



I J A P C

INTERNATIONAL JOURNAL OF AYURVEDA AND
PHARMACEUTICAL CHEMISTRY

www.ijapc.com

E ISSN - 2350-0204

VOLUME 9

ISSUE 1

10TH JULY

2018

Greentree Group Publishers

Current Mini Review on *Dhattura* (*Dhattura stramonium* Linn.)

M.R. Kavyashree^{1*}, S. Vasansatish², A. Harini³ and L. Hegde Prakash⁴

^{1,3,4}Department of Dravyaguna, SDM College of Ayurveda and Hospital Hassan, Karnataka, India

²Department of Panchakarma, SDM College of Ayurveda and Hospital Hassan, Karnataka, India

ABSTRACT

Dhattura (*Dhattura stramonium* Linn.) is one of the commonly available weed which is well known for its toxic effect. It is described in Ayurveda, the Indian system of medicine for its therapeutic uses in various ailments like *Jwara* (Fever), *Kushta* (Skin diseases), *Visha* (Poison), *Shwasa* (Respiratory disease), *Shula* (Pain), *Shotha* (Inflammation), *Amavata* (Rheumatoid arthritis) and many others. In recent years, the plant has been screened for its antifungal, antimicrobial, antispasmodic, antibacterial, anticancer, antioxidant, analgesic and anti-inflammatory activities. The present article is a review on the therapeutic potential listed in Ayurveda, research updates on Phytoconstituents and pharmacological activities. The review demonstrates that the plant is a potential for the treatment in various illness.

KEYWORDS

Dhattura, *Dhattura stramonium*, *Classical uses*, *Activities*



Greentree Group Publishers

Received 26/04/18 Accepted 23/05/18 Published 10/07/18

INTRODUCTION

Dhattura (*Dhattura stramonium*) of Solanaceae family is widely described in Ayurveda classics; this herb has its own ethno-medicinal importance, since it plays an important role in the treatment of various diseases. It is used as a single drug or an ingredient of compound formulation. *Dhattura* is found common in districts of central and South India, especially in temperate and warmer regions of India. It is an herb covered with greyish tomentum. Stem erect 3-4ft. high, stout herbaceous. Leaves are large, and unequal at the base. Flowers are funnel shaped and appearing three together. Fruits are spinous and hanging downwards. Seeds are highly toxic^{1,2}. The present review attempts to compile information from regarding *Dhattura* including synonyms, classification, properties, actions and formulations from *bhrihatrayee* (classical texts), *nighantu* (lexicons) *sangrahagranthas* (compendia), text related to *prayoga* (therapeutic use) and ethno medical books in systematic manner.

SOURCE OF DHATTURA

Literature reveals that various textbooks refer to different *Dhattura* species as sources of *Dhattura*³.

1) DHATTURAMETAL LINN:

Annual herb 4 to 5 feet tall, with ovate alternate –unequal at the base leaves 7 to 8

inches, and flowers are white inside, Violet and Yellowish outside with purple calyx. The fruit is spiny Capsule with a diameter of 1.25inch, Seeds are yellowish brown.

2) DHATTURA INOXIA MILL:

Annual shrub, Stem and Leaves are covered with soft and grayish hairs. Flowers are white in color 6 to 8inch long. Fruit is spiny 2 inches or more in diameter.

3) DHATTURA STRAMONIUM LINN:

Annual herb, Stem is erect and stout; Leaves are smooth, toothed and irregularly undulated. The flowers are white or violet trumpet shape, 4 inches long. The Capsule is egg shaped filled with many black seeds.

VARIETIES

Classical *Nighantu*'s of Ayurveda refer to different types/varieties of *Dhattura* based on the color of the flower. The table (01) shows the varieties as enlisted in different lexicons^{4,5,6}.

Table 1 Varieties of *Dhattura*

Lexicon	No. of Varieties	Name
<i>Bhavaprakasha Nighantu</i>	05	<i>Sita</i> (white flowers)
		<i>Nila</i> (Violet flowers)
		<i>Krishna</i> (Black flowers)
		<i>Lohita</i> (Red flowers)
		<i>Pita</i> (Yellow flowers)
<i>Rajanighantu</i>	03	<i>Shweta Dhattura</i>
		<i>Krishna Dhattura</i>
		<i>Raja Dhattura</i>
<i>Nigantuadarsha</i>	03	<i>Raja Dhattura</i>
		<i>Dhattura</i>
		<i>Videshi Dhattura</i>

CLASSIFICATION

Dhattura has not been classified under any categories in the *Samhitas* of Ayurveda. It has been categorized under various *varga* (groups) in the classical lexicons of Ayurveda. Table (02) shows the classification of *Dhattura* in various *nighantu*⁴⁻¹⁵.

