



Phytochemical screening of hydro-alcoholic leaf and stem extracts of *Calotropis procera* R.Br.

Monika Gupta^{1*} and Jatinder Pal Singh²

¹Department of Chemistry, Suraj Group of Institutions, Haryana
²Department of Chemistry, Lovely Professional University, Panjab

ABSTRACT

Calotropis procera R.Br., is a perennial shrub, commonly known as Aawk, milkweed or wasteland weed. It is a member of family Asclepiadaceae, leaf and stem were evaluated for its phytoconstituents, which is used in several traditional medicines to cure various diseases. This shrub has been known to possess analgesic, antitumor, antihelmintic, antioxidant, hepatoprotective, antidiarrhoeal, anticonvulsant, antimicrobial, oestrogenic, antinociceptive, and antimalarial activity. The leaves and dry stem were extracted with 70% ethanol and concentrated to obtain residue. Phytochemical screening reveals the presence of alkaloids, cardiac glycosides, flavonoids, steroids, tannins, triterpenoids, carbohydrates and saponins in the hydroalcoholic leaf extract of *Calotropis procera* R.Br.,

Key words: *Calotropis procera* R.Br. and hydroalcoholic leaf extract.

INTRODUCTION

Aawk (*Calotropis procera*) an important drug plant of Ayurveda is known in our country from the ancient time. Being native to India, it grows wild up to 900 m, throughout the country on a variety of soils and in different climates[1]. There are two common species of *Calotropis*, viz. *Calotropis gigantea* (Linn.) and *Calotropis procera* (Ait.) R.Br. described by the Sanskrit writers.

It is a slow growing variety of *Calotropis procera*. Leaves are simple, opposite and sub-sessile ovate and cordate at base. *Calotropis procera* contains latex in almost all parts of the plant. Flowers are beautiful, white in color, in umbellate lateral cymes. Fruits are fleshy follicles, green; seeds attached with abundant white coma[2,3]. Various chemical constituents have been reported from different parts of the plant[4]; The stem, bark of *C. procera* yields resin and wax. The wax contains β -amyrin and its isovalerate, calotropeols-a and b, mixture of tetracyclic triterpene, traces of sterols, C31 and C33 hydrocarbons, fatty acids and giganteol. The leaf contains ascorbic acid, ortho-pyrocatechic acid and also contains β -amyrin, taxasterol, tarasterol and β -sitosterol[5]. Ayurveda system of medicine recommends the use of *C. procera* in the treatment of cutaneous diseases, intestinal worms, cough, ascites, asthma, bronchitis, dyspepsia, paralysis, swellings, intermittent fevers, anorexia, inflammations and tumours. In large doses, it acts as a purgative and emetic[6]. The leaves are useful in conditions like paralysis, swellings, wounds, ulcers, eczema, skin eruptions, cold sweats, asthma and intermittent fevers. The flowers are used to treat asthma, catarrh, anorexia, inflammations and fever[3,7]. Siddha system of medicine recommends the use of root, bark, leaf, flower, latex of *C. procera* in diseases of vattam and kapham, snake bite, rat bite poisonings, leprosy, convulsions, swelling in joints, worm infestations and skin diseases[8].

EXPERIMENTAL SECTION

The leaves of *Calotropis procera* were collected, washed thoroughly with water, dried under shade at room temperature and powdered using hand mill to make a coarse powder and stored in well-closed light resistant container until further used.

Preparation of the extracts

Powdered plant material is subjected for cold maceration with ethanol (70%), the solvent was then separated by filtration and the marc is air-dried. The air dried marc was subjected for extraction with alcohol using Soxhlet apparatus at 50°C. Materials were extracted until liquid in the side arm of the Soxhlet apparatus became colorless. Mucilla were collected and combined with the macerates and subjected for solvent recovery using rotary evaporator. The extract is then dried in reduced pressure using vacuum. The dried extract is then stored at low temperature (4°C) for further use. The extract is screened for phytochemical investigation as per protocol [9-12].

Table 1: Preliminary phytochemical constituents present in the hydro-alcoholic leaf and stem extract of *Calotropis procera*

S. No.	Chemical constituent	Test	HLE		
1.	Alkaloids	Mayer's test	+		
		Wagner's test	+		
		Dragendorff's test	+		
		Hager's test	+		
2.	Glycosides	Chrysorbin test	+		
		Legal test	+		
		Molisch test	+		
		Fehling test	+		
		Benedict's test	+		
3.	Carbohydrates	Barfoed's test	+		
4.	Proteins	Biuret's test	-		
		Xanthoproteic test	-		
		Liebermann buchard test	+		
		Salkowski test	+		
5.	Steroid	Sulphur test	+		
		Acetic anhydride plus H ₂ SO ₄ test	-		
		Ferric chloride test	+		
6.	Tannins	Salkowski test	+		
		Liebermann starch morawski test	+		
7.	Triterpenes	Hirschorn test	+		
		Tschujawes test	+		
		Ferric chloride test	+		
8.	Flavanoids	Shinoda test	+		
		10% NaOH	+		
		10% Lead acetate	+		
		Mineral acid test	+		
		Zinc dust test	+		
		9. Saponins		Lieberman buchard sterol reaction	+
				Salkowski reaction	+

RESULTS AND DISCUSSION

The present study attempts the evaluation of leaf of *C. procera* for preliminary phytochemical studies. In this study, preliminary phytochemical screening reveals the presence of alkaloids, cardiac glycosides, flavonoids, steroids, tannins, triterpenoids, carbohydrates and saponins in the hydro-alcoholic leaf extract of *C. procera* (Table 1).

REFERENCES

- [1] MB Yelne; PC Sharma and TJ Dennis. Central council for research in Ayurveda and Siddha, New Delhi; **2000**, Vol. 2, 69-73.
- [2] M Srivastava ;NU Siddiqui and M Aslam. *Oriental J. Chem.*, **2006**, 22(2), 393-396.
- [3] <http://ayurvedicmedicinalplants.com/plants/581.html>.
- [4] PB Murti ; and TR Seshadri. *Proc. Indian Acad. Sci.*, **1945**, 21, 147-154.
- [5] P Shilpkar; MayurSha and DR Chaudhary, *Curr. Sci.*, **2007**, 92(4), 435-437..
- [6] G Balamurugan ;P Muralidharan and S Selvarajan, *J. Sci. Res.*, **2009**, 1(1), 153-159.
- [7] <http://www.herbsguide.net/arka.html>
- [8] SN Yoganarasimhan, *Medicinal Plants of India*, Vol. 1, Interline Publishing Pvt. Ltd., Bangalore. **1996**, p. 88.
- [9] TE Wallia, *Text Book of Pharmacognosy*, 5th Edn., CBS Publishers and Distributors, New Delhi, **1985**.

[10] KRKhandelwal;CK Kokate;AP Pawarand SB Gokhle.*PracticalPharmacognosy*, 1st Edn., Nirali Prakashan. **1995**.

[11]M Gupta; A Gupta and S Gupta.*International J. of Indigenous medicinal Plants*.**2013**, 46(2), 1196-1199

[12]M Gupta;S Thakur; A Sharma and S Gupta.*Oriental Journal of Chemistry*. **2013**,29(2), 475-481