

Floristics Study of Angiosperm Sympetalae Wild Plants in Hinthada Township

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Abstract

A study of angiosperm (sympetalae) in Hinthada Township was carried out during January 2022 to September 2022. The specimens were studied for the morphological characters. Collected specimens were identified Hooker (1872), Backer (1965), B.P Pandey (1999), Heywood (1978) and this species were arranged according to Judd *et. al* (2002), classification system. The result expressed that altogether 8 species belonging to 8 genera and 7 families had been collected in Hinthada Township. Most of the species in this research were medicinally, ethno-medicinally and used as vegetable plants.

Keywords : angiosperm, morphology and identification

INTRODUCTION

The present study deals with the taxonomic studies of Hinthada Township is located between 17° 20' and 18° 31' N and 94° 48' and 95° 47' E. The angiosperms were traditionally divided into monocotyledons and dicotyledons; however, this division is no longer supported by recent systematic studies.

Angiosperms have traditionally been divided into monocots (plants with a single cotyledons, radicle aborting early in growth with the root system adventitious, stems with scattered vascular bundles and usually lacking secondary growth, leaves with parallel venation, flower 3-merous, and pollen grains usually monosulcate) and dicots (plants with two cotyledons, radicle not aborting and giving rise to mature root system, stems with vascular bundles in a ring and often showing secondary growth, leaves with a network of veins forming a pinnate to palmate pattern, flowers 4 or 5 merous and pollen grains pre-dominantly tricolpate or modifications thereof). Judd *et. al.*, 2002.

Sympetaly (fused petals) is a flower characteristic that historically was used to classify a grouping of plants termed sympetalae, but this term has been abandoned in newer molecular based classifications, although the grouping has similarity to the modern term asterids. ([www. https://en wik.org> dict> sympetalae](https://en.wik.org/wiki/sympetalae))

MATERIALS AND METHODS

Collection and identification of Plants

Study site

The present study was conducted in Hinthada Township, which is situated in Hinthada District, Ayeyarwady Region. It is located between 17° 20' and 18° 31' N and 94° 48' and 95° 47' E.

Study period

Field collection of plants was conducted from January 2022 to September 2022.

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Materials and collecting of the specimens

The collected specimens were examined their internal and external morphological characters. These specimens were identified by key and description from taxonomic literatures, such as Hooker (1872), Backer (1965), B.P Pandey (1999), and Judd *et al* (2002). The classification system of plants in Hinthada University was followed by APG III Judd *et. al* (2002).

RESULTS

In this study 8 species belong to 8 genera of 7 families were arranged by Judd *et. al* APG III (2002). The detailed morphological character of the habits, leaves, inflorescences, flowers, calyx, corolla, stamens, ovaries, fruits and seeds were presented.

Table 1. List of collected species (Sympetalae)

Kingdom - Plantae

Phylum - Tracheophyta

Class - Magnoliopsida

Clade	Clade	Order	Family	No	Scientific name
Asterid clade (Core Asterids) (Sympetalae)		Ericales	Myrsinaceae	1.	<i>Ardisia humulis</i> VahL.
	Euasterids I	Solanales	Solanaceae	2.	<i>Cestrum nocturnum</i> L.
		Solanales	Solanaceae	3.	<i>Physalis minima</i> L.
		Solanales	Convolvulaceae	4.	<i>Ipomoea carenae</i> Jacq.
		Solanales	Boraginaceae	5.	<i>Heliotropium indicum</i> L.
		Gentianales	Apocynaceae	6.	<i>Calotropis gigantea</i> L. Dryand
		Lamiales	Verbenaceae	7.	<i>Lantana indica</i> Roxb.
		Lamiales	Lamiaceae	8.	<i>Clerodendrum indicum</i> (L.) O. kuntze

Taxonomic description of the collected species (Sympetalae)

1. Scientific Name - *Ardisia humulis* VahL. Symb. Bot. 3140. 1794.

Myanmar Name - Kyet-ma-ok

Family - Myrsinaceae

Flowering and Fruiting period - November to September

Undershrub, about 40 cm high. Stem soft wooded terete. Leaf simple, alternate to spiral, petiolate, exstipulate; laminae elliptic to obovate, entire margin, acute tip. Inflorescence axillary 1 to 3 flowered cyme. Flower pink colour, bisexual, actinomorphic, about 7.0 cm long and 1.2 cm wide, hypogynous, bract minute. Sepal synsepalous, 5, calyx cup-shaped. Petal sympetalous 5. Stamen apostemonous, 5, filament very short, anther ditheous, extrorse, longitudinal dehiscence. Carpel 2, syncarpous, ovary superior, ovoid, free central placentation, style long, stigma simple. Fruit berry globose, red. Seed 1.

