

TAXONOMIC STUDY ON TEN SPECIES OF FABACEAE FROM PAUK TOWNSHIP, MAGWAY REGION

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Abstract

Taxonomic study on ten species belonging to the family Fabaceae in Pauk Township was carried out. The flowering specimens were collected and identified from June 2019 to May 2020. Totally 8 genera were resulted. Five species are under the subfamily Caesalpinioideae and the other five species are under Papilionoideae. The caesalpinioideae species are *Bauhinia acuminata* L., *Bauhinia racemosa* Lam., *Parkinsonia aculeata* L., *Senna auriculata* (L.) Roxb. and *Senna hirsuta* (L.) Irwin & Barneby. The papilionoideae species are *Butea monosperma* (Lam.) Taub., *Crotalaria striata* DC., *Dalbergia oliveri* Gamble ex Prain, *Erythrina microcarpa* Koord. & Valetton and *Millettia pinnata* (L.) Panigrahi. Among the study species, 6 species are trees, 2 species are shrubs and 2 species are herbaceous. The leaf types of 8 species are compound and the other 2 species are simple leaves. The taxonomic descriptions of each species were described with their respective figures. Myanmar name, English name and Flowering period have been mentioned. An artificial key to the genera and species were constructed. It is hoped that the present research will provide the valuable information for further studies and will support in teaching to the students.

Keyword: Taxonomic study, Fabaceae, identified, 8 genera, Artificial key to the genera and species

Introduction

Taxonomy is basically concerned with the classification of organisms (Singh 2010). Taxonomy is a science that includes identification, nomenclature and classification of objects. Nomenclature is concerned with the determination of the correct name of a known plant according to a nomenclatural system. The naming of plants is a subject of international importance. It is a function of taxonomy that is regulated by what are known as the International Rules of Botanical Nomenclature (Lawrence 1951).

The family Fabaceae (Leguminosae) is the third largest family of the flowering plants. The family Fabaceae or Leguminosae is commonly known as the legume, pea or bean. It can be divided into 3-subfamilies. They are Caesalpinioideae, Mimosoideae and Papilionoideae (Simpson 2006). The family Mimosaceae, Caesalpinioideae and Fabaceae were treated under the order Fabales by Cronquist (1981).

Fabaceae consists of about 425 genera, 12000 species distributed worldwide. The more primitive woody genera mostly occur in the hemisphere are in the tropics whereas the more advanced and herbaceous genera are found in temperate regions, especially rich in Mediterranean countries (Anonymous 2008).

The subfamilies Caesalpinioideae can be easily characterized by the flowers; irregular, zygomorphic with five petals which are not differentiated into standard, wings and keel. The stamens are usually ten visible externally in Caesalpinioideae. In the subfamilies Papilionoideae; flowers are irregular, zygomorphic and is made up of five petals, two wing petals and two petals partially fused together to form a boat-shaped keel. The keel enclose the stamen, which are not visible externally (Haywood 1978).

Papilionoideae commonly known as the legume, pea or bean family are a large and economically important family of flowering plants. It includes trees, shrubs and perennial or annual herbaceous plants, which are easily recognized by their fruit (legume) and their compound

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stipulated leaves. The family is widely distributed and is the third largest land plant family. Papilionoideae is especially important because the seeds and pods are the source of human and animal food (Simpson 2006).

In the present research, Taxonomy on ten species belonging to Fabaceae from Pauk Township, Magway Region was studied. The climate condition of the study area is wet and dry. The temperature is highest in the months of May and June. The temperature is lowest in the months of November and December.

The aims of this research are to study the taxonomy on ten species of Fabaceae and provide the knowledge to other researcher. The objectives are to carry out the morphological characteristics of collected species, to identify and classify them and to record the list of these species.

Materials and Methods

The flowering plant specimens of Fabaceae in Pauk Township were collected from June 2019 to May 2020. Field observation was made by using GPS (Global Positioning System). Locations of the collected plants were also noted. The images of inflorescences and flowers were recorded by taking photographs. Then these specimens were kept into the plastic bags. The morphological characters of collected specimens were recorded by using a dissecting microscope.

The taxonomic identification of collected plants was carried out by referring to Anonymous (2008), Backer (1965), Dassanayake (1980-1996), Hooker (1875) and Nasir & Ali (1977). The genera and species were arranged alphabetically in table. Myanmar names were referred to Hundley and Chit Ko Ko (1987) and Kress *et al.* (2003). The valid names of studied species were checked in the website of International Plant Name Index. The taxonomic descriptions were presented with their respective figures. An artificial key to the genera and species were constructed.

Results

Totally 10 species belonging to 8 genera were verified and classified. The arrangement of the genera and species were placed alphabetically in Table 1.

Table 1 List of the collected species from Pauk Township

Group	Order	Family	No.	Scientific name
Eudicot	Fabales	Fabaceae	1.	<i>Bauhinia acuminata</i> L.
			2.	<i>Bauhinia racemosa</i> Lam.
			3.	<i>Butea monosperma</i> (Lam.) Taub.
			4.	<i>Crotalaria striata</i> DC.
			5.	<i>Dalbergia oliveri</i> Gamble ex Prain
			6.	<i>Erythrina microcarpa</i> Koord. & Valetton
			7.	<i>Millettia pinnata</i> (L.) Panigrahi
			8.	<i>Parkinsonia aculeata</i> L.
			9.	<i>Senna auriculata</i> (L.) Roxb.
			10.	<i>Senna hirsuta</i> (L.) Irwin & Barneby

1. An artificial key to the genera

- 1. Corolla caesalpiniaceous ----- 2
- 1. Corolla papilionaceous----- 4
 - 2. Leaves simple; flowers bracteolate ----- *Bauhinia*
 - 2. Leaves compound; flowers ebracteolate ----- 3
- 3. Staminodes absent -----*Parkinsonia*
- 3. Staminodes present ----- *Senna*
 - 4. Stamens monadelphous----- *Crotalaria*
 - 4. Stamens diadelphous----- 5
- 5. Leaves 3-foliolate----- 6
- 5. Leaves 5- to many-foliolate ----- 7
 - 6. Keels much longer than standards ----- *Butea*
 - 6. Keels much shorter than standards -----*Erythrina*
- 7. Leaflets opposite ----- *Millettia*
- 7. Leaflets alternate ----- *Dalbergia*

2. Taxonomic description1. *Bauhinia acuminata* L., Sp. Pl. 1: 376. 1753. (Figure 1)

Myanmar name : Swedaw phyu

English name : Orchid tree

Flowering period : April to July

Perennial erect shrubs, up to 2 m high; stems and branches terete, glabrous. Leaves simple, alternate, bilobed; stipules linear, pubescent; petioles 2.5-3.5 cm long, glabrous; blades ovate, 4.0-7.0 cm by 3.0-5.0 cm, obtuse to subcordate at the base, entire along the margin, deeply cordate at the apex, pubescent beneath. Inflorescences axillary and terminal racemes, few-flowered; peduncles up to 6 cm long, pubescent. Flowers bisexual, zygomorphic, pentamerous, hypogynous, white, 5.5-6.0 cm in diameter; pedicels 1.5-2.0 cm long, pubescent; bract and bracteoles ovate, 0.2 cm long, pubescent, persistent. Calyx splitting spathaceous, 5-lobed; tubes 1.3-2.0 cm long; lobes lanceolate, 0.3-0.5 cm long, green, pubescent. Corolla caesalpinaceous; petals 5, free, white; lobes lanceolate to oblong, 3.0-4.0 cm long, glabrous; claw 0.5-1.0 cm long. Stamens 10, all fertile, inserted; filaments filiform, unequal, 1.5-2.5 cm long, white, glabrous; anthers dithecous, dorsifixed, oblong, 0.3-0.4 cm long, yellow. Carpel 1; ovary superior, linear, about 1 cm long, yellow, unilocular with many ovules on the marginal placentae; style filiform, 0.8-1.2 cm long, glabrous; stigma simple, green; stipe about 1.0 cm long. Pods linear-oblongoid, flat, dehiscent, up to 12 cm long, many-seeded. Seeds compressed, orbicular.

