

Review Article : Open Access

A review on an ayurvedic medicine, Vilwadi gutika used in the management of toxicity

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Article Info

Article history

Received 5 October 2023

Revised 22 November 2023

Accepted 23 November 2023

Published Online 30 December 2023

Keywords

Ayurvedic medicine

Vilwadi gutika

Toxicity

Poison

Toxic effect

Abstract

Ayurveda, the indigenous system of medicine explains in detail about the management of a wide range of toxic substances under the branch of ayurvedic toxicology (Agadatantra). Ayurvedic toxicology is one among the eight branches of Ayurveda which deals with toxicity and various toxic managements ranging from snake poison to diseases arising due to toxic accumulation in the body. A detailed description of the etiology, pathogenesis, and management of various kinds of poisons has been explained in the ayurvedic classics. Apart from the usual classical textbooks in Ayurveda, unique toxicology textbooks on the management of different poisons, practised specifically in Kerala such as Kriya kaumudi, Prayoga samucchayam and Kodasseri margam, have explained elaborately about the treatment of wide variety of toxins. Under ayurvedic toxicology, numerous formulations that can be effectively administered in the management of poison have been well explained and this ayurvedic medicine (Vilwadi gutika) is one such antitoxic formulation, whose practical applicability knows no bounds. In clinical practice, this ayurvedic medicine is not limited to poisonous cases alone, but also is widely administered in managing various skin conditions, infective stages, communicable diseases, chronic disorders with idiopathic causes, etc., by ayurvedic clinicians in their day-to-day practice. An insight into this ayurvedic antitoxic formulation will render an ayurvedic physician, the aid to manage several diverse clinical cases with ease.

1. Introduction

In Ayurveda, the common terminology used for drug or medicine is Bhesha, or Aushada, or Dravya (Remadevi, 2004), and has been viewed with more importance for the treatment and prevention of the disease. Acharya Caraka has included it under the three causative factors for health as per ayurvedic concepts (Trikamji, 2009a) and has placed it in the second place in the four pillars of ayurvedic treatment (Trikamji, 2009b).

As per the principles of Ayurveda explained under the branch of Ayurveda dealing with medicinal plants (Dravyaguna vinjaneeya), every substance including poison is considered to possess medicinal properties and it solely depends upon the physician's skill to make a drug a beneficial one or a harmful one. An ideal drug is said to cure the diseases without causing any side effects. Ayurveda gave a comprehensive approach to the complete knowledge of the drugs, right from the procurement, identification, processing, and application. A physician should be well aware of the therapeutic value of drugs, along with the clinical knowledge of the practical application of these drugs.

In the case of ayurvedic toxicology, antidotes or antitoxic formulations that are specifically used for the treatment of poisonous cases are known as Agada yogas (Sakshi and Nilima, 2023). In the present

day, only a few such antitoxic formulations and practices are used for the management of snake bite poisoning, the reason for the same being, the non-availability of the drugs, the controversy regarding the identity of the ingredients of the formulations mentioned in the classical texts and the lack of confidence of the practitioners caused mainly due to the above factors.

2. Ayurvedic medicine (Vilwadi gutika)

Vilwadi gulika (also known Vilwadi agada, Bilwadi vati, Bilwadi gutika) is a multiherbal ayurvedic antitoxic medicine widely used for the treatment of various bites and systemic disorders. Generally, due to its wide availability, it is the drug of choice for toxic effects developed in the human body due to any underlying cause including infections. It is a highly effective antitoxic formulation and the reference of this formulation is available in Ashtanga Hridaya and Ashtanga Samgraha, two well-known ayurvedic classical treatises, Visha Jotsnika and Kriya Kaumudi, which are renowned toxicology text books from Kerala and in Sahasrayogam, a textbook of ayurvedic formulations, under the chapter dealing specifically about tablets (Shubha *et al*, 2017).

As this article is a literary review, the sources of data are collected from available ayurvedic compendia including the classical ayurvedic toxicology textbooks from Kerala, and contemporary textbooks, journals, and relevant websites.

