

DEPARTMENT OF BOTANY, NATIONAL TAIWAN UNIVERSITY
in cooperation with
CHINESE-AMERICAN JOINT COMMISSION ON RURAL RECONSTRUCTION

Animal Industry Series No. 7

THE LEGUMINOSAE OF TAIWAN
For Pasture and Soil Improvement

臺灣豆科牧草及綠肥

莊清漳 黃 嘉



TAIPEI, TAIWAN, CHINA

August, 1965

THE LEGUMINOSAE OF TAIWAN

For Pasture and Soil Improvement

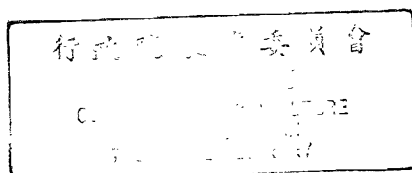
By

Ching-Chang Chuang

Plant Taxonomist, Department of Botany, National Taiwan University

Chia Huang

Fodder Specialist, Animal Industry Division, J. C. R. R.



TAIPEI, TAIWAN, CHINA

August, 1965

FOREWORD

This taxonomic study of Taiwan legumes based on the authors' field experience as well as a herbarium experiences, embodies 177 species and 4 varieties, serving as a reference for the improvement of soil fertility and finding the economic uses of these plants, particularly as a source of the nutrients to improve the fodder.

The accurate description of the species, accompanied by excellent illustrations and keys to genera and species, makes the work a genuine contribution to botanic science.

The notes of economic values following the taxonomic treatment of each species will, no doubt, function as an important guide for research in soil investigation and the improvement of fodder.

This study of Taiwan legumes with the combination of purposes, both scientific and applied, is one of the first papers written in Taiwan in this field in recent years. Without unflinching patience and scientific skill, one can hardly accomplish such an extensive work as this.

Hearty congratulation to the authors for their great success!

Bao-Yu Yang
Chairman
Department of Botany
National Taiwan University
April 1966

The Leguminosae are one of the most important of all the families of plants. Some species are known to almost everyone, but many are only known to taxonomists. Mr. C. C. Chuang and Mr. C. Huang have prepared a very valuable bulletin making it possible for all who are interested in plants to be able to identify the legumes of Taiwan. Many of the legumes found growing in Taiwan have been introduced, and some of these have only very recently been introduced, but there are also a number of species that are thought to be endemic in Taiwan and up until now have not been found elsewhere.

The carefully prepared keys, descriptions, and illustrations have added greatly to the knowledge of our Taiwan Flora. We hope the day is not too far off when all the families of plants on Taiwan can be as well known as this one.

Charles E. DeVol
Professor of Botany
National Taiwan University
April 1966

As those in many other countries, farmers in Taiwan tend to overemphasize the importance of feeding concentrates to cows. The application of concentrates increases the high cost of production. Among them the protein supplement usually ranks as the most expensive item. With the rapid progress of our grass program in recent years, farmers have come to realize the importance of grasses in cow feeding. The adequate supply of grasses with the addition of some supplementary feeds has considerably reduced the cost of production of milk. Indeed, on the irrigated level land in Taiwan, where farm holdings are small, intensive farming will remain to be the prevailing agricultural system. Dairying under such condition depends on zero grazing through application of heavy fertilizers to grasses and the supply of protein supplements to cows. It is justifiable as long as the existing cost relationship between fertilizers and concentrates, and the price of milk are in favor of doing so. In other words, the maximum harvest of dry matter from the cultivated grasses and the highest yield per cow are the main objectives which our farmers must try to attain under the present situation. On the other hand, with the ever increasing demand for marginal land development, particularly on hillsides, the establishment of legumes in a mixed sward for the reduction of fertilizer cost and improvement in soil fertility and nutritive of the pasture has been given particular attention. Research along that line and basic information on legumes and related subjects are urgently required.

In this bulletin, Messrs. Chuang and Huang present the results of a taxonomic study on legumes in Taiwan, which has been completed under a series of JCRR projects sponsored by the Department of Botany, National Taiwan University. I not only salute the authors and the related workers at the University for a job nicely done, but wish also to thank our friends from other countries, without whose encouragement and assistance our program of grasses and legumes would not have proceeded with such a rapid pace as we have witnessed. In this connection, I want to mention especially Mr. Howard W. Ream, former Chief of this

Division, and Dr. J. Griffiths Davies, Director of Cunningham Laboratory, CSIRO, Australia. The assistance rendered to us by FAO experts under the present UNDP/FAO Livestock Program for Marginal Land in Taiwan is also greatly appreciated.

This bulletin will no doubt prove to be a useful reference material for persons interested in this field. There remains much to be done from the findings of suitable grasses and legumes to successful pasture establishment and management. With the the close cooperation of all the workers concerned, I have no doubt that a systematic presentation on pasture research will soon be published in the future. With the joint effort by our agriculturists, I am again quite sure that a workable farming pattern for our slopeland which embodies a balanced integration of intensive and extensive types of farming will soon be developed. The role of a mixed pasture in building up soil fertility under such a program will indeed be fully appreciated by them.

Robert Chung Tao Lee, Ph. D.
Chief
Animal Industry Division

March 1966

INTRODUCTION

Legumes have been cultivated as economic crops for several thousand years. Some are well-known as human foods, other are used as fodder, cover crops, and green manure, and it is evident that the value of legumes has long been recognized.

From 1961 to 1965, we have been investigating the legumes of Taiwan both by examining herbarium specimens and by field observation. We have found many species that may be used not only as valuable forage crops, but also for increasing soil fertility, and some species that can be used for retarding weed growth and soil conservation.

This taxonomic work is a project sponsored by the Department of Botany, National Taiwan University and Animal Industry Division of JCRR. Its purpose is to investigate the legumes of Taiwan with an object of finding plants suitable for pasture and soil improvement. About 52 genera 177 species and 4 varieties of legumes of Taiwan including introduced and naturalized species are described in this paper. Descriptions of the family and genera together with an analytical key to genera, species and variety are given. Each species described is followed by notes on habitat, flowering period and distribution. Economic values are also indicated. About 162 illustrations have been prepared.

The writers wish to express their appreciation to Dr. Charles E. DeVol for his managing this project, helpful suggestions and reading of the manuscript. Grateful acknowledgement in due to Prof. B. Y. Yang, Head of the Department of Botany, National Taiwan University, and Prof. W. F. Lin, former Director of Taiwan Forestry Research Institute for their encouragement and valuable suggestions. We are particularly thankful to Prof. T. S. Liu, Head of the Forestry Department of National Taiwan University for his encouragement in studying the *Desmodium* species with us. We are also thankful to Mr. J. L. Wang, Mr. C. C. Chen, Mr. C. C. Kuo and Mrs. L. C. Huang for their skillful drawings and to Mr. M. T. Kao, of the National Taiwan University, and Mr. J. M. Chao, of the Taiwan Normal University, and Mr. K. C. Chang and Mr. C. S. Liang of the Taiwan Agricultural Research Institute for their help. Finally, we wish to express our appreciation to the Joint Commission on Rural Reconstruction for its financial support.

CHARACTERISTICS OF THE LEGUMINOSAE

Herbs, shrubs or trees. Many of the species may bear *root-tubercles* containing nitrogen-fixing bacteria. *Leaves* stipulate and often stipellate, alternate or only rarely opposite; pinnately, palmately, or digitately compound, or simple, sometimes with the rachis ending in a tendril. *Inflorescence* axillary, leaf-opposed or terminal, simple, racemose or paniced, bracts and bracteoles usually both present. *Flowers* usually irregular, hermaphroditic, rarely regular or polygamous; *sepals* 5, free or the upper two more or less connate, sometimes 2-lipped; *petals* 5, unequal, valvate or imbricate, usually free or some partially united; *stamens* normally 10, rarely fewer or indefinite; *filaments* free or variously connate, often diadelphous or monadelphous; *anthers* 2-celled, generally opening lengthwise; *ovary* solitary, superior; *style* simple, cylindrical, declinate; *stigma* simple capitate, terminal or oblique; *ovules* one to many, on the ventral suture. *Fruit* usually a dry, dehiscent legume, typically dehiscent by 1 or both sutures into 2 valves, or indehiscent, sometimes jointed and breaking up into 1-seeded joints. *Seeds* 1 to many, usually without endosperm.

A very large family, containing about 600 genera and approximately 13,000 species of world wide distribution.

Key to the genera found on Taiwan

1. Flowers small and regular, in dense heads or spikes; petals valvate..(1) *Leucaena*
1. Flowers irregular, usually in racemes, petals imbricate..... 2
2. Flowers not papilionaceous; petals slightly unequal, the upper innermost in the bud(2) *Cassia*
2. Flowers papilionaceous; petals unequal, the upper outermost in the bud..... 3
3. Pods constricted between the seeds or composed of 1-seeded joints; seeds usually one, or rarely few 4
3. Pods not constricted and jointed between the seeds; seeds several to many....17
4. Stamens all united in a closed tube 5
4. Stamens variously united but not in a closed tube 6
5. Leaflets 2-4, digitately compound; pods not ripening underground....(52) *Zornia*
5. Leaflets 4, pinnately compound; pods ripening underground.....(6) *Arachis*
6. Pods with diagonal depressions; leaves covered with minute glandular dots(8) *Cajanus*
6. Pods and leaves not as above 7

7. Pods several jointed.....	8
7. Pods reduced to a single joint.....	15
8. Leaflets numerous; stamens in 2 sets of 5 each.....	9
8. Leaflets 1 or 3, occasionally 5; stamens grouped 9 and. 1.....	11
9. Shrubs; calyx campanulate, 5-clefted; pods 2-4 jointed.....	(34) <i>Ormocarpum</i>
9. Herbs or small shrubs; calyx deeply 2-lipped; pods 4-8 jointed.....	10
10. Pods folded together within the calyx.....	(43) <i>Smithia</i>
10. Pods straight, long exserted from the calyx.....	(3) <i>Aeschynomene</i>
11. Stipules connate, fused to the petiole, often forming a sheath around the stem.....	(45) <i>Stylosanthes</i>
11. Stipules not as above.....	12
12. Pods exserted and exceeding the calyx.....	13
12. Pods folded together within the calyx.....	14
13. Pods flat; calyx herbaceous.....	(16) <i>Desmodium</i>
13. Pods turgid; calyx scarious.....	(4) <i>Alysicarpus</i>
14. Flowers in dense racemes; calyx not enlarged in fruit; leaflets broader than long.....	(49) <i>Uraria</i>
14. Flowers in loose racemes; calyx enlarged in fruit; leaflets longer than wide.....	(28) <i>Lourea</i>
15. Pedicels solitary, in the axils of deciduous bracts; keel of the flower curved, acuminate.....	(9) <i>Campylotropis</i>
15. Pedicels often 2-4 together, subtended by persistent bracts; keel of the flower erect, obtuse or truncate; often with cleistogamous flowers.....	16
16. Shrubs, woody at base; pedicels often long and slender, bearing a single bracteole.....	(25) <i>Lespedeza</i>
16. Herbaceous annuals; pedicels short, bearing 4 braceoles at the base of calyx.....	(24) <i>Kummerowia</i>
17. Leaves pinnate or palmate; leaflets more than 5.....	18
17. Leaves simple or trifoliolate.....	26
18. Leaves palmately compound.....	(29) <i>Lupinus</i>
18. Leaves pinnately compound.....	19
19. Leaves even pinnate, the terminal leaflet represented by a tendril or bristle or absent.....	20
19. Leaves odd pinnate.....	22
20. Slender annuals; rachis terminating in a tendril.....	21
20. Shrubs or small trees; rachis not tendril-bearing.....	(42) <i>Sesbania</i>

21. Styles bearded in a tuft or ring at apex.....	(50)	<i>Vicia</i>
21. Styles bearded down one side	(37)	<i>Pisum</i>
22. Flowers solitary, axillary; seeds 1-2.....	(13)	<i>Cicer</i>
22. Flowers in axillary and terminal racemes, head-like clusters or umbels; seeds many		23
23. Leaves pinnately 5-foliolate; the lowest pair of leaflets arising from the base of petioles like stipules.....	(27)	<i>Lotus</i>
23. Leaves odd-pinnate; the lowest pair of leaflets not as above.....		24
24. Anthers apiculate, centrally attached	(23)	<i>Indigofera</i>
24. Anthers obtuse, basifixed		25
25. Flowers mostly in leaf-opposed racemes; keel curved, not beaked; pods linear or oblong, usually turgid.....	(46)	<i>Tephrosia</i>
25. Flowers mostly in axillary racemes, keel obtuse; pods linear, flattened.....	(7)	<i>Astragalus</i>
26. Herbs, shrubs or trees not vines.....		27
26. Climbing or twining vines.....		34
27. Leaflets serrulate		28
27. Leaflets entire.....		30
28. Leaves palmately trifoliolate; flowers in dense globose to oblong heads.....	(48)	<i>Trifolium</i>
28. Leaves pinnately compound; flowers in axillary and terminal racemes		29
29. Racemes usually long; pods wrinkled, not coiled.....	(31)	<i>Melilotus</i>
29. Racemes short; pods coiled.....	(30)	<i>Medicago</i>
30. Anthers apiculate.....	(23)	<i>Indigofera</i>
30. Anthers obtuse, basifixed		31
31. Stamens monadelphous, anthers dimorphous.....		32
31. Stamens diadelphous, anthers uniform.....		33
32. Calyx turbinate, 4 upper often connate	(26)	<i>Lotonomis</i>
32. Calyx campanulate, 5-cleft or upper two teeth slightly connate....	(15)	<i>Crotalaria</i>
33. Leaves simple or digitately 3-foliolate; lower surface gland-dotted; seeds 1 or 2.....	(32)	<i>Moghania</i>
33. Leaves pinnately 3-foliolate, lower surface not gland-dotted; seeds 8-10	(40)	<i>Pycnospora</i>
34. Styles bearded at or near the top		35
34. Styles beardless on the stigmatic part.....		41

35. Calyx lobes shorter than tube.....	(14) <i>Clitoria</i>
35. Calyx lobes as long or longer than tube.....	36
36. Keel bent inwards at right angles, beaked	37
36. Keel not as above	38
37. Pods flat	(17) <i>Dolichos</i>
37. Pods cylindrical	(18) <i>Dolichovigna</i>
38. Corolla with keel coiled or spiralled.....	(36) <i>Phaseolus</i>
38. Corolla with keel arched or curved but not coiled.....	39
39. Stigma strongly oblique or introrse; roots not tuberous.....	(51) <i>Vigna</i>
39. Stigma subglobose, strictly terminal or on inner face of style; roots tuber-bearing.....	40
40. Pistil with stigma terminal; pods 4-winged.....	(38) <i>Psophocarpus</i>
40. Pistil with stigma on inner face; pods not winged.....	(35) <i>Pachyrrhizus</i>
41. Leaves glandular dotted on the lower surface; leaflets without stipels.....	42
41. Leaves not glandular dotted on the lower surface; leaflets with or without stipels.....	44
42. Seeds 1-2	(41) <i>Rhynchosia</i>
42. Seeds 3 to many.....	43
43. Pods marked with transverse lines or depressions between the seeds.....	(11) <i>Cantharospermum</i>
43. Pods glabrous, without depressed lines between the seeds	(20) <i>Dunbaria</i>
44. Leaflets exstipellate.....	45
44. Leaflets stipellate	46
45. Anthers uniform, all fertile.....	(22) <i>Glycine</i>
45. Anthers dimorphoic, alternate and abortive	(47) <i>Teramnus</i>
46. Keel exceeding the wings and standard	47
46. Keel not exceeding the wings and standard.....	48
47. Perennial herbaceous or woody vines, usually covered with brown stinging hairs; flowers 2 at each node; styles beardless.....	(33) <i>Mucuna</i>
47. Annual, slender, twining herbs, sparingly covered with white appressed hairs, flowers 3 at each node; styles pubescent nearly to tip....	(44) <i>Stizolobium</i>
48. Stamens diadelphous.....	49
48. Stamens monadelphous	52

49. Flowers and pods dimorphic, cleistogamous flowers growing underground(5) *Amphicarpea*
49. Flowers and pods monomorphic.....50
50. Calyx truncate; pods linear, falcate torulose(19) *Dumasia*
50. Calyx campanulate, the upper two teeth connate51
51. Keel straight, nodes of inflorescence usually enlarged(21) *Galactia*
51. Keel incurved, nodes of inflorescence not enlarged.....(12) *Centrosema*
52. Upper lip of calyx not projecting, the lower teeth more prominent; pods not woody, without ribs.....(39) *Pueraria*
52. Upper lip of calyx much exceeding the lower; pods woody, strongly ribbed on either side near the upper margin.....(10) *Canavalia*

1. *Leucaena* BENTH.

Leucaena BENTH. in Hook. Journ. Bot. 4: 416, 1842.

Trees and shrubs, evergreen, usually unarmed; leaves bipinnate, leaflets small, numerous; flowers sessile, in close heads, 5-merous, not papilionaceous, usually bisexual; the calyx short, 5-lobed; petals 5, valvate, free; stamen 10, exserted; ovary stalked, many-ovuled; pod stalked, broadly linear, flat, dehiscent, the margins not breaking from the valves at maturity.

About 20 species mostly in tropical and subtropical regions of North America. South America.

CHINESE NAME: 銀合歡屬

JAPANESE NAME: Gin-gokan Zoku.

Leucaena glauca (LINN.) BENTH. in Hook. Journ. Bot. 4: 416, 1842. Fig. 1

Small trees; leaves bipinnate, pinnae 4-8 paired, leaflets 10-20 paired, oblong-linear to lanceolate, acute, oblique, 7-12 mm. long, glaucous below; a petiolar gland usually present, on the first pinnae of petiole; flowers white in dense globose heads, heads solitary, axillary, long-peduncled, 2-5 cm. in diameter; calyx 5-lobed; petals 5, erect, very narrow, about one-third as long as the stamens; stamens 10; pods linear, flat, acuminate 12-18 cm. long; seeds 10-20, shining, brown.

CHINESE NAME: 銀合歡

ENGLISH NAME: White Popinac.

JAPANESE NAME: Gin-go-kan.

FLOWERING TIME: All the year.

HABITAT: Naturalized and growing as a weed throughout the island at low altitudes.

DISTRIBUTION: Widely distributed in tropical and subtropical regions.

ECONOMIC VALUE: This species used as fodder, the young foliage is very palatable, rich in protein and nutritious.

小喬木，高約2—4m。二回羽狀複葉，羽片4—8對，小葉10—20對，長橢圓狀線形至披針形，頂端銳形，長7—12mm。花白色，密生於球狀頭狀花序，花序1—2，腋生；小蕊10枚。莢果線形扁平，長12—18cm。種子10—20，光亮，褐色。本種分佈於全島平地和山坡，耐旱性極強，可作牧草和綠肥。

2. *Cassia* LINN.

Cassia LINN. Sp. Pl. 376, 1753.

Trees, shrubs or herbs; leaves even pinnate, sometimes much reduced, petiolar gland present or absent, stipules present; flowers yellow, usually conspicuous, nearly regular, in axillary racemes or terminal panicles, rarely solitary, bracts and bract-oles present; calyx tube short; sepals 5, imbricate; petals 5, subequal, imbricate; stamens 10, 3-5 often reduced or sterile; anthers opening by 2 apical pores; ovary sessile or stalked; pods dehiscent or indehiscent, flattened or rounded, often somewhat woody usually septate between the seeds; seeds several or many.

About 450 species, in most tropical and subtropical regions.

CHINESE NAME: 決明屬

ENGLISH NAME: Senna.

JAPANESE NAME: Kawara-ketumei.

Key to species

1. Leaflets small, linear, falcate, less than 2 cm. long..... 2
1. Leaflets large, ovate, obovate, oblong or lanceolate, more than 2 cm. long..... 4
2. Plants slender, ascending or prostrate; leaflets linear,
3-10 mm. long, 1-2 mm. wide 3
2. Plants stout and erect; leaflets narrowly oblong
1.5-2 cm. long, 3 mm. wide.....(4) *C. Leschenaultiana*
3. Stamens 10; leaflets 25-60 in pairs, 3-10 mm. long, 2 mm. wide..(5) *C. mimosoides*
3. Stamens 9; leaflets 7-14 in pairs; about 3 mm. long,
1mm. wide.....(2) *C. garambiensis*
4. Leaflets 4 or 6, glabrous on both surfaces; plants less than 1m. high..(7) *C. tora*
4. Leaflets more than 6, glabrous to densely pubescent; plants over 1 m. high.... 5
5. Petiolar glands at the base of petioles; rachis wingless;
flowers 2 or in corymbose racemes 6
5. Petiolar glands absent; rachis narrowly winged on each side;
flowers in spike-like racemes.....(1) *C. alata*
6. Plants nearly glabrous; flowers more than 2, in corymbose
racemes; pods glabrous, 10 cm. long, 1 cm. wide(6) *C. occidentalis*
6. Plants pubescent; flowers 2; pods pilose 10-25 cm. long, 5 mm. wide..(3) *C. hirsuta*

1. *Cassia alata* LINN. Sp. Pl. 378. 1753.

An erect shrub, about 3 m high; leaves pinnate, 40–60 cm. long; leaflets 8–24, oblong, rounded, apiculate, 5–15 cm. long; petiolar glands absent; rachis narrowly winged on each side; stipules triangular, persistent; flowers yellow, in terminal and axillary spike-like racemes; sepals spatulate, obtuse, 1 cm. long; petals ovate 1.5 cm. long; stamens 7, staminoides 3; pods straight, flat, linear, glabrous with 4 broad crenulate wings.

CHINESE NAME: 翼軸決明

ENGLISH NAME: Ringworm Cassia.

JAPANESE NAME: Hane-senna.

FLOWERING TIME: October to January.

HABITAT: Cultivated.

DISTRIBUTION: A tropical American plant distributed all over the tropical regions.

直立灌木，高約3m。羽狀複葉，長40—60cm，小葉8—24，長橢圓形，頂端圓形具尖凸，長5—15cm，葉軸兩側具狹翼。花黃色，頂生或腋生，總狀花序。莢果直立，扁平，線形，無毛，具4寬翼。本種是引進栽培種。

2. *Cassia garambiensis* HOSOKAWA in Journ. Soc. Trop. Agr. 4: 197, 1932. Fig. 2

A slender, prostrate herb, about 10–20 cm. long; leaves 7–14 in pairs; leaflets about 3 mm. long, 1 mm. wide; flowers yellow, large 1.5 cm. in diameter; sepals ovate, acute, 7 mm. long; petals obovate, 9 mm. long; stamens 9; pods linear, flat, 3 cm. long, pubescent; seeds 9–12.

CHINESE NAME: 鵝鑾鼻決明

JAPANESE NAME: Garambi-nemutya.

ENGLISH NAME: O-luan-pi Senna.

FLOWERING TIME: October to May.

DISTRIBUTION: Endemic to Taiwan.

匍匐草本，長約10—20cm。羽狀複葉，小葉7—14對，長3cm，寬1mm。花黃色，腋生，小蕊9枚。莢果線形，扁平，長約3cm。本種分佈於鵝鑾鼻、墾丁一帶之沙地，可作覆蓋和綠肥。

3. *Cassia hirsuta* LINN. Sp. Pl. 378. 1753.

An erect, annual suffrutescent herb, about 1 m. high; leaves pinnate, 15–30 cm. long; leaflets 8–12, ovate, acuminate, 4–10 cm. long, densely covered with hairs; petiolar gland at the base of petiole; flowers yellow, in pairs, axillary or terminal; sepals ovate, pilose, 6 mm. long; petals ovate-oblong, 1.2 cm. long; stamens 7, staminoides 3; pods, linear, falcate, flat, pubescent, about 10–25 cm. long, 15 mm. wide.

CHINESE NAME: 毛決明

JAPANESE NAME: Ke-senna.

HABITAT: Naturalized weed in open waste places in Southern Taiwan.

FLOWERING TIME: November to January.

DISTRIBUTION: An American plant but distributed in the tropical regions.

ECONOMIC VALUE: Used for soil cover and green manure.

毛泱明一年生直立灌木狀草本，高約1m。羽狀複葉，長15—30cm，小葉8—12，卵形，漸尖，長4—10cm，兩面密生硬毛。黃花一對，腋生或頂生，小蕊7枚，另具退化小蕊3枚。莢果鐮形，扁平，具長毛，長約10—25cm。本種是引進栽培種，已歸化於本島南部荒地，可作覆蓋和綠肥。

4. *Cassia Leschenaultiana* DC. in Mem. Soc. Hist. Nat. Gen 2: 132, 1824. Fig. 3

An erect stout, shrubby plant, about 1.5 m high; leaves bipinnate; leaflets 16-24 pairs, narrow oblong, mucronate, 1-2 cm. long, pubescent; flowers yellow axillary, 1 to 3 together; sepals linear-lanceolate 7 mm. long; petals elliptic or orbicular, 8 mm. long; stamens 10, 1 or 3 reduced to staminoides; pods 2.5-5 cm. long, linear, flat; seeds 8-16.

CHINESE NAME: 大葉山扁豆

HABITAT: Cultivated in tea plantations for green manure.

DISTRIBUTION: India, Malaya, Southern China.

直立，強壯半灌木，高約1.5m。二回羽狀複葉，小葉16—24對，狹狀長橢圓形，具短尖，長1—2cm。黃花1—3，腋生。莢果線形，扁平，長約2.5—5cm。本種為引進種，栽培於茶園，可作綠肥。

5. *Cassia mimosoides* LINN. Sp. Pl. 379, 1753.

Fig. 4

An annual herb, with ascending wiry branches, about 10-60 cm. high, more or less pubescent; leaves about 3-10 cm. long; leaflets 40 to 60 in pairs, linear, falcate, mucronate 3-10 mm. long, petiolar gland present, stipules large, linear, subulate, persistent; flowers yellow, axillary, solitary or several together; sepals lanceolate, acute, 5-6 mm. long; petals obovate, obtuse; stamens 10, long and short filaments alternate; pods linear, flat, dehiscent 1.5-3.5 cm. long, slightly curved, seeds 20-26.

CHINESE NAME: 山扁豆

ENGLISH NAME: Mountain Flat-bean.

JAPANESE NAME: Kawara-ketumei

HABITAT: A weed growing in open places through the island.

FLOWERING TIME: July to November.

DISTRIBUTION: Introduced from tropical countries.

ECONOMIC VALUE: This species is used for green manure.

一年生草本，高約10—60cm。羽狀複葉，長3—10cm，小葉40—60對，鐮狀線形，具短尖。花黃色，一至數朵，腋生，小蕊10枚。莢果線形，扁平，開裂，長1.5—3.5cm。分佈於全島平地可供作綠肥。

6. *Cassia occidentalis* LINN. Sp. Pl. 377. 1753.

Fig. 5

An erect suffrutescent herb, about 1-1.5 m. high; leaves pinnate, 20 cm. long; leaflets 8-10, oblong or ovate-lanceolate, acuminate, 3-8 cm. long, 1-3 cm. wide, margin

hairy; stipules lanceolate, caducous, petiolar gland at the base of petiole; flowers yellow, in terminal and axillary corymbose racemes; sepals obovate, nearly orbicular; petals obovate, 12 mm. long; stamens 7, staminoides 3; pods linear, slightly curved, 10 cm. long, 1 cm. wide; seeds about 30-40.

CHINESE NAME: 望江南

JAPANESE NAME: Kusa-senna.

ENGLISH NAME: Coffee Senna.

HABITAT: A weed growing in open waste places.

FLOWERING TIME: July to October.

DISTRIBUTION: Introduced from tropical America.

望江南直立，半灌木狀草本，高約1—1.5m。羽狀複葉，長20cm，小葉8—10，長橢圓形或卵狀披針形，漸尖，長3—8cm，葉緣具細毛。黃花頂生或腋生，繖房狀總狀花序，小蕊7枚，退化小蕊3枚。莢果線形，扁平，稍彎，長10cm。本種分佈於平地荒地或山坡，可供作綠肥。

7. *Cassia tora* LINN. Sp. Pl. 376, 1753.

Fig. 6.

An erect suffrutescent herb, about 20-100 cm. high; stipules linear, caducous; leaves pinnate; leaflets 6, obovate to oblong-obovate, obtuse, apiculate, 2-5 cm. long, with a gland between the leaflets of 1st and 2nd pairs; flowers axillary, in pairs; bracts linear; sepals ovate, acute, 8 mm. long; petals obovate, 12-15 mm. long; stamens 7, staminoides 3; pods linear nearly 4-angled, 15 cm. long, 3-4 mm. wide; seeds 25-30.

CHINESE NAME: 決明

ENGLISH NAME: Sickle Pod.

JAPANESE NAME: Ebisu-gusa.

FLOWERING TIME: July-September.

HABITAT: Growing wild on sandy soil and open hills.

DISTRIBUTION: Widely distributed in tropical and subtropical regions.

半灌木狀草本，高20—100cm。羽狀複葉，小葉6枚，倒卵形至長橢圓狀倒卵形，頂端鈍形，具細尖，長2—5cm。黃花一對，腋生。莢果線形，長15cm。本種分佈於南部砂地或山坡，可供作綠肥。

3. *Aeschynomene* LINN.

Aeschynomene LINN. Sp. Pl. 713, 1753.

Erect herbs or undershrubs; leaves odd-pinnate, leaflets numerous, small, linear, sensitive; flowers yellow or yellowish-orange, in sparse racemes; calyx deeply 2-lipped, the lips faintly toothed; stamens diadelphous in two sets of 5 each; anthers uniform; pods linear, flattened, breaking transversely into 1-seeded joints at maturity.

About 70 species, native to warmer regions of Australia, America, Africa and Asia.

CHINESE NAME: 合萌屬

ENGLISH NAME: Joint Vetch.

JAPANESE NAME: Kusanemu-zoku.

Key to species

1. Stems smooth; leaflets 20-30 pairs, obtuse at the apex;
pods 1-3 cm. long, 4 mm. wide, lower suture slightly
indented *A. indica*
1. Stems sticky; leaflets 15-20 pairs, acute at the apex;
pods 2.5-3 cm. long, 2.5-3 mm. wide, lower suture deeply
indented *A. sensitiva*

Aeschynomene indica LINN. Sp. Pl. 713, 1753.

Fig. 7.

An annual, erect, branched herb, about 30-120 cm. high, glabrous; stipules lanceolate, 1 cm. long, produced at the base below their insertion, deciduous; leaves odd-pinnate; leaflets numerous 20-30 pairs, linear or oblong, obtuse at the apex, 10-15 mm. long; racemes axillary, 1-4-flowered; flowers yellow, 8 mm. long; calyx 2-lipped, the upper lip entire or slightly 2-cleft, the lower 3-lobed; stamens in 2 sets of 5 each; pods linear, straight or curved, 1-3 cm. long, 4-8 jointed.

CHINESE NAME: 合 萌

ENGLISH NAME: Joint Vetch.

JAPANESE NAME: Kusanemu.

FLOWERING TIME: June to October.

HABITAT: Common in wet open places throughout the island.

DISTRIBUTION: Spreading everywhere in the tropical region of Asia, Africa and Australia.

ECONOMIC VALUE: This species used as green manure. It is not palatable to livestock.

一年生直立草本，高約30—120cm，全株無毛。奇數羽狀複葉，小葉20—30對，線形或長橢圓形，頂端鈍形，長10—15mm。花1—4，黃色，腋生總狀花序，花萼二唇形，小蕊10枚，分爲2束，各束爲5。莢果線形，長約1—3cm，具有4—8節。本種分佈於本島各潮濕地區，可作綠肥。

Aeschynomene sensitiva SWARTZ. DC. Prod. 2: 320, 1825.

Fig. 8

A shrub with slender sticky branches, about 150-200 cm tall; stipules lanceolate, 1-1.2 cm. long; leaves odd-pinnate; leaflets 15-20 pairs, linear-oblong, acute at the apex, 8-10 mm. long; flowers 2-4, in sparse corymbs; bracts ovate, leafy; calyx deeply 2-lipped; petals 7 mm long, yellow; pods 4-7 jointed, the ventral suture deeply indented, 2.5-3 cm. long.

CHINESE NAME: 敏感合萌

ENGLISH NAME: Sensitive Joint Vetch.

HABITAT: Cultivated.

DISTRIBUTION: A common American plant.

ECONOMIC VALUE: This species which has been introduced and used for green manure and soil cover.

灌木，高約150—200cm。奇數羽狀複葉，小葉15—20對，線狀長橢圓形，頂端銳形，長8—10mm。黃花2—4，疏生於繖房花序。莢果具4—7節，腹縫線深縊縮，長2.5—3cm。本種為引進種，用作綠肥和覆蓋作物。

4. *Alysicarpus* NECKER

Alysicarpus NECKER Elem. 3: 15, 1790.

Erect or spreading, branched, annual herbs; leaves simple, subcoriaceous, suborbicular to linear; stipules scarious, striated, acuminate; leaflets stipellate; flowers small, in axillary or terminal racemes; calyx scarious, teeth deeply cleft, the upper 2 often connate; corolla not exserted, standard broad, keel obtuse; stamens diadelphous, anthers uniform; pods cylindric or turgid, straight, composed of several indehiscent 1-seeded joints.

About 15 species, distributed in the tropics of the old world.

CHINESE NAME: 練莢豆屬

JAPANESE NAME: Take-hagi Zoku.

ENGLISH NAME: Alyce Clover.

Key to the species

1. Leaves linear; calyx exceeding several joints of the pod.... (1) *A. bupleurifolius*
1. Leaves suborbicular to oblong-lanceolate; calyx as long as the first or the first 2 joints of the pod..... 2
2. Erect herbs, 1–1.5 m. high, branches hirsute; leaves elliptic or oblong-lanceolate, usually more than 2 cm. long.....(3) *A. vaginalis*
2. Prostrate herbs, 15–50 cm high, branches nearly glabrous; leaves elliptic, oblong or suborbicular, 1–2 cm long.....(2) *A. nummularifolius*

1. *Alysicarpus bupleurifolius* (LINN.) DC. Prodr. 2: 352, 1825. Fig. 9

An erect, slender, branched herb, about 20–50 cm. high; leaves linear 2–5 cm. long, 3–4 mm. wide; stipules lanceolate, acuminate at the apex, 5–8 mm long; racemes terminal, slender, 10–15 cm long; flowers in pairs, 6 mm long; calyx scarious 6–7 mm long, deeply 4-lobed, teeth lanceolate the upper 2 connate; pods 4–6 jointed, smooth, turgid, about 1.5–2 cm. long.

CHINESE NAME: 長葉練莢豆

JAPANESE NAME: Nagaba-takehagi.

FLOWERING TIME: October to February.

HABITAT: A weed growing in open grasslands of the southern part of Taiwan.

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

纖細，直立草木，高約20—50cm。單葉線形，漸尖長2—5cm。花各節一對，頂生總狀花序。莢果具4—6節，平滑，圓柱狀，長約1.5—2cm。本種分佈於高雄、屏東等縣，可作綠肥之參考。

2. *Alysicarpus nummularifolius* (LINN.) DC. Prodr. 2: 352, 1825. Fig. 10

A spreading or prostrate herb, 15–50 cm. high, nearly glabrous; leaves very variable, elliptic, oblong or lanceolate, obtuse, rounded or acute at the apex, 1–2 cm. long, 0.5–1.5 cm. wide; flowers 6 mm. long, rather densely arranged in terminal racemes; pods mostly crowded, rugose, 3–6 jointed, 1–2 cm. long.

CHINESE NAME: 山土豆

JAPANESE NAME: Maruba-takehagi.

FLOWERING TIME: More or less all the year.

HABITAT: In open waste places, grasslands and roadsides throughout Taiwan.

DISTRIBUTION: India, Ceylon, Polynesia, Malaya, Southern China and Taiwan.

ECONOMIC VALUE: This species used as green manure.

一年生匍匐性草本，高約15—50cm，幾乎無毛。葉形化極大，有橢圓形，長橢圓形和披針形等，鈍尖或銳尖，長1—2cm。花紫紅色，長6mm，密排於頂生總狀花序。莢果圓柱狀，具3—6節，長1—2cm。本種分佈於全島路旁，荒地和草原，為一良好綠肥。

3. *Alysicarpus vaginalis* DC. Prodr. 2: 353, 1825. Fig. 11

An erect or ascending herb, with many branches, about 1–1.5 m. high, densely hirsute; leaves elliptic, retuse or rounded and oblong-lanceolate, obtuse 1.5–5 cm. long; stipules scarious, striated; flowers 6 mm long, usually loosely arranged in terminal racemes; pods cylindrical, rugose, puberulent, 4–7 jointed, 1.5–2 cm. long.

This species is very similar to *A. nummularifolius*: but it can be distinguished from the latter by the hirsute branches and larger leaflets.

CHINESE NAME: 山地豆，土豆舅。

ENGLISH NAME: Alyce Clover.

JAPANESE NAME: Sasa-hagi.

FLOWERING TIME: August to February.

DISTRIBUTION: Spreading throughout the tropics of the old world.

ECONOMIC VALUE: An improved strain of *Alysicarpus vaginalis* DC., commonly known as alyce clover, has been imported from California to Taiwan as a forage crop. It is recommended that it be seeded in grass pastures in April and May. Although it sets seeds abundantly in late fall, it is has been noticed that unless the land has been harrowed, the self-seeding is sparse. Alyce clover can produce around 45 tons of green forage per hectare with 16.21% dry matter and 3.88% crude protein on fresh basis.

直立草本，高約1—1.5m，具毛。單葉橢圓形，先端渾圓，有微缺或長橢圓形，鈍尖，長1.5—5cm。花藍紫色，長6mm，疏生頂端總狀花序。莢果圓柱形，具4—7節。本種分佈於新竹、臺南、高雄、屏東等縣為很有價值的綠肥作物。

5. *Amphicarpaea* ELLIOTT.

Amphicarpaea ELLIOTT. in Journ. Acad. Philad. 1: 372, 1817.

Twining herbs; stems slender, pubescent; leaves trifoliolate, with stipules and stipels; flowers pink or white, few, axillary, cleistogamous, without petals, the pods maturing under the ground; bracts veined the same as the stipules; calyx tubular; teeth distinct, unequal; corolla much exerted, standard and wings with a distinct spur on each side of the claw; stamens diadelphous; ovary many ovuled; style filiform, inflexed, glabrous; pods linear oblong or broadly linear, flat, 2-valved.

About 5 species distributed in Indo-china, Mainland China, Japan and America. One species in Taiwan.

CHINESE NAME: 野毛扁豆屬

ENGLISH NAME: Hog Peanut.

JAPANESE NAME: Yabu-mame Zoku.

Amphicarpaea edgeworthii BENTH. var. *japonica* OLIVER in Journ. Linn. Soc. 9: 164, 1867. Fig. 12

Perennial twining herbs, about 80-100 cm. tall, pubescent; stipules narrowly ovate, persistent, 3-4 mm. long; leaves trifoliolate, terminal leaflets broadly ovate, obtuse or acute, 3-6 cm. long, both surfaces covered with appressed hairs; flowers few, axillary, purple, 1.5-2 cm long; calyx 5-teeth, pubescent; pods flat, slightly curved, 2.5-3 cm. long, glabrous.

CHINESE NAME: 野毛扁豆

JAPANESE NAME: Yabu-mame.

HABITAT: Open grassland.

FLOWERING TIME: September to November.

DISTRIBUTION: Japan, Mainland China and Taiwan.

多年生、纏繞草本，全株被柔毛。三出複葉，頂小葉闊卵形，鈍尖。花紫色，少數。腋生。莢果兩型，正常者，扁平稍彎曲，光滑。本種產於嘉義縣鹿林山。

6. *Arachis* LINN.

Arachis LINN. Syst. ed. 1. 1735.

Low prostrate, annual herbs; leaves even pinnate; leaflets mostly 2 pairs, without tendrils, stipules prominent, adnate to base of petiole, not stipellate; flowers yellow, solitary or few and axillary; calyx tube slender, standard broad and large, wing oblong free, keel incurved, beaked; stamens diadelphous, 9 and 1, or sometimes 9 and monadelphous, filaments united in a closed tube; anthers some versatile, and some subbasifixed; pods maturing under ground, oblong-cylindric, reticulate, indehiscent, constricted, between the seeds; seeds 1-3.

About 10 species in South America and Africa, 1 cultivated in all warm countries.

CHINESE NAME: 落花生屬

ENGLISH NAME: Peanut.

Arachis hypogea LINN. Sp. Pl. 741, 1753.

Fig. 13

An annual, hairy branched herb, about 30-70 cm. high; leaves pinnate, 8-12 cm. long; leaflets 4, oblong to obovate, obtuse, apiculate, 2-7 cm. long; stipules linear-lanceolate, forming clasping sheaths, 2-5 cm. long; flowers yellow, solitary or few fascicled, axillary; calyx tube slender; corolla about 8 mm. long; stamen 9, monadelphous; pods oblong, reticulate, 1 to 5 cm. long, maturing under ground, seeds 1-3.

CHINESE NAME: 落花生

ENGLISH NAME: Peanut.

JAPANESE NAME: Nan-kin-mame

FLOWERING TIME: July to August.

DISTRIBUTION: A native to Brazil, now widely cultivated throughout the world.

ECONOMIC VALUE: Seeds are used for human food, the herbage is used for forage.

落花生是一年生草本。小葉4枚，長橢圓形至倒卵形，葉尖鈍形，長2—7cm；托葉與葉柄癒合成鞘狀。黃花，腋生，小蕊9枚，單體。莢果長橢圓，長1—5cm，在地下成熟。種子1至3粒。本種為重要經濟作物之一，榨油剩餘之花生渣可製成花生餅是良好的飼料，本種不但可供作飼料而且為優良的綠肥。

7. **Astragalus** LINN.

Astragalus LINN. Sp. Pl. 755, 1753.

Perennial or annual herbs, rarely undershrubs. Leaves odd-pinnate, the leaf-rachis terminating either in a leaflet or a spine; leaflets without stipules; flowers white, yellow to purplish in axillary racemes, often forming a head-like cluster at the top of a scape; calyx tubular or campanulate, equal, gibbous on the back, teeth 5, subequal; keels equal to or a little shorter than the wings; stamens diadelphous, anther uniform. Pods linear or oblong, usually turgid.

A very large genus with about 1500 species occurring throughout the subtropical and temperate regions.

CHINESE NAME: 紫雲英屬

ENGLISH NAME: Milk Vetch.

JAPANESE NAME: Genge-zoku.

Key to the species

1. Plants erect or ascending, 2-30 cm. high, glabrous..... 2
1. Plants slender, prostrate, about 40-50 cm, pubescent.....(2) *A. nokoensis*
2. Annual herbs, leaflets obovate or oblong.....(3) *A. sinicus*
2. Perennial herbs, leaflets elliptical or long ovate.....(1) *A. nankotaizanensis*

1. **Astragalus nankotaizanensis** SASAKI, in Trans. Nat. Hist. Soc. Formos. **21**: 152, 1931. Fig. 14

A perennial, erect herb about 20-30 cm. high, covered with strigous hairs; leaves impari-pinnate, 5-7 cm. long; leaflets 13-17, elliptic or long ovate, rounded or mucronate at the apex, 7-12 mm. long; stipules oval or elliptic, obtuse, 5 mm. long; flowers 4-6, bright yellow, on a terminal close umbellate or corymbose head; calyx-tube campanulate, 3 mm. long; pods unknown.

CHINESE NAME: 南湖大山紫雲英

JAPANESE NAME: Nanko-wogi.

FLOWERING TIME: June to July.

DISTRIBUTION: Endemic to Taiwan.

多年生草本，高約20—30cm，密被長毛。奇數羽狀複葉，小葉13—17，橢圓形或長卵形，頂端圓渾或微缺，長7—12mm。花黃色，4—6，呈密傘形或繖房花序，頂生。本種分佈於南湖大山。

2. **Astragalus nokoensis** SASAKI, in Trans. Nat. Hist. Soc. Formos. **21**: 151, 1931. Fig. 15

An annual slender prostrate herb, about 40 cm. long, quite, glabrous; leaves impari-pinnate, 3.5-12 cm. long; leaflets 11-13, opposite, obovate, retuse or emarginate at the apex, 6-13 mm. long, 4-7 mm. wide; stipules triangular, 1-2 mm. long; flowers in axillary, corymbose head; calyx-tube campanulate, 5 mm. long, 5 teeth; pods 1.5 cm long, with long beaked and awned at the base.

CHINESE NAME: 能高紫雲英

JAPANESE NAME: Kibana-no-rengeso.

FLOWERING TIME: July.

HABITAT: In swampy places and along roadsides.

DISTRIBUTION: Endemic to Taiwan.

一年生草本，莖纖細而匍匐，無毛。奇數羽狀複葉，小葉11—13，倒卵形，頂端微缺，長約6—13mm。花藍色，呈繖房狀頭狀花序。莢果長1.5cm。本種分佈於南投、嘉義等縣高海拔地區，可作牧草或綠肥之參考。

3. **Astragalus sinicus** LINN. Mant Pl. **1**: 103, 1767. Fig. 16

An ascending herb, thinly pubescent, about 10-25 cm. high; stipules ovate, acute, 3-6mm. long; leaflets 9-11, obovate or oblong, membranaceous, 5-15 mm. long, rounded at the apex; flowers 7-10, pinkish-purple, at the top of a scape, forming a head-like cluster; peduncles 10-20 cm long; calyx about 4 mm. long, with white, thin hairs, teeth lanceolate, shorter than the tube; pods black, 2-celled, 2-2.5 cm long, 4 mm wide, glabrous.

CHINESE NAME: 紫雲英

ENGLISH NAME: Chinese Milk Vetch.

JAPANESE NAME: Genge, Renge-so.

FLOWERING TIME: March to May.

HABITAT: Along roadsides and swamps or in rice fields.

DISTRIBUTION: Japan, Mainland China and Taiwan.

ECONOMIC VALUE: This species has been extensively used as winter green manure on northern Taiwan paddy fields and used as a forage crop.

一年生草本，高10—25cm。小葉9—11，倒卵形或長橢圓形，頂端圓形。花紫色，7—10，呈頭狀花序，花序柄長10—20cm。莢果成熟時呈黑色，長2—2.5cm。紫雲英為本島北部稻田冬季極優良的綠肥，並可供作飼料。

8. *Cajanus* DC.

Cajanus DC. Cat. Hort. Monsp. 85, 1813.

An erect small shrub; leaves trifoliolate, entire, undersurfaces covered with minute glandular dots; flowers in axillary racemes, calyx with 2 upper lobes united; corolla much exerted, standard large and broad, auricled at base, keel obtuse, incurved; stamens diadelphous, 9 and 1, ovary few-ovuled; style thickened upward, stigma terminal; pods linear, acute, straight, with diagonal depressions, dehiscent, seeds 3-7.

Cajanus cajan (LINN.) MILLSP. in Field Col. Mus. Bot. 2: 53, 1900.

Fig. 17

An erect shrub, about 1-3 m. high, plants covered with grayish hairs; leaflets 3, oblong-lanceolate to lanceolate, acuminate, 3-10 cm. long, both surfaces soft pubescent and covered with glandular dots; flowers yellow or orange, brownish on back, varying into other color combinations, in axillary corymbose racemes, calyx 7 mm. long, companulate, pubescent, teeth lanceolate; corolla about 1.5 cm. long; pods 5-7 cm. long, linear, long-beaked, hairy, dehiscent, with depressions; seeds orbicular, compressed, 3-7.

CHINESE NAME: 樹豆，花蝶樹豆

JAPANESE NAME: Ki-mame.

ENGLISH NAME: Pigeon Pea, Cajan.

FLOWERING TIME: February to November.

HABITAT: Cultivated.

DISTRIBUTION: Probably a native of India, but introduced into the tropical regions of the world. Cultivated for its edible seeds.

直立灌木，高約1—3m，全株密被灰白色茸毛。三出葉，小葉長橢圓形到披針形，漸尖，長3—10cm，兩面除具毛之外，還具腺點。花黃色、橙色或褐色，呈繖房狀總狀花序，腋生。莢果線形，有長喙，具斜向之縊溝，長5—7cm。本種為引進栽培種，不但可作土壤之改良而且葉可作飼料。

9. *Campylotropis* BUNG.

Campylotropis BUNG. Pl. Mongholic-Chin. 6, 1835.

Deciduous shrubs, branches densely or laxly covered with silky hairs; leaves

trifoliate, usually pubescent; stipules setaceous persistent; flowers in axillary racemes or terminal panicles, purple, solitary in the axils of deciduous or persistent bracts; bracts ovate-lanceolate, acuminate; the pedicels with joints near the base of the calyx; calyx campanulate, 5-clefted or upper two teeth connate; corolla longer than the calyx; standards ovate, wings falcate, obtuse, auriculate; keels beaked, curved; stamens diadelphous, anthers uniform; pods ovate or oblong, reticulate; margins glabrous or clothed with hairs, seed one.

About 40 species in Asia and 20 species distributed in China.

CHINESE NAME: 彎龍骨屬

JAPANESE NAME: Tonpo-hagi-zoku.

Campylotropis giraldii SCHINDL. in Repert. Sp. Nov. Fedde **11**: 343, 1912. Fig. 18

A small shrub, about 2 m. high, clothed with short silky hairs; stipules setaceous 3-4 mm, long; leaves trifoliate; obovate or oblong, mucronate, 2-3 cm. long, glabrous above, pubescent beneath; flowers purple, 10-12 mm. long, in dense axillary racemes or terminal panicles; peduncles clothed with pubescence; calyx 4 mm. long, 4-cleft teeth triangular, acuminate; corolla 3-4 times as long as the calyx; pods oblong, 8-10 cm. long, covered with pubescence, distinctly reticulate.

This species was included in *Lespedeza* before Schindler's work. In 1912 he separated this from the latter by its curved keels and jointed pedicels at the base of the calyx, and created a new genus.

CHINESE NAME: 彎龍骨

JAPANESE NAME: Ton-po-hagi.

FLOWERING TIME: May to September.

HABITAT: On the bushlands of central Taiwan.

DISTRIBUTION: Maniland China and Taiwan.

小灌木，高可達 2 m。三出複葉，小葉倒卵形或長橢圓形，具微缺，長 2—3 cm。花紫色，密生呈腋生總狀花序或頂生圓錐花序。莢果長橢圓形，具微毛，呈顯明的網狀，長 8—10 cm。本種分佈於本島臺北、新竹、花蓮、臺東等地。

10. *Canavalia* DC.

Canavalia DC. Leg. Mem. **9**: 375, 1825.

Coarse twining or erect herbs; leaves 3-foliate, leaflets stipellate; flowers large purple, pink or white in raceme-like thyrses; calyx tubular, 2-lipped, the upper lip prominent, entire or 2-lobed, the lower 3-toothed very small; corolla much exerted; stamens monadelphous, anthers uniform; style beardless; pods linear, flat and woody, mostly dehiscent, ribbed on both sides of the upper sutures; several-seeded.

A genus with about 40 species in the tropical and subtropical regions of both hemispheres.

CHINESE NAME: 刀豆屬

JAPANESE NAME: Nata-mame Zoku.

Key to species

1. Leaflets orbicular, broadly rounded or retuse at the apex, cuneate at the base.....(2) *C. lineata*
1. Leaflets ovate, acute or acuminate at the apex, rounded or subcordate at the base..... 2
2. Pods flat, 30 cm long.....(1) *C. ensiformis*
2. Pods turgid, 8-15 cm. long.....(3) *C. microcarpa*

1. *Canavalia ensiformis* (LINN.) DC. Prodr. 2: 904, 1825. Fig. 19

An erect or semi-erect herb, about 60-100 cm. high, nearly glabrous; leaves trifoliate, leaflets ovate-oblong to ovate, acute or acuminate and mucronate, 5-10 cm long; flowers purple, 2.5-3 cm. long, in pendulous racemes, calyx 1.5 cm. long, upper lip cleft into 2 broad lobes, lower lip cleft into 3 small teeth, stamens diadelphous; pods broad linear 30 cm long, 2.5-4 cm wide flat, slightly curved, seeds 10-14, white, elliptical.

CHINESE NAME: 刀豆

ENGLISH NAME: Jack Bean.

JAPANESE NAME: Nata-mame.

HABITAT: Cultivated.

DISTRIBUTION: A native of west India.

ECONOMIC VALUE: It is cultivated for green manure and soil cover.

直立或半直立草本，高60—100cm，幾乎平滑。三出葉，小葉卵狀長橢圓形至卵形，頂端銳形，具微缺，長5—10cm。花紫色，長2.5—3cm，着生於下垂總狀花序。小蕊兩體。莢果闊線形，長達30cm，扁平，稍呈彎曲。本種是栽培種，供為綠肥和覆蓋作物。

2. *Canavalia lineata* (THUNB.) DC. Prodr. 2: 404, 1825. Fig. 20

A perennial twining or prostrate herb; stipules ovate, acute 4-5 mm long, deciduous; leaves trifoliate, terminal leaflets orbicular or obovate, broadly rounded or retuse at the apex, cuneate at the base, 5-10 cm. long, 5-8 cm. wide; upper surface sparsely clothed with appressed hairs, lower surface nearly glabrous; racemes with long peduncles; flowers pink-purple, 3 cm. long; calyx 2-lipped, the upper lip large, broadly 2-lobed, the lower one small, subtruncate; pods oblong, 5-6 cm long, several seeded, somewhat turgid.

This species is distinguished from *C. microcarpa* by the leaflets being orbicular, broadly rounded or retuse at the apex, cuneate at the base.

CHINESE NAME: 濱刀豆

JAPANESE NAME: Hama-natamame.

FLOWERING TIME: June to August.

HABITAT: Spreading throughout this island along the seashore.

DISTRIBUTION: Japan, Ryukyu, Mainland China and Taiwan.

多年生纏繞或葡萄草本。三出葉，小葉圓形或倒卵形，頂端圓形，微凹，基部楔形，長5

—10cm。花紫紅色，長3cm。莢果長橢圓形，長5—6cm，肥大。分佈於全島海邊砂地，可作覆蓋植物。

3. *Canavalia microcarpa* (DC.) PIPER. in Proc. Biol. Soc. Wash. **30**: 177, 1917.

A scandent or twining herb; leaves trifoliate; terminal leaflets ovate, acute at the apex, rounded or subcordate at the base, about 8–15 cm long; both surfaces thinly clothed with appressed hairs; racemes axillary, with long peduncles; flowers pink, 2.5 cm. long; pods thick, broadly turgid, 10–14 cm. long, ribbed on both sides of the upper sutures, 6-seeded.

CHINESE NAME: 肥豬仔豆

JAPANESE NAME: Taka-natamame.

FLOWERING TIME: July to March.

HABITAT: Throughout the thickets near the seashore of this island, but not on the sandy beaches.

DISTRIBUTION: India, Malaya, Southern China and Taiwan.

本種特徵與濱刀豆極像似，但小葉呈卵形，分佈於平地叢林可作覆蓋植物。

11. *Cantharospermum* WIGHT et ARNOTT

***Cantharospermum* WIGHT et ARNOTT Prodr. 1: 255, 1834.**

Slender, twining herbs; leaves 3-foliate, exstipellate, stipules small or none, leaflets usually gland-dotted beneath; flowers yellow, solitary or racemes in axillary; calyx-teeth acuminate, distinct, longer or shorter than the tube; corolla exerted, the keel not beaked; stamens diadelphous; pods oblong, straight, somewhat turgid, marked with transverse lines or depressions between the seeds.

About 20 species, distributed in India, Australia and Eastern Asia.

CHINESE NAME: 蠱豆屬

JAPANESE NAME: Hime-kuzu Zoku.

***Cantharospermum scarabaeoides* (LINN.) BAIL.** in Bull. Soc. Linn. Paris **1**: 384. 1889.

Fig. 21

A slender trailing herb; leaves trifoliate, leaflets obovate to oblong, obtuse at the apex; the lateral ones oblique, 1.5–3 cm. long, pubescent, teeth linear; pods oblong, straight, about 2 cm. long covered with spreading brown hairs, strongly compressed between the seeds by transverse lines; 3–5 seeded.

CHINESE NAME: 蠱豆，山豆根

JAPANESE NAME: Birodo-himekuzu.

HABITAT: Widely distributed in this island, on open fields.

FLOWERING TIME: October to March.

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

一年生，纖細纏繞草本。三出複葉，小葉倒卵形至長橢圓形，頂端鈍形長1.5—3cm。花黃色，腋生總狀花序。莢果長橢圓形，直立，長約2cm，密被褐色毛，種子間有明顯的縊縮，

本種在本島原野極為普遍，可作綠肥和牧草。

12. *Centrosema* BENTH.

Centrosema BENTH. in Ann. Wien Mus. 2:117, 1838.

Scandent vine; leaves trifoliolate, stipules persistent, basifixed; flowers large and showy, in axillary racemes, bracts and bracteoles persistent, calyx shortly campanulate, teeth subequal or the upper 2 connate, corolla exserted, standard orbicular, longer than the wings, wings falcate, obovate, keel incurved, stamens diadelphous, very many-ovuled, style incurved; pods linear, longitudinally ridged, two-valved.

About 26 species in tropical America.

CHINESE NAME: 山珠豆屬

ENGLISH NAME: *Centrosema*.

Centrosema pubesens BENTH. in Ann. Wien. Mus. 2: 119, 1838.

Fig. 22

A perennial scandent vine; leaves trifoliolate, terminal leaflets ovate or oblong, shortly acuminate, 5-6 cm. long, 3-3.5 cm. wide, glabrous on the both surfaces; flowers pink, 1.5 cm. long, 3-5 in axillary racemes, bracts large, broadly ovate 6 mm. long, calyx campanulate, 5-cleft, outer surface of standard densely covered with silky-tomentose hairs; pods linear, 4-7 cm. long, 5 mm wide, flat, glabrous, dehiscent long acuminate, ridged along both sutures; seeds 7-15.

CHINESE NAME: 山珠豆

ENGLISH NAME: *Centrosema*.

HABITAT: Cultivated.

DISTRIBUTION: A native of South America, is cultivated throughout the tropics and subtropics.

ECONOMIC VALUE: It is a good cover plant and also used for green manure and fodder. One of the best adapted exotic species.

多年生纏繞藤本。三出複葉，頂小葉卵形或長橢圓形，漸尖，長5—6cm。花紫色，3—5，呈總狀花序，腋生。莢果線形，扁平、無毛、開裂、長4—7cm。本種在1955年自馬來亞引進，為目前柑桔園、香蕉園等地的優良覆蓋綠肥作物，其莖葉並且為非常良好的飼料。

13. *Cicer* LINN.

Cicer LINN. Syst. ed. 1, 1735.

Small annual and perennial herbs; leaves pinnate, rachis usually ending in a spine or abortive tendril, leaflet margins dentate or serrate, stipules large and usually toothed; flowers small white or purplish, solitary or few; axillary, calyx deeply 5-toothed, standard broadly ovate, clawed, wings obliquely obovate, free, stamens diadelphous, anther uniform; ovary sessile, 2 to many-ovuled; style incurved or inflexed, glabrous; pods oblong, turgid, 2-valved.

About 15 species distributed in Western Asia.

CHINESE NAME: 同鵲豆屬

ENGLISH NAME: Chick Pea.

Cicer arietinum LINN. Sp. Pl. 738, 1753.

Fig. 23

An annual herb, stems erect, branched, covered with sticky appressed glandular hairs, about 25–50 cm. high; leaves pinnate, leaflets 9–15, opposite or alternate, ovate, obovate or oblong, obtuse, margin serrate, 10–15 mm. long, stipulate; flowers 8–10 mm. long, white, solitary, axillary, calyx 6–8 mm. long, teeth linear; pods oblong, turgid 1.5–2.5 cm. long; seeds 1–2.

CHINESE NAME: 同鵲豆

ENGLISH NAME: Chick Pea, Garbanzo Bean.

HABITAT: Cultivated.

DISTRIBUTION: Native in west Asia, but now grown in the Mediterranean area, tropical Asia, most parts of Africa and South and Central America.

ECONOMIC VALUE: This is a good soil-renovating species; seeds are edible.

一年生直立草本，被有腺毛，高約25—50cm。羽狀複葉，小葉9—15，卵形，倒卵形或長橢圓形，頂端鈍形，鋸齒緣，長10—15mm。花白色，單生於葉腋，長8—10mm。莢果長橢圓形，肥大，長1.5—2.5cm。種子1—2粒。本種為引進栽培種，可改良土壤，種子可供食用。

14. *Clitoria* LINN.

Clitoria LINN. Sp. Pl. 1: 753, 1753.

A perennial twining herb or shrub; leaves odd-pinnate; leaflets 5–7 stipellate; stipules persistent; flowers large and showy, bluish-purple, red to nearly white, solitary or racemes in axillary; calyx thin, tubular, 5-lobed; standard large and erect, much longer than the wing, keel incurved; stamens diadelphous; anthers uniform; pods linear and flattened, several seeded, dehiscent.

A genus about 30 species in warm and temperate regions.

CHINESE NAME: 蝶豆屬

JAPANESE NAME: Tyo-mame Zoku.

Clitoria ternatea LINN. Sp. Pl. 1: 753, 1753.

Fig. 24

A tall scandent vine, pubescent; leaves odd-pinnate; leaflets 5–9, ovate to oblong, obtuse at the apex, 3–7 cm. long; stipules small, acicular; flowers solitary and nearly sessile, 3–5 cm. long calyx 1.2–1.5 cm. long, teeth lanceolate, subtended by orbicular bracts; corolla bright blue with lighter markings; pods linear, flat, beaked, 5–10 cm. long, 6–10 seeded.

CHINESE NAME: 蝶豆，羊豆

ENGLISH NAME: Kordofan Pea.

JAPANESE NAME: Tyo-mame.

FLOWERING TIME: April to December.

HABITAT: Common in thickets, often cultivated.

DISTRIBUTION: Widely distributed in the tropical regions of both hemispheres, but probably Asian in origin.

ECONOMIC VALUE: This species is used as green manure and forage.

蔓性草本。奇數羽狀複葉，小葉5—9，卵形至長橢圓形，頂端鈍形，長3—7cm。花藍色，單生於葉腋。莢果線形，扁平，具喙，長5—10cm。本種分佈於臺南、高雄、屏東等縣之平地，是一種優良的牧草和綠肥。

15. *Crotalaria* LINN.

Crotalaria LINN. Sp. Pl. 1: 714, 1753.

Annual or perennial herbs or shrubs; leaves simple or trifoliate; stipules prominent, minute or lacking; flowers few to many in terminal racemes or 1 to several in the axils of leaves; calyx 5-cleft or with upper two teeth connate, teeth linear or lanceolate; corolla as long as, or exceeding the calyx, usually yellow, sometimes purplish or pink; stamens 10, monadelphous, connate; anthers dimorphous, basifixed on long filaments and versatile on short filaments, alternately arranged; style strongly incurved, somewhat bearded; pods subglobose to oblong, inflated, sessile or stalked not septate, with 2 to numerous seeds.

A large genus with about 300 species in the tropical and subtropical regions.

CHINESE NAME: 野百合屬

ENGLISH NAME: *Crotalaria*, Rattle box, Rattle pod.

JAPANESE NAME: Tanukimame Zoku.

Key to species

1. Leaves simple 2
1. Leaves trifoliate.....13
2. Stipules large, prominent..... 3
2. Stipules minute or lacking 6
3. Stems angled; stipules ovate-lunate.....(19) *C. verrucosa*
3. Stems cylindrical; stipules lanceolate or linear, reflexed..... 4
4. Leaflets oblong to lanceolate, 1-3 cm long; corolla yellow,
4-15 mm long, as long as or not longer than the calyx..... 5
4. Leaflets oblanceolate, 10-13 cm. long; corolla purple,
16 mm. long, much exserted.....(16) *C. spectabilis*
5. Flowers small 4-6 mm. long, more than 6 per raceme;
pod 5-6 mm. long(1) *C. acicularis*
5. Flowers large 1.5 cm. long, always 2 to 3 in number;
pod 2-3 cm. long.....(8) *C. ferruginea*
6. Corolla exceeding the calyx; leaves more than 2 cm. wide 7
6. Corolla as long as the calyx; leaves less than 2 cm. wide..... 8

7. Leaves oblanceolate, obtuse, 10-13 cm. long; pods glabrous(4) *C. assamica*
7. Leaves linear to oblong, acute, apiculate, 7-10 cm. long;
pods silky pubescent.....(10) *C. juncea*
8. Leaves oblong to elliptic..... 9
8. Leaves linear or oblanceolate.....10
9. Stems decumbent; leaves less than 1 cm. long, densely
arranged; pods subglobose 1 cm. long(15) *C. similis*
9. Stems ascending; leaves 2-3 cm. long, loosely arranged;
pods oblong 1-1.5 cm. long(6) *C. chinensis*
10. Calyx less than 1 cm. long, slightly hairy, hairs less than
1 mm. long; inflorescence elongate.....11
10. Calyx 1-2.5 cm. long, densely hairy, hairs 2-5 mm. long; inflorescence compact..12
11. Leaves oblanceolate, 2-2.5 cm. long; calyx 7 mm. long,
membranaceous; pods exceeding the calyx, 7-10 mm. long(2) *C. albida*
11. Leaves linear, 3-4 cm. long; calyx 5-6 mm, long, thick;
pods subglobose about 5 mm. long(12) *C. linifolia*
12. Flowers yellow; calyx 2.5 cm. long(5) *C. calycina*
12. Flowers purplish-blue; calyx 1 cm. long(11) *C. sessiliflora*
13. Pods 2 seeded14
13. Pods many seeded.....15
14. Terminal leaflets oblong to obovate, apex obtuse; pods
5-6 mm. long.....(7) *C. elliptica*
14. Terminal leaflets obovate-cuneate truncate or emarginate
at the apex; pods 3-4 mm. long(17) *C. trifoliastrum*
15. Stems and pods densely pubescent or puberulent.....16
15. Stems and pods glabrous.....17
16. Leaflets elliptic to obovate, obtuse, 5-6 cm. long(9) *C. incana*
16. Leaflets oblong, acute, 4-5 cm. long(3) *C. anagyroides*
17. Leaflets linear or oblong, 10-30 mm. wide.....18
17. Leaflets obovate to oblong, 3-4 cm. wide(13) *C. saltiana*
18. Leaflets 8-15 mm. long wide; pods 3 cm. long,
5 mm. wide(11) *C. lanceollata*
18. Leaflets 2-3 cm. wide; pods 3-3.5 cm. long, 8-10 mm.
wide(18) *C. usarramoensis*

1. **Crotalaria acicularis** BUCH.—HAM. in Wall. Cat. n. 5390, 1832. Fig. 25

A herb, about 20–60 cm. high, clothed with hairs; leaves membranous, oblong, 1–2 cm. long, 0.5–1 cm. wide, obtuse at both ends, sessile; stipules linear, reflexed; raceme axillary or terminal, 6–30 flowered; calyx 4–6 mm. long, cleft nearly to the base, teeth linear, acuminate, clothed with long brown hairs; corolla yellow, as long as the calyx, standard round or obovate; pods cylindrical, 5–6 mm. long, 10–12 seeded.

This species is characterized by the branches being clothed with rough, spreading hairs and with linear reflexed stipules.

CHINESE NAME: 針狀葉鈴豆

JAPANESE NAME: Hime-tanukimame.

FLOWERING TIME: September to October.

HABITAT: Open grasslands and grassy slopes in southern Taiwan.

DISTRIBUTION: India, Java, Philippines, Southern China and Formosa.

草本，高約20—60cm，全株密被長毛。單葉，長橢圓形，頂端鈍形，長1—2cm。總狀花序腋生或頂生，花黃色。莢果圓柱形，長5—6mm。本種分佈於、臺南、高雄、屏東等縣。

2. **Crotalaria albida** HEYNE in Roth. Nov. Sp. Pl. 333, 1821. Fig. 26

An erect herb, 15–50 cm. high, pubescent; leaves oblanceolate, upper surface glabrous, lower surface pubescent, sessile; stipules very small; racemes axillary or terminal, 6–20 flowered, bracts small linear; calyx 6–8 mm. long, deeply cleft, teeth linear, acuminate, covered with short soft hairs; corolla yellow, exceeding the calyx; pods glabrous, cylindrical 7–10 mm. long, 6–12 seeded.

This is a very variable species. Hosokawa (1932) created one form and one variety, but after careful examination of the type specimens of these two, I think that they are very similar to the present species in the characters both of flowers and fruits, therefore I am not using subspecific names.

CHINESE NAME: 響鈴豆

JAPANESE NAME: Hozaki-tanukimame.

FLOWERING TIME: May to October.

HABITAT: Widely distributed in open grasslands throughout the island.

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

直立草本，高約15—50cm。單葉倒披針形，頂端鈍形。花黃色，總狀花序頂生或腋生。莢果無毛，圓柱形，長7—10mm。本種分佈較廣，如臺北、南投、臺中、嘉義、臺南、高雄、屏東等縣境內都有，可作綠肥。

3. **Crotalaria anagyroides** H. B. K. Nov. Gen. et Sp. 6: 404, 1823. Fig. 27

Small shrubs, about 60–120 cm. high, puberulent; leaves trifoliate, leaflets oblong, acute, apiculate, 4–5 cm. long, 2 cm. wide, stipules minute, setaceous, deciduous; racemes terminal, 10–30 flowered; calyx 7 mm. long, densely covered with silky hairs; corolla yellow, 14 mm. long, exserted; pods oblong, 2–3 cm. long, 1 cm. wide,

sessile.

CHINESE NAME: 三尖葉豬屎豆

JAPANESE NAME: Ki-tanukimame.

FLOWERING TIME: May to August.

HABITAT: Cultivated and naturalized.

DISTRIBUTION: Tropical America, Africa and Asia.

小灌木，高約60—120cm。三出複葉，小葉長橢圓形，頂端銳尖，具細尖，長4—5cm。總狀花序頂生，花黃色，長14mm。莢果長橢圓形，長2—3cm。本種為引進栽培者，但現在已歸化本島，是優良的綠肥之一。

4. *Crotalaria assamica* BENTH. in Hook. Lond. Journ. Bot. 2: 481. 1843. Fig. 28

An erect, stout herb; branches and calyx pubescent; leaves simple, oblanceolate, obtuse, cuneate 10–13 cm. long, 2–4 cm. wide, upper surface glabrous, lower surface pubescent; stipules minute; racemes terminal, 20–30 flowered; bracts setaceous, minute, 3–4 mm. long; calyx 1–1.5 cm. long, upper teeth connate; corolla golden-yellow, twice as long as the calyx; pods oblong, 4–5 cm. long, glabrate.

The present species has often been mistaken for *C. retusa*, but it is clearly different from the latter in having the leaves oblanceolate, obtuse, apiculate and the corolla being golden-yellow and 2 cm. long.

C. retusa is characterized by the leaves obovate, retuse and corolla yellow 1.2–1.5 cm. long.

CHINESE NAME: 大豬屎青

JAPANESE NAME: Kogane-tankimame.

FLOWERING TIME: July to October.

HABITAT: In thickets.

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

直立，強壯草木。單葉，倒披針形，頂端鈍形，長10—13cm。總狀花序頂生，花金黃色。莢果長橢圓形，長4—5cm，無毛。本種分佈於本島新竹縣境，可作綠肥。

5. *Crotalaria calycina* SCHRANK. Pl. Rar. Monac. t. 12, 1819. Fig. 29

An erect annual herb, about 20–80 cm. high, plants clothed with long silky hairs; leaves linear, 7–12 cm. long, 6–8 mm. wide, upper surface hairy on costa, lower surface densely clothed with silky hairs, sessile; stipules very small; racemes terminal, 2–12 flowered, calyx 2–3 cm. long, covered with long brown hairs, upper teeth oblanceolate, lower teeth lanceolate; corolla yellow, shorter than the calyx; bracts foliaceous, lanceolate 10–20 mm. long; pods glabrous, about 15 mm. long, 20–30 seeded.

This species is very similar to *S. sessiliflora*, but it can be easily distinguished by its large calyx which is about 2.5 cm. long and by being densely clothed with long (5 mm) spreading hairs.

CHINESE NAME: 長萼野百合

JAPANESE NAME: Gaku-tanukimame.

FLOWERING TIME: July to October.

HABITAT: Open grasslands and along river-banks.

DISTRIBUTION: Tropical Asia, Africa, Malaya, and Northern Australia.

直立一年生草本，高約20—80cm。單葉線形，長7—12cm。花黃色，花萼很長，長達2—3cm，密被褐色長硬毛。莢果長15mm，無毛。本種分佈於本島原野和河邊，可作綠肥。

6. *Crotalaria chinensis* LINN. Syst. 10: 1158, 1759. Fig. 30

A herb, about 15–16 cm. high, stems slender. covered with appressed hairs; leaves oblong, 2–3 cm. long, 5–7 mm. wide, acute at the apex, upper surface glabrous, lower surface pubescent; stipules absent; flowers in terminal racemes, sometimes axillary, 1–3 flowered, bracts and bracteoles small, linear, 6–8 mm. long, calyx 8–12mm, long, densely clothed with silky hairs, corolla whitish-yellow, as long as the calyx; pods glabrous, 10–15 mm. long, enclosed by the calyx; 15–20 seeded.

The present species is very similar to *C. ferruginea* in most features, but differs from the latter in lacking stipules and having pods enclosed by the calyx.

CHINESE NAME: 臺灣野百合

JAPANESE NAME: Taiwan-tanukimame.

FLOWERING TIME: July to October.

HABITAT: Open grasslands at low altitudes.

DISTRIBUTION: Eastern India to Southern China, Malaya, Philippines and Formosa.

草本，莖纖細，高15至16cm。單葉長橢圓形，頂端銳形，長2—3cm。花黃色，呈頂生總狀花序。莢果平滑，長10—15cm。本種分佈於臺中、臺南、屏東等縣，可作綠肥。

7. *Crotalaria elliptica* ROXB. Fl. Ind. 3: 279, 1832. Fig. 31

A perennial herb, about 20–60 cm. high, covered with thin hairs; leaves trifoliate; terminal leaflet 15–24 mm. long, 8–13 mm. wide, oblong or obovate, obtuse or rounded at the apex, cuneate at the base, upper surface glabrous, lower surface covered with short soft hairs, lateral leaflets smaller; petiole 1–1.5 cm. long; stipules 1–2 mm. long, reflexed, racemes terminal or axillary, bracts small, less than 1 mm. long, calyx hairy, deeply 5-cleft, teeth lanceolate, 2 mm. long; pods oblong, covered with short soft hairs; 2 seeded.

This species is very near to *C. trifoliastrum* in having pods with 2 seeds, but is distinguished from it by its oblong to obovate leaflets and obtuse apex.

CHINESE NAME: 橢圓葉野百合

JAPANESE NAME: Daien-tanukimame.

FLOWERING TIME: August to October.

HABITAT: Open grasslands in the southern part of this island.

DISTRIBUTION: Common in South China and Formosa.

多年生草本，高約20—60cm。三出複葉，頂小葉長橢圓形或倒卵形，頂端鈍形或圓形，長15—24mm。總狀花序頂生，或腋生花黃色，長1cm。莢果長橢圓形。種子二粒。本種分佈於屏東和臺東等縣，可作綠肥。

8. *Crotalaria ferruginea* GRAH. in Wall. Cat. no. 5398, 1832. Fig. 32

An erect or decumbent herb, with many branches, covered with fine silky hairs; leaves simple, oblong to lanceolate, 2-3 cm. long, 7-15 mm. wide, obtuse at the apex; stipules lanceolate, reflexed, persistent; racemes 2-3 flowered; bracts linear, persistent; calyx 1.7 cm. long, covered with brown silky hairs; corolla 1.3 cm. long yellow, not longer than the calyx; pods oblong, 3 cm. long, 1 cm. wide, glabrous, 20-30 seeded.

This species may be used as green manure or fodder. The simple, oblong-lanceolate leaf, with prominent reflexed stipules; glabrous, oblong pods 2-3 cm. long are the outstanding features of this species.

CHINESE NAME: 野花生, 偽地藍, 荷豬草

JAPANESE NAME: Nanban-tanukimame.

FLOWERING TIME: June to October.

HABITAT: Open grasslands at low and medium altitudes.

DISTRIBUTION: India to China, Malaya, Philippines and Formosa.

直立或外傾草本。單葉長橢圓形至披針形，頂端鈍形，長2—3cm，有托葉，反捲。總狀花序腋生，花黃色。莢果長橢圓形，長3cm。本種分佈本島各地，可供作綠肥。

9. *Crotalaria incana* LINN. Sp. Pl. 716, 1753. Fig. 33

An erect, branched, undershrub, about, 1 m. high, clothed with grey pubescence; leaves trifoliate, leaflets elliptic to obovate, obtuse, apiculate, 5-6 cm. long, 2.5-3 cm. wide, upper surface glabrous, lower surface pubescent; racemes terminal 5 to 20 cm. long; calyx 1 cm. long, clefts lanceolate covered with hairs; corolla yellow, 10-13mm. long, exserted; pods deflexed, inflated, 3-4 cm. long, 1 cm. wide or less, densely hairy, 20-30 seeded.