Table 2 Classification in different *nighantu*

Lexicons	Varga
<i>Bhavaprakashanighantu</i>	<i>Guduchyadivarga</i>
<i>Rajanighantu</i>	<i>Karaviryadivarga</i>
<i>Nighantuadarsha</i>	<i>Kantakaryadivarga</i>
<i>Dhanvantarinighantu</i>	<i>Karaviryadivarga</i>
<i>KaiyadevaNighantu</i>	<i>Aushadivarga</i>

Table 3 The list of synonyms

S. N	PARYAYA	BN	RN	DN	KN	PN	MN	NA	GR	YD	DH	SN
1	<i>Dhatur</i>	+	+	-	-	+	+	+	+	+	+	-
2	<i>Matulaputraka</i>	+	-	-	+	-	-	-	+	-	-	-
3	<i>Shivpriya</i>	+	-	-	-	-	-	+	+	-	+	+
4	<i>Shivashekhar</i>	-	+	-	-	-	-	-	-	-	-	-
5	<i>Devata</i>	+	-	+	+	-	+	-	+	-	-	-
6	<i>Harivallabha</i>	-	-	+	-	-	-	-	-	-	-	-
7	<i>Kalahpushpa</i>	-	+	-	-	-	-	-	-	-	-	-
8	<i>Dhatura</i>	+	-	-	-	-	-	-	+	-	-	-
9	<i>Dhurta</i>	+	+	+	+	+	+	+	+	+	-	-
10	<i>Kharjughna</i>	-	+	-	-	-	-	-	-	-	-	-
11	<i>Madan /madank</i>	+	+	+	+	-	+	+	+	-	-	+
12	<i>Unmatta/unmattak</i>	+	+	+	+	+	+	+	+	+	+	+
13	<i>Mahamohi</i>	+	-	-	-	-	-	+	+	-	-	+
14	<i>Matulaka</i>	-	+	-	-	-	-	-	-	-	-	-
15	<i>Matula</i>	+	-	-	+	+	-	+	+	-	-	-
16	<i>Kantakphala</i>	-	+	-	-	-	-	-	-	-	+	-
17	<i>Kitav</i>	-	+	+	+	+	+	+	+	-	-	+
18	<i>Shath</i>	-	+	+	+	-	+	-	-	-	-	-
19	<i>Tarak</i>	-	-	-	-	-	+	-	-	-	-	-
20	<i>Dhustur</i>	-	-	-	+	-	-	+	-	-	-	+
21	<i>Turi</i>	-	-	-	+	-	+	-	+	-	+	-
22	<i>Kanakhavya</i>	+	+	-	+	-	+	+	-	-	+	+
23	<i>Kanak</i>	-	-	+	-	-	-	-	+	+	-	-
24	<i>Khal</i>	-	+	-	-	-	-	-	-	-	-	-
25	<i>Mohan</i>	-	+	-	-	-	-	-	-	-	-	-
26	<i>Shyaam</i>	-	+	-	-	-	-	-	-	-	-	-
27	<i>Tarala</i>	-	-	-	+	-	-	-	-	-	-	-
28	<i>Gantapushpa</i>	+	-	-	-	-	-	-	-	-	+	-

BN-Bhavaprakasha Nighantu, RN-Raja Nighantu, DN-Dhanvantarinighantu, KN-Kaiyyadevanighantu, MN-Madanapalanighantu, GR-GunaRatnamala, PN-Priyanighantu, NA-Nighantuadarsha, DH-Dravyagunahasthamalaka, YD-Yadavadravyaguna, SN-Shodalanighantu

<i>Shaligramanighantu</i>	<i>Guduchyadivarga</i>
<i>Madanapalanighantu</i>	<i>Abhayadivarga</i>
<i>Priyanighantu</i>	<i>Shatapushpadivarga</i>
	<i>a</i>
<i>Shodalanighantu</i>	<i>Karaviryadivarga</i>
<i>Yadhavadravyagunavignyan</i>	<i>Kantakaryadivarga</i>
	<i>a</i>
<i>Gunaratnamala</i>	<i>Guduchyadivarga</i>
<i>Rasaratnasamuccya</i>	<i>Upavishavarga</i>

SYNONYMS

Ayurveda lexicons describe the plant, *Dhattura* by assigning synonyms to describe either morphology or pharmacological properties. Table (03) shows the list of synonyms attributed to *Dhattura*^{4,5,6,7,8,9,10,11,13,14,16}.

