurs in extensive pure stands in many parts of its range and is one of the most dominant conifers in Japan and Korea. It grows in a variety of acidic soils, from dry sandy or rocky sites to peaty soils. In Japan it reaches from near sea level (and close to the shore) up to 2,300 m in the mountains, but on mainland Asia its altitudinal range is more restricted and extends upward to only 900 m a.s.l. in NE China and 1,300 m in Korea. In areas where broad-leaved forest dominates, *P. densiflora* is restricted to poorer sites such as rock outcrops on south-facing slopes and edges of moors or mountain lakes. Here it mixes with the angiosperms and can quickly recolonize ahead of them after forest fires (http://www.iucnredlist.org/details/42355/0).

There are three varieties. *Pinus densiflora* var. *ussuriensis* Liou et. Q. L. Wang is characterized by pendulous seed corns. *Pinus densiflora* var. *zhangwuensis* S. J. Zhang *et al*. is characterized by not white powdery first-year branchlets and not or slightly twisted needles. According to the recent genetic study, *P. densiflora* is most closely related to *Pinus sylvestris*. *Pinus densiflora* in Japan has roughly three genetic clusters, namely southwesten, middle, and northeastern Japan.

Pinus densiflora is a disturbance-dependent species. Pollen analysis has revealed that this species starts to expand its dominance since ca. 1,500 years ago, which corresponds well with human activities such as agriculture or forest fires in Japan. In the past, *P. densiflora* used to be one of the major plantation species following *Cryptomeria japonica* or *Chamaecyparis obtusa* in Japan. However, due to pine wilt disease (*Bursaphelenchus xylophilus*, a microscopic organism), *P. densiflora* forests have been seriously declined. Although transmitted by indigenous longhorn beetle, nematode is an alien invasive species from North America since early 20th century. The previous epidemic had a peak in 1979 and lasted a decade. It resulted in a loss of 2.4 (million m^3) of pine woods. The disease has spread not only in Japan, but also in Taiwan, South Korea, North Korea, and China (Nakamura & Tabata 2014). Resistant variety of *P. densiflora* has been developed for adaptation purpose. Controling methods include disposal of killed trees (cut and burn, fumigation, chipping etc.) and chemical treatment of live trees. In some areas of Japan, deciduous broad-leaved forests dominated by *Quercus serrata* or *Castanea crenata* have been developed after the decline of *P. densiflora*.

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Conservation status:

Currently it is in the LC (Least Concern) in the IUCN Red List.

Ethnic use:

It is used for construction, engineering works, boxes, ships, wrapping sheet, wood wool, and pulp. *P. densiflora* forests nationwide was once heavily used as fuelwood forest. Thus, forest floors have poor nutrients. Such condition favors the growth of Matsutake mushrooms. Nowadays, the mushroom production has been declined due to the decline of *P. densiflora* forests.

Written by Tetsuya Matsui & Katsunori Nakamura

Pinus parviflora Siebold & Zucc.

Pinaceae

- 日本五针松 [Ri ben wu zhen song]
- ゴヨウマツ (五葉松) [Goyo-matsu]
- 섬잣나무 [Seom-jar-na-mu]
- Сосна мелкоцветковая [Sosna melkotcvetkovaya]

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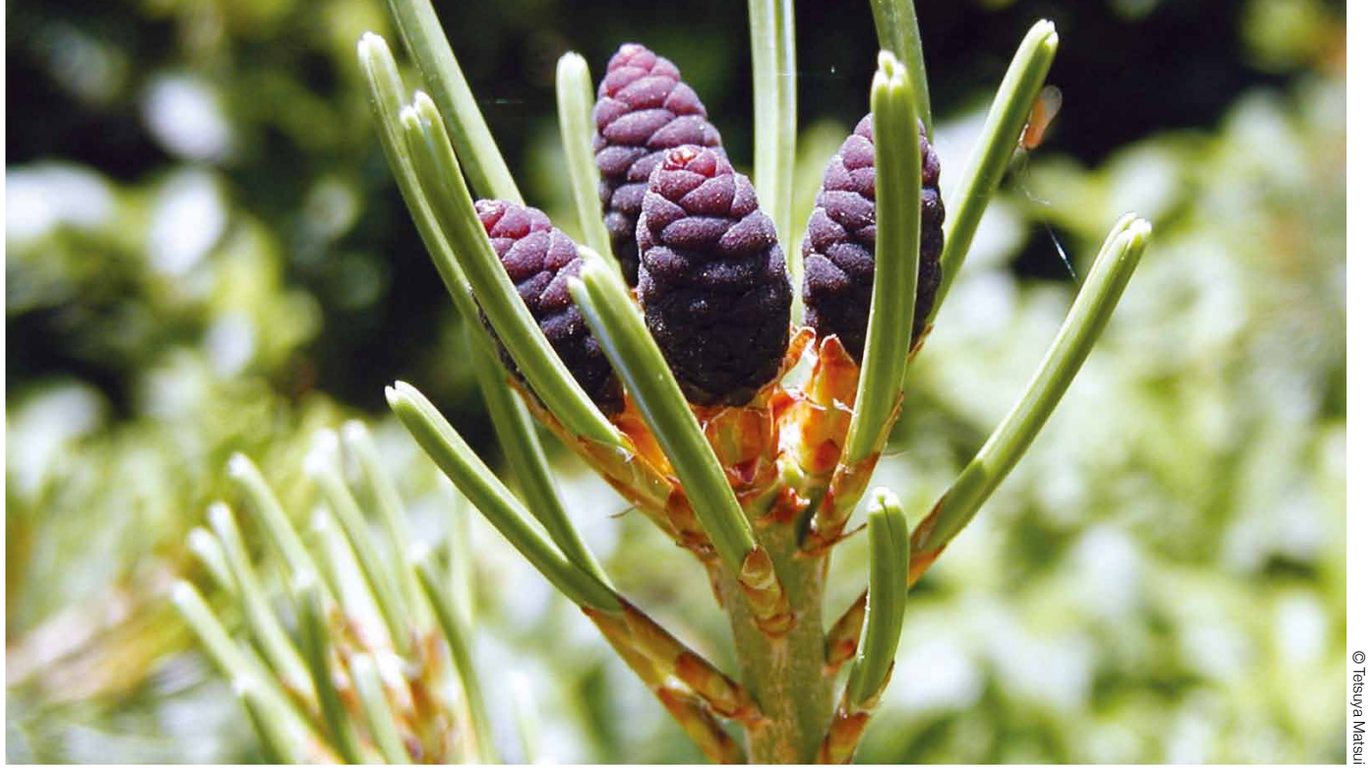
Description

Evergreen five-needle leaved canopy trees, up to 15–25 m in tall. Needle leaves 5–6 cm long. Cones 4–7 cm, with broad, rounded scales. Seeds 8–11 mm long, with a vestigial 2–10 mm wing. It grows mainly on the ridge part of temperate forests. In Japan, this species usually share forest canopy with many other deciduous broad-leaved trees (e.g. *Quercus crispula*, *Tilia japonica*) or coniferous trees (e.g. *Abies homolepis*, *Thuja standishii*).



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Firstly, *Pinus parviflora* was described in Flora Japonica by Siebold and Zuccarini in 1842. Mayr nominated *P. pentaphylla* in 1890, and Augustine Henry recombined it as the variety *pentaphylla under P. parviflora* in 1910. Since then two varieties have been accepted. The nominated variety *parviflora* distributes in the southern part of Japan and has obovate seeds with the wings shorter than seeds. The variety *pentaphylla* distributes in the northern part of Japan and has elliptic seeds with the wings as long as seeds. *Pinus himekomatsu* Miyabe et Kudo is a synonym of *P. parviflora* var. *parviflora*. Many cultivars which are often used as bonsai are described. Some researchers relate *Pinus parviflora* to *P. kwangtungensis* in China and/or *P. morrisonicola* in Taiwan (Farjon, 1984).

Sub-section *Strobi* is distributed from Vietnam to Japan. On the other hand, sub-section *Cembrae* (such as *Pinus pumila*, *Pinus koraiensis*) is distributed from Japan, Sakhalin, Siberia, to Europe. The Japanese archipelago is located at the transitional zone between the distributions of these two sub-sections *Strobi* and *Cembrae*. In some regions of Japan, introgressive hybridization between *P. parviflora* and *P. pumila* has been observed. They are described as *P. hakkodensis* or *P. pumila* var. *kubinaga*.

In the Tanigawa mountains of central Japan, *P. parviflora* grows at lower elevation whereas *P. pumila* grows at higher elevation. Watano *et al*. (1996) have studied their leaf form and DNA types (both mitochondria DNA and chloroplast DNA). Forms of needle leaves will change from the typical *P. parviflora* type to the intermediate type at above 1,600 m, then change to typical *P. pumila* type at above 1,940 m. The chloroplast DNA is paternally inherited. However, mitochondria DNA has maternal inheritance. Chloroplast DNA analysis showed that trees under elevation of 1,940 m were all *P. parviflora* type. On the other hand, mitochondria DNA analysis showed that trees under elevation of 1,700 m were *P. parviflora* type while trees above elevation of 1,700 m were all *P. pumila* type, suggesting that introgressive hybridization occurred between *P. pumila* as a seed parent and *P. parviflora* as a pollen parent.

Distribution and habitat

Japan (widely from southern Kyushu to Hokkaido), Korea (Ulleung Island). The sub-section *Strobi*, which includes *P. parviflora*, distributes from Vietnam (*P. dalatensis*), Hainan Island (*P. fenzeliana*), Guangdong (*P. kwangtungensis*), Taiwan (*P. morrisonicola*), Korea, and Japan (*P. parviflora*) (Mirov, 1967).

P. parviflora occurs at altitudes from just above sea level to about 2,500 m, with an optimum between 1,000 and 1,500 m a.s.l. in montane forests. It is found in both pure and mixed stands with other conifers and also with angiosperms, usually on steep slopes, dry sites or rocky ridges. At high, subalpine habitats this species becomes dwarfed (IUCN, http://www.iucnredlist.org/details/42388/0).

Conservation status

In the IUCN Red List, it is considered as LC (Least Concern). *P. parviflora* populations in the Boso Peninsula of Chiba prefecture in Japan is isolated under the warmest climatic conditions among other *P. parviflora* populations in Japan. They are considered as remnants of the last glacial period. In 2015, only 85 trees are surviving in the entire Peninsula area. Its number has been seriously declined due to multiple causes such as pine wilt disease (see *P. densiflora* section), climate warming, or deer browsing.

Ethnic use

It has been used for bonsai, garden tree, piano, violin, lacquer ware, and traditional house construction.

The bonsai of *P. parviflora* "Miyajima" in training since 1685 in Japan. It is now displayed in the United States National Arboretum. Written by Tetsuya Matsui

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Pinus pumila (Pall.) Regel

Pinaceae

- 偃松 [Yan song]
- ハイマツ (這松) [Hai-matsu]
- 눈잣나무 [Nun-jat-na-mu]
- Одой Нарс [Odoi nars]
- Кедровый стланик [Kedrovy stlanik]

Together with *Pinus koraiensis*, *P. albicaulis*, *P. Sibirica*, *P. Cembra*, and *P. pumila* belongs to subgenus *Cembrae*. There are only five species in this sub-section in the world. In fact, the species was described as a variety of *P. cembra* in Europe at first. Synonyms of *P. pumila* (Pall.) Regel includes *P. cembra* var. *pigmaea* Loud., *P. pigmaea* Fisch. ex Spach, *P. pumila* (Pall.) Regel var. *kubinaga* Ishii et Kusaka and *P. pumila* (Pall.) Regel var. *yezoalpina* Ishii et Kusaka.

In Eastern Siberia or north-east China, the center of *P. pumila* distribution, the species often grows as understory shrub tree under forest canopy of *Larix gmelinii* or *L. sibirica*. However, in Japanese archipelago, the southern range limit of this species, *P. pumila* is a typical alpine species. It forms scrub zone above sub-alpine conifer forest zone dominated by *Abies veitchii* and *A. mariesii*.

To assess the impact of global warming on *P. pumila*, species distribution model (SDM) has been constructed in Japan based on parameters of actual distribution data and climatic conditions (Horikawa *et al*., 2009). SDM predicted that the size of its suitable habitats under the present climate was 7,867 km^2. However, in 2081–2100, its suitable area was reduced 14 to 31%. This suggests that its suitable habitats will shrink or disappear in all mountainous locations where this species is distributed. The Tohoku region is particularly vulnerable. Its suitable areas are predicted to be reduced to 0 to 9% in 2081–2100 according to two different future climate change scenarios. If so, the remaining suitable areas will be roughly divided into two regions: the mountainous areas of central Japan and Hokkaido (Horikawa *et al*., 2009).

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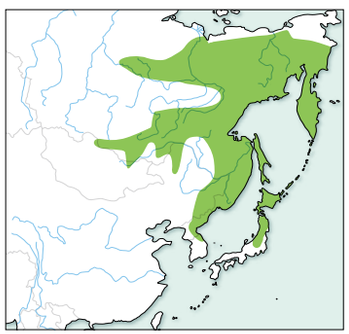
Description

Dwarf pine of five-needle. Leaves needle-like, formed in bundles of five, 4–6 cm long. The cones 2.5–4.5 cm long, with large nut-like seeds, ripened in the next year. The seeds typically dispersed by alpine birds such as nutcracker (*Nucifraga caryocatactes*). It typically grows in alpine zone of Japan, forming dense scrub (10 cm to 3 m in height). In Japanese alpine zone, *P. pumila* flowers can be seen between June and July, and it grows together with *Rhododendron aureum*, *Sorbus sambucifolia*, *Coptis trifolia*, *Streptopus streptopoides* var. *japonicus*, *Vaccinium smallii* var. *smallii* or *Empetrum nigrum* var. *japonicum*.



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Distribution and habitat

Russia (Eastern Siberia, Far East excluding Chukotka), Mongolia (Khentii), Korea (Mostly north part), China (Heilongjiang, Jilin, Nei Mongol), Japan (Honshu and Hokkaido). On the peninsula of Kamchatka, it is distributed from 300 m to 1,000 m. In Japan, it grows at altitudes between 50 m and 1,700 m in Hokkaido and between 1,400 m and 3,180 m in central Hohshu (Hayashi, 1954).
In Korea, it grows between 900 m and 2,540 m (Mirov, 1967). Its tree shape varies depending on microhabitat. It can grow creepy at places with strong wind blow such as mountain ridge or hollows with heavy snow accumulation. Its stem is rather ascendant in less snow area such as Mongolia (Khentii) and the northern coastal area of Sakhalin.

Conservation status

Because *P. pumila* is almost always distributed in alpine zone in Honshu, Japan, they grow within the national parks.

Ethnic use

This species has been used as bonsai with occasional garden use.