Specimens examined: Magway Region, Pauk Township, Say Gyi Mountain area, N 21° 43' 34.0" and E 94° 24' 37"; elevation 320 m; 8 July 2019; Kay Kay, collection no.1

2. *Bauhinia racemosa* Lam., Encycl. 1 (2): 390. 1785. (Figure 2)

Myanmar name : Phalan

English name : Unknown

Flowering period : June to September

Perennial trees, up to 6 m high; stems and branched terete. Leave simple, bilobed, alternate, exstipulate; petioles 1.8-5.0 cm long; blades ovate-orbicular, 4.5-10.5 cm by 3.5-7.5 cm, cordate at the base, entire along the margin, lobed, obtuse at the apex, hairy on both surface. Inflorescence terminal or axillary raceme; many-flowered peduncle 12.0-20.5 cm long, glabrous. Flower bisexual, zygomorphic, pentamerous, hypogynous, pinkish white, 0.5-0.7 cm indiameter; pedicel 0.1-0.3 cm long, pubescent. Calyx spathaceous, 5-lobed; tube cubular, 0.2-0.3 cm long; lobe 0.1-0.2 cm long. Petal 5, free, lobe 4.5-5.5 cm long, glabrous, lanceolate, hairy. Stamen 10, free, exerted, all fertile; filaments filiform; anther ditheous, dorsifixed, oblong, 0.2-0.5 cm long, longitudinal dehiscing. Carpel one; ovary superior, linear, 0.1-0.3 cm long, pubescent, stalked, unilocular with many ovule in the locule on the marginal placentae; style short, 1.0-1.5 cm long; stigma peltate. Pods compressed, linear dehiscent, 5.5-8.5 cm long, many-seeded. Seeds flat.

Specimens examined: Magway Region, Pauk Township, Say Gyi Mountain area, N 21° 43' 38.0" and E 94° 24' 36"; elevation 350 m; 8 July 2019; Kay Kay, collection no.2.

3. *Butea monosperma* (Lam.) Taub., Nat. Pflanzenfam. 3 (3): 366, f. 131 M-N. 1894. (Figure 3)

Myanmar names : Pauk

English name : Flame of the forest

Flowering Period : November to March

Perennial deciduous tree, up to 6.5 m high; stems and branches cylindrical, woody, fine hairy when young. Leaves pinnately trifoliolate compound, alternate; stipules small, 0.2-0.6 cm long, pubescent; petiole terete, 10.5-19.0 cm long; blades obovate, the terminal leaflet larger than two lateral leaflet, 12.0-23.0 cm by 10.5-15.5 cm, rounded or oblique at the base, entire along the margin, obtuse at the apex glabrous on both surfaces. Inflorescences axillary or terminal fasciculate raceme, many-flowered; peduncle terete, 10.5-43.5 cm long, pubescent. Flowers bisexual, zygomorphic, pentamorous, hypogynous, orange, 3.5-5.5 cm in diameter, bract lanceolate, 0.5-0.8 cm long; pedicel terete, 2.0-3.5 cm long, pubescent. Calyx campanulate, 5-lobed; tubes 1.5-3.7 mm long, pubescent. Corolla papilionaceous, vexillariform, 5-lobed, laterally compressed; standard lanceolate, 5.5-8.5 cm long with short claw; wing falcate, 4.5- 6.5 cm long with claw, glabrous. Stamens 10, diadelphous; staminal tube 4.0-7.5 cm long; anther ditheous, basifixed, oblong 2.0-4.0 mm long, longitudinal dehiscing. Carpel 1; ovary superior, 2.0-3.5 cm long, unilocular with 5-10 ovule in the locule on the marginal placentae; style terminal, curved; stigma simple. Pods oblongoid, twisted, pale yellow, 8.5-15.5 cm long, few-seeded. Seeds flat.

Specimens examined: Magway Region, Pauk Township, Say Gyi Mountain area, N 21° 43' 35.0" and E 94° 24' 30"; elevation 700 m; 1 November 2019; Kay Kay, collection no.10.

4. *Crotalaria striata* DC., Prodr. 2: 131. 1825. (Figure 4)

Myanmar name : Taw pike san

English name : Smoth crotalaria

Flowering period : June to August

Annual herbs, up to 85 cm high; stems and branches angular, glabrous. Leaves palmately trifoliolate compound, alternate; petioles about 3.5 cm long, glabrous; leaflets ovate, unequal, middle one larger, about 5.0 cm by 2.5 cm, obtuse at the base; entire along the margin, emerginate at apex, glabrous above, pubescent beneath. Inflorescences terminal racemes, many-flowered; peduncles about 10.5 cm long, pubescent. Flowers bisexual, irregular, zygomorphic, pentamerous, hypogynous, about 1.0 cm in diameter, yellow; pedicels about 0.5 cm long, pubescent. Calyx campanulate, 5-lobed; tubes about 0.5 cm long; lobes lanceolate, unequal, 0.1-0.6 cm long, pale

green, slightly pubescent. Corolla papilionaceous, 5-lobed; standards ovate-oblong, about 0.6 cm long, shortly clawed; wings oblong, about 0.7 cm long, shortly clawed; keels beak-shaped, pubescent. Stamens 10, monadelphous; filaments unequal, about 1.5 cm long, pale yellow; anthers dimorphic, ditheous, basifixed and dorsifixed, yellow. Ovary superior, oblong, about 1.0 cm long, hairy, unilocular with many ovules on the marginal placentae; styles curved, about 0.4 cm long, pubescent; stigmas simple. Pods oblong-linear, about 3.5 cm long, pubescent. Seeds obovate, flat, brown, glabrous.

Specimens examined: Magway Region, Pauk Township, Say Gyi Mountain area, N 21° 43' 34.0" and E 94° 24' 36"; elevation 700 m; 5 July 2019; Kay Kay, collection no. 3.

5. *Dalbergia oliveri* Gamble ex Prain, J. Asiat. Soc. Bengal. Pt. 2, Nat. Hist. 66: 451. 1897. (Figure 5)

Myanmar name : Tamalan

English name : Burmese rose wood

Flowering period : March to May

Perennial deciduous tree, up to 14.0 m high; stems and branches terete. Leaves unipinnate compound, imparipinnate, alternate; stipules minute, caducous; petioles slender, pubescent, petiole 1.0-2.5 mm long, slender, pubescent; leaflets 5 to 10, oblong, 3.5-5.5 cm long, pale pink when young, pubescent, rounded and unequal at the base, entire along the margin, pubescent on both surfaces. Inflorescences terminal and axillary paniculate raceme; peduncle linear, 10.5-15.5 cm long. Flowers bisexual, zygomorphic, hypogynous, pentamous, purple to pink, 0.8-1.1 cm in diameter; bract caducous. Calyx campanulate; 5 lobed; tube cup-shaped, 0.2-0.3 cm long; lobes 0.1-0.5 cm long, pubescent. Corolla papilionaceous; standards ovate, 0.6-1.5 cm long, clawed; wings oblong, 0.5-0.8 cm long, clawed; glabrous, keels obtuse, 0.4-0.6 cm long, glabrous. Stamens 5+5, diadelphous; filaments 0.2-0.5 cm long; anthers ditheous, dorsifixed, ovoid, 0.1-0.2 cm long, longitudinal dehiscing. Carpel 1; ovary superior, oblong, 0.2-0.4 cm long, pubescent, unilocular with few ovules in the locule on marginal placentae; styles terminal, 0.1-0.3 cm long, glabrous, incurved; stigmas simple. Pods flattened, 1- to 4-seeded with samara. Seeds ovoid, glabrous.

