AYUSHDHARA
ISSN: 2393-9583 (P)/ 2393-9591 (O)
An International Journal of Research in AYUSH and Allied Systems

Research Article

# A STUDY ON *VISHAGHNA* PROPERTY OF *SHANKHPUSHPI* (*CONVOLVULUS PLURICAULIS* CHOIS) W.S.R. TO SUB ACUTE TOXICITY IN ALBINO WISTAR RATS

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**KEYWORDS:** *Shankhpushpi, Convolvulus Pluricaulis, Sub Acute Toxicity, Albino Wistar Rats, Medhyarasayan, Vishaghna,* Hepatotoxicity, Nephrotoxicity.

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## ABSTRACT

*Shankhpushpi* (*Convolvulus pluricaulis* chois) is an indigenous and very significant herb which is considered as a gift of nature in Ayurveda. In Ayurvedic literature, *Shankhpushpi* is considered as *Medhya rasayana* means it enhances the knowledge, memory and retaining power of a person. *Shankhpushpi* which is well described and abundantly available is taken for the *Vishaghna* property also. Although, the *Medhya* property of *Shankhpushpi* is well marketed and used by different pharmaceutical companies but, the *Vishaghna* property of this miraculous drug should be researched and established as it may fulfil the long awaited gap of Ayurvedic antitoxic substance (*Agad*).

In this study 24 albino wistar rats were divided in four groups such as group G1, G2, G3 & G4 with 6 rats in each group. Group G2, G3 & G4 had received PCM in dose 1000mg/kg body weight for 7 days to induce hepato-nephro toxicity while group G1 was normal control group which was kept on normal feeding. After inducing hepato-nephro toxicity the sample drug *Shankhpushpi* in Group G2 in the form of *Churna* and in group G3 in the form of aqueous extract (*Kwatha*) was administered while in group G4 only normal saline was administered for 28 days. On the basis of study it can be concluded that toxicity induced by 1000mg/kg body weight PCM did not cause any neurological manifestations. After 28 days administration of drug *Shankhpushpi Churna* as well as *Kwatha* in group G2 & group G3, body weight and food consumption in this group slightly increased while in group G4 no any significant changes were found. Therapeutic administration of *Shankhpushpi* as *Churna* as well as *Kwatha* significantly decreased PCM induced toxicity.

## INTRODUCTION

Traditional system of medicine is becoming the new face of present system of medicine. It exists in every continent of the globe and in every cultural area of world. Each of this traditional medicine system has its own origin and an individual basic philosophy. In India, Ayurveda system of medicine provides health care for a large part of population.

In Ayurveda, *Acharya Charaka* has described *Ayurvedoamritanam* means in this world existence of Ayurveda is just like *Amrita* which purifies all effects of *Visha* which could be correlated as diseases and thus, makes a person healthy and prosperous.

In *Ashtang* Ayurveda, by very ancient time *Agada tantra* was placed on an important place. By different *Acharyas* as those days the person consisting of knowledge of poison, treatment of poison and identification of poison was considered as an eminent person of society, as during ancient period there were many cases of biting of different animals, insects and accidental consumption of poisons. In present era, day by day hepato and nephro toxicity is developing due to consumption of alcohol, NSAID's, corticosteroids etc, and the medicines developed by scientists are failing in the treatment of such manifestations so, the relevance

of traditional system of medicines specially *Agada tantra* has been increased and whole world is looking towards Ayurveda for the solutions of this burning issue.

*Agada* means the medicament which is used as an antidote to combat these morbid conditions. *Agada tantra* deals with identification of poisons, type of poisons from minerals, plants and animal kingdom as well as anti toxic property of plants or herbs. *Shankhpushpi* (*Convolvulus pluricaulis* chois) of family convolvulaceae, is an indigenous and very significant herb which is considered as a gift of nature in Ayurveda.

