

## ON THE TAIWAN SPECIES OF LESPEDEZA

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The present paper is an attempt to summarize our knowledge of the species of the genus *Lespedeza* on Taiwan.

6 species of this genus are treated in this paper. A description of the genus, analytical key to species, species descriptions, habitat, flowering period, and the general distribution of each species has been given and an illustration for each has been prepared.

The specimens studied are deposited in the Herbarium of Department of Botany, National Taiwan University (TAI) and the Herbarium of Taiwan Forest Research Institute (TAIF).

*Lespedeza* with approximately 100 species are mainly confined to the temperate regions of eastern Asia, Australia and eastern North America. About 40 species of this genus are reported from Mainland China.

*Lespedeza* is closely related to *Campylotropis* and *Kummerowia* which are separated from those genera by having different flower characters as was point out by A. K. Schindler (1912).

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### *Lespedeza* MICHX.

***Lespedeza* Michx.** Fl. Bor. Amer. **2:** 70, t. 39, 1803; DC. Prodr. **2:** 348 1825; Benth. in Benth. et Hook. f. Gen. Pl. **1:** 524. 1862; Baker, in Hook. f. Fl. Brit. Ind. **2:** 142. 1876; Steward, Man. Vasc. Pl. Yangtze Valley 182, 1958.

Mostly perennial erect herbs and undershrubs, or rarely annuals. Leaves pinnately 3-foliolate without stipels; stipules small, persistent. Flowers small white, yellow, red to purplish in axillary racemes or crowded on the axis, often cleistogamous; bracts persistent, 2 bracteoles at the base of calyx; calyx campanulate, lobes linear to lanceolate; standard obovate or oblong and clawed; keel incurved; stamens diadelphous, anthers uniform. Pods ovate or slightly spherical, flattened, indehiscent, 2-seeded.

**Chinese Name:** 胡枝子屬 (Hu-chih-tzu Shu).

**English Name:** Bush Clover.

**Japanese Name:** Hagi Zoku.

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## Key to species

1. Flowers large, 10-20 mm long, calyx 4-lobed, without cleistogamous flowers; pods pedicellate .....2
1. Flowers small, less than 10 mm long, calyx 5-lobed, cleistogamous flowers on the lower branches; pods sessile.....3
2. Calyx lobes acuminate, the upper lobe cleft into two small shallow teeth; pods nearly spherical, about 5-7 mm long.....(1) *L. bicolor*
2. Calyx lobes acute, the upper lobe not cleft; pods ovate, 10 mm long.....(5) *L. pubescens*
3. Flowers borne on long peduncles; peduncles 10-25 mm long, exceeding the leaves.....4
3. Flowers borne on short peduncles, peduncles shorter than the leaves in length.....5
4. Peduncles glabrous, capillary, long.....(6) *L. virgata*
4. Peduncles pubescent, stout, short.....(4) *L. daurica*
5. Leaflets narrowly cuneate, apex truncate or emarginate 10-20 mm long, 1-3 mm wide.....(3) *L. cuneata*
5. Leaflets oblong or obovate, apex mucronate, 10 mm long, 5 mm wide.....(2) *L. chinensis*

1. **Lespedeza bicolor** Turcz. in Bull. Soc. Nat. Mosc. **13**: 69, 1840; Steward, Man. Vasc. Pl. Low. Yangtze Valley 185, 1958; Liu, Ill. Nat. Intr. Lig. Pl. Taiwan **1**: 534 f. 465, 1960; Kitamura Col. Ill. Herb. Pl. Japan 100, 1963.

*Lespedeza bicolor* Turcz var. *japonica* Nakai in Tokyo Bot. Mag. **37**: 73, 1923; Hosokawa in Journ. Soc. Trop. Agr. **5**: 287, 1933; Masam. Short Fl. Formosa 101, 1936, List Vasc. Taiwan 73, 1954.

