IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

PHARMACOGNOSTIC EVALUATION AND PHYTOCHEMICAL SCREENING OF *ANTHOCEPHALUS CADAMBA* AND *HIBISCUS ROSA* FOR ANTIDIABETIC ACTIVITY

1Shoket Ali, 2Mahendra Singh Rathore, 3Ankita Sharma, 4Lakhan Lakhujani

1Research Scholar, 2Principal

1Geetanjali University ,

2Geetanjali Institute of Pharmacy, Geetanjali University

3Research Scholar, Maharaja Agrasen University, Baddi

4Assistant Professor, Maulana Azad University, Jodhpur

Abstract

The present-day prevalence of diabetes has become a significant global concern, impacting metabolism and insulin secretion. Diabetes mellitus poses health and socioeconomic challenges worldwide, affecting 25% to 33% of populations. Both genetic and environmental factors contribute to diabetes. This study aims to evaluate the phytochemical, physiochemical, and pharmacognostical characteristics of the leaves of *Hibiscus rosa and Anthocephalus cadamba*. The leaves of *Hibiscus rosa and Anthocephalus cadamba* are caustic and bitter, with an odourless taste, according to pharmacognostical investigations. The leaves can range in colour from green to pale yellow. Physiochemical study reveals varying extractive values in various solvents, with ethanol exhibiting the highest extractive value. Saponins, alkaloids, tannins, and phenolics have been detected in the leaf powder of *Hibiscus rosa and Anthocephalus cadamba*, according to phytochemical study. The study's botanical, physical, and chemical criteria can be utilised to determine the drug's identity and purity, which will determine the herb's safety and effectiveness.

Keywords: Diabetes, *Anthocephalus cadamba*, *Hibiscus rosa,* Physiochemical and Phytochemical analysis

1. INTRODUCTION

In the contemporary era, diabetes has emerged as a significant global health challenge, impacting metabolic processes and influencing insulin function and secretion. Diabetes mellitus poses health and socioeconomic challenges worldwide, affecting populations ranging from 25% to 33%. Both hereditary and environmental factors contribute to the development of diabetes, underscoring the multifactorial nature of this widespread health issue.[1,2] In the initial phases of diabetes, insulin production is deficient, disrupting the metabolism of sugar and impeding its regulation in the bloodstream. This deficiency may trigger the breakdown of fat, protein, and glycogen, leading to elevated blood sugar levels and the production of ketones by the liver. There is substantial evidence linking disturbances in macromolecule metabolism with chronic hyperglycemia, impairing insulin secretion and function.[3,4] Long-term consequences of diabetes may include damage to the heart, eyes, and nerves, potentially leading to death or disability. Hyperglycemia, a hallmark of diabetes, is associated with the progression and treatment outcomes of various conditions. Additionally, diabetes symptoms may manifest as increased thirst, weight loss, and polyuria.[5,6]

Anthocephalus cadamba, locally known as Kadamb, is used for medicinal purposes, addressing various health issues such as microbiological infections, diabetes mellitus, fever, inflammation, diarrhea, cough, vomiting, ulcers, and debility. The plant contains diverse chemical compounds, including flavonoids, tannins, phenolic compounds, triterpenoid glycosides, alkaloids, and saponins, contributing to its therapeutic properties.[7,8]

Hibiscus Rosa (Malvaceae) is a widely used medicinal plant found in tropical and subtropical regions worldwide. Various parts of Hibiscus Rosa Sinensis Linn are utilized for their therapeutic properties, including anti-tumor, antifertility, anti-ovulatory, anti-implantation, anti-inflammatory, analgesic, antiestrogenic, antipyretic, antispasmodic, antiviral, antifungal, antibacterial, hypoglycemic, spasmolytic, CNS depressant, hypertensive, and juvenoid activities.[9,10]

2. MATERIAL AND METHODS

2.1 Plant material

The leaves of *Anthocephalus Cadamba* and *Hibiscus rosa* were gathered from local farmers in various regions. Before extraction, plant materials were shade-dried and coarsely pulverized.

2.2 Extractive value of *Anthocephalus Cadamba and Hibiscus rosa*

2.2.1 Petroleum ether extract

In a flask, a 10g sample of *Anthocephalus Cadamba* and *Hibiscus rosa* leaf powder was macerated with 100ml of petroleum ether for 18 hours while being stirred frequently. After rapid filtration, 25ml of the filtrate was dried in a 105°C water bath and placed in a china pan. Residue measurements were compared to the initial powder sample, allowing calculation of the percentage of extractive soluble in petroleum ether.

