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Comparative phytochemical screening of ethanolic extracts (flower and leaf) of morphotypes of *Hibiscus Rosa-sinensis* Linn

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Abstract

Hibiscus Rosa-sinensis Linn. is one of the important medicinal as well as ornamental plant, belongs to family Malvaceae. It is commonly called Gurhal. The extracts (flower and leaves) are largely used in the treatment of various diseases.

The phytochemical screening of ethanolic extracts of four Morphotypes of this plant species are known to contain–Flavonoids, glycosides, phytosterols, terpenoids, phenolic compound, carbohydrates, proteins, tannins, gum and mucilage. Alkaloids, saponins, fixed oil and fats were totally absent. Anthoquinone present in all flower extracts, but absent in all leaf extracts of morphotypes. The result showed that there were no differences in their phytochemical constituents. The presence of flavonoids, glycosides, phytosterols, terpenoids, phenolic compound and tannins are mainly contributed in the medicinal utility of the plant. Since, these constituents are common in all the four tested morphotypes, any one of them can be used as a substitute for others.

Keywords: *Hibiscus Rosa-sinensis* Linn. Phytochemical, morphotypes, extract.

1. Introduction

Nature has been a source of medicinal agents for thousands of years and a large number of drugs have been isolated from natural sources. Higher plants, as a source of medicinal compounds have continued to play an important role in the maintenance of human health since ancient time.

Hibiscus rosa-sinensis Linn. (Malvaceae) is widely distributed throughout the world. It is an evergreen woody glabrous showy shrub with about 1.5-2.5 m height. Leaves are coarsely toothed above and entire below ovate bright green and 3 nerved base. The flowers are axillary solitary campanulate. (Kaushik *et al.*, 1999) [7]. Several articles and ancient literature have been shown that the flowers of this plant possess antifertility activity (Pekamwar *et al.*, 2013) [13]. Flower is used for treatment of inflammation (Kritkar and Basu, 1984) [8] and menorrhagia (Nadkarni, 1998) [12]. Flower buds are taken raw for relieving stomach pain (Maheshwari, 2000) [11]. The flower of *Hibiscus rosa sinensis* Linn. possess various activity such as anticonvulsants, antidiabetic, antipyretic and antioxidant (Agrawal *et al.*, 2012) [1]. Flower is made into paste and given to treat irregular menstruation (Retnam *et al.*, 2006) [14]. Young leaves used for wound healing and treatment for dandruff (Trivedi, 2010) [16]. Ethanolic flower extract shows antihyperlipidemic activity (Sikarwarand and Patil, 2015) [15]. The juice of the fresh root is given for gonorrhoea (Caius, 1986) [2]. In present research work four morphotypes of *Hibiscus rosa-sinensis* Linn. are selected.

Morphotype I (*Hibiscus* Red) - Red flower with 5 petals

Morphotype II (*Hibiscus* Pink) - Pink flower with 5 petals

Morphotype III (*Hibiscus* Yellow) - Yellow flower with 5 petals

Morphotype IV (*Hibiscus* White) - White flower with 5 petals (Kaushik *et al.*, 1999) [7]

The present paper deals with useful information regarding phytochemical screening of four morphotypes which can be used for successful treatment of many diseases.

2. Material and methods

For present investigation the plant material of *Hibiscus rosa sinensis* Linn. (Flower and leaves) were collected from D.A.V.V. campus Indore and Apna garden vishnupuri Indore.

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The collected plant material was identified with the help of Flora of British India (Hooker JD, 1875) [6]. To obtain ethanolic extract 100 gms of shade dried plant material was extracted with 500 ml of ethanol (95%) in "Soxhlet Extraction apparatus". Finally the prepared plant was macerated with water for 24 hrs. to obtain aqueous extract. The extract was concentrated by distilling off the solvent (Kokate, 1994; Kokate *et al.*, 1993) [9, 10].

The extract thus obtained was then subjected to preliminary phytochemical screening for identification of various plant constituents by methods suggested by (Finar, 1962; Farnsworth 1966; Horborne *et al.*) [4, 3].

