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Phytochemical Profile and Ethanomedicinal uses Anatomy, Anti-Microbial Activity of Asclepias CurassavicaL

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Abstract: ***Since, ancient times, the plants have been a veritable source of drugs. Different extracts from traditional medicinal plants have been tested to identify the source of the therapeutic effects. AsclepiascurassavicaL. (leaf) extract made in Methanol, Petroleum ether contains different secondary metabolites (Phytochemicals) with biological activity that can be of therapeutic index. preliminary Phytochemical screening of plant parts of AsclepiascurassavicaL.. It is interesting to note that the action of the extracts of AsclepiascurassavicaL. is nontoxic. The obtained result provide a support for the use of this plant in traditional medicine and suggest its further advance investigation. Phytochemical screening of the crude extracts revealed the presence of saponins, tannins, alkaloids, and other phyto constituents which were reported during present investigation were cardiac glycosides, flavonoids, glycosides, steroids, terpens and tannins. The consequences of this work has clarified that many active bioconstituents of AsclepiascurassavicaL..consist effective qualities in its tending action. Thus it may be exploited by Scientists in the development of human medicines and drugs. Herbal medicines have been used from the earliest times to the present day. Herbal medicines exhibit a remarkable therapeutic diversity. Asclepiascurassavica L.is an Ayurvedic plant which is used in several traditional medicines to treat a variety of diseases. Since five different extracts showed antimicrobial activity, it can be predicted that variety of antimicrobial compounds are present in this plant. After 24h the plates were observed for zone of inhibition***

Keywords: Phytochemical Profile, Ethno medicinal uses ,Anatomy, Anti-Microbial Activity

1. Introduction

Since ancient time, human beings have always been mostly depended on plant resources for their basic needs like food, medicine, fiber, fodder, shelter, etc. Formerly, they were directly dependent on plants, but due to modernization and with advancement of science and technology this dependence on plants as a direct source has been slightly reduced. All the same, the tribe's and other aboriginal people, who have traditionally lived in the forests, continue to remain fully dependent on plants for their survival. Living close to the nature, the people residing in and nearby forests have assimilated unique knowledge about plant utilization for different purposes through the course of their centuries old experience. Therefore, ethno botanical studies of different tribal localities may lead to find new information on unexploited natural resources and new uses of existing resources as sources of medicine, food, etc. But at some places recent changes in tribal attitude due to habitat displacement, deforestation, modernization, etc. have led to decline and even disappearance of this rich knowledge system. Therefore, it is essential to gather their entire knowledge on plant use before losing it forever. It is well understood now that in one or more ways man's life has always been intimately connected with the plants. There is practically no human activity in which plants do not play a role. Therefore, in widest sense, ethno botany has a linkage with almost every other faculty of science and field of knowledge. Today ethnobotany has become an important and crucial area of research and development in medicine research, conservation of biodiversity at genetic, specific and ecosystem level and well considered in socio-economic development of the region. In the recent past there has been a global trend towards revival of interest in the indigenous system of medicine. Even the developed countries equipped with modern allopathic medicines, have started realizing the potentialities of traditional system of medicine. Furthermore, the searches for new herbal drugs have been strengthened by the widespread rejection of chemicals and the growing attraction for herbal remedies. There is an increasing awareness among the people about the use of herbal drugs, which are believed to be safe and do not produce undesirable side effects like most of the modern synthetic drugs and this awareness is one of the reasons, which created enormous worldwide demand for herbal drugs.

Presently, the importance of ethnobotanical research mainly for medicine and food is keenly felt, as it represents one of the best avenues for searching new economic plants for food and medicine. In recent years several workers became attracted in ethnobotanical studies and a lot of information about different uses of plants prevalent among the various tribes has been gathered. The recent rediscoveries of certain remarkable uses of plants gave new life to this ancient science of ethnobotany. Several plants (eg. cocoa, maize, rubber, etc.) used today, were originally identified and developed through indigenous knowledge, the chemical constituents like tranquilizers, rescinnamine and reserpine have been obtained from the roots of Rauvolfiaserpentina, used in India for more than a thousand years in folk medicine for snake bite (Maheshwari, 1996). A recent drug, 'Jeevani' is being produced from the plant Trichopuszeylanicusssp. travancoricus, which is having strong energy enhancing properties. The drug is seen as a rival to the South Korean root ginseng (Pinax ginseng). Other examples where ethnomedicines have provided lead in the development of drugs used in modern system of medicine are cocaine, morphine, quinine, colchicines, atropine, ephedrine, codeine, emetin,caffeine, reserpine, vinblastine, gugulin and taxol, etc.