In Ayurvedic literature, *Shankhpushpi* is considered as *Medhya rasayana* means it enhances the knowledge, memory and retaining power of a person. Mainly, four *Medhya rasayana* are described by *Acharya* Charaka.[1]

***Mandookparnyah swarasah prayojyah kshiren yashtimadhukasya churnam***

***Raso guduchyastu samoolpushpyah kalkah prayojyah khalu shankhpushpyah*** **(Ch.chi.1-3/30)**

The last among four *Medhya rasayana* described by *Acharya Charaka* is *Shankhpushpi* which is advised by *Acharya* in the form of *Kalka*, *Kalka* is a unique Ayurvedic preparation, which is prepared by rubbing a medicine on hard object with the help of pestle. So, by such procedure a semisolid preparation is formed which is known as *Kalka. Shankhpushpi* holds an important place among *Medhya rasayana* because of its rejuvenating property, antioxidant and neuroprotective activity. It is an important constituent in different Ayurvedic medicines like *Vati, Asava, Arishta* and different types of *Paanaka*.

*Shankhpushi* is also studied for its anti microbial, insecticidal and antifungal activities by different research scholars and it has also shown effect on different poisonous materials. In present study, the *Vishaghna* property of *Shankhpushpi* was chosen keeping it in mind that the previous studies have been done on *Shankhpushpi* which clearly indicates its action like *Medhya* drug. Although, the *Medhya* property of *Shankhpushpi* is well marketed and used by different pharmaceutical companies but, the *Vishaghna*[2,3] property of this miraculous drug should be researched and established as it may fulfil the long awaited gap of Ayurvedic antitoxic drug.

It is a subject of research that's why our *Acharyas* had suggested different *Rasayana* in different preparations forms. It means the particular preparations may be working in a better way in those particular forms, so the scholar has chosen the *Shankhpushpi* in the form of *Churna* and *Kwatha* preparation as a *Vishaghna dravya* and it is an effort to establish the *Vishaghna* property of *Shankhpushpi Churna* and *Kwatha*.

## AIM AND OBJECTIVES

- The aim of the proposed study is to examine the antitoxic effect of *Shankhapushi* by administering the same on the albino Wistar rats.
- To determine the anti toxic activity of *Shankhpuspi* on different organs of albino wistar rats.

## MATERIAL AND METHODS

## EXPERIMENTAL STUDY

The experimental study was carried out at Siddhartha Institute of Pharmacy, Dehradun after obtaining permission from Institutional Animal Ethics Committee with Approval number-SIP/IAEC/PCOL/02/2018.

### Sub acute Toxicological protocol

Experimental protocol (animals) was approved from IAEC and all experiment has been performed as per guideline of CPCSE and CCRAS. The nephrotoxic and hepatotoxic study was carried out on albino wistar rats weighting about 100-150gm according to CCRAS guidelines.

### Test drugs:

- *Shankhpushpi Churna*
- *Shankhpushpi Kwatha* (aqueous extract)

### Dose and route of administration of drug

Dose of *Shankhpushpi Churna* and extract for rat was calculated on the basis of Paget rule of dose determination.

- **For 200gm of wt. rat dose = 0.018 × Adult human dose**
- For *Shankhpushpi Churna* dose for 200gm of wt. rat = 0.018 × 6gm = 0.108gm

(Normal human *Churna* dose = 6 gm)[4]

- So, for 100gm of rat dose = 0.054gm or 54mg in divided doses

### Dose of *Shankhpushpi* aqueous extract

According to *Sharangdhar samhita*- (*Madhyam Khand*1/4)[5]

- Normal human dose of *Kwatha* = 2 tola =23gm

23× 8 = 184ml/4 =46ml (Human dose)

So, dose for 200 gm of rat = 0.018 × 46 ml =0.828ml (1gm=1ml)

- For 100gm of rat dose =0.428ml

The drug *Shankhpushpi Churna* and *Kwatha* (aqueous extract) were administered orally with

the help of feeding gavage of suitable size sleeved on to a syringe nozzle to all the groups.

**Procedure**

In this study, total 24 albino wistar rats (male & female) were divided into four groups, marked them with the help of picric acid as 'H' (Head), 'B' (Body), 'T' (Tail), 'HB' (Head Body), 'BT' (Body Tail) and 'NM' (No mark). Each group having six rats and denoted them as G1 (normal control group), G2 (*Shankhpushpi Churna* group), G3 (*Shankhpushpi Kwatha* group) and G4 (Normal Saline group) and then kept into different boxes.

