Study on Morphology, Histology of Leaves and Preliminary Phytochemical Test of *Synedrella nodiflora* (L.) Gaertn. (Bizat-Hpo)

San San Tun

ABSTRACT

The Plant *Syndrella nodiflora* (L). Gaertn. is locally known as Bizat-Hpo, belonging to the family Asteraceae. It was collected and growing wild in Hinthada University campus, Hinthada Township, Ayeyarwaddy Division .The microscopical characters of leaves were examined by using the free hand section cutting. In addition, the powdered sample of leaves showed the presence of a-ammo acids, carbohydrates, flavonoids, starches, phenolic compounds and steroids.

Key words : Morphology, Histology, Photochemistry

INTRODUCTION

Synedrella nadi/lor a (L.) Gaertn. is a small annual and perennial, belongs to the family Asteraceae .This family is the largest family of the angiosperms, containing about 950 genera and probably 20,000 species (Hooker, 1986 and Kress, 2003). It was also known as Cinderella weed the generic name of *Synedrella* is a'derivative of the Greek synedros. (= placed together) and describes the crowding together of the small flowers, specific name nodiflora relates to the presence of the clusters around the nodes in the upper parts of the plant (http://bangiaiol. Index. Php / JLES). The extract of *Synedrella nodifloa* (L.) Gaertn. contained steroids, gums, reducing sugars, phenolic compounds, saponins, tannins and triterpenoids,. The' leaves are used as poultice for sore rheumatism, as remedy for hiccup and threatened abortion, laxative, diuretic and juice of the leaves is used for earache in the treatment of itch, eczema, scabies and any type of skin disorders (www. Tjpsr. com).

The leaves of the plant are eaten by human as vegetable in Indonesia (http:// www.greenpharmacy). It was also used for the treatment of epilepsy and pain, for cardiac troubles, wounds and for stopping bleeding, for poulticing sore legs and for headache after confinement (www. rchi. nlm. nih. com)* Various extracts of *Synedrella nodiflora* (L.) Gaertn are showing anti-diabetic, anti-tdiarrhoeal, anti-inflammatory and antimicrobial activities (www.rchi.nlm.com), The present study, therefore, seeks to evaluate the morphological, histological and phytochemical screening have been undertaken.

The aim of the study is to know the Myanmar medicinal plant of *Synedrella nodiflora* (L.) Gaertn. (Bizat-hpo). The objectives are to study the morphological characters, to examine the histological diagnostic characters, to determine the phytochemical and to test the leaves of this plant.

MATERIALS AND METHODS

Botanical studies, the plants *Synedrella nodiflora* (L.) Gaertn were collected from the Hinthada University campus, Hinthada Township, Ayeyarwaddy Division. Histological study, the leaves of fresh specimen were determined by using free hand section cutting. In preparation the section which was cleaned by using the chloralhydrate soultion (Johanson's method 1940). The preparation of powdered sample leaves was washed and dried in shade until constant weight.

Dried sample leaves powdered by using mill and keep in air tight bottle for further studied. The preliminary phytochemical examination of the powdered leaves were tested qualitatively for the presence or absence of alkaloids, carbohydrates, glycosides, phenolic compounds, a amino acids, saponins, flavonoids, steriods, reducing sugars, starch, cyanogenic glycosides terpenoids and tannins according to the method of Trease & Evans. 2002, Unani medicine, 1987).

RESULTS

Botanical Description

Scientific name - *Synedrella nodiflora* (L.) Gaertn.
Synonyms - *Verbesina nodiflora* (L.) Gaertn.
Myanmar name - Bizat-hpo
English name - Synedrella
Family - Asteraceae (Compositae)

Morphological characters of *Synedrella nodiflora* (L.) Gaertn.

