

Key to the Genera of Thai Papilionaceous Plants

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INTRODUCTION

Leguminosae is one of the largest and of the great economic importance family, comprising of about 650 genera and 18,000 species worldwide. There are about 102 genera and 614 species indigenous to Thailand.

In general features, leguminaceous plants can be easily recognized by its two-valved pod; ovary one locule, tipped by a style; ovules adaxially attached on the placenta; stamens usually 10, rarely fewer or numerous. The family is classified into three subfamilies, Caesalpinioideae, Mimosoideae and Papilionoideae. All of these subfamilies have their own significance characters, differing from each other mainly in the characters their flowers, pods and seeds.

The essential features of the subfamily Papilionoideae are the papilionoid flowers. Calyx teeth are imbricate in bud with the lower most tooth outside the adjacent lateral ones, and the two upper most teeth inside. Petals are also imbricate in bud with the adaxial or standard outside the wing petals, and two inner most petals or keel housing the stamens and pistil.

Papilionoideae is recognized as the largest subfamily of the Leguminosae. It contains approximately 440 genera and 12,000 species, distributed throughout tropics, subtropics and warm to temperate regions of the world. As far as known, there are about 71 genera and 450 species indigenous to Thailand. This amount is not included some exotic 19 genera and 23 species which are under cultivation and become spontaneous. Ecologically, most of the native species are highly characteristic of open and disturbed area from above sea level up to ca 2500 m alt. of the country.

In providing the present key for the Flora of Thailand, outstanding and significance characters easily recognized by naked eyes or by the help of x10 magnified hand lens are used. But in some groups of plants with close relationship and very narrow definitions, it is unavoidable in using accessory characters for identification. The key may be applicable only for Thailand and adjacent countries in SE. Asia mainland.

All papilionaceous plants in Thailand, including the exotic species, are grouped into 16 tribes: *Abreae*, one genus; *Aeschynomenae*, 7 genera (2 exotic genera); *Cicereae*, one

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exotic genus; *Crotalarieae*, one native and one exotic genera; *Dalbergieae*, 2 genera; *Desmodieae*, 13 genera; *Euchesteeae*, one genus; *Genisteae*, one exotic genus; *Indigoferae*, one native and one exotic genera; *Lepedezeae*, 3 genera; *Phaseoleae*, 37 genera (6 exotic genera); *Sesbanieae*, one genus; *Sophoreae*, 2 genera; *Tephrosieae*, 6 native and one exotic genera; *Trifolieae*, 2 native and 2 exotic genera; and *Vicieae*, 4 exotic genera.

Phaseoleae is comparatively the largest tribe, consisting of 37 genera, subdivided into 7 subtribes as: *Cajaninae*, 6 genera; *Clitorinae*, 2 genera; *Diocleinae*, 8 genera; *Erythrininae*, 4 genera; *Glycineae*, 6 genera; *Ophrestiinae*, one genus; and *Phaseolinae*, 10 genera.

Identification keys to all the tribes, subtribes and the native genera within the tribes have been made. An artificial key to genera either indigenous or exotic occurring in Thailand is provided.

Principally, Papilionoideae in Thailand are herbaceous plants with pinnately uni–3-foliolate leaves belonging to the tribes *Desmodieae*, *Lepedezeae*, *Phaseoleae* and *Trifolieae*. Simple and digitate leaves are *Crotalarieae* and a part of *Cajaninae* (*Flemingia*) and *Indigoferae*. Paripinnate leaves are *Abreae*, *Aeschynomenae* (in part), *Sesbanieae* and *Vicieae*. Imparipinnate leaves with many leaflets mainly are *Indigoferae* and *Tephrosieae* (*Tephrosia*). Trees, shrubs and large woody climbers with opposite leaflets are mainly represented by *Tephrosieae*; leaflets alternate is *Dalbergieae*.

Terminal leaflet with palmate, reticulate venation, having 3–5(–7) main nerves at base are the majority of the tribe *Phaseoleae*. The secondary veins of leaflets of *Tephrosia*, a genus in the tribe *Tephrosieae*, are closely paralleled. Scalariform venation is characterized to *Desmodieae*. The margins of leaflets in this subfamily are generally entire. Serrate margins can be found in *Trifolieae* and in the genus *Cyamopsis* of the tribe *Indigoferae*.

Indumentum of papilionaceous plants is generally simple; medifixed or T-shaped hairs present in the tribe *Indigoferae*; hooked hairs in the tribe *Desmodieae*, and irritant bristle hairs in the genus *Mucuna* and *Dioclea*. Resinous glands are present in *Cajanineae*, this character is scarcely occurred on its vegetative parts, but evident on calyx, ovary and pod.

Stamens are generally connated into a tube, a sheath or diadelphous with a vexillary one free. Stamens are grouped into 4+5 or 5+5 in the genus *Dalbergia*, and completely free in the tribe *Sophoreae*.

Anthers usually uniform, but dimorphic one, i.e. alternately long basifixed and short dorsifixed represent in *Crotalarieae* and *Genisteae*. Five fertile anthers alternating 5 aborted ones are in the genus *Teramnus*. Generally an anther opens lengthwise, except the genus *Antheroporum* and *Dalbergia* of which anthers open apically by a short longitudinal slit.

The pod or fruit of the subfamily *Papilionoideae* often varies among the tribes, the genera and also sometimes among the species. Pod jointed or articulate in tribes *Aeschynomenae* and *Desmodieae*; drupaceous pod in *Euchresteeae*; and moniliform pod in the genus *Sophora*. Samaroidal with apical seed pod is characteristic to *Butea* and *Spatholobus*. Inflated pod is in *Crotalaria* and *Pycnospora*.

Further more details about this subfamily are referable to Polhill, R.M. and Raven, P.H. (1981).

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KEY TO THE TRIBES

1. Stamens all free or connated at base only I. **Sophoreae**
1. Stamens distinctly connated higher up in 1–2(–3) bundles
2. Anthers dimorphic, alternately long basifixed and shorter dorsifixed. Leaves simple, 1-foliolate or digitately 3–many-foliolate. Erect, prostrate herbs or undershrubs
3. Stamens in a sheath opened on the upper side XII. **Crotalarieae**
3. Stamens in a tube Genisteae (*Lupinus*–exotic)
2. Anthers more or less uniform, if not so, climbers
4. Leaflets toothed; nerves extending to the toothed margins; indumentum simple
5. Leaves pinnately 9–13(–15)-foliolate; stipules free; indumentum often glandular Cicereae (*Cicer*–exotic)
5. Leaves pinnately or digitately 3-foliolate; stipules more or less adnate to petiole; indumentum not glandular XI. **Trifolieae**
4. Leaflet entire or rarely toothed, if so, nerves looped within the margins; indumentum medifixed or T-shaped hairs
6. Leaves paripinnate or digitately 2–4-foliolate, sometimes terminated by a tendril or a bristle; leaflets opposite, rarely alternate
7. Leaves terminated by a tendril. Seeds without a radicular lobe Vicieae (*Lathyrus*, *Lens*, *Pisum*, and *Vicia*–exotic)
7. Leaves terminated by a bristle or without any projection. Seeds with a radicular lobe
8. Pod jointed, articulate, or sometimes developed underground. Stipules peltate or as appendages, persistent, sometimes adnate to the petiole X. **Aeschynomenae**
8. Pod neither jointed nor articulate. Stipules not peltate nor as appendages, caducous
9. Trees, shrubs or erect herbs. Inflorescence elongate, often pendulous. Stamens diadelphous, 9+1. Pod linear, terete V. **Sesbanieae**
9. Climbing herbs or woody climbers, sometimes scandent. Flowers usually fasciculate at nodes of leafless branches or in leaf-axils; sometimes crowned at top in an erect inflorescence. Stamens 9, monadelphous. Pod oblong, flat III. **Abreae**
6. Leaves simple, uni-foliolate, imparipinnately 3–many-foliolate, or sometimes digitately 3(–7)-foliolate
10. Anthers gland-tipped or apiculate; indumentum medifixed or T-shaped hairs VI. **Indigoferae**
10. Anthers neither gland-tipped nor apiculate, if so, indumentum simple
11. Fruit drupaceous. Wing and keel petals similar XIII. **Euchrestae**
11. Fruit distinctly 2-valved pod. Wing and keel petals different
12. Pod jointed when ripe and transversely septate, usually breaking up into 1-seeded segment, sutures rarely entire and opening downwards on one side, very rarely 1-seeded or inflated, if so, tertiary nerves of leaflets scalariform
13. Tertiary nerves of leaflets scalariform. Hooked hairs present at least on the inflorescence and pod VII. **Desmodieae**
13. Tertiary nerves of leaflets reticulate. Hooked hairs absent X. **Aeschynomenae** (in part *Ormocarpum*)
12. Pod not jointed, 1–many-seeded
14. Valves of pod very thin, papery like, 1(–2)-seeded. Inflorescence sometimes with greatly enlarged, papery boat-shaped bracts. Seeds with a radicular lobe longer than cotyledonally lobe VIII. **Lespedezeae**
14. Valves of pod thick, leathery or woody, usually many-seeded; rarely pericarp very thin, paper-like and one-seeded, if so, anthers open apically by a short longitudinal slit and valves of the pod distinctly coarse with densely fibrous nerves, or pod winged along the suture (s)
15. Leaves with opposite leaflets or sometimes digitate (*Phaseoleae* in part). Pod usually dehiscent (except samaroid)
16. Valves of pod either thick, woody or leathery; rarely pericarp thin, if so, pod winged or sharp-ridged along the suture (s), or climbing herbs with the secondary veins of leaflets closely paralleled. Leaves usually with many leaflets; leaflets with reticulate venation IV. **Tephrosieae**

16. Valves of pod thin, often fleshy; rarely thick, if so, one-seeded samaroid or pod with irritant bristle hairs, neither winged nor sharp-ridged along the suture (sometimes pod winged) on the surface but not along the suture IX. Phaseoleae
15. Leaves with alternate leaflets. Pod indehiscent, valves distinctly coarse and densely fibrous-nerved on the surface over the seed cavity; if valves smooth, paper-like, anthers open apically by a short longitudinal slit II. Dalbergieae

I. SOPHOREAE Sprengel (1818). Figure 1–2.

Trees or shrubs, rarely herbs. Leaves pinnately 1–many-foliolate, sometimes stipulate. Flowers in panicle or racemes; stamens (9–)10, free or jointed at the very base; anthers $\pm$ similar; ovary 1–many-ovulate; style glabrous at least on the upper part. Fruits various, but not jointed, dehiscent or not. Seeds oblong-reniform, oblong-ellipsoid to globose; hilum small, sometimes arillate; radicle short.

Forty-seven genera, mostly in the tropical regions; two genera in Thailand.

KEY TO THE GENERA

1. Stigma terminal. Calyx caducous in fruit
2. Calyx-teeth shorter than the tube or obscure. Pod moniliform (Figure 1) Sophora
2. Calyx-teeth longer than the tube. Pod flat, oblong or strap-shaped. Ceylon (type); Malesia: S. Sumatra, Borneo, Celebes, Talaud Is., Philippines, New Guinea and Micronesia; expecting to be found in peninsular Thailand Pericopsis mooniana Thw.
1. Stigma lateral. Calyx persistent in fruit; teeth as long as or longer than tube (Figure 2) Ormosia

II. DALBERGIEAE Bronn. ex DC. (1825). Figure 3.

Trees, shrubs, scandent or woody climbers. Leaves imparipinnate with alternate leaflets, rarely 1–3-foliolate. Flowers in panicle or racemes; bracts and bracteoles small, more or less caducous; calyx 5-toothed; standard generally without callus; keel petals generally adnate on lower side, obtuse, not interlocked with wings; stamens 10, monadelphous or diadelphous; anthers $\pm$ uniform; style glabrous above; stigma small. Pod with 1–few-seeded, indehiscent, usually with strong massive fibrous over the seed-chambers, often winged. Seeds globose to oblong-reniform, usually with thin testa; radicle short, straight or curved.

Nineteen genera, mainly confined to tropical America; two genera in Thailand.

KEY TO THE GENERA

1. Anthers basifixed, opened apically by a short longitudinal slit. Pod oblong or linear, sometimes falcate. Seeds serially arranged, when more than one seed (Figure 3: 1) Dalbergia
1. Anthers dorsifixed, opened by a slit lengthwise. Pod a rounded samaroid. Seeds grouped in the central part of the pod (Figure 3: 2) Pterocarpus

III. ABREAE (Wight & Arn.) Hutch. (1964). Figure 4.

Climbing herbs or woody climbers, rarely scandent shrubs. Leaves paripinnate; leaflets numerous, opposite. Flowers usually fasciculate at nodes of leafless twigs or in leaf-axils, or sometimes crowded at top of erect pseudoracemes; bracts and bracteoles small; calyx subtruncate to shortly toothed; standard shortly clawed, with small inflexed auricles; keel petals shallowly falcate, abaxially adnate, interlocked with wings; stamens 9, monadelphous; anthers uniform; style glabrous. Pod flat, compressed, more or less septate, dehiscent. Seeds subglobose to ellipsoid, sometimes bright red with black spot at the small hilum.

A pantropical monotypic genus (*Abrus*). Figure 4.

IV. TEPHROSIEAE (Benth.) Hutch. (1964). Figure 5–6.

Trees, shrubs or rarely climbing herbs. Leaves usually imparipinnate, rarely 1–3-foliolate or digitately 3-foliolate; leaflets opposite; stipels often present. Flowers in panicle, or in pseudoracemes, sometimes in terminal racemes, rarely 1–2-flowered in leaf-axils and in axillary racemes; calyx various, usually campanulate, 4–5-toothed or lobed, sometimes truncate; standard with or without callus; wings free or adnate to keel; stamens monadelphous or diadelphous; anthers uniform; ovary 2–many-ovulate; style glabrous or hairy; stigma terminal, capitate. Pod various, ± dehiscent, woody or coriaceous. Seeds various-shaped, flat or round in cross section; radicle straight or curved.

About fifty genera mainly in tropical regions, six genera native to Thailand.

KEY TO THE GENERA

1. Inflorescence paniculate, rarely racemose, if so, terminal, subterminal or leaf-opposed; very rarely 1–2-flowered in leaf-axils, if so, venation of leaflets close and parallel
2. Flowers in terminal, subterminal or leaf-opposed racemes, rarely 1–2-flowered in leaf-axils
 3. Bracts and bracteoles large, equal or longer than flowers, enveloping flowering buds. Pod woody, with sculptured valves **Afgekia**
 3. Bracts and bracteoles small. Pod leathery (Figure 5: 4) **Tephrosia**
2. Flowers in a panicle, either long or short branching
 4. Anthers opened transversely by a slit at the apex. Standard petal narrowly obovate or spatulate. Pod inflated (Figure 5: 1) **Antheroporum**
 4. Anthers opened lengthwise. Standard petal oblong, orbicular to reniform; often with cordate or auriculate base
 5. Pod thick, woody or leathery, dehiscent; sutures unwinged (Figure 6) **Millettia** (including *Callerya*, *Fordia* and *Padbruggea*)
 5. Pod papery to thin, leathery, indehiscent; suture (s) winged (Figure 5: 2) **Derris**
1. Inflorescence racemose or pseudoracemose, in leaf-axils, or at leaf scars of old branches
 6. Pod oblong, with a distinct sharp edge along upper suture when young. Plant along sea coast (Figure 5: 3) **Pongamia**
 6. Pod linear, with blunt edge on both sutures (native of S. America) **Gliricidia sepium** (Jacq.) Walp.

V. **SESBANIEAE** Hutch. (1964).

Herbs, rarely shrubs. Leaves paripinnate, imparipinnate, 1-foliolate or simple; stipules present; stipels present or absent. Flowers in axillary racemes or rarely single or few in leaf-axils; calyx truncate or 5-toothed; standard petal orbicular, ovate, or reniform, reflexed, with basal appendages, callus or inflexed auricles; wings free from keel; stamens monadelphous or diadelphous; anthers uniform; ovary stipitate with many ovules; style sometimes hairy above or penicillate below the small, terminal stigma. Pod mostly with partition between the seeds. Seeds ovoid to oblong-reniform or oblong with small round hilum; radicle at most incurved.

Five genera mainly in tropical America; one genus in Thailand (*Sesbania*).

VI. **INDIGOFERAE** (Benth.) Rydp. (1923). Figure 7.

Herbs or less often shrubs; indumentum medifixed (T-shaped) hairs. Leaves imparipinnate, rarely 3-foliolate, digitate, uni-foliolate or simple; leaflets opposite or alternate, entire or toothed; stipels present or absent. Flowers usually in axillary racemes; petals generally caducous just after explosive release of pollens; stamens monadelphous or diadelphous; anthers uniform, apiculate or gland-tipped. Pod generally septate, usually dehiscent, rarely turgid and indehiscent. Seeds globular to rectangular; hilum small; cotyledons unequal, the radicle oblique.

Four genera, mostly in tropical regions; one native and one exotic to Thailand.

KEY TO THE GENERA

1. Margin of leaflet serrate. Stamens monadelphous. Pod broad, flat, with longitudinally ridge at a distance below the suture **Cyamopsis**
1. Margin of leaflet entire. Stamens diadelphous. Pod mostly cylindric, rarely laterally compressed (Figure 7) **Indigofera**

VII. **DESMODIEAE** (Benth.) Hutch. (1964). Figure 8–10.

Shrubs or often herbs, rarely trees. Leaves pinnately 3(–9)-foliolate, rarely 1-foliolate; tertiary venation of leaflets often scalariform; stipules mostly striated; stipels generally present. Flowers generally in terminal or axillary pseudoracemes, rarely panicle or racemes; calyx 5-toothed, sometimes 2-lipped; petals caducous just after explosive release of pollen; stamens 10, monadelphous or diadelphous; anthers uniform; style glabrous on the upper part. Pod transversely jointed or articulate, hooked hairs present, many-seeded, rarely one-seeded, usually breaking up into 1-seeded segment; sutures rarely entire and opening along one side. Seeds with a well-developed radicular lobe; hilum small.

Twenty-seven genera, mainly in tropical regions; 13 genera in Thailand.

KEY TO THE GENERA

1. Calyx greatly enlarged, membranous, hyaline-like after anthesis. Pod folded at the article between the seeds and included within the calyx (Figure 8: 2) **Christia**

1. Calyx not much enlarged after anthesis; pod exerted
 2. Calyx glumaceous, striated with strong nerves proliferated from base of the lobes (Figure 8: 1) **Alysicarpus**
 2. Calyx not glumaceous
 3. Pod inflated, many-seeded, straight (Figure 9: 10) **Pycnospora**
 3. Pod compressed, flat, one to many-seeded, in the latter case usually transversely jointed or articulated
 4. Leaves fused, forming a primary bract-like, composed of two lateral suborbicular or elliptic leaflets, and with a subulate terminal one, enveloping a subumbellate or short-branched inflorescence (Figure 9: 9) **Phyllodium**
 4. Leaves not fused
 5. Stipules united, 3-fid, sheathing stem (Figure 8: 6) **Dicerma**
 5. Stipules free, entire, not 3-fid
 6. Petioles broadly winged; leaves 1-foliolate (Figure 9: 11) **Tadehagi**
 6. Petioles unwinged; leaves (1-)3-5(-7)-foliolate
 7. Inflorescence umbellate, axillary; flower solitary in one primary bract (Figure 8: 4) **Dendrolobium**
 7. Inflorescence terminal or leaf-opposed, varied; flowers rarely solitary in one primary bract
 8. Inflorescence short; flowers crowded in dense heads or oblong racemes; pedicels hookedly inflexed at the apex and inversting the flowers. Fruit with a very long stipe, nesting within a group of bracts (Figure 9: 8) **Mecopus**
 8. Inflorescence elongate, pedicels straight or slightly curved. Pod not nesting in the bracts
 9. Calyx lobes very narrow with long subulate to acicular (needle-like) apex. Pod folded between the seeds; stalk $\pm$ hooked (Figure 9: 12) **Uraria** (including *Urariopsis*)
 9. Calyx lobes triangular, with acute to acuminate apex. Pod straight, falcate, rarely folded between the seeds
 10. Lateral leaflets only half the size of the terminal one. Inflorescence conical when young due to the imbricate large bracts. Pod not distinctly jointed between the seeds, dehiscing along the lower suture (Figure 8: 3) **Codariocalyx**
 10. Lateral leaflets $\pm$ equal and similar to the terminal one. Pod different from above
 11. Stipules much wider than stem, cordate, with auriculate base. Flower solitary in one primary bract. Pod nearly entire on both sutures (Figure 10) **Murtonia**
 11. Stipules narrower than stem, if not, triangular with truncate base. Flowers 2-many per one primary bract
 12. Pod longly articulated and folded between the seeds (Figure 9: 7) **Hegnera**
 12. Pod straight or falcate, transversely jointed between the seeds (Figure 8: 5) **Desmodium**

VIII. LESPEDEZAE Hutch. (1964). Figure 11.

Shrubs, subshrubs or herbs. Leaves (1-)3-foliolate; leaflets with reticulated venation; stipels usually absent. Flowers in axillary fascicles, racemes or terminal racemes, panicle or capitate; calyx 5-toothed, 2-lipped; standard petal often with inflexed auricles; stamens 10, monadelphous or diadelphous; anthers uniform; style glabrous on the upper part. Pod 1(-2)-seeded; pericarp very thin, paper-like. Seeds with a well-developed radicular lobe; hilum small.

Five genera, mainly in tropical regions; three genera in Thailand.