This species is very similar to *C. saltiana*, but differs from the latter by its obtuse, apiculate leaflets and densely hairy pods.

CHINESE NAME: 恆春野百合

JAPANESE NAME: Kosyun-tanukimame.

FLOWERING TIME: April to October.

HABITAT: In waste places in the southern part of this island.

DISTRIBUTION: A native of tropical America, and now widely distributed in the Tropics.

直立半灌木，高約1m。三出複葉，小葉橢圓形至倒卵形，頂端鈍形，具細尖，長5—6cm。總狀花序頂生，黃花長10—13mm。莢果外拆，肥大，長3—4cm，密被長毛。本種分佈於屏東縣可供作綠肥。

10. *Crotalaria juncea* LINN. Sp. Pl. 714, 1753. Fig. 34

An erect suffrutescent herb, about 1-2 m. high, with slender silky branches; leaves simple, linear to oblong, acute, apiculate 7-10 cm. long, 1-2 cm. wide, with brown hairs on both side; stipules minute, setaceous; flowers bright yellow, in

terminal racemes 8-30 cm. long, calyx 2 cm. long, densely covered with brown hairs; pods oblong, 3 cm. long, pubescent, seeds 10-15.

CHINESE NAME: 太陽蕨

ENGLISH NAME: Sun Hemp.

DISTRIBUTION: Native of India.

ECONOMIC VALUE: This species is cultivated for green manure.

直立半灌木，狀草本，高1—2m。單葉線形至長橢圓形，頂端銳形，具細尖，長7—10cm。花黃色，總狀花序頂生，長8—30cm。莢果長橢圓形，長3cm。本種引進栽培者，可供作牧草及綠肥，纖維可供織物。

11. **Crotalaria lanceolata** E. Mey. Comm. Pl. Afr. Austr. 1: 24, 1835. Fig. 35

Stem suffruticose, with a few long straight erect or spreading branches, upper part slightly pubescent, stipules none; leaves trifoliate, leaflets linear 30-70 mm. long, 8-15 mm. wide, narrowed at both ends, mucronate, both surfaces nearly glabrous; flowers in long stalked lax many flowered racemes, terminal; calyx campanulate, thinly silky, 3 mm. long; corolla bright yellow; pods cylindrical, sessile, black and glabrous.

CHINESE NAME: 披針葉豬屎豆

HABITAT: Cultivated.

DISTRIBUTION: Native to Africa.

半灌木，高1m左右。三出葉，小葉線形，長3—7cm。總狀花序頂生，花黃色。莢果圓柱形，黑色，無毛。本種係引進種，非洲原產，可供作綠肥。

12. **Crotalaria linifolia** LINN. f. Suppl. 322, 1781. Fig. 36

An erect herb, about 30-60 cm. high, densely covered with short soft hairs; leaves linear, 2-5 cm. long, 2-4 mm. wide, obtuse at the apex; exstipulate; racemes terminal or axillary; bract linear 2-3 mm. long, calyx 6-8 mm. long, deeply cleft, densely covered with hairs; corolla yellow; pods glabrous, subglobose, about 5 mm. long; 8-10 seeded.

In 1932 Yamamoto created a new variety because some plants were much branched at the base, after careful observation, I cannot find any real difference between them.

CHINESE NAME: 線葉野百合

JAPANESE NAME: Hosoba-tanukimane.

FLOWERING TIME: May to October.

HABITAT: Open grasslands in the southern part of this island.

DISTRIBUTION: India to South China, Formosa, Philippines, Malaya and Australia.

直立草本，高約30—60cm，密被短柔毛。單葉線形，頂端鈍形，長2—5cm。總狀花序頂生或腋生，花黃色。莢果略球形，無毛，長約5mm。本種分佈於本島南部廣野，可作綠肥。

13. *Crotalaria saltiana* ANDR. Bot. Rep. t. 643, 1811. Fig. 37

An erect shrub, 50–70 cm. high, stems stout, puberulent, marked with slender longitudinal grooves; leaves trifoliolate, leaflets obovate or obovate-oblong, obtuse, often emarginate, apiculate, 3–5 cm. long, 2–4 cm. wide: stipules minute, setaceous deciduous: racemes terminal, 20–40 cm. long, 20–30 flowered; calyx 7 mm. long, sparsely covered with silky hairs, teeth lanceolate; corolla exerted 1.2 cm. long, yellow with red stripes: pods deflexed, oblong, cylindrical, 4 cm. long; 20–30 seeded.

This species is usually cultivated and used for green manure. It can be easily identified by its obovate, emarginate, apiculate leaflets and oblong deflexed pods.

CHINESE NAME: 黃野百合, 豬屎豆

JAPANESE NAME: Ohmituba-tanukimame or Kibanahagi.

FLOWERING TIME: June to October.

HABITAT: Common in fields, road sides, and waste places throughout the island.

DISTRIBUTION: Tropical Asia, Africa and America.

一年生直立灌木，高50—70cm。全株被緊貼短柔毛。三出葉，小葉倒卵形，先端鈍形，具有微缺，基部楔形，長3—5cm。總狀花序，約具20—30朵花，花黃色。莢果橢圓形成熟時近無毛，外折，長4cm。本種分佈於全島廣野，路旁，荒地，可供優良綠肥。

14. *Crotalaria sessiliflora* LINN. Sp. Pl. ed. 2: 1004, 1753. Fig. 38

An erect herb, 20–100 cm. high, covered with appressed hairs; leaves linear or lanceolate, acute at both ends, 4–10 cm. long, 0.5–1 cm. wide; stipules minute, setaceous: racemes terminal or axillary, 2–20 flowered; bracts linear, bracteoles at the upper end of pedicel; calyx 10–15 mm. long, densely clothed with brown yellow hairs; corolla purplish-blue, as long as the calyx; pods glabrous, sessile, as long as the calyx, 10–15 seeded.

A very widely distributed species. Differing from *C. calycina*, by its head-like racemes, purple-blue flowers and with its calyx. 1 cm. long.

CHINESE NAME: 野百合

JAPANESE NAME: Tanukimame.

FLOWERING TIME: May to October.

HABITAT: Open grasslands.

DISTRIBUTION: From India to Malaya, Philippines, Taiwan and Japan.

直立草本，高20—100cm，被有壓伏毛。單葉線形，披針形，先端銳形，長4—10cm。很像長蔓野百合，唯頭狀總狀花序和紫色花可與之區別，花萼長1cm。本種分佈於臺北、新竹、桃園、臺南、屏東、花蓮等縣，可作綠肥。

15. *Crotalaria similis* HEMSL. in Kew Journ. Bot. 4: 44, 1852. Fig. 39

A small decumbent herb, about 5–20 cm. high, densely clothed with silky hairs; leaves simple, subsessile, ovate to elliptic, 3–8 mm. long, 2–4 mm. wide, acute at the apex; stipules absent; racemes terminal, 3–5 flowered, or solitary; 2 bracteoles at the base of calyx; calyx 6 mm. long, upper two clefts slightly connate, densely

covered with hairs; corolla as long as the calyx, yellow; pods oblong 1 cm. long; 10-22 seeded.

This species is characterized by its small dense leaves which are less than 1 cm. long, and by its black, oblong pods, as long as the calyx.

CHINESE NAME: 鵝鑾鼻野百合

JAPANESE NAME: Garambi-tanukimame.

FLOWERING TIME: February to July.

HABITAT: Open sandy places on the south cape of this island.

DISTRIBUTION: Endemic.

小草本，莖纖細，高5—20cm，密被絨毛。單葉，卵形至橢圓形，先端銳形，長3—8mm。總狀花序頂生，具有3—5朵，花黃色。莢果長橢圓形，長1cm。本種分佈於屏東縣恒春墾丁和鵝鑾鼻一帶沙地，可作綠肥之參考。

16. *Crotalaria spectabilis* ROTH. Nov. Pl. Sp. 341, 1821. Fig. 40

An erect herb, 1-1.5 m. high, with stout branches; leaves simple, oblanceolate, 10-13 cm. long, 5 cm. wide, obtuse, entire, glabrous above, pubescent beneath, stipules broadly ovate, conspicuous; flowers many, in terminal racemes to 20-30 cm. long, bracts persistent, broadly ovate, foliaceous reflexed, calyx 1.2 cm. long, teeth lanceolate, corolla 1.6 cm. long, exserted, purplish; pods glabrous, 5 cm. long, 1.5 cm. wide, seeds 20-30.

CHINESE NAME: 紫花野百合

ENGLISH NAME: Showy *Crotalaria*.

FLOWERING TIME: August to November.

DISTRIBUTION: Native to the Old World Tropics.

ECONOMIC VALUE: This species is cultivated as green manure.

直立草本，高1—1.5cm，具有強壯的分枝。單葉倒披針形，先端鈍形，長10—13cm，花紫色，長1.6cm。莢果無毛，長5cm。本種由美國引進，可供作綠肥。

17. *Crotalaria trifoliatum* WILLD. Sp. Pl. 3: 983, 1806. Fig. 41

An erect perennial herb, about 30 cm. high, with many branches, finely pubescent; leaves trifoliate, terminal leaflets, obovate, cuneate, 7-10 mm. long, deeply emarginate at the apex, upper surface glabrous, lower surface pubescent; racemes terminal or axillary, 5-10 flowered; bracts minute, setaceous; calyx 3 mm. long, pubescent; corolla yellow; pods 4 mm. long, subglobose, sessile, clothed with thin hairs; 2-seeded.

The present species is similar to *C. elliptica*, but differs from it by having obovate leaflets.

CHINESE NAME: 三葉野百合

JAPANESE NAME: Mitsuba-tanukimame.

HABITAT: Open places in the southern part of the island.

DISTRIBUTION: India, Australia, Philippines and Taiwan.

直立多年生草本，高30cm。三出複葉，頂小葉倒卵形，楔形，長7—10cm。總狀花序頂生或腋生，花黃色。莢果略呈球形，長4mm。本種分佈於屏東、臺東等縣。

18. **Crotalaria usaramoensis** BAK. f. in Journ. Linn. Soc. Bot. 42: 346, 1914. Fig. 42

An erect shrub, about 1.5–2 m. high, stems slightly pubescent with longitudinal grooves; leaves trifoliate, membranaceous, leaflets oblong, acuminate, 5–10 cm. long, 2–3 cm. wide; stipules minute, setaceous, deciduous; racemes terminal to 40 cm. long, calyx campanulate, glabrous, 6 mm. long, corolla yellow, 1.3 cm. long; pods oblong, 3–4 cm. long, seeds 40–50, red.

CHINESE NAME: 光萼野百合

JAPANESE NAME: Usuramo-tanukimame.

ENGLISH NAME: Usuramo Crotalaria.

HABITAT: Cultivated and naturalized.

DISTRIBUTION: Native of South America.

直立灌木，高約1.5—2m。三出複葉，頂小葉長橢圓形，先端漸尖，長5—10cm。總狀花序頂生，黃花。莢果長橢圓形，長3—4cm。本種係南美原產，現在已歸化本島，可供綠肥之用。

19. **Crotalaria verrucosa** LINN. Sp. Pl. ed. 1: 715, 1753. Fig. 43

An erect, stout herb, slightly pubescent or nearly glabrous, about 40–80 cm. high, branches 4-angled; leaves simple broadly elliptical, apex apiculate, base acute, 5–12 cm. long, 2–5 cm. wide, with prominent veins; stipules foliaceous, ovate-lunate; racemes terminal, 10–20 flowered, bracts linear, minute; calyx 1 cm. long, finely pubescent; corolla twice as long as the calyx, purple; pods oblong, 2.5–3.5 cm. long, finely pubescent; 10–12 seeded.

The present species can be easily identified by its broad elliptical leaves, 4-angled branches, and large ovate-lunate stipules.

CHINESE NAME: 大葉野百合

JAPANESE NAME: Ohba-tanukimame.

HABITAT: Open grasslands.

DISTRIBUTION: Tropical Asia, Africa and America.

ECONOMIC VALUE: It is cultivated for green manure.

直立粗壯草本，高約40—80cm，莖呈方形。單葉闊橢圓形，具細尖，長5—12cm。托葉呈葉狀，半月形顯著。總狀花序頂生，花紫色。莢果長橢圓形，長2.5—3.5cm。本種分佈於本島中、南部，可作綠肥。

16. **Desmodium** DESVAUX

Desmodium DESVAUX, in Journ. Bot. 1: 122, 1813.

Annual or perennial herbs, undershrubs or shrubs; leaves usually palmately trifoliate or reduced to unifoliate, rarely pinnately 5-foliolate; 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.

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

CHINESE NAME: 山馬蝗屬, 山菘豆屬

ENGLISH NAME: Tick Clover, Beggar Ticks, Tick Trefoil.

JAPANESE NAME: Nusubito-hagi Zoku.

Key to the species

1. Leaves unifoliolate 2
1. Leaves trifoliolate..... 7
2. Petioles prominently winged, branches trianngular.....(15) *D. pseudotriquetrum*
2. Petioles not winged, branches cylindrical 3
3. Leaves less than 3 cm. long..... 4
3. Leaves usually 4-10 cm. long..... 5
4. Plants pubescent; leaflets deltoid-cordate, much longer than broad..... (7) *D. gracillimum*
4. Plants glabrous; leaflets reniform, length half as long as broad..(19) *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 broad(6) *D. gangeticum*
6. Pods straight, constricted on both sutures, joints fusiform.....(26) *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 suture 9

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 appressed silky hairs; leaflets obovate, truncate, retuse or emarginate at the apex; flowers solitary or 2-3 fascicled.....(23) *D. triflorum*
10. Flowers in umbels, axillary11
10. Flowers in racemes, axillary and terminal14
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 persistent large, rounded, foliaceous bracts.....(16) *D. pulchellum*
12. Flowers not as above13
13. Leaflets 2-3 cm. long, less than 2 cm. wide; pods usually with two joints(4) *D. dispernum*
13. Leaflets 4-8 cm. long, 3-5 cm. wide; pods with 3-6 joints.....(24) *D. umbellatum*
14. Pods with 2 or 3 joints, long stalked.....15
14. Pods with more than 3 joints, nearly sessile17
15. Flowers 3-4 mm. long, pedicels less than 5 mm. long; stipules linear, 1 mm. wide.....(18) *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 on the lower surface.....(22) *D. Tashiroi*
16. Leaflets lanceolate, acute, pubescent; the veinlets prominent, without whitish spots on the lower surface.....(12) *D. laterale*
17. Pods constricted on both sutures.....18
17. Pods constricted only on ventral sutures.....24
18. Herbs; branches with hook-hairs; stipules foliaceous; pods less than 2 mm. wide.....(20) *D. scorpiurus*
18. Shrubs; branches with appressed hairs or nearly glabrous; stipules lanceolate or linear; pods 2-3 mm. wide.....19
19. Pod-joints length as long as width.....20
19. Pod-joints length much longer than width21
20. Leaf margin conspicuously undulate on upper half..(21) *D. sequax* var. *sinuatum*
20. Leaf margins entire.....(17) *D. purpureum*

21. Terminal-leaflets ovate; stipules 5-6 mm. long,
deciduous; flowers 3-5 mm. long.....(13) *D. laxiflorum*
21. Terminal-leaflets lanceolate, elliptic to obovate-oblong;
stipules 10 mm. long, persistent; flowers 6-10 mm. long22
22. Leaflets with a large white spot on either side of midrib.....(25) *D. uncinatum*
22. Leaflets not as above23
23. Plants nearly glabrous; leaflets lanceolate, acute at
both ends; stipules spinescent(2) *D. caudatum*
23. Plants clothed with densely appressed hairs; leaflets
elliptic to obovate, obtuse at the apex; stipules lanceolate(5) *D. floribundum*
24. Pods falcate, indistinctly jointed, dehiscent along ventral suture,
without raised reticulations(8) *D. gyrans*
24. Pods straight, conspicuously jointed, indehiscent, with raised reticulations.....25
25. Branches erect; leaves oblong; flowers in dense
terminal racemes, pedicels glabrous, 3 mm. long.....(9) *D. heterocarpum*
25. 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. 3: 45, 1867. Fig. 44

An undershrub, about 30-60 cm. tall; branches numerous, ascending, finely clothed with appressed hairs; leaves trifoliate; petioles 10-15 mm. long; leaflets subcoriaceous, green, glabrous above, appressedly 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 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 on lower suture.

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.

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.

半灌木，高30—60cm。三出複葉，頂小葉倒卵形或長橢圓形，先端鈍形，截形具微尖，長2—3cm。花粉紅色，成對於頂生或腋生總狀花序。莢果4—5節，長1.5—2cm腹縫線縮。本種分佈全島平野或山坡，可作綠肥和牧草。

2. *Desmodium caudatum* (THUNB.) DC. Prodr. 2: 337, 1825. Fig. 45

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.

ECONOMIC VALUE: Used as fodder and as an insecticide by soaking the leaves in soy sauce or prickles, to prevent the growth of maggots.

灌木，高1m。三出複葉，托葉有翼，小葉披針形，先端銳形。花綠白色，長5—6mm，呈腋生和頂生總狀花序。莢果4—6節，扁平，長5—7cm，具鈎毛。本種分佈於北部廣野或叢林中，可供作牧草。

3. *Desmodium cephalotes* (ROXB.) WALL. Wight, Icon. t. 373, 1843. Fig. 46

A shrub; branches triangular, with densely appressed 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 umbels, axillary; peduncles 5-8 mm. length of pedicels unequal; calyx 5-5 mm. long, teeth lanceolate, clothed with dense white-silky hairs; each calyx with two bracts at the base; corolla white 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.

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

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.

ECONOMIC VALUE: Used for green manures.

小灌木，莖呈三角形，密被貼伏長白毛。三出複葉，頂小葉長橢圓形或倒卵形，先端銳形，長5—7cm。花白色，長8—12mm，構成繖形花序，腋生。莢果3—6節，密被白色絨毛。本種分佈於臺南、高雄、屏東一帶可作改良土壤之參考。

4. **Desmodium dispernum** HAY. Icon. Pl. Formos. 3: 69, 1913.

Fig. 47

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; peducles 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.

This species is very similar to *D. cephalotes* and *D. umbellatum*; because of its umbelliform racemes, 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 usually have two joints these are the outstanding characteristics of the present species.

CHINESE NAME: 雙節山馬蝗

JAPANESE NAME: Hutaumi-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.

灌木，高2.5—3m，無毛。三出複葉，頂小葉倒卵形，先端圓形，微缺，長2—3cm。花白色，2—6構成繖形總狀花序。莢果1—2節。本種分佈於屏東和高雄境內。

5. **Desmodium floribundum** (D. DON) G. DON, Gen. Syst. 2: 297, 1832.

Fig. 48

An erect shrub, woody branches angular and densely clothed with appressed hairs; leaves trifoliate, subcoriaceous; petioles 3-5 cm. long; terminal leaflet obovate-oblong or elliptic, 5-10 cm. with sparingly appressed hairs above, densely covered with appressed grey hairs beneath, obtuse or subacute at the apex; stipules lanceolate, acuminate, 7-10 mm. long, persistent; flowers very large, 8-10mm. 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 appressed silky hairs.

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 appressed hairs are its peculiar features. Commonly scattered in thickets at about 1,000 m. elevation in the central mountainous regions of Taiwan.

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.

灌木, 全株密被貼伏毛。三出複葉, 頂小葉倒卵形或橢圓形, 長5—10cm。花紫色。莢果5—8節, 背腹縫線各節處緊縮。本種分佈於中部山地。

6. *Desmodium gangeticum* (LINN.) DC. Prodr. 2: 327, 1825. Fig. 49

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, composed 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 tropical Asia, Africa and Australia.

ECONOMIC VALUE: An annual fodder plant, also used as green manure.

直立半灌木, 高可達 1.5m。單葉長橢圓形, 先端鈍形。花小, 粉紅色。莢果5—8節。本種分佈於中、南部, 可供作牧草和綠肥。

7. *Desmodium gracilimum* HEMSL. in Ann. Bot. 9: 152, 1895. Fig. 50

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, 2mm. wide, constricted between the joints on both sutures, and with minute hooked-hairs, 3–5-jointed; segments oblong.

This species is characterized by its 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, arranged loosely in a terminal raceme.

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.

匍匐草本，莖纖細，被白短毛。單葉三角形，基部心形，長 2—3cm。花紫紅色。莢果線形，3—5節。本種分佈於高雄、屏東等地。

8. **Desmodium gyrans** (LINN. f.) DC. Prodr. 2: 326, 1825.

Fig. 51

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-oblancolate; 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-purple, 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.

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

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, Australia, Philippines and Taiwan.

直立半灌木，高約60—90m。三出複葉花。色紅紫，莢果鐮形，4—5節。本種分佈於高雄、屏東等縣境。

9. **Desmodium heterocarpum** (LINN.) DC. Prodr. 2: 337, 1825.

Fig. 52

An erect undershrub, attaining 60-90 cm. high, woody branches elongated, with fine densely appressed 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, appressedly 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; corolla 5 mm. long; pods erect, crowded, about 1.5-2 cm. long, 3 mm. wide, spreading upward; 4-7-jointed, joints as wide as long, with raised reticulatons and hooked hairs, constricted on lower suture.

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

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 Malaya to Australia and Polynesia.

直立半灌木, 高約 60—90m。三出複葉, 頂小葉長橢圓形, 長 2—3cm。花粉紅色, 長 5mm。密集於頂生總狀花序。莢果直立, 具 4—7 節, 有鈎毛。本種分佈於全島各地, 可作土壤改良之用。

10. *Desmodium heterophyllum* (WILLD.) DC. Prodr. 2: 334, 1825. Fig. 53

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 m. wide, apex rounded, emarginate, upper surface glabrous, lower surface pubescent; stipules lanceolate, 5 mm. 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, 3 mm. wide, dorsal suture continuous, the ventral constricted.

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 covered with long spreading hairs and the leaflets being oblong or elliptic, and rounded at the apex.

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.

ECONOMIC VALUE: A good pasture for feeding cattle.

匍匐草本, 莖纖細。三出複葉, 小葉長橢圓形。花紫紅色, 單立或疏總狀花序, 腋生。莢果 4—6 節。本種分佈全島各地, 可作牧草。

11. **Desmodium lasiocarpum** (BEAUV.) DC. Prodr. 2: 328, 1825.

Fig. 54

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 paniced; flowers small, 4-5 mm. long, numerous; pedicels about 2 mm. long, densely pubescent; bracts minute, setaceous; calyx about the same length as the bract, densely hairy, the teeth lanceolate, as long as the tube; corolla 3-4 times longer than calyx; pods with minute hooked-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.

ECONOMIC VALUE: This species is considered good for green manure.

直立半灌木，高1—2m，密被褐色絨毛。單葉卵形，長5—6cm。花紫色，密生於腋生總狀花序。莢果4—5節。本種分佈於臺南、高雄、屏東等縣，可作綠肥。

12. **Desmodium laterale** SCHINDLER, in Fedde, Repert. 22: 258, 1926.

Fig. 55

A small slender herb; stems angular, 25-30 cm. long, thinly pubescent; leaves trifoliolate; 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 broad; the lateral ones with smaller bases, slightly paniced, stipules lanceolate, acuminate, 5-7 mm. long; racemes terminal, sometimes oblique; peduncles slender, about 20-40 cm. long; flowers in clusters of 1-3; 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-rhomboidal, width half of the length, covered with hooked-hairs, constricted nearly to upper suture.

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. 2: 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. We prefer to follow Ohwi's opinion (1956) in putting *D. laxum* (non DC.) as a synonym of the present species.

CHINESE NAME: 琉球山馬蝗

JAPANESE NAME: Ryukyu-unsubito 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 (Kyushu, Yakushima), Ryukyu and Taiwan.

草本，高25—30cm。三出複葉，頂小葉狹卵形，先端銳形。花紫紅色，總狀花序頂生。莢果2—3節，各節半菱形。本種分佈全島各山地林下，其根有根瘤，可作土壤改良之參考。

13. *Desmodium laxiflorum* DC. Prodr. 2: 335, 1825. Fig. 56

A prostrate undershrub, about 1-2 m. high; woody branches clothed with dense short hairs; leaves trifoliolate; petioles 1.5-2 cm. long; leaflets membranous, ovate or broadly oblong, 4-7 cm. long 2-5 cm. wide, acute or sometimes obtuse at the apex, pubescent on upper surface, with minutely appressed hairs 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, Malay, Philippines, Mainland China and Taiwan.

半灌木，莖匍匐性。三出複葉，小葉卵形，先端銳形，有時爲鈍形。花紫色，疏生於腋出或頂生總狀花序。莢果5—7節。本種分佈於全島廣野，可作牧草和綠肥。

14. *Desmodium microphyllum* (THUNB.) DC. Prodr. 2: 337, 1825. Fig. 57

An erect undershrub with very slender branches, slightly hairy; leaves trifoliolate; 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 appressed hairs; stipules 3-5 mm. long, linear lanceolate; flowers very small, pink, 3-6 loosely arranged on a long filiform hairy peduncle forming short lateral racemes, 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.

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

CHINESE NAME: 小葉山藜豆

JAPANESE NAME: Koba-no-hagi.

FLOWERING TIME: July to November.

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

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

半灌木。三出複葉，小葉長橢圓形，長5—10mm。花紫紅色，小型，莢果2—4節。本種分佈於臺中、南投、花蓮等山地。

15. *Desmodium pseudotriquetrum* DC. in Ann. Sci. Nat. 1: 100, 1825. Fig. 58

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.

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

CHINESE NAME: 瓠瓢草，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.

灌木，高約50—60cm，莖呈三角形。葉長橢圓形至披針形，先端銳形，長6—10cm。花紅紫色。莢果6—7節。本種分佈於全島各荒地。

16. *Desmodium pulchellum* (LINN.) BENTH. Fl. Hongk. 83, 1861. Fig. 59

A shrub, about 1–2 m. high, with 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 or subacute at the apex; lateral ones much smaller, upper surface glabrous, lower surface softly pubescent, sometimes slightly undulate 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.

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

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.

灌木，高約1—2m。三出複葉，小葉長橢圓形至披針形，長6—10cm。花白黃，隱藏於兩片大型葉狀苞片中。莢果通常2節。本種分佈於新竹以南各林下山坡或廣野。

17. *Desmodium purpureum* (MILL.) FAWC. & RENDLE, Fl. Jamaica 4: 36, 1920. Fig. 60

An upright, suffrutescent herb, about 90–100 cm. high, slightly pubescent; stipules triangular, 1 cm long, leaves trifoliolate, terminal leaflets lanceolate, obtuse, apiculate, 4–10 cm long, 2–4 cm wide, both surfaces pubescent; flowers purple, 3–4 mm. long, in terminal and axillary racemes; pods 5–6 jointed, 1.5–3 cm. long, both sutures deeply indented, joints 3 mm. long, 3 mm. wide.

CHINESE NAME: 紫花山馬蝗

ENGLISH NAME: Tall Tick Clover, Florida Beggar Weed.

HABITAT: Cultivated.

DISTRIBUTION: Native to tropical and subtropical America.

ECONOMIC VALUE: It is used for pasture, hay, soil cover and green manure.

半灌木草本，高約90—100cm。三出複葉，小葉披針形，鈍尖。花紫色，長3—4mm。莢果5—6節。本種係引進栽培，可供作牧草和綠肥。

18. *Desmodium racemosum* (THUNB.) DC. Prodr. 2: 337, 1825. Fig. 61

A small undershrub, about 60–120 cm. high, branches slender, terete, glabrescent; leaves trifoliolate; 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-rhomboidal, 5–7 mm. long; stalk of pod 2–8 mm long.

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 in having linear stipules being 3–7 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 lands.

DISTRIBUTION: Japan, Ryukyu and Taiwan.

小半灌木，高約60—120cm。三出複葉，小葉卵形或潤卵形，長4—8cm。花紅紫色，呈頂生和腋生總狀花序。莢果2節，各節呈半菱形。本種分佈於桃園、臺中、花蓮等縣林下。

19. **Desmodium reniforme** (LINN.) DC. Prodr. 2: 327, 1825.

Fig. 62

A prostrate herb, with slender filiform branches, 30 cm. long or more, glabrous; leaves simple, subcoriaceous, 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, composed 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 much longer than broad, upper suture straight, lower suture a little constricted.

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

CHINESE NAME: 腎葉山馬蝗

JAPANESE NAME: Zinyo-makie-hagi.

FLOWERING TIME: August to October.

HABITAT: In open thickets at low altitudes.

DISTRIBUTION: India, Java and Taiwan.

匍匐草本。單葉，闊心形或腎形，長1—1.5cm，闊2—2.5cm，無毛。本種分佈於高雄、屏東等縣境原野。

20. **Desmodium scorpiurus** (Sw.) DESV. in Journ. Bot. 1: 122, 1813.

Fig. 63

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 pairs; 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.

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 and by being clothed with hooked-hairs and leafy stipules.

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.

匍匐草本，被鈎狀毛。三出複葉，頂小葉橢圓形。花紫紅色，呈腋生和頂生總狀花序。莢果3—8節，被鈎毛。本種原產熱帶美洲，已歸化本島南部各縣原野，可作牧草或綠肥。

21. *Desmodium sequax* WALL. Pl. Asiat. Rar. 2: 46, t. 157, 1832. var. *sinuatum* (Miq.)

HOSOKAWA in Journ. Soc. Trop. Agr. 4:313, 1932.

Fig. 64

A shrub, about 50–60 cm. high, branches terete, with dense ferrugineous 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 and conspicuously repand at the apex; stipules lanceolate, acute, 5 mm. long, deciduous; racemes terminal and axillary, 10–15 cm. long; flowers solitary or 2 in clusters, loosely arranged 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 ferrugineous hooked hairs and length as long as width.

This species is characterized by the leaves which are undulate along their margins, especially so toward the apex.

The pods with joints of same length and width, covered with ferrugineous hooked hairs, are also outstanding features of this species.

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.

灌木，高約50—60cm，密被絨毛。三出複葉，小葉菱形，葉緣前半部波狀形。花紫色。莢果8—12節。本種分佈於全島山坡，可供作牧草和綠肥。

22. *Desmodium Tashiroi* MATSUM. in Journ. Sci. Coll. 12: 415, 1899. Fig 65

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 oblique, 13–16 mm. long.

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 often with prominent whitish spots in the areolae.

4. Flowers large, 5-7 mm. long.

This species has long been considered as conspecific with *D. laxum* DC. (Matsumura in Journ. Sci. Coll. 12: 415, 1899), but it is apparently different from the latter.

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.

直立草本，高約30cm。三出複葉，頂小葉卵形，先端漸尖，葉腹面具有顯著的白斑。花淡紫色，長5—7mm。本種分佈於中，北部林下。

23. *Desmodium triflorum* (LINN.) DC. Prodr. 2: 334, 1825.

Fig. 66

A small herb, stems filiform and prostrate, wholly clothed with short appressed 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 side, with hooked hairs and reticulate veins.

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.

CHINESE NAME: 蠅翼草，珠仔草

JAPANESE NAME: Hai-makie-hagi.

FLOWERING TIME: All the year round.

HABITAT: In open grasslands.

DISTRIBUTION: Spread throughout the tropical regions.

ECONOMIC VALUE: Used as fodder in hot climatic regions.

一年生小型草本。三出複葉，小葉倒卵形。花紅紫色，單立或2—3叢生於葉腋。莢果2—5節。本種分佈全島各地，可供作牧草和綠肥。

24. *Desmodium umbellatum* (LINN.) DC. Prodr. 2: 325, 1825.

Fig. 67

A shrub, 1-2m. high, branches cylindrical, young branches densely covered 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 dense 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 appressed-hairs and reticulate veins.

This species is distinguished from *D. dispernum* 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.

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.

ECONOMIC VALUE: The wood is used for fuel, while the flowers are of medicinal use.

灌木，高1—2m。三出複葉，小葉卵狀長橢圓形，長4—8cm。花白色，腋生繖形花序。莢果4—5節。本種分佈於本島南端、蘭嶼和綠島。

25. *Desmodium uncinatum* DC. Prodr. 2: 235, 1825.

Fig. 68

A perennial spreading, suffrutescent herb, about 1 m. high or more; stipules minute, leaves pinnately trifoliolate, leaflets lanceolate, acuminate, 4-5 cm. long, 2 cm. wide, with a large white spot along either side of the midrib; flowers white, 8-9 mm. long, in terminal and axillary racemes, calyx campanulate, 5-cleft; pods 8-9-jointed, about 4-5 cm. long, upper suture straight, lower suture deeply indented, joints 6 mm. long, 4 mm. wide.

CHINESE NAME: 西班牙三葉草

ENGLISH NAME: Spanish Clover.

HABITAT: Cultivated.

DISTRIBUTION: A native to tropical America.

多年生半灌木狀草本。三出複葉，小葉披針形，先端漸尖，長4—5cm，中肋兩旁具有白色大斑點。花白色，長8—9mm，呈腋生和頂生總狀花序。莢果8—9節。本種係引進種，頗能適應臺灣之環境，可在海拔1,800公尺以下之地區種植，尤宜在砂質土壤生長，可供作優良牧草。

26. *Desmodium zonatum* Miq. Fl. Ind. Bat. 1: 250, 1855.

Fig. 69

An undershrub, about 60 cm. high, with very slender procumbent woody branches, finely downy on 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.

This species is very near to *D. gangeticum*, but it can be easily distinguished from the latter by the straight pods, constricted on both sutures and fusiform joints.

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.

半灌木，高約60cm。單葉卵形或長橢圓狀披針形，長4—6cm。花紫紅色。莢果4—8節。本種分佈於新竹和花蓮等縣境。

17. **Dolichos** LINN.

Dolichos LINN. Sp. Pl. 1: 725, 1753.

Twining herbs; leaves pinnately 3-foliolate; leaflets stipellate; stipules very small; flowers white, reddish to purple, axillary, solitary or usually somewhat fascicled in nodulose racemes; calyx-tube campanulate, teeth long or short; corolla exerted, standard very broad, auricled at the base; wings adnate to the keel; stamens diadelphous, the stigma terminal, below which the style is bearded; pods linear to oblong, flat usually curved, beaked.

About 20-50 species in the tropics of both hemispheres.

CHINESE NAME: 扁豆屬

ENGLISH NAME: Dolichos.

JAPANESE NAME Huzi-mame-zoku.

Key to species

- 1. Flowers about 2 cm long; pods 7-12 cm. long, 2 cm. wide.....(2) *D. lablab*
- 1. Flowers about 1 cm. long; pods 3-7 cm. long, 0.5-1 cm. wide 2
- 2. Plants nearly glabrous.....(1) *D. falcatus*
- 2. Plants pubescent, densely clothed with spreading hairs(3) *D. uniflorus*

1. **Dolichos falcatus** KLEIN in Willd. Sp. Pl. 3: 1047, 1800. Fig. 70

A perennial slender, twining vine, glabrous; stipules small, lanceolate, reflexed, persistent; leaves trifoliolate, leaflets membranaceous, ovate to oblong-ovate, 1-2 cm. long, acute at the base; flowers pink, white or purple, 1 cm. long, in axillary racemes; calyx glabrous, teeth short, pedicels solitary, as long as or exceeding the petioles; pods oblong, somewhat curved, 5-7 cm. long, 8 mm. wide, 6-8-seeded.

This species was reported by Dr. Hosokawa as *D. kosyunesis*, occurring in Taiwan (in Journ. Soc. Trop. Agr. 4: 312, 1932) but after my study, I consider these two are the same species, therefore I treat the latter as a synonym of this species.

CHINESE NAME: 鑷茨扁豆

JAPANESE NAME: Kosyun-hudimame.

FLOWERING TIME: October to March.

HABITAT: In the dry thickets.

DISTRIBUTION: Widely distributed in India, Philippines, and Taiwan.

多年生纖細纏繞藤本。三出複葉，小葉卵形。花紫色。莢果長橢圓形，稍彎，長5—7cm。本種分佈於屏東縣境，可供作牧草。

2. *Dolichos lablab* LINN. Sp. Pl. 725, 1753.

Fig. 71

A twining vine, reaching 6 m. or more, stems usually purplish; stipules small, basifixed; leaves trifoliolate, terminal leaflets ovate, the lateral ones lop-sided, acute or acuminate, 7–15 cm. long; flowers lavender or white, 2 cm. long, 2–4 at each node in elongated racemes; calyx campanulate, 4-cleft; pods oblong, flat, 7–12 cm. long, 2 cm wide, straight or somewhat curved; seeds 3–5.

CHINESE NAME: 扁豆，肉豆，鵲豆

ENGLISH NAME: Hyacinth Bean.

JAPANESE NAME: Ingen Mame.

HABITAT: Cultivated.

FLOWERING TIME: August to December.

DISTRIBUTION: This species is widely cultivated in South and Central America, India, China and Africa.

ECONOMIC VALUE: Seeds are edible and the leaves are used for hay, silage and green manure.

纏繞藤本。三出複葉，小葉卵形，先端漸尖，長7—15cm。花紫色或白色，長2cm。莢果橢圓形，扁平。本種栽培於世界上熱帶地域，可供作飼料和綠肥，種子可供食用。

3. *Dolichos uniflorus* LAM. Encycl. 2: 299, 1786.

An annual herb, suberect or when elongated more or less twining; leaves trifoliolate; leaflets ovate, faintly mucronate, 2–3 cm. long; stipules ovate-lanceolate, 5 mm. long; flowers 1 or 2, axillary on very short pedicels; calyx 5 mm. long, linear acuminate; corolla yellow 1 cm. long; pods oblong, much recurved, 3–4 cm. long, 4–5-seeded.

CHINESE NAME: 黃花扁豆

ENGLISH NAME: Horsegrain, Kulthi Bean.

JAPANESE NAME: Kibana-huzimame.

FLOWERING TIME: September to November.

HABITAT: In the dry thickets of the southern part of the island.

DISTRIBUTION: Tropical Asia.

ECONOMIC VALUE: This species is used for forage, soil cover and green manure; seeds are used as food for cattle.

一年生草本，纏繞莖。三出複葉，小葉卵形。花黃色，莢果長橢圓形，頗彎曲，長3—4cm。本種分佈於屏東、恆春，可作牧草、覆蓋作物和綠肥。

18. *Dolichovigna* HAY.

Dolichovigna HAY. Icon. Pl. Formos. 9: 35, 1920.

Twining vine; leaves trifoliolate, leaflets stipellate and stipulate flowers few in axillary short racemes; calyx campanulate, covered with brown stiff hairs; corolla exerted, wings shorter than the standard and keel; stamens 10, diadelphous; style slender, incurved, with a tuft of hairs near the top; stigma terminal; pods cylindrical, linear, beaked, densely covered with stiff hairs; seeds glossy, cylindrical, truncate.

CHINESE NAME: 毛藕豆屬

ENGLISH NAME: *Dolichovigna*.

Key to species

1. Terminal leaflets ovate-lanceolate, about 8 cm. long.....(1) *D. formosana*
1. Terminal leaflets rhomboidal-ovate, about 3-4 cm long.....(2) *D. rhombifolia*

1. *Dolichovigna formosana* HAY. Icon. Pl. Formos. 9: 35, 1920.

Fig. 72

An annual, slender, twining herb, pubescent; leaflets 3, terminal leaflets ovate-lanceolate, acute at the apex, rounded at the base, 8 cm. long; lateral ones oblique; flowers purplish, 12-15 mm. long, in short racemes; pods linear, densely clothed with brown hairs, 7-8 cm. long.

CHINESE NAME: 毛藕豆

JAPANESE NAME: Taiwan-huzimame.

FLOWERING TIME: November to March.

HABITAT: In dry thickets in the southern part of Taiwan.

DISTRIBUTION: India, Malaya, Philippine and Taiwan.

纖細纏繞草本。三出葉，頂小葉菱形，先端銳形，長3.5—4cm。花長1cm。莢果線形，密被褐色硬毛。本種分佈於臺南、高雄等縣。

2. *Dolichovigna rhombifolia* HAY. Icon. Pl. Formos. 9: 36, 1920.

Fig. 73

A slender, twining herb, densely pubescent; leaves 3-foliolate; terminal leaflets rhomboidal-ovate, acute at the apex, 3.5-4 cm. long; flowers 1 cm. long, in axillary racemes; calyx oblique, campanulate 4 mm. long, pubescent; pods linear, densely covered with brown hairs, 5-6 cm. long.

CHINESE NAME: 菱葉藕豆

JAPANESE NAME: Kobano-huzimame.

FLOWERING TIME: August to October.

HABITAT: On the dry waste places in southern part of the island.

DISTRIBUTION: Endemic.

一年生纏繞草本。三出複葉，小葉卵狀披針形，先端銳形長8cm。花紫色，長12—15mm。莢果線形，密被褐色長硬毛，長7—8cm。本種分佈於臺南、高雄等縣。

19. *Dumasia* DC.

Dumasia DC. in Ann. Soc. Nat. Ser. 1(4): 96, 1825.

Climbing herbs, leaves 3-foliolate, leaflets stipellate; flowers whitish yellow; in axillary racemes; calyx-tube cylindrical, gibbous with a very oblique subtruncate mouth; corolla exserted, standard spurred on both sides, wings and keels adherent, with small blades and very long claws; stamens diadelphous, anthers uniform; pods linear, falcate, dehiscent, torulose.

About 6 species widely distributed in North America, Malaya, Java, Philippine, Mainland China and Taiwan.

Dumasia bicolor HAY. Fl. Mormos. 75. 1908.

Fig. 74

A twining herb; leaves 3-foliolate, terminal leaflets ovate, acute at the apex, 6 cm. long; stipules setaceous, 5 mm. long; flowers in axillary racemes, calyx tubular 9 mm. long, with an oblique subtruncate mouth; corolla yellow, 14 mm. long; pods linear, villose, always 1-seeded.

CHINESE NAME: 臺灣野豇豆

JAPANESE NAME: Taiwan-nosasage.

FLOWERING TIME: July to October.

HABITAT: In open thickets and secondary forests of the island.

DISTRIBUTION: Endemic to Taiwan.

纏繞草本。三出複葉，小葉卵形，先端銳形，長6 cm。花黃色，呈腋生總狀花序。莢果線形，具長柔毛。本種分佈於南投、花蓮等縣山上。

20. *Dunbaria* WIGHT ET ARNOTT.

Dunbaria WIGHT ET ARNOTT. Prodr. 1: 258, 1824.

Slender, woody or herbaceous climbers; leaves trifoliolate, distinctly gland-dotted on the lower surfaces, stipels rarely present; flowers few, axillary; solitary or racemose; calyx-teeth long and narrow, the lowest distinctly exceeding the others; corolla exserted, standard auricled, stamens diadelphous, anthers uniform; pods linear, flattened, not marked with depressed lines between the seeds.

About 15 species widely distributed from India to Japan, southward to Australia.

CHINESE NAME: 野扁豆屬

JAPANESE NAME: No-azuki-zoku.

Dunbaria rotundifolia MERR. in Philip. Journ. Sci. 15: 242, 1919.

Fig. 75

A twining herb, with very slender stems, pubescent; leaves trifoliolate; leaflets round-rhomboid, 1-2 cm. long, the lower surface distinctly dotted with small, reddish glands; stipules minute, linear, 2 mm. long; flowers yellow, 3-4 on short peduncles; calyx gland-dotted, pubescent, 4 mm. long; pods linear, recurved, 3-5 cm. long, 6-8-seeded.

CHINESE NAME: 臺灣野扁豆

JAPANESE NAME: Takasago-no-azuki.

FLOWERING TIME: August to November.

HABITAT: In the thickets in the central part of the island.

DISTRIBUTION: Widely distributed in Asia and Australia.

纖細纏繞草本。三出複葉，小葉菱形，長1—2cm。葉腹面具有顯著的紅色腺點。花黃色，3—4朵，呈短總狀花序。莢果線形，長3—5cm。本種分佈於臺中、屏東等縣山地叢林。

21. *Galactia* P. BR.

Galactia P. BR. Hist. Jam. 298, 1756.

Twining herbs; leaves trifoliate; stipellate; flowers racemose, small; the nodes of the inflorescence usually enlarged; calyx tube short, teeth narrow, linear or lanceolate, the upper two connate; petals nearly equal in length; keel obtuse, nearly straight; stamens diadelphous, anthers uniform; pods linear, flattened, recurved.

About 45 species, mostly in Tropical America.

CHINESE NAME: 乳豆屬

JAPANESE NAME: Hagikazura Zoku.

Key to the species

1. Leaflets round or elliptical, emarginate at the apex,
1.5–2 cm. long, as long as broad (2) *G. Tashiroi*
1. Leaflets oblong or lanceolate, obtuse or emarginate
at the apex, 2–4 cm. long, twice as long as as wide..... 2
2. Peduncles slender; pods distinctly falcate, 5 cm. long *G. formosana*
2. Peduncles stout; pods nearly straight, the base or
tip curved, less than 5 cm. long..... (3) *G. tenuiflora*

1. *Galactia formosana* MATSUM. in Journ. Sci. Coll. 12: 424, 1899.

A twining herb; leaves trifoliate; leaflets oblong or lanceolate, 2–4 cm. long, undersurface clothed with appressed hairs; flowers 4–5, in axillary racemes, 7–8 mm. long; calyx 4-lobes, 5 mm. long; pods linear, flattened, 5 cm. long, 7–8-seeded.

CHINESE NAME: 臺灣乳豆

JAPANESE NAME: Wusuba-hagi-kadsura.

FLOWERING TIME: September to November.

HABITAT: In the thickets of the southern part of the island.

DISTRIBUTION: Endemic.

纏繞草本。三出複葉，小葉長橢圓形或披針形，長2—4cm。花粉紅色，4—5，呈腋生總狀花序。莢果線形，扁平，長5cm。本種分佈於屏東縣，係本島原產。

2. *Galactia Tashiroi* MAXIM. in Bull. Acad. Sci. St. Petersburg. 31: 34, 1886.

A twining herb; leaves trifoliate; leaflets round or elliptical, emarginate at the

apex, 1.5–2 cm. long, lower surface densely clothed with appressed hairs; flowers 6 to 8, in axillary racemes; calyx 4–5 mm. long, clothed with appressed hairs; pods linear, flattened, 4–5 cm. long; 5–8-seeded.

CHINESE NAME: 田代氏乳豆

JAPANESE NAME: Hagi-kazura.

FLOWERING TIME: May to July.

HABITAT: In the open thickets in the southern part of Taiwan and adjacent islands.

DISTRIBUTION: Ryukyu and Taiwan.

纏繞草本。三出複葉，小葉圓形或橢圓形，長 1.5—2cm。花 6—8，呈總狀花序。莢果線形，扁平，長 4—5cm。本種分佈於屏東縣境內。

3. *Galactia tenuiflora* WILLD. ex Wight et Arn. Prod. 206, 1834.

Fig. 76

A slender twining herb; leaves trifoliolate; leaflets oblong, rounded at the apex, 2 cm. long, densely clothed with appressed hairs; stipules lanceolate, small, deciduous; flowers 4–8, 10 mm. long, axillary, in slender racemes; calyx 6 mm. long, pubescent; pods linear, flattened, sparingly pubescent, 3–5 cm. long; 7–8 seeded.

CHINESE NAME: 小花乳豆

JAPANESE NAME: Kobana-hagikazura.

FLOWERING TIME: September to October.

HABITAT: In thickets.

DISTRIBUTION: India to Malaya, Australia, Southern China and Taiwan.

纖細纏繞草本。三出複葉，小葉長橢圓形，先端圓形，長 2 cm。花粉紅色，4—8，呈腋生總狀花序。莢果線形，扁平，長 3—5cm。本種分佈於全島原野。

22. *Glycine* LINN.

Glycine LINN. Sp. Pl. 1: 753, 1753.

Twining herbs; leaves trifoliolate, rarely 5 or 7; leaflets stipellate; stipules small and free from the petioles; flowers small; purple or white, in short axillary racemes; calyx tube campanulate, teeth distinct, long or short; petals about equal; the standard not infolded, style short, beardless; stamens more or less monadelphous; anthers uniform; pods narrow, linear, or linear-oblong, somewhat flattened, usually constricted between the seeds.

About 40 species distributed in Africa, Asia and Australia.

CHINESE NAME: 大豆屬，黃豆屬

JAPANESE NAME: Daizu Zoku.

Key to species

1. Inflorescence longer than the leaves, about 4–8 cm long 2
1. Inflorescence shorter than the leaves, about 1–3 cm long 4

- 2. Terminal leaflets ovate(1) *G. javanica*
- 2. Terminal leaflets linear, oblong or lanceolate..... 3
- 3. Plants covered with thin appressed hairs; terminal leaflets oblong, 1.5-2 cm. long.....(3) *G. tabacina*
- 3. Plants densely villose; terminal leaflets linear-oblong or lanceolate, 4 cm. long.....(5) *G. tomentosa*
- 4. Stems erect, stout; leaflets broadly ovate.....(2) *G. max*
- 4. Stems slender, twining; leaflets elliptical or linear..... 5
- 5. The terminal leaflets elliptical, rounded or mucronate at the apex, 3-3.5 cm long.....(4) *G. tomentella*
- 5. The terminal leaflets linear, obtuse at the apex, 2-3 cm. long(6) *G. ussuriensis*

1. **Glycine javanica** LINN. Sp. Pl. 754, 1753. Fig. 77

A perennial twining vine, covered with reflexed appressed hairs; stipules ovate, 1-5 mm. long; leaves pinnately trifoliolate, leaflets ovate, acute, 3-10 cm. long, upper surface glabrous, lower surface pilose to silky-strigose; flowers many in dense axillary racemes; calyx 4-6 mm. long, sparsely strigillose, teeth about three times the length of the tube; corolla white, 4-6 mm; long; pods oblong-linear, 2-3 cm. long, transversely septate; seeds 3-5.

CHINESE NAME: 爪哇大豆, 野生大豆

ENGLISH NAME: Rhodesian Kudzu.

HABITAT: Cultivated.

FLOWERING TIME: October to December.

DISTRIBUTION: India, Ceylon, Malaya and Jaya.

ECONOMIC VALUE: This species is used as forage and green manure.

多年生纏繞藤本。羽狀三出葉。小葉卵形，頂端銳形，長3—10cm。花白色，腋生總狀花序。莢果線形，長2—3cm。本種於1960年由澳洲引進，頗適合本島環境，生長優良，可作牧草、覆蓋作物及綠肥。

2. **Glycine max** (L.) MERR. Interpret. Herb. Amb. 274, 1917. Fig. 78

An annual herb, stems usually stout, erect, covered with brown hairs, about 60-100 cm. high; stipules broadly ovate, 3-7 mm. long; leaves pinnately trifoliolate, leaflets ovate to narrowly-ovate, obtuse or short-acute, apiculate, 8-14 cm. long, usually sparsely silky strigose on both surfaces; flowers few in axillary racemes; calyx 5-7 mm. long, setose, teeth subequal, lanceolate; corolla white or purple, 6-7 mm. long; pods oblong, 2-7 cm. long, pendent, coarsely covered with brown hairs; seeds 2-3.

CHINESE NAME: 大豆, 黃豆

ENGLISH NAME: Soya Bean.

JAPANESE NAME: Dai-zu.

HABITAT: Cultivated.

DISTRIBUTION: Mainland China and Japan.

ECONOMIC VALUE: Soya Bean is chiefly cultivated for the seeds which are used for human food, oil and the whole plant for forage.

一年生直立草本。三出複葉，小葉卵形，先端鈍形或具細尖，長3—7cm。花少數，紫色，呈腋生總狀花序。莢果長橢圓形，長2—7cm。本種種子供食用和榨油，莖、葉可作飼料。

3. *Glycine tabacina* (LABILL.) BENTH. Fl. Austr. 2: 244, 1864.

A scandent herb, clothed with thin appressed hairs; leaves trifoliate; the terminal leaflets oblong or lanceolate, 1.5–2 cm. long, obtuse at the apex, lower surface clothed with appressed hairs; stipules lanceolate, 2.5 mm. long; flowers 5–7 mm. long, in axillary racemes; calyx campanulate 4 mm. long, teeth 5; pods linear 2 cm. long.

CHINESE NAME: 澎湖大豆

JAPANESE NAME: Tabano-mame.

FLOWERING TIME: August.

HABITAT: In open grass lands by the seashore.

DISTRIBUTION: Australia, Mainland China and Taiwan.

攀援草本。三出複葉，頂小葉長橢圓形或披針形，先端鈍形。花紫色，長5—7mm。莢果線形，長2cm。本種分佈於澎湖一帶島嶼，可作綠肥。

4. *Glycine tomentella* HAY. Icon. Pl. Formos. 9: 29, 1920. Fig. 79

A scandent or prostrate herb, densely clothed with appressed hairs; leaves trifoliate; leaflets elliptical, rounded or mucronate at the apex, 3–3.5 cm. long; stipules lanceolate, triangular 2.5 mm. long, hirsute; flowers violet, in short axillary racemes, calyx campanulate, 3.5 mm. long, densely hairy, pods linear, dehiscent, 1 cm. long, 1–3-seeded.

Differs from *G. tomentosa* in having elliptic leaflets rounded or mucronate at the apex and very short inflorescence.

CHINESE NAME: 闊葉大豆

JAPANESE NAME: Hiroha-yabu mame.

FLOWERING TIME: October to April.

HABITAT: In open grasslands at Mao-pi-tou, Ping-tung Hsien.

DISTRIBUTION: Endemic.

攀援或纏繞草本。三出複葉，小葉橢圓形，端圓形或具短先尖，長3—3.5cm。花紫色，呈腋生總狀花序。莢果線形，長1cm。本種分佈於屏東縣境內，可作改良土壤之參考。

5. *Glycine tomentosa* BENTH. Fl. Austr. 2: 245, 1864. Fig. 80

A twining or prostrate herb, densely villose; leaves trifoliate; leaflets linear-oblong or lanceolate, obtuse at the apex, 4 cm. long; stipules lanceolate, acute 3 mm. long; flowers violet, 7 mm. long, in long axillary racemes; inflorescence longer than the leaves; calyx campanulate, 3 mm. long, densely clothed with hairs; pods linear, dehiscent, clothed with appressed hairs, 2–3 cm. long, 6–8-seeded.

CHINESE NAME: 長葉大豆

JAPANESE NAME: Nagaba-yabu mame.

HABITAT: In open fields.

DISTRIBUTION: Southern China, Philippines and Australia.

纏繞或匍匐草本。三出複葉，小葉線狀長橢圓形或披針形，先端銳形長，4 cm。花紫色。莢果線形，密被貼伏毛，長2—3cm。本種分佈於新竹、臺東等縣原野，可作牧草。

6. *Glycine ussuriensis* REGEL & MAACK, in Tent. Fl. Ussure 50, 1861. Fig. 81

An annual twining vine; stems pilose; leaves trifoliolate, leaflets linear, obtuse, mucronate 2-3 cm. long, both surfaces with silky-strigose hairs; stipules deltoid, hirsute 2 mm. long; flowers 5 mm. long, in axillary racemes, calyx pilose 3-4 mm. long, teeth lanceolate, acuminate; pods linear, falcate, dehiscent, 1.5-2.5 cm. long, densely clothed with spreading, ferruginous hairs; seeds 2-3.

CHINESE NAME: 野大豆，蔓豆

JAPANESE NAME: Tsuru-mame.

FLOWERING TIME: August to October.

HABITAT: In open fields.

DISTRIBUTION: Japan, Korea, Northern and Central China and Formosa.

一年生纏繞藤本。三出複葉，小葉線形，先端鈍形，具短尖，長2—3cm。莢果鐮狀線形，長1.5—2.5cm，密被褐色絨毛。本種分佈於桃園、新竹一帶，可作牧草。

23. *Indigofera* LINN.

Indigofera LINN. Sp. Pl. 751, 1753.

Shrubs or perennial herbs, covered with appressed hairs; leaves odd-pinnate, rarely trifoliolate, sometimes simple; stipules herbaceous, subulate to setaceous; flowers small, usually in axillary racemes, pink, red to purple; calyx campanulate, 5-toothed, the lowest one longest, standard ovate to obovate, keels straight, not beaked, spurred at the base; stamens diadelphous or monadelphous, anthers spiculate, centrally attached; pods linear-cylindrical or angular, often curved, dehiscent; 1 to many seeded; the seeds usually separated by false partitions.

About 400 species in tropical and subtropical regions of both hemispheres.

CHINESE NAME: 木藍屬

ENGLISH NAME: Indigo.

JAPANESE NAME: Komatunagi Zoku.

Key to the species

1. Leaves simple.....(6) *I. tinifolia*
1. Leaves compound..... 2
2. Leaves trifoliolate..... 3
2. Leaves pinnate..... 4

- 3. Leaflets obovate, the lower surfaces not gland-dotted;
pods not 4-winged.....(11) *I. trifoliata*
- 3. Leaflets oblanceolate or oblong, the lower surfaces
small gland-dotted; pods 4-winged.....(4) *I. glandulifera*
- 4. Plants densely clothed with spreading brown hairs(5) *I. hirsuta*
- 4. Plants quite or nearly glabrous or slightly pubescent 5
- 5. Leaflets less than 1 cm. long..... 6
- 5. Leaflets more than 1 cm. long 7
- 6. Stems slender; flowers in long filiform racemes; pods 4-angled..(1) *I. byobiensis*
- 6. Stems stout; flowers in spike-like racemes; pods not 4-angled..(8) *I. ramulosissima*
- 7. Pods much curved.....(9) *I. suffruticosa*
- 7. Pods straight or only curved at the apex 8
- 8. Stems creeping; leaflets alternate.....(2) *I. endecaphylla*
- 8. Stems erect; leaflets opposite..... 9
- 9. Pods deflexed.....10
- 9. Pods ascending and spreading11
- 10. Leaflets 5-15; racemes as long as leaves.....(10) *I. tinctoria*
- 10. Leaflets 15-17; racemes twice as long as leaves.....(47) *I. nigrescens*
- 11. Leaflets 3-5 cm. long; flowers dense; pods 4-5 mm.
broad(13) *I. Zollingeriana*
- 11. Leaflets 1-2.5 cm. long; flowers loose; pods 2-3 mm. broad12
- 12. Upper surfaces of leaves glabrous.....(12) *I. venulosa*
- 12. Upper surfaces of leaves pubescent(3) *I. galegoides*

1. **Indigofera byobiensis** HOSOKAWA in Journ. Soc. Trop. Agr. 4: 200, 1932. Fig. 82

A slender shrub, about 30-50 cm. high; branches clothed with appressed hairs; stipules setaceous, 1-2 mm. long; leaves pinnate, 5-7 leaflets, oblong or elliptical, both surfaces covered with appressed hairs, the lower parts denser than the upper parts; racemes filiform, axillary, 5-7 cm. long, much longer than leaves; flowers red, 4-5 mm. long; pods linear, 4-angled, 2.5 cm. long, 2.5 mm. wide, clothed with appressed hairs; 5-7 seeded.

The present species is allied to *I. tinctoria* L., but it differs from the latter by having very long filiform racemes and 4-angled legumes.

CHINESE NAME: 貓鼻頭木藍

JAPANESE NAME: Hai-komatunagi.

FLOWERING TIME: May to August.

HABITAT: In open grasslands.

DISTRIBUTION: Endemic to Taiwan.

纖細灌木。羽狀複葉，小葉5—7，長橢圓形。花紅色。莢果線形，具四稜角，長2.5cm。本種分佈於屏東縣。

2. *Indigofera endecaphylla* JACQ. Icon. Pl. Rar. t. 570, 1786. Fig. 83

An annual herb; stems prostrate or trailing, clothed with grey appressed hairs; leaves pinnate compound, 2.5–7 cm. long, leaflets usually 9–11, alternate, oblanceolate to obovate, sometimes linear, 10–20 mm. long, rarely up to 20 mm. long, clothed with a few appressed hairs on lower surfaces; racemes about as long as the leaves; flowers small, violet-purple; pods linear, straight, 4-angled, 10–20 mm. long, glabrescent; 8–10 seeded.

CHINESE NAME: 十一葉馬棘

ENGLISH NAME: Trailing Indigo.

FLOWERING TIME: May to September.

HABITAT: In open grasslands.

DISTRIBUTION: India to southeastern China, tropical and southern Africa.

ECONOMIC VALUE: Trailing Indigo is a very good cover crop, but it is toxic to animals.

一年生葡萄草本。羽狀複葉，小葉9—11，倒披針形至倒卵形。花紫紅色。莢果直立，線形。本種分佈於本島北部、中部，係一種優良的覆蓋植物。

3. *Indigofera galeoides* DC. Prodr. 2: 225, 1825. Fig. 84

A shrub, about 1 m high, branches thinly clothed with appressed hairs when young; leaves pinnate, 10–15 cm. long, with 21–25 leaflets, opposite, oblong, 2 cm. long, 6–8 mm. wide, both surfaces clothed with short appressed hairs; racemes 6–10 cm. long, flowers dense, 9 mm. long, rose-red; pods 5–7 cm. long, subcylindrical, straight, upward; 15–18 seeded.

CHINESE NAME: 假大青藍

JAPANESE NAME: Mansu-komatunagi.

HABITAT: In open grasslands.

DISTRIBUTION: Mainland China and Taiwan.

灌木。羽狀複葉，小葉21—25。花紅色。莢果長5—7cm。本種分佈於屏東縣境內。

4. *Indigofera glandulifera* HAY. Mater. Fl. Formos. 74. 1911. Fig. 85

A small shrub, about 20–30 cm. high, with many slender branches, clothed with appressed hairs when young; leaves trifoliate, 2–3 cm. long; leaflets oblong-obovate, oblanceolate, 1 cm long, 4 mm. wide; both surfaces clothed with appressed hairs, lower surface gland-dotted; racemes very short, less than 5 mm. long; flowers small, 3 mm. long, clustered in the axils; pods linear, slightly complanate, 4-winged, about 12 mm. long, 1.5 mm. wide.

JAPANESE NAME: Kosyun-komatunagi.

FLOWERING TIME: June to September.

HABITAT: In waste places in the southern part of the island.

DISTRIBUTION: An endemic plant to Taiwan.

小灌木。三出複葉，小葉長橢圓形，倒披針形，腹面具有腺點。花紅色，腋生。莢果線形。本種分佈於高雄、屏東縣內，可作土壤改良之參考。

5. *Indigofera hirsuta* LINN. Sp. Pl. 751. 1753. Fig. 86

An annual or biennial herbaceous plant, 50–60 cm. high, stems densely clothed with short brown spreading hairs; stipules setaceous, plumose, 1 cm. long; leaves 8–10 cm. leaflets 5–7, obovate, 3–3.5 cm. long, densely clothed with appressed hairs; racemes 10–25 cm. long, shorter than leaves, flowers very dense, red, 4–5 mm. long; pods linear, straight, densely clothed with spreading hairs; 6–8 seeded.

CHINESE NAME: 毛馬棘

ENGLISH NAME: Hairy Indigo.

JAPANESE NAME: Tanuki-komatunagi.

FLOWERING TIME: June to September.

HABITAT: In waste places.

DISTRIBUTION: Widely spread throughout the regions of tropical Asia, Africa America and Australia.

ECONOMIC VALUE: It is cultivated as a cover and green manure, but it is also used for hay and pasture.

一年生草本，密被褐色短毛。羽狀複葉，小葉5—7，倒卵形。花紅色，密生呈腋生總狀花序。莢果線形。本種分佈於本島各平地，可作覆蓋植物，綠肥和飼料。

6. *Indigofera linifolia* RETZ. Obs. 4: 29, 1786. Fig. 87

An annual herb, 15–20 cm. high, with many slender branches, clothed with silvery hairs; stipules minutely setaceous; leaves simple, linear acute, both surfaces, more or less densely clothed with white pubescence; racemes shorter than the leaves, 5–8 mm. long; flowers red, 3.5 mm. long; pods small, round, 2 mm. in diameter, covered with silvery hairs.

CHINESE NAME: 細葉木藍

JAPANESE NAME: Hime-konatanagi.

FLOWERING TIME: May to August.

HABITAT: On dry rocky and grassy banks.

DISTRIBUTION: India, Ceylon, Malaya, Australia, Philippines, Mainland China and Formosa.

一年生草本，密被銀白色毛。單葉線形。花紅色，腋生。莢果圓形，長約2 mm。本種分佈於高雄、屏東、臺東等縣。

7. *Indigofera nigrescens* KURZ. EX PRAIN in Journ. As. Soc. Beng. 67: 286, 1898.

Fig. 88

An erect shrub, over 50 cm. high, clothed with appressed hairs; leaves pinnate, 8 cm. long; leaflets 15–17, oblong, 20 mm. long, 10 mm. wide, both surfaces covered

with appressed hairs; racemes almost twice as long as the leaves; flowers red, 7 mm. long, dense; bracts prominent; pods 15-20 mm. long, straight or slightly recurved, 7-8 seeded.

CHINESE NAME: 臺灣木藍

JAPANESE NAME: Yambaru-komatunagi.

FLOWERING TIME: June.

HABITAT: Distributed in open grasslands of southern Taiwan.

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

灌木。羽狀複葉，小葉15—17，長橢圓形，長20cm。花紅色。本種分佈於花蓮，屏東等縣。

8. *Indigofera ramulosissima* HOSOKAWA in Journ. Soc. Trop. Agr. 4: 199, 1932.

Fig. 89

A small stout shrub, with many firm, subglabrous branchlets; leaves under 3 cm. long, leaflets 7, obovate 3-8 mm. long, apex obtuse or emarginate; stipules minute setaceous; racemes 1.3-2.5 cm. long, axillary, 6-12 flowered; flowers 3-3.5 mm. long; calyx 2-3 mm. densely covered with grey hairs, teeth deltoid, as long as the calyx tube; pods linear, straight, 1.5 cm. long; 4-6 seeded.

Very similar to *I. semitrijuga* Forsa., but the present species differs chiefly from the latter in having many subglabrous branchlets and having the lobes of calyx deltoid.

CHINESE NAME: 太魯閣木藍

JAPANESE NAME: Taroko-komatunagi.

HABITAT: On dry rocky slopes.

DISTRIBUTION: An endemic plant to Taiwan.

小灌木。羽狀複葉，小葉7枚，倒卵形。花長3—3.5mm，呈腋生總狀花序。本種分佈於花蓮縣境。

9. *Indigofera suffruticosa* MILL. Gard. Dict. 8: 2, 1768.

Fig. 90

An erect shrub 90-150 cm. long, clothed with grey appressed hairs; leaves 5-8 cm. long, pinnate, leaflets 7 sometimes 3-5, obovate, lower surfaces clothed with appressed hairs; racemes spike-like, axillary, flowers red, 5 mm. long; pods 10-15 mm. crowded, reflexed, strongly curved; 6-8 seeded.

CHINESE NAME: 大青，野青樹

FLOWERING TIME: Most of the year.

HABITAT: In open waste places throughout this island.

DISTRIBUTION: Mainland China, Philippines and Taiwan.

ECONOMIC VALUE: This species is well known as a source of indigo and is also used to some extent for cover and green manure.

直立灌木，高約90—150cm。羽狀複葉，小葉7枚，倒卵形。花紅色。莢果反捲，長10—15mm。本種分佈於全島各地廣野，可作覆蓋和綠肥。

10. *Indigofera tinctoria* LINN. Sp. Pl. 751, 1753.

Fig. 91

An erect shrub, 50–60 cm. high, branches with thin silvery hairs; leaves pinnate, 2.5–5 cm. long; leaflets 9–13, obovate-oblong, 15 mm. long turning blackish when dried; racemes axillary, nearly sessile, shorter than the leaves; flowers reddish-yellow, 4–5 mm. long; pods straight, 2.5 mm. long, 8–10 seeded.

CHINESE NAME: 木藍

JAPANESE NAME: Taiwan-komatunagi.

FLOWERING TIME: August to December.

HABITAT: In waste places.

DISTRIBUTION: Pantropic.

ECONOMIC VALUE: *I. tinctoria* is the main source of indigo. It is unpalatable, but is sometimes used for cover and green manure.

直立灌木，高50—60cm。羽狀複葉，小葉9—13，倒卵狀長橢圓形，長1.5cm。花紅色。莢果直立，長2.5mm。本種分佈本島南部，可用作覆蓋和綠肥的參考。

11. *Indigofera trifoliata* LINN. Cent. Pl. 2: 29, 1756.

Fig. 92

A small shrub, about 15–30 cm. high, with many procumbent or scandent branches, clothed with thinly appressed hairs; leaves trifoliolate, 10–25 mm. long; leaflets obovate, emarginate, 10 mm. long, 5–8 mm. wide; stipules minutely setaceous, both surfaces covered with appressed hairs and without glandular dots on lower surface; racemes axillary, 6–12 flowered, usually shorter than the leaves; calyx 2 mm. long, teeth setaceous; corolla 6–7 mm. long, red; pods straight, deflexed, 12–15 mm. long, glabrescent, 6–8 seeded.

CHINESE NAME: 三葉木藍

JAPANESE NAME: Mituba-koatunagi.

HABITAT: In open grasslands.

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

小灌木。三出複葉，小葉倒卵形，長10cm。花紅色，長7mm，呈腋生總狀花序。莢果直立，長1—1.5cm。本種分佈於屏東、臺東等縣，可作牧草和綠肥。

12. *Indigofera venulosa* CHAMP. in Hook. Kew, Journ. Bot. 4: 44, 1852.

Fig. 93

An erect shrub, 30–50 cm. high, plants glabrous; leaves pinnate, 10–15 cm. long; leaflets 10–15 cm. long; leaflets 11–15, ovate or rounded, 2–2.5 cm. long, 1–1.5 cm. wide, undersurface covered with appressed hairs, veinlets prominent; racemes slightly shorter than leaves, axillary; flowers light purple, 11 mm. long; pods straight, 4–5 cm. long, 10–12 seeded.

CHINESE NAME: 脈葉木藍

JAPANESE NAME: Taiwan-kusahudi.

HABITAT In thickets.

DISTRIBUTION: Mainland China and Formosa.

直立灌木。羽狀複葉，小葉11—15，卵形或圓形，長2—2.5cm。花紫色，長11mm。本種分佈於桃園、臺中、花蓮等縣山地。

13. *Indigofera Zollingeriana* MIQ. Fl. Ind. Bat. 1: 310, 1855.

Fig. 94

A shrub, about 50-60 cm. high, branchlets straight; leaves pinnate, 11-15 cm. long, leaflets 9 or 11, oblong 3-4.5 cm. long, 1.5-2 cm. wide; flowers in terminal and axillary racemes, about 8-10 cm. long; flowers densely arranged; calyx broadly campanulate, 1.5 mm. long; corolla 9 mm. long, red; pods linear, cylindrical, 3-4 cm. long, 10-20 seeded.

CHINESE NAME: 紅頭馬棘

JAPANESE NAME: Kotokomatunagi.

HABITAT: In thickets along the seashore on the southern part of the island.

DISTRIBUTION: Malaya, Philippines, Southern China and Taiwan.

24. *Kummerowia* SCHINDLER

Kummerowia SCHINDLER Repert. Sp. Nov. Fedde 10: 403, 1912.

Prostrate or decumbent annual herbs; stems slightly clothed with pubescence; leaves trifoliolate, usually small; without stipels; stipules small, membranaceous, 5-7 mm. long; flowers 5 mm. long, axillary, often of 2 kinds, papilionaceous and cleistogamous flowers, pink; calyx 5-lobed, teeth ovate, two bracts at the base of calyx; pods 3 mm long, with only one joint, flattened, sessile.

Only two species distributed in temperate regions of eastern Asia.

CHINESE NAME: 雞眼草屬

JAPANESE NAME: Yahazuso Zoku.

Key to species

1. Branches covered with antrorse hairs; leaflets 0.7-14 cm. long, usually obovate, emarginate, margin bristly ciliate, bracts 1-3 veined; calyx glabrous; pods 2.5 mm long, elliptical, about half the length of calyx.....(1) *K. stipulacea*
1. Branches covered with retrorse hairs; leaflets 10-15 mm. long, oblong, obtuse or somewhat acute; bracts 5-7 veined; calyx covered with appressed hairs; pods 3.5 mm. long, spherical, as long as the length of calyx(2) *K. striata*
1. *Kummerowia stipulacea* (MAXIM.) MAKINO in Bot. Mag. Tokyo 28:107, 1914.

Fig. 95

An erect annual herb, about 40 cm. high; stems slender, branched with antrorse hairs; stipules ovate, 5 mm. long, leaves trifoliolate, upper leaflets oblong, lower ones obovate, emarginate, margin bristly ciliate, 0.7-14 cm. long; flowers 5 mm. long, pink; bracts with 1-3 veined, calyx glabrous, more than half the length of the pods; pods 2.5 mm. long, elliptical, rounded at the apex, with a very short straight or recurved point.

CHINESE NAME: 圓葉雞眼草

ENGLISH NAME: Korean Lespedeza.

JAPANESE NAME: Maruba-yahazuso.

HABITAT: Open grassland and roadside.

FLOWERING TIME: August to October.

DISTRIBUTION: Manchuria, Korea, Japan, Mainland China and Taiwan.

ECONOMIC VALUE: It is used as fodder and green manure.

直立一年生草本，高約40cm。三出複葉上部，小葉長橢圓形，下部小葉倒卵形。花紫紅色，長5mm。莢果橢圓形，先端圓形，具短尖凸。本種分佈於臺中縣草原和路旁，可作牧草和綠肥。

2. *Kummerowia striata* (THUNB.) SCHINDL. in Repert. Sp. Nov. Fedde 10: 403, 1912.

Fig. 96

An erect annual herb; branches with retrorse hairs; stipules narrowly ovate, 5-8 mm. long, persistent; leaves trifoliate; leaflets membranaceous, oblong, 10-15 mm. long, 5-8 mm. wide, obtuse or somewhat acute at the apex; flowers 5 mm long, pink; bracts as long as the calyx tube, ovate, obtuse, with 5-7 veins; calyx 3 mm. long, 5-cleft, teeth ovate, half as long as the calyx; cleistogamous flowers present, calyx the same as in papilionaceous flowers; pods 3.5 mm. long, flattened, slightly spherical, clothed with appressed hairs.

This species differs from *K. stipulacea* by its calyx being less than half the length of the beaked pods.

CHINESE NAME: 雞眼草

ENGLISH NAME: Common or Japanese Lespedeza.

JAPANESE NAME: Yahazu-so.

HABITAT: Very common in open waste grasslands at low altitudes.

FLOWERING TIME: August to October.

DISTRIBUTION: Japan, Korea, Manchuria, Mainland China, Ryukyu and Taiwan.

ECONOMIC VALUE: Used for forage and green manure.

直立一年生草本。三出複葉，小葉長橢圓形。花紫紅色。莢果長3.5mm。本種分佈於本島草原和路旁，可作牧草和綠肥。

25. *Lespedeza* MICHX.

Lespedeza MICHX. Fl. Bor. Amer. 2: 70, t. 39, 1803.

Mostly perennial erect herbs and undershrubs, or rarely annuals; leaves pinnately 3-foliate 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

ENGLISH NAME: Bush Clover.

JAPANESE NAME: Hagi-Zoku.

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 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, 100 mm. long, 5 mm. wide.....(2) *L. chinensis*

1. **Lepedeza bicolor** TURCZ. in Bull. Soc. Nat. Mosc. 13: 69, 1840. Fig. 94

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.

半灌木, 高60—180cm。三出複葉, 小葉長橢圓形, 長 1.5—4cm。花紫紅色, 長 12—17 mm。莢果稍圓形。本種分佈於南投縣山地。

2. **Lepedez chinensis** G. Don Gen. Syst. 2: 307, 1832. Fig. 95

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: 裏白胡枝子

JAPANESE NAME: Uraziro-makichangi.

FLOWERING TIME: July to November.

HABITAT: On brushlands of 1,000-1,500 m.

DISTRIBUTION: Mainland China and Formosa.

ECONOMIC VALUE: This is valuable for pasture and green manure.

直立小灌木。三出複葉，小葉長橢圓形或倒卵形，長10—18mm。花白色，腋生，呈總狀花序。莢果卵形。本種分佈於臺北、南投、花蓮、臺東等縣，可作牧草。

3. *Lespedeza cuneata* (DU MONT. D. COURS.) G. Don Syst. 2: 307, 1832. Fig. 96

A perennial erect herb, about 60-100 cm. high; leaves trifoliate, leaflets linear-oblong, 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 suborbicular, 3 mm. long, longer than the calyx.

CHINESE NAME: 鐵掃帚，千里光

ENGLISH NAME: Sericea, Perennial Lespedeza.

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.

ECONOMIC VALUE: This species is used for hay and also for pasturing and soil improvement.

