

## TAXONOMIC STUDY ON NINE SPECIES OF FAMILY FABACEAE IN KYAING TONG UNIVERSITY CAMPUS

Tin Tin Maw<sup>1</sup>

### Abstract

The present study deals with the members of family Fabaceae growing in Kyaing Tong University Campus. All species are collected during January to December in 2018. Some Fabaceae from Kyaing Tong University Campus have been collected, identified and then morphological characteristic were studied. In this study, nine species belonging to eight genera of family Fabaceae were identified and systematically arranged with relevant photographs. Artificial key to the species, detail description of the individual species has also been described. In addition, their flowering period, Myanmar names and English names were also described. Comparable characteristic of the species were constructed according to their different characters.

**Keywords:** Taxonomy, Fabaceae, Kyaing Tong University Campus

### Introduction

Kyaing Tong Township is situated in Golden Triangle of Eastern Shan State of Myanmar. Kyaing Tong University Campus is located in Kyaing Tong Township. Kyaing Tong University Campus is bounded by Soannawkham village in the east, Taunggyi-Kyaing Tong Road in the west, Zaytawon monastery and Thiladama monastery in the south and Nahkam village in the north. It lies between 21°16'40"-21°17'20" North Latitude and 99°34'10"-99°34'50" East Longitude. Kyaing Tong University Campus lies 800 meter above sea level. The area is about 0.72 kilometer square.

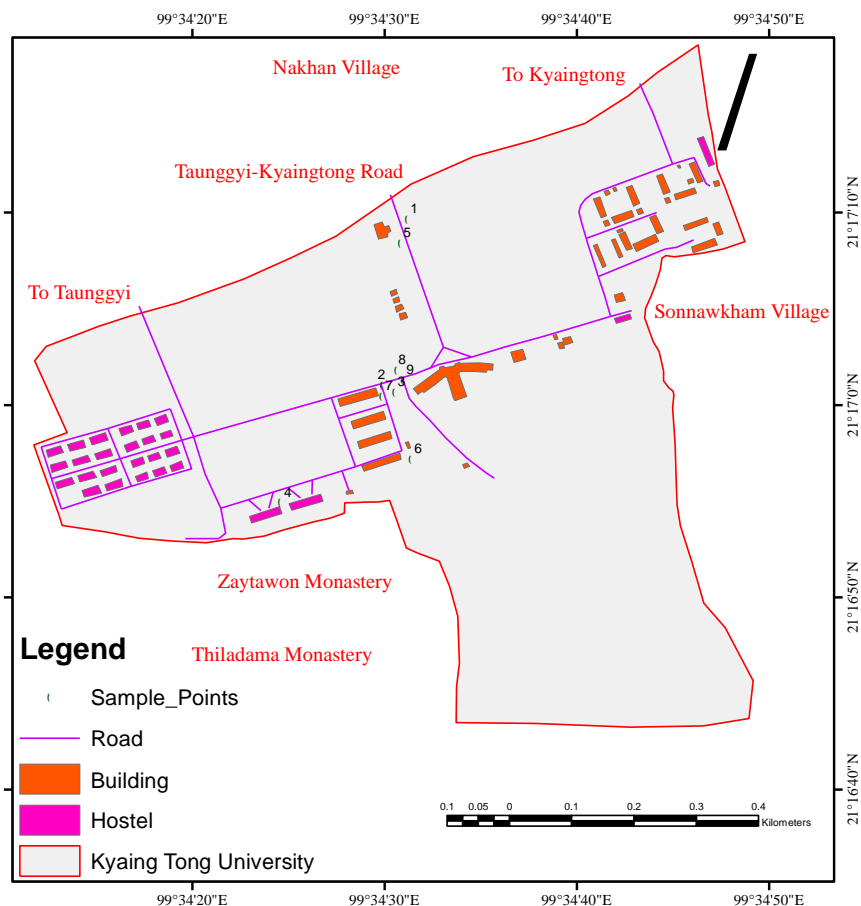
During the period from January to December 2018, an average monthly rainfall is 23.31 inches and 10 rainy days. This area almost gets minimum rain fall in January and February. The average maximum temperature is 28.78° C and average minimum temperature is 17.18° C. The coldest month of this area is February (10.6° C). The warmest month is April (32.4° C). The maximum percentage of humidity in August is 88 and the minimum percentage of humidity in February is 45. The predominant bedrocks are limestone. The major soil types are red-gray and yellow-grey sandy soils cover with mountain area and alluvial soils cover flat land and low land area. Kyaing Tong University Campus is in the mountain deciduous forest region.

The Fabaceae or Leguminosae commonly known as the legume, pea, or bean family are 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, stipulate leaves. Many legumes have characteristic flowers and fruits. The family is widely distributed and is the third-largest land plant family in terms of number species, with about 751 genera and 19,000 known species (<http://en.m.wikipedia.org> > wiki > Fabac.). Kress *et. al.* (2003) recorded 84 genera and 509 species in the checklist of Myanmar. In the present study 9 species belonging to 8 genera of family Fabaceae had been identified and fully described. *Indigofera linnaei* Ali. was commonly found in this area. *Crotalaria juncea* L. was rarely found in the study area.

