

Biochemical Studies in *Hybanthus enneaspermus* (L.) F. Muell.

Medicinally Important Plant.

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Abstract:

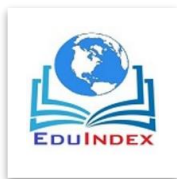
Hybanthus enneaspermus (L.) F. Muell.(Violaceae) is one of the important plant used in the treatment of anemia and has no toxicity as per earlier reports of fertility. Plant is used in the treatment of different kinds of diseases such as acute renal injury, diabetic complications, analgesic and anti-allergic, anti-proliferative and antioxidant etc. The plant also showed biologically active biochemical macro and micro elements.

Present study were carried out for the elemental analysis of different parts of *Hybanthus enneaspermus* such as root, stem and leaves. The experiment were carried out to analyze 15 different elements viz., Total Nitrogen (N), Total Phosphorous (P), Total Potassium (K), Calcium (Ca), Magnesium (Mg), Sodium (Na), Protein, Sulphur (SO₄), Copper (Cu), Iron (Fe), Zinc (Zn), Manganese (Mn), Boron (B) and Aluminum (Al). Results of present study revealed that *Hybanthus enneaspermus* is a rich source of nutritional elements.

Key words: *Hybanthus enneaspermus*, biochemical, Protein, nitrogen

Introduction:

Hybanthus enneaspermus is a small perennial herb distributed in warmer parts from Uttar Pradesh, Southern to Deccan peninsula of India, Ethanol fraction extract of *Hybanthus enneaspermus* have potent growth inhibitory activity against HEp-2 cell line with IC₅₀ value of 19.75µg/ml and results indicated that it has anti proliferative activity and may used as anticancer agent (Saravanan, et. al., 2013). Ethanol extract of *H. enneaspermus* flower revealed highest antioxidant activity followed by acetone, water, petroleum ether and chloroform. Phytochemical screening of extract showed the presence of flavonoids and phenols (Mohanapriya, et al., 2016). Ethanol extract of *H. enneaspermus* leaf at 1000mg/kg dose significantly reduced paw licking time compared to standard drug acetaminophen and doses at 500 and 1000 mg/kg



significantly increased the tail flick latency compared to acetaminophen in the formalin test (Afolabi, *et al.*, 2014). Alcoholic extract of *Hybanthus enneaspermus* showed more pronounce effect (59.4%) as compare to aqueous extract (57.4%) on Freund's adjuvant induced arthritis at the end of 30 days treatment. Phytochemical screening showed existence of different secondary metabolites viz., alkaloids, flavonoids, glycosides, phenols, carbohydrates and tannins (Tripathy, *et al.*, 2009). Leaves and whole plant of *Hybanthus enneaspermus* used in easy delivery (Olanipekun, *et al.*, 2016).

Materials and Methods:

The plant material were collected from the department of Botany, Kakatiya University, Telangana and brought to laboratory. Plant material were washed with running tap water and shade dried till it get constant weight. The fine powder were prepared with the help of mortle and pistle or mixer grinder. Powder filtered through sieve. The fine powder were used for the biochemical analysis which was carried out in MIT Center for Analytical Research and Studies. Elemental analysis were carried by using the standard protocol suggested by (Tandon...,)

Results and Discussion:

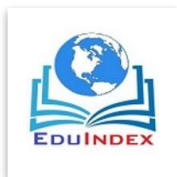
Different parts i.e. root, stem and leaves of *Hybanthus enneaspermus* were screened for the various biochemical elemental analysis. Leaves showed the highest percentage of total nitrogen (0.454%) followed by stem (0.290%) and root (0.290%), Total Phosphorous (P) percent highest value recorded in leaves (0.884%) followed by stem (0.472%) and root (0.239%). Maximum value for Total Potassium (K) recorded in leaves (1.420%) where as in stem (1.289%) and in root (0.495%). Leaves showed the highest percent value for (23.11%) Calcium (Ca) followed by stem (19.93%) and root (15.73%), Highest percent value for Magnesium (Mg) were observed in leaves (7.22%) followed by stem (6.23%) and root (4.91%).



Photo. 1. *Hybanthus enneaspermus* L.

Table 1. Biochemical composition of *Hybanthus enneaspermus* L.

Sr. no.	Biochemical elements	Root (%)	Stem (%)	Leaves (%)
1	Total Nitrogen (N)	0.290	0.368	0.454
2	Total Phosphorous (P)	0.239	0.472	0.884
3	Total Potassium (K)	0.495	1.289	1.420
4	Calcium (Ca)	15.73	19.93	23.11
5	Magnesium (Mg)	4.91	6.23	7.22
6	Sodium (Na)	1.005	1.061	1.050
7	Protein	1.813	2.301	2.839
8	Sulphur (SO ₄)	0.786	0.834	1.664



9	Copper (Cu)	0.0039	0.0023	0.0025
10	Iron (Fe)	0.125	0.143	0.146
11	Zinc (Zn)	0.0053	0.0069	0.0070
12	Manganese (Mn)	0.00029	0.0035	0.0035
13	Boron (B)	--	0.00052	0.00049
14	Molybdenum (Mo)	0.00026	0.00034	0.00034
15	Aluminum (Al)	0.0342	0.0461	0.0365

Maximum percent value for Sodium (Na) were recorded in stem (1.061%) followed by leaves (1.050%) and root (1.005%), highest percent value for Protein were recorded in leaves (2.839%) followed by stem (2.301%) and root (1.813%). Maximum Sulphur (SO₄) percent value were observed in leaves (1.664%), for stem (0.834%) and root (0.786%). The highest percent values for Iron (Fe) and Zinc (Zn) were recorded in leaves (0.146, 0.0070%) followed by stem (0.143, 0.0069%) and root (0.125, 0.0053%).

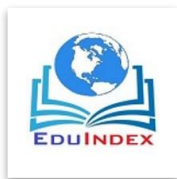
Root showed the maximum Copper (Cu) percent value (0.0039%) whereas leaves (0.0025%) and stem (0.0023%). Leaves and stem showed maximum percent value for Manganese (Mn) (0.0035%) and root (0.0029%). Stem showed highest value for Boron (B) (0.00052%) while leaf (0.00049%). Leaf and stem showed similar value for Molybdenum (Mo) (0.00034%) and root (0.00026%). Highest percent value for Aluminum (Al) were observed in stem (0.0461%) followed by leaf (0.0365%) and root (0.0342%) (**Table 1**). This is first kind of work were carried out on the elemental analysis of root, stem and leaves of *Hybanthus enneaspermus* L.

Conclusion:

From the present studies it can be concluded that *Hybanthus enneaspermus* is rich source of various biochemical elements such as Nitrogen (N), Phosphorous (P), Potassium (K), Calcium (Ca), Magnesium (Mg), Sodium (Na), Protein, Sulphur (SO₄), Copper (Cu), Iron (Fe), Zinc (Zn), Manganese (Mn), Boron (B), and Aluminum (Al). As compared to the root and stem, leaves revealed the presence of maximum percent for biochemical component analyzed.

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