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SCREENING OF PHYTOCHEMICAL AND BIOCHEMICAL ANALYSIS OF MEDICINAL PLANT *HYBANTHUS TRAVANCORICUS* (BEDD.) MELCH.

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ABSTRACT

Hybanthus is an herbal plant used for medicinal purpose. Since ancient time, people are exploring the plant species in search of new drug, which has resulted in exploitation of large number of medicinal plants with curative properties to treat various ailments. The importance of medicinal plants becomes more patent now in developing countries. Present investigation deals with the qualitative analysis of phytochemicals and biochemical analysis in the plant part of *Hybanthus travancoricus*. Phytochemical screening was performed with standard protocols using acetone, petroleum ether and aqueous extract. The phytochemical study showed in the presence of alkaloids, glycosides, amino acids, proteins flavonoids, phenols, saponins and tannins. In biochemical the experiments were carried out to analyze five different elements viz., estimation of total protein, chlorophyll, carotenoid, carbohydrate and Amino acid. Results of present study revealed that *Hybanthus travancoricus* is a rich source of nutritional elements.
Keywords **:** *Hybanthus travancoricus*, Phytochemical, biochemical.

Introduction

The genus *Hybanthus Jacq*. is distributed in tropical and subtropical regions of Africa, Asia, Australia and America with about 150 species. Grey Wilson (1981) discussed the identity of different taxa of *Hybanthus* occurring in Trop. Africa. Two species of *Hybanthus* are found in India, viz. *Hybnthus enneaspermus* (L.) F. Muell. and *H. travancoricus* (Beddome) Melchior. *Hybanthus enneaspermus* is variable species and occurs as a common weed throughout India. *Hybanthus travancoricus* is endemic to southern Western Ghats of Kerala and Tamil Nadu (Banerjee & Pramanik, 1993).

The plant is cultivated particularly as a medicinal plant has been used in treatments and preventions of diverse diseases as folklore medicines. Traditionally the plant is used as an aphrodisiac, demulcent, tonic, diuretic, in urinary infections, diarrhoea, cholera, leucorrhoea, gonorrhoea, dysuria, inflammation and sterility. (Schippmann *et al*., 2002). The medicine plants contained a wide range of chemical substances (called as phytochemicals) that can be used to treat chronic as well as infectious disease (Hashim *et al.,* 2010). They are grouped as alkaloids, glycosides, flavanoids, saponins, tannins, carbohydrate and essential oils. Medicinal plants contain some natural products which perform definite physiological action on the human body and these bioactive substances include tannins, alkaloids, carbohydrates, terpenoids, steroids and flavonoids (Edoga *et al.,* 2005). The present investigation deals with the phytochemical and biochemical analysis in *Hybanthus trvancoricus* stem and leaf.

Materials and Methods

Systematic position

Kingdom	:	Plantae
Division	:	Magnoliophyta
Class	:	Magnoliopsida
Order	:	Malpighiales
Family	:	Violaceae
Genus	:	*Hybanthus*
Species	:	*travancoricus*
Local name	:	Orithalthamari

Collection of materials

Fresh leaves of *Hybanthus travancoricus* was collected from Malaimari Edaicode, Kanyakumari District, Tamil Nadu. India

Preparation of Extract

The plants were dried under shade condition for 1 month and cut into small pieces, pulverized in a grinder and store in sterile container for further use. The solvents like acetone, petroleum ether and aqueous were used for the extraction.

About 10 gm of powdered plant material was soaked separately in 100 ml of acetone, petroleum ether and aqueous for 3 to 4 days at room temperature in dark condition. The extracts were filtered by using Whatman No.1 filter paper. The filtrate was concentrated to dryness under reduced pressure at 40°C using a rotary evaporator and stored at 4°C for further use. Each extracts was re-suspended in the respective solvent and used for the analysis of phytochemicals.

Qualitative Phytochemical Analysis

The phytochemicals like Alkaloid (Evans and Trease, 2002), Carbohydrate (Harborn, 1998; Adebayo and Ishola, 2009), Protein (Harborn, 1998; Adebayo and Ishola, 2009). Glycoside (Siddiqui and Ali., 1997), Flavonoid (Sofawora, 1993; Somo Lenski *et al*., 1974; Harbone, 1973), Triterpenoid (Ayoola *et al.,* 2008), Phenolic compound (Sofawora, 1993; Trease and Evans, 1989; Harbone, 1974), Tannin (Trease and Evans, 1985), Saponin (Kumar *et al.,* 2009) and Anthraquinone (Adebayo *et al.,* 2012) were analysed.

Biochemical Analysis

The fresh plant *Hybanthus travancoricus* leaf and *stem* were collected for biochemical analysis. Plant materials were washed with running tap water. The plant sample is weighed then grind in mortar and pestle. The Biochemicals like total protein (Lowry *et al.*, 1951), chlorophyll (Arnon, 1949), carbohydrate (Roe, 1955), carotenoid (Kirak and Allen, 1565), amino acid (Moore and Stein, 1948)were analysed.

Results and Discussion

Phytochemical analysis *Hybanthus travancoricus* of using different solvent extracts

The present study carried out on the plant sample revealed the presence of phytochemicals. The phytochemical characters of the plants investigated are summarized in the Table: 1. The Acetone extract of *Hybanthus travancoricus was* found to contain glycosides, protein and aminoacids, phenols, flavanoids and tannins. Petroleum ether extracts show alkaloid, protein and aminoacids, flavanoids, tannins, phenols and saponins. Aqueous extracts show alkaloids, protein and aminoacids flavanoids, tannins and phenols. All three extracts have shown the negative result of carbohydrates, anthraquinones, steroids and triterpenoids. In acetone extract alkaloids and saponins were absent. Glycoside and saponin absent in aqueous extract.

