

Preliminary Phytochemical Analysis of *Sida angustifolia* Mill., Plant Specimen from Malvaceae Family

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Abstract: The present research paper represents the preliminary phytochemical screening of the crude extract of *Sida angustifolia* Mill., plant belongs to the Malvaceae family exposed to find out the presence of various bioactive components. The specimen shows the occurrence of Alkaloids, Flavonoids, Phytosterols, Carbohydrate, Phenolic compounds and Tannins mostly while Glycosides, Saponins, Proteins and Free Amino Acids and Gums and mucilage in trace amount. The diversity of phytochemicals found suggests that *Sida angustifolia* Mill., could serve as a source of useful drugs for future.

Keywords: *Sida angustifolia* Phytochemical, Alkaloid, Flavonoids, Phytosterols, Tannin.

I. INTRODUCTION

Medicinal plants are part and parcel of human society to combat diseases, from the beginning of civilization (Biswas *et. al.* 2002). According to the World Health Organization, 2003 about 80% of the population of developing countries being unable to afford pharmaceutical drugs rely on traditional medicines, mainly plant based, to sustain their primary health care needs (Goyal *et. al.* 2008).

Herbal medicines are in great demand in the developed as well as developing countries for primary healthcare because of their wide biological and medicinal activities, higher safety margins and lesser costs (Crag *et. al.* 1997 and Padma 2005).

Sida L. is one of largest genera in family Malvaceae with ca. 250 species distributed mainly in tropical and subtropical areas of the world. Some species of *Sida* L. as *S. acuta*, *S. codifolia*, *S. indica*, *S. cordata*, *S. alnifolia*, *S. fryxelli*, *S. mysorensis*, *S. rombofolia*, *S. retusa*, and *S. spinosa* has been screened out for the phytochemical evaluation due to medicinal value they have (Rameshree *et. al.*, 2008, Ekpto *et. al.*, 2009, Nalubega *et. al.*, 2014, Richa *et. al.*, 2014, Selvadurai 2017, Gulnaz *et.al.*, 2018, Raj *et. al.*, 2018, Asha *et. al.*, 2018, Dhanapalvenkatachalam *et. al.* 2019, Bakut *et. al.*, 2020, Rajeswari *et. al.*, 2020 and Margaret *et. al.*, 2021) which shows the occurrence of different phytochemical and microbial activity. The extensive survey of literature shows the lack of information on phytochemicals study of the *S. angustifolia* Mill., hence the plant material is selected for the preliminary phytochemical screening.

1.1 Morphological Description of *S. angustifolia* Mill.

Annual or perennial herbs or suffrutices, erect or prostrate, glabrous or pubescent or pilose to densely tomentose or velutinous. Leaves usually undivided, serrate or crenate-serrate, occasionally 3-lobed, cuneate to cordate at the base, usually petiolate. Flowers small to medium-sized, usually cream or orange, long- pedicelled to sub-sessile or solitary, clustered or fasciculate in the leaf-axils or arranged in racemes (sometimes subcapitate or subumbellate) or spikes. Epicalyx absent. Calyx shallow- campanulate to saucer-shaped; lobes ovate or triangular, generally acute to acuminate. Petals not clawed. Staminal tube dilated at the base, divided at the apex into several to many free filaments; free parts of filaments terete. Ovary of 5 to many carpels; each with a single pendulous ovule; style terete or sub-clavate; stigmas capitate or truncate. Fruit of 5 to many mericarps ultimately separating from the torus, dehiscent at the apex (or rarely at the base) or indehiscent, smooth, transversely ribbed, glabrous or hairy, usually acute, beaked or awned. Seeds triangular; cotyledons folded; endosperm scanty or absent. (Photo plate - 1)