Figure 1. *Ardisia humulis* Vahl.

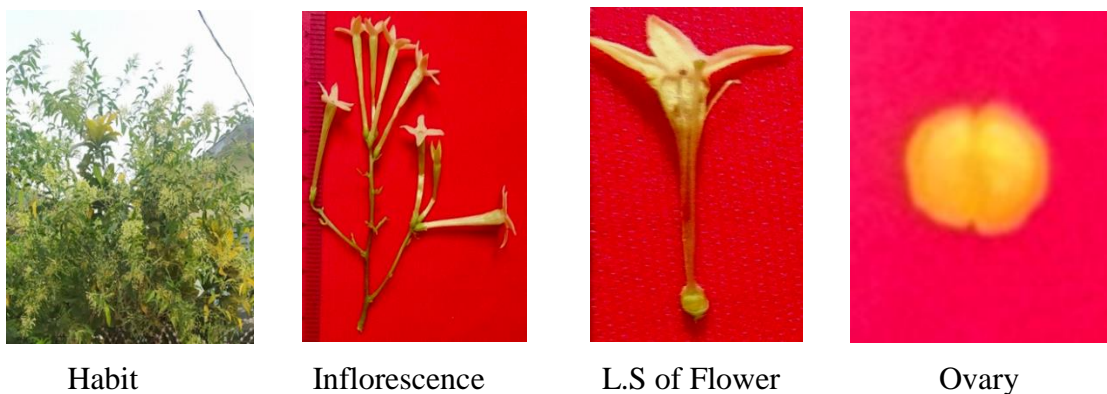
2. Scientific Name - *Cestrum nocturnum* L. Sp. Pl. ed. 2.191.1753

Myanmar Name - Nya-hnwe-pan

Family - Solanaceae

Flowering and Fruiting period - August to September

Shrub, about 1.0 – 1.5m high. Stem terete, glabrous. Leaf simple, alternate, petiolate, exstipulate, laminae elliptic-oblong, entire margin, acute tip. Inflorescence axillary cyme, peduncle, glabrous. Flower cream colour, blooming at night, bisexual, actinomorphic, about 2.5 cm long and 2.0 cm wide, hypogynous, bracteate, pedicellate. Sepal synsepalous, 4-5, calyx tube and lobe present, tubular, valvate, green. Petal synpetalous, 4-5, corolla tube and lobe present, tubular, valvate, cream colour. Stamen apostemonous 5, filament with appendages at the middle, anther ditheous, introrse, basifixed, longitudinal dehiscence. Carpel 2, syncarpous, ovary superior, ovoid, axile placentation, 2 ovules in each locule, style slender, stigma capitate. Fruit berry oblong, seed 1 seeded.

Figure 2. *Cestrum nocturnum* L.

3. Scientific Name - *Physalis minima* L. Sp. Pl. 1.183.1753

Myanmar Name - Bauk-pin

Family - Solanaceae

Flowering and Fruiting period - Through out the year

An annual herb, about 0.25-1.25 cm high. Stem quadrangular. Leaf simple, alternate, petiolate, laminae ovate to lanceolate, 4.4-9.0 cm long and 1.3-5.2 cm wide. Inflorescence

axillary one-flowered cyme, about 2.0 cm long and 7.0 cm wide. Flower yellow colour, bisexual, zygomorphic, about 1.8 cm long and 7.0 mm wide, hypogynous. Sepal synsepalous 5, calyx tube and lobe present. Petal synpetalous, 5, corolla tube and lobe present. Stamen apostemonous, 5, filament about 4.0 mm long, anther oblong lanceolate, yellow with blue margin cells, introrse, basifixed, longitudinal dehiscence. Carpel 2, syncarpous, ovary superior, axile placentation, many ovules in each locule, style one, stigma bilobed. Fruit berry, subglobose, the whole fruit enclosed by accrescent calyx 5-10 angulate ribbed.



Figure 3. *Physalis minima* L.