The formulation consists of thirteen ingredients excluding goat's urine (basta mootra) which is used as the medium to triturate (Table 1). Most of the drugs are hot in potency (usna virya), pungent after biotransformation (katu vipaka), mitigate the bodily humour kapha

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and vata (kaphavata hara), increase the digestive fire (dipana), facilitate normal digestion (pachana) and removes obstructions to the channels

in the body (srotho shodhana) in nature (Table 2). The chemical compositions of the ingredients are mentioned below in Table 3.

Table 1: Ingredients of the ayurvedic medicine (Vilwadi gutika)

S. No.	Drug	Botanical/ Zoological name	English name	Part used	Proportion
1.	Vilwa	<i>Aegle marmelos</i> Corr.	Bael tree	Root	1 part
2.	Surasa	<i>Ocimum sanctum</i> Linn.	Indian Basil/Holy basil/Sacred basil	Seeds, flower	1 part
3.	Karanja	<i>Pongamia glabra</i> Pierre.	Indian beech	Fruit	1 part
4.	Tagara	<i>Valeriana wallichii</i> DC.	Indian valerian	root	1 part
5.	Surahwa	<i>Cedrus deodara</i> Roxb.	Himalayan cedar deodar	Heartwood	1 part
6.	Amalaki	<i>Emblica officinalis</i> Gaertn.	Indian gooseberry	Fruit	1 part
7.	Haritaki	<i>Terminalia chebula</i> Retz.	Chebulic myrobalan	Fruit	1 part
8.	Vibhitaki	<i>Terminalia belerica</i> Roxb.	Belleric myrobalan	Fruit	1 part
9.	Shunti	<i>Zingiber officinale</i> Rosc.	Ginger	Rhizome	1 part
10.	Maricha	<i>Piper nigrum</i> Linn.	Black pepper	Fruit	1 part
11.	Pippali	<i>Piper longum</i> Linn.	Long pepper	Fruit	1 part
12.	Haridra	<i>Curcuma longa</i> Linn.	Turmeric	Rhizome	1 part
13.	Daruharidra	<i>Cocinium fenestratum</i> Gaertn and Colber.	Indian berbery	Heartwood	1 part
14.	Goat's urine (Basta mootra), medium for trituration	<i>Capra aegagrus</i> Gmelin.	Goat	Urine	Q.S.

Source: Vagbhata (2010)

Table 2: Pharmacodynamics properties of ingredients

S. No.	Drug	Taste (Rasa)	Quality (Guna)	Potency (Virya)	Biotransformation (Vipaka)	Action on doshas (bodily humour) (Doshagnata)
1.	<i>A. marmelos</i>	Astringent, bitter	Light, dry	Hot	Pungent	Mitigates kapha and vata
2.	<i>O. sanctum</i>	Astringent, bitter, and pungent	Light, dry	Hot except for seed (cold potency)	Pungent	Mitigates kapha and vata
3.	<i>P. glabra</i>	Bitter, pungent, and astringent	Light, penetrating, and unctuous	Hot	Pungent	Mitigates kapha and vata
4.	<i>V. wallichii</i>	Bitter, pungent, astringent, and sweet	Light, unctuous, and laxative	Hot	Pungent	Mitigates kapha and vata
5.	<i>C. deodara</i>	Bitter and pungent	Penetrating and light	Hot	Pungent	Mitigates kapha and vata
6.	<i>E. officinalis</i>	Astringent, sour, sweet, bitter, and pungent	Heavy, dry, and cold	Cold	Sweet	Mitigates all three bodily humours vata, pitta, and kapha
7.	<i>T. chebula</i>	Astringent, bitter, sweet, sour, and pungent	Light, dry	Hot	Sweet	Mitigates vata, pitta, and kapha
8.	<i>T. belerica</i>	Astringent and bitter	Light and dry	Hot	Sweet	Mitigates vata, pitta and kapha
9.	<i>Z. officinale</i>	Pungent	Light and unctuous	Hot	Sweet	Mitigates vata, pitta and kapha