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<sup>1</sup> Dr, Associate Professor, Department of Botany, Kyaing Tong University

The aims and objectives of the present research are mainly to record the knowledge on the natural resources in study area, to give valuable information of Fabaceae to other researchers and to provide a partial fulfillment of the family Fabaceae in Eastern Shan State of Myanmar.



1. *Crotalaria juncea* L.
2. *Desmodium gangeticum* (L.) DC.
3. *Desmodium heterocarpon* (L.) DC.
4. *Indigofera linnaei* Ali.
5. *Millettia macrostachya* Collett & Hemsley
6. *Pueraria montana* (Lour.) Merr.
7. *Smithia conferta* Smith.
8. *Tadehagi triquetrum* (DC.) Ohashi
9. *Vigna umbellata* (Thunb.) Ohwi & Ohashi

**Figure 1** Location map of Kyaing Tong University Campus  
(Source: Department of Geography, Kyaing Tong University)

## Materials and Methods

Some members of Fabaceae were collected from Kyaing Tong University Campus. The specimens were collected from January to December, 2018. The specimens were kept immediately into the plastic bags to identify and classify systematically. The collected specimens

had been observed and noted in detail. In addition to construction of artificial key to the species, all the resulting species are systematically arranged into genera according to alphabetically. The specimens were recorded by photographs. The collected specimens were identified with the references of Flora of British India, Vol. 2 (Hooker, 1879), Flora of Java (Backer, 1965), Flora of Ceylon, Vol. 7 and Vol. 10 (Dassanyake, 1991 and 1996), Flora of Hong Kong, Vol.2 (Anonymous, 2008), Flora of China (Wu. *et.al.*, 2010) and Flora of West Pakistan, (Ali. and Nasir, 1973-1977)

## Results

**Table 1 List of the collected species of Fabaceae (Subclass : Magnoliidae)**

Order	Family	Scientific names	Myanmar names
Fabales	Fabaceae	1. <i>Crotalaria juncea</i> L.	Pan-paik-san
		2. <i>Desmodium gangeticum</i> (L.) DC.	Than-byet-gyi
		3. <i>Desmodium heterocarpon</i> (L.) DC.	Unknown
		4. <i>Indigofera linnaei</i> Ali.	Meyaing
		5. <i>Millettia macrostachya</i> Collett & Hemsley	Ye-thinwin
		6. <i>Pueraria montana</i> (Lour.) Merr.	Unknown
		7. <i>Smithia conferta</i> Smith.	Unknown
		8. <i>Tadehagi triquetrum</i> (DC.) Ohashi	Lauk-the
		9. <i>Vigna umbellata</i> (Thunb.) Ohwi & Ohashi	Unknown

## Taxonomic descriptions

### Fabaceae (Lindl. 1836)

#### 1. *Crotalaria juncea* L. Sp. Pl. 2: 714.1753.

Myanmar name : Pan-paik-san

English name : Sunn hemp; India hemp

Flowering period : December to May

Annual erect herbs, 2.5 m high; stems and branches terete, ribbed, appressed silky pubescent. Leaves unifoliate compound, alternate; stipules linear, 2.5 mm long, caducous; petioles 3-5 mm long; blades oblong to linear-lanceolate, 6-9.5 cm by 1.5-3 cm, attenuate at the base, entire along the margin, acuminate and mucronate at the apex, pilose on both surfaces, more densely beneath. Inflorescences terminal racemes, 10-20-flowered, 25- 30 cm long; peduncles 10-16 cm long. Flowers yellow, 2-2.2 cm in diameter, bracts linear, 3-5 mm long, persistent; bracteoles linear acuminate, 2-4 mm long, inserted at base of calyx tube, pubescent; pedicels 5-8 mm long, tomentose. Calyx bilabiate, 5-lobed, densely rusty pilose; tube 5-7 mm long; lobes lanceolate, 1.3-1.5 cm long, curved. Corolla papilionaceous, exserted, tinged with reddish; standard suborbicular, 1.8-2 cm by 1.5-2 cm, with 2 appendages at base, clawed; wings obovate-oblong, 1.5-2 cm by 0.9 cm; keels falcate, 1.8-2.1 cm by 1 cm, twisted beak. Stamens

10, monadelphous; filaments 1-1.5 cm long; anthers dithecous, dimorphic; articulate anthers 2 mm long; ovoid anthers 1 mm long. Ovary oblong, 7-9 mm long, hairy, unilocular, with many ovules on the marginal placentae; style 4-4.5 mm long, incurved, ciliated along both sutures; stigma simple. Pods sessile, oblong-cylindrical, 2.5-3.5 cm by 1-1.5 cm, 8 to 15-seeded, inflated, rusty pubescent. Seeds obliquely-cordiform, 4-6 mm long, light brown to black, smooth to papillose. (Figure 2. A)

**Distribution** : A native of India but widely distributed elsewhere in the tropics (Rudd as cited in Dassanayake 1991). According to Kress *et. al.* (2003), this species was distribution in Ayeyarwady Division, Bago Division, Mon State, and Yangon Division of Myanmar.