(MehrotraShanta, et al., 1996) The importance of primitive attempts in ethnobotany for medicinal uses of plants were based on speculations only but in present age such medicinal plants have great importance due to the fact that many alkaloids and other important chemicals are being isolated from plants by using better techniques of chemical analysis and isolation methods, however, much work has still to be done, as new medicinal uses of plants are being reported continuously by several workers from different localities.

In traditional medicine AsclepiascurassavicaL.

1) Acts as an emetic and controls edema,vitilligo, hemorrhoids, suppresses aggravated disorders and skin diseases.
2) The plant species AsclepiascurassavicaL and mentioned in the official pharmacopoeias of Ayurveda
3) The overall objectives of the present paper investigates Anatomy, Micro and Macroscopic, studies have been done to authenticate threw material of original plant material.
4) This research is a best of botanical sources allied to Ayurvedic drug adulterations with pharmacognostical studies.
5) Plant-derived substances have recently become of great interest owing to their versatile applications. Medicinal plants are the richest bio-resource of drugs of traditional systems of medicine, modern medicines food supplements, folk medicines, pharmaceutical intermediates and chemical entities for synthetic drugs.
6) Extraction (as the term is pharmaceutically used) is the separation of medicinally active portions of plant (and animal) tissues using selective solvents through standard procedures.
7) The products so obtained from plants are relatively complex mixtures of metabolites, in liquid or semisolid state or (after removing the solvent) in dry powder form, and are intended for oral. or external use. These include classes of preparations known as decoctions, infusions, fluid extracts, tinctures, pilular (semisolid) extracts or powdered extracts.
8) Antimicrobial activity the antimicrobial activity of plant extracts were tested by agar disk diffusion method (1). Antimicrobial activity of each plant extract was tested against four bacteria: Bacillus subtilis, Staphylococcus aureus, Pseudomonasaeruginosa and E.coli.The MHA (Mueller Hinton Agar) was prepared and poured in the plates after sterilization. The plates were allowed to solidify for 15 min. Then 0.1 ml of 24hr old culture of test organism was transferred in sterile MHA plate aseptically and spreader with the help of glass spreader. Sterile 5mm whatman filter paper disks were loaded with plant extract and placed over inoculated plates. The plates were then incubated at 37^0C for 24h. After incubation the plates were observe for zone of inhibition. The diameter of zone of inhibition was recorded for the positive plates.

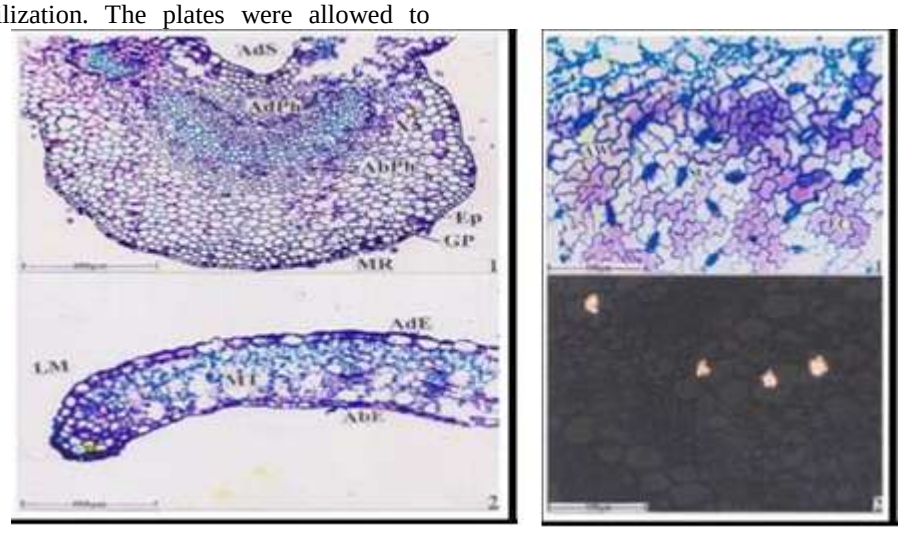
2. Results and Discussion

1. **Ethanomedicinal Uses**
AsclepiascurassavicaL.
Uses:
Med.:

1) *Cough: Root extract 20-30ml taken to treat cough for 2-3 days.
2) Intestinal worms: Leaf juice 2-10ml mixed with curd and taken as an anthelmintic.
3) Wounds: Leaf powder mixed in oil and applied on wounds.

Anatomy of Asclepiascurassavica
Microscopic Features
The midrib is broadly convex and semicircular on theabaxial side and shallow wide concavity on the adaxialside. The vascular strand is 500 mm thick wide and 160□m thick (Figure 1.1). The marginal part of the lamina isblunt, semicircular and 200 □m thick (Figure 1.2). The epidermal cells are fairly thick walled, their anticlinal wallsare highly wavy and the cells appear amoeboid (Figure2.1). The druses are small and diffuse in distribution(Figure 2.2). They are 10 □m in diameter. The veinterminations are simple unbranched and curved (Figure3.1). The vein terminations are branched repeatedlygiving rise to dendroid outline of the terminations (Figure3.2). The xylem cylinder is 700 □m thick. Secondary xylemincludes narrow straight xylem rays, angular vessels andxylem fibers (Figure 4.1). The root is 2.6 mm thickshowing well developed periderm, secondary phloem andsecondary xylem (Figure 5.1). The cortex includes three to five layers of parenchyma cells including a single layer ofcorticalfibers (Figure 5.2).