Perennial herbs, sometime shrub branchlets erect, quadrangular, pubescent, long stem. Leaves simple and opposite, exstipulate, petiole long, eliptical to ovate, leaf blade is hairy, the margin is serrated. Inflorescense axillary or terminal capitulum long. Subtended by lanceolate bracts flower few corollas yellow. Flowering and fruiting period happen throughout the year. Disc flowers bisexual: corolla tubular-campanulate, 4-lobed; style branches linear with long filiform appendages. Ray flowers oblong lanceolate, blackish with pale, narrow, thich wing with upward by pointing sharp appendages. Fruit achene, obovate to elliposoid. Ray floret seed, disc floret seed are flattened, oblong. Disfloret seeds are thickened, elongate with bristles at the apex.

Morphological characters of *Synedrella nodiflora* (L.) Gaertn.

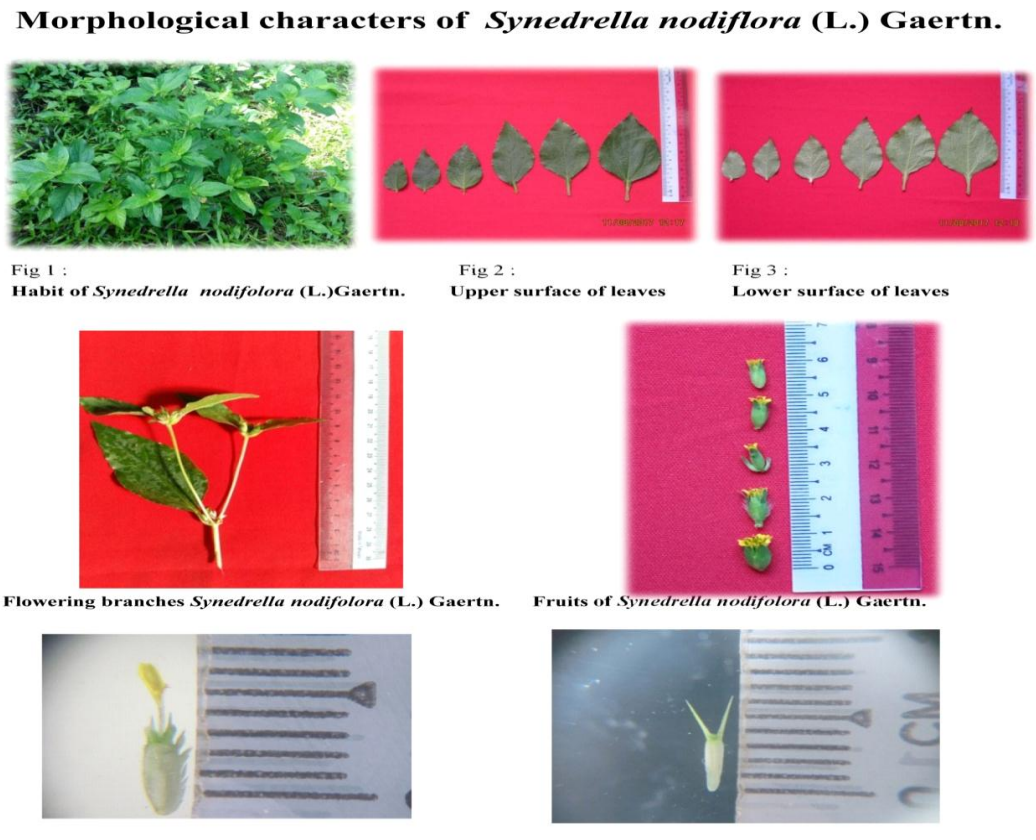

Fig 1 : Habit of *Synedrella nodifolora* (L.)Gaertn.
Fig 2 : Upper surface of leaves
Fig 3 : Lower surface of leaves
Flowering branches *Synedrella nodifolora* (L.) Gaertn.
Fruits of *Synedrella nodifolora* (L.) Gaertn.

