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Phytochemical analysis on *Caryota urens* (fishtail palm) fruit from VIT university campus for pharmaceutical use

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ABSTRACT

Caryota urens is a species which is known as flowering plant. *Caryota urens* is belonging to the palm family mainly from Singapore, Eastern Burma and some other places in India also. It grows mainly in open fields of hot areas and some rainforest areas also. The *Caryota urens* are commonly called toddy palm and wine palm because it is used to prepare wine. And is also known as jaggery palm which is named because of the use of preparation of jaggery. The distribution of the main active principles in the ethyl acetate extracts of *Caryota urens* dry fruits were screened by using various different solvents system. The phytochemical property of *Caryota urens* species shows the presence of carbohydrate, alkaloids, flavanoids and phenols, organic and inorganic nature. The main scope is to study the qualitative analysis of *Caryota urens* dry fruits for pharmacological benefits.

Keywords: Phytochemical screening, *Caryota urens* plant extracts.

INTRODUCTION

Trees are the gift of nature. Trees are the heaven in this world. The increasing new inventions increase new diseases. So the mankind should learn the disease and drugs for cure. Palms are the most beneficial plants to people in the Tropics. The botanical name Fishtail palm is *Caryota urens* which name gets because of the present of stinging chemicals known as 'Urens' in the fruit. The *Caryota urens* is a member of the family Arecaceae. These are mostly grown in the country of Asia. These species are grows from the India to Burma especially Myanmar and some islands like Sri Lanka country [1, 14]. In Ayurveda recommends the use of *Caryota urens* for seminal weakness and urinary disorders, the juice is applied on the forehead for hemicranias. In traditional medicine porridge prepared from *Caryota urens* flower is used to treat gastric ulcer, migraine headaches, snake bite poisoning, as well as rheumatic swellings. The fruits contain calcium oxalate crystals which is a skin and membrane irritant which is not edible. *Caryota urens* species are known as Sugar palm also, which is used in ancient medicine to treat hemicranias and rheumatic swelling. Ancient medicine technologies recommend these flowers of the trees are used as a home remedy and improve the hair growth. The roots of the trees are used as the tooth ailments. The sap of fishtail palm is sweet in nature. So it is used to produce sugar which is known as jaggery [2, 3, 13, 15, 16]. So the collected information prompted us to take up phytochemical studies on the dry fruits of the *Caryota urens* plant situated in our VIT Campus.

MATERIALS AND METHODS

Place of the Plant Collection

The dry fruits from the *Caryota urens* species are collected, from the VIT University, Vellore Tamilnadu during summer season .

COLLECTION OF PLANT MATERIAL AND PREPARATION OF EXTRACTS

The collected plant material was shaded dried, coarsely powdered separately for extraction. Each of the dried and powdered samples was extracted with various solvents (Toluene, Hexane, Ethyl acetate and Petroleum ether) for 96 hours. The extracts were concentrated using water bath set at 60°C. After that the respective extracts were weighed and percentage extractive values were determined [12, 17, 21].

PHYTOCHEMICAL SCREENING

The phytochemical tests were carried out for the above mentioned plant extracts using the standard procedures to identify the components. The various chemical tests show the presence of various phytoconstituents like alkaloids, flavonoids, carbohydrates, organic and inorganic acids [4, 18].

TESTS FOR FLAVANOIDS

Test for alkaline reagent:

To the extract of *Caryota urens* test solution, and add few drops of sodium hydroxide(NaOH) solution, after that the formation of intense yellow colors turns to colorless because of the addition of some drops of dilute acetic acid which indicate the flavonoids present in our test solution [11, 19].

Ferric Chloride Test:

Add few drops of ferric chloride solution with the extracted *Caryota urens* solution. Then the green color was formed by the addition of Fe Cl₃.

PHENOLIC COMPOUNDS TEST:

Ferric Chloride Test:

To the *Caryota urens* test solution and add some drops of 5% ferric chloride (FeCl₃) solution. The dark green color will appear which indicates the phenol compounds are present in our solution [5,10, 20].

Lead Acetate Test:

To the *Caryota urens* test solution and few drops of 10% lead acetate solution was added. White Precipitate indicates the phenolic compounds present in our solution.

Gelatin Test:

To the sample extract solution and add some drops of 5% Gelatin solution. White Precipitate indicates the phenolic compounds present in our solution.

AMINO ACID TEST:

Test for Ninhydrin:

1ml of sample solution and add with ninhydrin reagent. Purple color was appears which indicates the presence of amino acids.

ANALYSE FOR PROTEIN AND CARBOHYDRATES:

Biuret test:

To the test sample and add 6% NaOH solution and violet colour appears when small drops of 1%CuSO₄ solution was added, which indicates the presence of protein [8,9].

Molisch's Test:

To the extract solution, and add few drops of alcoholic α -naphthol. And 1 ml of concentrated sulphuric acid was added slowly through the sides of the tube, purple color which turns to violet color ring was appears at the Junction of the solution [6, 7, 18].

TEST FOR ORGANIC ACIDS**Oxalic Acid:**

To the test solution and few drops of 1% KMnO₄ and dilute H₂SO₄, color disappears.

Malic Acid:

To the test solution added 2-3 drops of 40% FeCl₃ solution, appears yellowish colour.

TEST FOR INORGANIC ACIDS**Sulphate Test:**

To the test solution and add lead acetate reagent, white precipitate appears which is soluble in NaOH.

