



E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2016; 5(6): 38-42
Received: 06-09-2016
Accepted: 07-10-2016

AB Chate

Adarsh Shikshan Prasarak
Mandl's K.T. Patil College of
Pharmacy, Osmanabad,
(Maharashtra), India.

SB Tole

Adarsh Shikshan Prasarak
Mandl's K.T. Patil College of
Pharmacy, Osmanabad,
(Maharashtra), India.

Dr. SM Patil

Adarsh Shikshan Prasarak
Mandl's K.T. Patil College of
Pharmacy, Osmanabad,
(Maharashtra), India.

Medicinal plant of Ayurveda and their prospect in modern drug research

AB Chate, SB Tole and Dr. SM Patil

Abstract

The present study deals with the medicinal plant of Ayurveda and their prospect in modern drug research. The Ayurveda including medicinal plant like *Thevetia Peruviana* there uses, Activity and the isolation of new drug in modern drug research on pharmaceutical concept. The *Thevetia Peruviana* as a using to there *Thevetia A* and *Thevetia B*, others include *peruvoside*, *nerrifolin*, *thetoxin* and *ruvoside*. The study deals with *Digitoxigenin* and *Cannogenin* identification of modern drug research from *Thevetia Peruviana*.

Keywords: medicinal plant, ayurveda, modern drug research

1. Introduction

Ayurveda is a traditional indigenous system of medicine is a part of the rich and vast Indian Heritage. In Sanskrit the term Ayurveda consists of two words; Ayur-life and Veda-science (Science of life). The main objective of Ayurveda is to protect 'Ayush' which include healthy living along with theoretical of measure that related to physical, mental, social and spiritual hormone. It is a traditional system in India and is recognised in another part of word as an alternative system of medicine.

For cardiac diseases, herbal treatments have been used in patients with congestive heart failure. Several plants, including *Terminalia Arjuna*, *Inula recemosa*, and *Astragalus membranaceus*, have been found to have Therapeutic usage for the treatment of Cardiovascular Disease. The bark of the *Terminalia Arjuna* tree has a long history of used as a cardiac tonic as well, and has been indicated in the treatment of coronary artery disease, heart failure, hypercholesterolemia, and for relief of angina pain.

Inula recemosa is another traditional Ayurvedic botanical that has potential cardio protective benefit. In human trials, a combination of *Inula recemosa* and *Commiphora mukul* was shown to superior to nitro-glycerine in reducing the chest pain and dyspnea associated with angina.

Cardiovascular Disease is a term used to describe a large range of diseases that affect the heart or blood vessel. There are various diseases considered as Cardiovascular Disease includes coronary artery disease, heart attack, heart failure, high blood pressure and stroke. The term Cardiovascular Disease is often used interchangeably with "heart disease" because both terms refer to diseases of the heart or arteries. Whatever name is used Cardiovascular Disease or heart disease it is clear that diseases of the heart and blood vessels are serious problems. Cardiovascular Disease is the number one worldwide killer of men and women.

In this region, 48.6 percent of deaths were caused by Cardiovascular Disease in the year 2000. By 2020, 46.4 percent deaths are expected to be attributable to Cardiovascular Disease in this region. Moreover, Cardiovascular Disease will soon become the main cause of death and disability in the developing world as well; by 2020, a third (33.8 percent) of all deaths is expected to be due to Cardiovascular Disease. In year 2000, 16.7million people died from Cardiovascular Disease, accounting for 30.3 percent of all deaths worldwide; more than half of these deaths were in developing countries. Not only is Cardiovascular Disease a considerable health burden (e.g. high morbidity and high mortality), It causes also a significant health care cost (i.e. economic burden), which will continue to grow as the population ages. In the current set-up, the antiproliferative, anti-hyper cholesterolemic, anti-diabetic, anti-inflammatory effects of spices have overriding importance, as the key health concern of mankind nowadays is diabetes, Cardiovascular Diseases, arthritis and cancer.

2. Pharmacology and Cardiovascular Application

The areas of pharmacological and cardiovascular applications have been investigated and reported by many workers.

Correspondence**AB Chate**

Adarsh Shikshan Prasarak
Mandl's K. T. Patil College of
Pharmacy, Osmanabad,
(Maharashtra), India.

