

# Pharmacognostic Study of *Hybanthus Enneaspermus* (LINN.) F. MUELL.

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## ABSTRACT

*Hybanthus enneaspermus*(Linn.)F.Muell.(L.)F. is small sized herb belongs to *Violaceae* family, commonly called Ratan Purush or Purush Ratna is an important medicinal herb used to treat the diseases. The whole plant is used by Andh, Gond, Naikede, Pradhan, Kolam tribes, villagers and herbalist of Mahur range forest of Nanded district to treat chlorea, urinary tract infection, abdominal pain and enhance sexual vigour. Pharmacognostic studies of plant drug is carried out for evaluation of drug and to detect the adulteration. It includes dermal characters like trichomes, stomata and anatomical features. The plant was analyzed for its preliminary screening of phytochemicals. The result reveals that the presence of bioactive constituents comprising alkaloids, Flavonoids, Tannin, terpenoids, anthraquinones and cardiac glycosides. The antimicrobial assay also conducted to prove the proclaimed ethnobotanical claims. The present study helpful to standardize or evaluation of drugs.

Keywords: *Hybanthus enneaspermus*, pharmacognostic studies, Mahur forest.

## INTRODUCTION

In India, herbal medicines play a major role in the treatment of diseases. Large number of medicinal plants are available especially in developed and developing countries, which are used by tribal, villagers and herbalist. Medicinal plant contains huge quantity of useful secondary metabolites. The uses of different plant extract and bioactive compound or phytochemicals has known antimicrobial properties can be of great significance in therapeutic treatment, (Prusti, *et.al.* 2008). Medicinal plants synthesizing unlimited number of highly complex and active phytochemical. These plants are constantly screened for their pharmacological activities. The active principal present in the medicinal plants are further isolation as drugs for therapeutic purpose (Rajsekhar *et.al.* 2016).

The *Hybanthus enneaspermus*(Linn.)F.Muell. is small, erect perennial herb. Stem is woody at base. Leaves are subsessile, linear, margin distantly crenate. Flower axillary, pink coloured. Capsule ovoid with many white seed (fig.5). *Hybanthus enneaspermus*(Linn.)F.Muell. is used in folk medicine by the rustics, villagers, herbalist and tribals of Mahur range forest for the treatment of chlorea, urinary tract infection, abdominal pain and enhance sexual vigor.

The whole plant is used in the treatment of Cholera, Urinary tract infection, stomach trouble, ulcer, gonorrhoea, scorpion sting, sexual disorder and enhance sexual vigor ( Immanuel and Elizabeth, 2009., Lohidas and Parthipan, 2015., Nandagoapalan *et.al.* 2015., Paul David Selson *et.al.* 2019 and Kottaimuthu,2008.) Therefore, the preliminary phytochemical investigation is necessary to prove proclaimed ethnomedicinal uses.

## MATERIAL AND METHODS

### a) Plant material

The *Hybanthus enneaspermus*(Linn.)F.Muell. were collected from Bhimkund area of Mahur range forest of Nanded district, Maharashtra. The collected plant was taxonomically identified by using renowned floras (Naik 1979, Naik *et al.* 1998., Chetty *et al.* 2008 and Yadav and Sirdesai 2002). The voucher specimen was deposited in Department of Botany, Nutan Mahavidyalay Sailu, Dist. Parbhani. Plants were shade dried and powdered. The powdered plants were successively extracted with different solvent. The fresh leaves and stem were used for the study of macroscopic and microscopic characters.

### b) Preliminary phytochemical Screening:

Phytochemical screening of plant extracts of *Hybanthus enneaspermus*(Linn.)F.Muell in different solvent were undertaken by using standard method for the analysis secondary phyconstituents like alkaloids, glycosides, flavonoids, tannins, saponins, terpenoids and cardiac glycosides (Harborne,

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1984).

#### c) Preparation of extract

Plant powder was subjected to Soxhlet extraction with petroleum ether (60-80<sup>o</sup>c), Methanol (64.5-65.5<sup>o</sup>c) and water for 3-4 h in the order of increasing polarity of solvents (Daniel, 1991). The extracted solvent is evaporated to make the final volume one fourth of its original volume. Yield of extracts are 6.3, 12.7 and 14.56 % respectively. The extracts are stored at 4<sup>o</sup>c in airtight bottles for further study.