An undershrub, about 60-180 cm. high; stipules setaceous, persistent; leaves trifoliolate; leaflets oblong, herbaceous, 1.5-4 cm. long, 1-2.5 cm. wide, upper surfaces glabrous when old, lower surfaces clothed with appressed hairs; racemes axillary, longer than the leaves, flowers pink, 12-17 mm. long; calyx 5 mm. long, teeth 2-3 mm. long, lanceolate, acuminate, bracts and bracteoles narrowly ovate, minute; pods nearly spherical clothed with thin appressed hairs, 5-7 mm. long.

**Chinese Name:** 胡枝子, 隨軍茶.

**Japanese Name:** Yama-hagi.

**Flowering Time:** July to November.

**Distribution:** Japan, Manchuria, Mainland China, Korea and Formosa.

**Habitat:** In thickets.

**Specimens Examined:**

Nantou Hsien: Luan-ta shan, *Konishi*, Nov. 1906 (TAIF).

2. **Lespedez chinensis** G. Don Gen. Syst. **2**: 307, 1832; Forb. et Hemsl. in Journ. Linn. Soc. Bot **23**: 180, 1887; Ito et Matsum. in Journ. Soc. Coll. **12**: 405, 1899;



Fig. 1. *Lespedeza bicolor* Turcz.

Matsum. in Tokyo Bot. Mag. **16**: 71, 1902; Hay. Icon. Pl. Formos. **1**: 190, 1911; Masam. List Vasc. Pl. Taiwan 73, 1954.

*Lespedeza formosensis* Hosokawa in Journ. Soc. Trop. Agr. **5**: 287, 1933; Masam. Short Fl. Formos. 102, 1936.

An erect or ascending small shrub, about 1 m high; stipules setaceous, persistent; leaves trifoliolate; leaflets oblong-elliptic or oblong-obovate, apex truncate, rounded, emarginate, 10-18 mm. long, 3.5-7.5 mm. wide, upper surface glabrous or puberulous, lower surface clothed with white appressed hirsute hairs; racemes axillary, with short peduncles, 1.5 cm, long; flowers few, white, calyx deeply 5-cleft, teeth linear-lanceolate 2-2.5 mm long; corolla 7 mm. long, keels longer than standard; cleistogamous flowers on lower branches, axillary, without pedicels; pods ovate, 4 mm. long, extending beyond the calyx, pubescent.

This species is characterized by the silvery appressed hairs on the lower surface of the leaves.

**Chinese Name:** 裹白胡枝子.

**Japanese Name:** Uraziro-makiehangi.

**Flowering Time:** July to November.

**Habitat:** On brushlands of 1,000-1,500 m.

**Distribution:** Mainland China and Formosa.

**Specimens Examined:**

Taipei Hsien: Kuan-yin Shan, H. Shimada, Oct. 28, 1932; Pei-tou, Y. Shimada, Sept. 28, 1935.

Nantou Hsien: Wu-she, G. Masamune, 2128, 1348.

Hwalien Hsien: Tai-lu-ko, S. Suzuki, 8764, 9028; Tien-hsiang Y. Yamamoto, Oct. 23, 1930.

Taitung Hsien: Mt. Taitung Y. Yamamoto et K. Mori, July 31, 1937.

3. *Lespedeza cuneata* (Du Mont. d. Cours.) G. Don Syst. **2**: 307, 1832; Benth. Fl. Hongk. 87, 1861; Nakai in Tokyo, Bot. Mag. **37**: 74, 1923; Lesped. Jap. et Korea 98, 1927; Masam. Short Fl. Formos. 101, 1936; List Vasc. Pl. Taiwan 73, 1954. Ohwi Fl. Jap. 680, 1956, Steward. Man. Vasc. Pl. Low. Yangtze Valley 185, 1958.

*Hedysarum sericeum* (non Mill.) Thunb. Fl. Jap. 287, 1784.

*Anthyllis cuneata* Du Mont d. Courset Bot. Cult. **4**: 100, 1811.