PHARMACOLOGICAL PROPERTIES

In Ayurveda, the actions of any herb are analyzed based on the five basic principles, *Rasa* (taste), *Guna*

(properties), *Virya* (potency), *Vipaka* (aftertaste), *Prabhava* (special action).

Table (04) shows the opinion on the pharmacological properties as stated in different lexicons^{4,5,6,7,8,11,13,14}.

Table 4 Pharmacological properties

	BN	RN	DN	KN	PN	NA	GR	YD
Rasa	<i>Kasaya, madhura, Tikta.</i>	<i>Katu</i>	<i>Katu</i>	<i>Kasaya, madhura, Tikta.</i>	<i>Tikta</i>	<i>Katu</i>	<i>Kasaya, madhura, Tikta</i>	<i>Katu, Kasaya, Madura, Tikta</i>
Guna	<i>Guru</i>	-	-	<i>Guru</i>	-	-	<i>Guru</i>	<i>Guru</i>
Virya	<i>Usna</i>	<i>Usna</i>	<i>Usna</i>	-	<i>Usna</i>	<i>Usna</i>	<i>Usna</i>	<i>Usna</i>
Vipaka	-	-	-	-	-	<i>Katu</i>	-	-
Prabhava	-	-	-	-	-	<i>Madakari, Jwaragna</i>	-	-

BN-BhavaprakashaNighantu, RN-Raja Nighantu, DN-Dhanwantarinighantu, KN-Kaiyyadevanighantu, GR-GunaRatnamala, PN-Priyanighantu, NA-Nighantuadarsha, YD-Yadavadravyaguna.

KARMA (ACTIONS) AND ROGHAGNATA (INDICATIONS)

The action of any herb is analyzed on the basis of its effect on the *Dosha* (humors) of the body. It has been stated that *Dhattura* has *Kaphavatahara* action, i.e. it mitigates the *Kapha* and *Vatadosha*⁶.

Based on the pharmacological properties and action on the *Dosha*, *Dhattura* is referred to possess pharmacological actions. Table (05) Shows *Dhattura* pharmacological actions as listed in different lexicons^{4,5,7,8,9,10,11,13,14}.

Table 5 Pharmacological actions of *Dhattura*

	BN	RN	DN	KN	PN	MN	YD	GR	SN
<i>Madakaraka</i>	+	-	-	+	+	+	+	+	+
<i>Bramakara</i>	-	+	+	-	-	-	+	-	-
<i>Jwaragna</i>	+	+	+	+	+	+	+	+	+
<i>Agnivardaka</i>	+	-	-	-	-	-	-	+	+
<i>Kantikaraka</i>	+	+	+	+	-	+	-	+	+
<i>Vishagna</i>	+	-	-	+	+	+	+	+	+
<i>Shwasa</i>	-	-	-	-	+	-	-	-	-
<i>Krimi</i>	+	-	+	+	+	+	+	+	+
<i>Kushta</i>	+	+	+	+	+	+	+	+	+
<i>Kandugna</i>	+	+	+	+	-	-	+	-	+
<i>Vranapida</i>	+	+	+	+	-	-	+	-	+

BN-BhavaprakashaNighantu, RN-Raja Nighantu, DN-Dhanwantarinighantu, KN-Kaiyyadevanighantu, MN-Madanapalanighantu, GR-GunaRatnamala, PN-Priyanighantu, YD-Yadavadravyaguna, SN-Shodalanighantu
Dhattura is also useful in *Kushta*¹⁷ and *Mushika visha*¹⁸.

