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Preliminary Phytochemical Screening of Different Solvent Mediated Medicinal Plant *Sida sivarajani* (Malvaceae) Extracts Evaluated

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Medicinal plants have bioactive compounds which are used to cure various diseases.In the present investigation involves the preliminary phytochemical analysis to find out the various chemical constituents from the plant sample of *Sida sivarajani*. Four different solvents viz. Acetone, water, n-hexane and methanolwere used to obtain extracts from plantleaves. The extracts were subjected to preliminary phytochemical screening using standard procedure. The phytochemical screening reveals the presences of carbohydrates, cardic glycosides; phenol & terpenoids are present in all four solvents. Among all the four extracts, maximum phytochemicals were found dissolved in water, n-hexane and methanol.

Key words: Medicinal plants,phytochemicals, analysis, Sida Sivarajani

Phyto constituents are the natural bioactive compounds found inplants. This phyto constituent's work with nutrients and fibers toform an integrated part of defense system against various diseasesand stress conditions. Phyto chemicals (Handral *et al.*, 2012) are basically divided intotwo groups, i.e. primary and secondary constituents; according totheir functions in plant metabolism. Primary constituents comprise common sugars, amino acid, proteins and chlorophyll while secondary constituents consist of alkaloids, terpenoid, steroids andflavonoids, so on.

Plants are nature's "Chemical factories" providing the richest source of organic chemicals on earth. The world is blessedwith a great variety of natural vegetations, some of which are used as traditional medicineto cure various sicknesses and diseases. But, considering richnessof the plant world, the knowledge of plants acquired by man is still insufficient. World Health Organization (Ujowundu *et al.*, 2010) describes a medicinal plant as any plant in which one or more of its organs contains substances thatcan be used for therapeutic purposes or which are precursors for the synthesis of useful drugs. Many of our official drugs have come through the research work of the botanists, chemists and ethnobotanists. Since botanists specialize in gathering knowledge of plants. Consequently they form a bridge between the natives and plants, eventually utilization ofplants are possible when a chemist acts as a bridge between the botanists and the users.

Morphology of Sidasivarajanii (Tambde *et al.*, 2020)

Erect, branched, undershrub, 1 m tall. Stem terete, green, minutely pubescent with small stellate hairs. Leaf blades on younger shoot much larger, concolorous, obovate or suborbicular, truncate or rounded at base, margins serrate to create, entire towards base, sub-obtuse or acute at apex; those on flowering shoots smaller, rhomboid to lanceolate, 3-nerved from base, lateral nerves 3–6 pairs, nerves raised on the lower surface, densely stellate-tomentose beneath, sparsely pubescent above, petiolate, stipulate. Flowers axillary, solitary; pedicelate. Calyx 3–6 mm across, campanulate, 5–lobed; the lobes, ovate, acuminate at apex, tomentose with minute stellate hairs. Corolla orange-yellow; petalsobovate, retuse or emarginate at apex, minutely stellate hairy at base. Staminal column 2–2.5 mm long, stellate pubescent; antheriferous at apex, filaments 1–2 mm long, anthers reiform, pale-yellow. Ovary 1–1.5 mm diameter, conical, stellate hairy; styles 5, covered by minute stellate hairs, stigma capitate, yellow. Schizocarps 2–3 mm long, ovoid-ellipsoid, raised at centre, green when immature, light brown at maturity, grooved between mericarps; mericarps 5, 3–4 × 1.5–2 mm, completely included in the calyx, completely covered densely with long stellate and sparsely with simple hairs; awns 1–1.5 mm long, covered with stellate hairs. Seed one per mericarps, brownish to black, laterally compressed, glabrous at the hilum (Figure 1).

Phenology: Flowering from September to February; fruiting from October to March.

MATERIALS AND METHODS

Plant Collection and Identification

The plant species of were collected from Tumsar regions of Bhandara District, Maharashtra, India during the months of August, September and October in the year 2019.

Processing of plant samples

The plants leaves of Sidasivarajanii(Malvaceae) of was taken from Tumsar regions of Bhandara District , crushed to powder form, and then taken in thesoxhlet apparatus for hot extraction with organic solvents such asAcetone, water, n-hexane and methanol.