4. Scientific Name - *Ipomoea carnea* Jacq. Subsp. *Fistulosa* (Martius ex Choisy)
D.F. Austin. 26: 235-238.1977

Myanmar Name - Taung-ka-zun

Family - Convolvulaceae

Flowering and Fruiting period – Through out the year

Perennial shrub, about 2.5 m high. Stem puberulous, terete, containing milky juice. Leaf simple, alternate, petiolate, laminae ovate to ovate-oblong, cordate base, entire margin, acuminate tip. Inflorescence terminal and axillary cyme, about 13.0 cm long and 5.0 cm wide. Flower purple colour, bisexual, actinomorphic, about 9.0-7.0 cm long. Sepal synsepalous, 5, calyx tube and lobe present. Petal synpetalous, 5, corolla tube and lobe present, infundibuliform, valvate, purple. Stamen apostemonous, 5, filament unequal, anther hairy at the base, ditheous, dorsifixed, longitudinal dehiscence. Carpel 2, syncarpous, ovary superior, axile placentation, 2 ovules in each locule, stigma 2 globose lobed. Fruit not available.



Figure 4. *Ipomoea carnea* Jacq.

5. Scientific Name - *Heliotropium indicum* L. Sp. P1. ed. 1.130.1753

Myanmar Name - Sin-let-maung

Family - Boraginaceae

Flowering and Fruiting period – June to January

Annual herb, about 1.3 m high. Stem stout and cylindrical with longitudinal grooves, branched densely hirsute hairs. Leaf simple, alternate to subopposite, petiolate, exstipulate, laminae ovate, laminae ovate, undulate margin, acute tip. Inflorescence unilateral scorpioid cyme. Flower purplish-white colour, bisexual, zygomorphic, about 5.0 mm long and 2.0 mm wide, hypogynous. Sepal synsepalous, 5, calyx tube and lobe present. Petal synpetalous, 5, corolla tube and lobe present, rounded, purplish-white. Stamen apostemonous 5, anther sagittate, ditheous, introrse, basifixed, longitudinal dehiscence. Carpel 2, syncarpous, ovary superior, ovoid, axile placentation, one ovule in each locule, style one, stigma capitate. Fruit nutlets, subtenden by the persistent calyx.



Habit



Inflorescence



L.S of Flower



Ovary

Figure 5. *Heliotropium indicum* L.

6. Scientific Name - *Calotropis gigantea* (L.) Dryand.in Ait.Hort.Kewed.2.2:78.1811

Myanmar Name - Mayo

Family - Apocynaceae

Flowering and Fruiting period – January to July

Stout shrub, about 2.7 m high. Stem woolly, milky latex present. Leaf simple, opposite and decussate, petiolate, exstipulate, laminae broadly elliptic to oblong-obovate, entire margin, acute tip. Inflorescence terminal and axillary umbellate cyme. Flower cream colour, bisexual, actinomorphic, hypogynous, bracteate, pedicellate. Sepal synsepalous, 5, calyx connate at the base cup-shaped, valvate. Petal synpetalous, 5, corolla tube and lobe present, campanulate corona laterally compressed, adnate to the staminal column; Stamen apostemonous, 5, connate into staminal corona with fleshy horn-like scales, anther adnate to the stigma forming a gynostegium, pollinia pendulous solitary in each cell, pollinia 5, extrorse, longitudinal dehiscence. Carpel 2, syncarpous, ovary superior, ovoid, axile placentation, many ovules in each locule, style one, stigma capitate with 5-angle. Fruit not available.

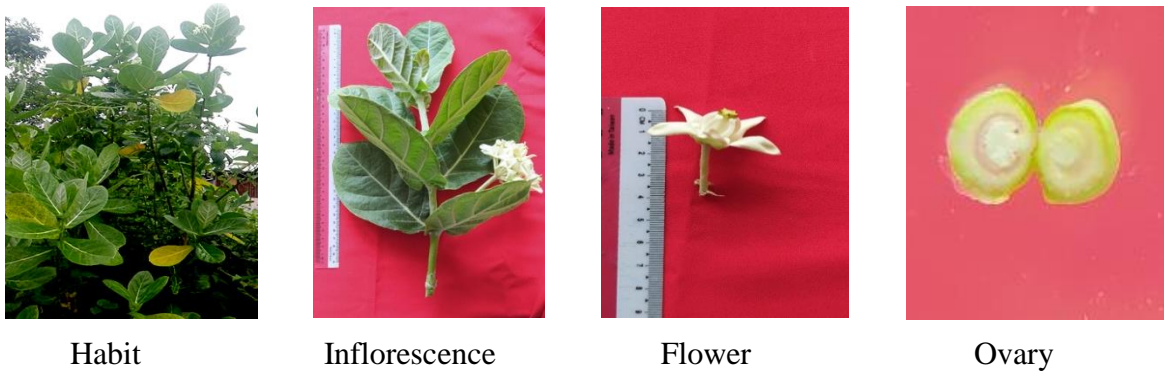


Figure 6. *Calotropis gigantca* (L.) Dryand.

