

Botanical and Phytochemical Studies on Leaves of *Passiflora foetida* L. (Taw-suka)

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Abstract

The paper materials *Passiflora foetida* were collected from Hinthada University Campus in Hinthada Township, Ayeyarwaddy Region. This specimen was locally known as Taw-suka, Pan-kunyar. Its belongs to the family Passifloraceae. In this paper, morphological studies, preliminary phytochemical analysis and physico-chemical examination of leaves were conducted. Preliminary phytochemical analysis showed that the presence of alkaloid, glycoside, reducing sugar, saponin, steroid, terpenoid, phenolic compound, α -amino acid, carbohydrate, tannin and protein except the cyanogenic glycoside in leaves. In physico-chemical examination, the polar solvents of aqueous and methanol were most soluble than other solvents.

Keywords: *Passiflora foetida*, morphological studies, phytochemical and physico-chemical

INTRODUCTION

Myanmar is rich in medicinal plants. Most of the people use traditional medicine for the treatment of diseases. Among them, *Passiflora foetida* L. is well known for its used in medicinal purpose it is used as surface covering for smothering weed and enhance organic matter production. The leaves are employed in baths for skin infections. Herbal Medicine use in Primary Health Care in (ASEAN, 2014 and www.ijpbs.net).

Passiflora foetida L. also called as stinking passion flower or wild water lemon and local names are taw-sukar and pan-kunyar. It belongs to Passifloraceae family. There are about 600 species of this plant reported in several places in Asia, including India, Thailand, Myanmar, Indonesia, Singapore and many more that are occurred in tropical and sub-tropical plant of the word (www.academicjournals.org/AJBS).

MATERIALS AND METHODS

Collection and Identification of *Passiflora foetida* L.

The specimens were collection from Hinthada University Campus in Hinthada Township, Ayeyarwaddy Region, during the flowering and fruiting period.

Preparation and drying of powered samples from the leaves of *Passiflora foetida* L.

The collected samples of this plant parts were washed with water to remove impurities. After washing, the samples were air dried and ground to get powdered and stored in air tight containers to prevent contamination. And then, this samples were used for further study. The experimental work for the phytochemical, physico-chemical and elemental concentrations were carried out at Hinthada University and Universities' Research Center, Yangon University.

Phytochemical Screening of Leaves of *Passiflora foetida* L.

Preliminary phytochemical screenig of leaves of *Passiflora foetida* L. were carried out to determine the presence or absence of alkaloids, glycosides, flavonoids, saponins, reducing sugar, cyanogenic glycoside, steroid, terpenoid, phenolic compound, α -amino acid, flavonoid,

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protein and starch were carried out according to the procedures by (Harbone, 1973; Trease & Evans, 1978 and Center Council for Research in Unani Medicine, 1987). The result were shown in Table and Figure.

Physico-chemical Characterization of Leaves of *Passiflora foetida* L.

In this characters, moisture content, acid-insoluble content, aqueous soluble ash content and solubility in different solvents such as ethanol, methanol, petroleum ether, ethyl acetate, chloroform, acetone and aqueous soluble matter content were carried out according to the methods of (Trease & Evans, 1978; Marini Bettolo *et al.*, 1981 and Central Council for Research in Unani Medicine, 1987).

RESULTS

Botanical studies

Scientific name - *Passiflora foetida* L.

Synonyms - *Passiflora hastate* Bertol.

Myanmar name - Taw-suka, pan-kunyar

English name - Foul Passiflora, stinking passion flower

Family - Passifloraceae

Morphological characters of *Passiflora foetida* L.

Annual or perennial herbaceous vine. Leaves simple, alternate, petaloid, palmately tri-foliolate. Inflorescence axillary and solitary cyme 2.6 feet long. Flowers white, peduncle 3cm to 5cm long, 0.2 cm to 0.4 cm wide. Sepals (5), synsepalous. Petals 5, apopetalous. Stamens 5, 2-rowed corona of purplish filaments 0.4 cm to 0.7 cm long, 0.1 cm to 0.3 cm wide. Pistil 3, tricarpeal, syncarpous, parietal placentation, numerous ovules in each locule. Fruits oval, 1.6 cm to 2.4 cm long. Seeds numerous, usually ovoid, flattened, wedge-shaped, irregularly ridged, surrounded by a transparent aril.