2. Anatomy



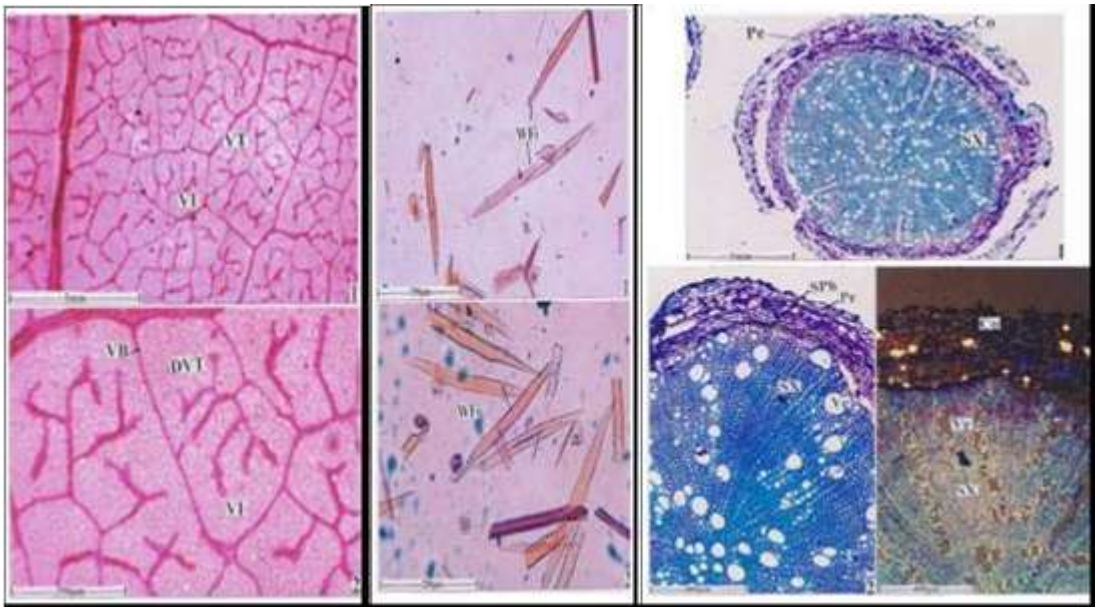


Figure 2: Anatomy And Powder Microscopy of AsclepiascurassavicaL

Detail for the Figures

Figure 1.1: T.S. of midrib; Figure 1.2: T.S. of leaf margin; Abph: Abaxial phloem; AdE: Adaxial epidermis; AdS: Adaxial side; Ep:Epidermis; Gp: Ground plan; LM: Leaf margin; MR: Midrib; MT: Mesophyll tissue; X : Xylem; Adph: Adaxial Phloem; AbE: Abaxialepidermis; Figure 2.1: Paradermal view of epidermal cells and stomata; Figure 2.2: Calcium oxalate crystals in the mesophyll tissue as seen under polarized light; Aw: Anticlinal wall; EC: Epidermal cell; St: Stomata; Figure 3.1: Venation pattern; Figure 3.2: Vein-islet and vein terminations enlarged; DvT: Dendroid vein termination; VB: Vein boundary; VI: Vein-islet; VT: Vein-termination; Figure 4.1: T.S. of petiole entire view; Figure 4.2: A sector enlarged; Lf: Laticifer; Vs: Vascular strand; Figure 5.1: T.S. of stem showing cortex, outer of inner phloem and secondary xylem; LfCrystal DistributionCalcium oxalate crystals of druses are sparsely distributedin the mesophyll cells. The druses are small and diffuse indistribution with 10 □m in diameter. Crystals are sparelydistributed in the cortex (Figure 2.2 & 5.3).

Powder Microscopy

Powder or macerated preparation of the plant showsmostly fibers and vessel elements.

Wide fibers: The wide fibers are short and spindle shaped(Figure 6.1). The walls are thin and the lumen is wide. Nopits are seen on the walls cells inclusions also absent. Thewide fibers are 350 □m long and 20-30 □m wide (Figure6.2).

1) Epidermal cells and stomata
   The adaxial epidermis as seen in surface view consists ofpolyhedral, thin walled cells with straight anticlinal walls
2) Laticifer
   Narrow, unbranchedlaticiferous canal is seen situatedwithin the vascular strand. The laticifer runs all along theveins. It is darkly stained (Figure 2.3).
3) Crystals
   Calcium oxalate crystals are abundant in the epidermalcells. Crystals in the form of thin short needles whichaggregated into prominent fan-shaped masses. Fan shaped masses of needles of crystals are againaggregated into large groups which are mostly stellate inappearance (Figure 3.1, 2, 3)
4) Stem
   Stem measuring 1.9 mm thick was studied. The stem isfairly young with limited extent of secondary growth. The epidermis is thin and intact. Cells are small and squarish. Cortex is heterogeneous. It consists of outer 2or 3 layers of chlorenchyma and inner entire region ofparenchyma. In the median zone of the cortex occur several large masses of sclerenchyma arranged in aregular ring (Figure 4.1, 2).
5) Root
   Thin root, measuring 1 mm in diameter consists of anarrow superficial periderm which is 4 layered. The cellsare thin walled and tabular in shape; they are suberised. Secondary phloem elements are in compact radial row'sradiating from the xylem core. Inner to the periderm is anarrow zone of 6 or 7 layers of compact cortical parenchyma cells. (Figure 5.1)The vascular cylinder is circular with central dense core ofxylem surrounded by outer zone of secondary phloem.Secondary xylem comprises much wider vessels as wellnarrow vessels, both type being intermixed. The vessels are circular and thick walled. The vessels are surroundedby highly thick walled and lignified fibers (Figure 5.2).

Powder microscopic observations

The powder of the plant exhibits the following inclusions.There are narrow and wide fibers in the powder. Vessel elements: The vessel elements are wide and cylindrical. They havewide, circular perforations at end walls; the perforation ishorizontal in orientation. Dense, multiseriate borderedpits are abundant on the lateral walls. The vesselelements are (Figure 6.1, 2, 3)

Table 1: Phytochemical Screening of AsclepiascurassavicaL.

