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PHYTOCHEMICAL EVALUATION OF SOME MEDICINAL PLANTS

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ABSTRACT

Natural products are the source of synthetic and traditional herbal medicine. Phytochemicals are compounds that occur naturally in plants. The use of plants and plant products as medicines could be traced as far back as the beginning of human civilization. The present study was aimed to investigate the phytochemical screening of *Momordica charantia*, *Punica granatum* and *Psidium guajava* leaves. The result of the qualitative phytochemical constituents of these leaves extracts showed presence of all the tested phytochemicals alkaloids, terpenoids, flavonoids, carbohydrates and saponins. Thus, the results suggests, the beneficial role of their leaves also supports their traditional uses and proved to be useful for clinical studies. Further studies will need to find its bioactivity which can give fruitful results in phytopharmaceutical.

Keywords: *Phytochemicals, Medicinal Plants, Momordica charantia, Punica granatum and Psidium guajava*

INTRODUCTION

Plant extracts and compounds derived from plants are in use as drug from the ancient times (John and Koperuncholan, 2012). Numerous studies have identified compounds within herbal plants that are effective antibiotics (Basile *et al.*, 2000). Traditional healing systems around the world that utilize herbal remedies are an important source for the discovery of new antibiotics (Okpekon *et al.*, 2004). Extractive values gives an idea about the nature of the chemical constituents present in the crude drug, these phytochemical constituents are responsible for definite physiological action of the human body (Akinmoladun *et al.*, 2007). Plants are endowed with various phytochemical molecules such as vitamins, terpenoids, phenolic acids, lignins, stilbenes, tannins, flavonoids, quinones, coumarins, alkaloids, amines, betalains, and other metabolites, which are rich in antioxidant activity (Zheng and Wang, 2001), (Cai *et al.*, 2003). Studies have shown that many of these antioxidant compounds possess anti-inflammatory, antiatherosclerotic, antitumor, antimutagenic, anticarcinogenic, antibacterial, and antiviral activities (Sala *et al.*, 2002), (Rice-Evans *et al.*, 1995). In the present work three different medicinal plants each belonging to different families were evaluated for their phytochemical properties.

MATERIALS AND METHODS

Plant Material

Fresh plant leaves were collected randomly from the agriculture field of Sheohar district of Bihar, India. The details of plant screened, their families, vernacular names and their therapeutic uses are given in Table 1. Fresh plant material were washed with distilled water, air dried and then homogenized to fine powder.

Preparation of the Extracts

The air-dried plant sample was macerated with water in a closed flask, frequently shaken, filtered and filtrate was used for the phytochemical analysis.

Phytochemical Screening

The preliminary phytochemical screening was performed according to the Harborne (1998) and Kokate (2001) method. Mayer's test was performed for alkaloids (200 mg plant material in 10 ml hexane, filtered, 2 ml filtrate+ 1% HCl + steam, 1 ml filtrate + 6 drops of Mayer's reagents) white precipitate indicated the presence of respective alkaloids. Salkowski test was applied for the presence terpenoids (0.5 g plant material in 10 ml methanol, filtered. 5 ml filtrate + 2 ml chloroform+ 3 ml concentrated H₂SO₄)

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reddish brown coloration indicates the presence of terpenoids. Ammonia Test was done for the presence of flavonoids (0.5 g plant extract + 10 ml distilled water, filtrated + 5 ml ammonia solution + 1 ml concentrated H₂SO₄) yellow color indicates the presence of flavonoids. Benedict's test was done for carbohydrates (0.3 g plant sample + 3 ml distilled water, filtrated, filtrate + 2 ml Benedict's reagents + boiled) reddish orange color appeared indicates presence of carbohydrates. Foam test was performed for saponins (1 ml extract + 15 ml distilled water, shaken vigorously) formation of foam in the upper part of test tube indicates presence of saponins.

RESULTS AND DISCUSSION

Results

The phytochemical characteristics of three medicinal plants tested were summarized in the table-2. The results revealed the presence of medically active compounds. *Momordica charantia* gives positive result for alkaloids, flavanoids and saponins while negative for terpenoids and carbohydrates where as *Punica granatum* showed positive result for alkaloids, carbohydrates and saponins while negative for terpenoids and flavanoids on the other hand *Psidium guajava* gives negative result only for alkaloids and positive for all other.

Table 1: Ethnobotanical information of some traditionally used Indian medicinal plant species selected for Phytochemical activity

Plant Species	Family	Vernacular name	Part used	Therapeutic use
<i>Momordica charantia</i>	Cucurbitaceae	Bitter melon (Karela)	Leaves	A leaf tea is used to treat diabetes, to expel intestinal gas, promote menstruation, and as antiviral agent against measles and hepatitis viruses (Ahmed; <i>et al.</i> , 2001), (Takemoto, 1983)
<i>Punica granatum</i>	Lythraceae	Pomegranate (Anaar)	Leaves	For the treatment of dysentery, diarrhea, helminthiasis, acidosis, hemorrhage and respiratory pathologies (Choi <i>et al.</i> , 2011)
<i>Psidium guajava</i>	Myrtaceae	Guava (Amrood)	Leaves	<i>P. guajava</i> leaves reported to have antioxidant activity (Masuda <i>et al.</i> , 1999), antibacterial activity (Rogerio, 2005) and kidney problems (Ticzon, 1997) antiulcer activity (Swarnamoni, 2009).

Table 2: Phytochemical constituents of three medicinal plants studied

Plant Species	Alkaloids	Terpenoids	Flavanoids	Carbohydrates	Saponins
<i>Momordica charantia</i>	++	-	+	-	+
<i>Punica granatum</i>	+	-	-	+	+
<i>Psidium guajava</i>	-	+	++	++	+

Presence of constituent = +; Present in more quantity = ++; Absence of constituent = -.

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Discussion

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). The experiments performed during the current study confirm the presence of alkaloids, terpenoids, flavonoids, carbohydrates and saponins. The phytoconstituents i.e. alkaloids and flavonoids are antibiotic principles of plants. These antibiotic principles are actually the defensive mechanism of the plants against different pathogens (Hafiza, 2000). The terpenoids group show significant pharmacological activities, such as anti-viral, anti-bacterial, anti-malarial, anti-inflammatory, inhibition of cholesterol synthesis and anti-cancer activities (Mahato and Sen, 1997). Saponins which are used to stop bleeding and in treating wounds and ulcers as it helps in red blood cell coagulation (Okwu and Josiah, 2006). Awareness of local community should be enhanced incorporating the traditional knowledge with scientific findings. Further studies will need to find its bioactivity which can give fruitful results in phytopharmaceutical.

Conclusion

Presence of phytochemical constituents in *Momordica charantia*, *Punica granatum* and *Psidium guajava* leaves extract supports its traditional uses and proved to be useful for clinical studies.

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