

## Study on Morphological Characters and Phytochemical Screening on the Flowers of *Senna siamea* Lam. (Mezali)

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### Abstract

The well-known plant of *Senna siamea* Lam. (Mezali), the family Caesalpiniaceae has been undertaken for this research. Plant materials were collected from Hinthada Township, Ayeyawaddy Division, during flowering period. In this paper, the morphological characters, preliminary phytochemical tests and physico-chemical properties were presented. The preliminary phytochemical investigation revealed that except starch, tannin and cyanogenic glycoside are presence like others. In the physico-chemical properties, the powdered samples of flowers were most significantly soluble in aqueous than other solvents.

**Keywords:** *Senna siamea* Lam. (Mezali), Morphology and Phytochemical screening.

### Introduction

The herbal plants of *Senna siamea* Lam. are wild and cultivated types. These plants are belong to the family Caesalpiniaceae. This family consists of about 150 genera and 2200 species. This family is widespread in tropical and subtropical regions, only a few species grow in distinctly temperate climate (Cronquist, 1981).

*Senna siamea* is a medium-size, evergreen tree growing up to 18 cm tall, with a straight trunk of up to 30 cm in diameter, bole short, crown usually dense and rounded at first, later becoming irregular and spreading with drooping branches. The leaves are dark green, alternate and pinnately compound. The yellow flowers occur at the end of branches. The fruits are black pods with thickened edges. *Senna siamea* is native of South and Southeast Asia that grows up to 18m in height with an erect and slender stem. It is commonly used as shade tree in plantations, as windbreak, or as hedgerows. In Myanmar, *Senna siamea* Lam. was commonly known as Mezali (John kress, 2003). This plant was grown wild throughout the world. In Burmese tradition, during the full moon day of Tazaungmon, Myanmar people pick up *Senna siamea* buds to make salad (mezali phu thoke) and to make soup.

### Materials and Method

The specimens were collected from Hinthada University Campus, Hinthada Township, Ayeyawaddy Division during the flowering and fruiting periods. The fresh parts of the flowers were used for morphological and phytochemical and physico-chemical characters were studied. The fresh specimens were identified and described according to Cronquist, (1981) and Trease and Evans, (1978). The fresh specimens were thoroughly washed with water and dried at room temperature for several weeks. Then, the dried materials were pulverized with grinding machine. The powdered sample was kept in tightly closed bottles to be used for further study.

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## Results

### Botanical Description

Scientific name	- <i>Senna siamea</i> Lam.
Myanmar name	- Mezali
English name	- Kassod tree, Cassod tree, Cassia tree
Family	- Caesalpiniaceae

### Morphological characters of *Senna siamea* Lam. (Mezali)

An evergreen trees, medium-size plant, evergreen trees, growing at to 20-25 m tall, long stem and leaf green-reddish in colour, woody. Leaves are alternate, pinnately compound, paripinnate with slender, green reddish, petiole short, rachis pulvinate, rounded at both ends. Inflorescence axillary and terminal raceme, corymbose. Flowers bright yellow, bracteate, pedicellate, ebracteolate, complete, bisexual, zygomorphic, pentamerous, hypogynous. Sepal 5, free, aposepalous, imbricate, sepeloid. Petal 5, free, apopetalous, imbricate, peteloid (yellow). Stamens 10, usually frees, rarely connate, but sometimes reduced to staminodes, two stamens longer than others, anther basifixed. Carpel 1, monocarpellary, ovary superior, marginal placentation, style long, stigma simple. Fruit are pods, flattened, splitting. Seeds are numerous, bean-shaped, flat, exalbuminous.

Flowering and Fruiting time : August to May.

Geographic position of the study area is Hinthada University Campus of the N 17°38'24.5", E 95° 26' 10.9"



Figure 1. The morphological characters of *Senna siamea* Lam.

### Preliminary phytochemical tests from powdered flowers of *Senna siamea* Lam.

The preliminary phytochemical tests were carried out to determine the presence or absence of alkaloid, glycoside, reducing sugar, saponin, cyanogenic glycoside, carbon-hydrate, phenolic compound, flavonoid,  $\alpha$  amino acid, steroids, terpenoids and tannin in flowers of *Senna siamea* Lam. The results were shown in Table 1.