Written by Tetsuya Matsui

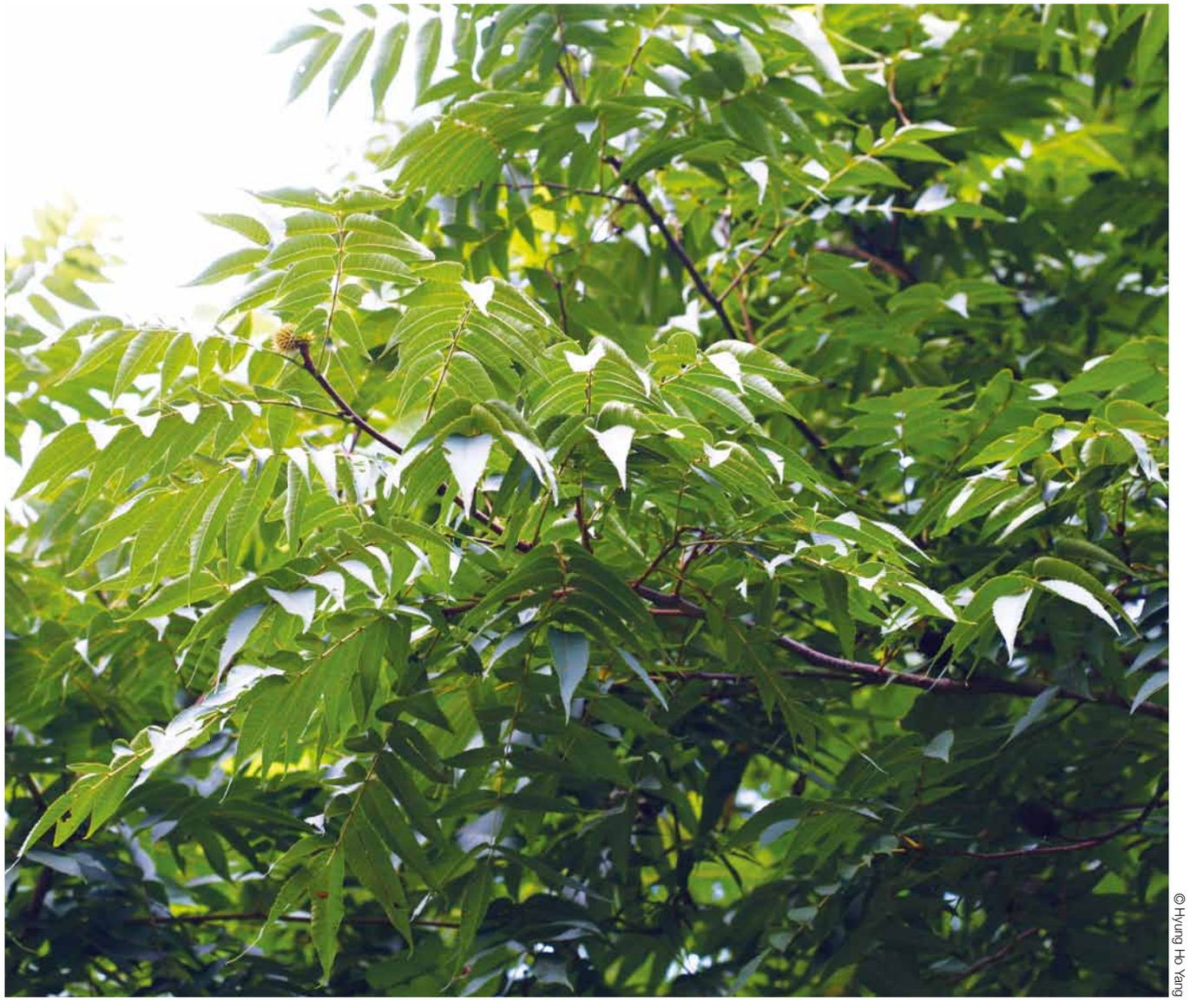
Platycarya strobilacea Siebold & Zucc.

Juglandaceae

- 化香树
[Hua xiang shu]
- ノグルミ (野胡桃)
[Nogurumi]
- 굴피나무
[Gul-pi-na-mu]
- Платикария шишконосная
[Platikariya shishkonosnaya]

Description

Deciduous shrubs or trees, 3–15 m tall. Leaves pinnately compound, 8–30 cm long; leaflets 1–19; lateral small leaflets sessile; leaflet blades ovate-lanceolate to narrowly elliptic-lanceolate, 3–11 × 1.5–3.5 cm, lower surfaces hairless, except for dense cluster of hairs at base and along midveins lower surfaces; leaflet bases oblique to cuneate; terminal leaflets with small petiolules 0.6–3.5 cm, base rounded or broadly cuneate. Bisexual spikes 2–10 cm; central spikes female in basal 1–3 cm, male in apical 1–3.4 cm, or sometimes absent. Male spikes 2–15 cm; bracts ovate, 2–3 mm, apex acute to acuminate. Female flowers with straight or reflexed bract. Fruiting spikes ovoid-ellipsoid or ellipsoid-cylindric to subglobose, 2.5–5 × 1–3 cm; bracts lanceolate, 4–10 × 2–3 mm. Fruits (nutlets) suborbicular to obovate, 3–6 × 3–6 mm. Flowering in May to July, fruiting in July to October.



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The genus *Platycarya* Sienold & Zucc. is endemic to East Asia (Oh, 2007; Chen *et al*., 2012). In the genus, *P. strobilacea* Siebold & Zucc. and *P. longzhouensis* S.Ye Liang & G.J. Liang are only species with accepted taxonomic names (The Plant List, www.theplantlist.org). *P. strobilacea* is characterized with several ancient morphologies such as bisexual inflorescence aggregated on terminals of braches, bracts separated by ovary and fruits, and the first pair of true leaves of the sprout being a simple leaf (Manos & Stone, 2001; Chen *et al*., 2012). *Platycarya* fossil records show that the genus was distributed in all Northern Hemisphere during the early stage of the Tertiary period, but almost became extinct during the Quaternary ice age surviving only in East Asia (Manchester, 1989; Zhou & Momohara, 2005; Chen *et al*., 2012).

Distribution and habitat

China (Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Shandong, Sichuan, Yunnan, and Zhejiang), Taiwan, Japan (Introduced and cultivated), Korea (Central and South), and Vietnam. Mixed forests and thickets on mountain slopes.

Conservation status

No conservation status has been given to the species. Recent molecular data show the evidence for recent demographic expansions of *P. strobilacea* in Eastern China (Chen *et al*., 2012)

Ethnic use

Fruits and roots have medicinal uses, and bark extracts can be used for fishing (Lee, 1996; Lee, 2003).

Written by Kyong-Sook Chung

© Gyu Young Chung

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Platycladus orientalis (Linn.) Franco

Cupressaceae

- 側柏 [Ce bai]
- コノテガシワ (児手柏) [Konote-gashiwa]
- 측백나무 [Cheuk-baek-na-mu]
- Плосковеточник восточный (биота восточная) [Ploskovetochnik vostochnyi]

Description

Trees up to more than 20 m tall. Trunk up to 1 m (or more) diameter at breast height. Bark reddish brown to light grayish brown, thin, flaking in long strips. Crown ovoid-pyramidal when young, broadly rounded or irregular when old. Leaves 1–3 mm, apex bluntly pointed; facial leaves rhomboid, with a conspicuous, linear, glandular groove at center abaxially; lateral leaves overlapping facial ones, boat-shaped, ridged, apex slightly incurved. Pollen cones yellowish green, ovoid, 2–3 mm. Seed cones when immature bluish green, subglobose, ca. 3 mm in diam., reddish brown when ripe, subovoid, 1.5–2(–2.5) × 1–1.8 cm. Proximal 2 fertile cone scales 2-seeded, distal 2 fertile scales 1-seeded. Seeds grayish brown or purplish brown, ovoid or subellipsoid, 5–7 × 3–4 mm, slightly ridged. Pollinating in March to April, fruiting in October.

Type specimen is from North China.

Distribution and habitat

China (S Gansu, Hebei, Henan, Shaanxi, Shanxi. introduced or status uncertain in Anhui, Fujian, N Guangdong, N Guangxi, Guizhou, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, S Nei Mongol, Shandong, Sichuan, Xizang, Yunnan, Zhejiang), Korea (chungcheongbuk-do, Gyeongsangbuk-do), and East Russia.
It is difficult to distinguish natural occurrences from local introductions due to extensive cultivation and planting in the past. The wild species of Thuja orientalis distribution in north at China.

Ethnic use

Thuja orientalis is one of the most popular ornamental trees in China.

Written by Jin Yonghuan

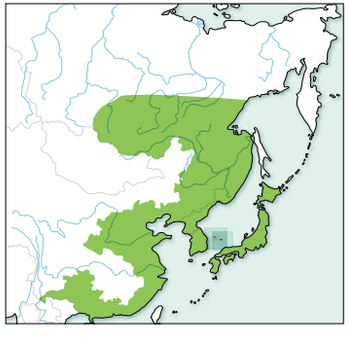
Platycodon grandiflorus (Jacq.) A. DC.

Campanulaceae

- 桔梗 [Jie geng]
- キキョウ (桔梗) [Kikyo]
- 도라지 [Do-ra-ji]
- Широколокольчик крупноцветковый [Shirikokolokolchik krupnotcvetkovyi]

Description

Stems 20–120 cm tall, usually glabrous, rarely densely puberulent, simple, rarely branched above. Leaf blade adaxially green, ovate, elliptic or lanceolate, 2–7 × 0.5–3.5 cm, abaxially glabrous (rarely puberulent along veins) and glaucous, adaxially glabrous, base broadly cuneate or rounded, margin serrate, apex acute or acuminate. Hypanthium hemispherical, obovoid or obconic, rarely campanulate, glaucous. Calyx lobes triangular or narrowly triangular, sometimes tooth like. Corolla blue or purple (rarely pink or white), 1.5–4.5 cm. Capsule globose, obconic, or obovoid, 0.7–2.5 × 0.7–1.5 cm. Flowering in July to September, fruiting in August to October.



Type specimens are collected from Siberia. There is only one species and one variety all over the world. The variety is *Platycodon grandiflorus* (Jacq.) A. DC. var. *album* Hort.(Zhou, 1994). *Platycodon homallanthinus* A. DC. has been recorded in northern China. However, Fl. URSS (1957) put it in *Astrocodon expansus* (Rud.) Fed. and stated that it was only distributed in Russia's far east. Chinese scholars haven't seen the specimens (Hong, 1983). The flower of *Platycodon grandiflorus* is often used as family crest in Japan.

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Distribution and habitat

China (Anhui, Chongqing, Fujian, Guangdong, N Guangxi, Guizhou, Hebei, Heilongjiang, Jilin, Liaoning, Henan, SE Yunnan, Zhejiang), Japan (Hokkaido, Honshu, Shikoku, Kyushu, Ryukyu), Korea (all provinces), and Russia (southern part of Far East and south of East Siberia). Its habitat includes sunny herb communities, sand, sunny slopes, meadows, sparse thickets, forest edge, and forests (rarely) below elevation of 2,000 m. It is widely cultivated elsewhere. It has drought resistance.

Conservation status

Currently this species is listed in the red book as a rare species. Natural resources of wild *Platycodon grandiflorus* are exhausted. In Japan, wild populations of *Platycodon grandiflorus* are declining. This species has been listed in the red-list (category "vulnerable"). In the 1970s, *Platycodon grandiflorus* artificial planting test was successful that cultivated *Platycodon grandiflorus* began to enter the market.

Ethnic use

Platycodon grandiflorus is both a resource plant and a medicinal plant. It is edible. It is also an ornamental plants with economic value.

Written by Jin Yonghuan

Polygala fallax Hemsl.

Polygalaceae

- 黄花倒水莲
[Huang hua dao shui lian]
- Истод обманчивый
[Istod obmanchivyi]

Description

Shrubs or small trees. Roots stout with yellowish outsides. Leaf blades green, membranous, and lanceolate to elliptic-lanceolate. Racemes terminal or axillary, pubescent; bracteoles caducous, basal, and linear-oblong. Sepals 5; the outer 3, small and uneven in size; the inner 2, petaloid, obliquely obovate, and large. Petals 3, yellow; the lateral oblong, with apexes nearly truncate. Stamens 8 with ovoid anthers. Ovaries globose, compressed, and ciliate; styles thin and shallowly 2-lobed, with tubiform apexes; stigmas have short stalks. Capsules greenish yellow, broadly obcordate to orbicular or obovoid. Flowering in May to August, fruiting in August to October.

Distribution and habitat

China (Fujian, Guangdong, Guangxi, Guizhou, Hunan, Jiangxi, and Yunnan). It grows in forests, beside streams, or in moist areas in valleys at altitudes of 400–1,700 m.

© Ning Zulin

This species was first named *Polygala fallax* (Hemsl, 1886). However, it was published as *P. forbesii* (Chodat, 1896) and *P. aureocauda* (Dunn, 1911). *P. forbesii* and *P. aureocauda* are synonyms for *P. fallax* Hemsl.

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Conservation status

Polygala fallax is endemic to China and has important medicinal value. With the increasing demand for medicines, the wild population is declining, and shortages have been reported. At present there are no protective measure for this useful species. However, to meet market demand the research on seed propagation and tissue culture has been carried out, which raises the possibility for artificial cultivation.

Ethnic use

Polygala fallax is a valuable medicinal plant that contains a variety of bioactive components. It acts as a blood activator, anti-inflammatory, anti-viral, etc. In addition, it is a very good ornamental plant.

Written by Ning Zulin

Potentilla ikonnikovii Juz.

Rosaceae

- 委陵菜属 [Wei ling cai shu]
- Иконниковын гичгэнэ [Ikonnikovyn gichgene]
- Лапчатка Иконникова [Lapchatka ikonnikova]

Description

Perenual herb with smooth, thick, unbranched stock, covered with remains of leaf-stalks. Stems 2–9, prostrate or ascending, 8–10 cm long. Leaves pinnate, with usually 2 pairs of leaflets, the terminal lobe and uppermost pair 7–17 × 5–8 mm, the lower smaller and more distant, covered with sparse straight hairs; leaflets divided to 2/3–3/4. Flowers actinomorphic, with numerous carpels and stamens, yellow, 8–12 mm in terminal few-flowered inflorescens. Fruit as a group of achenes, brown and wrinkled when ripe. Flowering and fruiting in July to August (Grubov, 1982).

Distribution and habitat

Mongolia (Gobi Altai region: Gobi Gurvan Saikhan mountains) (Karsten *et al*., 2005; Urgamal *et al*., 2014). Its habitat includes rock clefts and among stones in upper and middle mountain belts (Karsten *et al*., 2005).

© Batlai Oyuntsetseg

Potentilla ikonnikovii Juz. is endemic to Mongolia (Urgamal *et al*., 2014), described from the Gobi Altai phytogeographical region.

Conservation status

It is listed in the Mongolian Red Book (2013). Currently it has no statutory protection. IUCN status has been proposed for this species.

Written by Batlai Oyuntsetseg & Vanjil Gundegmaa

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Primulina fengkaiensis Z. L. Ning & M. Kang

Gesneriaceae

封开报春苣苔
[Feng kai bao chun ju tai]

Примулина фенгкайская
[Primulna fengkaiskaya]

Description

Perennial herbs. Rhizomes subterete. Leaf blades elliptic to elliptic–lanceolate, asymmetric, adaxially pubescent, and abaxially appressed pubescent. Cymes 1 or 2 branches and 3–9 flowers; bracts lanceolate, margins entire or 2–5 inconspicuous crenulations. Corolla pale purple, with purple marks and purple stripes inside; tube narrowly funnelform, 3–3.8 cm long, with an orifice of 1.8–2 cm in diameter; the adaxial lip lobes broadly ovate or suborbicular, the apex truncate or retuse; the abaxial lip lobes obovate, the apex truncate or retuse. Stamens 2. The stigma has two ovate lobes. The capsule straight andlinear. Seeds elliptic and measure approximately 0.5 mm. Flowering in March to May, fruiting in May to June.

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Distribution and habitat

China (native to Guangdong; Huaiji and Fengkai). It grows mainly on moist rock faces.

Primulina fengkaiensis was newly described and illustrated in 2015 (Ning *et al*., 2015), and has no other name.

Conservation status

There is no conservation status regarding this species. *Primulina fengkaiensis* is currently known from a few local populations in a narrow limestone area in Fengkai County and Huaiji County, Zhaoqing City, Guangdong, China. It is locally abundant and grows mainly on moist rock faces. It is easy to breed. The South China Botanical Garden introduced some individuals from the field population into cultivation in their location in Guangzhou, China in 2011; those plants are now forming colonies.

Ethnic use

Its flowers are big and beautiful, and it is a very good ornamental plant for indoor viewing, potted.