KEY TO THE GENERA

1. Flowers subtended by greatly enlarged, papery, boat-shaped bracts; standard with a pair of callous-like above auricle-flaps. Climbers (Figure 11: 3) **Phylacium**
1. Flowers not subtended by greatly enlarged bracts; standard without callouses. Erect herbs or shrubs

- 2. Keel petals straight, blunt; anthers apiculate or gland-tipped; bract subtending 2 flowers; bracteoles persistent (Figure 11: 2) **Lespedeza**
- 2. Keel shallowly falcate, acute; anthers neither apiculate nor gland-tipped; bract subtending one flower; bracteoles early caducous (Figure 11: 1) **Campylotropis**

IX. PHASEOLEAE DC. (1825). Figure 12–25.

Predominantly twining, sometimes prostrate, or erect herbs, less often subshrubs, woody climbers or rarely trees. Leaves usually pinnately 3-foliolate, less commonly 1–9-foliolate, rarely digitate; leaflets entire, sometimes 3–5(–7) palminerves, and reticulate venation; stipules and stipels present. Inflorescence mostly pseudoraceme, nodose pseudoraceme or panicle; stamens 10, diadelphous (9+1) or monadelphous; ovary (1–)2–many-ovulate; style either apical or on lower part; stigma varied, terminal or sometimes lateral. Pod and seeds varied.

Eighty-four genera worldwide, mostly in tropical and subtropical regions; 38 genera in Thailand.

KEY TO THE SUBTRIBES

- 1. Petals differing considerably in length and width; standard much shorter than wings or wings much smaller than the other petals, or keel very small and much shorter than androecium and gynoecium **1. Erythrinae**
- 1. Petals subequal, if not, keel shorter than wings enveloping androecium and gynoecium; standard larger covering another petals
 - 2. Calyx and pod always with resinous gland. Leaves and other vegetative parts often with resinous gland **6. Cajaninae**
 - 2. Resinous gland absent
 - 3. Style expanded, flattened, sometimes beaked beyond stigma or circinating the stigma; stigma often lateral; style rarely terete, if so, then bearded with large, capitate or peltate stigma, and often with a ring of hairs **7. Phaseolinae**
 - 3. Style terete or subterete, unbearded; stigma generally small, terminal
 - 4. Standard petal with callous or appendage at base or sometimes at face, or base and face thickened; claw often strongly reflexed. Pod often ridged, winged or samaroid. Seeds with a prominent or large hilum. Inflorescence rachis generally distinctly nodose or reduced branches **2. Diocleinae**
 - 4. Standard petal without callous or appendage, base and face not thickened; claw generally erect. Inflorescence rachis rarely nodose or reduced branches
 - 5. Standard large covering keel and wings; bracteoles large **5. Clitoriinae**
 - 5. Standard not as above; bracteoles small
 - 6. Petals glabrous, rarely sparsely hairy; if so, stamens with 5 fertile, alternating 5 aborted anthers **3. Glycininae**
 - 6. Petals distinctly hairy; anthers all fertile **4. Ophrestiinae**

1. ERYTHRININAE Benth. (1837). Figure 12.

Leaves pinnately 3–many-foliolate, not gland-dotted. Inflorescence nodose or not. Petals much different in length and width, sometimes hairy; standard unappendaged. Ovary with erect or coiled style; stigma terminal, capitate or obsolete. Pod and seeds various.

Three genera indigenous in Thailand.

KEY TO THE GENERA

1. Standard petal as long as or shorter than keel. Herbaceous or woody climbers
 2. Standard petal much longer than wings. Anthers uniform. All vegetative parts and fruit without irritant bristle hair
 3. Keel petals boat-shaped with a long narrow beak. Style incurved but not coiled. Leaves 3-foliolate. (Exotic plant, native to the Philippines) *Strongylodon macrobotrys* A. Gray
 3. Keel petals lunate with an obtuse or rounded apex. Style coiled. Leaves (3–)5–7(–9)-foliolate (Figure 12: 1) **Apios**
 2. Standard much shorter than other petals. Anthers 5 longer anthers sub-basifixed, alternating 5 shorter versatile anthers. Calyx and fruit usually with irritant bristle hairs (Figure 12: 3) **Mucuna**
1. Standard petal much larger and longer than other petals; keel very small, much shorter than stamens and pistil. Trees or shrubs (Figure 12: 2) **Erythrina**

2. DIOCLEINAE Benth. (1837). Figure 13–16.

Leaves pinnately 3-foliolate, rarely 1 or 5-foliolate, not gland-dotted. Inflorescence often prominently nodose or paniculate. Standard petal often strongly reflexed against claw, with or without appendage. Ovary with glabrous style; stigma terminal, capitate. Pod varied, sometimes samaroid; seed varied, with or without aril.

Seven genera indigenous in Thailand.

KEY TO THE GENERA

1. Leaves uni-foliolate; branches 4-angled, ribbed with appressed, retrose hairs (Figure 13) **Nogra**
1. Leaves pinnately 3-foliolate
 2. Calyx with 2 upper lips much wider and longer than the lower 3. Stipules swollen at the insertion (Figure 16: 3) **Canavalia**
 2. Calyx not as above
 3. Terminal leaflet palminerved, 3–5(–7) nerves
 4. Ovary longer than the style. Pod terete, compressed or flattened. Inflorescence elongate panicle, with short or long side branches, and often longer than leaves; rachis coarse, often thicker than petiole (Figure 16: 5) **Pueraria**
 4. Ovary shorter than the style. Pod 4-angled. Inflorescence pseudoracemes, crowded, often shorter than leaves; rachis slender, thinner than petiole. Native to tropical America *Calopogonium mucunoides* Desv.
 3. Terminal leaflet pinnate venation
 5. Petals densely hairy outside; standard hairy on both surfaces
 6. Flowers 2–3 cm long. Petioles adaxially flat, and narrowly winged, 1–1.5 cm across (Burma, type) *Meizotropis buteiformis* Voigt
 6. Flowers 4.5 cm or more long. Petioles subterete, less than 5 mm across. Large woody climbers or trees (Figure 15: 1) **Butea**
 5. Petals glabrous or glabrescent; flowers 2 cm or less long. Herbs, scandent shrubs or woody climbers
 7. Climbing herb or suffrutescent climber (Figure 14) **Galactia**
 7. Woody climbers or scandent shrubs
 8. Standard petal without callous. Pod samaroid without irritating hairs. Stipules not elongated below the insertion (Figure 15: 2) **Spatholobus**
 8. Standard petal with prominently thick callous-like appendage at base. Pod compressed with irritating hairs. Stipules auriculate, elongated below the insertion (Figure 16: 4) **Dioclea**

3. GLYCININAE Benth. (1837). Figure 17–19.

Leaves pinnately (1–)3-foliolate, not gland-dotted. Inflorescence not or scarcely nodose. Petals glabrous, standard unappendaged. Ovary with glabrous style or sparsely hairy below stigma; stigma terminal, capitate. Seeds usually with small hilum, aril not developed or very small.

Six genera indigenous in Thailand.

KEY TO THE GENERA

1. Terminal leaflet palminerved, 3(–5) nerves
 2. Flowers $\pm$ 7 mm long. Calyx campanulate. Bracts and bracteoles persistent
 3. Stamens 5 fertile, alternating with 5 aborted. Pod abruptly curved at right angled or hooked at apex (Figure 17) **Teramnus**
 3. Stamens 10, all fertile. Pod not as above (Figure 18: 4) **Glycine**
 2. Flowers $\pm$ 15 mm long. Calyx tubular. Bracts and bracteoles persistent or very early caducous
 4. Calyx prominently gibbous dorsally at base, with obliquely truncate mouth; teeth obsolete. Bracts and bracteoles persistent (Figure 18: 3) **Dumasia**
 4. Calyx not gibbous; teeth distinct; bracts and bracteoles very early caducous or absent (Figure 18: 1) **Amphicarpaea**
1. Terminal leaflet pinnate venation
 5. Bracteoles large, enveloping flowers. The upper and the lower calyx teeth subequal (Figure 18: 2) **Diphellarium**
 5. Bracteoles much smaller than flowers. The upper calyx teeth much longer than the three lowers (Figure 19) **Shuteria**

4. OPHRESTIINAE Lackey (1977). Figure 20.

Leaves 1–9-foliolate, not gland-dotted. Inflorescence not or scarcely nodose. Standard scarcely reflexed against claw, hairy outside, unappendaged; other petals pubescent to glabrous. Ovary with glabrous style; stigma terminal, capitate. Seeds with prominent aril around the short hilum.

One genus (*Cruddasia*) in Thailand. Figure 20.

5. CLITORIINAE Benth. (1837). Figure 21.

Leaves usually 3-foliolate, rarely 1 or 5–9-foliolate, not gland-dotted. Inflorescence not or scarcely nodose. Standard large, hairy outside, unappendaged; other petals hairy to glabrous. Ovary with hairy style; stigma terminal. Pod and seeds varied, with or without aril around the hilum.

Two genera, one exotic and one indigenous in Thailand.

KEY TO THE GENERA

1. Calyx campanulate. Style spatulate. Native of Tropical America *Centrosema pubescens* Benth.

1. Calyx narrowly campanulate to tubular. Style clavate, thickened about half way up toward apex (Figure 21)
Clitoria

6. CAJANINAE Benth. (1837). Figure 22–24.

Leaves pinnately or digitately 3-foliolate, rarely uni-foliolate, often with resinous gland-dotted; calyx, ovary and pod always with resinous gland dots.

Seven genera indigenous in Thailand.

KEY TO THE GENERA

1. Leaves pinnately or digitately 3-foliolate
 2. Leaves digitately 3-foliolate. Stipules united and sheathing stem, leaving distinct scars around the node. Pod inflated (Figure 22: 3) **Flemingia**
 2. Leaves pinnately 3-foliolate. Stipules free not sheathing stem. Pod compressed
 3. Calyx-lobes greatly expanded and papery after flowering (Figure 23) **Paracalyx**
 3. Calyx-lobes not expanded after flowering
 4. Keel petals with a long distinct acute beak; the beak often strongly incurved and sometimes twisted. Standard often unequal-sided (Figure 22: 1) **Dunbaria**
 4. Keel petals with an undistinct or short blunt beak. Standard $\pm$ equal-sided
 5. Ovary 3–10-ovulate. Pod transversely grooved between the seeds. Seeds close to each other (Figure 24) **Cajanus**
 5. Ovary 1–2-ovulate. Pod not grooved between the seeds. Seeds rather distant (Figure 22: 4) **Rhynchosia**
1. Leaves uni-foliolate
 6. Stipules united and sheathing stem, leaving scars around the node. Pod inflated **Flemingia**
 6. Stipules free not sheathing stem. Pod flattened or lateral compressed (Figure 22: 2) **Eriosema**

7. PHASEOLINAE Benth. (1837). Figure 25.

Leaves 3-foliolate (in Thailand); leaflets palminerved, with 3–5(–7) nerves, not gland-dotted, rarely with uncinata hairs. Inflorescence nodose or not; bracteoles mostly present. Petals sometimes pubescent; standard often with 2(–4) or 1 large appendage on the face. Keel petals usually fused along the upper as well as the lower margin. Style bearded or pilose about the stigma, or flattened and ciliate, rarely unbearded and terete, sometimes inrolled or rotate about its axis; stigma terminal and lateral. Pod and seeds varied.

Ten genera, including cultivated plants, in Thailand.

KEY TO THE GENERA

1. Herbs with short, tufted, creeping branches. Fruits developing underground. Cultivated **Voandzeia subterranea** (Linn.) DC.
1. Long climbing, trailing or erect herbs, rarely with long creeping branches. Fruits not developed underground
 2. Leaflets irregularly dentate mucronate at margin. Style strap-shaped and circinating the stigma. Cultivated **Pachyrhizus erosus** (Linn.) Urb.
 2. Leaflets entire. Style different
 3. Keel petals with a long, linear, strongly incurved or coiled beak

4. Keel petals with a strongly coiled beak
 5. Calyx narrowly campanulate to tubular; standard petal erect, with a long claw. Stigma terminal, capitate
Macroptilium
 5. Calyx campanulate; standard petal reflexed, with a short claw. Style beak beyond stigma or stigma lateral
 6. Bracts and bracteoles elongated or short peltate base, early caducous; rachis of inflorescence often swollen or thickened throughout. Infructescence stalk not much different from the time at anthesis (Figure 25: 4)
Vigna
 6. Bracts and bracteoles neither elongated nor peltate base, persistent at least until anthesis and sometimes persisting and accrescent in fruit; rachis of inflorescence nodose at the insertion of pedicels. Infructescence stalk much thicker and longer than the time at anthesis
Phaseolus
4. Keel petals with a strongly incurved or sometimes slightly twisted beak
 7. Stigma terminating style. Stipules neither elongated nor peltate base
 8. Style gradually narrowing from base but thickened and bearded near the apex; stigma very small. Valves of pod thick, double septate between the seeds (Figure 25: 3)
Dysolobium
 8. Style slender but cylindric or clavate with a tuft of hairs quite a distance from apex; stigma capitate. Valves of pod thin and with a very thin soft tissue between the seeds (Figure 25: 2)
Dolichovigna
 7. Stigma lateral; style beaked beyond stigma. Stipules elongated or peltate base
Vigna
3. Keel petals with a short or blunt beak
 9. Style beaked beyond stigma. Inflorescence rachis generally swollen or thickened throughout
Vigna
 9. Style not beaked beyond stigma. Inflorescence rachis nodose at the insertion of pedicel or shortly branched
 10. Style thickened at base, gradually narrowing to the abruptly incurved apex, with a ring of hairs at tip. Stipules, bracts and bracteoles with an elongated or peltate base. Pod broadly 4-winged. Cultivated
Psophocarpus tetragonolobus (Linn.) DC.
 10. Style distinctly narrowed at base, at least at the junction of ovary tip and style base, beginning thickened or swollen from near base up to apex or clavate, hairy on the internal face or glabrous; stigma capitate or peltate
 11. Style glabrous; stigma peltate or broadly capitate, with a ring of hairs. Inflorescence usually shorter than leaves; peduncle cylindric or clavate; rachis with one rarely 2–3-flowered at a node. Pod linear; sutures entire (Figure 25: 1)
Dolichos
 11. Style hairy; stigma capitate without ring of hairs. Inflorescence often longer than leaves; peduncle thickened at base then gradually narrowing through the rachis end; rachis with many flowered at a node or sometimes shortly branched. Pod oblong; sutures undulate and verrucose along the upper one or both sides. Cultivated
Lablab purpureus (Linn.) Sweet

X. AESCHYNOMENAE (Benth.) Hutch. (1964). Figure 26.

Shrubs or herbs, sometimes scandent, rarely small trees. Leaves paripinnate rarely imparipinnate or digitate; leaflets 2-many, rarely 1, alternate or opposite. Stipules often appendiculate below the point of attachment and adnate to the petiole; stipels usually absent. Flowers in axillary or terminal raceme, panicle, fascicle or solitary; bracteoles present. Calyx campanulate, sometimes bilabiate, 4–5-toothed. Stamens 10, monadelphous or diadelphous; anthers usually uniform, rarely dimorphic. Style filiform, glabrous, with minute terminal stigma. Pod jointed, usually breaking into 1-seeded indehiscent segment; rarely developed underground and not jointed. Seeds reniform (except geocarpic pod with oblong seed), with a rather small radicular lobe and small lateral hilum.

Twenty-five genera worldwide, 6 native and 2 exotic in Thailand.

KEY TO THE GENERA

1. Leaves pinnately imparipinnate or odd-digitate, 3–many-foliolate
2. Leaves pinnately or digitately 3-foliolate; secondary nerves of leaflet close, straight and parallel, forming a

- graminaceous looking. Cultivated *Stylosanthes* spp.
2. Leaves pinnately 5–many-foliolate; secondary nerves of leaflet curved and distinctly pinnate-nerved (Figure 26: 4) *Ormocarpum*
1. Leaves pinnately paripinnate, or even digitate, 2–many-foliolate; leaflets opposite or alternate but without the terminal one
3. Leaflets 1–5 opposite pairs, rarely more
4. Stipules strongly adnate and forming wings along the proximal part of the petiole. Pod developed underground. Cultivated *Arachis hypogaea* Linn.
4. Stipules free from petiole, and peltate base
5. Bracts comparatively large, leaf-like, enclosing the flowers. Leaves with 1–2 pairs of leaflets
6. Flowers in interruptedly spicate inflorescence or solitary in leaf-axils. Bracts lanceolate acute, usually 2–3 times as long as the flower. Pod muricate (Figure 26: 6) *Zornia*
6. Flowers in dense head-like inflorescence, covered by a group of large rounded or reniform, imbricate bracts. Pod smooth or reticulate (Figure 26: 3) *Geissaspis*
5. Bracts smaller than flower. Calyx deeply 2 lips, bracteole like or glumaceous looking. Leaves usually with more than 3 pairs of leaflets
7. Pod coiled into a ring, much exerted calyx, the article breaking off, leaving the persistent sutures (Figure 26: 2) *Cyclocarpa*
7. Pod floded at the article between the seeds and enclosed by the enlarge calyx (Figure 26: 5) *Smithia*
3. Leaflets numerous, alternate but without a terminal one. Stipules appendaged at base (Figure 26: 1) *Aeschynomene*

XI. TRIFOLIEAE (Bronn) Benth. (1865). Figure 27–28.

Annual or perennial herbs, rarely shrubs. Leaves pinnately or digitately 3-foliolate; veins of leaflet usually extended to the teeth on the margins. Stipules more or less adnate to petiole. Flowers few to many in axillary racemes sometimes capitate or spicate, or solitary. Bracts usually present; bracteoles absent. Calyx campanulate, 5-toothed. Stamens 10, diadelphous or monadelphous; anthers $\pm$ uniform. Style glabrous; stigma terminal, capitate. Pod various, straight, falcate, spirally coiled or ovate, included or exerted from calyx, dehiscent or indehiscent. Seeds various.

Seven genera worldwide, mainly in Europe, 2 native and 2 exotic in Thailand.

KEY TO THE GENERA

1. Leaves digitately 3-foliolate
2. Stipules large, membranous, strongly adnate to petiole. Leaflets distinctly serrate. Flowers many in head. Cultivated *Trifolium*
2. Stipules small, slightly adnate to petiole. Leaflets entire or weakly serrulate. Flowers solitary or in an umbel of 2–3-flowered on long axillary peduncle (Figure 27) *Parochetus*
1. Leaves pinnately 3-foliolate; leaflets toothed or serrate
3. Fruits coiled, spiny. Cultivated *Medicago*
3. Fruits not coiled, nutlet-like, with sculpture surfaces (Figure 28) *Melilotus*

XII. CROTALARIEAE (Benth.) Hutch. (1964). Figure 29.

Shrubs or herbs. Leaves simple, digitately 3–7-foliolate or rarely uni-foliolate. Flowers in terminal, subterminal, leaf-opposed or less often axillary, racemes or heads,

sometimes solitary or aggregated into leafy pseudoracemes. Bracts and bracteoles small. Calyx often bilabiate, 5-toothed. Standard sometimes with basal callous-like appendage; wings often with scaly patterns; keel obtuse, pointed or beaked. Stamens 10, monadelphous, sheath open on upper side; anthers dimorphic, alternately basifixed and shorter dorsifixed. Style glabrous or with 1–2 lines of hairs. Pod turgid, rarely flat. Seeds usually oblique-cordiform, less often reniform; radicular lobe usually prominent; hilum small; rim aril sometimes conspicuous.

Sixteen genera worldwide, one native and one cultivated in Thailand.

KEY TO THE GENERA

1. Stamens with 5 long alternating 5 short anthers. Upper part of style with 1–2 rows of hairs. Pod turgid (Figure 29) **Crotalaria**
1. Stamens with 4 long alternating 6 short anthers. Upper part of style glabrous. Pod flat. Cultivated **Lotononis**

XIII. EUCHRESTEAE (Nakai) Ohashi (1973). Figure 30.

Shrubs or subshrubs. Leaves imparipinnate. Stipules small, early caducous; exstipulate. Flowers in terminal leaf-opposed racemes. Bracts small; bracteoles absent. Calyx tubular, gibbous at base, with 5 short teeth. Standard narrowly obovate to oblong, tapered to claw, not strongly reflexed; wings and keel not much differentiated. Stamens 10, diadelphous; anthers uniform. Ovary long stipitate, usually 2-ovulate; style slender, glabrous. Fruit fleshy, ellipsoid, indehiscent, 1-seeded. Testa membranous, adherent to fruit wall; radicle small, straight.

A monotypic genus in South-East and East Asia.