Fig.4: achene of ligulate flower

Fig. 5: achene of tubular flower

Fig.14 Ray floret seeds of *Synedrella nodifolora* (L.) Gaertn.

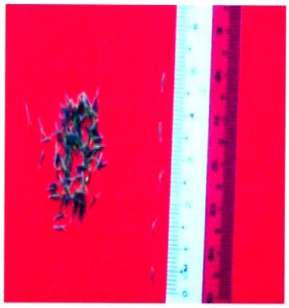

Fig.15 Disc floret seeds of *Synedrella nodifolora* (L.) Gaertn.

Histological characters of *Synedrella nodiflora* (L.) Gaertn. Lamina

In surface view, cuticle layer is found as smooth and thin wall cells; the epidermal cells of lamina are thin-walled parenchymatous cells, the anticlinal walls are wavy, the stomata is present on both surfaces, fewer in upper surface, annomocytic stomata. Lower and upper epidermal cells are only one-layered barrelshaped parenchymatous cells. Chloroplast are more abundantly occured in upper surface. Vascular bundles are found collateral type.

In surface view, epidermal cells are elongated and rectangular in shaped, thin-walled parenchymatous cells. In transverse section, the midrib arm-shaped in outline. The glandular and covering trichomes are present. Three vascular bundles are found in the middle region, these are embedded in the cortical region and the largest bundles are located in the central. All bundles are collateral type. All vasular bundles are oval-shaped and Phloem in lower side and xylem in upper side.

In surface view, the epidermal cells of petioles are elongated and thin-walled parenchymatous cells, trichomes simlar to those of lamina. Petioles are covered with a thick cuticle. In transverse section, the petioles are cup-shaped in outline. Epidermis is found as one-layered, thin-walled parenchymatous cells. The vascular bundles are sub oval-shaped, collateral type,

Histological characters of *Synedrella nodiflora* (L.) Gaertn.

Lamina

Fig.8: Upper surface of lamina with anomocytic stomata

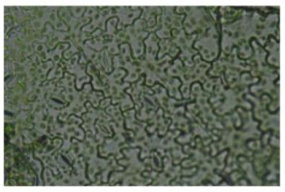

Fig.9: Lower surface of chloroplast cells and anomocytic stomata

Fig.10 : T.S of lamina

Midrib

Fig.11 : Surface view of midrib

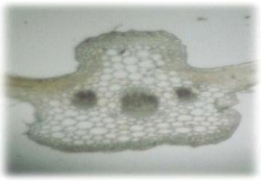

Fig.12 : T.S of midrib

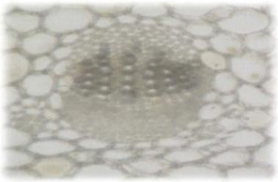

Fig.13 : T.S of midrib showing vascular bundle

Petiole

Fig.14 : Surface view of petiole

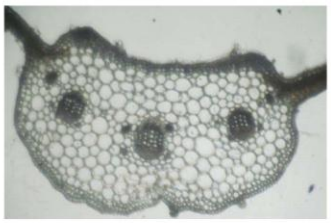

Fig.15 : T.S of petiole

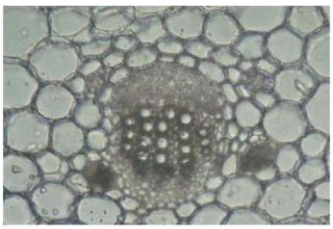

Fig.16 : T.S of petiole showing vascular bundle

Preliminary Phytochemical examination of powdered leaves of *Synedrella nodiflora* (L.) Gaertn.