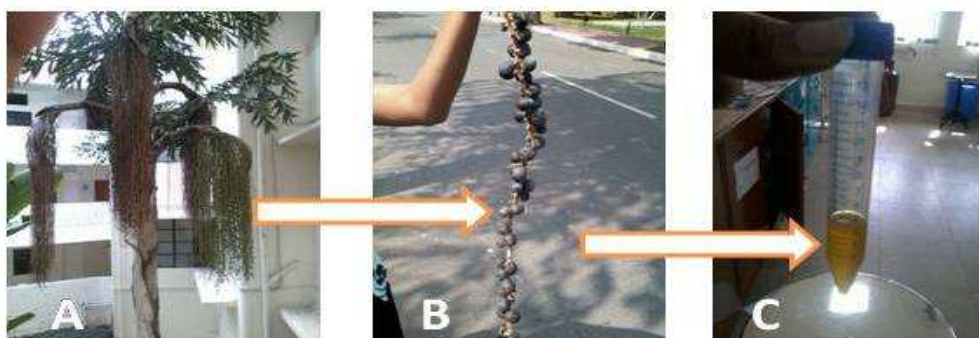
Carbonate Test:

To the test solution and add dilute HCl solution, liberate CO₂ gas. Indicate the presence carbonate.

RESULTS AND DISCUSSION**Table 1: Phytochemical screening of *Caryota urens***

S. No	Name of Test	Procedure	Observation	Solvents			
				Toluene	Hexane	Ethyl acetate	Petroleum ether
1.	FLAVONOIDS TEST	With the Test solution +Few drops of NaOH solution Test solution +Few drops of FeCl ₃ solution	Yellow color Green color	+ve	+ve	+ve	+ve
	i. Alkaline reagent test for flavonoids ii. Ferric chloride test			+ve	+ve	+ve	+ve
2.	PHENOLIC COMPOUNDS	Test solution +Few drops of neutral 5% FeCl ₃ Test solution+10% few drops of lead acetate solution Test solution+10% few drops of gelatin	Green colour White precipitate White precipitate	+ve	+ve	+ve	+ve
	i. Ferric chloride test			+ve	+ve	-ve	+ve
	ii. Lead acetate test ii. Gelatin test			+ve	+ve	+ve	+ve
3.	AMINO ACID Ninhydrin test	Test solution +few drops of 5% ninhydrin	Violet color	-ve	-ve	-ve	-ve
4.	PROTEIN TEST Biuret test	Test solution+4% NaOH +few drops of 1% CuSO ₄	Violet color	-ve	-ve	-ve	-ve
5.	CARBOHYDRATE TEST Molisch's test	Test solution +few drops of alcoholic α naphthol +0.2 ml con.H ₂ SO ₄	Purple to violet color rings appear	+ve	+ve	+ve	+ve
6.	ORGANIC TEST	Test solution +few drops of 1% KmNO ₄ +dis.H ₂ SO ₄ Test solution+2 to 3 drops of 40% FeCl ₃ solution	Purple color disappears Yellowish color	+ve	+ve	+ve	+ve
	i. Oxalic acid ii. Malic acid			-ve	+ve	+ve	+ve
7.	INORGANIC ACID	Test solution +lead acetate reagent Test solution+ diluted HCl	White precipitate appears which is soluble in NaOH Liberate CO ₂ gas	+ve	+ve	+ve	+ve
	i. Sulphate test ii. Carbonate test			-ve	-ve	-ve	-ve

(NOTE: +ve- Positive,-ve- Negative)

**Figure:-1**

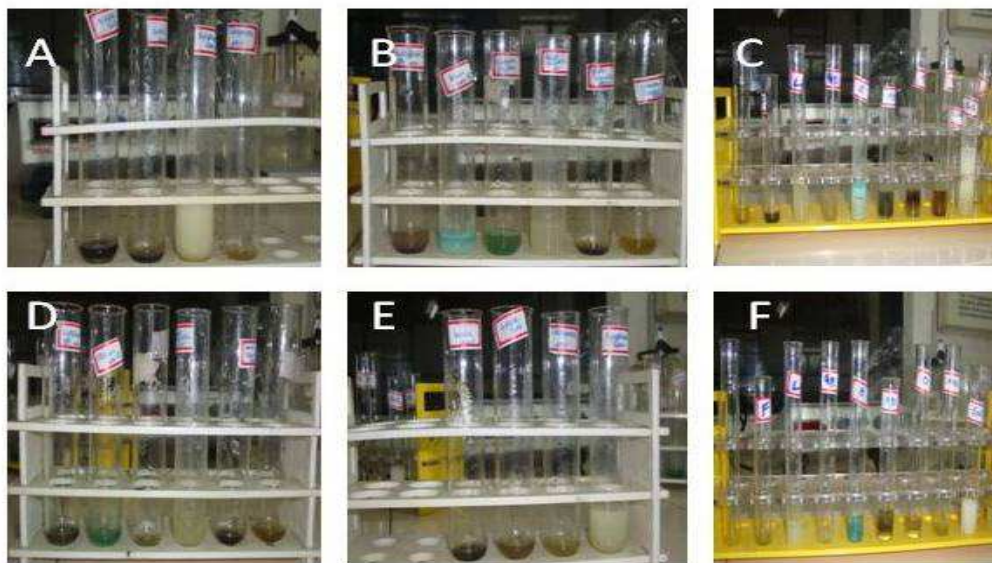


Figure:-2

(NOTE: Fig. 1: A-Fishtail palm tree, B-Dry fruits, C-Extracted solution Fig 2: A, B-Toluene extract, C-Petroleum ether extract, D, E-Ethyl acetate extract, F-Hexane extract)

CONCLUSION

From the phytochemical properties of the *Caryota urens* fruits, alkaloid, flavonoid, carbohydrate, organic and inorganic compounds are present. The presence of oxalic acid proved the *Caryota urens* fruit contain crystal structure organic compound known as calcium oxalate crystals which are a skin and membrane irritant and not edible. Protein and amino acid are absent. This research can be useful for further studies and development of *Caryota urens* plant for pharmacological use.

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