**Inducing Hepatotoxicity and Nephrotoxicity by PCM**

Rats of Group $G_1$ which was normal control group were kept on normal feeding while in group $G_2$, $G_3$ & $G_4$ rats, hepatotoxicity and Nephrotoxicity was induced by giving overdose of PCM (2000mg/kg body weight). The dose of suspension of PCM with the help of gavage was given to the rats daily and the same process was continued up to 7 days. The dose has been given in single dose to the animals according to their body weight. After 7 days blood sample was collected for haematological tests, liver function test and renal function test.

**Preparation of Suspension of PCM:**

The administration of crude form of PCM in rats was difficult, so a suspension of PCM have been formed with the help of CMC (Carboxyl methyl cellulose). In this suspension PCM was dissolved in 1% CMC solution i.e., 1gm of CMC was dissolved in 100 ml of water.

With the help of CMC, a solution was formed in which 10ml solution contains 2000mg of PCM, so, by calculating 1ml solution contains 200mg of PCM. After that, this suspension was administered to the animals according to their body weight.

**Dose of PCM according to body weight:**

This suspension form of PCM was administered to animals of group $G_2$, $G_3$ & $G_4$ according to their body weight. The animals of group $G_1$ which was the control group were kept on normal feeding. The calculated dose of PCM was given in group $G_2$, $G_3$ & $G_4$, but, after 12 hours observation, 2 animals of group $G_2$ & $G_4$ died, so, The dose of PCM was revised to 1000mg/kg in accordance with the work of an article[6], then new solution was formed i.e. 1ml solution contains 100mg of PCM.

**Mortality: (Within $D_{1-7}$)**

After 12 hours of administering over dose of PCM marked animal 'T' of group $G_2$ and 'BT' of group $G_4$ died, 3rd day after administering over dose of PCM animal 'B' of group $G_2$ and 'B' of group $G_3$ died and 4th day after administering over dose of PCM animal 'HB' of group $G_4$ died.

**Methodology for *Vishaghna* study**

Hepatotoxicity and nephrotoxicity was induced in albino wistar rats by giving PCM of dose 1000mg/kg body weight for seven days. After inducing hepatotoxicity and nephrotoxicity, antitoxic study was carried out in following four groups.

**Group1:** Normal control group, six normal and healthy rats were given normal diet and normal saline for 28 days.

**Group2:** Six hepatotoxic and nephrotoxic induced rats were given crude *Shankhpushpi* for 28 days.

**Group3:** Six hepatotoxic and nephrotoxic Induced rats were given aqueous extract of *Shankhpushpi* for 28 days.

**Group4:** Six hepatotoxic and nephrotoxic induced rats were given normal saline for 28 days.

**OBSERVATION AND RESULTS**

- Hepato- nephro toxicity in rats was induced by administering PCM of dose 1000mg/kg body weight while dose of 2000mg/kg body weight causes mortality. All animals were observed after dosing at least once during first 30 minutes, periodically during the first 24 hours, with special attention given during the first 4 hours and daily for 7 days and thereafter 28 days. All observations like changes in skin and fur, eyes and mucous membranes, salivation, diarrhoea, lethargy, sleep and coma, morbidity and mortality are observed. On the basis of neurological examination it was found that toxicity induced by 1000mg/kg body weight dose of PCM did not causes any neurological manifestations, it causes only hepato and nephro toxicity. In this study it was found that administration of *Shankhpushpi Churna* as well as *Kwatha* in hepato-nephrotoxic induced rats reduces the level of toxicity while administering normal saline no any significant changes were found.

