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Strychnos Nux-Vomica and Its Recent Advances with its Pharmacotherapeutic Perspectives

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ABSTRACT

Strychnos nux vomica is a commonly used upvisha in many ayurvedic preparations. It is used as a content of many Ayurvedic medicines which are used in treatment of many diseases like abdominal pain, upset stimuli, depression, insomnia, chronic respiratory diseases and so on. Many studies have been conducted on SNV and some properties of SNV are discovered which is found to be very useful like anti hyperglycaemic action, apoptotic action etc. But before using it as a medicine the proper detoxification is needed. If it is not done properly the adverse reaction may occur. In this article we are going to study SNV, its recent advances with its pharmacotherapeutic perspectives. Through this article we will study Properties of SNV with ayurvedic and modern perspectives, therapeutic uses of SNV with ayurvedic and modern perspectives.

KEYWORDS

Nux vomica, Recent Advances, Pharmacotherapeutic, Apoptotic effect



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INTRODUCTION

As per ancient system of medicine this plant belongs to upvisha category (*sthavar vanaspatik visha*) and is also known as poisonous nut tree. Since ancient time it has been used as a ayurvedic remedy for various diseases. Basically SNV is deciduous to India and South east Asia. It is found all continents of India¹⁸. It is medium sized tree belonging to loganiaceae family. It is a major source of highly poisonous intensive bitter alkaloid strychnine and Brucine.

This poison is used to kill bats, wild dogs, foxes and rodents. Accidental poisoning is due to breathing of powder or absorption through skin. Its absorption takes place through all mucus membrane. After that it is taken by liver and muscle cells. 80% of absorbed poison is oxidized in liver. Excretion of poison takes through kidney, bile, milk and saliva. After death it may be found in cadaver up to 4 years¹⁰.

This article is based on review of Ayurvedic as well as modern scriptures and textbooks related to subject and related matter on Pharmacotherapeutic significance of drug and the collection of recent advances recent advances. Information is collected from old *Ayurvedic Samhitas*, old ayurvedic literature,

nighantus and recent advances are collected from internet.

AIM

To study *Strychnus nux vomica* and its recent advances with its Pharmacotherapeutic perspectives.

OBJECTIVES

1. To study the properties of SNV through Ayurvedic literature.
2. To study the properties of SNV through modern literature.
- 3 To study pharmaco therapeutic uses of SNV from Ayurvedic perspectives.
- 4 To study pharmaco therapeutic uses of SNV from modern perspectives.

LITERATURE REVIEW

Properties of *kuchala* (*Strychnos nuxvomica*) according to various literature of Ayurveda has been mentioned in tabulation form in table no.1.

MEDICINAL DOSES

60 – 120 mg detoxified powder of seeds _ Gogate²

1/4*Ratti* _ Rastarangini¹⁹

15-30 mg strychnine_ parikh¹

FATAL DOSE

50 – 100 mg powder of seeds – Reddy¹⁰

1-2 crushed seeds (15-30 mg of strychnine)¹⁴



AYURVEDIC ANTIDOTE²¹-Opium, Tobacco, Camphor, Ganja

PHYTOCHEMISTRY/ CHEMICAL CONSTITUENTS¹³

Nux vomica contains total 13 alkaloids among those the major are strychnine, it is a major source of strychnine which is

highly poisonous alkaloid. *Kuchala* seeds contain 2.6-3% alkaloids. Out of which strychnine is 1.25-1.5%, Brucine is 1.7% and rest are Vomisine, Kajine and novacine (N-methyl, Pseudo brucine, strychnine and isostrychnine, Cuchalocide, loganic acid, hemidesmine).