These include: hypolipidemic action (which has been recognized since the Vedic ages) and its anti-inflammatory effect. The hypolipidemic action was pioneered by the laboratory investigations carried out by the research workers based on the postulation of sushruta that guggul is very useful in the treatment of obesity. It is reported that the uptake of LDL-cholesterol from the blood by the liver increase due to Guggulsterones consequently the concentration of LDL also decreases. The stereo isomers E – and Guggulsterones have been reported as main component in Guggulipid (an antagonist ligands for the bile acid receptor farnesoid X receptor (FXR) are responsible for hypolipidemic activity. Cardio protective and anti-hypolipidemic activity of ethyl acetate extract of commiphora mukul has been reported to possess preventive activity against deteriorating changes in serum cholesterol, triglycerides, and plasma fibrinogen level in lab animals. Further, increase in plasma fibrinolytic activity has also been noted. The oleoresin part of guggul, at a dose of 12.5 mg/100g has been noted to produce pronounced anti-arthritis and anti-inflammatory activities. Few side effects such as weight loss, peptic ulcer have been noted in lab animal fed on extract against those, given betamethasone. Clinical study was carried out on patients (35 in number) with rheumatoid arthritis using Guggulipid and based on this study results, does requirement side effects long with change in haematology were recorded. Results of the study were very encouraging and showed the digestive and analgesic activity of Guggulipid with no toxic or side effects. In another study 20 patients with hyperlipidemia were given Guggulipid in two different dose levels and noted to decrease total cholesterol and triglyceride concentration.

3. Congenital Heart Diseases and Cardiovascular Diseases

According to Lokhande et al. (2006) and Caraka samhita of agnivesa, plants are termed as cardiac tonic as follows:

Botanical Name	Family	Useful Parts
Magnifera indica Linn.	Anacardiaceae	Fruit
Gmelina asiatica Linn.	Verbenaceae	Fruit
Carissa carandas Linn.	Apocynaceae	Fruit, Bark, Leaves
Garcinia indica Choisy	Guttifereae	Fruit
Garcinia pedunculata Roxb.	Guttifereae	Fruit
Punica granatum Linn.	Lythraceae	Flowers, Fruits
Citrus medica Linn.	Rutaceae	Fruit

In Ayurveda Emblica officinalis fruits are reputed Rasayanas and rejuvenators. They are extensively used in Ayurvedic preparation for the treatment of a number of diseases and debility stats and are one of the three constituents of triphala (equal parts of three myrobalans, taken without seed).



Fig 1: *Thevetia peruviana*

4. Pharmacological Classification

Botanical name:	<i>Thevetia peruviana</i>
Kingdom:	Plantae
Family:	Apocynaceae
Order:	Gentianales
Genus:	<i>Thevetia</i>
Species:	peruviana

5. Materials and Methods

This plant is native of central & South America, but now frequently grown throughout the tropical and shrub or small tree that bears yellow or orange-yellow, trumpet like flowers and its fruit is deep red/black in color enhancing a large seed that bears some resemblance to a Chinese “lucky nut”. It contains a milky sap containing a compound called Thevetin that is used as a heart stimulant but in its natural form is extremely poisonous, as are all part of the plant, especially the seed. Its leave is long, lance shaped and green colour. Leaves are covered in waxy coating to reduce water loss. Its stem is green turning silver/ gray as it ages.

Thevetia peruviana is cultivated as an ornamental plant and planted as large flowering shrub or tree standards in garden and parks in temp climates. It tolerates most soil and is drought tolerant exposure part full or reflected sun, revels in the water sample is the best soil improve garden soil with good drainage maintenance low periodic pruning and litter cleanup training when young to tree if desired can be grown as shrub or tree outside in warmer will tolerate most kinds of soil as long as they are well drained and are situated in full sun in a sheltered area. Useful as a landscaping plant in warmer climates as it does not need much maintenance.

5.1. Part Use

It is an ornamental plant and mostly all parts of plants are medicinal use these are flowers, leaves, seed and root.