10.	<i>P. nigrum</i>	Pungent	Light and penetrating	Hot	Pungent	Mitigates kapha and vata
11.	<i>P. longum</i>	Pungent	Light, unctuous, and penetrating	Neither too hot nor too cold	Pungent	Mitigates kapha and vata
12.	<i>C. longa</i>	Bitter and pungent	Light and dry	Hot	Pungent	Mitigates kapha and pitta
13.	<i>C. fenestratum</i>	Bitter and astringent	Light and dry	Hot	Pungent	Mitigates kapha and pitta
14.	Goat's urine (medium for trituration)	Hot and salty	Light, dry, and penetrating	Hot	Pungent	Mitigates kapha and vata

Source: Gopendra and Chaitra (2021)

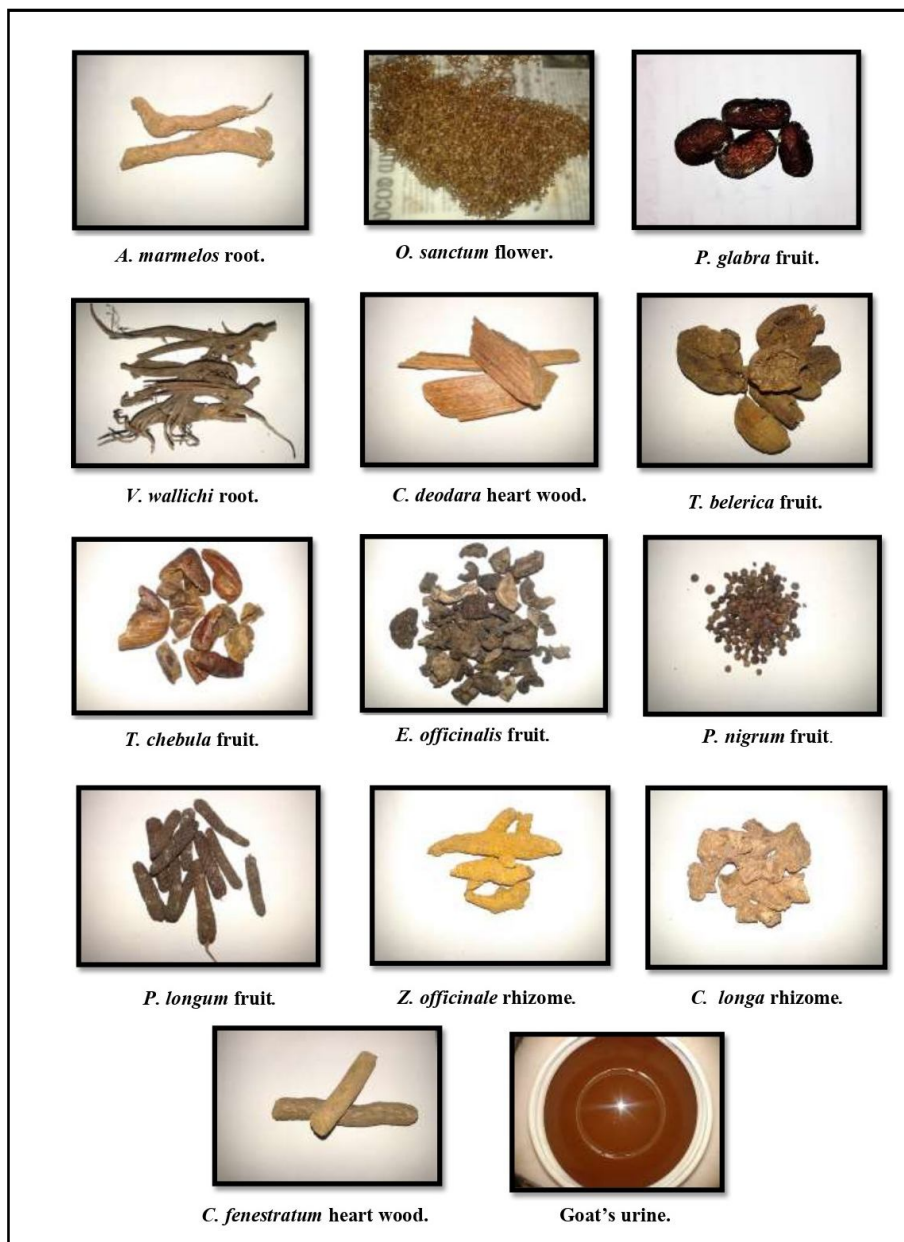


Figure 1: Ingredients of ayurvedic medicine (Vilwadi gutika).