ETHNO MEDICAL USES^{19,20,21}

1. Paste of *Dhattura* leaves and roots applied locally in case of joint pain.

2. Leaves are used in the form of cigarette in asthmatic condition.

3. The paste of leaves is applied to scorpion sting.
4. Juice of *Dhattura* leaves mixed with sugar and taken in dose of 125ml alleviates all types of fever.
5. Local application of juice of *Dhattura* leaves and *nimba*(*Azadirachta indica*) in skin disease like eczema and ringworm
6. Alopecia nearby vein punctured and applied with juice of *Dhattura* leaves and *bhallataka*(*Semecarpus anacardium* Linn)
7. The paste of turmeric with juice of *Dhattura* leaves is used in mastitis
8. In mastitis with galactorrhoea, hot fomentation of leaves is effective.
9. Oil prepared with the leaves used as externally in *charmaroga* (Skin disorders) and *Vatavyadhi* (Disease of nervous system)
10. In *amavata* (Rheumatoid arthritis), *sandishota* (Inflammation of joint), *nadishula*, *Andgridhrasi* (Sciatica) fomentation given with *kwatha* (Decotion) of leaves and leaves also applied on the affected part.
11. Seed and leaves were used to sedate the psychotic patients and to treat insomnia.
12. *Dhattura* leaves juice is locally applied in case of eczema and ringworm infestation.
13. The *Dhattura* leaves juice mixed with mercury or juice of heated leaves singly destroys ticks and lice by local application
14. *Dhattura* flower juice useful in earache
15. *Dhattura* fruit juice is applied to the scalp in case of dandruff and Hair falling.
16. Fruits are sedative and intoxicative.
17. One fruit of *Dhattura* powdered with *kwatha* of *Asana* (*Pterocarpus marsupium* Roxb) root becomes free from rabies
18. *Payasa* (rice with milk) cooked with *Shweta Dhattura* and mixed with *guda* (Jaggery), ghee alleviates all types of insanity.
19. Application of paste of *Haridra* (*Curcuma longa* Linn) and *Dhattura* fruit in breast pain.
20. *Dhattura* is used as antidote in case of rabies, mixture of *Swethapunarnavva* (*Boerhavia diffusa* Linn) (5gm) and *Dhattura* root (500mg) in cold water or milk should be given.
21. Juice of *Mandukaparni* (*Centella asiatica*) and paste of *Dhattura* root applied in boils.
22. Seeds are useful as aphrodisiac
23. *Dhattura* seed grounded and made in to pill applied in toothache.
24. *Dhattura* seed used in increasing dose like *pippalivardhamana* (*Piper longum*) with cold water destroys severe filaria.

25. *Dhattura* fruit and *kakodumbara* (*Ficus hispida*Linn) root taken with rice water destroys rabies.

FORMULATIONS

Dhattura is used a major ingredient in many Ayurveda formulations for the fore described pharmacological actions and are listed below in table 6²²⁻²⁹

Table 6 The list of important formulations containing *Dhattura* as a major ingredient