Written by Ning Zulin

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Primulina huaijiensis Z. L. Ning & J. Wang

Gesneriaceae

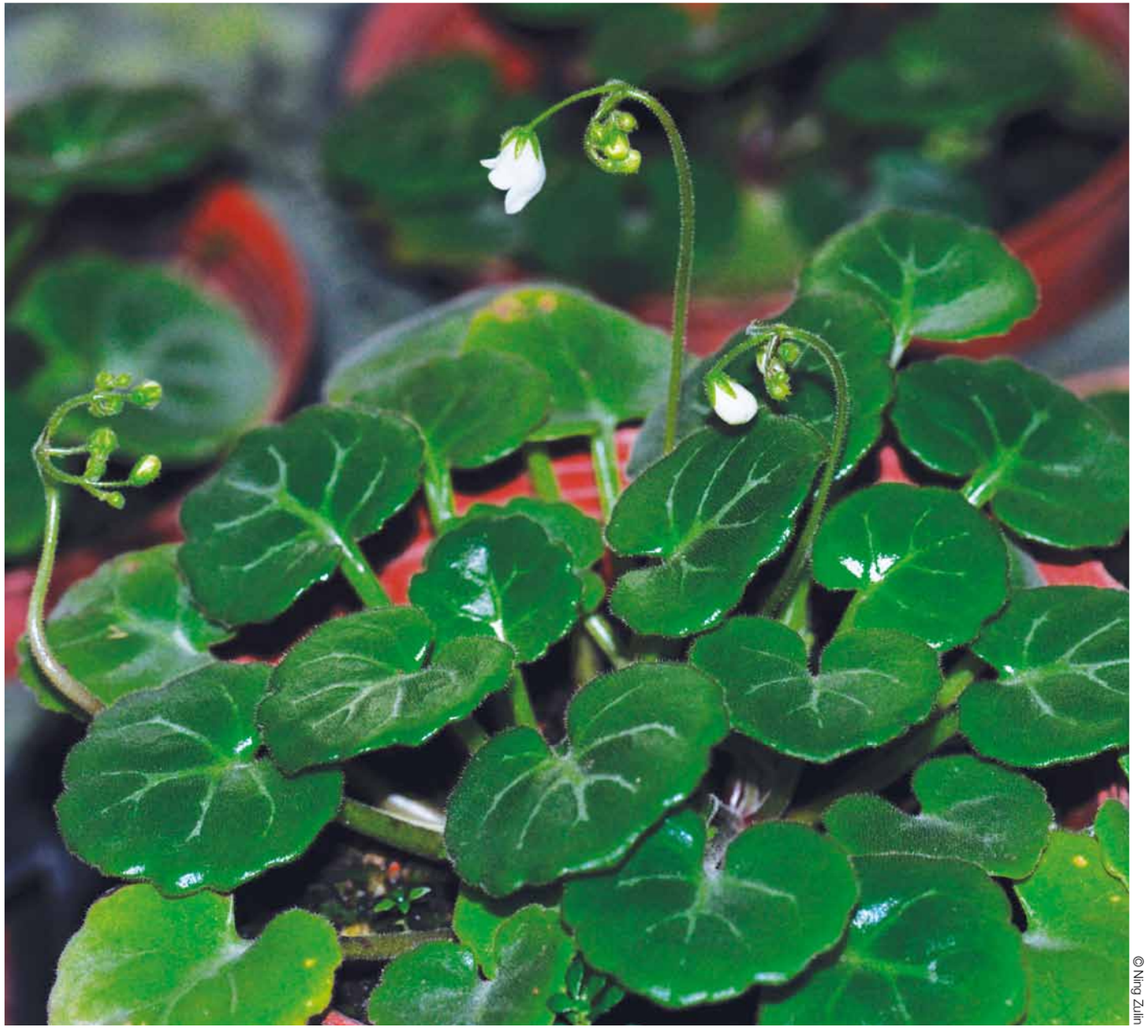
- 怀集报春苣苔
[Huai ji bao chun ju tai]
- Примулина хуайджийская
[Primulna khuaidzhiiskaya]

Description

Perennial herbs. Rhizomes subterete. Leaves all basal; leaf blades coriaceous, reniform, with rounded or obtuse apexes, cordate or deeply cordate bases, crenate or repand margins; palmate veins 5–7 cm, conspicuously prominent on both sides, and silvery-white on the upper surfaces. Cymes 1–3-branched. Corollas white, obliquely campanulate, and abaxially swollen; tubes 4–6 mm long, orifices about 5.5 mm in diameter; adaxial lip lobes sub-rounded with sub-rounded lamellar appendages inside. Staminodes 2. Ovaries broadly ovoid and glandular puberulent; stigmas hippocrepiform. Capsules linear-oblong. Flowering in October to December, fruiting in November to January.

Distribution and habitat

China (Huaiji of Guangdong). It grows mostly on wet rocks in limestone caves.



© Ning Zulin

Primulina huaijiensis was newly described and illustrated in 2013 (Ning *et al*., 2013), and has no other name.

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Conservation status

Primulina huaijiensis is currently known only from one population on moist rock faces in a single Karst cave, Huaiji County, Northern Guangdong, China. Field surveys found that the population size is small, comprising no more than 200 plants.

Ethnic use

The shade of plant is tolerance, and is an excellent indoor ornamental plant.

Written by Ning Zulin

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Prinsepia sinensis (Oliver) Oliver ex Bean

Rosaceae

- 东北扁核木
[Dong bei bian he mu]
- カラサイカチモドキ (唐棣擬)
[Kara-saikachi-modoki]
- 빈추나무 [Bin-chu-na-mu]
- Принсепия китайская
[Printcepiya kitayskaya]

Description

Shrubs, up to 2 m tall. Branches grayish green to purplish brown, robust, glabrous. Branchlets reddish brown, longitudinally angled, glabrous. Spines erect to recurve, 6–10 mm, usually leafless. Winter buds purplish red, ovoid, pubescent. Petiole 5–10 mm, glabrous. Leaf blade ovate-lanceolate, lanceolate, or very rarely lorate, 3–6.5 × 0.6–2 cm, abaxially pale green, adaxially dark green; base subrounded to broadly cuneate; margin remotely serrate; apex acute, acuminate or caudate; secondary veins abaxially prominent, adaxially impressed. Inflorescences in leaf axis, 1- to 4-flowered fascicle. Bracts small, membranous, lanceolate, adaxially pubescent, glabrescent. Flowers ca. 1.5 cm in diameter. Pedicel 1–1.8 cm (to 2 cm in fruit), glabrous. Hypanthium campanulate, outside glabrous. Sepals triangular-ovate, short, outside glabrous, margin ciliate. Petals yellow, obovate, base shortly clawed, apex obtuse. Drupe purplish red to purplish brown, subglobose to oblong, 1–1.5 cm in diameter, glabrous. Flowering in April to May, fruiting in May to September.

© Valentin Yakubov

© Svetlana Nesterova

Distribution and habitat

China (Heilongjiang, Jilin, Liaoning, Nei Mongol), Korea (Hamgyeongbuk-do, Pyeongannam-do), and Russia (southern part of Primorskii Territory). Its habitat includes mixed forests, forests of shady slopes, open places on slopes, and stream sides.

Conservation status

It has been included in the Red Data Book of Primorskii Krai, Russia (2008).

Ethnic use

Its fruit is edible. Fruit can be used as pulp and fragrance. Its seeds have been used as medicine to cool the body and brighten eyes. Its wood can be used to make cane and all kinds of handles. This species can also be used for urban greening. The wood of *Prinsepia sinensis* (Oliver) Oliver ex Bean is hard and exquisite. Its color is red brown with russet pattern sometimes. It is an ideal material for carving and grinding. Its embedded flat circular stone decorative pattern can be processed into arts and crafts.

Written by Cao Wei

Pulsatilla cernua (Thunb.) Bercht. ex J. Presl

Ranunculaceae

- 朝鲜白头翁
[Chao xian bao tou weng]
- オキナグサ (翁草)
[Okina-gusa]
- 가는할미꽃
[Ga-neun-hal-mi-kkok]
- Прострел поникающий
[Prostrel ponikayushchii]

Description

Perennial herbs. Plants 14–28 cm tall. Leaves 4–6, not fully expanded at anthesis. Petiole 4.5–14 cm, with thick long pilose hairs. Leaf blade ovate, 3–7.8 × 4.4–6.5 cm, 3-foliolate, abaxially thickly pilose, adaxially glabrous; lateral leaflets sessile or subsessile, pinnately divided; central leaflet long petiolulate, broadly ovate, base divided into 3 segments. Scape 2.5–6 cm, elongated in fruit, with long hairs. Involucral bracts 3–4.5 cm, abaxially puberulent, basally connate into 0.8–1.2 cm tube, apical palmate lobes linear, margin entire or slightly 3-lobed. Sepals purplish red to dark purple, abaxially puberulent, apex rounded to blunt. Stamens ca. 1/2 as long as sepals. Anthers yellow. Infructescences 6–8 cm in diameter. Achenes obovate-oblong, ca. 3 mm, sparsely puberulent; persistent styles ca. 4 cm. Flowering in April to May, fruiting in May to June.

The genus *Pulsatilla* is distributed in the middle of cool temperate zone in the northern hemisphere. It contains approximately 45 spp. Its relative species *P. nipponica* (Takeda) Ohwi grows in alpine zone of Hokkaido and northern Honshu. No intraspecific taxa has been nominated.

In Japan, this species had been widely distributed in grassland and dry riverbed. However, this species became endangered due to excessive collection for horticulture, reclamation of grasslands, and abandonment of grassland management.

Japanese name of this species (okina-gusa) comes from aggregated fruits with long white-hair compared to old-man's head (okina means old-man in Japanese). Children used to pretend to play hair-dressing with this plant. This plant is poisonous, avoided by cows and horses (Minamitani, 2003).

Distribution and habitat

It grows in Japan, Korea (Jeju-do), Russia (Southern part of Far East only), and China (Heilongjiang, Jilin, Liaoning, Nei Mongol). In Japan, this specie had been widely distributed in grassland and dry riverbed.

Conservation status

The species is nominated as VU in Red Data Book 2014, Japan. The probability of extinction after 100 years is estimated to be 30%. Since local people are familiar with this species, some volunteers in local areas are working on conservation such as guard against illegal collection, propagation, and removing tall grass against succession.

Ethnic use

Horticulture is very popular for this species. Its dried roots have been used as medicine for fever, diarrhea, stomachache, toothache, and menstrual irregularity (Minamitani, 2003).

Written by Haruka Ohashi

Quercus myrsinifolia Blume

Fagaceae

- 小叶青冈 [Xiao ye qing gang]
- シラカシ (白樫) [Shirakashi]
- 가시나무 [Ga-si-na-mu]
- Дуб мирзинолистный [Dub mirzinolistnyi]

Q. myrsinifolia is an evergreen broad-leaved tree. It is distinguished from other species by leaves with regularly serrate margins and abaxially whitish farinose greens (Lee, 2012). On the Korean Peninsula, the species are widely distributed in frequently overlapping areas populated with *Q. acuta* and *Q. salicina*, typical members of evergreen forests (Lee, 1996; Lee, 2006; Lee *et al*., 2009). However, Lee *et al*. (2014) recently reported that there are 169 mature individual trees strictly limited to Jin Island and occur in only three subpopulations. Previous misidentifications for plant specimens are the main reasons for confusion about its distribution on the Korean Peninsula. Therefore, the remaining populations on the Jin Island should be conserved.

© Jung-Hyun Lee

Description

Trees grow to 20 m tall and 1 m in across. Branchlets glabrous, dark purplish brown. Leaves alternate, lanceolate, oblong-lanceolate or elliptic-ovate, 8–11 × 2–4 cm, coriaceous, apex acuminate, base cuneate or widely cuneate, margins conspicuously serrate, above deep green, beneath farinose green but dark gray when dry, glabrous; secondary veins 13–18 pairs, the veins enter to the teeth; petioles 1–2.5 cm long, glabrous. Staminate catkins 6–10 cm long, inflorescense from axils of leaves on lower part of young brachlets, sparse soft hairy, pendulous; perianth 4–5-parted; 4–5 stamens. Pistillate erect spikes, 3–5-flowered, inflorescences on upper part of young branchlets; pistillate flowers nearly sessile, with one caducous bract and two bracteoles; three styles, obovate, bent outward. Cupules cup-like, greenish gray, scales in 4–6 concentric rings, with graysh short hairs, serrulate margins. Nuts ellipsoid or ovate ellipsoid, 1.5–2 × 1–1.5 cm, deep brown above. Flowering in late April to May, maturing from October, ripen in first year.

Distribution and habitat

Central and Southeast China (including Anhui, Fujian, Guangdong, Guangxi, Guizhou, Henan, Hunan, Jiangsu, Jiangxi, Shaanxi, Sichuan, Yunnan, Zhejiang), Korea (Jindo Island and Jeju-do), Japan (evergreen broad leaved forests of Kyushu to Honshu), Taiwan (Sanhsingishan, Aoti, Ilan), Laos, Northern Thailand, and Vietnam. In lower mountain slopes and valleys.

Conservation status

On Jin Island, conservation is considered to be satisfactory because the area has long conserved its evergreen broad leaved forests. As a result, numerous seedlings and saplings are detected.

Ethnic use

The tree has been used in gardens. It is suitable for smaller gardens, given that they are slow growing. People also used its seeds for food.

Written by Jung-Hyun Lee

Quercus serrata Murray

Fagaceae

- 枹栎 [Bao li]
- コナラ (小楢) [Ko-nara]
- 졸참나무 [Jol-cham-na-mu]
- *Дуб пильчатый* [Dub pilchatyi]

Description

Deciduous trees, up to 25 m tall. Leaves subsessile to petiolate; petiole up to 3 cm, glabrous or glabrescent; leaf blade narrowly elliptic-ovate, ovate-lanceolate or obovate, (5–) 7–17 × (1.5–) 3–9 cm, thinly leathery, with adherent single hairs when young, abaxially glabrous or occasionally stellate tomentose, base cuneate to nearly rounded, margin glandular serrate, apex acuminate to acute; secondary veins 7–12 on each side of mid vein. Female inflorescences 1.5–3 cm. Cupule cupular, 5–8 mm × 1–1.2 cm, enclosing 1/4–1/3 of nut. Bracts triangular, adherent, margin pilose. Nut ovoid to ovoid-globose, 1.7–2 × 0.8–1.2 cm; Scar 5–6 mm in diameter, flat. Stylopodium ca. 1 mm in diameter. Flowering in March to April, fruiting in September to October (eFloras, 2015).

Distribution and habitats

Japan, Korea, China, and Taiwan. Most Konara oak forests we see in Japan are secondary forests. These forests are expanded by anthropogenic activity. However, several forest patches have low human impact in areas between warm temperate and cool temperate zones.

© Haruka Ohashi

The species often hybridizes with *Q. crispula*, *Q. aliena*, and *Q. dentata*. Taiwan population is sometimes separated as *Q. glandulifera*.

Konara oak has the ability to sprout and reproduce of and reproduction at young age, which is suitable for coppice with a 15–30 year rotation. Most Konara oak secondary forests are sustainable under proper human interference. However, most of these Konara oak forests are abandoned recently without any use. They are under succession pathway. Its genetic diversity is a little higher in the southen population. While its genetic structure was clinal from northeast to southwest in nucleic SSR variation, cpDNA showed clear border between northeast and southwest areas (Matsumoto, 2015). The border is concordant with geographic border called Itoigawa-Shizuoka structural border. Similar pattern has been observed for several species such as *Quercus crispula* and *Carpinus laxiflora*.

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Conservation status

Quercus serrata is quite abundant in area with human activity. However, due to decrease of human forest management activity, oak ambrosia beetle *Platypus quercivorus* is causing severe damage, leading to death of *Quercus* species including *Q. serrata*. The damage is still increasing from the western part of Honshu to the northeastern part. Currently it is not listed in the Red Data Book 2014 Japan.

Ethnic use

Konara oak has been used as timber, fuelwood, mushroom log, food, and fertilizer. Untill the 1960's, it is commonly used as fuel woods or charcoal materials in Japan. Tanninn from its bark has been used for staining. Its acorns have been used for cake in Japan and Korea.

Written by Haruka Ohashi

Rhododendron fauriei Franch.

Ericaceae

- ケナシハクサンシャクナゲ (毛無白山石楠花) [Kenashi-hakusan-shakunage]
- 만병초 [Man-byeong-cho]
- Рододендрон Фори [Rhododendron fori]

© Bondarchuk Svetlana

Description

Small hermaphroditic evergreen trees or shrubs, to 3–6 m tall. Bark dark gray, young brunches with a soft brownish pubescence. Leaves leathery, 6–15(20) cm length and 2–5(7) cm wide, upper side dark green, bare and shiny, down side lighter. Petioles 1–2(3) cm length during pubescence. Flowers 5–15(30) in umbellate-corymbose racemes. Corolla 2–4(5) cm in diameter, white, cream or pinkish, campanulate, with spots on the inner surface of the upper lobe. Stamens 10, with pubescent filaments. Capsule 1.5 cm length and 0.5 cm wide. Seeds 1–2 mm length and 0.8 mm wide. Flowering in June, fruiting in October.