#### Pharmacognostic studies

##### Macroscopic study

Morphological studies were done using simple microscope. The shape, apex, base, margin, taste and odour of plant powder was observed.

##### Microscopic studies:

The free hand transactions of leaves and stem were taken and stained by using double stained differential staining technique and mounted in DPX (Johanson, 1940). The cellular and anatomical illustration were prepared by using camera lucida and some photograph were taken with the help of digital camera.

The leaf is peeled off for the study of stomata and the trichomes of upper and lower epidermis. For the study of vessels the stem is macerated by using Jeffery's fluid and stained with aqueous 1% saffranin and mounted in glycerine and made semipermanent by ringing with DPX mountant.

The plant powder was treated with phloroglucinol and HCl for the detection of lignin. Glycerin and iodine solution were used to determine calcium oxalate crystal and starch grains respectively (Kokate, 1997).

#### OBSERVATIONS

**T. S. of Stem:** The T.S. of stem is wavy in out line. The epidermis is single layered, thin with cuticle. Stomata are reported on epidermis. Beneath the epidermis 1-3 layered hypodermis is present followed by multilayered parenchymatous cortex. Endodermis and pericycle is not clearly visible. Next to the cortex a ring of many conjoint, collateral and open vascular bundles are present. Multilayered parenchymatous pith is present in center. (Fig. 1).

**Stomata:** The leaf is simple smooth, leaf lamina entire uncostate reticulate pattern of venation, the leaf is amphistomatic. The stomatics of both the surfaces are anisocytic, the guard cells are surrounded by three subsidiaries of which one is distinctly smaller than other two. (Fig. 2 A and B).

**Trichome:** The trichomes are present on upper and lower leaf surfaces. The trichomes of both the surfaces are unicellular with cytoplasmic content, the foot is embedded into epidermal cell and tip of the trichome is slightly bent. The trichomes of upper are longer than lower surface. (Fig. 4)

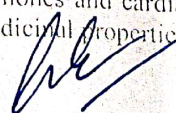
**Vessels:** The vessel elements of the secondary xylem shows variation where, 50% of vessels are spiral thickening. Both the end wall plates transverse, having size 70  $\mu$  diameters and 370  $\mu$  length. In 50% vessels lateral wall thickening is scalariform with long beak. Both the end wall plates are oblique with simple perforation, having 110  $\mu$  diameter and 310  $\mu$  length. (Fig.3).

**Phytochemical constituents:** The preliminary phytochemical analysis of plant powder shows the presence of alkaloids, flavonoids, tannins terpenoides, anthraquinones and cardiac glycosides. The Glycoside, Reducing sugar, Phlobatannins and Saponin are absent (Table. 1).

**Powder analysis:** The plant powder was characterized by its morphological features like green colour; presence of specific odour and bitter taste. Microscopic study of powder reveals the presence of yellow-pigmented endodermal layer, lignified and hemicellulosic cells with oil globules. (Table. 2&3)

#### DISCUSSION AND CONCLUSION

The present study reveals that the *H. enneaspermus* is used by tribal and local people as folk medicine to treat many diseases. The extracts of plant powder of *H. enneaspermus*, contain alkaloids, flavonoids, tannins terpenoides, anthraquinones and cardiac glycosides. The presence of different phytochemicals in the plants gives specific medicinal properties. Therefore, *H. enneaspermus* is medicinal potential due

  
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to presence of above phytochemicals.

It is very essential to isolate the bioactive component from plant so that it can be used further designing specific drug (Krishnamoorthy *et.al.*, 2014). The pharmacognostic characters and phytochemical values used as the diagnostic tool for the standardization of this medicinal plant (Raveendra and John, 2007). The pharmaceutical and antimicrobial studies could be done that will further elucidate and characterize the active components and authenticate its folkloric efficacy.