S.no	Formulations	Internal/ External	Dosage form	Context	Part used	References
1	<i>Arkaditailam</i>	E	<i>Taila</i>	<i>Gridrhasi</i>	Leaves Juice	BBR-1
2	<i>Agnimukhorasa</i>	I	<i>Vati</i>	<i>Shoola</i>	Leaves	BBR-1
3	<i>Ananda rasa</i>	I	<i>Vati</i>	<i>Atisara</i>	Seed	BBR-1
4	<i>Unmatataila</i>	E	<i>Taila</i>	<i>Kushta</i>	Seed	BBR-1
5	<i>Udayabhaskaro rasa-3</i>	I	<i>Rasa</i>	<i>Shoola</i>	Leaves juice	BBR-1
6	<i>Udayadityao rasa</i>	E	<i>Lepa</i>	<i>Kushta</i>	Seed	BBR-1
7	<i>Unmatabhairava rasa</i>	I	<i>Vati</i>	<i>Kasa</i>	Seed	BBR-1
8	<i>Unmadagajakesarirasa</i>	I	<i>Avaleha</i>	<i>Unmada</i>	Seed	BBR-1
9	<i>Ekangaveer rasa</i>	I	<i>Rasa</i>	<i>Vatavyadhi</i>	Seed	BBR-1
10	<i>Kamadevavati</i>	I	<i>Vati</i>	<i>Vajikarana</i>	Seed	BBR-1
11	<i>Kanaka tailam-1</i>	E	<i>Taila</i>	<i>Shairorog</i>	Seed	BBR-1
12	<i>Kandaryasaartailam</i>	E	<i>Taila</i>	<i>Kushta</i>	Seed	BBR-1
13	<i>Kumaratailam</i>	E	<i>Taila</i>	<i>Shiroroga</i>	Leavesjuice	BBR-1
14	<i>Kanakasava</i>	I	<i>Aasava</i>	<i>Hikka</i>	Rootbark	BBR-1
15	<i>Kanakadilepa</i>	E	<i>Lepa</i>	<i>Visarpa</i>	Seed	BBR-1
16	<i>Gandhaktailam</i>	I	<i>Taila</i>	<i>Karnaroga</i>	Leavesjuice	BBR-2, YR
17	<i>Chintamani rasa</i>	I	<i>Vati</i>	<i>Jwara</i>	Seed	BBR-2
18	<i>Jayamangalo rasa-1</i>	I	<i>Vati</i>	<i>Jwara</i>	Leaves juice	BBR-2
19	<i>Jatiphala rasa</i>	I	<i>Vati</i>	<i>Atisara</i>	Seed	BBR-2
20	<i>Jwarabhairava rasa-2</i>	I	<i>Vati</i>	<i>Jwara</i>	Seed	BBR-2
21	<i>Jwaramatangakesari rasa</i>	I	<i>Vati</i>	<i>Jwara</i>	Seed	BBR-2
22	<i>Jwarankush rasa-2</i>	I	<i>Rasa</i>	<i>Jwara</i>	Leaves	BBR-2
23	<i>Jwarankush rasa-3</i>	I	<i>Rasa</i>	<i>Jwara</i>	Leaves juices	BBR-2
24	<i>Jwarankush rasa-4</i>	I	<i>Vati</i>	<i>Jwara</i>	Seeds	BBR-2
25	<i>Jwarankush rasa-8</i>	I	<i>Rasa</i>	<i>Jwara</i>	Seeds	BBR-2
26	<i>Dugdhavati-1</i>	I	<i>Vati</i>	<i>Shotha</i>	Leaves juice	BBR-3
27	<i>Dhaturtailam</i>	E	<i>Taila</i>	<i>Vipadika</i>	Seed	BBR-3
28	<i>Rasendrachudamani rasa</i>	I	<i>Avaleha</i>	<i>Vajikaran</i>	Leaves juice	BBR-4
29	<i>Lakshmi vilas-1</i>	I	<i>Vati</i>	<i>Sannipat</i>	Seed	BBR-4
30	<i>Sutasekhara rasa-1</i>	I	<i>Vati</i>	<i>Amlapitta</i>	Seed	BBR-5
31	<i>Kshara yoga-3</i>	I	<i>Churna</i>	<i>Shoola</i>	Seed	BBR-5
32	<i>Abhayadilepa</i>	E	<i>Lepa</i>	<i>Vrana</i>	Leaves	BBR-5
33	<i>Aanandabhairavigutika</i>	I	<i>Gutika</i>	<i>Sannipata</i>	Seed	BBR-5
34	<i>Kakodumbara yoga-1</i>	I	<i>Churna</i>	<i>Visha</i>	Fruit	BBR-5
35	<i>Lakshmivilas rasa</i>	I	<i>Vati</i>	<i>Sannipata</i>	Seed	RC
36	<i>Lokanatha rasa</i>	I	<i>Vati</i>	<i>Sannipata</i>	Leavesjuice	RC
37	<i>Rasendragutika</i>	I	<i>Vati</i>	<i>Kasa</i>	Seed	RC
38	<i>Unmattaila</i>	E	<i>Taila</i>	<i>Vipadika</i>	<i>Rasakriya</i>	VS
39	<i>Dhaturbijataila</i>	E	<i>Taila</i>	<i>Vipadika</i>	Seed	CD
40	<i>Ahiphenataila</i>	I	<i>Taila</i>	<i>Karnashula</i>	Leaves juice	RT
41	<i>Unmata rasa</i>	I	<i>Rasa</i>	<i>Sannipata</i>	Fruit	RT
42	<i>Tribhuvankirti rasa</i>	I	<i>Rasa</i>	<i>Sannipatajwara</i>	Leaves juice	YR