*Lespedeza argyrea* Sieb. et Zucc. in Abhandl. Akad. Muench. **4**: 2, 120, 1845.

*Indigofera chinensis* Vogel, Forb. et Hemsl. in Journ. Linn. Soc. Bot. **23**: 156, 1887.

*Lespedeza sericea* (Thunb.) Miq. (non Benth.) in Ann. Mus. Bot. Lugd. Bat. **3**: 49, 1867; Baker in Hook. f. Fl. Brit. Ind. **2**: 142, 1876.

*Lespedeza juncea* Pers var. *sericea* (Thunb.) Miq. in Ann. Mus. Bot. Lugd. Bat. **3**: 49, 1867; Forb. et Hemsl. in Journ. Linn. Soc. Bot. **23**: 181, 1887; Hay. Icon. Pl. Formos. **1**: 190, 1911.



Fig. 2. *Lespedeza chinensis* G. Don

A perennial erect herb, about 60–100 cm. high; leaves trifoliate, leaflets linear-oblongate, retuse or rounded at the apex, the upper surfaces nearly glabrous, the lower surfaces clothed with appressed hairs, 10–25 mm. long, 2–4 mm. wide; flowers 2–4, axillary, fascicled, nearly without peduncles, pedicels 1–2 mm. long; calyx 3–4 mm. long, deeply 5 cleft, the lobes narrow lanceolate; corolla 6–7 mm. whitish-yellow, violet-striped at the base; pods ovate, as long as the calyx; cleistogamous flowers few, in axillary fascicles, calyx 1.5–2 mm. long; pods suborbiculate, 3 mm. long, longer than the calyx.

**Chinese Name:** 鐵掃帚, 千里光.

**Japanese Name:** Medo-hagi.

**Flowering Time:** July to October.

**Habitat:** Open grasslands.

**Distribution:** Japan, Manchuria, Mainland China, Korea, Ryukyu, Formosa also in India and Australia.

**Specimens Examined:**

Taipei Hsien: Tai-pei, *S. Sasaki*, July 3, 1910, *T. Hosokawa*, 3278, 3421; *T. Kawakami* 13339 (TAIF); Sui-yen-ti, *K. Koreishi*, Sept. 12, 1927, *I. Tanaka*, Aug. 2, 1916. *S. Suzuki*, Nov. 7, 1930, March 18, 1928, June 9, 1929. April 17, 1929, *H. Shimizu* Nov. 20, 1934, *T. Tanaka* et *Y. Shimada*, 11188; Ying-ko, *T. Hosokawa*, 3276; Hsintien, *H. Shimizu*, 2381; Yang-ming Shan, *Y. Yamamoto*, Oct. 10, 1929, *T. Kawakami* 13341 (TAIF); Ta-tun Shan, *S. Sasaki* 13342 (TAIF); Fu-kuei-chao, *H. Shimada*, Oct. 27, 1932; Shih-pai, *T. Suzuki*, ST 20570; Tan-shui, *T. Hosokawa*, 3279.

Taoyuan Hsien: Tao-yuan *T. Kawakami* et *S. Sasaki* 13343 (TAIF).

Ilan Hsien: Chiao-chi, *C. C. Chuang*, 2275. Wu-fen-chi, *M. T. Kao* 3276, 5040. Nan-shan, *S. Suzuki* Oct. 23, 1928, *T. Hosokawa*, July 11, 1931.

Miaoli Hsien: Pei-shu, *M. T. Kao* 3748.

Taichung Hsien: Li-shan *M. T. Kao* 5018.

Nantou Hsien: Wu-she, *G. Masamune*, 1945. Pu-li, *Y. Kudo*.

Changhua Hsien: Pa-kua Shan, *H. Morimoto*, July 11, 1942.

Tainan Hsien: Nan-nei, *T. Hosokawa*, 3277; *S. Sasaki* 13344 (TAIF).

Pingtong Hsien: Ping-tung. *E. Matuda*. 13345 (TAIF).