多年生直立草本。三出複葉，小葉線狀倒披針形，先端鈍形和圓形花白色或黃白色。莢果卵形。本種分佈於全島草原，山坡和路旁，雖不為牛羊所嗜食，但可當為牧草。

4. *Lespedeza daurica* (LAM.) SCHINDL. in Fedde Repert, 22: 274, 1926. Fig. 97

An undershrub, about 20-80 cm. high; stems, leaves, and inflorescence clothed with whitish appressed hairs; stipules setaceous; leaves trifoliate; 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; cleistogamous 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.

半灌木。三出複葉，小葉狹長橢圓形。花密生於葉腋。莢果闊卵形，長3—3.5mm。本種分佈新竹縣海邊，為很有價值的牧草和綠肥。

5. *Lespedeza pubescens* HAY. Mater. Fl. Formos. 80, 1911.

Fig. 98

An erect shrub, about 1-2 m. high; leaves trifoliate; 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.

ECONOMIC VALUE: This species is considered good for fodder.

直立灌木，高約1—2m。三出複葉，小葉長橢圓形，長3—5cm。花紫色，腋生總狀花序。莢果卵形，長1cm。本種分佈於本島中、北部山地，頗有希望的牧草和綠肥。

6. *Lespedeza virgata* (THUNB.) DC. Prodr. 2: 350, 1825.

Fig. 99

An undershrub, about 40-60 cm. high; leaves trifoliate; leaflets ovate-oblong, mucronate at the apex, 10-15 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, 1-25 mm. long.

CHINESE NAME: 蒔繪菝

JAPANESE NAME: Makie-hagi.

FLOWERING TIME: July to September.

HABITAT: Grassland.

DISTRIBUTION: Japan, Korea, Mainland China, Ryukyu and Formosa.

半灌木。三出複葉，小葉卵狀長橢圓形，長7—1.5mm。花白色，腋生。莢果卵狀長橢圓形。本種分佈於臺北、宜蘭、臺中等縣山坡，可作牧草和綠肥。

26. **Lotononis** ECKL. & ZEYH.

Lotononis ECKL. & ZEYH. Enum. 176, 1836.

Herbs or undershrubs; stipules present; leaves digitately trifoliolate; flowers sessile, axillary or in congested racemes; calyx turbinate, the 4 upper teeth often connate; standard oblong; keel upcurved; stamens monadelphous; anthers alternately versatile and basifixed; pods linear, flat or turgid; seeds many.

About 5 species or more are indigenous in Africa.

CHINESE NAME: 羅特豆屬

ENGLISH NAME: *Lotononis*.

Lotonis Bainesii BAKER. in Oliver, Fl. Trop. Afr. 2: 6, 1871. Fig. 100

A perennial, slender herb, stems creeping, branched, glabrous, with adventitious roots at the nodes, about 30 cm. high; stipules ovate, acuminate, leaflets 3, linear, slightly rounded, mucronate, 2.5–4 cm. long, glabrous; flowers 1 cm. long, in dense umbellate heads; calyx 4 mm. long, campanulate, slightly silky pubescence, teeth short; corolla yellow, 3 times as long as the calyx; pods linear, 1.2 cm. long; seeds very small.

CHINESE NAME: 羅特豆

ENGLISH NAME: *Lotononis*.

HABITAT; Cultivated.

DISTRIBUTION: Africa

ECONOMIC VALUE: It is fairly frost resistant, very palatable, grows with grasses in pastures.

多年生，匍匐草本。三出複葉，小葉線形。花黃色，呈繖形狀頭狀花序。莢果線形，長1.2cm。本種係引進栽培者，為一種優良的牧草。

27. **Lotus** LINN.

Lotus LINN. Sp. Pl. 773, 1753.

Annual or perennial herbs, leaves usually 5-foliolate; the lowest pair of leaflets arising from the base of the petiole like stipules; flowers 1 to several in axillary umbels, whitish to yellowish, rose or purple; calyx tube campanulate, teeth equal in length, standard obovate, clawed, exceeding the wings, keel incurved, shortly beaked; stamens diadelphous; filaments dilated at the apex; anther uniform; pods linear, turgid, septate between the seeds, many seeded.

About 150 species, distributed in the temperate regions of world.

CHINESE NAME: 百脈根屬

ENGLISH NAME: Trefoils.

JAPANESE NAME: Miyako-gusa-gusa-zoku.

Key to the species

1. Fleshy herbs; leaflets oblanceolate, 1.5-2 m. long; flowers white usually 4.....(1) *L. australis*
1. Perennial, procumbent herbs; leaflets obovate, 5-10 mm. long; flowers yellow, 1 or 2.....(2) *L. corniculatus* var. *japonicus*

1. **Lotus australis** ANDR. Bot. Rep. t. 624, 1799. Fig. 101

Fleshy herbs; leaves 5-foliolate; leaflets oblanceolate, mucronate at the apex, 1.5-2 cm. long, flowers white, 1.3 mm. long, usually 4 in the axillary umbels; with long peduncles 2-3 cm. long; pods linear, straight, 4-5 cm. long, glabrous; many seeded.

CHINESE NAME: 澳洲百脈根

JAPANESE NAME: Yambaru-ebosigusa.

FLOWERING TIME: April to May.

DISTRIBUTION: Australia and Taiwan. (limited to Botel Tobago).

ECONOMIC VALUE: This is a wild species for forage.

多年生草本。羽狀複葉，小葉5枚，倒披針形，具微尖。花白色，長1.3mm。莢果線形，無毛。本種僅分佈於蘭嶼，可作牧草。

2. **Lotus corniculatus** LINN. Sp. Pl. 775, 1753. var. **japonicus** REGEL. Ind. Sem. H. Petrop. 23, 1864. Fig. 102

A perennial herb, stems slender, glabrous; leaves 5-foliolate, the lowest pair of leaflets at the base of petiole like stipules; leaflets obovate, 7-15 mm. long, rounded or mucronate at the apex; flowers 8 mm. long, yellow, 1 or 2 in the axillary umbels; peduncles about 3 cm. long; calyx 6-7 mm. long, teeth linear-lanceolate, longer than the tube; pods linear, straight, 2-2.5 cm. long, dehiscent; many seeded.

CHINESE NAME: 百脈根，鳥脚擬三葉草

ENGLISH NAME: Birds-foot Trefoil.

JAPANESE NAME: Miyako-gusa.

FLOWERING TIME: April to September.

HABITAT: Spreading along the seashore at Keelung.

DISTRIBUTION: A native of temperate Europe and Asia.

ECONOMIC VALUE: Very valuable for forage.

多年生草本。小葉5片。花黃色，呈繖形花序。莢果線形，長2—2.5cm。鳥脚擬三葉草分佈於本島北部，為良質之牧草。

28. *Lourea* NECKER

Lourea NECKER Elem. 3: 17, 1790.

Erect or spreading herbs; leaves 1 to 3-foliolate, membranous; leaflets stipellate; flowers simple or in terminal racemes; calyx membranous, campanulate, growing larger after flowering, teeth lanceolate, as long as the tube; corolla equalling or exceeding the calyx, standard broad, keel obtuse; stamens diadelphous, anthers uniform; pods folded together within the calyx, few, 1-seeded, jointed with reticulations.

About 4 species, widely distributed in India, China, Malaya and Australia.

CHINESE NAME: 羅瑞草屬

JAPANESE NAME: Hohozuki-hagi zoku.

Key to the species

- 1. A shrub, with erect woody branches; leaflets oblong, obtuse at the apex, 5-6 cm. long(1) *L. campanulata*
- 1. A herb, with slender, prostrate branches; leaflets reniform, emarginate at the apex, 0.5-1 cm. long.....(2) *L. obcordata*

1. *Lourea campanulata* BENTH. in Miq. Pl. Jungh. 215, 1852. Fig. 103

A shrub, with erect, woody branches and densely clothed with hairs; leaves trifoliolate; leaflets coriaceous, oblong, obtuse at the the apex, 5-6 cm. long, both surfaces covered with hairs, stipellate; flowers in terminal racemes or panicles; calyx campanulate, 5 mm. long, teeth triangular, acute, 3 mm. long, clothed with hairs; pods 2-3 jointed, each joints 2 mm. long, completely enclosed by the calyx.

CHINESE NAME: 東埔羅瑞草

JAPANESE NAME: Tombo-huzihogusa.

HABITAT: On the grasslands and waste places in the southern part of the island.

FLOWERING TIME: July to October.

DISTRIBUTION: India, Mainland China and Taiwan.

灌木。三出複葉，小葉長橢圓形，先端鈍形，長5—6cm。花呈頂生總狀花序或圓錐花序。莢果具2—3節。本種分佈於屏東縣境，可作牧草或綠肥之參考。

2. *Lourea obcordata* (POIR.) DESV. in Journ. Bot. 1: 122, 1813. Fig. 104

A herb, stems slender and prostrate, pubescent, about 30-60 cm. long; leaves trifoliolate; leaflets broadly obovate, reniform, emarginate at the apex, 0.5-1 cm. long, 0.8-1.2 cm. wide; both surfaces covered with hairs; stipules lanceolate, acuminate, 3 mm. long; in terminal racemes or panicles, slender 3-18 cm. long; calyx campanulate, hairy, with distinct reticulations, teeth 3 mm. long at first, but after flowering becoming 7 mm. long, completely enclosing the fruit; pods usually 2-jointed, each joint 2 mm. long, much reticulate.

This species is easily distinguished from *L. campanulata* by the reniform leaflets

and being emarginate at the apex.

CHINESE NAME: 羅瑞草

JAPANESE NAME: Hohozuki-hagi.

FLOWERING TIME: July to November.

HABITAT: On the waste places of the southern part of Taiwan.

DISTRIBUTION: Tropical Australia, Malaya, Mainland China and Taiwan.

匍匐草本。三出複葉，小葉闊倒卵形或腎形。花呈頂生總狀花序或圓錐花序，花萼在開花後，包蓋莢果。莢果具兩節。本種分佈於彰化、高雄、屏東等縣荒地。

29. *Lupinus* LINN.

Lupinus LINN. Syst. ed. 1, 1735.

Annual and perennial herbs; leaves palmately compound with 2-15 narrow leaflets; stipules adnate to base of petiole; flowers showy, mostly white, blue or purplish in terminal racemes or spikes, sometimes whorled; calyx 2-lipped, deeply toothed; standard erect, broad, with reflexed edges, keel incurved with beak; stamens monadelphous; anthers dimorphous; style incurved, stigma terminal, bearded; pods oblong or linear, flattened, dehiscent, mostly constricted between the seeds; seeds many.

About 300 species in the temperate regions of North America, South America, Europe, Africa and Western Asia.

CHINESE NAME: 羽扇豆屬

ENGLISH NAME: Lupine.

Key to species

1. Flowers blue, 1 cm. long, sparse in terminal racemes.....(1) *L. angustifolius*
1. Flowers yellow, 1.8 cm. long, densely whorled in terminal racemes.....(2) *L. luteus*

1. *Lupinus angustifolius* LINN. Sp. Pl. 721, 1753.

Fig. 105

An annual herb, stems erect about 30-70 cm. high; stipules linear, 5 mm. long; leaves palmately compound, leaflets 7-9, linear, obtuse, 2-4 cm. long, 3-4 mm. wide, both surfaces nearly glabrous; flowers 1 cm. long, blue, in axillary and terminal racemes; pods oblong, 5-7 cm. long, flat, densely pubescent; seeds 5-6.

CHINESE NAME: 狹葉羽扇豆

ENGLISH NAME: Narrow-leaved Lupine.

HABITAT: Cultivated.

FLOWERING TIME: April to July.

DISTRIBUTION: A Mediterranean species that has been extensively cultivated in Europe, New Zealand, Australia, South Africa and North America.

ECONOMIC VALUE: Mostly used as cover or for soil improvement.

一年生草本。掌狀複葉，小葉7—9，線形，先端鈍形，長2—4cm。花籃色，長1cm，腋生或頂生總狀花序。莢果長橢圓形，長5—7cm。本種係引進者，可作覆蓋和土壤的改良。

2. *Lupinus luteus* LINN. Sp. Pl. 721, 1753. Fig. 106

An annual or biennial herb, stems erect, simple, densely pubescent, about 30-60 cm. high; leaves palmately compound, leaflets 7-9, linear, lanceolate, oblong, acute, 2-4 cm. long, hirsute; flowers yellow, fragrant, 1.8 cm. long, whorled in long terminal racemes; upper lip of calyx 2 cleft, lower 3 toothed; pods oblong, flat, 5 cm. long, hairy; seeds 2-5, large, dull light gray with brown markings.

CHINESE NAME: 黃花羽扇豆

ENGLISH NAME: Yellow Lupine.

JAPANESE NAME: Noboli-huzimame.

HABITAT: Cultivated.

FLOWERING TIME: March to May.

DISTRIBUTION: Europe, South Africa and North America.

ECONOMIC VALUE: This species is used as green manure.

一年生或二年生草本。掌狀複葉，小葉7—9，線形，披針形或長橢圓形，先端銳形。花黃色，長1.8cm。莢果長橢圓形，扁平，長5cm。本種係引進者，宜植於砂質壤土，可供作綠肥。

30. *Medicago* LINN.

Medicago LINN. Sp. Pl. 778, 1753.

Annual or perennial herbs, with erect or trailing stems; leaves pinnately 3-foliolate, mostly denticulate at the apex; stipules adnate to petioles; flowers in dense axillary racemes, small and yellow; calyx campanulate, teeth 5, nearly equal; standard oblong or obovate, not auricled; stamens diadelphous; style short, little incurved, beard-less; stigma capitate; pods small, spiral or much curved, indehiscent, smooth or spiny, seeds one to many.

About 120 species, native to the temperate regions of Europe, Asia, and Africa, but widely introduced elsewhere.

CHINESE NAME: 苜蓿屬

ENGLISH NAME: Bur Clover.

JAPANESE NAME: Umagoyasi zoku.

Key to species

1. Flowers purple; pods slightly pubescent, 1-8 seeded. perennial
with deep tap root(3) *M. sativa*
1. Flowers yellow; pods glabrous..... 2
2. Plants glabrous; stipules mostly divided beyond the half,
very conspicuously lacerate; pods spiny, 3-7 seeded.....(1) *M. hispida*
2. Plants pubescent; stipules lanceolate, acuminate, slightly
dentate to entire along the margins; pods smooth, 1-seeded(2) *M. lupulina*

1. **Medicago hispida** GAERTN. Fruct. et Sem. Pl. 2: 349, 1791. Fig. 107

An annual herb, with decumbent, glabrous stems; leaves trifoliolate; leaflets broad-obovate, 1-2 cm. long, 5-15 mm. wide, emarginate, denticulate at the apex, cuneate at the base, stipules mostly divided beyond the middle, very conspicuously lacerate; flowers 2-6, yellow, in loose axillary clusters; bracts linear, minute; calyx 2 mm. long, teeth lanceolate, as long as the tube; pods 2-3 coiled, strongly veined with 2 rows of spines, many seeded.

CHINESE NAME: 苜蓿, 刺球苜蓿

ENGLISH NAME: Bur Clover.

JAPANESE NAME: Umagoyasi.

FLOWERING TIME: April to May.

HABITAT: On roadsides and a lawn weed.

ECONOMIC VALUE: Bur Clover is used as a very good winter forage crop and a green manure, but limited on Taiwan.

一年生草本。三出複葉，小葉闊倒卵形，長1—2cm，先端鋸齒緣。花2—6，黃色。莢果螺旋形，具兩排細刺。刺球苜蓿分佈於北部路旁和草地，為一優良之冬季牧草及綠肥，但其栽培並不普遍。

2. **Medicago lupulina** LINN. Sp. Pl. 779, 1753. Fig. 108

A annual herb, 30-60 cm. high, pubescent, stems decumbent at base; leaves trifoliolate; leaflets obovate, denticulate toward the apex, 7-15 mm. long, 5-15 mm. wide; stipules acuminate, slightly dentate to entire; flowers 1.5-2 mm. long, yellow, in dense heads, peduncles exceeding the leaves; bracts setaceous. minute; calyx 1.5 mm. long, teeth setaceous; pods spineless, indehiscent, much curved, strongly veined, nearly glabrous, with only one seed.

This species is distinguished from *M. hispida* by having one-seeded smooth pods and a pubescent plant body.

CHINESE NAME: 天藍

ENGLISH NAME: Hop Clover.

JAPANESE NAME: Kometubu-umagoyasi.

FLOWERING TIME: April to May.

HABITAT: In open places, dry grasslands and fields.

ECONOMIC VALUE: Used as as a forage crop, also used as a green manure.

一年生草本。三出複葉，小葉倒卵形，先端具鋸齒緣。花小黃色，長1.5—2mm。莢果彎曲，無刺。本種分佈本島北部，作為牧草之產量並不高，但自播性頗強，可供作綠肥。

3. **Medicago sativa** LINN. Sp. Pl. 778, 1753. Fig. 109

A perennial herb, with a very deep tap-root; stems glabrous, branched, about 30-100 cm, high; stipules large, entire; leaves trifoliolate, leaflets obovate to oblanceolate, obtuse to emarginate at the apex, cuneate at the base, 2-2.5 cm. long, denticulate toward the apex; flowers purplish, dense, in short axillary racemes; pods 2-3 coiled, slightly pubescent, indehiscent; seeds 1-8.

CHINESE NAME: 紫花苜蓿

ENGLISH NAME: Alfalfa.

JAPANESE NAME: Murasaki-umagoyasi.

FLOWERING TIME: May to August.

DISTRIBUTION: A native of Europe and Western Asia, and now widely distributed.

ECONOMIC VALUE: This species is grown for forage.

多年生草本。三出複葉，小葉倒卵形至倒披針形，長2—2.5cm，先端鋸齒緣。花紫色，密生於葉腋之總狀花序。莢果螺旋形。本種係引進者，供作牧草。

31. *Melilotus* Juss.

Melilotus Juss. Benth. et Hook. f. Gen. Pl. 1: 487, 1862.

Annual or biennial herbs, with erect or decumbent stems; leaves pinnately trifoliate, mostly narrow, with denticulate margins, stipules adnate to petioles; flowers small in slender axillary racemes, yellow or white; calyx-tube campanulate, teeth 5, nearly equal, lanceolate; standard oblong or obovate, not auricled; wings longer than the straight, obtuse keels; stamens diadelphous, anthers uniform; style slender, incurved above, beardless, stigma terminal; pods small globose or ovate, wrinkled, indehiscent, much exserted, 1 to two seeded.

About 20 species in the eastern hemisphere.

CHINESE NAME: 草木樨屬

JAPANESE NAME: Singawahagi-zoku.

Key to species

1. Flowers 5–6 mm. long, standard as long as wing; pods finely pubescent, ovoid, 3 mm. long(2) *M. officinalis*
1. Flowers 2–4 cm. long, standard longer than the wing..... 2
2. Leaflets linear, 10–20 mm. long, 2–5 mm. wide, margins denticulated above the middle; flowers 2–3 mm. long; pods globose, 2–3 mm. long(1) *M. indicus*
2. Leaflets oblong or oblanceolate, 10–30 mm. long, 5–10 mm. wide, margins entirely denticulated; flowers 3–4 mm. long; pods oblong, 3–4 mm. long.....(3) *M. suaveolens*

1. *Melilotus indicus* (LINN.) ALL. Fl. Pedem. 1: 308, 1785.

Fig. 110

A biennial herb, about 20–50 cm. high, with many branches; leaves pinnately trifoliate; leaflets linear, 10–20 mm. long, 2–5 mm. wide, margins denticulated above the middle; stipules setaceous; flowers in axillary racemes, 2–3 mm. long, yellow; calyx lobes lanceolate, 1 mm. long; pods globose, 2–3 mm. long, 1-seeded.

The present species is very near to *M. suaveolens*, but differs from the latter by its linear leaflets and denticulated margins above the middle.

CHINESE NAME: 郎日巴花

ENGLISH NAME: Sour Clover.

JAPANESE NAME: Sinagawahagi.

HABITAT: Distributed on roadside and seashore.

DISTRIBUTION: Introduced from Europe.

ECONOMIC VALUE: Sour Clover has long been cultivated for forage.

二年生草本。三出複葉，小線形，長10—20mm。花黃色，長2—3mm，腋生總狀花序。莢果球形。本種分佈於本島北部海邊，頗適合於耐鹹性土壤，可用為海埔地綠肥之用。

2. *Melilotus officinalis* (LINN.) LAM. Fl. Franc. 2: 594, 1778.

An annual or biennial herb, about 90–100 cm. high; leaves trifoliolate, leaflets obovate to oblanceolate, obtuse, 10–25 mm. long, denticulated nearly all round; flowers small, yellow, 5–6 mm. long, in long axillary racemes; pods ovoid, 3 mm. long, pubescent, slightly denticulate.

CHINESE NAME: 黃香草木樨

ENGLISH NAME: Yellow Sweet Clover.

FLOWERING TIME: May to August.

HABITAT: Cultivated.

DISTRIBUTION: Native of Europe, but now widespread in the temperate zones.

ECONOMIC VALUE: This species is a very important forage crop.

一年生或多年生草本。三出複葉，小葉倒卵形至倒披針形，先端鈍形，長10—25mm，鋸齒緣。花小，黃色，莢果卵珠形。本種係引進種，為很重要的牧草之一。

3. *Melilotus suaveolens* LEDEB. Ind. Sem. Hort. Drop. Suppl. 5, 1824. Fig. 111

A biennial herb, glabrous, about 50–90 cm. high, erect, with many branches; leaves pinnately trifoliolate; leaflets narrow oblong or oblanceolate, obtuse at the base, 10–30 mm. long; margins denticulated; stipules narrow, subulate-setaceous; flowers in axillary racemes, 3–4 mm. long, yellow; calyx campanulate, 1.5 mm. long, pubescent; standard longer than the wing and keel; pods oblong 3–4 mm. long, indehiscent, with reticulated wrinkles, 1-seeded.

CHINESE NAME: 草木樨，辟汗草

JAPANESE NAME: Ebirahagi.

FLOWERING TIME: April to August.

HABITAT: In northern Taiwan along the seashore.

DISTRIBUTION: Japan, Korea, Mainland China and Taiwan.

ECONOMIC VALUE: This herb is used as fodder and green manure.

二年生草本。三出複葉，狹長橢圓形或倒披針形，先端鈍形。花黃色，腋生總狀花序。莢果長橢圓。本種分佈於北部海邊，為一不重要之牧草。

32. *Moghania* J. ST.-HILAIRE

Moghania J. ST.-HILAIRE, Journ. Bot. (Paris) 1: 61, 1813.

Shrubs, rarely herbs; leaves simple or digitately trifoliolate; leaflets gland-dotted

on the lower surfaces; flowers in racemes or panicles, or in small cymes; calyx tube short, teeth narrow, acuminate; corolla little or not at all exerted, the petals equal in length; stamens diadelphous, anthers uniform; pods oblong, turgid, usually 2-seeded. About 40 species widely distributed in the tropics of the Old World.

CHINESE NAME: 千斤拔屬

ENGLISH NAME: *Moghania*.

The generic name *Flemingia* was used for many years but in 1944, Dr. Hui-lin Li treated this as *Moghania* J. St.-Hilaire.

Key to the species

1. Leaves simple; bracts large, rounded, persistent, 2 cm. long, enclosing the cymes.....(4) *M. strobilifera*
1. Leaves trifoliate; bracts small, lanceolate or ovate, caducous, 6-7 mm. long, not enclosing the flowers 2
2. Stipules persistent, with long tips, 5-6 mm. long.....(1) *M. lineata*
2. Stipules caducous, acute or acuminate..... 3
3. Petioles with prominent narrow wings; leaflets acuminate at the apex(2) *M. macrophylla*
3. Petioles without wings; leaflets obtuse at the apex.....(3) *M. philippinensis*

1. ***Moghania lineata*** (LINN.) O. KUNTZE Rev. Gen. Pl. 1: 199, 1891. Fig. 112

A erect small shrub, about 30-50 cm. high, pubescent; leaves trifoliate; the terminal leaflets oblanceolate-oblong, obtuse at the apex 5-6 cm. long, exstipellate; stipules lanceolate, with long tip, scarious, 5-6 cm. long; flowers 5 mm. long, in axillary and terminal panicles; bracts very minute, linear; calyx 5 mm. long, densely pubescent, teeth lanceolate; corolla beaked; pods rounded, 2-seeded, pubescent.

This species is characterized by the persistent, long pointed stipules and by having axillary and terminal panicles.

CHINESE NAME: 線葉千斤拔

JAPANESE NAME: Inu-tanukimame.

FLOWERING TIME: June to August.

HABITAT: In open grasslands at low altitudes.

DISTRIBUTION: India to Northern Australia.

直立小灌木。三出複葉，小葉倒披針形，先端鈍形。花長 5 mm，腋生和頂生圓錐花序。莢果圓形，有二種子。本種分佈於屏東縣境。

2. ***Moghania macrophylla*** (WILLD.) O. KUNTZE Rev. Gen. Pl. 1: 199, 1891. Fig. 113

An erect shrub, about 1-2 m. high, young branches pubescent; leaves digitately trifoliate; leaflets oblong, apex acuminate, base cuneate, about 8 cm. long, both surfaces thin, pubescent, petioles narrowly winged; stipules caducous; flowers white,

1.5 cm. long; calyx campanulate, deeply 5-cleft, teeth linear, 5 mm. long; pods oblong, turgid, 1.5 cm. long. 2-seeded.

CHINESE NAME: 一條根

JAPANESE NAME: Enoki-mame.

FLOWERING TIME: June to August.

HABITAT: Distributed in thickets and fields.

DISTRIBUTION: India, Malaya, Southern China and Taiwan.

灌木。三出複葉，小葉長橢圓形，先端漸尖。花白色，莢果長橢圓形。本種分佈新竹、臺南、高雄、屏東等縣。

3. *Moghania philippinensis* (MERR. & ROLFE) LI in Amer. Journ. Bot. 31: 227, 1944.

Fig. 114

A scandent shrub, densely pubescent: leaves trifoliate; terminal leaflets oblong, obtuse at the apex, 3-8 cm. long, lower surface densely villose; stipules linear-lanceolate, 7 mm. long; flowers 6-7 mm. long, purple, in short axillary racemes which are shorter than the leaves; calyx deeply 5-cleft, 5 mm. long, teeth linear; pods oblong, turgid, 8-10 mm. long, 2-seeded.

CHINESE NAME: 菲律賓千斤拔

JAPANESE NAME: Birodo-enokimame.

FLOWERING TIME: October to November.

HABITAT: On open grassy slopes at lower altitudes.

DISTRIBUTION: Philippines, Southern China and Taiwan.

攀援灌木。三出複葉，小葉長橢圓形，先端鈍形。花紫色，莢果長橢圓形。本種分佈於高雄、屏東等縣。

4. *Moghania strobilifera* (LINN.) J. ST.-HILAIRE ex Jackes. Ind. Kew. 2: 252, 1894.

Fig. 115

An erect shrub, about 50-150 cm. high; leaves simple, ovate to oblong, acute, 7-16 cm. long, lower surface pubescent, stipules lanceolate, acute, 5 cm. long; racemes axillary and terminal, composed of numerous, large rounded or reniform bracts, distichously arranged in a zig-zag line, each enclosing cymes of flowers; calyx 5-cleft, teeth lanceolate; corolla yellow-green, 8 mm. long; pods oblong, turgid, 10 mm. long, 2-seeded.

The present species is characterized by the simple leaves and rounded bracts which enclose cymes of flowers, and are conspicuously large.

CHINESE NAME: 佛勒明豆

JAPANESE NAME: Soro-huzi.

FLOWERING TIME: All the year around.

HABITAT: In the thickets and open dry places.

DISTRIBUTION: India, China and Malaya.

直立灌木。單葉卵形至長橢圓形，先端銳形。花綠黃色，呈聚繖花序，而為圓形或腎形之苞片所包圍。莢果長橢圓形，膨狀。本種分佈於臺南、屏東縣一帶。

33. *Mucuna* ANDANSON

Mucuna ANDANSON Fam. 2: 325, 1763.

Annual or perennial coarse vines; leaves trifoliate; leaflets large, stipellate; flowers in racemes; calyx campanulate, the 2-upper teeth quite connate, the lower longer than the lateral lower ones; corolla long exserted, standard half as long as the beaked keel; the wings usually a little longer than the keel; stamens diadelphous, anthers dimorphous; style beardless; pods linear to oblong, compressed, smooth or transversely ridged, winged along the sutures or not, softly pubescent.

About 30 species in all tropical regions.

CHINESE NAME: 血藤屬

JAPANESE NAME: Kuzu-mame Zoku.

Mucuna macrocarpa WALL. Pl. Asat. 1: 41, t. 47, 1830.

Fig. 116

A large, climbing vine, usually clothed with ferrugineous hairs; leaves trifoliate; terminal leaflets oblong, acute at the apex, 15 cm. long; the lateral ones oblique, small, racemes about 40 cm. long; calyx campanulate, densely clothed with ferrugineous hairs; corolla dark purple, 5 cm. long; pods linear-oblong, flattened, 40 cm. long, distinctly torulose, 8-12 seeded.

CHINESE NAME: 血藤

JAPANESE NAME: Kuzu-modama.

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

DISTRIBUTION: India, Southern China and Taiwan.

ECONOMIC VALUE: This species is a valuable fodder.

大藤本。三出複葉，頂小葉長橢圓形，先端鈍形。花暗紫色，長 5 cm。莢果線形，扁平，達長 40 cm。本種分佈本島山地，為有價值的飼料。

34. *Ormocarpum* BEAUV.

Ormocarpum BEAUV. Fl. Oware 1: 95, t. 58, 1804.

Shrubs; leaves odd-pinnate; leaflets exstipellate; stipules lanceolate, striated, persistent; flowers in lax racemes; calyx campanulate; 2 upper teeth deltoid, 3 lower lanceolate, standard broad, keel much curved, stamens in 2 sets of 5 each, anthers uniform; pods linear, turgid, indehiscent, joints oblong.

About 20 species spread all round the world in tropical regions.

Ormocarpum cochinchinese (LOUR.) MERR. in Philip. Journ. Sci. 5: 76, 1910. Fig. 117

An evergreen shrub; leaves odd-pinnate; leaflets 9-17, oblong, obtuse at the base, 2-2.5 cm. long; stipules lanceolate, 5-cleft, teeth triangular, 1 cm. long; pods linear, 5-12 cm. long, 2-4-jointed smooth.

CHINESE NAME: 濱槐

JAPANESE NAME: Hama-senna.

HABITAT: On dry open slopes and in thickets on the islands surrounding Taiwan.
DISTRIBUTION: Tropical Africa, India, Southern China, Malaya and Australia.

灌木。奇數羽狀複葉，小葉9—17，先端鈍形。莢果線形，2—4節。本種分佈於本島南部之島嶼上。

35. *Pachyrrhizus* RICH.

***Pachyrrhizus* RICH.** ex DC. *Mém. Légum.* 379, 1825.

Perennial twining or erect herbs, with tuberous roots; leaves trifoliolate, lobed or sinuate; stipellate and stipulate; racemes axillary; flowers violet or white on fascicled pedicels at thickened nodes; bracts setaceous, caducous; calyx 2-lipped, upper lip notched, lower 3-toothed; standard broad, auriculate at the base, keel obtuse and incurved; stamens diadelphous; style bearded along inner side; stigma globose, with tip involute; pods large, linear, compressed or turgid, constricted between the seeds.

About 5 species in tropical America, but now widely naturalized in the tropics of the Old World.

CHINESE NAME: 豆薯屬

ENGLISH NAME: Yam Bean.

***Pachyrrhizus erosus* (LINN.) URBAN.** *Symb. Antill.* 4:311, 1905. Fig. 118

A climbing vine, with tubers; stems up to 5 m. high; leaves trifoliolate, terminal leaflets broadly rhomboidal upper margin often somewhat dentate or lobed, lateral leaflets ovate or rhomboidal, 3-15 cm. long; flowers violet or white, at thickened nodes on fascicled pedicels; racemes axillary; calyx campanulate, 8 mm. long, wings as long as standard, 2-2.5 cm. long; pods flat, pubescent, 6-10 cm. long; seeds 8-10.

CHINESE NAME; 豆薯

ENGLISH NAME: Yam Bean.

HABITAT: Cultivated.

DISTRIBUTION: Widely naturalized in Old World Tropics.

ECONOMIC VALUE: This species is cultivated for the edible tubers.

藤本，具有塊莖。三出複葉，小葉闊菱形，上部葉緣稍有鋸齒。花紫色，腋生總狀花序。莢果線形，扁平。本種為引進栽培種，塊莖可供食用，莖、葉、種子有毒。

36. *Phaseolus* LINN.

***Phaseolus* LINN.** *Sp. Pl.* 723, 1753.

Twining or erect herbs; leaves trifoliolate; leaflets stipellate; stipules basifixed or peltate, persistent; flowers in axillary racemes; calyx campanulate, the lower teeth usually longer than the others, the upper 2 subconnate; corolla much exerted, keel prolonged, spirally twisted; stamens diadelphous, style filiform, bearded along one side below the stigma; pods linear to oblong, compressed or swollen.

About 60 species mostly tropical, many cultivated.

CHINESE NAME: 菜豆屬

JAPANESE NAME: Turuazuki Zoku.

Key to species

1. Stipules small basifixed; flowers white, cream-colored, or dark purple; pods broad, subcompressed..... 2
1. Stipules inserted above the base; flowers yellow; pods thick, subterete, cylindrical 5
2. Plants perennial; flowers dark purple 15-20 mm long.....(1) *P. atropurpureus*
2. Plants annual; flowers 9-15 mm. long..... 3
3. Pods oblong, flat, 5-8 cm. long, 2 cm. wide.....(4) *P. lunatus*
3. Pods slender, linear, compressed, 10-20 cm. long, 5 mm. wide..... 4
4. A twining herb.....(9) *P. vulgaris*
4. An erect herb, with non-climbing habit.....(10) *P. vulgaris* var. *humilis*
5. Pods very densely hairy, hairs 2-3mm long..... 6
5. Pods glabrous or only sparsely pubescent, hairs 1mm long 7
6. Twining herbs; pods densely clothed with long white hairs; seeds oblong, blackish, with concave hilum or scar.....(6) *P. mungo*
6. Erect bushy herbs; to 0.5 m. high; pods sparsely covered with stiff hairs; seeds nearly or quite globular, green, the helium not concave.....(7) *P. radiatus*
7. Stipules large, prominent 7-17 mm. long..... 8
7. Stipules small, 2-4 mm. long..... 9
8. Stipules acuminate at both ends, 2-3 mm. wide at point of attachment; leaflets ovate or lanceolate, acute, entire or shallowly lobed(2) *P. calcaratus*
8. Stipules acute at the apex, rounded at the base, 3-5 mm. wide, at point of attachment; leaflets rhomboid, usually deeply 3-lobed, obtuse or short acute.....(8) *P. trilobatus*
9. Bracteoles as long as the calyx; stems glabrous(3) *P. gracilicaulis*
9. Bracteoles shorter than the calyx; stems pubescent(5) *P. minimus*

1. **Phaseolus atropurpureus** DC. Prodr. 2: 395, 1825.

Fig. 119

A perennial, twining vine, stems pubescent; leaves trifoliolate, leaflets broad ovate or rhomboid, obtuse 4-6 cm. long, usually deeply lobed, both surfaces conspicuously pubescent; stipules deltoid, 5 mm. long; flowers dark purple, 15-20 mm. long, on long axillary racemes; calyx campanulate, teeth short, pubescent; pods linear, spreading, nearly straight, 4-8 cm. long, less than 5 mm. wide; seeds 5-8.

CHINESE NAME: 賽芻豆

ENGLISH NAME: Purple Bean, Siratro.

HABITAT: Cultivated.

DISTRIBUTION: A native of the South-Western United States. Widely distributed in North, Central and South America.

ECONOMIC VALUE: This species is used as fodder and as a cover crop.

多年生纏繞植物。三出複葉，小葉闊卵形或菱形，但通常有深缺刻，先端鈍形，長4—6 cm。花暗紫色，長15—20mm。莢果線形，長4—8cm。本種在1966年，由澳洲引進，在本島南部栽培，生長非常良好，頗有推廣價值，可作覆蓋和飼料。

2. *Phaseolus calcaratus* Roxb. Hort. Beng. 54, 1814. Fig. 120

A slender twining herbaceous vine, clothed with spreading hairs; leaves trifoliate; leaflets broadly ovate or lanceolate, acute at the apex, entire and shallowly lobed, 3–10 cm. long, variable in shape; stipules peltate 7–8 mm. long, inserted above the base; racemes long-peduncled; flowers few, yellow, 1.5 cm. long, calyx 3–4 mm. long, teeth short, deltoid; pods linear, slender 6–9 cm. long, with slightly appressed hairs, 8–12-seeded.

CHINESE NAME: 蛋白豆，飯豆

ENGLISH NAME: Tapilon, Rice Bean.

JAPANESE NAME: Yabuturu-aduki.

FLOWERING TIME: All the year round.

HABITAT: In open grasslands throughout this island.

DISTRIBUTION: A native of tropical America, introduced in the tropics of the Old World.

ECONOMIC VAULE: This species is a good forage legume and its seeds are used for food.

纏繞草本。三出複葉，小葉闊卵形和披針形。花黃色，長1.5cm。莢果線形，長6—9cm。本種分佈於本島各地，可供作飼料。

3. *Phaseolus gracilicaulis* Ohwi in Act. Phytotax. et Geobot. 12: 111, 1943.

A annual twining vine, stems glabrous; leaves trifoliate, leaflets lanceolate, acuminate, 4–6 cm. long, 1 cm. wide; petioles 2–4 cm. long; stipules 3 mm. long; flowers yellow, 1 cm. long, in long axillary racemes, up to 40 cm. long; calyx 4 mm. long, teeth shallow; pods linear, spreading, 4–8 cm. long.

CHINESE NAME: 光莖蛋白豆

JAPANESE NAME: Hime-kanime.

HABITAT: Open hills and waste places, in the southern parts of this islands.

FLOWERING TIME: June to November.

DISTRIBUTION: India, Malaya, Java and Taiwan.

ECONOMIC VALUE: This species is used as green manure and fodder.

一年生纏繞藤本，無毛。三出複葉，小葉披針形。花黃色，長1 cm。莢果線形，長4—8 cm。本種分佈於高雄、屏東等縣。

4. *Phaseolus lunatus* LINN. Sp. Pl. 724, 1753.

Fig. 121

A slender annual herb, slightly pubescent or glabrous, up to 4 m. long; stipules small, basifixed; leaves trifoliolate, leaflets broad ovate, acuminate, 4–12 cm. long; flowers many, 9–10 mm. long, white, in axillary racemes; calyx bracteoles ovate, as long as the calyx; calyx campanulate, teeth 3, the upper 2 connate; pods oblong flat, somewhat curved, 5–8 cm. long, 2 cm. wide; seeds 2–4.

CHINESE NAME: 觀音豆, 雪豆, 皇帝豆

ENGLISH NAME: Sieva Bean.

JAPANESE NAME: Kochio-mame.

FLOWERING TIME: June to August.

DISTRIBUTION: A native of tropical America, cultivated in all tropical and warm countries.

ECONOMIC VALUE: This species is used for cover and green manure, seeds for food.

一年生纏繞藤本。三出複葉，小葉闊卵形，先端漸尖，長4—12cm。花白色，有時紅紫色。莢果長橢圓形，扁平。本種係熱帶美洲原產，現在廣泛地栽培於全世界溫、熱帶地區，可供作覆蓋和飼料，種子可供食用。

5. *Phaseolus minimus* ROXB. Fl. Ind. 3: 290, 1832.

Fig. 122

According to the shape of leaflets, Dr. Hosokawa (in Journ. Soc. Trop. Agr. 5: 289, 1933.) divided this species into 4 forms, but the leaflets are very variable in size and shape.

Form. *typicus* Hosokawa in Journ. Soc. Trop. Agr. 5: 289, 1933.

A slender twining herb, nearly glabrous; leaves trifoliolate; leaflets oblong or ovate, entire usually 2.2–5 cm. long, variable in size and shape; stipules peltate, small, 5 mm. long; racemes slender, axillary, flowers 10 mm. long, yellow, usually 2 or 3 on the top of long peduncles; calyx 3 mm. long; pods linear, 3–4 cm. long.

CHINESE NAME: 小葉山茶豆

JAPANESE NAME: Koba-no-turuazuki.

FLOWERING TIME: July to September.

HABITAT: In thickets and grasslands.

DISTRIBUTION: Philippines, Southern China, Japan, Taiwan.

纖細纏繞植物。三出複葉，小葉長橢圓形或卵形，葉形之變化極大。花黃色，長10cm。莢果線形，長3—4cm。本種分佈於全島各地草原，可供牧草和綠肥。

Form. *heterophyllus* (HAY.) HOSOKAWA in Journ. Soc. Trop. Agr. 5: 289, 1933.

Leaflets of 2 kinds, linear and ovate, obtuse or acute at the apex, 3-lobed or undulate on the margins.

CHINESE NAME: 變葉山茶豆

JAPANESE NAME: Taiwan-turuazuki.

FLOWERING TIME: July to September.

HABITAT: In open grasslands.

DISTRIBUTION: Endemic to Taiwan.

Form. **linealis** HOSOKAWA in Journ. Soc. Trop. Agr. 5: 289, 1933.

Leaflets 3, linear, 5-6 cm. long, 4-7 mm. wide.

CHINESE NAME: 細葉山茶豆

JAPANESE NAME: Hosoba-taiwan-turuazuki.

FLOWERING TIME: July to October.

DISTRIBUTION: Endemic to Taiwan.

Form. **rotundifolius** (HAY.) HOSOKAWA in Journ. Soc. Trop. Agr. 5: 289, 1933.

Leaflets 3, round, as long as wide, about 1.5 cm. long.

CHINESE NAME: 圓葉山茶豆

JAPANESE NAME: Hime-hama-azuki.

FLOWERING TIME: July.

HABITAT: On grasslands by the seashores.

DISTRIBUTION: Endemic to Taiwan.

6. **Phaseolus mungo** LINN. Mant. 1: 101, 1767.

Fig. 123

An annual, spreading herb, about 120 cm. long, densely clothed with retrose-stigose hairs; leaves trifoliolate, leaflets ovate to rhombic-ovate, acuminate, 5-10 cm. long; stipules lanceolate, 13-14 mm. long; flowers yellow, 6-8 mm. long, at the top of axillary racemes, up to 6 cm. long; calyx bracts linear, as long as the calyx; pods linear, nearly terete, 4-5 cm. long, erect or spreading, clothed with dense white hairs; seeds oblong with square ends, 3 mm. long, mostly black, with a white concave hilum.

CHINESE NAME: 小豆, 豇豆

ENGLISH NAME: Urd Black Gram.

HABITAT: Cultivated.

DISTRIBUTION: A native of India and central Asia, distributed in most tropical and subtropical regions.

ECONOMIC VALUE: Seeds used as a vegetable.

一年生蔓性草本。三出複葉，小葉卵形，先端漸尖，長5—10cm。花黃色，長6—8mm。莢果線形，長4—5cm，密被白色。本種係引進者，已歸化於屏東縣內，可供作飼料和綠肥，種子可供食用。

7. **Phaseolus radiatus** LINN. Sp. Pl. 725, 1753.

An erect, bushy herb, up to 50 cm. high, stems stout, sparsely covered with retrose-strigose hairs, dark colored when dry; leaves trifoliolate, leaflets ovate-spherical, short acute, 10-15 cm. long; stipules ovate, acuminate, 10 mm. long; flowers greenish-yellow, bracts broadly ovate, obtuse, shorter than the calyx, caducous; pods 6-7 cm. long, slender, usually brown, strigose; seeds globular, green, the hilum not concave.

CHINESE NAME: 綠豆

ENGLISH NAME: Mung. Green or Golden Gram.

HABITAT: Cultivated.

DISTRIBUTION: A native of India, widely cultivated in tropical and subtropical regions.

ECONOMIC VALUE: Seeds used as a vegetable.

直立叢生灌木狀草本。三出複葉，小葉卵形，長10—15cm。花黃色，莢果細長，疏生褐色糙伏毛。本種係栽培種，種子供食用，莖、葉可做飼料。

8. *Phaseolus trilobatus* (LINN.) SCHREB. in Nov. Act. Nat. Cur. 4: 132, 1770.

A branched twining vine, to 120 cm. long, covered with retrorse strigose hairs; leaves trifoliolate, leaflets rhomboid or ovate, short acute, 3-5 cm. long, usually deeply 3-lobed, both surfaces pubescent; stipules broadly ovate, acute at the apex, 6-19 mm. long, 3-5 mm. wide at point of attachment; flowers 8-10 mm. long, yellow, in axillary heads, peduncles 5-9 cm. long; calyx campanulate, teeth triangular, 2 mm. long; pods cylindrical, pendent, sparsely covered with stiff hairs, 3-5 cm. long, 3-4 mm. wide; seeds 6-12, gray.

CHINESE NAME: 三裂葉菜豆

ENGLISH NAME: Trilobed Bean.

HABITAT: Widely distributed in open fields in the southern parts of Taiwan.

FLOWERING TIME: October to May.

DISTRIBUTION: India, Java, and Taiwan.

ECONOMIC VALUE: This species is grown as forage and green manure.

纏繞植物。三出複葉，小葉菱形或卵形，通常具有三深裂。花黃色，長8—10mm。莢果圓柱形，成熟時黑色，具有硬毛。本種分佈於本島南部各縣，可做飼料和綠肥。

9. *Phaseolus vulgaris* LINN. Sp. Pl. 723, 1753.

Fig. 124

An annual pubescent twining herb; stipules ovate-lanceolate; leaves trifoliolate, leaflets broadly ovate to rhombic-ovate, 5-11 cm. long, lateral leaflets unequal sided; flowers white, 1.5-2 cm. long, few at or near the top of peduncles shorter than the leaves; pods slender, linear, compressed or rounded, pubescent or glabrate, straight, 10-20 cm. long.

CHINESE NAME: 菜豆，龍爪豆

ENGLISH NAME: Kidney Bean.

FLOWERING TIME: June to September.

HABITAT: Cultivated in gardens.

DISTRIBUTION: Cultivated in all warm regions, native origin uncertain.

ECONOMIC VALUE: Seeds and young pods used as vegetables.

一年生纏繞植物。三出複葉，小葉闊卵形。花白色，長1.5—2cm。莢果圓柱形，長10—20cm。本種栽培作蔬菜，亦可作飼料。

10. *Phaseolus vulgaris* LINN. var. *humilis* ALEF.

Fig. 125

An annual erect herb, glabrate, without climbing habit, about 30-60 cm. high; leaves trifoliolate, leaflets rhomboid-ovate, acuminate, lateral leaflets unequal sides, 10-15 cm. long, both surfaces covered with thin hairs or glabrous; stipules 4 mm. long, deltoid; flowers yellow, 1 cm. long, 3-5 in the axillary racemes; pods slender, 10-20 cm. long, rounded, glabrous.

CHINESE NAME: 矮性菜豆

HABITAT: Cultivated.

DISTRIBUTION: Cultivated in all warm regions.

ECONOMIC VALUE: This species is used as human food, green manure and forage.

一年生直立草本。其特徵與菜豆得相似。莢果可作蔬菜外，莖、葉可作綠肥和牧草。

37. *Pisum* LINN.

Pisum LINN. Syst. ed. I. 1735.

Annual and perennial erect or climbing herbs; leaves pinnate, leaflets 1-3 pairs, rachis ending in a branched tendril; stipules large, foliaceous; flowers white or reddish-purple, in axillary racemes or solitary; calyx campanulate, oblique or gibbous at the base; corolla exserted, standard very broad, wings somewhat united with keel; stamens diadelphous; style enlarged at the top, bearded down one side; pods oblong, flattened, dehiscent; seeds several.

About 6 species in Eurasia.

CHINESE NAME: 豌豆屬

ENGLISH NAME: Pea.

JAPANESE NAME: Endo.

Pisum sativum LINN. Sp. Pl. 727, 1753.

Fig. 126

An annual herbaceous vine, to 1 m. high, glabrous; leaves pinnate, leaflets ovate to oblong, with tendrils; stipules mostly larger than leaflets, denticulate on basal part; flowers 1-3, white; calyx campanulate, deeply 5-lobed, lobes lanceolate; pods oblong, nearly straight on the back, glabrous; seeds 2-10.

CHINESE NAME: 豌豆

ENGLISH NAME: Garden Pea.

JAPANESE NAME: Endo.

HABITAT: Cultivated.

FLOWERING TIME: March to June.

DISTRIBUTION: Eurasia.

ECONOMIC VALUE: Cultivated for edible seeds, pods and leaves for fodder.

一年生草本。羽狀複葉，小葉卵形至長橢圓形，先端具卷鬚。花白色。莢果長橢圓形。本種莢果、種子供作食用，莖、葉可作飼料。

38. *Psophocarpus* NECK.

Psophocarpus NECK. Elem. 3: 45, 1790.

Twining herbs, with tuberous roots; leaves trifoliolate, stipellate, stipule 2-parted; flowers large, bright blue or purplish, few or several in a close nodulose raceme; calyx slightly 2-lobed, upper 2 teeth connate; corolla exserted; stamens diadelphous, odd one sometimes free only at base; anthers monomorphic; style prominent and incurved; stigma bearded at the top; pods oblong, square in cross section, longitudinally winged along each angle; seeds many.

About 5 species in tropical Asia and Africa.

CHINESE NAME: 四稜豆屬

ENGLISH NAME: Goa Bean.

Psophocarpus tetragonolobus (LINN.) DC. Prodr. 2: 403, 1824.

Fig. 127

An annual twining herb, glabrous, with large tubers; stipules lanceolate, 4 mm. long; leaves trifoliolate; leaflets broadly ovate, rhomboid, acute, 4-10 cm. long, both surfaces glabrous; 3-5 flowered in loosely axillary racemes; bracteoles much shorter than the calyx, ovate, round at the apex; calyx glabrous, campanulate, teeth short, round; corolla much exserted, bright blue, 20 mm. long; pods large, glabrous, with 4 broad jagged wings, about 15 cm. long.

CHINESE NAME: 四稜豆, 豆菜

ENGLISH NAME: Goa Bean or Asparagus Pea.

JAPANESE NAME: To-sai.

HABITAT: Cultivated.

DISTRIBUTION: Native of India, but distributed in tropical Asia and Africa.

ECONOMIC VALUE: Cultivated for edible roots and edible pods.

一年生纏繞草本，具有塊根。三出複葉，小葉闊卵形，長4—10cm。花藍色，長2cm。莢果長15cm，具有4闊翼。本種係栽培種，根和莢果可作食用。

39. *Pueraria* DC.

Pueraria DC. in Ann. SC. Nat. Ser. 4: 97, 1825.

Twining herbs or small shrubs; leaves trifoliolate, leaflets stipellate; flowers large or small, densely fascicled, in long often compound racemes; calyx teeth long or short, the upper connate; corolla distinctly exserted; standard usually spurred at the base; stamens monadelphous, anthers uniform; pods linear, flattish.

About 15 species native to eastern and tropical Asia.

CHINESE NAME: 葛屬

ENGLISH NAME: Kudu.

JAPANESE NAME: Kudu Zoku.

Key to species

1. Stipules peltate; pods densely hirsute, about 6–10 mm. wide..... 2
1. Stipules basifixed; pods sparsely pilose, 4 mm. wide(2) *P. phaseoloides*
2. Leaflets entire, longer than wide; bracts not longer than bracteoles; flowers 12–15 mm. long; wing longer than keel.....(3) *P. tonkinensis*
2. Leaflets sometimes trilobed, as long as wide, bracts longer than bracteoles; flowers 15–20 mm. long, wing shorter than keel.....(1) *P. lobata*

1. ***Pueraria lobata*** (WILLD.) OHWI in Bull. Tokyo Sci. Mus. 18: 16, 1947.

A perennial, twining vine, leaves trifoliolate; leaflets rhomboidal, ovate, acute at the apex, 10–15 cm. long; sometimes trilobed, lower surface densely whitish tomentose; stipules lanceolate, acute, 15–20 mm. long; flowers 18–20 mm. long, purplish-red, calyx 8–10 mm. long; bracts with stiff hairs at the tip, longer than the bracteoles; pods linear, flattened, 6–9 cm. long, 9–10 mm. wide.

CHINESE NAME: 葛藤

ENGLISH NAME: Kudzu.

JAPANESE NAME: Kuzu.

FLOWERING TIME: July to September.

HABITAT: In thickets and forests.

DISTRIBUTION: Mainland China, Japan and Taiwan.

ECONOMIC VALUE: This species is a valuable cover crop, fiber plant and a source of starch.

多年生藤本。三出葉，小葉菱狀卵形，長10—15cm。花紫紅色，長18—20mm。莢果線形，扁平，長6—9cm。本種係栽培種，可用作覆蓋作物，纖維作物（莖）及藥用澱粉（根）。

2. ***Pueraria phaseoloides*** (ROXB.) BENTH. in Journ. Linn. Soc. Bot. 9: 125, 1867. Fig. 128.

A perennial twining herb; stems densely clothed with spreading brown stiff hairs; stipules small, lanceolate, basifixed; leaves trifoliolate, leaflets nearly orbicular, broadly ovate, rhomboid, usually 3-lobed, acute, both surfaces covered with dense long appressed brown stiff hairs; flowers 12 mm. long, purple, at the top of long peduncles in axillary racemes; pedicels short, nodulose; bracts and bracteoles lanceolate; pods linear, slender, pilose, 5–8 cm. long, 4 mm. wide.

CHINESE NAME: 熱帶葛藤

ENGLISH NAME: Tropical Kudzu.

FLOWERING TIME: August to December.

HABITAT: Distributed in the open places in the southern part of this island.

DISTRIBUTION: Tropical Kudzu is indigenous in the East Indies, but is now grown in most tropical regions.

ECONOMIC VALUE: This species is used as a valuable fodder crop, soil cover and green manure.

多年生藤本。三出複葉，小葉近圓形或闊卵形，通常具三深裂，密被褐色毛。花紫色，長12mm。莢果細長，線形。熱帶葛藤為良好之覆蓋及牧草作物，適宜於臺灣中、南部一帶栽培。

3. **Pueraria tonkinensis** GAGN. in Lecomte, Not. Syst. **3**: 202, 1914. Fig. 129

A twining vine, densely clothed with brown coarse hairs; leaves trifoliate; leaflets rhomboidal-ovate or ovate-lanceolate, acuminate at the apex, entire, 10–16 cm. long; lower surface densely silvery tomentose; stipellate linear, stipules lanceolate, obtuse 1 cm. long; flowers 15 mm. pink, densely arranged, in axillary racemes; calyx campanulate, 5-cleft; bracts without stiff hairs, shorter than the bracteoles; pods linear, flattened, 2–4 cm. long, 6 mm. wide; covered with dense brown hairs.

CHINESE NAME: 臺灣葛藤

JAPANESE NAME: Taiwan-kuzu.

FLOWERING TIME: April to October.

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

DISTRIBUTION: Mainland China, Ryukyu and Taiwan.

ECONOMIC VALUE: Taiwan Kudzu is used as a valuable forage plant.

纏繞藤本。三出複葉，小葉菱狀卵形或卵狀披針形，先端漸尖，長10—16 cm。花紫色，密集於腋生總狀花序。莢果線形、扁平，長2—4 cm。本種分佈全島各地，可供作牧草及纖維作物。

40. **Pycnospora** R. BR.

Pycnospora R. BR. ex Wight et Arn. Prodr. **1**: 197, 1834.

Low shrubs; leaves pinnately trifoliate; flowers minute, in racemes; calyx deeply cleft, the upper teeth subconnate; corolla much exserted, standard roundish, keel obtuse, wings cohering; stamens diadelphous, anthers uniform; pods oblong, turgid, 2-valved, 8–10 seeded, not jointed, but marked with transverse veins.

Only one species in tropical regions.

CHINESE NAME: 密子草屬

JAPANESE NAME: Kintyaku-mame Zoku.

Pycnospora lutescens (POIR.) SCHINDL. in Journ. Bot. **64**: 145, 1926. Fig. 130

A perennial herb, with slender stems; leaves pinnately trifoliate; leaflets obovate, obtuse 1–3 cm. long; stipellate, upper surface glabrous, lower surface clothed with dense hairs; flowers in loosely terminal racemes; bracts scariosse, ovate-cuspidate, deciduous; calyx 2.5 mm. long; pods oblong, 1–1.5 cm. long, turgid, covered with thin hairs, black when mature, 6–8-seeded.

This species has long been considered as *P. nervosa* by many botanists, but I agree with Schindler's opinion and treat it as *P. lutescens*.

CHINESE NAME: 密子草

JAPANESE NAME: Kintyaku-mame.

FLOWERING TIME: August to October.

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

DISTRIBUTION: India to southern China and tropical Australia.

ECONOMIC VALUE: This species is used as green manure.

多年生草本。三出複葉，小葉倒卵形，先端鈍形，長1—3cm。花黃色，疏生頂端總狀花序。莢果長橢圓形，膨大，長1—1.5cm，成熟時呈黑色。本種分佈於全島草原，可供牧草或土壤之改良。

41. *Rhynchosia* LOUR.

Rhynchosia LOUR. Fl. Cochinch. 460, 1790.

Twining or creeping herbs; leaves simple or trifoliate; leaflets usually punctate with yellow brown glandular dots; exstipellate; flowers yellow in axillary or terminal racemes; style beardless; stamens diadelphous, anthers uniform; pods rounded or oblong, flattened, dehiscent, 1-3 seeded.

About 100 species in the tropical and subtropical regions.

CHINESE NAME: 鹿藿屬

JAPANESE NAME: Tankiri-mame Zoku.

Key to the species

1. Pods oblong, straight, 12-13 mm. long, constricted at the middle(3) *R. volubilis*
1. Pods oblanceolate, falcate, 10-30 mm. long..... 2
2. Leaflets 5 cm. long, calyx 6 mm. long, teeth obtuse(2) *R. sericea*
2. Leaflets 1 cm. long, calyx 4 mm. long, teeth acuminate(1) *R. minima*

1. ***Rhynchosia minima*** (LINN.) DC. Prodr. 2: 385, 1825. Fig. 131

A twining, slender herb, nearly glabrous; leaves trifoliate; leaflets broadly obovate, obtuse, 1-2 cm. long; stipules minute, lanceolate 4 mm. long, caducous; racemes axillary, 6-12-flowered; flowers yellow, 7-8 mm. long, calyx 4 mm. long, teeth acuminate; pods oblanceolate, falcate, 1 cm. long, 2-seeded.

CHINESE NAME: 小葉括根

JAPANESE NAME: Hime-noaduki.

FLOWERING TIME: May to August.

HABITAT: In open grasslands at low altitudes.

DISTRIBUTION: Common in the tropics.

ECONOMIC VALUE: This species is used for green manure.

纏繞草本。三出複葉，小葉闊倒卵形，先端鈍形，長1—2cm。花黃色，長7—8mm。莢果倒披針形，鐮形，長1cm。本種分佈於高雄、屏東和澎湖等縣，草原和路旁可作牧草和綠肥。

2. *Rhynchosia sericea* SPAN. in Linn. 15: 195, 1841.

Fig. 132

A woody climber, densely clothed with soft short spreading hairs; leaves trifoliate; leaflets round-rhomboidal, cuspidate, 5 cm. long, both surfaces densely hairy; racemes of many axillary flowers, densely arranged on peduncles; calyx 6 mm. long, teeth obtuse, densely pubescent; pods oblanceolate, 3 cm. long, falcate, pubescent, 2-seeded.

CHINESE NAME: 絨毛括根

JAPANESE NAME: Kinu-noaduki.

FLOWERING TIME: July to November.

HABITAT: In open grasslands.

DISTRIBUTION: Malaya and Java.

纏繞木本。三出複葉，小葉圓菱形，具硬尖，長5cm。花黃色，腋生總狀花序。莢果倒披針形，長3cm。本種分佈於臺中、臺南等縣可作綠肥。

3. *Rhynchosia volubilis* LOUR. Fl. Cochinch. 460, 1790.

Fig. 133

A twining herb; leaves trifoliate, leaflets ovate-rhomboidal, obtuse at the apex, 2-4 cm. long, lower surface tomentose; stipules narrowly ovate, acute 4-5 mm. long; racemes nearly sessile, 10-20-flowered; flowers 8-10 mm. long, yellow; calyx 6-8 mm. long, teeth lanceolate, acuminate; pods oblong, swollen, constricted at the middle 12-13 mm. long.

CHINESE NAME: 鹿藿，括根

JAPANESE NAME: Tankiri-mame.

FLOWERING TIME: September to October.

HABITAT: In open grasslands.

DISTRIBUTION: Japan, Mainland China and Taiwan.

纏繞草本。三出複葉，小葉卵狀菱形，先端鈍形，長2—4cm。花黃色，長8—10mm。莢果長橢圓形，膨大，本種分佈於全島各地。

42. *Sesbania* Scop.

Sesbania Scop. Intr. 308, 1777.

Erect annual or perennial herbs or small trees; leaves evenly pinnate, leaflets numerous, oblong or linear, obtuse, mucronate; stipules herbaceous, caducous; flowers in terminal and axillary racemes, yellowish, red or orange; calyx campanulate, shallowly 2-lipped or 5-toothed; standard broad, keel straight or recurved; stamens diadelphous; pods elongate, linear, septate between the seeds, dehiscent; seeds many.

About 40 species in the tropical and subtropical regions.

CHINESE NAME: 田菁屬

ENGLISH NAME: *Sesbania*.

Key to species

1. Small trees; flowers showy, large, about 7-8 cm. long,
rose-red or white(1) *S. grandiflora*
1. Herbs and shrubs; flowers small, 1.3-1.5 cm. long, yellow 2
2. Flowers 1.3 cm. long, 1-3; pods erect, spreading, falcate.....(2) *S. roxburgii*
2. Flowers 1.5 cm. long, 4-12; corolla covered with purple spots;
pods pendulous, twisted.....(3) *S. sesban*

1. ***Sesbania grandiflora*** (LINN.) PERS. Syn. 2: 316, 1807. Fig. 134

A small tree, glabrous, about 5-10 m. high; leaves pinnate, 20-30 cm. long, leaflets 40-60, oblong, obtuse, glaucous, 2-3.5 cm. long; flowers 2-4, in short axillary racemes, rose-red or white and showy, 7-8 cm. long; calyx campanulate, undulate dentate; pods pendulous, linear, 20-60 cm. long, compressed, slightly torulose.

CHINESE NAME: 大花田菁

ENGLISH NAME: Large-flowered sesban.

JAPANESE NAME: Sirogotyo.

HABITAT: Cultivated.

DISTRIBUTION: A native of West Indies and South Florida.

ECONOMIC VALUE: Flowers, pods and young shoots are used for human food and cattle fodder.

小喬木，高約5—10m。羽狀複葉，小葉40—60，長橢圓形，先端鈍形。花2—4，紫紅、白色，長7—8cm。莢果下垂，長20—60cm。本種係栽培植物。

2. ***Sesbania roxburgii*** MERR. in Philip. Journ. Sci. 4: 269, 1909. Fig. 135

An annual herb, about 1-1.5 m. high, nearly glabrous; leaves even pinnate, 12-15 cm. long, leaflets 40-80, oblong, obtuse, apiculate, base oblique, 1-2 cm. long; flowers 1-3, in axillary racemes, pedicels 1-2 cm. long; calyx campanulate, pale green, petals yellow, standard retuse, 1.3 cm. long; stamens 10, diadelphous; pods linear, straight, falcate, 18-25 cm. long.

CHINESE NAME: 田菁

ENGLISH NAME: Tsuno-kusa-nemu.

HABITAT: Cultivated in the fields.

DISTRIBUTION: India, Malaya, Java, Philippines and Taiwan.

ECONOMIC VALUE: This species is valuable for green manure.

1年生草本。偶數羽狀複葉，小葉40—80，長橢圓形。花黃色，1—3，腋生總狀花序。莢果細長，鐮形，長18—25cm。本種係引進栽培者，供稻田綠肥。

3. ***Sesbania sesban*** (LINN.) MERR. in Philip. Journ. Sci. 7: 235, 1912. Fig. 136

A shrub, about 2-3 m. high, glabrous; leaves pinnate, 5-12 cm. long. leaflets 20-40, linear-oblong, apiculate or mucronate, 1.7-2 cm. long; flowers 4-12, in axillary racemes, pedicels 1.5-2.5 cm. long; calyx campanulate, 5-toothed, petals yellow,

standard, 1.5 cm. long covered with purple spots; stamens 10, diadelphous; pods linear, pendulous, twisted, 16-20 cm. long.

CHINESE NAME: 印度田菁

JAPANESE NAME: Indo-kusanemu.

HABITAT: Cultivated in the fields.

DISTRIBUTION: Widely distributed in tropical and subtropical regions.

ECONOMIC VALUE: This species is used as green manure.

灌木。偶數羽狀複葉，小葉20—40。線狀長橢圓形。花黃色，4—12。莢果下垂，扭曲。本種係栽培種，可用作綠肥。

43. *Smithia* AIT.

Smithia AIT. Hort. Kew. 3: 496 t. 13, 1789.

Herbs or undershrubs; leaves pinnate, leaflets small, many, sensitive to light leaf-rachis ending in a bristle; stipules scarious, with large auricles, exstipellate; flowers racemose or clustered in axillary heads; calyx deeply divided into 2-lips, lips entire; standard orbicular, keel incurved, obtuse; stamens 10, in two sets of 5 each; pods few or many, minute, flattened or turgid enclosed by the calyx.

Widely distributed throughout the tropical regions of Asia and Africa.

CHINESE NAME: 施氏豆屬

JAPANESE NAME: Shiba-nemu-zoku.

Key to the species

1. Leaflets oblanceolate; calyx membranous, veins distinctly anastomosing, 6-8 mm. long(1) *S. ciliata*
1. Leaflets oblong; calyx rigid, veins close, parallel, simple, 5 mm. long.....(2) *S. sensitiva*

1. *Smithia ciliata* ROYLE Illustr. 201 t. 35 fig. 2, 1839. Fig. 137

Annual herbs; stems slender, 15-50 cm. long; leaves pinnate, 2-3 cm. long, leaflets membranaceous, 8-14, oblanceolate, rounded at the apex, 5-12 mm. long, margins and midribs covered with bristles; flowers yellow, 12-to many, clustered, in axillary racemes, peduncles 1-1.5 cm. long, deeply divided into 2 lips, pods 6-8 jointed, each joint slightly orbicular 1-1.5 mm. long, covered with papillae.

CHINESE NAME: 施氏豆

JAPANESE NAME: Shiba-nemu.

FLOWERING TIME: October.

HABITAT: On the slopes at medium altitudes of the island.

DISTRIBUTION: India, Formosa and Japan.

一年生草本。羽狀複葉，小葉8—14，倒披針形。花黃色，12至多數。莢果6—8節，被有乳狀突起。本種分佈於嘉義、高雄等縣之高山。

2. *Smithia sensitiva* AIT. Hort. Kew 13: 496, t. 13, 1789.

Fig. 138

Annual herbs, stems slender, with many branches and covered with bristles; leaves pinnate, 1.5-3 cm. long; leaflets oblong, rounded at the apex, 6-15 mm. long, midribs covered with bristles on the lower surface; flowers yellow, in 1-6 flowered clusters in the axillary racemes; peduncles upright, 1.5-2 cm. long; calyx 6-8 mm. long, teeth acuminate, with bristles; pods 4-6 jointed, densely covered with papillae.

CHINESE NAME: 靈敏施氏豆

JAPANESE NAME: Nemuli-hagi.

FLOWERING TIME: May to November.

HABITAT: In open wet places, chiefly at medium altitude.

DISTRIBUTION: Tropical Asia and Africa, Malaya, Australia and Formosa.

一年生草本。羽狀複葉，小葉長橢圓形，先端圓形，長6—15mm。花黃色，1—6，腋生。莢果4—6節。本種分佈於桃園、新竹、臺中和屏東各縣，可作土壤之改良。

44. *Stizolobium* P. BR.

Stizolobium P. BR. Hist. Jamaic. 290, 1756.

Coarse annual vines; leaves trifoliolate, leaflets broadly stipellate; stipules small, lanceolate; flowers in long nodulose racemes; calyx campanulate, 2-lipped; corolla long exserted; standard shorter than the keel, wings as long as the keels; stamens diadelphous, anthers dimorphous; style filiform, usually pubescent nearly to tip but not bearded; stigma small, terminal; pods turgid and thick or compressed, more or less ridged along the suture, softly pubescent; seeds large, subglobose to oblong.

About 12 species in the Old World Tropics.

CHINESE NAME: 黎豆屬

ENGLISH NAME: Velvet Bean.

JAPANESE NAME: Hassjoo-mame.

Stizolobium hassjoo PIPER & TRACY. in U. S. Dept. Agric. Bur. Pl. Industry Bull. 179: 17; 1910.

Fig. 139

A slender, annual vine, sparingly white-pubescent; leaves trifoliolate, leaflets ovate, acute and abruptly mucronate, 8-13 cm. long, both surfaces white pubescent; flowers dark purple, 4 cm. long, 3-7 in axillary racemes; calyx 1.2 cm. long, saccate, densely pubescent, lower lobe a half longer than the lateral ones; pods linear, 9-12 cm. long, with prominent side ridge and clothed with white appressed pubescence; and seeds 3-6, oblong flattened, ash-colored.

CHINESE NAME: 黎豆，虎爪豆，富貴豆

ENGLISH NAME: Yokohama Bean.

JAPANESE NAME: Hassjoo-mam.

HABITAT: Cultivated.

DISTRIBUTION: Probably native of Japan, now widely distributed in tropical

regions.

ECONOMIC VALUE: This species is used as green manure and fodder, seeds are used for food after the toxin has been removed.

一年生纖維藤本。三出複葉，小葉卵形，先端銳形，長8—13cm。花暗紫色，長4cm，3—7，腋生總狀花序。莢果線形，長9—12cm，密被白色貼伏毛，有顯著的稜。本種係引進者，為一重要之夏季一年生綠肥作物。莖、葉可供牧草用，種子有毒，去毒後可供加工用。

45. *Stylosanthes* SWARTZ.

Stylosanthes SWARTZ. Prod. Veg. Ind. Occ. 108, 1788.

Perennial herbs or small shrubs, stems prostrate or ascending; leaves trifoliolate, leaflets linear, lanceolate or ovate, without stipels; stipules scariose, connate, forming a sheath; flowers yellow or yellow-orange, in terminal heads or short spikes; calyx with an elongated filiform tube, upper 4 teeth connate, lower one distinct; corolla inserted at the throat of calyx tube; stamens monadelphous, anthers dimorphous; pods flattened, 1-2 jointed, rugose-reticulate, indehiscent.

About 25 species mostly in the tropical and subtropical regions of Asia, Africa, South America and North America.

CHINESE NAME: 筆花豆屬

ENGLISH NAME: Pencil-flower.

Stylosanthes gracilis H. B. K. Nov. Gen. et Sp. 6: 507, t. 596, 1823. Fig. 140

An erect, branched, perennial herb, pubescent, about 30-60 cm. high, usually rooting at the nodes; stipels absent, stipules conspicuous, connate, adnate to the petioles, forming a sheath, clothed with long hairs; leaves palmately trifoliolate, leaflets linear-oblong, acute, cuspidate, 2-3 cm. long, upper surface glabrous, lower surface pubescent; flowers yellow-orange, 10-12 mm. long, in terminal and axillary heads; calyx tubular, teeth acuminate, clothed with bristle-like hairs; pods oblong, 2-jointed, indehiscent.

CHINESE NAME: 筆花豆

ENGLISH NAME: Brazilian Lucerne, Stylo.

HABITAT: Cultivated.

DISTRIBUTION: A native of Africa.

ECONOMIC VALE: This is a valuable pasture plant, which is very drought resistant.

直立多年生草本。三出複葉，小葉線狀長橢圓形，先端銳形，托葉顯著癒合與葉柄合生成鞘狀。花黃橙色，長10—12mm，呈頭狀花序。莢果長橢圓形，2節。本種係引進栽培者，為優良的牧草之一，耐旱性頗強。

46. *Tephrosia* PERS.

Tephrosia PERS. Syn. 2: 328, 1807.

Perennial herbs or undershrubs; leaves usually odd-pinnate, with 3 to numerous

leaflets and rarely unifoliate; exstipellate; stipules mostly slender herbaceous; flowers in terminal or axillary racemes, white, pink, red to purple; calyx campanulate, teeth distinct, subequal, or upper 2 connate or lower 2 longer; standard suborbiculate, keel incurved, not beaked; stamens monadelphous or diadelphous; anthers all alike, style much curved, filiform or flattened, glabrous or barbate; pods linear, straight or somewhat curved, flattened, dehiscent; continuous or obscurely septate between the seeds.

About 300 species mostly in the tropical and subtropical areas.

CHINESE NAME: 灰毛豆屬

JAPANESE NAME: Nanbankusahudi.

Key to the species

1. Calyx-teeth short, deltoid..... 2
1. Calyx-teeth narrow, cuspidate, as long as the tube 3
2. Shrubs; leaflets oblong, acute 5-7 cm. long; flowers white, 2 cm. long.....(1) *T. candida*
2. Suffrutescent herbs; leaflets oblanceolate, emarginate, 2-4 cm. long; flowers yellow.....(3) *T. noctiflora*
3. Inflorescence longer than the leaves, 10-15 cm. long.....(5) *T. purpurea*
3. Inflorescence shorter than the leaves, 1-3 cm. long..... 4
4. Leaflets 13-17, oblanceolate, 10-15 mm. long; pods slightly curved at the tip, 3.5 cm. long(2) *T. ionophlebia*
4. Leaflets 11-13, obovate, 5-10 mm. long; pods straight, 2-2.5 cm. long.....(4) *T. obovata*

1. ***Teprosia candida*** (ROXB.) DC. Prodr. 2: 249, 1825. Fig. 141

A shrub, about 1-3 m. high, branches striated, strigose; leaves pinnate, 5-22 cm. long, leaflets 17-27, oblong, acute, 5-7 cm. long; racemes terminal and axillary; bracts subulate, deciduous; calyx 4-5 mm. long, strigillose, upper lobes completely fused; corolla white, 2-2.5 cm. long, finely short-strigose on the back; pods linear, 6-9 cm. long, 7-9 mm. wide, covered with stiff hairs; seeds 10-13.

CHINESE NAME: 白花鐵富豆

JAPANESE NAME: Kidati-nanban-kusahudi.

FLOWERING TIME: October to December.

HABITAT: Cultivated.

DISTRIBUTION: Native of Inida.

ECONOMIC VALUE: This species is used for green manure, especially in tea plantations.

灌木。羽狀複葉，小葉17—27，長橢圓形，先端銳形。花白色，長2—2.5cm。莢果扁平，線形。本種係引進豆科植物，用作綠肥作物，尤其宜用在茶園。

2. **Tephrosia ionophlebia** HAY. Icon. Formos. 9: 21, 1920.

Fig. 142

A perennial herb, stems clothed with thin appressed hairs; leaves odd-pinnate; leaflets 13-17, oblanceolate, retuse at the apex, 1-1.5 cm. long, under surfaces clothed with pubescence, stipules linear, 3 mm. long. flowers 1 cm. long, in axillary racemes, shorter than leaves, 2-3 cm. long; calyx campanulate, 5 mm. long; pods linear, 3.5 cm. long, slightly curved at the tip, 5-7-seeded.

CHINESE NAME: 紫葉灰毛豆

JAPANESE NAME: Kuroba-nanban-kusahudi.

FLOWERING TIME: July to August.

HABITAT: On open waste places.

DISTRIBUTION: Endemic.

多年生草本。奇數羽狀複葉，小葉13—17，倒披針形，先端鈍形。花紅色，長1cm。莢果線形，長3.5cm。本種分佈於臺南、高雄等縣荒地或草原，可供作綠肥。

3. **Tephrosia noctiflora** BOJ. Hort. Maurit. 93.

Fig. 143

An erect suffrutiscent herb, about 1-2 m. high; stems clothed with brown hairs; leaves pinnate, leaflets 15-19, oblanceolate, emarginate, apiculate, 2-4 cm. long, upper surface glabrous, lower side pubescent; stipules setaceous, 5-7 mm. long; flowers yellow, 7 mm. long, in long axillary racemes, opposite leaves; calyx campanulate, teeth short; pods linear, flat, 4-5 cm. long, somewhat curved, densely covered with long brown hairs; seed 8-10.

CHINESE NAME: 黃花鐵富豆

JAPANESE NAME: Birodo-nanban kusahudi.

FLOWERING TIME: July to December.

DISTRIBUTION: Africa and India.

ECONOMIC VALUE: This species cultivated in tea plantations for green manure.