43	<i>Kanaksundara rasa</i>	I	<i>Vati</i>	<i>Grahani</i>	Seed	YR
44	<i>Kanakarishtha</i>	I	<i>Arishta</i>	<i>Kushtha</i>	Bark	YR
45	<i>Gandhaktaila</i>	I	<i>Taila</i>	<i>Karnaroga</i>	Leaves juice	YR
46	<i>Panchvaktra rasa</i>	I	<i>Rasa</i>	<i>Sannipatajwara</i>	Leaves juice	YR
47	<i>Laghuvishagarbhataila</i>	I	<i>Taila</i>	<i>Vatavyadhi</i>	Seed	YR
48	<i>Agnimukha rasa</i>	I	<i>Rasa</i>	<i>Gulma</i>	Root	RRS
49	<i>Kanakadivati</i>	I	<i>Vati</i>	<i>Visha</i>	Seed	RRS
50	<i>Mrutasanjivani</i>	I	<i>Rasa</i>	<i>Jwara</i>	Root	BR

BBR-Bharatabhaishajyaratnakara, RC-Rasendrachintamani, VS-VangasenaSamhita, CD-Chakradatta,

RT-Rasatarangini, YR-Yogaratnakara, RRS-Rasaratnasamuchya, BR-Baishajyaratnavali.

DISCUSSION

Dhattura has been attributed with *Tikta*, *Kashaya*, *Madhura* and *katurasa*, *Ushnavirya*, *Katuvipaka*; has *laghu*, *rukshagunas*. It pacifies *kapha*, *vatadoshas*. *Dhattura* is being used as an ingredient in many formulations and it used both internally and externally. As external application, formulations are indicated for *Gridhrasi* (Sciatica), *Kushta* (Skin disorders), *Vatarakta* (Gout), *Vipadika* (Scaly lesion on palms and soles), *Vatavyadhi* (Joint disorders), *Vrana* (Wound), *Shlipada* (Fliariasis), *Krimi* (Worms), *Shotha* (Inflammation), *Netraroga* (Eye disorder). In Internal administration the formulation indicated for *Arsha* (Hammerohids), *Grahani* (Sprue), *Gulma* (Abdominallump), *Karnaroga* (Eardisorder), *Visarpa* (Erysepales), *Mutrakruccha* (Dysuria), *Hikka* (Hiccough), *kasa* (Cough), *Jwara* (Fever), *Shula* (Pain), *Unmada* (Insanity), *Apasmara* (Epilepsy), *Kushta* (Skin disorders), *Vatavyadhi* (Joint disorders),

Rajayakshma (Tuberculosis), *Rasyana* (Rejuvenation), *Vajikarna* (Aphrodisiac).

Dhattura has been investigated for antifungal, antimicrobial, antispasmodic, antibacterial, anticancer, antioxidant, anti-asthmatic, analgesic activities and anti-inflammatory activities.

Antispasmodic activity

Dhattura stramonium dried leaves reported to contain 0.25% of tropane alkaloid with main active constituent are atropine, hyoscyamine and scopolamine, which all known pharmacologically and therapeutically to have ant muscarinic effect causing clearly antispasmodic and antidiarrheal effect when used in herbal medicine³⁰.

Analgesic and Anti-inflammatory Activity

Hydro alcoholic extract of *Dhattura stramonium* leaves like flavonoids, phenols, Alkaloids and steroids that reported to have analgesic as well as anti-inflammatory effect³⁰.

Antifungal activity

Acetone extracts of *Dhattura stramonium* have been reported to have antifungal

activity against several fungi including *Penicillium expansum*, *Aspergillus Niger*, *Aspergillus parasiticus*, *Colletotrichum gloeosporioides*, *Fusarium oxysporum*, *Trichoderma harzianum*, *Phytophthora nicotiana*, *Pythium ultimum* and *Rhizoctonia solani*. The fungicidal effects of the extracts indicate the potential of *Dhatura stramonium* seeds as a natural source of antifungal agent³¹.

Anti-asthmatic activity

Dhatura stramonium contains a variety of alkaloids, including atropine and scopolamine, having anticholinergic and bronchodilating activity. Atropine and scopolamine act on the muscarinic receptors by blocking them (particularly the M2 receptors) on airway smooth muscle and sub mucosal gland cells, which dilate bronchial smooth muscle and ease asthmatic attacks³¹.