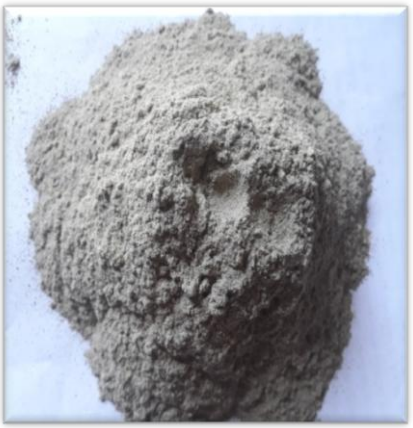
**The effect of *Shankhpushpi Churna* and *Kwatha* in different groups**

| Parameters | P value of group G2 | Result | P value of group G3 | Result | P value of group G4 | Result |
|---|---|---|---|---|---|---|
| TLC | 0.003(<0.05) | S | 0.005(<0.05) | S | 0.053(>0.05) | NS |
| ESR | 0.003(<0.05) | S | 0.001(<0.05) | S | 0.052(>0.05) | NS |
| S. Bilirubin | 0.000(<0.05) | S | 0.000(<0.05) | S | 0.059(>0.05) | NS |
| A. Phosphatsae | 0.001(<0.05) | S | 0.004(<0.05) | S | 0.401(>0.05) | NS |
| SGPT | 0.015(<0.05) | S | 0.000(<0.05) | S | 0.158(>0.05) | NS |
| SGOT | 0.015(<0.05) | S | 0.221(>0.05) | NS | 0.600(>0.05) | NS |
| S. Creatinine | 0.001(<0.05) | S | 0.002(<0.05) | S | 0.706(>0.05) | NS |
| BUN | 0.017(<0.05) | S | 0.015(<0.05) | S | 0.150(>0.05) | NS |
| Uric Acid | 0.000(<0.05) | S | 0.000(<0.05) | S | 0.060(>0.05) | NS |