Specimens examined: Magway Region, Pauk Township, Say Gyi Mountain area, N 21° 43' 28.0" and E 94° 24' 39"; elevation 1063 m; 10 May 2020; Kay Kay, collection no.7.

6. *Erythrina microcarpa* Koord. & Valetton, Exkurs. Fl. Java 2: 401. 1912. (Figure 6)

Myanmar name : Kathit

English name : Unknown

Flowering period : March to May

Perennial small deciduous trees, up to 5 m high; stems and branches terete, pubescent when young. Leaves pinnately trifoliolate compound, alternate; stipules linear, caducous; petioles terete, 5.0- 7.6 cm long, pubescent; rachis 2.5-7.0 cm long; petioles terete, 3.0-7.0 cm long, pubescent; leaflets triangular ovate, terminal leaflet larger than the lateral ones, 3.5-7.0 cm long, truncate at base, entire along the margin, acuminate at the apex, glabrous on both surfaces. Inflorescences terminal and axillary dense raceme, many-flowered; peduncle 5.0-10.0 cm long, pubescent. Flowers bisexual, zygomorphic, pentamerous hypogynous, red, 1.5-3.0 cm in diameter; bracts linear, 1.0-2.0 mm long. Calyx spathaceous; 5-lobed; tube tubular 4.5-6.5 mm long; lobes triangular, 1.0-2.7 mm long, pubescent. Corolla papilionaceous; standards ovate lanceolate, 2.0-3.7 cm long; wings orbicular, 4.5-6.5 mm long, glabrous; keels rhomboid, 1.3-2.7 cm long. Stamens 10, diadelphous; staminal tube 2.0-3.8 cm long, reddish, glabrous; free, filaments filiform,

1.0-2.0 cm long; anther ditheous, dorsifixed, oblong, 1.0-2.2 mm long, longitudinal dehiscent. Carpel 1; ovary superior, linear, stipitate, 1.5-2.5 cm, unilocular with few ovule in the locule on the marginal placentae; style terminal curved, 1.0-2.0 cm long; stigma simple. Pods linear, stright, black, few-seeded, 5.8-10.5 cm long. Seeds ellipsoid, glabrous.

Specimens examined: Magway Region, Pauk Township, Say Gyi Mountain area, N 21° 43' 32.0" and E 94° 24' 38"; elevation 750 m; 10 May 2020; Kay Kay, collection no. 8.

7. *Millettia pinnata* (L.) Panigrahi, Fl. Bilaspur Distr. 1: 210. 1989. (Figure 7)

Cytisus pinnatus L. Sp. Pl. 2: 741. 1753.

Myanmar name : Thinwin pyu

English name : Pongame oiltree

Flowering period : March to May

Perennial deciduous tree, up to 8 m high; stems and branches terete, glabrous. Leaves unipinnate compound, imparipinnate, alternate; stipules triangular, 2.0-5.0 mm long, glabrous; petioles slender, 1.5-2.5 cm long; leaflets 5 to 7, opposite, ovate or obovate, 3.0-5.5 cm by 3.5-4.0 cm, rounded and unequal at the base, entire along the margin, glabrous on both surfaces. Inflorescences terminal and axillary raceme, many-flowered; peduncle slender, 2.0-3.0 cm long, glabrous. Flowers bisexual, zygomorphic, pentamerous, hypogynous, pinkish violet, 0.4-0.8 cm in diameter, pedicels 0.5 cm long, pubescent. Calyx cup-shaped; tube 0.3-0.7 cm long. Corolla papilionaceous; standards ovate, 0.4-0.8 cm long; wings oblong, glabrous; keels obtuse, 0.3-0.5 cm long. Stamens 10, diadelphous; filaments linear, 0.5-0.6 cm long; anthers ditheous, versatile, oblong, 0.1-0.2 cm long, longitudinal dehiscing. Carpel 1; ovary superior, oblong, sparsely pubescent, 0.3-0.5 cm long, unilocular with few ovules in the locule on marginal placentae; style terminal; stigma simple. Pods linear, flattened, 5.0-7.5 cm long, 2- to 3-seeded, woody. Seeds linear oblong, glabrous.

Specimens examined: Magway Region, Pauk Township, Say Gyi Mountain area, N 21° 43' 33.0" and E 94° 24' 36"; elevation 1063 m; 10 May 2020; Kay Kay, collection no. 9.

8. *Parkinsonia aculeata* L., Sp. Pl. 1: 375. 1753. (Figure 8)

Myanmar name : Mya sein

English name : Jerusalem thorn

Flowering period : August to December

Perennial erect small trees, up to 5 m high; stem and branched terete, pubescent; spines straight, 2 - 3 cm long. Leaves bipinnate compound, imparipinnate, alternate; stipules spinescent; petioles short, about 1 cm long; secondary rachis up to 30 cm long; leaflets 35- to 50-paired; blades obovate-oblong, 0.2-0.4 cm by 0.1-0.2 cm, subrounded at the base, entire along the margin, rounded at the apex, pubescent on both surfaces, usually deciduous. Inflorescences axillary raceme, 10-15-flowered; peduncles 10-15 cm long. Flowers bisexual, zygomorphic, pentamerous, hypogynous, bright yellow, 1.5-2.0 cm in diameter, fragrant; pedicels about 1.5 cm long. Calyx campanulate, 5-lobed, yellowish green; tubes 0.1-0.2 cm long; lobes ovate-oblong, reflexed. Corolla caesalpinaceous; petals 5, limb suborbicular, 1.5-2.0 cm long, clawed, pubescent. Stamens 10, free, all fertile, inserted; filaments filiform, 0.5-1.0 cm long, hairy at the base; anthers ditheous, dorsifixed, oblong, reddish brown. Carpel one; ovary superior, oblong, pubescent, unilocular with many ovules on the marginal placentae; style terminal, reddish, glabrous; stigma

simple. Pods linear, cylindrical, constricted between the seeds, 5.0-13.0 cm long, yellowish brown, indehiscent, few-seeded. Seeds oblong, compressed, glabrous.

Specimens examined: Magway Region, Pauk Township, Say Gyi Mountain area, N 21° 43' 32" and E 94° 24' 38"; elevation 1063 m; 10 August 2019; Kay Kay, collection no. 4.

9. *Senna auriculata* (L.) Roxb., Fl. Ind. 2: 349. 1832. (Figure 9)

Cassia auriculata L., Sp. Pl. 379. 1753.

Myanmar name : Peik thingat

English name : Tanner's cassia

Flowering period : August to March

Perennial shrubs, up to 3.0 m high; stems and branches terete, pubescent. Leaves unipinnate compound, paripinnate, alternate; stipules auriculate, about 1.0 cm long, foliaceous, persistent; petioles 1.5-2.5 cm long; racheae 4.0-7.0 cm long, orange-red gland between each pairs of leaflets; leaflets 8- to 12-paired, obovate-oblong to elliptic-oblong, 1.5-2.5 cm by 1.0-1.2 cm, obtuse at the base, entire along the margin, obtuse at the apex, pubescent on both surfaces. Inflorescences axillary or terminal paniculate corymbose raceme, many-flowered; peduncles 5.0-10.0 cm long, glabrous. Flowers bisexual, zygomorphic, pentamerous, hypogynous, bright yellow, about 2.5 cm in diameter; pedicels 1.5-3.0 cm long; bracts linear. Sepals 5, free, ovate, 0.2-0.6 cm long, concave, green. Corolla caesalpinaceous, petals 5, obovate, 1.5-2.0 cm long, shortly clawed, yellow with orange veins, glabrous. Stamens 10, free, 7 fertile, staminodia 3, included; filaments filiform, unequal, 3 longest, 3.0-6.0 mm long; anthers dithecous, basifixed, curved, yellow, opening by apical pores. Carpel 1; ovary superior, linear, about 1.5 cm long, unilocular with many ovules in the locule on the marginal placentae; styles filiform, 1.0-2.0 cm long, curved; stigmas simple. Pods linear-oblongoid, compressed, 8.0-12.0 cm long, brown, few-seeded, septate, dehiscent, wingless. Seeds ovate-oblong, compressed, dark brown.