Flowering and fruiting period – Throughout the year.

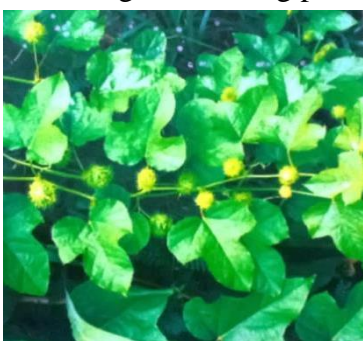


Fig. 1. Habit of *Passiflora foetida* L.



Fig. 2. Inflorescence of *Passiflora foetida* L.



Fig. 3. Flower of *Passiflora foetida* L.

Fig 4. Fresh fruits of *Passiflora foetida* L.Fig5 . Seeds of *Passiflora foetida* L.

Preliminary Phytochemical screening of powdered sample leaves from *Passiflora foetida* L.

In preliminary phytochemical screening, the presence of alkaloids, glycosides, saponins, reducing sugar, steroid, phenolic compound, α -amino acid, flavonoid, carbohydrate, tannin and protein were observed but cyanogenic glycoside and terpenoid were absent in leaves of *Passiflora foetida* L. The results data was shown in Table-1 and Figures 5 - 18.

Table-1. Preliminary Phytochemical Screening of Powdered samples on leaves from *Passiflora foetida* L.

No	Chemical constituents	Extract	Reagent used	Observation	Results
1	Alkaloid	EtOH	1.Mayer's reagent 2.Wagner's reagent 3.Hager's reagent	White ppt. Yellow ppt. Orange ppt.	+
2	Glycoside	EtOH	H ₂ O + NaOH	White ppt.	+
3	Reducing sugar	H ₂ O	Fehling's solution A and B	Yellow ppt.	+
4	Saponin	H ₂ O	Distilled water	Persistent foam	+
5	Cyanogenic glycoside	H ₂ O	Conc:H ₂ SO ₄ sodium picrate paper	No colour change	-
6	Steroid	EtOH	CHCl ₃ +conc:H ₂ SO ₄	Green colour	+
7	Terpenoid	EtOH	CHCl ₃ +conc:H ₂ SO ₄	No colour change	-
8	Phenolic compound	EtOH	10% FeCl ₃	Green colour	+
9	Flavonoid	EtOH	HCl / Mg	Pink colour	+
10	α -amino acid	H ₂ O	Ninhydrin reagent	Purple spot	+
11	Carbohydrate	H ₂ O	Benedict's solution	White ppt.	+
12	Tannin	H ₂ O	5% FeCl ₃	Yellow brown	+
13	Starch	H ₂ O	Iodine solution	No colour change	-
14	Protein	H ₂ O	Millon's reagent	Brown ppt.	+