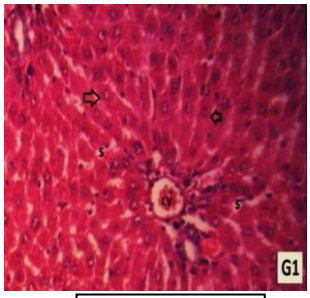
***S- Significant, NS-Not significant**





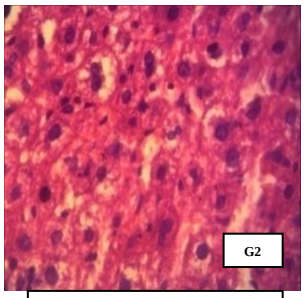



**Liver**



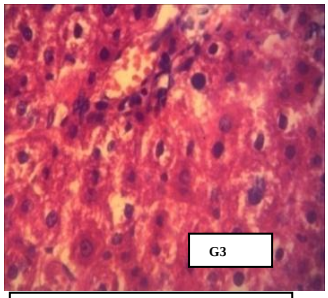

Normal control group

Normal architecture of



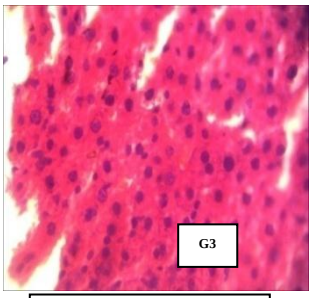

PCM +*Shankhpushpi churna*

Mild congestion with mild necrosis




PCM+ *Shankhpushpi* extract

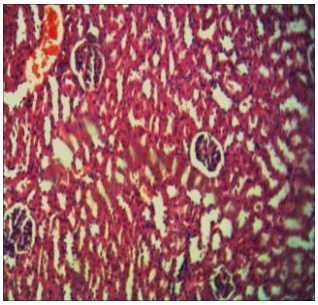
Mild congestion with mild necrosis




PCM+Normal saline

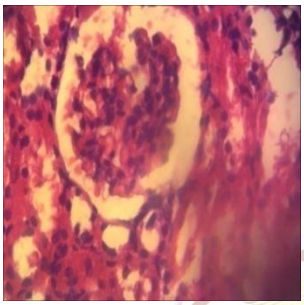
Damage in central veins, necrosis

**Kidney**



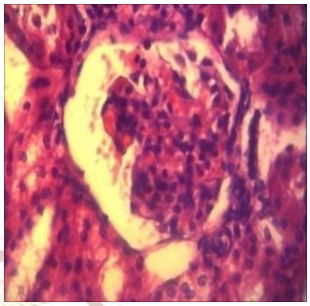
G1 normal control group

Normal bowmans capsule with normal PCT & DCT, no necrosis



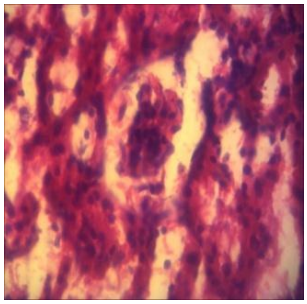
G2 PCM+ *Shankhpushpi Churna*

Mild necrosis & congestion



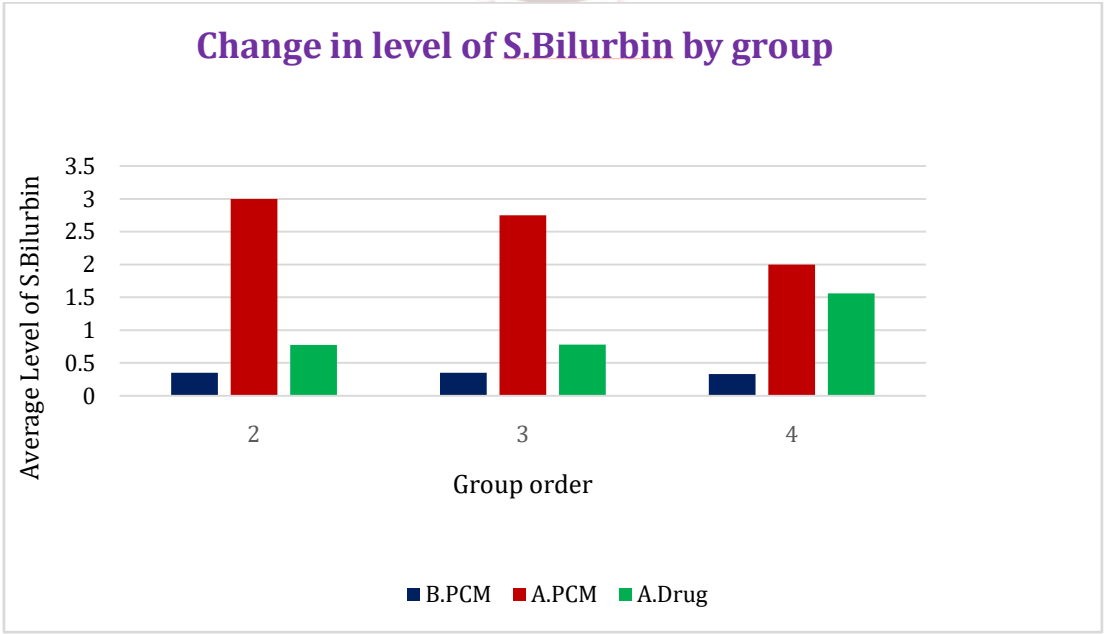
G3, PCM+*Shankhpushpi* extract

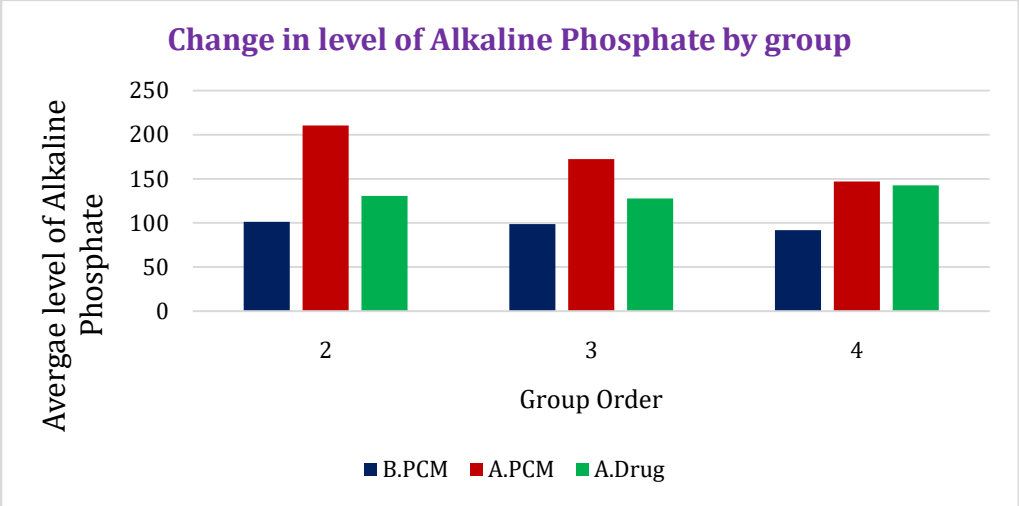
Mild necrosis & congestion

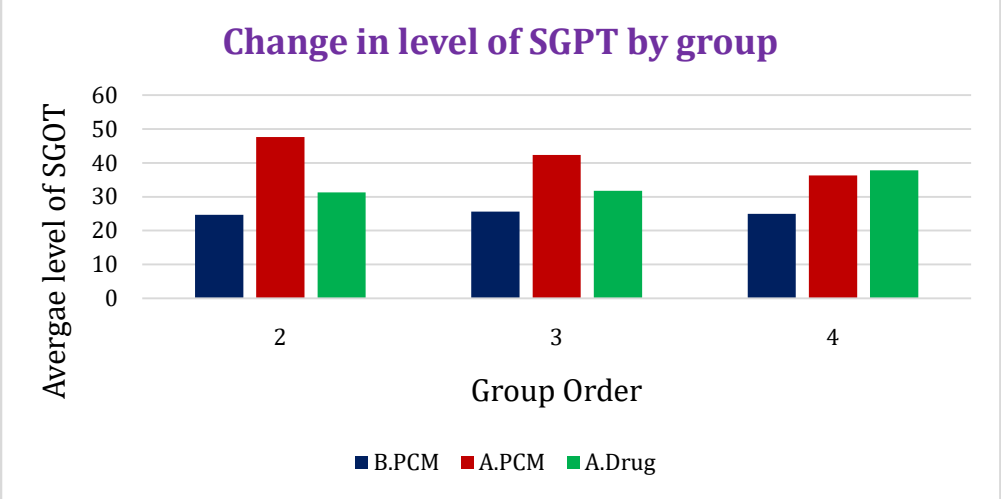


G4 PCM+ Normal saline

Necrosis, congestion and extavasation of red blood






**Histo- Pathological Results**

In Histo-pathological reports of liver and kidney it was found that in G1 group which was normal control group, liver sections showing normal appearing portal area, area around hepatic vein appears normal and no necrosis was found and both kidney show similar morphology, architecture of tubules and