Preparation of Extract

The *Sida sivarajanii* (Malvaceae) leaves were separated and cleaned well. Cleaned leaves were then dried under shade. The drying was done until all the water molecules evaporated and leaves became well-dried for grinding. After drying, the leaves were ground well using mechanical blender into fine powder and transferred into air-tight container with proper labelling for further use. The dried and powdered leaves were extracted sequentially with acetone, water, n-hexane and methanol using Soxhlet apparatus. The plant specimen leaves powder was weighed (20 g) and successively extracted with 200 ml of solvents like

methanol (60°- 80° C), acetone, n-hexane and aqueous by soxhelation for a period of 24 hours.

Qualitative Phytochemicals Screening

The extract was tested for the presence of bioactive compounds by using standard methods (Sofowra, 1993; Trease, Evans, 1989; Harborne, 1973)

The methanol, acetone, n-hexane and aqueous leaves extracts were screened for different phytochemicals constituents' viz., glycosides (Aiyegroro, Okoh, 2010; Silva *et al.*, 2017), carbohydrate (Raaman, 2006; Singh, Kumar, 2017), reducing sugars (Raaman, 2006; Singh, Kumar, 2017), protein & amino acids (Silva *et al.*, 2017; Raaman, 2006), flavonoids (Singh, Kumar, 2017; Gul *et al.*, 2017), saponins (Raaman, 2006; Tiwari *et al.*, 2011; Rauf *et al.*, 2013) alkaloids (Silva *et al.*, 2017; Raaman, 2006, Auwal *et al.*, 2014; Singh, Kumar, 2017), tannins (Tiwari *et al.*, 2011; Pandey, Tripathi, 2014), phenol (Raaman, 2006; Tiwari *et al.*, 2011), terpenoids (Gul *et al.*, 2017), Gum & Mucilages (Raaman, 2006), Fixed Oils and Fat (Raaman, 2006; Nanna *et al.*, 2013), and resins (Singh, Kumar, 2017; Kumar *et al.*, 2013).

RESULTS AND DISCUSSION

Results obtained for qualitative screening of phytochemicals leaves extracts of Sida Sivarajaniiin four different solvents are shown in Table 1. It is seen that most of the compounds were present in the aqueous extract except Coumarin Glycosides Protein & Amino acids, Carbohydrate & Reducing Sugars, and Gum&Mucilages. The preliminary phytochemicals study reveals that the presence of Alkaloids, Tannins, Flavonoids, Terpenoids, Cardic, Anthraquioneare present in water, n-hexane and methanol solvents. The extract exhibits the presence of Alkaloids, Tannins, Flavonoids, Terpenoids, Cardic, Anthraquionein water, n-hexane and menthol extract but absent in acetone extracts. Phytochemicals tests such as tannins and phenolic compounds, polysterols, terpenoids, and resins are present in water and methanol extracts and absent in ether extract. The results of screening test revealed the presence of medically active compounds in leaves.

Figure 1. Photo plate of *Sida sivarajanii* Tambde, Sardesai & A.K. Pandey
A- Habitat, B- Flowers C- Young & Mature Fruits

Table 1: Qualitative Phytochemicals Analysis of leaves of *Sida Sivarajani* L. f. extracts

S. No	Phytochemicals constituents	Water	n-hexane	Methanol	Acetone
1	Saponins	+	-	-	+
2	Alkaloids	+	+	+	+
3	Tannins	+	+	+	-
4	Flavonoids	+	+	+	-
5	Terpenoids	+	+	+	-
6	CardicGlycosides	+	+	-	-
7	Anthraquione	+	+	+	+
8	Coumarin Glycosides	-	-	+	-
9	Protein &Amino acids	-	-	-	-
10	Carbohydrate &Reducing Sugars	-	-	-	-
11	Fixed oil & fats	+	-	-	+
12	Gum &Mucilages	-	+	-	+
13	Resins	+	+	-	+

'+' represents the presence of compounds; '-'represents the absence of compounds

CONCLUSION

The present study was carried out to determine the qualitative phytochemicals constituents present in the extracts of *Sida Sivarajani*. The result reveals that the aqueous extract of plant material showed maximum phytochemicals constituents. The same extract could be utilized for the isolation of further bioactive metabolites. The study also provides a strong evidence for the use of extract to treat various pharmacological activities. It was concluded that the plant is rich in phytochemicals with significant medicinal applications.