直立半灌木狀草本。羽狀複葉，小葉15—19，倒披針形，長2—4cm。花黃色，長7mm，呈腋生總狀花序，與葉對生。莢果扁平，線形，長4—5cm。本種係引進種，宜栽培於茶園作綠肥。

4. **Tephrosia obovata** MERR. in Philip. Journ. Sci. 5: 69, 1910.

Fig. 144

A small perennial herb, stems densely pubescent; leaves odd-pinnate, leaflets 11-13, obovate, mucronate at the apex, 5-10 mm. long, both surfaces densely covered with silky hairs; stipules triangular 4 mm. long; flowers 10 mm. long, red, in axillary racemes; peduncles 1-2 cm. long, calyx campanulate, 3 mm. long, teeth linear; pods linear, straight, 2-2.5 cm. long, densely clothed with long silky hairs, 6-7-seeded.

CHINESE NAME: 臺灣灰毛豆

JAPANESE NAME: Taiwan-kusahudi.

FLOWERING TIME: Most of the year.

HABITAT: In dry open places in the southern part of the island.

DISTRIBUTION: Philippines and Taiwan.

ECONOMIC VALUE: This is used as green manure.

多年生草本。奇數羽狀複葉，小葉倒卵形，具短尖，長5—10mm。花紅色，腋生總狀花序。莢果線形，長2—2.5cm。本種分佈於高雄、屏東和臺東等縣，可供作綠肥。

5. **Tephrosia purpurea** PERS. Syn. 2: 329, 1807.

Fig. 145

A perennial herb, stems slender, erect or decumbent at base, about 30–60 cm. high; leaves odd-pinnate; leaflets 17, oblanceolate, obtuse at the apex, 2 cm. long, glabrous above, clothed with silky hairs below; stipules linear 5 mm. long; racemes axillary, opposite the leaves, about 10–15 cm. long; flowers red, 7–8 mm. long, fascicles of 3 or 4; pods 4 cm. long, somewhat curved, clothed with thin hairs, 6–10 seeded.

CHINESE NAME: 烏仔草，紫草藤

JAPANESE NAME: Namban-kusahudi.

FLOWERING TIME: Most of the year.

HABITAT: In open waste places in the southern part of the island.

DISTRIBUTION: Widely distributed in tropical regions.

ECONOMIC VALUE: This species is used a valuable green manure.

多年生草本。奇數羽狀複葉，小葉17枚，倒披針形，先端鈍形。花紅色，長7—8mm。莢果線形，彎曲，長4 cm。本種分佈於中、南部原野，可供作綠肥。

47. **Teramnus** Sw.

Teramnus Sw. Benth. et Hook. f. Gen. Pl. 1: 550, 1862.

Slender, twining herbs; leaves trifoliate; flowers small in axillary paniced racemes; calyx campanulate, teeth distinct, subequal or the two upper ones not so long; corolla little exserted; petals about equal in length, standard not spurred; stamens monadelphous; alternate anthers small, abortive; style short curved beardless; pods linear, hooked with the persistent style at the tip, flattish, septate between the seeds.

A small genus about 4 species distributed through out the Tropics.

CHINESE NAME: 野黃豆屬

JAPANESE NAME Yabumame Zoku.

1. **Teramnus labialis** (LINN. F.) Spr. Syst. 3: 235, 1825.

Fig. 146

A slender, twining vine, densely hirsute; leaves trifoliate; terminal leaflets oblong or oblong-ovate, obtuse, acute or mucronate at the apex; about 2–6 cm. long, variable in size; lower surface densely covered with appressed hairs, stipules minute, lanceolate deciduous; flower 5 mm. long, in short axillary racemes; calyx campanulate, 5-clefted, teeth lanceolate, clothed with appressed hairs; corolla purple; pods linear, flattened, curved at the apex, slightly pubescent, about 4 cm. long, 10-seeded.

Differs from *T. angustifolius* by its terminal leaflets being oblong and the apex being acute, obtuse or mucronate and variable in size.

CHINESE NAME: 闊葉野黃豆

JAPANESE NAME: Hirohano-yabumame.

FLOWERING TIME: October to January.

HABITAT: In thickets, waste places at low and medium altitudes.

DISTRIBUTION: Widely distributed in tropical regions.

ECONOMIC VALUE: This is a valuable pasture plant.

纖細纏繞藤本。三出複葉，頂小葉長橢圓形，先端鈍形，長2—6cm。花紫色呈腋生總狀花序。莢果線形，扁平頂端彎曲。本種分佈於高雄、屏東等縣，可作牧草。

48. *Trifolium* LINN.

Trifolium LINN. Sp. Pl. 764, 1753.

Annual and perennial herbs; leaves mostly trifoliolate, entire or denticulate; stipules adnate to petioles; flowers small, red, pink or yellow in dense head-like clusters or spikes, calyx teeth nearly equal, petals stamens 10, diadelphous, anthers monomorphous, style filiform, beardless, stigma more or less oblique; pods small, membranous, enclosed by the persistent petals, 1-6 seeded, indehiscent.

About 300 species in temperate regions.

CHINESE NAME: 翹搖屬

ENGLISH NAME: Clover.

Key to species

1. Plants glabrous; leaflets obcordate; flowers white, 7-8 mm. long, pedicellate, with bracts; heads on long slender peduncles directly from the creeping stems(2) *T. repens*
1. Plants hairy; leaflets ovate or obovate; flowers red or purplish, 10-12 mm. long, sessile, without bracts; heads on short peduncles or sessile from leafy erect or ascending stems.....(1) *T. pratense*

1. *Trifolium pratense* LINN. Sp. Pl. 768, 1753.

Fig. 147

An erect or ascending herb, about 30-60 cm. high; stems branched, sparsely villous-pubescent with spreading hairs; leaves trifoliolate, leaflets ovate, oblong, obtuse, emarginate, 3-5 cm. long, minutely denticulate; stipules ovate, scarious, with hair-like points; heads globose on short peduncle or sessile; calyx hairy, teeth setaceous, 5-8 mm. long; corolla red or purplish, 10-12 mm. long; pods oval, one seeded.

CHINESE NAME: 紅荷蘭翹搖，紅三葉草

ENGLISH NAME: Red Clover.

JAPANESE NAME: Murasaki-tsumekusa.

HABITAT: Cultivated, introduced from Europe.

FLOWERING TIME: May to July.

DISTRIBUTION: Widely cultivated in the world.

ECONOMIC VALUE: This species is very important for forage and soil improvement.

直立草本。三出複葉，小葉卵形或長橢圓形。花紅色或紫紅色，呈頭狀花序。莢果卵形。本種係引進栽培者，極為良好的牧草和綠肥之一。在本島高海拔地區生長極為優良，並可採種。

2. *Trifolium repens* LINN. Sp. Pl. 767, 1753.

Fig. 148

A creeping perennial herb, about 10–30 cm. long, glabrous; leaves trifoliolate, leaflets obcordate, minutely denticulate, 8–20 mm. long; stipules ovate-lanceolate, 4–10 mm. long; flowers white, 7–8 mm. long, in rather loose globular heads, pedicellate, peduncles elongate; calyx glabrous, teeth acuminate, shorter than the tube; pods small, linear; seeds 3–4.

CHINESE NAME: 白荷蘭翹搖

ENGLISH NAME: White Clover.

HABITAT: Cultivated.

FLOWERING TIME: April to July.

DISTRIBUTION: Eurasia and North America.

ECONOMIC VALUE: This species is also very important for forage and soil improvement.

多年生匍匐草本。三出複葉，小葉倒心形，微鋸齒緣。花白色，長7—8mm，呈頭狀花序。莢果很小。在1954年自美國引進，為非常優良的牧草和綠肥。

49. *Uraria* DESV.

Uraria Desv. in Journ. Bot. 1: 122, t. 5, 1813.

Suffruticose or perennial herbs; leaves 1–3-foliolate, or odd-pinnate, leaflets 1–9, stipellate, stipules free, acuminate, striated; flowers very numerous, small, in dense cylindric or spike-like racemes; calyx tube very short, two upper teeth short, three lower teeth usually elongated, setaceous; standard broad, wings adhering to the obtuse keel; stamens diadelphous, anthers uniform; pods small, turgid, with 2–6 joints folded within the calyx, indehiscent, each joint ovate, often placed face to face.

About 8 species distributed in India, Mainland China, Formosa, and southward to Australia.

CHINESE NAME: 貓尾草屬

JAPANESE NAME: Hudihogusa Zoku.

Key to the species

1. Leaflets linear, 5–10 mm. wide.....(4) *U. picta*
1. Leaflets oblong, rounded or round-cordate, more than 2 cm. wide..... 2
2. Leaflets 5 on upper branches, 3 on lower ones, oblong, obtuse at the apex, more than 5 cm. long.....(3) *U. macrostachya*

2. Leaflets usually 3, round-ovate or round-cordate, obtuse, emarginate or retuse, less than 5 cm. long..... 3

3. Leaflets obtuse at the apex.....(2) *U. aequilobata*

3. Leaflets retuse at the apex(1) *U. lagopodioides*

1. ***Uraria aequilobata*** HOSOKAWA in Journ. Soc. Trop. Agr. 4: 202, 1932. Fig. 149

A small suffrutescent herb; leaves trifoliolate; leaflets round or round-obcordate, obtuse or retuse at the apex, 2-4 cm. long; stipules lanceolate, setaceous 4-5 mm. long; racemes terminal, cylindrical, 3-5 cm. long; flowers 5-6 mm. long; calyx campanulate, 5 mm. long, densely clothed with fine hairs; pods 2-jointed; each joint ovate, 4 mm. long, with reticulation.

The present species is closely allied to *U. rufescens* Schindl., but it differs from the latter by having round-obcordate leaflets with a retuse apex, equal lobed calyx and being a much smaller plant.

CHINESE NAME: 圓葉貓尾草

JAPANESE NAME: Murubano-huzihogusa.

FLOWERING TIME: May to October.

HABITAT: On dry grasslands.

DISTRIBUTION: Mainland China and Taiwan.

半灌木草本。三出複葉，小葉圓形或圓狀倒心形，長2—4cm。花長5—6mm。莢果二節。本種分佈於雲林、花蓮、臺東等縣。

2. ***Uraria lagopodioides*** DESV. in M'em. Soc. Linn. Par. 4: 309, 1826. Fig. 150

A small shrub; leaves trifoliolate; leaflets rounded or ovate, rounded obtuse or slightly emarginate at the apex, 2.5-5 cm. long, lower surfaces clothed with dense hairs; stipules lanceolate, acuminate 4-5 mm. long; flowers dense in terminal racemes, cylindrical, 3-5 cm. long; bracts lanceolate, acuminate 6-8 mm. long, deciduous, each bract contains 2 flowers; pedicels 4 mm. long, densely pubescent; calyx campanulate, 7 mm. long; corolla 5-6 mm. long; pods 2-jointed, each joint ovate, with reticulation.

CHINESE NAME: 尾萼豆

JAPANESE NAME: Ohoba-huzihogusa.

FLOWERING TIME: April to December.

HABITAT: In open dry grasslands.

DISTRIBUTION: Widely distributed in the Philippines, India, Mainland China, and southward to Australia.

小灌木。三出複葉，小葉圓形或卵形。花密生，呈頂端總狀花序。莢果二節。本種分佈於臺南、高雄和屏東等縣原野或山坡，對水土保持和土壤之改良有幫助。

3. ***Uraria macrostachya*** WALL. Pl. Asiat. Rar. 2: 8 t. 110, 1831. Fig. 151

A undershrub, about 1.5 m. high; branches stout, pubescent; leaves odd-pinnate, on upper branches usually 5, on lower branches 3, rarely 7; leaflets oblong-ovate or

rounded, obtuse at the apex, 5-10 cm. long; stipules triangular, acuminate 6-10 mm. long; racemes terminal, attaining 30 cm. long; flowers 7-8 mm. long, purple; calyx tube short, upper teeth, 6 mm. long, lower 3 teeth, 7 mm. long; pods 3-7 jointed.

CHINESE NAME: 貓尾草

JAPANESE NAME: Huzihogusa

FLOWERING TIME: May to October.

HABITAT: In dry waste places.

DISTRIBUTION: Mainland China and Taiwan.

粗壯半灌木。奇數羽狀複葉，上半小葉7枚，下部3枚，長橢圓形或圓形，長5—10cm。花紫色，長7—8mm，生於頂端總狀花序。莢果3—7節。本種分佈本島山坡或荒地。

4. *Uraria picta* (JACQ.) DESV. in Journ. Bot. 1: 123, t. 5. fig. 19, 1813. Fig. 152

A perennial shrub, about 1-2 m. high, clothed with pubescence; leaves odd-pinnate, leaflets 5-7, membranaceous, linear, obtuse, 5-9 cm. long, 7-10 mm. wide, lower surface densely pubescent; stipules ovate, acuminate, 7-9 mm. long; racemes terminal, 10-20 cm. long; bracts lanceolate, 25 mm. long; calyx 7 mm. long, 5-cleft upper two lanceolate, lower three linear, clothed with long hairs, corolla 6-8 mm. long, purple; pods 3-5 jointed.

CHINESE NAME: 細葉貓尾草

JAPANESE NAME: Hosoba-hudihogua.

FLOWERING TIME: August to October.

HABITAT: In open grasslands.

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

小灌木。奇數羽狀複葉，小葉5—7，線形，先端鈍形。花紫色，呈頂生總狀花序。莢果3—5節。本種分佈於屏東縣墾丁一帶。

50. *Vicia* LINN.

Vicia LINN. Sp. Pl. 1: 734, 1753.

Annual or perennial, herbaceous, trailing or climbing vines; leaves pinnate, with tendrils terminating the leaf apex, leaflets few to many; stipules truncate or sagittate, persistent; flowers purple, yellowish in axillary racemes; wing united with the keel; stamens diadelphous, anthers uniform, style slender, with a tuft of hairs at the top; pods flattened to terete, mostly dehiscent, 2 to many seeded.

About 150 species widely distributed in the temperate regions of both hemispheres.

CHINESE NAME: 蠶豆屬

ENGLISH NAME: Vetch.

JAPANESE NAME: Sola-mame Zoku.

Key to species

1. Leaves without tendrils; pods thick 5-12 cm. long.....(4) *V. faba*
1. Leaves tendril-bearing; pods not large as above..... 2
2. Peduncles very short or wanting; flowers 1-3..... 3
2. Peduncles well developed; flowers many..... 4
3. Leaflets oblong or oblanceolate, 2-3 cm. long; flowers 20-30 mm. long; seeds brown, somewhat compressed(6) *V. sativa*
3. Leaflets linear, 10-25 mm. long, 2-5 mm. wide; flowers 10-15 mm. long; seeds black, globose, 4-6 mm wide(1) *V. angustifolia*
4. Flowers few, 2-6, 3-5 mm. long..... 5
4. Flowers many, 1-2 cm. long 6
5. Stipules lacinate; pods densely hairy; seeds 2(5) *V. hirsuta*
5. Stipules sagittate, not cleft; pods glabrous; seeds 4.....(7) *V. tetrasperma*
6. Annual; flowers 15 mm. long, standard shorter than the keel..... 7
6. Perennial; flowers 10-12 mm. long, standard as long as the keel (2) *V. cracca*
7. Plants densely clothed with soft hairs; lower calyx teeth longer than the tube.....(8) *V. villosa*
7. Plants sparsely clothed with short appressed hairs or nearly glabrous; calyx teeth shorter than the tube.....(3) *V. dasycarpa*

1. *Vicia angustifolia* ROTM. Tent. Fl. Germ. 1: 110, 1778.

An annual herb, glabrous; stems slender, 30-60 cm high; leaves pinnate, leaflets 8-16, narrowly linear, acute or emarginate, mucronate, 10-25 mm. long; flowers 10-15 mm. long, violet, sessile, 2-3, axillary; calyx teeth about as long as the tube; pods narrow, oblong, 3-4 cm. long; seeds black, globose, 4-6 mm. wide.

CHINESE NAME: 狹葉野豌豆

ENGLISH NAME: Narrow-leaved or August Vetch.

JAPANESE NAME: Hosoba-yahazuendo.

FLOWERING TIME: March to May.

DISTRIBUTION: Native of Europe.

ECONOMIC VALUE: This species is used for forage.

一年生草本，無毛。羽狀複葉，小葉8—16，狹線形，長10—25mm。花紫色，無柄，2—3，腋生。莢果狹長橢圓形，長3—4cm。本種分佈於本島北部，為冬季之牧草及綠肥。

2. *Vicia cracca* LINN. Sp. Pl. 735, 1753.

Fig. 153

A perennial climbing herb, about 80-150 cm. high, stems slender, trailing, lightly pubescent; leaves pinnate; leaflets 18-24, linear to linear-oblong, mucronate at the apex, 15-30 mm. long, tendril prominent; racemes axillary, dense, many flowered;

flowers purplish, 10-20 mm. long; calyx teeth short, deltoid; pods narrow, oblong, flattened, glabrous, 25-30 mm. long, 5-8-seeded.

This species is characterized by the racemes being 6-15 cm. long, and having many dense flowers.

CHINESE NAME: 草藤

ENGLISH NAME: Cow Vetch, Blue Vetch.

JAPANESE NAME: Kusahudi.

FLOWERING TIME: May to September.

HABITAT: In open fields on the eastern part of the island.

DISTRIBUTION: Japan, Southern China and Taiwan.

ECONOMIC VALUE: This species is used for forage, sometimes used as an ornamental.

多年生纏繞草本。羽狀複葉，小葉18—24，線形至線狀長橢圓形，具短尖，並具顯著的卷鬚。花紫色，腋生總狀花序。莢果狹長橢圓形。本種分佈於本島東岸——花蓮和臺東等縣，可作牧草。

3. *Vicia dasycarpa* TEN. Viagg. Abruzz 81, 1829.

An annual or sometimes perennial, slightly pubescent, stems slender, climbing about 1-2 m. high; leaves pinnate, leaflets 6-8 pairs, linear-oblong, rounded, apiculate 1.5-2 cm. long, 5-7 mm. wide; inflorescence short-pedicelled, in one sided racemes; flowers few to many, pink, about 15 mm. long; pods oblong, 2-3 cm. long; seeds rather large, purplish-brown, 2-6.

CHINESE NAME: 苕子

ENGLISH NAME: Wooly Pod Vetch.

FLOWERING TIME: March to May.

HABITAT: Cultivated.

DISTRIBUTION: Native of Europe.

ECONOMIC VALUE: This species is adapted to sandy soils and tolerates acidity, used as green manure and fodder.

一年生纏繞植物。羽狀複葉，小葉6—8對，線狀長橢圓形。花紫紅色，呈一面向的總狀花序。莢果長橢圓形，長2—3cm。本種在1959自美國引進，在本省各地均可栽培，適於砂質土壤，耐酸性極強，可供作牧草和綠肥。

4. *Vicia faba* LINN. Sp. Pl. 737, 1753.

Fig. 154.

An erect annual herb, stems simple, stout, glabrous 4-angled, about 60 cm. high; stipules large, toothed; leaves pinnate, leaflets mostly alternate, 1-3 pairs, elliptic to oblong, obtuse, apiculate, 5-8 cm. long, terminal one wanting or represented by very rudimentary tendril; flowers 2-6, in axillary racemes, peduncle very short; calyx campanulate, 5-cleft, 1 cm long; corolla white with purplish blotch, 2.5-3.5 cm. long; pods thick, oblong, 5-12 cm. long; seeds several.

CHINESE NAME: 蠶豆

ENGLISH NAME: Broad Bean, Field Bean.

JAPANESE NAME: Sola-mame.

HABITAT: Cultivated.

FLOWERING TIME: March to June.

DISTRIBUTION: Introduced from northern Africa and south western Asia.

ECONOMIC VALUE: Cultivated as vegetable and for fodder.

直立一年生草本。羽狀複葉，小葉1至3對，橢圓形至長橢圓形，不具卷鬚。花白色，2—6，腋生總狀花序。莢果長橢圓形，肥厚。本種係栽培種。種子可供食用，莖葉可作家畜飼料。

5. *Vicia hirsuta* (LINN.) S. F. Gray Zenker, Fl. Thu. 4: t. 696, 1836. Fig. 155

An annual, climbing vine, about 80–120 cm. high; leaves pinnate, leaflets 16–24, oblong, elliptic or ovate, mucronate or obtuse at the apex, 15–20 mm. long, stipules 2-cleft, 3 mm. long; flowers few, pale purple, 3–4 mm. long, on 2–3 cm. long slender peduncles; pods oblong, densely pubescent, 8 mm. long, 2-seeded.

This species can be easily identified by its densely pubescent pods and being 2-seeded.

CHINESE NAME: 小巢菜

JAPANESE NAME: Suzume-no-endo.

ENGLISH NAME; Hairy Vetch or Tare.

FLOWERING TIME: March to May.

HABITAT; In open grasslands in the northern part of the island.

DISTRIBUTION: Naturalized from Europe, widely distributed in Japan, Mainland China and Taiwan.

ECONOMIC VALUE: Used for forage.

一年生纏繞草本。羽狀複葉，小葉16—24，長橢圓形，橢圓形或卵形，先端鈍形具短尖。花淡紫色，少數。莢果長橢圓形，長8 mm。本種分佈本島北部為優良的冬季牧草及綠肥。

6. *Vicia sativa* LINN. Sp. Pl. 736, 1753. Fig. 156

An annual herb, about 25–90 cm. high, clothed with thin white soft hairs; leaves pinnate; leaflets 8–16, oblong or oblanceolate, truncate and apiculate, 8–18 mm. long, stipules sagittate; flowers 1 or 2, purple, 13 mm. long, with short axillary peduncles; pods oblong, 4–5 cm. long.

CHINESE NAME: 野豌豆，苕子，苕菜

ENGLISH NAME: Common Vetch, Vetch.

JAPANESE NAME: Yahazu-endo.

FLOWERING TIME: March to May.

HABITAT: Roadside and field weed.

DISTRIBUTION: Introduced from Europe, widely distributed in Japan, Mainland China and Taiwan.

ECONOMIC VALUE: Hairy vetch is a good winter pasture legume and is used for green manure.

一年生草本。羽狀複葉，小葉8—16，長橢圓或倒披針形，長8—18mm。花紫色，1—2，長13mm。莢果長橢圓形，長4—5cm。本種分佈於本島北部，為優良的冬季牧草及綠肥之一。

7. *Vicia tetrasperma* (LINN.) MOENCH. Meth. 148, 1794. Fig. 157

An annual or biennial herb, slender stems, about 30–60 cm. high, pubescent; leaves pinnate; leaflets linear-oblong, mucronate at the apex, 12–17 mm. long; stipules truncate 3 mm. long; flowers purple or whitish-purple, 5 mm. long, in slender, axillary peduncles; pods oblong, glabrous, 8–10 mm. long, 4-seeded.

CHINESE NAME: 鳥喙豆

JAPANESE NAME: Kasumagusa.

ENGLISH NAME: Slender Vetch.

FLOWERING TIME: April to May.

HABITAT: On open grasslands in the northern part of the island.

DISTRIBUTION: Naturalized from Europe, widely distributed in Japan, Ryukyu, Mainland China and Taiwan.

一年生或越年生草本。羽狀複葉，小葉線狀長橢圓形，具短尖，長12—17mm。花淡紫色，長5mm。莢果長橢圓形，長8—10mm。本種分佈於本島北部，用為牧草和綠肥。

8. *Vicia villosa* Roth. Tent. Fl. Germ. 2(2): 182, 1793.

An annual or biennial climbing herb, about 1–2 m. high, stems villous; leaves pinnate, leaflets 5–10 pairs, linear-oblong, obtuse or acute, mucronate, tendril prominent and branched; flowers numerous in a long one-sided raceme, purple, 15 mm. long; pods broadly oblong, oblique at each end, 2.5 cm. long, pale, glabrous; seeds 2–6.

CHINESE NAME: 毛苕子

ENGLISH NAME: Hairy or Winter Vetch.

HABITAT: Cultivated.

FLOWERING TIME: May to July.

DISTRIBUTION: Eurasia.

ECONOMIC VALUE: This is used for hay, green fodder and as a soil improving crop.

一年生或越年生草本。羽狀複葉，小葉5—10對，線狀長橢圓形，先端鈍形，具卷鬚。花紫色，長15mm，呈一邊向的總狀花序。莢果長橢圓形。本種係引進者，為良好的牧草和綠肥。

51. *Vigna* SAVI

Vigna SAVI Mem. Phas. 3: 7, 1826.

Annual or perennial vines, with twining or prostrate herbaceous stems; leaves trifoliate; the terminal leaflets stalked; stipules persistent; flowers yellow, white or purplish in clustered racemes; calyx campanulate, teeth long or short, the upper 2

often connate; corolla much exerted, keel truncate or with an ascending or slightly recurved beak not coiled; stamens diadelphous, anthers uniform; style bearded along one side below stigma; pods long and slender, many-seeded.

About 60 species in the tropical and subtropical regions.

CHINESE NAME: 豇豆屬

JAPANESE NAME: Sasage Zoku.

Key to species

1. Keel prolonged into a distinct beak 2
1. Keel not prolonged into a beak..... 3
2. Leaflets ovate, acute, hairy, 3-5 cm. long.....(1) *V. luteola*
2. Leaflets broadly ovate to oblong-ovate, obtuse, glabrous, 5-6 cm. long(2) *V. marina*
3. Pods glabrous, very long, 20-100 cm. long, cultivated 4
3. Pods densely clothed with brown hairy, 10 cm. long(5) *V. vexillata*
4. Pods inflated and flabby up to 1 m. long.....(3) *V. sesquipedalis*
4. Pods hard and firm, not inflated and flabby, 20-30 cm. long(4) *V. unguiculata*

1. ***Vigna luteola*** (JACQ.) BENTH. in Mart., Fl. Bras. 15: 194, t. 50, 1859. Fig. 158

A trailing or twining herb, stems slender, clothed with spreading hairs; leaves trifoliolate; terminal leaflets ovate, acute at the apex, 3-5 cm. long; stipules lanceolate 4 mm. long; flowers 1 cm. long, yellow, on peduncles, equalling or exceeding the leaves; calyx subglabrous, 4 mm. long, teeth lanceolate, as long as the tube; pods linear 5-6 cm. long, pubescent.

This species differs from *V. marina* by its ovate leaflets, acute apex, and from *V. vexillata* by its lanceolate leaflets.

CHINESE NAME: 長葉豇豆

JAPANESE NAME: Nagaba-hamasasage.

FLOWERING TIME: August to October.

DISTRIBUTION: Cosmopolitan in the tropical regions.

蔓性纏繞草本。三出複葉，頂小葉卵形，先端銳形，長3—5cm。花黃色，長1cm，腋生。莢果線狀，長5—6cm。本種分佈於高雄、屏東等縣，草質良好。

2. ***Vigna marina*** (BURM.) MERR. Inter. Herb. Amb. 285, 1917. Fig. 159

A prostrate or climbing vine, glabrous; leaves trifoliolate; leaflets broadly ovate to oblong-ovate, obtuse at the apex, 5-6 cm. long; stipellate; stipules narrow ovate, basifixed; scapes axillary, erect, 10 cm. long, with many racemosely arranged flowers at the top; flowers yellow, 15-18 mm. long; calyx 2.5-3 mm. long, nearly glabrous, teeth deltoid; pods subcylindrical, reflexed, 4-5 cm. long, 5-6-seeded.

CHINESE NAME: 濱豇豆

JAPANESE NAME: Hama-aduki.

FLOWERING TIME: April to July.

HABITAT: In thickets throughout the island along the seashore.

DISTRIBUTION: In the tropics of the world.

匍匐或纏繞植物。三出複葉，小葉闊卵形至長橢圓狀卵形，先端鈍形，長5—6cm。花黃色，長15—18mm。莢果圓柱形，長4—5cm。本種分佈於臺北、高雄和宜蘭等縣海邊，為良質的牧草。

3. *Vigna sesquipedalis* (LINN.) FRUWIRTH Unbau Huelsenfrucht. 254, 1898.

An annual trailing vine, glabrous; leaves trifoliolate, terminal leaflets rhomboid-ovate, acute, 7-14 cm. long; flowers yellowish or violet, 20-25mm. long, 2-3 on the top of a long peduncle; bracts spatulate, acute, caducous; calyx campanulate, lanceolate, acuminate, glabrous; style bearded; pods inflated and flabby when green, up to 1 m long.

CHINESE NAME: 長豇豆

ENGLISH NAME: Yard Long Bean, Asparagus Bean.

JAPANESE NAME: Hata-sasage.

FLOWERING TIME: July to a August.

DISTRIBUTION: Native of South China, and widely cultivated in Mainland China, Japan and Taiwan.

ECONOMIC VALUE: Young pods are used for vegetables.

一年生纏繞植物。三出複葉，頂小葉菱狀卵形，先端銳形，長7—14cm。花黃色或紫色，腋生。莢果長形。本種係栽培蔬菜之一，莖、葉可作家畜飼料。

4. *Vigna unguiculata* (LINN.) WALP. Rep. 1: 779, 1842.

Fig. 160

A trailing herbaceous vine, glabrous; stipules large; leaves trifoliolate, leaflets 3, rhomboid-ovate, acute, 8-15 cm. long petioled, margin usually shallowly lobed on basal half; flowers violet, 3-6, on the end of a long peduncle; calyx campanulate, 4-lobed, lobes lanceolate; corolla twice as long as calyx; pods 20-30 cm. long, straight, pendent.

CHINESE NAME: 豇豆

ENGLISH NAME: Cowpea.

JAPANESE NAME: Sasage.

HABITAT: Cultivated in gardens.

FLOWERING TIME: June to August.

DISTRIBUTION: The species is native to the Old World tropics, but has been widely introduced elsewhere.

ECONOMIC VALUE: It is grown primarily for its edible seeds.

一年生纏繞草本。三出複葉，小葉菱狀卵形，長8—15cm。花紫色，腋生於長花梗頂端。莢果圓柱形，長20—30。本種係栽培種，種子可供食用，莖、葉可作飼料。

5. *Vigna vexillata* (LINN.) BENTH. in Mart., Fl. Bras. 15: 194, t. 50, 1859.

Fig. 161

A perennial herb, stems slender, twining, somewhat covered with appressed hairs; leaves trifoliate; leaflets lanceolate, acute at the apex, 6-10 cm. long, both surfaces with brownish hairs; stipules broad, lanceolate 3-4 mm. long, basifixed; scapes axillary, 10-20 cm. long; flowers large, reddish-purple, 2-2.5 cm. long, 2-4 on the top; calyx 8-10 cm. long, silky, teeth lanceolate, as long as the tube; pods linear, 10 cm. long, densely clothed with brown hairs, 10-15-seeded.

CHINESE NAME: 披針葉豇豆

JAPANESE NAME: Akasasage.

FLOWERING TIME: September to October.

HABITAT: In thickets in the central part of the island.

DISTRIBUTION: Cosmopolitan in tropics.

多年生草本。三出複葉，小葉披針形，先端銳形，長6—10cm。花紫紅色，長2—2.5cm，腋生於長花梗頂端。莢果線形，長10cm。本種分佈南投縣境，為良質的牧草。

52. *Zornia* GMEL.

Zornia GMEL. Syst. Nat. 1076, 1791.

Annual or perennial herbs, with mostly prostrate or semi-erect, slender stems; leaves palmately compound with 2-4 leaflets, often glandular-punctate; flowers commonly yellow, in axillary lax racemes; calyx minute, upper teeth short, connate; the lowest shorter than the two middle ones; corolla much exerted, standard broad, keel incurved acute; stamens monadelphous, anthers dimorphous; pods flattened, indehiscent, with several small round joints.

About 15 species, mostly in the tropical and subtropical regions of North and South America, Africa and Asia.

CHINESE NAME: 丁葵草屬

JAPANESE NAME: Sunazi-mame Zoku.

Zornia diphylla (LINN.) PERS. Syn. 2: 318, 1807.

Fig. 162

Perennial, slender, branched herbs, glabrous, about 20-50 cm. high; leaflets 2, lanceolate, acute or acuminate, 1-2.5 cm. long; stipules lanceolate, with a long spur; racemes slender, 2-6 cm. long, many flowered; flowers yellow, 8-10 mm. long; bracts ovate, 8-10 cm. long, quite hiding the flower and pod; pods 2-6-jointed, oblong, flattened, 3-4 mm. long, densely prickly.

CHINESE NAME: 丁葵草

JAPANESE NAME: Sunazi-mame.

FLOWERING TIME: July to August.

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

DISTRIBUTION: Widely spread all over the tropical regions.

ECONOMIC VALUE: This species is used locally as a medicinal herb and may have importance as fodder.

多年生纖細草本。小葉2枚，披針形，先端銳形，長1—2.5cm。花黃色，長8—10mm。莢果2—6節，扁平。本種分佈於臺北、新竹、彰化及屏東等堤防或乾旱草地，可作牧草用。

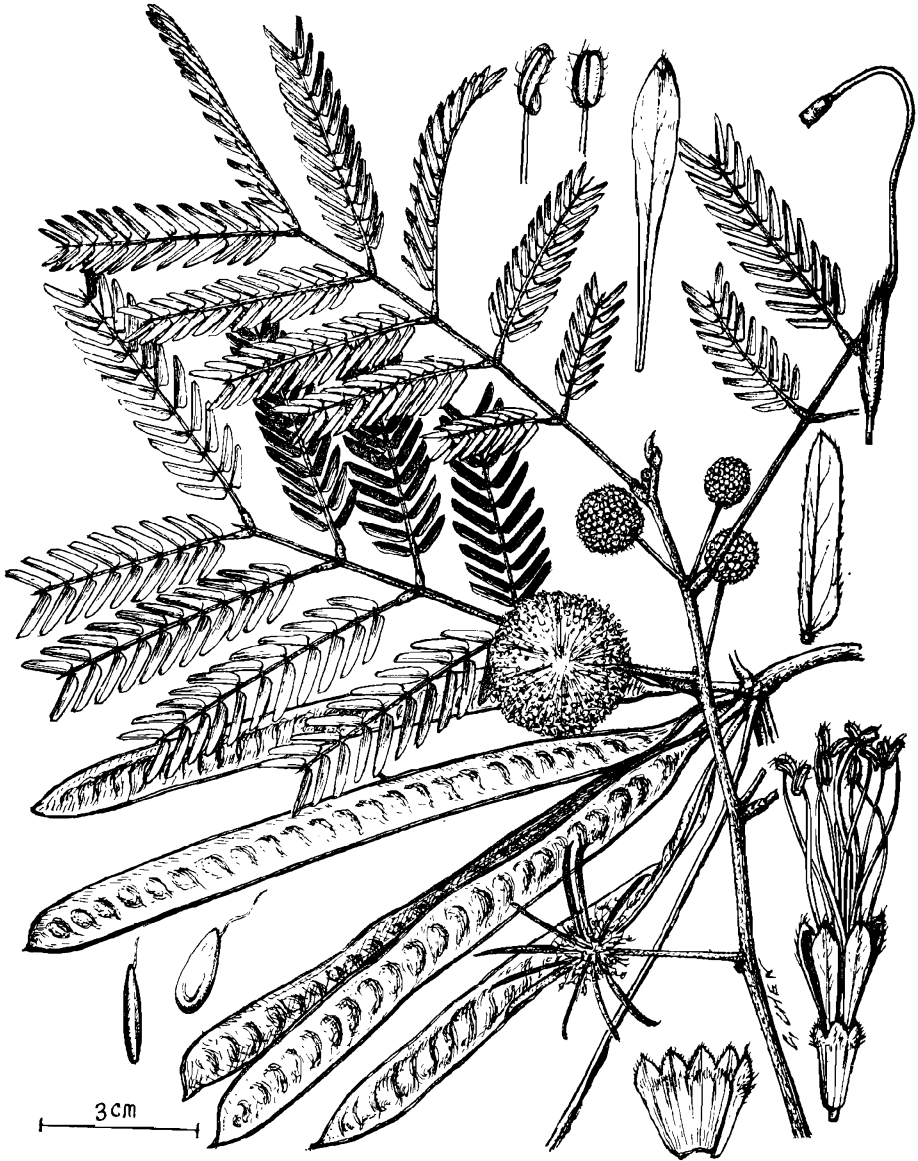


Fig. 1. *Leucaena glauca* (Linn.) Benth.

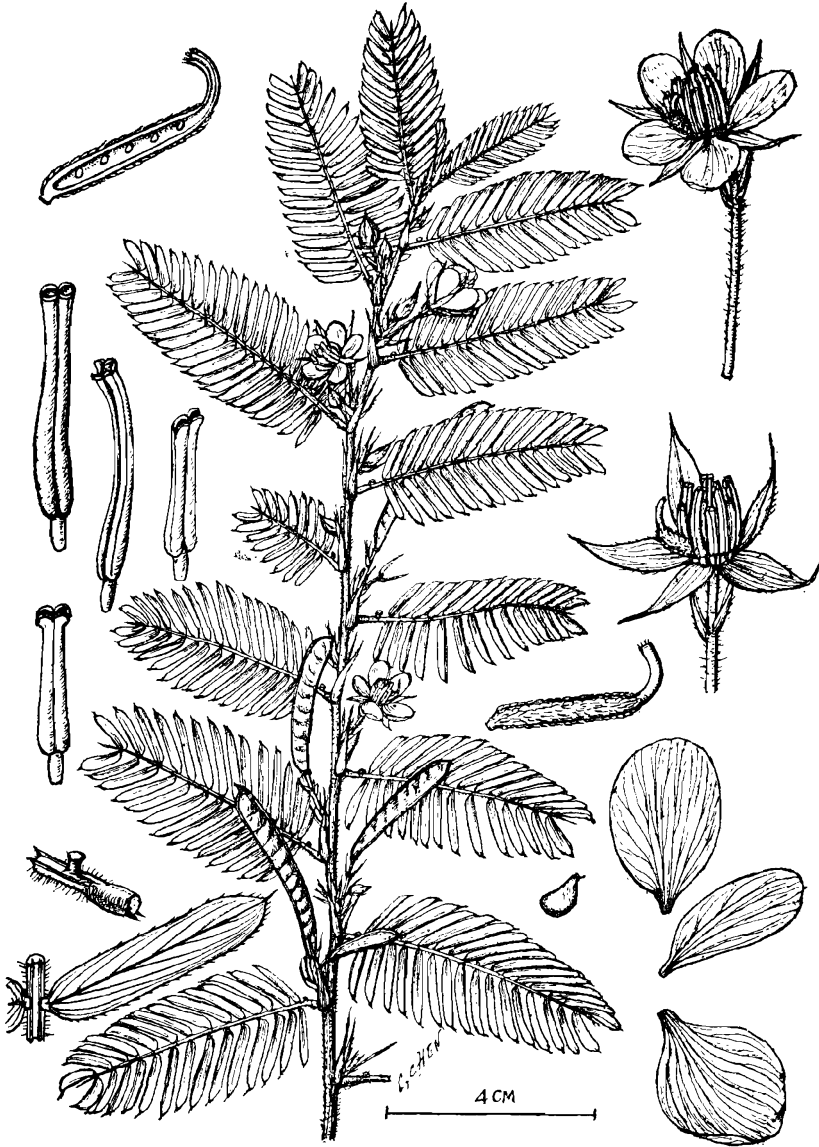


Fig. 3. *Cassia Leschenaultiana* DC.



Fig. 4. *Cassia mimosoides* LINN.

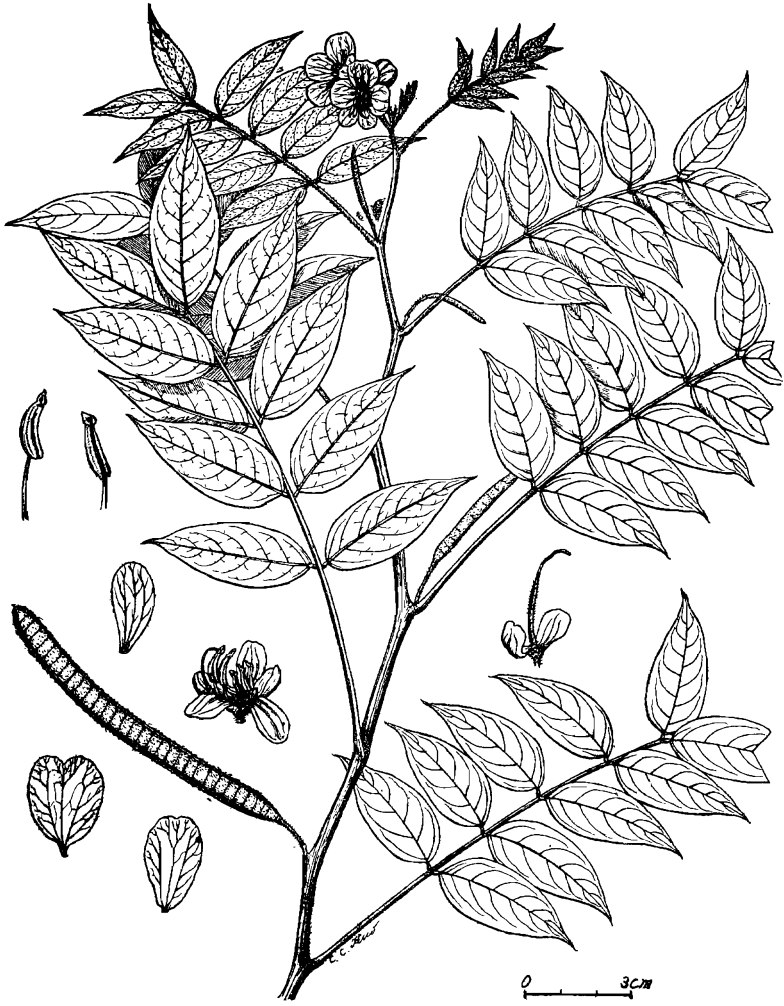


Fig. 5. *Cassia occidentalis* LINN.

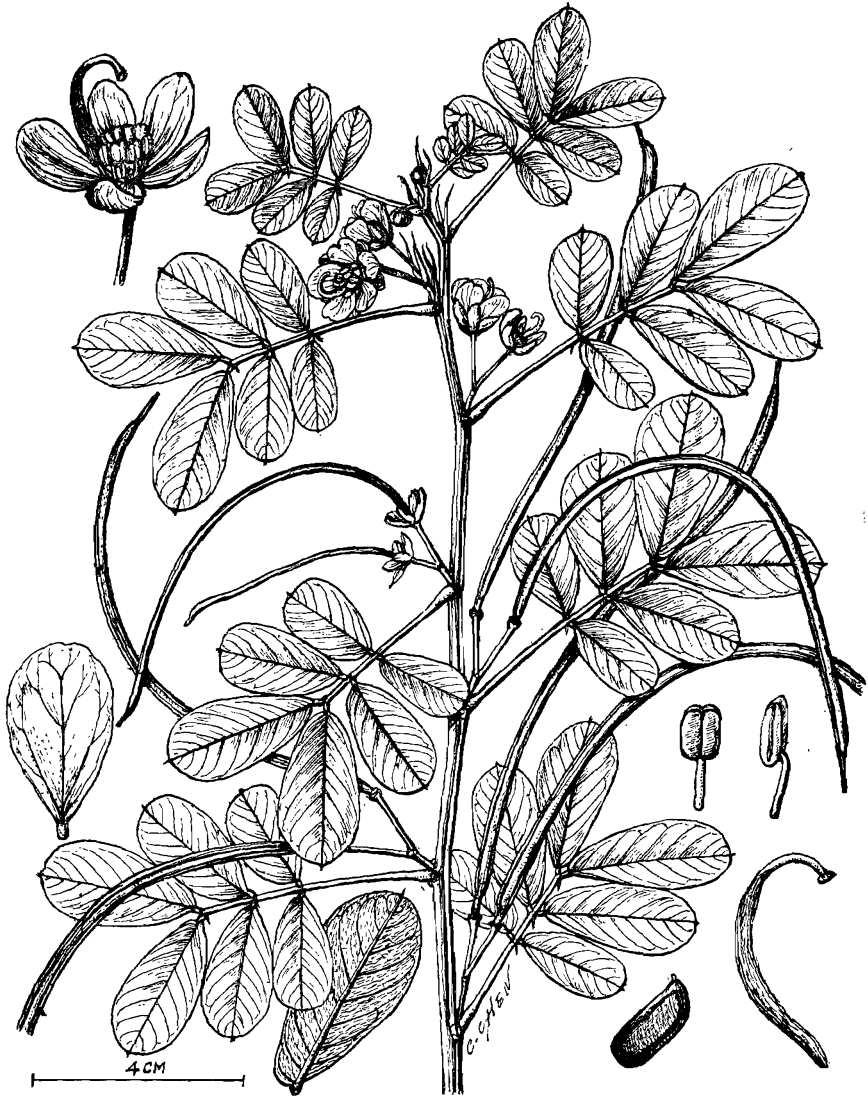


Fig. 6. *Cassia tora* LINN.

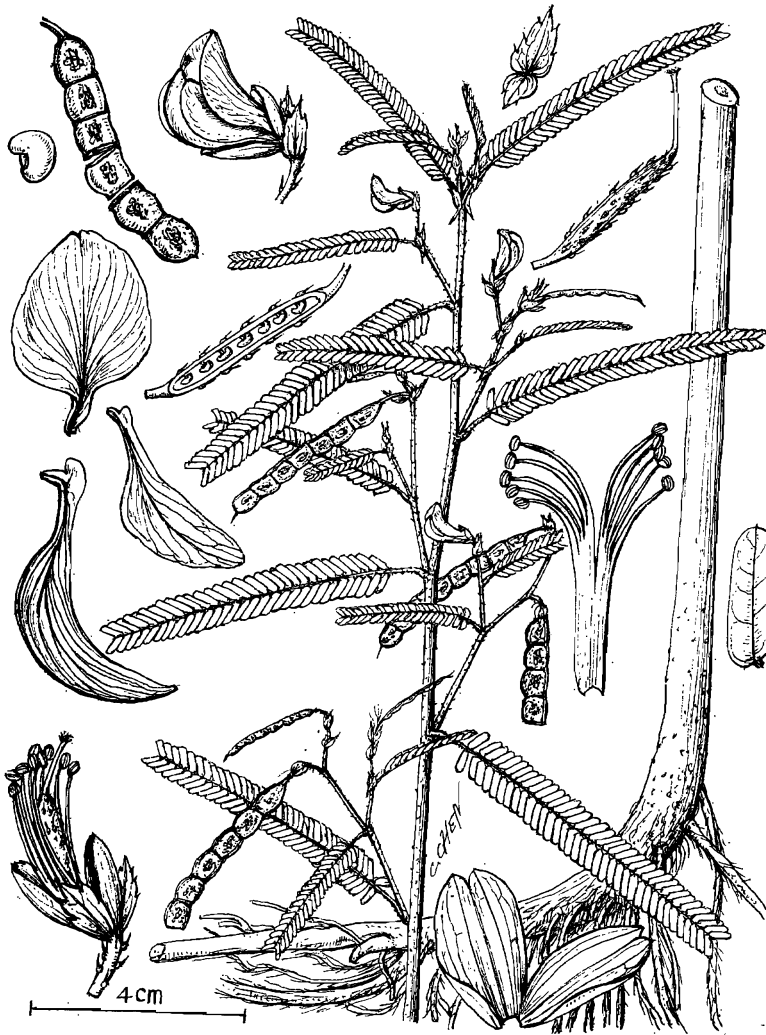


Fig. 7 *Aeschynomene indica* LINN.

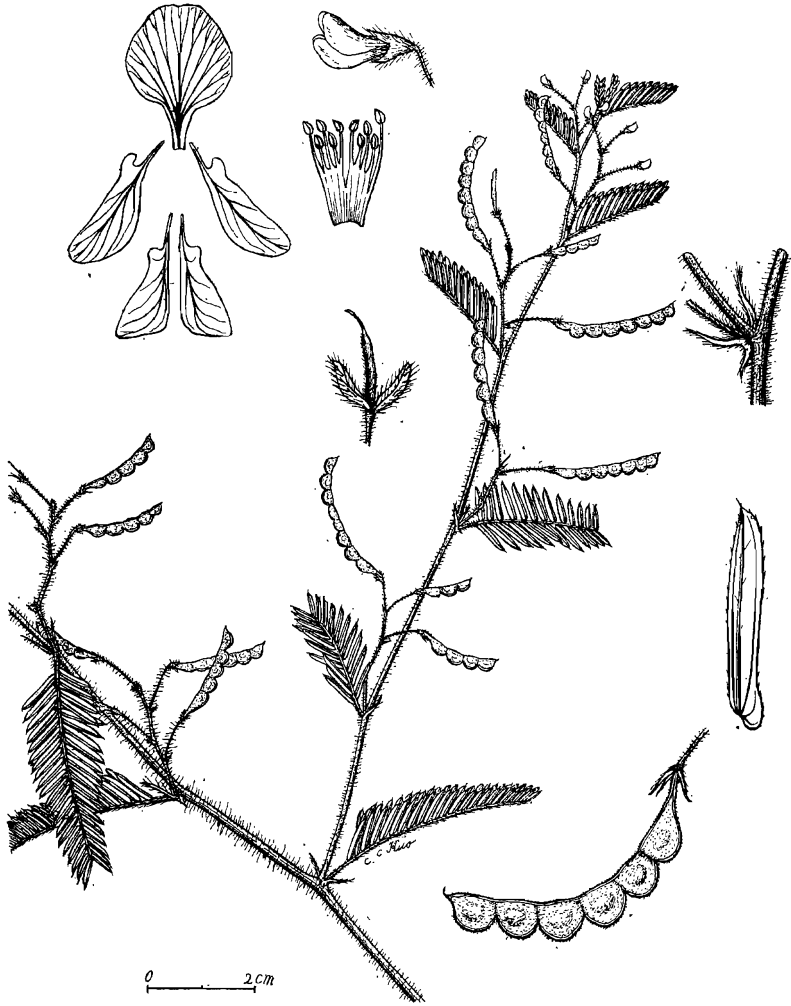


Fig. 8. *Aeschynomene sensitiva* SWARTZ.

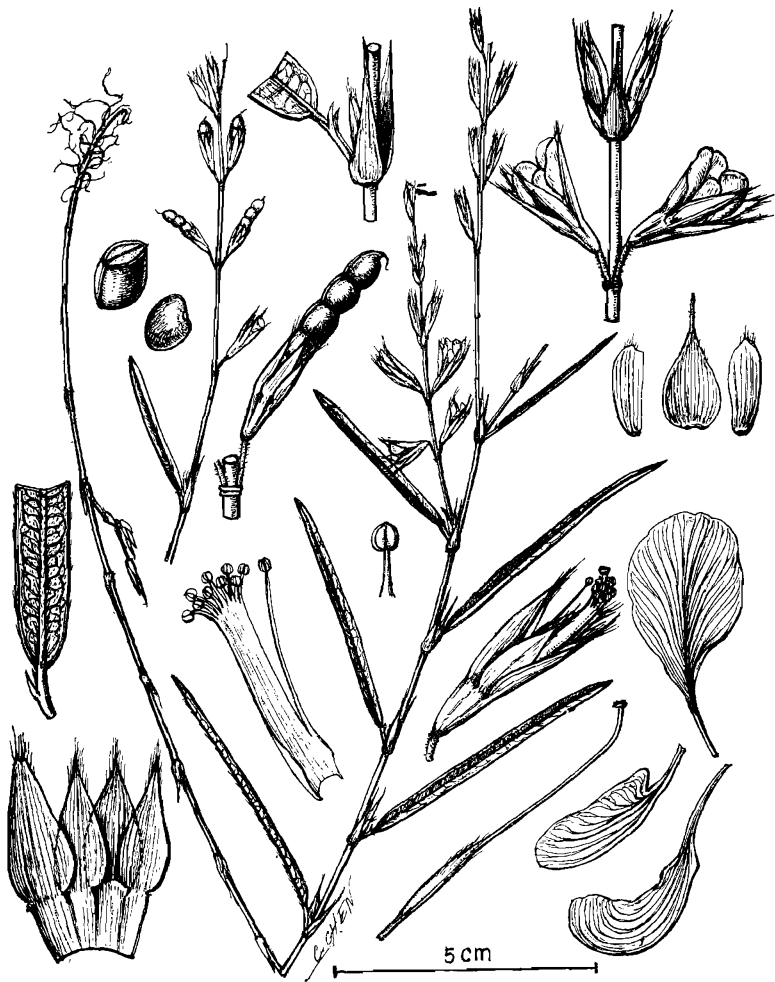


Fig. 9. *Alysicarpus bupleurifolius* (Linn.) DC.

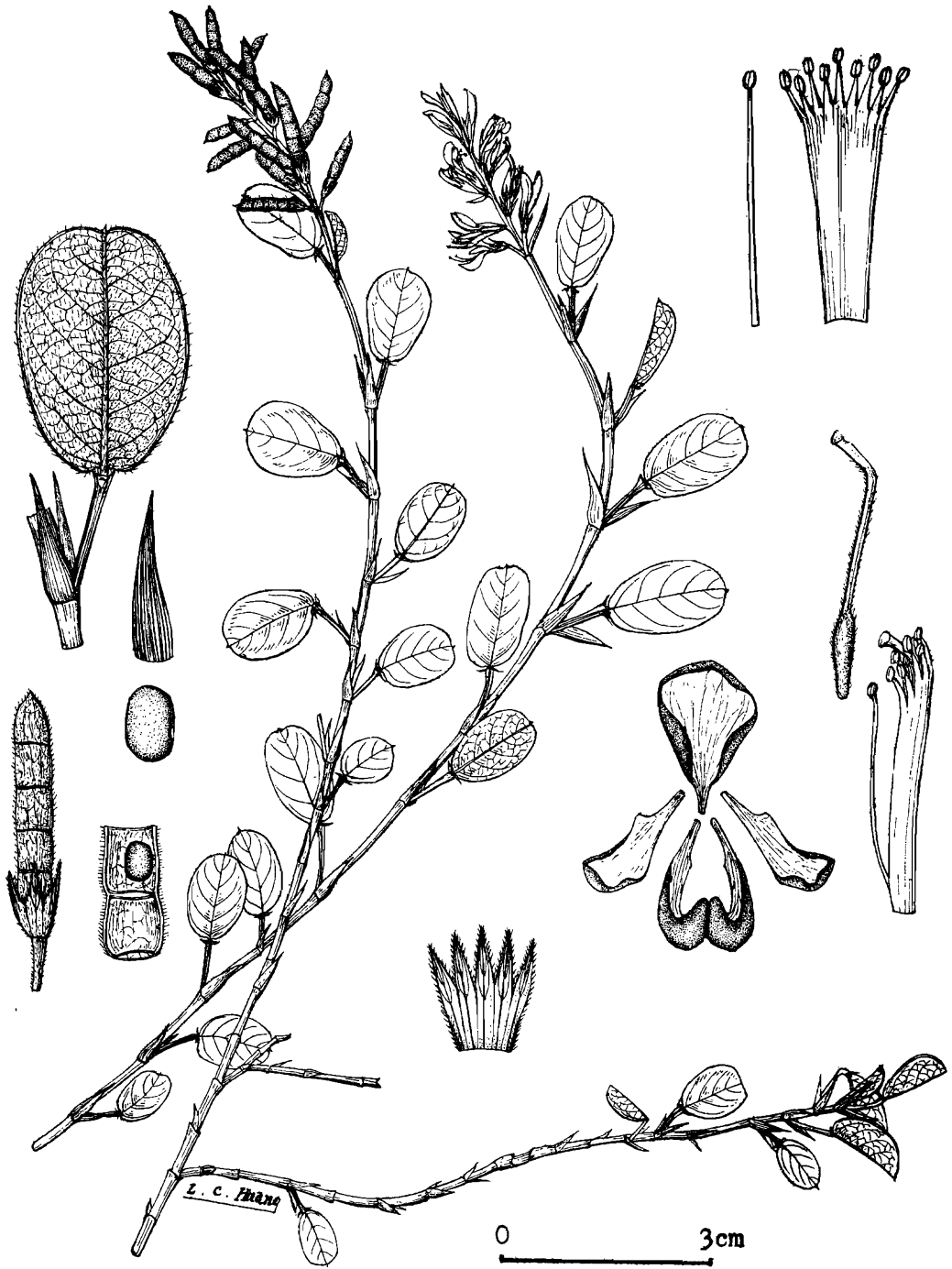


Fig. 10. *Alysicarpus nummularifolius* (Linn.) DC.

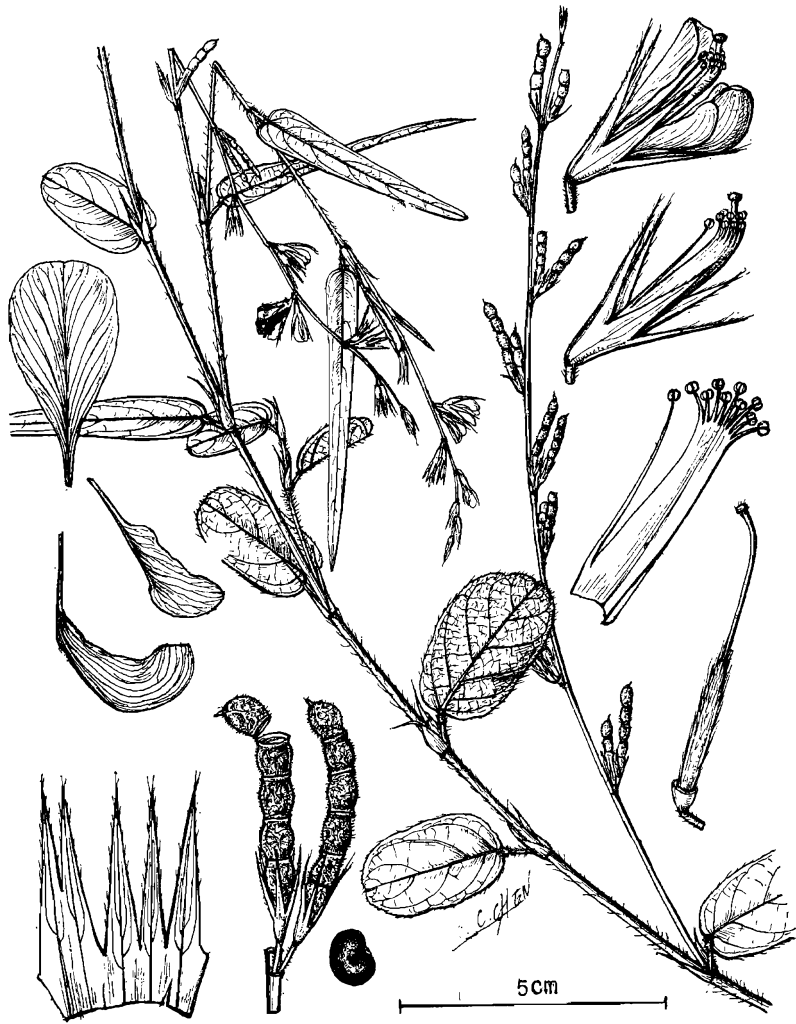


Fig. 11. *Alysicarpus vaginalis* DC.



Fig. 12. *Amphicarpaea Edgeworthii* BENTH. var. *japonica* OLIVER



Fig. 13. *Arachis hypogea* LINN.

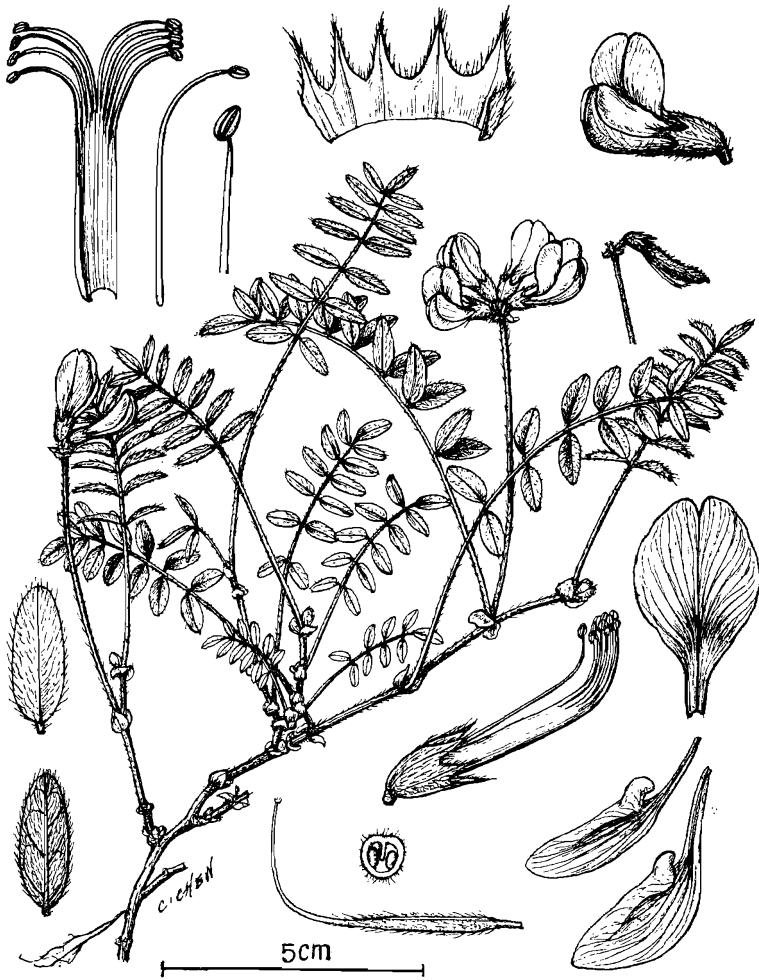


Fig. 14. *Astragalus nankotaizanensis* SASAKI

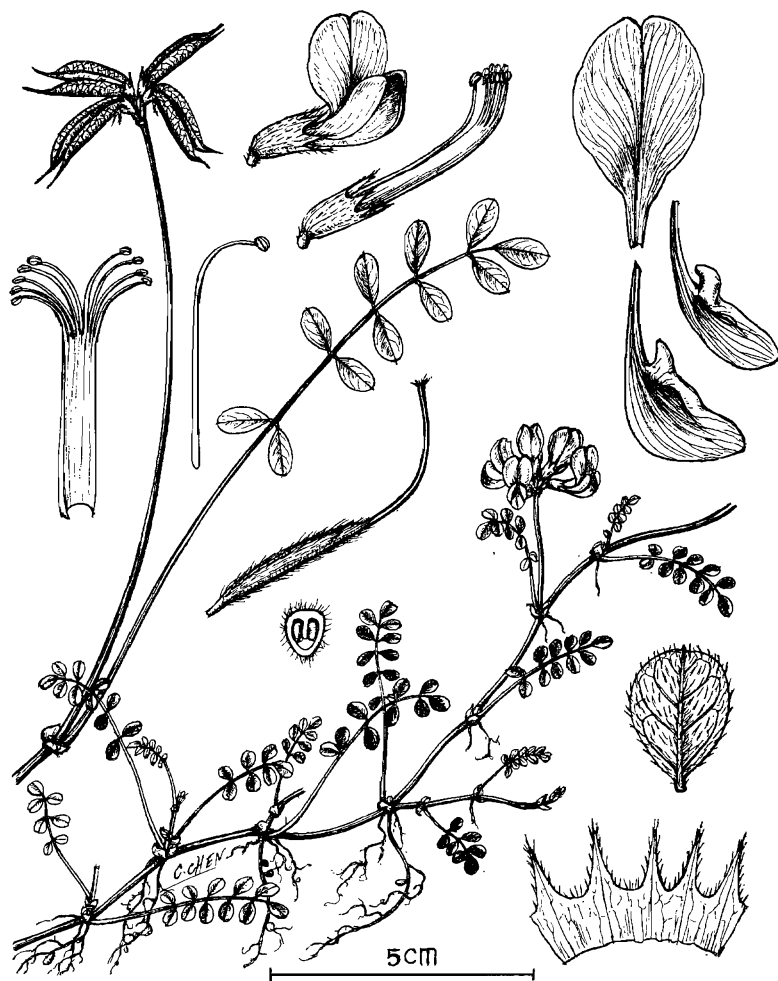


Fig. 15. *Astragalus nokoensis* SASAKI

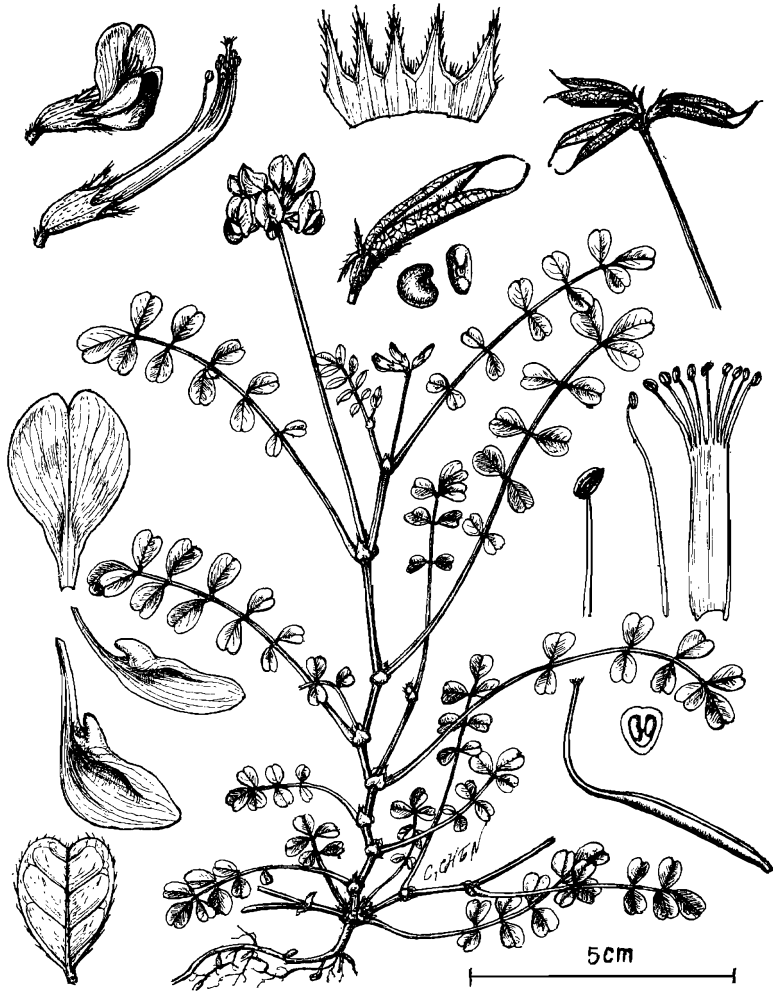


Fig. 16. *Astragalus sinicus* LINN.



Fig. 17. *Cajanus cajan* (LIMN.) MILLSP.

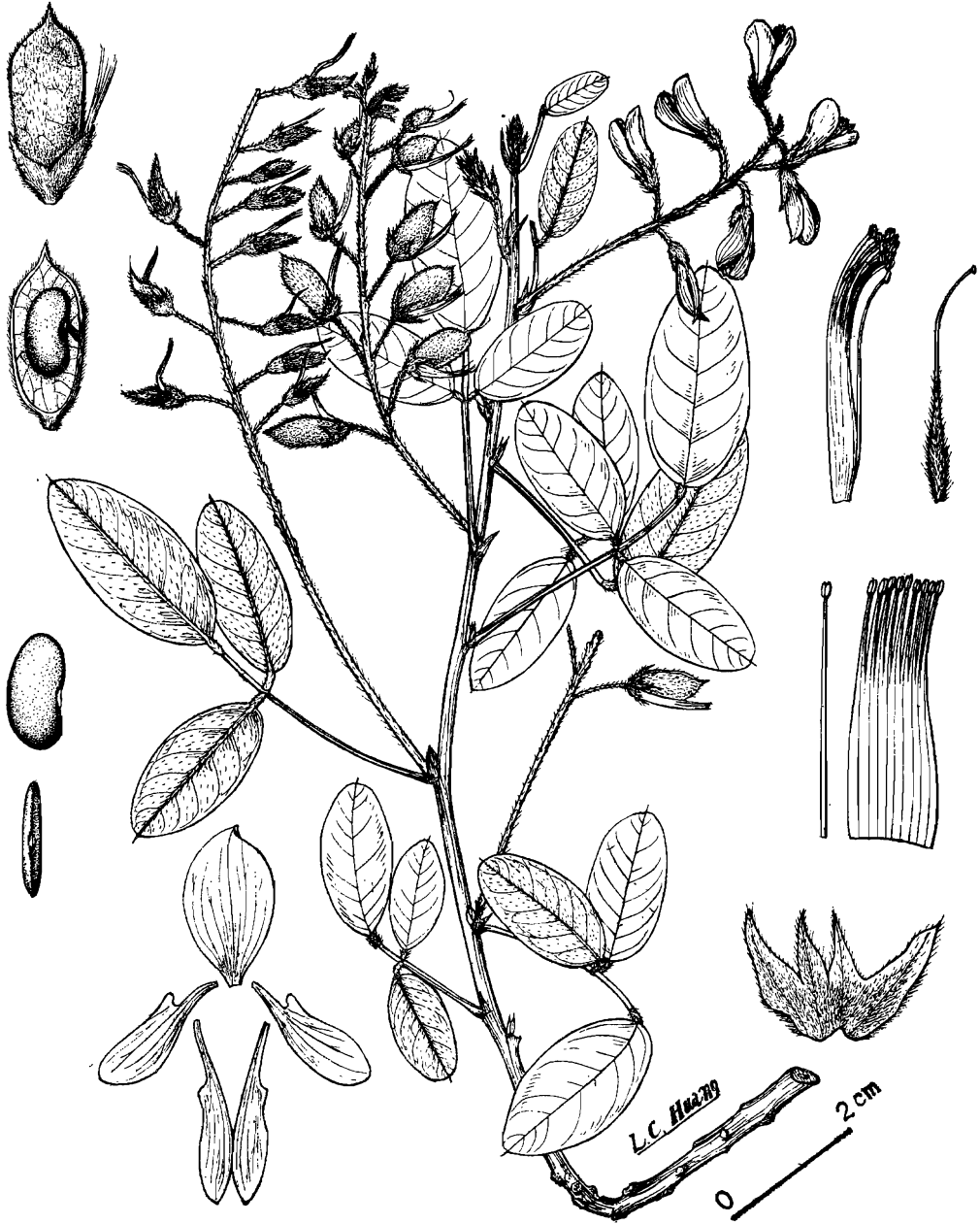


Fig. 18. *Campylotropis Giralдии* SCHINDL.

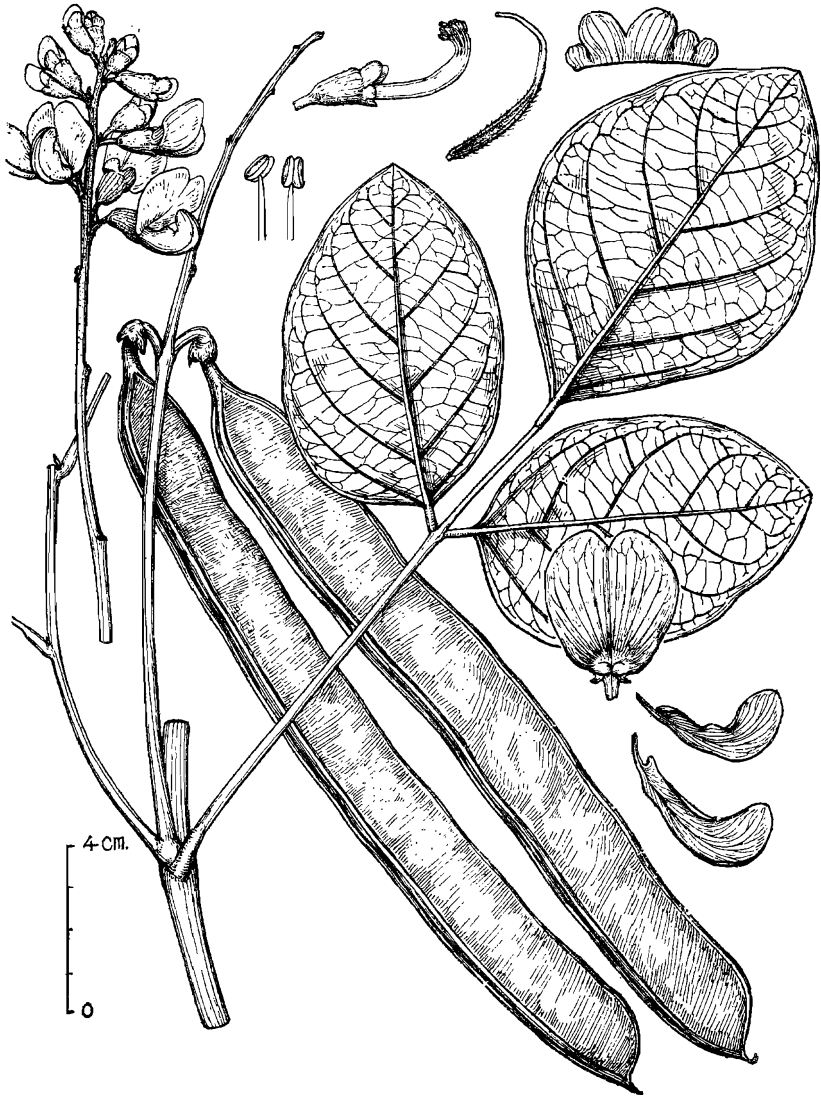


Fig. 19. *Canavalia ensiformis* (Linn.) DC.



Fig. 20. *Canavalia lineata* (THUNB.) DC.

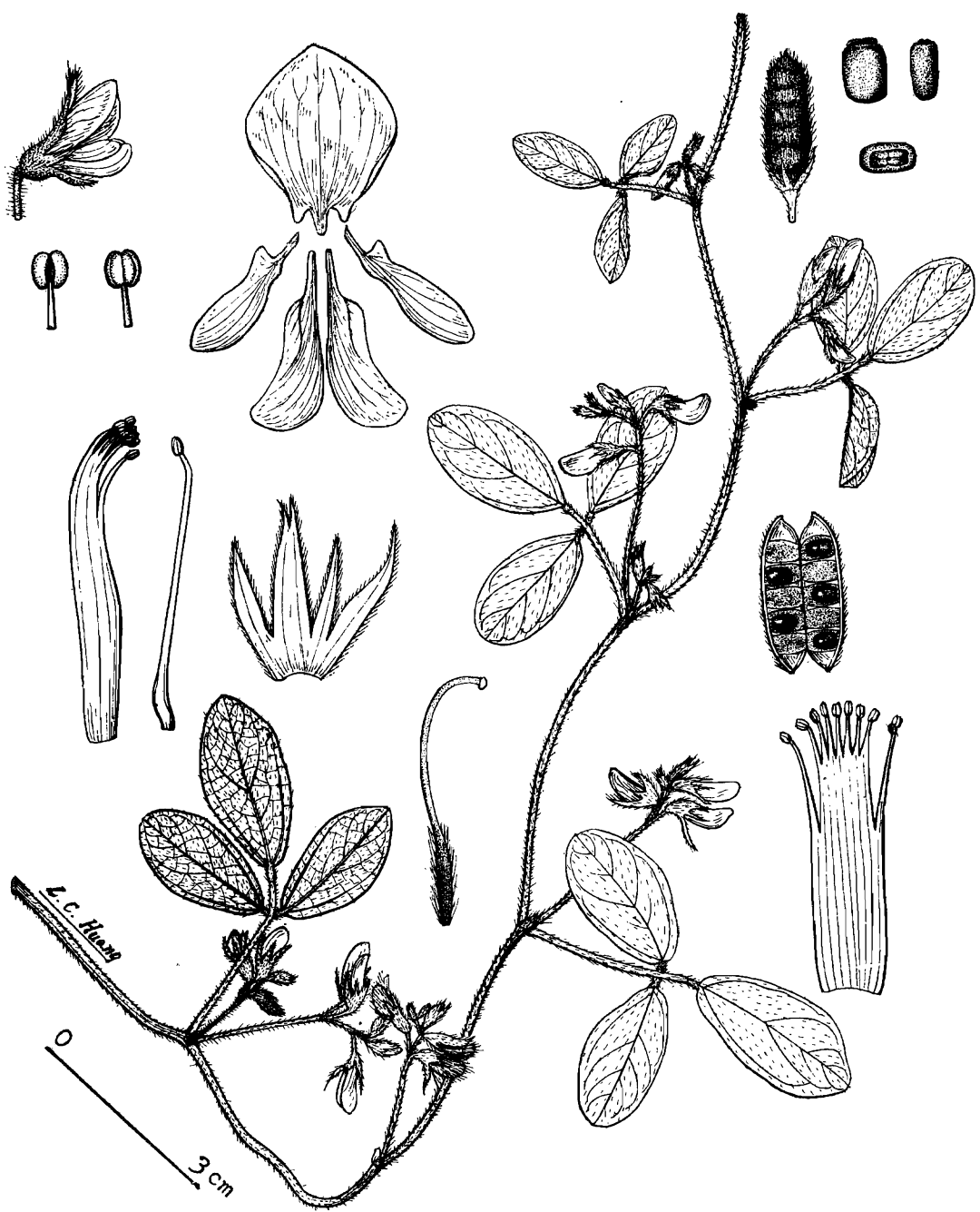


Fig. 21. *Cantharospermum scarabaeoides* (Linn.) Bail.

