

ON THE TAIWAN SPECIES OF DESMODIUM

by

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On account of the richness of species and the various uses of many plants of Leguminosae, the authors have, from the beginning of last autumn, devoted themselves to the study of the family which has long been neglected by the botanists in Taiwan.

This paper which is a part of our taxonomic study on the leguminous plants, is an attempt to summarize our knowledge on the species of the Genus *Desmodium* in this island.

Desmodium is one of the largest groups in Leguminosae. It comprises many herbaceous plants, but mostly common shrubs or undershrubs, occurring in waste places, open grasslands, thickets and open secondary forests in Taiwan. Many species of the genus, such as *D. racemosum* and *D. gangeticum*, etc., have flattened, one-seed-jointed pods covered with minute hooked or sticky hairs which are easily adhesive to animals or even to man's clothings especially trousers to reach their purposes of distribution; therefore, they are referred to as Shan-ma-huang (山馬蝗) in Chinese name, and as Tick clover or Tick trefoil in English name. This is one reason why most of the species of the genus have their wide-distribution in the island.

As to the uses of the plants of this Genus, many species, such as *D. gangeticum*, *D. pulchellum*, *D. triflorum* and *D. umbellatum*, etc., are cultivated as fodders, green manure crops and soil coverings. A few others are often used locally as medicinal drugs.

The Generic name, *Desmodium*, was created by A. N. Desvaux in 1813. Under this name, he listed 13 species in "Journal de Botanique" Vol. I, 122. In 1862, Bentham divided the genus into 12 sections, basing chiefly upon the features of legumes and the various habits. These are *Dendrolobium*, *Phyllodium*, *Pteroloma*, *Dicerma*, *Catenaria*, *Scorpiurus*, *Dollinera*, *Chalarium*, *Nicolsonia*, *Sagotia*, *Pleurolobium*. Following Bentham's ideas, Baker (1876) split it into 8 subgenera, such as *Dendrolobium*, *Phyllodium*, *Dicerma*, *Catenaria*, *Pteroloma*, *Desmodium*, *Sagotia*, *Pleurolobium*. Since then, several new sections have been added to the genus by many taxonomists, such as Miquel (1855) and Schindler (1924), etc.

In the present study, 23 species and one variety of *Desmodium* of Taiwan are included. Most of the materials used for this study are collected by the junior author himself, a few are based on specimens kept in our University herbarium. Descriptions of the genus together with an analytical key to species and variety are given. Each species described is followed by notes on habitat, flowering period and general distribution; and the economic values are also indicated.

The authors wish to express their sincere gratitude to Dr. Charles E. DeVol for

his encouragement and valuable suggestions during the progress of this study. Grateful acknowledgement is due to Prof. B. Y. Yang, Acting Head of the Department of Botany for her kind encouragement and help. The authors are particularly thankful to Mr. M. T. Kao and Mr. J. M. Chao for their help in collecting materials in the field as well as typewriting this paper and to Mr. C. C. Kuo for his skillful drawings of all the species included. Finally, the authors wish to express their appreciation to the Joint Commission on Rural Reconstruction for its partial financial support as well as to Mr. Chia Huang, the Specialist together with other Staff Members of Animal Industry Division, JCRR.

Desmodium Desv.

Desmodium DESVAUX, in Journ. Bot. I (1813), 122 t. 5 f. 15; DC. Prodr. II (1825), 325; Benth. in Benth. & Hook. f. Gen. Pl. I (1862), 519; Baker in Hook. f. Fl. Brit. Ind. II (1876), 161; Merr. Fl. Manil. (1912), 238; Ohwi Fl. Jap. (1956), 681; Steward Man. Vasc. Pl. Yangtze Valley (1958), 180.

Desmodium—from the Greek word *desmos*, meaning a chain, on account of manner in which the joints of the pods are held together.

Annual or perennial herbs, undershrubs or shrubs. Leaves usually palmately trifoliate or reduced to unifoliate, rarely pinnately 5-foliate; stipules small, lanceolate, acuminate; stipels present, acuminate, persistent. Flowers small, in axillary and terminal racemes, often paniculately compound; bracts 2, deciduous, sometimes large and foliaceous; calyx herbaceous, campanulate or turbinate, teeth longer or shorter than the tube, the two upper teeth often subconnate; corolla exserted, white to purplish; standard broad, round to oblong, gradually narrow or spurred at the base, wings more or less adhering to the keel; the keels usually obtuse, sometimes connate; stamens 10, diadelphous, rarely monadelphous, anthers all alike; ovary sessile or stipitate; style incurved; stigma minute, capitate; ovules 2 to many, rarely reduced to one. Pods flattened, deeply lobed on one or both sides, and separating into two to many 1-seeded joints when mature; joints indehiscent or rarely dehiscent along ventral suture, mostly covered by minute hooked or sticky hairs.

CHINESE NAME: 山馬蝗屬 (Shan-ma-huang Shu).

山荳豆屬 (Shan-lu-tou Shu).

ENGLISH NAME: Tick clover, Beggar ticks, Tick Trefoil.

JAPANESE NAME: Nusubito-hagi Zoku.

DISTRIBUTION: About 250 species mostly distributed in the temperate and tropical regions.

Key to the species

- | | |
|----------------------------|----|
| 1. Leaves unifoliate | 2. |
| 1. Leaves trifoliate..... | 7 |

2. Petioles prominently winged, branches triangular.....(15) *D. pseudotriquetrum*
2. Petioles not winged, branches cylindrical.....3.
3. Leaves less than 3 cm. long4.
3. Leaves usually 4-10 cm. long5.
4. Plants pubescent; leaflets deltoid-cordate, length much greater than width(7) *D. gracillimum*
4. Plants glabrous; leaflets reniform, length half as long as width.....(18) *D. reniforme*
5. Plants densely clothed with short soft brown hairs; stipules awl-shaped from a much broader base; leaflets orbicular-ovate to orbicular, obtuse at the apex.....(11) *D. lasiocarpum*
5. Plants glabrous or sparingly clothed with whitish hairs; stipules linear-lanceolate; leaflets oblong, oblong-lanceolate to ovate, acute at the apex.....6.
6. Pods falcate constricted on ventral suture, length of joints as long as width(6) *D. gangeticum*
6. Pods straight, constricted on both sutures, joints fusiform(24) *D. zonatum*
7. Leaves less than 2 cm. long.....8.
7. Leaves more than 2 cm. long10.
8. A suffruticose plant with slender branches; pods deeply constricted on both sutures.....(14) *D. microphyllum*
8. A small herb, stems filiform prostrate; pods constricted only on ventral suture9.
9. Branches covered with long spreading hairs; leaflets usually oblong or elliptic, rounded at the apex; flowers in loose racemes.....(10) *D. heterophyllum*
9. Branches covered with adpressed silky hairs; leaflets obovate, truncate, retuse or emarginate at the apex; flowers solitary or 2-3 fascicled.....(22) *D. triflorum*
10. Flowers in umbels, axillary.....11.
10. Flowers in racemes, axillary and terminal.....14.
11. Branches triangular; leaflets with conspicuous grey long-silky veins, acute at the apex.....(3) *D. cephalotes*
11. Branches cylindrical; leaflets with thinly puberulus or nearly glabrescent veins, obtuse at the apex.....12.
12. Flowers included in two persistant large, rounded, foliaceous bracts(16) *D. pulchellum*
12. Flowers not as above.....13.
13. Leaflets 2-3 cm. long, less than 2 cm. wide; pods usually with two joints.....(4) *D. dispermum*

13. Leaflets 4-8 cm. long, 3-5 cm. wide; pods with 3-6 joints.....(23) *D. umbellatum*
14. Pods with 2 or 3 joints, long stalked.....15.
14. Pods with more than 3 joints, nearly sessile.....17.
15. Flowers 3-4 mm. long, pedicels less than 5 mm. long;
stipules linear, 1 mm. wide(17) *D. racemosum*
15. Flowers 5-7 mm. long, pedicels 5-12 mm. long;
stipules lanceolate, 3 mm. wide16.
16. Leaflets ovate, acuminate, glabrous; the veinlets
obscure, with whitish spots at the lower surface.....(21) *D. Tashiroi*
16. Leaflets lanceolate, acute, pubescent; the veinlets
prominent, without whitish spots at the lower
surface(12) *D. laterale*
17. Pods constricted on both sutures18.
17. Pods constricted only on ventral suture22.
18. Herbs, branches with hook-hairs; stipules foliaceous;
pods less than 2 mm. wide(19) *D. scorpiurus*
18. Shrubs, branches with adpressed hairs or nearly
glabrous; stipules lanceolate or linear;
pods 2-3 mm. wide.....19.
19. Leaf-margins conspicuously undulate on the upper
half; length of pod-joints as long as width, upper
suture slightly constricted(20) *D. sequex* var. *sinuatum*
19. Leaf-margins entire, length of pod-joints much longer
than width, both sutures equally constricted.....20.
20. Terminal-leaflets ovate; stipules 5-6 mm. long,
deciduous; flowers 3-5 mm. long.....(13) *D. laxiflorum*
20. Terminal-leaflets lanceolate, elliptic to obovate-oblong;
stipules 10 mm. long, persistant; flowers
6-10 mm. long.....21.
21. Plants nearly glabrous; leaflets lanceolate, acute at
both ends; stipules spinescent(2) *D. caudatum*
21. Plants clothed with densely adpressed hairs; leaflets
elliptic to obovate, obtuse at the apex; stipules
lanceolate(5) *D. floribundum*
22. Pods falcate, indistinctly jointed, dehiscent along
ventral suture, without raised reticulations(8) *D. gyrans*
22. Pods straight, conspicuously jointed,
indehiscent, with raised reticulations.....23.
23. Branches erect; leaves oblong; flowers in dense
terminal racemes, pedicels glabrous, 3 mm. long.....(9) *D. heterocarpum*

23. Branches scandent; leaves obovate to oblong; flowers
in loose terminal and lateral racemes, pedicels
pubescent, 4–5 mm. long.....(1) *D. Buergeri*
1. **Desmodium Buergeri** Miq. Ann. Mus. Bot. Lugd.-Bat. III (1867), 45; Merr. in Philip.
Journ. Sci. V (1910), 85, Enum. Philip. Pl. II (1923) 284; Masam. Fl. Geobot.
Yakushima (1934) 245; Ohwi, Fl. Jap. (1956) 682.

Desmodium polycarpum (DC.) MATSUM. Ito & Matsum. in Journ. Sci. Coll. XII (1899), 416; Matsum. & Hay. Enum. Pl. Formos. (1906) 107; Mak. & Nem. Fl. Jap. ed. 2 (1931), 565.

Desmodium heterocarpum DC. var *Buergeri* HOSOKAWA in Journ. Soc. Trop. Agr. IV (1932), 201; Masamune, Short Fl. Formos. (1936) 98 & List Vasc. Pl. Taiwan (1954) 72.

Fig. 1. An undershrub, about 30–60 cm. tall; branches numerous, ascending, finely clothed with adpressed hairs. Leaves trifoliate; petioles 10–15 mm. long; leaflets subcoriaceous, green, glabrous above, adpressedly hairy beneath, the terminal one obovate or oblong, rounded, obtuse, truncate or minutely cuspidate at the apex, 2–3 cm. long, 1.5–2 cm. wide, the two lateral ones smaller; veins slightly raised, curved upwards near margins; stipules lanceolate, 5–8 mm. long, persistent. Flowers loosely arranged in pairs, forming an axillary and terminal racemes; pedicels pubescent, 4–5 mm. long, upwards; bracts ovate, cuspidate or acuminate, margins ciliated, 4–6 mm. long, deciduous; calyx 1 mm. long, teeth acute; corolla 4–5 mm. long, pink. Pods 1.5–2 cm. long, 3 mm. wide, sessile, twisted, 4–5-jointed; joints with raised reticulations and hooked hairs, length as long as width, indented in lower suture.

CHINESE NAME: 柏氏小槐花.

JAPANESE NAME: Hai-sibahagi.

FLOWERING TIME: August to October.

HABITAT: On borders of thickets and open grassy slopes at medium altitudes throughout the island.

DISTRIBUTION: Japan, Korea, Ryukyu, Taiwan, Southern China, Philippines and Indo-China.

SPECIMENS EXAMINED:

TAIPEI HSIEN:

Shi-lin (士林) S. Suzuki, Oct. 27, 1921.

Tsu-shan-yen (芝山巒) S. Suzuki, Nov. 3, 1928.

Yang-ming-shan (陽明山) T. Hosokawa 3419; T. Nakamura, 3939; N. Murakami, 86.

Ch'i-hsing-shan (七星山) S. Sasaki, Oct. 1927; S. Suzuki Sept. 3, 1926.

Tan-shui (淡水) K. Koreishi, Mar. 15, 1927; N. Y. Ku, 454.

Mu-tsu-shan (拇指山) S. Suzuki, 12110.

Chin-shan (金山) C. C. Hsu, Oct. 23, 1960; S. Suzuki, 3531.

Hsin-pei-tou (新北投) M. T. Kao, K3766; T. Uehata, Oct. 13, 1929; H. Morimoto, 421.

Ta-tun-shan (大屯山) T. Hosokawa, 3162.

Hsin-tien (新店) T. Hosokawa, Oct. 28, 1930; H. Shimizu, Nov. 21, 1936; H. Keng & M. T. Kao, K1406.

Liu-chang-li (六張犁) T. Tanaka, 2591.

Nuan-nuan (暖暖) T. Suzuki, 5125, 5380, 420262; N. Fukuyama, 1484; G. Masamune, 1479.

Suei-yuan-ti (水源地) H. Shimizu, 113, 438 & Dec. 19, 1934; S. Suzuki, Nov. 7, 1930.

Kuan-yin-shan (觀音山) H. Shimada, 21, SH778; C. C. Hsu, Oct. 16, 1960; S. Suzuki, 11986.

Taipei (臺北) T. Hosokawa, 3429; S. Sasaki, Oct. 21, 1923.

ILAN HSIEN:

Kuei-shan-tao (龜山島) G. Masamune & S. Suzuki, July 3, 1932.

TAOYUAN HSIEN:

Tao-yuan (桃園) Y. Shihada, 570C; S. Suzuki, Nov. 1, 1925.

Ta-chi (大溪) T. Hosokawa, 3155.

Chiao-pan-shan (角板山) T. Hosokawa, Oct. 11, 1931, 3159.

Nei-li (內壢) C. C. Hsu, Oct. 21, 1960.

MIAOLI HSIEN:

Tsao-chiao (造橋) M. T. Kao, K3743.

HSINCHU HSIEN:

Hsin-chu (新竹) Y. Shimada, 4489 & 576C.

Nei-ma (內藪) Y. Yamamoto, et al. 130.

TAICHUNG HSIEN:

Chia-pao-tai (佳保台) C. C. Kuo, 575.

NANTOU HSIEN:

Sun-moon Lake (日月潭), Y. Kudo & S. Sasaki, 15105.

Ho-she (和社) S. Suzuki, 511; Y. Yamamoto, Nov. 10, 1938.

Wu-she (霧社) G. Masamune, 2007.

YUNLIN HSIEN:

Tou-liu (斗六) Y. Yamamoto, & S. Kamikoti, 3815.

HWALIEN HSIEN:

Tai-lu-ko (太魯閣) S. Suzuki, 8881, 8931.

Hsin-cheng (新城) S. Suzuki, & K. Ko, 4988, 4978, 4987.

TAITUNG HSIEN:

Tai-tung-shan (臺東山) Y. Yamamoto, 715.

Ta-wu (大武) E. Matuda, 1024, 1025; Y. Yamamoto, Jan. 4, 1931.

Yueh-yeh (月野) Y. Yamamoto, 3350, 3355, 3347.

Chih-pen (知本) S. Sasaki, Oct. 9, 1934.

KAOHSIUNG HSIEN:

Chi-shan (旗山) T. Hosokawa, Nov. 2, 1931

PINGTUNG HSIEN:

- Wan-tan (萬丹) H. Simizu, 2169, 2109.
 Heng-chung (恒春) T. Soma, 506.
 Hsia-ma-li (射鹿里) T. Hosokawa, Nov. 14, 1931.
 O-luan-pi (鵝鑾鼻) T. Hosokawa, 3160, 3428.

NOTE:

This species is very similar to *D. heterocarpum*; but it can be easily identified by the scandent stems, pubescent pedicels, and loosely arranged flowers. Because of its strong similarity to *D. heterocarpum* Dr. Hosokawa (1932) has considered the present species as a variety of the latter.

2. *Desmodium caudatum* (THUNB.) DC. Prodr. II (1825), 337; Koidzumi in Tokyo Bot. Mag. XLIV (1930), 103; Mak. & Nem. Fl. Jap. ed. 2 (1931), 562; Makino, Ill. Fl. Jap. (1955) 419; Ohwi, Fl. Jap. (1956) 682; Steward, Man. Pl. Yangtze Valley (1958) 181.

Hedysarum caudatum THUNB. Fl. Jap. (1784) 286.

Hedysarum laburnifolium POIR. Encycl., Meth. Dict. Bot. VI (1804), 422.

Catenaria laburnifolia (POIR.) BENTH. Pl. Jungh. I (1852), 220; Miq. Fl. Ind. Bat. FI. (1855) 257.

Desmodium laburnifolium (POIR.) DC. Prodr. II-(1825), 337; Baker, in Hook. f. Fl. Brit. Ind. II (1876), 163; Forb. & Hemsl. in Journ. Linn. Soc. Bot. XXIII (1887), 173; Trim. Fl. Ceyl. II (1894), 48; Henry, in Trans. Asiat. Soc. Jap. XXIV. Supp. (1895) 33; Ito & Matsum. in Journ. Sci. Coll. XII (1899), 413; Matsum. in Tokyo Bot. Mag. XVI (1902), 75; Matsum. & Hay. Enum. Pl. Formos. (1906) 107; Hay. Icon. Formos. I (1911), 185; Ridl. Fl. Mal. Penin. I, (1922) 608; Masam. Short Fl. Formos. (1936) 98, List. Vasc. Pl. Taiwan (1954) 72.

Catenaria caudata (Thunb.) Schindl. in Fedde, Rep. Sp. Nov. XX. (1924) 275.

Fig. 2. An ascending shrub, about 1 m. high; branches nearly glabrous. Leaves trifoliate; petioles 2-3 cm. long, with very thin wings; leaflets membranous, the terminal one lanceolate, acute at both ends, 7-12 cm. long, 2-3 cm. wide, upper surface dark green, veins elevated on both surfaces; the lateral ones smaller; stipules spinescent, 5-10 mm. long. Flowers in axillary and terminal racemes or panicles; calyx lobes acuminate, hairy; corolla 5-6 mm. long, yellow or greenish white. Pods 5-7 cm. long, flattened, 4-6-jointed; joints narrow oblong, 10-13 mm. long, 3 mm. wide, with brown hooked hairs.

CHINESE NAME: 銳葉小槐花, 金腰帶, 味噌草.

JAPANESE NAME: Misonaosi.

FLOWERING TIME: July to November.

HABITAT: In waste places and thickets at low altitudes in the northern part of the island.

DISTRIBUTION: Japan, Southern Korea, China, Ryukyu, Taiwan, India and Malaya.

SPECIMENS EXAMINED:

TAIPEI HSIEN:

Taipei (臺北) T. Hosokawa, 3163.

Tzan-tsu-shan (蟾蜍山) S. Suzuki & S. Rin, Aug. 10 1928; T. Suzuki, Sept. 1931.

Mu-tzu-shan (拇指山) H. Shimizu, 304.

Liu-chang-li (六張犁) T. Tanaka, 2593.

Tsu-shan-yen (芝山巖) T. Nonaka & K. Mori, April 27, 1933.

Keelung (基隆) T. Kawakami, Sept. 17, 1908; M. T. Kao, K4304.

Hsin-tien (新店) H. Shimizu, 2382, 3235; H. Keng & M. T. Kao K1405.

San-hsia (三峽) T. Hosokawa, 3164.

Pa-tu (八堵) S. Suzuki, Oct. 25, 1917.

Nan-kang (南港) C. C. Chuang, 2259.

TAOYUAN HSIEN:

Chung-li (中壢) C. I. Lin, Aug. 6, 1934.

HWALIEN HSIEN:

Sui-ling (水林) H. Keng & M. T. Kao, K2534.

ECONOMIC VALUE:

Used by the natives as fodders, and as an insecticide by soaking the leaves in soy sauce or prickles, etc. to kill the maggots.

3. **Desmodium cephalotes** (Roxb.) WALL. Wight, Icon. (1843) t. 373; Baker, in Hook. f. Fl. Brit. Ind II (1876), 161; Hance, in Journ. Bot. (1880) 260; Forbes. & Hemsl. In Journ. Linn. Soc. Bot. XXIII (1887), 171; Trim. Fl. Ceyl. II (1894), 47; Henry, in Trans. Asiat. Soc. Jap. XXIV Supp. (1895), 33; Ito & Matsum. in Journ. Sci. Coll. XII (1899), 412; Hay. Icon. Pl. Formos. I (1911), 183; Masamune, Short Fl. Formos. (1936) 97 & List Vasc. Pl. Taiwan (1954) 72.