**Specimen examined** : Eastern Shan State; Kyaing Tong Township, Kyaing Tong University Campus, N 21°17'9.66", E 99° 34'31.20", 803 meter, Dr. Tin Tin Maw, 20.3.2018, collected no. 5.

## 2. *Desmodium gangeticum* (L.) DC., Prod. 2: 327. 1825.

*Hedysarum gangeticum* L., Sp. Pl. 746. 1753.

Myanmar name : Kyemi-hpo, Than-byet-gyi

English name : Sal leaves desmodium

Flowering period : October to December

Erect to ascending shrubs, to 1.5 m high, stems stout, woody, slightly angular, short grey hairy, much branched, densely downy while young. Leaves unifoliate compound, alternate, stipules subulate, 0.7-1.5 cm long, sparsely white long hairy, persistent; petioles 1-2 cm long, canaliculate above, appressed grey hairy; leaflets ovate-oblong or broadly elliptic, 2.5-8 cm by 2-5 cm, obtuse at the base, entire and ciliate along the margin, acuminate at the apex, subcoriaceous, puberulous above, sparsely appressed grey hairy beneath. Inflorescences axillary or terminal racemes or panicle, many flowered, 15-30 cm long; peduncles 1.5-3.5 cm long, densely white hairy. Flowers 2-5 in a fascicle, white or purple, 4-5 mm in diameter; bracts setaceous, about 5 mm long, fugacious, white long hairy; pedicels about 2-4 mm long, densely hooked hairy. Calyx campanulate, 5-lobed, densely hooked hairy; tube about 2 mm long; lobes setaceous, longer than the tube. Corolla papilionaceous; standard obovate, about 4 by 4 mm, broadly rounded at the apex; wings about 5 mm by 3 mm; keels about 6 mm by 4 mm. Stamens 10 (9+1), diadelphous; free filaments about 3 mm long; anthers dithecous, uniform. Ovary oblong, about 2.5-4 mm long, sparsely white hooked hairy; style filiform; stigma capitate. Pods lomentum, 6 to 8 jointed, falcate, 10 cm by 3 mm, compressed, glabrous or minute hooked hairy, the upper suture straight, the lower deeply indented. (Figure 2. B)

**Distribution** : Old world tropics; Africa, Ceylon, India, Indo-China, southern China, Malaysia, northern Australia, naturalized in the West Indies (Rudd as cited in Dassanayake 1996). Kress *et. al.* (2003) noted that this species was widely distributed in the checklist of Myanmar.

**Specimen examined** : Eastern Shan State; Kyaing Tong Township, Kyaing Tong University Campus, N 21°17'1.08", E 99°34' 29.88", 810 meter, Dr. Tin Tin Maw, 15.12.2018, collected no. 9.

**3. *Desmodium heterocarpon* (L.) DC., Prod. 2: 337. 1825.***Hedysarum heterocarpon* L., Sp. Pl. 747. 1753.

Myanmar name : Unknown

English name : Asian tick trefoil; carpon desmodium; tick clover

Flowering period : July to October

Perennial, prostrate herbs or subshrubs, 30-150 cm high; stems and branches terete, much branched from base of stem, more or less appressed hairs. Leaves trifoliate compound, alternate; stipules subulate, 5 mm long; petioles 1.5-2 cm long; leaflets obovate, elliptic or oblong 1.5-6 cm by 1-3 cm, obtuse or rounded at the base, entire along the margin, rounded or obtuse, emarginate, mucronate at the apex, glabrous above, appressed pubescent beneath. Inflorescences terminal or axillary dense racemes, many flowered, 2.5-7 cm long, white uncinat hairs or yellowish or white straight appressed hairs; peduncles 1-2.5 cm long. Flowers purple, 5-6.5 mm in diameter, usually in pairs; bracts ovate, long acuminate, 3-6 mm long, concave, hairs; pedicels 3-7 mm long. Calyx campanulate, 4-lobed, sparsely pubescent; tube 1.5-2 mm long; lobes longer than the tube. Corolla papilionaceous, exserted, standard obovate, 5-6 mm by 5-6 mm, shortly clawed; wings obovate, 4-5 mm long, clawed, auriculate; keels oblong, 5-6 mm long, distinctly curved, obtuse at the apex. Stamens 10 (9+1), diadelphous; free filaments 3-4 mm long, anthers ditheous, uniform. Ovary narrowly oblong, 3-4 mm long, pubescent, unilocular, with few ovules on the marginal placentae; style 4-5 cm long; stigma capitate. Pods lomentum, 15-30 mm by 2.5-3 mm, 4 to 6 jointed, upper suture shallowly undulate, sparsely uncinat hairy or glabrous; joints quadrate. Seeds rectangular, 1.5-2.5 mm by 1.3-1.7 mm, rim-aril prominent. (Figure 2. C)

**Distribution** : Widely spread in the Old World, Africa, Ceylon, India, Indichina, China, Korea, Japan, Malesia, Australia and Pacific Islands (Pedley as cited in Dassanayake 1996).