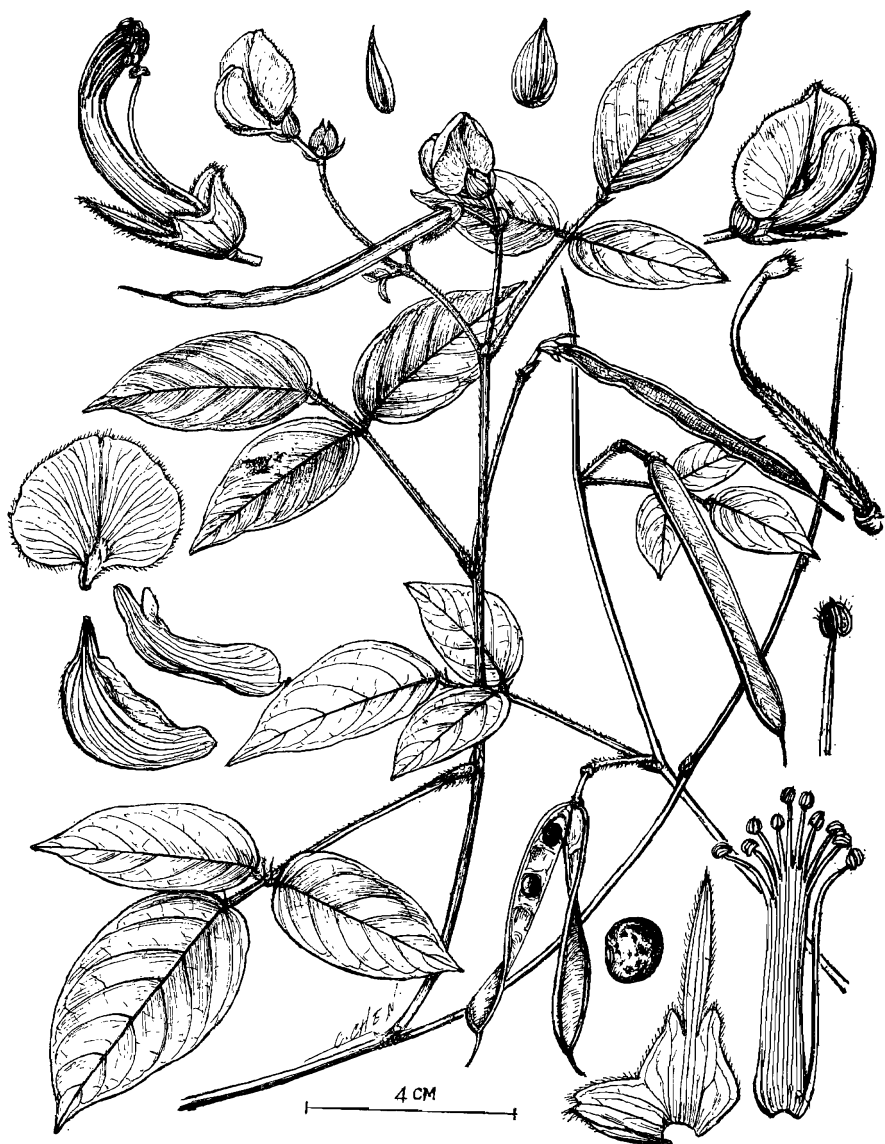


Fig. 22. *Centrosema pubesens* BENTH.



Fig. 23. *Cicer arietinum* LINN.

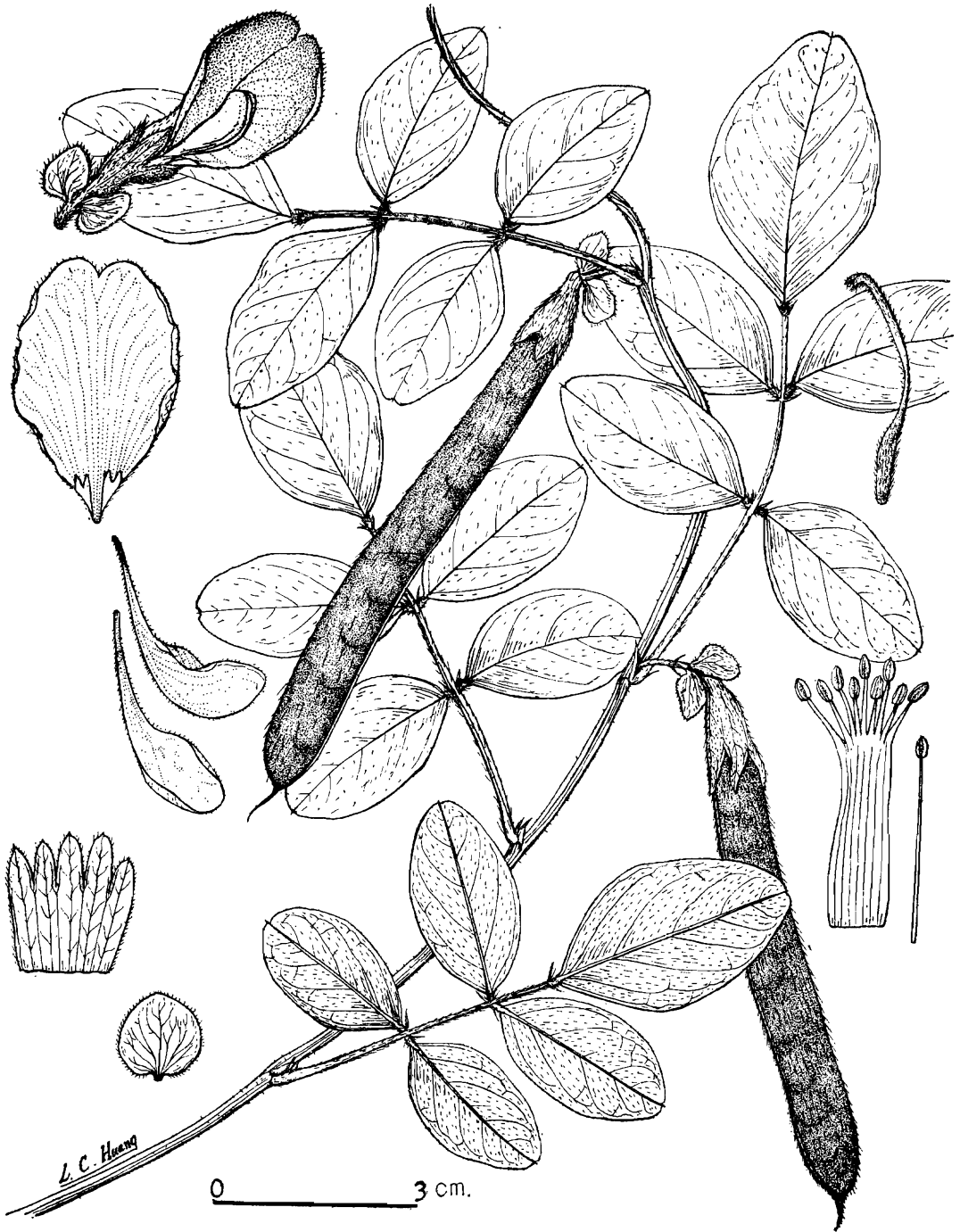


Fig. 24. *Clitoria ternatea* LINN.



Fig. 25. *Crotalaria acicularis* BUCH.-HAM.

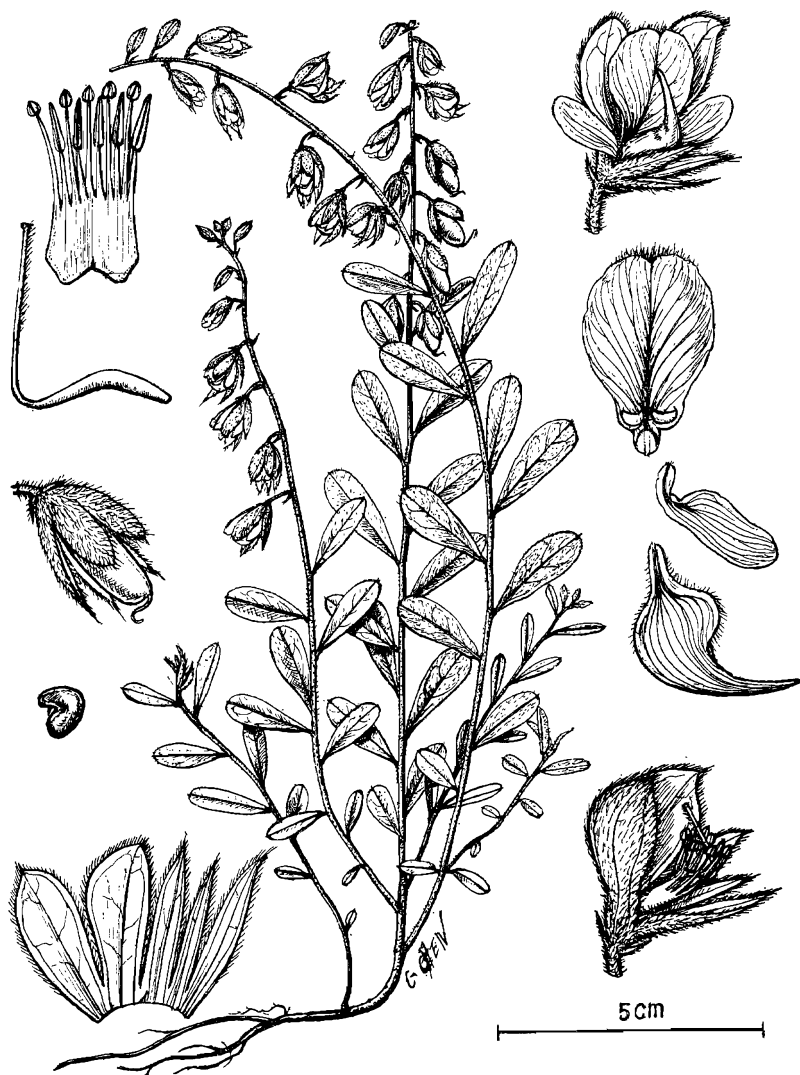


Fig. 26. *Crotalaria albida* HEYNE



Fig. 27. *Crotalaria anagyroides* H. B. K.



Fig. 28. *Crotalaria assamica* BENTH.

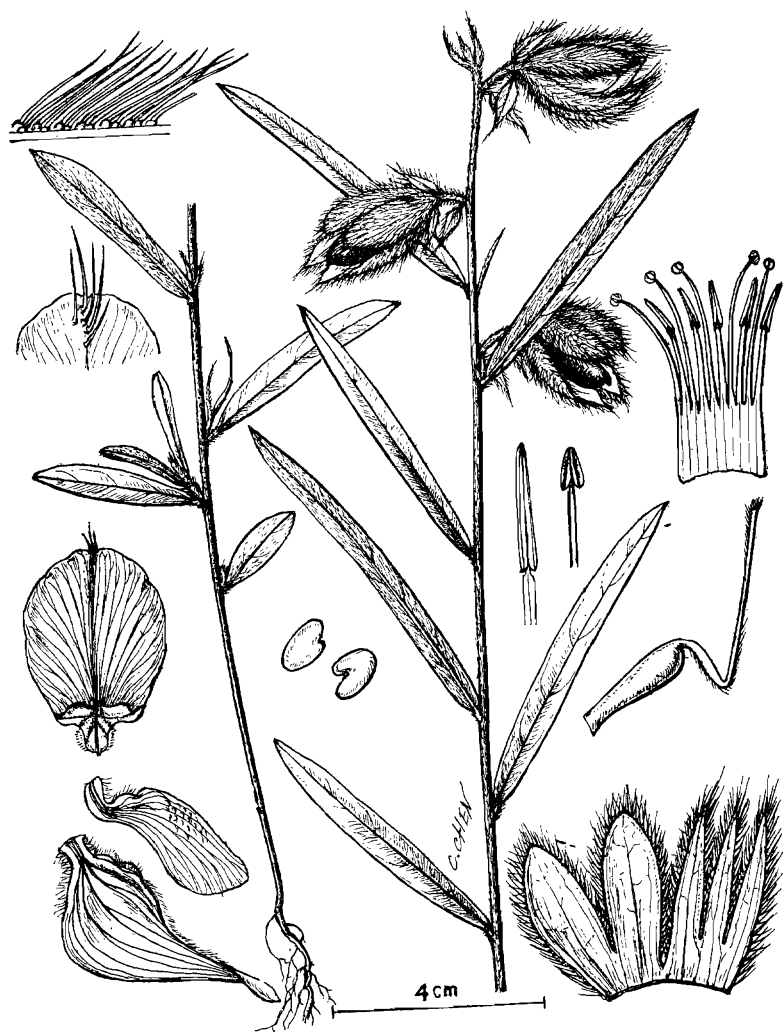


Fig. 29. *Crotalaria calycina* SCHRANK.

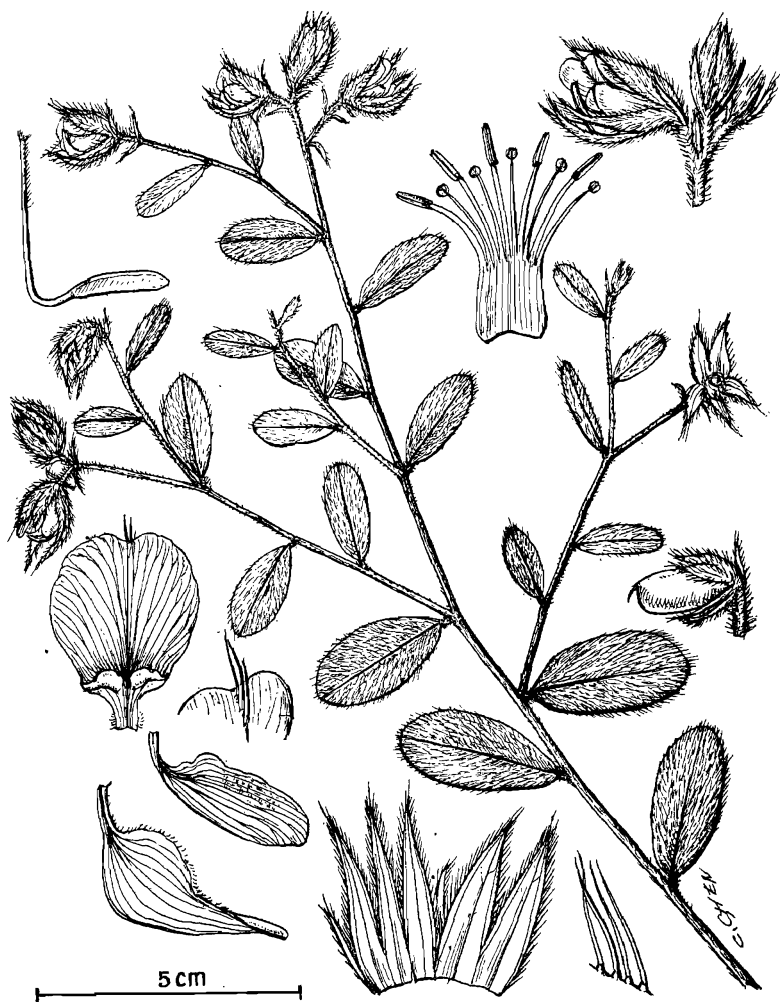


Fig. 30. *Crotalaria chinensis* LINN.

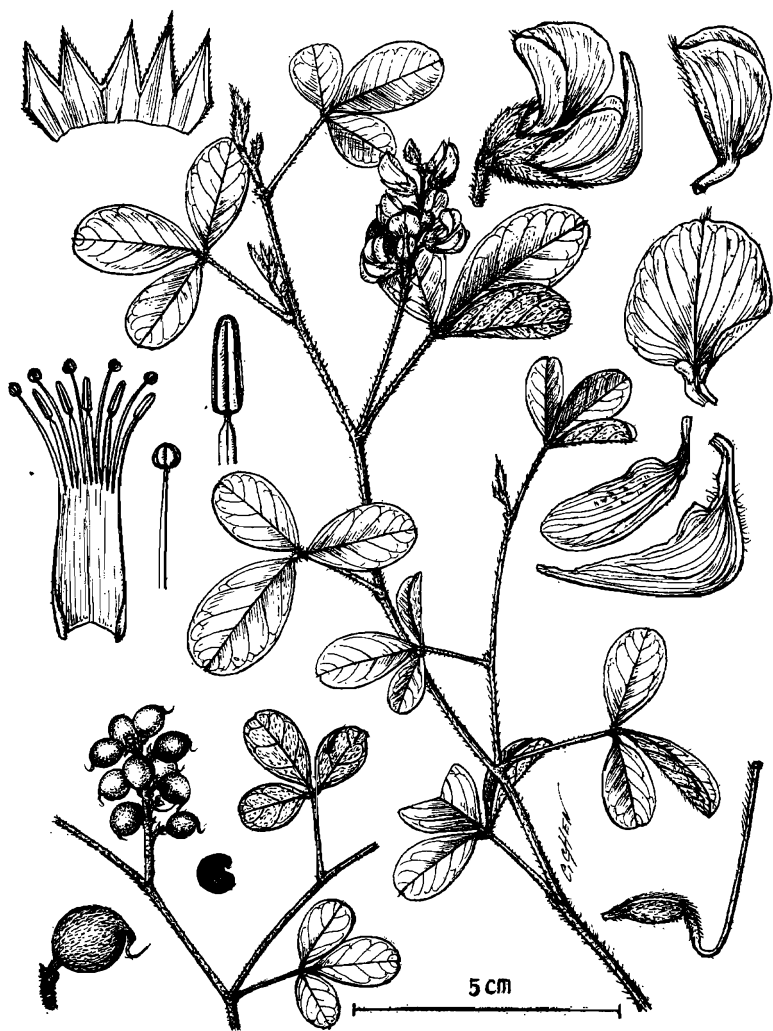


Fig. 31. *Crotalaria elliptica* Roxb.

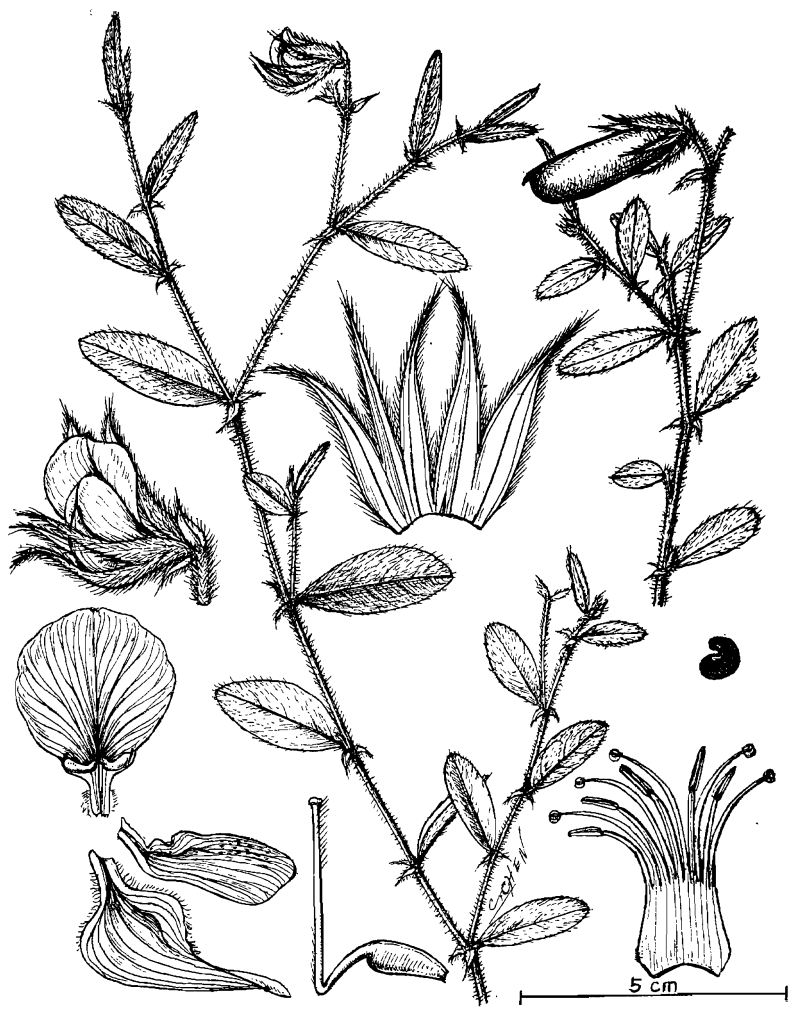


Fig. 32. *Crotalaria ferruginea* GRAH.



Fig. 33. *Crotalaria incana* LINN.



Fig. 34. *Crotalaria juncea* LINN.

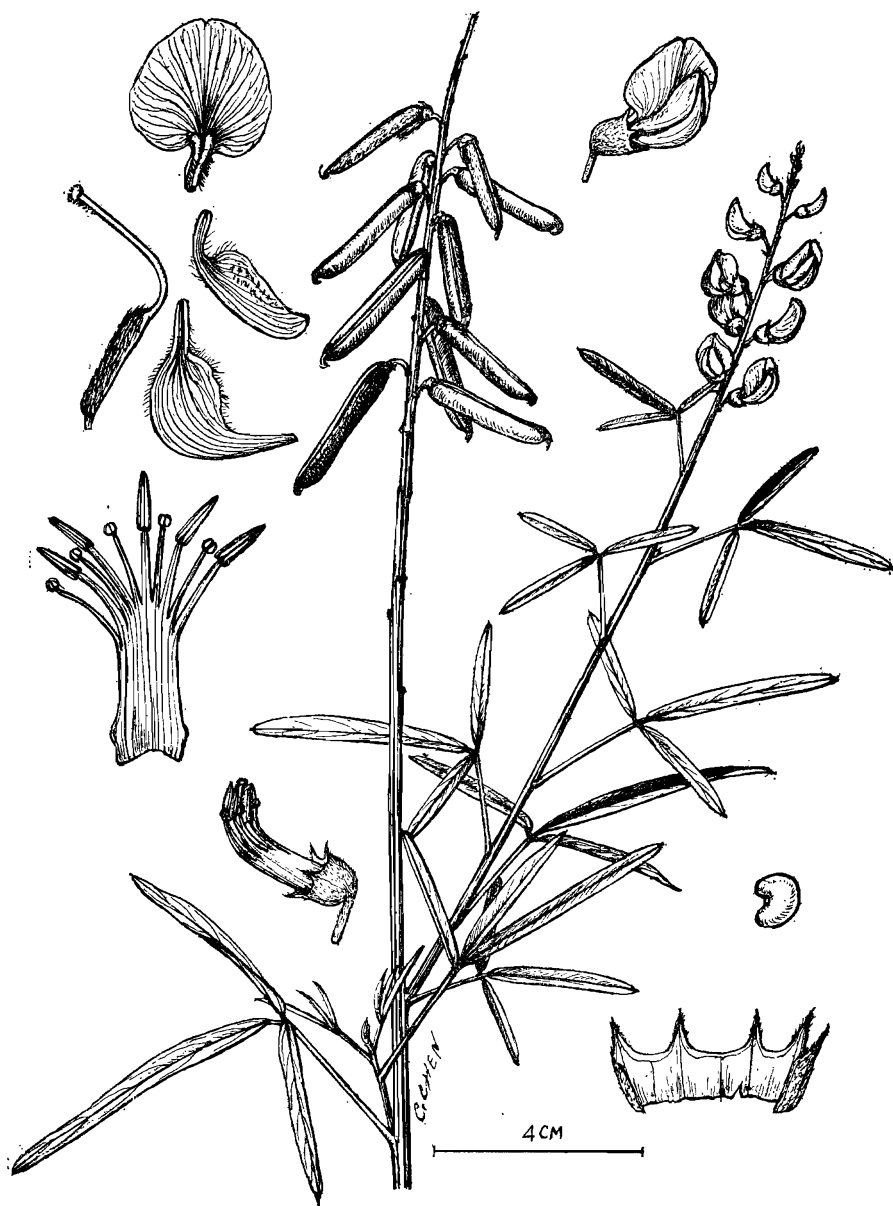


Fig. 35. *Crotalaria lanceolata* E. MEY.

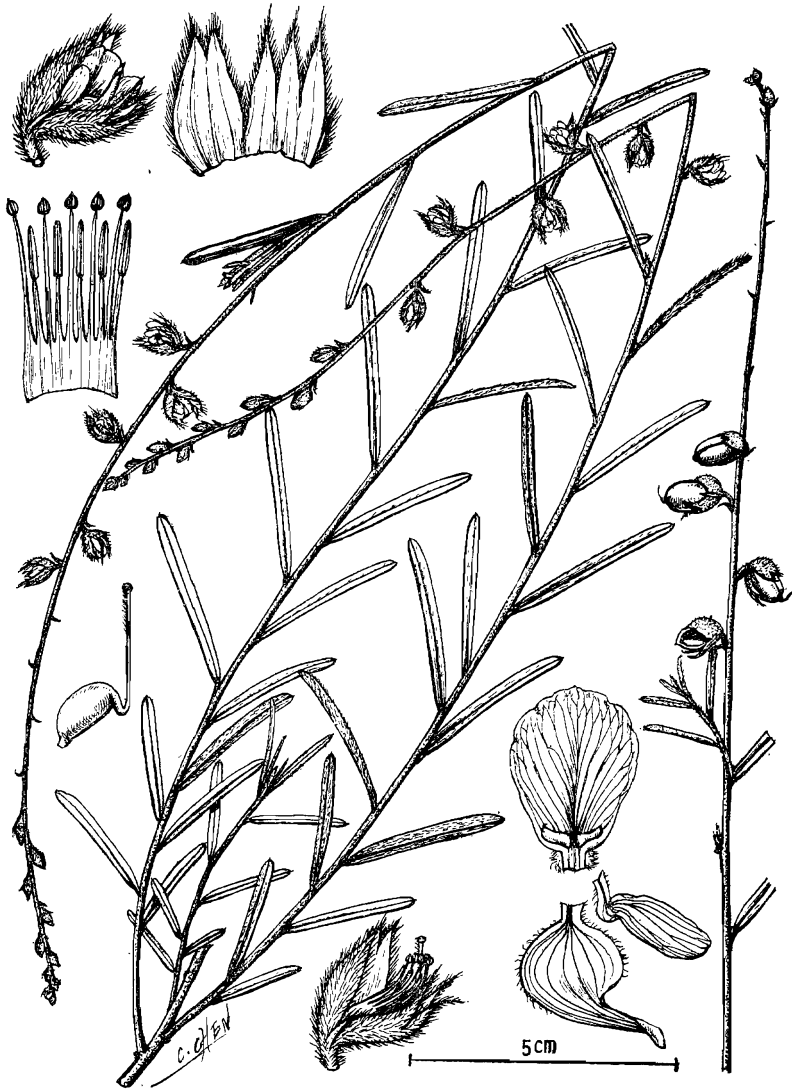


Fig. 36. *Crotalaria linifolia* LINN. F.



Fig. 37. *Crotalaria saltiana* ANDR.



Fig. 38. *Crotalaria sessiliflora* LINN.

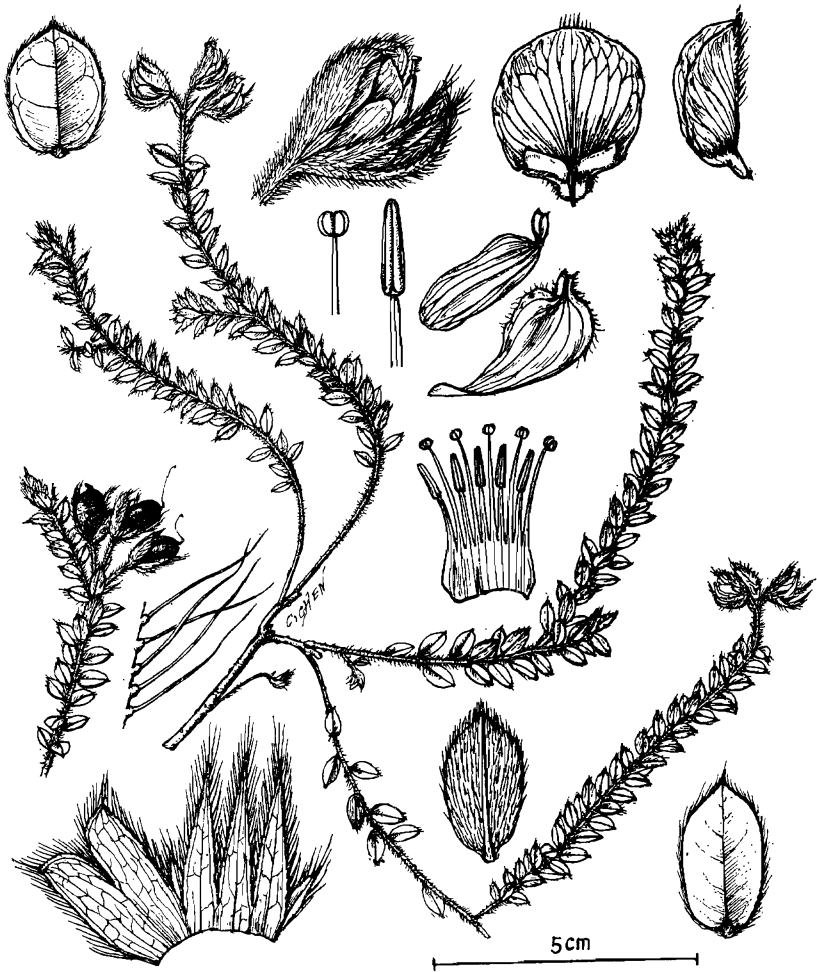


Fig. 39. *Crotalaria similis* HEMSL.



Fig. 40. *Crotalaria spectabilis* Roth.



Fig. 41. *Crotalaria trifoliatrum* WILLD.

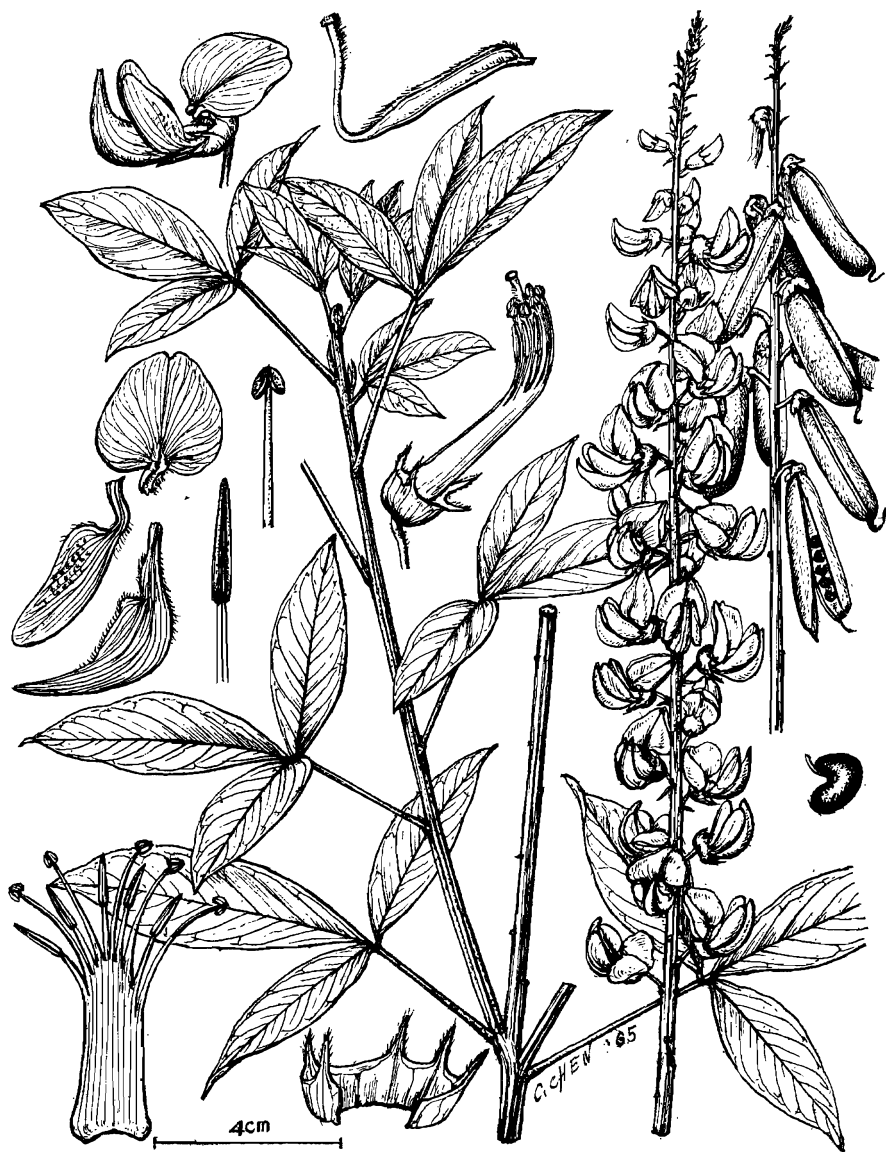


Fig. 42. *Crotalaria usaramoensis* BAK. F.

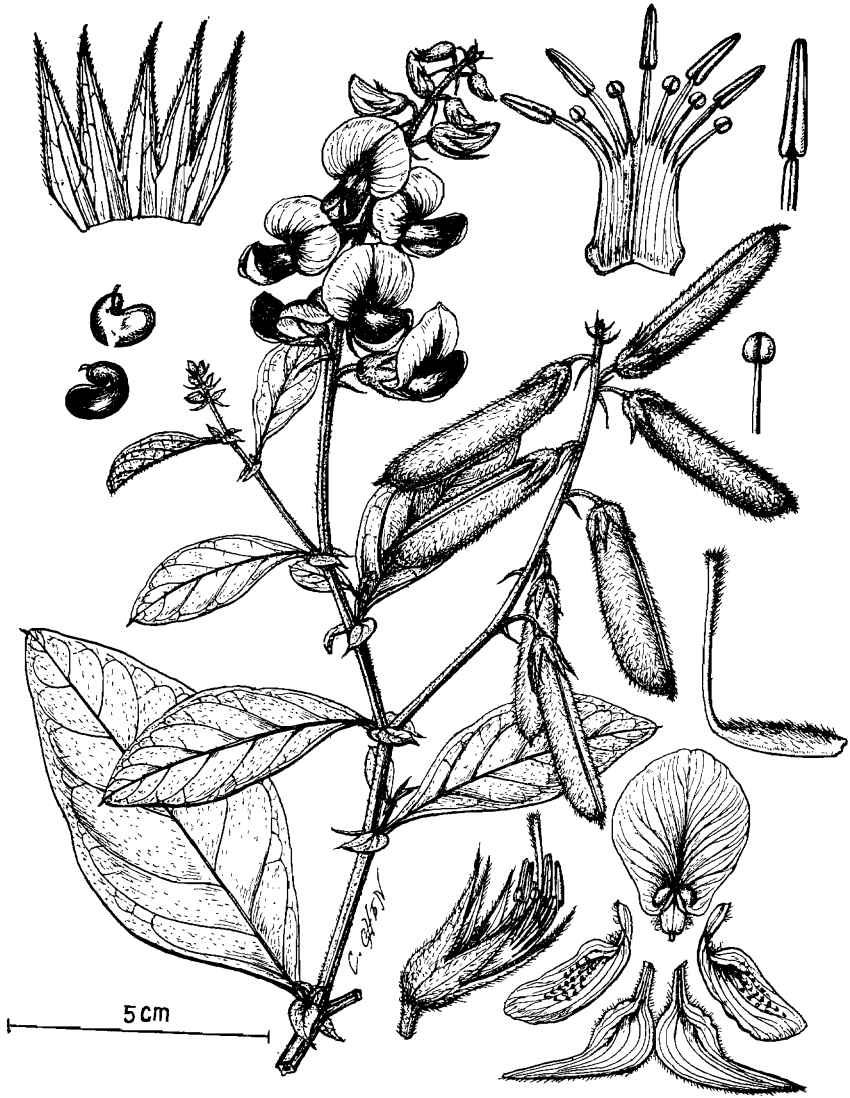


Fig. 43. *Crotalaria verrucosa* LINN.

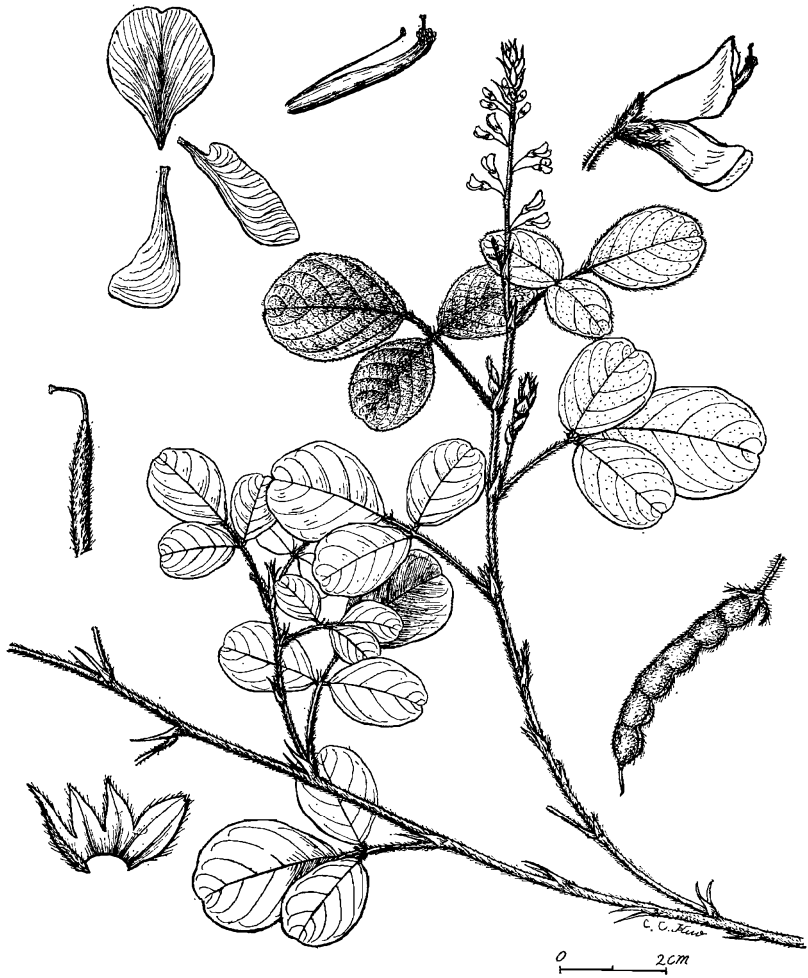


Fig. 44. *Desmodium Buergeri* Miquel.



Fig. 45. *Desmodium caudatum* (THUNB.) DC.

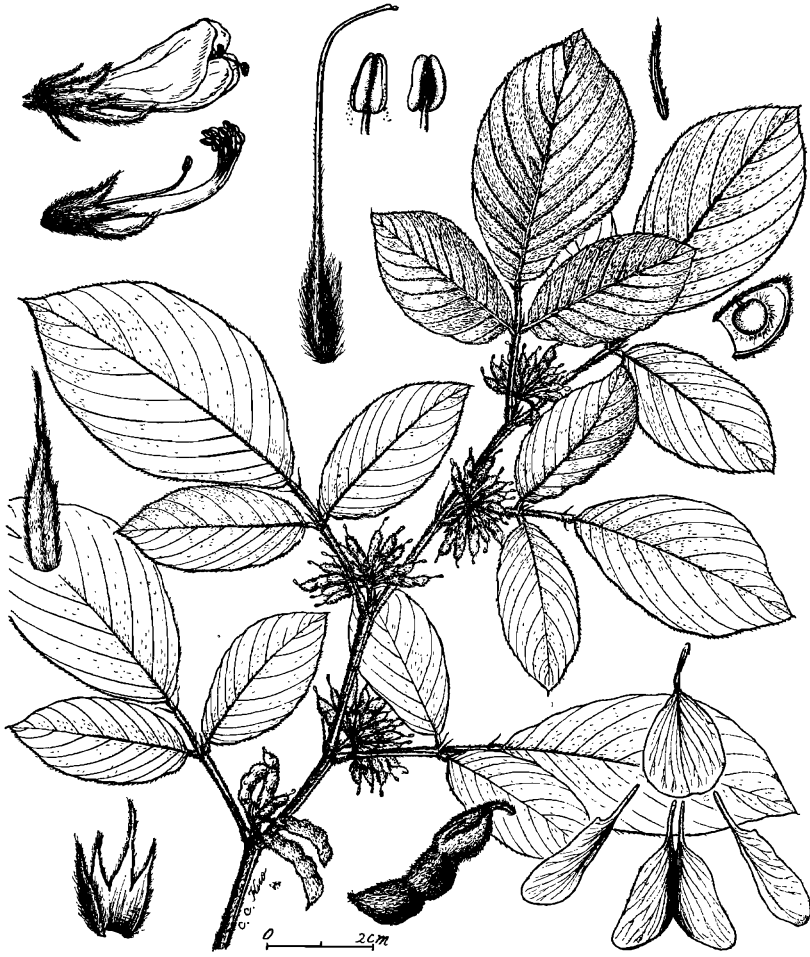


Fig. 46. *Desmodium cephalotes* (ROXB.) WALL.

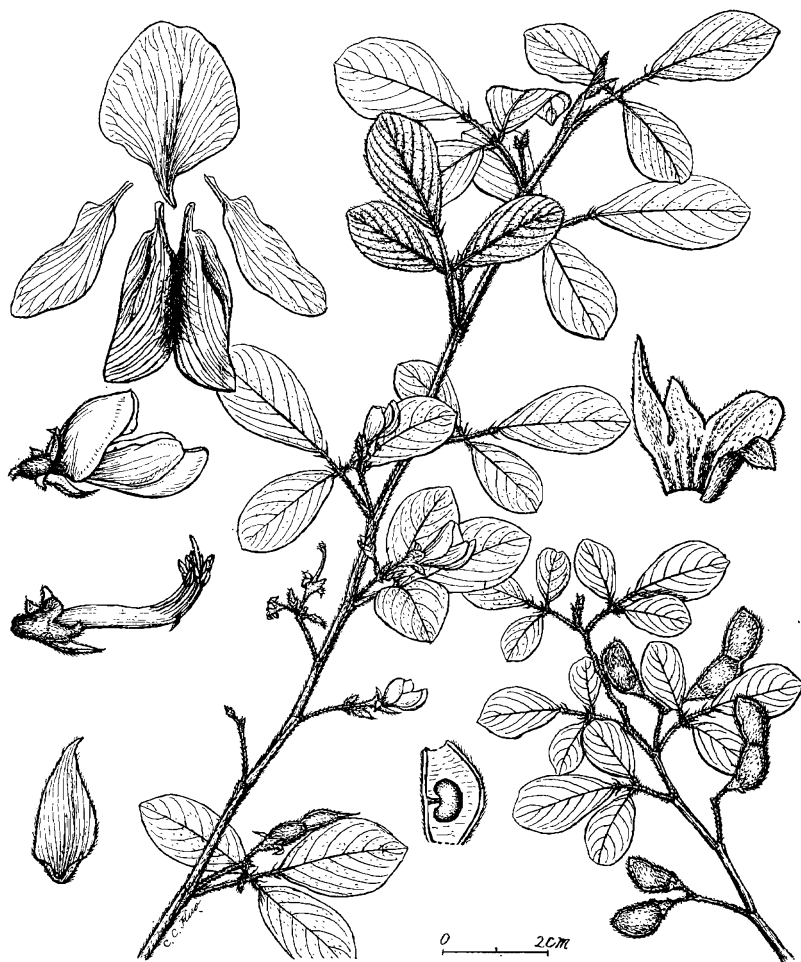


Fig. 47. *Desmodium dispersum* HAY.



Fig. 48. *Desmodium floribundum* (D. DON) G. DON



Fig. 49. *Desmodium gangeticum* (LINN.) DC.

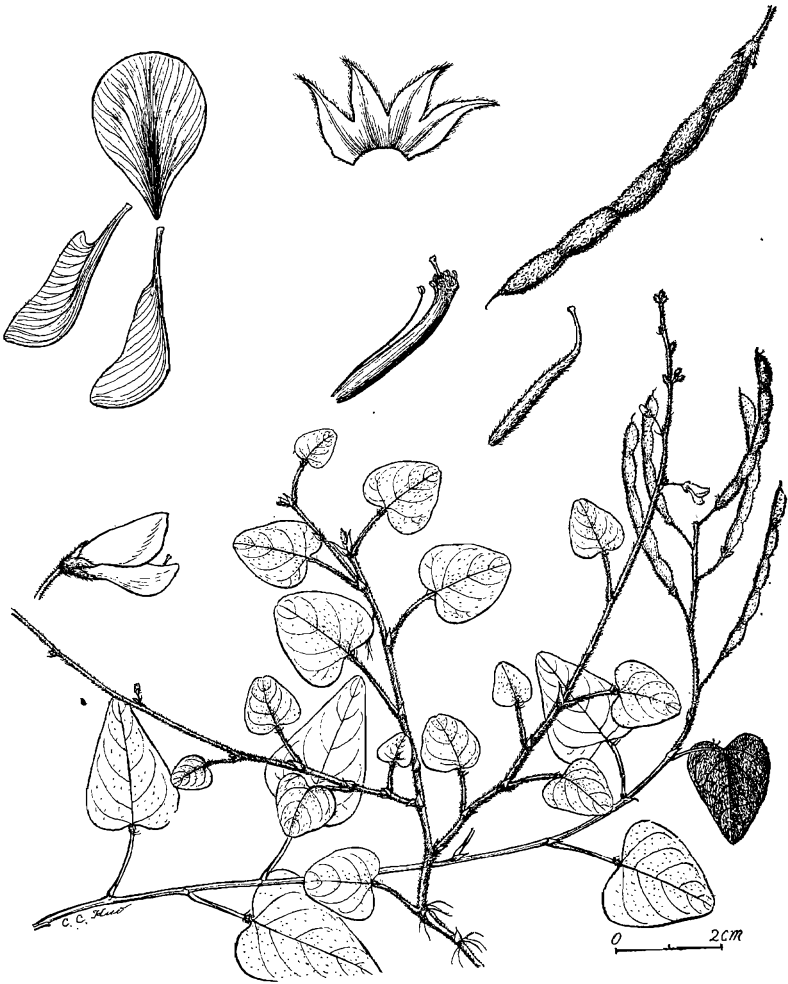


Fig. 50. *Desmodium gracilimum* HEMSL.



Fig. 51. *Desmodium gyrans* (Linn. f.) DC.



Fig. 52. *Desmodium heterocarpum* (Linn.) DC.

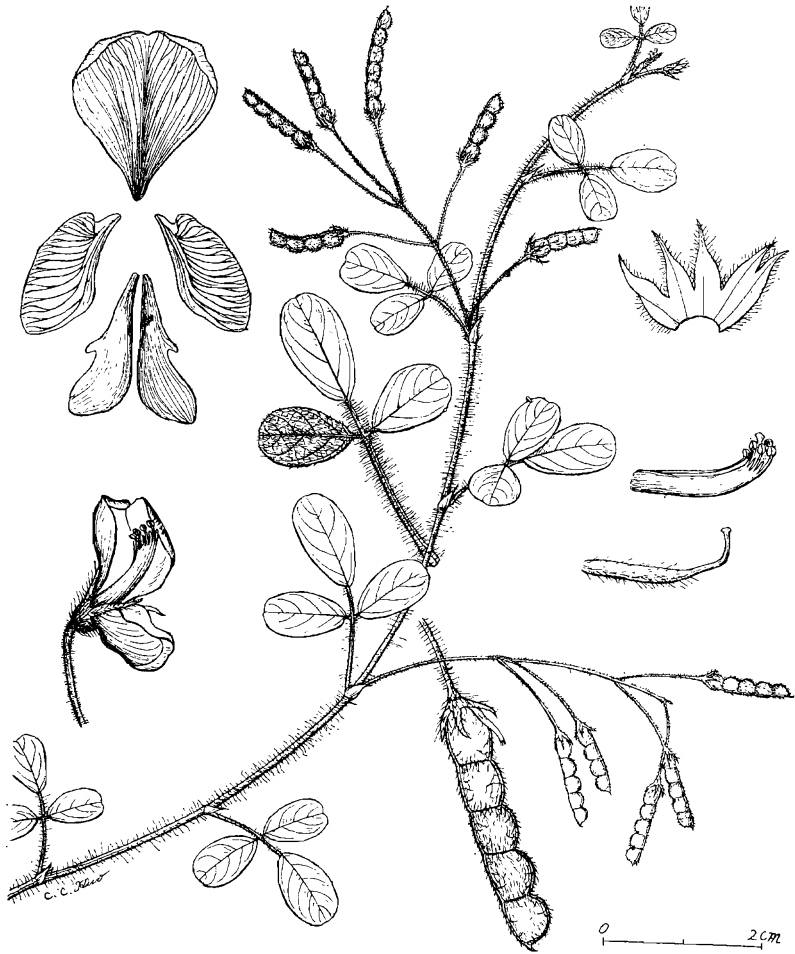


Fig. 53. *Desmodium hetrophyllum* (WILLD.) DC.



Fig. 54. *Desmodium lasiocarpum* (BEAUV.) DC.



Fig. 55. *Desmodium laterale* SCHINDLER



Fig. 56. *Desmodium laxiflorum* DC.



Fig. 57. *Desmodium microhyllum* (THUNB.) DC.

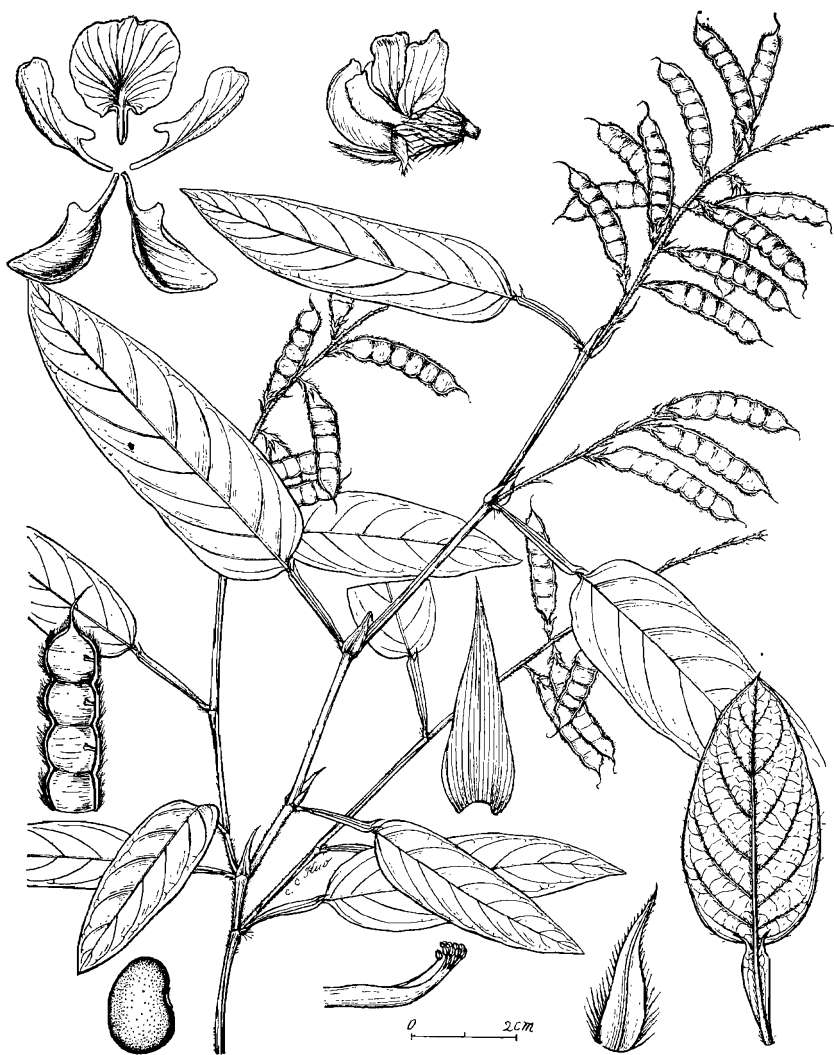


Fig. 58. *Desmodium pseudotriquetrum* DC.



Fig. 59. *Desmodium pulchellum* (Linn.) Benth.



Fig. 60. *Desmodium purpureum* (MILL.) FAWC. & RENDLE



Fig. 61. *Desmodium racemosum* (THUNB.) DC.



Fig. 62. *Desmodium reniforme* (LINN.) DC.



Fig. 63. *Desmodium scorpiurus* (Sw.) Desv.

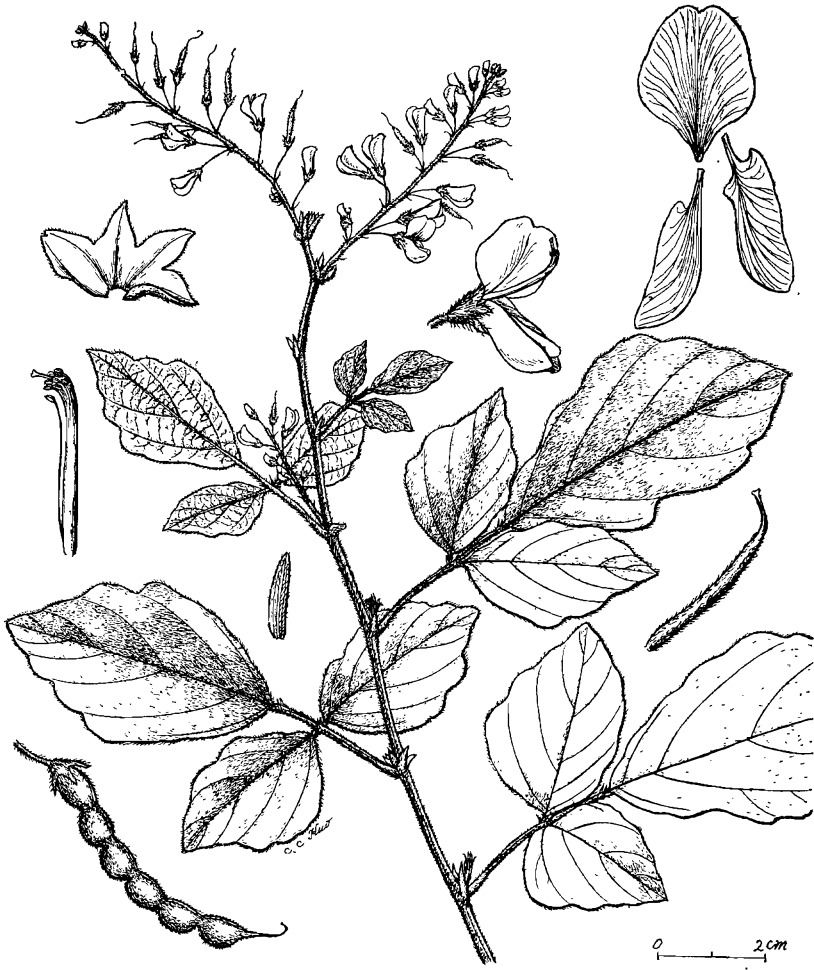


Fig. 64. *Desmodium sequax* WALL. var. *sinuatum* (MIQ.) HOSOKAWA



Fig. 65. *Desmodium Tashiroi* MATSUM.

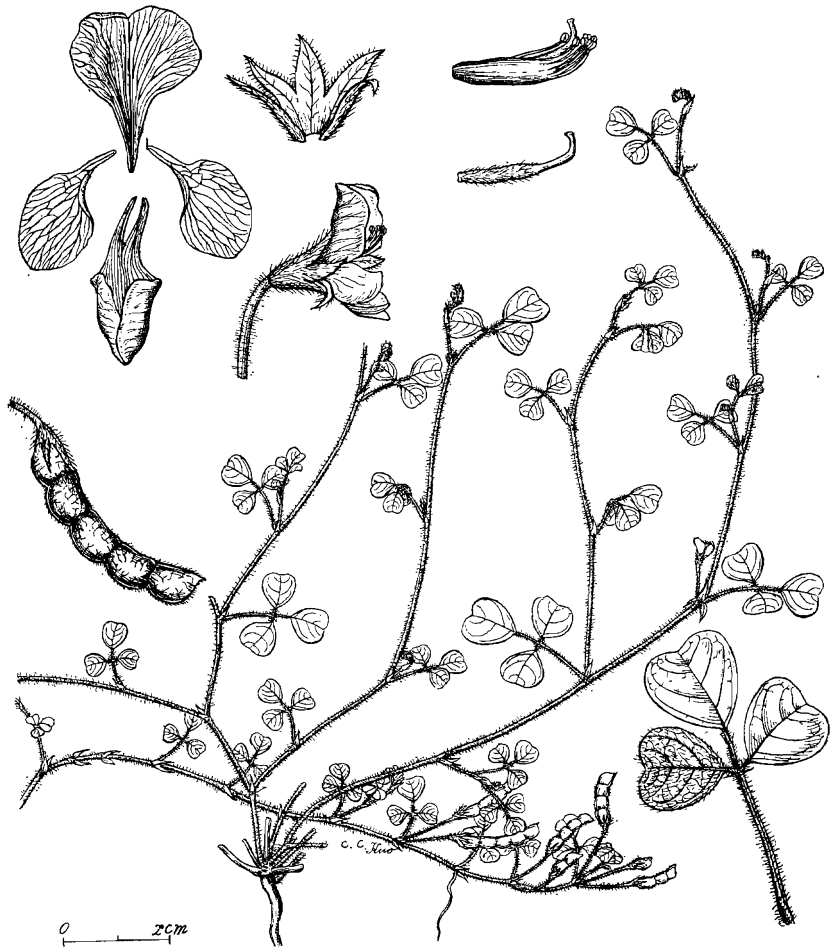


Fig. 66. *Desmodium triflorum* (Linn.) DC.



Fig. 67. *Desmodium umbellatum* (Linn.) DC.

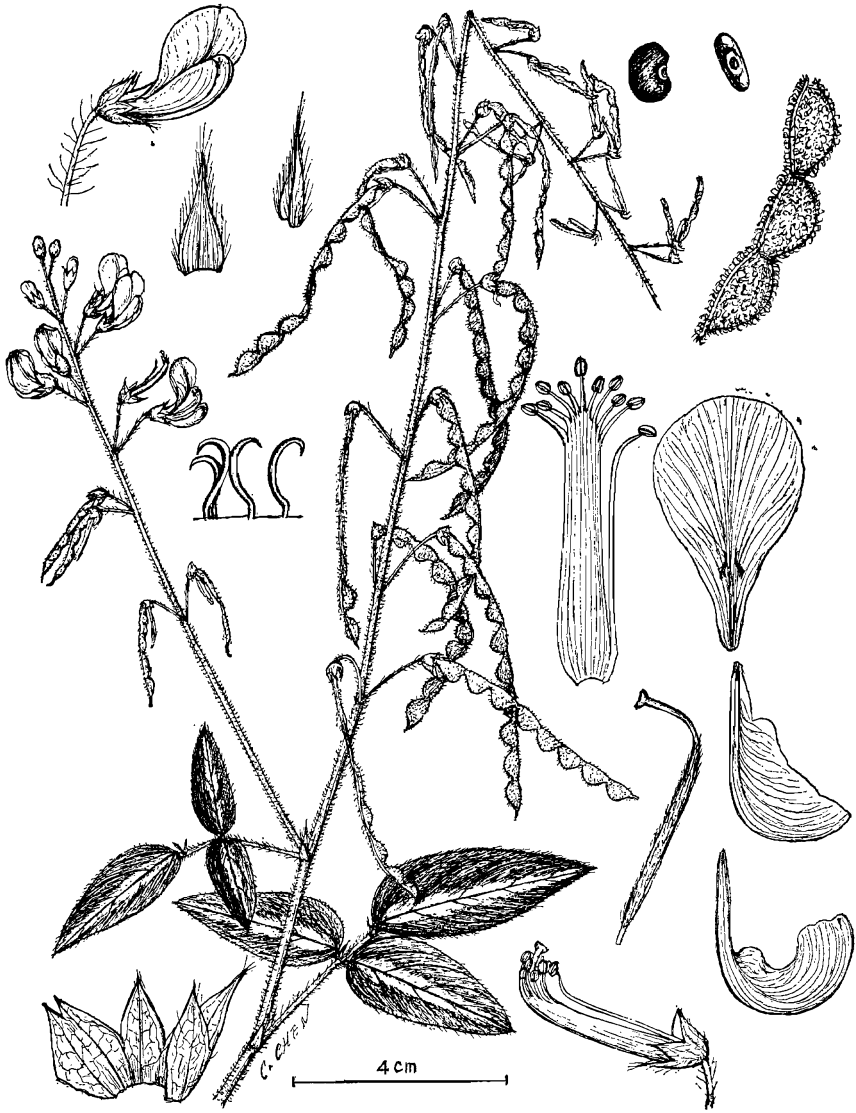


Fig. 68. *Desmodium unciatum* DC.



Fig. 69. *Desmodium zonatum* MIQ.

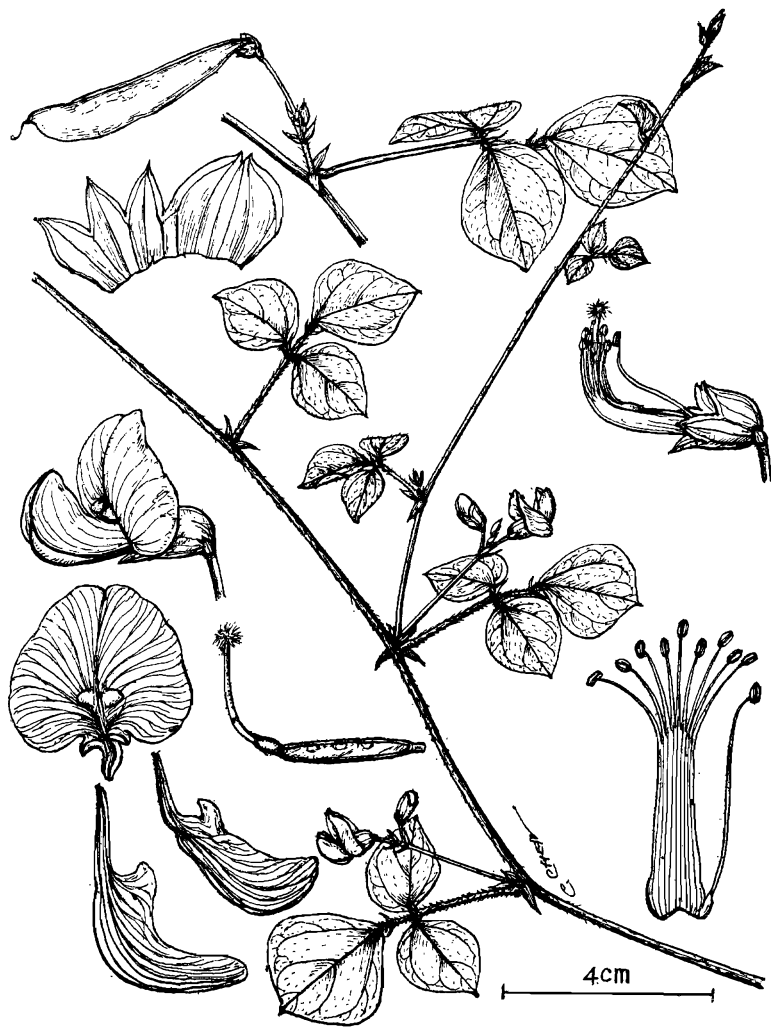


Fig. 70. *Dolichos falcatus* KLEIN



Fig. 71. *Dolichos lablab* LINN.



Fig. 72. *Dolichovigna formosana* HAY.

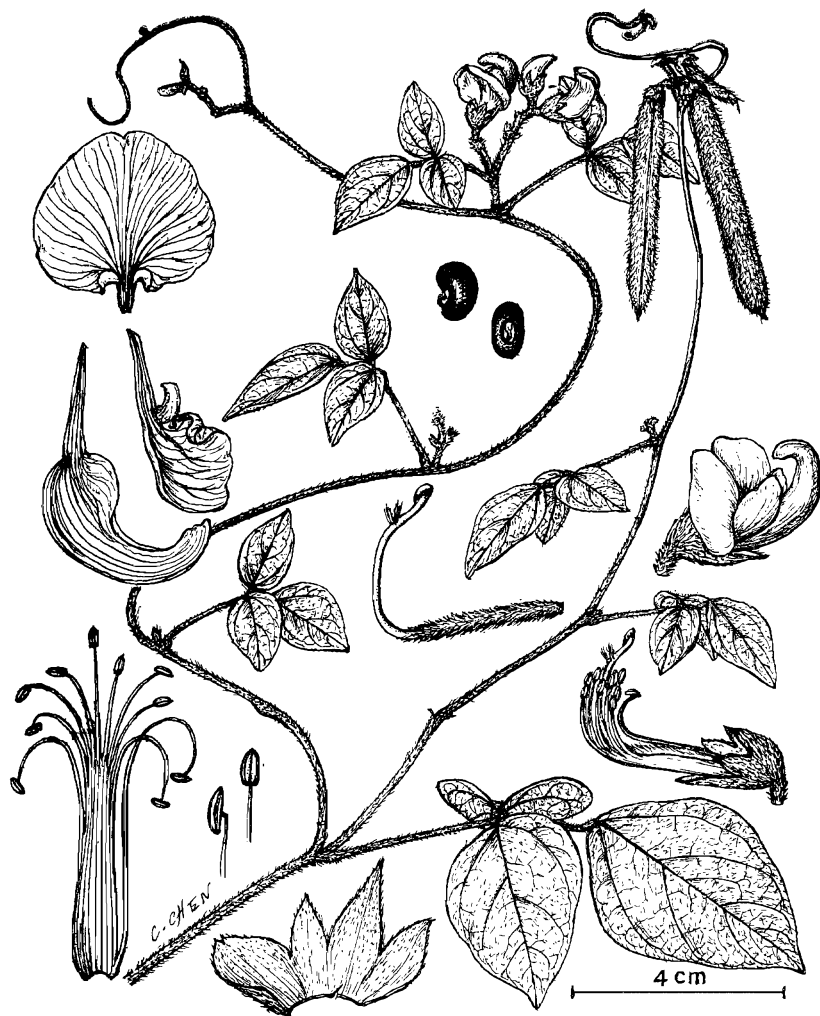


Fig. 73 *Dolichovigna rhombifolia* HAY.

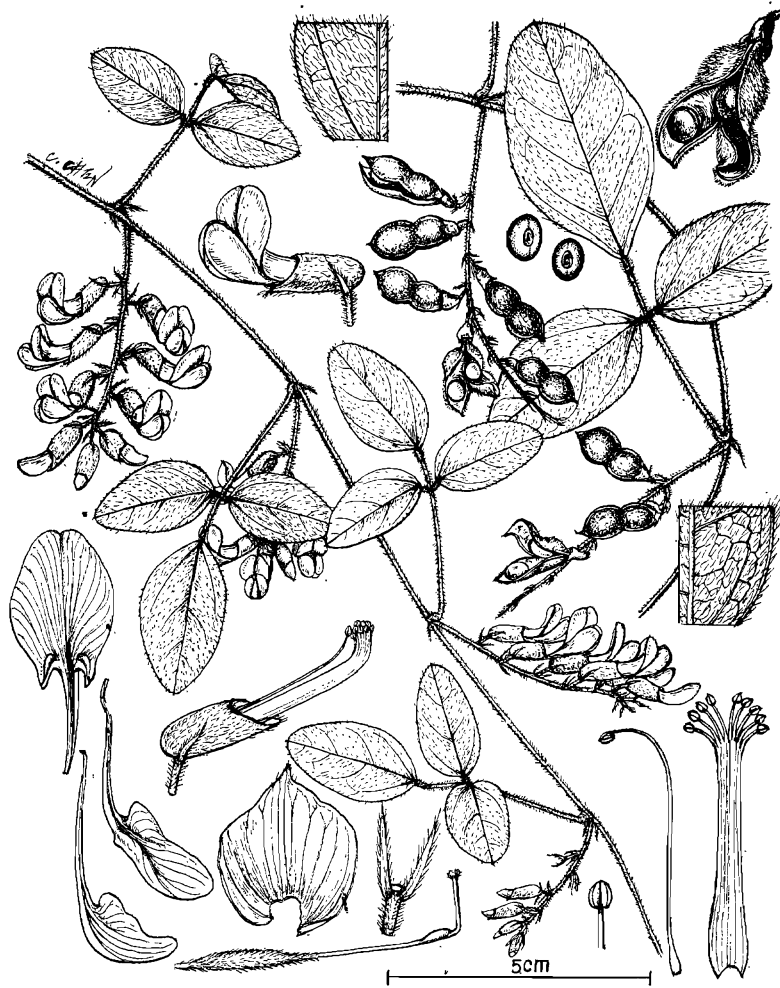


Fig. 74. *Dumasia bicolor* HAY.

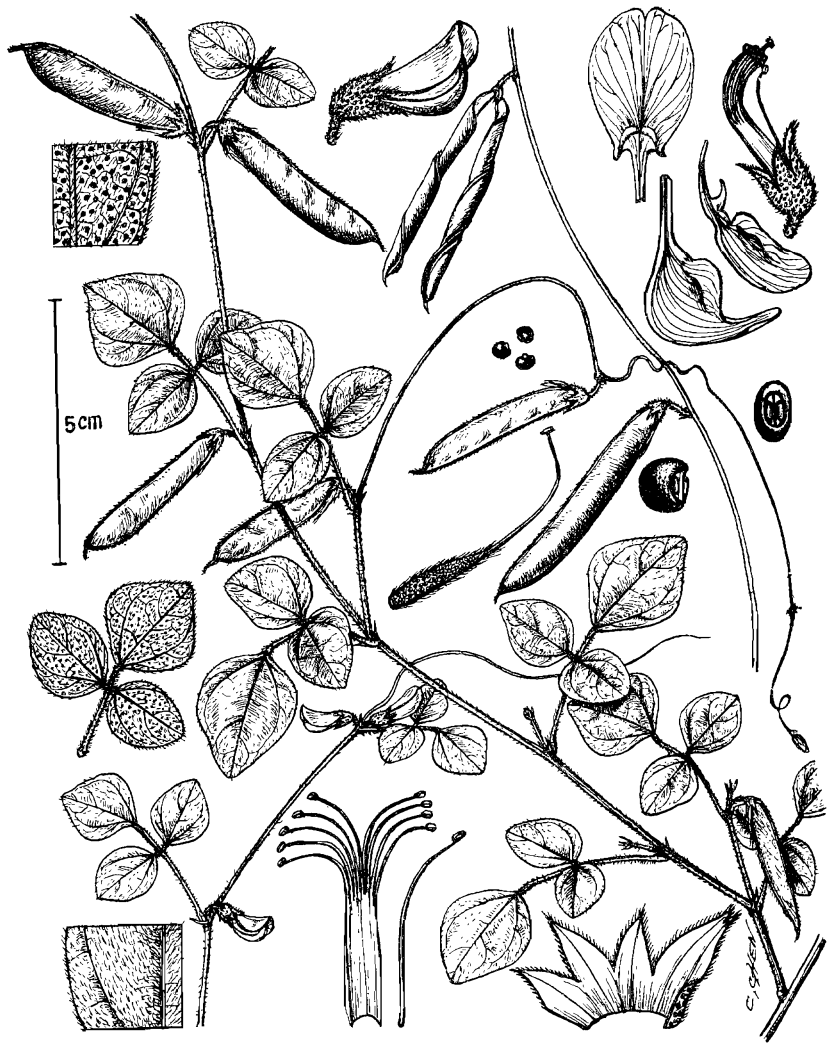


Fig. 75. *Dunbaria rotundifolia* MERR.

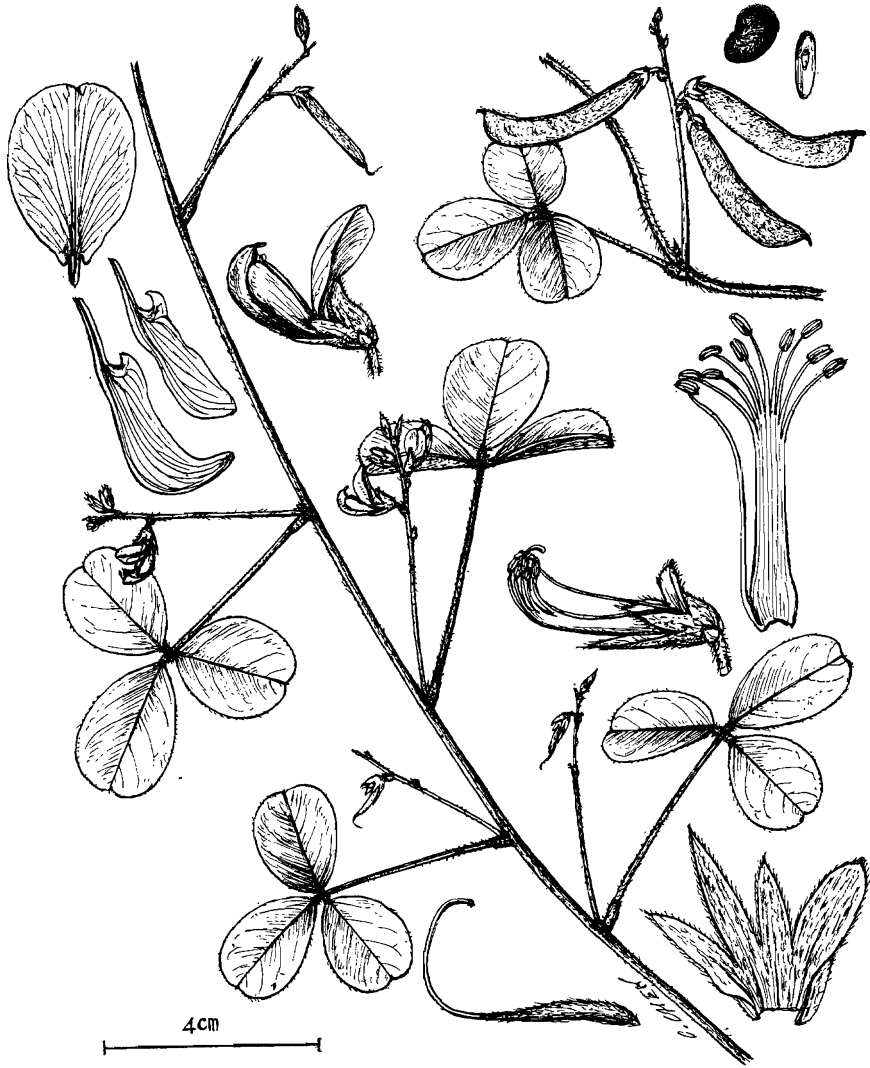


Fig. 76. *Galactia tenuiflora* WILLD.

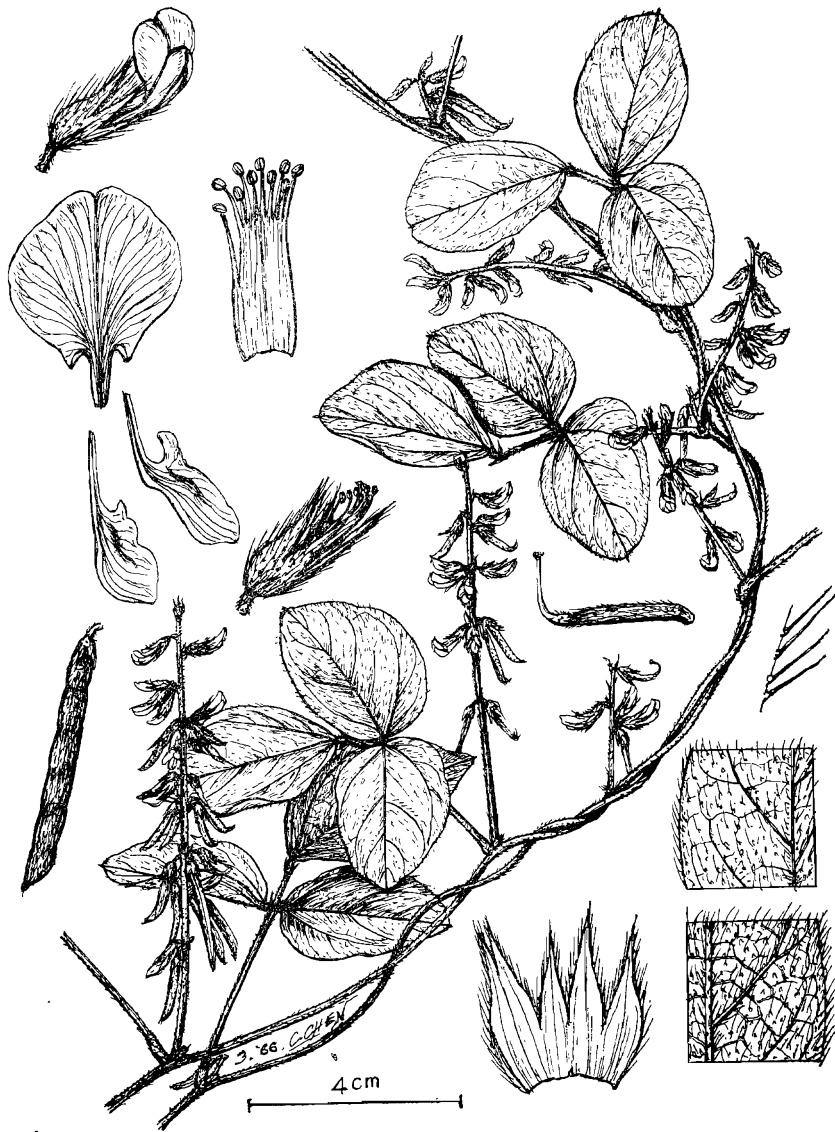


Fig. 77. *Glycine javanica* LINN.