Hedysarum cephalotes Roxb. Fl. Ind. III (1832), 360.

Hedysarum umbellatum Roxb. Fl. Ind. III (1832), 363.

Desmodium congestum WALL. Wight, Icon. (1849) t. 209.

Dendrobium cephalotes BENTH. Miq. Fl. Ind. Bat. I (1855), 263.

Desmodium cephalotes WALL. var. *typica* PRAIN. in Journ. Asiat. Soc. Beng. LXVI (1897), 389; Matsum. & Hay. Enum. Pl. Formos. (1906) 106.

Fig. 3. A shrub; branches triangular, with densely adpressed long silky hairs. Leaves trifoliate; petioles 2-3 cm. long, deeply canaliculated above; leaflets oblong or obovate, 5-7 cm. long, 3-4 cm. wide, apex acute, with conspicuous long-silky hairs on the veins beneath; stipules lanceolate, 8-10 mm. long, hairy, deciduous. Flowers in dense umbells, axillary; peduncles 5-8 mm. long, length of pedicels unequal; calyx 4-5 mm. long, teeth lanceolate, clothed with dense white-silky hairs; each calyx with two bracts at the base; corolla red, 8-12 mm. long, twice the length of calyx. Pods 1-1.5 cm. long, 3-4 mm. wide, slightly curved, constricted on both sutures; 3-6-jointed, length the same as width, densely covered with hairs.

CHINESE NAME: 假木豆.

JAPANESE NAME: Sirage-mame-hagi.

FLOWERING TIME: August to October.

HABITAT: In open grasslands and along borders of thickets at low and medium altitudes, only found in the southern part of this island.

DISTRIBUTION: India, Malaya, Philippines, Southern China and Taiwan.

SPECIMENS EXAMINED:

TAINAN HSIEN:

Ma-tou (麻豆) H. Morimoto, 433.

KAOHSIUNG HSIEN:

Sou-shan (壽山) T. Hosokawa, Aug. 22 1931.

Chu-tou-chiao (竹頭脚) S. C. Lee, T. Ho & M. T. Kao, Sept. 13, 1955.

Liu-kuei (六龜) Y. Yamamoto & K. Mori, 778.

Chi-shan (旗山) T. Hosokawa, Oct. 30, 1931.

PINGTUNG HSIEN:

Heng-ch'un (恆春) T. Hosokawa, Aug. 18, 1931. & Nov. 2, 1931; K. Yamada, May 1916.

Ssu-chung-ch'i (四重溪) T. Okada, Aug. 20, 1940.

O-lan-pi (鵝鑾鼻) T. Hosokawa, Aug. 11, 1931.

Hsia-ma-li (射麻里) T. Hosokawa, Aug. 12, 1931; E. Matuda, Aug. 13, 1915.

Man-chou (滿州) T. Hosokawa, Aug. 14, 1931.

TAITUNG HSIEN:

Chih-pen (知本) S. Sasaki, Oct. 8, 1934.

NOTE:

Differs from *D. umbellatum* in being a smaller plants with triangular branches which are clothed with long dense grey silky hairs and with smaller pods.

ECONOMIC VALUE:

Used for green manures.

4. **Desmodium dispermum** HAY. Icon. Pl. Formos. III (1913) 69; Masamune, Short Fl. Formos. (1936) 98 & List Vasc. Pl. Taiwan (1954) 72.

Fig. 4. A shrub about 2.5-3 m. high; branches cylindrical, glabrous, the older ones with prominent lenticels. Leaves trifoliate; petioles 5-6 mm. long, pubescent; the terminal leaflet 2-3 cm. long, less than 2 cm. wide, obovate, rounded, emarginate at the apex, cuneate at the base, pubescent on both surfaces; the lateral ones smaller; stipules linear lanceolate, 4-5 mm. long, deciduous. Flowers 2-6, in loose umbelliform racemes, axillary; peduncles 5-10 mm. long; calyx 5-6 mm. long, 4-lobed, with two bracts at the base, pubescent; corolla white, 1 cm. long, the two keels united. Pods 1.5-2 cm. long, 5-6 mm. wide, with one or two joints, pubescent.

CHINESE NAME: 雙節山馬蝗.

JAPANESE NAME: Hutatumi-hagi.

FLOWERING TIME: April to May.

HABITAT: Along streams or in open places at low and medium altitudes. Only found in the southern part of the island.

DISTRIBUTION: Endemic to Taiwan.

SPECIMENS EXAMINED:

PINGTUNG HSIEN:

- Ssu-chung-ch'i (四重溪) C. C. Chuang, 2177.
 Nan-ping-she (南平社) T. Hosokawa, Nov. 17, 1931.
 Hisa-ma-li (射麻里) T. Hosokawa, Nov. 14, 1931.
 Heng-ch'un (恒春) T. Hosokawa, Nov. 9, 1931.
 KAOHSIUNG HSIEN:
 Ta-shu (大樹) T. Okada, Aug. 1940.
 Kao-hsiung (高雄) E. Matuda, July 20, 1915.

NOTE:

From the umbelliform racemes, this species is very similar to *D. cephalotes* and *D. umbellatum*; but it differs from the latter two in having much smaller leaflets which are about 2-3 cm. long, less than 2 cm. wide. The pods being usually with two joints are also the outstanding characteristics of the present species.

5. ***Desmodium floribundum*** (D. DON) G. DON, Gen. Syst. II (1832), 297; Baker, in Hook. f. Fl. Brit. Ind. II (1876), 167; Forbes & Hemsl. in Journ. Linn. Soc. Bot. XXIII (1887), 172; Hay. Icon. Pl. Formos. I (1911), 183; Masamune, Short Fl. Formos. (1936) 97 & List Vasc. Pl. Taiwan (1954) 72; Steward, Man. Yangtze Valley (1958) 181.

Hedysarum floribundum DON. Prodr. (1825) 244.

Desmodium sambuense DC. Prodr. II (1825), 335.

Desmodium multiflorum DC. Prodr. II (1825), 335.

Desmodium angulatum DC. Prodr. II (1825), 335.

Desmodium dubium LINDL. Bot. Reg. (1826) t. 967; Bot. Mag. (1830) t. 2960.

Fig. 5. An erect shrub, woody branches angular and densely clothed with adpressed hairs. Leaves trifoliate, subcoriaceous; petioles 3-5 cm. long; terminal leaflet obovate-oblong or elliptic, 5-10 cm. long, 3-5 cm. wide, with sparingly adpressed hairs above, densely covered with adpressed grey hairs beneath, obtuse or subacute at the apex; stipules lanceolate, acuminate, 7-10 mm. long, persistent. Flowers very large, 8-10 mm. long, in axillary and terminal racemes, moderately close; pedicels 5-7 mm. long, finely hairy; calyx deeply cleft, 4-5 mm. long; corolla purple. Pods 3-5 cm. long, 5-8-jointed, constricted on both sutures, clothed with dense adpressed silky hairs.

CHINESE NAME: 紫藤小槐花, 野黃豆.

JAPANESE NAME: Hudibana-mame.

FLOWERING TIME: July to August.

HABITAT: In thickets and open places at medium altitudes.

DISTRIBUTION: Taiwan, Mainland China and India.

SPECIMENS EXAMINED:

TAICHUNG HSIEN:

Pa-hsien-shan (八仙山) C. C. Kou, Sept. 14, 1962.

Chia-po-tai (佳保臺) T. I. Chuang, Aug. 11, 1950.

Neng-kao shan (能高山) S. Suzuki, Aug. 26, 1929; S. Sasaki, July 28, 1921.

Wu-she (霧社) S. Sasaki, Aug. 26, 1929.

NOTE:

This is a suffruticose species. It is characterized by the large flowers being usually 8-10 mm long, with deeply cleft calyx, purple corolla and finely hairy pedicels.

The woody branches being angular and densely clothed with adpressed hairs are also its peculiar features. Commonly scattered in thickets at about 1,000 m. altitudes in the central mountainous regions of Taiwan.

6. *Desmodium gangeticum* (LINN.) DC. Prodr. II (1825), 327; Wight, Icon. (1840) t. 271; Benth. Fl. Hongk. (1861) 84; Baker in Hook. f. Fl. Brit. Ind. II (1876), 168; Forbes. et Hemsl. in Journ. Linn. Soc. Bot. XXIII (1887), 172; Trim. Fl. Ceyl. II (1894), 51; Ito et Matsum. in Journ. Sci. Coll. XII (1899), 416; Matsum. in Tokyo Bot. Mag. XVI (1902), 76; Matsum. et Hay. Enum. Pl. Formos. (1906) 76; Hay. Icon. Pl. Formos. I (1911), 184; Merr. Fl. Manil. (1912) 241; Ridl. Fl. Mal. Penin. I (1922), 610; Merr. Enum. Philip. Pl. II (1923), 285; Masam. Short Fl. Formos. (1936) 97 & List Vasc. Pl. Taiwan (1954) 72.

Hedysarum gangeticum LINN. Sp. Pl. ed. 1 (1753), 746.

Hedysarum collinum ROXB. Fl. Ind. III (1832), 349.

Desmodium gangeticum LINN. var. *neaei* DC. Prodr. II (1825), 327.

Fig. 6. An erect undershrub, attaining 1.5 m. high, woody branches with sparse hairs. Leaves simple, oblong, usually 8-10 cm. long, 3-4 cm. wide, those on the upper branches smaller, with an acute point at apex, nearly glabrous above, thin hairy beneath; petioles 1-2 cm. long; stipules linear, 7-10 mm. long. Inflorescence of loose terminal and axillary racemes, composing of clusters of flowers, attaining 15-25 cm. long. Flowers 2 to 6 in clusters, with pedicels 4-5 mm. long, spreading upwards; bracts minute, bristle-like; calyx pubescent, 15 mm. long, teeth lanceolate; corolla 3 mm. long. Pods falcate 1.5-2 cm. long, 2-3 mm. wide, 5-8-jointed; joints roundish, slightly pubescent, with hooked hairs, constricted on ventral suture.

CHINESE NAME: 大葉山馬蝗.

JAPANESE NAME: Tamatunagi.

FLOWERING TIME: July to November.

HABITAT: In thickets and secondary forests at low and medium altitudes in the central and southern parts of the island.

DISTRIBUTION: Widely distributed in the tropical Asia and Africa to Australia.

SPECIMENS EXAMINED:

ILAN HSIEN:

Tai-ping Shan (太平山) S. Sasaki, May 13, 1932. & May 18, 1932.

MIAOLI HSIEN:

Ta-hsin (大興) S. Suzuki, 12431.

CHANGHUA HSIEN:

Cho-shui-ch'i (濁水溪) S. Sasaki, Oct. 22, 1933.

TAINAN HSIEN:

Chu-tou-chi (竹頭崎) T. Hosokawa, 3149.

Chia-li (佳里) H. Morimoto, Sept. 4, 1941.

Ma-tou (麻豆) H. Morimoto, Aug. 23, 1942.

KAOHSIUNG HSIEN:

Chu-ch'u-tang (九曲堂) T. Hosokawa, Apr. 3, 1931. & 3148

Sou-shan (壽山) T. Hosokawa, Aug. 22, 1931.

PINGTUNG HSIEN:

Ssu-chung-chi (四重溪) C. C. Hsu, Oct. 10, 1960.

Heng-ch'un (恒春) T. Hosokawa, Oct. 30, 1931, & Nov. 9, 1931

Ping-tung (屏東) E. Matuda, Oct. 1915.

San-ti-men (三地門) S. Suzuki, 11340.

Hsiao-liu-chiu (小琉球) T. Hosokawa, 2806, 2825.

Ken-ting (墾丁) T. Hosokawa, 3146.

Nan-ping-she (南平社) T. Hosokawa, Nov. 17, 1931.

Kao-shu (高樹) T. Hosokawa, Nov. 8, 1931.

Tsuang-fang-su (船帆石) T. Hosokawa, 3147.

HWALIEN HSIEN:

Tai-lu-ko (太魯閣) S. Sasaki, May 5, 1932; S. Suzuki, 8644.

TAITUNG HSIEN:

Tai-tung (臺東) Y. Yamamoto, 1968.

Chih-pen (知本) S. Sasaki, Oct. 9, 1932.

ECONOMIC VALUE:

An annual fodder plant, also used as green manure.

7. *Desmodium gracilimum* HEMSL. in Ann. Bot. IX (1895), 152; Henry, in Trans. Asiat. Soc. Jap. XXIV Supp. (1895), 33; Ito & Matsum. in Journ. Sci. Coll. XJI (1899), 414; Matsum. in Tokyo Bot. Mag. XIV (1902), 76; Matsum. & Hay. Enum. Pl. Formos. (1906) 107; Hay. Icon. Pl. Formos. I (1911), 185; Masamune, Short Fl. Formos. (1936) 98 & List Vasc. Pl. Taiwan (1954) 72.

Fig. 7. A procumbent or prostrate herb, stem slender, covered with short whitish hairs. Leaves simple, deltoid-cordate, 2-3 cm. long, 2-2.5 cm. wide, obtuse at the apex, green and sparingly pubescent above, densely whitish hairy beneath; petioles slender, 1-2 cm. long; stipules lanceolate, 4-5 mm. long. Racemes terminal, slender; flowers solitary or 2 in a cluster, small, reddish-purple in color, loosely arranged on the floral axis; pedicels about 4 mm. long. Pods linear, 2-3 cm. long, 2 mm. wide, constricted between the joints on both sutures, and with minute hooked-hairs, 3-5-jointed; segments oblong.

CHINESE NAME: 三角葉山馬蝗.

JAPANESE NAME: Hime-kohagi.

FLOWERING TIME: August to November.

HABITAT: In waste places at low altitudes.

DISTRIBUTION: Endemic to Taiwan.

SPECIMENS EXAMINED:

PINGTUNG HSIEN:

Hsia-ma-li (射麻里) T. Hosokawa, 3417. & Aug. 1931.

Man-chou (滿州) T. Hosokawa, Aug. 12, 1931.

KAOHSIUNG HSIEN:

Chi-shan (旗山) T. Hosokawa, 3151.

NOTE:

This species is characterized by the pubescent and prostrate habit with simple triangular leaves being 2-3 cm. long, 2-2.5 cm. wide and with flowers mostly in clusters of 2, arranging loosely in a terminal raceme.

8. *Desmodium gyrans* (LINN. f.) DC. Prodr. II (1825), 326; Miq. Fl. Ind. Bat. I (1855), 243; Baker in Hook. f. Fl. Brit. Ind II (1867), 174; Trim. Fl. Cel. II (1894), 56; Henry, in Trans. Asiat. Soc. Jap. XXIV Supp. (1895), 33; Matsum. in Tokyo Bot. Mag. XVI (1902), 75; Matsum. & Hay. Enum. Pl. Formos. (1906) 107; Hay. Icon. Pl. Formos. 1 (1911), 185; Merr. Enum. Philip. Pl. II (1923), 285; Masamune, Short Fl. Formos. (1936) 98 & List Vasc. Pl. Taiwan (1954) 72, Makino, Ill. Fl. Jap. (1955) 420.

Hedysarum gyrans LINN. f. Suppl. (1781) 332; Roxb. Fl. Ind. III (1832), 351.

Fig. 8. An erect undershrub, up to 60-90 cm. high, woody branches cylindrical, glabrous. Leaves trifoliate; petioles about 1-2 cm. long; leaflets subcoriaceous, the terminal one narrowly oblong or oblong-lanceolate, 3-6 cm. long, 1.5-2.5 cm. wide, obtuse at the apex, generally with sparsely silky pubescent hairs beneath, glabrous above; the lateral ones very small, broadly linear or linear-ob lanceolate; stipules linear acuminate, 5-10 mm. long, deciduous. Flowers in axillary and terminal racemes or terminal panicles; pedicels 3-4 mm. long, spreading, with finely short hairs; calyx campanulate, teeth deltoid, shorter than the tube, nearly glabrous; corolla reddish-yellow, 6-7 mm. long, with deciduous ovate bracts. Pods falcate 3 cm. long, 4-5 mm. wide, indistinctly jointed, slightly indented and dehiscent along ventral suture.

CHINESE NAME: 舞草。

JAPANESE NAME: Mai-hagi.

FLOWERING TIME: October to December.

HABITAT: In thickets and ravines at low and medium altitudes in the southern part of Taiwan.

DISTRIBUTION: India, Malaya, tropical Australia, Philippines and Taiwan.

SPECIMENS EXAMINED:

HWALIEN HSIEN:

Yu-li (玉里) T. Suzuki, ST 19757.

KAOHSIUNG HSIEN:

Chi-chan (旗山) T. Hosokawa, Oct. 31, 1931.

PINGTUNG HSIEN:

Heng-ch'un (恒春) T. Hosokawa, 3153.

Ken-ting (墾丁) C. C. Chuang, 2206.

NOTE:

The present species is often confused with *D. gyroides*, but differing from the latter in having sickle-shaped pods with slightly pubescent or glabrescent hairs and slightly indented sutures, and leaves with two much smaller lateral leaflets being linear-ob lanceolate in outline, 1-2 cm. long, 2-4 mm. wide.

9. *Desmodium heterocarpum* (LINN.) DC. Prodr. II (1825), 337; Trim. Fl. Ceyl. II (1894),

53; Merr. in Philip. Journ. Sci. V (1910), 84 & Enum. Philip. Pl. II (1923), 285;

Masamune, Short Fl. Formos. (1936) 98 & List Vasc. Pl. Taiwan (1954) 72.

Hedysarum heterocarpum LINN. Sp. Pl. (1753) 747; Thunb. Fl. Jap. (1784) 287.

Desmodium polycarpum DC. Prodr. II (1825), 334; Miq. Fl. Ind. Bat. I (1855), 242;

Baker, in Hook. f. Fl. Brit. Ind. II (1876), 171; Forbes. & Hemsl. in Journ.

Linn. Soc. Bot. XXIII (1887), 175; Henry in Trans. Asiat. Soc. Jap. XXIV

Supp. (1895), 33; Matsum. in Tokyo Bot. Mag. XVI (1902), 78; Hay. Icon. Pl.

Formos. I (1911), 186; Ridl. Fl. Mal. Penin. I (1922), 609.

Fig. 9. An erect undershrub, attaining 60-90 cm. high, woody branches elongated, with fine densely adpressed hairs. Leaves trifoliate; petioles 1-1.5 cm. long; leaflets subcoriaceous; the terminal one oblong or obovate oblong, 2-3 cm. long, 1-2 cm. wide, the lateral ones smaller, apex obtuse, rounded or mucronate, the veins slightly raised on both surfaces, curved upwards near the margins, green, glabrous above, adpressedly grey hairy beneath; stipules lanceolate, cuspidate, 10 mm. long. Flowers crowded in dense terminal racemes; pedicels glabrous, 3-5 mm. long, upwards; bracts ovate, lanceolate, cuspidate or acuminate, margins ciliated, deciduous; calyx teeth acuminate, tube exceeding; corolla 5mm. long. Pods erect, crowded, about 1.5-2 cm. long, 3mm. wide, spreading upward; 4-7-jointed, length the same as width, with raised reticulations and hooked hairs, constricted in lower suture.

CHINESE NAME: 小槐花, 大本山土豆.

JAPANESE NAME: Siba-hagi.

FLOWERING TIME: August to November.

HABITAT: In thickets and open grasslands at low and medium altitudes throughout the island.

DISTRIBUTION: Tropical Africa and Asia through Malay to Australia and Polynesia.

SPECIMENS EXAMINED:

TAIPEI HSIEN:

Tai-pei (臺北) H. Shimizu, 445 & June 9, 1929; T. Suzuki, 420261; T. Hosokawa, 3154.

Yang-ming-shan (陽明山) H. Shimizu, 663.

Ch'ing-mei (景美) K. Kobayashi, Sept. 1931.

San-hsia (三峽) T. Hosokawa, 3157.

TAOYUAN HSIEN:

Ta-ch'i (大溪) T. Hosokawa, Oct. 28, 1930.

KAOHSIUNG HSIEN:

Chi-shan (旗山) T. Hosokawa, Nov. 4, 1931. & Oct. 30, 1931.

Chia-hsien (甲仙) T. Hosokawa, Nov. 2, 1931.

Ta-shu (大樹) T. Mori, Nov. 24, 1935.

Kang-shan (岡山) T. Okada, July 26, 1940.

Sou-shan (壽山) T. Hosokawa, 3156.

TAINAN HSIEN:

Wu-shan-t'ou (烏山頭) H. Morimoto, Nov. 3, 1932.

PINGTUNG HSIEN:

San-ti-men (三地門) S. Suzuki, 11348.

NOTE:

The present species is distinguished from *D. Buergeri* by the erect stems, glabrous pedicels, crowded flowers arranging in dense terminal racemes and oblong or obovate-oblong leaflets being obtuse at the apex.