PROPERTIES OF NUX VOMICA

Character	<i>Raj nighantu</i> ⁶	<i>Ras tarangini</i> ¹¹	<i>Bhawprakash</i> ⁴
Ras	<i>Tikta katu</i>	<i>Katu</i>	<i>Tikta</i>
Guna	<i>Ruksha, laghu, tikshna</i>	-	<i>Lghu(lightness)</i>
Vipak	<i>Katu</i>	-	-
Virya	<i>Ushna(Hot)</i>	<i>Atyant ushna(very hot)</i>	<i>Shital(cool)</i>
Prabhav	<i>Kustha vinashanam(antileprotic)</i>	<i>Nadishul nibarhanam(neurogenic pain killer), Amlapittahar</i>	<i>Grahi(), Madkarak</i>

DETOXIFICATION PROCESS/ SHODHANA

1. *Swedan* (steaming) of seeds are done in *dolayantra*(ancient instrument for steaming) with *kanji* (sour liquid), then coats are removed after that seeds are roasted in ghee, powder is made in crucible and stored in glass jar¹⁶.
2. Seeds are soaked in *gomutra* (cow urine) for 7 days after that seed coats are removed, seeds are boiled in cow milk and then seeds are roasted in cow ghee.
3. Seeds are soaked in *kanji* (sour liquid) for 3 days, coats are removed and seeds are dried in sunlight, powder is made²⁰.

KALPA OF KUPILU

1. *Shulharan yoga*
2. *Agnitundi vati*
3. *Ekan veer rasa*
4. *Shulharan yoga*

5. *laxmivilas rasa*

MEDICINAL USES

1. **Vatvyadhi** _ proper detoxified *kuchala* is used in various ayurvedic medicines like *laxmivilas rasa*, *agnitundi vati*, on *vata vyadhi* like facial paralysis, neuralgia, anti-inflammatory, pain killer, *kaphahara*, *kasahara*, energizer, antileprotic, *kusthaghna*, *kandughna*, *jantunashana*, *vranashodhana*.
2. **Respiratory stimulant**_ it increases respiratory rate and tidal volume.
3. **Emmangaug**_ stimulate and increase menstrual flow and makes regular menstruation and white discharge, yellow discharge with pain.
4. **Abortifacient**-it cause abortion when taken in large doses.
5. **Antidiabetic**²⁴ - It can be used as an anti hyperglycemic. When all other herbal

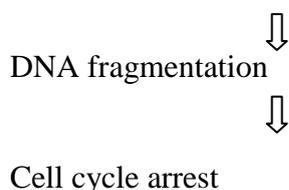


medicines fails to maintain normal blood sugar level at the time it helps to relieve diabetic symptoms. But it should not be used for more than two months. After completing 2 months the medicine should be discontinued. The drug work according to its prabhav (principle of nature of drug). *Kapha vata* dominated diseases can be specially cured with this drug.

6. **Anticancerous**²⁰ - The chemotherapy which is commonly used now a days in the treatment of cancer, is highly toxic in nature and it may show very adverse effect also. Multiple myeloma is an incurable haematological malignancy with high incidence rate in elders. SNV extract promotes anti proliferative activity in dose and time dependant manner. Anti proliferative and cytotoxic activity is performed because of the alkaloids strychnine and brucine.

7. **Apoptotic effect of brucine on hepatocellular CA**⁹ - Brucine which is one among the four alkaloids exhibited strongest toxic effect the apoptotic action of Brucine and its mechanism to cause HePG2 cell apoptosis. Mechanism is as follows

HePG2 cell apoptosis shrinkage



↓

Apoptotic cell death

8. **Peristaltic moments** - The mixture of alkaloids is used as GI stimulant. It increases appetite by stimulation of peristalsis. Strychnine alkaloid increase flow of gastric enzymes. So it is used in chronic diarrhea and constipation.

9. **H pylori infection** - A study suggested that influence of *nux vomica* and *callenduala officinalis* ethanol extract of both plants might be potent inhibitor of H-pylori induced gene expression.

10. **Analgesic and anti inflammatory**²² - The study on brucine and brucine - N- oxide extracts from the seeds of SNV, shows significant protective activity against thermic and chemical stimuli. Brucine-N-oxide shows inhibitory effect than Brucine in carrageenan induced leg oedema model. While both shows significant results i.e. prostaglandin inhibition and inhibition of E2 receptors. The result suggests involment of central and peripheral mechanism in pain modulation and anti inflammatory action .

