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Phytochemical screening of *Enicostemma littorale* plant from Washim district of Maharashtra state

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Abstract

The phytochemical screening of plants plays a commercial role and has great interest in pharmaceutical companies for the manufacture of the new drugs to treat various diseases. The present research work is conducted to search the qualitative analysis of the plant material of *Enicostemma littorale*. Qualitative phytochemical evaluation was carried out to test the presence of alkaloids, Terpenoids, flavonoids, carbohydrates, tannin, saponin, amino acid, glycoside and phenol in the methanol, petroleum ether and acetone extracts of plant material using Soxhlet extraction methods. The present effort is targeted at the evaluation of the phytochemicals present in the plant species.

Keywords: *Enicostemma littorale*, soxhlet apparatus, methanol, petroleum ether and acetone, phytochemical etc.

Introduction

Phytochemicals are the chemicals that are present naturally in plants. Nowadays these phytochemicals become more popular due to their countless uses, Phytochemicals play a vital role against several diseases such as asthma, arthritis, cancer etc. Unlike pharmaceutical chemicals, these phytochemicals do not have any side effects. Since the phytochemicals cure diseases without causing any harm to human beings these can also be considered as medicine (K. Sahirabanu and L. Catherine, 2015) [6].

Plant products have been part of phytomedicines since time immemorial. This can be derived from barks, leaves, flowers, roots, fruit and seeds. Medicinal plants which form the backbone of traditional medicine have in the last few decades been the subject of very intense pharmacological studies (Hasler and Blumberg, 1999.) [7]

In the present work, of phytochemical analysis was carried out in plants *Enicostemma littorale* Blume.

Enicostemma littorale Blume is herbaceous and perennial herb 10-15 cm high. It is branched from the base with erect stems. Leaves are sessile and can be linear or linear-oblong (Abirami, 2004). Flowers are white in whorled axillary clusters and are sessile. The fruits are capsule, one-celled with many small, pale, ridged ovate seeds. Ayurveda describes the plant as stomachic and laxative. The plant is very bitter. It can be used as an anthelmintic and it cures fever (Sarvanan *et al.*, 2012) [8]. It is traditionally used as antidiabetic due to the presence of C-glycosyl flavonoids. It is also used as a urinary astringent, antiperiodic, anthelmintic, anti-inflammatory, antioxidant, antimicrobial, antiedematogenic, antitumor activities, laxative and carminative. Animal experiments of *E. littorale* Blume reported its hypoglycaemic activity (Jaishree and Badami, 2010) [9].

Materials and Methods**Collection of plant material**

Fresh plant material of *Enicostemma littorale* Blume is collected from rural areas of Washim districts like Panghrikute and Hiwara Maharashtra, India respectively. The plant species *Enicostemma littorale* Blume commonly occurs in non-cultivated land, along with the roadside. Shady moist place plant material washed under tap water 2-3 times to remove soil particles and dust the plant material was shaded for 18 days. After drying plant material is ground into a fine powder and then transferred into an airtight container with proper labelling for further use (Devi *et al.*, 2023) [5].



Preparation of Solvent Extract

The leaves and stem of the plant of *Enicostemma littorale* Blume sample were dried and then powdered using mixer and grinder 5 gm of plant powdered was extracted in different solvent by using Soxhlet extractor and then tests were carried out with different reagents.

Qualitative phytochemical analysis of leaves and stem of *Enicostemma littorale* Blume were carried out and result were recorded as present (+) or absent (-) depending on the outcome of the test.

Test for Alkaloids

Wagner's' test: Add 2 ml of Wagner's reagents was added into plant extract and the resulting reddish-brown precipitate indicates positive test for alkaloids (Wagner, 1993) ^[1].

Test for Tannins: A few drops of 0.1% ferric chloride was added and observed blackish blue or brownish green coloration indicates the presence of tannin.

Test for Saponins: Extract was added with 5ml of distilled water in a test tube and then it was shaken and the formation of stable foam indicates presence of saponin (Chen *et al.*, 2006) ^[2].