7. Scientific Name - *Lantana indica* Roxb. Hort. Beng, 46, hyponym.1814

Myanmar Name - Tanar-hin-cho

Family - Verbenaceae

Flowering and Fruiting period – March to September

Shrub, about 0.61 m high. Stem cylindrical and densely pungent smell pubescent, branches long, rambling. Leaf simple, opposite and decussate, petiolate, exstipulate, laminae lanceolate, serrate margin, acute tip. Inflorescence axillary ovoid head, usually 2-per node. Flower pale-purple colour, bisexual, zygomorphic, about 1.2 cm long and 4.0 mm wide, hypogynous, bracteate. Sepal synsepalous 5, calyx valvate, green. Petal synpetalous (1+2+2), bilabiate, corolla tube and lobe present, pale purple. Stamen apostemonous 2+2, didynamous, filament very short, anther ditheous, introrse, basifixed, longitudinal dehiscence. Carpel 2, syncarpous, ovary superior, axile placentation, one ovule in each locule, style terminal, stigma capitate. Fruit drupe.

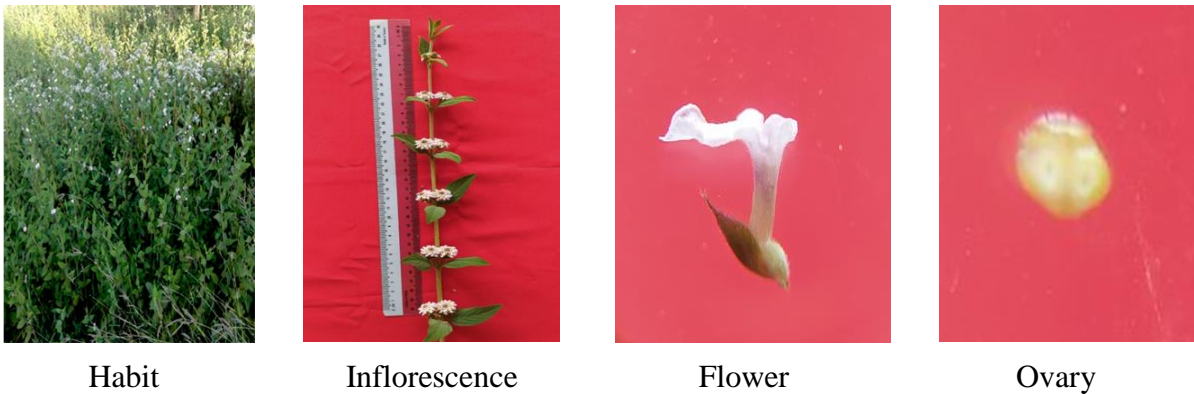


Figure 7. *Lantana indica* Roxb.

8. Scientific Name - *Clerodendrum indicum* (L.) O.kuntze.Rev.Gen.2: 586.1891.

Myanmar Name - Nga-yan-padu

Family - Laminaceae

Flowering and Fruiting period – December to March

Shrub, about 2.0 m high, stem quadrangular in young. Leaf simple, opposite and decussate, petiolate, exstipulate, laminae linear lanceolate to oblanceolate, 6.0 – 10.2 cm long

and 1.0 – 2.0 cm wide. Inflorescence terminal panicles. Flower white colour, bisexual, actinomorphic, about 13.0 cm long 3.0 cm wide, hypogynous, bracteate, pedicellate. Sepal synsepalous 5, calyx tube and lobe present. Petal synpetalous 5, corolla tube and lobe present, tubular, valvate. Stamen apostemonous, 4, filament slender, purple, exserted, anther oblong, ditheous, extrorse, dorsifixed, longitudinal dehiscence. Carpel 2, syncarpous, ovary superior, ovoid, axile placentation, 2 ovules in each locule, stigma bifid. Fruit calyx accrescent, 4-lobed, bright green turning black in mature. Seed 1-4.



Figure 8. *Clerodendrum indicum* (L.) O.kuntze.