Hwalien Hsien: Tai-lu-ko, *T. Suzuki*, 16377, *E. Matuda*, Aug. 8, 1918; Tien-hsiang, *Y. Yamamoto*, Oct. 23, 1930.

Taitung Hsien: Pei-nan, *S. Kobayashi* 13346 (TAIF).

4. *Lespedeza daurica* (Laxm.) Schindl. in Fedde Repert, **22**: 274, 1926; Rehder in Journ. Arnold. Arb. **7**: 176, 1926; Nakai Lesped. Jap. et Korea **78**, 1927; in Tokyo Bot. Mag. **46**: 56, 1932. Ohwi Fl. Jap. 679, 1956.

*Trifolium dauricum* Laxm. Nov. comment Acad. Petropol **15**: 560 t. 30 f. 5 1771.

*Lespedeza Shimadai* Masam. in Journ. Soc. Trop. Agr. **3**: 30, 1930.

*Lespedeza daurica* (Laxm.) Schindl. var. *Shimadai* (Masam.) Masam. et Hosokawa, in Journ. Soc. Trop. Agr. **5**: 59, 1933; Masam. Short Fl. Formos. 101, 1936; List.

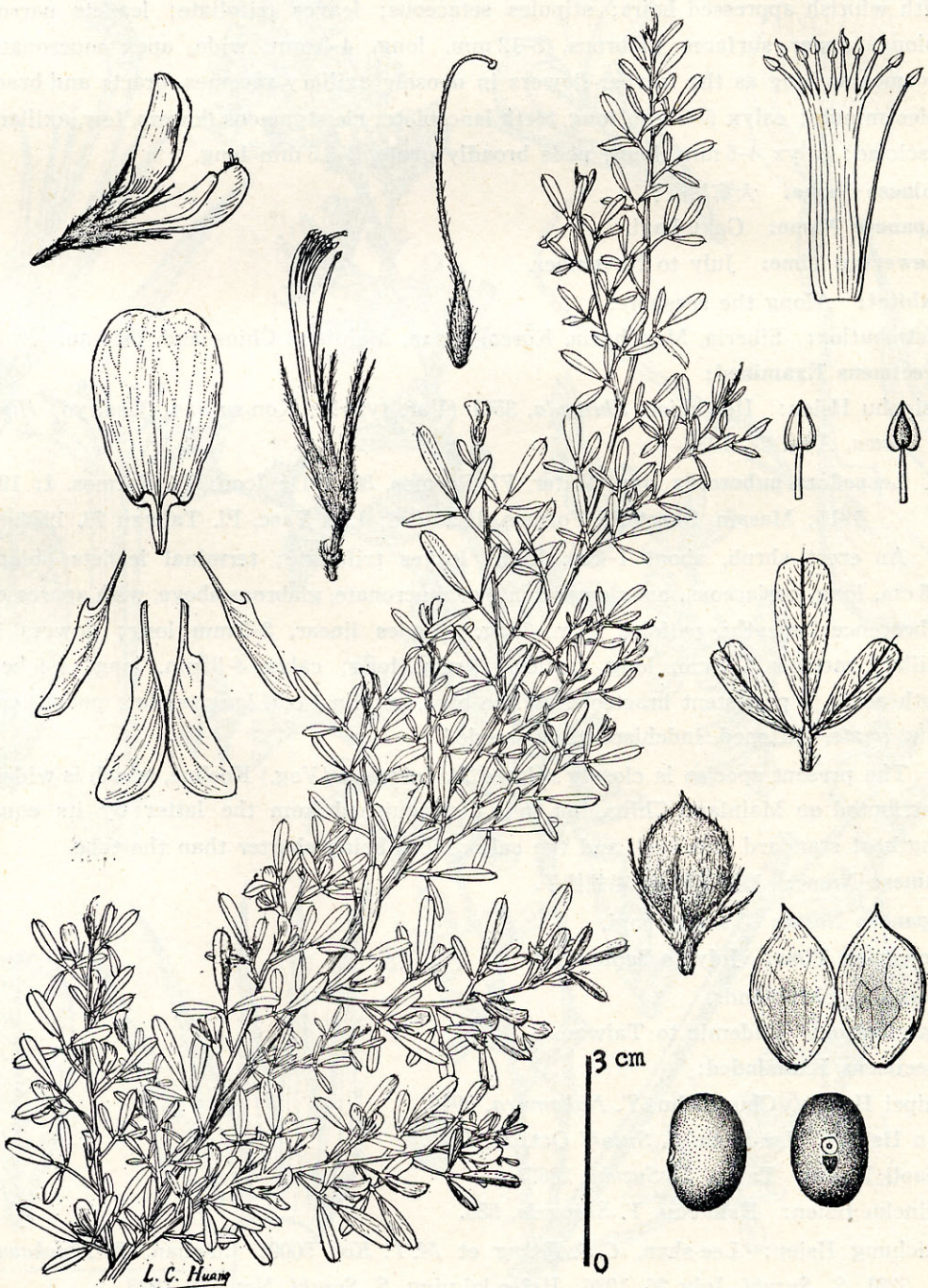


Fig. 3. *Lespedeza cuneata* (DU MONT. d. COURS.) G. DON

Vasc. Pl. Taiwan 73, 1954; Liu Ill. Nat. Intr. Lign. Pl. Taiwan 1: 535 t. 466, 1960.

An undershrub, about 20–80 cm. high; stems, leaves and inflorescence clothed with whitish appressed hairs; stipules setaceous; leaves trifoliolate; leaflets narrow oblong, upper surfaces glabrous, 8–12 mm. long, 4–5 mm. wide, apex mucronate; racemes as long as the leaves; flowers in densely axillary racemes, bracts and bracteoles minute; calyx 5–6 mm. long, teeth lanceolate; cleistgamous flowers, few, axillary, fascicled; calyx 4–5 mm. long; pods broadly ovate, 3–3.5 mm long.