10. ***Desmodium heterophyllum* (Willd.) DC.** Prodr. II (1825), 334; Miq. Fl. Ind. Bat. I (1855), 238; Baker in Hook. f. Fl. Brit. Ind. II (1876), 173; Forbes. & Hemsl. in Journ. Linn. Soc. Bot. XXIII (1887), 173; Trim. Fl. Ceyl. II (1894), 55; Henry in Trans. Asiat. Soc. Jap. XXIV. Supp. (1895) 33; Ito & Matsum. in Journ. Sci. Coll. XII (1899), 417; Matsum. in Tokyo Bot. Mag. XVI (1902), 78; Matsum. & Hay. Enum. Pl. Formos. (1906) 107; Hay. Icon. Pl. Formos. I (1911), 185; Merr. Fl. Manil. (1912) 240; Ridl. Fl. Mal. Penin. I (1922), 606; Merr. Enum. Philip. Pl. II (1923), 286; Masamune, Short Fl. Formos. (1936), 98 & List Vasc. Pl. Taiwan (1954) 72; T. S. Liu, S. Sasaki & H. Keng, in Quart. Journ. Taiwan Mus. VIII 4 (1955), 297.

Hedysarum heterophyllum Willd. Sp. Pl. III (1800), 1211.

Desmodium caespitosum DC. Prodr. II (1825), 333.

Hedysarum reptans Roxb. Fl. Ind. III (1832), 354.

Fig. 10. A trailing herb; stems slender, filiform, internodes elongate, covered with long spreading hairs. Leaves trifoliate; petioles 1 cm. long; leaflets oblong-elliptic or obovate-oblong, 5-18 mm. long, 3-10 mm. wide, apex rounded, emarginate, upper surface glabrous, lower surface pubescent; stipules lanceolate, 5mm. long, 2 mm. wide. Flowers rather small, 5-6 mm. long, axillary, solitary or in loose racemes; pedicels 1.2-1.5 cm. long, covered with hairs; calyx hairy, corolla pink. Pods 4-6-jointed, joints flat, 1.6-2 cm. long, 3mm. wide, dorsal suture continuous, the ventral constricted.

CHINESE NAME: 變葉山馬蝗.

JAPANESE NAME: Kawariba-makie-hagi.

FLOWERING TIME: May to August.

HABITAT: In open, usually damp grasslands at low and medium altitudes throughout the island.

DISTRIBUTION: India to the Mascarene Islands, Malaya, Philippines, Southern China and Taiwan.

SPECIMENS EXAMINED:

TAIPEI HSIEN:

Tai-pei (臺北) C. C. Chuang, 2257; S. Suzuki, 12867. 12790. Oct. 8, 1928; K. Koreishi, Feb. 8, 1927; T. Hosokawa, 3158.

Shui-yuen-ti (水源地) S. Suznki, May 12. 1929. 12365; Chin & T. Tanaka, Aug. 2. 1930.

Kuan-yin-shan (觀音山) S. Suzuki, 11909.

Tsu-shan-yan (芝山巖) T. Nonaka & K. Mori, April 27, 1933.

Shih-pai (石碑) C. C. Chuang, Nov. 11, 1961.

Hsin-chuang (新莊) C. C. Hsu, Jan. 28, 1960.

Ho-ping-tao (和平島) T. Hosokawa, June 28, 1931.

Yang-ming-shan (陽明山) C. C. Hsu, Oct. 2, 1960; Hosokawa, Oct. 4, 1931.

Pei-tou (北投) E. Matuda, July 21, 1918.

Yeh-liu (野柳) T. Hosokawa, July 28, 1931.

Ta-t'un shan (大屯山) G. Masamune, 2746.

Shi-ting (石碇) H. Keng, & M. T. Kao, Kl 303.

Hsin-tien (新店) H. Shimizu, 2110. 2384.

Chi-long Yu (基隆嶼) Y. Yamamoto, Y. Onuma & T. Outi, 123. 124.

ILAN HSIEN:

Lo-tung (羅東) S. Hirazuka, July 24, 1910.

Kuei-shan-tao (龜山島) G. Masamune & S. Suzuki, July 3, 1932.

HSINCHU HSIEN:

Hsin-chu (新竹) Y. Shimada, 568.

MIAOLI HSIEN:

Nei-ma (內麻) Y. Yamamoto, 135. 139.

TAICHUNG HSIEN:

Ta-hsin (大興) S. Suzuki, 6883.

Ta-li (大里) Y. Yamamoto & S. Suzuki, 342. 359.

TAINAN HSIEN:

Wu-shan-t'ou (烏山頭) H. Morimoto, May. 9, 1942,

PINGTUNG HSIEN:

Wan-tan (萬丹) H. Shimizu, 2381.

Man-chou (滿州) T. Hosokawa, April 7, 1931.

HWALIEN HSIEN:

Yu-li (玉里) T. Suzuki, ST 19851.

TAITUNG HSIEN:

Tai-tung shan (臺東山) Y. Yamamoto, July 1929.

Cheng-kong (成功) Y. Yamamoto, 2032.

NOTE:

This species is somewhat similar to *D. triflorum*; but it can be distinguished from the latter by the flowers being solitary or in loose racemes, the branches which are covered with long spreading hairs and the leaflets being oblong or elliptic, rounded at the apex.

ECONOMIC VALUE:

A good pasture used for feeding cattle.

11. **Desmodium lasiocarpum** (BEAUV.) DC. Prodr. II (1825), 328; Merr. in Journ. Sci. V (1910), 88, Fl. Manil. (1912) 241, Enum. Philip. Pl. II (1932), 286; Masamune, Short Fl. Formos. (1936) 98 & List Vasc. Pl. Taiwan (1954) 72.

Hedysarum lasiocarpum BEAUV. Fl. Oware Benin. I (1804), 32; Poir. in Lam. Encycl. Supp. V (1817), 15.

Hedysarum latifolium ROXB. Hort. Beng. (1814) 57 & Fl. Ind. III (1832), 350.

Desmodium latifolium (ROXB.) DC. Prodr. II (1825), 328; Baker, in Hook. f. Fl. Brit. Ind. II (1879), 168; Miq. Fl. Ind. Bat. I (1855), 246; Forb. & Hemsl. in Journ. Linn. Soc. Bot. XXIII (1887), 173; Trim. Fl. Ceyl. II (1894), 51; Henry, in Trans. Asiat. Soc. Jap. XXIV Supp. (1895), 33; Matsum. & Hay. Enum. Pl. Formos. I (1911), 185.

Fig. 11. An erect undershrub, 1-2 m. high; woody branches densely clothed with short brown pubescent hairs. Leaves simple, scabrous, usually triangular-ovate or orbicular-ovate, about 5-6 cm. long, the base rounded, but often cordate, slightly repand along the margins, and densely clothed with short soft brown hairs on both surfaces; petioles 1 cm. long, stout, densely pubescent; stipules awl-shaped from a much broader base. Racemes of dense flowers, axillary and terminal, sometimes panicled; flowers small, 4-5 mm. long, numerous; pedicels about 2 mm. long, densely pubescent; bracts minute, setaceous; calyx about the same length of the bract, densely hairy, the teeth lanceolate, as long as the tube; corolla 3-4 times longer than calyx. Pods with minute hook-hairs, 2 cm. long, 3-4 mm. wide, 4-5-jointed, the upper suture slightly constricted.

CHINESE NAME: 絨毛葉山馬蝗.

JAPANESE NAME: Ohba-hagi.

FLOWERING TIME: October to November.

HABITAT: In open grasslands and thickets at low and medium altitudes in the southern part of Taiwan.

DISTRIBUTION: In Tropical Africa and Asia to Philippines, Southern China and Taiwan.

SPECIMENS EXAMINED:

TAINAN HSIEN:

Kuan-tze-ling (關子嶺) K. Sawada, Oct. 29, 1908.

Chu-tou-chi (竹頭崎) T. Hosokawa, Nov. 4, 1931.

KAOHSIUNG HSIEN:

Chia-hsien (甲仙) T. Hosokawa, Oct. 31, 1931.

PINTGUT HSIEN:

Kao-shu (高樹) T. Hosokawa, 3166.

NOTE:

This species is easily identified by the awl-shaped stipules arising from a much broader base, covered with dense soft brown hairs.

12. *Desmodium laterale* SCHINDLER, in Fedde, Repert. XXII (1926), 258; Ohwi, Fl. Jap. (1956) 683; Hatusima & Amano, Fl. Okinawa (1958), 45.

Desmodium laxum (non DC.) Ito et MATSUM. In Journ. Sci. Coll. XII (1899), 415; Matsum. in Tokyo Bot. Mag. XIV (1902), 76; Matsum. & Hay. Enum. Pl. Formos. (1906) 107; Hay. Icon. Pl. Formos. I (1911), 186; Masamune, Short Fl. Formos. (1936) 98 & List Vasc. Pl. Taiwan (1954) 72; T. S. Liu, S. Sasaki & H. Keng in Quart. Journ. Taiwan Mus. VIII 4. (1955), 297.

Fig. 12. A small slender herb; stems angular, 25–30 cm. long, thinly pubescent. Leaves trifoliate; petioles 3–5 cm. long; leaflets membranous or subcoriaceous, pubescent or glabrous above, sparsely hairy on veins beneath, 3-veined at the base, veinlets conspicuous; the terminal leaflet narrow ovate, acute at the apex, 5–10 cm. long, 1.5–3 cm. wide, 2–3 times longer than width, the lateral ones smaller. bases slightly panicled, stipules lanceolate, acuminate, 5–7 mm. long. Racemes terminal, sometimes oblique; peduncles slender, about 20–40 cm. long; flowers in clusters of a few; pedicels slender, 1–2 cm. long; calyx-lobes shallow and rounded, 1 mm. long, slightly pubescent; corolla pink, 5–7 mm. long, keels and wings with spur at the base; bracts ovate, acuminate, 1–3 mm. long, deciduous. Pods 1–2 cm. long, with stalk 1 cm. long, 2–3 jointed, segments 9 mm. long, 4 mm. wide, half-rhomoidal, width half of the length, covered with hooked-hairs, constrictions oblique, nearly to upper suture.

CHINESE NAME: 琉球山馬蝗.

JAPANESE NAME: Ryukyu-nusubito hagi.

FLOWERING TIME: July to October.

HABITAT: In shady ravines and forests along streams, mostly at low and medium altitudes throughout the island.

DISTRIBUTION: Japan (Kyusyu, Yakushima), Ryukyu and Taiwan.

SPECIMENS EXAMINED:

TAIPEI HSIEN:

Tzan-tsü shan (蟾蜍山) N. Fukuyama, 1455.

Ta-t'un shan (大屯山) E. Matsuda, July 6, 1918.

Shi-ting (石碇) I. C. Ling, April 30, 1934.

Hsin-tien (新店) C. C. Chuang, 2117; T. Hosokawa, Oct. 28, 1930.

Wu-lai (烏來) C. C. Chuang, 2129. 2309.

TAOYUAN HSIEN:

Ciao-pan shan (角板山) N. Fukuyama, July 15, 1931.

Ta-c'iu (大溪) T. Hosokawa, 3172.

NANTOU HSIEN:

Sun-moon Lake (日月潭) Y. Kudo & S. Sasaki, 15439; R. Ueki, Oct. 23, 1930.

Pu-li (埔里) S. Suzuki, July 20, 1926.

KAOHSIUNG HSIEN:

Wu-wei shan (武威山) E. Matuda, 1021.

NANTOU HSIEN:

Ping-tung (屏東) S. Suzuki, 11126.

Pai-wan (排灣) E. Matuda, Nov. 7, 1916.

Nan-nin-shan (南嶺山) T. Hosokawa, 3170.

Keng-ting (墾丁) Y. Kudo & S. Suzuki, 15878.

O-luan-pi (鵝鑾鼻) S. Suzuki, 12570.

TAITUNG HSIEN:

Tai-tung-shan (臺東山) Y. Yamamoto, 693, 705, 716, 1996.

Chih-peu (知本) S. Suzuki, 10751.

Botel Tobago (蘭嶼) G. Masamune, 3836.

HWALIEN HSIEN:

Chi-lai-chi (奇萊崎) S. Suzuki, Aug. 21, 1929.

Tsao-hsien-shan (草仙山) N. Fukuyama & T. Suzuki, ST16203.

ILAN HSIEN:

Tu-chang (土場) G. Masamune, Aug. 4 1944.

Oo-bi-shan (蛾眉山) G. Masamune, April 25, 1938.

Tai-ping-shan (太平山) S. Suzuki, July 1929 & 5879; T. Hosokawa, 3171.

NOTE:

This species has been determined as *D. laxum* DC. by Ito & Matsumura (1899), Matsumura (1902), Matsumura & Hayata (1906), Hayata (1911), and Masamune (1936 1954), etc. After carefully studying the original description of De Candolle (Prodr. II, 336, 1825) and comparing with specimens, we consider it is a quite different plant which is less than 40 cm. high, with narrowly ovate terminal leaflets (5–10 cm. long) acute at the base, and with lanceolate acuminate stipules being 5–7 mm. long. To our conclusion, we should rather follow Ohwi's opinion (1956) in putting *D. laxum* (non DC.) as a synonym of the present species.

13. **Desmodium laxiflorum** DC. Prodr. II (1825), 335; Miq. Fl. Ind. Bat. I (1855), 251; Baker in Hook. f. Fl. Brit. Ind. II (1876), 164; Forbes. & Hemsl. in Journ. Linn. Soc. Bot. XXIII (1887), 173; Henry in Trans. Asst. Soc. Jap. XXIV Supp.

(1895), 33; Ito & Matsum. in Journ. Sci. Coll. XII (1899), 414; Matsuin. in Tokyo Bot. Mag. XVI (1902), 77; Matsum. & Hay. Enum. Pl. Formos. (1906) 107; Hay. Icon. Pl. Formos. I (1911), 185; Masamune, Short Fl. Formos. (1936) 98 & List Vasc. Pl. Taiwan (1954) 72; T. S. Liu, S. Sasaki & H. Keng in Quart. Journ. Taiwan Mus. VIII 4 (1955), 297.

Hedysarum diffusum Roxb. Fl. Ind. III (1832), 357.

Desmodium diffusum (Roxb.) DC. Prodr. II (1825), 335.

Fig. 13. A prostrate undershrub, about 1-2 m. high; woody branches clothed with dense short hairs. Leaves trifoliate; petioles 1.5-2 cm, long; leaflets membranous, ovate or broadly oblong, 4-7 cm. long, 2-5 cm. wide, obtuse at the apex, pubescent on upper surface, adpressedly minutely hairy beneath; stipules 5-6 mm. long, pubescent, deciduous. Racemes axillary and terminal, often with a long slender stalk; flowers 1-3 to a node; pedicels 4-5 mm. long, spreading; bracts minute, ovate, mucronate at apex, 3 mm. long; calyx densely hairy, teeth lanceolate, longer than tube. Pods 3 cm. long, 2 mm. wide, 5-7-jointed, constricted on both sutures.

CHINESE NAME: 疏花山馬蝗, 大葉拿身草.

JAPANESE NAME: Hosomi-hagi.

FLOWERING TIME: August to November.

HABITAT: In thickets and secondary forests at low and medium altitudes throughout the island.

DISTRIBUTION: India, Malaya, Philippines, Mainland China and Taiwan.

SPECIMENS EXAMINED:

TAIPEI HSIEN:

Tai-pei (臺北) T. Hosokawa, Oct. 1931 & Sept. 6, 1931.

Tzan-tsu-shan (蟾蜍山) T. Hosokawa, April 7, 1931; Y. Yamamoto & S. Suzuki, Oct. 10, 1928.

Liu-chan-li (六張犁) T. Tanaka, Oct. 11, 1917.

Kuan-yin-shan (觀音山) C. C. Hsu, Oct. 16, 1960; M. T. Kao, 4834; T. Fukuyama, Nov. 24, 1940 & June 16, 1940.

Mu-tzu-shan (拇指山) S. Suzuki, 12111; H. Shimada, SH691.

Pei-tou (北投) N. Murakami, Oct. 23, 1936.

Shih-tin (石碇) C. C. Chuang, 2312.

Yang-ming-shan (陽明山) T. Hosokawa, Oct. 4, 1931; H. Shimada, Oct. 26, 1932.

Ta-tung-shan (大屯山) T. Hosokawa, Aug. 24, 1930.

Hsin-tien (新店) H. Shimizu, 2953.

Wu-lai (烏來) S. Suzuki, 11626.

San-hsia (三峽) T. Hosokawa, Oct. 25, 1931.

Shan-tzu-chiao (山子脚) C. C. Hsu, Oct. 21, 1960.

Chi-hsing-shan (七星山), S. Suzuki, Nov. 2, 1928.

ILAN HSIEN:

Kuei-shan-tao (龜山島) G. Masamune & S. Suzuki, July 3, 1932.

TAOYUAN HSIEN:

Ta-chi (大溪) T. Hosokawa, 3168.

HSINCHU HSIEN:

Ta-ping (大坪) Y. Shimada, Sept. 1908.

Chu-tung (竹東) H. Shimizu, Oct. 1934.

TAINAN HSIEN:

Nan-hwa (南化) S. Suzuki, Nov. 2, 1934.

Chu-tou-chi (竹頭崎), T. Hosokawa, Nov. 4, 1931.

PINGTUNG HSIEN:

Heng-chun (恒春) J. Kawahara, Dec 8, 1943; T. Hosokawa, 3169.

Pai-wan (排灣) E. Matuda, 1019.

Man-chou (滿州) T. Hosokawa, April 7, 1931.

TAITUNG HSIEN:

Tai-tung-shan (臺東山) Y. Yamamoto, 707, 745, 8225.

HWALJEN HSIEN:

Yu-li (玉里) Y. Yamamoto, 3084.

14. *Desmodium microphyllum* (THUNB.) DC. Prodr. II (1825), 337; Miq. in Ann. Mus. Bot. Lugd.-Bat. III (1867), 45; Matsum. in Tokyo Bot. Mag. XVI (1902), 78; Merr. in Philip. Journ. Sci. V (1910), 86, Enum. Philip. Pl. II (1923), 287; Masamune, Short Fl. Formos. (1936) 98 & List Vasc. Pl. Taiwan (1954), 72; Ohwi, Fl. Jap. (1956) 682; Steward, Man. Pl. Yangtze Valley (1958), 181.

Hedysarum microphyllum THUNB. Fl. Jap. (1784) 284.

- Desmodium parvifolium* DC. in Ann. Sci. Nat. I (1825), 100; prodr. II (1825), 334; Benth. Fl. Hongk. (1861) 84; Baker in Hook. f. Fl. Brit. Ind. II (1876), 174; Trim. Fl. Ceyl. II (1894), 55; Forbes. & Hemsl. in Journ. Linn. Soc. Bot. XXIII (1887), 174; Ito & Matsum. Journ. Sci. Col. XII (1899), 418; Matsum. & Hay. Enum. Pl. Formos. (1906) 107; Hay. Fl. Mont. Formos. (1908) 74, Icon. Pl. Formos. I (1911), 186.

Fig. 14. An erect undershrub with much slender branches, wholly slightly hairy. Leaves trifoliate; petioles slender, 5-10 mm. long; leaflets crowded, small, oblong or elliptic, 5-10 mm. long, 4-6 mm. wide, obtuse, mucronate at the apex, upper surface glabrous, lower surface slightly clothed with adpressed hairs; stipules 3-5 mm. long, linear-lanceolate. Flowers very small, pink, 3-6 loosely on a long filiform hairy peduncle forming short lateral racemes, then a short terminal panicle; calyx 3 mm. long, densely pubescent, lobes acuminate. Pods 1 cm. long, 3 mm. wide, 2-4-jointed; joints with both sutures deeply indented, length as long as width.

CHINESE NAME: 小葉山葵豆.

JAPANESE NAME: Koba-no-hagi.

FLOWERING TIME: July to November.

HABITAT: On grass slopes at medium altitudes of the central parts of the island.

DISTRIBUTION: Japan, Ryukyu, Taiwan, Mainland China, Philippines and India.

SPECIMENS EXAMINED:

TAICHUNG HSIEN:

Pei-nan-an-pu (卑南鞍部) T. Hosokawa, July 11, 1931; S. Suzuki, July 4, 1960.

Su-pi-k'eng (石壁坑) S. Suzuki, July, 1, 1924.

NANTOU HSIEN:

Wu-she (霧社) S. Suzuki, Nov. 18, 1926; Shimada, Oct. 1918; G. Masamune, 2013, 2034; S. Sasaki, Aug. 26, 1929.

HWALIEN HSIEN:

Neng-kao shan (能高山) E. Matuda, Aug. 7, 1919.

Tai-lu-ku (太魯閣) T. Hosokawa, Aug. 13, 1932.

NOTE:

From the small leaves being less than 2 cm. long, the present species is similar to *D. heterophyllum* and *D. triflorum*; but it can be distinguished from the latter two by the suffruticose habit and the pods being more deeply constricted on both sutures.