11. **Immunomodulatory**²¹ - the result of a study confirms the suppressive activity of SNV on allergen specific IgE antibody response and suggested the local application for allergic conditions. It decreases weakness of body by reducing dhatu shaithilya and by performing



rasayana karm in adults. According to dr. Gogate it has HIV inhibition activity²¹.

DISCUSSION

As we know SNV is an herb known since very ancient times. It has medicinal as well as spiritual impotence. People born in *Ashwini nakshatra* worships this plant hence it is known as plant of *AshwiniNakshatra*. Rodents are killed by using seeds of this plant¹². SNV belongs to upvisha category (less toxic poisons) according to Ayurveda¹⁷. In modern toxicology it belongs to the category of neurotoxic spinal vegetablepoison¹⁵. This poison comes under rules and regulation of drug and cosmetic act 1940. Though the plant belongs to poisonous platcategory but has great importance in ancient system of medicines. It works as a medicine when it is taken in prescribed doses. The process of detoxification reduces its toxicity. Therefore it should be always taken in detoxified form.

Now a day's globalization of Ayurvedic medicine increasing, Ayurveda is proven as a big industry for medicine. Many researches carried out in the field of Ayurveda are very much beneficial for the field of medicine. In the present era, SNV is not supposed to be a traditional medicine only but it is also using as a

medication for treating of some challenging disease like CA, diabetes, respiratory diseases and so on. Chemotherapy used in the treatment of CA is a kind of poison. In future if researches will be carried on SNV, it may replace with use of Brucine as a medication for the treatment of CA. It is also a good anti hyperglycemic drug¹³.

In some scripts different properties of SNV are mentioned. In this modern era we can standardize the drug and know their exact properties by using modern tools. In this article information about SNV has collected from Rastarangini, sharangdhar samhita, Bhavpraksh nighantu, etc texts of Ayurveda and modern literature collected from internet and various books of toxicology like Parikh, singhals toxicology, Reddy.

While studding SNV through different Ayurvedic and modern books it is found that many similar things are mentioned by both literatures like Immunomodulatory action shows similarity with Rasayana property²¹ of SNV, other properties also shows similarity. This kind of similar work has been carried out in our institute²³ on *Semicarpus Anacardium*. And such studies are a milestone in drug development program.

Drug development program is very much dependant on herbal medicines hence SNV



have big scope for research in field of medicines. This article gives basic information regarding to SNV and its Pharmacotherapeutic uses. It may prove helpful in increasing the knowledge of students, practitioners and researchers also.

CONCLUSION

In this article most of the information regarding the nux vomica has been collected. It proves to be helpful to students and doctors practicing Ayurveda. Pharmacotherapeutic properties of SNV are also discussed in this article, which shows there are lots of newly detected uses of SNV and still there is lots of scope for further research for this drug. It may also prove to be helpful to treat some difficult disease like C.A. and diabetes. Therapeutic significance provided, will be helpful to development of herbal medicines. Ultimately it will be helpful for drug development programme.