Rhododendron fauriei has been described from Japanese samples of U.J. Faurie in 1886. Earlier, in 1834, another species – *Rhododendron brachycarpum* D. Don ex G. Don has been described from Japan as well. Before 1968, *Rhododendron brachycarpum* was only found on Kuril Island (Iturup and Kunashir) in the Russian Far East territory (Kudo, 1925). Then *Rhododendron fauriei* Franch. var. *roseum* Nakai was specified for the same islands (Tatewaki, 1957; Vorob'yev, 1963, 1968; Voroshilov, 1966). New habitats of *Rhododendron fauriei* with white flowers were described in Central Sikhote-Alin in 1968 (Shemetova, 1970; Flyagina, 1972). It was a significant discovery for botanists – to find this species in the continental part of Russian Far East. The latest published flora of the Russian Far East includes two species – *R. fauriei* for the continental part (Sikhote-Alin) and *R. brachycarpum* in the Kuril Islands (Hohryakov & Mazurenko, 1991). *R. fauriei* was identified in North Korea (Nakai, 1952). *R. brachycarpum* is suggested for the flora of Korea (Chang, 2007). *R. brachycarpum*, *R. brachycarpum f. fauriei* (Franch.) Murata and *R. brachycarpum f. nemotoanum* (Makino) Murata are suggested for the flora of Japan (BG Plants, 2015 - http://bean.bio.chiba-u.jp/bgplants/ylist_detail_disp.php?pass=23374). There are no data covering the distribution area of *R. brachycarpum* and *R. fauriei* that clarify the taxonomy status of these species and within species units.

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Distribution and habitat

Russia (Far East: Central part of Primorskiy Kray, Sikhote-Alin Mountain Range, only one point, located on the territory of Sikhote-Alin Reserve; Kuril Islands – Iturup and Kunashir), Korea (Yanggang-do, Jjagang-do, Pyeonganbuk-do, Hwanghaebuk-do, Hwanghaenam-do, Gangwon-do, Gyeongsangnuk-do, Jeollanam-do) and Japan (Hokkaido and Honshu). Grows in Korean Pine-broadleaf and dark-coniferous forests, from 750 to 1,000 m above sea level, mainly on the northern and northeast slopes in the Sikhote-Alin; mixed forests with oak and fir on the slope of mountains facing north at an altitude of 1,200–1,526 m above sea level at a 30–45 degree angle of inclination (Lee & Shim, 2011); and forests and alpine zones, from 700–3,700 m above sea level in Japan. In the Sikhote-Alin Rh. fauriei is characterized by group accommodation; larger trees are surrounded by a lot of small undergrowth (Flyagina, 1972). Seeds germinate mainly in deadwood, overgrown with moss. Plants develop slowly, reaching a height of 4–6 meters at 80–100 years of age.

Conservation status

R. fauriei is a rare endangered species in Russian Far East and is included in the Russian Federation's Red Data Book (2008) and Red Data Book of the Primorskii Krai (2008). This species is conserved in the Sikhote-Alin Reserve. The main limiting factors threatening *R. fauriei* are low population abundance and fires. Populations of this species are regularly monitored in the Sikhote-Alin Biosphere Reserve (Bondarchuk, 2014). *R. brachycarpum* is rare species in Korea with least concern (LC) status (Korea Forest Service, 2008). The number of individual plants and habitats are decreasing in Korea (Korea Forest Service, 2008).

Ethnic use

R. fauriei (*R. brachycarpum*) have high ornamental value and excellent pharmaceutical effects. This species is cultivated in many botanical gardens of the world.

Written by Elena A. Pimenova

Rhodoleia championii Hooker

Hamamelidaceae

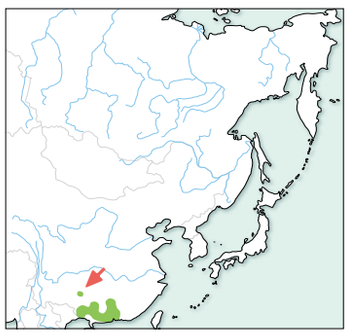
- 红花荷 [Hong hua he]
- ヤグルマソウ (矢車草) [Yaguruma-so]
- Родолея широкоовальнолистная [Rodoleya shirokoovalnolistnaya]

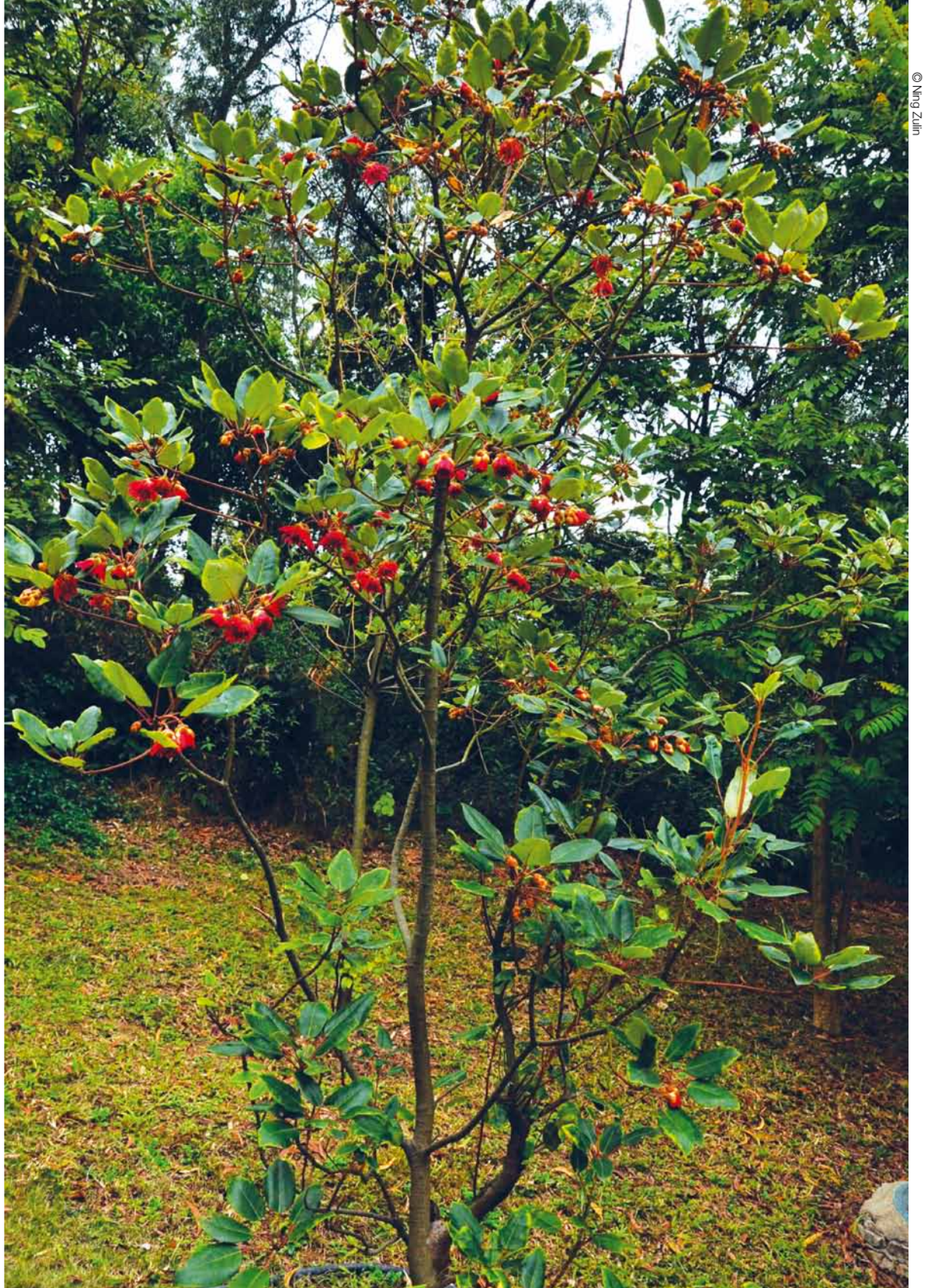
Description

Trees. Leaves simple and alternate; leaf blades ovate to broadly ovate, firmly leathery, with broadly cuneate bases and, obtuse or subacute apexes; obscurely 3-veined at the base. Inflorescence capitate, axillary; flowers bisexual, with several scalelike bracts; petals red and spatulate; stamens as long as petals; ovaries glabrous; styles somewhat shorter than stamens. Capsules 5, ovoid-globose. Seeds yellow-brown and flat. Flowering in February to June, fruiting in May to August.

Distribution and habitat

China (central and western Guangdong, Hainan), Indonesia (Sumatra), western Malaysia, Myanmar, and Vietnam.
It grows at an altitude of about 1,000 m.





This species was first named *Rhodoleia championii* in 1850 (Hooker, 1850). Based on the shapes and sizes of leaf blades and petals, Fu (1991) described and illustrated a new species named *R. latiovatifolia*, that has broadly ovate leaf blades, longer inflorescences (2.8–4 cm long), and spoon-shaped petals that are 5–6 mm wide. *R. latiovatifolia* is a synonym for *R. championii*.

Conservation status

Rhodoleia championii is considered threatened, mainly because of increasing localization. In-situ protection is encouraged as this species has high genetic diversity at both the species and population levels. Artificial propagation of *Rhodoleia championii* is relatively simple.

Ethnic use

Rhodoleia championii is an ornamental landscape tree. The wood can also be used to make furniture and boats.

Written by Yu Qianxia

Rodgersia podophylla A.Gray

Saxifragaceae

- 鬼灯檠
[Gui deng qing]
- ヤグルマソウ (矢車草)
[Yaguruma-so]
- 도깨비부채
[Do-kkae-bi-bu-chae]
- Роджерсия стополистная
[Rodzhersiya stopolistnaya]

Description

Perennial herbs. Rhizomes stout, thickened, and creeping. Basal leaves palmately compound, 5(–7) obovate leaflets; apex 3–5-lobed, adaxially glabrous lobes; brownish, slender scale-like hairs abaxially along veins; serrate margin; acuminate apex. Cauline leaves Alternate, smaller than basal ones, upper ones simple or palmately 3 or 4-lobed. Flowering stems 1 m tall, stout, with several alternate leaves. Inflorescences paniculate, terminal, with multiple flowers, branches and pedicels, densely paleaceous hairs, sometimes glandular heads. Calyx tube shallowly cup-shaped, adnate to ovary, 5–7 lobes, greenish white when young, later white, abaxially and marginally sparsely glandular hairy, adaxially glabrous, apex acuminate. Petals absent. Ten stamens, two carpels, proximally connate, ovary half-inferior, ovoid. Capsules narrowly ovoid, with styles persisting as two divergent breaks, many seeded. Flowering in June to July.

Rodgersia L., composed of six taxa, is endemic to East Asia (China, Korea, and Japan), and one species is native to Korea (Pan & Cullen, 2001; Wakabayashi, 2001). Pan (1994) identified four distribution patterns of the genus: (1) Japan-Korea, (2) Qinling Daba Mountains, (3) Hengduan Mountains, (4) East Himalayas. R. *podophylla* belongs to the Japan-Korea distribution pattern and may be considered the most primitive one in the genus, as some archaic characters are preserved (e.g. diploid with $2n = 30$, small pollen grains, obscurely reticulate ornamentation of pollen, 7–5 sepals with open veins. etc.). In addition, the center of origin of *Rodgersia* may be in the Japan-Korea area. Japan was contiguous to the Asian continent not isolated before the late Tertiary. Therefore, the origin of the genus must precede the late Tertiary (late Cretaceous to early Tertiary).

Distribution and habitat

China (Jilin and Liaoning), Korea (Gyeonggi-do, Gangwon-do, Chungcheongbuk-do, Gyeongsangbuk-do, Hamgyeongnam-do, Hamgyeongbuk-do, Pyeonganbuk-do) and Japan (Hokkaido, Honshu). In shaded, damp slopes of mountain forests.

Conservation status

The Korea Forest Service considers *Rodgersia* L. to be a least concern (LC) species (2008). According to herbarium data, the species mainly occurs in the northern areas of Korea having the south most distribution in Gyeongsangbuk-do Province (middle of South Korea), however, some reports suggest the species distribution is in the southern parts of Korea, such as Mt. Jili in Jeollabuk-do and Gyeongsangnam-do Provinces.

Ethnic use

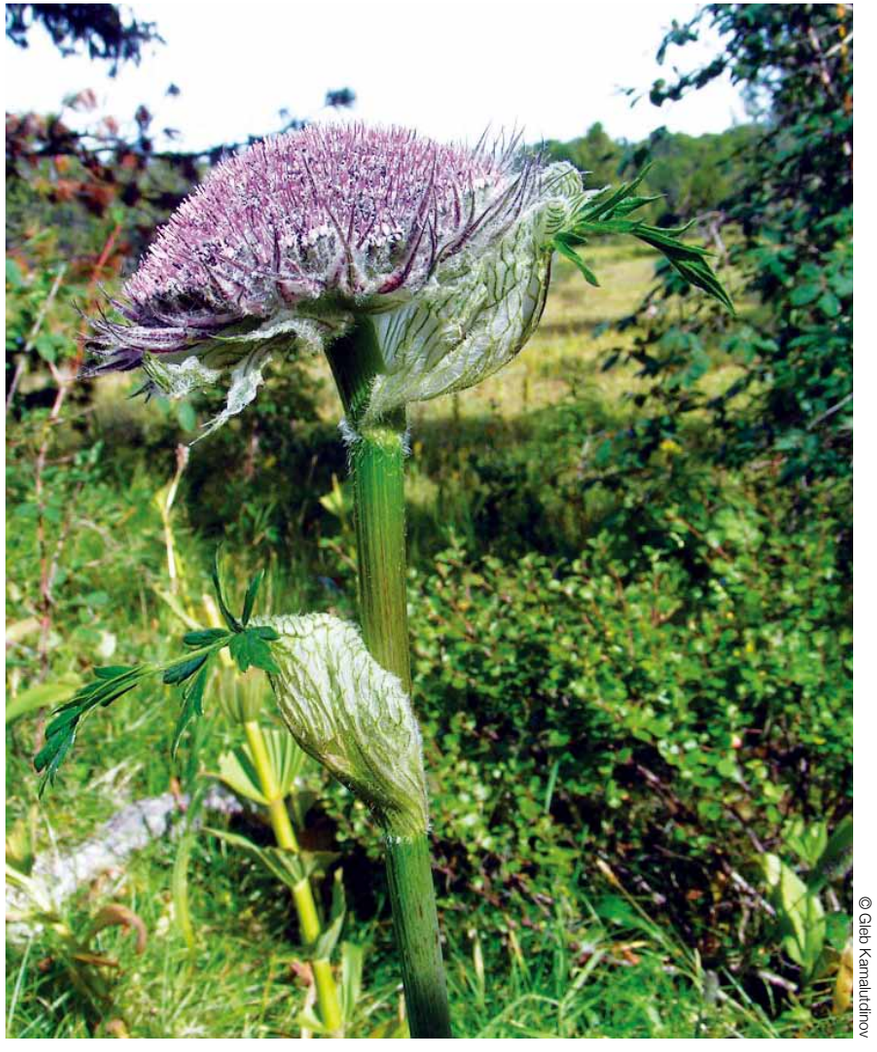
In Korea, rhizomes are rarely used for medicinal purposes.

Written by Gyu Young Chung

Sajania monstrosa Pimenov

Apiaceae

- Гаж соёлж
[Gaj soyolj]
- Саяночка странная
[Sayanochka strannaya]



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Description

Perennial, terrestrial herbs. Allorhizous root. Stems few, 30–50 cm. Leaf trifoliate-pinnaty, no stipule. Flower almost simple umbel, 5–10 mm, yellow to orange, pink and greenish, attractive, animal-pollinated; sepal and petal number 5, with fusion free; carpel and style number 2. Fruit size to 5 mm, dry, splitting in 2 parts (mericarp). Seed 2. Flowering in July and August (Urgamal, 2013).

Distribution and habitat

Mongolia (only Khentei mountain region, Onon river) (Gubanov, 1996; Urgamal, 2013).

Sajania monstrosa Pimenov is subendemic to Mongolia (Urgamal *et al*., 2014).

Conservation status

Currently it is listed as a Rare Plant in the Mongolian Red Book (2013).