Table 3: Chemical composition of ingredients

S. No.	Drug	Chemical constituents
1.	<i>A. marmelos</i>	It contains 6, 7-dio-mecoumarin, scopoletin, tembamide, umbdliferone, marmesin, skimmin, skimmianine, xanthotoxin, decursol, haplopine, furoquinoline, sitosterol, aegelin, aegelenine, and phellandrene.
2.	<i>O. sanctum</i>	It contains volatile oil, bornyl acetate, cadinene, camphene, camphor, carvacrol, caryophellene, eugenol, limonene, methyl chavicol, etc.
3.	<i>P. glabra</i>	It contains karanjin, pongamol, pongol, glabrin, neoglabrin, 3-methoxy pongapin.
4.	<i>V. wallichii</i>	It contains valrianic acid, irovalaic acid, caproic acid, hydroxy valeranon, etc.
5.	<i>C. deodara</i>	It contains sesquiterpene (himochalene, himacholol), P-methylacetophenone, atlantone, and deodarin.
6.	<i>E. officinalis</i>	It contains galic acid, lupeol, oleanolic aldehyde, ellagic acid, tannic acid, and cellulose.
7.	<i>T. chebula</i>	It contains chebulogic acid, chebulinic acid, anthraquinone, terchebin, vitamin C, sugar, 18 amino acids, phosphoric succenic and tannin.
8.	<i>T. belerica</i>	It contains tannin, sistosterol, galic acid and eugalic acid, mannitol, rhamnase, chebulogic acid, glucose and fructose.
9.	<i>Z. officinale</i>	It also contains special alkaloids and chemicals like zingiberene, zingiberol, curcumene, D-curcumene, oleo mresin, gingerin, gingerol shogaol and zingerone.
10.	<i>P. nigrum</i>	It also contains piperine, piperidine, pinene, caryophyllene alanine, pipercolic acid, cryptone, piperettine, chavicine, and some volatile oils.
11.	<i>P. longum</i>	It contains piperine, sitosterol, 4-5 dioxoaporphines, pipericide, piperlongumine, piplartine and sesamin.
12.	<i>C. longa</i>	It contains curcumin, curcumenone, cineole, camphene, sitosterol, vitamin A, protein, and carbohydrate.
13.	<i>C. fenestratum</i>	It contains berberin, karachine, taxilamine, palmatine, oxyacanthine, starch and glycosides, etc.
14.	Goat's urine	It mainly contains sodium chloride and urea. It also contains nitrogen and p-Ethyl phenyl sulphuric acid (Grant, 1948). 95% of the urine is made up of water and the remaining 5% constitutes the solutes.

Source: Nitin *et al.* (2021)

2.1 Pharmacological action and uses of goat's urine

Due to the pungent taste after biotransformation and hot properties, goat's urine mitigates kapha and vata and removes excessive pitta. It is considered to be antihelmintic, anti-inflammatory, and analgesic and also possess scraping action (lekhana), facilitating the downward movement of vata (anulomana). It also purifies the rakta which is one among the 7 bodily compositions as per ayurvedic concept. It is indicated in various diseases such as depleting disorders (rajayakshma), disorders related to the abdomen (udararoga), skin disorders (kushtha), and various systemic disorders causing the rise of body temperature collectively termed jwara (Nitin *et al.*, 2021).

