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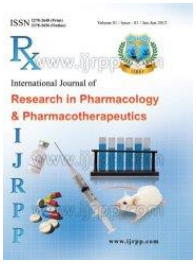

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Phytochemical screening of Desmostachya bipinnata, Canthium dicoccum Sebestiania chaemelea

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ABSTRACT

Plants contain various phytochemical constituents i.e. primary and secondary metabolites. Various secondary metabolites have proved their therapeutic activities due to their medicinal properties. So phytochemical screening of active principles present in medicinal plants is primary and valuable step of drug discovery. In present study 3 medicinal plants selected of different families were selected for screening of bioactive principles. Screening of 3 selected medicinal plants was performed to identify the presence of tannins, terpenoids, flavonoids, saponins, and steroids etc using standard methods. All the selected medicinal plants were found to contain alkaloids, glycosides, flavonoids, tannins. Triterpenoids present in *Sebestiania chaemelea* but absent in *Desmostachya bipinnata, Canthium dicoccum.* Saponins present in *Desmostachya bipinnata, Canthium dicoccum* but absent in *Sebestiania chaemelea.* Whereas proteins, steroids were absent in all the selected three plants. It is evident from study that all the three medicinal plants have similar efficacy due to presence of similar phytochemical constituents present in all three medicinal plants.

Keywords: Medicinal plants, Preliminary, Screening, Phytochemical.

INTRODUCTION

Medicinal plants which act as therapeutic agents are also a good source of information for a wide variety of phytochemical constituents which can be developed as drugs with precise and good selectivity. These are the bank of potentially useful active constituents which could serve as novel leads and clues for newer drug design [1]. The most important of these bioactive constituents of plants are alkaloids, tannins, flavonoids and saponin compounds [2]. Correlation between the phytoconstituents and the therapeutic activity of plant is desirable to know for the synthesis of compounds with particular activities to treat different health ailments and chronic diseases as well [3]. Owing to the significance in the above context, such preliminary phytochemical screening of plants is the need of the hour in order to identify newer therapeutic agents with improved efficacy. Number of studies has also reported around the world [4-8]. Thus, the present study handles with the phytochemical screening based on screening tests of three medicinal plants viz., *Desmostachya bipinnata, Canthium dicoccum, Sebestiania chaemelea* for discover their chemical constituents. All these plants possess different bioactivities which were later

correlated with the presence of similar specific phytoconstituents.

MATERIALS AND METHODS

Plant Material Collection

Aerial parts of *Desmostachya bipinnta* were collected from Tirupati. The plant authentication was done The plants *Desmostachya bipinnata, Canthium dicoccum and Sebastiania chamaelea* powder were collected from Guntur, authenticated by Botanist Dr D.Daniel Gnana Sagar at Andhra Christian College. Aerial parts of *Desmostachya bipinnta* were dried at room temperature for 2-3 days. The dried aerial parts of *Desmostachya bipinnta* powdered in a mixture. The extraction was done by using the process of soxhlet extraction. 250 grams of fine powder was suspended in 400 mL methanol for 48 hours at 65 degrees of temperature soxhlet extractor. After 48 hours the extract was taken and residue was dried [15].

Preliminary Phytochemical Screening

Screening of the above six selected medicinal plants for various phytochemical constituents were carried out using standard methods [9-11].

RESULTS

PRELIMINARY PHYTOCHEMICAL SCREENING

TEST FOR CARBOHYDRATES

Molisch's test

To 2-3ml of extract few drops of alpha-napthol solution in alcohol was added. To this concentrated sulphuric acid was added from the test-tube. Violet ring at the junction of two liquids, shows the presence of carbohydrates in all the extracts.

Fehling's test

1ml of Fehling's A and Fehling's B solution was added and heated on water bath for one minute. To this equivalent volume of test solution was added and heated on boiling water bath for 5-10 minutes, a yellow, then brick red precipitate was formed which confirms the presence of carbohydrates in *Desmostachya bipinnata, Sebestiania chaemelea* except *Canthium dicoccum*.