Written by Magsar Urgamal

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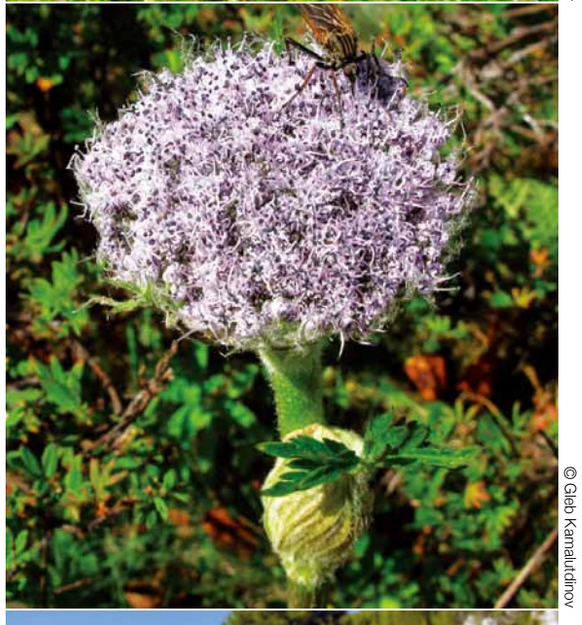

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Salix arbutifolia Pallas

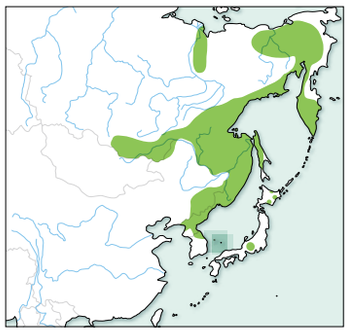
Salicaceae

- 钻天柳 [Zuan tian liu]
- ケショウヤナギ (化粧柳) [Kesho-yanagi]
- 새양버들 [Sae-yang-beo-deul]
- Чозения [Chozeniya]
- Ива земляничниколистная [Iva zemlyanichnikolistnaya]

© Takayuki Kawahara

Description

Deciduous canopy trees on river side in cool temperate zone, up to 30 m tall. Trunk gray in the young stage and blackish gray in old. Brachlets reddish. Leaf blade narrowly obovate to narrowly oblong-ovate, apex acute to acuminate, 2–8 cm long, 1–2 cm wide, margin obscurely serrate, lower surface glabrous and whitish. Petioles glaucous, 5–7 mm long. Dioecious. Catkins pendulous in flower, ascending after anthesis, cylindric, 2–5 cm long, 5 mm in diameter, 4–6 cm long in fruit. Stamens usually 5, slightly unequal in male flower. Ovary 1, narrowly ovate ca. 2 mm long; style ca. 0.4 mm long (Ohashi, 2006). No clonal reproduction. Flowering in late April to May, fruiting in August to October.



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The species was firstly described as *Salix arbutifolia* by Pallas in 1877. The epithet means leaf of Arbutus (Ericaceae) or Strawberry tree which is distributed in Europe. Nakai proposed the new genus name *Chosenia* in 1918 due to its free bud scales imbricated on the adaxial side and deciduous floral bracts of female flowers as well as pendulous katkins. He moved this species into *Chosenia* in 1920 as *C. splendida*. The name of *Chosenia* is derived from Chosen, another name of Korea. Skvortsov (1957) recognized *C. splendida* as a synonym of *C. arbutifolia* in 1957. *Chosenia macrolepis* (Turcz.) Kom. is also treated as a synonym.

Azuma *et al*. (2000) clarified that *Chosenia* and *Toisusu* were nested in *Salix* based on molecular phylogeny. Barkalov and Kozyrenko (2014) supported this relationship with expanded molecular data. Finally, it is concluded that *Salix arbutifolia* is a valid name taxonomically. Ohashi (2001) proposed a new monotypic subgenus *Chosenia according* to the result. Its chromosome number is reported to be $2n = 38$. Currently, no intraspecific taxon is recognized for this species. The hybrid between *S. arbutifolia* and *S. cardiophylla* (formerly treated as x *Toisochisenia kamikotica* (Kimura) Kimura is rarely recorded as x *Salix kamikochica* Kimura from Nagano Pref. in Honshu. The Japanese name Kesho-yanagi means 'makeup willow' because its trunk and twigs are covered with white powder, especially on juvenile trees. Its Korean name means new western popular, although it is actually native to Korean Peninsula.

Nagamitsu *et al*. (2014) examined the genetic diversity and relationship based on materials from Japan and Russia. Chloroplast DNA data have shown that the Hokkaido population has closer relationship with those in Nagano rather than those in Sakhalin despite the fact that Sakhalin is geographically closer to Hokkaido. As a result, the following three clusters have been recognized: Japan, Sakhalin and Kamchatka, and continental Russia. Nucleic SSR data showed different patterns. Monbetsu population, the northernmost one in Japan, is closer to Sakhalin and Kamchatka populations when structure analysis was performed. The populations in Nagano have been left. They became relic after ancient populations moved southward during the past glacial periods and northward during the post glacial period.

Safe site for *S. arbutifolia* is riverside with round stones and sand (Shin & Nakamura, 2005; Shin, 2009). However, *Salix arbutifolia* is less tolerant to submergence for long time than other Salix species (Nagasaka *et al*., 1994; Shin, 2009). Such habitat means rather fast flow, frequent flood, less mud, and changeable river root. Adult trees sometimes stand along old river routes far from today's river routes.

Distribution and habitat

Russia (Kamchatka to east Siberia), Japan (Hokkaido, Honshu (Nagano Pref.), Korea (Hamgyeongbuk-do, Hamgyeongnam-do, Pyeonganbuk-do, Pyeongannam-do, Gangwon-do), and China (northeast). Japanese populations are separated between Hokkaido and Nagano Pref., Central Honshu. Its local distribution in Hokkaido is mainly in Hidaka, Tokachi, and Kitami Area.
In Sakhalin, Russia, it is mainly distributed in the central part. On the other hand, this species is abundant on the middle part of rivers around Vladivostok. Its distribution may be affected by vegetation history through the glacial and interglacial periods with special habitat preference.

Conservation status

The species was nominated as VU in Red Data Book 2000. However, it was removed from Red Data Book 2014. Nagamitsu *et al*. (2003) have estimated the probability of extinction after 100 years based on population size deviation and concluded that it has almost 0% chance of extinction. However, local populations especially in Honshu are not so large. They could still face extinction (NT in RDL of Nagano Pref.). Recent decrease of flood frequency by flow volume management may accelerate the decline of its population size because it would deprive the chance of regeneration of this species.

Ethnic use

Its wood has been scarcely used for other purposes except as fuels.

Written by Takayuki Kawahara

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Salsola passerina Bunge

Amaranthaceae

- 珍珠猪毛菜
[Xhen zhu zhu mao cai]
- Бор бударгана
[Bor budargana]
- Солянка воробьиная
[Solyanka vorobinaya]

Description

Subshrubs 15–30 cm tall, densely covered with T-shaped hairs. Stem branched from base, woody branches spreading, gray-brown, branches densely covered with globose buds. Leaves subulate or triangular, 2.3 × ca. 2 mm, abaxially slightly keeled, usually early deciduous, base expanded, apex acute. Inflorescence spikelike, bracts ovate, bractlets broadly ovate, margin membranous, apex acute. Perianth (including wings) 7.8 mm in diameter in fruit, segments narrowly ovate, abaxially slightly fleshy and winged from middle in fruit, margin membranous; portion of segment below wing glabrous, portion above wing connivent with others and forming a cone, T-shaped hairy, 3 wings yellow-brown or light purple-red, reniform, 2 other wings obovate, smaller. Anthers free from base to near apex, oblong, anther appendage lanceolate, apex acute. Stigmas filiform. Seed horizontal or vertical. Flowering in July, fruiting in August to September (Zhu *et al*., 2003).

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This species is from Mongolia (Eastern Gobi, Shilin-Khuduk), subendemic to Mongolia (Urgamal *et al*., 2014). Plants from Lake Uvs nuur basin, the northernmost and isolated part of the distribution range of this species in Mongolia, are characterized by very small and closely arranged vegetative buds, very slender branches and small bush size. This features are evidently explained by the direct influence of climatic conditions of this basin which are most severe for this southern saltwort. No differences whatsoever of reproductive organs have been noticed between Uvs nuur plants and plants from the main part of the range and hence Uvs nuur plants can be treated only as a variant, var. *minor* mihi (Grubov, 1966).

Distribution and habitat

Mongolia (Depression of Great Lakes, Walley of Lakes, Eastern Gobi, Gobi Altai, Dzungarian Gobi, Trans Altai Gobi, Alashan Gobi), China (Western Gansu, Nei Mongol, Ningxia, Qinghai). Its habitats include stony slopes of hills and mountains and clayeypebble, debris, salty depression margins, solonchaks and subsaline sands of lake depressions as edificator of desert steppe and deserts (Grubov, 1982).

Ethnic use

Primary pastureland plant of the Gobi desert. Camels, sheep and goats graze it in spring and winter (Ulziikhutag, 1985).

Written by Radnaakhand Tungalag & Nyam-Osor Batkhuu

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Saussurea orgaadayi Khanm. & Krasnob.

Asteraceae

风毛菊属
[Feng mao ju shu]

Оргадай банздоо
[Orgadai banzdoo]

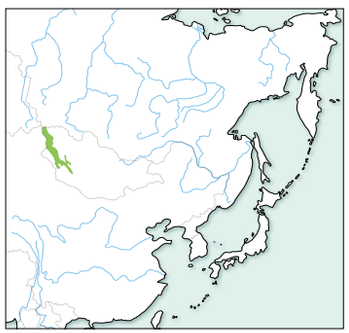
Соссюрея оргаадай
[Sossyureya orgaadai]

Description

Perennial herbs 40–80 cm tall. Caudex stout, unbranched, densely covered with fibrous remains of petioles. Stem solitary, 1.5–2 cm in diameter, erect, simple; stem at base (root collar) wrapped with fibrous towy remnants of dead leaves. Rosette and stem leaves petiolate; leaf blade narrowly ovate, elliptic or obovate, both surfaces green and glandular hairy, base decurrent, margin denticulate to serrulate, apex acute to obtuse; uppermost stem leaves sessile, membranous, pale yellow or whitetish green. Capitula 10–15, in a hemispheric synflorescence 8–10 cm in diameter, sessile or shortly pedunculate. Involucre hemispheric to broadly campanulate, 1–2.5 cm in diameter. Corolla purple. Flowering in July to August, fruiting in August to October (Pyak *et al*., 2008).

Distribution and habitat

Mongolia (Mongolian Altai mountain region: Munkh Khairkhan mountain) (Olonova & Beket, 2010; Dariimaa, 2014, Urgamal *et al*., 2014). Its habitats include stony tundra in alpine belt, stony streams, and rubbly-stony slopes (2,300–3,000 m a.s.l.).



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Saussurea orgaadayi Khanm. & Krasnob. is subendemic to Mongolia, described from Mongolia (Urgamal *et al*., 2014).

Conservation status

Currently it is listed in the Red Data Book Altai Republic of Russia without any statutory protection.

Ethnic use

Medicinal plant. However, its specific uses are currently unclear.

Written by Batlai Oyuntsetseg

Schizopepon bryoniifolius Maxim.

Cucurbitaceae

- 裂瓜 [Lie gua]
- ミヤマニガウリ(深山苦瓜) [Miyama-niga-uri]
- 산외 [San-oe]
- Схизопепон бриониелистный [Schizopepon brionielistnyi]

Description

Annual herbs. Stem 2–3 m long. Branches slender, subglabrous or slightly puberulent. Tendrils filiform, glabrous. Petiole slender, 4–13 cm, sometimes puberulent. Leaf blade ovate or broadly ovate-cordate, 6–10 × 5–9 cm, membranous, puberulent, palmately 5–7-veined, 3–7-angular or -lobed, margin irregularly dentate, apex acuminate. Sinus semicircular. Flowers very small, bisexual, solitary or in 3–5-flowered racemes. Peduncle filiform, 1–1.5 cm, puberulent. Calyx segments lanceolate, ca. 1.5 mm, 1-veined, entire. Corolla rotate. Segments white, ca. 2 × 0.8–1 mm, 3-veined. Stamens inserted at base of calyx tube, free, ca. 1 mm, glabrous. Filaments linear. Anthers ca. 0.5 mm, anther cells erect, connective not produced. Ovary ovoid, 3-locular. Style short. Stigmas 3. Fruit broadly ovoid, 10–15 mm, apex acute, 3-valved, 1–3 seeded. Seeds ovate, ca. 9 × 5.5 mm, compressed, margin irregularly dentate, apex truncate. Fruiting in June to November.

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Distribution and habitat

China (Hebei, Heilongjiang, Jilin, Liaoning), Korea (Pyeonganbuk-do, Gangwon-do, Gyeonggi-do, Gyeongsangbuk-do, Jeju-do), Japan (South Kuriles, Hokkaido, Honshu, Kyushu), and Russia (Primorskii and Khabarovskii Territories, Amur Region, southern part of Sakhalin Island and South Kuril Islands). Its habitat included river valleys and forests at elevation of 500–1,500 m.

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Ethnic use

It can be used to make cane and all kinds of handles. Its fruit is edible and bitter. Fruit can be used as fragrance. Its seeds have been used as medicine to clear heat and brighten eyes. It can be used for urban greening.

Written by Cao Wei

Schoenoplectiella lineolata (Franch. & Sav.) J. Jung & H.-K. Choi

Cyperaceae

- ヒメホタルイ (姫蛍藺)
[Hime-hotaru-i]
- 제주고랭이
[Je-ju-go-raeng-i]
- Камыш линейчатый
[Kamysh lineichatyi]

Description

Perennial herb. Plants up to 10–35 cm tall, with creeping rhizomes forming bulb thickening at the ends and orthotropic shoots spaced by 1.5–3 cm. Stems smooth. Leaves 2 filmy, translucent, brownish, 1–5 cm of length, without lamina. Inflorescence unbranched, sessile single spikelets. Bracts culm-like, 1–2.5 cm long, straight, continuation of the stem.
Spikelets with 2–4 flowers, 5–10 mm long. Glumes on green keel yellowish or brownish. Stamens 2–3, anthers 2–2.5 mm length. Stigmas 2. Flowering in July, fruiting in July to August. Plants from Russian Far East are smaller than those from Japan, their height up to 15 cm, leaves 1–2 cm, flowers up to 5 mm (Kozhevnikov, 1988).

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Scirpus lineolatus was identified in the Russian Far East only in the Terneiskii District of Primorskii Territory in Yaponskoye Lake (Voroshilov, 1982; Kozhevnikov, 1988). Further, this species was described for the Golubichnoye Lake of the same district (Nesterova, 2005) and from Amur Territory (Darman, 2009).
Reichenbach (1846) reported *Scirpus* as the subgenus *Schoenoplectus*. Palla (1888) transferred the rank of *Schoenoplectus* from a subgenus to a genus (Jung & Choi, 2010). The species of this genus share several morphological characteristics, namely ligulathe leaves, a culm-like primary bract, and pseudo-lateral branched inflorescence. The species of this genus was considered as *Schoenoplectus* s. l. until Lye (2003) recognized the polyphyly of *Schoenoplectus* s. l. *Schoenoplectiella* differs from *Schoenoplectus* s. str. in its morphology as having unbranched inflorescence.

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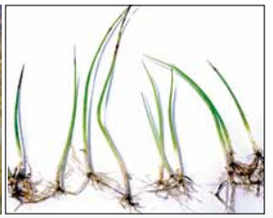

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Distribution and habitat

Russia (Central part of Primorskii Krai, Yaponskoye and Golubichnoye lagoon lakes in Terneyskii District (Nesterova, 2005); Amur Oblast, Zolotuchino oxbow lake in Poyarkovskii District (Darman, 2009)), Japan (Honshu, Shikoku), Korea (South parts) and Taiwan. Grows in water up to 25 cm deep in freshwater lakes, and in sandbanks. Sometimes *S. lineolata* occurs up to 1 m deep and forms thickets of vegetative shoots. It only forms generative shoots over water (Nesterova & Pimenova, 2012).

Conservation status

S. lineolata has been included to the Red Data Book of Primorskii Krai (2008) and Amur Oblast (Darman, 2009). This species is conserved in the Sikhote-Alin Biosphere Reserve, where regular monitoring of populations is conducted (Nesterova, 2005; Nesterova & Pimenova, 2012).

Written by Elena A. Pimenova

Scutellaria baicalensis Georgi

Laminaceae

- 黄芩 [Huang qin]
- コガネバナ (黄金花) [Kogane-bana]
- 황금 [Hwang-geum]
- Шлемник байкальский [Shlemnik baikalskii]

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Description

Perennial herbs, with fleshy rhizomes 2–3 cm in diameter. Stems erect, (15)35–85(120) cm in height with thick leaves. Leaves simple, entire-kind, petiole 2 mm long, lamina 1.5–4.5(5) cm long, 0.5–1.2 cm wide, linear-lancet or lancet, sharp, base rounded, upper side lustrous, lower side naked or sparsely puberulent, with hair along the border. Inflorescence raceme ca. 6–10(15) cm height, unilateral, terminal. Flowers blue, in leaf axils. Pedicles short. Calyx 4 mm long, two-lips, entire, and hairy. Corolla 2–2.5(3) cm long, tubular, two labiate, widening to throat to 6 mm, densely pubescent hair, erect upper lip, galeated, lower lip tri-lobed, middle lobe broadest. Fruit coenobium, from four one-seeded eremuses, ca. 2 mm long, ovoid, flattened, and hilly. Flowering in July to August, fruiting in August to September.