ARTIFICIAL KEY TO THE GENERA

1. Leaves simple (a single leaf without stipel) or uni-foliolate (a single leaf with stipel) **Key A**
1. Leaves compound, 2–many-foliolate
 2. Leaves either odd-pinnate or digitate with unpaired leaflets
 3. Leaves digitate; leaflets unpaired **Key B**
 3. Leaves odd-pinnate (imparipinnate)
 4. Leaves pinnately 3-foliolate, lateral leaflets opposite **Key C**
 4. Leaves pinnately 5–many-foliolate, rarely 3-foliolate, if so, scandent shrubs or woody climbers and leaflets alternate **Key D**
 2. Leaves either paripinnate with many leaflets or digitate with 2 or 4 leaflets, sometimes terminated with a tendril or a bristle **Key E**

KEY A

(Leaves simple or uni-foliolate)

1. Leaves simple or seemingly simple, without stipel; petiole very short
2. Pod flattened. Calyx and ovary dotted by resinous glands. Root tuberous. Indumentum simple **Eriosema**
2. Pod terete or nearly so, without resinous gland. Vegetative parts with or without medifixed hairs; root not tuberous

- 3. Stipules adnate to petiole; medifixed hairs present. Bracteoles absent. Anthers uniform, gland-tipped or apiculate. Pod septate between the seeds **Indigofera**
- 3. Stipules free from petiole; medifixed hairs absent. Bracteoles present. Anthers dimorphic. Pod inflated or turgid, continuous **Crotalaria**
- 1. Leaves pinnately uni-foliolate, with stipel; petiole long
 - 4. Leaflets obcordate, kidney- or fan-shaped; apex broadly rounded, truncate or retuse
 - 5. Pod folded at the article between the seeds, nesting within the membranous hyaline enlarge calyx **Christia**
 - 5. Pod usually straight or falcate, jointed, sinuate at lower side, exerted the calyx
 - 6. Inflorescence short; flowers crowded in dense heads or oblong terminal racemes; pedicels hookedly inflexed at the apex and inverting the flowers. Pod with a very long stipe, nesting within a group of bracts **Mecopus**
 - 6. Inflorescence elongate, lax; pedicels straight or slightly curved. Pod sessile or shortly stipitate, not nesting in the bracts **Desmodium**
 - 4. Leaflets not as above, apex acute
 - 7. Petioles broadly winged. Pod oblong, jointed, sinuate **Tadehagi**
 - 7. Petioles unwinged. Pod jointed or turgid
 - 8. All parts especially leaves and calyx with resinous gland dots. Pod short, oblong, inflated **Flemingia**
 - 8. All parts without resinous gland
 - 9. Pod jointed or articulate between the seeds. Hooked hairs present
 - 10. Calyx scariously striate; teeth glumaceous. Pod subterete, straight **Alysicarpus**
 - 10. Calyx not as above, fleshy, herbaceous or membranous
 - 11. Calyx teeth very narrow with long subulate to needle like or acicular apex. Pod folded at the article between the seeds **Uraria**
 - 11. Calyx teeth broad, generally triangular with acute to acuminate apex. Pod straight or falcate **Desmodium**
 - 9. Pod entire not jointed nor constricted. Hooked hairs absent
 - 12. Erect or ascending herbs very rarely small shrubs
 - 13. Stipules fleshy or herbaceous, adnate to petiole; indumentum of medifixed hairs. Petals equal; anthers apiculate or gland-tipped **Indigofera**
 - 13. Stipules scarious, free from petiole; indumentum of simple hairs. Standard petals much longer than wings and keel **Clitoria**
 - 12. Climbing or trailing herbs; stipels caducous **Nogra**

KEY B

(Leaves digitately compound; leaflets unpaired)

- 1. Leaves digitately 3-foliolate
 - 2. Stipules large, membranous, strongly adnate to petiole
 - 3. Leaflets entire, narrow, graminaceous. Inflorescence few-flowered. Pod jointed **Stylosanthes**
 - 3. Leaflets broad, serrate, not graminaceous. Inflorescence head like, many-flowered. Pod entire **Trifolium**
 - 2. Stipules small, free or shortly adnate to petiole
 - 4. Creeping herb, rooting at nodes; stem very slender, glabrous or glabrescent. Leaflets sometimes obscurely serrulate. Flowers solitary or in 2–3-flowered umbel on a long axillary peduncle **Parochetus**
 - 4. Small erect shrubs or perennial herbs
 - 5. Stipules united, sheathing stem when young
 - 6. Stipules bifid, often separate at maturity. Leaves and calyx with resinous gland-dots; terminal leaflet with palmate reticulate venation, having 3–5(–7) main nerves at base. Pod inflated **Flemingia**
 - 6. Stipules 3-fid. Leaves and calyx without resinous gland; terminal leaflet with pinnate reticulate venation. Pod jointed **Dicerma**
 - 5. Stipules free from each other. Vegetative parts without resinous gland. Terminal leaflet with pinnate reticulate venation
 - 7. Indumentum of medifixed hairs. Anthers uniform, with apiculate or gland-like tip. Pod septate between the seeds **Indigofera**

- 7. Indumentum of simple hairs. Anthers dimorphic without apiculate or gland-like tip
- 8. Upper part of style with 1–2 rows of hairs. Pod inflated or turgid **Crotalaria**
- 8. Upper part of style glabrous. Pod flat **Lotononis**
- 1. Leaves digitately 5–many-foliolate. Stamens monadelphous; anthers dimorphic. Pod inflated
- 9. Leaves with 5–7-foliolate; stipules free from petiole **Crotalaria**
- 9. Leaves with (5–7–)17 or more leaflets; stipules adnate to petiole **Lupinus**

KEY C

(Leaves imparipinnate with 3 leaflets, the lateral one opposite)

- 1. Terminal leaflet with palmate reticulate venation, having 3–7 main nerves at base
- 2. Petals subequal in length. Annual or short-lived perennial herbs, rarely small woody climbers
- 3. All parts with resinous glands
- 4. Calyx-lobes greatly expanded and papery after flowering **Paracalyx**
- 4. Calyx-lobes not expanded after flowering
- 5. Keel petals with a long distinct acute beak; beak often strongly incurved and twisted; standard often with unequal-sided limb **Dunbaria**
- 5. Keel petals with an undistinct or short, blunt beak; standard petal with $\pm$ equal-sided limb
- 6. Ovary 3–many-ovulate. Pod transversely grooved between the seeds; seeds closely lying in a row **Cajanus**
- 6. Ovary 1–2-ovulate. Pod not transversely grooved; seeds rather distant **Rhynchosia**
- 3. All parts without resinous gland
- 7. Keel petals with a distinct, long sometimes coiled or twisted beak, rarely blunt, if so, style expanded, flattened, sometimes beaked beyond the stigma or circinating the stigma. Style rarely tereted, if so then bearded or stigma large capitate or peltate and often with a ring of hairs
- 8. Herb with short, tufted, creeping branches. Fruit developed underground **Voandzeia subterranea** (Linn.) DC.
- 8. Long climbing, trailing or erect herbs, sometimes with long creeping branches. Fruit rarely developed underground
- 9. Leaflets irregularly dentate mucronate at margin; style strap-shaped and circinating the stigma **Pachyrhizus erosus** (Linn.) Urb.
- 9. Leaflets with entire margin; style of ovary different
- 10. Keel petals with a long linear, either strongly incurved or coiled beak
- 11. Keel petals with a strongly coiled beak
- 12. Calyx narrowly campanulate to tubular. Standard petal with a long claw, $\pm$ erect or slightly reflexed. Stigma terminal capitate **Macroptilium**
- 12. Calyx with a short campanulate tube. Standard petal with a short claw and usually strongly reflexed. Style beaked beyond stigma or stigma lateral
- 13. Bracts and bracteoles neither elongate nor peltate at base, persistent at least until anthesis and sometimes persisting in fruit. Stalk of infructescence much thicker and longer than the time at anthesis; rachis nodose at the insertion of pedicel **Phaseolus**
- 13. Bracts and bracteoles elongate or peltate at base, very early caducous. Rachis of inflorescence often swollen and thicken throughout. Stalk of infructescence not much different from the time at anthesis **Vigna**
- 11. Keel petals with an incurved or sometimes slightly twisted beak
- 14. Stigma terminating style. Stipules neither elongate nor peltate at base
- 15. Style gradually narrowing from base but thickened and bearded near the apex; stigma very small. Valves of pod thick and with thick double septate between the seeds. Seeds round, globose or subglobose **Dysolobium**
- 15. Style slender, cylindric or clavate with a tuft of hairs quite a distance from apex; stigma capitate. Valves of pod thin and with thin soft tissue between the seeds **Dolichovigna**
- 14. Stigma lateral; style beaked beyond stigma. Stipules with an elongate or peltate base **Vigna**
- 10. Keel petals with a short or blunt beak

16. Style beaked beyond stigma. Inflorescence rachis generally swollen or thickened throughout
Vigna
16. Style not beaked beyond stigma. Inflorescence rachis nodose at insertion of the pedicels
17. Style thickened at base, gradually narrowing to the abruptly incurved apex, with a ring of hairs at tip. Stipules, bracts and bracteoles with an elongate or peltate base. Pod broadly 4-winged
Psophocarpus tetragonolobus (Linn.) DC.
17. Style distinctly narrowed or constricted at base, at least at the junction of ovary and style, thickened or swollen from near the base up to apex or clavate; stigma capitate or peltate
18. Style glabrous; stigma peltate or broadly capitate, with a ring of hairs. Inflorescence stalk cylindric or clavate; rachis with one, rarely 2–3-flowered at the nodes. Pod linear; sutures entire
Dolichos
18. Style hairy; stigma small capitate, without hairs. Inflorescence stalk thickened at base then gradually narrowing through rachis end; rachis with many-flowered at a node or sometimes shortly branched. Pod oblong, undulate and verrucose along either the upper or both sutures
Lablab purpureus (Linn.) Sweet
7. Keel petal unbeaked or very rarely shortly beaked. Style terete or subterete, pubescent or ciliate but unbearded; stigma small
19. Anthers 5 fertile, alternating 5 aborted. Pod abruptly curved at right angle or hooked by a persistent style at apex
Teramnus
19. Anthers 10, all fertile
20. Calyx tubular; claw of wing and keel petals distinctly longer than the limb. Ovary always shorter than the style
21. Calyx prominently dorsally gibbous at base, obliquely truncate at mouth; teeth obsolete. Bracts and bracteoles persistent
Dumasia
21. Calyx not as above; teeth distinct. Bracts and bracteoles absent or very early caducous
Amphicarpaea
20. Calyx campanulate, claw of wing and keel petals much shorter than the limb; rarely narrowly campanulate and claw of wing and keel petals equal the limb, if so, ovary longer than the style
22. Style, filiform, longer than the ovary. Pod linear, 4-angled
Calopogonium mucunoides Desv.
22. Style thick equalling or shorter than ovary. Pod flattened or laterally compressed
23. Flowers less than 7 mm long; corolla equal or slightly longer than calyx; standard petal erect. Ovary elliptic to oblong or narrowly oblong
Glycine
23. Flower more than 7 mm long, rarely smaller, if so, corolla much exerted calyx; standard petal strongly reflexed. Ovary linear
Pueraria
2. Petals differing considerably in width and length; standard much shorter than wings; wings much smaller than standard and keel; keel very small and much shorter than androecium and gynoecium. Trees, shrubs or woody climbers, rarely climbing herbs or suffrutescent, if so, keel lunate and the style coiled or pod with irritant bristle hairs
24. Standard petal as long as or shorter than the keel
25. Standard much longer than the wings. All vegetative parts and fruit without irritant bristle hairs
26. Keel petals boat-shaped with a long narrow beak. Style incurved but not coiled. Native of the Philippines
Strongylodon macrobotrys A. Gray
26. Keel petals lunate, obtuse or round apex. Style coiled
Apios
25. Standard much shorter than wings and keel. Calyx and fruit usually with irritant bristle hairs
Mucuna
24. Standard petal much wider and longer than the other petals. Stamens and ovary much exerted the keel
Erythrina
1. Terminal leaflet with pinnate reticulate venation
27. Resinous gland dots present on calyx, pod and vegetative parts
Cajanus
27. Resinous gland absent
28. The upper calyx lobes much wider and longer than the lower. Stipules thickened or swollen at the insertion
Canavalia
28. Calyx lobes subequal in width. Stipules not thickened nor swollen at the insertion
29. Bracteoles larger than and completely enveloping the flowers. Upper and the lower calyx teeth much

longer than the lateral ones

Diphyllarium

29. Bracteoles smaller than the flowers

30. Petals differing considerably in width and length: standard much shorter than wings; wings much smaller than standard and keel; and keel much shorter than androecium and gynoecium

31. Standard petal much longer and larger than other petals. Androecium and gynoecium much exerted keel. Trees or shrubs **Erythrina**

31. Standard petal as long as or shorter than the keel. Herbaceous or woody climbers

32. Standard petal much shorter than the other petals; keel distinctly beaked or with a sharply pointed apex. Calyx and fruit usually with irritant bristle hairs. Climbing, trailing herbs or woody climbers **Mucuna**

32. Standard petal as long as or shorter than the keel but much longer than the wings. Keel obtuse, rounded at apex. Style coiled near the apex. All vegetative parts and fruit without irritant hairs **Apios**

30. All petals generally subequal in length, if not, the keel is shorter than the wings; standard petal largest covering the other petals

33. Petals distinctly hairy. Pod samaroid or not

34. Large woody climbers, big shrubs or trees. Flowers 4.5 cm or more long, all petals hairy. Pod samaroid **Butea**

34. Annual, perennial or suffrutescent climbing, trailing or small shrubs. Flowers 3.5 cm or less long

35. Petiole coarse, 1–1.5 cm or more thick when dry, adaxial flattened with very prominently angular ribbed or wing-like; leaflets up to 47.5 by 35 cm. All petals densely hairy; standard densely hairy on both sides. Pod samaroid (India, type; Burma)

Meizothopis buteiformis Voigt

35. Petiole 2–3 mm or less thick when dry, not ribbed or wing-like. Standard petal hairy outside, glabrous inside, the other petals generally glabrous, rarely all petals hairy

36. All petals subequal. Style thickened at base, gradually narrowing to near the apex, glabrous or with a few scattered hairs

37. Flowers 1 cm or less long. Ovary flat, longer than the style. Pod flat with thin valves **Cruddasia**

37. Flowers over 1.5 cm long. Ovary subterete, shorter than the style. Pod with thick valves **Millettia**

36. Standard larger than and covering other petals; wings larger than keel. Style thickened from about half way or above the upper half to the apex, pubescent or ciliate along inner face or at the apex

38. Calyx campanulate. Style spatulate. Pod linear with 4 wide, raised nerves along the sutures **Centrosema pubescens** Benth.

38. Calyx tubular or narrowly campanulate. Style clavate. Pod narrowly oblong, sometimes with narrow longitudinal ribs below upper suture **Clitoria**

33. Petals glabrous or nearly so

39. Woody climbers, large scandent shrubs or sometimes trees

40. Standard petal without callous

41. Calyx-teeth distinct, usually more than half as long as the tube. Pod woody, thick leathery or samaroid

42. Petal equalling or slightly exerted calyx; claw of standard included in the calyx tube. Pod samaroid **Spatholobus**

42. Petals much exerted calyx; claw of standard equalling or slightly exerted calyx. Pod not samaroid; sutures thick

43. Standard petal oblong, orbicular or broadly ovate, with rounded or auriculate base. Anthers opened lengthwise by longitudinal slit. Pod $\pm$ compressed **Millettia**

43. Standard petal narrowly obovate to spatulate, without auricle at base (base cuneate). Anthers opened by a transverse slit at the apex. Pod inflated **Antheroporum**

41. Calyx teeth shallowly dentate or obscure. Petals much exerted calyx; claw of standard equalling or exerted calyx. Pod normally with sharp ridges or narrow wings along the sutures; valves papery to coriaceous **Derris**

40. Standard petal with thick callous at base. Pod thick-valved, with irritant bristle hairs **Dioclea**
39. Erect, ascending, trailing herbs or suffrutescent, rarely small shrubs
44. Calyx 4-toothed due to the upper 2 calyx-teeth completely jointed; calyx-tube distinctly shorter than the teeth. Ovary including style much shorter than the staminal tube at the time of anthesis **Galactia**
44. Calyx usually 5-toothed, the upper 2 calyx-teeth free or sometimes only partly jointed; calyx rarely 4-toothed, if so, the tube much longer than the teeth or calyx tubular. Style as long as stamens at anthesis
45. Stipules adnate to the pulvinous of the petiole
46. Leaflet-margins toothed or serrate
47. Indumentum of medifixed (T-shaped) hairs. Anthers apiculate or gland-tipped
***Cyamopsis tetragonoloba* (Linn.) Taub.**
47. Indumentum of simple hairs. Anthers neither apiculate nor gland-tipped
48. Fruit coiled, spiny ***Medicago sativa* Linn.**
48. Fruit not coiled, nutlet-like, with sculptured surfaces **Melilotus**
46. Leaflet-margins entire
49. Secondary veins of leaflets close, straight and parallel, graminaceous; indumentum simple. Pod jointed ***Stylosanthes***
49. Secondary veins of leaflets distinctly pinnate-nerved; indumentum of medifixed (T-shaped) hairs; pod not jointed **Indigofera**
45. Stipules free from the petiole, often striate or scarious, rarely small, subulate or setaceous. Tertiary nerves of leaflets scalariform, if not pod entire and hooked hairs absent
50. Terminal leaflet obcordate to kidney- or fan-shaped; apex broadly rounded, truncate or retuse. Pod compressed, jointed or articulate between the seeds
51. Pod nesting within the membranous hyaline enlarged calyx **Christia**
51. Pod much exerted calyx
52. Pod straight or falcate, usually sinuate along the lower suture **Desmodium**
52. Pod folded at the article between the seeds **Hegnera**
50. Terminal leaflet not as above; apex blunt to acute
53. Inflorescence bracts greatly enlarging, papery, boat-shaped. Climbers **Phylacium**
53. Inflorescence bracts not much enlarged as above. Erect or ascending herbs or shrubs
54. Pod not jointed, 1-many-seeded, flat, compressed, terete or inflated
55. Leaves with distinct stipels
56. Inflorescence short umbellate. Pod flattened, 1-seeded
Dendrolobium lanceolatum
56. Inflorescence elongate. Pod many-seeded
57. Hooked hairs present. Calyx campanulate, 5-toothed. Pod inflated
Pycnospora
57. Hooked hairs absent. Calyx tubular, 4-toothed. Pod flat **Shutheria**
55. Leaves without stipels
58. Primary bracts subtending 2 flowers; bracteoles persistent. Anthers apiculate or gland-tipped **Lespedeza**
58. Primary bracts subtending 1 flower; bracteoles caducous. Anthers neither apiculate nor gland-tipped **Campylotropis**
54. Pod jointed or articulate between the seeds
59. Calyx-teeth very narrow with long subulate to needle like or acicular apex, and spreading long straight hairs. Pod folded at the article between the seeds **Uraria**
59. Calyx-teeth broader, generally triangular with acute to acuminate apex. Pod straight or falcate
60. Stipules united and sheathing stem, 3-lobed at apex. Pod usually biarticulate
Dicerma biarticulatum
60. Stipules free from each other
61. Stipules large, cordate or auriculate at base, much wider than the stem, persistent. Flowers solitary at a node in elongate racemes. Sutures of pod nearly entire on both sides **Murtonia**

- 61. Stipules triangular, usually narrower than stem, caducous
- 62. Leaves fused, forming a primary bract-like, usually composed of 2 lateral suborbicular leaflets, sometimes elliptic with rounded apex and a subulate terminal one, enveloping short subumbellate racemes

Phyllodium

- 62. Leaves not fused

- 63. Inflorescence umbel-like, in leaf-axils, sometimes forming a terminal panicle-like

Dendrolobium

- 63. Inflorescence pseudoracemes or panicle, 2-many-flowered at a node

- 64. Lateral leaflets only half the size of the terminal leaflet. Inflorescence conical when young due to the imbricate large bracts. Pod not distinctly jointed between the seeds, dehiscing along the lower suture

Codariocalyx

- 64. Terminal and lateral leaflets subequal. Inflorescence not as above. Pod conspicuously jointed, usually indehiscent

Desmodium

KEY D

(Leaves imparipinnate with 5-many-foliolate, rarely 3-foliolate, if so, scandent shrubs or woody climber and leaflets alternate).

- 1. Trees, shrubs and woody climbers
 - 2. Leaflets alternate. Pod flattened or very compressed, indehiscent
 - 3. Stem when cut with red sticky exudation. Anthers dorsifixed, opened by a longitudinal slit lengthwise. Pod suborbicular; seeds grouped centrally **Pterocarpus**
 - 3. Stem when cut without sticky exudation. Anthers basifixed, opened by a transverse slit at the apex. Pod oblong; seeds serially arranged **Dalbergia**
 - 2. Leaflets opposite. Stamens all free or united in 1-2-bundled
 - 4. Stamens all free or connate at base only. Trees or shrubs
 - 5. Calyx caducous in fruit; teeth shorter than tube or obscure. Stigma terminal. Pod moniliform; seeds brown **Sophora**
 - 5. Calyx persistent in fruit; teeth as long as or longer than tube. Stigma lateral. Pod oblong; seeds red, scarlet or, rarely black **Ormosia**
 - 4. Stamens united, monadelphous or diadelphous
 - 6. Inflorescence a panicle, with either long or sometimes very short side branches
 - 7. Anthers opened by a transverse slit at the apex. Standard petal narrowly obovate or spatulate. Pod inflated **Antheroporum**
 - 7. Anthers opened by a longitudinal slit lengthwise. Standard petal oblong, orbicular or reniform, usually with cordate or auriculate base
 - 8. Valves of pod thick, either woody or leathery; sutures unwinged **Millettia**
 - 8. Valves of the pod papery to coriaceous; sutures winged **Derris**
 - 6. Inflorescence either racemes or pseudoracemes
 - 9. Climber. Inflorescence a terminal raceme **Afgekia**
 - 9. Trees or shrubs. Inflorescence, either an axillary raceme or pseudoraceme
 - 10. Tree. Pod oblong; distinctly sharp edge along the upper suture when young **Pongamia**
 - 10. Shrub. Pod linear; young pod blunt on both sutures. (Native of S. America) **Gliricidia sepium** (Jacq.) Walp.
 - 1. Herbs or under shrubs (erect to climbing or trailing)
 - 11. Erect, diffuse, decumbent herbs or under shrubs
 - 12. Margin of leaflets serrate
 - 13. Leaves 5-foliolate; secondary veins distinctly pinnate. Indumentum of medifixed (T-shaped) hairs. Stipules adnate to the pulvinous petiole (Native of tropical Africa) **Cyamopsis senegalensis** Guill. & Perr.

