RESEARCH ARTICLE

Phytochemical screening of *E. chaetaria,* (Roem. & Schult.), Cyperaceae Bhandara District of Maharashtra

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ABSTRACT

*E. chaetaria, (Roem. &Schult.)*is less known plant species of *Eleocharis*, in India, even in Maharashtra? These plants are economically and biologically insignificant. But traditionallymore important, because some traditional people used such a plant in medicinal purposes. The present study investigate, the qualitative and quantitative phytochemical analysis of the major bioactive constituent in *E. chaetaria, (Roem. &Schult.)*.The plant where found to contain, Alkaloid, Tannin, Flavonoids, Saponin, Steroid, Terpene. The importance of the distribution of these chemical constituent discuss with respect to biologically most active form.

Key word: - E. chaetaria, *Eleocharis*, Phytochemical analysis.

INTRODUCTION

E. chaetaria, (Roem. & Schult.) is species of genus *Eleocharis*, family Cyperaceae, verified by Clark C. B. 04-1887 it is a combination to *E. retroflexa*.*E.chaetaria* are amphibious species fresh water usually C3and C4, carboxylation plant. Culms- sometime solitary, strongly compressed in cross section, Leaves- basal 2 per culm, Bract- absent rarely proximal scale of spikelet resembling short bract. Flower- bisexual, bristles straight or curved, Stamens- 1-3, Style- longer, 2-3 fid, base persistent. Exiccata- Betekar Bothali water margin of Lake, Mohadi Tehsil of Bhandara District Maharashtra, India.

MATERIALS AND METHODS

Collection and identification of plant materials:

The whole plant of *Eleocharisacutangulawhere* collected from uncultivated farmland located near wet environment of lake BapheraTumsar Tehsil. The plant sample identified by authors.

The voucher specimen where deposited. The plant samples were air dried and ground into uniform powder. The aqueous extract of sample prepared by soaking 100g of dried powder sample in 200 of distilled water for 12 h. The extract were filtered using whatman filter paper no. 42 (125m.m.)

Phytochemical Screening:

Chemical test were carried out on the aqueous extract using standard procedure to identify the constitute as described by Harborne (1992 ;1998),; Kokate(1994); Ablude (2001; 2007).

Fig.1. E.chaetaria, (Roem. &Schult.)

Alkaloid Determination:

0.5 to 0.6 g of the methanolic plant extract was mixed in 8 ml of 1% HCl warmed & filtered. 2 ml of the filtrate were treated separately with both reagent (Maeyer's & Drangendorff's reagent) after which it was observed whether the alkaloids were present or absent in the turbidity. Yellow or reddish brown precipitation formation represent Alkaloid present (Harborne 1992)

Carbohydrate Determination:

Fehling test- 5cm3 of mixture of equal volumes of Fehling A and B was added to 2cm3 of each extract in a test tube. The resultant mixture was boiled for 2 minute. A brick red precipitation of copper oxide was observed. (Ablude 2001)

Tannin and Phenol Determination:

Two drop of 5persent fecl3 was added to 1cm3 of extract. A blue dirty green precipitate was observed in each extract presence of tannin and phenol respectively (Ablude 2007).

Flavonoids Determination:

5 ml of dilute ammonia solution where added to a portion of the aqueous filtrate of plant rhizome extract followed by addition of conc. H_2SO_4. A yellow colour observed in extract indicated the presence of flavonoids. The yellow colouration disappeared on standing then add few drop of 1% aluminum solution of filtrate further yellow colour obtained indicating the presence of flavonoids. (Safowara 1993, Harborne 1993).

Gum and resin Determination:

About 10ml of the extract was slowly added to 25ml of absolute alcohol under constant stirring. Precipitation indicate the presence of Gum and Resins. (Harborne 1993)

Fixed oil and Fat determination:

A drop of concentrated extract was passed in between two filter paper and kept undisturbed. Oil stained on the paper indicate the presence of Oil and Fats. (Harborne 1993)

Saponin Determination:

About 1ml of the extract was dissolve in 20ml of water and shake in graduated cylinder for 15 minutes. Formation of 1cm layer of foam indicate the presence of saponin. (Kokate 1994)

Phytosterol Determination:

Two ml of acetic anhydride was added to 0.5g ethanolic extract of sample with 2 ml H_2SO_4. The colour changed from violet to blue or green in some sample indicating the presence. (Harborne 1993)

Terpenoids Determination:

Five ml of each extract was mixed in 2ml of chloroform and conc. H_2SO_4 (3ml) was carefully added to form a layer. A reddish brown colouration of the inter face was formed to show positive result for the presence of terpenoids. (Ablude 2001)

Glycosides Determination:

10cm3 of 50persent H2So4 was added to 1cm3 of each extract in a test tube. The mixture was heated in boiling water for 5 minute. 10cm3 of Fehling solution (5cm3 of each solution A and B) was added and boiled. A brick red precipitated indicating presence of Glycoside. (Ablude 2001)

Quantitative Phytochemical Analysis

By standard procedure applied for Alkaloids, Carbohydred, Tannin, Phenol, Flavonoids, Saponin, and Terpen.