2.2.2 Extract from Chloroform of *Anthocephalus Cadamba and Hibiscus rosa*: -

A 10g sample of *Anthocephalus Cadamba* and *Hibiscus rosa* leaf Powder and 100ml of chloroform were macerated together in a sealed glass container for six hours, left to stand overnight with occasional shaking, and then filtered the following morning. 25ml of filtrate was evaporated at 105°C in a water bath and placed on a china dish.

2.2.3 Water extract of *Anthocephalus Cadamba* and *Hibiscus rosa*: -

In a glass jar with a glass stopper, 100ml of distilled water was added to a 10g sample of *Anthocephalus Cadamba and Hibiscus rosa* leaf powder and macerated for six hours. The mixture was continuously shaken for 18 hours and then filtered. The resultant solution was evaporated to dryness, yielding 25ml of filtrate. By comparing the weight of the residue to the initial powder sample, the proportion of extractive content that is water soluble was calculated.

2.2.4 Ethanolic extract of *Anthocephalus Cadamba and Hibiscus rosa*: -

In a glass jar with a glass stopper, 100ml of ethanol was macerated with a 10gm of sample of *Anthocephalus Cadamba* and *Hibiscus rosa* leaf powder for six hours. After 18 hours of intermittent shaking and settling, the sample was rapidly filtered. A 25ml sample of the final filtrate was dried in a 105°C water bath and put in a china dish.

2.3 PHYTOCHEMICAL CHEMICAL TEST

The ethanol crude extract of *Anthocephalus Cadamba and Hibiscus rosa* leaves were screened for the presence of secondary metabolites that may have correlations with the antiulcer activity of the extract. The extracts were examined for the following phytochemicals; flavonoids, glycosides, alkaloids, tannins, and saponins using appropriate reagents.

2.4 Physiochemical Character

2.4.1 Determination of Ash value:

2.4.1.1 Total Ash value:

Place about 2-4g of the ground air-dried material, accurately weighed, in a previously ignited and tared crucible (usually of platinum or silica). Spread the material in an even layer and ignite it by gradually increasing the heat to 500- 600°C until it is white, indicating the absence of carbon. Cool in a desiccator and weigh. If carbon-free ash cannot be obtained in this manner, cool the crucible and moisten the residue with about 2 ml of water or a saturated solution of ammonium nitrate R. Dry on a water-bath, then on a hot-plate and ignite to constant weight. Allow the residue to cool in a suitable desiccator for 30 minutes, then weigh without delay. Calculate the content of total ash in mg per g of air-dried material.

2.4.1.2 Determination of water-soluble ash value

25 ml water added to cauldron containing all out fiery remains and bubbled for 5 minutes. The immiscible matter was assembled on Whatman channel paper and washed in boiling water. For 6 hours at 500-600 degree Celsius, channel paper was exchanged for a unique pot and lighted

cauldron. The heaviness of this deposit was subtracted from the heaviness of aggregate fiery remains which water-dissolvable powder tranquilizes. Water solvent fiery remains (%) figured utilizing the equation given below.

Water soluble ash (%) = **Weight of water soluble ash** / **Weight of drug** × **100**

2.4.1.3 Determination acid insoluble ash value

For 5 minutes, total slag is overflowed with 25 ml of weak Hydrochloric corrosive. On Whatman channel paper, the unsolvable problem gathered. It was cleaned in hot water until the unbiased filtrate and crease were removed. Put Whatman paper in the pot and light for 6 hours at 500-600 degree Celsius. The suppress heater turned off and permitted to cool. Cauldron is evacuated, cooled in desiccator and deposit weighed. Corrosive insoluble fiery debris in rate was ascertained from the accompanying equation below.

Acid insoluble ash (%) = **weight of acid insoluble ash /weight of drug** × **100**

2.4.2 Determination of Extractive value:

2.4.2.1 Determination of alcohol soluble extractive value:

The maceration of powdered leaf material was carried out with 30ml methanol in a closed conical flask for 24 h. The solution thus, obtained was filtered through filter paper and filtrate was evaporated to dryness. The residue was dried at 105 ºC, weighed and extractive value was determined with respect to air dried sample.