Test for flavonoids: A few drops of lead acetate were treated with extract and yellow coloration indicates presence of flavonoid.

Test for Phenol: The extract was treated with 3-4 drop of ferric chloride solution bluish black or blue green colour indicates positive test for phenol (Mace. M. D, (1963) ^[3].

Test for Terpenoids: Extract was mixed in 2 ml of chloroform and concentrated H₂SO₄ (3ml) was carefully added to form reddish brown coloration in inner face indicates positive test for terpenoid.

Test for Amino acid: When extract in which two drop of Ninhydrin reagent added then purple colour form it indicates positive test for amino acid (Yasuma. A and Ichikawa (1953) ^[4].

Test for Carbohydrates

Benedict's test: Reagent was added with extract and heated on boiling water bath for 2 min reddish brown precipitate indicates the presence of carbohydrates.

Test for Glycosides: To know volume of extract 1ml of distilled water added and aqueous solution of NaOH was

added and formation of yellow colour indicates positive test for glycosides.

Observation

Enicostemma littorale Leaf

Secondary metabolites	Methanol extract	Petroleum ether extract	Acetone extract
Alkaloids	-	+	-
Tannins	-	-	-
Saponins	+	+	+
Flavonoids	-	-	-
Terpenoids	-	-	-
Phenol	+	-	+
Carbohydrates	-	-	-
Amino acid	-	-	+
Glycoside	-	-	+



Methanol extract of *Enicostemma littorale* leaf



Petroleum ether extract of *Enicostemma littorale* leaf



Acetone extract of *Enicostemma littorale* leaf

Enicostemma littorale Stem

Secondary metabolites	Methanol extract	Petroleum ether extract	Acetone extract
Alkaloids	+	+	+
Tannins	+	-	+
Saponins	+	+	+
Flavonoids	-	-	-
Terpenoids	-	-	+
Phenol	-	-	-
Carbohydrates	-	-	-
Amino acid	-	-	-
Glycoside	-	-	-

Methanol extract of *Enicostemma littorale* stemPetroleum ether extract of *Enicostemma littorale* stemAcetone extract of *Enicostemma littorale* stem**Result and Discussion**

Phytochemical analysis of methanol extract of *Enicostemma littorale* Blume leaf shows positive test for saponins, phenol and negative test for all other secondary metabolites. Petroleum ether extract shows positive test for alkaloids, Saponins and negative test for tannin, flavonoids, terpenoids, phenol, carbohydrates, amino acid, and glycoside. Acetone extract shows positive test for saponins,

phenol and negative test for alkaloids tannin, flavonoids, terpenoids, carbohydrates, amino acids and glycoside.

Methanol extract of *Enicostemma littorale* Blume stem shows positive test for alkaloids, tannin, saponins, and negative test for flavonoids, terpenoids, phenol, carbohydrates, amino acid, glycoside. Petroleum ether extract shows positive test for alkaloids and saponins and negative test for tannin, flavonoids, terpenoids, phenol, carbohydrates, amino acid and glycoside. Acetone extract shows positive test for alkaloids, tannin, saponins and negative test for flavonoids, terpenoids, phenol, carbohydrates, amino acid and glycoside.

Conclusion

The result revealed the presence of medicinally important constituents in the wild plants studied. Many evidences gathered in earlier studies which confirmed the identified phytochemicals to be bioactive. Several studies confirmed the presence of these phytochemicals contribute medicinal as well as physiological properties to the plant studied in the treatment of different ailments. Therefore, extracts from *Enicostemma littorale* Blume plant could be seen as a good source for useful drugs. The traditional medicine practice is recommended strongly for these plant as well as it is suggested that further work should be carried out to isolate, purify, and characterize the active constituents responsible for the activity of these plant.

Also, additional work is encouraged to elucidate the possible mechanism of action of the extracts the *Enicostemma littorale* Blume this plant are source of secondary metabolites and the solvent choice is very important for extraction of phytochemical from plant. Wild plant is helpful for discovering and manufacturing of new drugs.

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