Table 1 : Phytochemical analysis of *Hybanthus travancoricus* using different solvent extracts

Phytochemicals	Acetone	Petroleum ether	Aqueous
Alkaloids	–	+	+
Carbohydrates	–	–	–
Glycosides	+	–	–
Protein &Aminoacids	+	+	+
Flavanoids	+	+	+
Steroids and Triterpenoids	–	–	–
Phenols	+	+	+
Tannins	+	+	+
Saponins	–	+	–
Anthraquinones	–	–	–

*(+) Present (-) Absent

The earlier works and presence of similar compounds was observed in methanolic extract of *Hybanthus enneaspermus* (Priya *et al.*, 2011; Krishnan *et al.,* 2012; Krishnamoorthy *et al.,* 2014; Anand and Gokulakrishnan, 2012 ; Singh *et al.,* 2015). Aqueous extract, recorded the presence of flavanoids, alkaloids, glycosides, phytosterols, diterpenes, carbohydrates and proteins while petroleum ether extract, showed the presence of alkaloids, glycosides, phytosterols and proteins (Raveendra and Britto 2007; Hemashenpagam and Praveena 2010 and Krishnamoorthy *et al.,* 2014).

Biochemical Analysis of *Hybanthus travancoricus* stem and leaf

The biochemicals like protein, chlorophyll, carbohydrate, carotenoid and amino acids were analyzed for the selected *Hybanthus travancoricus.*

The total amount of protein content in *Hybanthus travancoricus* stem and leaf shows 5.0±0.16mg/g and 5.6±0.16 mg/g. In carbohydrate 0.82±0.02 mg/g and 0.90±0.01 mg/g. In Amino acid 0.21±0.009 mg/g and 0.22±0.16 mg/g. In carotenoid in *Hybanthus travancoricus* stem and leaf shows 0.30±0.16 mg/g and 0.21±0.01 mg/g. In chlorophyll ʻa', ʻb' in *Hybanthus travancoricus* stem shows 0.14±0.012 mg/g, 0.21±0.04 mg/g and leaf shows 0.14±0.16 mg/g, 0.39±0.02 mg/g. Total chlorophyll content in stem and leaf shows 0.34±0.02 mg/g and 0.58±0.06 mg/g.

The maximum amount of protein content was observed in *Hybanthus travancoricus* stem (5.0± 0.16mg/g) and the minimum amount of chlorophyll ʻa' and ʻb' content was observed in *Hybanthus travancoricus* stem (0.14±0.021 mg/g 0.14±0.16). The maximum amount of protein content was observed in *Hybanthus travancoricus* leaf (5.6 ± 1.16 mg/g) and the minimum amount of chlorophyll ʻa' content was observed in *Hybanthus travancoricus* leaf (0.21±0.04 mg/g) carotenoid content was observed in (0.21±0.01 mg/g).

Prashant Patankar and Sanjay R. Biradar (2019) discussed *Hybanthus enneaspermus* stem and leaves were screened for the various biochemical elemental analysis. Highest percent value for Protein were recorded in leaves (2.839%) followed by stem (2.301%).

Table 2: Biochemical analysis of *Hybanthus travancoricus* stem and leaf

S.No.	Biochemicals	*Hybanthus travancoricus* (mg/g)	
		Stem	Leaf
1	Protein	5.0±0.16	5.6±0.16
2	Carbohydrate	0.82±0.02	0.90±0.01
3	Aminoacids	0.21±0.009	0.22±0.16
4	Carotenoid	0.30±0.16	0.21±0.01
5	Chlorophyll ʻa'	0.14±0.021	0.21±0.04
6	Chlorophyll ʻb'	0.14±0.16	0.39±0.02
7	Total chlorophyll	0.34±0.02	0.58±0.06

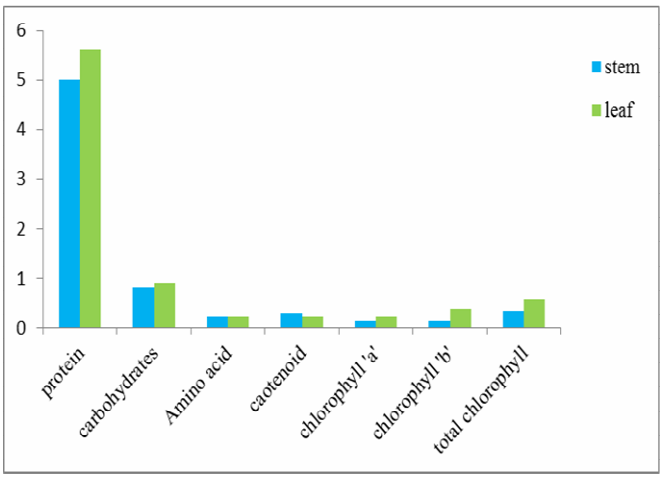

Fig. 1: Biochemical analysis of *Hybanthus travancoricus* stem and leaf

Conclusion

Plants have been used by humans and animals for their food and health purposes from ancient days. The medicinal plant, *Hybanthus travancoricus* is widely used as a folk medicine and has plenty of phytochemicals and biochemicals. The pharmacological activities, further research work in this plant leading to active compounds isolation which can be used as potential drugs for diseases after clinical trials.

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