2.4.2.2 Determination of Water-soluble extractive value:

The leaf powder sample was macerated with 50ml distilled water in a closed conical flask for 24 h. After maceration, the filtrate was allowed to dry on a water bath and then at 105ºC to obtain a constant weight. The percentage of water-soluble extractive value was determined with reference to air dried leaf material.

2.4.2.3 Determination of Moisture content:

About 1.50 gm. of powdered drug was weighed accurately in a tared porcelain dish, which was previously dried at 105^0C in hot air oven to constant weight and then weighed. From the difference in weight, the percentage loss of drying with reference to the air-dried substance was calculated and recorded.

% Moisture content = Total moisture content / Total wt. of powder X 100

3. RESULTS

3.1 Percentage Yield of Extracts (%w/w)

3.1.1 ***Anthocephalus Cadamba***

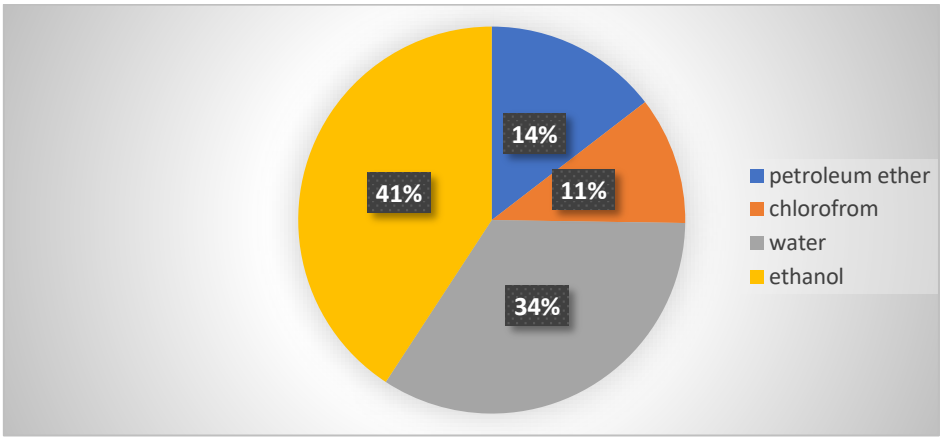

Figure 1. AC Extract with % Efficiency

3.2 *Hibiscus rosa*

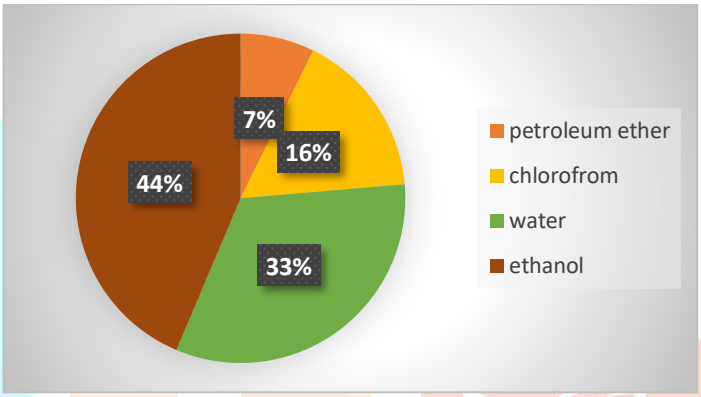

Figure 2. HR Extract with % Efficiency

3.3 Phytochemical study

3.3.1 *Anthocephalus Cadamba*

S. No.	Chemical constituents	AC			
		Petroleum Ether	Chloroform	Water	Ethanol
1	Fixed oils& fats	+	-	-	-
2	Alkaloid	-	+	-	+
3	Carbohydrate	-	-	+	+
4	Glycoside	-	-	-	+
5	Tannins and phenolic	+	-	+	+
6	Flavonoid	+	-	+	+
7	Saponin	-	+	+	+
8	Steroid	+	+	-	+

Table 1. Qualitative Assessment of AC

3.3.2 *Hibiscus rosa*

S. No.	Chemical constituents	HR			
		Petroleum Ether	Chloroform	Water	Ethanol
1	Fixed oils& fats	-	-	-	+
2	Alkaloid	+	-	-	+
3	Carbohydrate	+	+	+	+