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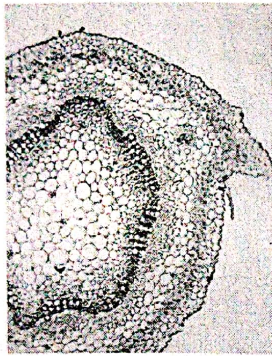


Fig.1 T. S. of Stem

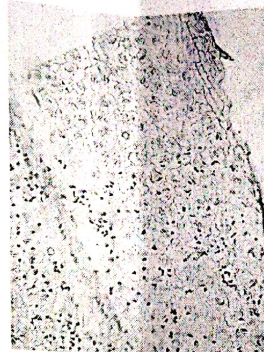


Fig. 2 A: Stomata lower epidermis B: Upper epidermis

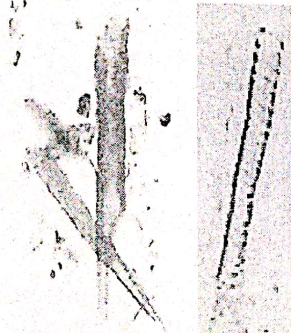


Fig.3. Stem Vessels

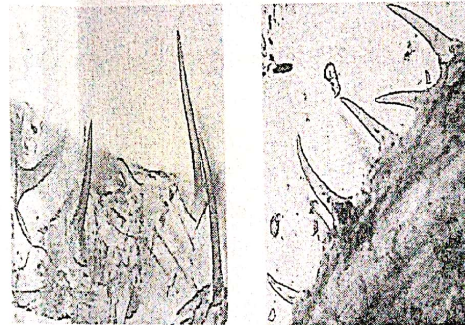


Fig. 4. Trichomes –Upper and Lower epidermis

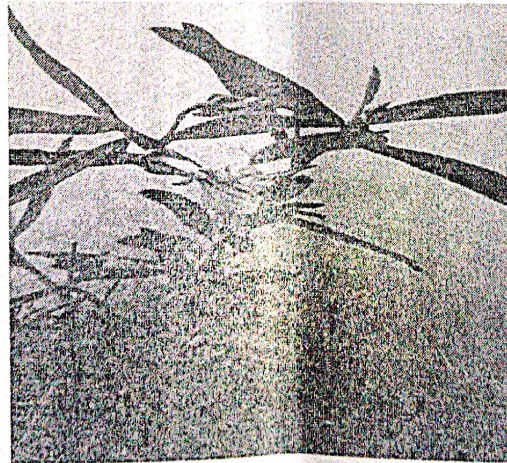


Fig. 5. *H. enneaspermus*

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Sr.no	Phytochemicals	Test	Sr. no	Phytochemicals	Test
1	Alkaloid	-	6	Phlobaphenins	-
2	Glycoside	-	7	Saponins	-
3	Flavonoids	-	8	Terpenoids	-
4	Tannins	-	9	Anthraquinones	-
5	Redoxing sugar	-	10	Cardiacglycosides	-

Table 1-Preliminary phytochemical screening of plant powder

Sr. no	Test	Observation	Inference
1	Colour	Green	Whole plant of <i>H. emneaspermus</i>
2	Odour	Specific	Aromatic crude drug
3	Taste	Bitter	Drug contain alkaloid

Table 2 Preliminary test

Sr no.	Reagent	Observation	Characteristic
1	Powder +Phloroglucinol+conc. HCL	Red colour	Lignified cells
2	Powder +Ruthenium red	Green	Muciligenous cells are Present in epidermis
3	Powder +Sudan red III	Red colour	Oil globules in the cell of endodermis
4	Powder +Acetic acid	Insoluble	Calcium oxalate
5	Powder +Dil. Hydrochloric acid	Soluble with effervescence	Cystolith
6	Powder +Conc.Sulphuric acid.	Brown colour	Stone cells are absent
7	Powder +Dil. Iodine sloution	blue colour	Starch is present
8	Powder +Dil. Iodine solution +Conc. Sulphuric acid	Blue colour	Hemicellulose in endodermis

Table No 3. Fluorescence analysis of the powdered plant of *H. emneaspermus*

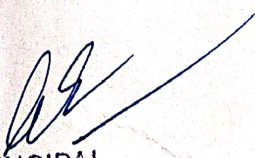
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