Specimens examined: Magway Region, Pauk Township, Say Gyi Mountain area, N 21° 43' 33.0" and E 94° 24' 35"; elevation 500 m; 10 August 2019; Kay Kay, collection no. 5.

10. *Senna hirsuta* (L.) Irwin & Barneby, Phytologia 44(7): 499. 1979. (Figure 10)

Cassia hirsuta L., Sp. Pl. 378. 1753.

Myanmar name : Kandauk

English name : Woolly wild sensitive

Flowering Period : August to November

Perennial foetid herbs, up to 70 cm high; stem and branches terete, hirsute. Leaves unipinnate compound, paripinnate, alternate; stipules linear, pubescent; petioles 3 - 5 cm long, pubescent, a gland above the pulvinus; racheae 5 - 8 cm long, hirsute; leaflets 3- to 5-paired, opposite; ovate-oblong or elliptic, upper pair of leaflets larger than lower one, 2.5-6.0 cm by 2.5-3.5 cm, rounded at the base, entire along the margin, acuminate at the apex, hirsute on both surfaces. Inflorescences axillary or terminal panicles, few-flowered; peduncles 1.0-2.0 cm long, pubescent. Flowers bisexual, zygomorphic, pentamerous, hypogynous, yellow, about 1.5 cm in diameter; pedicels 1.0-1.5 cm long, pubescent; bracts linear, pubescent. Sepals 5, obovate, concave, unequal, 0.5-0.7 cm long, green, pubescent without. Corolla caesalpinaceous, petals 5, obovate, yellow, unequal, 0.8-1.5 cm long, shortly clawed, pubescent. Stamens 10, free, 7 fertile; staminodia 3, filaments unequal, 2 longest, 5 medium, 3 shortest, 0.3-0.8 cm long, yellow; anthers dithecous, curved, unequal, opening by apical pores, pale brown. Carpel 1; ovary superior, linear, pubescent, unilocular with many ovules on the marginal placentae; styles filiform, curved,

about 0.2 cm long, yellow; stigmas capitate, yellow. Pods linear, compressed, up to 12 cm long, hirsute, many-seeded, pubescent. Seeds orbicular, pale brown, glabrous.

Specimens examined: Magway Region, Pauk Township, Say Gyi Mountain area, N 21° 43' 36.0" and E 94° 24' 39"; elevation 1063 m; 10 August 2019; Kay Kay, collection no. 6.

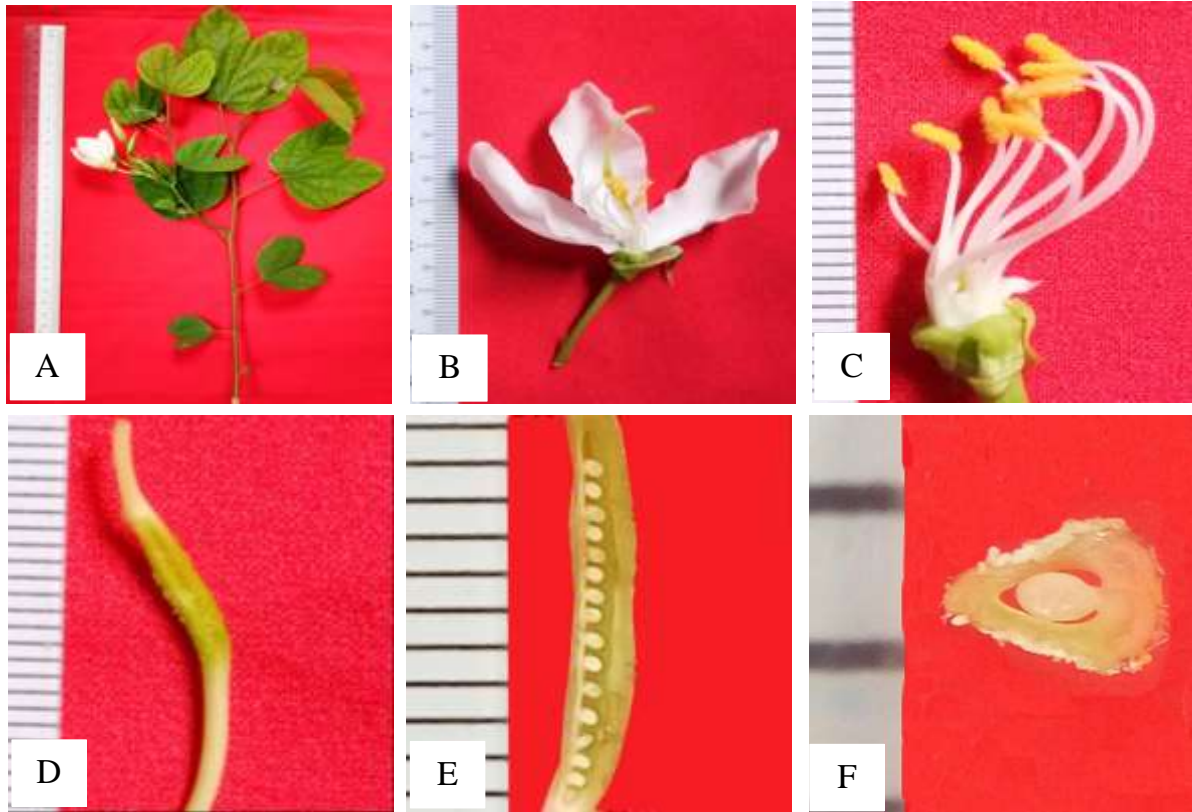
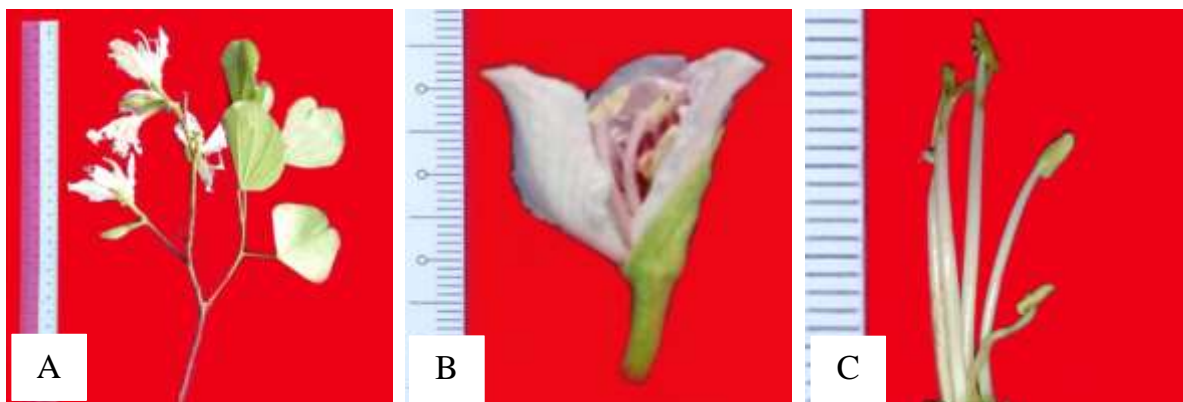


Figure 1 *Bauhinia acuminata* L.