4	Glycoside	-	+	-	-
5	Tannins and phenolic	-	+	-	+
6	Flavonoid	-	+	+	+
7	Saponin	+	+	+	+
8	Steroid	-	-	+	+

Table 2. Qualitative Assessment of HR

3.4 Physicochemical parameter

3.4.1 *Anthocephalus Cadamba*

S. No.	Physico-chemical Parameter	Result
1.	Total Ash	8.20±0.17
2.	Water soluble ash	1.25 ± 0.08
3.	Acid-insoluble ash	2.25 ± 0.06
4.	Moisture Content	9.67%
5.	Alcohol Soluble Extractive Value	19.37%
6.	Water Soluble Extractive Value	1.25 ± 0.08

Table 3. Physicochemical parameter of AC

3.4.2 *Hibiscus rosa*

S. No.	Physico-chemical Parameter	Result
1.	Total Ash	8.33±0.015
2.	Water soluble ash	2.90±0.05
3.	Acid-insoluble ash	1.25±0.11
4.	Moisture Content	10%
5.	Alcohol Soluble Extractive Value	16%
6.	Water Soluble Extractive Value	9%

Table 4. Physicochemical parameter of HR

4. CONCLUSION

The extractive value of *Hibiscus rosa* and *Anthocephalus Cadamba* show that ethanol extract has higher efficacy. So, ethanol extract is use for further study. In the present study, leafs of *Hibiscus rosa* and *Anthocephalus Cadamba*. The various extracts shown the presence of following active principles. Distilled water extract: Steroids, Glycosides, Alkaloids, Tannins, Phenolic compounds, Flavonoids. The observations made in the present study have clearly showed the bioactive potential of the plant *Hibiscus rosa* and

Anthocephalus Cadamba. From the ongoing studies, it can be concluded that the above extraction value extraction and phytochemical study together may be used as a tool for identification of *Hibiscus rosa* and *Anthocephalus Cadamba.*

5. REFERENCES

1. Alka Sawarker, C.R Jangde, P.D Thakre, Ranu Kadoo and Shushma Shelu, (Analgesic activity of *Hibiscus rosasinenesis* Linn in rats) Veterinary world, 2009; 2(9): 353-354.
2. Narika Shmizu, Masashi Tomoda, Izumi Suzuki and Katsutoshi Takada (Plant Mucilage XLIII. A representative Mucilage with biological activity from the leaves of *Hibiscus rosa sinensis*.) Boi pharm Bull, 1993; 16(8): 735-739.
3. Sikarwar Mukesh S and Patil M.B. (antihyperlipidemic effect of ethanolic extract of *Hibiscus rosa sinensis* flower in hyperlipidemic rats) RGUHS journal of pharmaceutical sciences, 2011; 1(2).
4. Neeru Vasudeva and S.K Sharma (post-coital antifertitbty activity of *Hibiscus rosa sinensis* Linn roots) Advance access publication, 2008; 5(1): 91-94.
5. Borhan Uddin, Tareq Hossan, Sudip Paul, Tanjia Ahmad, Taslim Nahar and Sohel Ahmad, (Antibacterial activity of the ethanol extracts of *Hibiscus rosa sinensis* leaves and flowers against clinical isolates of bacteria) Bangladesh journal of life science, 2010; 22(2): 65-73.
6. N. Adhirajan, T. Ravi Kumar, N. Shanmugasundaram, Mary Babu, (In vivo and in vitro evaluation of hair growth potential of *Hibiscus rosa sinensis* Linn) Journal of ethanopharmacology,
2003; 88: 235-239.
7. Jiradej Manosroi, Pongsathorn Dhumtanom Aranya Manosroi, (Anti-proliferative activity of essential oil extracted from Thai medicinal plants on KB and P388 cell lines) Cancer Letter, 2006; 235: 114-120.
8. Mehran Moradalizadeh, Naghmeh Samadi, Mansooreh Khodashenas, (Comparison of hydro Extraction and microwave assisted hydro Extraction methods in analysis of the essential oils) International journal of Biosciences, 2014; 4(6): 59-66.
9. Mahaveer Dhobi, Vivekananda Mandal and Siva Hemalatha, (Optimization of microwave assisted extraction of bioactive flavonolignan-silybinin) Journal of chemical metrology, 2009; 3:1, 13-23.
10. Tianviu Wu, Kefeng Wu, Tongwu Zhou Long Bao, Jiayuan Huang and Wende Li, "Microwave assisted extraction and effect of *Radix Rehmanniae* preparata osteoblast in vitro" Journal of chemical and pharmaceutical research, 2014; 6(7): 1216-1221.