15. *Desmodium pseudotriquetrum* DC. in Ann. Sci. Nat. I (1825), 100, Prodr. II (1825), 326; Ito & Matsum. in Journ. Sci. Coll. XII (1899), 413; Merr. in Philip. Journ. Sci. V (1910), 87; Hosokawa in Journ. Soc. Trop. Agr. IV (1932), 201; Masamune, Short Fl. Formos. (1936) 98 & List Vasc. Pl. Taiwan (1954) 72.

Desmodium triquetrum sensu HENRY, in Trans. Asiat. Soc. Jap. XXIV Supp. (1895), 34; Sasaki, List Pl. Formos. (1928) 231, non DC.

Pteroloma pseudotriquetrum (DC.) SCHINDL. in Fedde, Rep. Sp. Nov. Reg. Veg. XX (1924), 272.

Fig. 15. A shrub, about 50-60 cm. high, with crowded triangular branches, wholly pubescent. Leaves simple; petioles 2-3 cm. long, prominently winged; blades 6-10 cm. long, 2-4 cm. wide, oblong to lanceolate, acute at the apex, upper surface glabrous, lower surface hairy along the veins; veins 7-11 paired; stipules large, 1-2 cm. long, 2-4 mm. wide. Racemes axillary and terminal; flowers in axils of minute bracts; calyx 5 mm. long, hairy; corolla 7 mm. long, pink. Pods 2-3 cm. long, 5 mm. wide, 6-7-jointed, somewhat curved, with white hairs on both sutures, ventral suture constricted.

CHINESE NAME 瓢瓢草, 龍舌黃.

JAPANESE NAME: Tadehagi-modoki.

FLOWERING TIME: July to November.

HABITAT: On dry grasslands at medium altitudes throughout the island.

DISTRIBUTION: Northern India, Mainland China, Philippines and Taiwan.

SPECIMENS EXAMINED:

TAIPEI HSIEN:

San-hsia (三峽) T. Hosokawa, Oct. 25, 1931.

Ying-ko (鶯歌) N. Fukuyama, Sept. 6, 1931; S. Sasaki, July 27, 1927.

Nei-hu (內湖) E. Matuda, Sept. 19, 1915.

HSINCHU HSIEN:

Hsin-chu (新竹) Y. Shimada, 573, 574.

NANTOU HSIEN:

Pu-li (埔里) S. Suzuki, July 20, 1926.

Lien-hua-ch'i (蓮華池) Y. Yamamoto, Oct. 11, 1929.

TAINAN HSIEN:

Chu-tou-ch'i (竹頭崎) T. Hosokawa, 3177.

KAOHSIUNG HSIEN:

Chi-shan (旗山) T. Hosokawa, Oct. 30, 1931.

PINGTUNG HSIEN:

Heng-ch'un (恒春) T. Hosokawa, 3178.

Man-chou (滿州) T. Hosokawa, 3180.

Hsia-ma-li (射麻里) T. Hosokawa, 3181.

Keng-ting (墾丁) C. C. Chuang, 2204; T. Hosokawa, 3179.

NOTE:

This species is characterized by its prominently winged petioles and triangular branches.

16. *Desmodium pulchellum* (LINN.) BENTH. Fl. Hongk. (1861) 83; Baker, in Hook. f. Fl. Brit. Ind. II (1876), 162; Forbes. & Hemsl. in Journ. Linn. Soc. Bot. XXIII (1887), 175; Trim. Fl. Ceyl. II (1894), 48; Henry in Trans. Asiat. Soc. Jap. Supp. XXIV (1895), 33; Ito & Matsum. in Journ. Sci. Coll. XII (1899), 412; Matsum. in Tokyo Bot. Mag. XVI (1902), 75; Matsum. & Hay. Enum. Pl. Formos. (1906) 107; Hay. Icon. Pl. Formos. I (1911), 187; Merr. Fl. Manil. (1912) 238; Ridl. Fl. Mal. Penin. I (1922), 607; Merr. Enum. Philip. Pl. II (1932), 288; Masamune Short Fl. Formos. (1936) 98 & List Vasc. Pl. Taiwan (1954) 72; T. S. Liu, Ill. Nat. and Intr. Lign. Pl. Taiwan (1960) 526. f. 457.

Hedysarum pulchellum LINN. Sp. Pl. (1753) 747; Roxb. Fl. Ind. III (1832), 361.

Phyllodium pulchellum Desv. in M'ém. Soc. Linn. Paris IV (1826), 324; Miq. Ind. Bat. I (1855), 260.

Meibomia pulchella O. KUNTZE Rev. Gen. Pl. (1891) 197.

Dicerma pulchella DC. Prodr II (1825), 339.

Fig. 16. A shrub, about 1-2 m. high, with crowded finely pubescent branches. Leaves trifoliate; petioles 1-1.5 cm. long; terminal leaflet coriaceous, oblong or lanceolate, 6-10 cm. long, 3 cm. wide, obtuse, subacute at the apex; lateral ones much smaller, upper surface glabrous, lower surface softly pubescent, sometimes slightly repand or undulated along the margins; stipules 3-5 mm. long, ovate, acuminate. Inflorescence of terminal and lateral racemes, 15-20 cm. long, hairy; flowers small, 3-4 in loose clusters with short pedicels, wholly concealed in a pair of orbicular foliaceous bracts; calyx 2-3 cm. long, hairy, teeth lanceolate; corolla 3 times longer than the calyx,

yellow. Pods 7 mm. long, 3 mm. wide, 2-jointed, constricted on both sutures.

CHINESE NAME: 扇葉小槐花, 圓苞小槐花.

JAPANESE NAME: Utiwa-tunagi.

FLOWERING TIME: April to November.

HABITAT: Common in open thickets and waste places at low and medium altitudes throughout the island.

DISTRIBUTION: Ryukyu, Taiwan, Philippines, China to Tropical Asia and Australia.

SPECIMENS EXAMINED:

HSINCHU HSIEN:

Hsin-chu (新竹) T. Hosokawa, 3184.

MIAOLI HSIEN:

Miao-li (苗栗) T. Suzuki, ST20450.

NANTOU HSIEN:

Pu-li (埔里) T. Ito, Sept. 1916.

Su-pi-k'eng (石壁坑) S. Suzuki, Dec. 15, 1922.

TAICHUNG HSIEN:

Tung-shih (東勢) H. Shimizu, Jan. 9, 1935; N. Ueyama, Dec. 23, 1931.

TAINAN HSIEN:

Chu-tou-chi (竹頭崎) T. Hosokawa, 3183.

Wu-shan-tou (烏山頭) H. Morimoto, Nov. 3, 1942.

KAOHSIUNG HSIEN

Feng-shan (鳳山) M. Aminaga, Aug. 1940.

Ta-shu (大樹) T. Okada, Aug. 7, 1940.

Chi-shan (旗山) T. Hosokawa, Oct. 30, 1931.

Chu-ch'u-tang (九曲堂) T. Hosokawa, 3186.

Chia-hsien (甲仙) T. Hosokawa, Nov. 2, 1931 & Dec. 30, 1930.

PINGTUNG HSIEN:

San-ti-men (三地門) S. Suzuki, 113338.

Nan-pin-she (南平社) T. Hosokawa, Nov. 17, 1931.

Tsao-chou (潮州) E. Matuda, April 4, 1915; S. Sasaki, Aug. 1916.

Hsia-ma-li (射麻里) T. Hosokawa, 3185.

TAITUNG HSIEN:

Chih-pen (知本) S. Sasaki, Oct. 9, 1934.

Tai-tung-shan (臺東山) Y. Yamamoto & Mori, 8034.

NOTE:

This species is characterized by the specially large, persistant foliaceous bracts being rounded in outline, about 1 cm. long, 1 cm. wide.

17. *Desmodium racemosum* (THUNB.) DC. Prodr. II (1825), 337; Makino in Tokyo Bot.

Mag. XLIV (1930), 30; Mak. & Nem. Fl. Jap. ed. 2 (1931), 565; Ohwi Fl. Jap.

(1956) 683; Steward, Man. Pl. Yangtze Valley (1958) 182; Hatusima & Amano

Fl. Okinawa (1958) 45.

Hedysarum racemosum THUNB. Fl. Jap. (1784) 285.

Desmodium japonicum MIQ. in Ann. Mus. Bot. Lugd. Bat. III (1867), 46.

Desmodium oxyphyllum DC. in An. Sci. Nat. IV (1825), 102, Prodr. II (1825), 336; Ito & Matsum. in Journ. Sci. Coll. XII (1899), 414; Matsum. in Tokyo Bot. Mag. XVI (1902), 77; Steward; Man. Pl. Yangtze Valley (1958) 182.

Desmodium oxyphyllum DC. var. *japonicum* MATSUM. in Journ. Sci. Coll. XII (1899), 415.

Desmodium podocarpum sensu MIQ. in Ann. Mus. Bot. Lugd. Bat. III (1867), 46; Makino & Nem. Fl. Jap. (1925) 719, non DC.

Desmodium podocarpum DC. var. *japonicum* MAXIM. in M'el. Biol. XII (1886), 441.

Fig. 17. A small undershrub, about 60–120 cm. high, branches slender, terete, glabrescent. Leaves trifoliate; petioles 1.5–5 cm. long; leaflets membranous, glabrous above, thinly grey-silky beneath, the terminal one ovate or broadly ovate, 4–8 cm. long, 2.5–4 cm. wide, apex acute, base cuneate, the lateral ones much smaller. Flowers 3–4 mm. long, 3–4 in fascicles. Racemes of loose clusters of flowers, axillary and terminal, 30 cm. long; bracts lanceolate, acuminate, ciliated, 5–7 mm. long; pedicels ascending, 4–5 mm. long; calyx 1 mm. long, subglabrous, teeth very short; corolla pink, the bases of wing and keel without spur. Pods 2-jointed, deeply constricted on the dorsal suture; joints half-rhomoidal, 5–7 mm. long; stalk of pod 2–8 mm. long.

CHINESE NAME: 山馬蝗.

JAPANESE NAME: Nusubito-hagi.

FLOWERING TIME: July to October.

HABITAT: In shady places and secondary forests on low land.

DISTRIBUTION: Japan, Ryukyu and Taiwan.

SPECIMENS EXAMINED:

TAOYUAN HSIEN:

Chiao-pan-shan (角板山) T. Hosokawa, Oct. 11, 1931.

Ta-chi (大溪) T. Hosokawa, Oct. 26, 1930.

TAICHUNG HSIEN:

Su-pi-k'eng (石壁坑) S. Suzuki, Dec. 16, 1922.

HWALIEN HSIEN:

Tai-lu-ko (太魯閣) T. S. Liu, Aug. 28, 1953.

NOTE:

This is a very variable species. It superficially resembles *D. laterale*, but is distinguishable from the latter in having pink flowers 3–4 mm. long, without spurs at the bases of wing and keel, and linear stipules being 3–7 mm. long.

18. *Desmodium reniforme* (LINN.) DC. Prodr. II (1825), 327; MIQ. Fl. Ind. Bat. I (1855), 249; Baker in Hook. f. Fl. Brit. Ind. II (1876), 173; Henry in Trans. Asiatic Soc. Jap. XXIV Supp. (1895), 33; Matsum. & Hay. Enum. Pl. Formos. (1906),

107; Hay. Icon. Pl. Formos. I (1911), 187; Masamune, Short Fl. Formos. (1936) 98 & List Vasc. Pl. Taiwan (1954) 72.

Hedysarum reniforme LINN. Sp. Pl. ed. 2 (1753), 1051.

Fig. 18. A prostrate herb, with slender filiform branches, 30 cm. long or more, glabrous. Leaves simple, subcordate, 1-1.5 cm. long, 2-2.5 cm. wide, truncate or emarginate, glabrous; petioles 1-1.5 cm. long; stipules linear, minute, deciduous. Racemes usually terminal, composing of a few flowers or solitary in the axils of the leaves; pedicels 3-5 mm. long, nodding; bracts linear, minute; calyx turbinate, glabrous; corolla 4-5 mm. long. Pods glabrous, 2 cm. long, 2 mm. wide, 3-5-jointed; joints with length much longer than width, upper suture straight, lower suture a little constricted.

CHINESE NAME: 腎葉山馬鈴。

JAPANESE NAME: Zinyo-makie-hagi.

FLOWERING TIME: August to October.

HABITAT: In open thickets at low altitudes.

DISTRIBUTION: India, Java and Taiwan.

SPECIMENS EXAMINED:

KAOHSIUNG HSIEN:

Chia-hsien (甲仙) T. Hosokawa, 3425.

PINGTUNG HSIEN:

Keng-ting (墾丁) T. Hosokawa, Nov. 12, 1931.

O-luan-pi (鵝鑾鼻) T. Hosokawa, 3416; S. Sasaki, May 12, 1918.

NOTE:

This species is easily distinguished from *D. gracillimum* by the simple reniform-leaves. It is especially a glabrous plant in the genus.

19. **Desmodium scorpiurus** (Sw.) Desv. in Journ. Bot. I (1813), 122; DC. Prodr. II (1825), 333; Merr. in Philip. Journ. Sci. V (1910), 81, Fl. Manila (1912), 239; Hosokawa Journ. Soc. Trop. Agr. IV (1932), 201; Masamune Short Fl. Formos. (1936) 98.

Hedysarum scorpiurus Sw. Prodr. (1788) 107.

Desmodium akoense HAY. Icon. Pl. Formos. IX (1920), 23.

Fig. 19. An ascending or prostrate herb, with slender spreading branches, clothed with hooked-hairs. Leaves trifoliate; petioles 1.5-3 cm. long, with minute hooked-hairs; the terminal leaflet 1.5-3.5 cm. long, 0.7-3 cm. wide, elliptic, oblong-elliptic to ovate-oblong, lateral ones smaller, both surfaces with hairs; stipules leafy, 1-2 mm. long, 3-5 mm. wide, persistent. Racemes terminal and axillary, slender; flowers solitary or in pair; calyx 4-lobed, acuminate at the apex, pubescent; corolla 4 mm long, pink. Pods slender, 2-5 cm. long, less than 2 mm. wide, 3-8-jointed, the length of segments 3-4 times longer than the width, finely constricted between the joints, each joint with hooked-hairs.

CHINESE NAME: 阿猴舞草。

JAPANESE NAME: Ako-maihagi.

FLOWERING TIME: April to August.

HABITAT: In open dry places at low and medium altitudes.

DISTRIBUTION: A native of tropical America, but widely distributed in Philippines and the southern part of Taiwan.

SPECIMENS EXAMINED:

YUNLIN HSIEN:

Hu-wei (虎尾) M. Asikaga, April 20, 1933.

TAJNAN HSIEN:

Chia-li (佳里) H. Morimoto, Sept. 4, 1941. & Oct. 26, 1941.

Hsin-hua (新化) C. C. Chuang, 2021.

Nan-hua (南化) S. Suzuki, Nov. 2, 1934.

KAOHSIUNG HSIEN:

Tao-tzu-yuan (桃子園) T. Hosokawa, Aug. 24, 1931.

Sou-shan (壽山) T. Hosokawa, 3189.

Chi-shan (旗山) S. Yasukawa, Jan. 2, 1923.

Feng-shan (鳳山) S. Suzuki, 5648.

Chu-ch'i-tang (九曲堂) T. Hosokawa, 3190.

PINGTUNG HSIEN:

San-ti-men (三地門) C. C. Chuang, 2244.

Fang-liao (枋寮) T. Hosokawa, April 5, 1931.

Hsiao-liu-chiu (小琉球) T. Hosokawa, 2807, 2808, 2809, 2824.

Heng-ch'un (恒春) E. Matuda, 1011.

Ping-tung (屏東) Y. Yamamoto & S. Suzuki, 1824, 1869, 1873.

TAITUNG HSIEN:

Tai-tung (臺東) Y. Yamamoto, 3462.

Botel Tobago (蘭嶼) T. S. Liu & H. Keng, Aug. 3, 1954.

NOTE:

This is an introduced and naturalized species being widely distributed in the fields throughout the southern parts of the island. It can be easily identified by its prostrate habit clothed with hooked-hairs and leafy stipules.

20. *Desmodium sequax* WALL. Pl. Asiat. Rar. II (1832), 46, tab. 157. var. *sinuatum* (Miq.) Hosokawa in Journ. Soc. Trop. Agr. IV (1932), 313; Masamune, Short Fl. Formos. (1936) 98 & List. Vasc Pl. Taiwan (1954) 72; T. S. Liu, S. Sasaki & H. Keng in Quart. Journ. Taiwan Mus. VIII 4. (1955), 297.

Desmodium strangulatum WIGHT et ARNOTT, var. *sinuatum* MIQ. in Fl. Ind. Bat. I (1855), 255.

Desmodium dasylobum MIQ. Fl. Ind. Bat. Supp. (1862) 305.

Desmodium sinuatum BL. Hook. f. Fl. Brit. Ind. II (1876), 166.

Meibomia sinuatum OK. Rev. Gen. I (1891), 198.

Fig. 20. A shrub, about 50–60 cm. high, branches terete, with dense ferruginous pubescent hairs. Leaves trifoliate; petioles 2–5 cm. long; leaflets subcoriaceous, minutely pubescent or nearly glabrescent beneath, terminal one roundish-rhomboidal, 5–10 cm. long, 4–8 cm. wide, obtuse at the apex, conspicuously repand on the upper half; stipules lanceolate, acute, 5 mm. long, deciduous. Racemes terminal and axillary, 10–15 cm. long; flowers solitary or 2 in clusters, loosely arranging on the floral axis; pedicels 5 mm. long, with fine downy hairs; calyx 2–3 mm. long, teeth as long as the tube; corolla 5–6 mm. long, pink. Pods 4–5 cm. long, 3 mm. wide, 8–12-jointed; joints covered with ferruginous hooked hairs and length as long as width.

CHINESE NAME: 波狀葉山馬蝗, 山毛豆花, 烏山黃檀草.

JAPANESE NAME: Ohba-maihagi.

FLOWERING TIME: August to November.

HABITAT: In thickets, ravines and forests at low and medium altitudes throughout the island.

DISTRIBUTION: Widely spreading in tropical Asia.

SPECIMENS EXAMINED:

TAIPEI HSIEN:

Ch'in-shan (金山) S. Suzuki, 6148.

Hsin-tien (新店) C. J. Ling, Sept. 24, 1933; H. Shimizu, 2112. 2897; Y. Yamamoto, April 19, 1929; Y. Kudo, S. Suzuki & Mori, April 1929.

Wu-lai (烏來) T. Hosokawa, 3143; S. Suzuki, 3225. & Nov. 16, 1923; T. Suzuki, 10313.

A-yi (愛玉) M. T. Kao, 30103.

TAOYUAN HSIEN:

Chiao-pan-shan (角板山) T. Hosokawa 3418.

Ta-c'hi (大溪) T. Hosokawa, Oct. 26, 1930.

HSINCHU HSIEN:

Hsin-chu (新竹) N. Fukuyama, 3505; S. Sasaki, March 1909.

Ta-ping (大萍) T. Kawakami, 6041.

TAICHUNG HSIEN:

Ta-chien (達見) K. Mori, Oct. 29, 1936.

An-ma-shan (鞍馬山) T. S. Liu et al. Oct. 9, 1957.

NANTOU HSIEN:

Hou-she (和社) Y. Yamamoto, Nov. 10, 1938.

CHIAYI HSIEN:

A-li-shan (阿里山) T. C. Huang, 1602; S. Suzuki, Jan. 26, 1922; S. Sasaki, Oct. 1928; Y. Kudo & S. Suzuki, Dec. 24, 1928.

TAINAN HSIEN:

Chu-tou-ch'i (竹頭崎) T. Hosokawa, Nov. 4, 1931.

PJNGTUNG HSIEN:

Ai-liao (愛寮) E. Matuda, Nov. 7, 1916.

TAITUNG HSIEN:

Ta-wu (大武) G. Masamune, 1586.

Chih-pen (知本) S. Suzuki, 10898; T. Hosokawa, 5286.

Ching-shui (清水) Y. Yamamoto & K. Mori, July 30, 1937.

HWALIEN HSIEN:

Tai-lu-ko (太魯閣) S. Suzuki, 9631; T. Suzuki, ST 9713.

ILAN HSIEN:

Ta-yen-shan (大元山) M. T. Kao, K3182.

Tai-ping shan (太平山) S. Suzuki, Aug. 12, 1929 & Sept. 21, 1930. & Aug. 1, 1928.

Aug. 14, 1925. July 26, 1929. Aug. 1, 1925; C. C. Chuang, 2265.

Cho-shui-she (濁水社) Y. Yamamoto, Oct. 28, 1928.

NOTE:

This species is characterized by the leaves which are undulate along margins, especially so on the upper half.

The pods with joints of same length and width, covering with ferruginous hooked hairs, are also the outstanding features of this species.