CONFLICTS OF INTEREST

The authors declare that they have no potential conflicts of interest.

REFERENCES

Aiyegroro, O.A., Okoh, A.I. (2010). Preliminary phytochemical screening and in vitro antioxidant activities of aqueous extract of *Helichrysum longifolium* DC. *BMC Compl. And Alt. Med.*, 10, 21.

Auwal MS, Saka S, Mairiga IA, Sanda KA, Shuaibu A and Ibrahim A (2014). Preliminary Phytochemical and elemental analysis of aqueous and fractionated pod extracts of *Acacia nilotica* (Thorn mimosa). *Veterinary Research Forum*; 5(2), 95-100.

Gul R, Jan SU, Syed F, Sherani F, Nusrat Jahan (2017). Preliminary Phytochemicals Screening, Quantitative Analysis of Alkaloids, and Antioxidant Activity of Crude Plant Extracts from *Ephedra intermedia* Indigenous to Balochistan. *The Scientific World Journal,* Article ID 5873648

Handral H.K., Pandith A., Shruthi S.D. (2012) A review on *Murraya koenigii*: Multipotential medicinal plant. *Asian J. Pharm. Clin. Res.*, 5, 5–14.

Harborne, J.B. (1973). Phytochemicals Methods. Chapman and Hall Ltd., London, 49-188.

Kumar RS, Venkateshwar C, Samuel G, Rao SG (2013). Phytochemical Screening of some compounds from plant leaf extracts of *Holoptelea integrifolia* (Planch.) and *Celestruse marginata* (Grah.) used by Gondu tribes at Adilabad District, Andhrapradesh, India. *International Journal of Engineering Science Invention*. 2(8), 65- 70.

Nanna RS, Banala M, Pamulaparthi A, Kurra A, Kagithoju S (2013). Evaluation of Phytochemicals and Fluorescent Analysis of Seed and Leaf Extracts of Cajanus cajan L. *International Journal of Pharmaceutical Sciences Review and Research.*; 22(1), 11-18.

Pandey A and Tripathi S (2014). Concept of standardization, extraction and pre phytochemical screening strategies for herbal drug. *Journal of*

Pharmacognosy and Phytochemistry; 2(5), 115-119.

Raaman N. Phytochemical Techniques (2006), New India Publishing Agency, New Delhi, 19-24.

Rauf, A., Jan, M., Rehman, W., & Muhammad, N. (2013). Phytochemical, phytotoxic and antioxidant profile of *Caralluma tuberculata* NE Brown. *Wudpecker Journal of Pharmacy and Pharmacology*, 2(2), 21-25.

Silva GO, Abeysundara AT, Aponso MM (2017), Extraction methods, qualitative and quantitative techniques for screening of phytochemicals from plants. *American Journal of Essential Oils and Natural Products.*; 5(2), 29-32

Singh V, Kumar R. (2017). Study of Phytochemical Analysis and Antioxidant Activity of Allium sativum of Bundelkhand Region. *International Journal of Life Sciences Scientific Research*.; 3(6),1451-1458.

Sofowra, A. (1993) Medicinal Plants And traditional Medicine In Africa. Spectrum Books Ltd., Ibadan, Nigeria, 191-289.

Tambde G., Sardesai M.& Pandey A.K. (2020) *Sida sivarajanii* (Malvaceae): a new species from India, *Phytotaxa*, 428 (2), 104–112.

Tiwari P, Kumar B, Kaur M, Kaur G, Kaur H (2011). Phytochemicals screening and Extraction: A Review. *Internationale Pharmaceutica Sciencia.*; 1(1), 98- 106.

Trease, G.E., Evans, W.C. (1989). Pharmacognosy, Bailliere Tindall, London, 11, 45-50.

Ujowundu C.O., Okafor O.E., Agha N.C., Nwaogu L.A., Igwe K.O., Igwe C.U. (2010) Phytochemical and chemical composition of *Combretum zenkeri* leaves. *J. Med. Plants Res.*, 4, 965–968.