Ethanobotanical, Phytochemical and Pharmacological Review on Strychnous Nuxvomica

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ABSTRACT

Strychnous nuxvomica (KUCHLA) belongs to the family Loganiaceae used in folklore and traditional medicines. The objective of present review on kuchla outcomes the agronomy, phytochemical constituents, structures and used for treatment of antioxidant, hepatoprotective, antisnake venom, anticonvulsant, antimicrobial, antipyretic, analgesic, neuropharmacological, gastritis, antialcoholic, larvicidal activities. This studies provides valuable information of kuchla for future research and helpful for the other studies to be carried out.

Keywords: Strychnousnuxvomica; Ethnobotanical; Phytochemical; Pharmacological

INTRODUCTION

Strychnosnuxvomica also known as poisonousnut, Dog button, Kuchla, Kanjiramfits to the family Loganiaceae. It is an evergreen and medium size tree that is native to South Africa and India. The seeds and barks acquire various components that are used in folklore and traditional medicines in different countries. Now-a-days Nuxvomica is used in 60 formulations of Indian systems of medicine (Ayurveda, Homeopathy, Siddha, Unani and Yoga) out of the 30 of them are used in the disorders of vatadosha [1]. Principally this doesn’t possesses a role in modern medicine but it has been reported that it is widely used in elevation doses before 2nd worldwar. The effect of Nuxvomica is due to the presence of Strychnine and Brucine which are indole alkaloids. Strychnine stimulates the motor or sensory ganglia of spinal cord that consequences in fiery convulsions whereas Brucine causes paralysis of peripheral motor nerve and is not as much of harmful than the Strychnine [2]. At low doses it acts as stimulant, laxative and for the treatment of other stomach ailments. Various phytochemical constituents have been isolated and there is progression of investigation on this plant in research of dynamics and kinetics but there is no detailed review about the pharmacological aspects and medicinal uses. Therefore the present review is about the cultivation and its geographical distribution, folklore usage, ethnobotanical characters, pharmacognostical characters, phytochemical and pharmacological aspect.

Topographical distribution

This plant is commercially cultivated in European and United States, Fujian, Taiwan and throughout Tropical Asia. Fundamentally it is indigenous to east India and found profusely in south India largely collected from forests of Tamilnadu, Kerala and Malabar coast. The annual production of StrychnosNuxvomica seed in India was estimated at 2000 tones at the beginning of 1970’s. In the period of 1965 to 1971 the average production of StrychnosNuxvomica seeds in India was 18,000 kg/year. Most of this are exported to European and United States. Currently in 2000 as the technology has been improvised there is increase in exporting of Nuxvomica in India by export houses situated in Mumbai, Hyderabad, Kolkata [3].

Agronomy properties

The climate and soil should be favorable for the plant to grow well in dry humid tropical areas of the country. It grows over laterite, sandy and alluvial soils [4-6].

Ethnobotanical characters

1. Domain: Eukaryote
2. Kingdom: Plantae
3. Division: Magnoliophyta
4. Class: Magnoliopsida
5. Order: Getianales
The Seeds listed are phytochemicals that contribute to the defensive mechanism of plants and are known to treat diseases. They are compounds naturally present in the plants, such as strychnine, isostrychnine, pseudostrychnine, strychnine N-oxide, isostrychnine N-oxide, Brucine, Brucine N-oxide, Isobrucine, Isobrucine was identified as Nuxvomica [9].

**Fruits**
The phytochemicals present in the pericarp and pulp of the fruit are majorly strychnine and brucine along with the 4-hydroxystrychnine and a new base N-methyl-sec-pseudo-beta colubrine and a non-Indolic base cantleyine. Phenolic glycosides named as salidrosides and euchythosides were found [10].

**Leaves**
Phytochemical investigation on leaves yielded an outcome of the isolation of compounds like Kaempferol-7-glucoside, Umbelliferone, Quercitin-3-rhamnosome, kaempferol-3-rutinoside and Rutin [11].

**Flower**
Indole alkaloids were isolated by mass spectra like strychnine, brucine which are isolated first and by mass spectral evidence they have come to know the presence of colubrine in the mixture of strychnine. Others like vomicine, icajine and novacine are present [12].

**Barks**
The bark contains numerous components like flavonoids, carbohydrates, tannins, triterpenoids and glycosides which was determined by the preliminary phytochemical analysis. The roots consist of the alpha colubrine, loganin, vomicine, pseudobrugine, 16-hydroxycolubrine and compounds like beta -colubrin, brucine, caffeic acid ester, strychnine, pseudocorynicine pseudo strychnine, pseudobrugine, vomicine, icajine and novacine. Contemporary work on the root bark of Nuxvomica from Sri Lanka origin divulges the presence of these compounds nor-morcurine B, O-methylmacusine B, nor-melloninine B, isostrychnine, protostrychnine, 10-hydroxystrychnine, 12-hydroxystrychnine, 12-hydroxy-1 methoxystrychnine, 4-hydroxy-3-methoxystrychnine, 4-hydroxystrychnine along with strychnine and brucine. The stem bark consists of brucine, strychnine, mavacurine, pseudostyrchnine and caffeic acid ester. Research on stem bark by 13C NMR and Mass spectroscopy analysis reveals the presence of four dimeric bisindole alkaloids which are new demethoxyguiclavine, strychnoflavine, strychnoflavine N-methyllongicudatine and strychnocryscine [13].

**RESULTS AND DISCUSSION**

**Hepatoprotective**
The Indole alkaloid extracted from the fruit named as loganin has shown effective hepatoprotective activity In vitro and In vivo models of liver injury induced by the galactosamine. They established by ameliorating the galactosamine-mediated reduction of hepatocytes viability as well as bile volume and contents.

**Anti microbial**
The ethanolic seed extract of Strychnos nuxvomica was prepared and agar disc diffusion method test was carried out against the Staphylococcus aureus, Klebsiellainfluensae, Bacillus subtilis, Proteus, Salmonella typhi, E.coli strains at a 1000 C which results in the inhibition of only E.coli, Staphylococcus aureus and Klebsiella.
strains in a dose dependent manner.

**Anti diarrhoeal**

A research was carried out on the Strychnosnuxvomica for anti-diarrhoeal activity. The methanolic root bark extract was prepared and test was carried out against castor-oil induced diarrhoea which have the outcome of significant reduction time of diarrhoea and total weight of the faeces.

**Anti convulsant**

The ethanolic seed extract of Strychnosnuxvomica which has the Indole alkaloids mainly strychnine and brucine were taken and research was carried out and the outcome of there action on neurotransmitters of human alpha 1 ,alpha 1 beta glycine receptor ,alpha 7 nicotinic receptor ,5-HT3A Seratonin receptor, shown that strychnine and brucine has different stearic and electronic properties that show anticonvulsant activity.

**CONCLUSION**

This review will be a helpful tool for those who are interested to carry out the research work on Strychnosnuxvomica Linn which has been used in folklore and traditional medicines for several decades and this would be useful of studying different aspects towards Nuxvomica regarding its geographical, Ethanobotanical, phytochemical constituents and pharmacological activities.

**CONFLICT OF INTEREST**

There is no conflict of interest to be reported by any of the authors.

**REFERENCES**