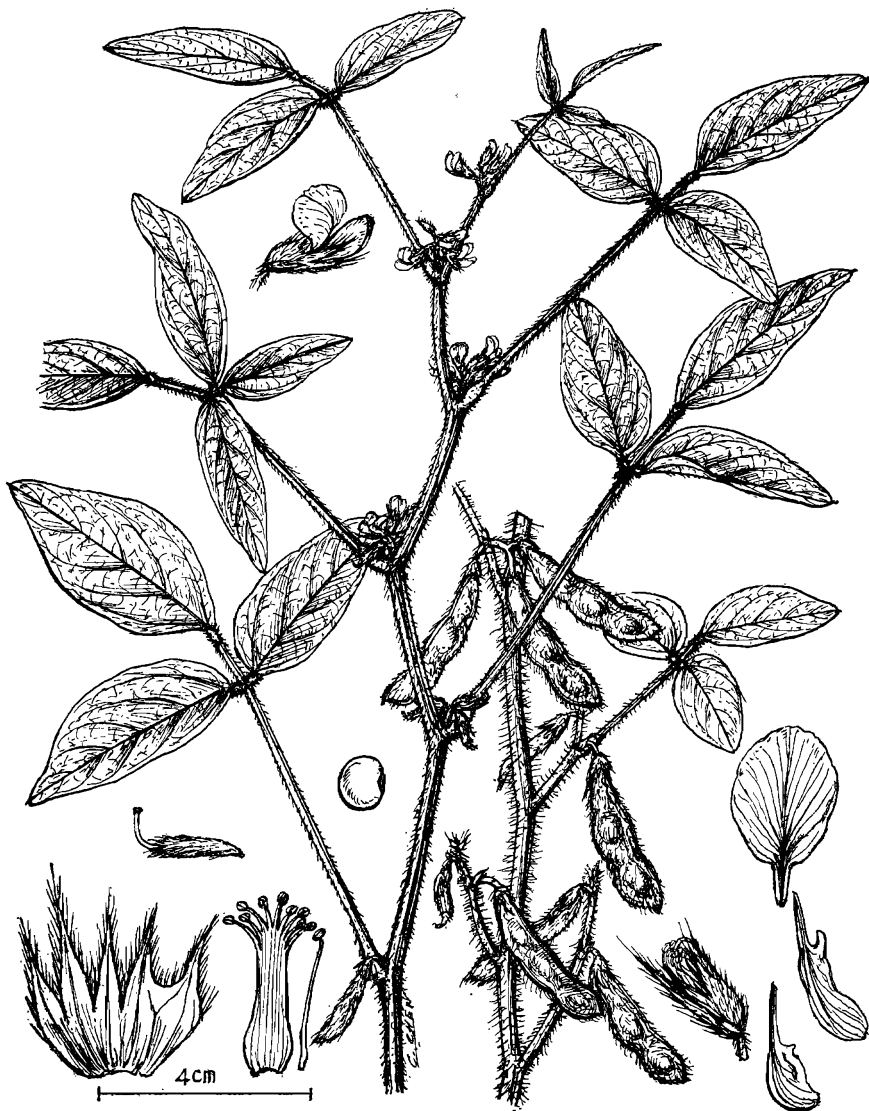


Fig. 78. *Glycine max* (LINN.) MERR.

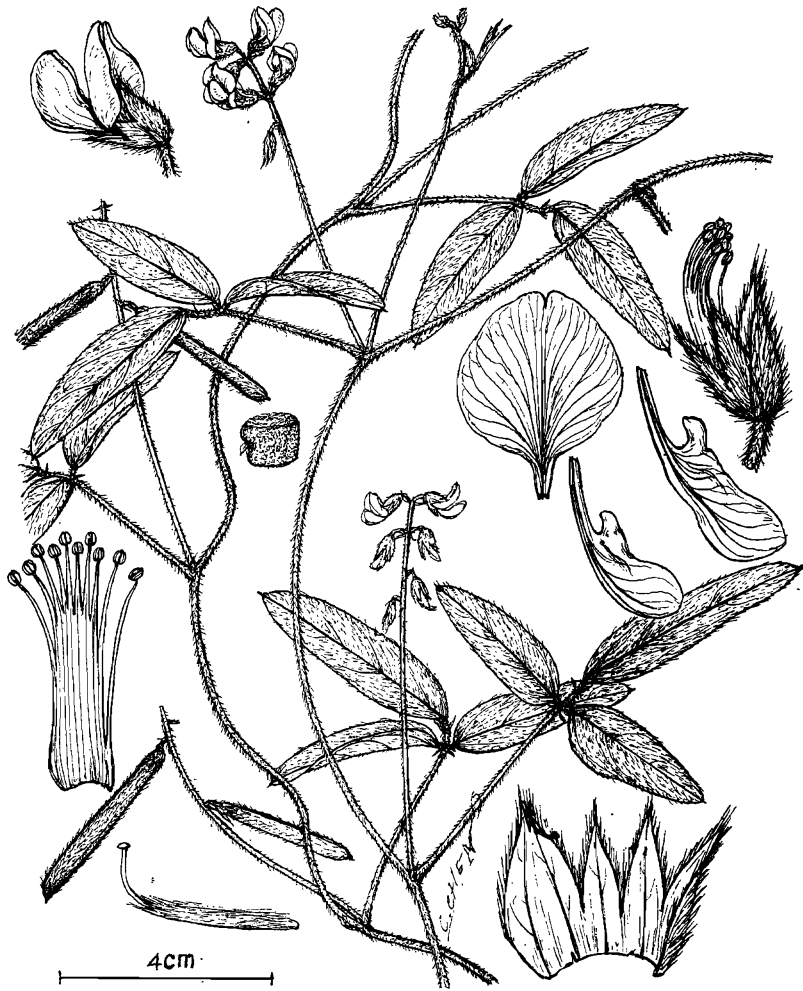


Fig. 79. *Glycine tomentosa* BENTH.

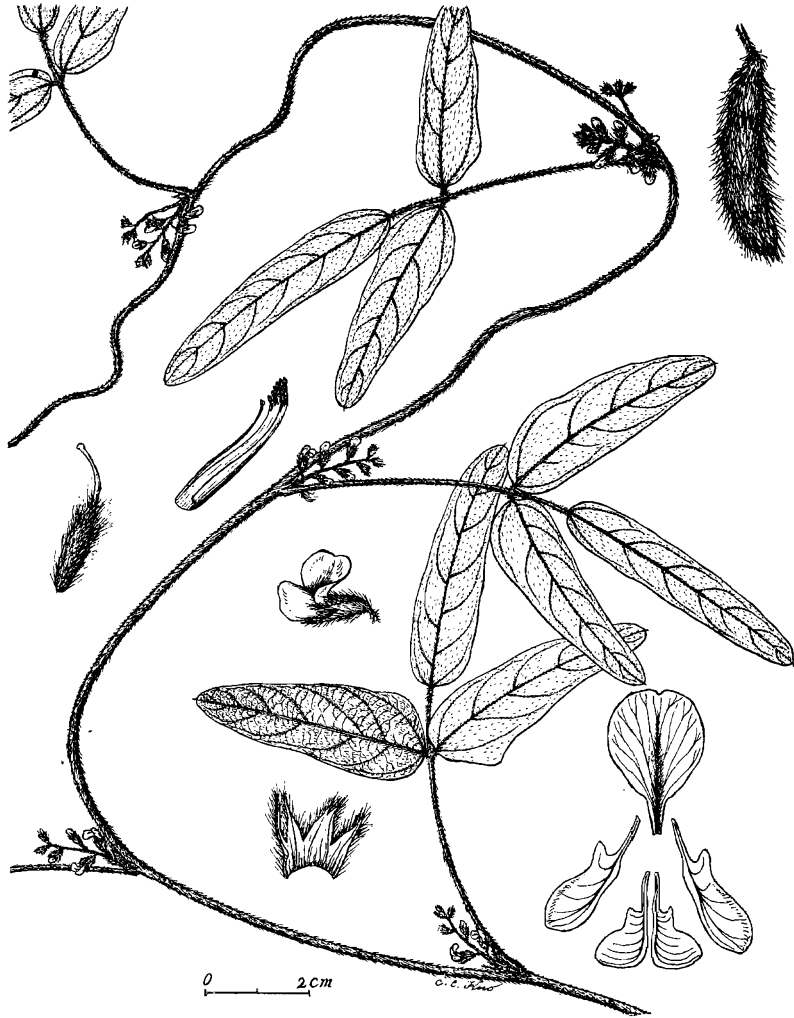


Fig. 80. *Glycine ussuriensis* REGEL & MAACK.

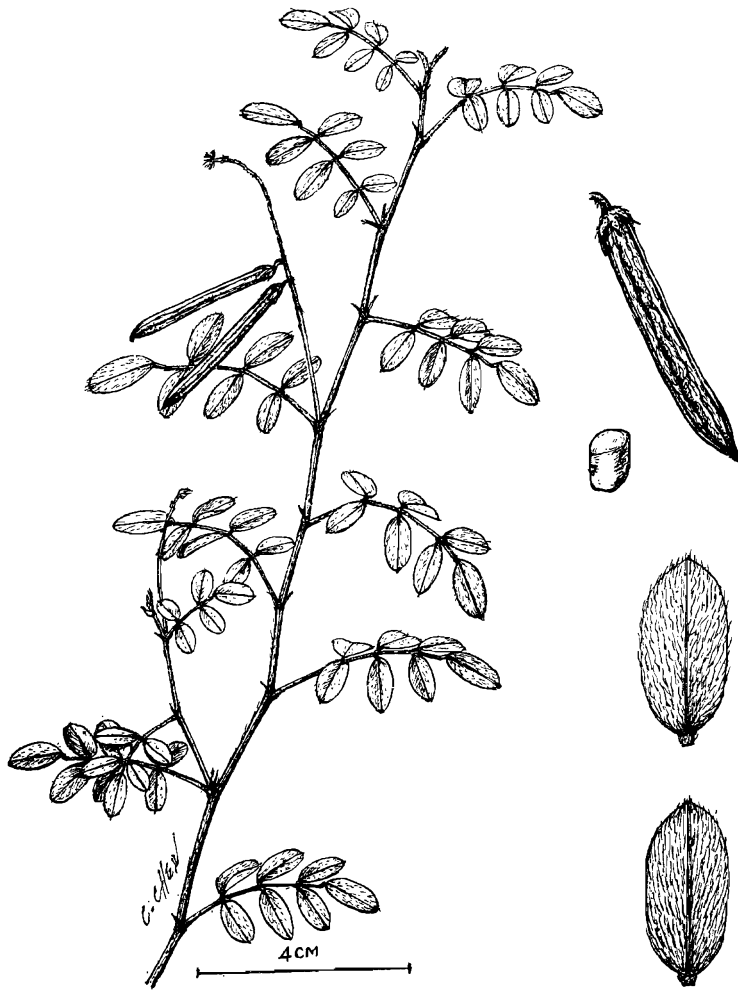


Fig. 81. *Indigofera byobiensis* Hosokawa

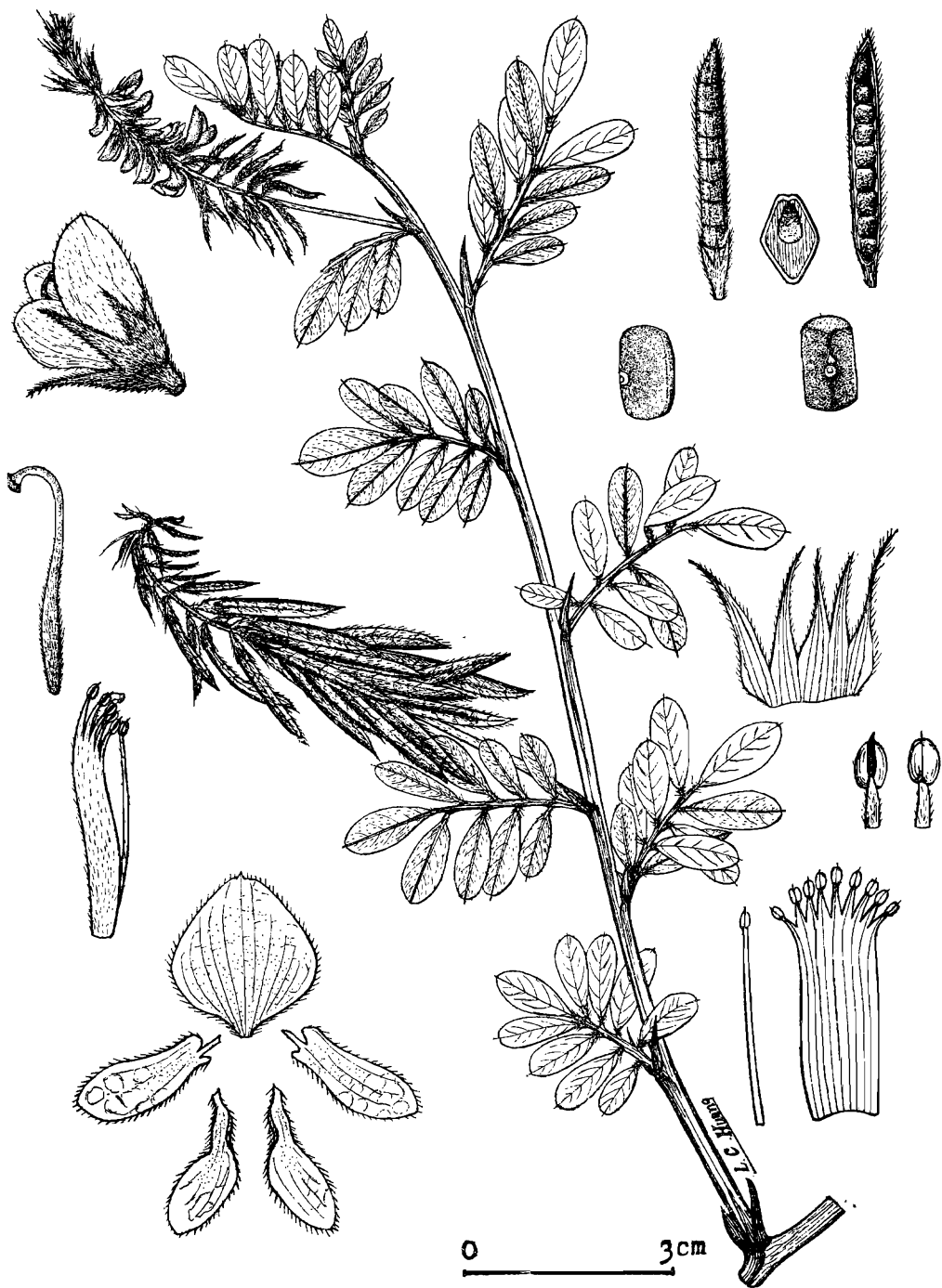


Fig. 82. *Indigofera endecaphylla* Jacq.

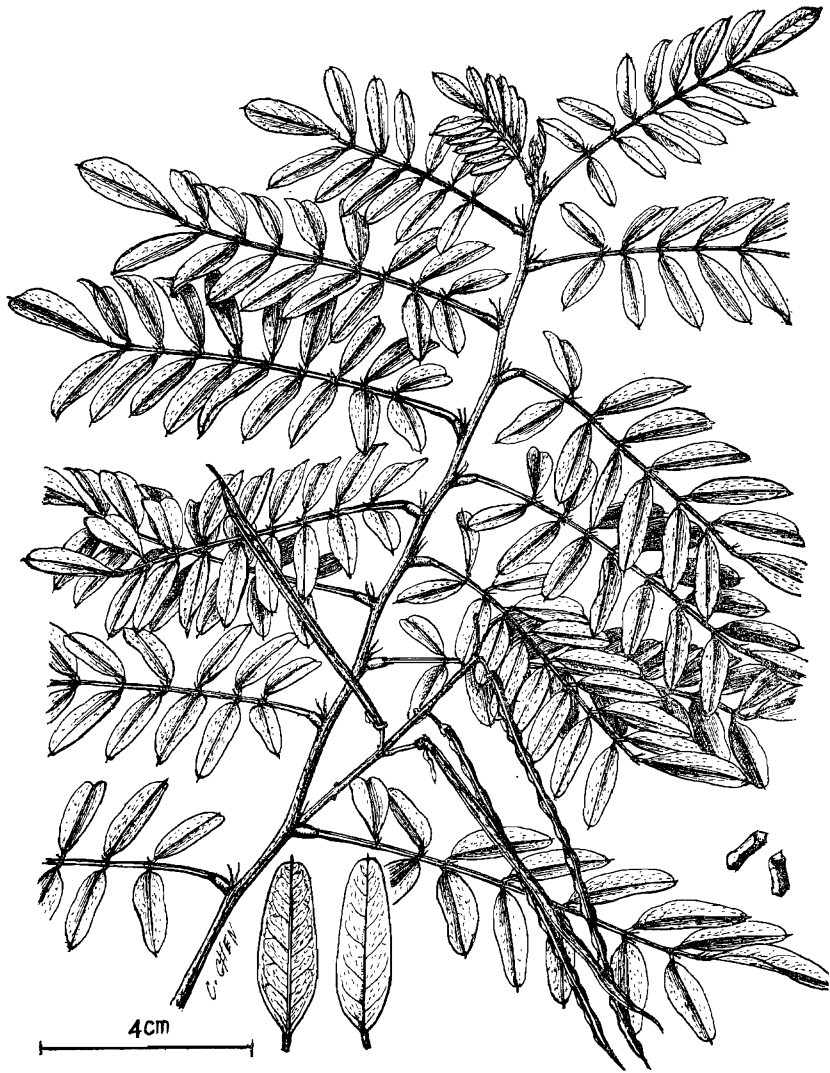


Fig. 83. *Indigofera galegoides* DC.

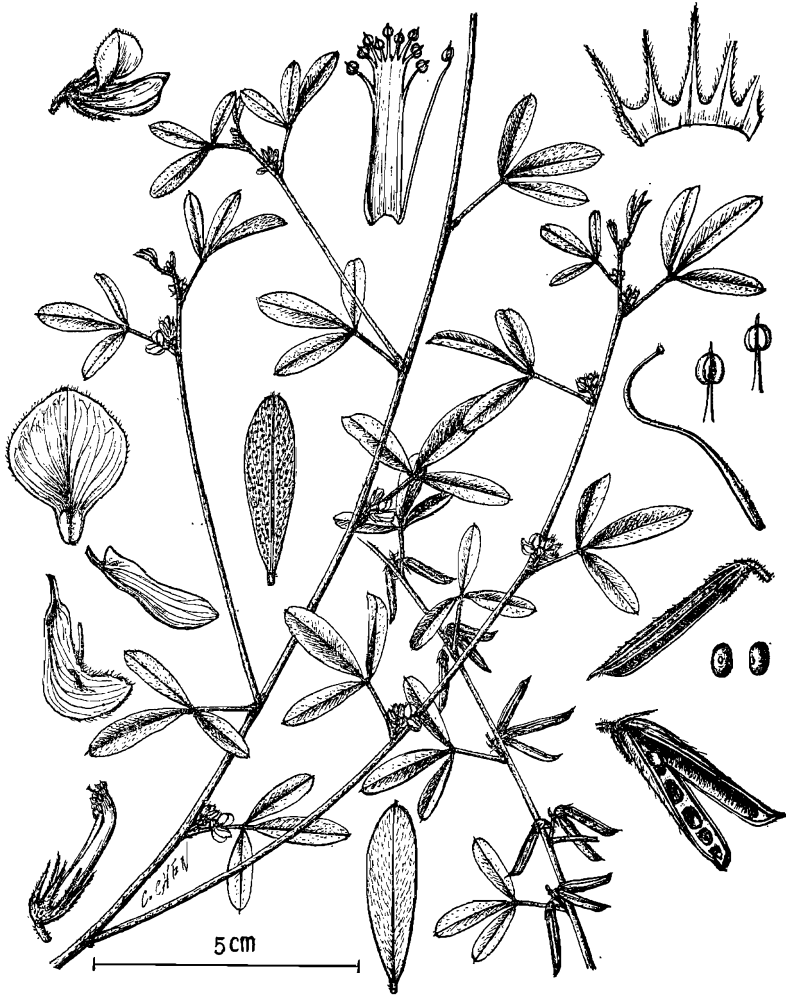


Fig. 84. *Indigofera glandulifera* HAY.



Fig. 85. *Indigofera hirsuta* LINN.

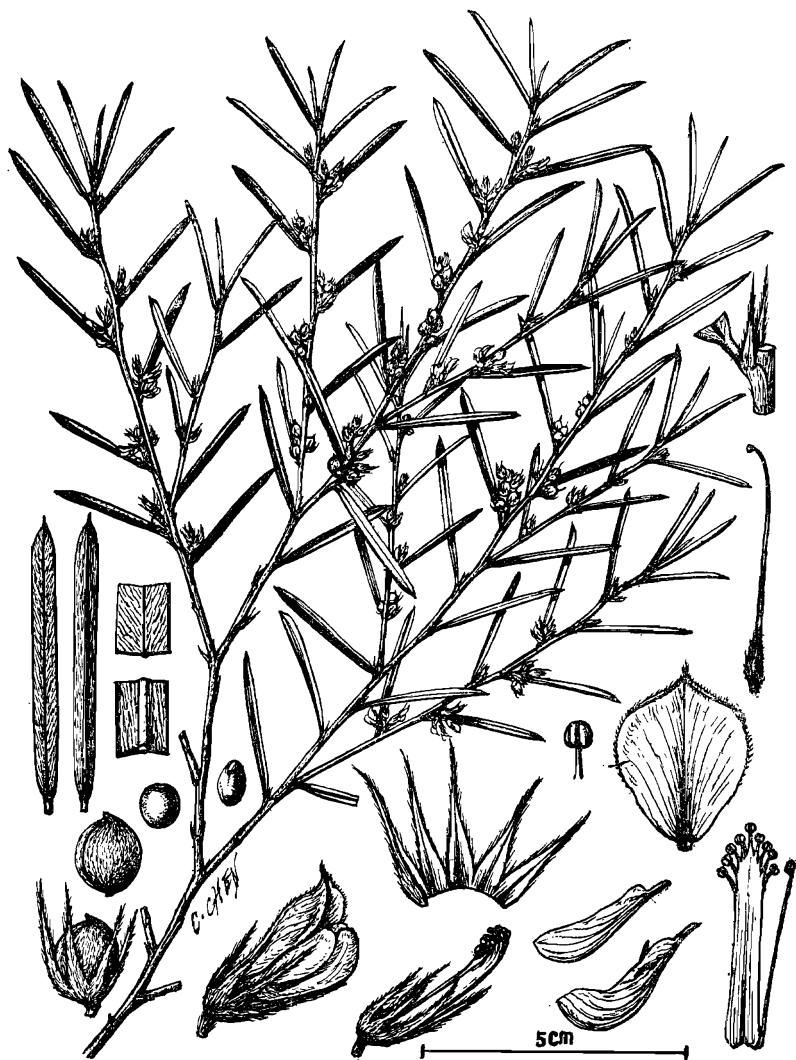


Fig. 86. *Indigofera linifolia* RETZ



Fig. 87. *Indigofera ramulosissima* Hosokawa



Fig. 88. *Indigofera suffruticosa* MILL.



Fig. 90. *Indigofera venulosa* CHAMP.

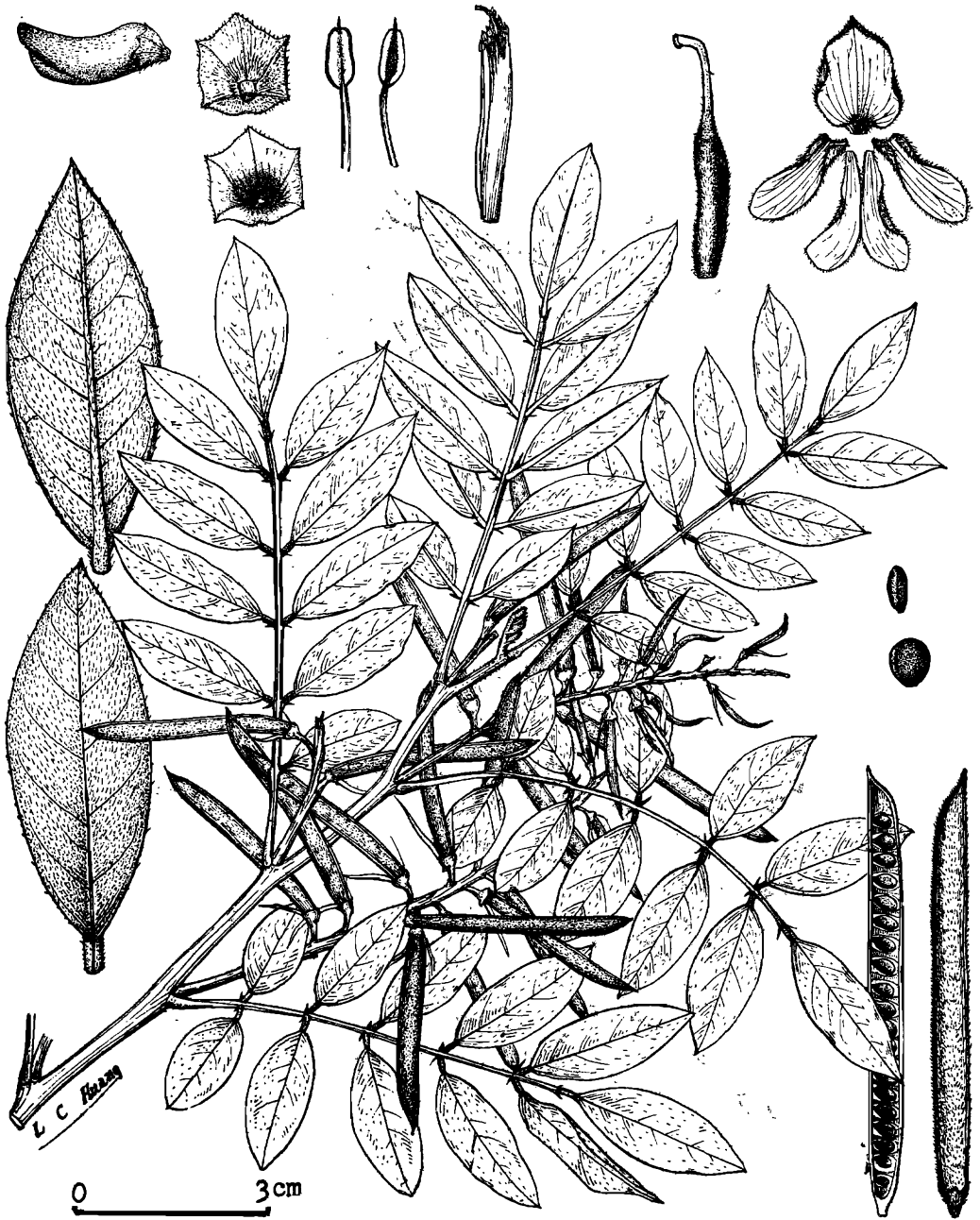


Fig. 91. *Indigofera Zollingeriana* Mro.



Fig. 92. *Kummerowia stipulacea* (MAXIM.) MAKINO



Fig. 93. *Kummerowia striata* (THUNB.) SCHINDL.

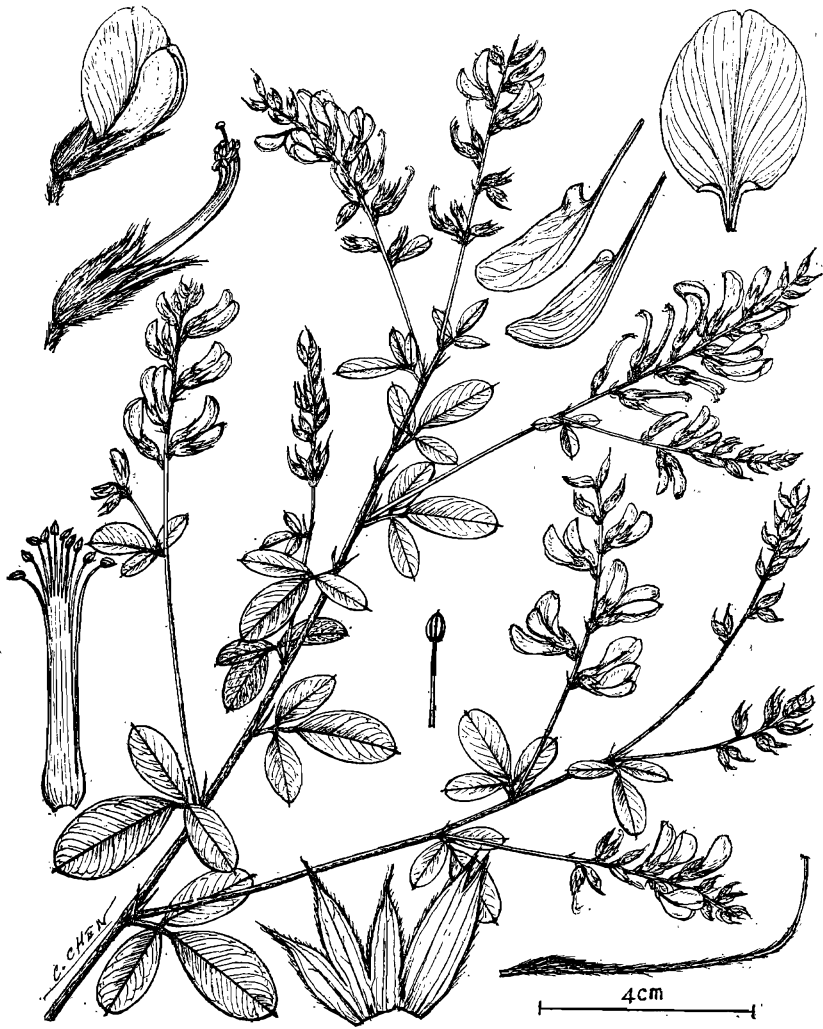


Fig. 94. *Lespedeza bicolor* Turcz.

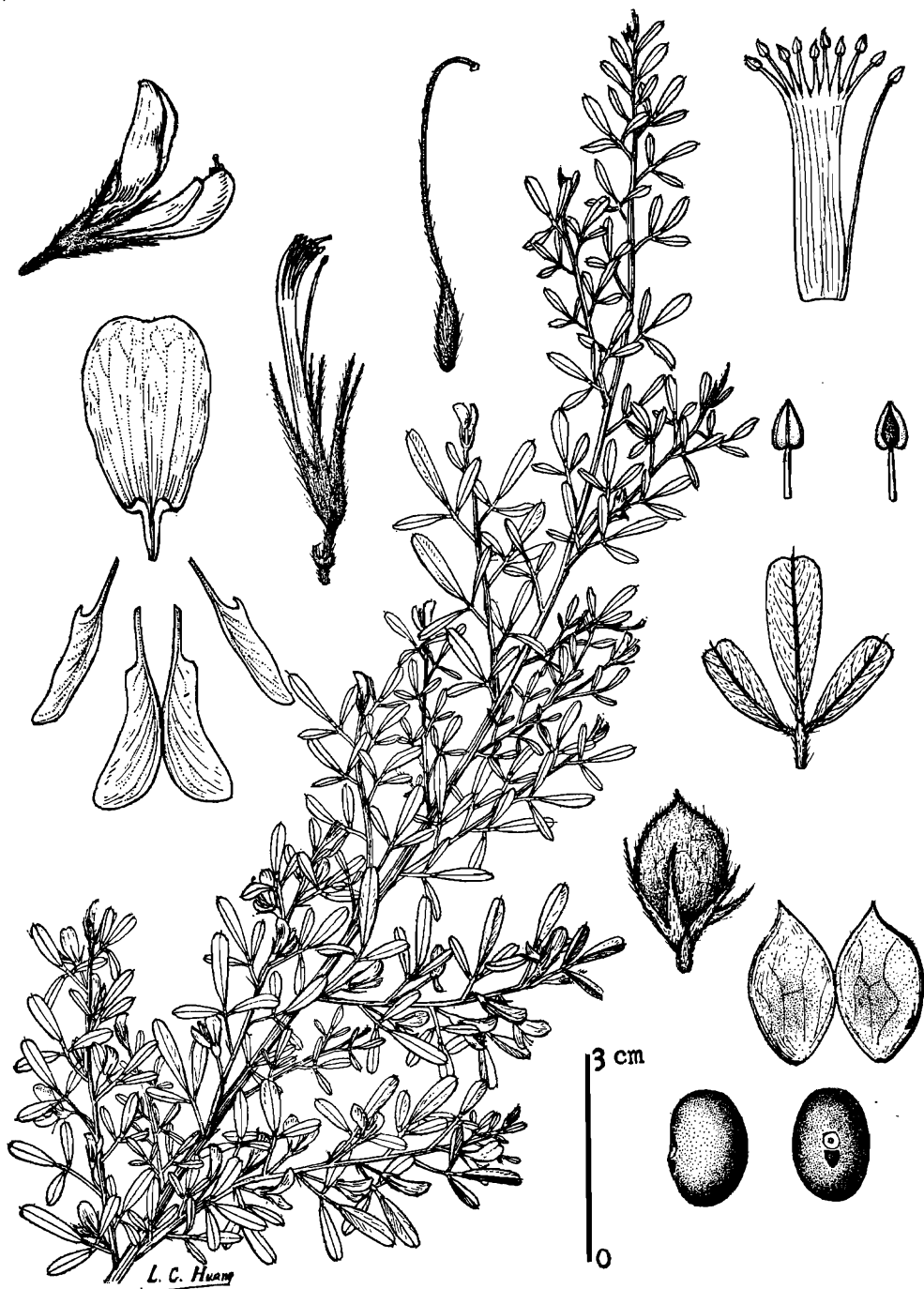


Fig. 96. *Lespedeza cuneata* (DU MONT. D. COURS.) G. DON



Fig. 97 *Lespedeza daurica* (LAM.) SCHINDL.

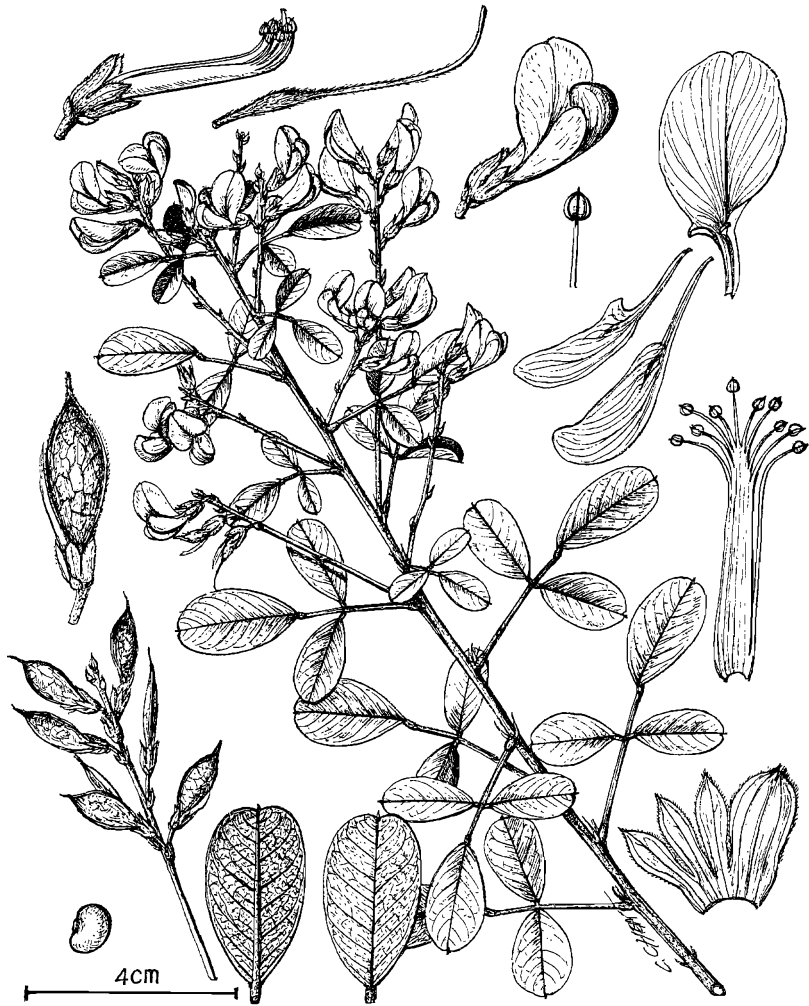


Fig. 98. *Lespedeza pubescens* HAY.



Fig. 99. *Lespedeza virgata* (THUNB.) DC.

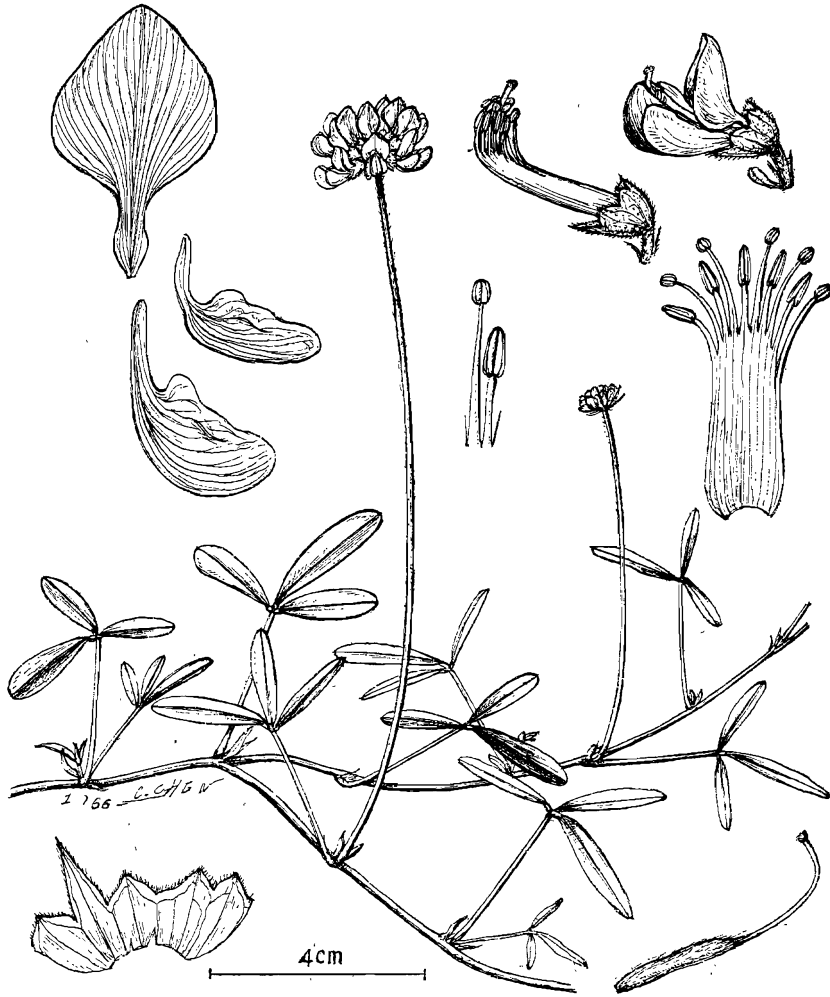


Fig. 100. *Lotononis Bainesii* BAKER



Fig. 101. *Lotus australis* ANDR.

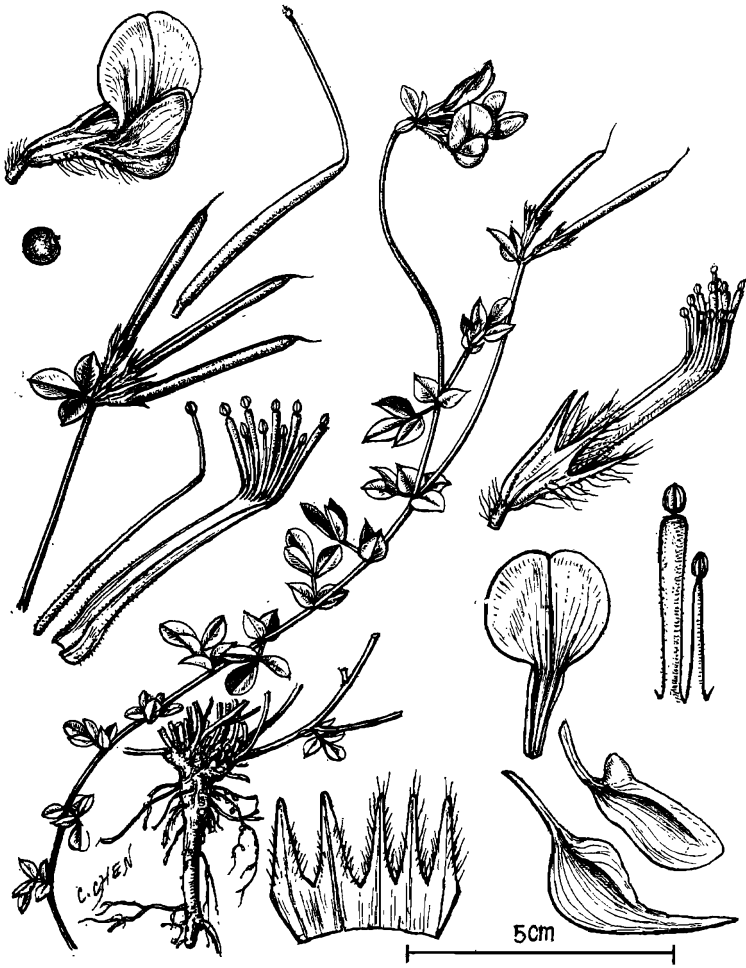


Fig. 102. *Lotus corniculatus* LINN. var. *japonicus* REGEL.



Fig. 103. *Lourea campanulata* BENTH.

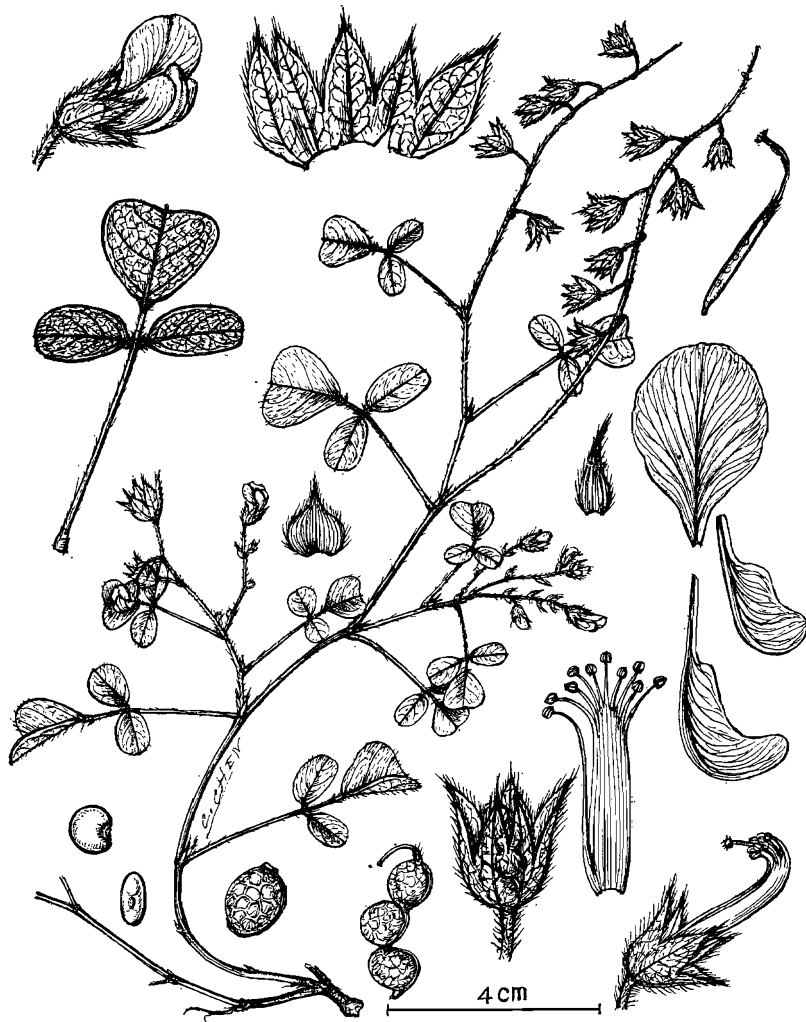


Fig. 104. *Lourea obcordata* (POIR.) DESV.

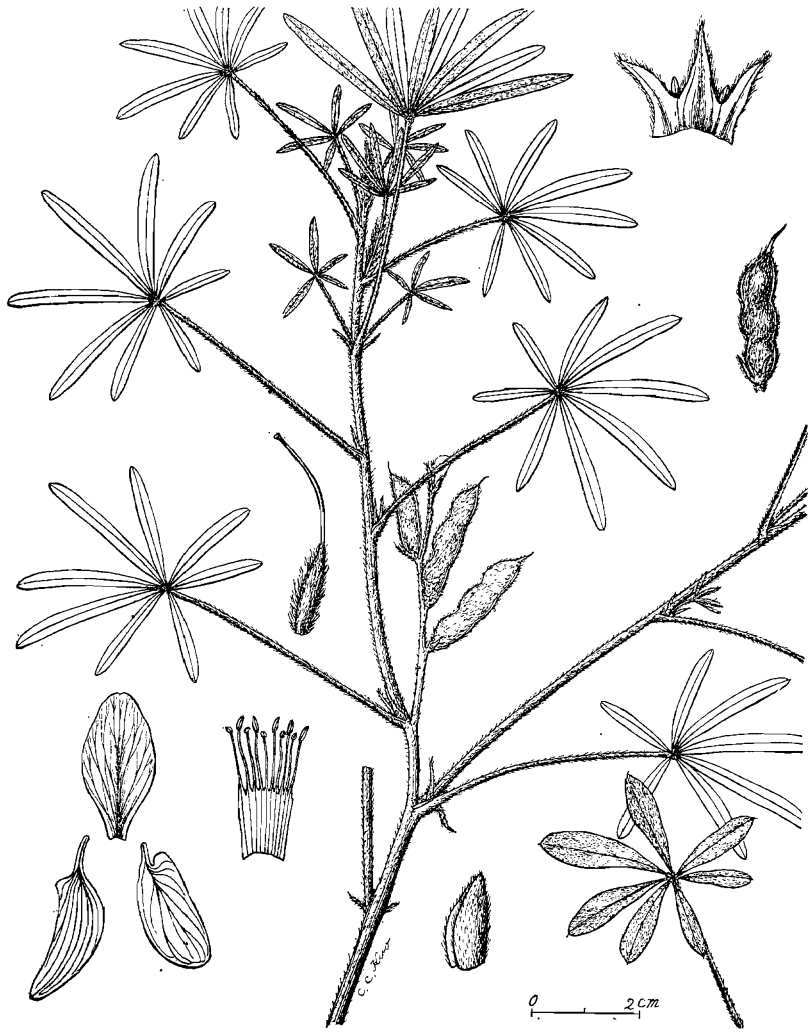


Fig. 105. *Lupinus angustifolius* LINN.



Fig. 106 *Lupinus luteus* LINN.

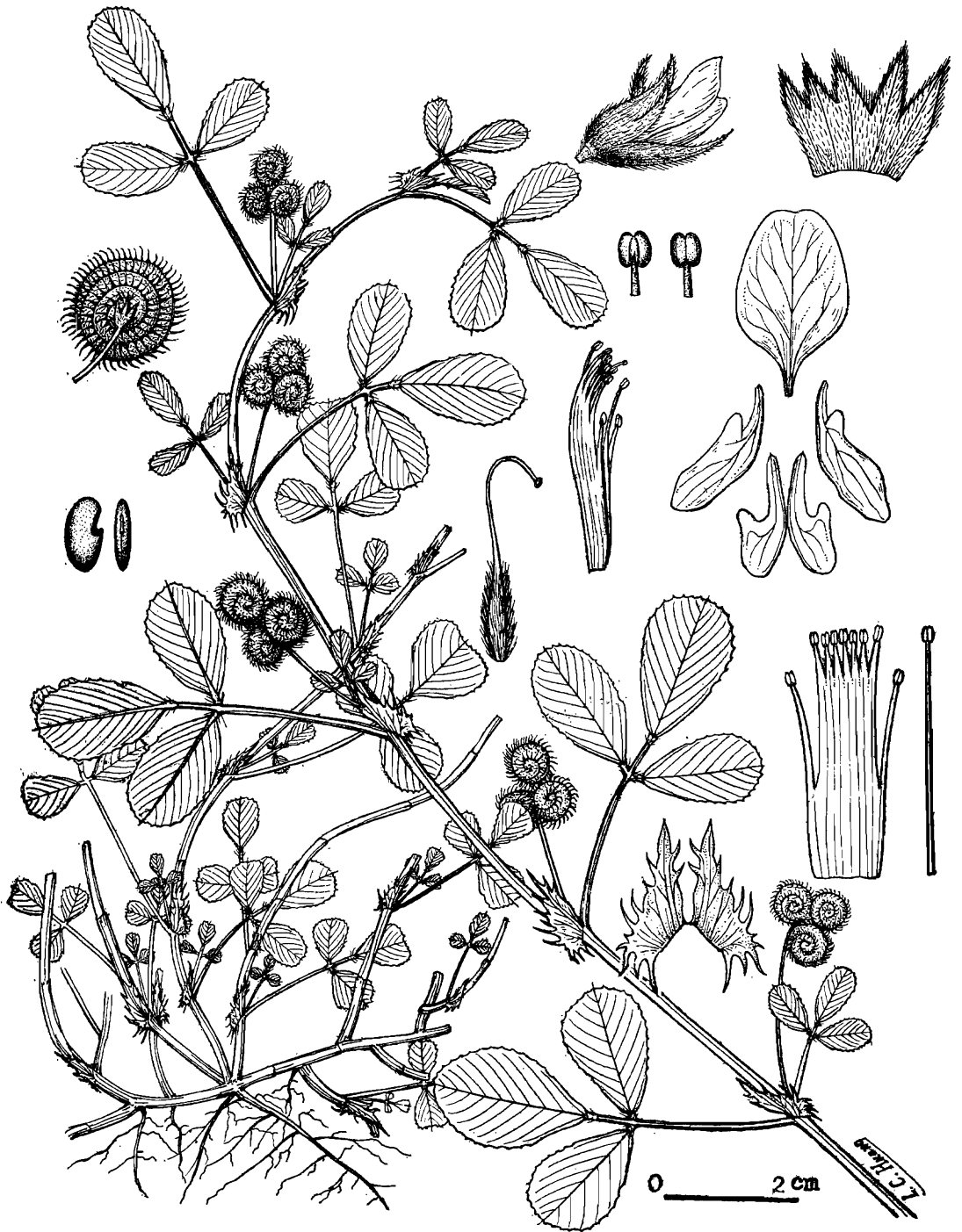


Fig. 107. *Medicago hispida* GAERTN.

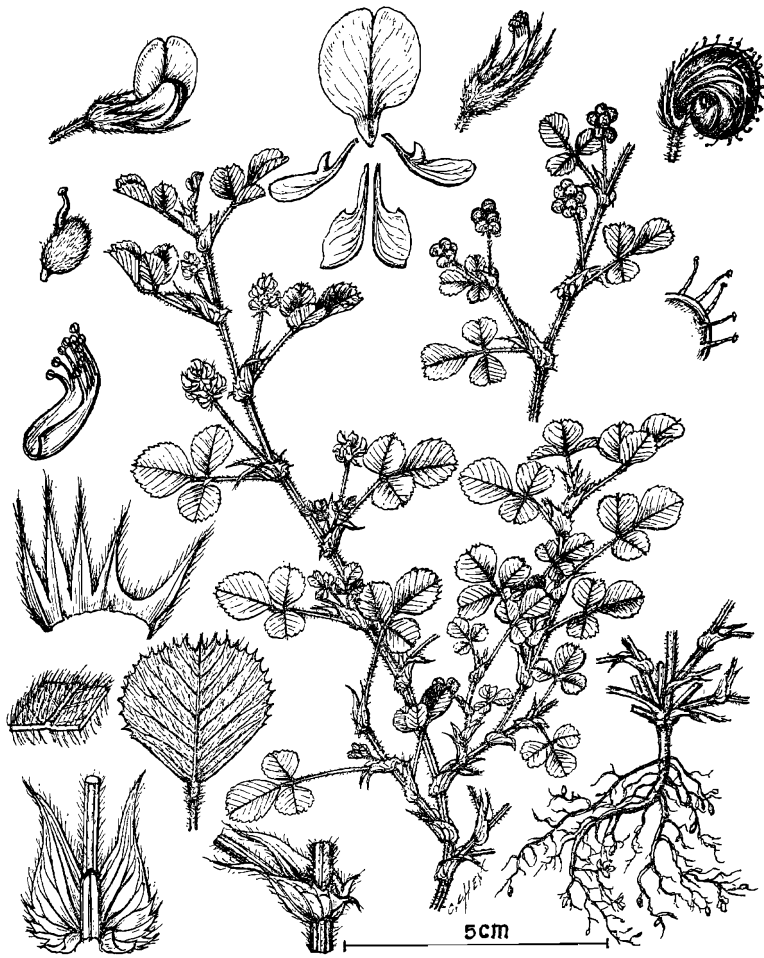


Fig. 108. *Medicago lupulina* LINN.

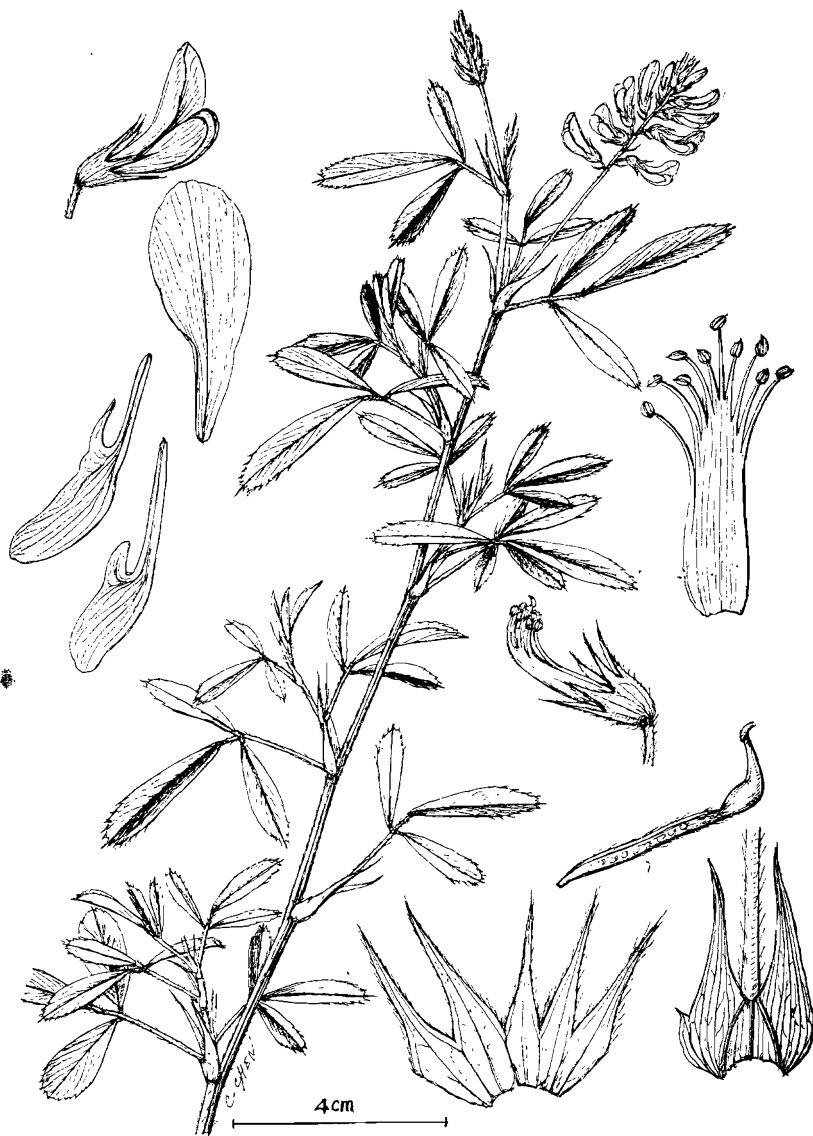


Fig. 109. *Medicago sativa* LINN.



Fig. 110. *Melilotus indicus* (Linn.) All.



Fig. 111. *Melilotus suaveolens* LEDEB.

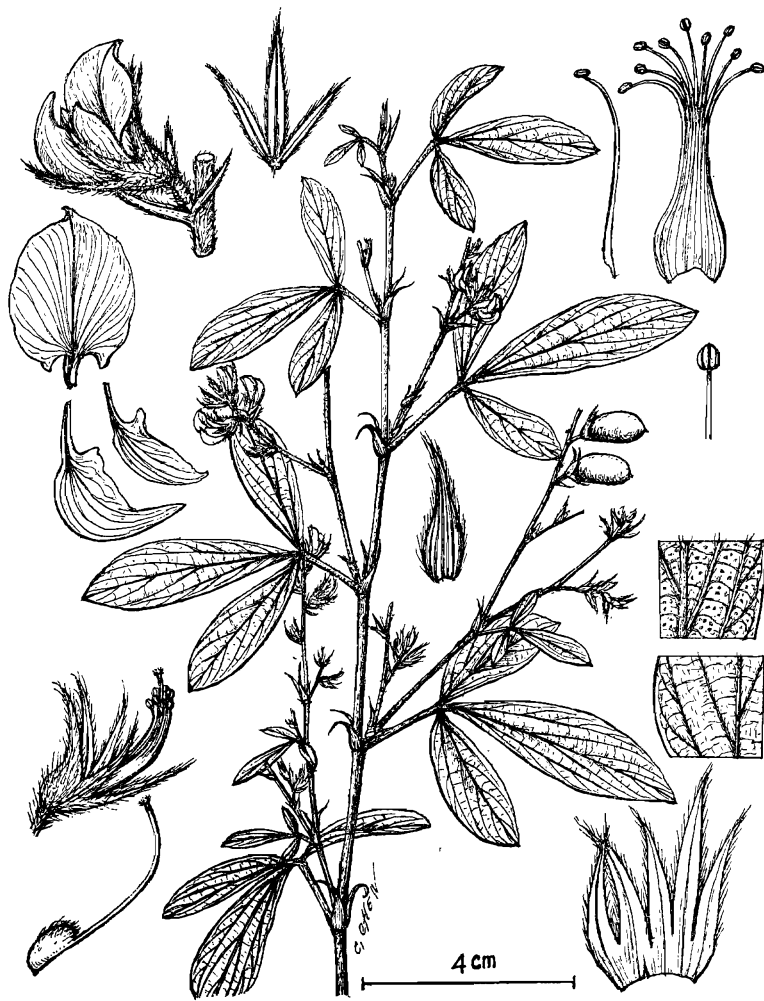


Fig. 112. *Moghania lineata* (Linn.) O. Kuntze



Fig. 113. *Moghania macrophylla* (WILLD.) O. KUNTZE



Fig. 114. *Moghania philippinensis* (MERR. & ROLFE) LI



Fig. 115. *Moghania strobilifera* (LINN.) J. ST-HILAIRE

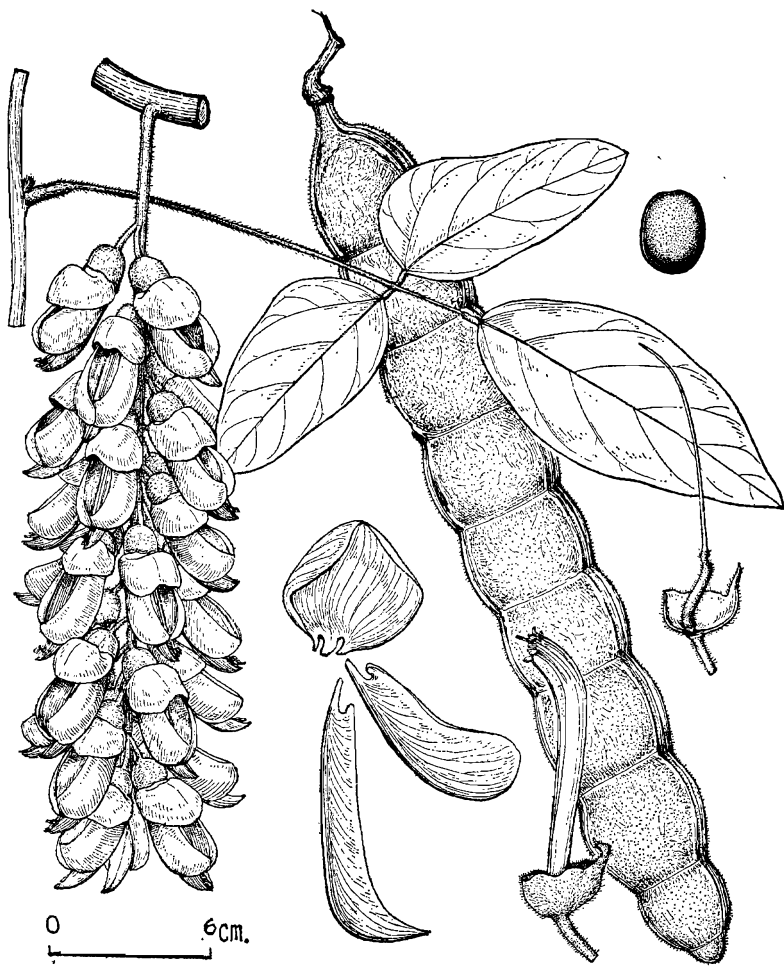


Fig. 116. *Mucuna macrocarpa* WALL.

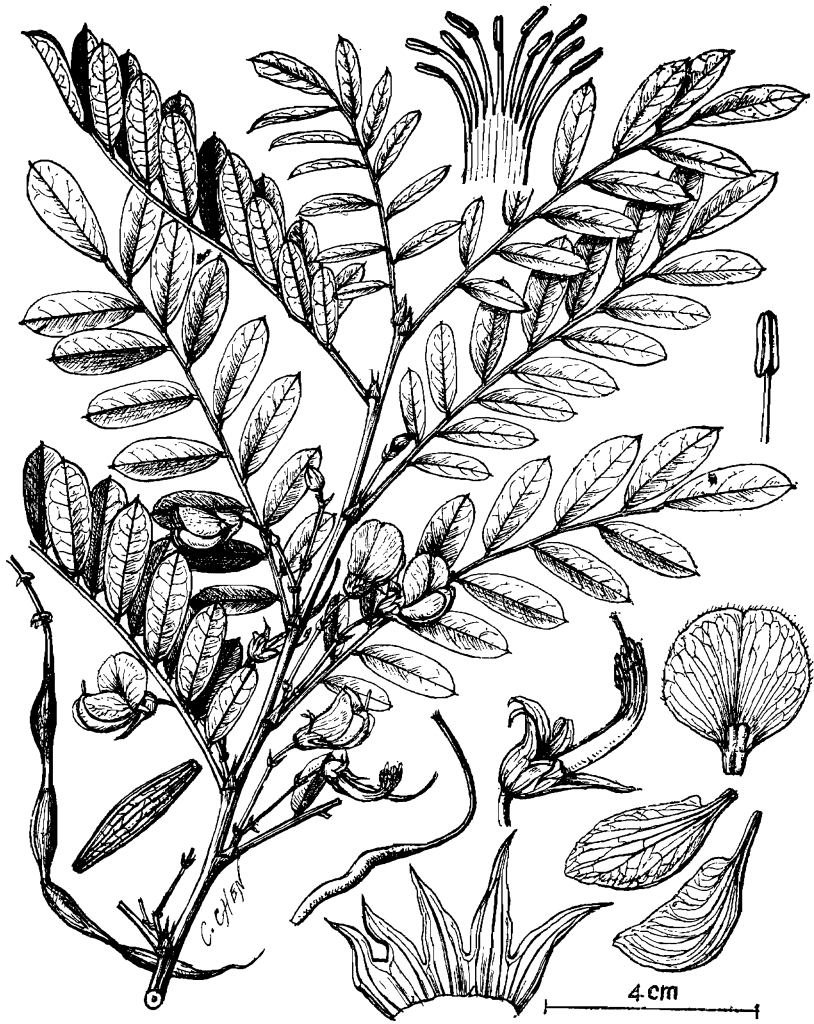


Fig. 117. *Ormocarpum cochinchinense* (LOUR.) MERR.

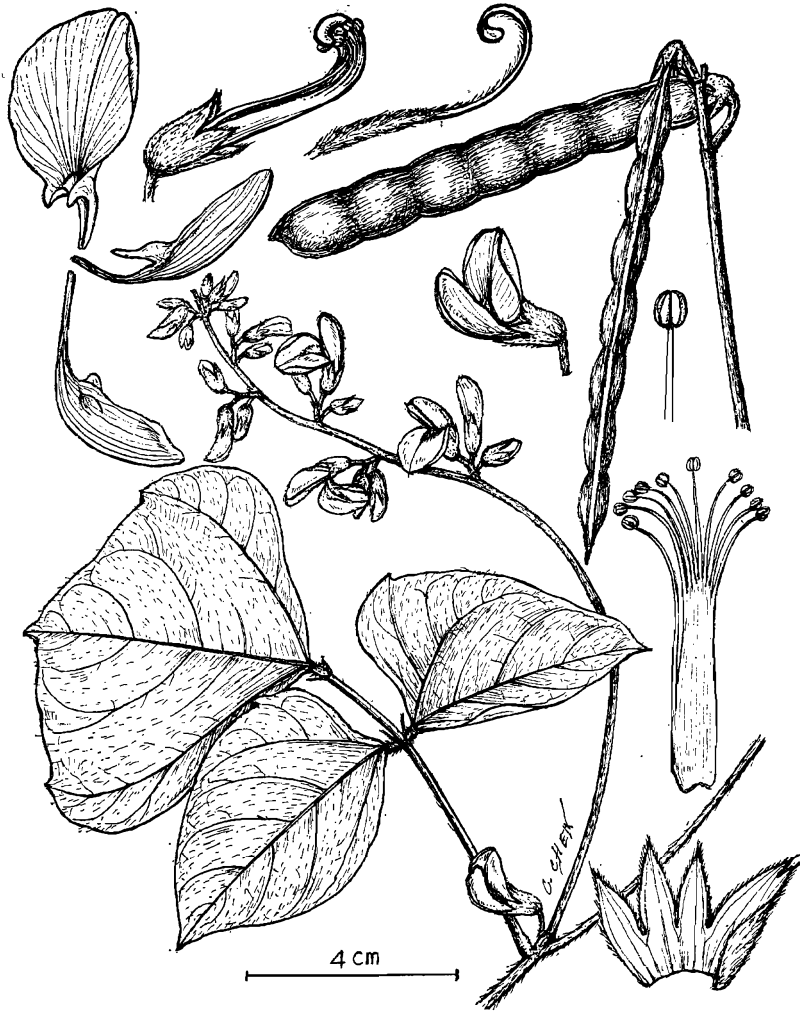


Fig. 118. *Pachyrrhizus erosus* (LINN.) URBAN.

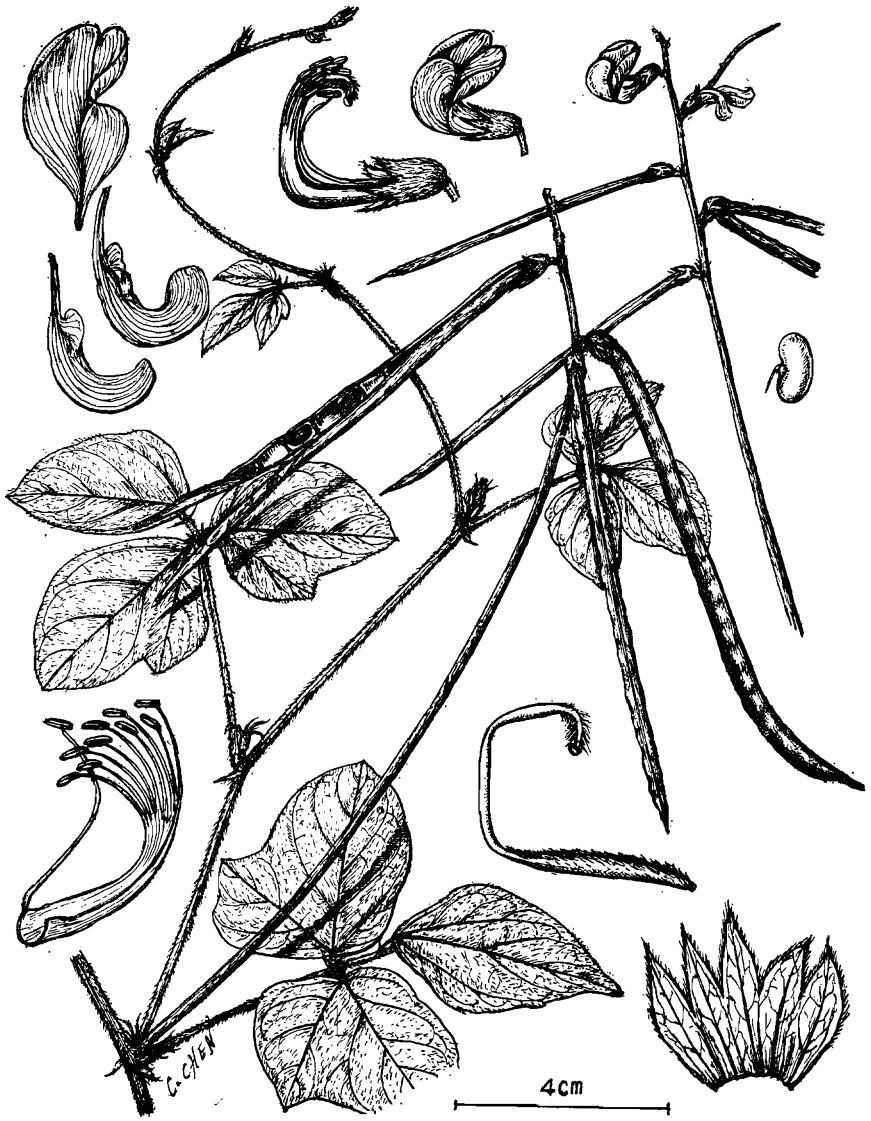


Fig. 119. *Phaseolus atropurpureus* DC.



Fig. 120. *Phaseolus calcaratus* ROXB.

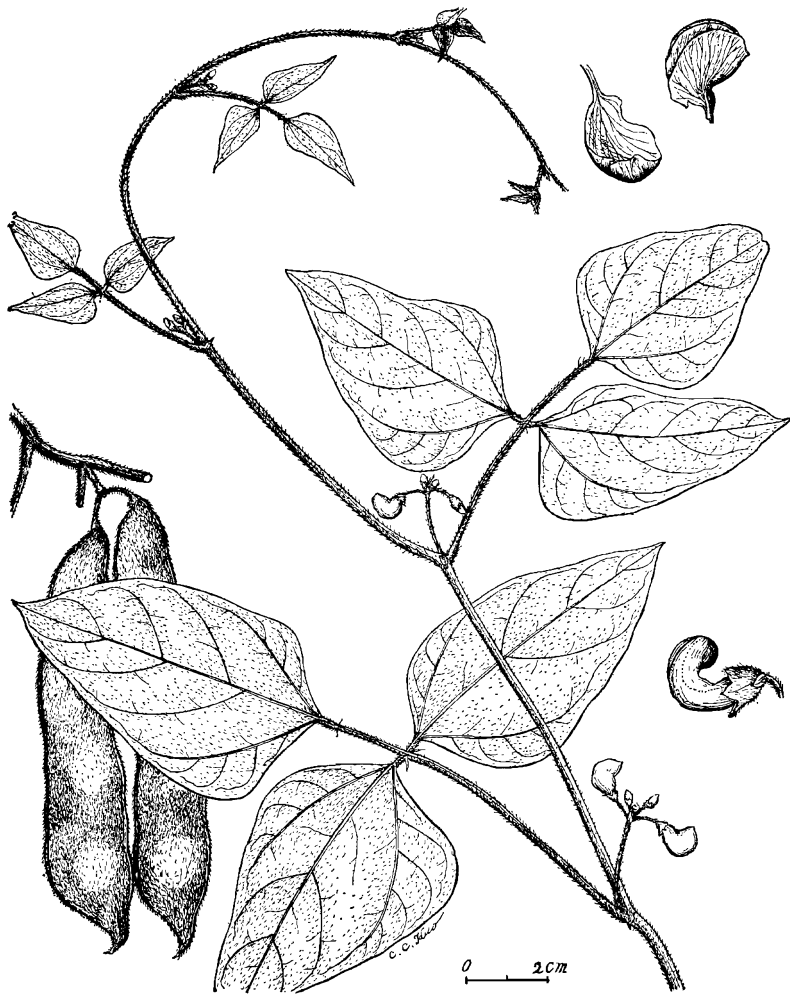


Fig. 121. *Phaseolus lunatus* LINN.

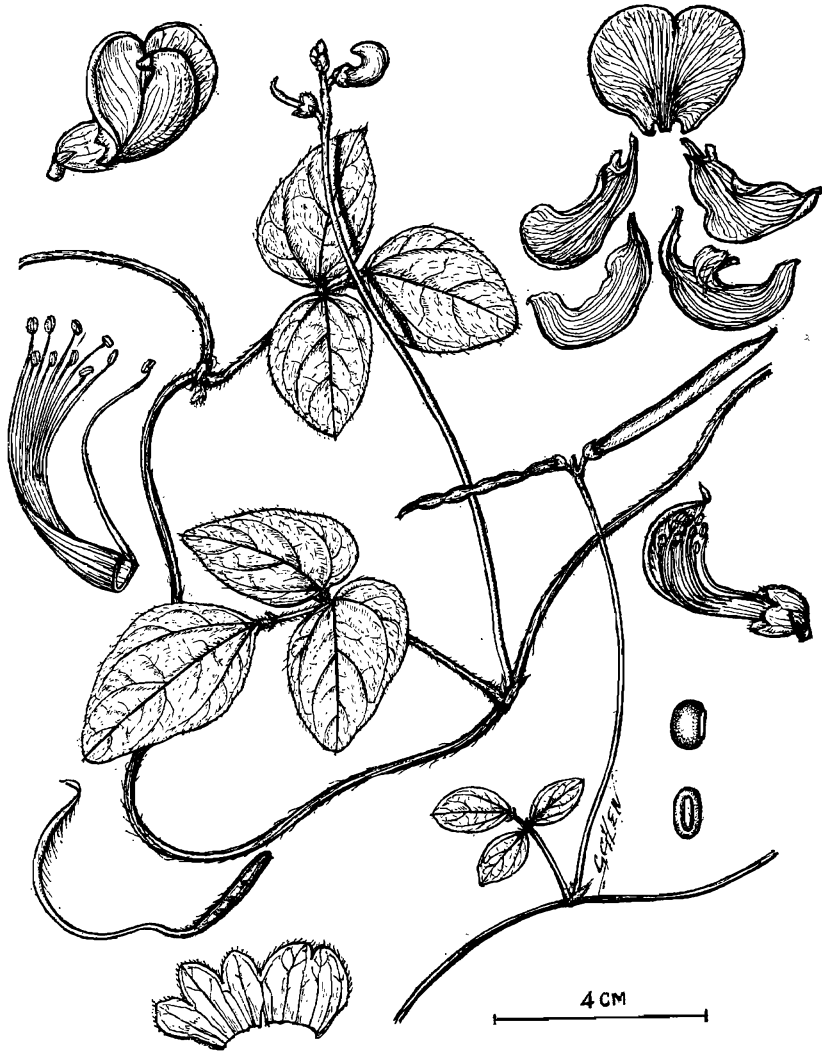


Fig. 122. *Phaseolus minimus* ROXB.