2.2 Introduction to ayurvedic tablets (gutika kalpana)

Gutika or tablet is a solid dosage form prepared by adding fine powder of drug/drugs to liquified jaggery or Indian Myrrha (guggulu) or water or sugar or honey or freshly extracted plant juice (swarasa) or a specific medium, either by heating or without heating. The size of the tablet depends upon the characteristics of its ingredients (Shobha, 2011). According to Acharya Vagbhatta, it is classified as a variety of preparation of a formulation in paste form known as kalka. Synonyms of gutika include vati, vatika, vataka, modaka, pindi, guda and varti. Although these preparations differ in size, shape, and binding agents, their method of preparation is the same (Shobha, 2011).

- **Vataka:** Bigger than vatika in size and weighs more than 1D 2 g.
- **Modaka:** Round lump or bolus that weighs between 20 g-100 g.
- **Gutika/vatika:** Smaller in size.

- **Pindi or pinda:** Pea-sized pills.
- **Varti:** Elongated in shape with tapering ends.
- **Guda:** Lump/paste/bolus form.

2.3 Method of preparation of ayurvedic tablets

The drugs are dried and made into fine powder separately. The powdered ingredients are added one after the other into a pestle and mortar and ground to a soft paste with prescribed fluids. Before rolling the pills, one should ensure that the prepared paste is not sticking to the fingers when rolled. After complete drying, they are stored in airtight containers. If sugar salt, or drugs of alkaline nature (kshara) are an ingredient, the pills should be kept away from moisture. The general dose of an ayurvedic tablet as per classics is 12 g, or as per the strength of the patient and the severity of the disease (Himasagara, 2001). If, kept in airtight containers, pills made from plant drugs can be used for up to 2 years. Sarangadhara Acharya has mentioned the expiry period of a tablet as 1 year (Himasagara, 2001). Pills should not lose their original colour, smell, taste, and form.

2.4 Method of preparation of the ayurvedic medicine (Vilwadi gutika)

All the ingredients of this formulation are taken in equal quantities and goat's urine is taken as per the requirement for trituration. After thorough washing, pounding, and drying, the ingredients are powdered to a fine powder. This is then ground in a sufficient quantity of goat's urine for 120 h using a grinder as per the standardization of the drug (Sibel, 2009). The grinding process is usually completed in 14

days. The fine paste obtained is then dried under shade and rolled into pills. For commercial purposes, binding agents are added with

the ingredients, dried in a drier and pressed into tablets weighing 500 g each (Figure 2).