Table 1. Preliminary phytochemical tests from powdered flowers of *Senna siamea* Lam.

No	Chemical constituents	Extract	Reagent used	Observation	Results
1	Alkaloid	1%HCl	1.Mayer’s reagent 2.Wagner’s reagent 3.Hager’s reagent 4.Dragendorff’s reagent	Cream color ppt. Reddish brown ppt. Orange ppt. Yellow ppt.	+
2	Carbohydrate	H <sub>2</sub> O	10% α-naphthol & Con: H <sub>2</sub> SO <sub>4</sub>	Purple ring	+
3	Glycoside	H <sub>2</sub> O	10% lead acetate solution	Pale yellow ppt.	+
4	Phenolic compound	H <sub>2</sub> O	1% FeCl <sub>3</sub>	Greenish black ppt.	+
5	α amino acid	H <sub>2</sub> O	Ninhydrin reagent	Pink colour	+
6	Saponin	H <sub>2</sub> O	H <sub>2</sub> O	Persistent foam	+
7	Tannin	H <sub>2</sub> O	1% gelatin & 10% NaCl solution	No ppt.	-
8	Flavonoid	70%EtOH	Mg ribbon & Conc: HCl	Pinkish brown colour	+
9	Steroid	Petroleum ether	Acetic anhydrite & Conc: H <sub>2</sub> SO <sub>4</sub>	Blurish green	+
10	Terpenoid	Petroleum ether	Acetic anhydrite & Con: H <sub>2</sub> SO <sub>4</sub>	Pink	+
11	Reducing sugar	H <sub>2</sub> O	Fehling’s solution	Brick red ppt.	+
12	Starch	H <sub>2</sub> O	Iodine solution	No colour change	-
13	Cyanogenic glycoside	H <sub>2</sub> O	Conc: H <sub>2</sub> SO <sub>4</sub> , sodium picrate paper	No colour change	-