A. Inflorescence
D. Pistil

B. L.S of flower
E. L.S of ovary

C. Stamens
F. T.S of ovary



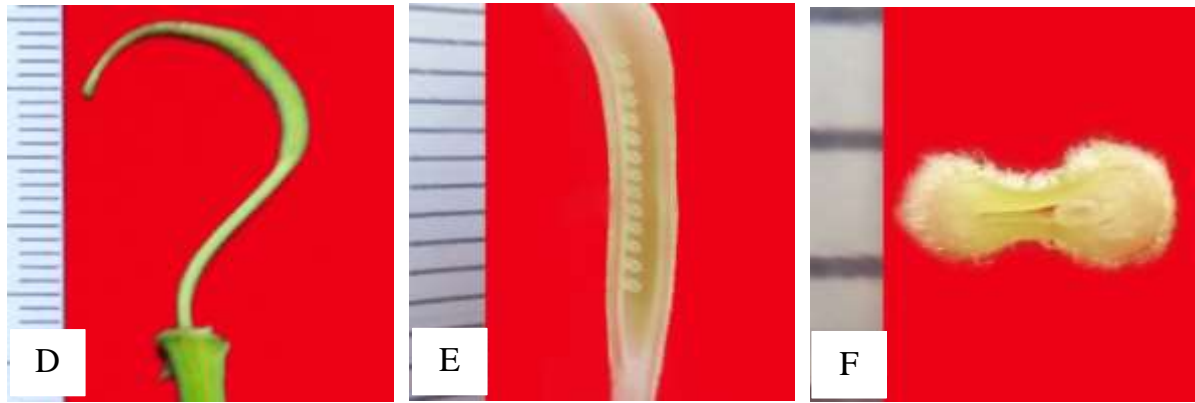


Figure 2 *Bauhinia racemosa* Lam.

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|------------------|-----------------|-----------------|
| A. Inflorescence | B. Flower | C. Stamens |
| D. Pistil | E. L.S of ovary | F. T.S of ovary |

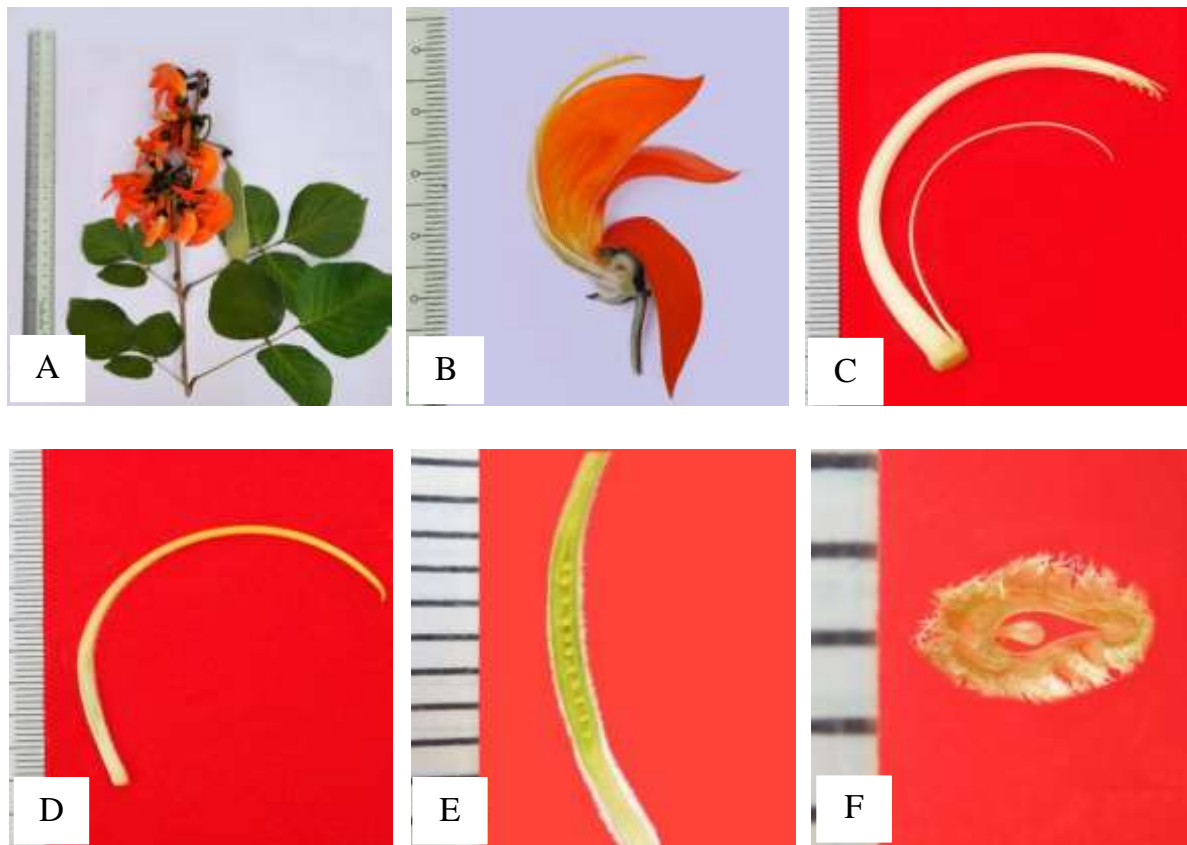


Figure 3. *Butea monosperma* (Lam.) Taub.

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|------------------|------------------|-----------------|
| A. Inflorescence | B. L.S of flower | C. Stamens |
| D. Pistil | E. L.S of ovary | F. T.S of ovary |

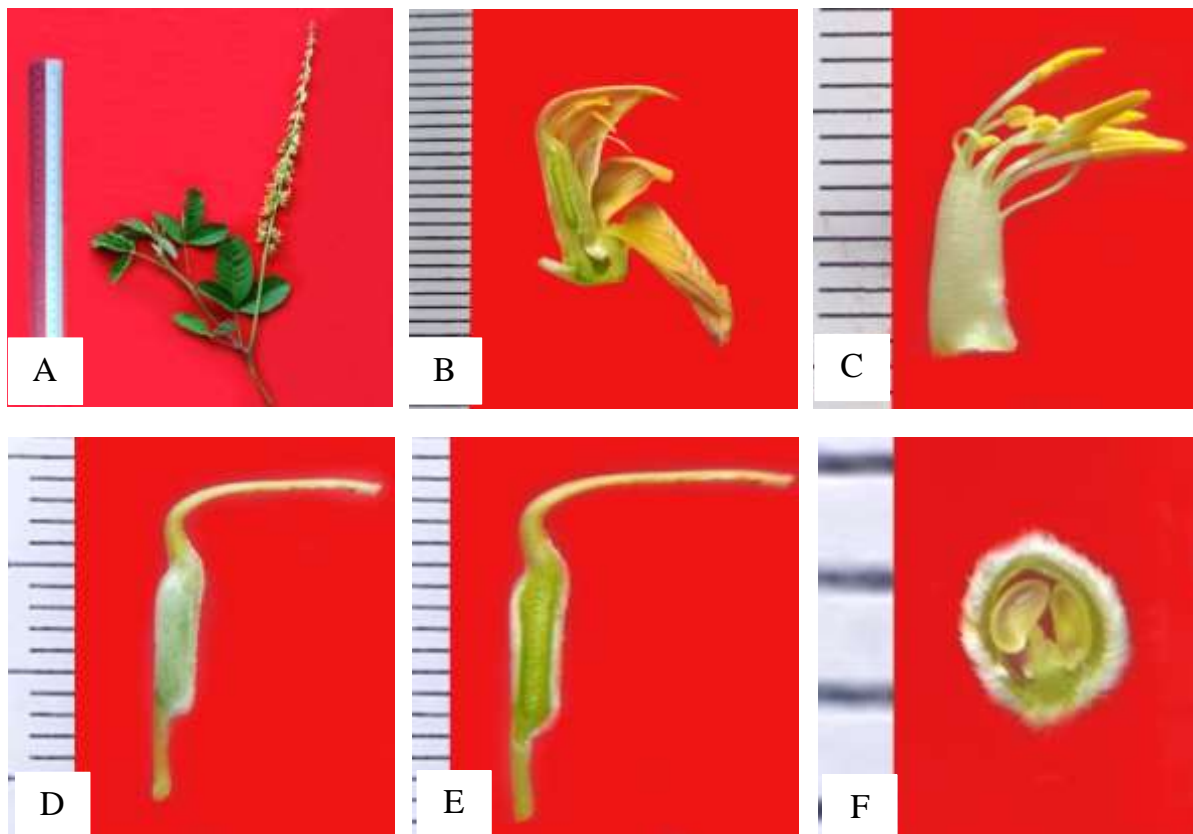


Figure 4 *Crotalaria striata* DC.