glomeruli appear normal in morphology. In group G2 and G3 liver sections showing mild hepatocytic degeneration and congestion while in group G4 mild to moderate hepatocytic degeneration and congestion was found in comparison to group G2 and G3. In group G2 and G3 sections of kidneys showing minimal tubular necrosis and vacuolar degeneration, mild congestion with mild lymphocytic infiltration was found while in group G4 sections showing moderate tubular necrosis, moderate congestion with moderate lymphocytic infiltration.

**DISCUSSION**

The drug *Shankhpushpi* having *Tikta rasa*, *Snigdha* and *Picchil guna, Sheeta Veerya*, *Madhur Vipaka* and *Tridosh Shamaka* properties.[7] In *Charaka Sutra Sthana* chapter 26, *Acharya Charaka* defined detail about *Rasa* and mentioned that *Tikta rasa* having *Vishaghna* property[8], so *Shankhpushpi* may act as *Vishaghna dravya* on the basis of *Rasa* and *Shankhpushpi* also having *Snigdha guna* which is opposite to *Guna* of *Visha*, due to which it may counteract the action of *Visha*.

For administration of dose in rats, PCM was first dissolved in water, but it was precipitated. Then, Ethanol was used to dissolve PCM, it was dissolved completely but it may cause more toxicity, so suspension of was prepared in CMC solution. After giving PCM for 7 days body weight and food Consumption in group G2, G3 & G4 was decreased.