13. Leaves pinnately 9–13(–15)-foliolate; secondary veins close and parallel. Indumentum simple, often glandular. Stipules leaf-like, free from petiole (Native of India) *Cicer arietinum* Linn.
12. Margin of leaflets entire
14. Indumentum of either medifixed (T-shaped) or simple hairs. Tertiary nerves of leaflets pinnate
15. Stipules distinct, $\pm$ adnate to the pulvinous petiole
16. Indumentum of medifixed (T-shaped) hairs. Anthers apiculate or gland-tipped. Pod terete or subterete, not jointed **Indigofera**
16. Indumentum of simple hairs. Anthers neither apiculate nor gland-tipped. Pod compressed jointed **Ormocarpum**
15. Stipules small, often obscure, free from petiole
17. Leaves pinnately 5–7-foliolate. Inflorescence very short, few-flowered. Fruit a 1-seeded drupe (Figure 30) **Euchresta**
17. Leaves pinnately many-foliolate. Fruit a many-seeded pod
18. Petals hairy outside. Stamens diadelphous. Pod oblong, laterally compressed. Leaflets closely parallel-nerved **Tephrosia**
18. Petals glabrous. Stamens all free or connate at base only. Pod moniliform. Leaflets distinctly pinnate-nerved **Sophora**
14. Indumentum of hooked hairs. Tertiary nerves of leaflets scalariform. Pod jointed or articulate
19. Flowers in pseudoracemes, 2–3-flowered in one primary bract. Pod straight, jointed, sinuate or folded at the article between the seeds. Stipules caducous
20. Calyx-teeth very narrow, subulate, with long needle like or acidulate apex. Pod folded at the article between the seeds **Uraria**
20. Calyx-teeth triangular with acute to acuminate apex. Pod straight or falcate, sinuate along the lower suture **Desmodium**
19. Flower solitary in one primary bract. Pod with entire sutures. Stipules persistent **Murtonia**
11. Climbing or trailing herbs
21. Standard very large, ca 4 cm long, enclosing the other petals; keel shorter and smaller than wings; wings about one third to one half the length of the standard. Bracteoles large, orbicular, membranous **Clitoria**
21. Standard and keel petal only slightly differing in length
22. Inflorescence an erect pseudoraceme; flowers ca 1 cm long. Petals hairy, all equal. Style erect **Cruidasia**
22. Inflorescence a lax, pendulous raceme; flowers 2.5–3 cm or more long. Petals glabrous, wings about half the length of the standard. Style coiled **Apios**

KEY E

(Leaves either paripinnate with many leaflets or with 2 or 4 leaflets, without terminal leaflet, sometimes terminated with a tendril or a bristle)

1. Leaflets usually 1–5 pairs
2. Stipules peltate at base. Stem branched at the base, often decumbent or diffuse. Pod jointed or articulate
3. Bracts large, leaf-like, enclosing the flowers. Leaves with 1–2 pairs of leaflets
4. Flowers in interruptedly spicate inflorescence or sometimes solitary in leaf-axils. Bracts lanceolate acute, usually 2–3 times longer than the flowers. Pod muricate **Zornia**
4. Flowers in dense head-like inflorescence, covered by large, rounded or reniform, imbricate bracts. Pod smooth or reticulate **Geissaspis**
3. Bracts smaller than the flowers. Leaves more than 3 pairs of leaflets
5. Pod coiled into a ring, much exerted the calyx; articles broken, leaving the persistent sutures **Cyclocarpa**
5. Pod folded at articles between the seeds, enclosed by the calyx **Smithia**
2. Stipules not peltate, sometimes auriculate
6. Stipules membranous, strongly adnate to and forming wings along the proximal part of the petiole. Rachis without apiculate tip. Pod developed underground. Cultivated *Arachis hypogaea* Linn.

6. Stipules leaf-like, free or scarcely adnate to the petiole. Rachis terminated by tendril. Pod not developed underground
7. Style longitudinally folded, with margins meeting abaxially, pubescent on adaxial face, dorsally compressed. Calyx lobes leafy. Pod many-seeded. Cultivated *Pisum sativum* Linn.
7. Style not folded as above
8. Style dorsally compressed, and adaxially pubescent
9. Leaflets conduplicate. Wing petals adherent to the keel for half or more of their length. Cultivated *Lens culinaris* Medic.
9. Leaflets supervolute. Wing petals free or nearly so from the keel. Cultivated *Lathyrus tingitanus* Linn.
8. Style not as above, usually bearded in tuft or ring at apex; if dorsally compressed, then totally or abaxially pubescent. Calyx lobes comparatively short and broad. Cultivated *Vicia sativa* Linn.
1. Leaflets more than 5 pairs
10. Erect herbs or shrubs usually in wet place. Flowers in simple raceme, 1(–2)-flowered at the nodes
11. Leaflets alternate but without the terminal one. Stipules membranous, lanceolate, appendaged at base, persistent. Inflorescence erect. Pod flat, jointed *Aeschynomene*
11. Leaflets opposite or rarely subopposite. Stipules small, subulate, caducous. Inflorescence pendulous. Pod linear, terete, not jointed *Sesbania*
10. Climbing or trailing herbs, sometimes woody climbers or scandent shrubs. Leaflets opposite. Flowers usually fasciculate at the node of leafless branches or in leaf-axils; sometimes crowded at top of an erect inflorescence. Pod oblong, entire, and flat *Abrus*

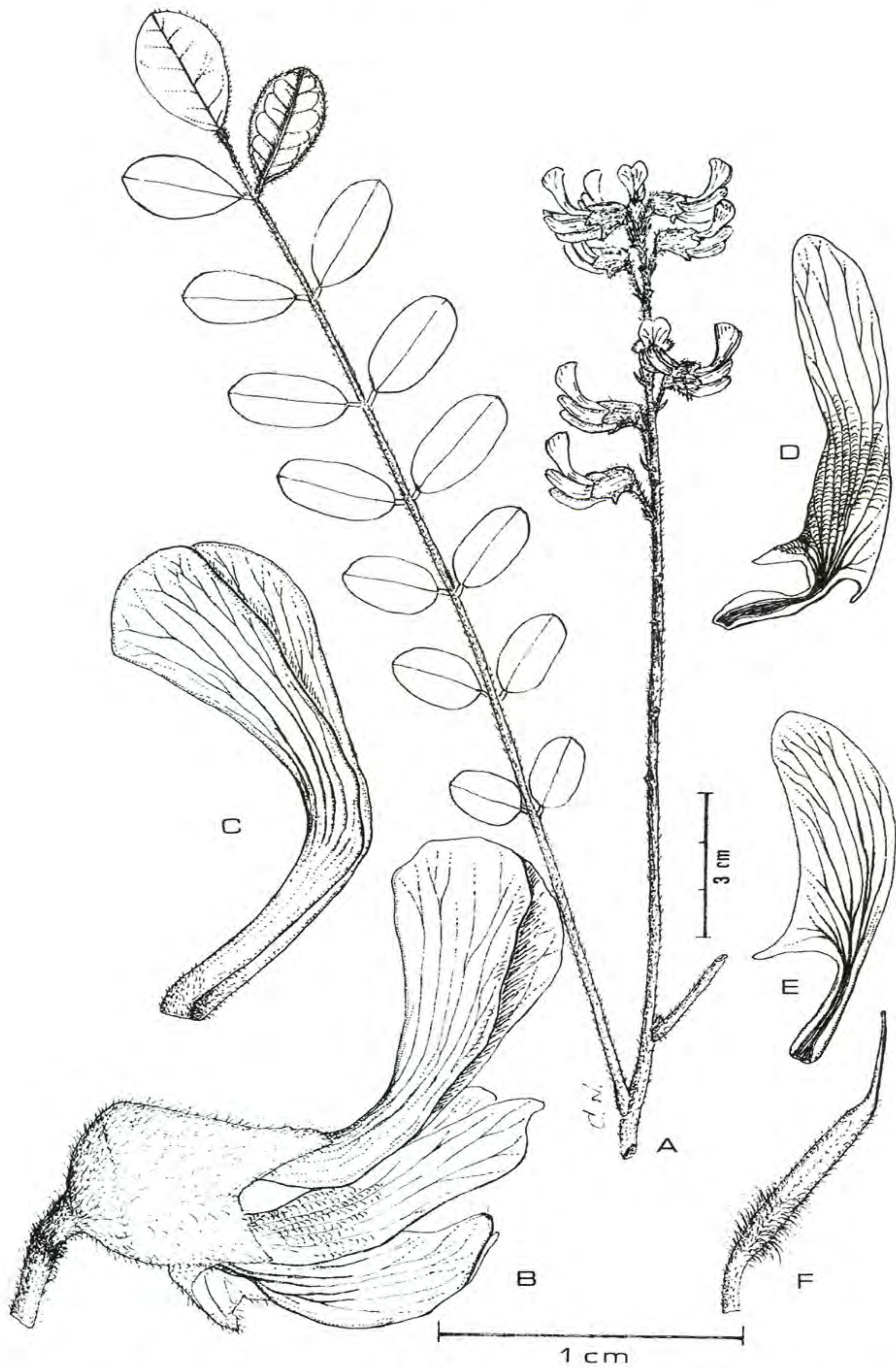


Figure 1. SOPHOREAE: *Sophora exigua*: A. flowering branch; B. flower; C. standard; D. wing; E. keel; F. ovary.

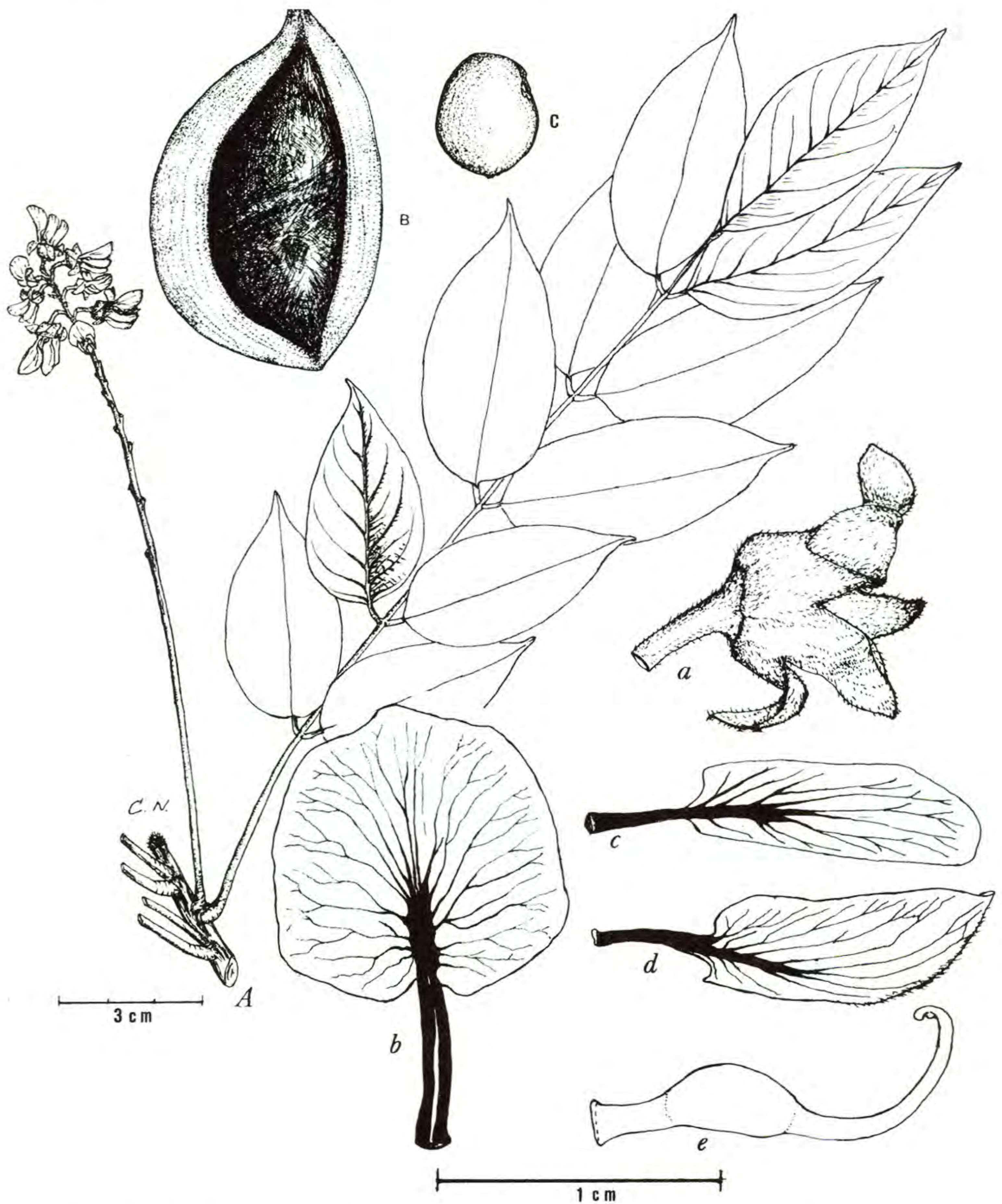


Figure 2. SOPHOREAE: *Ormosia kerrii*: A. flowering branch, a. calyx, b. standard, c. wing, d. keel, e. ovary; B. valve of pod; C. seed.

Figure 3. DALBERGIEAE

1. *Dalbergia glomeriflora*: branch with fruits; 1A. flowering branch; 1B. flower; 1C. bract; 1D. standard; 1E. wing; 1F. keel; 1G. calyx opened out; 1H. and 1I. stamens; 1J. gynoecium. Bar indicate 1 cm.
2. *Pterocarpus indicus*: flowering branch; 2A. flower; 2B. and 2C. stamens; 2D. gynoecium; 2E. fruit. Bar indicate 1 cm.



Figure 3. DALBERGIEAE

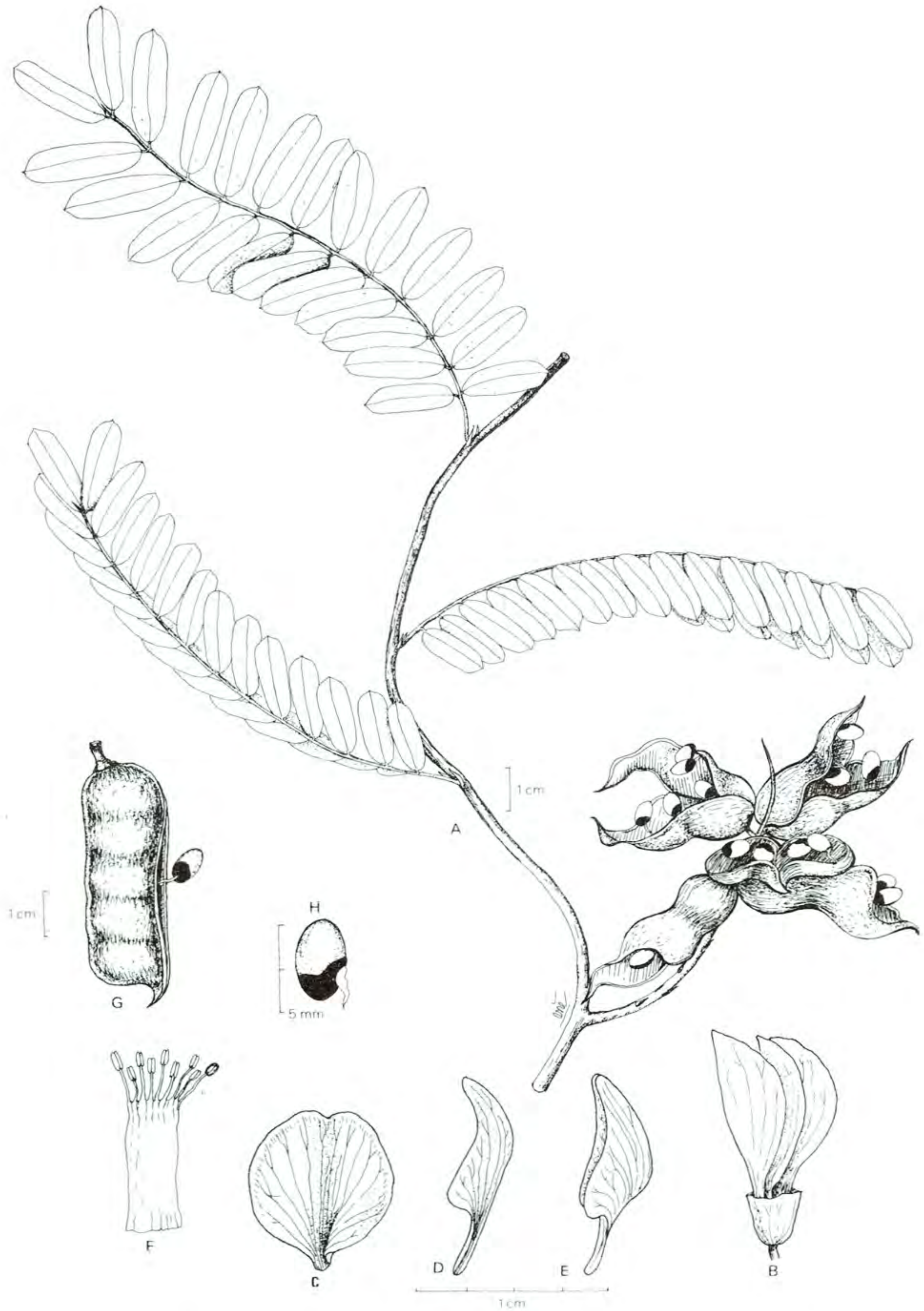


Figure 4. ABREAE: *Abrus pulchellus*: A. branch with fruits; B. flower; C. standard; D. wing; E. keel; F. stamens; G. fruit; H. seed.

Figure 5. TEPHROSIEAE

1. *Antheroporum pierrei*: 1A. flower; 1B. standard; 1C. wing; 1D. keel; 1E. stamens, 1F. gynoecium, 1G. fruit and seed. Bar indicate 1 cm.
2. *Derris trifoliata*: 2A. flower; 2B. standard; 2C. wing; 2D. keel; 2E. stamens; 2F. gynoecium, 2G. fruit. Bar indicate 1 cm.
3. *Pongamia pinnata*: 3A. flower; 3B. standard; 3C. wing; 3D. keel; 3E. stamens; 3F. gynoecium; 3G. fruit. Bar indicate 1 cm.
4. *Tephrosia purpurea*: 4A. flower; 4B. calyx opened out; 4C. standard; 4D. wing; 4E. keel; 4F. stamens; 4G. gynoecium; 4H. fruit and seeds. Bar indicate 1 cm.