No.	Type of compounds	Extract	Reagent	Observation	Results
1	Alkaloids	1%HCl	Mayer's reagent	No. ppt.	+
			Wagner's reagent	Blue ppt.	
			Dragendorff's reagent	No ppt.	
			Hager's reagent	No. ppt	
2	Carbohydrates	H_2O	10% α-naphthol & H_2SO_4 (Conc:)	Purple ring	+
3	Glycosides	H_2O	10% Lead acetate solution	White ppt.	+
4	Phenols	H_2O	5% $FeCl_3$ solution	Greenish black ppt.	+
5	α-amino acids	H_2O	Ninhydrin reagent	Light purple coulor	+
6	Saponins	H_2O	H_2O	Persistent foam	+
7	Tannins	H_2O	1% Gelatin & 10% NaCl solution	No ppt.	-
8	Flavonoids	70%EtOH	Mg ribbon & Conc; HCl	Brown colour	+
9	Steroids	Petroleum ether	Acetic anhydrite & Conc; H_2SO_4	Bluish green	+
10	Terpenoids	Petroleum ether	Acetic anhydrite & Conc; H_2SO_4	No colour	-
11	Reducing sugars	H_2O	Fehling's solution	Brick red ppt.	+
12	Starch	H_2O	Iodine solution	Bluish black	+
13	Cyanogenic glycosides	H_2O	H_2O, Conc; H_2SO_4, sodium picrate paper	No colour change	-