Most authors are accepted the name *Scutellaria baicalensis* Georgi, 1775, Bemerk. Reise Russ. Reich. 1:344 (Li & Hedge, 1994; Cherepanov, 1995; Probatova, 1995; Suh, 2007). *Scutellaria lanceolaria* Miquel and *S. macrantha* Fischer (Li & Hedge, 1994) are used synonymously in China.

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Distribution and habitat

Russia (South-Eastern Siberia, South of Far East) (Probatova, 1995; Zuev, 1997; Conspectus Florae Sibiriae, 2005); Mongolia (Northeastern) (Gubanov, 1996), Northeastern China (Gansu, Hebei, Heilongjiang, Jilin, Henan, Hubei, Jiangsu, Liaoning, Nei Mongol, Shaanxi, Shandong, Shanxi) (Liu, 1981; Li & Hedge, 1994), and Korea (northern part) (Suh, 2007). Grows in sunny dry grassy and rocky places, dry steppe grasslands, sparse oak forests, and in shrub thickets.

Conservation status

Scutellaria baicalensis is included in Red Data Book of the Primorskii Krai (Probatova, 2008) as a vulnerable species (VU).

Ethnic use

Scutellaria baicalensis is a medicinal plant well known in traditional Chinese medicine. The plant contains flavonoids, physiologically active substances with a broad spectrum of action (Shao *et al*., 1999; Huang *et al*., 2000; Zhang *et al*., 2003; Huang *et al*., 2006; Yoon *et al*., 2009; Jeong *et al*., 2011; Lin *et al*., 2011). It has antipyretic, choleretic, and diuretic properties. The root decoction is used in infectious diseases, rheumatism, arrhythmia, hypertension, pulmonary tuberculosis, and pneumonia (Shrëter, 1975). It is cultivated as an ornamental plant. The species is not distributed in Japan and Korea naturally. In Japan, the seeds were imported in the middle of Edo era (around the 18th century) and cultivated in the Koishikawa hospital and herb nursery (now the botanical gardens of University of Tokyo). The Japanese name, kogane-bana means golden flower.

Written by Svetlana V. Nesterova

Semiaquilegia adoxoides (DC.) Makino

Ranunculaceae

- 天葵 [Tian kui]
- ヒメウズ (姫烏頭) [Hime-uzu]
- 개구리발톱 [Gae-gu-ri-bal-top]
- Полуводосбор адоксовидный [Poluvodosbor adoksovidnyi]

Description

Perennial herbs with tubers developed. Tubers blackish brown, 1–2 cm long and 3–6 mm in diameter. Stems 1–5, 10–30 cm tall, sparse white hairs, branched. Basal leaves numerous, sheathed; petioles 3–12 cm; leaf blades ovate, suborbicular, or reniform, 1.2–3 cm, hairless; leaflets flabellate-rhombic to obovate-rhombic, 0.6–2.5 × 1–2.8 cm, tri-parted; segments 2- or 3-lobed. Flowers 4–6 mm in diameter. Pedicels slender, 1–2.5 cm, spreading white pubescent. Sepals white usually tinged with purple, narrowly elliptic, 4–6 × 1.2–2.5 mm, apexes acute. Petals spatulate, 2.5–3.5 mm, apex subtruncate. Staminodes white, linear-lanceolate, membranous, glabrous. Fruits (follicles) ovoid-ellipsoid, 6–7 × ca. 2 mm; seeds ovoid-ellipsoid, ca. 1 mm. Flowering in March to May, fruiting in April to June.

Distribution and habitat

China (Anhui, Fujian, Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Sichuan, E Yunnan, Zhejiang), Japan (Honshu, Shikoku, Kyushu), Korea (Jeollabuk-do, Jeollanam-do, Jeju-do). Broad-leaved forests with rich humus and loose soil. Roadsides, forests, and mountain slopes (Yaeu, 2007).

Semiaquilegia Makino is a small genus in the buttercup family (Ranunculaceae) with one or two species, occurring in East Asia (China, Japan, and Korea) (Yeau, 2007). The genus belongs to Thalictroideae characterized by T-type chromosome (small chromosomes with basic number x = 6 or 7) and is distinguished by shortly clawed, slightly tubular and shortly spurred (Tamura, 1995; Wang & Chen, 2007). The nomenclature of several taxa remain unresolved in this genus (The Plant List, www.theplantlist.org). There is *Isopyrum manshuricum* Kom. in the South of Primorskiy Krai (Luferov, 1995; 2004). Sometimes this species is included in the *Semiaquilegia* genus (Cherepanov, 1995). According to molecular data, *Semiaquilegia* was derived about 10 million years ago (Bastida *et al*., 2010).

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Conservation status

No specific conservation status has been given to the species *Semiaquilegia adoxoides* (DC.). Makino has been classified it as a weed in China (Wu *et al*., 2004).

Ethnic use

Roots have medicinal uses in Japan (Lee, 2003).

Written by Kyong-Sook Chung

Sorbaria sorbifolia (Linnaeus) A. Braun in Ascherson

Rosaceae

- 珍珠梅 [Zhen zhu mei]
- ホザキナナカマド (穂咲七竈) [Hozaki-nana-kamado]
- 쉬땅나무 [Swi-ttang-na-mu]
- Тэснавчит Шүргэнэ [Tesnavchit Shurgene]
- Рябинник рябинолистный [Ryabinnik ryabinolistnyi]

Description

Shrubs up to 2 m tall. Branches erect, branchlets glabrous or slightly pubescent. Stipules ovate-lanceolate to triangular-lanceolate, 8–13 mm, abaxially slightly pubescent, apex acuminate. Leaflets 11–17, opposite, lanceolate to ovate-lanceolate, 5–7 × 1.8–2.5 cm, glabrous or subglabrous on both surfaces or abaxially densely stellate hairy, lateral veins in 12–16 pairs, base subrounded to broadly cuneate, rarely slightly oblique, apex acuminate or caudate. Panicle 10–12 × 5–12 cm. Peduncle and pedicels more or less pubescent and stellate hairy. Bracts ovate to linear-lanceolate, 5–10 mm, slightly pubescent on both surfaces, later glabrescent, apex acuminate. Flowers 10–12 mm in diameter. Pedicel 5–8 mm. Hypanthium pubescent abaxially at base. Sepals persistent and reflexed (rarely spreading) in fruit, triangular, abaxially sparsely pubescent, apex obtuse or acute. Petals oblong or obovate, 5–7 mm. Follicles cylindric, ca. 3 mm, glabrous. Fruiting pedicel erect. Flowering in July to August, fruiting in September.

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Distribution and habitat

China (Heilongjiang, Jilin, Liaoning, Nei Mongol), Japan (Hokkaido, North Honshu), Korea (all provinces except Chungcheongnam-do and Jeju-do), Russia (almost through all Far East, including Kamchatka Peninsula, Sakhalin Island and Kuril Islands), and Mongolia. Its habitat includes open forests at elevation of 200–1,500 m.

Some varieties have been recognized within *S. sorbifolia*, including var. *stellipila* Maxim., var. *inserta* C. K. Schneid and var. *glandulsa* Nakai. The variety of *S. sorbifolia* var. *stellipila* is known to be distributed only in Korea and Japan.

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Ethnic use

The species is an ornamental plant. It has been used for urban greening. It also has medicinal usage. Written by Jin Yonghuan

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Spongiocarpella grubovii (N. Ulzij.) Yakovlev

Fabaceae

- 大花雀儿豆
  [Da hua que er dou]
- Грубовын хөндий
  [Gruboviin khóndii]
- Спонгиокарпелла Грубова
  [Spongiocarpella grubova]

Spongiocarpella grubovii (N. Ulzij.) Yakovlev is subendemic to Mongolia (Urgamal *et al*., 2014), described from the Alashan Gobi phytogeographical region.

Ethnic use

Poisonous plant (Ulziikhutag, 1985).

Written by Magsar Urgamal & Radnaakhan Tungalag

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Description

Small cushion spiny subshrubs. Stems shortened, 5–10 cm tall. Leaves 2–4 cm, 7- or 9-foliolate; stipules ovate, ca. 4 mm, submembranous, adnate to petiole. Leaves imparipinnate. Flowers solitary, axillary; calyx distinctly bilabiate, coarsely membranaceous, rusty-colored, with long white hairs. Keel without cusp. Legumes hard-coriaceous, lignescent, oblong-elliptic or oblong-ovate, 12–13 mm long. Flowering and fruiting in June and July.

Distribution and habitat

Mongolia (Eastern Gobi, Trans Altai Gobi, Alashan Gobi (Borzon Gobi)). Its habitats include slopes and bottoms of dry river beds as well as sanded tailings of desert hills (Grubov, 1982; Neuffer *et al*., 2003).

Conservation status

It is listed as “Endangered” in the Mongolian Red List (2011).

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Syneilesis aconitifolia (Bunge) Maximowicz

Asteraceae

- 兔儿伞 [Tu er san]
- タンバヤブレガサ (丹波破傘) [Tanba-yaburegasa]
- 애기우산나물 [Ae-gi-u-san-na-mul]
- Синейлезис борцоволистный [Sineilezis bortcovolistnyi]

Description

Perennial herbs, 70–120 cm tall. Stem erect, purple-brown, simple, glabrous. Cauline leaves usually 2(–3). Lower leaves long petiolate, peltate, glabrous, base amplexicaul, blade abaxially gray, adaxially pale green, palmately parted, segments 7–9, twice bifid, lobes linear-lanceolate, initially reflexed. Uppermost leaves sessile or shortly petiolate, bract-like, lanceolate. Capitula many, discoid, arranged in dense compound corymbs. Involucres tubular, glabrous at base, margin scarious. Florets 8–10, corolla pink-white, anthers purple, basally shortly hastate. Style branches elongated, compressed, apically obtuse, penicillate-puberulent. Achenes cylindric, glabrous, ribbed. Pappus of capillary bristles, sordid white to reddish. Flowering in June to July, fruiting in August to October.

Distribution and habitat

China (Anhui, Fujian, Gansu, Guizhou, Hebei, Heilongjiang, Henan, Jiangsu, Liaoning, Shaanxi, Shanxi, Zhejiang), Japan (West Honshus), Korea (northern part and Jeju-do), and Russia (Far East). Its habitat includes forest margins, slopes, or roadsides.

Syneilesis Maxim is endemic to eastern Asia with six taxa, occurring in China, Korea, Japan, and Russia (Far East) (Manchester *et al*., 2009). The genus belongs to subtribe Tussilagininae, tribe Senecioneae of Asteraceae. This species can be distinguished from other species by leaf segments narrow, 2.5–8 mm width. *S. aconitifolia* var. *longilepis* Kitam with long involucres is endemic to Japan. It is distributed in West Honshu (Kyoto Pref.) (Ito *et al*., 1995).

Ethnic use

Its roots and whole plant have been used as medicine to relax and activate the tendons, alleviate pain around the waist and lower extremities, and treat injuries (Chen & Nordenstam, 1995).

Written by Gyu Young Chung

Tigridiopalma magnifica C. Chen

Melastomataceae

- 虎颜花 [Hu yan hua]
- Тигридиопальма великолепная [Tigridiopalma velikolelepnaya]

The species named *Tigridiopalma magnifica* was described in 1979 (Chen, 1979), and has no other name.

Description

Perennial herbs. Rhizomes slightly woody. Stems reddish hispid. Leaves basal; petioles, terete with reddish hispid; leaf blades cordate, 20–30 × 20–30 cm or larger, membranous, abaxially densely furfuraceous, reddish villous with cordate bases, and margins ciliate and irregularly abruptly denticulate. Inflorescences axillary, scorpioid cymes; bracts caducous. Pedicels angular, narrowly winged on the angles, and sometimes nodose. Calyx lobes triangular-semiorbicular, inserted on tip of wing. Petals dark red. Longer stamens having anthers with a triangular spur and 2 adaxial tubercles. Shorter stamens having anthers with 2-tuberculate bases and decurrent, forming a short spur. Ovaries ovoid; apexes 5-lobed membranous crown and the lobe margins ciliate. Capsules funnelform cup-shaped. Flowering in November, fruiting in March to May.

Distribution and habitat

China (Xinyi, Yangchun in Guangdong). It grows in dense forests, valleys, stream sides or rock crevices at altitudes of 400–400 m.

Conservation status

Tigridiopalma magnifica is a rare and endangered plant in Guangdong Province, China. Because of its narrow distribution range and weak adaptation to environmental conditions, *T. magnifica* is becoming increasingly scarce in the wild. Fortunately, its natural distribution falls inside Yangchun e'huangzhang Nature Reserve Area (Li *et al*., 2009). It is listed in the China Plant Red Data Book under first-grade state protection.

Ethnic use

Tigridiopalma magnifica has a huge blade and dark red flowers. It is shade tolerant and can be grown in pots, and thus is a very good ornamental plant for indoor viewing.

Written by Ning Zulin

Tricyrtis macropoda Miq.

Liliaceae

- 油点草 [You dian cao]
- ヤマホトトギス (山杜鵑) [Yama-hototogisu]
- 뻐꾹나리 [Ppeo-kkuk-na-ri]
- Трициртис крупноногий [Tritcirtis krupnonogiy]

Description

Perennial herbs, rhizomatous. Rhizomes short, creeping. Stems erect, sometimes dichotomously branched, sparsely or densely hispidulous distally, up to 1 m. Leaves cauline, alternate, oblong to ovate, sessile, hispidulous on both surfaces, base cordate or rounded and amplexicaul, margin hispidulous-ciliate, apex acute or acuminate. Inflorescences axillary thyrses, terminal cymes or fascicles, and many flowers; pedicels sometimes bracteates. Flowers erect, showy; perianth campanulate or infundibular; tepals 6, in two whorls, free, early deciduous, apically recurved, greenish white or white, with purplish spots, ovate-elliptic to lanceolate, 1.5–2 cm × 5–7 mm; outer ones wider than inners ones, basally saccate; stamens 6, 1.5–2 cm; filaments slightly flattened, with purple spots; ovay tri-locular, glabrous, oblong; style tri-fid; stylodia apically bi-fid; numerous ovules. Capsule 2–3 cm. Flowering in June to August.

Distribution and habitat

China, South Korea, and Japan (widely distributed in the forests on the Western Pacific-side).

The genus *Tricyrtis* Wall. is composed of 18–20 known taxa and shows high endemism in East Asia (Takahashi, 1974, 1980, 1987; Peng & Tiang, 2007). In particular, ca. 13 taxa occur in Japan (Masamune, 1930; Takahashi, 1974, 1980) and ca. six taxa are known in Taiwan (Liu & Ying, 1978). *Tricyrtis macropoda* is closely related to *T. affinis* Makino, *T. pilosa* Wall. and *T. setouchiensis* Hr. Takahashi (Takahashi, 1974, 1980). Although Kitamura *et al*. (1966) consider that the former two are conspecific, Takahashi (1974) shows that they are distinct species. The characteristics of *T. dilatata* Nakai, which was considered as Korean endemic species, were verified as identical to *T. macropoda*.

Conservation status

Most taxa of the genus *Tricyrtis* are rare in the wild (Kitagawa & Koyama, 1958), but they have long been cultivated as ornamental garden plants (Mathew, 1985). *Tricyrtis macropoda* is categorized as a least concern rare plant in the national level of Korea (Korea Forest Service, 2008). Many wild populations of Korea suffer from illegal digging due to its ornamental value.

Ethnic use

Most of *Tricyrtis* species including *T. macropoda* are famous for ornamental value, particularly in shady gardens (Mathew, 1985). The young leaves of *T. macropoda* are an edible resource in Korea.

Written by Hyeok Jae Choi

Tripterygium wilfordii Hook.