3. Result and Discussion

Preliminary phytochemical screening of ethanolic (flower and leaves) extract was performed. The result showed that there

were no marked differences observed in the phytochemical constituents of four tested Morphotype except in carbohydrates contents. The presence of flavonoids, glycosides, phenolic compound, tannins, terpenoids, phytosterols, carbohydrates, proteins, amino acid, gum and mucilages were noted in all the four tested morphotypes.

Among the carbohydrates glucose and fructose were reported only in the ethanolic flower extracts but absent in leaf extracts. While lactose was present in all extracts (flower and leaf) but galactose was totally absent. Starch was present only in leaf extracts and absent in flower extracts. Alkaloids, saponins, fixed oil and fats were found absent in all the four tested morphotypes. Anthraquinone present in all flower extracts but absent in all leaf extracts of morphotypes. (Table No. 1)

Table 1: Preliminary phytochemical screening of ethanolic extract (Flower and leaf) of morphotypes of *Hibiscus rosa sinensis* Linn.

S No.	Plant constituents Test/Reagents	RF	PF	YF	WF	RL	PL	YL	WL
1.	Alkaloids								
	(i) Mayer's reagent	-	-	-	-	-	-	-	-
	(ii) Wagner's reagent	-	-	-	-	-	-	-	-
	(iii) Hager's reagent	-	-	-	-	-	-	-	-
2.	Carbohydrates								
	(i) Molisch's test	+	+	+	+	+	+	+	+
	(ii) Benedict's reagent	+	+	+	+	+	+	+	+
	(iii) Fehling solution	+	+	+	+	+	+	+	+
3.	Types of Carbohydrates								
	(i) Glucose	+	+	+	+	-	-	-	-
	(ii) Fructose	+	+	+	+	-	-	-	-
	(iii) Galactose	-	-	-	-	-	-	-	-
	(iv) Lactose	+	+	+	+	+	+	+	+
	(v) Starch	-	-	-	-	+	+	+	+
4.	Glycosides								
	(i) Keller kiliani test	+	+	+	+	+	+	+	+
5.	Phytosterols								
	(i) Liebermann's Burchard test	+	+	+	+	+	+	+	+
6.	Terpenoids								
	(i) Solkowski test	+	+	+	+	+	+	+	+
7.	Fixed oils and Fats								
	(i) Spot test	-	-	-	-	-	-	-	-
8.	Saponins								
	(i) Foam test	-	-	-	-	-	-	-	-
9.	Phenolic Compounds								
	(i) Ferric chloride solution	+	+	+	+	+	+	+	+
10.	Tannins								
	(i) Lead acetate solution	+	+	+	+	+	+	+	+
11.	Protein								
	(i) Xanthoprotic test	+	+	+	+	+	+	+	+
	(ii) Biuret test	+	+	+	+	+	+	+	+
	Amino acid								
	(i) Ninhydrin reagent	+	+	+	+	+	+	+	+
12.	Flavonoids								
	(i) Con HCl + Mg ribbon	+	+	+	+	+	+	+	+
13.	Gums and Mucilages								
	(i) Alcoholic precipitation	+	+	+	+	+	+	+	+
	(ii) Molisch's test	+	+	+	+	+	+	+	+
14.	Anthraquinones								
	Borntrager's test	+	+	+	+	-	-	-	-

RF, PF, YF, WF = Flower extracts of *Hibiscus* Red, *Hibiscus* Pink, *Hibiscus* Yellow, *Hibiscus* White.

RL, PL, YL, WL, = Leaf extracts of *Hibiscus* Red, *Hibiscus* Pink, *Hibiscus* Yellow, *Hibiscus* White.

4. Conclusion

The presence of flavonoids, glucosides, phytosterols, terpenoids, phenolic compounds and tannins is mainly contributed to the medicinal utility of the plant. Since, these constituents are common in all the four morphotypes, any one of them can be used as a substitute for others. The four morphotypes of *Hibiscus rosa - sinensis* Linn. are phytochemically similar although they differ in morphology.

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