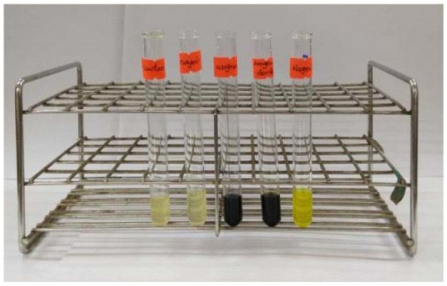

Fig.17 : Test for alkaloids

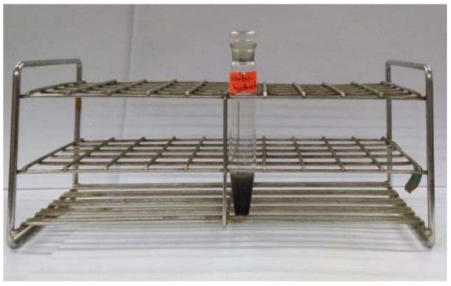

Fig.18 : Test for carbohydrates

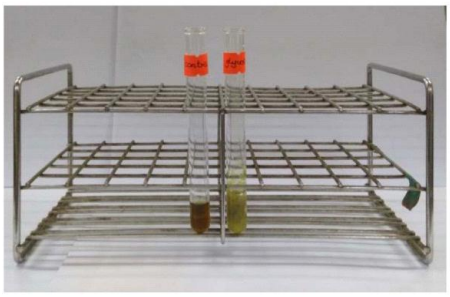

Fig.19 : Test for glycosides

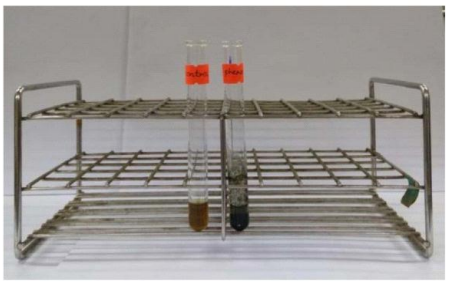

Fig.20 :Test for phenolic compounds

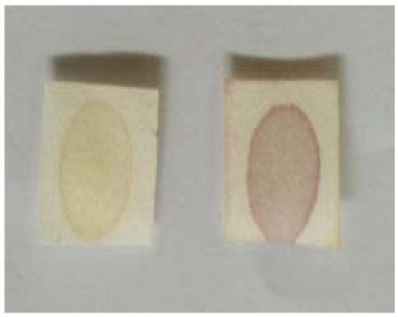

Fig.21 : Test for α-amino acids

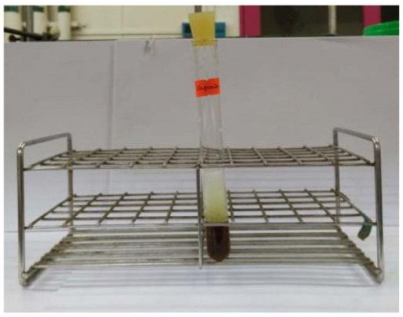

Fig.22 : Test for saponins

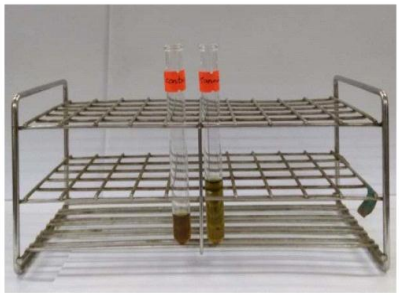

Fig. 23 : Test for tannins

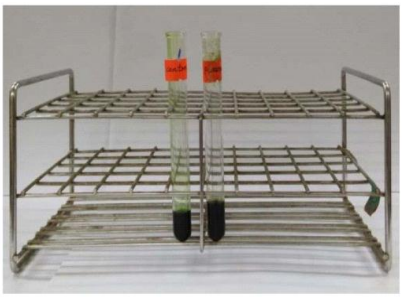

Fig. 24 : Test for flavonoid compounds

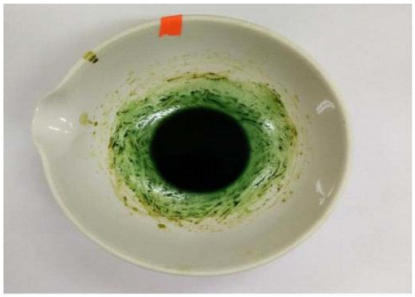

Fig. 25: Test for steroid and terpenoids

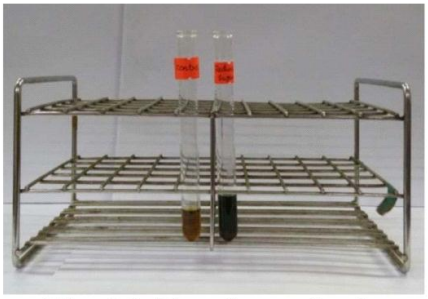

Fig. 26: Test for reducing sugars

Fig. 27: Test for starches

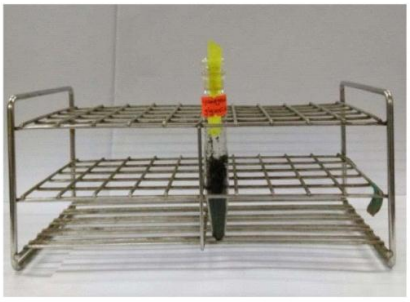

Fig. 28: Test for cyanogenic glycosides

DISCUSSION AND CONCLUSION

In the present studies, the morphological, microscopical and phytochemical screening of *Synedrella nodiflora* (L.) Gaertn, have been examined. It is perennial and annual herb. Leaves are opposite, petiolate, margin serrate. Inflorescence is an axillary or termial, peduncle sessile. Flowers are two types, ligulate flowers and tubular flowers, Fruit is an achene. These characters are in agreement with (Hooker ,1885) and (Lowrence, 1951). In the microscopical study, the leaves have been undertaken. Transverse section of lamina, stomata were present on both the epidermis and anomocytic type.

In transverse section of midrib, uniseriate multicellular trichomes were present. Vascular bundle are conjoint collateral and surrounded by parenchymatous cap on either side. These characters were in agreement with (Metcalfe and Chalk, 1950) and (Pandey, 1993). In preliminary phytochemical examination, glycosides, carbohydrates, reducing sugars, saponins, phenolic glycosides, flavonoids, starches and steroids were found to be present in powdered leaves. These characters were agreed with (Trease and Evan, 2002). In this research extraction of bioactive compounds from *Synedrella nodiflora* (L.) Gaertn, should be investigated for effective medicinal application in the role of Myanmar herbal medicinal sector.

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