5.2. Toxin

These are toxic to most vertebrates as they contain cardiac glycosides. Many cases of intentional and accidental poisoning of human are known. The toxins are cardenolides called Thevetin A & B; others include Peruvoside, nerrifolin, thevetoxin and rivoside. These are not destroyed by drying or heating. They produce gastric and cardio effects. Antibodies for treatment include atropine and digoxin antibodies and treatment may include oral administration activate charcoal. Ovine polyclonal anti-digoxin fab fragment antibody can be used to treat digoxin poisoning.

5.3. Medicinal Uses

Thevetia peruviana contains a milky sap containing a compound called thevetin that is used as a heart stimulant but in its natural form is extremely poisonous, as are all part of the plant, especially the seed. The toxins are cardenolides called Thevetin A and B (cereberoside), others include Peruvoside, nerrifolin, thevetoxin and ruvoside. These cardenolides are not destroyed by drying or heating and they are similar to digoxin from extract in both the conditions. So, the biochemical analysis is taken only acetone leaf and bark extract of *Thevetia peruviana* plant in laboratory condition.

5.4. Antispermatic activity

This study was conducted to evaluate the antifertility potential of *Thevetia peruviana* in male albino rats with their phytochemical evaluations. Phytochemical examination

showed that plant is rich in active constituents, i.e. amyirin acetate, lupeol acetate, amyirin, lupeol and thevetigenin. *T. peruviana* stem bark of methanol extract administered orally to male rats at the dose level of 100mg/rat/day did not cause any significant reduction in body weight, while the weight of reproductive organs reduced significantly. A significant fall in the total protein and sialic acid content of the testes, epididymides, seminal vesicle and ventral prostate as well as in the glycogen content of testes was also observed, however cholesterol was increased significantly and also cause the decline the spermatogenic elements. In conclusion *T. peruviana* inhibited spermatogenesis in rats.

Table 1: Effect of *Thevetia peruviana* modern drug research anti-inflammatory activity showing following result

Treatment	Dose (mg/kg)	Change in Paw edema mean	%of inhibition
Control	0	0.716 0.070	-----
Indomethacin	10	0.340 0.030	69.7
Carumbelloside-IV	10	0.482 0.040	41.8
Carumbelloside-IV	20	0.435 0.030	52.3
Carumbelloside-IV	40	0.360 0.030	60.4

Table 2: Rf (x100) values of the constituents of the flowers of *Thevetia peruviana*

Compound	Developing solvents*								
	A	B	C	D	E	F	G	H	I
Aglycone from Et2O fraction	-	1	4	17	38	85	39	48	72
A1: Quercetin (Authentic)	-	1	4	17	38	85	39	48	72
Aglycone from Et2O fraction	-	5	-	49	93	67	62	87	94
Kaemperol (Authentic)	-	5	-	50	93	67	62	87	94
Glycoside from EtOAc fraction	6.49	7.45	11.43	20.71	41.12	27.22	32.32	50	64.60

5.6. Antidiarrhoeal and Antimicrobial

The study screened the antidiarrhoeal, antimicrobial and cytotoxic effect of ethanol-extracted leaves of yellow oleander. The extract was tested against castor oil included diarrhoea in a model of albino rats and showed significant antidiarrhoeal activity. Disc diffusion method are used for test the in vitro antibacterial activities of the extract and exhibited poor antibacterial activities against both gram + and gram – bacteria. Ethanol extract leaves of yellow oleander showed narrow zone of inhibition in the bacteria lawns *Shigella flexneri*, *S. typhi*, *S. aureus*. Cytotoxic was determined against brain shrimp nauplii and LC₅₀ of the plant was determined as 627.21microgram/ml. The wide range of LC₅₀ value denotes the safety effect of the extract.

The modern drug research in ayurvedic system of *Thevetia peruviana* of ethanol extract leaves of yellow oleander consist of The animals were grouped as described above to study anti-inflammatory activity. The groups were fasted and treated with drugs/doses similar to that of carrageenan-induced hind paw edema. The drugs were administered one hour before the administration of the cathartic agent, castor oil 0.5 mL/g, p.o. after which the animals were placed individually in a propylene cage lined with P lter paper. The appearance of the P rst wet faeces and the total weights of the

5.5. Anti-Inflammatory

Thevetia peruviana seed contain glucosides of neriifolin, acetylneriifolin and therein. Seed oil distillates of *Thevetia peruviana* have been found to contain anti-bacterial activity. In the present work, the fresh flowers of *Thevetia peruviana* were subjected to phytochemical studies. The result of the study showed that the flower contain quercitine, kaempferol and quercitin-7-o-galactoside. The anti-inflammatory nature of the isolated compound was tested by in vitro method and the result of the study revealed that isolated compound showed a biphasic property.

wet and dry faeces were noted up to the 4th hour after administration of the drug.

