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Quantitative and Qualitative Analysis of Phytochemicals,Present in Flower Extract of Hibiscus Rosa Sinensis

Chemistry

KEYWORDS : H. rosa sinensis, Phytochemicals, traditional medicine, Phenol.

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ABSTRACT

Hibiscus rosa sinensis is known for its medicinal properties. Study for the determination of phytochemical analysis present in flower extract (Red, white and yellow) for various medicinally important compounds and their quantification. Qualitative analysis of phytochemicals show negative and positive test due to different variety on colours also. Especially in red one maximum amount of phenol has been found to present than white and yellow. The significance of the phytochemicals with respect to their role in traditional medicine treatment has been discussed.

Introduction:

Hibiscus rosa sinensis especially white and red is considered to have medicinal properties in the Indian traditional system of medicine (1) Numerous varieties, cultivars and hybrids are available with different shades of colour changing from white to pink and red and from orange to yellow. Flowers and leaves are found to possess antioxidant, antifungal, anti infectious, antimicrobial, anti-inflammatory, anti-diarrhetic and antipyretic activity (2) Phytochemicals like Tannin, Cyandin, diglycoside, flavonoids and vitamins, Quercetin-3-diglycoside, Terpenoids, Saponins, cyanidine-3-sophoroside-5-diglycoside etc. are present in Hibiscus-rosa-sinensis (3, 4, 5). Hibiscus petals are used to stimulate hair growth and to prevent premature graying and hair loss. The buds have cooling and astringent effect (6, 7). The phytochemical constituents are divided into two groups which are primary and secondary constituents; according to their functions in plant metabolism (8, 9). Primary constituents comprise common sugars, amino acids protein etc. while secondary constituents consists of alkaloids, terpenoids, phenolic compounds and many flavonoids, tannins etc. (10, 11, 12).

Materials and Methods:

Collection of flower samples : The flowers are collected from garden, Agricultural University, Nursery of Kanpur. The flowers are processed and analysed.

Processing flower samples : The flowers of Hibiscus rosa sinensis are properly washed in tap water and then rinsed in distilled water. The rinsed flowers are dried in oven at a temp. of 30-350C for 3-4 days. The dried flowers are pulverized, using a sterile electric blender, to obtain powdered form which is then stored in airtight glass container.

Preparation of solvent extract of flower samples : The hexane extract of flower sample is prepared by soxhlet apparatus. The essential oil is formed which is then separated from separating funnel.

Qualitative Analysis on phytochemical constituents

1. Test for glycosides :- 1 ml concentrated H2S04, 2ml of acetic acid and 1 drop of FeCl3 solution is taken in a test tube. Shake it after that this mixture is added into 5 or 6 ml of flower extract, brown ring appears which indicates the presence of glycosides.

2. Test for Tannins :- Take 0.4 to 0.6 g powdered sample and boiled in 20 ml distilled water and filtered. In filtered solution add 0.1% FeCl3 solution. Brownish green coloration observed which indicates the presence of Tannin.

3. Test for Flavonoids :- Take 2 ml of flower extract and add 1% NH3 solution in a test tube. A yellow coloration indicates the presence of flavonoids.

Quantitative Analysis on Phytochemical Constituent

Phenols :- Analysis of phenols is determined by using spectrophotometer. The flower sample (Powdered) is boiled with 60 ml $(CH_3CH_2)_2O$ for 20 minutes. 5 ml of this boiled sample is pipetted out into a flask and after that 10 ml distilled water is added. After that 2 ml NH4OH solution and 6 ml concentrated CH3 (CH2) CH2 OH is added to the above solution, which is in flask. The solution is made up to the mark and left for 30 minutes, and then measured at 505 nm wavelength by using sepctrophotometer.

Test for Alkaloids :- 6 g of flower sample is taken in a beaker and 200 ml of 10% CH_3COOH in ethanol to the flower sample. This mixture is covered with watch glass and allowed to become concentrated in a water bath. When solution reaches $^1/_4$. of the original volume and add Cone. NH4OH. Keep the solution for settle and the precipitated is collected and washed with dilute NH_4OH and then filtered. The residue is collected, dried and weight.

Tannins :- Quantity of tannins is determined by using the spectrophotometer method. 0.4g of flower sample is weighed in a flask. Add 50 ml of distilled water. Stirred it for 1 hr. The sample is filtered and then keep in 50 ml Volumetric flask and made upto mark. 5 ml of this solution is taken in a test tube and mixed with 2ml of 0.1 m FeCl3 in 0.1 m HCl and 0.008 M $K_4Fe(CN)_6.3H_2O$. The absorbance is measured with a spectrophotometer at 395 nm wavelength.

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Table- I
Qualitative Analysis on Phytochemcial Constituents

Flower extract	Phenols	Alkaloids	Tannins
Hibiscus rosa sinensis (Red)	++	++	++
H. rosa sinensis (White)	+	+	+
H. rosa sinensis (Yellow)	+	+	+

Table-II
Quantitative Analysis on Phytochemcial Constituents %

Flower extract	Phenols	Alkaloids	Tannins
Hibiscus rosa sinensis (Red)	0.678±0.14	0.51±0.16	7.5±0.20
H. rosa sinensis (White)	0.680±0.11	0.50±0.18	8.9±0.21
H. rosa sinensis (Yellow)	0.678±0.16	0.48±0.16	8.5±0.20

Results and Discussion: Qualitative analysis carried in each flower extract showed the presence of phytochemical constituents and the results are summarized in table I. It shows the Flavonids, tannins and Alkaloids.

Quantitative analysis :
The results of quantitative analysis as 3 major groups of phytohemical constituents in the flower extract of different colours of Hibiscus rosa sinensis is summarized in Table 2. The highest yield of alkaloid which is 0.51 g in red flower extract of followed by white flower extract which 0.50 g and 0.48 g by yellow flower extract of Hibisus rosa sinensis.

Conclusion :
This work has revealed further potential of these different colours of Hibiscus rosa sinensis flower in the area of pharmacology as potential source of useful drugs. The phytochemical screening on qualitative and quantitative analysis, shows that these extracts are rich in alkaloids tannins, flavonoids. Which are popular phytochemical constituents.

The flowers contain substantial quantities of flavonoids Table 1, which are associated with antioxidant, fever reducing, pain relieving (analgesic) and spasminhibiting (spasmolytic) activities. Flower has soothing properties which are used to relieve menstrual cramps and relax spasms and general cramping.

Hibiscus rosa sinensis also helps in wound healing (Nayak et al., 2007) and this can be explained due to existence of tannins (Table 2).

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