21. **Desmodium Tashiroi** MATSUM. in Ito & Matsum. in Journ. Sci. Coll. XII (1899), 415; Matsum. in Tokyo Bot. Mag. XVI (1902), 77; Masamune, Prel. Rep. Veg. Yak. (1929), 246, Mak. & Nem. Fl. Jap. ed. 2 (1931), 566; Ohwi, Fl. Jap. (1956) 683; Hatusima & Amano Fl. Okinawa (1958) 45.

Desmodium Gardneri sensu MAKINO, in Tokyo Bot. Mag. X (1896), 60; Matsum. & Hay. Enum. Pl. Formos. (1906) 107; Hay. Icon. Pl. Formos. I (1911), 184, non Benth.

Desmodium laxum sensu MASAMUNE, Short Fl. Formos. (1936), 98 & List Vasc. Pl. Taiwan. (1954) 72, non DC.

Fig. 21. An erect herb, stem about 30 cm. high, thinly pubescent. Leaves trifoliate; petioles 5-8 cm. long; leaflets membranous, the terminal one ovate or broadly ovate, 6-10 cm. long, 2.5-5 cm. wide, acuminate at the apex, cuneate at the base, the lateral ones smaller, bases slightly oblique, with 3 pairs of veins at the base, upper surface glabrous, lower surface with whitish spots, only pubescent on veins; stipules lanceolate, 5-10 mm. long. Racemes 10-30 cm. long, terminal; flowers loosely arranged, 5-7 mm. long; pedicels 1-1.5 cm. long; bracts linear, deciduous; calyx campanulate, glabrous, 1-2 mm. long. Pods 2-5 cm. long, 5 mm. wide, 2-3-jointed, long stalked; stalks 1 cm. long, with constrictions between the joints; joints oblique, 13-16 mm. long.

CHINESE NAME: 田代氏山馬蝗.

JAPANESE NAME: Tokiwa-yabu-hagi.

FLOWERING TIME: August to October.

HABITAT: In shady ravines and forests along streams, mostly at medium altitudes.

DISTRIBUTION: Japan, Ryukyu and Taiwan.

SPECIMENS EXAMINED:

TAIPEI HSIEN:

- Chu-tzu-hu (竹子湖) G. Masamune, 2470.
 Hsin-tien (新店) T. Hosokawa, Oct. 28, 1930.
 Wu-lai (烏來) T. Suzuki, 420262; C. C. Chuang, 2128.

TAOYUAN HSIEN:

- Ta-ch'i (大溪) T. Hosokawa, Oct. 26, 1930.

NANTOU HSIEN:

- Sun-Moon Lake (日月潭) Y. Kudo & S. Sasaki, 15439.

TAITUNG HSIEN:

- Chih-pen (知本) T. Hosokawa, 5190.

- Tai-tung-shan (臺東山) Y. Yamamoto & Mori, 8085; H. Keng & M. T. Kao, K
 2640. Y. Yamamoto, 2027, 2030, 2029.

- Ta-wu (大武) T. I. Chuang, 1919.

HWALIEN HSIEN:

- Muh-kwa shan (木瓜山) M. T. Kao, Aug. 14, 1956.

NOTE:

This species can be easily identified by the following characters:

1. Terminal leaflets ovate or broadly ovate, acuminate at the apex
2. Veinlets flat on both surfaces.
3. The leaf-blade with upper surface glabrous, lower surface pubescent on the veins and dispersed with prominent whitish spots.
4. Flowers large, 5-7 mm long.

This species has long been considered as a conspecies of *D. laxum* DC. by some botanists (Matsumura in Journ. Sci. Coll. XII, 415, 1899), but it is apparently a different one from the latter. It is a new addition to the Flora of Taiwan.

22. ***Desmodium triflorum* (LINN.) DC.** Prodr. II (1825), 334; Miq. Fl. Ind. Bat. I (1855), 238; Benth. Fl. Hongk. (1861) 83; Baker in Hook. f. Fl. Brit. Ind. II (1876), 173; Trim. Fl. Ceyl. II (1894), 54; Henry in Trans. Asiat. Soc. Jap. XXIV Supp. (1895), 33; Ito & Matsum. in Journ. Sci. Coll. XII (1899), 417; Matsum. in Tokyo Bot. Mag. XVI (1902), 78; Matsum. & Hay. Enum. Pl. Formos. (1906), 108; Hay. Icon. Pl. Formos. I (1911), 187; Merr. Fl. Manil. (1912) 240; Ridl. Fl. Mal. Penin. I (1922), 606; Merr. Enum. Philip. Pl. II (1932), 289; Masamune: Short Fl. Formos. (1936) 98 & List Vasc. Pl. Taiwan (1954) 72.

Hedysarum triflorum LINN. Sp. Pl. (1753) 749; Roxb. Fl. Ind. III (1832), 353.

Fig. 22. A small herb, stems filiform and prostrate, wholly clothed with short adpressed white hairs. Leaves trifoliate; petioles usually 5 mm. long; leaflets membranous, obovate-cuneate or obovate-truncate, apex retuse, truncate or emarginate, glabrous above, densely white hairy beneath, the terminal one 6-10 mm long, 7-8 mm wide; stipules acuminate, 3-4 mm long. Flowers axillary, solitary or 2-3-fascicled;

pedicels slender, about 7-10 mm. long; calyx hairy, 2 mm. long; corolla pink. Pods 8-15 mm. long, 3 mm. wide, 2-5-jointed, dorsal suture straight, constricted on ventral suture, with hooked hairs and reticulate veins.

CHINESE NAME: 蝶翼草, 珠仔草.

JAPANESE NAME: Hai-makie-hagi.

FLOWERING TIME: All the year round.

HABITAT: In open grasslands.

DISTRIBUTION: Spread throughout the tropical regions.

SPECIMENS EXAMINED:

TAIPEI HSIEN:

Tai-pei (臺北) T. Hosokawa, 3193; S. Suzuki, Dec. 24, 1932; T. Tanaka & Y. Shimada, May 30, 1932.

Yuen-shan (圓山) Aug. 18, 1933.

Mu-tzu-shan (拇指山) H. Shimizu, Dec. 12, 1934.

Shan-tzu-chiao, (山子脚) C. C. Hsu, Oct. 21, 1960.

TAOYUAN HSIEN:

Nei-li (內壢) C. C. Hsu, Oct. 21, 1960.

HSINCHU HSIEN:

Hsin-chu (新竹) T. Hosokawa, Aug. 9, 1931.

MIAOLI HSIEN:

Miao-li (苗栗) S. Suzuki, 12389.

TAICHUNG HSIEN:

Yueh-me (月眉) S. Suzuki, 6752.

Ta-nan (大南) Y. Yamamoto & Mori, 8450.

NANTOU HSIEN:

Sun Moon Lake (日月潭) S. Suzuki, 6714; Y. Kudo & S. Sasaki, 15106, 15440.

Pu-li (埔里) C. C. Chuang, 2065.

Chung-liao (中寮) Y. Yamamoto & S. Suzuki, 904, 909, 910, 913, 921.

YUNLIN HSIEN:

Hu-wei (虎尾) M. Asikaga, 2540, 7033; S. Suzuki, 6410, 6411, 6426; Y. Yamamoto et al. 1076, 1088.

CHIAYI HSIEN:

Chia-yi (嘉義) T. Yamasita, April 19, 1932.

Suan-t'ou (蒜頭) S. Suzuki & Kamikoti, 4765.

TAINAN HSIEN:

Ma-tou (麻豆) Y. Yamamoto & S. Suzuki, 1414; S. Suzuki & Kamikoti, 4812.

Yen-shui (鹽水) S. Suzuki & Kamikoti, 4638, 4640, 4641, 4642.

Nan-hua (南化) S. Suzuki, 5877.

Chia-li (佳里) H. Morimoto, Oct. 26, 1941.

Hsin-hua (新化) C. C. Chuang, 2022.

Tai-nan (臺南) Y. Yamamoto & S. Suzuki, 2367.

KAOHSIUNG HSIEN:

Ch'i-shan (旗山) S. Suzuki, 5759, 5824.

PINGTUNG HSIEN:

Hai-feng (海豐) Y. Yamamoto & S. Suzuki, 1885, 1875.

San-ti-men (三地門) C. C. Chuang, 2245.

Chi-mei (旗美) Y. Yamamoto & K. Mori, 7499, 7548.

Wan-tan (萬丹) Y. Yamamoto & K. Mori, 7593, 7647.

Tsao-chou (潮州) E. Matuda, April 1, 1915.

Hsiao-liu-chiu (小琉球) T. Hosokawa, 2826.

Heng-ch'un (恒春) S. Suzuki, 4111, 15735.

Ken-ting (墾丁) C. C. Chuang, 2217, 2222.

Ssu-chung-ch'i (四重溪) C. C. Hsu, Oct. 10, 1960.

O-luan-pi (鵝鑾鼻) T. Hosokawa, 3194, 3195.

TAITUNG HSIEN:

Tai-tung shan (臺東山) Y. Yamamoto & K. Mori, 8202.

Pei-nan (卑南) Y. Yamamoto, 3618.

An-sow (安朔) C. C. Hsu, Oct. 9, 1960.

Tsao-pu (草埔) C. C. Hsu, Oct. 9, 1960.

Yueh-yeh (月野) Y. Yamamoto, 3346.

Ta-wu (大武) C. C. Hsu, Oct. 8, 1960.

Lu Tao (綠島) Y. Kudo & K. Mori, July 6, 1930. & 1847.

HWALIEN HSIEN:

Yu-li (玉里) Y. Yamamoto, 3081, 3083; S. Suzuki, 5384.

Ma-tai-an (馬太鞍) Y. Yamamoto, 3247.

NOTE:

This species is easily distinguished from *D. heterophyllum* by its axillary, solitary or 2-3-fascicled flowers and obovate-truncate leaflets being retuse or emarginate at the apex.

ECONOMIC VALUE:

Used as fodder in hot climatic regions.

23. *Desmodium umbellatum* (LINN.) DC. Prodr. II (1825), 325; Baker in Hook. f. Fl. Brit. Ind. II (1876) 161; Forbes. & Hemsl. in Journ. Linn. Soc. Bot. XXII (1887), 177; Trim. Fl. Ceyl. II (1894), 47; Makino in Tokyo Bot. Mag. X (1896), 64; Ito & Matsum. in Journ. Sci. Coll. XII (1899), 412; Matsum. in Tokyo Bot. Mag. XVI (1902), 74; Matsum. & Hay. Enum. Pl. Formos. (1906) 180; Hay. Icon. Pl. Formos. I (1911), 187; Rild. Fl. Mal. Pemin. I (1922), 607; Merr. Enum. Philip. Pl. II (1923), 290; Masamune, Short Fl. Formos. (1936) 98 & List Vasc. Pl. Taiwan (1954) 72; T. S. Liu, S. Sasaki & H. Keng, in Quart.

Journ. Taiwan Mus. VIII 4 (1955), 297; T.S. Liu, Ill. Nat. and Intr. Lign. Pl. Taiwan (1960) 527. f. 458.

Hedysarum umbellatum LINN. Sp. Pl. (1753), 747.

Desmodium australe DC. Prodr. II (1825), 326.

Hedysarum arboreum ROXB. Fl. Ind. III. (1832) 360.

Dendrobium umbellatum W. et A. BENTH. Pl. Jungh. (1854) 216; Miq. Fl. Ind. Bat. I (1855), 262.

Meibomia umbelata OK. Rev. Gen. Pl. (1891), 197.

Fig. 23. A shrub, 1-2 m. high, branches cylindrical, young branches densely with fine soft hairs. Leaves trifoliate; petioles 2-4 cm. long; leaflets subcoriaceous, ovate-oblong or broad-oblong, 4-8 cm. long, 3-5 cm. wide, upper surface glabrous, lower surface paler, puberulous or nearly glabrescent, obtuse at the apex; stipules minute, bristle-like, 1 cm. long, deciduous. Flowers axillary, in loose umbels; pedicels 5-6 mm. long, unequal; peduncle 1-2 cm. long; calyx 4-5 mm. long, with densely silky hairs, teeth lanceolate pubescent; corolla more than twice as long as the calyx. Pods 2-4 cm. long, 5 mm. wide, 4-5-jointed; segments broadly oblong, constricted on both sutures, with adpressed-hairs and reticulate veins.

CHINESE NAME: 白古蘇花.

JAPANESE NAME: Ohki-hagi.

FLOWERING TIME: July to August.

HABITAT: Along the seashore in the southern part of Taiwan and the adjacent islets.

DISTRIBUTION: Tropical Asia, Polynesia, Philippines, Taiwan and Ryukyu.

SPECIMENS EXAMINED:

PINGTUNG HSIEN:

Ken-ting (墾丁) T. Suzuki, 420265; T. Hosokawa, Aug. 21, 1931.

O-luan-pi (鵝鑾鼻) T. Hosokawa, Aug. 11, 1931.

TAITUNG HSIEN:

Botel Tobago (蘭嶼) T. S. Liu & H. Keng, July 31, 1954. & Aug. 1, 1954; T. I. Chuang & C. C. Hsu, Aug. 17, 1958; Y. Kudo, & K. Mori, July 7, 1916; S. Sasaki, July 1912; C. Sata, July 14, 1932.

Hsiao-lan-yu (小蘭嶼) C. Sata, July 1, 1932.

Lu-Tao (綠島) T. Soma, July 1914.

NOTE:

This species is distinguished from *D. dispermum* by the pods having 3-6 joints and the leaflets which are larger than those of the latter, being 4-8 cm. long, 3-5 cm. wide. It is also distinguishable from *D. cephalotes* by the cylindrical woody branches.

ECONOMIC VALUE:

The wood is used for fuel, while the flowers are of medicinal uses.

24. *Desmodium zonatum* MIQ. Fl. Ind. Bat. I (1855), 250; Merr. Enum. Philip. Pl. II (1923), 290; Schindler in Fedde, Repert. XXII (1926), 261; Hosokawa, in Journ.

Soc. Trop. Agr. V (1933), 57. Masamune, Short Fl. Formos. (1936) 98 & List Vasc. Pl. Taiwan (1954), 72.

Desmodium ornocarpoides sensu THWAITES, Enumeratio Pl. Zeyl. (1859) 87 non DC.; Miq. Fl. Ind. Bat. Supp. I (1860), 113; Baker in Hook. f. Fl. Brit. Ind. II (1876), 164; Trim. Fl. Ceyl. II (1894), 49; Merr. in Philip. Journ. Sci. V (1910), 82; Ridl. Fl. Malay. Penin. I (1922), 610; Merr. Enum. Philip. Pl. II (1932), 287.

Desmodium teres sensu CLARKE in Journ. Linn. Soc. Bot. XXV (1889), 16, non Wall.

Desmodium Shimadai HAY. Icon. Pl. Formos. IX (1920), 24.

Meibomia zonata OK. Rev. Gen. Pl. I. (1891) 198.

Fig. 24. An undershrub, about 60 cm. high, with very slender procumbent woody branches, finely downy in young parts. Leaves simple; petioles usually 1.5-2 cm. long, pubescent; blades subcoriaceous, upper surface glabrous, lower surface pubescent, ovate or oblong-lanceolate, 4-6 cm. long, 1.5-2 cm. wide, acute at the apex; stipules lanceolate acuminate, 5 mm. long, persistent. Racemes terminal, more than 10 cm. long; flowers 1-2, remotely arranged; pedicels 1-1.5 cm. long, puberulous; calyx 2 mm. long, pubescent, teeth deltoid; corolla 4-5 mm. long, pink. Pods 4-6 cm. long, 2 mm. wide, pendulous, 4-8-jointed, constricted on both sutures; each segment 1.5-2 cm. long, fusiform, with raised conspicuous reticulations.

CHINESE NAME: 單葉拿身草.

JAPANESE NAME: Shimada-hagi.

FLOWERING TIME: August to October.

HABITAT: In thickets and forests at low and medium altitudes.

DISTRIBUTION: India, Ceylon, Malaya, Sumatra, Java, Philippines, Mainland China and Taiwan.

SPECIMENS EXAMINED:

HSINCHU HSIEN:

Chu-tung (竹東) Shimada, Oct. 4, 1929.

HWALIEN HSIEN:

Tai-lu-ko (太魯閣) T. Hosokawa, Aug. 13, 1932.

NOTE:

This species is very near to *D. laxiflorum* in the inflorescences, flowers, and pods, but it can be easily distinguished from the latter by the simple leaves.

EXCLUDED SPECIES

25. *Desmodium capitatum* (BURM.) DC. Prodr. II (1825), 336; Miq. Fl. Ind. Bat. I (1855), 241; Merr. in Philip. Journ. Sci. I. Supp. (1906), 65, Fl. Manila (1912), 240, Enum. Philip. Pl. II (1923), 284; T. S. Liu, S. Sasaki & H. Keng in Quart. Journ. Taiwan Mus. VIII 4 (1955), 297.

Hedysarum capitatum BURM. f. Fl. Ind. (1768), 167.

Meibomia capita O. KUNTZE Rev. Gen. Pl. (1891), 195.

NOTE:

This species has been reported occurring in Botel Tobago (Lan-yu), but we have seen neither a plant in the field nor a single sheet of specimen in our herbarium.

26. *Desmodium gyroides* (Roxb.) DC. Prodr. II (1825), 326; Baker, in Hook. f. Fl. Brit. Ind. II (1876), 174; Forbes. & Hemsl. in Journ. Linn. Soc. Bot. XXIII (1887), 173; Henry in Trans. Asiat. Soc. Jap. XXIV Supp. (1895), 33; Matsum. in Tokyo Bot. Mag. XVI (1902), 75; Hay. Icon. Pl. Formos. I (1911), 185; Ridl. Fl. Mal. Penin. I (1922), 611; Masamune, Short Fl. Formos. (1936) 98.

Hedysarum gyroides Roxb. Hort. Beng. (1814), 57.

Desmodium pseudogyroides Miq. Fl. Ind. Bat. I (1855), 244.

NOTE:

This species has been reported by Henry (1895) as occurring in Taiwan, but no specimens were collected in the fields, excepting cultivated ones. It is especially characterized by its spreading, brownish, densely hairy pods and branches.

27. *Desmodium recurvatum* (Roxb.) Grah. in Wall. Cat. (1832), t. 5717; Wight Icon. (1843), t. 374; Miq. Fl. Ind. Bat. I (1855), 250; Hosokawa in Journ. Soc. Trop. Agr. IV (1932), 201; Masamune, Short Fl. Formos. (1956) 98 & List Vasc. Pl. Taiwan (1954) 72.

Hedysarum recurvatum Roxb. Fl. Ind. III (1832), 358.

NOTE:

Hosokawa listed this species occurring in Taiwan, in Journ. Soc. Trop. Agr. IV (1932). There is only a sheet of specimen of the plant in our herbarium, so we are not sure whether it is correct or not.

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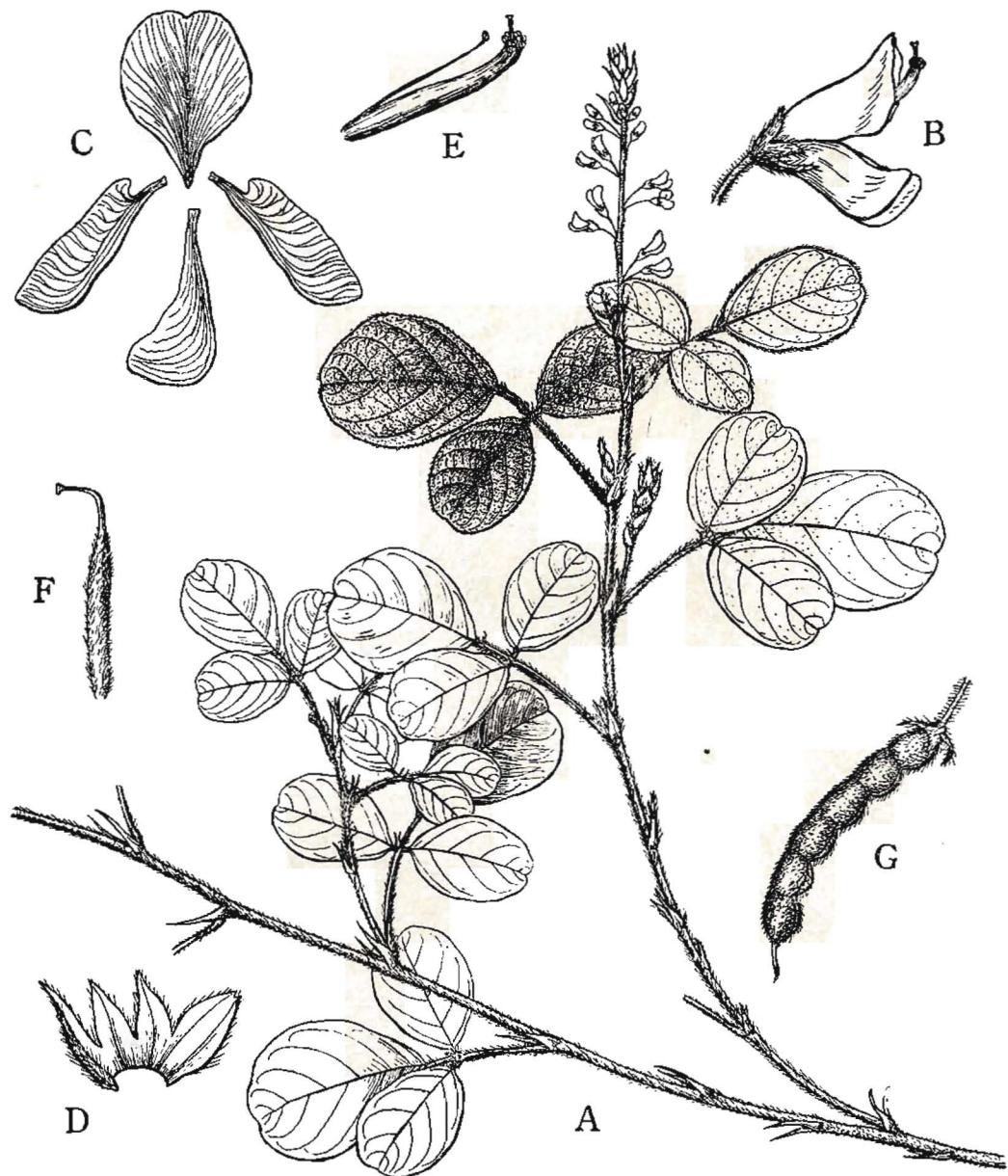


Fig. 1. *Desmodium Buergeri* MiQ.