+ Present

- Absent

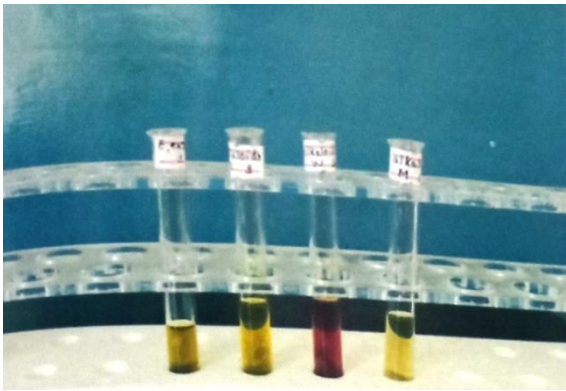


Fig 5 . Test for alkaloid

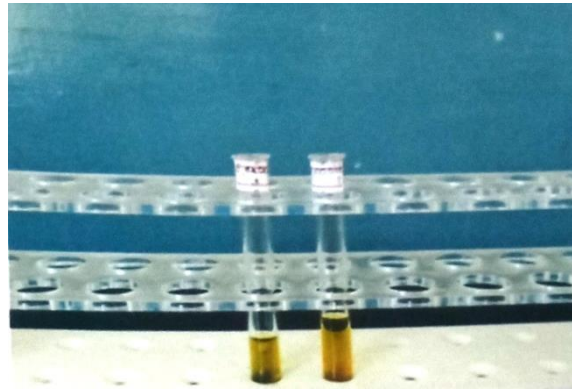


Fig 6. Test for glycoside

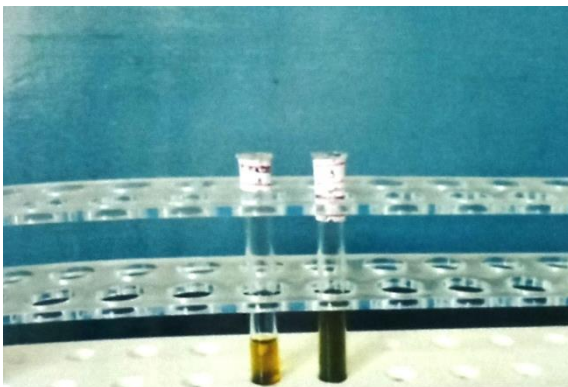


Fig 7. Test for reducing sugar

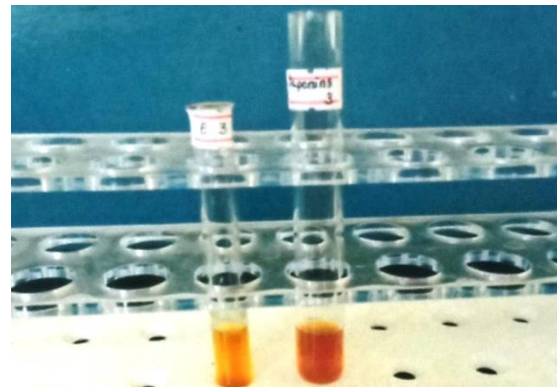


Fig 8. Test for saponin

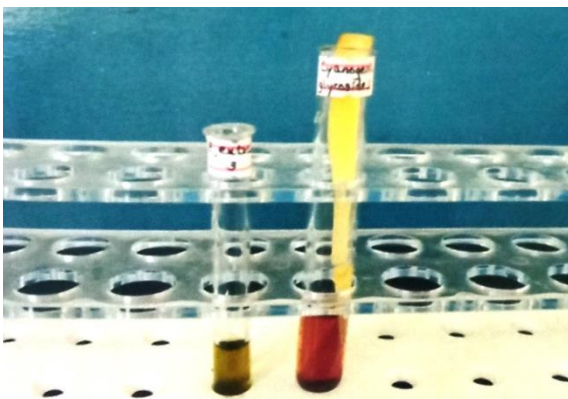


Fig 9. Test for Cyanogenic glycoside

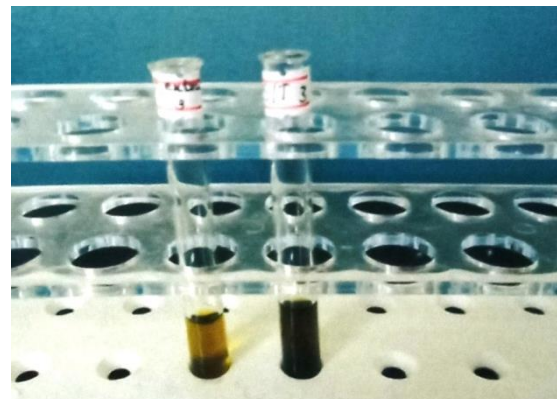


Fig 10. Test for Steroid and Terpenoid

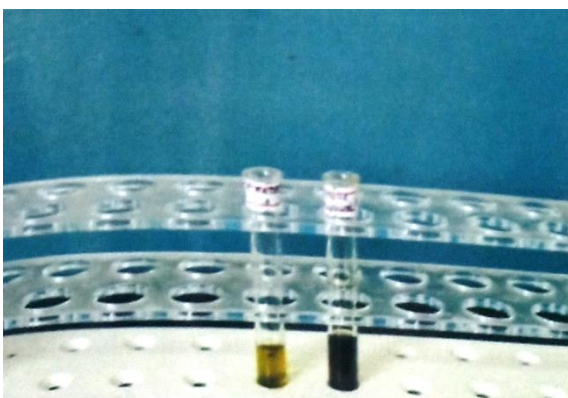


Fig 11. Test for Phenolic compound

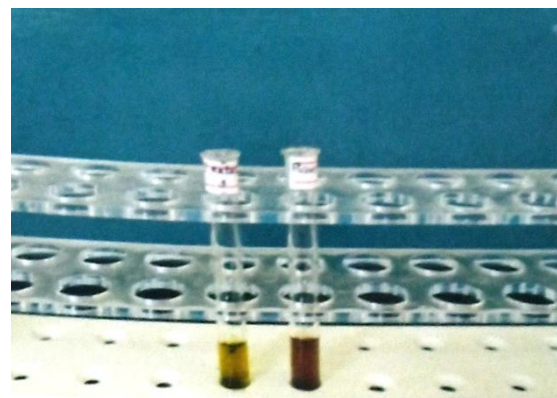


Fig 12. Test for Flavonoid

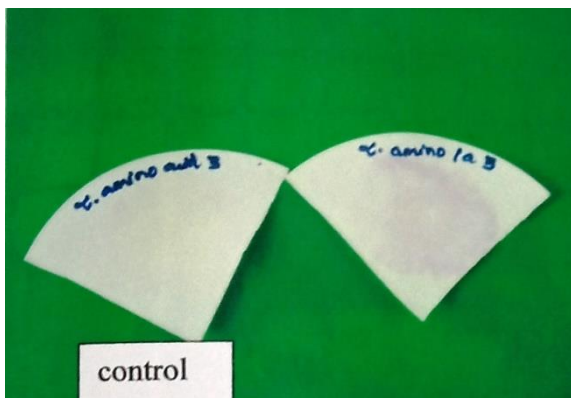


Fig 13. Test for α -amino acid

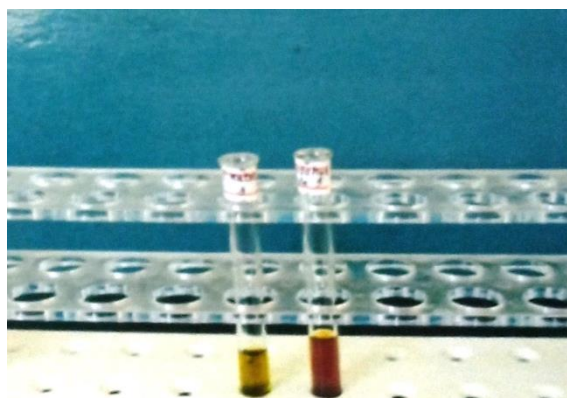


Fig 14. Test for Carbohydrate

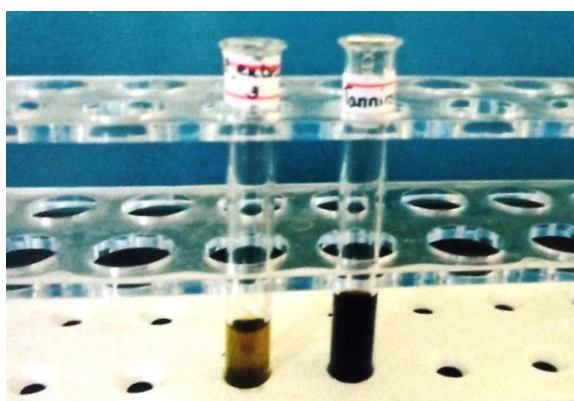


Fig 15. Test for Tannin

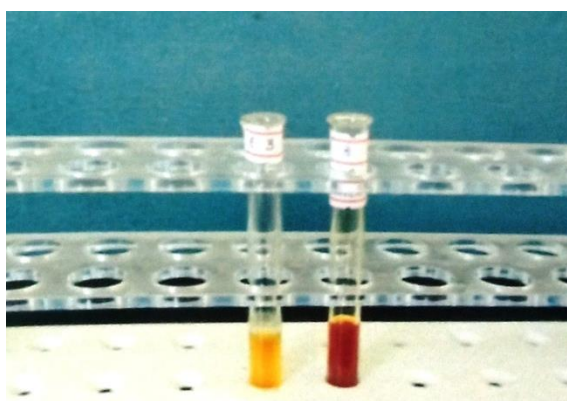


Fig 16. Test for Starch

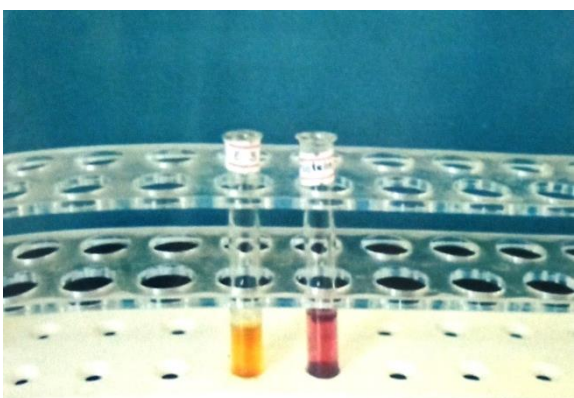


Fig 17. Test for Protein

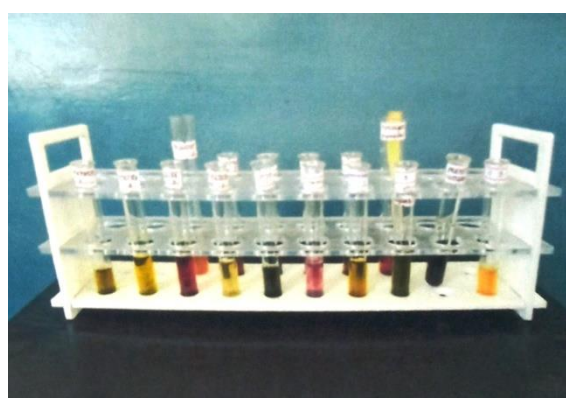


Fig 18. Preliminary Phytochemical tests from the leaves of *Passiflora foetida* L.

Physico - chemical characterization of leaves of *Passiflora foetida* L.