**Specimen examined** : Eastern Shan State; Kyaing Tong Township, Kyaing Tong University Campus, N 21°17'0.30", E 99°34'30.12", 809 meter, Dr. Tin Tin Maw, 6.10.2018, collected no. 8.

**4. *Indigofera linnaei* Ali, Bot. Not. 111: 549. 1958.**

Myanmar name : Meyaing

English name : Birdsville Indigo

Flowering period : September to November

Annual, procumbent herbs; stems and branches slender, densely appressed-pubescent. Leaves unipinnate compound, imparipinnate, alternate; stipules setaceous, 4-6 mm long, tomentose; petioles 2-3 mm long, pubescent; rachae 1.5-4 cm long, appressed-pubescent; leaflets 7 to 11, alternate, obovate-oblong or oblanceolate, 5-20 mm by 3-8 mm, accrescent upwards, cuneate at the base, entire along the margin, obtuse to truncate at the apex with mucronate, appressed-pubescent on both surfaces. Inflorescences axillary head-like racemes, 5-20-flowered, 6.5-8 cm long; peduncles 4-5 cm long, appressed-pubescent. Flowers reddish pink, 5-6 mm in diameter; bracts subulate, 1-2 mm long; pedicels 1-1.5 mm long. Calyx campanulate, 5-lobed, strigose outside; tube 1 mm long; lobes setaceous, 2 mm long, subequal.

Corolla papilionaceous, exserted; standard obovate, 4-5 mm by 3-5 mm, bright red, glabrous; wings obliquely-oblong, 3-5 mm by 3 mm, pink, clawed, shortly auriculate; keel 4-5 mm long, pink. Stamens 10 (9+1), diadelphous; free filaments 0.5 mm long, appressed-pubescent; anthers dithecous, uniform. Ovary oblongoid, 1-1.5 mm by 0.8 mm, glabrous, unilocular with 2-3 ovules on the marginal placentae; style 2-3 mm long, glabrous; stigma capitate. Pods oblong-cylindrical, 4-6 mm by 2 mm, 2 to 3-seeded, short-beaked, brown, appressed-pubescent. Seeds rounded or barrel-shaped, about 1.5 mm long, brown, glabrous. (Figure 2. D)

**Distribution** : Ceylon, India and Pakistan to Southeast Asia and Australia, usually in dry, barren places (Velva E. Rudd as cited in Dassanayake 1991). Kress *et al.* (2003) treated this species as *Indigofera enneaphylla* L. and he state that distributed in Mandalay Division.

**Specimen examined** : Eastern Shan State; Kyaing Tong Township, Kyaing Tong University Campus, N 21°16'54.96", E 99°34'24.60", 802 meter, Dr. Tin Tin Maw, 2.9.2018, collected no. 7.

**5. *Millettia macrostachya*** Collett & Hemsley, J. Linn. Soc., Bot. 28: 41. 1890.

Myanmar name : Ye-thinwin

English name : Chinese wisteria

Flowering period : March to May

Deciduous tree, up to 10 m high; stems and branches terete, woody, glabrous; bark pale brown with shallow cracks. Leaves unipinnate compound, imparipinnate, alternate; stipules small, caducous; petioles 5-9 cm long, pubescent; leaflets 7-9, opposite, broadly oblong to obovate elliptic, 8-14 cm by 4-7 cm, broadly cuneate and slightly oblique at the base, entire along the margin, acute at the apex, glabrescent on both surfaces; stipels tiny point; petiolules 4-7 mm long, pubescent. Inflorescences axillary pseudoracemes, many-flowered, 33-45 cm long, longer than subtending leaf, thick, straight, slightly puberulent; peduncles 6-9 cm long; rachis node whorled with 3-7 flowers clustered on a 2-4 mm long spur. Flowers purple, 2 cm in diameter; bracts and bracteoles small, brown puberulent, caducous; pedicels 3-5 mm long, pubescent. Calyx campanulate 5-lobed, pubescent; tube 4-5 mm long, lobes lanceolate, acuminate, 3-4 mm long. Corolla papilionaceous, exserted; standard orbicular, 2 cm by 2 cm, with green calluses at base, auriculate; wings oblong, 2 cm by 7 mm, auriculate; keels falcate-oblong, 2 cm by 6 mm, auriculate. Stamens 10 (9+1), diadelphous; free filament filiform, 1.3 cm long; anthers dithecous, uniform. Ovary linear, 6-7 mm long, pubescent, unilocular, with many ovules on marginal placentae; style curved, 6-7 mm long; stigma capitate. Pods linear, 8-12 cm by 1.2-1.5 mm, leathery, apex beaked, 3 to 4-seeded; sutures thickened. Seeds ellipsoid, 5 mm by 4 mm, olive-green. (Figure 2. E)

**Distribution** : China, Myanmar and Thailand ([https:// global species.org](https://global-species.org) > ntaxa). Kress *et al.* (2003) recorded that this species was distributing in Kachin State, Kayin State, Mandalay Division and Shan State of Myanmar.