An artificial key to the species

- 1. herbs -----2
- 1. shrub -----3
- 2. Inflorescences one-flower cyme ----- *Physalis minima* L.
- 2. Inflorescences unilateral scorpioid cyme ----- *Heliotropium indicum* L.
- 3. Latex present -----4
- 3. Latex absent -----4
- 4. Milky juice present, present flowers purple ----- *Ipomoea carnea* Jacq.
- 4. Milky latex, present flowers cream ----- *Calotropis gigantea* L. Dryand.
- 5. Placentation free central ----- *Ardisia humulis* Vahl.
- 5. Placentation axile -----6
- 6. Inflorescence cymose ----- *Cestrum nocturnum* L.
- 6. Inflorescence racemose -----7
- 7. Plant densely pungent smell ----- *Lantana indica* Roxb.
- 7. Plant smell absent ----- *Clerodendrum indicum* (L.) O. kuntze.

DISCUSSION AND CONCLUSION

The present research work deals with the taxonomic study of 8 selected species in Hinthada Township. Eight species of flowering plants belonging to 8 genera of 8 selected species of 7 families of sympetalae.

In this study, Annual herbs were found in *Heliotropium indicum* and *Physalis minima*. Undershrubs is only found in *Ardisia humulis* and other 5 plants were found a shrubs.

Milky latex was found in *Calotropis gigantean* and milky juice was found in *Ipomoea carnea*.

Opposite and decussate leaves arrangements were found in *Calotropis gigantea*, *Cestrum nocturnum*, *Lantana indica* and *Cleodendrum indicum*; Alternate leaves were found in *Ardisia humulis*, *Heliotropium indicum*, *Ipomoea carnea* and *Physalis minima*.

Terminal panicle inflorescence were found in *Cestrum nocturnum*, *Lantana indica* and *Cleodendrum indicum*. Axillary ovoid head inflorescence only found in *Lantana indica*. Many flower cymes were found in *Calotropis gigantea*, *Ipomoea carnea*; helicoid cyme only found in *Heliotropium indicum*. One to 3 flowers cymes were found in *Ardisia humulis* and *Physalis minima*.

The placentation of free central is only found in *Ardisia humulis*. The axile placentation were found in other 7 species of the plants.

In Myrsinaceae, the habit are shrub and leaves are alternate in *Ardisia humulis*. In *Ardisia humulis*, the inflorescence is cyme with pink coloured flower which are insect-pollinated. The petals stamens are 5 apostemonous and the carpel with free central placentation.

The Latex of *Calotropis gigantea* is highly poisonous. The staminal corona of gynostegium with 5-fleshy lobes, enlarge at the base into upturned horn and auricle. Pollen is aggregate into the pollinia.

The leaves arrangement of *Heliotropium indicum* is alternate to sub-opposite. The inflorescence are unilateral scorpioid cyme by its small purplish-white coloured flowers. In *Heliotropium* the nutlets are eaten by birds.

Ipomoea carnea, the flower of convolvulaceae is supported by the presence of milky juice. The leaves of *Ipomoea carnea* are eaten as vegetable and are useful for medicinally purposes.

In Solanaceae, recent morphological and molecular analyses indicated that the solanaceae are divided into 3-sub-families cestroideae, solanoideae and nalanoideae, Judd *et al* (2002). In *Cestrum nocturnum* and *Physalis minima* are medically uses the family solanaceae. The flower of *Cestrum nocturnum* is a powerful, sweet perfume, it's released at night, and are produced in cymose inflorescences. The flower colour of *Clerodendrum indicum* is white.

In *Lantana indica*, the flowers are irregular and bisexual, the stamens are four and bilocular ovary. *Lantana indica* has distinct odour colorfully described as landing somewhere on the smell spectrum.

These characters are agree with those mentioned by Hooker (1885), Backer (1965), Dassanayake (1981) and Judd *et al* (2002) and the medically uses are agree with the mentions by Indian medicinal plants (1918) and web information.

Acknowledgements

I'm particularly grateful to Dr Theingi Shwe, Rector, Dr Ye Ye Than and Dr Cho Kyi Than, Pro-Rector of Hinthada University for their permission to continue this work. Greatful acknowledgement is extended to Dr Khin Thuzar Myint, Professor, Head of the Department of Botany, Hinthada University, for her valuable advice, suggestion and encouragement. I'm also indebted to Dr Aye Aye Mar, Professor, Department of Botany, for her encouragement and criticisms.

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