Benedict's test

Equal volume of Benedict's regent and extract was mixed in a test tube and heated in boiling water for 5 min. Solution may appeared green yellow or red confirms the presence of carbohydrates in all the 3 extracts.

TEST FOR ALKALOIDS

Dragendroff's test

To 2-3ml of extract, very few drops of Dragendroff's reagent was added. Orange brown precipitate formed, confirms the presence of alkaloids in all the 3 extracts .

Mayer's test

To 1ml of extract few drops of Mayer's reagent was added. Precipitate formed, confirm the presence of alkaloids in all the 3 extracts.

Hager's test

To 1ml of extract Hager's reagent was added. Yellow precipitate formed, confirms the presence of alkaloids in all the 3 extracts.

Wagner's test

To 1ml of extract few drops of Wagner's regent was added. Reddish brown precipitate is formed, confirms the presence of alkaloids in all the 3 extracts.

TEST FOR FLAVONOIDS

Shinoda test

To 1-2ml of extract few magnesium turnings was added to this concentrated hydrochloric acid was added drop wise. Pink scarlet, crimson red or occasionally green blue color appears after few minutes indicate the presence of flavonoids in all the 3 extracts.

TEST FOR GLYCOSIDES

Borntrager's test

3ml of extract was boiled with 1ml of sulphuric acid in a test tube for 5 min, it was filtered while hot. The filtrate was cooled and shaken with similar volume of chloroform. Bottom chloroform layer was separated and shaken with half of its volume of dilute ammonia. A rose pink to red color produced in

ammonical layer, indicates the presence of anthraquinone glycosides in all the 3 extracts .

Baljet's test

Extract was treated with picric acid. Orange color formed indicates the presence of cardiac glycosides in all the 3 extracts.

Keller-Kilani test

To 2ml of extract, glacial acetic acid, 1 drop of 5%ferric chloride and concentrated sulphuric acid was added. Reddish brown color develops at the junction of two liquid layers appears bluish green confirms the presence of cardiac glycosides in all the 3 extracts.

Picric acid test

Filter paper strip was first soaked in 10%picric acid and then in 10% of sodium carbonate and dried. In a conical flask moistened powdered extract was placed and cooked. The above filter paper strip was placed in the slit in the cork and gently warmed at 37ºC.The filter paper turns red or maroon which indicates the presence of cynogenetic glycosides in all the 3 extracts.

TEST FOR SAPONINS

Froth formation tests

2ml of extract was transferred in a test tube containing water and shaken well. Stable froth (form) formed, indicates the saponins in 2 extracts except *Sebestiania chaemelea*.

TEST FOR TANNINS

Ferric chloride test

To 2ml of extract ferric chloride solution was added. Blue color appears for the presence of tannins all the 3 extracts.

Bromine water test

2ml of extract was treated with bromine water, discoloration of bromine water occurs which indicated the ance of tannins all the 3 extracts.

TEST FOR STEROIDS AND TRITERPENOIDS

Liebermann-Burckhardt test

2-3 ml of extract was treated with acetic anhydride, boiled and cooled. Then concentrated sulphuric acid was added from the sides of the test-tube, brown color ring was formed at the junction of two layer turns green which indicates the presence of steroids and formation of deep red color shows the absence of triterpenoids all the 3 extracts.

Salkowski test

2-3 ml of extract was treated with few drops of concentrated sulphuric acid, red colour at lower layer indicate the presence of steroids and formation of yellow color indicates the absence of triterpenoids all the 3 extracts.

Sulfur test

To 2ml of extract sulfur powder was added, it sinks to the bottom, which indicates the absence of steroids all the 3 extracts.