Antimicrobial activity

The methanol extracts of aerial parts of *Dhatura stramonium* showed the bactericidal activity against Gram-positive bacteria in a dose-dependent manner.

Ethanol extract exhibited the highest inhibitory activity against *Klebsiella pneumonia* followed by *Staphylococcus aureus*, with the least activity against *Salmonella typhi*. The aqueous extract showed activity on only *S. aureus*, while

Neisseria gonorrhoea was resistant to both extracts³¹.

Antiepileptic effect

Rats were continuously administered one of three herbal treatments (*Scutellaria lateriflora*, *Gelsemium sempervirens* and *Datura stramonium*) through the water supply for 30 days, one week after the induction of status epilepticus by a single systemic injection of lithium (3 mEq/kg) and pilocarpine (30 g/kg). The numbers of spontaneous seizures per day during a 15-min observation interval were recorded for each rat during the treatment period and during an additional 30 days when only tap water was given. Rats that received a weak solution of the three herbal fluid extracts displayed no seizures during treatment. However, when this treatment was removed, the rats displayed numbers of spontaneous seizures comparable to the controls³².

Anticancer activity:

Ahmad et al studied a variety of human cancer cells derived from breast (MDA-MB231), head and neck (FaDu), and lung (A549) and were exposed for 24 and 48 hours to *Datura* aqueous leaf extract and clonogenic cell survival as well as parameters indicative of oxidative stress were assayed. Exposure of these cells to the extract for 48 hours showed that all cancer cell lines were sensitive to cell

killing induced by *Datura* aqueous leaf extract exposure with some variability ($p < 0.05$)³³.

Antibacterial Activity:

The leave extract of *Dhatura stramonium* exhibits antibacterial activity. The antibacterial activity against the microorganism strains of *Salmonella typhii*, *Pseudomonas aeruginosa*, *Proteus vulgaris* in the alcoholic extract of the leaves *Dhatura stramonium* was found to be most efficient and moderately effective against *Klebsiella pneumonia*, *Staphylococcus-aureus* and *Escherica coli*. The different concentration of the alcoholic extracts of *Dhatura stramonium* was proved to be effective and concentration dependant antimicrobial activity against Gram positive and Gram-negative bacteria tested. This is also evidenced by several research groups and supporting the presence of antibacterial activity of *Dhatura stramonium* against Gram positive bacteria by dose dependent manner³³.

CONCLUSION

The present review indicates the importance of *Dhatura* (*Dhatura stramonium*), a toxic plant, as one of the important medicinal plant described for its pharmacological actions and indications in the Ayurvedic lexicons. Recent researches have validated its ethno medicinal uses and

demonstrate its effective use in various diseases.

REFERENCES

1. Lucas D Shanthakumar, Dravyaguna vignyana, Volume 2, Chaukamba Vlishwabharati, Varansi, P 304-08.
2. Shastry J.L.N Dravyagunavignyana volume 2, 1sted, Chaukamba Orientalia, Varanasi. 2004, P 382.
3. Erowid Daturavault, <http://erowid.org/plants/Datura/Datura.shtml>, cited on 27/4/2018, 9:05am
4. Bhavamishra, Bhavaprakasha nighnatu, Hindi commentary by Chunekar Kc, Edited by Pandey GS, Chaukhambha Bharati Academy, Varanasi, 2015, P 303.
5. Pandit Narahari, Rajnighantu, Karaviryadi varga, Chaukhamba orientalia, Varanasi, P 481-83.
6. Vaidya Bapalal, Nighantu Adarsha, Uttaraardha, kankaryadi varga, 1sted, Chaukhambha Bharati Academy, Varanasi, 1985, p 149-157.
7. Sharma PV (editor), Dhanvantari Nighantu, 3rded, Chaukhambha Orientalia, Varanasi, 2002, P 122.
8. Kaiyadeva, Kaiyadeva Nighantu, Sharma PV, Guru Prasad Sharma (editors), 1sted, Chaukhambha Orientalia, Varanasi, 1979, P 632.
9. Shaligramaji Vaishya, Shaligrama nighantu Bhushanam, Guduchyadivarga, Sri venkateshwara press, Bombay, P 232-34.
10. Shastry J.L.N, Madanapalanighantu, Abhayadivarga, Chaukhamba orientalia, Varanasi, P 277-79.
11. Sharma PV, Priyanighantu, Shatapushpadivarga, Chaukhambha Surabharati Prakashan, Varanasi, 1983, P 113.
12. Shodala, Shodalanighantu, with Commentary by Pandey Gyanendra, Karaviryadivarga, Dravyavali-Namavali, Chaukhambha Krishnadas Academy, Varanasi, 2009, P 13&91.
13. Yadavaji Trikarmaji, Yadhava dravyaguna vignyana, Shri sharma Ayurveda mandir, Varanasi, 4th ed, P 285.
14. Sri Bhavamishra, Gunaratnamala, edited by Pandey Kailash Pati, Guduchyadi varga, 1sted, Chaukhambha Sanskrit Bhavana, Varanasi, 2006, p 238.
15. Tripathi Indradev, Rasaratna samucchya, edited by devgini Kopy Chapter 10, Chaukhambha Sanskrit Samsthana, Varanasi, 2009.
16. Vaidya Mishra banavarilal, Dravyaguna hasthamalka, Kantakarikula, Publication Scheme, Jaipur-Indore, P 286.
17. Trikamji Yadvaji Acharya, Agnivesha Charaka Samhita Chakrapani Commentary, Chikitsasthan, Chapter 07, Kushta chikitsa, Chaukhambha Surbharati Prakashana, Varanasi, Reprint 2011.
18. Trikamji Yadvaji Acharya, Sushruta Samhita Nibandhadangarha commentary