A. Inflorescence
D. Pistil

B. L.S of flower
E. L.S of ovary

C. Stamens
F. T.S of ovary

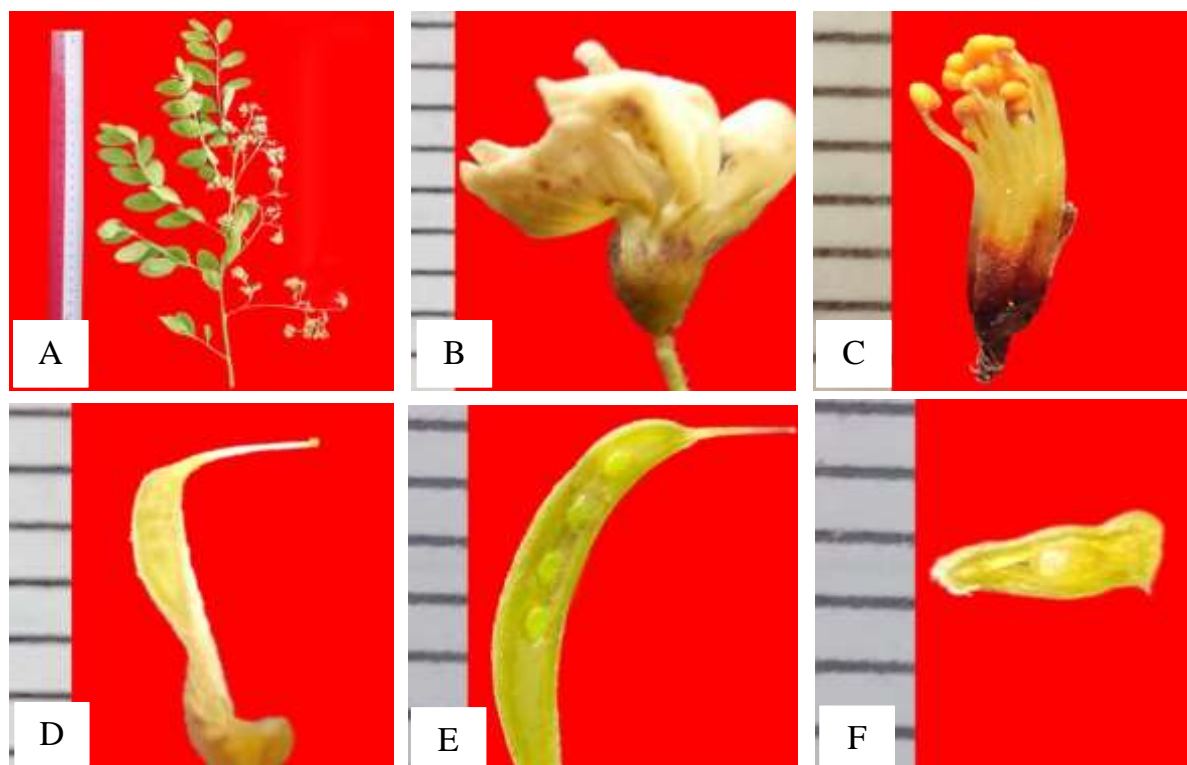


Figure 5 *Dalbergia oliveri* Gamble ex Prain

A. Inflorescence
D. Pistil

B. Flower
E. L.S of ovary

C. Stamens
F. T.S of ovary

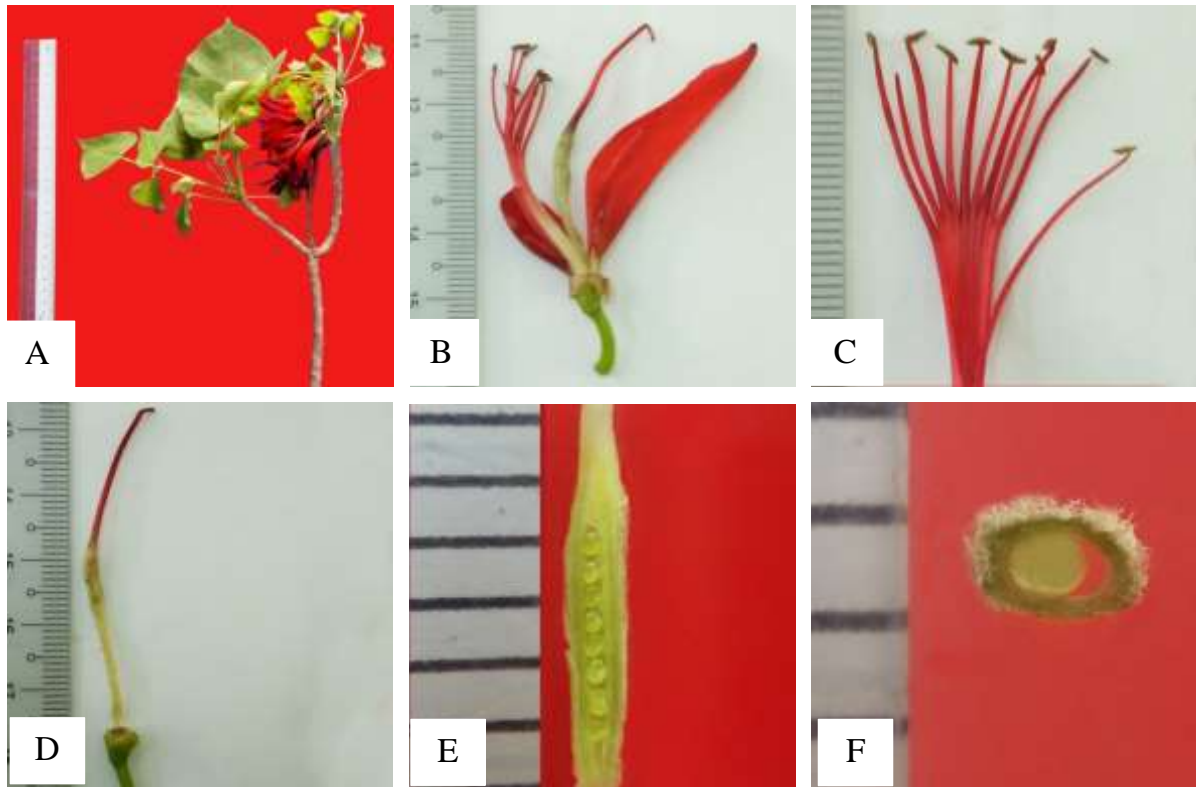


Figure 6 *Erythrina microcarpa* Koord. & Valetton

A. Inflorescence
D. Pistil

B. L.S of flower
E. L.S of ovary