A. Habit, $\times 1/1$. B. Flower, $\times 5$. C. Corolla, $\times 6$. D. Calyx, $\times 12$. E. Stamens, $\times 6$.
F. Pistil, $\times 6$. G. Pod, $\times 2$.



Fig. 2. *Desmodium caudatum* (THUNB.) DC.

A. Part of branch, $\times 1/1$. B. Flower, $\times 4$. C. Corolla, $\times 5$. D. Calyx, $\times 7$. E. Stamens, $\times 6$.
 F. Pistil, $\times 6$. G. Pod, $\times 1/2$.



Fig. 3. *Desmodium cephalotes* WALL.

A. Part of branch, $\times 1/1$. B. Stipule, $\times 3$. C. Flower, $\times 6$. D. Corolla, $\times 4$. E. Calyx, $\times 6$. F. Stamens, $\times 6$. G. Pistil, $\times 9$. H. Anthers, $\times 15$. I. Bract of Calyx, $\times 7$. J. Pod, $\times 3$. K. Seed, $\times 4$.

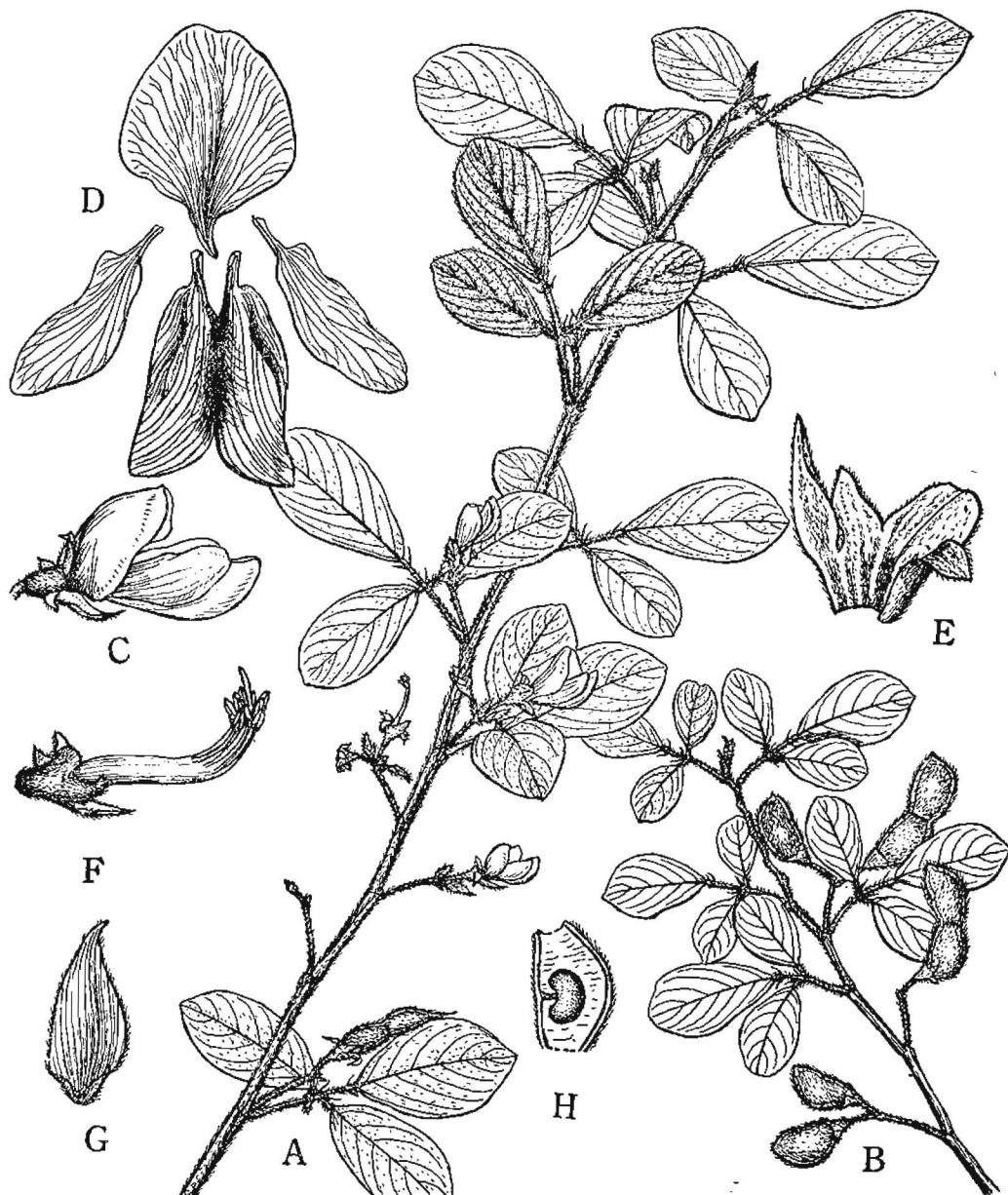


Fig. 4. *Desmodium dispermum* HAY.

- A. Part of branch, $\times 1/1$. B. Fruiting branchlet, $\times 1/1$. C. Flower, $\times 3$. D. Corolla, $\times 4$.
 E. Calyx, $\times 6$. F. Stamens, $\times 4$. G. Stipule, $\times 6$. H. Seed, $\times 2$.



Fig. 5. *Desmodium floribundum* (D. DON) G. DON

A. Part of branch, $\times 1/1$. B. Corolla, $\times 3$. C. Calyx, $\times 3$. D. Stamens, $\times 3$. E. Pistil, $\times 3$.
 F. Pod, $\times \frac{1}{2}$.



Fig. 6. *Desmodium gangeticum* (LINN.) DC.

A. Part of branch, $\times 1/1$. B. Leaflet, $\times \frac{1}{4}$. C. Flower, $\times 6$. D. Corolla, $\times 6$. E. Calyx,
 $\times 12$. F. Stamens, $\times 6$. G. Pistil, $\times 6$. H. Pod, $\times 2$.

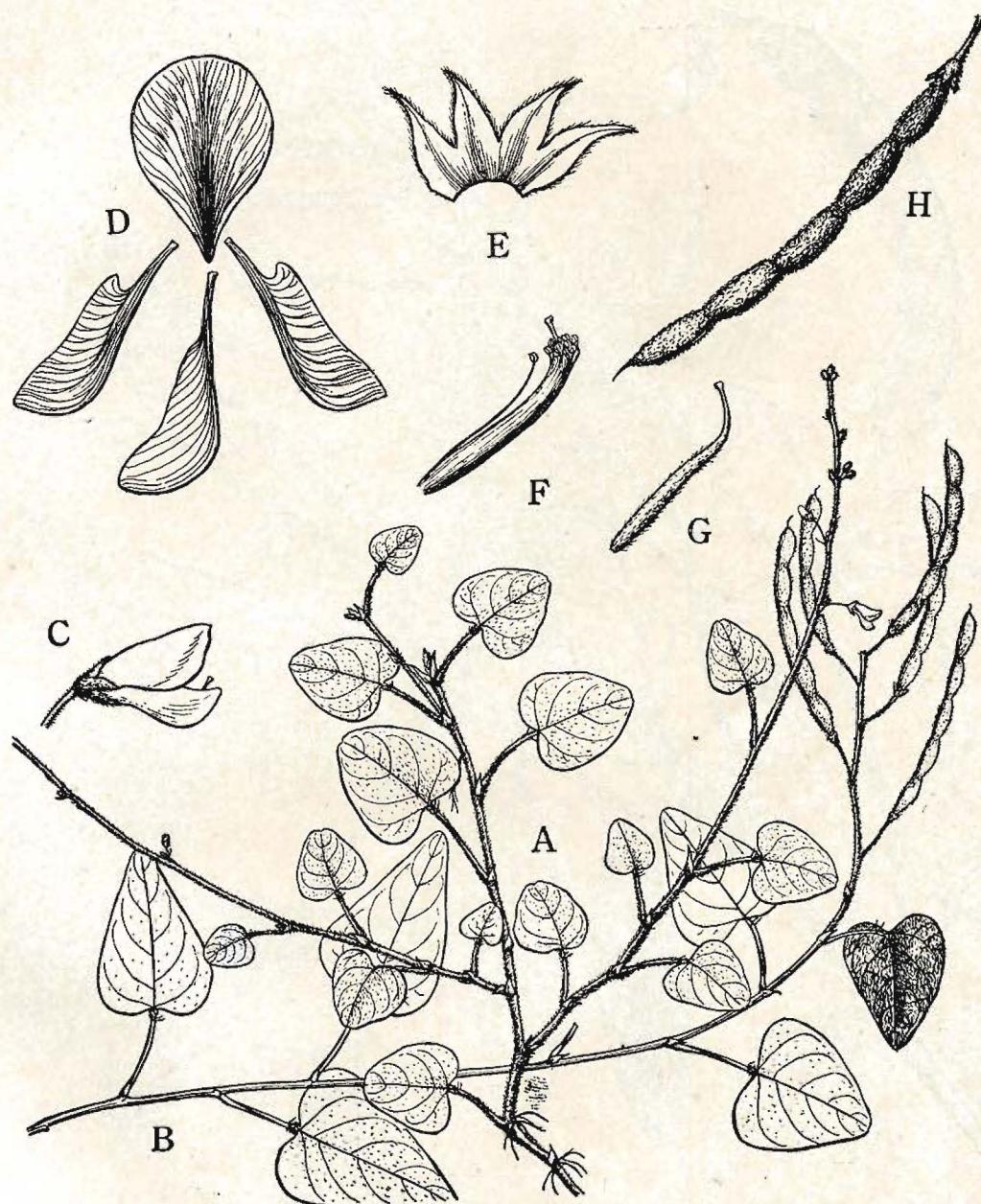


Fig. 7. *Desmodium gracillimum* HEMSL.

A. Habit, $\times 1/1$. B. Fruiting branchlet, $\times 1/1$. C. Flower, $\times 5$. D. Corolla, $\times 7$. E. Calyx, $\times 8$.
F. Stamens, $\times 7$. G. Pistil, $\times 7$. H. Pod, $\times 2$.

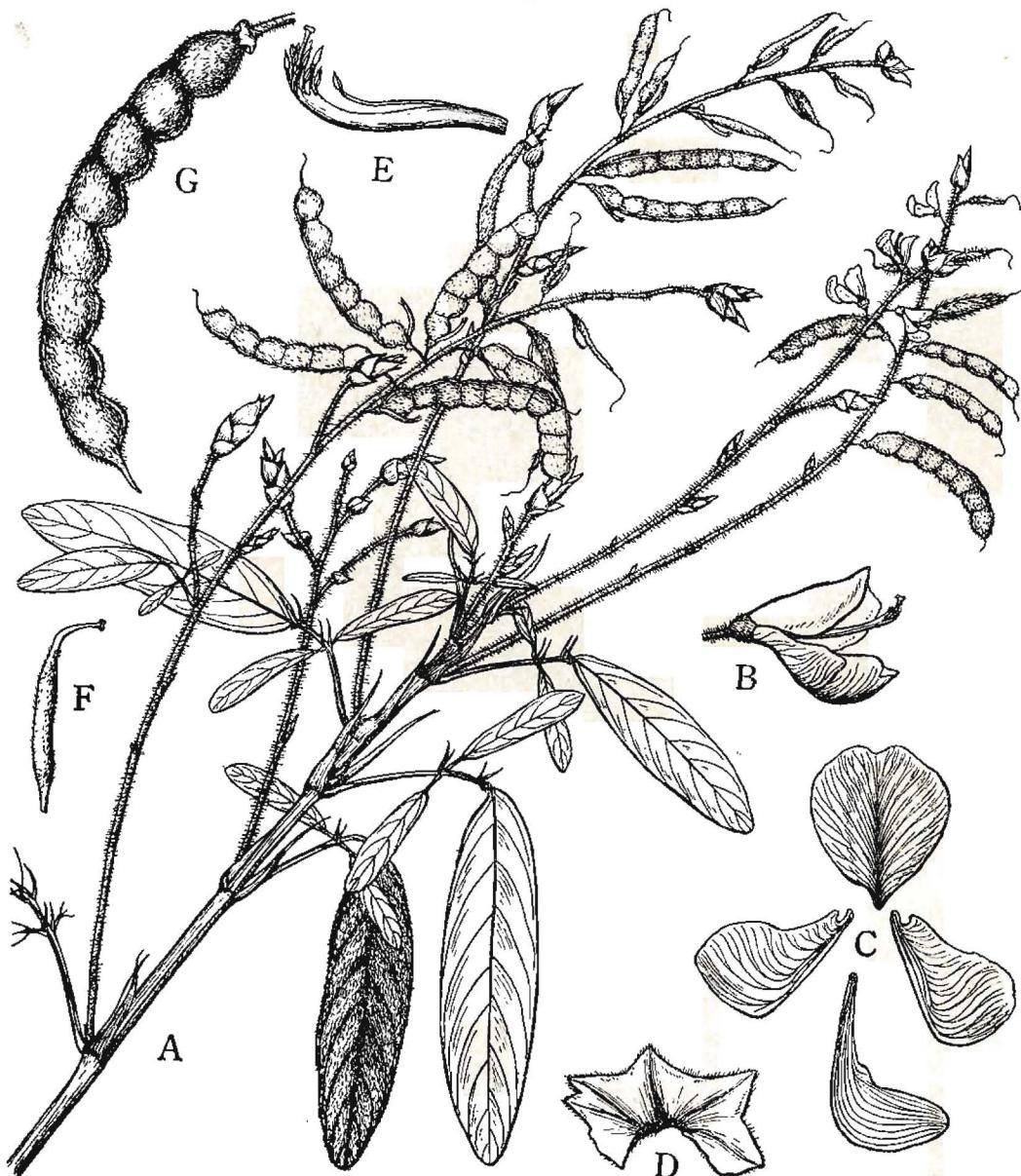


Fig. 8. *Desmodium gyrans* (LINN. f.) DC.

A. Part of branch, $\times 1/1$. B. Flower, $\times 3$. C. Corolla, $\times 3$. D. Calyx, $\times 6$. E. Stamens, $\times 9$.
 F. Pistil, $\times 4$. G. Pod, $\times 2$.

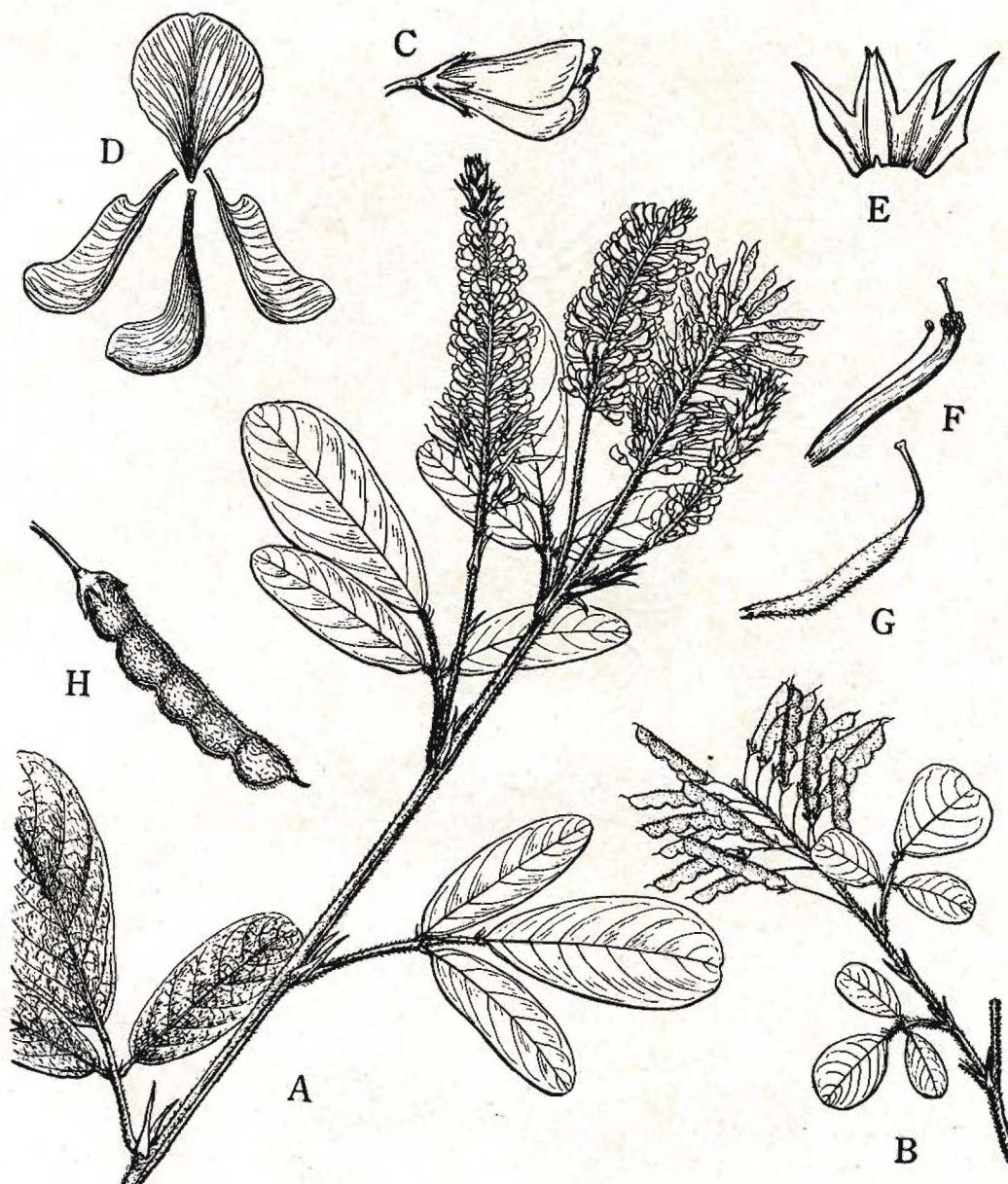


Fig. 9. *Desmodium heterocarpum* (LINN.) DC.

A. Part of branch, $\times 1/1$. B. Fruiting branchlet, $\times 1/1$. C. Flower, $\times 5$. D. Corolla, $\times 5$.
 E. Calyx, $\times 10$. F. Stamens, $\times 6$. G. Pistil, $\times 6$. H. Pod, $\times 3$.