**Specimen examined** : Eastern Shan State; Kyaing Tong Township, Kyaing Tong University Campus, N 21°17'8.46", E 99°34'30.84", 802 meter, Dr. Tin Tin Maw, 12.3.2018, collected no. 4.

**6. *Pueraria montana*** (Lour.) Merr., Trans. Amer. Philos. Soc., ser. 2. 24 (2) : 10, 210. 1935.*Dolichos montanus* Lour. Fl. cochinch. 440.1790.

Myanmar name : Unknown

English name : Japanese arrowroot

Flowering period : January to March

Robust climber, with tuberous roots; stems up to 8 cm long, woody at base, yellow hirsute throughout. Leaves trifoliate compound, alternate; stipules dorsifixed, ovate-oblong 1.8-2 cm by 8-10 mm, striate; petioles 6-20 cm long; leaflets broadly ovate or obliquely ovate, 7-19 cm by 5-15 cm, acute or oblique at the base, entire along the margin, acuminate at the apex, yellowish adpressed hairs. Inflorescences axillary raceme, many-flowered, 15-40 cm long, peduncles 1-2 cm long. Flowers purple or blue, 9-10 mm in diameter; bracts linear-lanceolate to linear, 1 cm long, brown yellowish hairs, caducous; bracteoles lanceolate, 5-6 mm long, brown yellowish hairs; pedicels 3-4 mm long. Calyx campanulate 5-lobed, brown yellowish hairs; tube 3-4 mm long; lobes lanceolate, acuminate, 4-6 mm long, subequal. Corolla papilionaceous, exserted; standard obovate, 8-10 mm by 9-10 mm; with yellow callosity at base, shortly clawed; wings falcate, 9-10 mm by 3 mm, with linear auricles at base; keels falcate-oblong, 7-8 mm by 4 mm, with very small and acute auricles. Stamens 10 (9+1), diadelphous; free filament filiform, 6 mm long; anthers ditheous, uniform. Ovary linear, 5 mm long, pubescent, unilocular, with many ovules on marginal placentae; style curved, 3-3.5 mm long; stigma capitate. Pods elliptic, 2.5-6 cm by 7-8 mm, flattened, constricted between the seeds, 2 to 6-seeded, brown hirsute. Seeds mostly many, ovoid-oblong or angular, 1-1.5 mm long, black-brown. (Figure 2. F)

**Distribution** : Asia-China, Japan, Korea, Myanmar, Thailand, Laos, Vietnam, Malaysia, Indonesia, Philippine, New Guinea, the Solomon Island (tropical. theferns. info > viewtropical > id).

**Specimen examined** : Eastern Shan State; Kyaing Tong Township, Kyaing Tong University Campus, N 21°16'57.60", E 99°34'30.96", 818 meter, Dr. Tin Tin Maw, 14.2.2018, collected no. 2.

**7. *Smithia conferta*** Smith in Rees, Cyclop. 33: n. 2. 1816.

Myanmar name : Unknown

English name : Paired flowered smithia

Flowering period : July to August

Annual, procumbent-decumbent or erect herbs; stems slender, many branched, woody 20-90 cm long, glabrous. Leaves unipinnate compound, paripinnate, alternate; stipules lanceolate, about 1 cm long, striate, scarios, persistent, appendage bilobed; lobes unequal; petioles 2-3 mm long, bristly; rachis 1-3.5 cm long, sparsely long hirsute; leaflets 3-7 pairs, opposite, subsessile, obovate-oblong, 4-12 cm by 3-4 mm, oblique at the base, entire along the margin, obtuse-rounded and mucronate at the apex, glabrous above, bristly along the margin and throughout on the midrib beneath. Inflorescences axillary, scorpioid racemes, 3-4 cm long, solitary or in pair, peduncles short. Flowers yellow, 5-8 mm in diameter; bracts ovate-elliptic, 2-3 mm long, acute, scarios, persistent; bracteoles ovate-elliptic, 1.5-2.5 mm long, acute, scarios, persistent; pedicels 2-3 mm long hispid. Calyx bilabiate, 5-lobed, a tuft of bristle only at the tip