**Chinese Name:** 大葉胡枝子.

**Japanese Name:** Gaku-hagi.

**Flowering Time:** July to November.

**Habitat:** Along the seashore.

**Distribution:** Siberia, Manchuria, Korea, Japan, Mainland China and Taiwan.

**Specimens Examined:**

Hsinchu Hsien: Hen-chiao, *Shimada*, 3561 (Var. type!); Kon-su-liao (Kosiryō) *Hirakawa*, Aug. 27, 1930.

5. *Lespedeza pubescens* Hay. Mater. Fl. Formos. 80, 1911; Icon. Pl. Formos. 1: 191, 1911; Masam. Short Fl. Formos. 102, 1936; List Vasc. Pl. Taiwan 73, 1954.

An erect shrub, about 1–2 m. high; leaves trifoliolate; terminal leaflets oblong 3–5 cm. long, coriaceous, apex emarginate or mucronate, glabrous above, with appressed pubescence beneath; petioles 3 cm. long, stipules linear, 2–3 mm long; flowers in axillary racemes, 7–8 cm. long, pedicels 3 mm. long; calyx 4–5 mm. long, 4-lobed, teeth acute, 2 persistent bracteoles at the base, corolla 1 cm. long, violet; pods 1 cm. long, ovate, flattened, indehiscent, one-seeded.

The present species is closely related *L. formosa* (Vog.) Koehne, which is widely distributed on Mainland China, but it is distinguished from the latter by its equal length of standard and keel, and the calyx lobes being shorter than the tube.

**Chinese Name:** 臺灣胡枝子, 毛胡枝子.

**Japanese Name:** Taiwan-hagi.

**Flowering Time:** July to September.

**Habitat:** Shrublands.

**Distribution:** Endemic to Taiwan.

**Specimens Examined:**

Taipei Hsien: Chu-tzu-hu, *T. Nakamura*, 3940.