Fig. 123. *Phaseolus mugo* LINN.

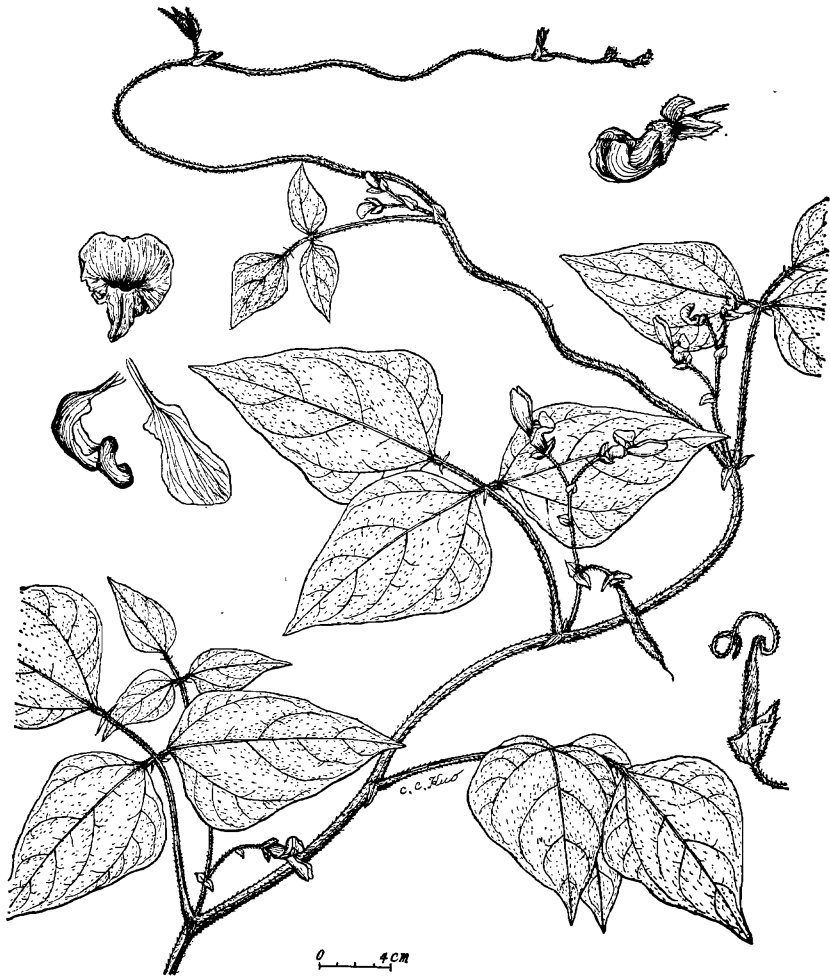


Fig. 124. *Phaseolus vulgaris* LINN.

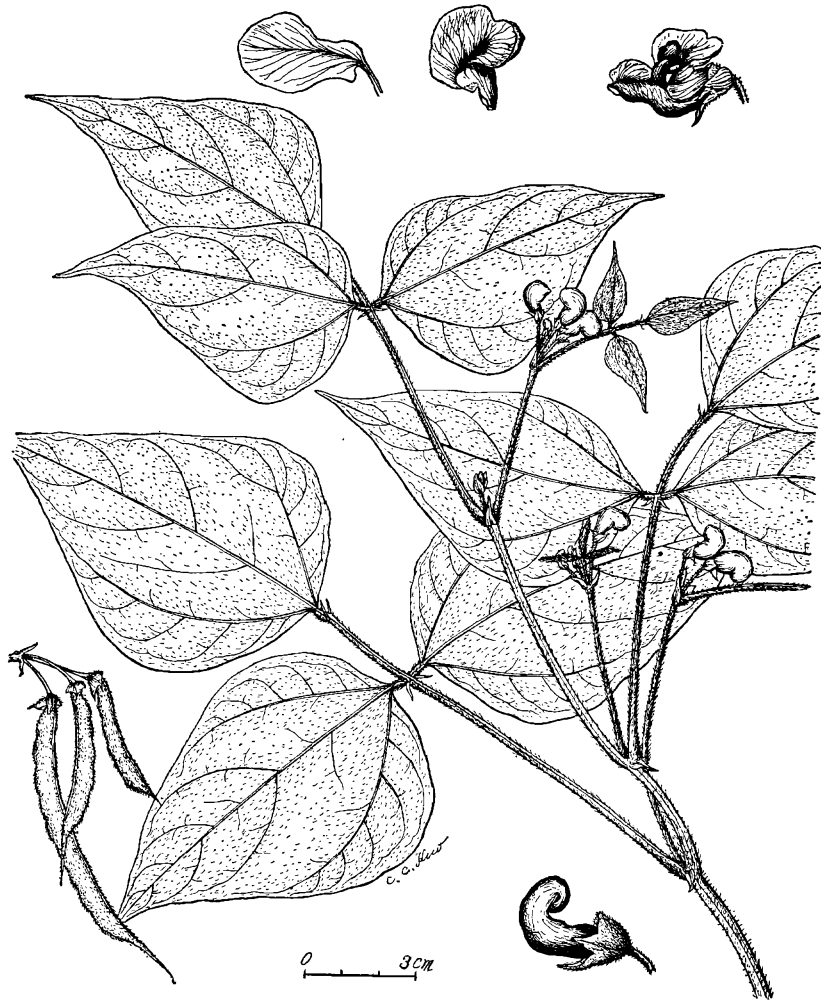


Fig. 125. *Phaseolus vulgaris* LINN. var. *humilis* ALEF.

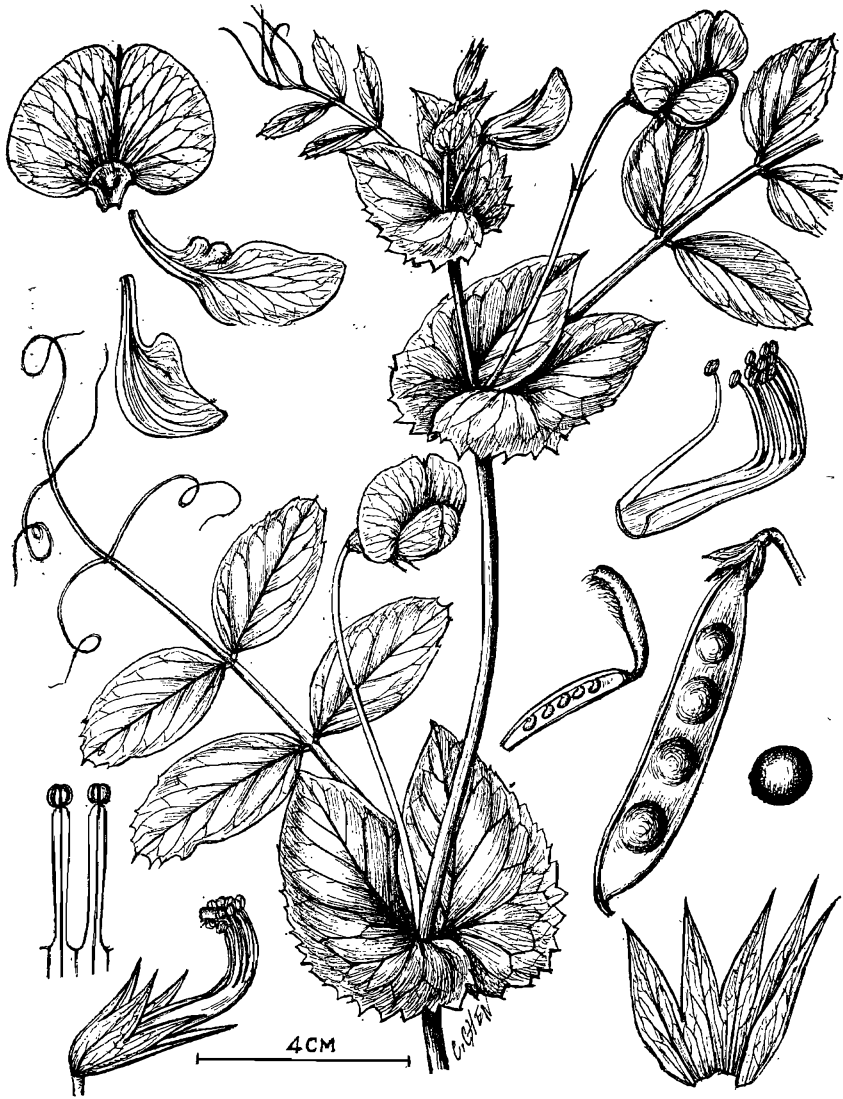


Fig. 126. *Pisum sativum* LINN.

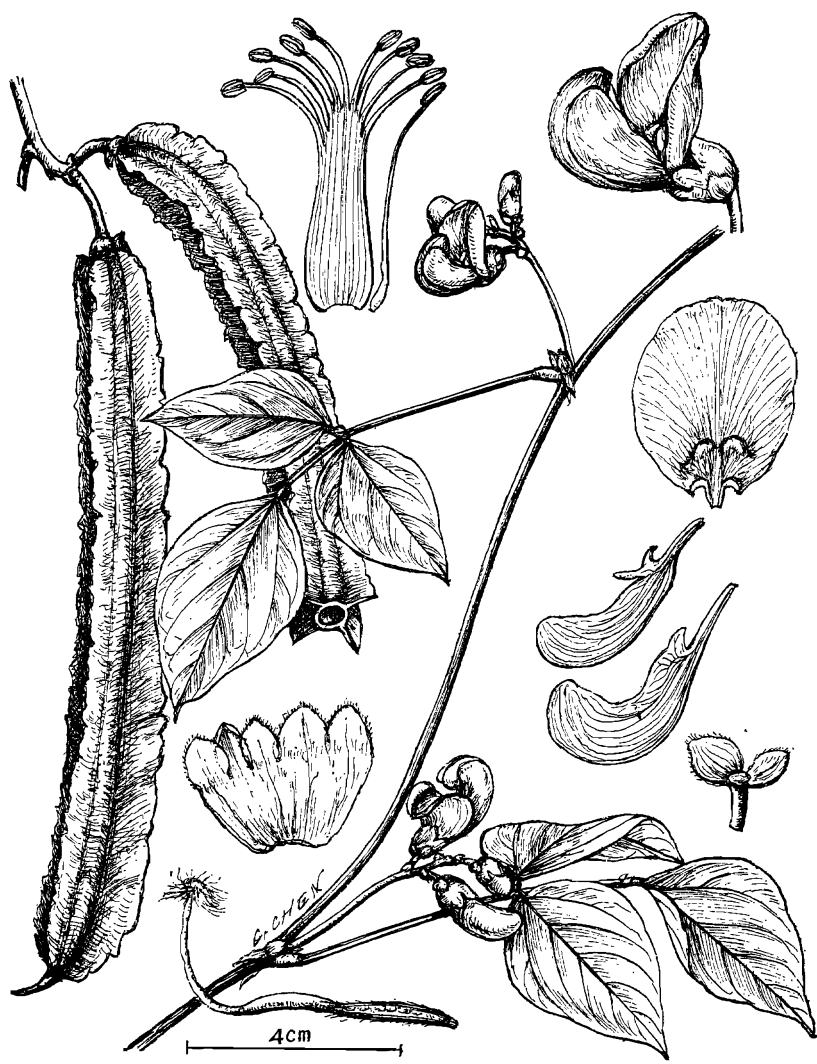


Fig. 127. *Psophocarpus tetragonolobus* (Linn.) DC.

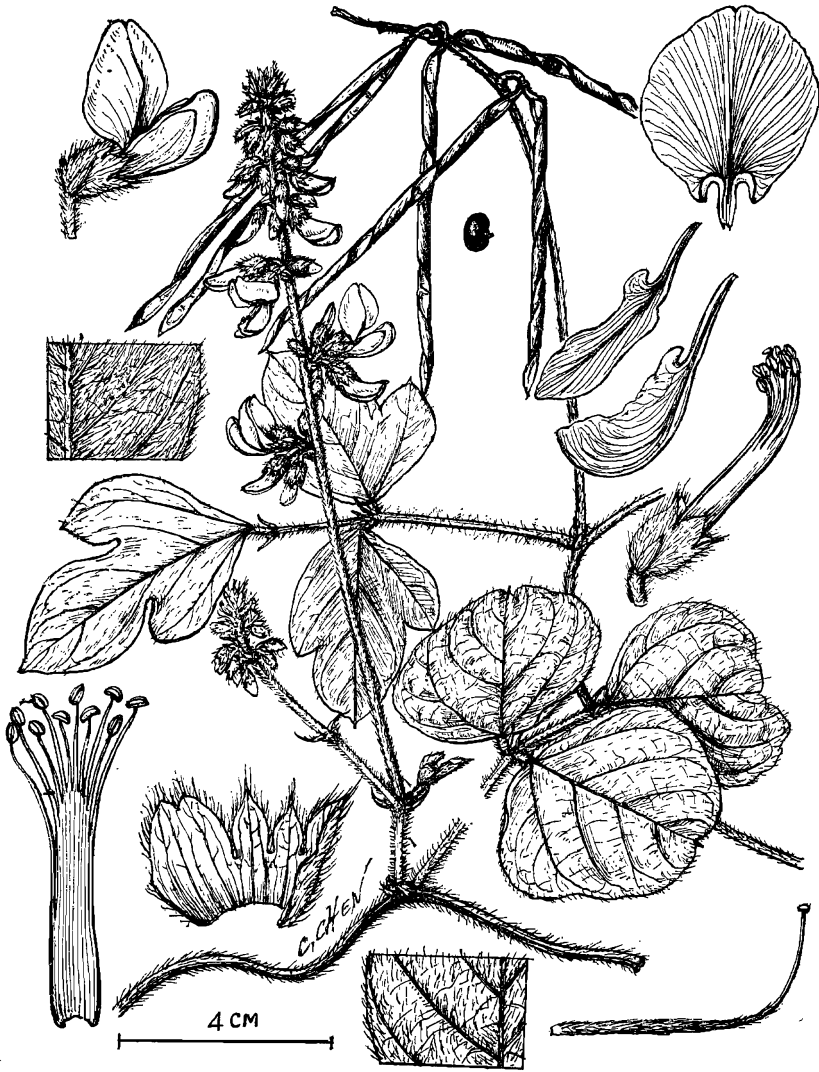


Fig. 128. *Pueraria phaseoloides* (ROXB.) BENTH.



Fig. 129. *Pueraria tonkinensis* GAGN.

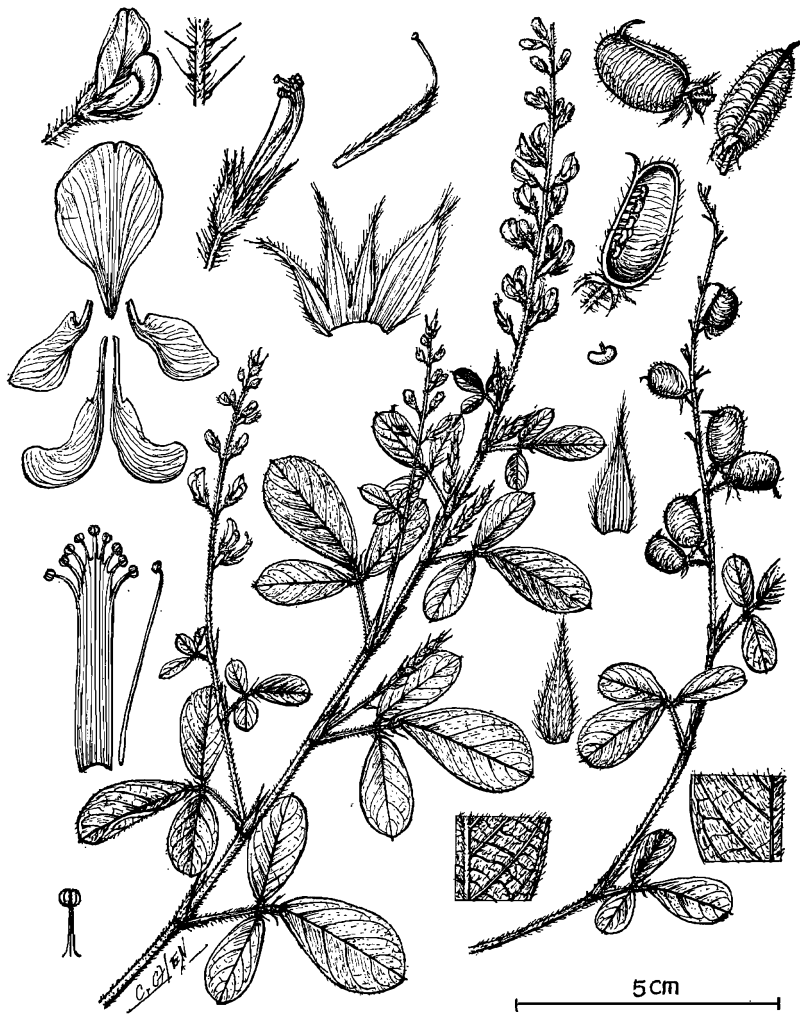


Fig. 130. *Pycnospora lutescens* (POIR.) SCHINDL.

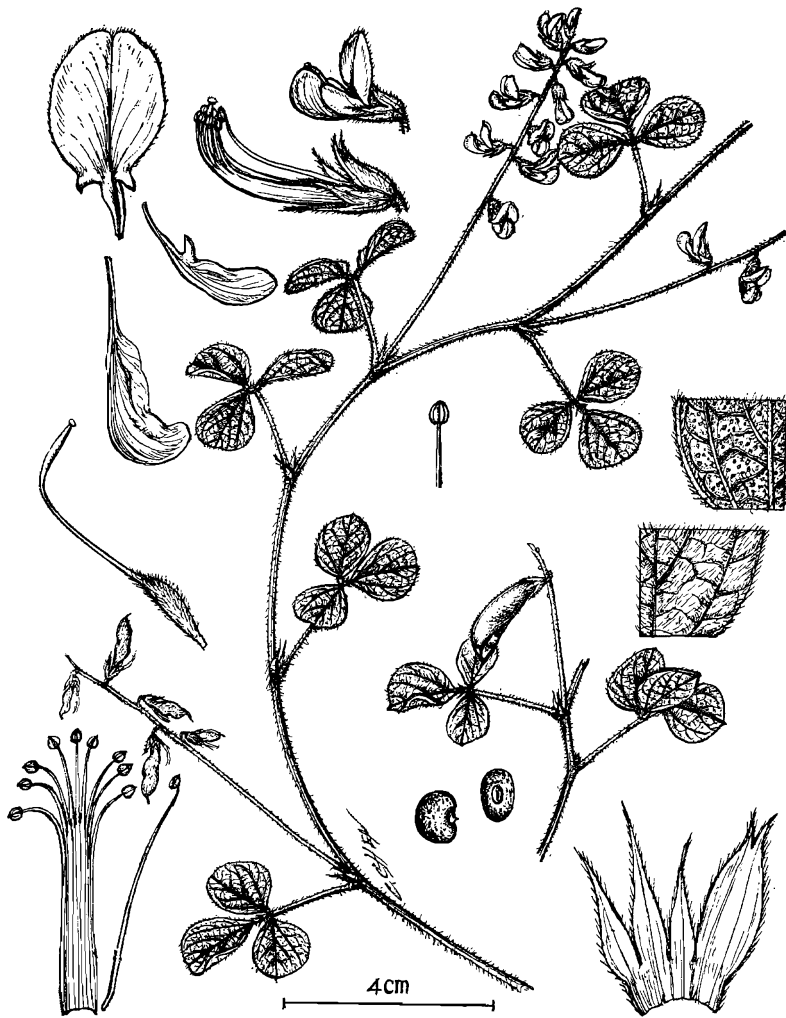


Fig. 131. *Rhynchosia minima* (Linn.) DC.

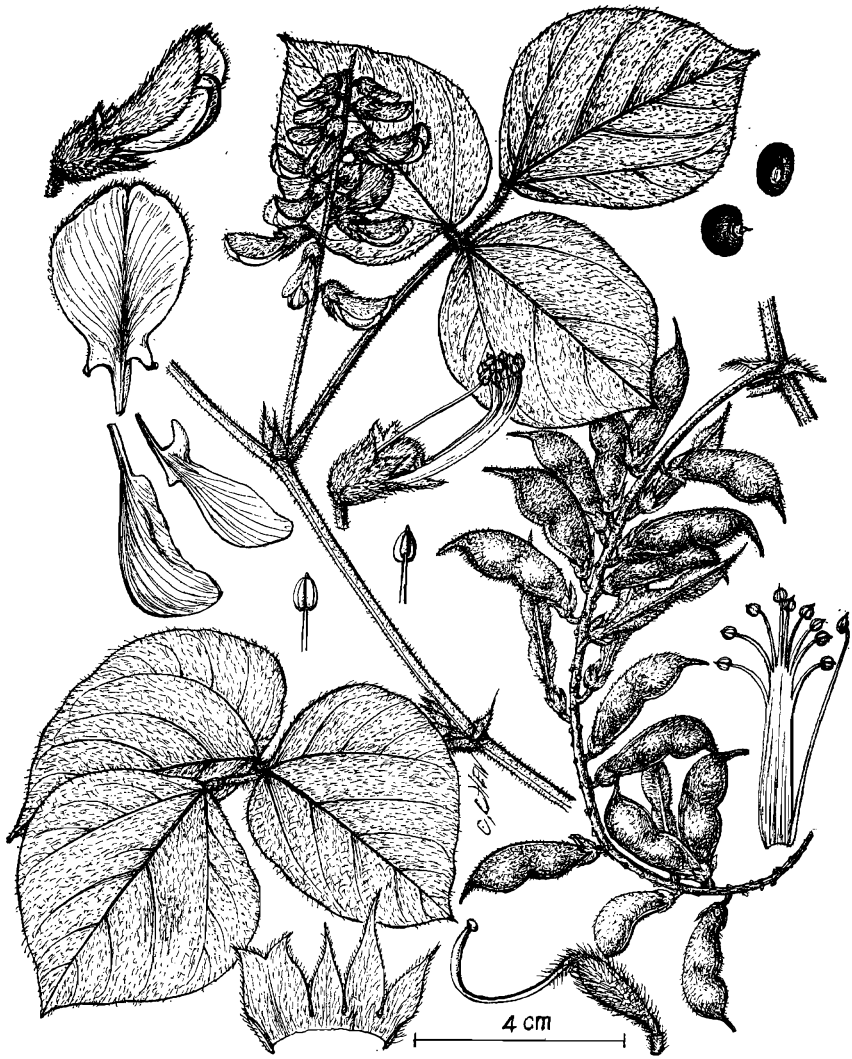


Fig. 132. *Rhychosia sericea* SPAN.

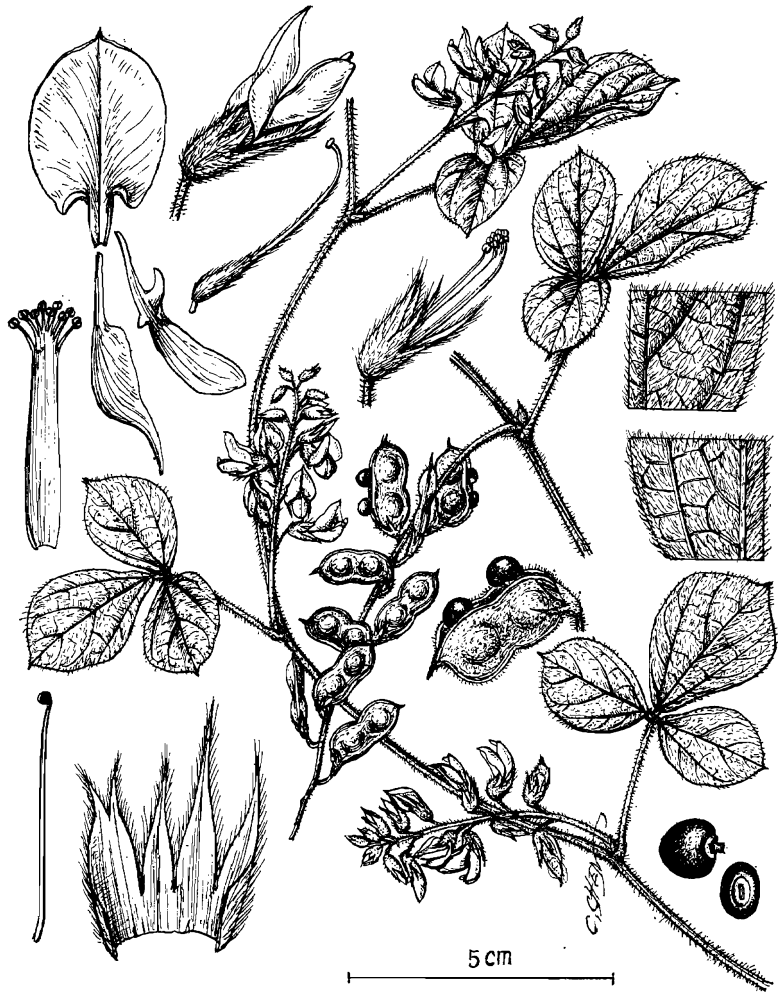


Fig. 133. *Rhynchosia volubilis* LOUR.

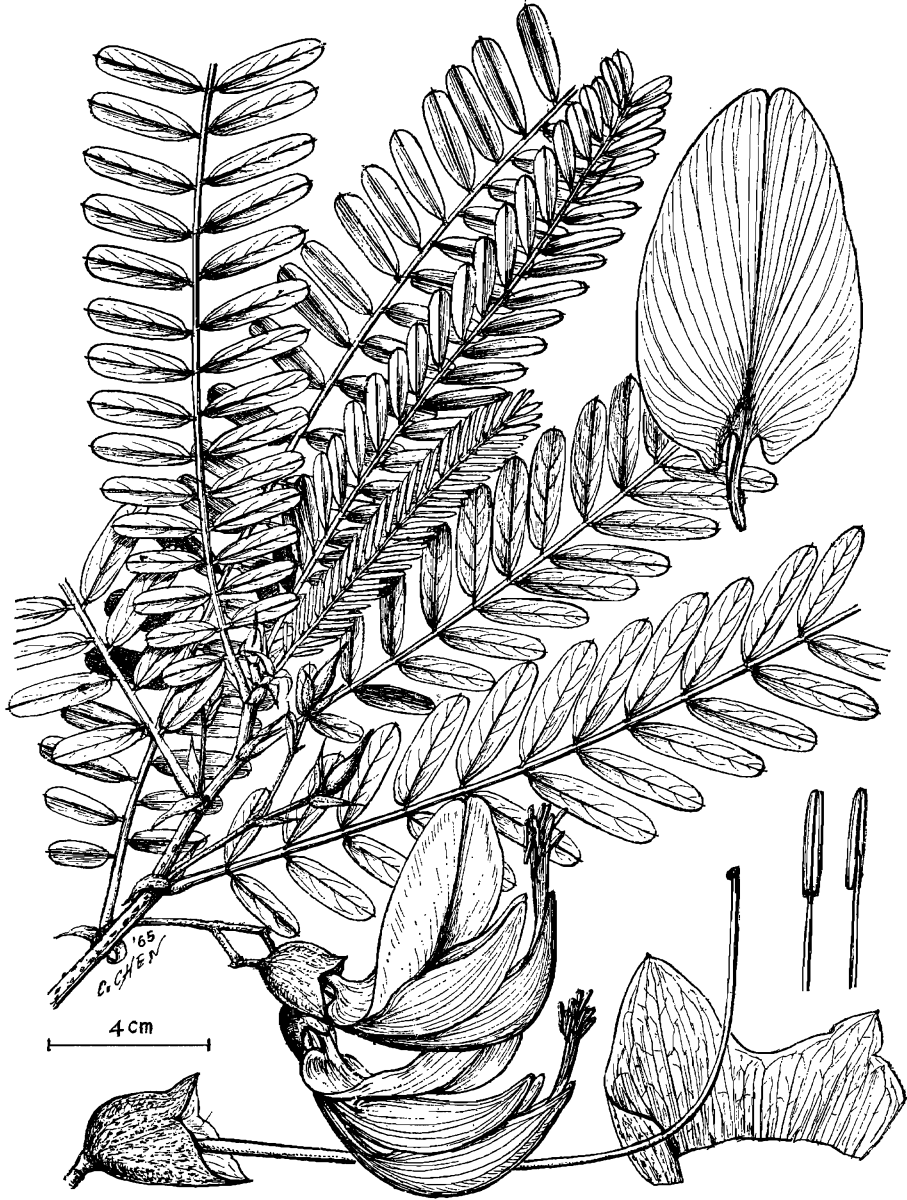


Fig. 134. *Sesbania grandiflora* (LINN.) PERS.

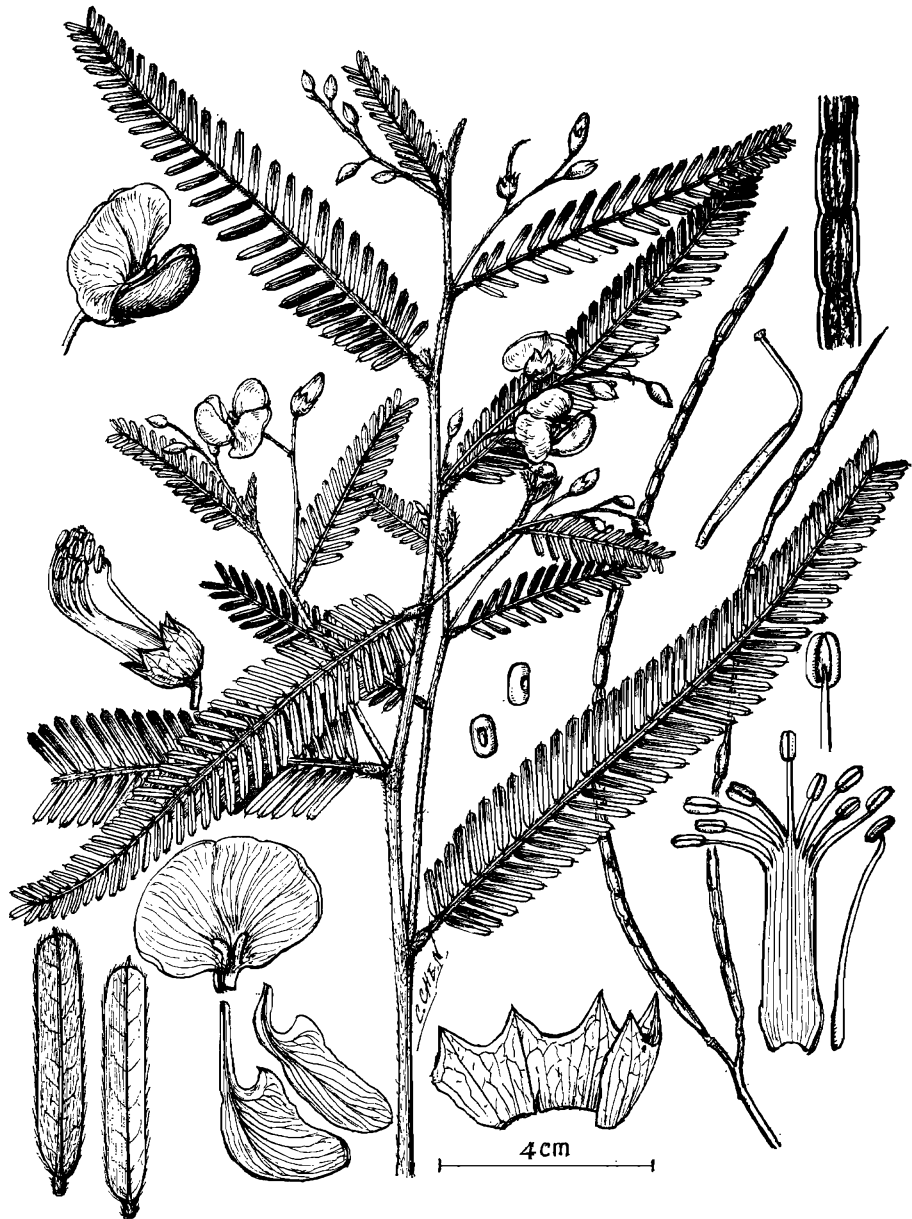


Fig. 135. *Sesbania roxburgii* MERR.

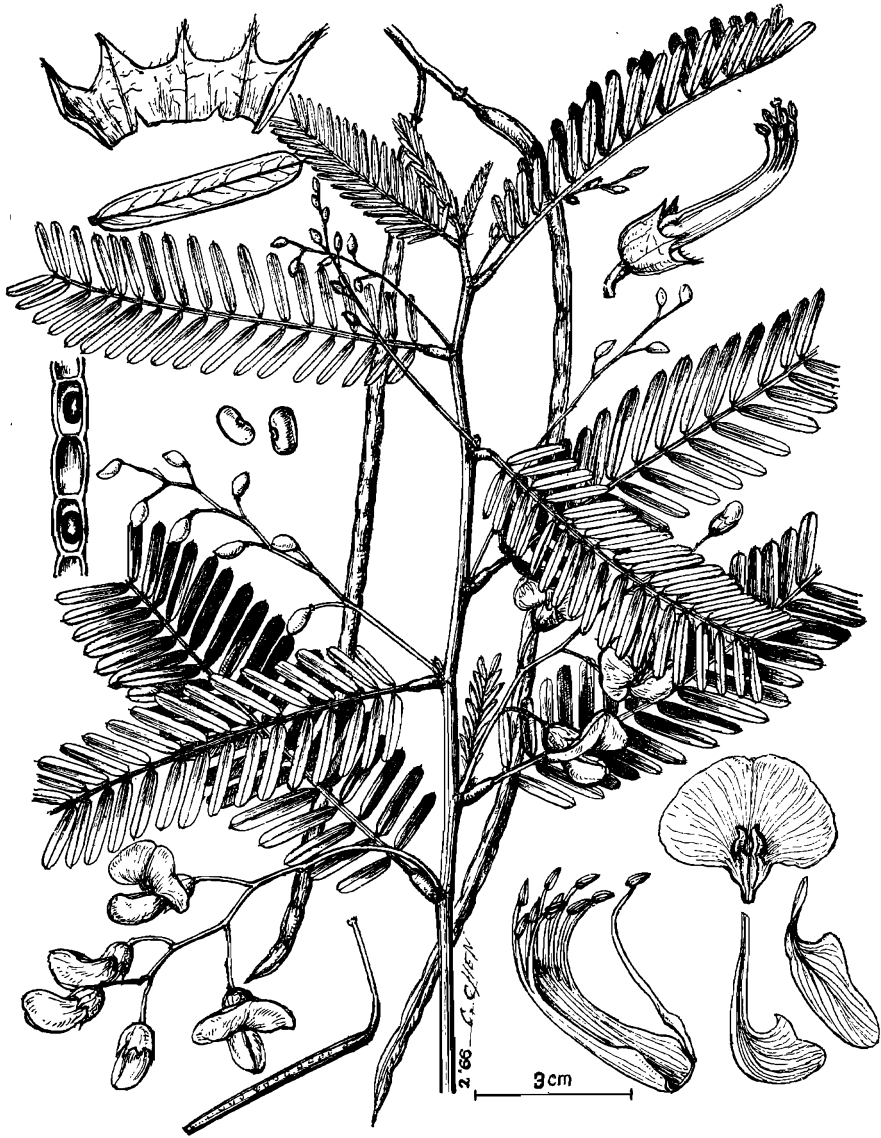


Fig. 136. *Sesbania sesban* (Linn.) Merr.

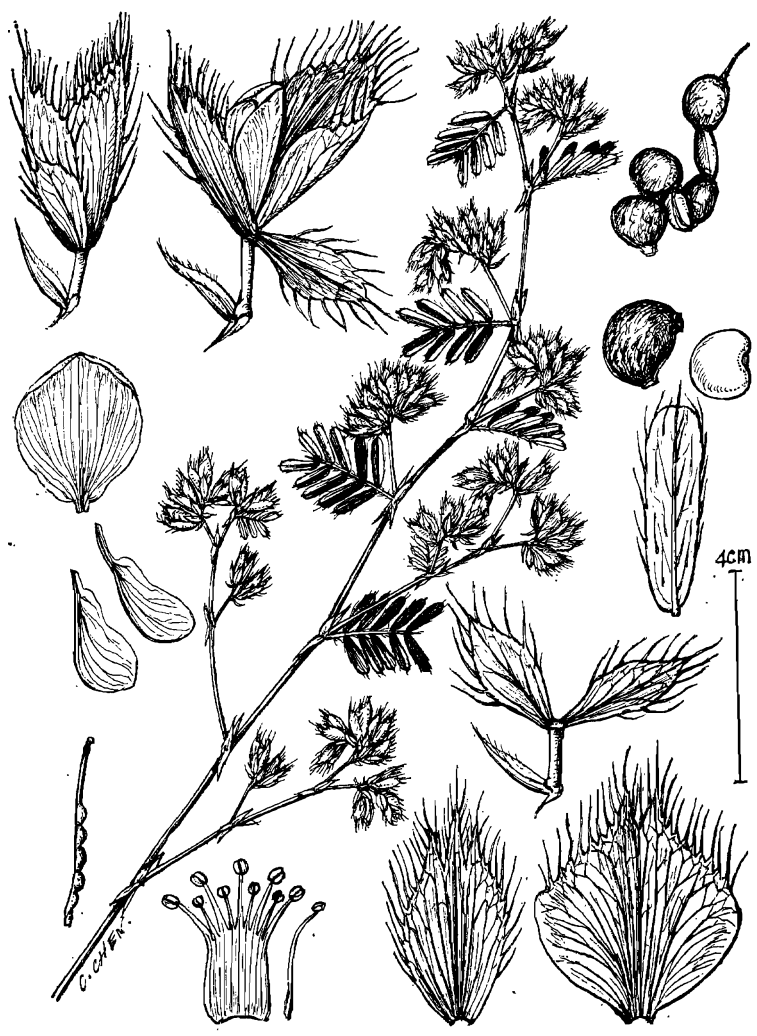


Fig. 137. *Smithia ciliata* ROYLE



Fig. 138. *Smithia sensitiva* Arr.

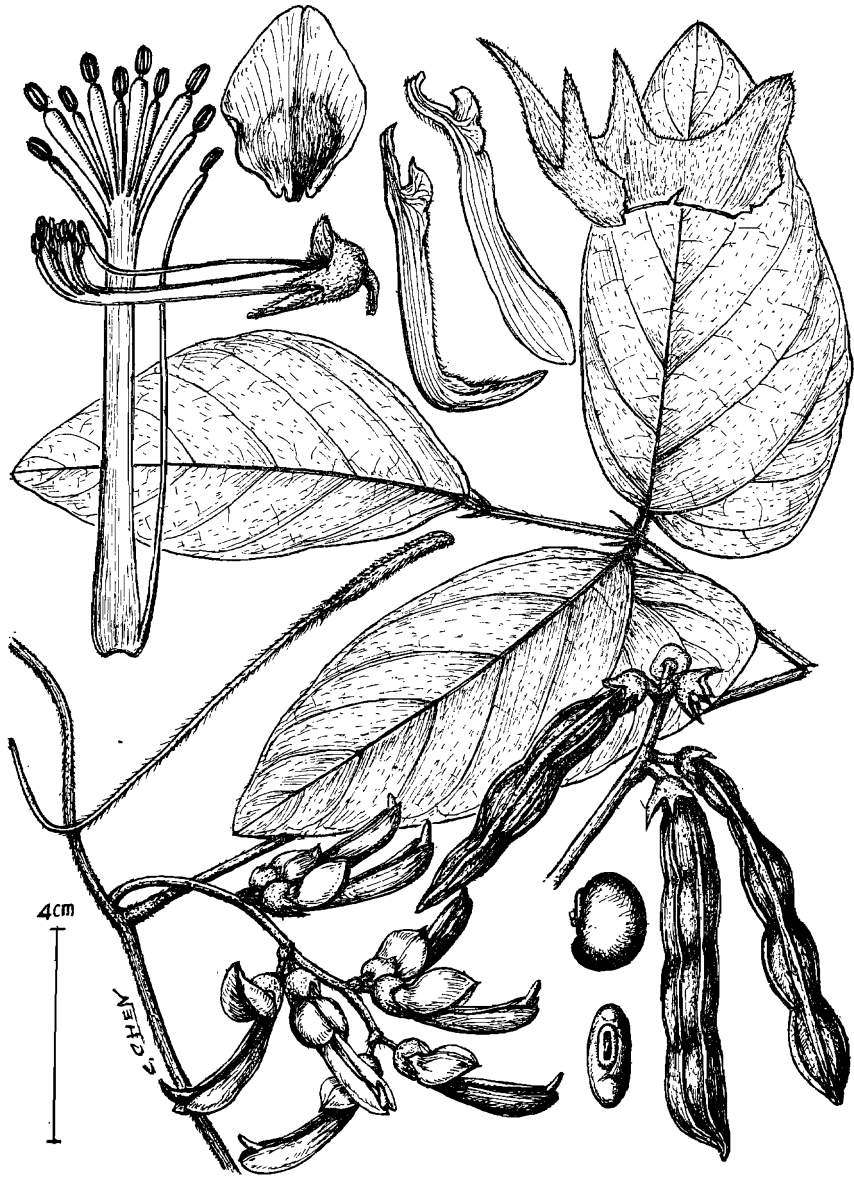


Fig. 139. *Stizolobium hassjoo* PIPER & TRACY.

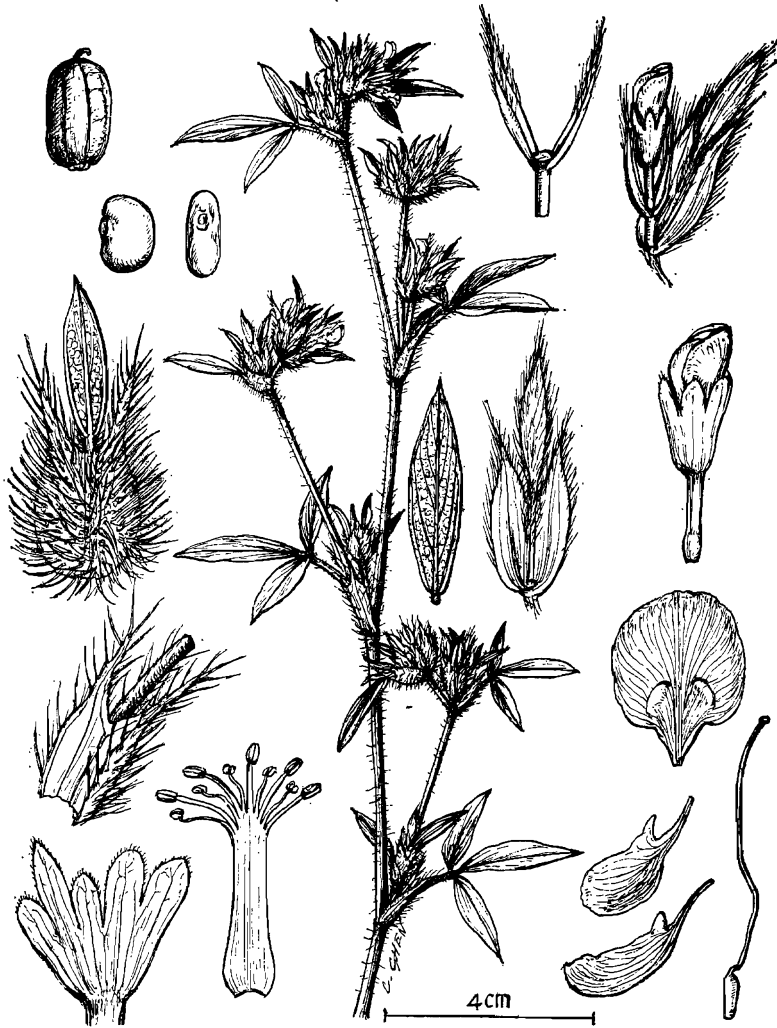


Fig. 140. *Stylosanthes gracilis* H. B. K.

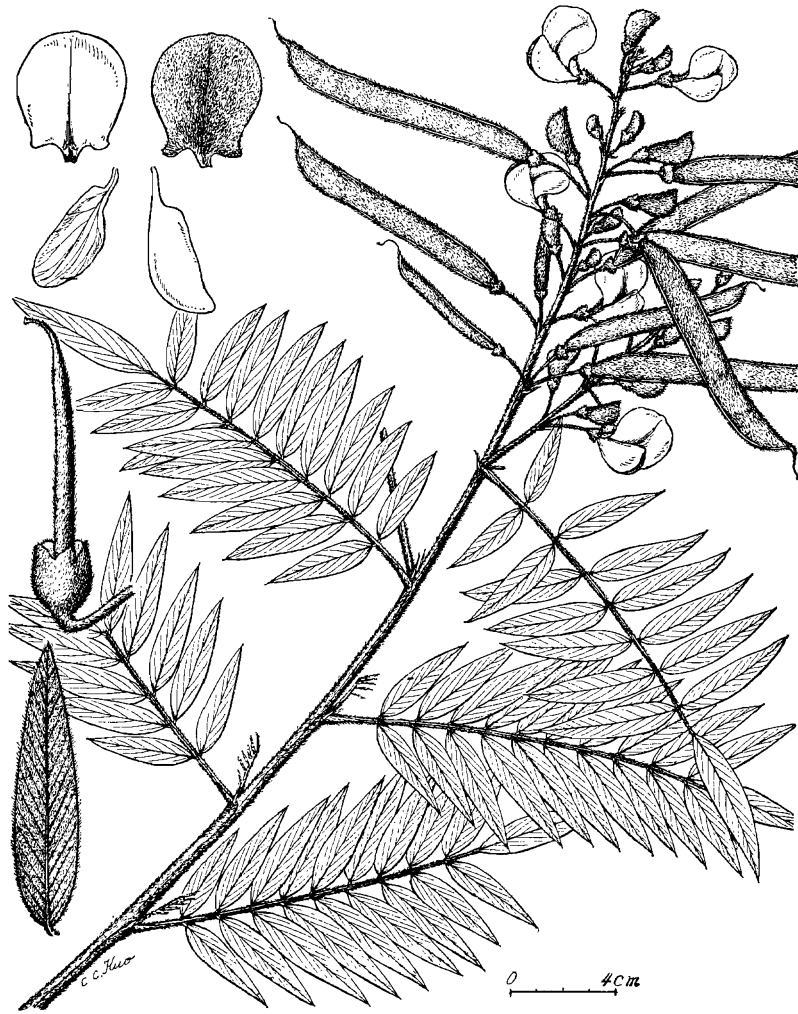


Fig. 141. *Tephrosia candida* (Roxb.) DC.

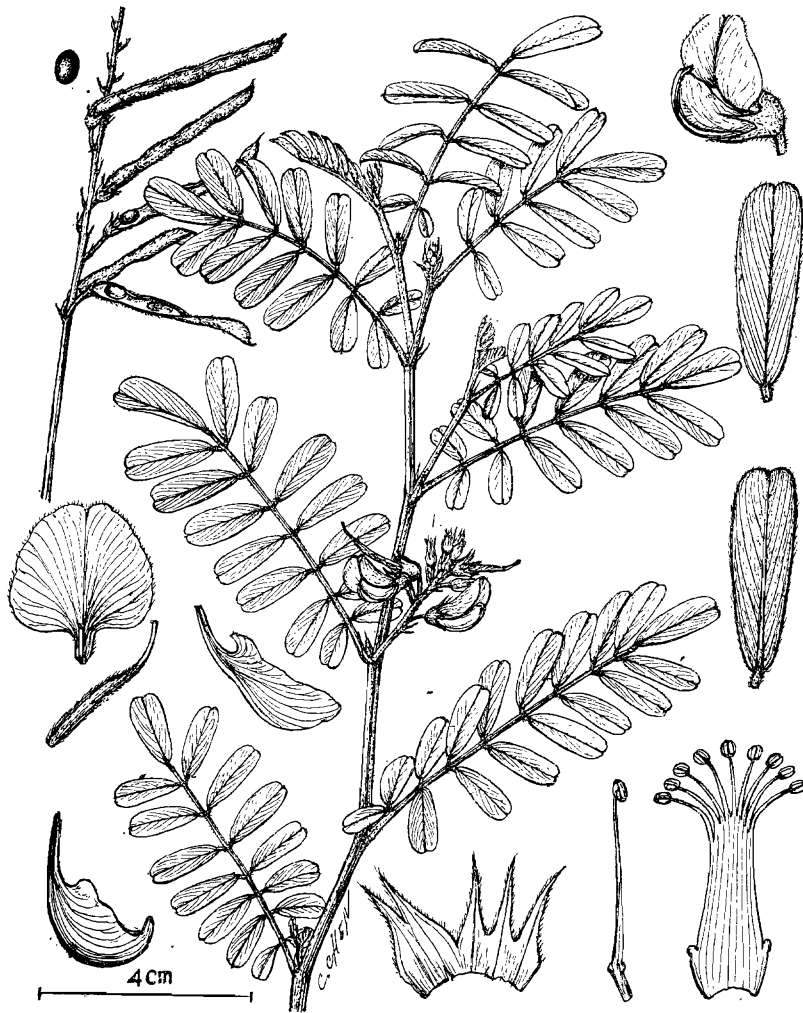


Fig. 142. *Tephrosia ionophlebia* HAY.

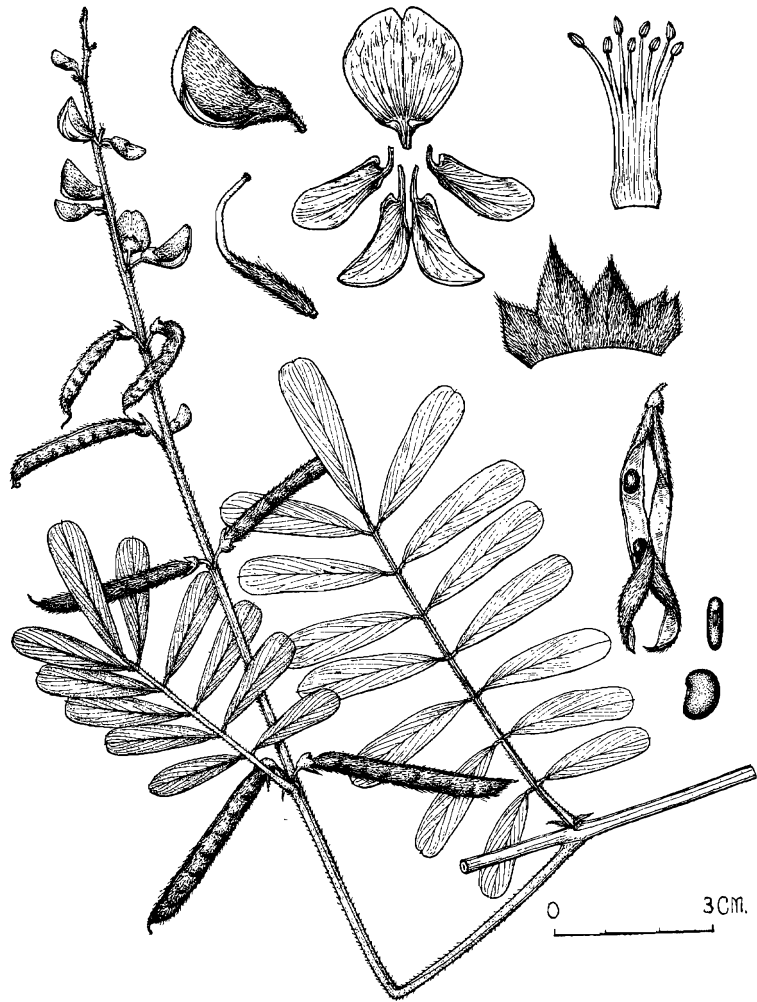


Fig. 143 *Tephrosia noctiflora* Boj.



Fig. 144. *Tephrosia obovata* MERR.

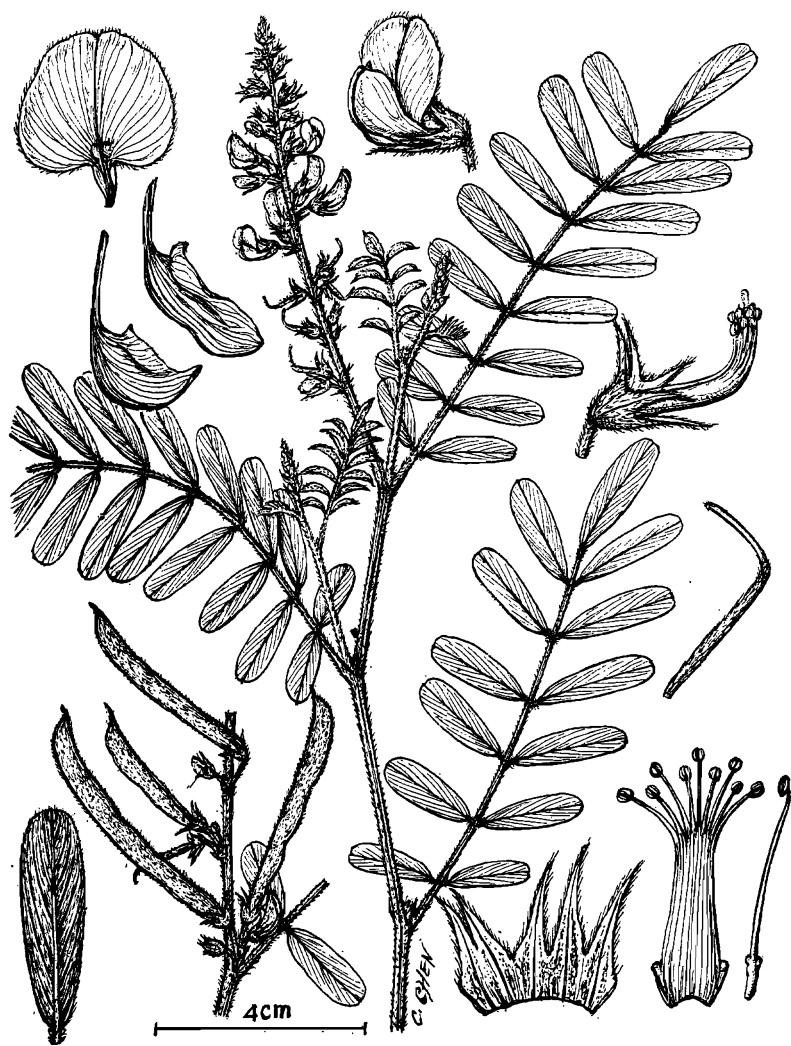


Fig. 145. *Tephrosia purpurea* PERS.

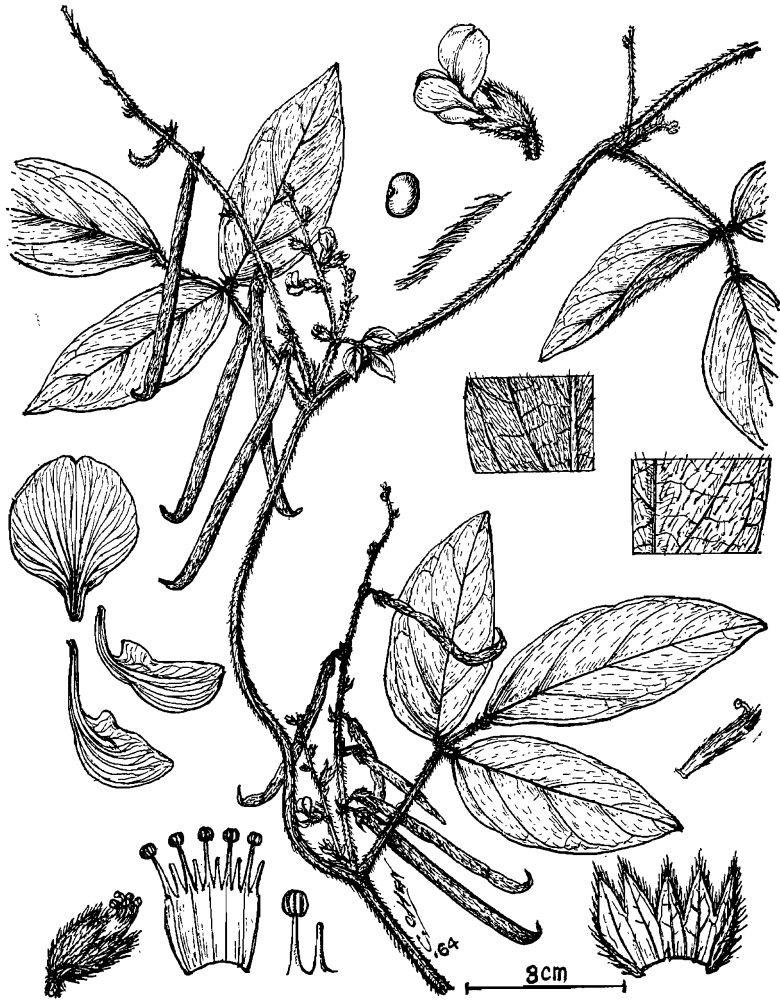


Fig. 146. *Teramnus labialis* (LINN. F.) SPR.

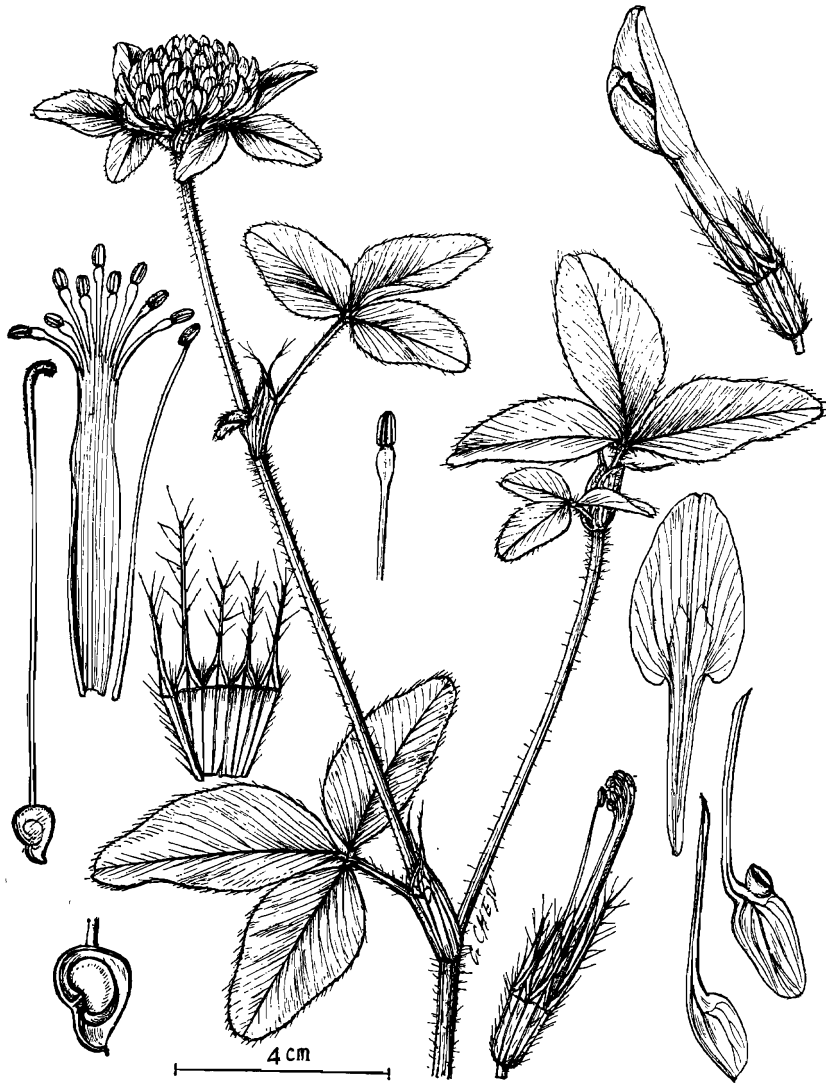


Fig. 147. *Trifolium pratense* LINN.



Fig. 148. *Trifolium repens* LINN.

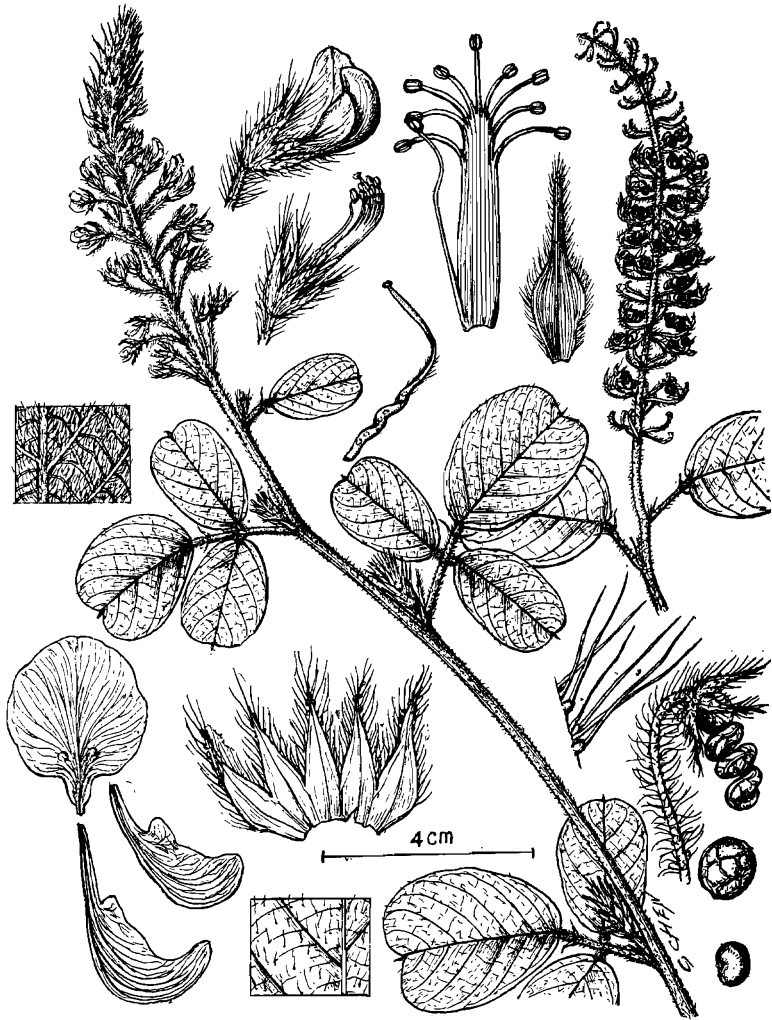


Fig. 149 *Uraria aequilobata* HOSOKAWA

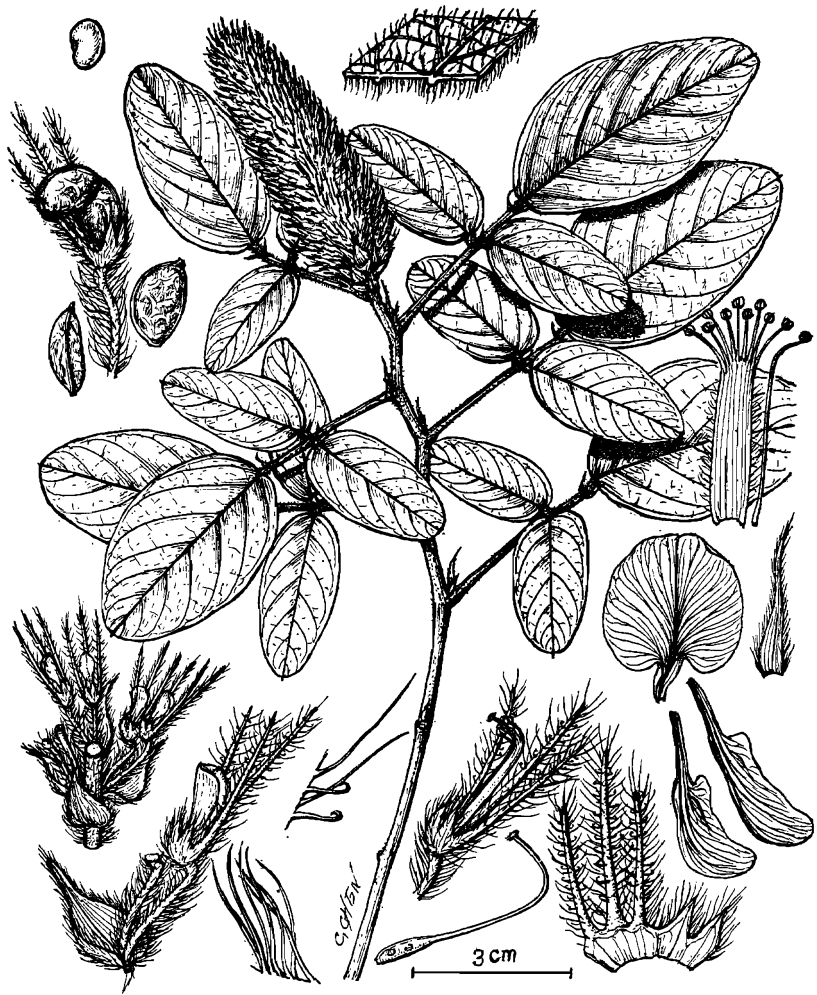


Fig. 150. *Uraria lagopodicides* Desv.

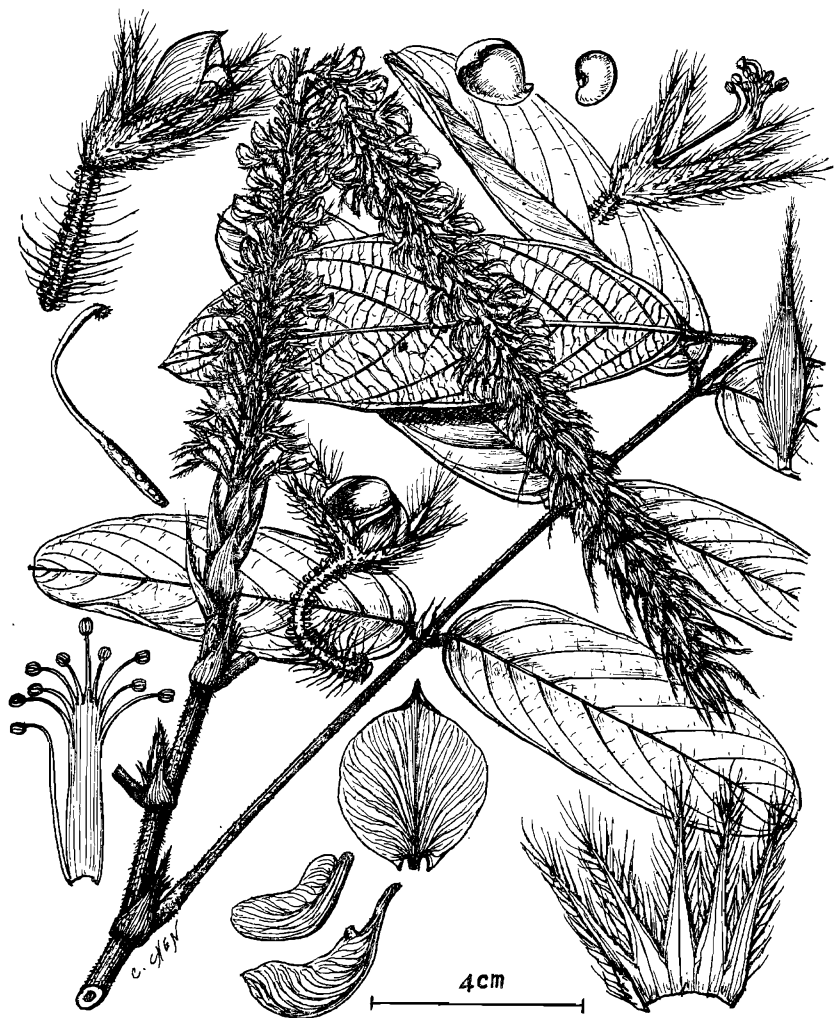


Fig. 151. *Uraria macrostachya* WALL.

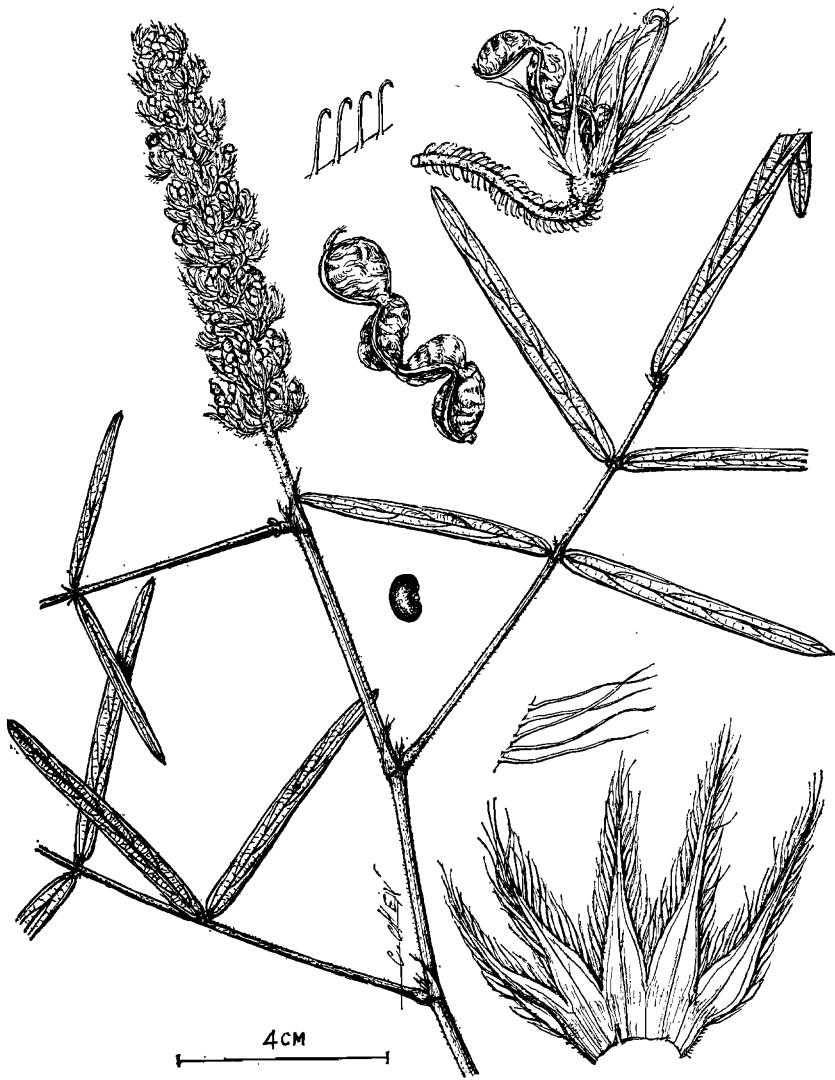


Fig. 152. *Uraria picta* (Jacq.) Desv.

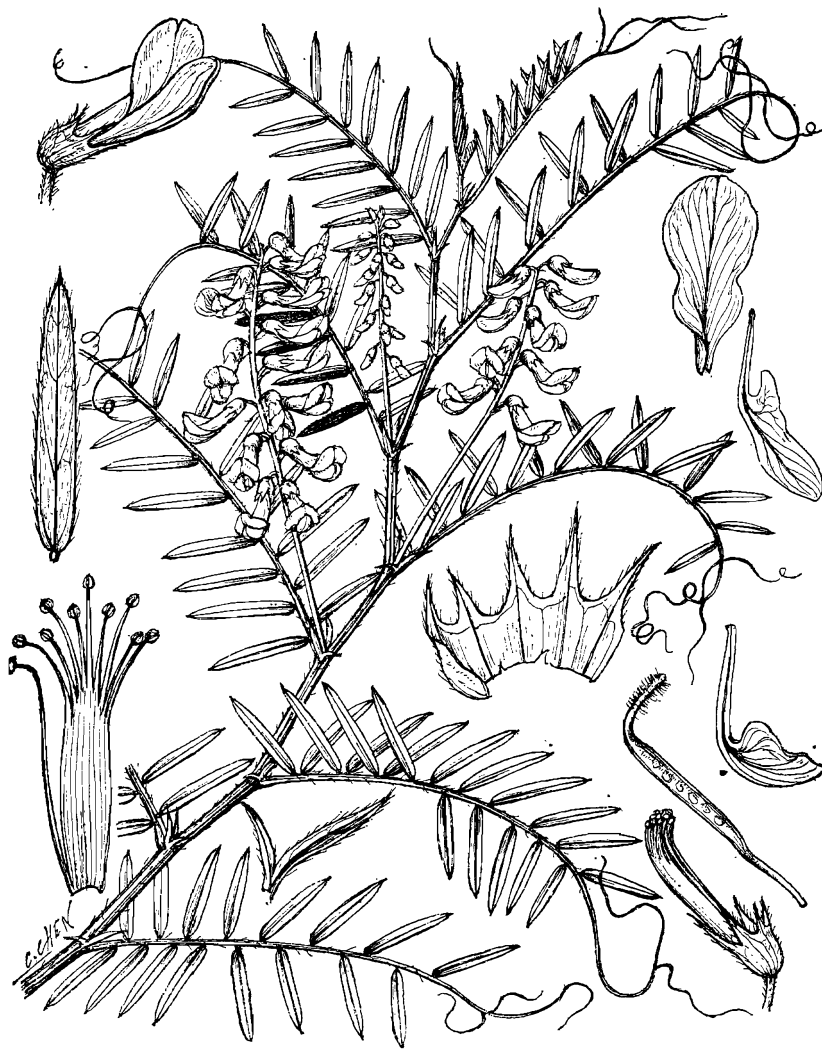


Fig. 153. *Vicia cracca* LINN.

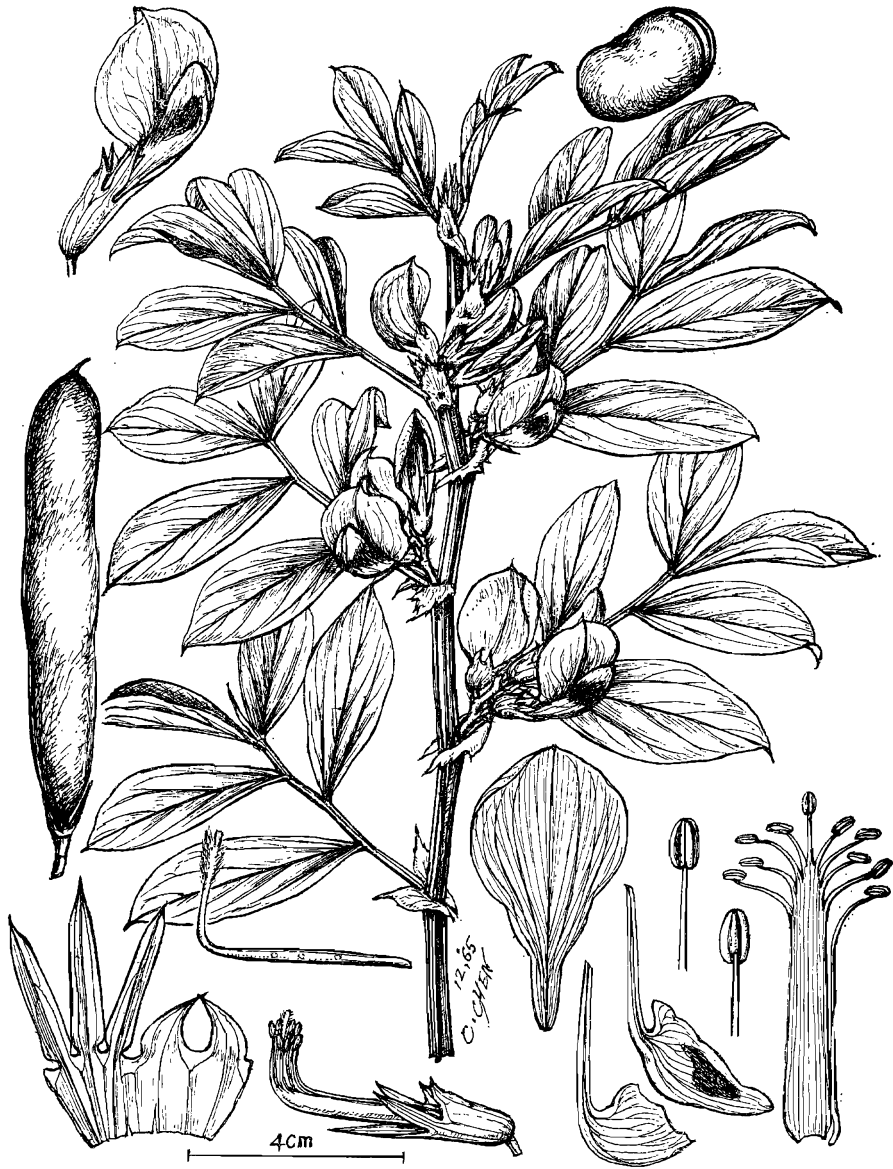


Fig. 154. *Vicia faba* LINN.