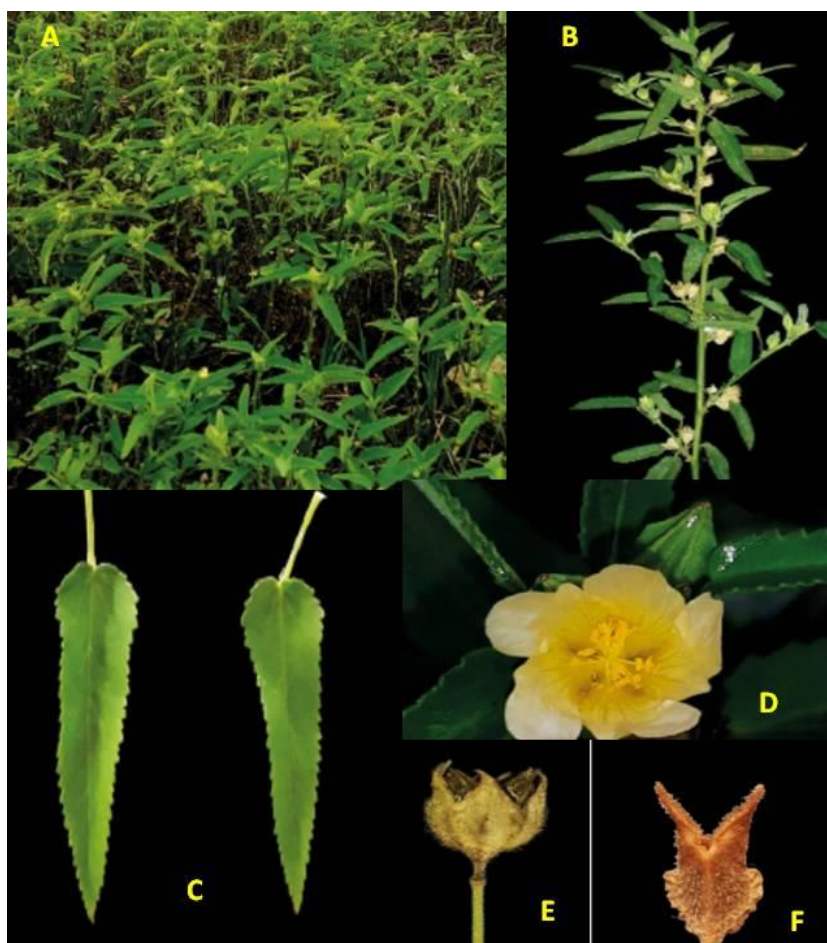


Photo plate 1 - *Sida angustifolia* Mill. – A- Habitat, B- Single Twig, C- Leaves, D- Flower, E- Fruit, F- Mericarp

II. MATERIALS AND METHODS

Sample Collection: Whole plant parts of *Sida angustifolia* Mill., were collected in a separate sterile polythene bags from the Tumsar town (Bhandara district Maharashtra state, India Collected by J. V. Gadpayale), Collected plant parts were examined and identified with the help of regional floras and Taxonomic experts.

Preparation of Solvent Extracts: The cleaned, healthy plant materials are cut in to small sections and dried under shade for three to four weeks. The dried material was ground into fine powder in an electric grinder. Powder so obtained was stored in desiccators setup and used for extraction. It was extracted in soxhlet apparatus using various solvents according to their polarity. Petroleum ether extract, Chloroform extract, Acetone extract, Ethanolic extract, Aqueous extract.

Phytochemical Evaluation: The extracts were subjected to find the occurrence of preliminary phytoconstituents present in it viz. alkaloids, carbohydrates, glycosides, Phytosterols, fixed oils & fats, phenolic compounds & tannins, proteins & free amino acids, gums & mucilage, flavonoids, Lignins and saponins. The following results are found-

Table: Preliminary Phytochemical Screening of *Sida angustifolia* Mill.

Sr. No	Phytoconstituents	Petroleum Ether extract	Chloroform extract	Acetone extract	Ethanolic extract	Aqueous extract
1	Alkaloids	-	+	+	++	-
2	Carbohydrates	-	+	+	+	-
3	Glycosides	-	-	-	++	-
4	Flavonoids	-	-	-	+	-



5	Phytosterols	+	+	-	++	-
6	Fixed oils and Fats	+	-	-	-	-
7	Saponins	-	-	-	+	+
8	Phenolic compounds and Tannins	+	+	+	+	+
9	Lignins	+	+	+	-	+
10	Proteins and Free Amino Acids	-	+	-	-	-
11	Gums and Mucilage	+	-	-	+	+

III. RESULTS

All the extracts of *Sida angustifolia* in different solvents were subjected to preliminary phytochemical investigation. More number of phytoconstituents like alkaloids, flavonoids, Phytosterols was found to be present in Ethanolic extract while Glycosides, Saponins, Proteins and Free Amino Acids and Gums and mucilage in trace amount in rest of the extracts.