Abbreviations- SNV – Strychnos nux vomica



REFERENCES

1. Dr. C.K. Parikh textbook of medical jurisprudence and forensic medicine and toxicology, sixth edition 2004, CBS publications new delhi, peripheral nerve poisons, section X, page no.58.
2. Vd. Vishnu gogate, Dravyaguna vidyan vaidyamitra publications first edition 2008, page no. 343-345.
3. Vd. Vaman Ganesh desai Aushadhi sanghaha rajesh publications pune 2nd edition 1975.
4. K.C. Chunekar bhavprakash nighantu of bhawmishra edited by G.S. Pandey, chukhambha publications 9th edition 1993, Amradi falvarga/kupilu/vrse no. 66-68/page no 568.
5. Vd. Ambikadatta shastri, Bhaishajya Ratnavali, edited by Rajeshwar Data Shashtri, Chaukhambha publications 1993/Lasikameh prakara/Chapter no.91/Verse no. 15-16/page no.821.
6. Dr. Vishwanath Dwivedi Raj nighantu, Chaukhambha publications, prabhadradi varga, page no.293.
7. Shaligram nighantu , Ayurved uddarak shaligram vaishya, Muradabad 19531st edition , publisher khemraj shrikrishna , venkateshwar press Mumbai
8. Vd. Vaman Ganesh desai, Aushadhi Sanghaha , Rajesh publications Pune 2nd edition 1975, Arkadi varga/page no.570.
9. The apoptotic effect of Brucine through the seeds of SN-V on human hepatoma cells is mediated via Bcl-2 and Ca⁺ involved mitochondrial pathway Xukung Deng, Fangzhong, Toxicological sciences, vol91, issue 1 may 2006/pages 59-69.
10. K.S. Narayan Reddy, The essentials of Forensic Medicine and Toxicology, K. Sugunadevi publications Hyderabad, 32nd edition 2013, Chapter no.34/spinal poisons/Page no.581.
11. Kashinath Shastri Ras tarangini of Sadanand Sharma 11th edition, Motilal Banarasidas prakashan new delhi, chapter no.24/0, Vishopvishadi vigyaniya 1979.
12. Rajesh Bhati, Strychnus nuxvomica seeds: pharmacognostical standardization, extraction and antidiabetic activity, Journal of Ayurveda and Integrative Medicine 2012Apr-Jun; 3(2):80-84.
13. S.K. Singhal, Singhal toxicology at a glance, Neurotoxic poisons , strychnus nux vomica, NBD publications Mumbai 9th edition 2016, page no.119.
14. K.S. Narayan Reddy, The essentials of Forensic Medicine and Toxicology, K. Sugunadevi publications Hyderabad, 32nd edition 2013, Chapter no.34/spinal poisons/Page no.580.
15. Vd. Bramhanand Tripathi , Sharangdhar Samhita, Anjannidan of maharshi Agnivesh, Deepika vyakhya,



Chaukhambha surbharati publications
Varanasi 2013, Madhyam khanda,
Rasadishodhanmaran kalpana chapter
no.12/ verse no. 295/ pg. no. 210.

16. Dr. S.D. Kamat, studies on medicinal
plants and drugs in Dhanvantari nighantu,
Chaukhambha publications Delhi 2002,
Mishrakadi varga, Upvisha, Verse no. 119/
page no.667.

17. Kashinath shastri, Rastarangini of
Sadanand Sharma, 11th edition , Motilal
Banarasidas publications New Delhi 1979,
chapter Chaturvinshati taranga/ verse
no.163/p.675.

18. Kashinath shastri, Rastarangini of
Sadanand Sharma, 11th edition , Motilal
Banarasidas publications New Delhi 1979,
chapter Chaturvinshati taranga/ verse
no.163/ p.675.

19. Kashinath shastri, Rastarangini of
Sadanand Sharma, 11th edition , Motilal
Banarasidas publications New Delhi 1979,
chapter 9th taranga/ verse no.172-173/
p.678.

20. Dr. Anil Shaha, International journal
of green pharmacy jul- sep 2016 (suppl)
10(3)/ s88 , A short review on anticancer
investigations of strychnous nux vomica,
Lovely professionals university phagwara,
Punjab, India.

21. Vd. Vishnu gogate, Dravyaguna
vidyan, vaidyamitra publications pune 1st
edition 11 feb/ 2008, page no. 343- 345.

22. Chen j. et al. Analgesic and anti-
inflammatory activity and
pharmacokinetics of Alkaloids from seeds
of Strychnos nux-vomica after transdermal
administration: effect changes in alkaloid
composition, JE thnopharmacol2012
Nanjing university of Chinese medicine
Nanjing China.

23. Vd. Pallavi Akhare, Therapeutic
significance of semicarpus anacardium
linn; areview. Int.j. Res. Ayurveda
pharm.m2015;6(4): 463- 468
<http://dx.doi.org/10.7897/2277-4343.06490>

24. V. Chitra , study of antidiabetic and
free radical scavenging activity of the seed
extract of Strychnos nux vomica,
international journal of pharmacy and
pharmaceutical science, volume 2,suppl 1,
2010 / page n. 106-110.