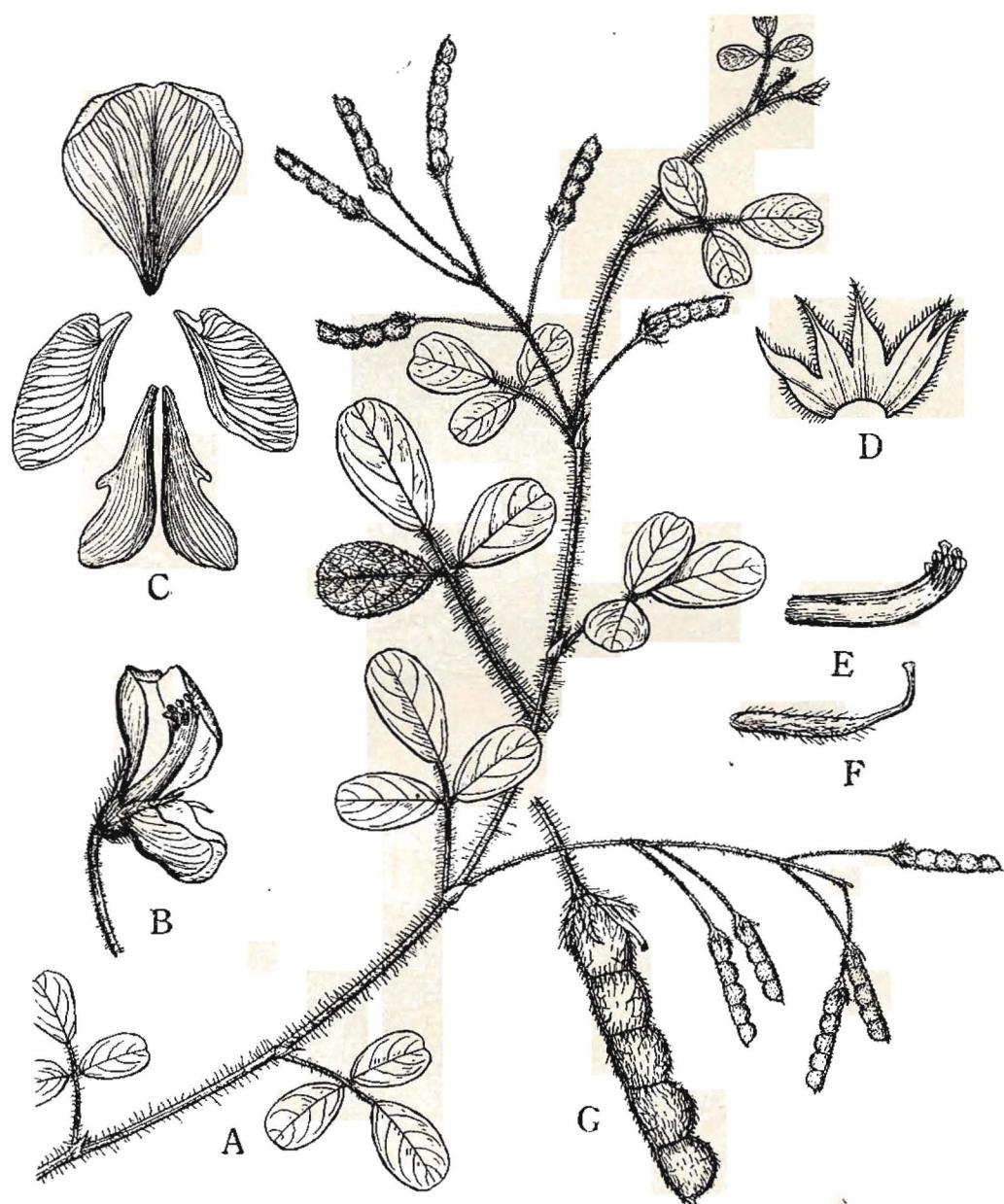


Fig. 10. **Desmodium heterophyllum** (WILLD.) DC.

* A. Habit, $\times 1\frac{1}{2}$. B. Flower, $\times 4$. C. Corolla, $\times 5$. D. Calyx, $\times 2$. E. Stamens, $\times 4$. F. Pistil, $\times 4$. G. Pod, $\times 3$.

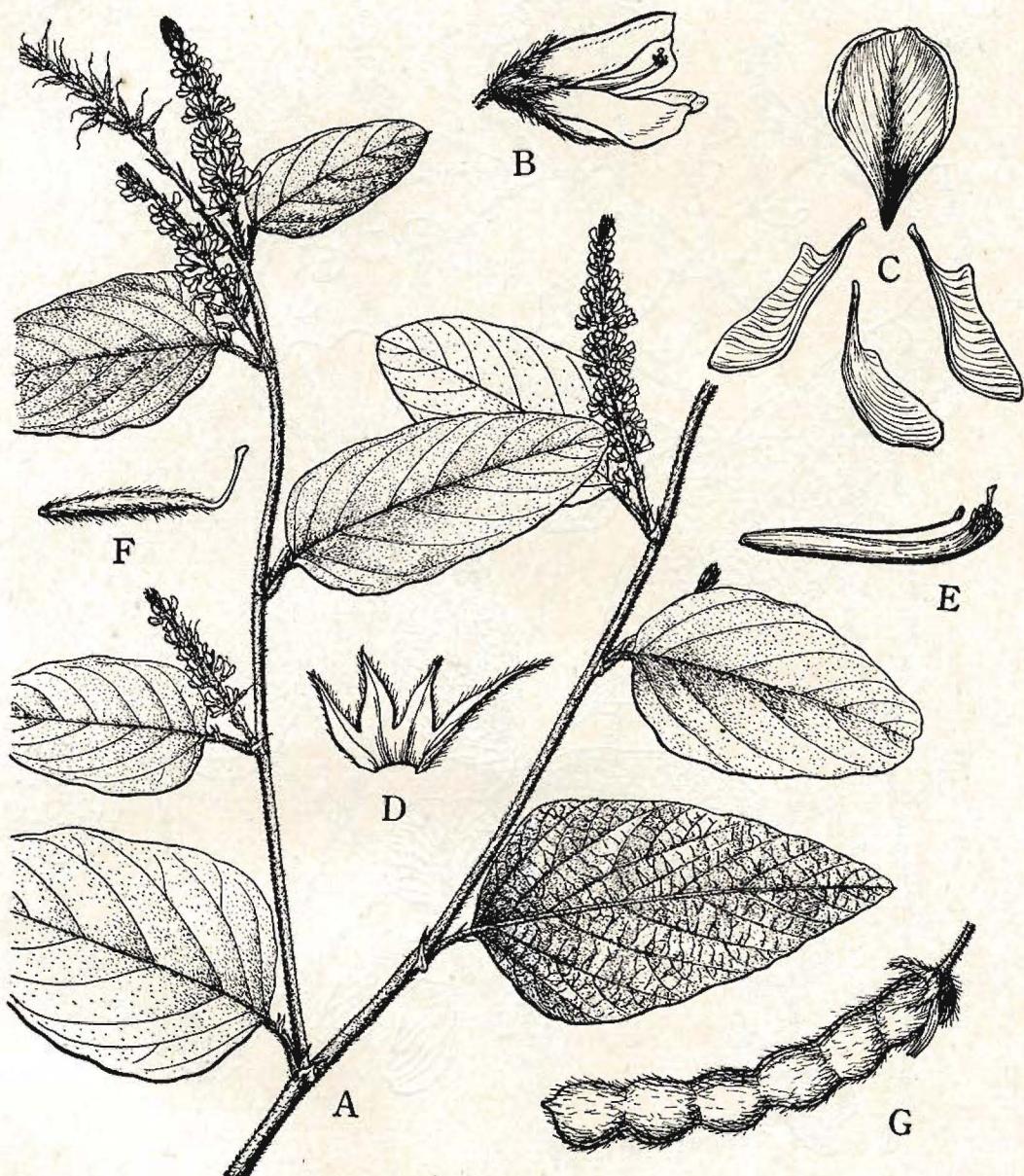


Fig. 11. *Desmodium lasiocarpum* (BEAUV.) DC.

A. Part of branch, $\times 1/1$. B. Flower, $\times 7$. C. Corolla, $\times 7$. D. Calyx, $\times 9$. E. Stamens, $\times 9$.
 F. Pistil, $\times 7$. G. Pod, $\times 4$.

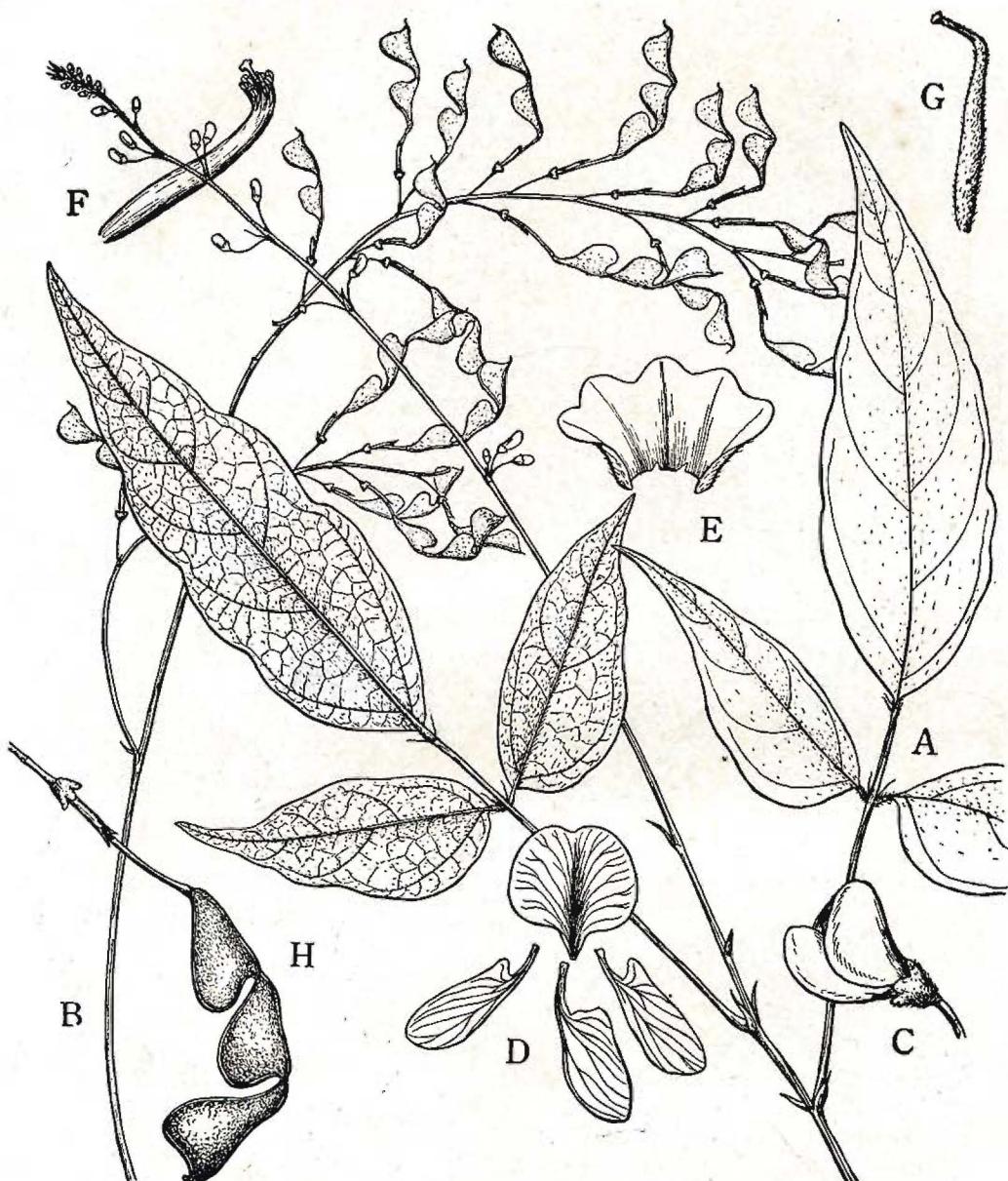


Fig. 12. *Desmodium laterale* SCHINDL.

A. Habit, $\times 1/1$. B. Fruiting branchlet, $\times 1/1$. C. Flower, $\times 4$. D. Corolla, $\times 4$. E. Calyx, $\times 12$. F. Stamens, $\times 8$. G. Pistil, $\times 8$. H. Pod, $\times 3$.

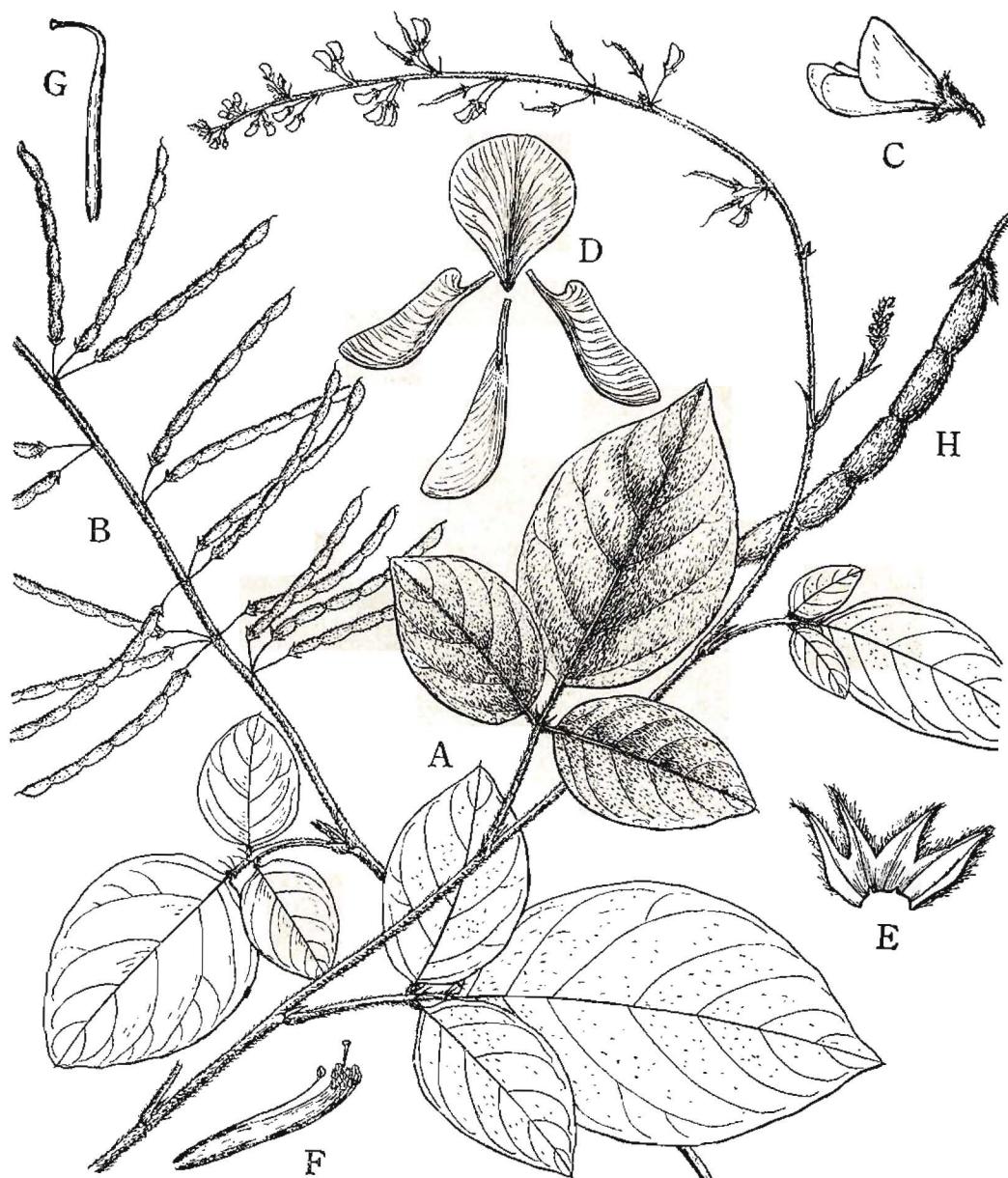


Fig. 13. *Desmodium laxiflorum* DC.

A. Habit, $\times 1/1$. B. Fruiting branchlet, $\times \frac{1}{4}$. C. Flower, $\times 5$. D. Corolla, $\times 6$. E. Calyx, $\times 12$. F. Stamens, $\times 8$. G. Pistil, $\times 8$. H. Pod, $\times 3$.



Fig. 14. *Desmodium microphyllum* (THUNB.) DC.

A. Part of branch, $\times 1/1$. B. Leaf, $\times 4$. C. Pod, $\times 3$.



Fig. 15. *Desmodium pseudotriquetrum* DC.

A. Part of branch, $\times 1/1$. B. Leaf, $\times 1/1$. C. Stipule, $\times 3$. D. Flower, $\times 7$. E. Corolla, $\times 8$.
 F. Stamens, $\times 8$. G. Bract of flower, $\times 7$. H. Inner side of Pod, $\times 2$. I. Seed, $\times 8$.

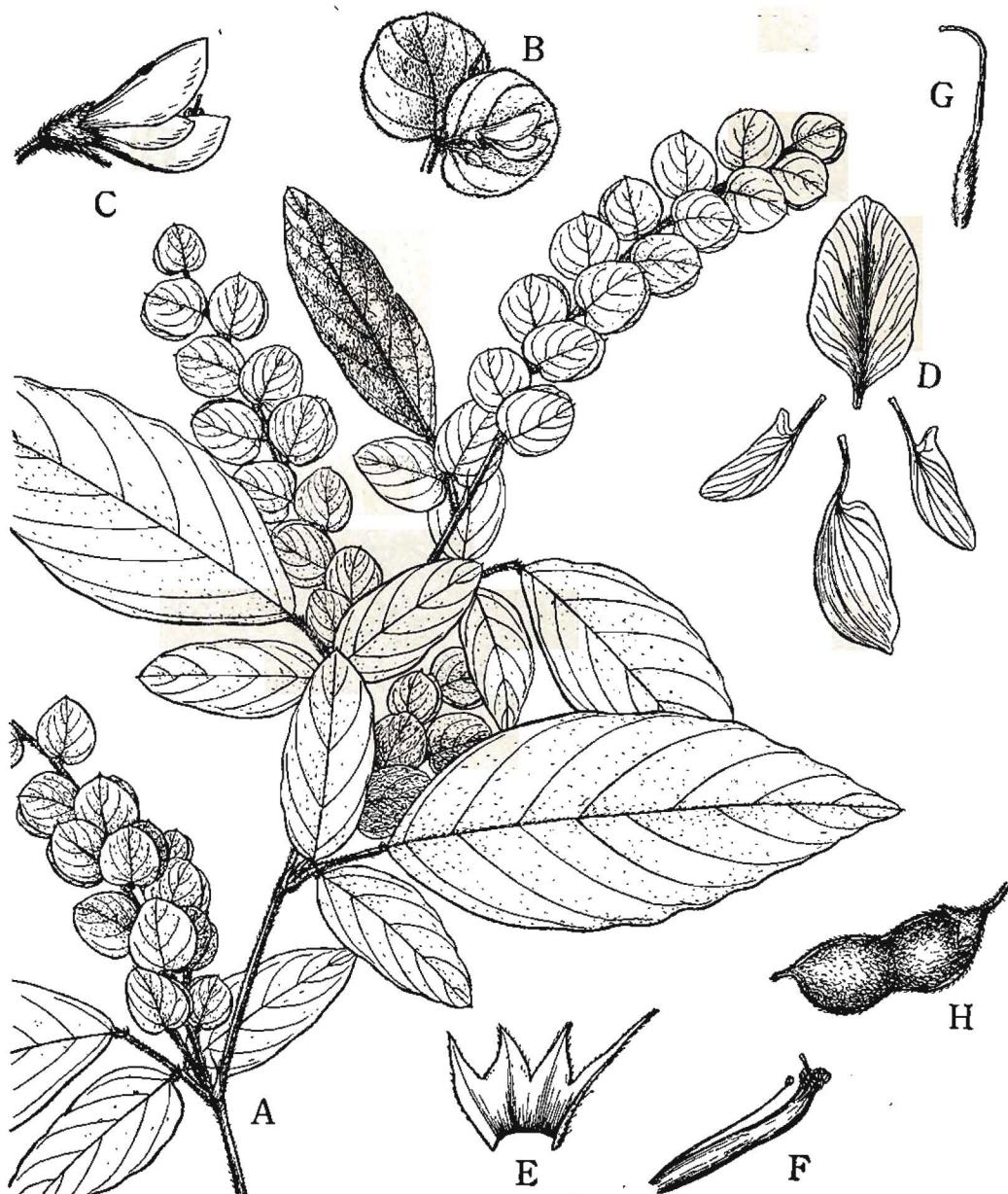


Fig. 16. *Desmodium pulchellum* (LINN.) BENTH.

A. Part of branch, $\times 1/1$. B. Bract of flower, $\times \frac{1}{2}$. C. Flower, $\times 1\frac{1}{2}$. D. Corolla, $\times 1\frac{1}{2}$.
 E. Calyx, $\times 3$. F. Stamens, $\times 2$. G. Pistil, $\times 2$. H. Pod, $\times 4$.



Fig. 17. *Desmodium racemosum* (THUNB.) DC.

A. Part of branch, $\times 1/1$. B. Flower, $\times 4$. C. Corolla, $\times 4$. D. Calyx, $\times 8$. E. Pistil, $\times 4$.
G. Pod, $\times 3$.

