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QUALITATIVE PHYTOCHEMICAL STUDY OF MEDICINAL PLANTS OF DURG DISTRICT

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ABSTRACT

Medicinal plants have some bioactive compounds which are used for curing various human diseases. Phytochemicals have two categories that are primary and secondary metabolites. Secondary metabolites contain phenolic and flavanoid compounds. In present study qualitative analysis of three medicinal plants such as – *Syzygium cumini*(jamun), *Psidium guajava (*jam*),Murraya koenigii*(meethi neem) and *Thevetia Peruviana* (kaner) has been done. Aqueous leaves extracts were used for the qualitative phytochemical screening of the plants. The results of the phytochemical analysis of these medicinal plants shown that flavanoids are found in high quantity in *Thevetia Peruviana* (kaner) and,*Murraya koenigii* (meethi neem) and not found in *Syzygium cumini* (jamun) and *Psidium guajava (*jam). Saponins are present in high amount in *Syzygium cumini* (jamun) and *Psidium guajava (*jam) and less in *Thevetia Peruviana* (kaner). Steroids are found in high quantity in *Psidium guajava (*jam) and less in *Murraya koenigii* (meethi neem) and absent in *Thevetia Peruviana* (kaner) and *Syzygium cumini* (jamun). The phytochemical analysis of plants has great interest in pharmaceutical companies for the further research work to produce effective medicines.

KEYWORDS: Phytochemical Screening, Metabolites, Flevenoids, Saponins

Chhattisgarh has been declared a herbal state of India. The importance of plants is known to us well. The plant kingdom is a treasure house of potential drugs and in the recent years there has been an increasing awareness about the importance of medicinal plants. Drugs from the plants are easily available, expensive, safe, and efficient and rarely have side effects. The plants which have been selected for medicinal use over thousands of years constitute the most obvious choice of examining the current search for therapeutically effective new drugs such as anticancer drugs (Dewick, 1996), antimicrobial drugs (Phillipson and Wright 1996), antihepatotoxic compounds. According to World Health Organization (WHO), medicinal plants would be the best source to obtain variety of drugs. About 80% of individuals from developed countries use traditional medicines, which has compounds derived from medicinal plants. However, such plants should be investigated to better understand their properties, safety, and efficiency (Arunkumar and Muthuselvam , 2009). Medicinal plants contain some organic compounds which provide definite physiological action on the human body and these bioactive substances include tannins, alkaloids, carbohydrates, terpenoids, steroids and flavonoids (Edoga *et al.,* 2005, Mann, 1978). These compounds are synthesized by primary or rather secondary metabolism of living organisms. Secondary metabolites are chemically and taxonomically extremely diverse compounds with obscure function. They are widely used in the human therapy, veterinary, agriculture, scientific research and countless other areas (Vasu *et al.,* 2009). A large number of phytochemicals belonging to several chemical classes have been shown to have inhibitory effects on all types of microorganisms in vitro (Cowan, 1999). Plant products have been part of phytomedicines since time immemorial. This can be derived from barks, leaves, flowers, roots, fruits, seeds (Criagg and David, 2001). Knowledge of the chemical constituents of plants is desirable because such information will be value for synthesis of complex chemical substances (Mojab *et al.*, 2003 Parekh and Chanda, 2007 Parekh and Chanda, S. 2008). In the present work, qualitative phytochemical analysis was carried out in four plants leaf.

MATERIALS AND METHODS

Fresh parts of four medicinal plants *Syzygium cumini*(jamun), *Psidium guajava (*jam) and *Thevetia Peruviana* (kaner) were collected from local area. The plant materials were taxonomically identified and authenticated by the Department of botany Bhilai Mahila Mahavidyalaya, Bhilai, Durg, Chhattisgarh,. The Plant Materials Were shade dried

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until all the water molecules evaporated and plants became well dried for grinding. After drying, the plant materials were ground well using mechanical blender into fine powder and transferred into airtight containers with proper labeling for future use.

Preparation of plant extracts

5gm of dried finely powdered plant material was taken in a beaker and 200ml of distilled water was added. The mixture was heated on a hot plate with continuous stirring at 30º-40ºC for 20 minutes. Then the water extract was filtered through filter paper and the filtrate was used for the phytochemical analysis. The water extract was kept in refrigerator when not in use. The extract was tested for the presence of bioactive compounds by using following standard methods (Sofowra, 1993 Trease and Evans, 1989, Harborne, 1973).

Test for proteins

Millon's test

Crude extract when mixed with 2ml of Millon's reagent, white precipitate appeared which turned red upon gentle heating that confirmed the presence of protein.

Ninhydrin test

Crude extract when boiled with 2ml of 0.2% solution of Ninhydrin, violet colour appeared suggesting the presence of amino acids and proteins.

Test for carbohydrates-

Fehling's test

Equal volume of Fehling A and Fehling B reagents were mixed together and 2ml of it was added to crude extract and gently boiled. A brick red precipitate appeared at the bottom of the test tube indicated the presence of reducing sugars.