The determination of physico-chemical characters such as moisture content, total ash, acid moisture ash and extractive values for various solvents were made according to the methods described in the (British Pharmacopoeia, 1968 and Trease & Evans, 1978). The extractive values of powdered leaves were investigated by using different solvents, such as ethanol, methanol, petroleum ether, chloroform, ethyl acetate, acetone and aqueous. According to this results methanol was the most soluble but ethanol and aqueous were moderately soluble. The results was shown in table-2.

Table 2. Physico - chemical characterization of leaves of *Passiflora foetida* L.

No.	Physico-chemical characters	Average (% W/w)
1	Moisture content	12.46
2	Total ash content	7.71
3	Water-soluble ash content	47.60
4	Acid-insoluble ash matter content	22.50
5	Ethanol soluble matter content	17.4
6	Methanol soluble matter content	21.1
7	Pet-ether soluble matter content	3.2
8	Ethyl-acetate soluble matter content	4.4
9	Chloroform soluble matter content	3.0
10	Acetone soluble matter content	5.6
11	Water soluble matter content	17.8

DISCUSSION AND CONCLUSION

In this study, *Passiflora foetida* L. is a branched annual herbaceous vine. The plant climbs by means of tendrils and spreads only by seed. Leaves are simple, alternate, stipules. Flowers are solitary in upper leaf axils, bracts long and deeply divided into hair-like segments that surround the flower and fruit. Fruits oval, ripe seeds are blackish flatted, irregularly ridged, surrounded by a transparent aril. These characters are in agreement with Backer (1963) and Hooker, (1879).

In preliminary phytochemical examination, chemical constituents such as alkaloid, glycoside, reducing sugar, saponin, steroid, phenolic compound, flavonoid, α -amino acid, carbohydrate, tannin and protein were more effective but starch and terpenoid were not found. In physico-chemical properties such as moisture content, total ash content, solubility in different solvents such as petroleum ether, ethyl acetate, chloroform, acetone, methanol, ethanol and aqueous were investigated. From these results, methanol, ethanol and aqueous were most soluble than other solvents. These characters in agreement with mentioned by (British Pharmacopoeia, 1968 and Central Council for Research in Unani Medicine, 1987).

It is used for treating headaches, emmenagogue and asthma. Leaves are used as vegetables. So, the herbal plants of *Passiflora foetida* L. can be used for medicinal purpose.

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