+ Present

- Absence

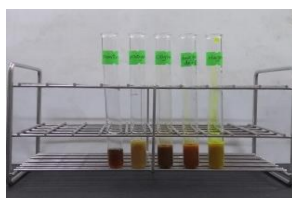


Figure 2. Test for alkaloid

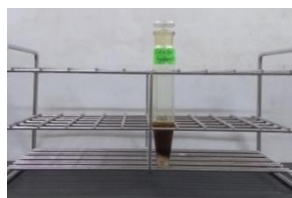


Figure 3. Test for carbohydrate

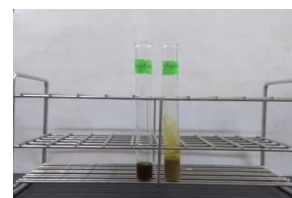


Figure 4. Test for glycoside

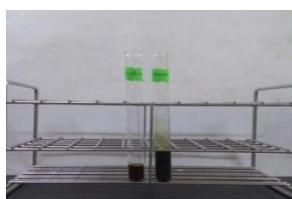


Figure 5. Test for phenolic compound

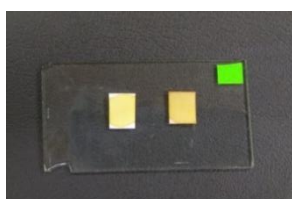


Figure 6. Test for α-amino

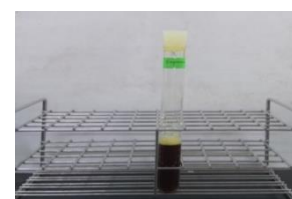


Figure 7. Test for saponin

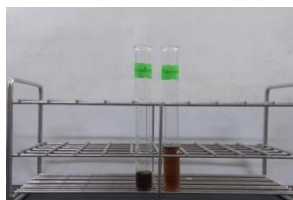


Figure 8. Test for tannin

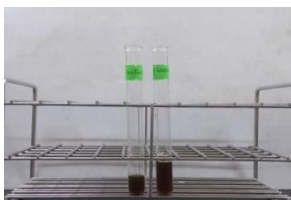


Figure 9. Test for flavonoid



Figure 10. Test for steroid and

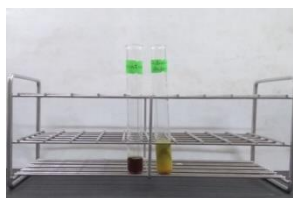


Figure 11. Test for reducing

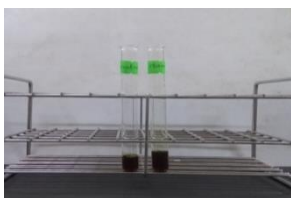
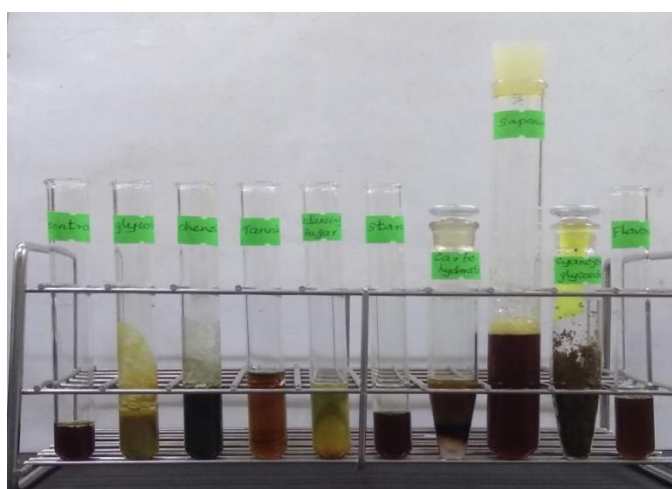


Figure 12. Test for starch



Figure 13. Test for cyanogenic

Figure 14. Preliminary Phytochemical tests of *Senna siamea* Lam.Table 2. Physico-chemical properties of powdered sample on flowers of *Senna siamea* Lam.

No	Physico-chemical characters	Average(%)
1	Moisture content	9.38%
2	Total ash content	4.39%
3	Water-soluble ash matter content	30.40%
4	Acid-insoluble ash mater content	0.07%
5	Petroleum ether matter content	1.8%
6	Ethyl acetate matter content	3.57%
7	Chloroform matter content	2.99%
8	Acetone soluble matter content	4.68%
9	Ethanol soluble matter content	14.8%
10	Methanol soluble matter content	13.5%
11	Aqueous soluble matter content	18.92%

In this experiment, the yield of water soluble ash was more than other soluble matters. The yield of pet-ether was less soluble than other soluble matters.

### Discussion and Conclusion

In the present investigation, the morphological studies on both vegetative and reproductive parts had been undertaken. Moreover, the preliminary phytochemical tests properties were also carried out. The preliminary phytochemical test indicated the flowers of *Senna siamea* Lam. showed the present of alkaloids, glycosides, carbohydrate, phenolic compound,  $\alpha$  amino acid, saponin, flavonoid, steroid, terpenoid and reducing sugar. These tests shown that the starch, the tannin and cyanogenic glycosides were absent in the flowers of *Senna siamea* Lam. These characters in agreement with mentioned by Trease and Evans, (1978). In the physico-chemical properties, the powdered samples of flowers were soluble in different solvents. Among them, it has the highest solubility in aqueous than other solvents. These characters are in agreement with mentioned by British Pharmacopoeia. (1968), Central Council of Research in Unani Medicine, (1987) and WHO, (1998).

*Senna siamea* Lam. is used for treading sleeping aid, stomachache, diarrhea, liver ailments and purgative. Flowers are used as vegetables for salad. Leaves are used in soup. All parts of the plant can be used for tanning. So, the herbal plant of *Senna siamea* Lam. can be used for medicinal purposes and it has much benefit for human.

### Acknowledgements

We would like to express my deepest gratitude to Dr Theingi Shwe, Rector, Hinthada University, Dr Yee Yee Than and Dr Aye Lwin, Pro-Rectors, Hinthada University, for allowing us to use all the facilities available in Hinthada University in doing this research. We would like to thank Dr Khin Thu Zar Myint, Professor and Head, Department of Botany and Dr Aye Aye Mar, Professor, Department of Botany, Hinthada University for their advice and suggestions.

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