C. Stamens
F. T.S of ovary

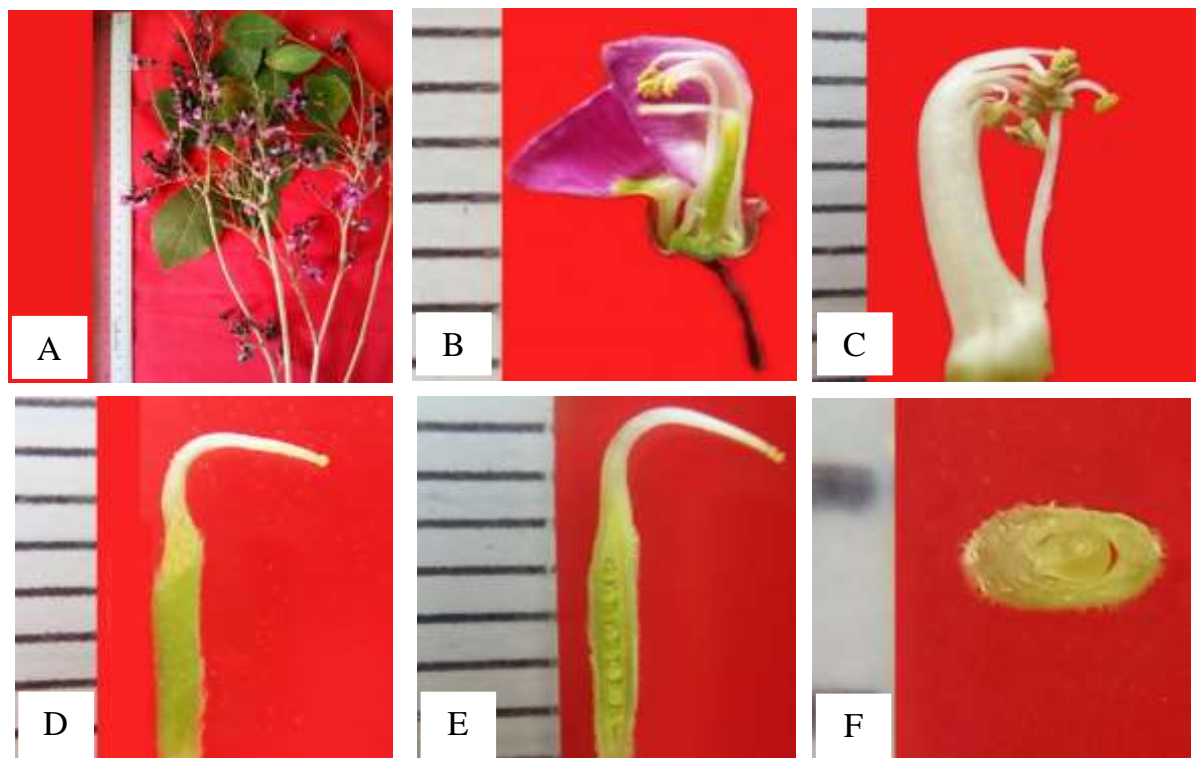


Figure 7 *Millettia pinnata* (L.) Panigrahi

A. Inflorescence
D. Pistil

B. L.S of flower
E. L.S of ovary

C. Stamens
F. T.S of ovary

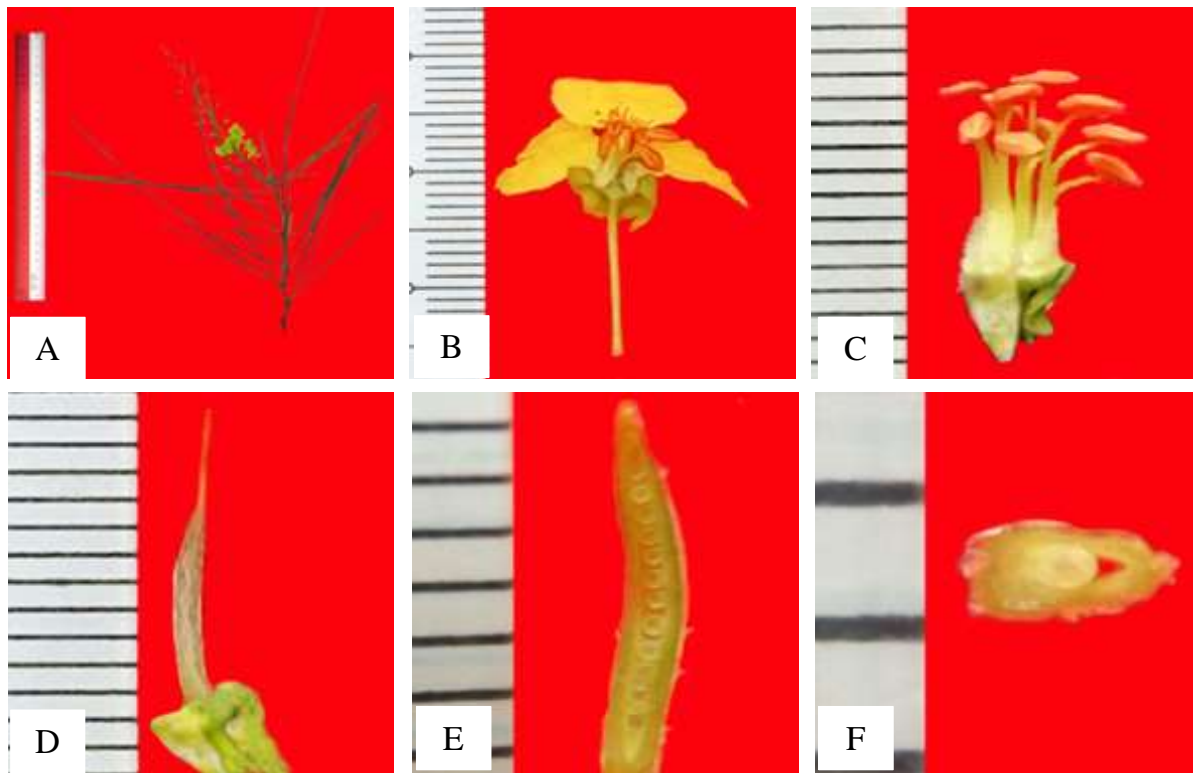


Figure 8 *Parkinsonia aculeata* L.

A. Inflorescence
D. Pistil

B. L.S of flower
E. L.S of ovary

C. Stamens
F. T.S of ovary



Figure 9 *Senna auriculata* (L.) Roxb.