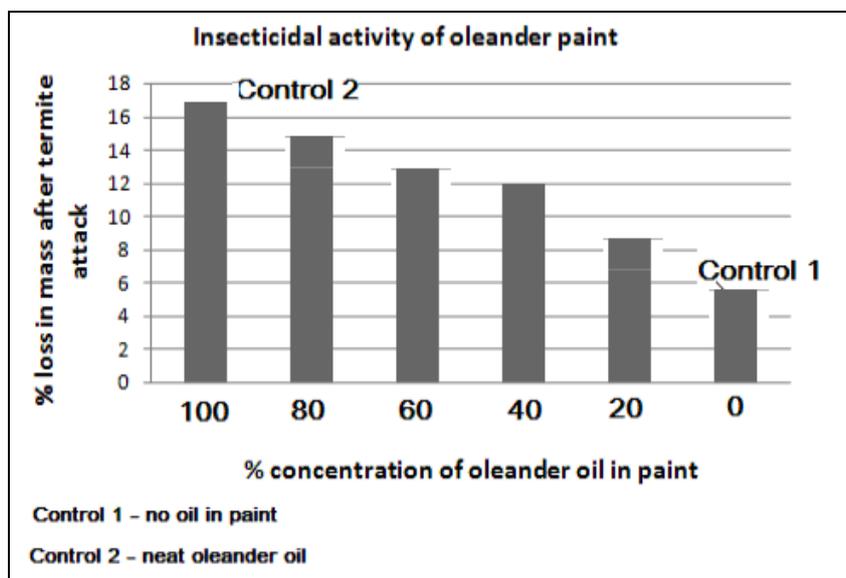
5.7. Anti-termite

Thevetia. peruviana Seed oil was used to make a surface coating with antifungal, antibacterial and anti-termite properties. The paint exhibited inhibitory activity against *E. coli*, *S. aureus*, *Bacillus substalis* and *Candida albicans* in a concentration dependent manner. The repellent action of paint against subterranean termites was significant. From these result, it was concluded that the *T. peruviana* based oil plant was substantially protected wood from subterranean termite attack.

Ayurvedic in modern drug research *Thevetia peruviana* seed oil used to make a surface coating with anti-fungal, antibacterial and anti-termite properties showing following result

5.8. Anti-termite activity

Labeled dry plywood plates (6 x 6 inches) were painted on both sides, (in triplicate) with the formulated paints. One set of control plates was painted with neat oleander oil, while the other was painted with a paint in which Yellow oleander oil was not added.



5.9. Antibacterial and antifungal assays

The procedure followed was as described by Cheesbrough. Inhibition zone diameters for paints were determined against *E. coli*, *S. aureus*, *B. subtilis* and *C. albicans*.

5.10. Flavanone and Flavone Glycosides/Reverse Transcriptase Inhibition

Flavanone and flavonol glycosides from the leaves of *T. peruviana* and their HIV-1 reverse transcriptase and HIV-1 integrase inhibitory activities: Two new flavone glycoside and a new flavonol glycoside were isolated from the leaves of *T. peruviana* and were investigated for their inhibitory effect against HIV-1 reverse transcriptase and HIV-1 integrase.

The modern drug research of flavonol glycoside from the leaves of *T. peruviana* contain is an evergreen flowering shrub belonging to the Dogbane family, Apocynaceae. It grows widely throughout tropical and subtropical regions. Its generic name is yellow oleander.²⁾ The latex of the oleander is poisonous to man, animals and certain insects. Despite its toxicity, oleander has been used as an abortifacient, to treat congestive heart failure, malaria, leprosy, indigestion, ringworm, venereal disease and even as a suicide instrument.³⁾ The leaves have been reported to contain iridoid glycosides,⁴⁾ flavonoids,⁵⁾ triterpenes,⁶⁾ monoterpenes⁷⁾ and cardiac glycosides. From the screening of Thai medicinal plants against HIV-1, an ethanol (EtOH) extract of *T. peruviana* showed high anti HIV-1 (IC₁₀₀ 51.56 mg/ml) and HIV-1 IN inhibitory activity (IC₅₀ 12.0 mg/ml).⁹⁾ Therefore, the EtOH extract of this plant was fractionated further into *n*-hexane, chloroform (CHCl₃), and water (H₂O) soluble fractions.