Celastraceae

- 雷公藤 [Lei gong teng]
- タイワンクロヅル [Taiwan-kuro-zuru]
- 미역줄나무 [Mi-yeok-jul-na-mu]
- Крылоорешник Вильфорда [Krylooreshnik wilforda]

Description

Deciduous subshrubs, or scandent and scrambling or sometimes semi-woody vines, 2–6(–10) m. Branching distally, slender or scrambling, minutely pubescent when young or in open sunlight, becoming glabrous when old or in shade, slightly angled, verrucose or not. Petiole 1–2 cm. Stipules linear, cadu cous. Leaf blade usually ovate or rounded-ovate, sometimes oblong or elliptic-ovate, (4.6–)8.6–12.5(–18.4) × (3.1–)5.7–8.9(–12.3) cm, papery, herbaceous (in shade or low light) to leathery (in direct sunlight or very dry conditions), glabrous or sparsely scurfy tomentose with reddish brown hairs, abaxially ± farinose, base broadly cuneate, or rounded to cordate, margin entire or less often crenulate, apex short to long acuminate or acute, tip often blunt. Thyrses large, composed of several to dozens of thyrselets, (4.5–)12.5–23.6(–38) × (2.3–)4.7–9.3(–15) cm. Flowers 1 normal and 1 an unfertilized male, whitish, greenish, or yellow-green, small, 4–6 × 4–6 mm. calyx 5-lobed, hemispheric, ca. 1 mm. Petals 5, oblong to subovate, slightly narrowed to base, 2–2.5 mm, apex rounded. Stamens 5, inserted at margin of cup-shaped and compressed disk. Disk bright green, fleshy, ca. 2 mm in diameter. Ovary superior, 3-edged, combined with disk at base, incompletely 3-locular, with 3 prominent ca. 1 mm lobes, short style at apex. Stigma capitate, bright purple. Samara usually green or greenish brown when mature, sometimes pink or pinkish purple, (1–)1.3–1.9(–2.3) × (0.7–)1.2–1.5(–1.9) cm. Seed compressed, 3-angled, ca. 5 × 1.3–3 mm. Flowering in May to October, fruiting in August to November.

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Type specimens are collected from Keelung, Taiwan. *T. regelii* Sprague et Takeda is used instead of this scientific name. In Japan, two species of *Tripterygium* (*T. regelii* Sprague et Takeda and *T. doianum* Ohwi) are naturally distributed. However, *T. wilfordii* is not naturally distributed.

Distribution and habitat

China (Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangsu, Jiangxi, S Jilin, SE Liaoning, Sichuan, N Taiwan, Xizang, Yunnan, Zhejiang), Korea (all provinces), and northeastern Myanmar. Its habitat includes mixed forests, forest margins, woodlands, scrub and wet places of mountain areas at elevation of 100–3,500 m.

Ethnic use

Its root, stem, and leaf are toxic. It can be used as insecticides or pesticide. Its bark fibers can be used as pulp.

Written by Jin Yonghuan

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Tsuga longibracteata W. C. Cheng

Pinaceae

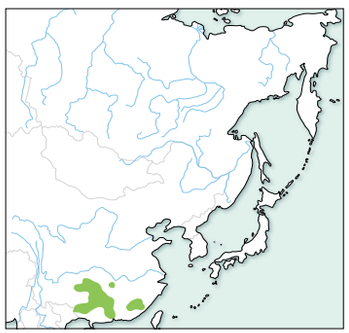
- 长苞铁杉
[Chang bao tie shan]
- Тсуга длинноприцветниковая
[Tsuga dlinnopritcvetnikovaya]

Description

Trees up to 30 m tall. Bark dark brown and longitudinally fissured. Branchlets brownish yellow or reddish brown, aging to a brown-gray or dark brown, glabrous. Leaf blades linear, smooth or faintly grooved, with 7–12 adaxial stomatal lines and 10–16 along each surface abaxially, full margins, and somewhat acute or slightly obtuse apexes. Seed cones purplish or red, maturing to dark brown persist for several years, then break off whole or disintegrate. Seed scales in the middle of cones broadly rhombic or suborbicular. Bracts subspatulate; apical cusps acute or acuminate. Seeds triangular-ovoid, wings ovate-oblong, and apexes rounded. Pollinating in March to April, fruiting in October.

Distribution and habitat

China (C and S Fujian, N Guangdong, C and N Guangxi, E Guizhou, S Hunan, and S Jiangxi). It grows on steep, sunny mountain slopes and ridges on acidic soils in areas with cool, temperate, humid climates and abundant rainfall and fog. It forms small, pure stands, or grows in evergreen, broad-leaved, sclerophyllous forests accompanying species of *Castanopsis*, *Lithocarpus*, and *Quercus*, or in mixed, mesophytic forests accompanying species including *Fagus longipetiolata*, *Pinus kwangtungensis*, and *Tetracentron sinensis*. It grows at altitudes of 300–2,300 m.



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This species was first named *Tsuga longibracteata* (Cheng, 1932). Hu (1951) called it *Nothotsuga longibracteata*. *Nothotsuga longibracteata* is now considered a synonym for *Tsuga longibracteata* in the FOC (Fu *et al*., 1999).

Conservation status

Tsuga longibracteata is a "living fossil" endemic to China in the Pleistocene era, and has been listed as a national second-order protected plant. Wild populations of *Tsuga longibracteata* are dwindling due to global climate change and other human activities (Lin *et al*., 2004).

Ethnic use

Tsuga longibracteata was found by Chinese botanists Jiangying professor on Fanjing Mountain, Guizhou Province, in 1930. It is an ancient relic, and is significant for studies of paleoecology and paleoclimate. In addition, it is a valuable timber and forest tree species and is used infolk medicine to treat arthritis and stomach ailments.

Written by Ning Zulin

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Tugarinovia mongolica Iljin.

Asteraceae

革苞菊 [Ge bao ju]

Монгол шардалан
[Mongol shardalan]

Монгол тугаринов
[Mongol tugarinov]

Тугариновия монгольская
[Tugarinoviya mongolskaya]

Description

Perennial herb, acaulescent, prickly, 5–10 cm tall. Thick caudex covered with white tomentum. Radical leaves leathery, both surfaces sparsely to densely cobwebby or lanate, oblong, 3–15 cm long, 1–4 cm wide, rigid-coriaceous undulate, dark green, petiolate, 1–3 thin peduncles bear single calathidia. Bracts leathery, with shallow spiny lobes, abaxially cobwebby, outer bracts leaf like, not always present, inner bracts smaller, with yellow spinules. Male capitula ca. 1 cm and female capitula ca. 2 cm in diameter. Involucre obconic to obovoid, ca. 1 cm in diameter. Phyllaries few, imbricate, linear-lanceolate, abaxially subglabrous, margin entire and ciliate, apex spiny. Corolla yellowish, 0.7–1.4 cm long. Style distally thickened in female florets smooth and with divergent triangular-ovate branches in functionally male florets covered with sweeping hairs at tip. Branches coherent, linear. Achene oblong, 8–10 mm, densely sericeous-villous. Pappus dirty white, inner pappus up to 1.5 cm. Flowering and fruiting in June to September (Shi *et al*., 2011).

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Tugarinovia mongolica Iljin. is subendemic to Mongolia (Urgamal *et al*., 2014), described from Great Lakes phytogeographical region.

Distribution and habitat

Southern Mongolia (Valley of Lakes, Eastern Gobi, Gobi Altai and Alashan Gobi) and Northern China (Nei Mongol). Its habitats include stony slopes, rocks, and desert debris (Grubov, 1982).

Conservation status

It is listed as a "Very Rare" species in the Mongolian Law on Natural Plants (1995) and "Very Rare" in the Mongolian Red Book (1997). It is listed as a "Vulnerable" in the Regional Red List (2011).

Ethnic use

In China its roots used for medicines (Shi *et al*., 2011).

Written by Dashzeveg Nyambayar

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Vicia ohwiana Hosok.

Fabaceae

- 头序歪头菜 [Tou xu wai tou cai]
- 함경나비나물 [Ham-gyeong-na-bi-na-mul]
- Горошек Ови [Goroshek ovi]

Description

Perennial herbs up to 70 cm tall, with rhizome. Stems solitary, slightly pubescent with a small number unbranched or sparsely branched. The sheet axis ends with thin spines. Leaves subsessile, 1-paired, broadly ovate or almost rhomboid, pointed at tip, bare or on the edge and midrib with sparse hairs, 40–70(100) × 35–50(70) mm. Inflorescence capitate, dense, and almost sessile. Stipules ovate or ovate-lanceolate, margin entire, without teeth. Raceme abbreviated to capitate, shorter than leaf and densely flowered. Calyx campanulate, 8–10 mm, with pubescent red hairs. Corolla bright purple, sometimes white. Beans obliquely oblong, 25–30 × 0.5 mm and naked, expands two valves. Flowering and fruiting in July to September.

Distribution and habitat

Russia (only Southern part of Primorskii Krai), Northeastern China (Hebei, Heilongjiang, Henan, Jilin, Liaoning, Shaanxi, Shandong, Shanxi) and Korea (Hamgyeongbuk-do) (Pavlova, 1989, Bao & Turland, 2010). Grows in mixed, broadleaved and oak forests, hill slopes, sunny slopes, grasslands, meadows; in Russia from 100 to 600 m; in China below 4,000 m.

Sometimes *V. ohwiana* (Hosokawa, 1933) has been considered as variations of *V. unijuga* - *V. unijuga* A. Braun var. *apoda Maximowicz* (Xia, 1998), and *Vicia unijuga* A. Br. var. *ohwiana* (Hosok.) Nakai (Voroshilov, 1982; Xia, 1998). Some scientists include this species to the comprehensive genus *Orobus* - *O. ohwianu*s (Hosokawa) Stankevicz & Roskov (Stankevich & Roskov, 1998). However, the studies of *V. ohwiana* show that this species have some morphological differences, which very clearly separat it from *V. unijuga*. These characteristics include long hairs, pubescent calyx and no teeth on edge stipules in *V. ohwiana*. In this regard, these species must be treated as independent from *V. unijuga* (Pavlova, 1989). 2*n* = 12 (Probatova & Sokolovakaya, 1986; Pavlova *et al*., 1989) and 2*n* = 12+0–2B (Rudyka, 1988).

Conservation status

V. ohwiana is included in the Red Data Book of the Primorskii Krai (2008) with conservation status of vulnerable (VU) species on the border area. The main limiting factor threatening this species is the destruction of habitat after deforestation, fires and construction. This species survives on islands of the Far Eastern Marine Reserve (Pavlova, 1998, Kiseleva, 2011), in the "Kedrovaya pad" Reserve and in the National Park "Land of the Leopard" (Shibneva, 2013).

Written by Valentina A. Kalinkina

Weigela florida (Bunge) A. DC.

Caprifoliaceae

- 锦带花
[Jin dai hua]
- オオベニウツギ (大紅空木)
[Oo-beni-utsugi]
- 붉은병꽃나무
[Bul-geun-byeong-kkot-na-mu]
- Вейгела цветущая
[Weigela tcvetushchaya]

Description

Shrubs 1–3 m tall. Young branches with 2 bilateral lines of short, minute hairs along internodes. Bark gray. Winter buds acute, scales 3 or 4, often smooth. Leaves sessile or with petiole to 3 mm. Blade oblong or elliptic to obovate-elliptic, 5–10 cm, abaxially densely pubescent or tomentose, adaxially sparsely pubescent, more densely so on veins, base broadly cuneate to rounded, margin serrate, apex acuminate. Flowers solitary or in cymes. Peduncles and pedicels glabrous to hirsute. Calyx ca. 2 cm. tube narrowly cylindric, ca. 1 cm, sparsely pubescent. Lobes lanceolate, ca. 1 cm, unequal. Corolla purple-red or rose, 3–4 × ca. 2 cm, outside sparsely pubescent. Lobes spreading, irregular, inside reddish. Filaments shorter than corolla. Anthers yellow. Ovary with a yellow-green gland in upper part. Stigma 2-lobed. Fruit 1.5–2.5 cm, crowned with a short beak, sparsely pubescent, seeds wingless. Flowering in April to August, fruiting in October.

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Distribution and habitat

China (Hebei, Heilongjiang, Henan, N Jiangsu, Jilin, Liaoning, Nei Mongol, Shaanxi, N Shandong, Shanxi), Japan (Kyushu), and Korea (all provinces). Its habitat includes bright or shady areas, scrub area, and mixed forests at elevation of 100–1,500 m.

According to the "Woody Plants in Northeast" (Liu & Wang, 1955), *W. praecox* (Lemoine) Bailey is distributed in Northeast China and DPR Korea. This species has similar appearance as *Weigela florida*. The two can be easily misidentified.

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Conservation status

Currently this species is listed in the red book as a rare species.

Ethnic use

The species is an important flowering shrub in northeast China and north China. It is an important garden plant in Japan. Its branches and leaves are thick with gorgeous design and colors. It flowers for more than two months. It is broadly used in landscapes. It is the main spring flower shrub in north China. This species has been commonly used in medicine.

Written by Jin Yonghuan

Weigela middendorffiana (Carrière) K. Koch

Caprifoliaceae

- ウコンウツギ (欝金空木)
[Ukon-utsugi]
- Вейгела Миддендорфа
[Veigela middendorfa]

Description

Deciduous shrub, up to 1.5(2) m tall with dark gray and gray odd branches. Young branches greenish, with two hairy ridges when young (sometimes hairless). Leaves ovate, lanceolate, elliptic, acuminate at apex, somewhat rounded at the base, (4)5–11(17) × (1.5)2.5–5 (7) cm wide, glabrous upper surface, lower surface hairy on veins, lateral veins 5–7 pairs, almost sessile or with petioles 1–3 mm long, hairy. Five-six flowers on terminal and axillarycymes with common pedicel up to 3 cm long. Subulate bracts, 0.2–1 cm long and ciliate; two bracteoles, linear or subulate, 3–8 mm long. Flowers 2–17 mm long with tube 8 mm long and two-lipped band nearly equal to tube, pale yellow, sparsely hairy outside; tube (2.5)5–8 cm long, tubular in lower third, abruptly inflated into 1.2–2 cm wide campanulate upper part, orangish spots on ventral inside; five lobes, oblong-ovate to widely ovate, three upper 5–8 mm long, two lower 8–10 mm long. Five stamens, inserted near base of inflated part of tube; filaments 1–1.5 cm long, free, densely hairy at the base; anthers in a row under dorsal side of corolla, linear, 6–7.5 mm long, reddish brown, and hairy on one side. Style longer than anthers, 2.5–3 cm long, white and glabrous; calyptrate stigma, 2.5–4 mm wide and white. Nectary gland rectangular, 1.5–2 mm long. Ovary narrowly fusiform, 0.6–1.2 cm × 1.5–3 mm wide, and glabrous. Calyx 0.6–1.7 cm long, deeply bilabiate near to base, ciliate, and persistent; upper lip three subulate or linear lanceolate lobes, 2–8 mm long; lower lip deeply divided into two linear or linear lanceolate lobes, 0.7–1.2 cm × 2–3 mm wide. Seed capsules ellipsoidal or spindle-shaped, 15–25 × 4–6 mm, and hairless. Rostrum 2–5 mm long, crowned by calyx, dehiscing by two valves from the rostrum base. Seeds linear, 4–5(8) mm long with elongate wings at both ends. Flowering in May to early August, fruiting in August to October.

Species was first described from the specimens of cultivated plant of unknown origin. Molecular phylogeny suggests *W. middendorffiana* is a sister group of *Diervilla* (Kim & Kim 1999).

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Distribution and habitat

Russia (Southern Sea of Okhotsk area, Primorskii and Khabarovsk regions, Sakalin Island, Kuril Islands) (Nedolouzhko, 1987; Koropachinskii, 2015) and Japan (Hokkaido, Northern Honshu (Tohoku)). Grows in the continental part of its range, mostly at upper part of subalpine spruce belts, in subalpine Betula ermanii forests, and at forest margins, between the belts of forests and Pinus pumila thickets (Krestov & Verkholat, 2000). In the insular part of range this species grows in subalpine scrub and exposed slopes, especially on volcanic mountains; in elevations of 200–1,800 m (Sato, 2007).

Conservation status

Species has no conservation status. Subalpine communities dominated by *Weigela middendorffiana* were treated as rare communities by Krestov & Verkholat (2000).

Ethnic use

Species was first cultivated and introduced to Europe in 1850. Since then many forms are cultivated in the world's temperate zones. The forms vary widely in flower color and are cited as a weigela hybrid.