Effect of *Shankhpushpi churna* (G2 Group)on S. Bilirubin, A. Phosphtase, SGPT, SGOT, Urea, S.creatinine and uric acid after giving the dose of PCM was found statistically significant and the effect of *Shankhpushpi kwatha* (G3 Group) on, S.Bilirubin, Alkaline Phosphtase, SGPT, Urea, S. creatinine, and uric acid were found statistically significant also while the effect of normal saline (G4 group) on all biochemical parameters were found statistically insignificant and Histo-pathological

changes in group G2 & G3 were significant in comparison to G4.

## CONCLUSION

Hepato- nephro toxicity in rats was induced by administering PCM of dose 1000mg/kg body weight while dose of 2000mg/kg body weight caused mortality. After inducing Hepato- nephro toxicity body weight and food consumption in rats of all groups decreased. After 28 days administering drug *Shankhpushpi Churna* as well as *Kwatha* in group G2 & group G3, body weight and food consumption in these group slightly increased while in group G4 no significant changes were found. In light of these observations, it was found that the therapeutic administration of *Shankhpushpi* as *Churna* as well as *Kwatha* significantly decreased PCM induced toxicity. No significant changes in biochemical parameters were found in PCM induced hepatonephro toxic rats after administration of normal saline. On the basis of histo-pathological investigations of liver and kidney in G4 group, hepatocytic degeneration and necrosis was more prominent in comparison to G2 & G3 group, in which sample drug was administered. So, it was found that induced hepatotoxicity was mildly recovered in group G2 & G3 in comparison to group G4. Also in kidney of G4 group, moderate tubular necrosis and moderate congestion was found in comparison to G2 & G3 group, in which sample drug was administered. So, it was found that induced nephro toxicity was mildly recovered in group G2 & G3 in comparison to group G4. As the study was planned keeping in mind that literary facts given by our *Acharyas* regarding *Vishaghna* properties of *Shankhapushpi* the study revealed that *Shankhpushpi* as an established *Medhya dravya* also acts as a *Vishaghna dravya.*

## REFERENCES


1. Pandit Kashinath Shastri and Gorakhnath Chaturvedi elaborated Vidyotini hindi commentary, Charak Samhita Vol.2, Chapter1/3, DShlok no.30-31,Chaukhambha Bharati Academy, Varanasi, reedition 2012,page no.39.
2. Krishna Chandra Chunekar, Bhavprakasha Nighantu, Guduchyadi varga, Shlok no.270, Chaukhamba Bharati Academy, Varanasi, reprint 2004. pp.454
3. Prof. Priyavrata Sharma, Kaideva Nighantu, Aushadi varga, shlok no.1494-95-96, Chaukhambha orientalia, Varanasi, 1st Edition 1979. pp.622
4. Ayurvedic Pharmacopia of India 1st English edition, published by Pharmacopoeia Commission for Indian Medicine & Homoeopathy, Ghaziabad. Government of India Ministry of AYUSH, 2016, Part1, vol.2.
5. Dr.Smt. Shailja Srivastava, Sharangadhara Samhita, Chaukhambha Orientalia Varanasi, 4th edition, 2005. pp.127-128
6. Mamdouh R. El-Ridi &Tarek R. Rahmy. Action of Vitamin C Against Acetaminophen- induced Hepato Renal Toxicity in Rats. Journal of Toxicology: Toxin Reviews, Volume 19, 2000 - Issue 3-4.
7. Dr.JLN Shastri, Drvyaguna vijyana vol.2, Chaukhambha Orientalia, Varanasi, 2nd edition 2005. pp.360.
8. Pandit Kashinath shashtri and Gorakhnath Chaturvedi, Charaka Samhita, sutra sthana, chapter 26, Hindi commentary by edited by Chaukhambha Bharti Academy, Varanasi, re-edition 2009. page no-506.



**Cite this article as:**
Romesh Kumar Jaiswal, Manisha Dikshit, Ramesh Chandra Tiwari, Ved Bhushan Sharma. A Study on Vishaghna Property of Shankhpushpi (Convolvulus Pluricaulis Chois) w.s.r. to Sub Acute Toxicity in Albino Wistar Rats. AYUSHDHARA, 2019;6(4): 2279-2285.

***Source of support: Nil, Conflict of interest: None Declared***