- of Dalhanacharya, Kalpasthana, Chapter 07, Mushika Kalpa adyaya, Chaukhambha orientalia, Varanasi, Reprint 2009, p 582.
19. Sharma PV, Classical use of Medicinal Plants, Chaukhamba Vishwabharati Varanasi, p 201.
 20. pandey Gyanendra, Dravyaguna vignana, part1, 2nded, Chowkamba krishnadas academy, Varanasi, P 594-97.
 21. Late Nadakarni K.M, Indian Materia Medica, Revised by Nadkarni A.K, Popular Prakashana Private Limited, Bombay, P 434-40.
 22. Shah NC (editor), Bharat bhaishajya ratnakara. Volume 1 to 5, 1sted, B Jain Publishers, New Delhi, 2005.
 23. Acharya DhundhukaNath, Rasendra chintamani, Misra SN, (editor) 1sted, Chaukhambha Orientalia, Varanasi, 2000.
 24. Vangasena. VangasenaSamhita. Edited by N Saxena, Volume I and II, 1sted, Chaukhamba Sanskrit Series office, Varanasi, 2004.
 25. Chakrapanidutta, Chakradatta, Edited by T Indradev, 4thed, Chaukhamba Sanskrit Sansthan, Varanasi, 2002.
 26. Shadanand Sharma, Rasa Tarangini, Edited by Shastri Kashinat, 11thed, Motilal banarasidas, Varansi, 2009.
 27. Tripathi ID, Tripathi DS, Yogaratnakar, 1sted, Krishnadas Academy, Varanasi, 1998.
 28. Shri Das Govind. Bhaishajya ratnavali, Mishra BS, Shastri AD, Shastri RD, (editors) 19thed, ChukhmbhaPrakashan, Varanasi, 2008.
 29. Doshi K.A., Patel M.H, Bhoomi Kalaria, Dhatura (*Datura innoxia* Mill.)” A Precious Toxic Plant - A Review, International journal of Ayurvedic and Herbal medicine, 2015.
 30. Duraid A Abbas, analgesiac, anti-inflammatory and antidiarrhoeal effects of datura stramonium hydro alcoholic leaves extract in mice, IJRRAS 14 (1) January 2013.
 31. Bhakta Prasad Gaire, LalitaSubedi, A review on the pharmacological and toxicological aspects of Daturastramonium L. Journal of Integrative Medicine, March 2013, Vol.11, No.2.
 32. Prof Dr Ali Esmail Al-Snafi, Medical importance of Daturafastuosa (syn: Daturametel) and Daturastramonium - A review, IOSR Journal of Pharmacy, Volume 7, Issue 2 Version,1 (Feb 2017), PP 43-58.
 33. Langonjam Rajeev Singh, Okram Mukherjee Singh, Daturastramonium: An overview of its phytochemistry and pharmacognosy, Research Journal of Pharmacognosy and Phytochemistry. 5(3): May-June 2013, P 143-148.