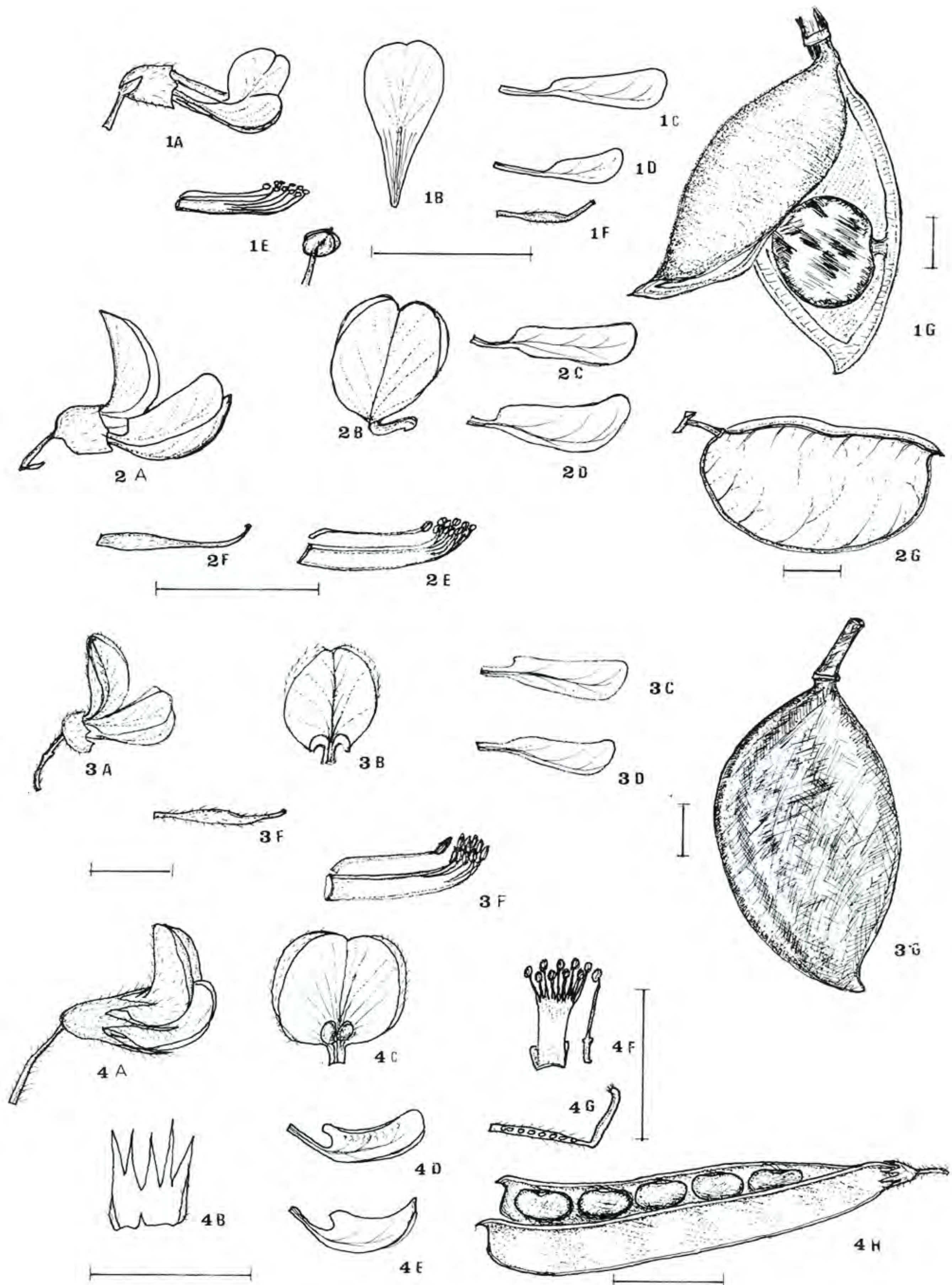


Figure 5. TEPHROSIEAE

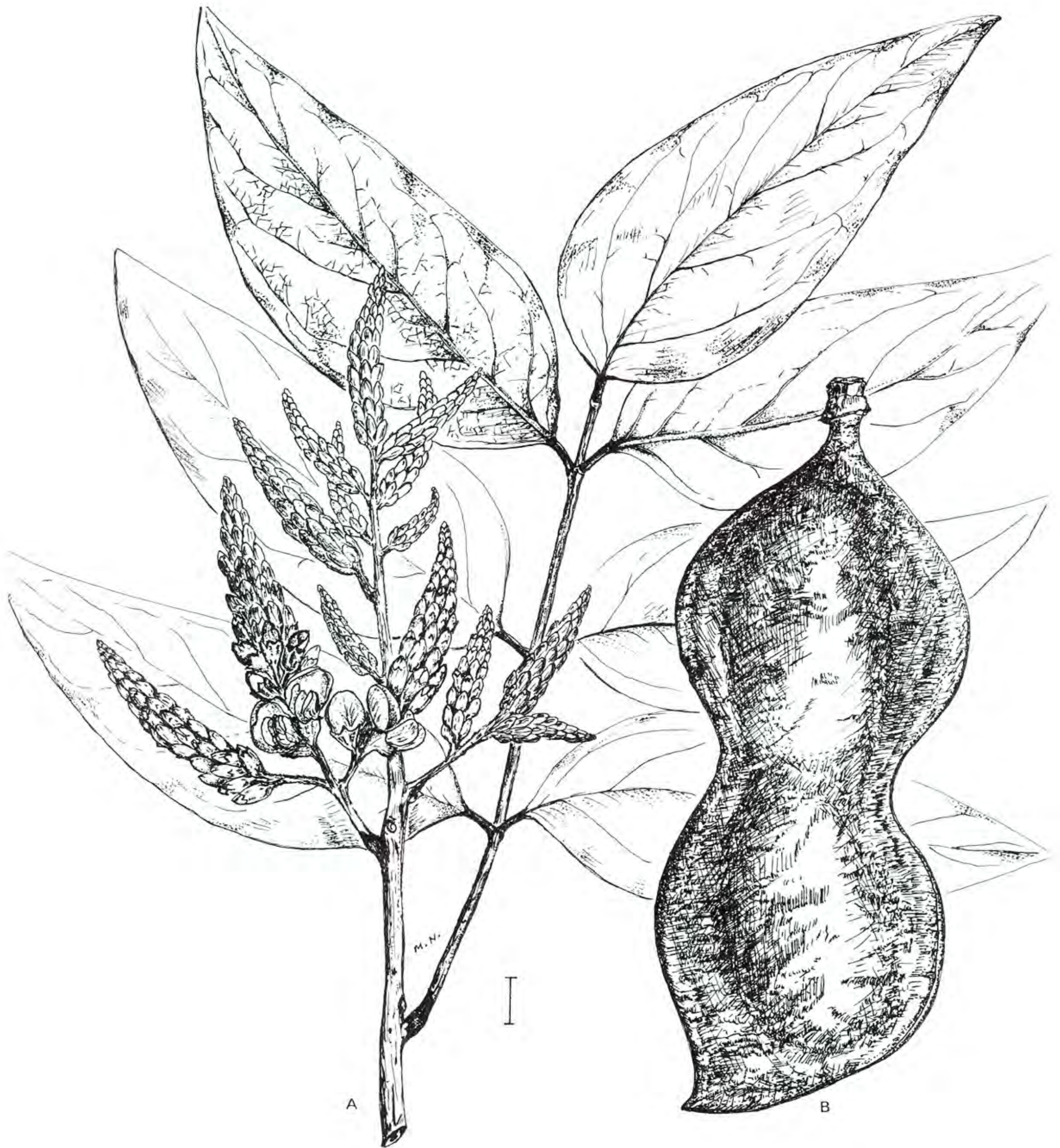


Figure 6. TEPHROSIEAE: *Millettia atropurpurea*: A. flowering branch; B. fruit. Bar indicate 1 cm.



Figure 7. INDIGOFERAE: *Indigofera hirsuta*: A. flowering branch; B. flower; C. calyx opened out; D. standard; E. wing; F. keel; G. stamens; H. gynoecium; I. and J. pod opened out. Bar indicate 1 cm.

Figure 8. DESMODIEAE

1. *Alysicarpus vaginalis*: branch with flowers and fruits; 1A. flower; 1B. standard; 1C. wing; 1D. keel; 1E. stamens; 1F. fruit. Bar indicate 1 cm.
2. *Christia obcordata*: branch with flowers and fruits; 2A. flower; 2B. standard; 2C. wing; 2D. keel; 2E. stamens; 2F. calyx with fruit; 2G. fruit. Bar indicate 1 cm.
3. *Codariocalyx motorius*: branch with flowers and fruits; 3A. flower; 3B. standard; 3C. wing; 3D. keel; 3E. calyx opened out; 3F. stamens; 3G. fruit. Bar indicate 1 cm.
4. *Dendrolobium umbelatum*: branch with flowers and fruits; 4A. flower; 4B. standard; 4C. wing; 4D. keel; 4E. calyx opened out; 4F. stamens; 4G. gynoeceum; 4H. fruit. Bar indicate 1 cm.
5. *Desmodium triflorum*: branch with flowers and fruits; 5A. leaf; 5B. flower; 5C. standard; 5D. wing; 5E. keel; 5F. calyx opened out; 5G. stamens; 5H. gynoeceum; 5I. fruit. Bar indicate 1 cm.
6. *Dicerma biarticulatum*: branch with flowers and fruits; 6A. leaf; 6B. stipules; 6C. standard; 6D. wing; 6E. keel; 6F. calyx; 6G. stamens; 6H. gynoeceum; 6I. fruit. Bar indicate 1 cm.



Figure 8. DESMODIEAE

Figure 9. DESMODIEAE

7. *Hegnere obcordata*: branch with flowers and fruits; 7A. standard; 7B. wing; 7C. keel; 7D. calyx; 7E. stamens; 7F. gynoecium. Bar indicate 1 cm.
8. *Mecopus nidulans*: branch with flowers and fruits; 8A. flower and bract; 8B. fruit and bract. Bar indicate 1 cm.
9. *Phyllodium pulchellum*: branch with flowers and fruits; 9A. bracts; 9B. flower; 9C. standard; 9D. wing; 9E. keel; 9F. calyx opened out; 9G. stamens; 9H. gynoecium; 9I. fruit. Bar indicate 1 cm.
10. *Pycnospora lutescens*: branch with flowers and fruits; 10A. standard; 10B. wing; 10C. keel; 10D. calyx opened out; 10E. stamens; 10F. gynoecium; 10G. fruit. Bar indicate 1 cm.
11. *Tadehagi triquetrum*: branch with flowers and fruits; 11A. standard; 11B. wing; 11C. keel; 11D. calyx; 11E. stamens; 11F. gynoecium; 11G. fruit.
12. *Uraria lagopodicides*: branch with flowers and fruit; 12A. flower and bract; 12B. standard; 12C. wing; 12D. keel; 12E. fruit. Bar indicate 1 cm.



Figure 9. DESMODIEAE



Figure 10. DESMODIEAE: *Murtonia kerrii*: A. branch with fruits; B. seed. Bar indicate 1 cm.

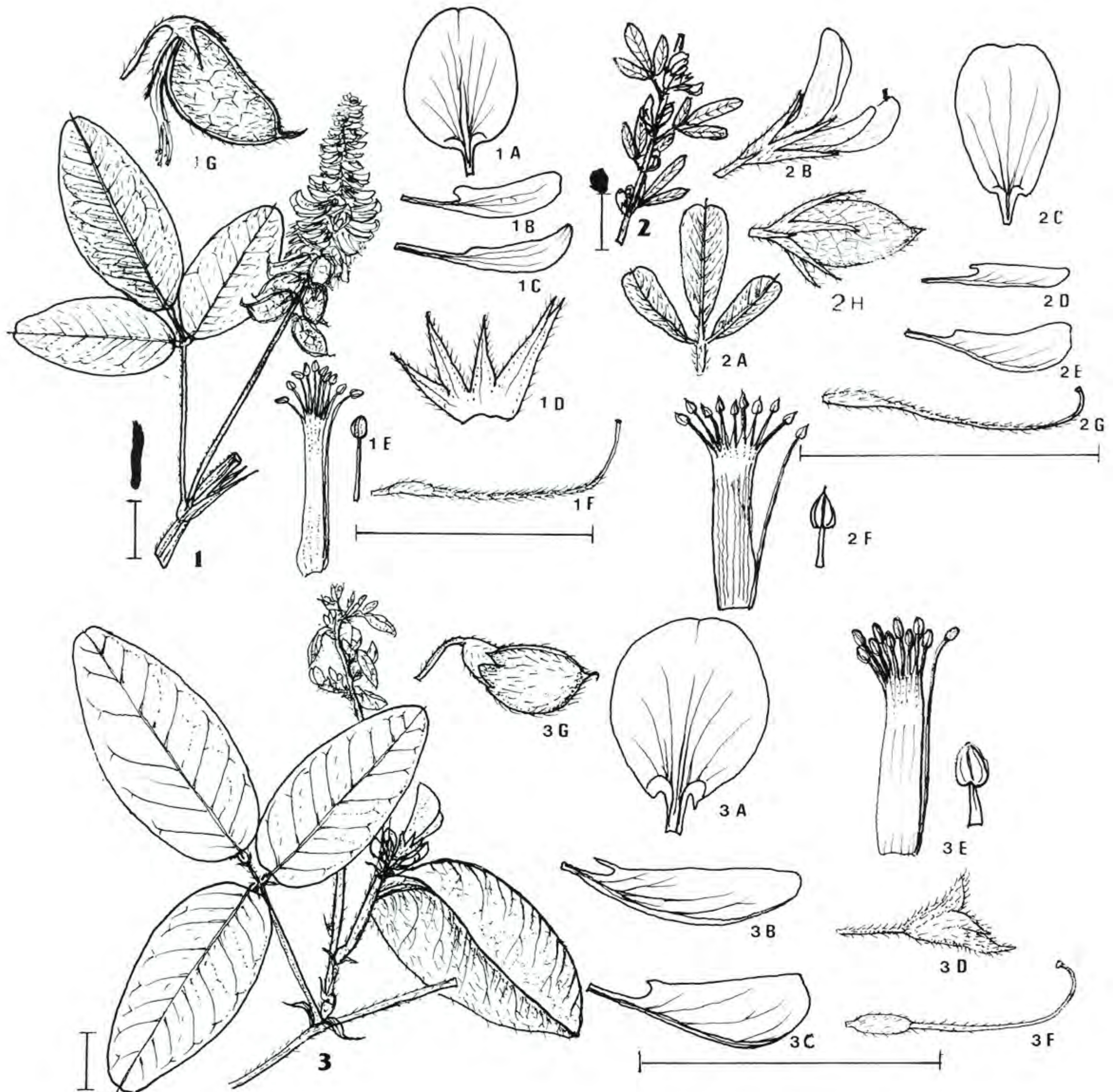


Figure 11. LESPEDIZEAE

1. *Campylotropis parviflora*: branch with flowers and fruits; 1A. standard; 1B. wing; 1C. keel; 1D. calyx opened out; 1E. stamens; 1F. gynoecium; 1G. fruit. Bar indicate 1 cm.
2. *Lespedeza juncea*: branch with flowers and fruits; 2A. leaf; 2B. flower; 2C. standard; 2D. wing; 2E. keel; 2F. stamens; 2G. gynoecium; 2H. fruit. Bar indicate 1 cm.
3. *Phylacium majus*: flowering branch; 3A. standard; 3B. wing; 3C. keel; 3D. calyx; 3E. stamens; 3F. gynoecium; 3G. fruit. Bar indicate 2 cm.

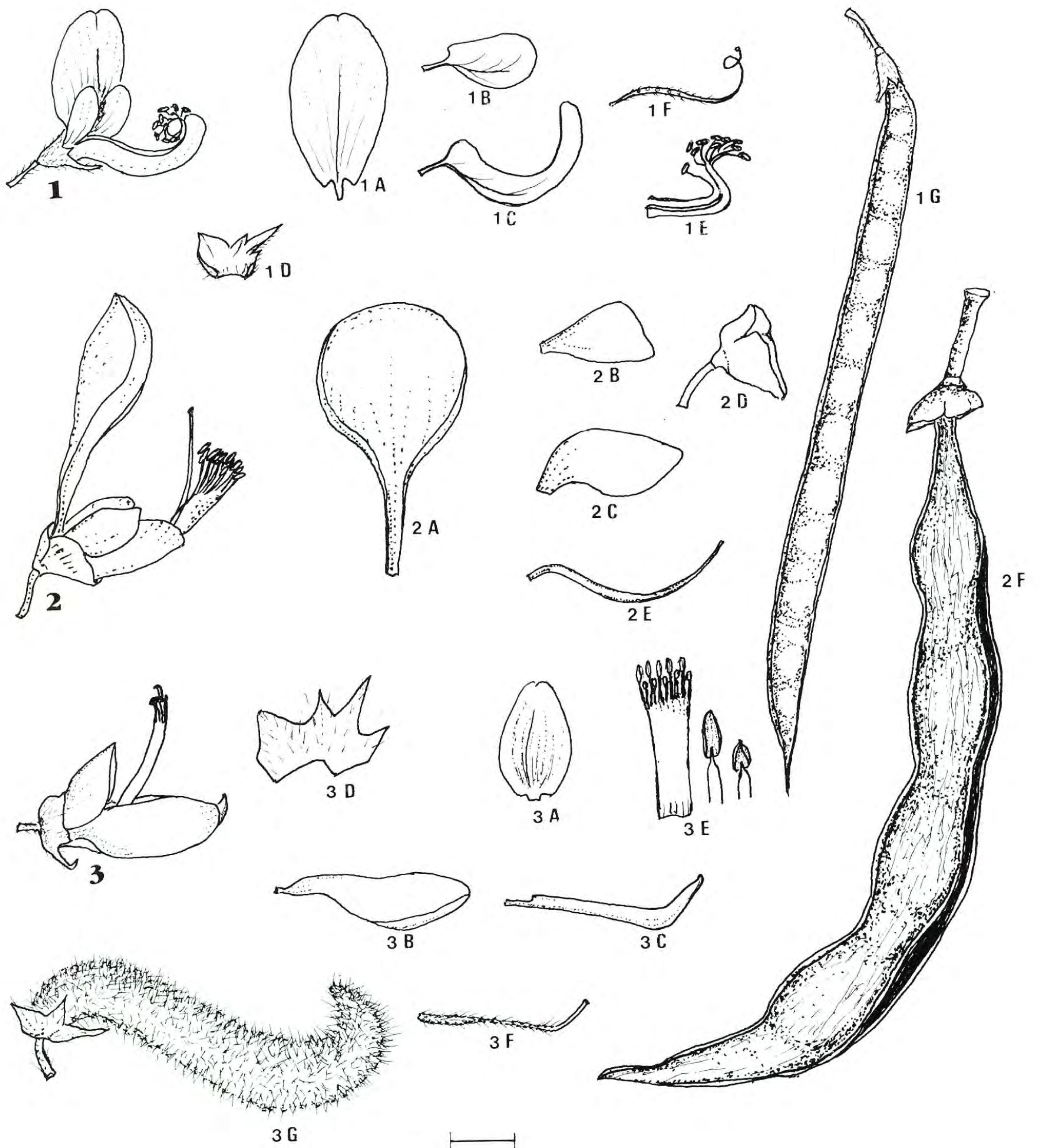


Figure 12. PHASEOLEAE: Erythrinae

1. *Apios carnea*: flower; 1A. standard; 1B. wing; 1C. keel; 1D. calyx opened out; 1E. stamens; 1F. gynoecium; 1G. fruit.
2. *Erythrina fusca*: flower; 2A. standard; 2B. wing; 2C. keel; 2D. calyx; 2E. gynoecium; 2F. fruit.
3. *Mucuna pruriens*: flower; 3A. standard; 3B. wing; 3C. keel; 3D. calyx opened out; 3E. stamens; 3F. gynoecium; 3G. fruit. Bar indicate 1 cm.

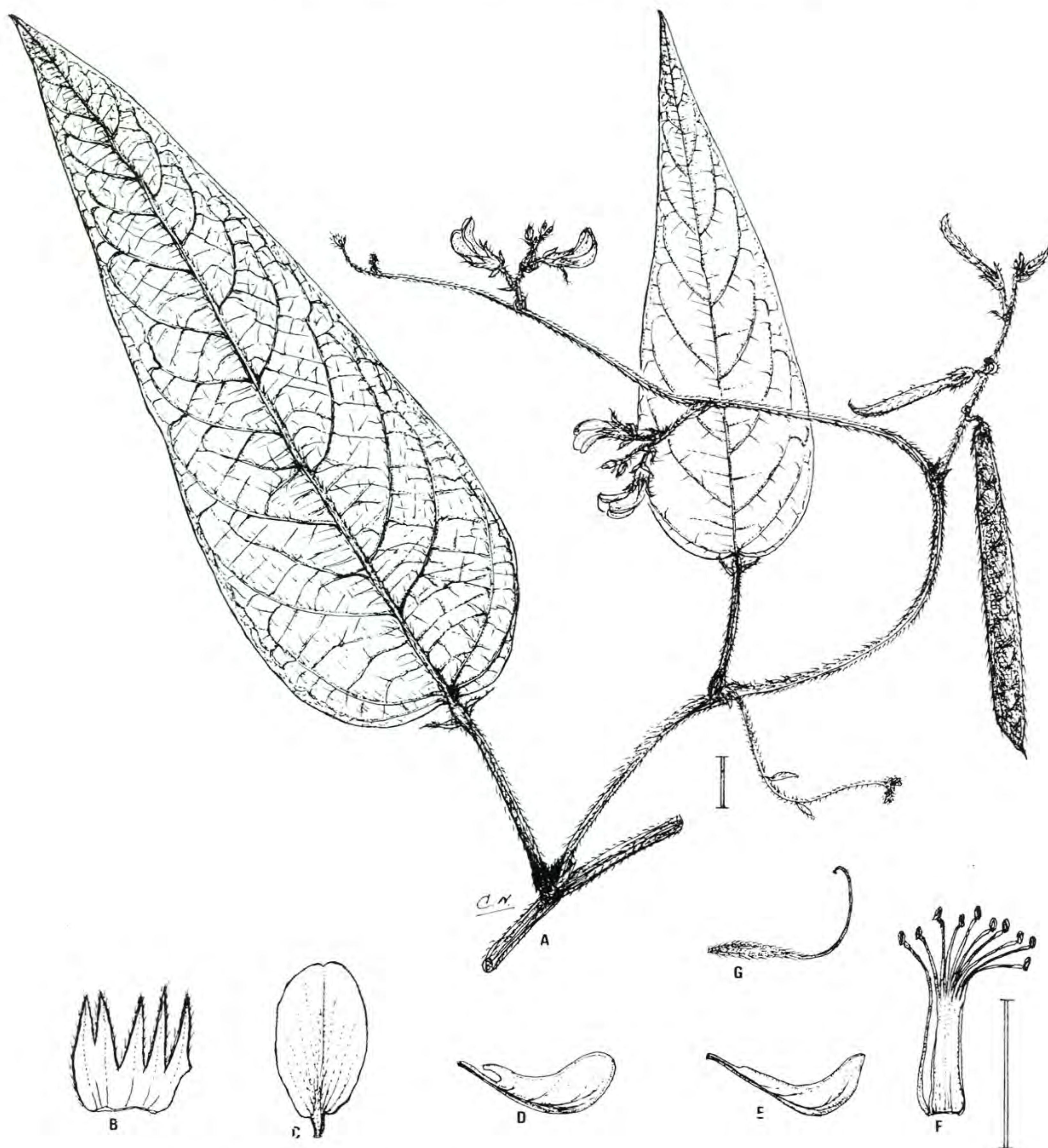


Figure 13. PHASEOLEAE: Diocleinae

Nogra grahamii: A. branch with flowers and fruits; B. calyx opened out; C. standard; D. wing; E. keel; F. stamens; G. gynoecium. Bar indicate 1 cm.