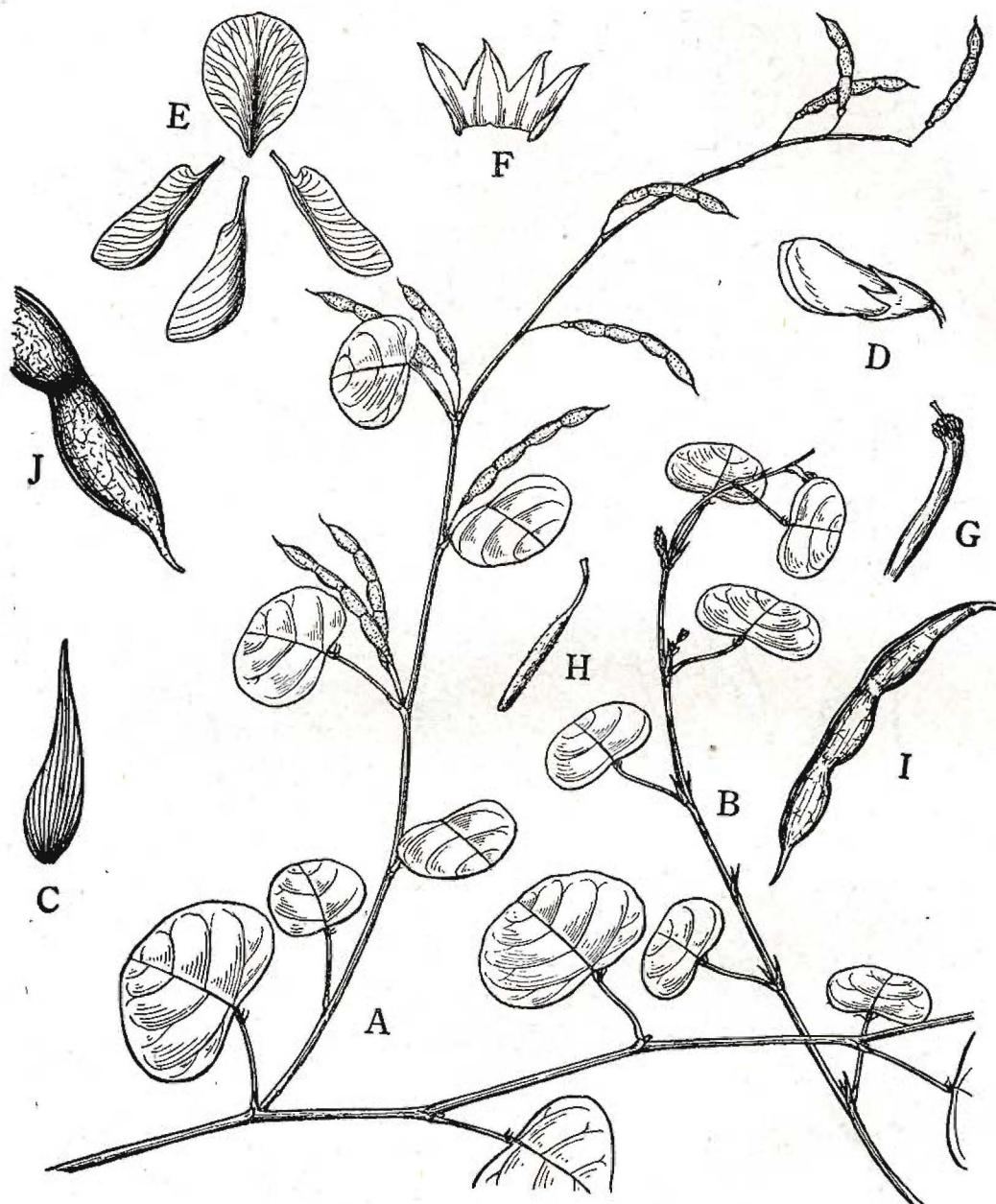


Fig. 18. *Desmodium reniforme* (LINN.) DC.

A. Habit, $\times 1/1$. B. Young branchlet, $\times 1/1$. C. Stipule, $\times 6$. D. Flower, $\times 6$. E. Corolla
 $\times 5$. F. Calyx, $\times 12$. G. Stamens, $\times 8$. H. Pistil, $\times 8$. I. Pod, $\times 3$. J. Joint of pod, $\times 5$.

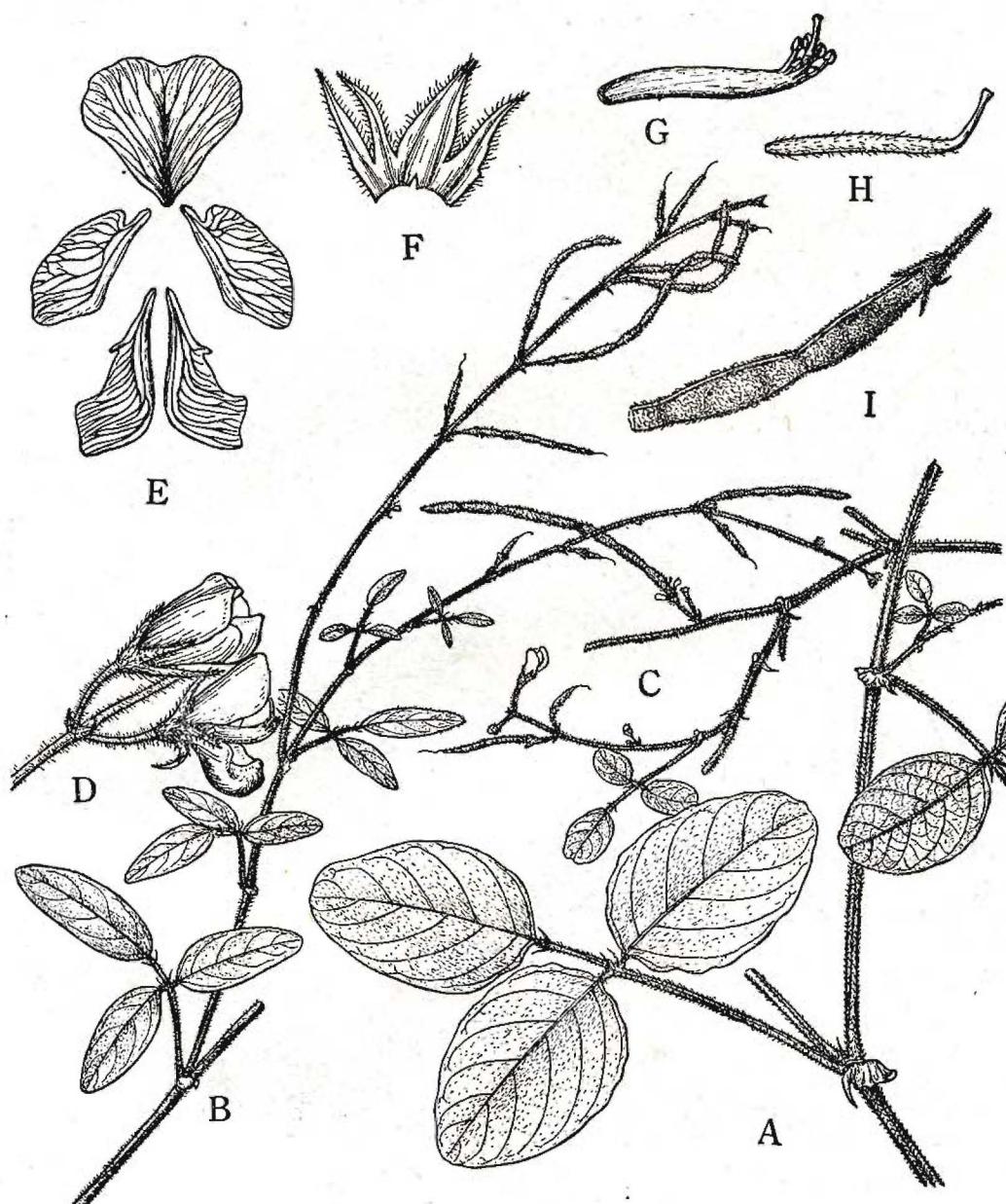


Fig. 19. *Desmodium scorpiurus* (Sw.) DESV.

A. Part of branch and large leaf, $\times 1/1$. B. Fruiting branchlet, $\times 1/1$. C. Flowering branchlet, $\times 1/1$. D. Flower, $\times 4$. E. Corolla, $\times 4$. F. Calyx, $\times 8$. G. Stamens, $\times 6$. H. Pistil, $\times 6$. I. Pod, $\times 4$.

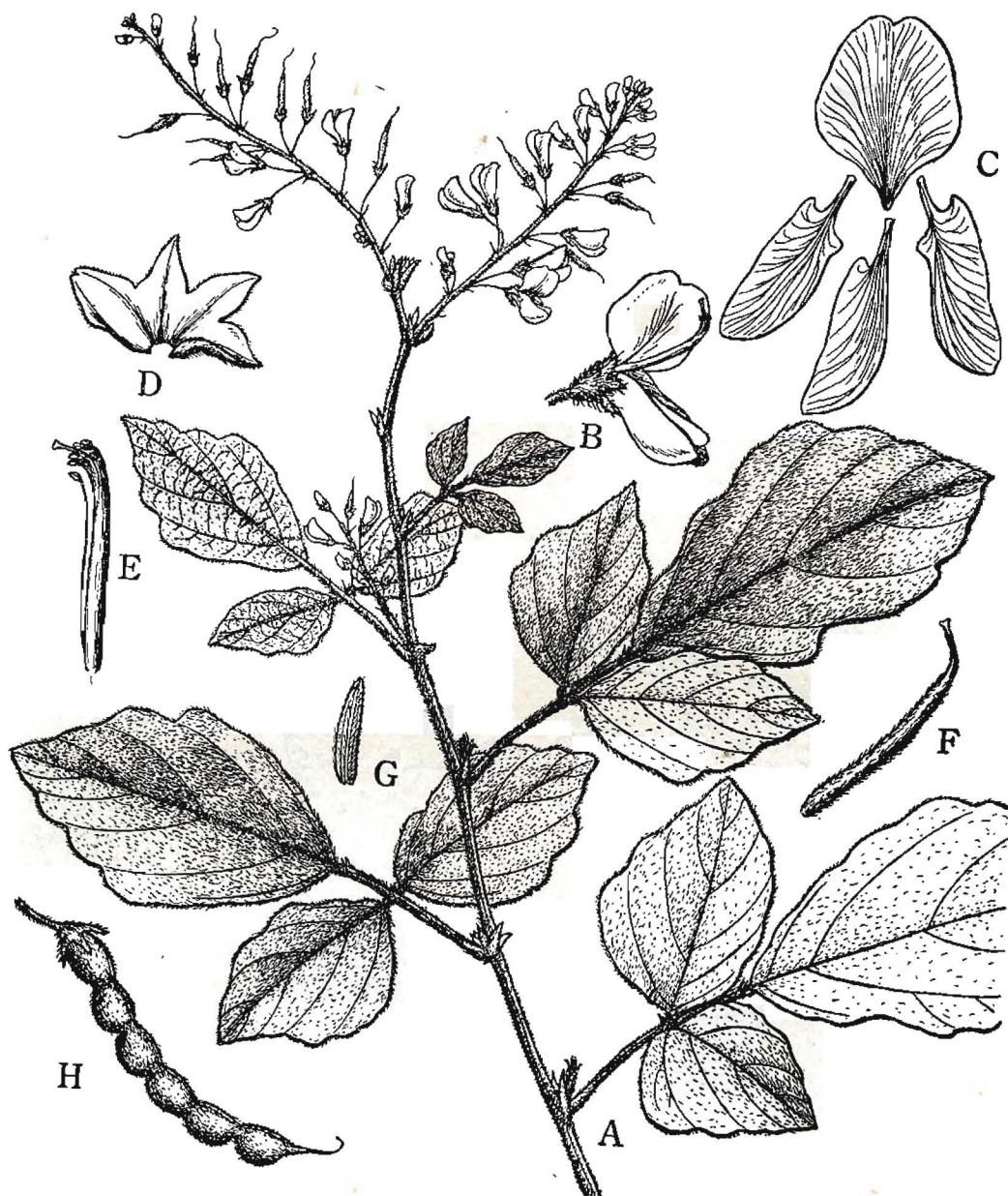


Fig. 20. *Desmodium sequax* WALL. var. *sinuatum* (MIQ.) HOSOKAWA

A. Part of branch, $\times 1/1$. B. Flower, $\times 3$. C. Corolla, $\times 4$. D. Calyx, $\times 6$. E. Stamens,
 $\times 4$. F. Pistil, $\times 4$. G. Stipule, $\times 3$. H. Pod, $\times 2$.



Fig. 21. *Desmodium Tashiroi* MATSUM.

A. Habit, $\times 1/1$. B. Fruiting branchlet, $\times 1/1$. C. Leaflet with white spots, $\times 10$. D. Flower, $\times 5$. E. Corolla, $\times 3$. F. Calyx, $\times 7$. G. Stamens, $\times 7$. H. Pistil, $\times 7$. I. Pod, $\times 2$.

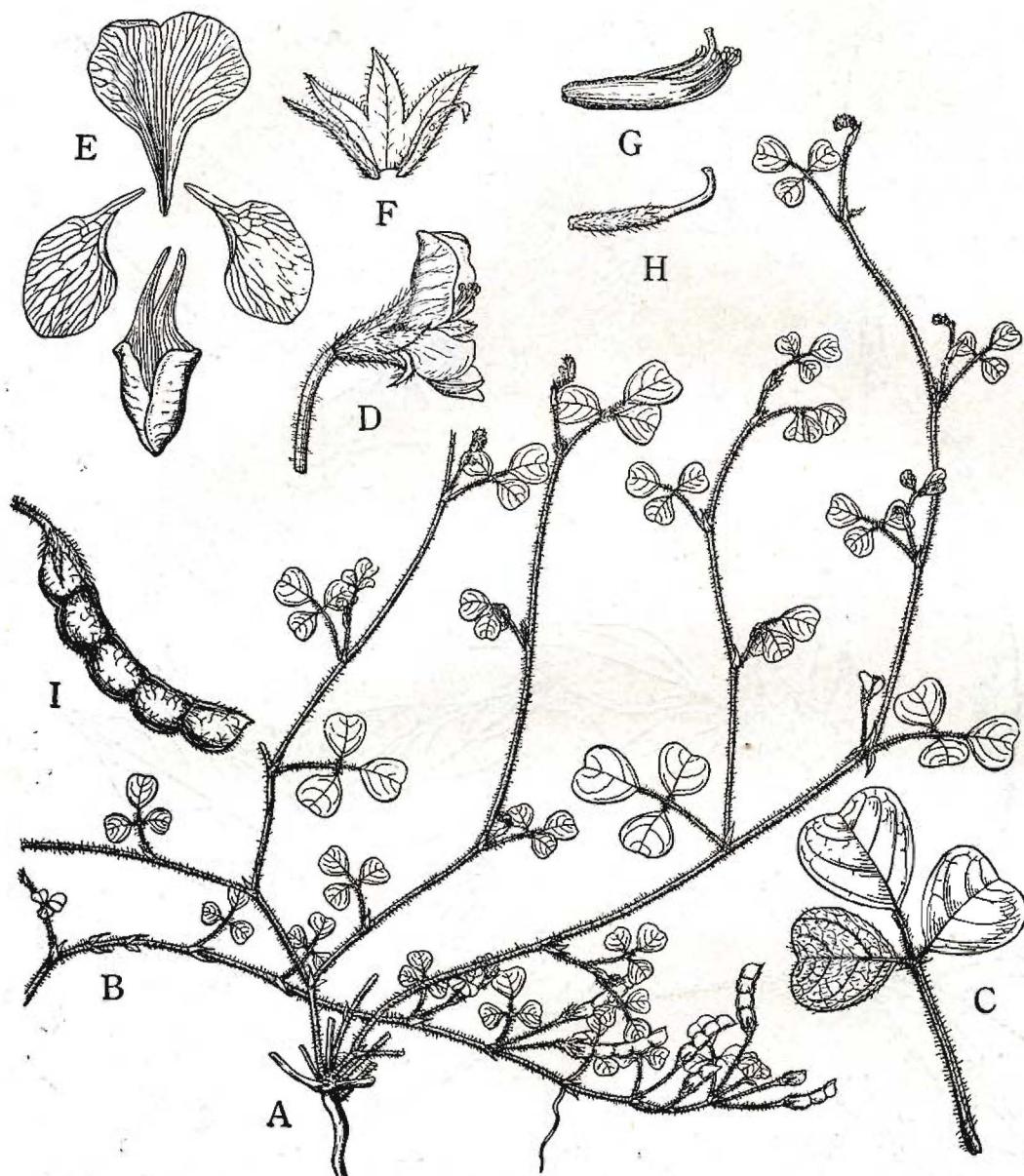


Fig. 22. *Desmodium triflorum* (LINN.) DC.

A. Habit, $\times 1/1$. B. Fruiting branchlet, $\times 1/1$. C. Leaf, $\times 3$. D. Flower, $\times 5$. E. Corolla, $\times 6$. F. Calyx, $\times 12$. G. Stamens, $\times 6$. H. Pistil, $\times 6$. I. Pod, $\times 4$.

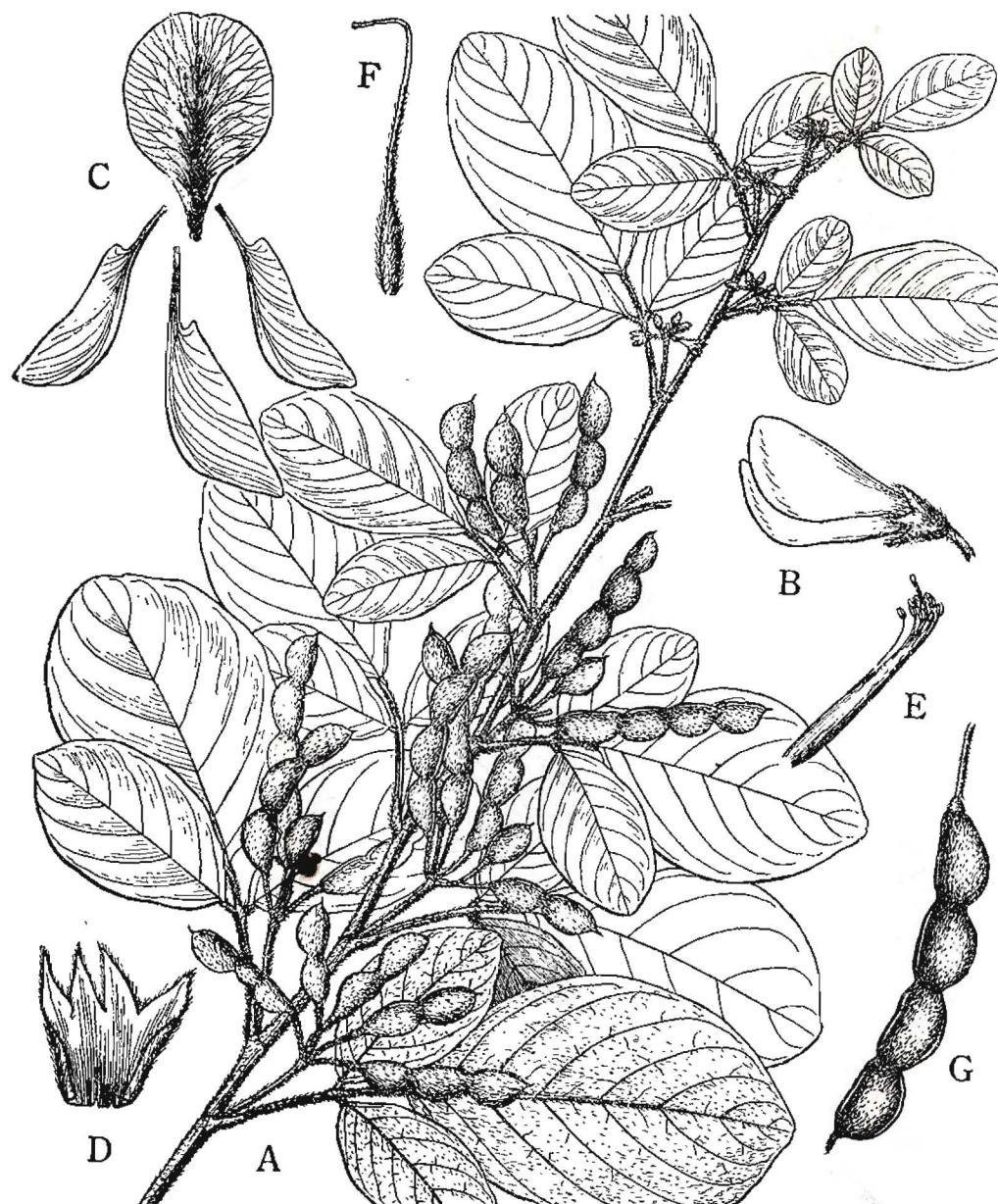


Fig. 23. *Desmodium umbellatum* (LINN.) DC.

A. Part of branch, $\times 1/1$. B. Flower, $\times 3$. C. Corolla, $\times 3$. D. Calyx, $\times 6$. E. Stamens,
 $\times 3$. F. Pistil, $\times 3$. G. Pod, $\times 2$.



Fig. 24. *Desmodium zonatum* Miq.

A. Fruiting branchlet, $\times 1/1$. B. Flowering branchlet, $\times 1/1$. C. Flower, $\times 5$. D. Corolla, $\times 6$. E. Calyx, $\times 10$. F. Stamens, $\times 6$. G. Pistil, $\times 6$. H. Pod, $\times 2$.