of back; tube 1-1.5 mm long; upper lip broadly ovate, 5-7 mm by 5.5 mm, acute, lower lip ovate, 5-7 mm by 3-4 mm. Corolla papilionaceous, exserted; standard orbicular, 7-10 mm by 8-10 mm; emarginate at apex, shortly clawed; wings obovate, 9-10 mm by 3.5-4 mm, auricle at base, clawed; keels boat-shaped, 7.5-8.5 mm by 3.5-4 mm, truncate at apex, auricle at base, clawed. Stamens 10 (5+5), diadelphous; staminal column 4-7 mm long, filament 2-2.5 mm long; anthers dithecous, uniform. Ovary linear, 2-3 mm long, glabrous, unilocular, with few ovules on marginal placentae; style 5-6 mm long; stigma pointed. Pod lomentum, more or less straight, included, 5 to 6 joined; joints suborbicular, 2 mm by 2 mm, papillose. Seeds subreniform, 0.8-1.3 mm by 0.6-1.6 mm. (Figure 2. G)

**Distribution** : Ceylon and southern India, in moist open areas at elevation up to about 1300 meter (Velva E. Rudd as cited in Dassanayake 1991).

**Specimen examined** : Eastern Shan State; Kyaing Tong Township, Kyaing Tong University Campus, N 21°17'0.06", E 99°34'29.52", 813 meter, Dr. Tin Tin Maw, 25.8.2018, collected no. 6.

**8. *Tadehagi triquetrum* (DC.) Ohashi, in Ginkgouna 1: 295. 1977.**

*Desmodium triquetrum* DC., Prod. 2: 326. 1825.

Myanmar name : Lauk-the; Shwe-gu-than-hlet

English name : Trefle gross

Flowering period : November to January

Erect shrubs, sometimes similar to small trees, about 2 m high; stems triquetrous, acutely angled, stout, woody, tomentose; branches zigzag, densely downy when young. Leaves unifoliate compound, alternate; stipules large, lanceolate, 1.5-1.8 cm by 4-5 mm, sharply acuminate at the apex; petioles winged, 2.5-4 cm by 4-5 mm, puberulous; leaflets lanceolate, 7-11 cm by 1.5-3.5 cm, obtuse at the base entire and ciliate along the margin, acuminate at the apex, subcoriaceous, glabrous above, densely appressed white silky hairy beneath. Inflorescences axillary and terminal racemes, many-flowered, 8-30 cm long; peduncles triquetrous, 3-9 cm long, with short hooked hairs. Flowers pinkish purple, 5-8 mm in diameter; bracts lanceolate 3 mm by 1 mm, hairy, persistent; pedicels 4-6 mm long, with dense hooked hairs. Calyx campanulate, 5-lobed, with white long straight hairs and short hooked hairs; lobes setaceous, longer than the tube, the lowest one longer. Corolla papilionaceous, exserted; standard orbicular, 6-8 mm by 6 mm, cuneate at the base, glabrous; wings 6 mm by 4 mm; keels 4 mm by 2 mm, connate. Stamens 10 (9+1), diadelphous; free filaments 2-3 mm long; anthers dithecous, uniform. Ovary oblongoid, 7 mm by 1 mm, densely villous, unilocular, with few ovules on the marginal placentae; style long, curved at the tip; stigma capitate. Pods lomentum, 7 to 10 jointed, 2.5-3 cm by 3-6 mm, compressed, shallowly constricted, strongly caudate at the apex, with dense white hairs. (Figure 2. H)

**Distribution** : Kress *et. al.* (2003) recorded that this species was distributed in Chin State, Kachin State, Kayin State, Mandalay Division, Sagaing Division, Shan State and Yangon Division of Myanmar.

**Specimen examined**: Eastern Shan State; Kyaing Tong Township, Kyaing Tong University Campus, N 21°17'1.86", E 99°34'30.66", 807 meter, Dr. Tin Tin Maw, 4.1.2018, collected no. 1.



**9. *Vigna umbellata*** (Thunb.) Ohwi & Ohashi, Jap. Bot. 44: 31. 1969.

*Dolichos umbellatus* Thunb; Trans. Linn. Soc. London 2: 339. 1794.

Myanmar name : Unkown

English name : Rice bean, Oriental bean

Flowering period : January to March

Annual, twining herbs; stems slender, 1-3 m long, pilose with yellow hairs when young, later glabrescent. Leaves trifoliolate compound; alternate, stipules peltate to lanceolate-oblong, 1-1.5 cm long; petioles 5-10 cm long; leaflets ovate or ovate-lanceolae, 5-10 cm by 2.5-6 cm, broadly cuneate or obtuse at the base, entire or slightly lobed along the margin, acute at the apex, sparsely pubescent on the both surface. Inflorescences erect axillary raceme, 2-3-flowered, 6-21 cm long; peduncles 5-20 cm long. Flowers bright yellow, 1.2-2cm in diameter, bracts lanceolate 4-5 mm long, caducous; bracteoles linear, 1.5 mm long; pedicels 5-6 mm long. Calyx campanulate, 5-lobed, tube 4 mm long, lobes deltoid, 1.5-4 mm long, ciliate. Corolla papilionaceous; standard suborbicular, 1.2-1.5 cm by 1.6 cm, emarginate, wings obovate, 1.5 cm by 1.6 cm, short clawed; keels obliquely-oblong, 1.4 cm by 1.2 cm, with an incurved beak and horn-like pocket on one side. Stamens 10 (9+1), diadelphous; filaments 5-6 mm long; anthers ditheous, uniform. Ovary cylinder, 3-3.5 mm long, glabrous, unilocular with many ovules on the marginal placentae; style 1 cm long, lower style constricted at ovary insertion and upper flat; incurved, bearded on the inner side; stigma beaked. Pods linear-terete, 6-10 cm by 0.5 cm, 6 to 12-seeded, green when young, black-brown at maturity, glabrous. Seeds oblong, 5-10 mm by 2-5 mm, brown or black, mottled, glabrous. (Figure 2. I)