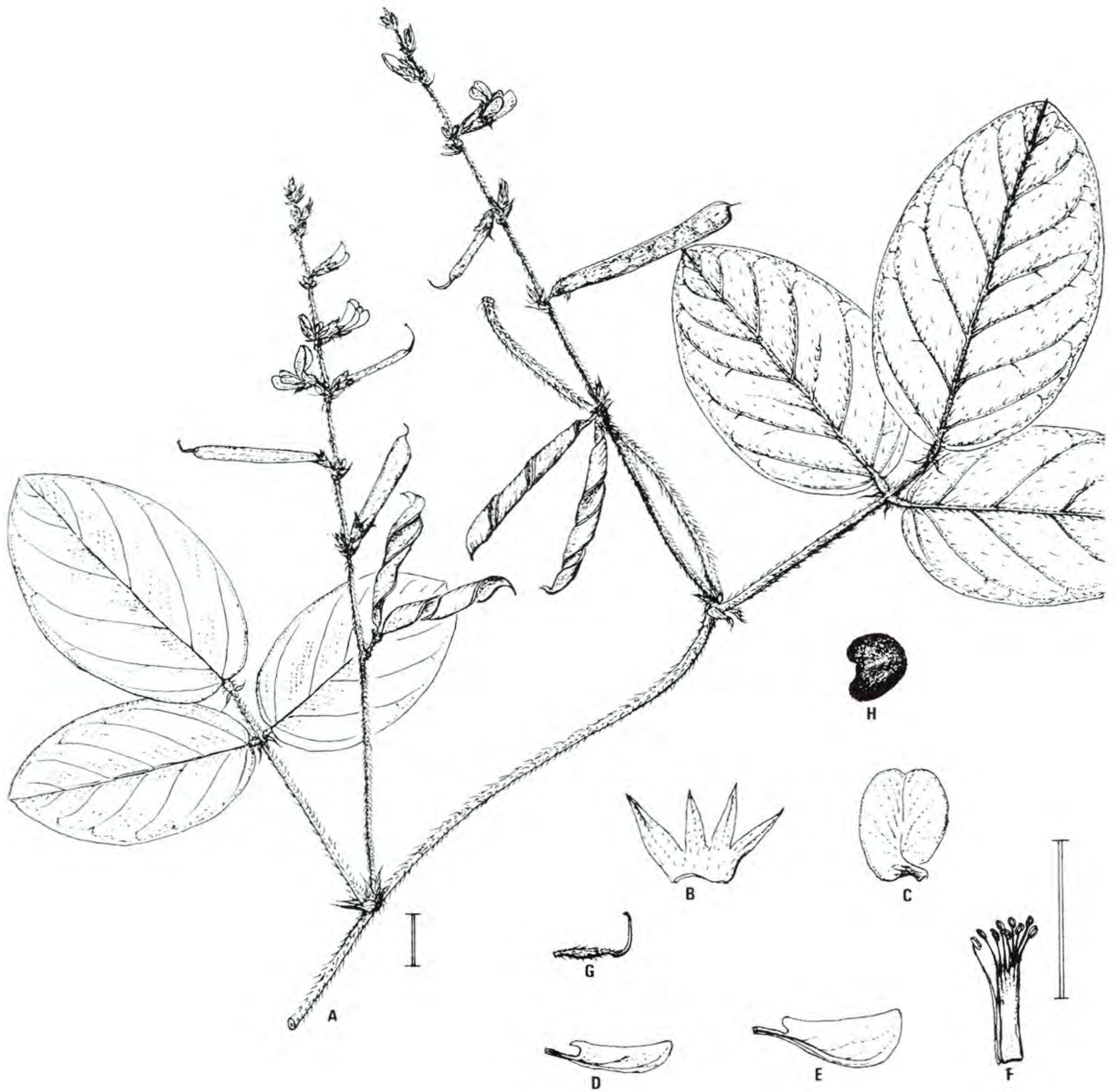


Figure 14. PHASEOLEAE: Diocleinae

Galactia tenuiflora: A. branch with flowers and fruits; B. calyx opened out; C. standard; D. wing; E. keel; F. stamens; G gynoeceium; H. seed. Bar indicate 1 cm.

Figure 15. PHASEOLEAE: Diocleinae

1. *Butea superba*: 1A. flower; 1B. calyx; 1C. standard; 1D. wing; 1E. keel; 1F. stamens; 1G. gynoecium; 1H. fruit. Bar indicate 1 cm.
2. *Spatholobus parviflorus*: 2A. flower; 2B. calyx opened out; 2C. standard; 2D. wing; 2E. keel; 2F. stamens; 2G. gynoecium; 2H. fruit. Bar indicate 1 cm.

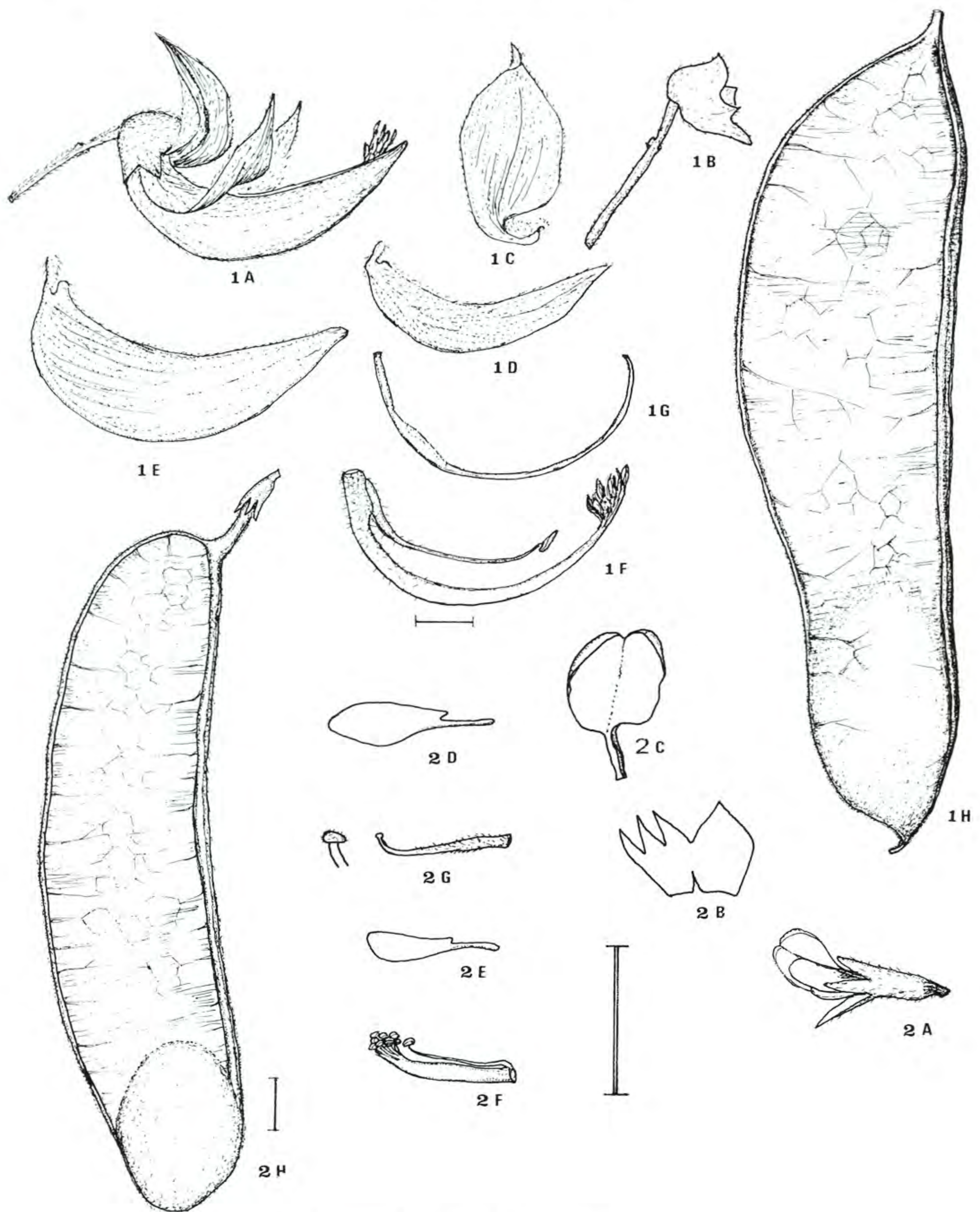


Figure 15. PHASEOLEAE: Diocleinae

Figure 16. PHASEOLEAE: Diocleinae

3. *Canavalia maritima*: 3A. flower; 3B. calyx opened out; 3C. standard; 3D. wing; 3E. keel; 3F. stamens; 3G. gynoeceium; 3H. fruit; 3I. seeds. Bar indicate 1 cm.
4. *Dioclea hexandra*: 4A. flowers; 4B. calyx opened out; 4C. standard; 4D. wing; 4E. keel; 4F. stamens; 4G. gynoeceium; 4H. fruit; 4I. seed. Bar indicate 1 cm.
5. *Pueraria maesenii*: 5A. flower; 5B. calyx opened out; 5C. standard; 5D. wing; 5E. keel; 5F. stamens; 5G. gynoeceium. Bar indicate 1 cm.

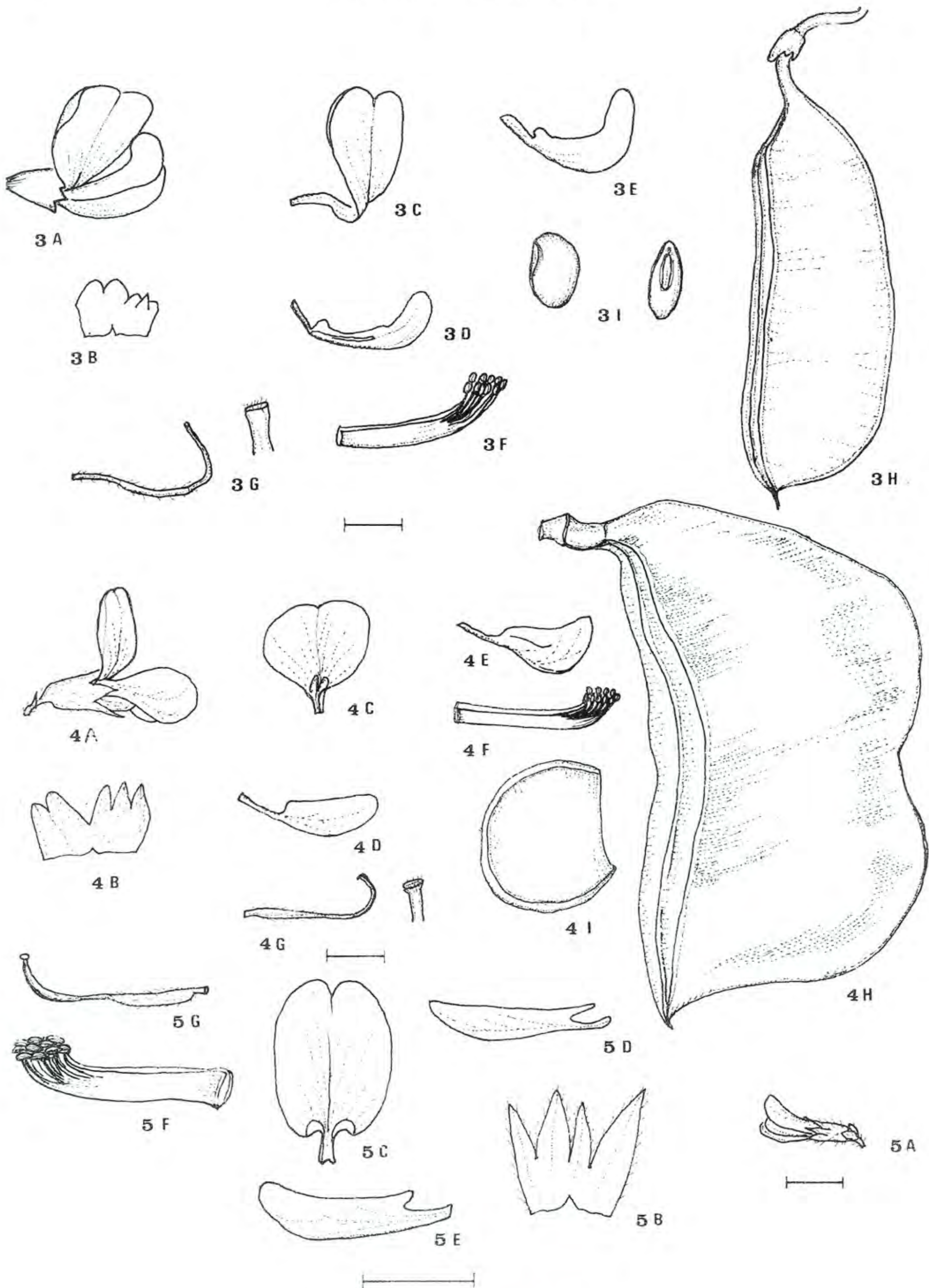


Figure 16. PHASEOLEAE: Diocleinae

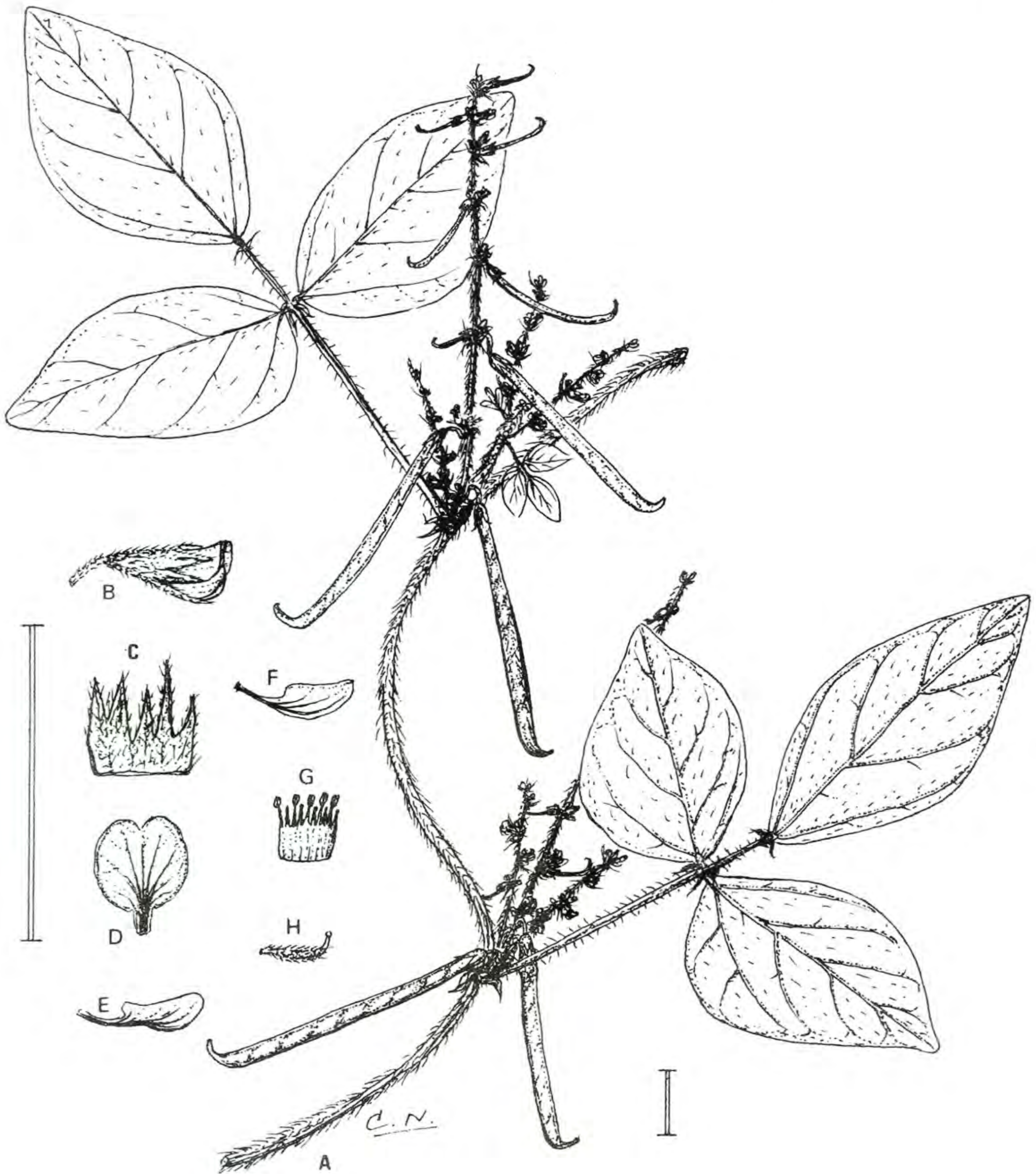


Figure 17. PHASEOLEAE: Glycininae

Teramnus labialis: A. branch with flowers and fruits; B. flower; C. calyx opened out; D. standard; E. wing; F. keel; G. stamens; H. gynoeceium. Bar indicate 1 cm.

Figure 18. PHASEOLEAE: Glycininae

1. *Amphicarpaea ferruginea* var. *bracteosa*: 1A. flower; 1B. calyx opened out; 1C. standard; 1D. wing; 1E. keel; 1F. gynoeceium. Bar indicate 1 cm.
2. *Diphyllarium mekongense*: 2A. flower and bracts; 2B. calyx opened out; 2C. standard; 2D. wing; 2E. keel; 2F. gynoeceium; 2G. fruit; 2H. seed. Bar indicate 1 cm.
3. *Dumasia leiocarpa*: 3A. flower; 3B. calyx; 3C. standard; 3D. wing; 3E. keel; 3F. gynoeceium; 3G. fruit; 3H. seed. Bar indicate 1 cm.
4. *Glycine wightii*: 4A. flower; 4B. calyx opened out; 4C. standard; 4D. wing; 4E. keel; 4F. gynoeceium; 4G. fruit; 4H. seed. Bar indicate 1 cm.