Alkaloid

5 g. of the sample was weighed into 250 ml beaker and 200 ml of 10 % acetic acid in ethanol was added and covered and allowed to stand for 4 hour. This was filtered and the extract was concentrated on a water bath to one quarter of the original volume. Concentrated Ammonium hydroxide was added dropwise to the extract until the precipitation was completed. This whole solution allow to settle and the precipitated was collected and washed with dilute ammonium hydroxide and then filtered. The residue is the alkaloid which was dried and weighed. (Harborne 1993)

Carbohydrates

5g. of sample was weighed and added to 4.5ml of alcohol. The mixture was shaken for 10 minute and centrifuged to obtained precipitate. The precipitate was dissolve in 0.5ml of 0.1N H_2So_4. This reconstituted solution was transfer to glass stoppered tubes and then hydrolyse in a water bath at 100^{0c} for 1 hour and weighed. (Goel et.al.1985, kokate 1994).

Tannin

500mg of the sample in each case was taken in a plastic bottle and 50ml of distilled water was added. Then it was shaken in a mechanical shaker for 1hour and filtered in a 50ml volumetric flask made up to the mark. 5ml of the filtrate was pipetted out in to the test tube and mixed with 2ml of 0.1M. $FeCl_3$ in 0.1N. HCl and 0.001M. $K_4Fe\ (CN)_6$ (Potassium Ferrocyanide). The absorbance was measured at nm with in 10minute. (Van Burden and Robinson 1981, Ablude 2001).

Phenol

The fat free sample was boiled with 50ml of ether for extraction of phenolic component for 15minute. The extract pipetted out in 50ml conical flask to added 10ml distilled water and 2ml ammonium hydroxide solution and 5ml concentrated amyl alcohol were also added. The sample were made to mark and left to react for 30minute for colour development. This was measured at nm. (Harborne 1993)

Flavonoids

10g. of plant sample was extracted repeatedly with 100ml of 80% aqueous methanol at room temperature. The whole solution was filtered through Whatman filter paper No. 42 (125mm). The filtrate was later transferred into a crucible and evaporated into dryness over a water bath and weighed to a constant weight. (Bohm and kocipal, Abyazan 1994)

Saponin

20g. of each grounded sample was put into a conical flask and $100cm^3$of 20% aqueous ethanol was added. Then the flask was heated on a hot water bath for 4 hour with constant stirring at about 55^{0c}. The mixture was then filtered and the residue was again extracted with another 200ml 20% ethanol. The combined extract was reduced to 40ml on a hot water bath at about 90^{0c}. The concentrate was transferred into a 250ml separatary funnel, added 20ml diethyl ether in it followed by vigorous shaking. The aqueous layer was recovered while the ether layer was discarded. The purification process was repeated. 60ml of n-Butanol was added. The combined n-Butanol extract where washed twice with 10ml of 5% aqueous sodium chloride. The remaining solution was heated in a water bath. After evaporation the sample were dried in oven, weighed, and saponin content was calculated as percentage. (Obadoni and Ochuko, 2001; Abulude, 2001).

Terpene

100g. of plant powder were taken separately and soaked in alcoholic solution for 24 hours then filtrate. The filtrated extract treated with petroleum ether.

Then estimate the total extract for terpene (Kokate, 1994; Ferguson, 1996).

RESULTS AND DISCUSSION

The present study carried out on the plant samples revealed the presence of medicinally active constituent. The phytochemical character of the E. chaetaria plant investigated are summarized in table-1, Alkaloid, Corbohydrate, Tannin and Phenol, Flavonoids, Saponin, found present in all plant part. Except phytosterol present in Aerial part, but absent in underground part of rhizomes. Quantitative estimation of the percentage crude chemical constituent in E.chaetaria studied is summarized in table-2. Rich amount of Alkaloid, Corbohydrate, Flavonoids, Saponin, present up to one percentage to Tannin and Phenol.

Table 1 Preliminary phytochemical screening of *E.chaetaria (Roem&Schult),*Aerial and underground part of plant.

Sr. No.	Plant Part	Alk.	Cor.	Ta & Fe	Flv.	Gum & Resin	Fixed Oil & Fats	Sap.	Pste.	Terp.	Glyc.
1	Arial Stem	+	+	+	+	-	-	+	+	-	-
2	Inflorence Fruiting Body	+	+	+	+	-	+	+	+	-	-
3	Underground rhizome	+	-	+	+	-	-	+	-	-	-

+ sign present, - sing absent, Alk- Alkaloids, Cor- Corbohydrates, Ta & Fe- Tanin&Fenol, Flv- Flavonoids, Sap- Saponin, Pste- Phytosterol, Terp- Terpene, Glyc- Glycocide.

Table 2: Percentage of proximate chemical composition of *E.chaetaria* (Roem & Schult).

Sr. No.	Plant Part	Alk.	Cor.	Flv.	Sap.	Ta.	Fe.	Terp.
1	Arial Stem	0.10	0.82	0.86	1.08	0.02	0.04	-
2	Inflorence Fruiting Body	0.49	0.07	0.59	2.09	0.16	0.09	-
3	Underground rhizome	0.31	-	0.86	0.71	0.05	1.00	-

The phytochemical analysis of quantitative estimation of percentage yield of crud chemical constituent studied show that the Aerial and Underground plant part rich in Alkaloids, Carbohydrates, Flavonoids, Saponin. They were known to show medicinal activity as well as exhibiting physiological activity. They are also widely employed as livestock and poultry feed, steroidal compound are of importance and interest in pharmacy due to their relationship with such a compound as sex hormones. Plant show the some activity of useful drugs. As claimed by traditional healers. Because of bioactive compound found in E.chaetaria plant.

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