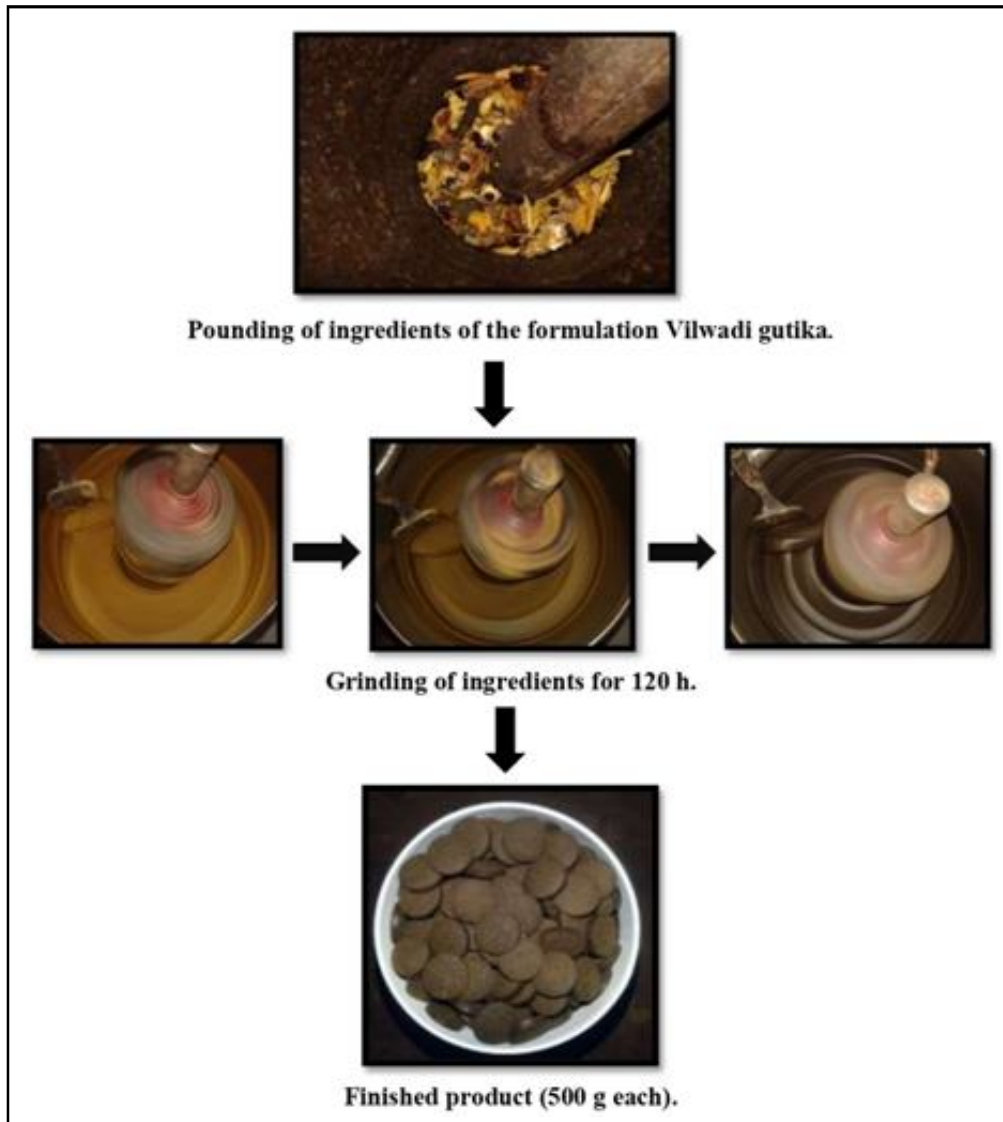


Figure 2: Method of preparation of the ayurvedic medicine (Vilwadi gutika).

This formulation consists of 13 ingredients and is a conventionally practised drug against various kinds of toxic conditions. In general, the medicine is possessing hot potency, reduces kapha and vata, and is antitoxic.

There are controversies regarding the duration of trituration and the medium used for trituration of this formulation. The market available-samples have a varied duration of grinding and there are opinions from renowned traditional toxicologists from Kerala that the grinding should be manual and should be continued for 6 months at a rate of 6 h a day. Another opinion is that the grinding should be done 3 h a day for 108 days or 24 h continuously for 15 days. There is also an opinion from traditional ayurvedic toxicologists that trituration (bhavana) should be done for 6 yamas per day for 6 months, where 1 yama equals 3 h (Gopendra and Chaitra, 2021; Shubha *et al.*, 2017). The medium of trituration though widely accepted as goat's

urine, controversies regarding the species of goat persist. Previous studies regarding the same show that goat's urine is the best medium for grinding for this particular formulation as it produces more effect when compared to other mediums such as cow's urine or water. There are opinions from traditional ayurvedic toxicologists from Kerala that the goat's urine quoted by Acharya refers to the urine of certain sheep that graze amidst the domestic goats. As the grinding time for the preparation of the drug has not been mentioned in the reference and since controversies exist, while preparing this formulation, the ingredients are preferred to be grinded for 120 h as per the standardisation done by a previous study (Sibel, 2009) conducted in the same, to meet the standard in the market available samples.

This ayurvedic medicine mitigates kapha and vata, increases the digestive fire (dipana), helps in normal digestion (pachana), is constive

in nature (grahi), removes the obstructions of the channels in the body (srotho shodhana), and is scraping (lekhana) in nature. It is a potent antitoxic medicine and is also indicated for vomiting, parasitic infestation, and infection caused by various microorganisms not visible to the naked eye (bhuta). Among the ingredients of this formulation, four drugs, and the medium of trituration have antitoxic properties.