A. Inflorescence
D. Pistil

B. L.S of flower
E. L.S of ovary

C. Stamens
F. T.S of ovary

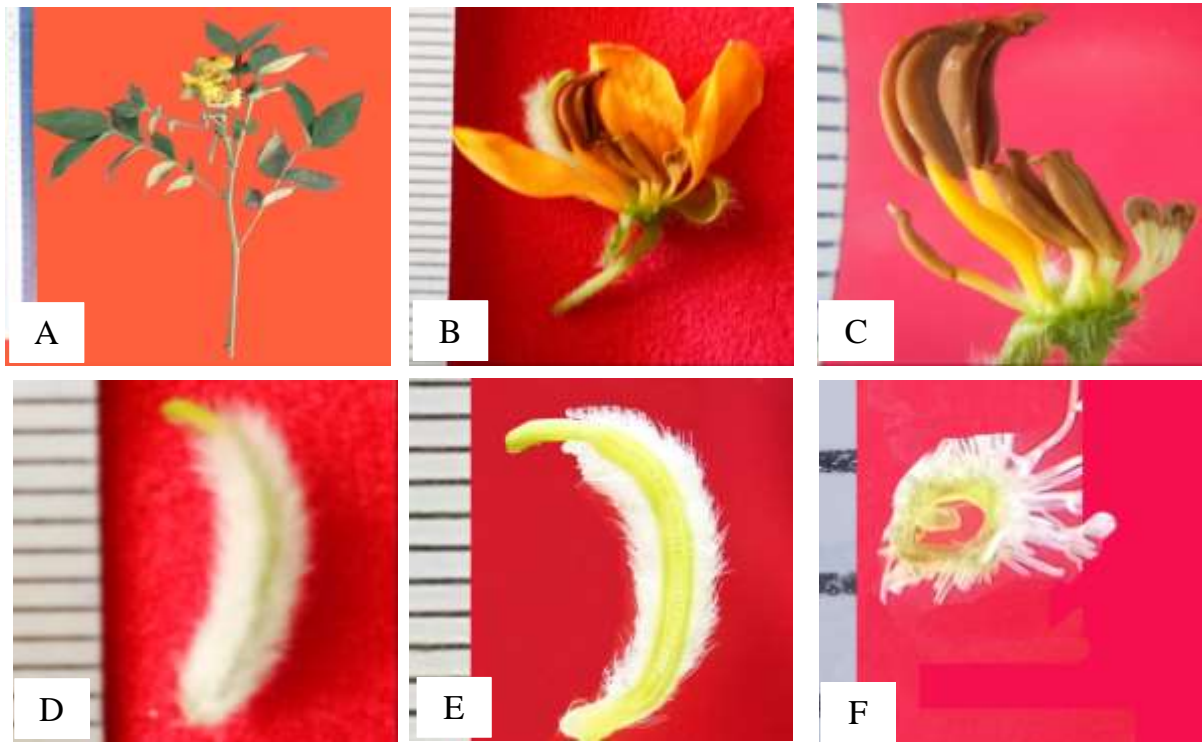


Figure 10 *Senna hirsuta* (L.) Irwin & Barneby

A. Inflorescence

B. L.S of flower

C. Stamens

D. Pistil

E. L.S of ovary

F. T.S of ovary

An artificial key to the studied species

- 1. Corolla caesalpinaceous ----- 2
- 1. Corolla papilionaceous ----- 6
 - 2. Plants arborescent ----- 3
 - 2. Plants herbaceous or shrubby ----- 4
- 3. Plants with spines; leaves compound; flowers bright yellow; anthers dorsifixed -----
----- 8. *Parkinsonia aculeata*
- 3. Plants without spines; leaves simple; flowers pinkish-white; anthers basifixed -----
----- 2. *Bauhinia racemosa*
 - 4. Leaves simple; stamens 10, all fertile ----- 1. *Bauhinia acuminata*
 - 4. Leaves compound; stamens 10, 7 fertile and 3 staminodes ----- 5
- 5. Plants herbaceous, foetid; leaflets 3- to 5-paired; glandular above the pulvinus; stipules linear
----- 9. *Senna hirsuta*
- 5. Plants shrubby, not foetid; leaflets 8- to 12-paired; glandular between each pair of leaflets;
stipules auriculate ----- 10. *Senna auriculata*
 - 6. Plants herbaceous; stamens monadelphous ----- 4. *Crotalaria striata*
 - 6. Plants arborescent; stamens diadelphous ----- 7

7. Leaflets trifoliolate ----- 8
7. Leaflets penta- or more-foliolate-----9
8. Flowers orange; wings falcate; anthers basifixed ----- 3. *Butea monosperma*
8. Flowers red; wings orbicular; anthers dorsifixed ----- 6. *Erythrina microcarpa*
9. Leaflets pubescent on both surfaces; peduncles 10.5-15.5 cm long; pods with wings -----
-----5. *Dalbergia oliveri*
9. Leaflets glabrous on both surfaces; peduncles 2.0-3.0 cm long; pods without wings -----
----- 7. *Millettia pinnata*

Discussion and Conclusion

The taxonomic study on ten species of Fabaceae from Pauk Township were carried out. Totally 8 genera were resulted. Among the resulting species, five species are under the subfamily Caesalpinioideae and the other five species are under the Papilionoideae. The caesalpinioideae species are *Bauhinia acuminata* L., *Bauhinia racemosa* Lam., *Parkinsonia aculeata* L., *Senna auriculata* (L.) Roxb. and *Senna hirsuta* (L.) Irwin & Barneby. The papilionoideae species are *Butea monosperma* (Lam.) Taub., *Crotalaria striata* DC., *Dalbergia oliveri* Gamble ex Prain, *Erythrina microcarpa* Koord. & Valeton and *Millettia pinnata* (L.) Panigrahi.

The family Mimosaceae, Caesalpinioideae and Papilionoideae were treated under the order Fabales by Cronquist (1981). A revised and updated classification of the flowering plants at the ranks of orders and families was published by the Angiosperm Phylogeny Group (2009-APG III). The family Mimosaceae, Caesalpinioideae and Papilionoideae were treated under the Family Fabaceae according to APG III system.

The family Caesalpinioideae is mainly distributed in tropical and subtropical region and consists of 171 genera and 2200-2300 species (Heywood 2007). Cronquist (1981) stated that this family is widespread in tropical and subtropical regions and it consists about 150 genera and 2200 species. Twenty six genera and 124 species were recorded in the checklist of Myanmar by Kress *et al.* (2003). In the subfamily Caesalpinioideae, three genera and 5 species were verified in the present study and described. The species of *Senna* were abundantly found in the study area.

The family Fabaceae (Papilionoideae) are the third largest family of flowering plants. They were distributed in tropical, subtropical and temperate region. They are mostly herbs, consists of 478 genera and 13,600 to 14,060 species (Heywood 2007). Cronquist (1981) recorded that it consists of about 400 genera and 10000 species and are widespread in temperate and cold tropical region. Kress *et al.* (2003) stated 452 species belonging to 84 genera of Papilionoideae in the checklist of Myanmar. In the present study, 5 species belonging to 5 genera from the subfamily Papilionoideae were presented. This family can be distinguished from other families by its flowers and stamens.

Kress *et al.* (2003) had recorded Pauk as *Butea monosperma* (Lam.) Kuntze in the checklist of Myanmar. Whereas the correct name is *Butea monosperma* (Lam.) Taub. He also stated Thinwin pyu as *Pongamia pinnata* Pierre. It was moved to the genus *Millettia* only recently. The correct name of it was *Millettia pinnata* (L.) Panigrahi. Moreover, Peik thingat had been recorded as *Cassia auriculata* L. It was changed into *Senna auriculata* (L.) Roxb. *Erythrina microcarpa* Koord. & Valeton had not been recorded in the checklist of Myanmar.

The different morphological characters of the study species were observed. According to the resulting data, 6 species are trees, 2 species are shrubs and the rest species are herb. The trees species are *Bauhinia racemosa* Lam., *Butea monosperma* (Lam.) Taub., *Dalbergia oliveri* Gamble

ex Prain, *Erythrina microcarpa* Koord. & Valetton, *Millettia pinnata* (L.) Panigrahi and *Parkinsonia aculeata* L. The shrubby plants are *Bauhinia acuminata* L. and *Senna auriculata* L. Among the collected species, the leaf-type of 8 species is the compound leaves whereas *Bauhinia acuminata* L. and *Senna auriculata* (L.) Roxb. possess simple leaves.

The inflorescence types of all studied species were seen as racemose inflorescence. The flowers characters of all studied species are bisexual, zygomorphic, pentamerous and hypogynous. Most of the flower colours on the studied plants is yellow. The sepal numbers of all study species are 5 and unite to form a tube. The petals of the studied species are not similar. In the flowers of the studied species, various fertile stamens and staminode were found. The fertile stamens 7 can be seen in *Senna auriculata* (L.) Roxb. and *Senna hirsuta* (L.) Irwin & Barneby. The carpel is only one, ovaries are superior and the placentation type is marginal in all studied plants. The shapes of fruits and the seeds are also variable. The fruit type of all studied species is pod. The number of seeds per fruit was found to be few to many.

The most valuable medicinal species were *Bauhinia acuminata* Lam, *Butea monosperma* (Lam.) Taub, *Senna auriculata* (L.) Roxb. and *Senna hirsuta* (L.) Irwin & Barneby. The economically important species are *Butea monosperma* (Lam.) Taub., *Dalbergia oliverri* Gamble ex Prain, *Erythrina microcarpa* Koord. & Valetton and *Millettia pinnata* (L.) Panigrahi. Among the studied species, *Butea monosperma* (Lam.) Taub. and *Erythrina microcarpa* Koord. & Valetton were most abundantly found in the study area. *Crotalaria striata* D.C and *Parkinsonia aculeata* L. were rarely occurred. The other species were widely distributing in the study area.

The present research partially accomplished the information on the members of Fabaceae in Pauk Township. The resulting data including the morphological characteristics are very valuable for identification and classification. It is hoped that the research work of the taxonomic study of ten species of Fabaceae growing in Pauk Township will give the valuable information for other researchers. This research will give the knowledge to students especially in the field of taxonomy. Moreover, this paper will benefit to the botany students.

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