Ilan Hsien: Nan-Shan, *S. Suzuki* Oct. 21, 1928.

Miaoli Hsien: Ta-hu, *T. Suzuki*, 20651.

Hsinchu Hsien: Hsin-chu, *Y. Shimada*, 586.

Taichung Hsien: Lee-shan, *C.S. Feung* et *M.T. Kao* 5000; Lu-chan, *T. Hosokawa*, 3281, *S. Suzuki*, July 26, 1936; Hsiao-lai-ping, *S. Sasaki*, Nov. 21, 1923.

Nantou Hsien: Wu-she, *G. Masamune*, 2076; T. Kawakami et U. Mori, 1136 (TAIF) Iso-syntype!; Chu-lien-ze, *S. Suzuki*, July 26, 1936.





Fig. 4. *Lespedeza daurica* (LAXM.) SCHINDL.



Fig. 5. *Lespedeza pubescens* HAY.

Nan-tou, *T. Kawakami* 13363 (TAIF); Pu-li *T. Kawakami* 13364 (TAIF).

Tainan Hsien: Tai-nan *S. Sasaki* 13369 (TAIF).

Taitung Hsien: Taitung, *Y. Shimada*, 6064; Kuang-shan, *W. Mori*, Nov. 1909.

6. *Lespedeza virgata* (Thunb.) DC. Prodr. 2: 350, 1825; Sieb. et Zucc. in Abhandl. Akad. Muench. 4: 2, 121, 1845; Forb et Hemsl. in Journ. Linn. Soc. Bot. 23: 182, 1887; Nakai Lesped. Jap. et Korea 81, 1927; Ito et Matusm. in Journ. Sci. Coll. 12: 405, 1899; Hay. Icon. Pl. Formos. 1: 192, 1911; Masam. Short Fl. Formos. 102, 1936; List Vasc. Pl. Taiwan 73, 1954, Ohwi Fl. Jap. 579, 1956, Steward, Man. Vasc. Pl. Yangtze Valley 185, 1958.

*Hedysarum virgatum* Thunb. Fl. Jap. 290, 1784.

*Lespedeza Swinhoei* Hance in Ann. Sci. Nat. Ser. 5: 210, 1866.

An undershrub, about 40–60 cm. high; leaves trifoliate; leaflets ovate-oblong, mucronate at the apex, 7–1.5 mm. long, 5–10 mm. wide, upper surface glabrous, lower surface clothed with appressed hairs; racemes in axillary peduncles, peduncles slender, longer than the leaves; calyx deeply cleft, teeth lanceolate, corolla 4–5 mm. long, white; pods 4 mm by 3 mm. oval-oblong, less than the calyx in length, clothed with thin appressed hairs; cleistogamous flowers in lower axils, without pedicels.

The present species is characterized by its capillary, spreading, smooth peduncles, 10–25 mm long.

**Chinese Name:** 蒔繪荻.

**Japanese Name:** Makie-hagi.

**Flowering Time:** July to September.

**Habitat:** Grassland.

**Distribution:** Japan, Korea, Mainland China, Ryukyu, and Formosa.

**Specimens Examined:**

Taipei Hsien: Bon-Bon, *H. Hosokawa*, 3283.

Ilan Hsien: Shu-Yuen *C. C. Chuang* July 10, 1963.

Taichung Hsien: Lu chan, *T. Hosokawa*, July 17, 1931; Tong-kon *S. Suzuki* July 27, 1936.

#### Excluded species

*Lespedeza tomentosa* (Thunb.) Sieb. ex Maxim. in Act. Hort. Petrop. 2: 376, 1873.

Ohwi Fl. Jap. 679, 1956; Kitamura Coloured Illustrations of Herbaceous plants of Japan (Choripetalae) 97, 1963.

Dr. Ohwi and Dr. Kitamura reported this species as growing on Taiwan but no specimens are available for examination at present.



Fig. 6, *Lespedeza virgata* (THUNB.) DC.