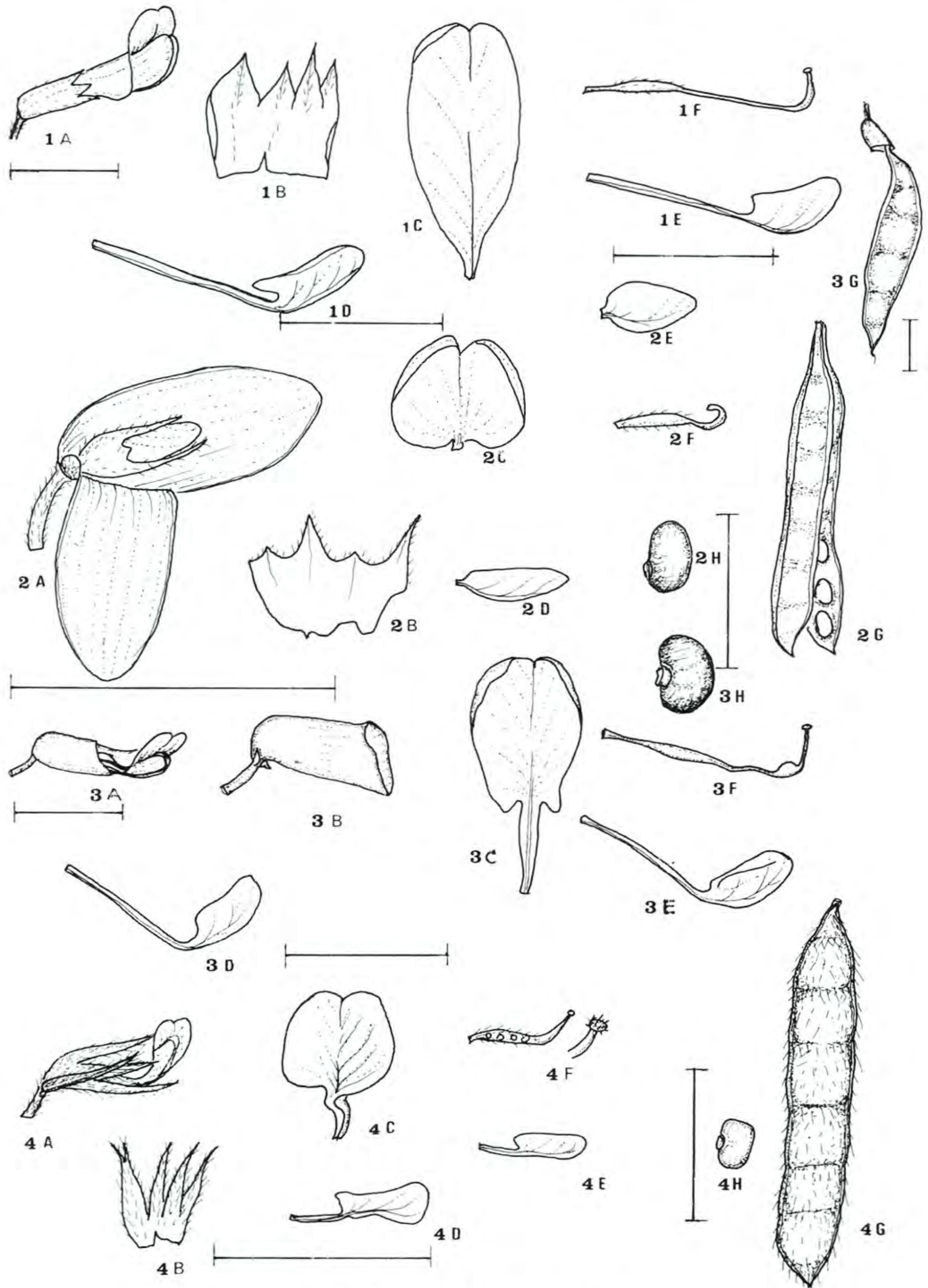


Figure 18. PHASEOLEAE: Glycininae

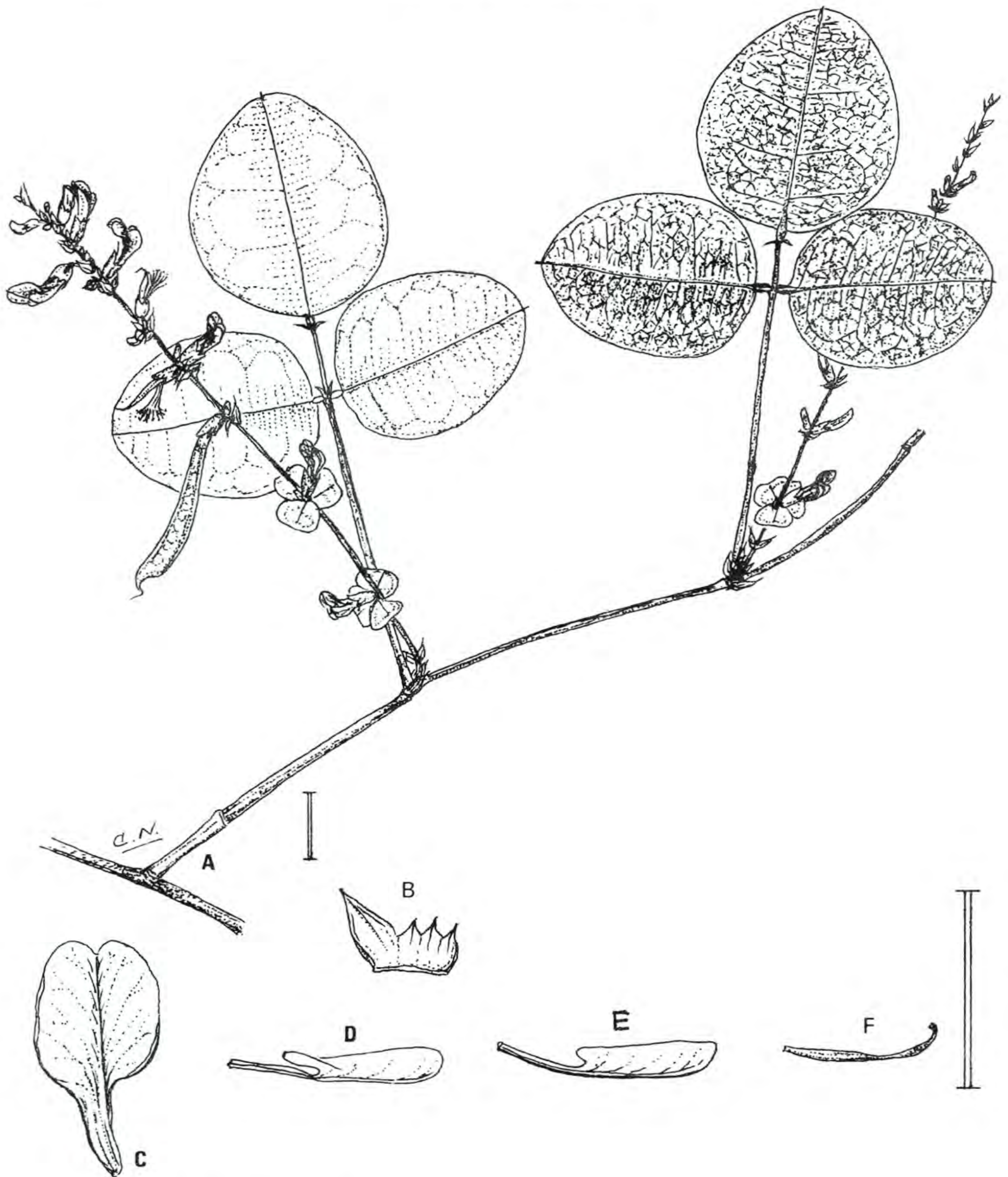


Figure 19. PHASEOLEAE: Glycininae

Shuteria suffulta: A. branch with flowers and fruits; B. calyx opened out; C. standard; D. wing; E. keel; F. gynoecium. Bar indicate 1 cm.

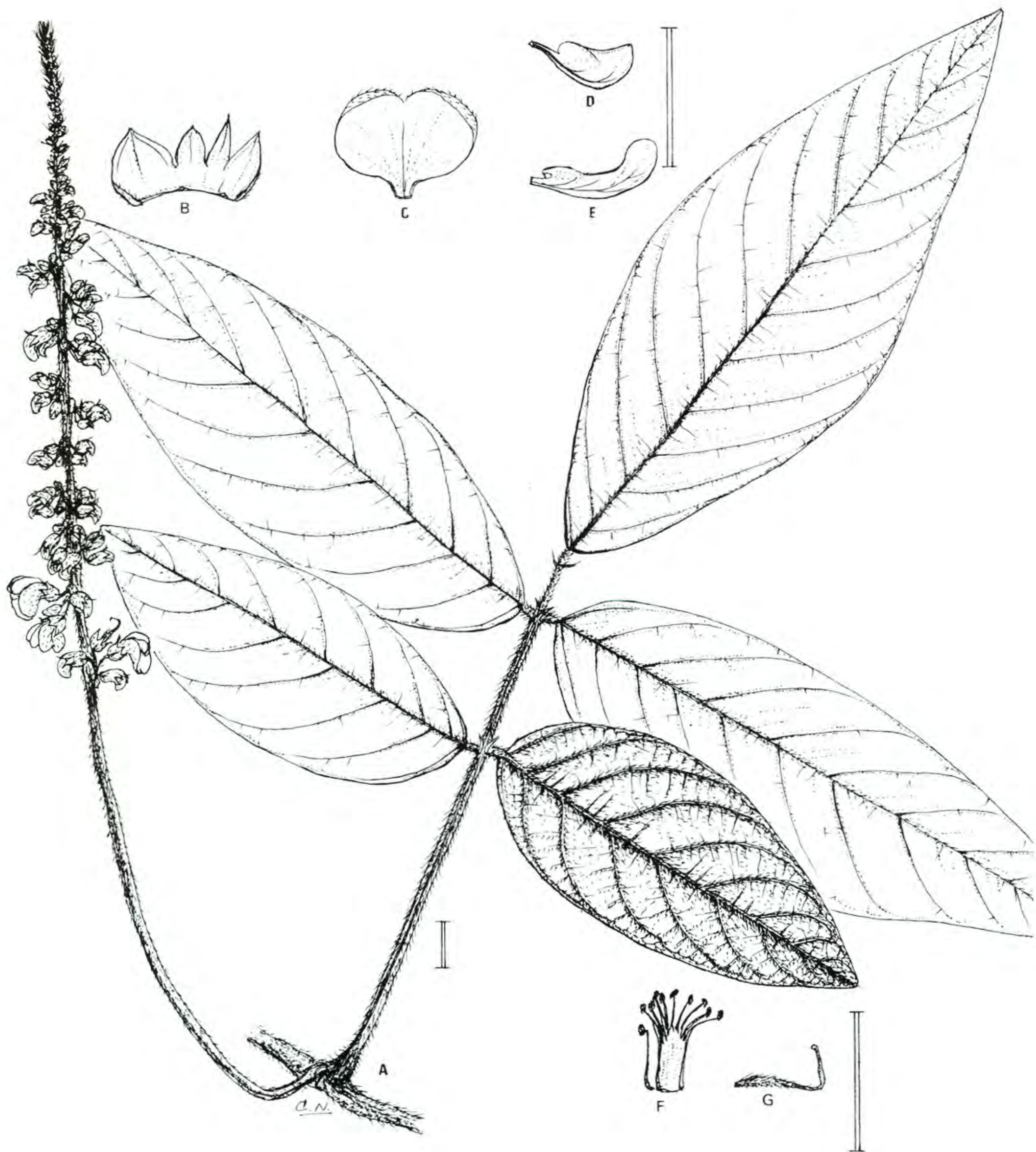


Figure 20. PHASEOLEAE: Ophestiinae

Cruddasia insignis: A. flowering branch; B. calyx opened out; C. standard; D. wing; E. keel; F. stamens; G. gynoecium. Bar indicate 1 cm.

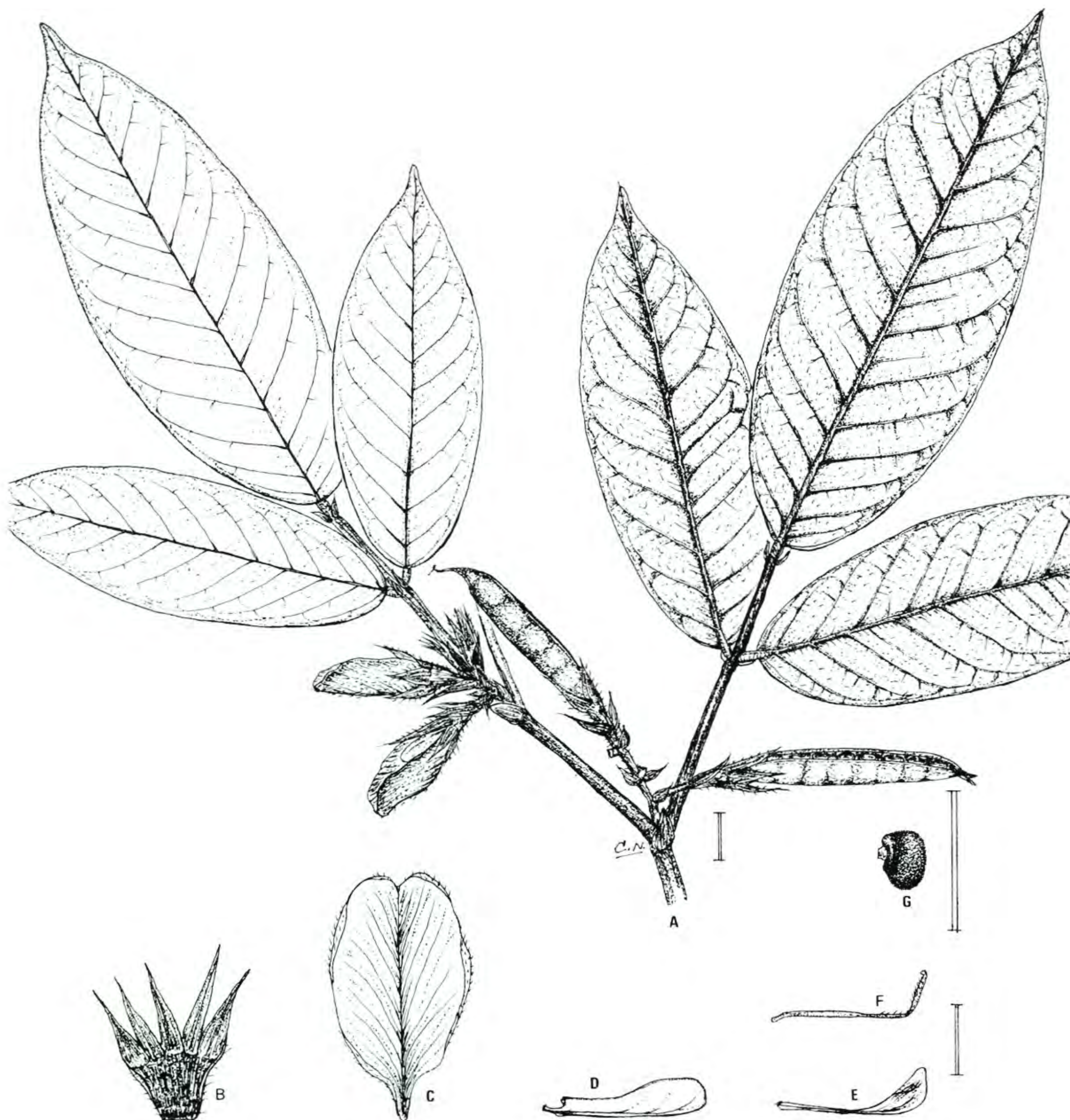


Figure 21. PHASEOLEAE: Clitoriinae

Clitoria macrophylla: A. branch with flowers and fruits; B. calyx opened out; C. standard; D. wing; E. keel; F. gynoecium; G. seed. Bar indicate 1 cm.

Figure 22. PHASEOLEAE: Cajaninae

1. *Dunbaria bella*: 1A. flower; 1B. calyx opened out; 1C. standard; 1D. wing; 1E. keel; 1F. gynoecium; 1G. fruit; 1H. seed. Bar indicate 1 cm.
2. *Eriosema chinense*: 2A. flower; 2B. calyx opened out; 2C. standard; 2D. wing; 2E. keel; 2F. gynoecium; 2G. fruit; 2H. seed. Bar indicate 1 cm.
3. *Flemingia macrophylla*: 3A. flower; 3B. calyx opened out; 3C. standard; 3D. wing; 3E. keel; 3F. gynoecium; 3G. fruit; 3H. seed. Bar indicate 1 cm.
4. *Rhynchosia suaveolens*: 4A. flower; 4B. calyx opened out; 4C. standard; 4D. wing; 4E. keel; 4F. gynoecium; 4G. fruit; 4H. seed. Bar indicate 1 cm.

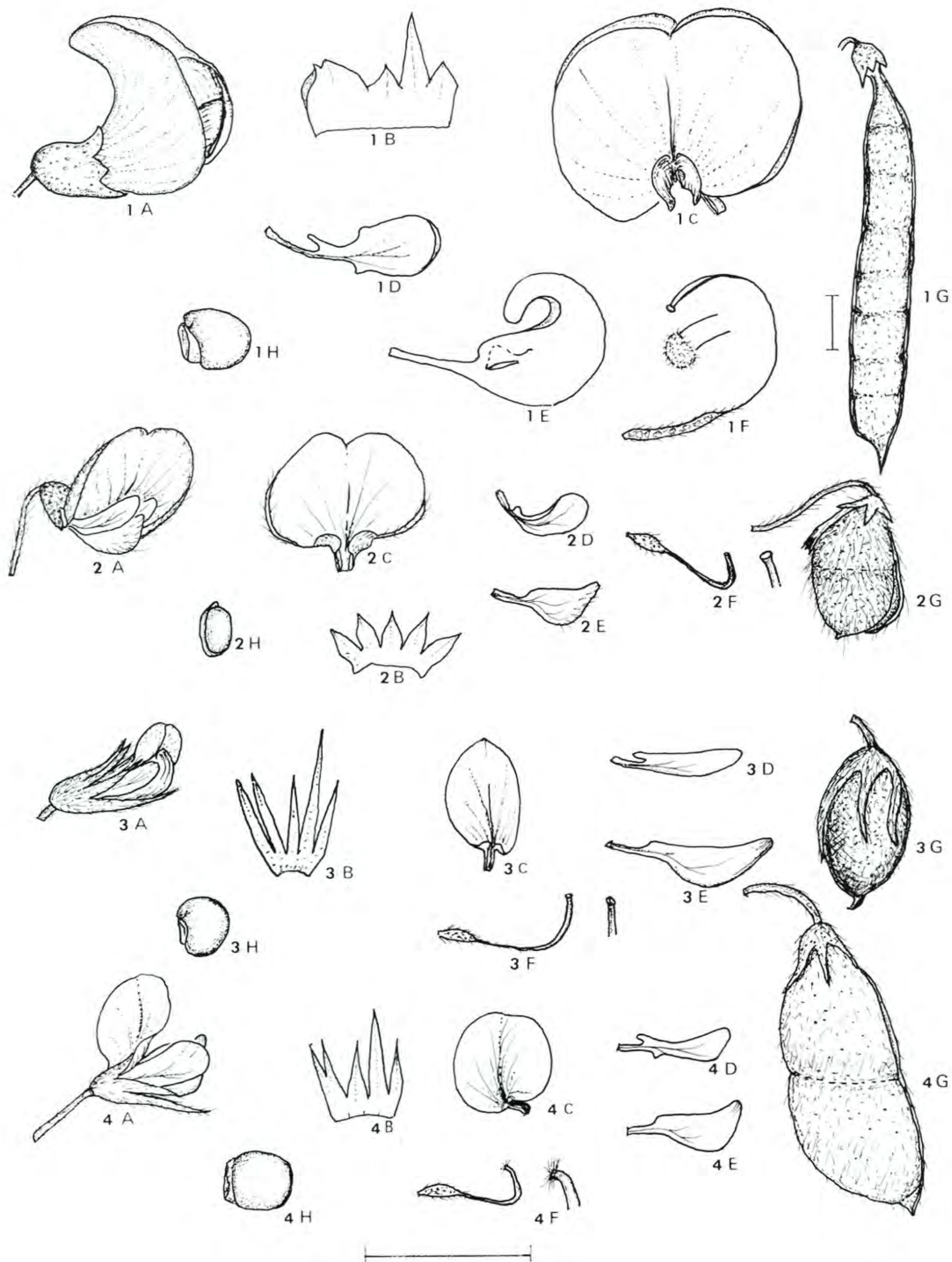


Figure 22. PHASEOLEAE: Cajaninae



Figure 23. PHASEOLEAE: Cajaninae

Paracalyx scariosa: A. branch with flowers and fruits; B. standard; C. wing; D. keel; E. stamens; F. gynoecium; G. fruit. Bar indicate 1 cm.

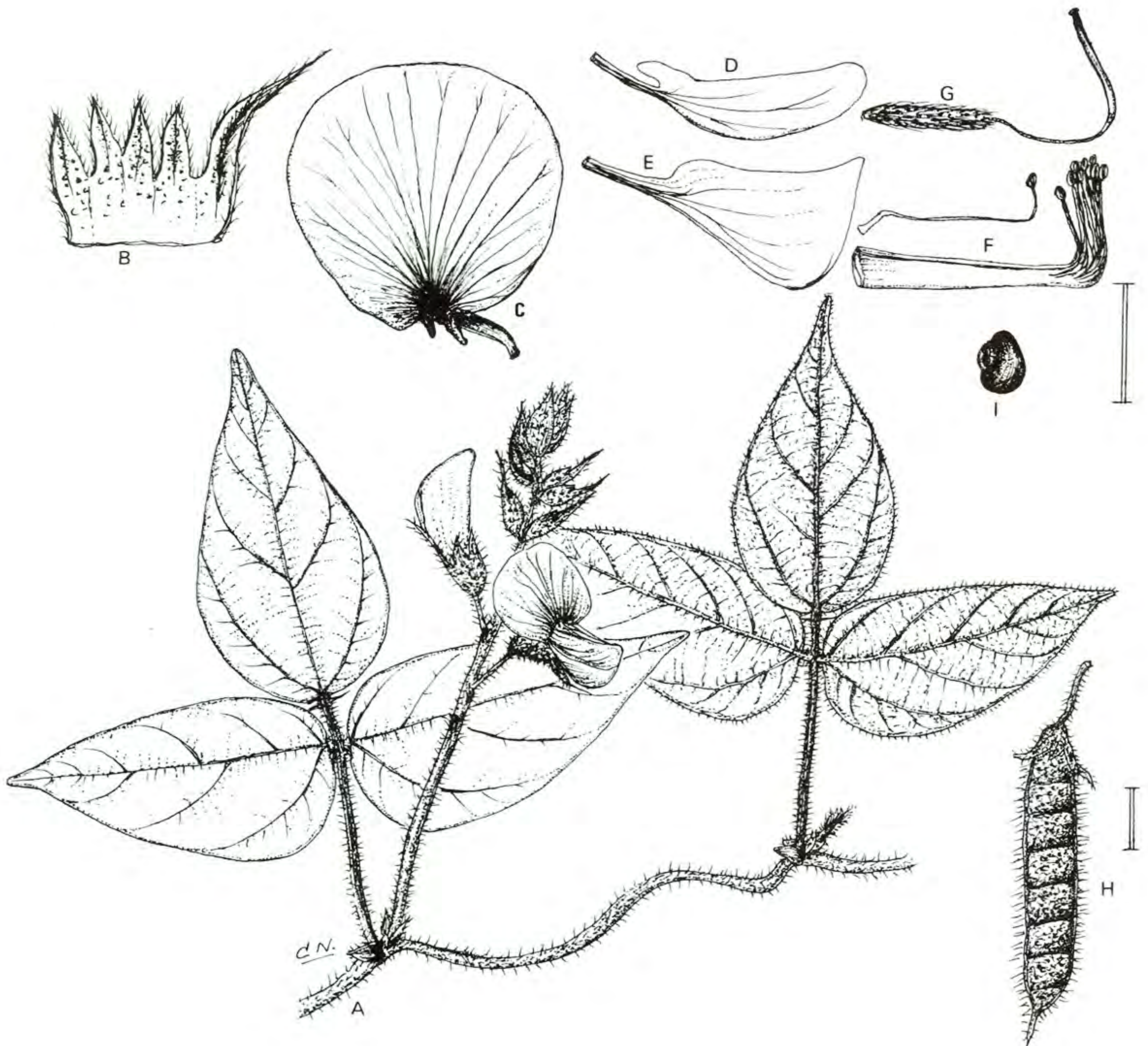


Figure 24. PHASEOLEAE: Cajaninae

Cajanus goensis: A. branch and inflorescence; B. calyx opened out; C. standard; D. wing; E. keel; F. stamens; G. gynoecium; H. fruit; I. seed. Bar indicate 1 cm.

Figure 25. PHASEOLEAE: Phaseolinae

1. *Dolichos subcarnosus*: 1A. calyx opened out; 1B. standard; 1C. wing; 1D. keel; 1E. stamens; 1F. gynoeceium; 1G. fruit; 1H. seeds. Bar indicate 1 cm.
2. *Dolichovigna pilosa*: 2A. calyx opened out; 2B. standard; 2C. wing; 2D. keel; 2E. stamens; 2F. gynoeceium; 2G. fruit; 2H. seeds. Bar indicate 1 cm.
3. *Dysolobium grande*: 3A. calyx opened out; 3B. standard; 3C. wing; 3D. keel; 3E. gynoeceium; 3F. fruit; 3G. seed. Bar indicate 1 cm.
4. *Vigna radiate*: 4A. calyx opened out; 4B. standard; 4C. wing; 4D. keel; 4E. gynoeceium; 4F. fruit; 4G. seed. Bar indicate 1 cm.