**Distribution** : Throughout India, Malaysia and the Philippine. Cultivated throughout tropical Asia and parts of Africa (Velva E. Rudd as cited in Dassanayake 1991).

**Specimen examined** : Eastern Shan State; Kyaing Tong Township, Kyaing Tong University Campus, N 21°17'1.32", E 99°34'30.96", 813 meter, Dr. Tin Tin Maw, 27.2.2018, collected no. 3.

**Table 2** Comparable characteristics of species in Fabaceae

No.	Scientific names	Habit	Leaves	Calyx	Stamens	Anthers	Pods
1.	<i>Crotalaria juncea</i> L.	herb	unifoliolate	bilabiate	monadelphous	dimorphic	not jointed
2.	<i>Desmodium gangeticum</i> (L.) DC.	shrub	unifoliolate	campanulate	diadelphous (9+1)	uniform	jointed
3.	<i>Desmodium heterocarpon</i> (L.) DC.	herb	trifoliolate	campanulate	diadelphous (9+1)	uniform	jointed
4.	<i>Indigofera linnaei</i> Ali.	herb	unipinnate	campanulate	diadelphous (9+1)	uniform	not jointed
5.	<i>Millettia macrostachya</i> Collett & Hemsley	tree	unipinnate	campanulate	diadelphous (9+1)	uniform	not jointed
6.	<i>Pueraria montana</i> (Lour.) Merr.	climber	trifoliolate	campanulate	diadelphous (9+1)	uniform	not jointed
7.	<i>Smithia conferta</i> Smith	herb	unipinnate	bilabiate	diadelphous (5+5)	uniform	jointed
8.	<i>Tadehagi triquetrum</i> (DC.) Ohashi	shrub	unifoliolate	campanulate	diadelphous (9+1)	uniform	jointed
9.	<i>Vigna umbellata</i> (Thunb.) Ohwi & Ohashi	herb	trifoliolate	campanulate	diadelphous (9+1)	uniform	not jointed

**An artificial key to the studied species:**

1. Stamens monadelphous; anthers dimorphic; pods inflated.....1. *Crotalaria juncea*
1. Stamens diadelphous; anthers uniform; pods not inflated.....2
  2. Trees; pods leathery.....5. *Millettia macrostachya*
  2. Shrubs, herbs, climbers; pods not leathery.....3
3. Pods jointed.....4
3. Pods not jointed.....7
  4. Leaves unipinnate compound; calyx bilabiate; stamens 5+5; pods included.  
.....7. *Smithia conferta*
  4. Leaves unifoliolate or trifoliolate compound; calyx campanulate, stamens 9+1; pods exerted.....5
5. Leaves trifoliolate compound; calyx 4-lobed.....3. *Desmodium heterocarpon*
5. Leaves unifoliolate compound; calyx 5-lobed.....6
  6. Petioles winged; branches zigzag.....8. *Tadehagi triquetrum*
  6. Petioles wingless; branches not zigzag.....2. *Desmodium gangeticum*
7. Procumbent herbs; leaves unipinnate compound.....4. *Indigofera linnaei*
7. Robust climbers or twining herbs; leaves trifoliolate compound.....8
  8. Inflorescences many-flowered; flowers purple to blue; standard with yellow callosity; pods constricted between the seeds, brown hirsute.....6. *Pueraria montana*
  8. Inflorescences 2-3-flowered; flowers bright yellow; standard without yellow callosity; pods terete, glabrous.....9. *Vigna umbellata*

## Discussion and Conclusion

The present study deals with the plants growing in Kyaing Tong University Campus. Totally, 9 species belonging to 8 genera of family Fabaceae under subclass Magnoliidae had been studied in the present paper. The genera in this research paper are *Crotalaria*, *Desmodium*, *Indigofera*, *Millettia*, *Pueraria*, *Smithia*, *Tadehagi* and *Vigna* under the family Fabaceae. The genera are arranged according to alphabetically.