Presence of various Phytochemical constituents represented in table 1

S.NO.	TEST	*Desmostachya bipinnata*	*Canthium dicoccum*	*Sebestiania chaemelea*
1.	**ALKALOIDAL TEST**			
	a.Dragondroffs test	Positive	Positive	Positive
	b.Mayer's test	Positive	Positive	Positive
	c.Wagner's test	Positive	Positive	Positive
	d. Hager's test	Positive	Positive	Positive
2.	**CARBOHYDRATES TEST**			
	a.Molish's test	Positive	Positive	Positive
	b.Fehling's test	Positive	Negative	Positive
	c.Benedict's test	Positive	Positive	Positive
	d. Baeford's test	Positive	Positive	Positive

3.	**STEROIDS TEST**			
	a.LibermannBuchard test	Negative	Negative	Negative
	b. Salwoski test	Negative	Negative	Negative
4.	**GLYCOSIDES TEST**			
	a.Legal test	Positive	Positive	Positive
	b.Baljet test	Positive	Positive	Positive
	c.Killerkilaini test	Positive	Positive	Positive
	d. Borntagers test	Positive	Positive	Positive
5.	**SAPONINS TEST**			
	a.Foam test	Positive	Positive	Negative
6.	**FLAVONOIDS TEST**			
	a.Shinoda test	Positive	Positive	Positive
7.	**TRITERPINOIDAL TEST**	Negative	Negative	Positive
8.	**TANNINS TEST**			
	a.Ferric chloride test	Positive	Positive	Positive
	b.Gelatin test	Positive	Positive	Positive
	c.Lead acetate test	Positive	Positive	Positive
9.	**PROTIEN& AMINOACIDS TEST**			
	a.Buret's test	Negative	Negative	Negative
	b.Ninhydrin test	Negative	Negative	Negative
	c.Xanthoprotic test	Negative	Negative	Negative

DISCUSSION

The secondary metabolites contribute effectively towards the therapeutic activities of medicinal plants such as hypoglycemic, antidiabetic, antioxidant, antimicrobial, antiinflammatory, anticarcinogenic, antimalarial, anticholinergic, antileprosy, antiobesity activities etc. [12]. All the 3 chosen medicinal plants for screening were found to contain tannins. Tannins have amazing excellent properties. They are known to improve the healing of wounds and inflamed mucous membranes. Flavonoids are also present in all 3 selected medicinal plants as a effective water-soluble antioxidant and free radical scavenger, which prevent oxidative cell damage and also have strong anticancer activity [13-14]. It also helps in managing diabetes induced oxidative stress and obesity. Numerous studies have confirmed that saponins possess the unique property of precipitating and coagulating red blood cells [15-16] Interestingly, saponins present in 2 extracts except *Sebestiania chaemelea* are proved the beneficiary effect in diabetes treatment. Plants containing carbohydrates, glycosides and coumarins are known to exert a beneficial action on immune system by increasing body strength and hence are valuable as dietary supplements. Coumarins can be suggested to be beneficial for hyperproliferative skin diseases on the basis of their antimicrobial and antiinflammatory effects [17]. Glycosides also have vast therapeutic efficacy as they are found in almost every medicinal plant. Moreover, alkaloids represent a class which affects the central nervous system, reduces appetite and behaves as diuretic [18]. Thus, from the present investigation medicinal properties of the selected 3 plants can be identified based on the phytoconstituents present in them.

CONCLUSION

Screening of 3 selected medicinal plants clearly reveals that the maximum classes of phytoconstituents are present in all three selected plant extracts. Hence, the above plant extracts could be explored for its highest therapeutic efficacy by pharmaceutical companies in order to develop safe

drugs for various ailments. Since these plants have been used in the treatment of different ailments, the medicinal roles of these plants could be related to such identified bioactive compounds. The quantitative analyses of these phytocompounds will be an interesting area for further study. Efforts should be geared up to exploit the biomedical applications of these screened plants due to the presence of certain class of phytocompounds for their full utilization.

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