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FORMULATION AND ANTIHYPERLIPIDEMIC ACTIVITY OF HIBISCUS ROSA SINENSIS

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ABSTRACT
The present article deals with the Hibiscus rosa sinensis Linn commonly named as Gurhal (Family Malvaceae) is a popular medicinal plant found in tropical and Sub-tropical region of world. Its leaves, barks, roots and flowers have been used in the Indian traditional system as medicine to treat various diseases. Experiment was performed for antihyperlipidemic activity, the solution was left to rest for 5 min before being added with 2 mL of 7.5% w/v sodium carbonate. The resulting colour absorbance was measured at 760 nm in a UV-Vis spectrophotometer. The weighed flower samples were subjected to hot water method extraction to extract the anthocyanin. Hibiscus rosa sinensis used to treat several ailments as antioxidant anti-fertility, anti- hyperlipidaemic, anti-Inflammatory CNS depressant etc. Principal constituents reported in Hibiscus Rosa Sinensis Linn are cyanidin chloride, cyclopeptide alkaloid, ascorbic acid, riboflavin etc. Anti Hyperlipidaemic activity was evaluated in albino Wistar rats against the simvastatin used as a control. During biological evaluation, VLDL, HDL and LDL are measured. Total phenolic content and pH was measured by using digital pH meter.

KEYWORDS: Hibiscus rosa sinensis, Anti Hyperlipidaemia, Hypercholesterolemia, Extraction, Titron model.

INTRODUCTION
Hibiscus rosa sinensis Linn (Family Malvaceae) is a plant which is widely distributed throughout the world and both types of lipid fractions were treated by lipid specialists with the aim of preventing cardiovascular disease, and greatly increased concentrations of triglycerides were treated to prevent acute pancreatitis. These clinical practices were driven by clinicians seeing patients with raised triglycerides and severe cardiovascular disease such as those with remnant hyperlipidaemia, epidemiological evidence and trials examining the benefit of triglyceride and cholesterol lowering.[1] The petal of Hibiscus rosa-sinensis contains quercetin-3-di-O-β-D-glucoside, quercetin-3-7-di-O-β-D-glucoside, quercetin- 3-O-β-D-sophorotrioside, kaempferol and kaempferol-3-O-β- xylosylglucoside. The major anthocyanin contained in the red flowers of H. rosasinensis is cyanidin-3-sophoroside. Several scientific breakthroughs, however, lead to more focus on raised LDL cholesterol as the main lipid target for cardiovascular disease prevention. Because triglycerides can be degraded by most cells, but cholesterol Cannot be degraded by any, the cholesterol content of triglyceride-rich lipoproteins (remnant cholesterol) is more likely to be the cause of atherosclerosis and cardiovascular disease rather than raised triglycerides.[2]

The natural plant products are widely used nowadays because of increasing the burden of diseases, HRS leaves, barks, roots and flowers have been used in the Indian traditional system as medicine to treat various diseases. Various research studies proved that the different parts of HRS plants possess Antioxidant, Antimicrobial, Antidiabetic, Antiulcer, Hepatoprotective, Antifertility, Antigenotoxic and Anti-inflammatory properties, which helps in treatment of many diseases.[3] Flowers and other parts of the plant are used to make medicine. Hibiscus is used for conditions such as high blood pressure, high cholesterol, increasing the production of breast milk etc. It is a flower which is widely grown in the Indian subcontinent and is available around the year. Many varieties are available worldwide among which the variety which is widely available in India is “Hibiscus rosa sinensis” Hibiscus has also medicinal properties and takes part as a primary ingredient in many herbal teas. The red flowered variety is preferred in medicine as reported. The flower plays a crucial role in treating medical problems including many cardiovascular disorders, helminthic disease and cancer. The plant also acts as an antioxidant and used in obesity management.[4] The vitamin C naturally found within the hibiscus works to complement the iron, increasing its absorption in blood and acts effective cure for anaemic patients. Anthocyanin-rich mixtures of 9 bioflavonoids may provide protection from DNA cleavage, estrogenic

activity, enzyme inhibition, boosting production of cytokines, anti-inflammatory activity, decreasing capillary permeability and fragility, and membrane strengthening. Drinking hibiscus tea for 2 -6 weeks decreases blood pressure in people with mildly high blood pressure. Taking hibiscus extract by mouth for 4 weeks may be as effective as the prescription drugs captopril for reducing blood pressure in people with moderate high blood pressure. Also helps in lowering Cholesterol in case of Hyperlipidaemia.[5] Hibiscus may help prevent change in heart structure and function that can occur due to high blood pressure. It contains anthocyanins and other polyphenols which may help in protecting against oxidative stress. Hibiscus rosa sinensis augments endogenous antioxidant compounds and prevents the myocardium from isoproterenol induced myocardial injury. It may help promote weight loss, reduce the growth of bacteria and cancer cells, and support the health of the heart and liver. The report suggested that it contains Tannins, Flavonoids, Steroids, Alkaloids, Saponins. The flower extract of Hibiscus rosa-sinensis (Red) contained 0.678±0.14% phenols, 0.51±0.16 % alkaloids and 7.5±0.20 % tannins. While the flower extract of Hibiscus rosa-sinensis (White) contained 0.680±0.11% phenols, 0.50±0.18 % alkaloids and 8.9±0.21 % tannins, and the flower extract of Hibiscus rosa-sinensis (Yellow) contained 0.678±0.16% phenols, 0.48±0.16 % alkaloids and 8.5±0.20% tannins.[6]

AIM AND OBJECTIVE

The aim of this formulation is to bring out the beneficial properties present in petals of hibiscus flowers. Our objective of this experiment is to find out antihyperlipidemic activity against the simvastatin, isolation and and evaluation against albino Wistar rats. The current paper discussed the chemical constituents, therapeutic importance of HRS as a promising medicinal plant with wide range of pharmacological activities which could be utilized in hyperlipidaemic activity.