Among the species in the present study, the species of *Indigofera linnaei* Ali. is commonly found in this area. The species *Crotalaria juncea* L. is rarely found. Among the 9 species, *Millettia macrostachya* Collett & Hemsley is tree, *Desmodium gangeticum* (L.) DC. and *Tadehagi triquetrum* (DC.) Ohashi. are shrubs, *Pueraria montana* (Lour.) Merr. is climber, the rest species are herbs. Leaves of *Crotalaria juncea* L., *Desmodium gangeticum* (L.) DC. and *Tadehagi triquetrum* (DC.) Ohashi are unifoliolate compound, *Desmodium heterocarpon* (L.) DC., *Pueraria montana* (Lour.) Merr. and *Vigna umbellata* (Thunb.) Ohwi & Ohashi are trifoliolate compound, others are unipinnate compound. The calyx of *Crotalaria juncea* L. and *Smithia conferta* Smith are bilabiate, but the rest species are campanulate. Except *Crotalaria juncea* L. is monadelphous stamens, others are diadelphous stamens. Pods of *Desmodium gangeticum* (L.) DC., *Desmodium heterocarpon* (L.) DC., *Tadehagi triquetrum* (DC.) Ohashi and *Smithia conferta* Smith are jointed, but those of others species are not jointed.

In this study, the observed characters for all species are agreement with the references cited by identified authors. *Pueraria montana* (Lour.) Merr. and *Smithia conferta* Smith have been collected in study area, but this two species were not found in other researchers and Myanmar by Kress et. al. (2003).

*Millettia macrostachya* Collett & Hemsley is used for ornamental plants. All 9 species are also medicinally important plants. *Smithia conferta* Smith included the IUCN (International Union for the Conservation of Nature) Red list of threatened species.

According to the data collected, it can be noted that 9 species from 8 genera of Fabaceae are distributing. The collected species are identified and described with comments on their scientific names, Myanmar names and coloured plates. It is hoped that this research of present investigation give valuable information of Fabaceae to other researchers in various field of study. Finally, it is also hoped that this research paper will provide a partial fulfillment of the family Fabaceae in Eastern Shan State of Myanmar.



A. *Crotalaria juncea* L.



B. *Desmodium gangeticum* (L.) DC.



C. *Desmodium heterocarpon* (L.) DC.

D. *Indigofera linnaei* Ali.E. *Millettia macrostachya*  
Collett & HemsleyF. *Pueraria montana* (Lour.) Merr.G. *Smithia conferta* SmithH. *Tadehagi triquetrum* (DC.)  
OhashiI. *Vigna umbellata* (Thunb.)  
Ohwi & Ohashi**Figure 2****Acknowledgements**

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## References

- Ali, S.I. and Y.J. Nasir, (1973-1977) *Flora of West Pakistan*, Department of Botany, University of Karachi, Karachi.
- Anonymous, (2008) *Flora of Hong Kong*, Vol. 2, Agriculture, Fisheries and Conservation Department, Printed in Government logistics Department, Hong Kong.
- Backer, C.A & R.C. Bakhuizen Van Den Brink, (1963) *Flora of Java*, Vol. 1-2 Netherlands, Rijksherbarium, Lelyden, N.V.P. Noordhoff.
- Brandis, D., (1906) *Indian Tree*, Assisted by Indian Foresters, Archibald Constable & Co. Ltd. 16 James Street Haymarket S.W. London.
- Brummitt, R.K., (1992) *Vascular Plant Families and Genera*. Royal Botanical Garden, Kew, Printed and bound by Whistable Litho Ltd., Great Briantain.
- Dassanayake, M.D., (1991, 1996) *A Revised Handbook to the Flora of Ceylon*, Vol. 7 and 10, University of Peradeniya, New Delhi.
- Hooker, J.D., (1879) *Flora of British India*, Vol. 2, L. Reeve & Co. 5 Henrietta street, Covent Garden London.
- Hutchinson, J. (1967) *Key to the Families of Flowering Plants of the World*, Claredon Press Oxford.
- Kress, J., *et al.*, (2003) *A Checklist of the Trees, Herbs and Climbers of Myanmar*, Department of Systematic Biology-Botany. National Museum of Natural History, Washington DC, USA.
- Lawrence, George H.M., (1951) *Taxonomy of Vascular Plants*, the Macmillan Company, New York.
- Rodford, Elbert E., (1986) *Fundamental of Plant Systematic*, Haper & Sons Company, New York.
- Subrahmanyam, N.S., (1995) *Modern Plant Taxonomy*, India, Reader in Botany Sri Venketashwara Collage, University of Delhi.
- Wu, C.Y. P.H. Raven, & D.Y Hong. Eds. (2010) *Flora of China*, Flora of China (Fabaceae) 10: 1-642, Science Press & Missouri Botanical Garden Press, Beijing & St. Louis.

## Website

[https:// global species. org](https://global.species.org) > ntaxa  
[tropical.theferns.info](http://tropical.theferns.info) > viewtropical > id  
[http//en.m.wikipedia.org](http://en.m.wikipedia.org) > wiki > Fabac.