6. Conclusion

It is quite evident from this review that *T. peruviana* contains a number of Phyto constituents which reveals its uses for various therapeutic purposes. Looking upon wide prospects and potential of *Peruviana* for a various purposes. The plant or its individual parts can be used for the treatment of various disorders in human being such as, diabetes, liver toxicity fungal infection, microbial infection, inflammation, pyrexia and relive pain. Still, so much work is required with the *Thevetia* to investigate the mechanism of action with other therapeutic activities.

7. Result

Medicinal plant of Ayurveda and there prospect in modern drug research in concern with *Thevetia peruviana* of gastric and cardiotoxic effect, application and medicinal uses of Ayurveda was studied.

8. References

- Bandara A, Scott A and Weinstein, Julian White and Michael Eddleston: A review of the natural history, toxicology, diagnosis and clinical management of *Nerium oleander* and *Thevetia peruviana* poisoning. *Toxicology official journal of the international society on Toxicology*. 2010; 56(3):273-281.
- Patil RK, Makari HK, Gurumurthy H. in vitro antimicrobial activity of ethanol extract of *Thevetia peruviana*, ejaefche. ISSN: 1579-4377
- Kokate CK, purohit AP, Gokhale SB pharmacognocny, Nirali prakashan, Thirty second edition. 2005, 201
- Sastri BN. (chief editor). *Wealth of India Thevetia peruviana* New Delhi National Institute of Science communication CSIR, 1, 218
<http://www.Mobot.org/gardeninghelp/plantfinder/plant.asp?code=A551>
Kemper Center: plant's Culture and Characteristics
- <http://ag.arizona.edu/pima/gardening/aridplants/T.peruviana.html>
- Shannon D, Langford & Paul J. Boor Oleander toxicity: an examination of human and animal toxic exposures", *Toxicology*. 1996; 109(1):1-13. Doi: 10.1016/0300-483X(95)03296-R.PMID8619248.
- Rajapakse S. Management of yellow oleander poisoning *Clinical Toxicology* 2009; 47(3):206-212
- Roberts DM, Southcott E, Potter JM. Roberts, Buckley N.A, Pharmacokinetics of digoxin cross-reacting substances in patients with acute yellow oleander (*T. Peruviana*) poisoning, including the effect of activated charcoal" *Therapeutic Drug Monitoring* 2006; 28(6):784-792.
- Bandara V, Weinstein SA, WHITE J, Eddleston M. A review of the natural history, toxicology, diagnosis and *T. peruviana* (yellow oleander) poisoning. *Toxicology*. 2010; 56(3):273-281.
- Eddleston M, Rajapakse S, Rajakanthan S, Jayalath L, Sjostrom, Santharaj W. Anti-digoxin Fab fragments in

- cardio toxicity induced by ingestion of yellow oleander: a randomized controlled trial. *Lancet* 2000; 355:967-972.
12. Kareru PG, Keriko JM, Kenji GM, Gachanja AN. Antitermite and antimicrobial properties of paint made from *T. Peruviana* (pers.) Schum. Oil extract *African Journal of Pharmacy and Pharmacology* 2010; 4(2):L087-089.
 13. Gupta R, Kachhawa JB, Gupta RS, Sharma AK, Sharma MC, Dodhal MP. Photochemical evaluation and antispermatogenic activity of *T. peruviana* methanol extract in male albino rats." *Hum Fertil (Comb)*. 2011; 14(1):53-9.
 14. http://en.wikipedia.org/wiki/Thevetia_peruviana
 15. Ravikumar HS, Patil TR, Kekuda P H. Gurumurthy: In Vitro antimicrobial activity of Ethenol extract of *Thevetia peruviana*. 2008; 2(1).