Sr. No.	Phytochemical Test	Name of test	Aquous extract of *AsclepiascurassavicaL*. leaves	Ethanolic extract of *AsclepiascurassavicaL*.leaves	Chloroform extract of *AsclepiascurassavicaL* .leaves
1.	Alkaloids				
1.1		Mayer'sreagent test	+ve	-ve	-ve
1.2		Wagner's reagent	+ve	-ve	-ve
1.3		Hager'sreagent test	+ve	-ve	-ve
2.	Carbohydrates				
2.1		Molish's test	-ve	-ve	-ve
2.2		Bendicts test	-ve	-ve	-ve
3	Test for Reducing Sugar's				
3.1		Fehling's test	-ve	-ve	-ve
4	Flavonoids				
4.1		Alkaline reagent test	+ve	-ve	+ve
4.2		Lead acetate test	+ve	-ve	–ve
5	Glycoside				
5.1		Borntrager test	-ve	-ve	+ve
5.2		Legal's test	-ve	-ve	+ve
5.3		Killer- Killiani test	-ve	-ve	+ve
6.	Tannin				
6.1		Ferric chloride test	–ve	-ve	+ve
6.2		Lead Acetate test	+ve	-ve	+ve
6.3		Dilute Sulphuric acid test	+ve	+ve	-ve
7.1	Phenol		-ve	-ve	+ve
8.	Saponin				
8.1		Faom Test	+ve	-ve	-ve
9.	Test for Proteins and amino acid				
9.1		Ninhydrin test	+ve	–ve	-ve
9.2		Biuret test	+ve	-ve	-ve
10.	Test for Fats and Oils				
10.1		Solubility test	+ve	-ve	-ve
11.	Testfor Diterpenoids and Steroids				
11.1		Salwonski Test	+ve	+ve	+ve
11.2		Libberman and Burchard's test	+ve	+ve	+ve
12.	Phytosterols		-ve	-ve	+ve
13.	Xanthoproteic test		+ve	-ve	-ve

1. Antimicrobial activity *Asclepiascurassavia*

Table 2: Antimicrobial activity of *Asclepiascurassavia*

Sr. No.	Type of extract	Diameter of zone of inhibition (mm)			
		E.coli	P. aeruginosa	B. subtilis	S. aureus
1	Aqueous (Hot)	0	0	0	0
2	Aqueous (cold)	0	0	6	0
3	Petroleum ether (Hot)	0	0	0	9
4	Petroleum ether(cold)	0	0	0	6
5	Chloroform (Hot)	0	0	0	9
6	Chloroform(cold)	0	0	0	10

Out of six extracts five extract showed antimicrobial activity. Cold aqueous extract showed antimicrobial activity against B. subtitles. However hot aqueous extract didn't showed activity against any bacteria. This indicates that active compounds present in aqueous extract are heat labile.

Both petroleum ether extract showed antimicrobial activity against S. aureus. Both chloroform extracts also showed antimicrobial activity against S. aureus. But hot extract has more activity than cold extract. This indicates heat increases the solubility of active compound. In case of petroleum ether hot extract has more activity than cold extract. This indicates heat increases the solubility of active compound. All the extract were specific for gram positive organisms only. Gram positive bacteria are resistant to this plant extracts.

Since five different extracts showed antimicrobial activity, it can be predicted that variety of antimicrobial compounds are present in this plant. After 24h the plates were observed for zone of inhibition

3. Conclusion

Since, ancient times, the plants have been a veritable source of drugs. Different extracts from traditional medicinal plants have been tested to identify the source of the therapeutic effects. AsclepiascurassavicaL. (leaf) extract made in Methanol, Petroleum ether contains different secondary metabolites (Phytochemicals) with biological activity that can be of therapeutic index. preliminary Phytochemical screening of plant parts of AsclepiascurassavicaL.. It is interesting to note that the action of the extracts of AsclepiascurassavicaL. isnontoxic. The obtained result provide a support for the use of this plant in traditional medicine and suggest its further advance investigation. Phytochemical screening of the crude extracts revealed the presence of saponins, tannins, alkaloids, and other phytoconstituents which were reported during present investigation were cardiac glycosides, flavonoids, glycosides, steroids, terpens and tannins. The consequences of this work has clarified that many active bioconstituents of AsclepiascurassavicaL..consist effective qualities in its tending action. Thus it may be exploited by Scientists in the development of human medicines and drugs.Herbal medicines have been used from the earliest times to the present day. Herbal medicines exhibit a remarkable therapeutic diversity. AsclepiascurassavicaL.is an Ayurvedic plant which is used in several traditional medicines to treat a variety of diseases.. *Cough: Root extract 20-30ml taken to treat cough for 2-3 days.

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