MATERIAL AND METHODS

Hibiscus flowers were collected, then petals were removed from the collected flowers, washed with distilled water and were shade dried for three days. The dried petals were grinded into powder for the further extraction.[7]

After crushing the petals, it was boiled in 100 ml of water at the temperature 51.8 degree Celsius. This temperature is favourable for anthocyanin to give water soluble extract. The pigment (Mucilage) was now extracted in the water after soaking crushed flowers in water for 5-6 hours and then boiling for 30 minutes. It was mechanically crushed into a coarse powder. The dry powder was obtained by heating it to over 50°C and sieving it (number 80). Different extraction methods along with different solvent were carried out in the anthocyanin extraction process. Solvents like distilled water, ethanol and citric acid were used.

Extraction methods include Ultrasound-Assisted Extraction (UAE) to obtain the maximum yield of anthocyanins by UAE, it is necessary to optimize the extraction conditions. In UAE, 1 g of powdered sample was mixed with 15 ml Distilled Water, 2% Citric acid, 85% Ethanol with 1:15 ratio.[8]

Using the above techniques, the extraction was completed, and observations were done by further analysis. The parameters included titrable acidity, pH, total phenols, total flavonoids, total soluble solids, Anthocyanin content and Antioxidant analysis and were observed. The observation for pH was done by using digital pH meter.

A 0.5 mL aliquot from each extract was added to 2.6 mL Folin-Ciocalteu's reagent solution (0.2 M). The solution was left to rest for 5 min before being added with 2 mL of 7.5% p/v sodium carbonate. The resulting colour absorbance was measured at 760 nm in a UV-Vis spectrophotometer after 15 min reaction time at 41 ºC. To obtain the phenolic compounds, concentration data, a calibration curve was constructed using different concentrations of gallic acid (15 to 70 mg·L-1). Total phenolic compounds content was expressed in mg of gallic acid equivalents per L of sample.[9]

The weighed flower samples were subjected to Hot Water method extraction to extract the anthocyanin, the hot water extraction method was selected as the best extraction method with high shelf-life Flavonoid content of the blend and hot water samples were obtained as 11.6875 ± 3.305 mg/g and 15.10 ± 0.847 mg/g respectively, where the final product of Hot water method contains high flavonoid content.

Biological activities

Oral administrations of H. rosa-sinensis Linn flowers ethanolic extract at 500 mg/kg b.w dosage were evaluated using 400 mg/kg triton and atherogenic diet induced hyperlipidaemia in albino Wistar rats.[10]

In triton model after 48 hours, the extract has managed to lower serum lipid levels to 78.5 ± 1.782 total cholesterol, 80 ± 2.387 triglycerides, 87.26 ± 2.443 phospholipids, 68.18 ± 2.1 LDL, 18.86 ± 1.39 mg/dl VLDL, and increased HDL level to 36 ± 2.3 mg/dl in triton model, compared to negative control and 10 mg/kg simvastatin positive control values significantly.

In atherogenic diet induced model, the ethanolic extract reduced serum lipid levels after 14 days to 72 ± 2.854 total cholesterol, 68.66 ± 1.240 triglycerides, 70 ± 3.287 phospholipids, 46 ± 2.606 LDL, 35 ± 1.141 mg/dl VLDL, and increased HDL level to 31.16 ± 2.465 mg/dl significantly in comparison to all control groups.

RESULT AND DISCUSSION

Different extraction methods along with different solvent were carried out in the anthocyanin extraction process.

Solvents like distilled water, ethanol and citric acid were used. Extraction methods include Ultrasound-Assisted extraction. Maximum yield of anthocyanin was extracted by UAE method. Oral administrations of H. rosa-sinensis Linn flowers ethanolic extract at 500 mg/kg b.w dosage were evaluated using 400 mg/kg triton and atherogenic diet induced hyperlipidaemia in albino Wistar rats. After 48 hours the extract decreased the serum lipid level and increased the HDL level in triton model. Total phenols, total flavonoids, total soluble solids, Anthocyanin content and antioxidant were analysed. It was found that drugs are reducing the cholesterol level as compared to simvastatin.

CONCLUSION

From the whole study, it can be concluded that anthocyanin isolated from the petals of hibiscus rosa sinensis can be used as pharmaceutical adjuvant for reducing cholesterol level. Each part of H. rosa sinensis contains a wide range of compounds. Hypercholesterolemia or hyperlipidaemia can be controlled by the Hibiscus rosa sinensis plants. Lower toxicity of this plant can be an advantage to qualify it to be used as new therapeutic agent.

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