IV. CONCLUSION

Phytochemicals found present in whole plant of extracts of *Sida angustifolia* Mill., indicates their potential for preparation of novel medicines due to the occurrence of phytoconstituents. Furthermore, isolation purification and characterization of the phytochemicals found present will make interesting studies.

REFERENCES

- [1]. Asha A, Shameema Farsana and EC Baiju (2018) Phytochemical profiling and antibacterial activity of selected *Sida* species against common human pathogenic bacteria: An in vitro study *Journal of Pharmacognosy and Phytochemistry*, 7(3): 1201-1205
- [2]. Bakut, J. M., Tende, Y. A., Agyigra, A. I., Tende, M. O., Zezi, A. U. and Danjuma, N. M. (2020) Preliminary Phytochemical and Toxicity Studies of Aqueous Leaf Extract of *Sida corymbosa* Plant. *American Journal of Plant Sciences*, 11, 1991-1997. <https://doi.org/10.4236/ajps.2020.1112140>
- [3]. B. R. Goyal, R. K. Goyal and A. A. Mehta (2008) Phyto-Pharmacognosy of *Archyranthes aspera*: A Review” *Pharmacog Rev*, vol.1
- [4]. Biswas K., I. Chattopadhyay, R. K. Banerjee and U. Bandyopadhyay (2002) Biological activities and medicinal properties of *Neem (Azadirachta indica)*” *Currnt Sci*, vol.82, no.11,pp.1336-1345
- [5]. Cragg G.M., D.J. Newman and K.M. Snader (1997)“Natural products in drug discovery and development” *J Nat Prod*, vol.60, pp.52-60
- [6]. Dhanapalvenkatachalam et al. (2019) Investigation of pharmacognostical and preliminary phytochemical characters of *Sida cordifolia* *International Journal of Research in Pharmacy and Pharmaceutical Sciences* Volume 4; Issue 3; 35-39
- [7]. Ekpo A., Etim P. C. (2009) Antimicrobial activity of ethanol and aqueous extracts of *Sida acuta* on microorganisms from skin infections. *Journal of Medicinal Plants Research*; 3(9):621-624.
- [8]. Gulnaz A.R et al. (2018) Biological activity and phytochemical screening of different extracts of *Sida cordata* (Burm.F.) borssum root; *IP International Journal of Comprehensive and Advanced Pharmacology* ;3(1):15-18
- [9]. Margaret Emmanuel Bassey1 , Imoh Imeh Johnny2 , Omodot Timothy Umoh1* and Utibe-Ima Monday George1 (2021) Comparative Phytochemical Analysis of the Leaves and Stem of Five Species of *Sida L.* *Journal of Complementary and Alternative Medical Research* 14(3): 26-31
- [10]. Nalubega R., Nyanzi S. A., Nakavuma J. L. (2014) Comparative study of in-vitro antimicrobial activity and phytochemical composition of *Sida cuneifolia* fruits, leaves, and stem bark extracts. *Int J Basic Clin Pharmacol*; 3:781-8

- [11]. Padma T.V. "India Ayurveda", Nature, pp.436-486, 2005.
- [12]. Remashree AB, Jayanthi A and Balachandran I. (2008) Comparative anatomy of six species of Sida, Phytomorphology. 58(3-4):1.
- [13]. Richa S. S. and Sharma M. L. (2014) Phytochemical Investigations and Anatomical Study of Three species of Sida. Biolife, 2(2):622-629
- [14]. Raj and Rajeswari (2018) Preliminary Phytochemical Screening of Sida rhombifolia, L., Using Different Solvents Trends in Biosciences 11(7) 1206- 1211
- [15]. Rajeswari et. al, (2020) Phytochemical Screening of Ethanolic Extract of Whole Plant of Sida Glutinosa Asian J Pharm Clin Res, Vol 13, Issue 4, 65-74
- [16]. Selvadurai S. (2017) Phytochemical Screening of Sida spinosa Linn. (Malvaceae), International Journal of Chem. Tech Research, 10(7): 825-835