Benedict test

Crude extract when mixed with 2ml of Benedict's reagent and boiled, a reddish brown precipitate formed which indicated the presence of the carbohydrates.

Molisch's test

Crude extract was mixed with 2ml of Molisch's reagent and the mixture was shaken properly. After that, 2ml of concentrated H_2SO_4 was poured carefully along the side of the test tube. Appearance of a violet ring at the inter phase indicated the presence of carbohydrate.

Iodine test

Crude extract was mixed with 2ml of iodine solution. A dark blue or purple coloration indicated the presence of the carbohydrate.

Test for flavonoids-(pho-100-0497)

Figure 1: Test for Flavonoids

Figure 2: Test for Saponins

Figure 3: Test for Steroid

Shinoda test

Crude extract was mixed with few fragments of magnesium ribbon and concentrated HCl was added drop wise. Pink scarlet colour appeared after few minutes which indicated the presence of flavonoids.

Alkaline reagent test

Crude extract was mixed with 2ml of 2% solution of NaOH. An intense yellow colour was formed which turned colourless on addition of few drops of diluted acid which indicated the presence of flavonoids.

Test for saponins-(pho-100-0500)

Crude extract was mixed with 5ml of distilled water in a test tube and it was shaken vigorously. The formation of stable foam was taken as an indication for the presence of saponins.

Test for steroid-(pho-100-0525)

Crude extract was mixed with 2ml of chloroform and concentrated H_2SO_4 was added sidewise. A red colour produced in the lower chloroform layer indicated the presence of steroids. Another test was performed by mixing crude extract with 2ml of chloroform. Then 2ml of each of concentrated H_2SO_4 and acetic acid were poured into the mixture. The development of a greenish coloration indicated the presence of steroids.

RESULTS AND DISCUSSION

The phytochemical characteristics of four medicinal plants tested were summarized in the table-1. The results revealed the presence of medically active compounds in the plants studied.

From the table, it could be seen that, proteins, carbohydrates, and flavonoids were present in all the plants. Steroid were absent only from the leaves of *Syzygium cumini*(jamun) and *Thevetia Peruviana* (kaner). large amount of saponins present in *Syzygium cumini*(jamun)and *Psidium guajava (*jam) less amount in *Thevetia Peruviana* (kaner) and absent in *Murraya koenigii* (meethi neem).

Table 1: Phytochemical constituents of four medicinal plants

Phytochemical test Plants	*Thevetia Peruviana* (kaner)	*Psidium guajava (*jam)	*Syzygium cumini* (jamun)	*Murraya koenigii* (meethi neem)
Proteins	++++	++++	++++	++++
Carbohydrates	++++	++++	++++	++++
Flavonoids	++++	+	+	++++
Saponins	+	+++	++++	-
Steroid	---	++++	---	++

Phytochemical analysis conducted on the plant extracts revealed the presence of constituents which are known to exhibit medicinal as well as physiological activities (Sofowra, 1993). Natural antioxidant mainly come from plants in the form of phenolic compounds such as flavonoid, etc. (Ali *et al.,* 2008].. Flavonoids are hydroxylated phenolic substances known to be synthesized by plants in response to microbial infection and they have been found to be antimicrobial substances against wide array of microorganisms in vitro. Their activity is probably due to their ability to complex with extracellular and soluble proteins and to complex with bacterial cell wall (Marjorie, 1996). They also are effective antioxidant and show strong anticancer activities (Salah *et al.*, 1995, Del-Rio *et al.,* 1997, Okwu, 2004). The plant extracts were also revealed to contain saponins, which are known to produce inhibitory effect on inflammation (Just *et al.,* 1998). Saponins has the property of precipitating and coagulating red blood cells. Some of the characteristics of saponins include formation of foams in aqueous solutions, hemolytic activity, cholesterol binding properties and bitterness (Sodipo, *et al.,* 2000, Okwu, 2004). Steroids have been reported to have antibacterial properties (Raquel, 2007) and they are very important compounds especially due to their relationship with compounds such as sex hormones (Okwu, 2001). Alkaloids have been associated with medicinal uses for centuries and one of their common biological properties is their cytotoxicity (Nobori *et al.,* 1994). The results obtained in this study thus suggest the identified phytochemical compounds may be the bioactive constituents and these plants are proving to be an increasingly valuable reservoir of bioactive compounds of substantial medicinal merit.

CONCLUSIONS

The results revealed the presence of medicinally important constituents in the plants studied. Many evidences gathered in earlier studies which confirmed the identified phytochemicals to be bioactive. Several studies confirmed the presence of these phytochemicals contribute medicinal as well as physiological properties to the plants studied in the treatment of different ailments. Therefore, extracts from these plants could be seen as a good source for useful drugs. The traditional medicine practice is recommended strongly for these plants as well as it is

suggested that further work should be carried out to isolate, purify, and characterize the active constituents responsible for the activity of these plants.

Also additional work is encouraged to elucidate the possible mechanism of action of these extracts.

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