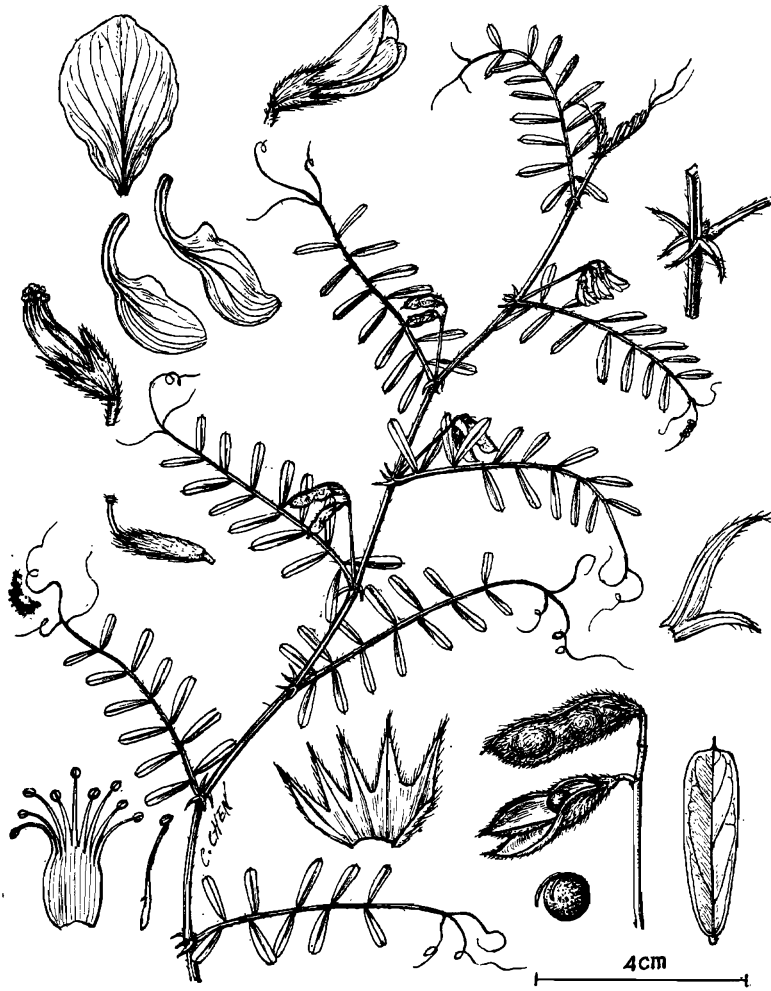


Fig. 155. *Vicia hirsuta* (Linn.) S. F. Gray

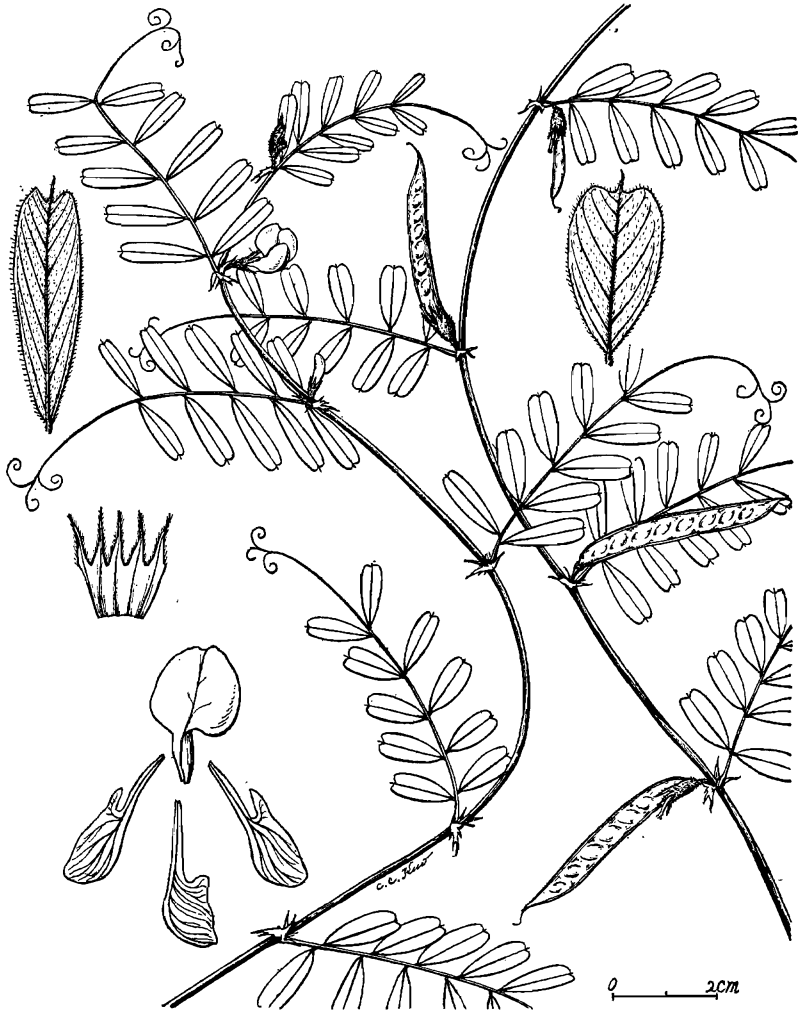


Fig. 156. *Vicia sativa* LINN.

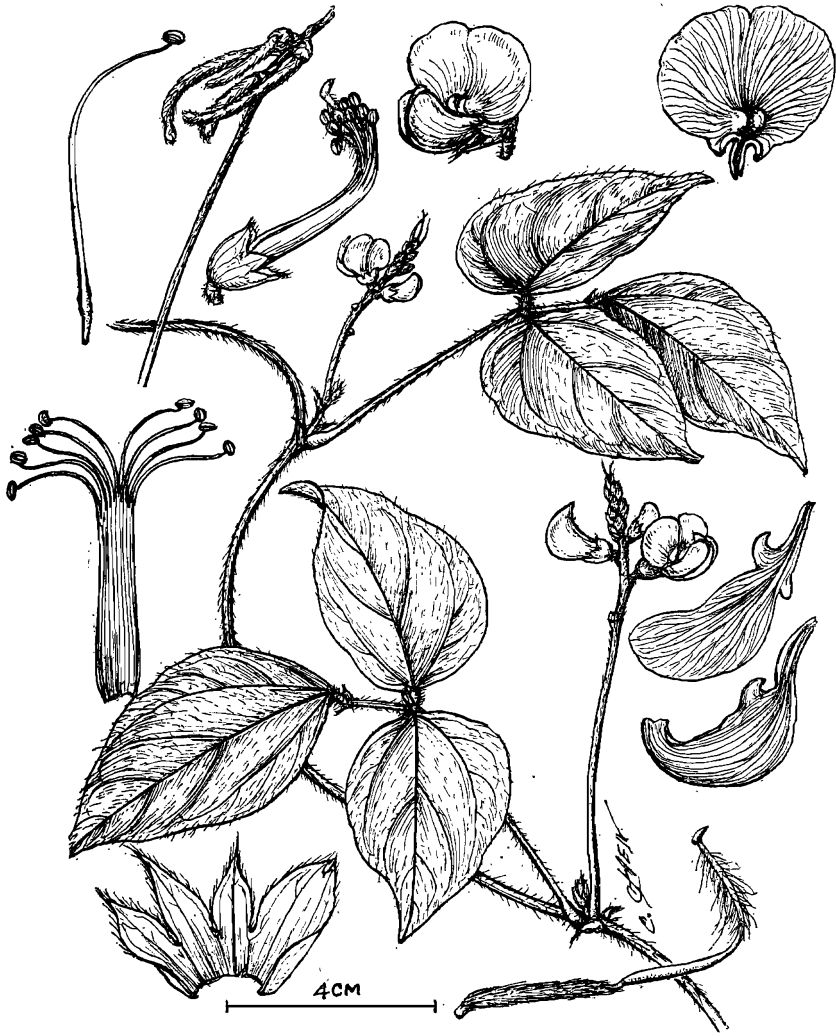


Fig. 158. *Vigna luteola* (JACQ.) BENTH.

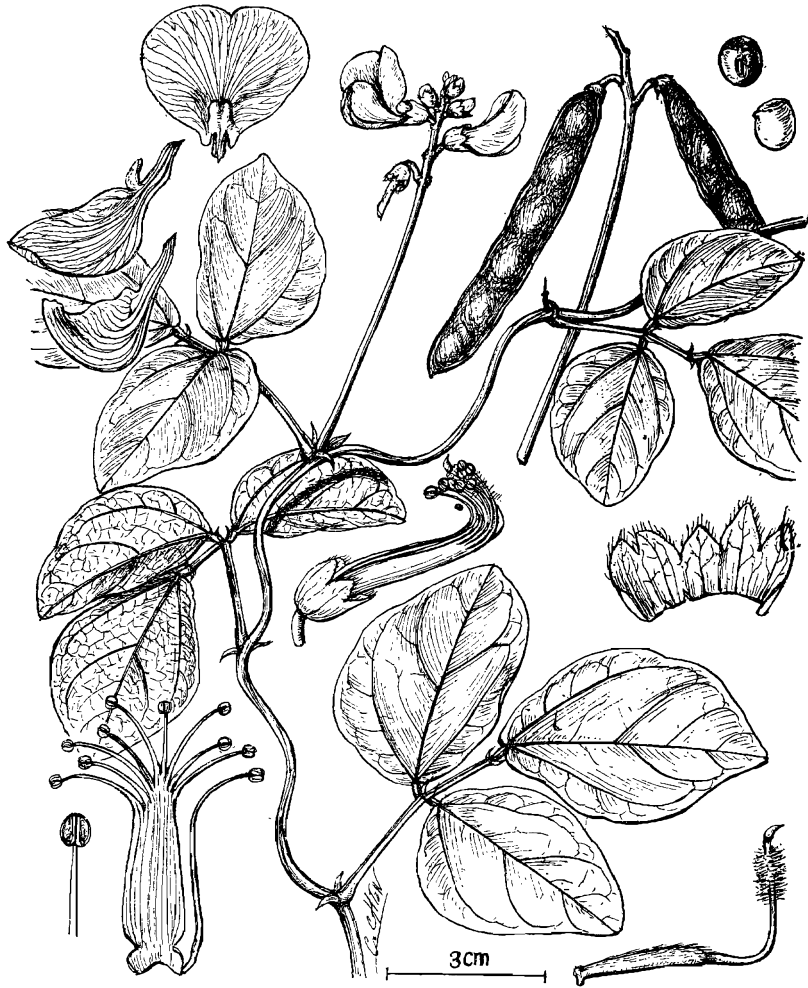


Fig. 159. *Vigna marina* (BURM.) MERR.



Fig. 160. *Vigna unguiculata* (Linn.) Walp.

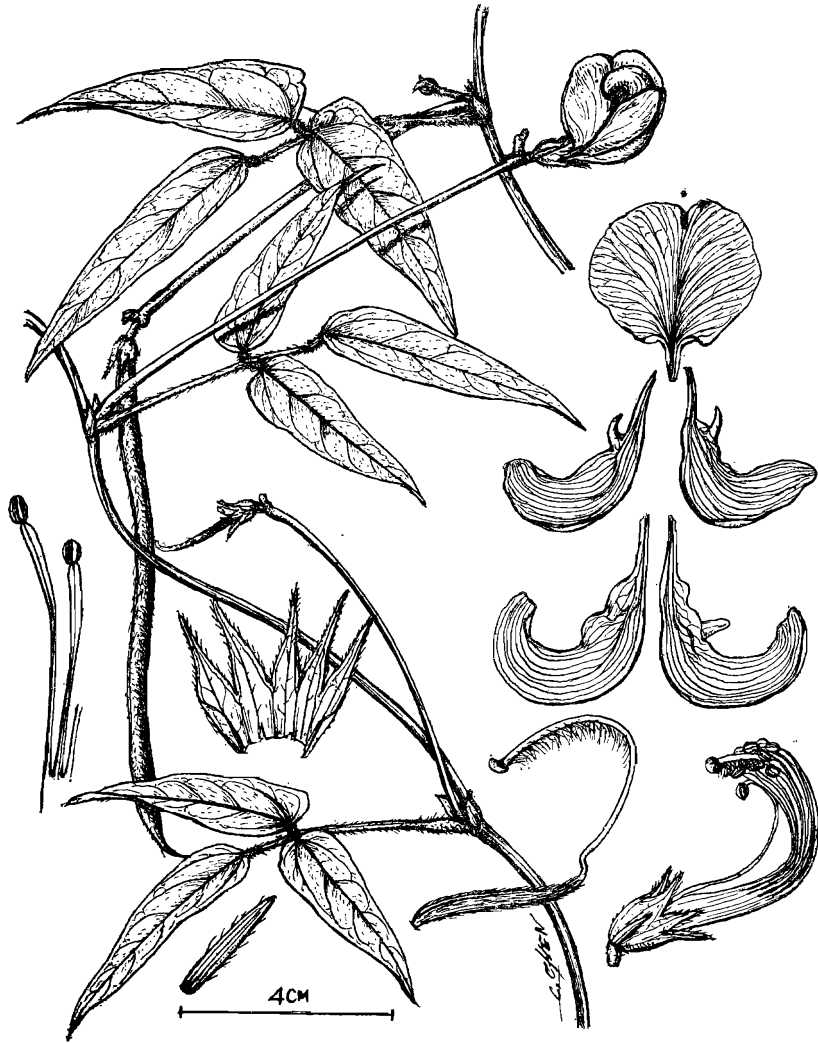


Fig. 161. *Vigna vexillata* (Linn.) Benth.

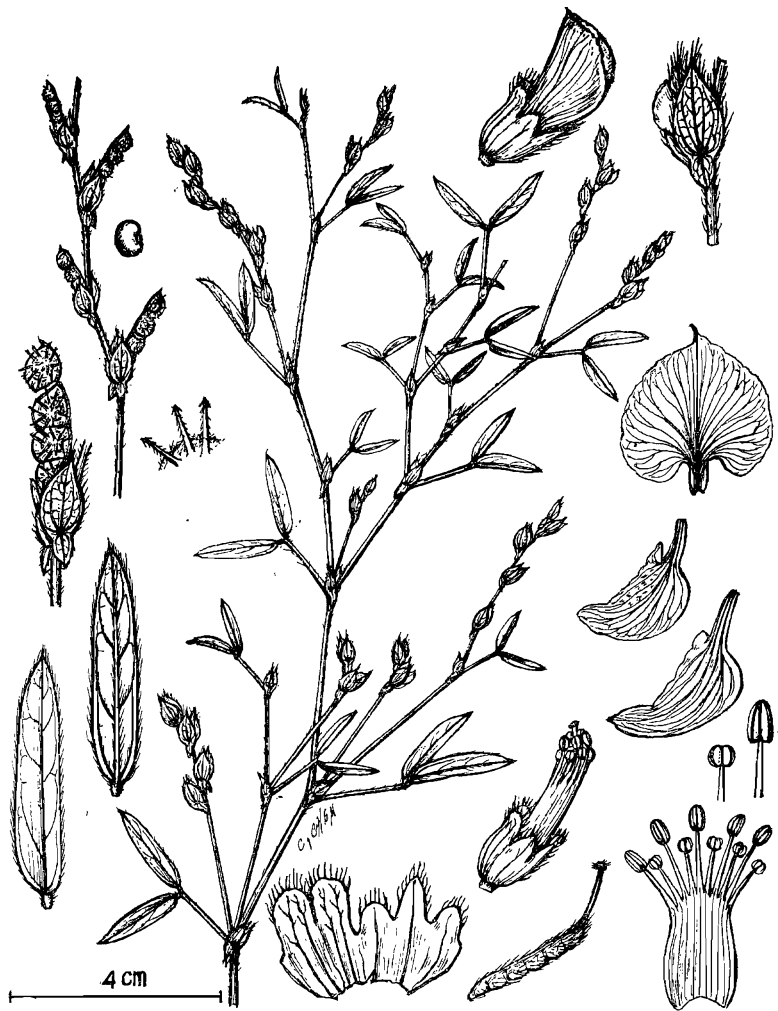


Fig. 162. *Zornia diphylla* (Linn.) Pers.

LITERATURE CITED

- (1) 于景讓：回鶻豆，科學農業 12(3, 4): 87-90, 1964.
- (2) 王啓柱：臺灣之飼料作物，臺銀季刊 8(2): 145-179, 1955.
 _____：臺灣之綠肥與覆土作物，臺銀季刊 8(2): 180-215, 1955.
 _____：臺灣光復前牧草調查與試驗之檢討，科學農業 5: 215-246, 1957.
 _____：幾屬適應臺灣的豆類植物在國內外之栽培與利用，農業科學 6: 99-119, 1958.
- (3) 甘偉松：臺灣藥用植物誌 1960
- (4) 林家榮：臺灣之綠肥，臺糖季刊 2(3, 4): 139-158, 1950.
- (5) 黃增泉：田菁與印度田菁之學名問題，臺灣森林 12: 31-36, 1957.
- (6) BAKER, E. G.: The African Species of *Crotalaria*. Journ. Linn. Soc. 42: 241-426, 1914.
- (7) BAKER, J. G.: In Hooker, J. D., The Flora of British India 2: 56-306, 1876.
 _____: In Oliver, D., Flora of Tropical Africa 2: 1871.
- (8) BAILEY, L. H.: Manual of Cultivated Plants rev. ed. 1958.
- (9) BRAND, A.: Monographie der Gattung *Lotus*. in Bot. Jahrb. Syst. Pflanz. 25: 166-232, 1898.
- (10) BENTHAM, G.: Flora Hongkongensis 1861.
 _____: Genera Plantarum 1: 1862.
- (11) CHUANG, C. C.: On the Taiwan Species of *Crotalaria* TAIWANIA 9: 65-92, 1963.
 _____: On the Taiwan Species of *Lespedeza*. TAIWANIA 10: 105-116, 1964.
- (12) CRAIB, W. G.: Indigoferas of China. Notes Bot. Gard. Edinburgh 8: 47-77, 1913.
- (13) DE CANDOLLE, A. P.: Prodromus Systematis Naturalis Regni Vegetabilis 2: 93-524, 1825.
- (14) FORBES, F. B. & HEMSLEY, W. B.: Index Flora Sinensis. Journ. Linn. Soc. Bot. 23: 150-217, 1886-1888.
- (15) HATUSIMA, S. & AMANO, T.: Flora of Okinawa 1958.
- (16) HAYATA, B.: Flora Montana Formosae. 1908.
 _____: Icones Plantarum Formosarum 1: 165-214, 1911, 4: 4-5, 1914, 5: 35, 1915, 8: 32-33, 1919, 9: 18-38, 1920, 10: 3-5, 1921.
 _____: Materials for A Flora of Formosa 1911.
- (17) HEGI, P. G.: Illustrierte Flora von Mittel-Europa 4(3): 1-1644, 1906-1931.
- (18) HENRY, A.: A List of Plants from Formosa. Trans. Asiat. Soc. Jap. 24: Supp. 30-40, 1859.
- (19) HERMANN, F. J.: A Revision of the Genus *Glycine* and its Immediate Allies 1962.
- (20) HOSOKAWA, T.: Notulae Leguminosarum ex Asiae-Orientis Journ. Soc. Trop. Agr. 4: 197-203, 308-316, 488-491, 1932, 5: 57-61, 287-290, 1933.
- (21) ITO, T. & MATSUMURA, J.: Tentamen Florae Lutchuensis. Journ. Sci. Coll. Imp. Univ. Tokyo 12: 393-444, 1899.
- (22) KANEHIRA, R.: Formosan Trees 1936.
- (23) KITAMURA, S. & MURATA, G.: Coloured Illustrations of Herbaceous Plants of Japan (Choripetalae) 1964.
- (24) KOIZUMI, G.: Contributiones ad Cognitionem Florae Asiae Orientalis. in Bot. Mag. Tokyo 44: 93-112, 1930.
- (25) KOODES, S. H.: Leguminosae. Exkursions Flora von Java 2: 366-369, 1912.
- (26) LI, H. L.: Woody Flora of Taiwan 1963.
- (27) LI, K. Y.: *Crotalaria* Species and Their Culture in Taiwan Sugar Cane Fields. Taiwan Sugar 5(2): 18-24, 1958.
- (28) LINNAEUS, C.: Species Plantarum 1753.
- (29) LIU, T. S.: Illustrations of Native and Introduced Ligneous Plants of Taiwan 1: 1960.
- (30) LIU, T. S. & CHUANG, C. C.: On the Taiwan species of *Desmodium* TAIWANIA 8: 67-126, 1962.
- (31) LIU, T. S., SASAKI, S. & KENG, H.: An Enumeration of the Plants of Lanyu (Botel Tobago). Quart. Journ. Taiwan Mus. 8(4): 283-328, 1955.
- (32) MAKINO, T.: Illustrated Flora of Japan 1955.
- (33) MAKINO, T. & NEMOTA, K.: Flora of Japan ed. 2, 1931.
- (34) MASAMUNE, G.: Short Flora of Formosa 1936.
 _____: A List of Vascular Plants of Taiwan 1954.
- (35) MATSUDA, S.: On *Melilotus* in China. Bot. Mag. Tokyo 25: 164-165, 1911.
 _____: A Variety of *Amphicarpaea Edgeworthii* Benth. Bot. Mag. Tokyo 25: 271, 1911.

- (36) MATSUMURA, J.: A conspectus of the Leguminosae. Bot. Mag. Tokyo **16**: 37-118, 1902.
- (37) MATSUMURA, J. & HAYATA, B.: Enumeratio Plantarum Formosanarum. Journ. Sci. Coll. Imp. Univ. Tokyo **22**: 102-117, 1906.
- (38) MERRILL, E. D.: A flora of Manila 1912.
 _____: An Enumeration of Philippine Leguminosae. Philip. Journ. Sci. **1**: Supp. 65, 1906, **5**: 1-136, 1910.
 _____: Enumeration of Philippine Plants **2**: 241-322, 1932.
- (39) MERRILL, E. D. & WALKER, E. H.: A Bibliography of Eastern Asiatic Botany 1938.
- (40) MIQUEL, F. A. W.: Prolusio Flora Japonicae. Ann. Mus. Bot. Lug-Bat. **3**: 1867.
- (41) NAKAI, T.: Plantae Japonicae & Koreanae. Bot. Mag. Tokyo **64**: 7-40, 1903.
- (42) OHWI, J.: A New Combination in Pueraria Bull. Tokyo Sci. Mus. **18**: 16, 1947.
 _____: Flora of Japan 1956.
- (43) RIDLEY, H. W.: The Flora of the Malay Peninsula **1**: 1922.
- (44) ROXBURGH, W.: Flora India **2**: 1832.
- (45) SCHINDLER, A. K.: Über einige Kleine Gattungen aus der Verwandtschaft von Desmodium. Desv. Repert. Sp. Nov. Fedde **20**: 266-286, 1924.
 _____: Kummerowia Schindler Novum Genus Leguminosarum in Fedde Repert. **10**: 403-404, 1911.
 _____: Desmodii generumque affinium species et combinations novae. Repert. Sp. Nov. Fedde **21**: 1-21, 1925, **22**: 250-288, 1926; **23**: 353-362, 1927.
- (46) STEWARD, A. N.: Manual of Vascular Plants of the Lower Yangtze Valley 1958.
- (47) TAUBET, P.: In Engelm. & Prantl, K. Die Natürlichen Pflanzenfamilien **3**: 70-388, 1891.
- (48) THUNBERG, C. P.: Flora Japonica 1784.
- (49) TRIMEN, H.: A Hand-book to the Flora of Ceylon **2**: 1894.
- (50) TURNER, B. L.: The Legumes of Texas 1959.
- (51) TUYAMA, T.: Linnaeus' triple names and the scientific name of Japanese Melilotus. Journ. Jap. Bot. **15**: 182-184, 1939.
- (52) WALKER, E. H.: A Bibliography of Eastern Asiatic Botany Supp. 1, 1960.
- (53) WHYTE, R. O. & TRUMBLE, H. C.: Legumes in Agriculture 1953.
- (54) WIGHT, R.: Icones Plantarum Indiae Orientalis **1**: 1840, **2**: 1843.
- (55) WOOD, C. E.: The American Barbistyled Species of Tephrosia Rhodora **51**: 193-384, 1949.
- (56) YAMAMOTO, Y.: Supplementa Iconum Plantarum Formosanarum **2**: 26-28, 1926.

INDEX

	Page
Leucaena Benth.....	6
Leucaena glauca (Linn.) Benth.....	7, 109
Cassia Linn.....	8
Cassia alata Linn.....	8
Cassia garambiensis Hosokawa.....	8, 110
Cassia hirsuta Linn.....	8
Cassia Leschenaultiana DC.....	9, 111
Cassia mimosoides Linn.....	9, 112
Cassia occidentalis Linn.....	9, 113
Cassia tora Linn.....	10, 114
Aeschynomene Linn.....	10
Aeschynomene indica Linn.....	11, 115
Aeschynomene sensitiva Swartz.....	11, 116
Alysicarpus Necker.....	12
Alysicarpus bupleurifolius (Linn.) DC.....	12, 117
Alysicarpus nummularifolius (Linn.) DC.....	13, 118
Alysicarpus vaginalis DC.....	13, 119
Amphicarpaea Elliott.....	14
Amphicarpaea Edgeworthii Benth. var. japonica Oliver.....	14, 120
Arachis Linn.....	14
Arachis hypogea Linn.....	15, 121
Astragalus Linn.....	15
Astragalus nankotaizanensis Sasaki.....	16, 122
Astragalus nokoensis Sasaki.....	16, 123
Astragalus sinicus Linn.....	16, 124
Cajanus DC.....	17
Cajanus cajan (Linn.) Millsp.....	17, 125
Campylotropis Bung.....	17
Campylotropis Giraldii Schindl.....	18, 126
Canavalia DC.....	18
Canavalia ensiformis (Linn.) DC.....	19, 127
Canavalia lineata (Thunb.) DC.....	19, 128
Canavalia microcarpa (DC.) Piper.....	20
Cantharospemrum Wight et Arnott.....	20
Cantharospemrum scarabaeoides (Linn.) Bail.....	20, 129
Centrosema Benth.....	21
Centrosema pubesens Benth.....	21, 130
Cicer Linn.....	21
Cicer arietinum Linn.....	22, 131
Clitoria Linn.....	22
Clitoria ternatea Linn.....	22, 132
Crotalaria Linn.....	23
Crotalaria acicularis Buch.-Ham.....	25, 133
Crotalaria albida Heyne.....	25, 134
Crotalaria anagyroides H. B. K.....	25, 135
Crotalaria assamica Benth.....	26, 136
Crotalaria calycina Schrank.....	26, 137
Crotalaria chinensis Linn.....	27, 138
Crotalaria elliptica Roxb.....	27, 139
Crotalaria ferruginea Grah.....	28, 140
Crotalaria incana Linn.....	28, 141
Crotalaria juncea Linn.....	28, 142
Crotalaria lanceolata E. Mey.....	29, 143
Crotalaria linifolia Linn. f.....	29, 144

<i>Crotalaria saltiana</i> Andr.....	30, 145
<i>Crotalaria sessiliflora</i> Linn.....	30, 146
<i>Crotalaria similis</i> Hemsl.....	30, 147
<i>Crotalaria spectabilis</i> Roth.....	31, 148
<i>Crotalaria trifoliastrum</i> Willd.....	31, 149
<i>Crotalaria usaramoensis</i> Bak. f.....	32, 150
<i>Crotalaria verrucosa</i> Linn.....	32, 151
<i>Desmodium</i> Desvaux.....	32
<i>Desmodium Buergeri</i> Miq.....	35, 152
<i>Desmodium caudatum</i> (Thunb.) DC.....	36, 153
<i>Desmodium cephalotes</i> (Roxb.) Wall.....	36, 154
<i>Desmodium dispernum</i> Hay.....	37, 155
<i>Desmodium floribundum</i> (D. Don) G. Don.....	37, 156
<i>Desmodium gangeticum</i> (Linn.) DC.....	38, 157
<i>Desmodium gracilimum</i> Hemsl.....	38, 158
<i>Desmodium gyrans</i> (Linn. f.) DC.....	39, 159
<i>Desmodium heterocarpum</i> (Linn.) DC.....	39, 160
<i>Desmodium heterophyllum</i> (Willd.) DC.....	40, 161
<i>Desmodium lasiocarpum</i> (Beauv.) DC.....	41, 162
<i>Desmodium laterale</i> Schindler.....	41, 163
<i>Desmodium laxiflorum</i> DC.....	42, 164
<i>Desmodium microphyllum</i> (Thunb.) DC.....	42, 165
<i>Desmodium pseudotriquetrum</i> DC.....	43, 166
<i>Desmodium pulchellum</i> (Linn.) Benth.....	43, 167
<i>Desmodium purpureum</i> (Mill.) Fawc & Rendle.....	44, 168
<i>Desmodium racemosum</i> (Thunb.) DC.....	44, 169
<i>Desmodium reniforme</i> (Linn.) DC.....	45, 170
<i>Desmodium scorpiurus</i> (Sw.) Desv.....	45, 171
<i>Desmodium sequax</i> Wal. var. <i>sinuatum</i> (Miq.) Hosokawa.....	46, 172
<i>Desmodium Tashiroi</i> Matsum.....	46, 173
<i>Desmodium triflorum</i> (Linn.) DC.....	47, 174
<i>Desmodium umbellatum</i> (Linn.) DC.....	47, 175
<i>Desmodium uncinatum</i> DC.....	48, 176
<i>Desmodium zonatum</i> Miq.....	48, 177
<i>Dolichos</i> Linn.....	49
<i>Dolichos falcatus</i> Klein.....	49, 178
<i>Dolichos lablab</i> Linn.....	50, 179
<i>Dolichos uniflorus</i> Lam.....	50
<i>Dolichovigna</i> Hay.....	51
<i>Dolichovigna formosana</i> Hay.....	51, 180
<i>Dolichovigna rhombifolia</i> Hay.....	51, 181
<i>Dumasia</i> DC.....	52
<i>Dumasia bicolor</i> Hay.....	52, 182
<i>Dunbaria</i> Wight et Arnott.....	52
<i>Dunbaria rotundifolia</i> Merr.....	52, 183
<i>Galactia</i> P. Br.....	53
<i>Galactia formosana</i> Matsum.....	53
<i>Galactia Tashiroi</i> Maxim.....	53
<i>Galactia tenuiflora</i> Willd.....	54, 184
<i>Glycine</i> Linn.....	54
<i>Glycine javanica</i> Linn.....	55, 185
<i>Glycine max</i> (Linn.) Merr.....	55, 186
<i>Glycine tabacina</i> (Labill.) Benth.....	56
<i>Glycine tomentella</i> Hay.....	56
<i>Glycine tomentosa</i> Benth.....	56, 187
<i>Glycine ussuriensis</i> Regel & Maack.....	57, 188

Indigofera Linn.	57
Indigofera byobiensis Hosokawa	58, 189
Indigofera endecaphylla Jacq.	59, 190
Indigofera galegoides DC.	59, 191
Indigofera glandulifera Hay.	59, 192
Indigofera hirsuta Linn.	60, 193
Indigofera linifolia Retz.	60, 194
Indigofera nigrescens Kurz.	60
Indigofera ramulosissima Hosokawa	61, 195
Indigofera suffruticosa Mill.	61, 196
Indigofera tinctoria Linn.	62
Indigofera trifoliata Linn.	62, 197
Indigofera venulosa Champ.	62, 198
Indigofera Zollingeriana Miq.	63, 199
Kummerowia Schindler	63
Kummerowia stipulacea (Maxim.) Makino.	63, 200
Kummerowia striata (Thunb.) Schindl.	64, 201
Lespedeza Michx.	64
Lespedeza bicolor Turcz.	65, 202
Lespedeza chinensis G. Don.	65, 203
Lespedeza cuneata (Du Mont. D. Cours.) G. Don.	66, 204
Lespedeza daurica (Lam.) Schindl.	66, 205
Lespedeza pubescens Hay.	67, 206
Lespedeza virgata (Thunb.) DC.	67, 207
Lotononis Eckl. & Zeyh.	68
Lotononis Bainesii Baker	68, 208
Lotus Linn.	68
Lotus australis Andr.	69, 209
Lotus corniculatus Linn. var. japonicus Regel.	69, 210
Lourea Necker	70
Lourea campanulata Benth.	70, 211
Lourea obcordata (Poir.) Desv.	70, 212
Lupinus Linn.	71
Lupinus angustifolius Linn.	71, 213
Lupinus luteus Linn.	72, 214
Medicago Linn.	72
Medicago hispida Gaertn.	73, 215
Medicago lupulina Linn.	73, 216
Medicago sativa Linn.	73, 217
Melilotus Juss.	74
Melilotus indicus (Linn.) All.	74, 218
Melilotus officinalis Lam.	75
Melilotus suaveolens Ledeb.	75, 219
Moghania J. St.-Hilaire	75
Moghania lineata (Linn.) O. Kuntze.	76, 220
Moghania macrophylla (Willd.) O. Kuntze.	76, 221
Moghania philippinensis (Merr. & Rolfe) Li.	77, 222
Moghania strobilifera (Linn.) J. St.-Hilaire.	77, 223
Mucuna Andanson.	78
Mucuna macrocarpa Wall.	78, 224
Ormocarpum Beauv.	78
Ormocarpum cochinchinense (Lour.) Merr.	78, 225
Pachyrrhizus Rich.	79
Pachyrrhizus erosus Urban.	79, 226
Phaseolus Linn.	79
Phaseolus atropupureus DC.	80, 227
Phaseolus calcaratus Roxb.	81, 228

Phaseolus gracicaulis Ohwi	81
Phaseolus lunatus Linn.	82, 229
Phaseolus minimus Roxb.	82, 230
Phaseolus mungo Linn.	83, 231
Phaseolus radiatus Linn.	83
Phaseolus trilobatus (Linn.) Schreb.	84
Phaseolus vulgaris Linn.	84, 232
Phaseolus vulgaris Linn. var. humilis Alef.	85, 233
Pisum Linn.	85
Pisum sativum Linn.	85, 234
Psophocarpus Neck.	86
Psophocarpus tetragonolobus (Linn.) DC.	86, 235
Pueraria DC.	86
Pueraria lobata (Willd.) Ohwi	87
Pueraria phaseoloides (Roxb.) Benth.	87, 236
Pueraria tonkinensis Gagn.	88, 237
Pycnospora R. Br.	88
Pycnospora lutescens (Poir.) Schindl.	88, 238
Rhynchosia Lour.	89
Rhynchosia minima (Linn.) DC.	89, 239
Rhynchosia sericea Span.	90, 240
Rhynchosia volubilis Lour.	90, 241
Sesbania Scop.	90
Sesbania grandiflora (Linn.) Pers.	91, 242
Sesbania Roxburgii Merr.	91, 243
Sesbania sesban (Linn.) Merr.	91, 244
Smithia Ait.	92
Smithia ciliata Royle	92, 245
Smithia sensitiva Ait.	93, 246
Stizolobium P. Br.	93
Stizolobium hassjoo Piper & Tracy.	93, 247
Stylosanthes Swartz.	94
Stylosanthes gracilis H. B. K.	94, 248
Tephrosia Pers.	94
Tephrosia candida (Roxb.) DC.	95, 249
Tephrosia ionophlebia Hay.	96, 250
Tephrosia noctiflora Boj.	96, 251
Tephrosia obovata Merr.	96, 252
Tephrosia purpurea Pers.	97, 253
Teramnus Sw.	97
Teramnus labialis (Linn. f.) Spr.	97, 254
Trifolium Linn.	98
Trifolium pratense Linn.	98, 255
Trifolium repens Linn.	99, 256
Uraria Desv.	99
Uraria aequilobata Hosokawa	100, 257
Uraria lagopodioides Desv.	100, 258
Uraria macrostachya Wall.	100, 259
Uraria picta (Jacq.) Desv.	101, 260
Vicia Linn.	101
Vicia angustifolia Roth.	102
Vicia cracca Linn.	102, 261
Vicia dasycarpa Ten.	103
Vicia faba Linn.	103, 262
Vicia hirsuta (Linn.) S. F. Gray	104, 263
Vicia sativa Linn.	104, 264

<i>Vicia tetrasperma</i> (Linn.) Moench.....	105, 265
<i>Vicia villosa</i> Roth.....	105
<i>Vigna Savi</i>	105
<i>Vigna luteola</i> (Jacq.) Benth.....	106, 266
<i>Vigna marina</i> (Burm.) Merr.....	106, 267
<i>Vigna sesquipedalis</i> (Linn.) Fruwirth.....	107
<i>Vigna unguiculata</i> (Linn.) Walp.....	107, 268
<i>Vigna vexillata</i> (Linn.) Benth.....	108, 269
<i>Zornia</i> Gmel.....	108
<i>Zornia diphylla</i> (Linn.) Pers.....	108, 270

APPENDIX I

List of Species introduced by JCRR between 1956 and 1964

I. *Perennial Legumes*

<u>No.</u>	<u>Scientific Name</u>	<u>English Name</u>	<u>Source</u>
C 1	<i>Medicago sativa</i> Linn.	Alfalfa, Africa	Imported Mar. 1956-US
C 2	<i>Medicago sativa</i> Linn.	Alfalfa, Indian	Imported Mar. 1956-US
C 3	<i>Medicago sativa</i> Linn.	Alfalfa, Arizona 21-5	Imported Mar. 1956-US
C 4	<i>Medicago sativa</i> Linn.	Alfalfa, Hairy Peruvian	Hawaii Mar. 3, 1957
C 5	<i>Lotus corniculatus</i> Linn.	Birds foot trefoil	Imported Mar. 1956-US
C 6	<i>Lotus tenuis</i> Wablst. & Kit.	Narrow leafed birds foot trefoil	
C 7	<i>Lotus tenuis</i> Wablst. & Kit.	Prostrate Birds foot trefoil	Davis, Calif. US. Mar. 3, 1957
C 8	<i>Lotus corniculatus</i> Linn.	Erect Birds foot trefoil	Davis, Calif. US. Mar. 3, 1957
C 9	<i>Lotus uliginosus</i> Schk.	Big trefoil	Imported Mar. 1956-US
C 10	<i>Lotus uliginosus</i> Schk.	Big trefoil	Imported Mar. 1956-US
C 11	<i>Trifolium repens</i> Linn.	Ladino clover	Imported Mar. 1956-US
C 12	<i>Trifolium repens</i> Linn.	Ladino clover	Davis, Calif. Mar. 3, 1957
C 13	<i>Trifolium repens</i> Linn.	Ladino clover (Otto Bohnert) Oregon strain	Davis, Calif. Mar. 3, 1957
C 14	<i>Trifolium repens</i> Linn.	White clover	Hawaii Mar. 3, 1957
C 15	<i>Trifolium pragiferum</i> Linn.	Strawberry clover	Imported Mar. 1956-US
C 16	<i>Trifolium pragiferum</i> Linn.	Strawberry clover (salinas)	Davis, Calif. Mar. 3, 1957
C 17	<i>Desmodium canum</i> Schell.	Kaimi clover	Hawaii Mar. 3, 1957
C 18	<i>Desmodium intortum</i> Urb.	Intortum clover	Hawaii Mar. 3, 1957
C 19	<i>Desmodium uncinatum</i> DC.	Spanish clover	
C 20	<i>Pueraria phaseoloides</i> Benth.	Tropical Kudzu	Imported 1953-US
C 21	<i>Pueraria phaseoloides</i> Benth.	Tropical Kudzu	Hawaii Mar. 3, 1957
C 22	<i>Pueraria phaseoloides</i> Benth.	Tropical Kudzu	Philippines, Apr. 20, 1957
C 23	<i>Pueraria tonkinensis</i> Gagn.	Kudzue-Cuttings	Native-Cuttings
C 24	<i>Calopogonium orthocarpum</i> Urb.	Calopogonium	Philippines, Apr. 20, 1957
C 25	<i>Centrosema pubescens</i> Benth	Centrosema	Philippines, Apr. 20, 1957
C 26	<i>Indigofera endecaphylla</i> Jacq.	Creeping Indigo	Hawaii Mar. 3, 1957
C 27	<i>Indigofera endecaphylla</i> Jacq.	Creeping Indigo	Imported earlier
C 28	<i>Indigofera suffruticosa</i> Mill.	Indigofera	Hawaii Mar. 3, 1957
C 29	<i>Stylosanthes guianensis</i> Sw.	Stylo	Saigon Apr. 15, 1961
C 30	<i>Desmanthus virgatus</i> Willd.	Dwarf Koa	Hawaii Mar. 3, 1957
C 31	<i>Leucaena glauca</i> Benth.	Kao haole (Ipilipil)	Hawaii Mar. 3, 1957
C 32	<i>Leucaena glauca</i> Benth.	Kao haole (Ipilipil)	Native
C 33	<i>Clitoria ternatea</i> Linn.	Kordofan Pea	Introduced earlier
C 34	<i>Desmodium ovalifolium</i> Wall.	Oval leaf Desmodium	Malay 1958
C 35	<i>Clitoria rubiginosa</i> Nees.		Introduced earlier
C 36	<i>Lespedeza cuneata</i> G. Don.	Sericea Lespedeza	Introduced 1956-US
C 37	<i>Sesbania aegyptica</i> Pers.	Sesbania	Native
C 38	<i>Lespedeza cuneata</i> G. Don.	Sericea Lespedeza	USDA July 5, 1957
C 39	<i>Lespedeza cuneata</i> G. Don.	Sericea Lespedeza	USDA July 5, 1957
C 40	<i>Hedysarium coronarium</i> Linn.	Sulla	USDA July 5, 1957
C 41	<i>Desmodium intortum</i> Urb.	Intortum clover	USDA July 5, 1957
C 42	<i>Desmodium distortum</i> Mac.	Distortum clover	USDA July 5, 1957
C 43	<i>Desmodium diffusum</i> DC.	Diffusum clover	USDA July 5, 1957
C 44	<i>Desmodium intortum</i> Urb.	Intortum clover	Beltsville, Md. July 1959

C 45	<i>Stylosanthes gracilis</i> H. B. K.	Stylo	Australian Dept. of Agri. & Stock, Sept. 5, 1957
C 46	<i>Pueraria phaseoloides</i> Benth.	Tropical Kudzu	Australian Dept. of Agri. & Stock, Sept. 5, 1957
C 47	<i>Glycine javanica</i> Linn.	Rhodesian Kudzu	Australian Dept. of Agri. & Stock, Sept. 5, 1957
C 48	<i>Medicago sativa</i> Linn.	Vernal Alfalfa	Univ. of Wis., U. S. Jan. 8, 1958
C 49	<i>Medicago sativa</i> Linn.	Dupuits Alfalfa	Univ. of Wis., U. S. Jan. 8, 1958
C 50	<i>Desmodium intortum</i> Urb.	Intortum clover	BPI Station, Baguio PI, April 1958
C 51	<i>Stylosanthes gracilis</i> H. B. K.	Stylo	BPI Station, Baguio PI, April 1958
C 52	<i>Trifolium repens</i> Linn.	La. White clover	U. S. Commercial, 1956
C 53	<i>Glycine javanica</i> Linn.	Rhodesian Kudzu	Div. of Crops & Pasture, Pretoria, South Africa, 1960
C 54	<i>Trifolium repens</i> Linn.	White clover permanent pasture, strain C. B.	Central Bureau, Holland, Aug. 31, 1960
C 55	<i>Trifolium repens</i> Linn.	White clover, hay type	Central Bureau, Holland Aug. 31, 1960
C 56	<i>Desmodium gyroides</i> DC.	Desmodium	Puerto Rico Exp. Station, Aug. 31, 1960
C 57	<i>Desmodium supinum</i> DC.	Desmodium	Puerto Rico Exp. Station, Aug. 31, 1960
C 58	<i>Desmodium gyrans</i> (Limm.) DC.	Desmodium	Puerto Rico Exp. Station, Aug. 31, 1960
C 59	<i>Desmodium intortum</i> Urb.	Intortum clover	Puerto Rico Exp. Station, Aug. 31, 1960
C 60	<i>Leucaena glauca</i> Benth.	Koa haole Bald hills strain	CSIRO Brisbane, July 5, 1960
C 61	<i>Leucaena glauca</i> Benth.	El Salvador strain	CSIRO Brisbane, July 5, 1960
C 62	<i>Leucaena glauca</i> Benth.	Guatemala strain	CSIRO Brisbane, July 6, 1960
C 63	<i>Leucaena glauca</i> Benth.	Hawaii strain	CSIRO Brisbane, July 6, 1960
C 64	<i>Leucaena glauca</i> Benth.	Peru strain	CSIRO Brisbane, July 6, 1960
C 65	<i>Leucaena glauca</i> Benth.	Rhodesia strain	CSIRO Brisbane, July 6, 1960
C 66			
C 67	<i>Desmodium uncinatum</i> DC.	Spanish clover	CSIRO, Australia March 1961
C 68	<i>Indigofera spicata</i> Forsk		CSIRO, Australia March 1961
C 69	<i>Lotononis Bainesii</i> Baker.		CSIRO, Australia March 1961
C 70	<i>Glycine javanica</i> Linn.	Rhodesian Kudzu	CSIRO, Australia March 1961
C 71	<i>Glycine javanica</i> Linn.	Rhodesian Kudzu	CSIRO, Australia March 1961
C 72	<i>Glycine javanica</i> Linn.	Rhodesian Kudzu	CSIRO, Australia March 1961
C 73	<i>Desmodium purpureum</i> (Mill.) Fawc & Rendle.		Since IARJ Delhi June 1961
C 74	<i>Glycine javanica</i> Linn.	Rhodesian Kudzu	CSIRO, Australia March 1961
C 75	<i>Glycine javanica</i> Linn.	Rhodesian Kudzu	CSIRO, Australia March 1961
C 76	<i>Glycine javanica</i> Linn.	Rhodesian Kudzu	CSIRO, Australia March 1961
C 77	<i>Glycine javanica</i> Linn.	Rhodesian Kudzu	CSIRO, Australia March 1961
C 78	<i>Glycine javanica</i> Linn.	Rhodesian Kudzu	CSIRO, Australia March 1961
C 79	<i>Glycine javanica</i> Linn.	Rhodesian Kudzu	CSIRO, Australia March 1961
C 80	<i>Glycine javanica</i> Linn.	Rhodesian Kudzu	CSIRO, Australia March 1961
C 81	<i>Centrosema pubescens</i> Benth.		Forestry Institute, PI, April 1961
C 82	<i>Leucaena glauca</i> (Linn.) Benth	Koa haole	Since IAPRI, Delhi June 1961
C 83	<i>Sesbania grandiflora</i> Pers.		Introduced earlier

C 84			
C 85	<i>Indigofera tinctoria</i> Linn.	Indigo	Fluru, India, June 1961
C 86	<i>Trifolium repens</i> Linn.	Victorian Dryland white clover	Dept. Agri, Australia July 1961
C 87	<i>Trifolium repens</i> Linn.	New Zealand Mother white clover	Dept. Agri, Australia July 1961
C 88	<i>Trifolium subterraneum</i> Linn.	Mt. Barker Subclover	Dept. Agri, Australia July 1961
C 89	<i>Trifolium subterraneum</i> Linn.	Bacchus Marsh subclover	Dept. Agri. Australia July 1961
C 90	<i>Trifolium subterraneum</i> Linn.	Tallarook sub-clover	Dept. Agri. Australia July 1961
C 91	<i>Trifolium subterraneum</i> Linn.	Clare sub-clover	Dept. Agri. Australia July 1961
C 92	<i>Trifolium subterraneum</i> Linn.	Yarloop sub-clover	Dept. Agri Australia July 1961
C 93	<i>Trifolium subterraneum</i> Linn.	Marrar sub-clover	Dept. Agri. Australia July 1961
C 94	<i>Trifolium subterraneum</i> Linn.	Palestine strawberry	Dept. Agri. Australia July 1961
C 95	<i>Medicago sativa</i> Linn	Hunter River lucerne	Dept. Agri. Australia July 1961
C 96	<i>Desmodium uncinatum</i> DC.	Spanish clover	Dept. Agri. Australia July 1961
C 97	<i>Trifolium repens</i> Linn.	Victorian irrigation white clover	Dept. Agri. Australia July 1961
C 98	<i>Indigofera subulata</i> Vahl.		Brazil 1962 Ream
C 99	<i>Glycine javanica</i> Linn.	Rhodesian Kudzu	CSIRO 1961
C100	<i>Clitoria ternatea</i> Linn.		CSIRO Dec. 1964
C101	<i>Trifolium pratense</i> Linn.	Red clover	U. S. Commercial Kendland
C102	<i>Trifolium pratense</i> Linn.	Orbit Red clover	Ream 1962, Brazil
C103	<i>Glycine javanica</i> Linn.	Rhodesian Kudzu	Ream 1962, Brazil
C104	<i>Desmodium discolor</i> Vogel		Ream 1962, Brazil
C105	<i>Clitoria ternata</i> Linn.		Ream 1962, Brazil
C106	<i>Glycine javanica</i> Linn.	Rhodesian Kudzu	Ream 1962, Brazil
C107	<i>Leucaena glauca</i> (Linn.) Benth		Ream 1962, Brazil
C108	<i>Desmodium barbatum</i> (Linn.) Benth.		Georgia Sta. US 1962
C109	<i>Desmodium barbatum</i> (Linn.) Benth.		Georgia Sta. US 1962
C110	<i>Desmodium barbatum</i> (Linn.) Benth.		Georgia Sta. US 1962
C111	<i>Desmodium canum</i> Schell.		Georgia Sta. US 1962
C112	<i>Desmodium canum</i> Schell.		Georgia Sta. US 1962
C113	<i>Desmodium canum</i> Schell.		Georgia Sta. US 1962
C114	<i>Desmodium cuneatum</i> Hook. & Arn.		Georgia Sta. US 1962
C115	<i>Desmodium discolor</i> Vogel		Georgia Sta. US 1962
C116	<i>Desmodium discolor</i> Vogel		Georgia Sta. US 1962
C117	<i>Desmodium hassleri</i> Schind.		Georgia Sta. US 1962
C118	<i>Desmodium heterocarpum</i> (Linn.) DC.		Georgia Sta. US 1962
C119	<i>Desmodium intortum</i> (Mill.) Urb.		Georgia Sta. US 1962
C120	<i>Desmodium intortum</i> (Mill.) Urb.		Georgia Sta. US 1962
C121	<i>Desmodium intortum</i> (Mill.) Urb.		Georgia Sta. US 1962
C122	<i>Desmodium limence</i> Hook.		Georgia Sta. US 1962
C123	<i>Desmodium nicaraguense</i> Oerst.		Georgia Sta. US 1962
C124	<i>Desmodium perplexum</i> Schubert		Georgia Sta. US 1992
C125	<i>Desmodium perplexum</i> Schubert		Georgia Sta. US 1962
C126	<i>Desmodium perplexum</i> Schubert		Georgia Sta. US 1962
C127	<i>Desmodium stipulaceum</i> DC.		Georgia Sta. US 1962

C128	<i>Desmodium tortuosum</i> (Sw.) DC.		Georgia Sta. US 1962
C129	<i>Desmodium tortuosum</i> (Sw.) DC.		Georgia Sta. US 1962
C130	<i>Desmodium tortuosum</i> (Sw.) DC.		Georgia Sta. US 1962
C131	<i>Desmodium tortuosum</i> (Sw.) DC.		Georgia Sta. US 1962
C132	<i>Desmodium tortuosum</i> (Sw.) DC.		Georgia Sta. US 1962
C133	<i>Desmodium tortuosum</i> (Sw.) DC.		Georgia Sta. US 1962
C134	<i>Desmodium uncinatum</i> Jacq.		Georgia Sta. US 1962
C135	<i>Desmodium uncinatum</i> Jacq.		Georgia Sta. US 1962
C136	<i>Desmodium uncinatum</i> Jacq.		Georgia Sta. US 1962
C137	<i>Desmodium uncinatum</i> Jacq.		Georgia Sta. US 1962
C138	<i>Desmodium uncinatum</i> Jacq.		Georgia Sta. US 1962
C139	<i>Desmodium uncinatum</i> Jacq.		Georgia Sta. US 1963
C140	<i>Desmodium uncinatum</i> Jacq.		Georgia Sta. US 1962
C141	<i>Desmodium uncinatum</i> Jacq.		Georgia Sta. US 1962
C142	<i>Desmodium uncinatum</i> Jacq.		Georgia Sta. US 1962
C143	<i>Desmodium</i> sp. 61-65		Georgia Sta. US 1962
C144	<i>Desmodium</i> sp. 61-66		Georgia Sta. US 1962
C145	<i>Desmodium</i> sp. 61-67		Georgia Sta. US 1962
C146	<i>Desmodium</i> sp. 61-69		Georgia Sta. US 1962
C147	<i>Desmodium</i> sp. 61-70		Georgia Sta. US 1962
C148	<i>Desmodium</i> sp. 61-71		Georgia Sta. US 1962
C149	<i>Desmodium</i> sp. 61-86		Georgia Sta. US 1962
C150	<i>Leucaena glauca</i> Benth.	Koa haole	CSIRO, Australia 1962
C151	<i>Desmodium distortum</i> Macbride		Ream 1962
C152	<i>Phaseolus atropurpureus</i> DC.	Siratro	CSIRO, Australia, Mar. 1961
C153	<i>Phaseolus atropurpureus</i> DC.	Siratro	CSIRO, Australia, Mar. 1961
C154	<i>Phaseolus atropurpureus</i> DC.	Siratro	CSIRO, Australia, Mar. 1961
C155	<i>Phaseolus atropurpureus</i> DC.	Siratro	CSIRO, Australia, Mar. 1961
C156	<i>Vigna repens</i> Baker		CSIRO, Australia, Mar. 1961
C157	<i>Vigna repens</i> Baker		CSIRO, Australia, Mar. 1961
C158	<i>Crotalaria verrucosa</i> Linn.		Native
C159	<i>Phaseolus mungo</i> Linn.	Perennial mungo	International Rice Research Institute Feb. 1963
C160	<i>Vigna marina</i> (Burm.) Merr.		Native, collected near Ilan
C161	<i>Teramnus uncinatus</i> Sw.		Native of Brazil, from Instituto Agronomic, Sao Paulo 1963 R.
C162	<i>Glycine javanica</i> Linn.		Brazil 1963 R.
C163	<i>Glycine javanica</i> Linn.		Brazil 1963 R.
C164	<i>Glycine javanica</i> Linn.		Brazil 1963 R.
C165	<i>Glycine javanica</i> Linn.		Brazil 1963 R.
C166	<i>Indigofera subulata</i> Vahl.		Brazil 1963 R.
C167	<i>Phaseolus radiatus</i> Linn.	Perennial mungo	Brazil 1963 R.
C168	<i>Centrosema pubescens</i> Benth.		CSIRO, Nov. 1964
C169	<i>Desmodium intortum</i> Urb.		CSIRO, Nov. 1964
C170	<i>Glycine javanica</i> Linn.		CSIRO, Nov. 1964
C171	<i>Glycine javanica</i> Linn.		CSIRO, Nov. 1964
C172	<i>Phaseolus atropurpureus</i> DC		CSIRO, Nov. 1964
C173	<i>Stylosanthes gracilis</i> H. B. K.		CSIRO, Nov. 1964
C174	<i>Trifolium burchellianum</i> Ser.		CSIRO, Nov. 1964
C175	<i>Trifolium ruepellianum</i> Fresen.		CSIRO, Nov. 1964
C176	<i>Trifolium semipilosum</i> Fresen.		CSIRO, Nov. 1964
C177	<i>Desmodium sandwicense</i> E. Mey.		CSIRO, Nov. 1964
C178	<i>Dolichos axillaris</i> E. Mey.		CSIRO, Dec. 1964
C179	<i>Dolichos lablab</i> Linn.		CSIRO, Dec. 1964
C180	<i>Lotononis bainesii</i> Baker		CSIRO, Dec. 1964
C181	<i>Phaseolus atropurpureus</i> DC.		CSIRO, Dec. 1964

C182	<i>Stylosanthes fruticosa</i> (Retz.) Alston	CSIRO, Dec. 1964
C183	<i>Stylosanthes gracilis</i> H. B. K.	CSIRO, Dec. 1964
C184	<i>Teramnus uncinatatus</i> Sw.	CSIRO, Dec. 1964
C185	<i>Vigna gracilis</i> Hook.	CSIRO, Dec. 1964
C186	<i>Vigna marina</i> (Burm.) Merr.	CSIRO, Dec. 1964

II. Summer Annual Legumes (All planted with seed)

<u>No.</u>	<u>Scientific Name</u>	<u>English Name</u>	<u>Source</u>
E 1	<i>Indigofera hirsuta</i> Linn.	Hairy Indigo	Imported March 1956, US
E 2	<i>Melilotus albus</i> Desr.	Hubam sweet clover	Imported March 1956, US
E 3	<i>Alysicarpus vaginalis</i> DC.	Alyce clover	Imported March 1956, US
E 4			
E 5	<i>Vigna unguiculata</i> (Linn.) Walp.	Giant cow pea	Imported by TSC, 1956, US
E 6	<i>Vigna unguiculata</i> (Linn.) Walp.	Reeve's selection	Imported earlier, US.
E 7	<i>Sesbania microcarpa</i> Muhl.	Sesbania	Davis, Calif.
E 8	<i>Sesbania roxburghii</i> Merr.	Sesban	Native
E 9	<i>Crotalaria juncea</i> Linn.	Sunn hemp	Introduced earlier
E 10	<i>Dolichos lablab</i> Linn.	Hyacinth bean	Introduced earlier
E 11	<i>Vigna unguiculata</i> (Linn.) Walp.	Victor cowpea	Introduced earlier, US
E 12	<i>Phaseolus calcaratus</i> Roxb.	Tapilan	Introduced earlier
E 13	<i>Cyamopsis psoraloides</i> DC.	Guar	USDA, July 5, 1957
E 14	<i>Kummeromia striata</i> (Thunb.) Schlindl.	Kobe lesyedeza X	USDA, July 5, 1957
E 15	<i>Kummeromia stipulacea</i> (Maxim.) Makino	Climax lespedeza	USDA, July 5, 1957
E 16	<i>Kummeromia stipulacea</i> (Maxim.) Makino	Rowan lespedeza	USDA, July 5, 1957
E 17	<i>Kummeromia stipulacea</i> (Maxim.) Makino	IOWA	USDA, July 5, 1957
E 18	<i>Kummeromia stipulacea</i> (Maxim.) Makino	Commercial	USDA, July 5, 1957
E 19	<i>Crotalaria saltiana</i> Andr.	Crotalaria	Harvested, Hsinchu Agri. Imp. Station, Sept. 1957
E 20	<i>Crotalaria lanceolata</i> E. Mey	Crotalaria	Harvested, Hsinchu Agri. Imp. Station, Sept. 1957
E 21	<i>Crotalaria saltiana</i> Andr.	Crotalaria	Harvested, Hsinchu Agri. Imp. Station, Sept. 1957
E 22	<i>Phaseolus lathyroides</i> Linn.	Phasemy bean	Harvested, Hsinchu Agri. Imp. Station, Sept. 1957
E 23	<i>Cajanus cajan</i> (Linn.) Mill.	Pigeon pea	Introduced earlier
E 24	<i>Cajanus cajan</i> (Linn.) Mill.	Pigeon pea	CSIRO Australia, Mar
E 25	<i>Melilotus alba</i> (Israel)	Sweet clover	U. S. Sept. 3, 1959
E 26	<i>Vigna unguiculata</i> (Linn.) Walp.	Groit cowpea	Introduced earlier, US
E 27	<i>Vigna unguiculata</i> (Linn.) Walp.	Suwannee cowpea	Introduced earlier, US
E 28	<i>Vigna unguiculata</i> (Linn.) Walp.	Clay cowpea	Introduced earlier, US
E 29	<i>Vigna unguiculata</i> (Linn.) Walp.	Cristanda cowpea	Introduced earlier, US
E 30	<i>Vigna unguiculata</i> (Linn.) Walp.	Iron cowpea	Introduced earlier, US
E 31	<i>Vigna unguiculata</i> (Linn.) Walp.	C. P. I. 8085 cowpea	Introduced earlier, US
E 32	<i>Vigna unguiculata</i> (Linn.) Walp.	C. P. I. 10753 cowpea	Introduced earlier, US
E 33	<i>Vigna unguiculata</i> (Linn.) Walp.	Q30 cowpea	Introduced earlier, US
E 34	<i>Vigna unguiculata</i> (Linn.) Walp.	Q31 cowpea	Introduced earlier, US
E 35	<i>Vigna unguiculata</i> (Linn.) Walp.	Poona pea	Introduced earlier, US from India
E 36	<i>Vigna vexillata</i> (Linn.) Benth.		Puerto Rico Exp. Station Aug. 31, 1960

E 37	<i>Vigna unguiculata</i> (Linn.) Walp.	Cowpea var. Indian Brown eye	Economic Garden March 1961
E 38	<i>Vigna unguiculata</i> (Linn.) Walp.	Cowpea var. New era	Economic Garden March 1961
E 39	<i>Vigna unguiculata</i> (Linn.) Walp.	Alyce clover	CSIRO, Dec. 1964
E 40	<i>Alysicarpus vaginalis</i> DC.	Alyce clover	CSIRO, Dec. 1964
E 41	<i>Cajanus cajan</i> (Linn.) Mill.	Pigeon pea	CSIRO, Dec. 1964
E 42	<i>Cassia rotundifolia</i> Pers.		CSIRO, Dec. 1964
E 43	<i>Dolichos lablab</i> Linn.		CSIRO, 1961
E 44	<i>Crotalaria rhodesiae</i> Bak.		CSIRO, 1964
E 45	<i>Phaseolus semierectus</i> Linn.		CSIRO, March 1961
E 46	<i>Stylosanthes sunndaica</i> Taub.	Townsville lucerne	CSIRO, Australia, March 1961
E 47			
E 48			
E 49	<i>Canavalia ensiformis</i> DC.	Jack bean	Economic garden, P. I. Feb. 1961
E 50	<i>Phaseolus calcaratus</i> Roxb.	Tapilon	Economic garden, P. I. Feb. 1961
E 51	<i>Vigna unguiculata</i> (Linn.) Walp.	Cowpea, Early Sugar Growder	Economic garden, P. I. Feb. 1961
E 52	<i>Phaseolus lathyroides</i> Linn.	Phasemy bean	Economic garden, P. I. Feb. 1961
E 53	<i>Glycine max</i> Linn.		Okinawa, April 1961
E 54	<i>Vigna unguiculata</i> (Linn.) Walp.	Cowpea, Early	Economic garden, March 1961
E 55	<i>Crotalaria anagyroides</i> HBK.		Introduced earlier
E 56	<i>Vigna unguiculata</i> (Linn.) Walp.	Cowpea Urda Black	Economic Garden, P. I. 1961
E 57	<i>Crotalaria saltiana</i> Andr.		Introduced earlier
E 58	<i>Crotalaria kirkii</i> Baker		Introduced earlier
E 59	<i>Crotalaria juncea</i> Linn.	Sunn hemp	Economic Garden, P. I. 1961
E 60	<i>Crotalaria spectabilis</i> Roth.	Showy crotalaria	Economic Garden, P. I. 1961
E 61	<i>Canavalia ensiformis</i> DC.		Introduced earlier
E 62	<i>Vigna unguiculata</i> (L.) Walp.	Cowpea, Urda Black	Economic Garden, Mar. 1961
E 63	<i>Cassia mimosoides</i> Linn.		Economic Garden, Mar. 1961
E 64	<i>Cassia Leschenautiana</i> DC.		Economic Garden, Mar. 1961
E 65	<i>Cassia occidentalis</i> Linn.		Economic Garden, Mar. 1961
E 66	<i>Cassia tora</i> Linn.		Economic Garden, Mar. 1961
E 67	<i>Sesbania Roxburghii</i> Merr.	Sesbania	Economic Garden, P. I. 1961
E 68	<i>Vigna unguiculata</i> (Linn.) Walp.	Cowpea Var. Buff	Economic Garden, P. I. 1961
E 69	<i>Phaseolus aureus</i> Roxb.	Cambodian mungo	Thailand, 1957
E 70	<i>Sesbania Roxburghii</i> Merr.		Thailand, 1957
E 71	<i>Sesbania aculeata</i> Poir.	Sesbania	Pakistan, 1957
E 72	<i>Tephrosia candida</i> DC.		Introduced earlier
E 73	<i>Tephrosia candida</i> DC.		Malaya, 1958
E 74	<i>Tephrosia noctiflora</i> Boj.		Introduced earlier
E 75	<i>Stizolobium hassjoo</i> Piper & Tracy	Velvet bean	Introduced earlier
E 76	<i>Mucuna pruriens</i> DC.	Velvet bean	Economic Garden, P. I. March 1961
E 77	<i>Stizolobium</i> spp.	Velvet bean	Thailand, 1957
E 78	<i>Phaseolus calcaratus</i> Roxb.	Tapilon	Burma, 1957
E 79	<i>Stylosanthes sunndaica</i> Taub.		Arneata Grassland Farm P. I. March 1961
E 80	<i>Stizolobium aterrimum</i> Piper & Tracy	Bengal bean	Vietnam, 1959
E 81	<i>Vigna unguiculata</i> (Linn.) Walp.	Cowpea var. Indian Buff	Economic garden, P. I. March 1961
E 82	<i>Vigna unguiculata</i> (Linn.) Walp.	Cowpea var. Red cowpea	Economic garden, P. I. March 1961

E 83	<i>Vigna unguiculata</i> (Linn.) Walp.	Cowpea var. Chinese Red	Economic garden, P. I. March 1961
E 84	<i>Vigna unguiculata</i> (Linn.) Walp.	Cowpea var. Tagtaga	Economic garden, P. I. March 1961
E 85	<i>Vigna unguiculata</i> (Linn.) Walp.	Cowpea E. C.	India, June 1961
E 86	<i>Vigna unguiculata</i> (Linn.) Walp.	Cowpea Russian giant	India, June 1961
E 87	<i>Sesbania speciosa</i> Taub.		Fluru, India, June 1961
E 88	<i>Indigofera tinctoria</i> Linn.		Mandy, India, June 1961
E 89	<i>Stizolobium hassjoo</i> Piper & Tracy	Velvet bean	June 1961 since IARI, Dalhi
E 90	<i>Trigonella foenum-graecum</i> Suter.	Fennugreek	IARI, Delhi, June 1961
E 91	<i>Aeschynomene sensitiva</i> SW.		Vietnam, March 1961
E 92	<i>Sesbania exasperata</i> H. B. K.		Prodedencia, Iao 1962 R.
E 93	<i>Calopogonium orthocarpum</i> Urb.		Taiwan collected 1960
E 94	<i>Vigna luteola</i> Benth.		Brazil, 1962 Ream
E 95	<i>Stylosanthes guianensis</i> Sw.		Brazil, 1962 Ream
E 96	<i>Dolichos Lablab</i> Linn.	Labe-labe	Institute Agronomia St Paulo.
E 97	<i>Phaseolus aureus</i> Roxb.	Feijao mango	Brazil, 1962 Ream
E 98	<i>Phaseolus</i> sp.		Brazil. 1962 Ream
E 99	<i>Cajanus cajan</i> (Linn.) Mill.	Pigeon pea	LSU JC Miller/YS 1962
E100	<i>Cajanus cajan</i> (Linn.) Mill.	Pigeon pea	LSU JC Millor/YS 1962
E101	<i>Cajanus cajan</i> (Linn.) Mill.	Pigeon pea	Parkistan, 1960, Kun
E102	<i>Crotalaria juncea</i> Linn.	Sunn hemp	Parkistan, 1960, Kun
E103	<i>Phaseolus aconitifolius</i> Roxt.	Malikalia	Pakristan, 1960. Kun
E104	<i>Viga unguiculata</i> (Linn.) Walp.		Vietnam, 1961
E105	<i>Crotalaria usaramoensis</i> Bak.		P. I. 1961
E106	<i>Dolichos Lablab</i> Linn.		Brazil, 1963
E107	<i>Cajanus cajan</i> (Linn.) Mill.		Brazil, 1963
E108	<i>Crotalaria aurea</i> Dinter.		Brazil, 1963
E109	<i>Stylosanthes humilis</i> H. B. K.	Towensville lucerne	CSIRO, 1962

III. Winter Annual Legumes (All planted with seed)

No.	Scientific Name	English Name	Source
F 1	<i>Pisum arvense</i> Linn.	Austrian winter pea	Davis, Calif. Mar. 3, 1957
F 2	<i>Pisum arvense</i> Linn.	Austrian winter pea	Imported March 1956, US
F 3	<i>Vicia atropurpurea</i> Desf.	Purple vetch	Imported March 1956, US
F 4	<i>Vicia atropurpurea</i> Desf.	Purple vetch	Davis, Calif. Mar. 3, 1957
F 5	<i>Vicia sativa</i> Linn.	Common vetch	Davis, Calif. Mar. 3, 1957
F 6	<i>Vicia sativa</i> Linn.	Common vetch	Imported 1956, US
F 7	<i>Vicia villosa</i> Roth.	Hairy vetch	Davis, Calif. Mar. 3, 1957
F 8	<i>Trifolium incarnatum</i> Linn.	Crimson clover	Imported March. 1956 US
F 9	<i>Trifolium subterraneum</i> Linn.	Subterranean clover	Imported March 1956, US
F 10	<i>Trifolium subterraneum</i> Linn.	Subterranean clover	Davis, Calif. March 3, 1957
F 11	<i>Astragalus sinicus</i> Linn.	Milk vetch	Imported earlier
F 12	<i>Lupinus luteus</i> Linn.	Sweet yellow lupine	Imported earlier
F 13	<i>Lupinus angustifolius</i> Linn.	Sweet blue blue	Imported earlier, US
F 14	<i>Lupinus luteus</i> Linn.	Yellow lupine	Imported earlier
F 15	<i>Lupinus angustifolius</i> Linn.	Blue lupine	Imported earlier
F 16	<i>Trifolium alexandrinum</i> Linn.	Berseem clover	Davis, Calif. Mar. 3, 1957
F 17	<i>Trifolium resupinatum</i> Less.	Persian clover	Imported in March 1956, US
F 18	<i>Vicia villosa</i> Roth.	Hairy vetch	Imported in March 1956, US
E 19	<i>Trifolium incarnatum</i> Linn.	Crimson clover	Japan, 1958
F 20	<i>Trifolium incarnatum</i> Linn.	Crimson clover	Japan, 1958
F 21	<i>Trifolium incarnatum</i> Linn.	Crimson clover	Japan, 1958

F 22	<i>Trifolium incarnatum</i> Linn.	Crimson clover Talladega	Forage and Range Res. Branch, Beltsville June 12, 1959
F 23	<i>Trifolium incarnatum</i> Linn.	Crimson clover Chief	Forage and Range Res. Branch, Beltsville June 12, 1959
F 24	<i>Lupinus angustifolius</i> Linn.	Borre sweet lupine	Forage and Range Res. Branch, Beltsville June 12, 1959
F 25	<i>Lupinus luteus</i> Linn.	Sweet yellow weiko II lupine	Forage and Range Res. Branch, Beltsville June 12, 1959
F 26	<i>Lupinus luteus</i> Linn.	Sweet yellow weiko III lupine	Forage and Range Res. Branch, Beltsville June 12, 1959
F 27	<i>Pisum arvense</i> Linn.	Romack pea	Forage and Range Res. Branch, Beltsville June 12, 1959
F 28	<i>Pisum arvense</i> Linn.	Papago pea	Forage and Range Res. Branch, Beltsville June 12, 1959
F 29	<i>Pisum arvense</i> Linn.	Australian winter pea	Forage and Range Res. Branch, Beltsville June 12, 1959
F 30	<i>Pisum arvense</i> Linn.	Wild winter pea	Forage and Range Res. Branch, Beltsville June 12, 1959
F 31	<i>Astragalus glycyphyllos</i> Linn.	Milk vetch Milk vetch	National Plant Materials Center S. C. S., Beltsville July 13, 1959
F 32	<i>Astragalus sinicus</i> Linn.	Milk vetch	National Plant Materials Center S. C. S., Beltsville July 13, 1959
F 33	<i>Astragalus cicer</i> Linn.	Milk vetch	National Plant Materials Center S. C. S., Beltsville July 13, 1959
F 34	<i>Vicia dasycarpa</i> Ten.	Lana vetch	U. S. Commercial, 1960
F 35	<i>Trifolium hirtum</i> All.	Rose clover	U. S. Sept, 3, 1959 R.
F 36	<i>Astragalus falcatus</i> Linn.	Milk vetch	National Plant Materials Center S. C. S. U. S. July 13, 1959
F 37	<i>Trifolium subterraneum</i> Linn.	Barker clover	U. S. Commercial, 1956
F 38	<i>Lupinus luteus</i> Linn.	Neven sweet yellow	Central Bureau, Holland Aug. 31, 1960
F 39	<i>Vicia sativa</i> Linn.	Negro vetch	Central Bureau, Holland Aug. 31, 1960
F 40	<i>Vicia faba</i> Linn.	Broad bean	W. Scotland College of Agri., Scotland July 1960 (Ream)
F 41	<i>Vicia lithyacea</i>		IARI, Delhi, June 1961 (R.)
F 42	<i>Vicia amphicarpa</i> Dorthes		IARI, Delhi, June 1961 (R.)
F 43	<i>Vicia narbonensis</i> Linn.		IARI, Delhi, June 1961 (R.)
F 44	<i>Vicia gresta</i>		IRAI, Delhi, June 1961 (R.)
F 45	<i>Vicia claudiat</i>		IARI, Delhi, June 1961 (R.)
F 46	<i>Vicia niola</i>		IARI, Delhi, June 1961 (R.)
F 47	<i>Trifolium subterraneum</i> Linn.		IARI, Delhi, June 1961 (R.)
F 48	<i>Trifolium michelianum</i> Sav.		Beaumont Seed, 1962 Ream
F 49	<i>Trifolium</i> sp.	Giant Ball clover	Brazil, 1962 Ream

F 50	<i>Trifolium resupinatum</i> Linn.	Late Persian clover	Beaumont Seed, 1962 (R)
F 51	<i>Pisum sativum</i> Linn.	Parkistan pea	Parkistan, 1960 Kun
F 52	<i>Lathyrus</i> sp.	Kheshari	Parkistan, 1960 Kun
F 53	<i>Cicer arietinum</i> Linn.	Gram chickpea	Parkistan, 1960 Kun
F 54	<i>Lens esculenta</i> Moench	Lentil	Parkistan, 1960 Kun
F 55	<i>Medicago tribuloides</i> Desr.		CSIRO, Australia, 1962
F 56	<i>Vicia dasycarpa</i> Ten.	Auburn vetch	U. S. Commercial, 1962
F 57	<i>Vicia atropurpurea</i> Desf.	Purple vetch	Australian Commercial, 1962
F 58	<i>Lens culinaris</i> Media	Lentil	USDA March 1963
F 59	<i>Lens culinaris</i> Media	Lentil	USDA March 1963
F 60	<i>Lens culinaris</i> Media	Lentil	USDA March 1963
F 61	<i>Lens culinaris</i> Media	Lentil	USDA March 1963
F 62	<i>Lens culinaris</i> Media	Lentil	USDA March 1963
F 63	<i>Lens culinaris</i> Media	Lentil	USDA March 1963
F 64	<i>Lens culinaris</i> Media	Lentil	USDA March 1963
F 65	<i>Lens culinaris</i> Media	Lentil	USDA March 1963
F 66	<i>Lens culinaris</i> Media	Lentil	USDA March 1963
F 67	<i>Lens culinaris</i> Media	Lentil	USDA March 1963
F 68	<i>Lens culinaris</i> Media	Lentil	USDA March 1963
F 69	<i>Lens culinaris</i> Media	Lentil	USDA March 1963
F 70	<i>Lens culinaris</i> Media	Lentil	USDA March 1963
F 71	<i>Lens culinaris</i> Media	Lentil	USDA March 1963
F 72	<i>Lens culinaris</i> Media	Lentil	USDA March 1963
F 73	<i>Lens culinaris</i> Media	Lentil	USDA March 1963
F 74	<i>Lens culinaris</i> Media	Lentil	USDA March 1963
F 75	<i>Lens culinaris</i> Media	Lentil	USDA March 1963
F 76	<i>Lens culinaris</i> Media	Lentil	USDA March 1963
F 77	<i>Vicia pannonica</i> Crantz	Hungaria vetch	USDA March 1963
F 78	<i>Medicago hispida</i> Gaertn.	Bur clover	U. S. Commercial, 1956

行政院農委會圖書室



0001424