Written by Pavel V. Krestov

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Weigela subsessilis (Nakai) L. H. Bailey

Caprifoliaceae

병꽃나무
[Byeong-kkot-na-mu]

Вейгела почтисидячая
[Veigela pochtisidyachaya]

© Gyu Young Chung

Description

Deciduous shrubs, up to 3 m tall. Petiole 2–4 mm, pubescent. Leaves opposite, obovate or widely ovate, hairy on both surfaces, with densely ascending or appressed hairs on main veins on lower surface, lateral veins 4–6 pairs. Inflorescences cymes, axillary on lateral branches, with 1–2 flowers. Calyx deeply penta-lobed to base, pubescent; lobes equal, linear, pubescent. Corolla infundibuliform, pale yellow at first, then gradually turning dark purple red inside, purple red outside at anthesis, hairly outside, five lobes, suberect or ascending, widely ovate or semi-circular. Stamens nearly as along as corolla, glabrous, linear anthers, yellow. Discoid stigma. Fruit capsules cylindrical with a short beak, slightly curved, dehiscing form apex, hairy. Seeds compressed and narrowly winged on three sides. Flowering in April to May.

Distribution and habitat

Korea (nearly all provinces).

Weigela is composed of twelve species occurring in Northeast Asia with the highest species diversity in Japan and Korea (Hara, 1983; Backlund & Pyck, 1998). The genus has been traditionally treated as Caprifoliacea, but also sometimes considered in Diervillaceae. *W. subsessilis* is endemic to Korea and belongs to sect. *Weigela* characterized with deeply penta-lobed (down to base) calyxes. Kim & Kim (1999) demonstrated that the nrDNA ITS sequence data distinguishes the species from others in the genus. However, the species name status in The Plant List (www.theplantlist.org) still remains an unresolved name. The status should be corrected to an accepted name. In addition, Flora of China (2001) states the occurrence of *W. japonica* in Korea. The morphological characteristics of the species are similar to those of *W. subsessilis*; the molecular data distinguish the two species, and the natural populations of the species have not been found in Korea. Based on fossil records, the oldest fossils of *Weigela* are seeds from the Oligocene in West Siberia, Asia. The genus later expanded into East Asia and Europe, as well as into Arctic/Subarctic areas of North America via the North Atlantic Land Bridge and/or Bering Land Bridge in the Miocene. *Weigela* disappeared from Europe and North America conceivably during the Pleistocene glaciation, but survived in Asia until now (Liang *et al*., 2013).

Conservation status

The species is endemic to Korea and common distribution pattern throughout the Korean peninsula of the species does not require conservation efforts.

Ethnic use

The species has been used as an ornamental plant, and in some areas, young leaves are popular vegetables (Chung *et al*., 2010; Im *et al*., 2011; Jeong *et al*., 2014).

Written by Gyu Young Chung

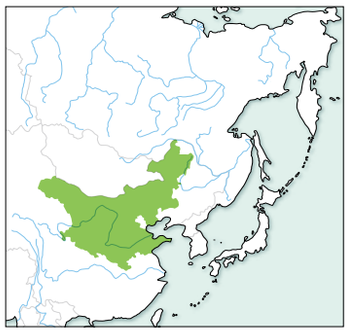
Xanthoceras sorbifolia Bunge

Sapindaceae

- 文冠果
[Wen guan guo]
- ブンカンカ (文冠果)
[Bunkanka]
- 문관과(文冠果)
[Mun-guan-gua]
- Ксантоцерас рябинолистный
[Ksantotceras ryabinolistnyi]

Description

Deciduous shrubs or small trees, 2–5 m tall. Branches brownish red, strong, stout, glabrous. Terminal buds and lateral buds with imbricate scales. Leaves with petiole 15–30 cm, leaflets 4–8-jugate, abaxially green when fresh, adaxially deep green, lanceolate or subovate, bilaterally slightly asymmetrical, 2.5–6 × 1.2–2 cm, membranous or papery, abaxially tomentose and fascicle stellate when young, adaxially glabrous or sparsely hairy on midvein, lateral veins slender, slightly prominent on both sides, base cuneate, apex acuminate, margin sharply serrate, terminal leaflet usually deeply 3-lobed. Inflorescences terminal, male ones axillary, erect, 12–20 cm. Peduncle short, often with rudimentary scales at base. Pedicels 1.2–2 cm. Bracts 0.5–1 cm. Sepals 6–7 mm, grayish tomentose. Petals white, purplish red or yellow at base, ca. 2 cm × 0.7–1 cm, with evident veins, claw ciliate on both sides, hornlike appendage on disk orange, 4–5 mm. Stamens ca. 1.5 cm. Filaments glabrous. Ovary grayish tomentose. Capsules black, shiny, ca. 1.8 cm. Flowering in the spring, fruiting in early autumn.



Distribution and habitat

China (Gansu, Hebei, Henan, Nei Mongol, Ningxia, Shaanxi, Shandong, Shanxi), Japan, and Korea (cultivated). It can grow under bright light. It is resistant to cold and drought with waterlogging resistance. It has strong cold fighting ability. It can safely overwinter at temperature of 41.4 ℃. Because the annual rainfall is only 148.2 mm in Ningxia, scattered raw fruit trees have been crowned. Its habit includes hill slopes, grass sand, abandoned land, rocky Mountains, loess hill and gully, cliff side, relaxed soil, sandy waste, gravel, clay, and light saline soil with abundant humidity.

Ethnic use

Its seeds are edible.

Written by Cao Wei

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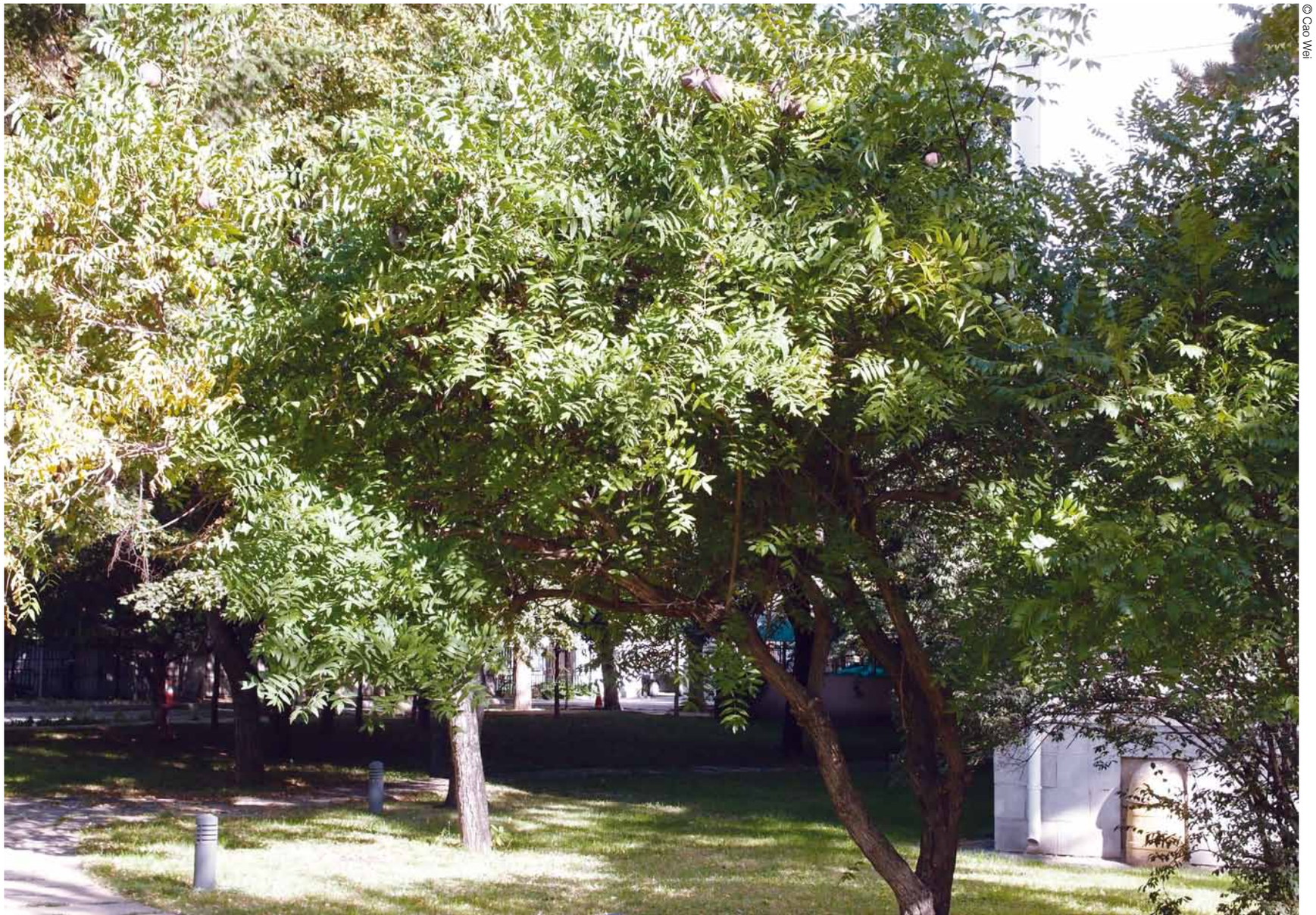

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Zygophyllum gobicum Maxim.

Zygophyllaceae

- 戈壁霸王 [Ge bi ba wang]
- Говийн хотир [Goviin khotir]
- Парнолистник гобийский [Parnolistnik gobiiskii]

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Description

Perennial herbs, glaucous, reddish in autumn. Stems much branched, prostrate, 10–20 cm. Stipules distinct, ovate, 2–7 mm. Leaves with 2 leaflets; petiole 2–7 mm; leaflet blades obliquely ovate, 5–20 × 3–8 mm, larger basally on stem. Flowers paired. Pedicel 2–3 mm. Sepals 5, green or orange, elliptic to oblong, 4–6 mm. Petals pale green or orange, smaller than sepals. Stamens 6–8 mm, longer than petals. Capsule ellipsoid, 8–14 × 6–7 mm, pendulous, indehiscent, both ends obtuse. Flowering in June, fruiting in August (Liu and Zhou, 2008).

Distribution and habitat

Mongolia (Trans Altai Gobi) and China (northern Gansu, western Nei Mongol, Qinghai, eastern Xinjiang). Its habitat is gravel deserts (Gubanov, 1996).

Zygophyllum gobicum Maxim. is subendemic to Mongolia (Urgamal *et al*., 2014).

Conservation status

Currently it is not listed in the Mongolian Red List (2011) or the Mongolian Red Book (2013).

Written by Magsar Urgamal

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Zygophyllum potaninii Maxim.

Zygophyllaceae

- 大花霸王
[Da hua ba wang]
- Потанины хотир
[Potaniny khotir]
- Парнолистник Потанина
[Parnolistnik potanina]

Description

Perennial herbs, 10–25 cm tall. Stems thick, erect or spreading, basally much branched. Stipules connate, ca. 3 mm, herbaceous. Leaves with 2 or 4 leaflets; petiole 3–8 mm, winged; leaflet blades obliquely obovate, elliptic, or rotund, 1–2.5 × 0.5–2 cm, thick. Flowers axillary, paired or in threes, pendulous. Pedicel shorter than sepals, elongating after anthesis. Sepals yellowish, obovate, 6–11 × 4–5 mm. Petals white but orange at base, spatulate-obovate, shorter than sepals. Stamens longer than sepals; appendages linear-elliptic, half as long as filaments. Capsule ovoid-globose to globose, 1.5–2.5 × 1.5–2.6 cm, pendulous, 5-locular, with 5 wings, wings 5–7 mm, 4 or 5 seeds per locule. Seeds obliquely ovoid, ca. 5 × 3 mm. Flowering in May and June, fruiting in June to September (Liu and Zhou, 2008).

Distribution and habitat

Mongolia (Khovd, Mongolian Altai, Gobi Altai, Dzungarian Gobi, Trans Altai Gobi, Alashan Gobi) and China (Gansu, Inner Mongol, Xinjiang). Its habitats in Mongolia include debris tailings of mountains and hills, sandy-pebble bottom of dry river beds, stony slopes of hills, and pebble deserts (Gubanov, 1996).

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Zygophyllum potaninii Maxim. is subendemic to Mongolia (Urgamal *et al*., 2014).

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Conservation status

It is listed as a "Very Rare" species in the Mongolian Law on Natural Plants (1995), and "Very Rare" in the Mongolian Red Book (1997). It is listed as "Endangered" in the Regional Red List (2011).

Ethnic use

Its taste is bitter with cool and blunt potency. It has been used for the following: as a diuretic, treating inflammation, liver cirrhosis, ulcers, healing wounds, treating degeneration of liver and bile, and for treating ascites tumors. It is prepared into infusion and decoction. This herb has been used in Mongolian medicine for hepatitis, hepatocirrhosis, cholecystitis, and ascites (Ligaa *et al*., 2015).

Written by Magsar Urgamal & Nyam-Osor Batkhuu

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East Asia Biodiversity Conservation Network (EABCN)

Background

- The IPCC Fourth Assessment Report (2007) alarmed on the increasing level of climate change and its impact to the environmental degradation in the future: The average world temperature rose 0.76 ˚C from 1850 to 2005; the average temperature will rise 1.4–5.8 ˚C more by 2100; the grassland will become desert; the forest will be destroyed; and in 50 years from then over 1/3 of the earth plants and animals will be extinct or will be endangered.
- The degree of climate change in East Asia is in much more serious level than the world average level, estimated to be increased of average temperature to 3.5 ˚C and of the rainfall amount to 4.5%, which urgently calls the cooperation within the countries to diminish it.
- The East Asia is the area where many plant species are commonly distributed including rare and endemic plant species.
- It is necessary to establish the East Asia Biodiversity Conservation Network to provide the basis for promoting conservation and sustainable use of forest plant resources.
- The plant conservation agenda was proposed at the IUCN WCC held in Jeju in 2012 corresponding the CBD GSPC 2020, and it is necessary to cooperate in the regional level to implement the strategies in supporting the agenda.

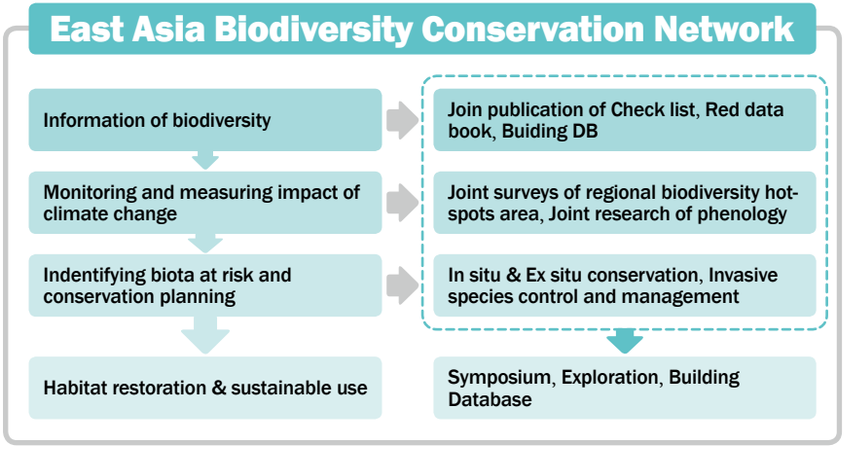
Progress

The progress of the establishment and development of the EABCN has been in:

- Proposed agenda in the 5th IUCN World Conservation Congress (WCC) in September 2012 (Jeju)
- Delegated a Working Group and Regional Focal Point of each institute in September 2012 (Vladivostok Botanical Garden)
- Signed a Letter of Intent (LOI) to build the East Asia Biodiversity Conservation Network agreement in November 2013 (Korea National Arboretum)
- Convened a Working Group Meeting for multilateral MOU and discussed on topics of joint researches in April 2014 (Seoul)
- Published Important plant species guide book in East Asia and signed on the multilateral MOU in October 2014 (Pyeongchang)
- Convened a Working Group Meeting for Atlas of the Vascular Plants in East Asia and Publication in April 2015 (Seoul)
- Convened the Steering Committee Meeting for joint research and the EABCN Workshop on Climate Change Impact Monitoring in June 2015 (Tsukuba)
- Organized the Special Committee Meeting for revision of Rules of Procedure (ROP) in July 2015 (Jeju)

EABCN joint research topics

- Research on the monitoring of species distribution by climate change
- Development of East Asia Integrated flora (Check list)
- Monitoring on exotic plants and building data sharing platform
- Strengthening the research capacity and human resources



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