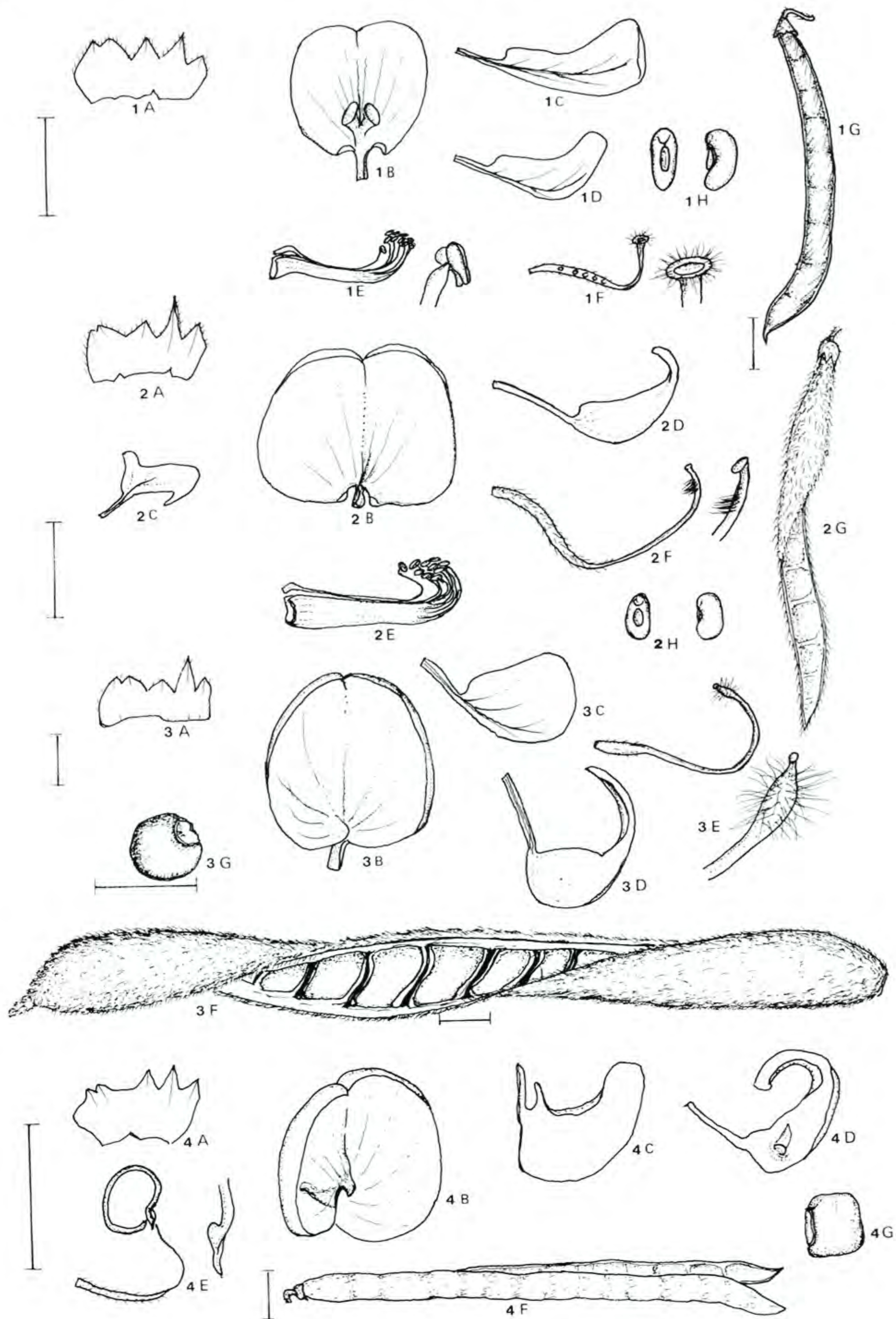


Figure 25. PHASEOLEAE: Phaseolinae

Figure 26. AESCHYNOMENAE

1. *Aeschynomene americana*: branch with flowers and fruits; 1A. stipules; 1B. leaflet; 1C. flower; 1D. standard; 1E. wing; 1F. keel; 1G. stamens; 1H. gynoecium and calyx; 1I. fruit. Bar indicate 1 cm.
2. *Cyclocarpa stellaris*: branch with flowers and fruits; 2A. leave and stipules; 2B. standard; 2C. wing; 2D. keel; 2E. calyx opened out; 2F. stamens and gynoecium; 2G. fruit. Bar indicate 1 cm.
3. *Geissaspis cristata*: branch with flowers and fruits; 3A. bract; 3B. standard; 3C. wing; 3D. keel; 3E. stamens and calyx; 3F. fruit. Bar indicate 1 cm.
4. *Ormocarpum cochinchinense*: branch with flowers and fruits; 4A. standard; 4B. wing; 4C. keel; 4D. calyx opened out; 4E. stamens and gynoecium. Bar indicate 1 cm.
5. *Smithia ciliata*: branch with flowers and fruits; 5A. flower; 5B. standard; 5C. wing; 5D. keel; 5E. stamens; 5F. fruit. Bar indicate 1 cm.
6. *Zornia diphylla*: branches with flowers and fruits; 6A. flower and bracts; 6B. standard; 6C. wing; 6D. keel; 6E. calyx opened out; 6F. stamens; 6G. fruit. Bar indicate 1 cm.



Figure 26. AESCHYNOMENAE

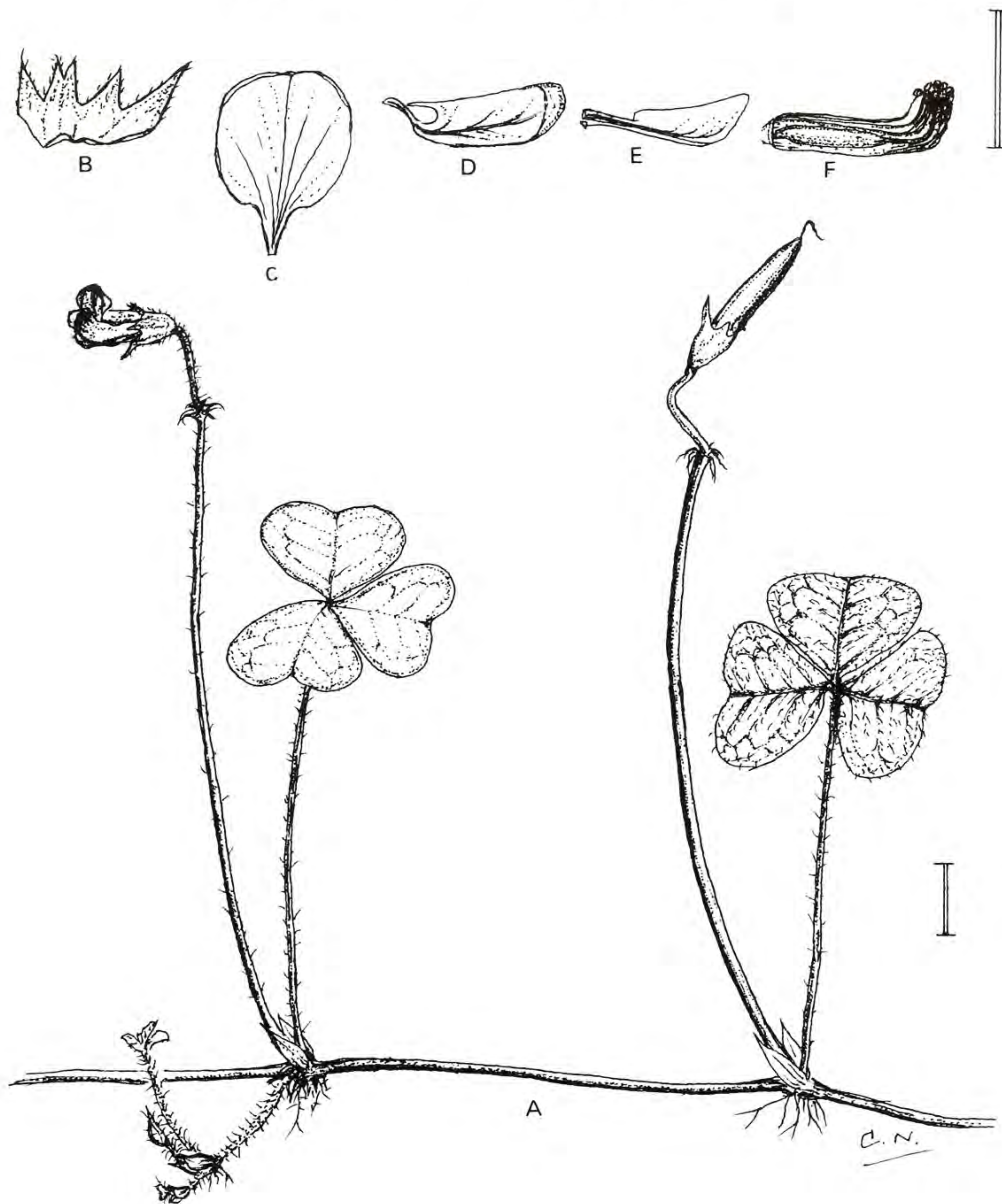


Figure 27. TRIFOLIEAE

Parochetus communis: A. branch with flower and fruit; B. calyx opened out; C. standard; D. wing; E. keel; F. stamens and gynoecium. Bar indicate 1 cm.

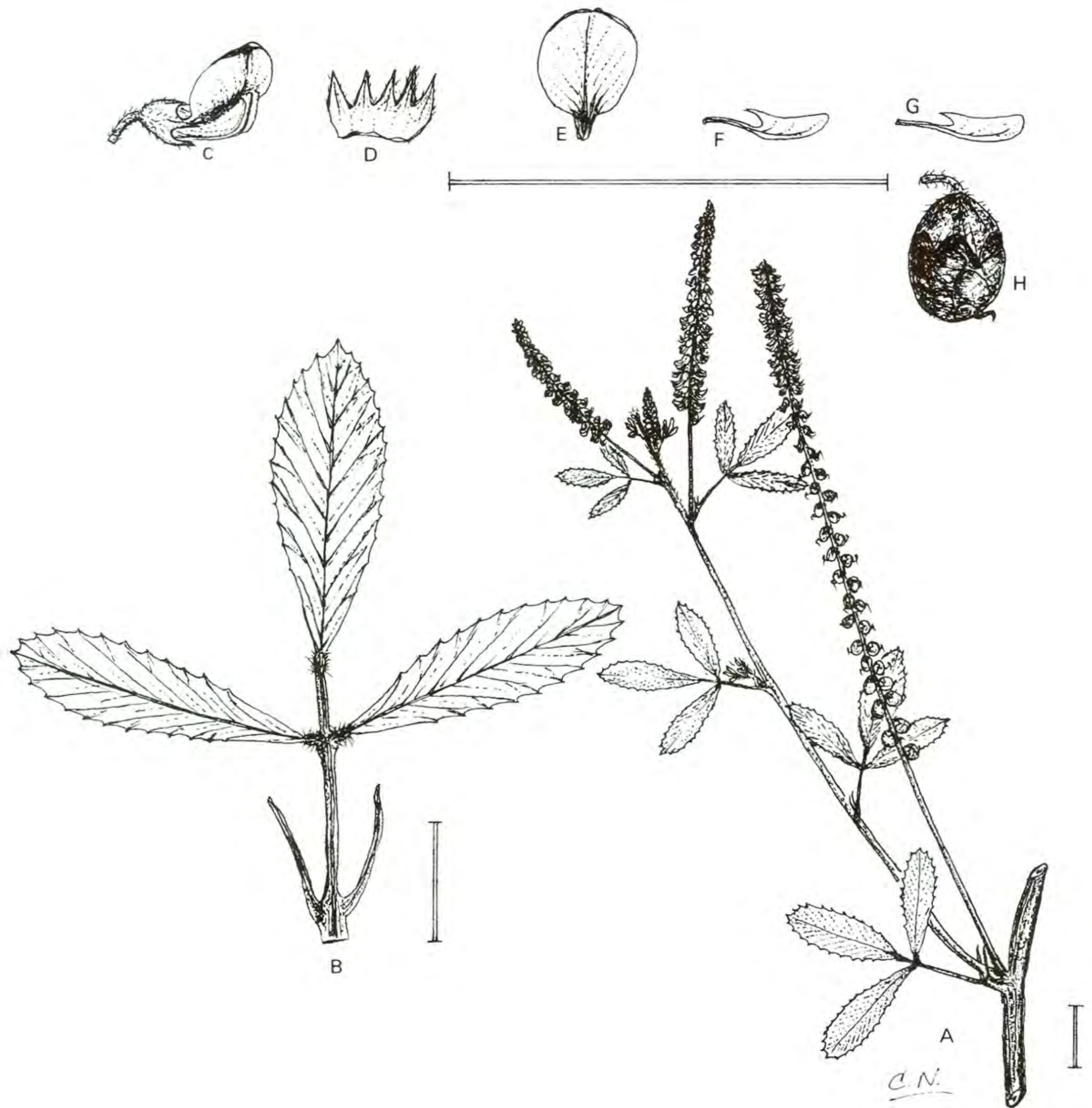


Figure 28. TRIFOLIEAE

Melilotus indica: A. branch with flowers and fruits; B. leaf; C. flower; D. calyx opened out; E. standard; F. wing; G. keel; H. fruit. Bar indicate 1 cm.

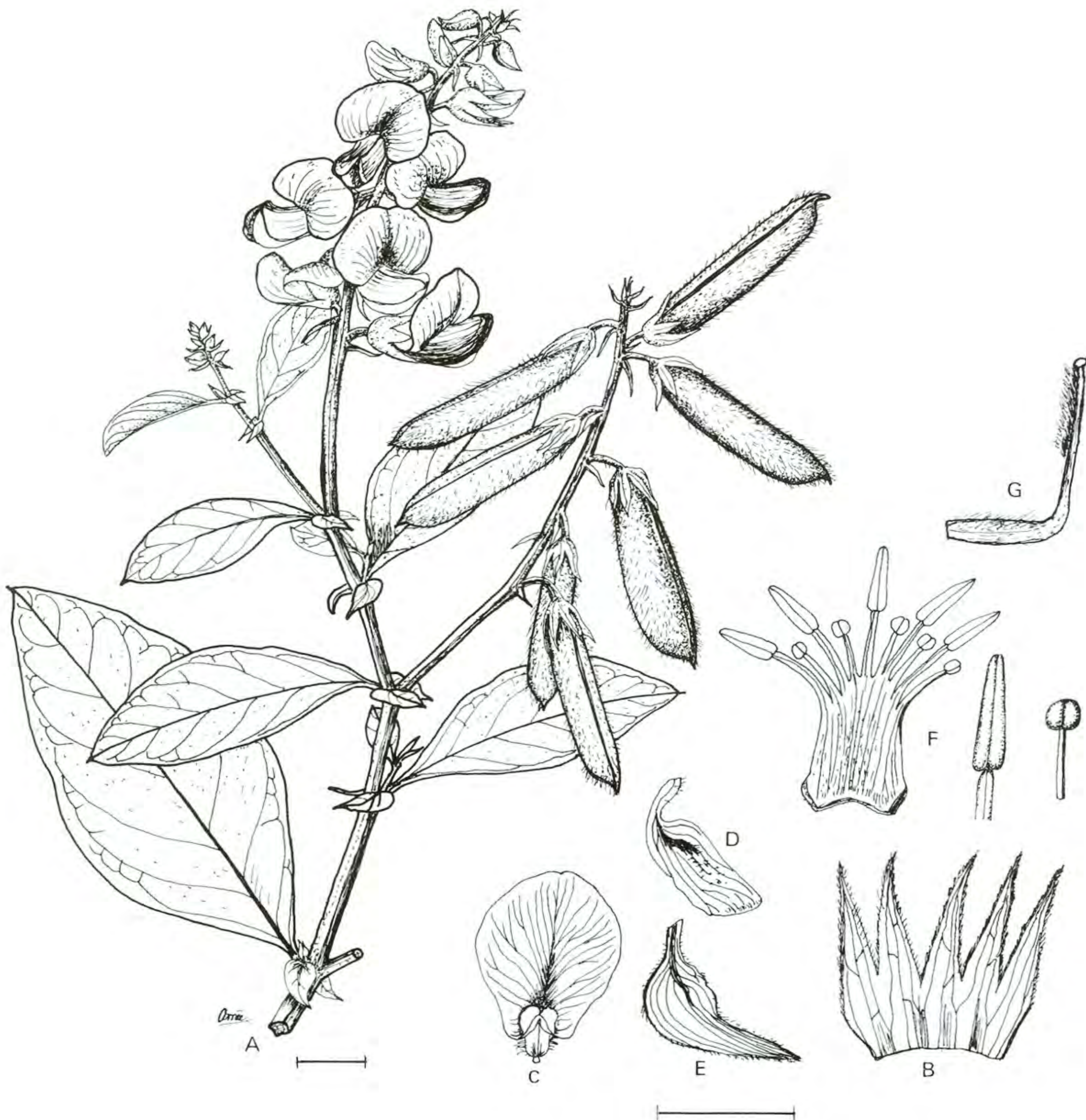


Figure 29. CROTALARIEAE

Crotalaria verrucosa: A. branch with flowers and fruits; B. calyx opened out; C. standard; D. wing; E. keel; F. stamens; G. gynoeceium. Bar indicate 1 cm.

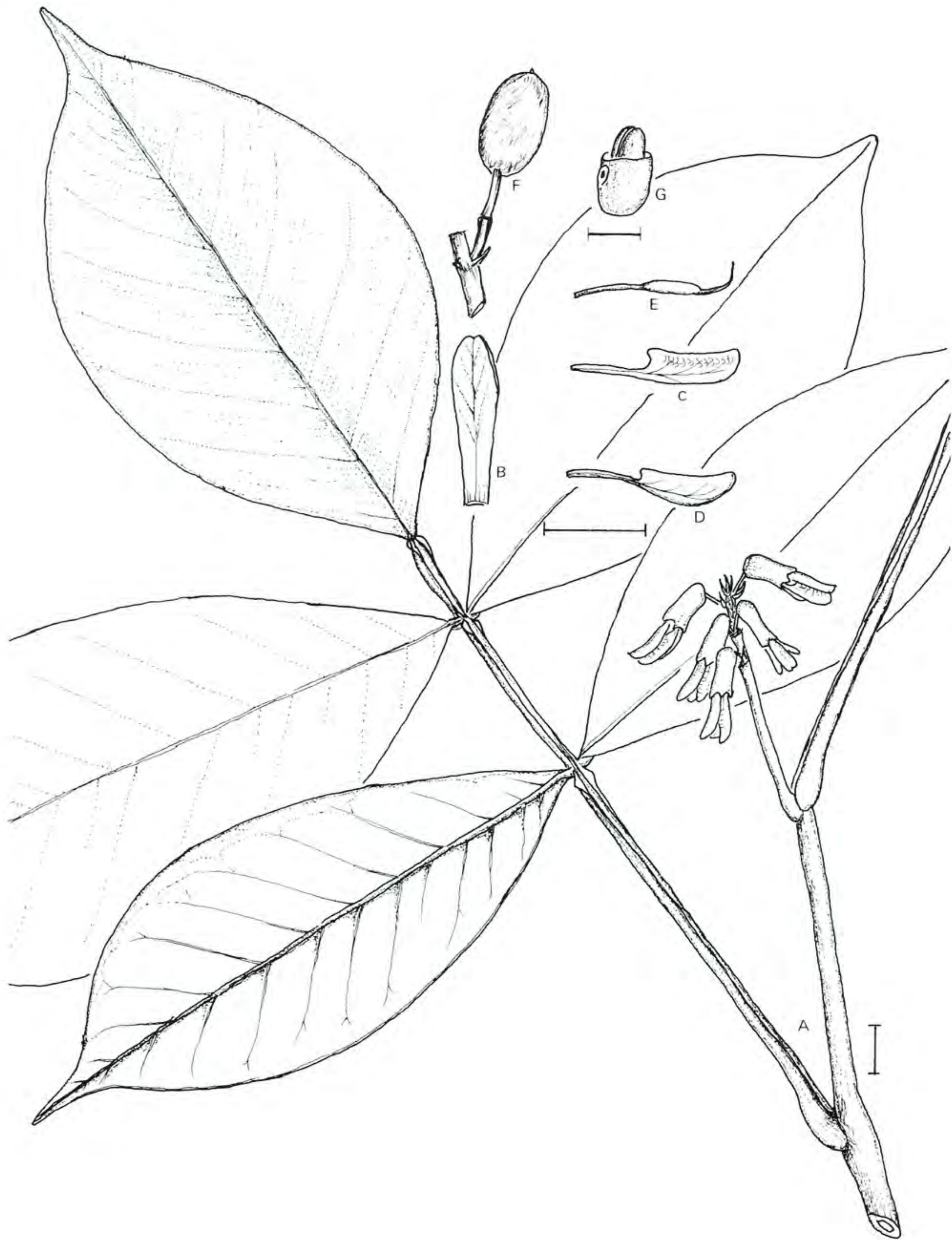


Figure 30. EUCHRESTEAE

Euchresta horsfieldii: A. flowering branch; B. standard; C. wing; D. keel; E. gynoecium; F. fruits; G. seed. Bar indicate 1 cm.