3. Probable mode of action in the management of toxicity

A. marmelos is a proven anti-inflammatory drug by virtue of its hot potency, pungent taste after biotransformation, and astringent and bitter taste. It is found to have healing qualities and is good for blood purification (Ashutosh *et al.*, 2023). As it mitigates kapha and vata, it is suitable for the treatment of pain and swelling and is effective in managing various inflammatory changes in the body. *O. sanctum* is an anti-inflammatory, analgesic, and antipyretic drug with immunoregulatory action. It also acts as an antihistamine, antibacterial and has proven antitoxic effects. The drugs, *P. glabra*, *C. longa*, and *C. fenestratum* help to reduce skin lesions and are effective in managing the itching sensation associated with it. *V. Wallichii* has antitoxic properties while *C. deodara* possesses anti-inflammatory and analgesic action. *T. chebula* brings about the normal downward movement of vata (vata anulomana), which is primarily essential for interrupting the pathogenesis of inflammation and pain as per ayurvedic concept, thereby preventing them. A few drugs in this formulation possess cold potency and neither cold nor hot potency such as *P. longum*, which may act as a drug that reduces pitta. *Z. officinale* is used to manage acute and chronic inflammation, skin infection and oxidative stress, traditionally (Dheeraj *et al.*, 2023).

Some drugs such as *T. chebula*, *T. belerica*, *Z. officinale*, and *P. longum* are sweet after biotransformation, which may again contribute to reducing pitta, which in turn helps in reducing burning sensation, erythema, *etc.*, like symptoms, which occur in toxins predominantly causing the derangement of pitta, an example of which is viper snake bite poison (mandali visha). It also possesses antipyretic action, making it a drug of choice in various infective and communicable diseases arising with fever as a symptom.

This ayurvedic formulation is also found to be effective in other systemic disorders such as depression while administering it in the form of instillation through nasal orifice (nasya) (Sahala and Jithesh, 2019). It was widely practiced in the form of collyrium (anjana) and nasal instillation, before administering the blowing therapy (oothu chikitsa), by the traditional ayurvedic toxicologist in Kerala. This is usually done to revive an unconscious person when severely affected by the adverse effect of poison. The formulation is also highly effective in managing bite cases like spider bites, insect poison, poisonous bites of centipede, scorpion sting, *etc.*

4. Types of the ayurvedic medicine (Vilwadi gutika) mentioned in classics

Two other ayurvedic antitoxic formulation which is an adaptation of this classical formulation (Table 4), is the Visha Vilwadi gutika mentioned in Prayogasammucchayam (Puthezhathu, 1999) and Laghu (Cheriyi) Vilwadi gutika mentioned in Kodasseri margam, (Sreekumariamma, 1988), two main toxicology textbooks available in Malayalam language.

Table 4: Comparison of the ingredients of three ayurvedic medicines

Vilwadi gutika	Visha Vilwadi gutika	Cheriyi Vilwadi gutika
<i>A. marmelos</i>	<i>A. marmelos</i>	<i>A. marmelos</i>
<i>O. sanctum</i>	<i>O. sanctum</i>	<i>O. sanctum</i>
<i>P. glabra</i>	<i>P. glabra</i>	<i>P. glabra</i>
<i>V. wallichii</i>	<i>V. wallichii</i>	<i>Z. officinale</i>
<i>C. deodara</i>	<i>C. deodara</i>	<i>P. nigrum</i>
<i>E. officinalis</i>	<i>E. officinalis</i>	<i>P. longum</i>
<i>T. chebula</i>	<i>T. chebula</i>	<i>C. longa</i>
<i>T. belerica</i>	<i>T. belerica</i>	<i>C. fenestratum</i>
<i>Z. officinale</i>	<i>Z. officinale</i>	Goat's urine
<i>P. nigrum</i>	<i>P. nigrum</i>	
<i>P. longum</i>	<i>P. longum</i>	
<i>C. longa</i>	<i>C. longa</i>	
<i>C. fenestratum</i>	<i>C. fenestratum</i>	
Goat's urine	<i>Cyclea peltata</i>	
	<i>Aristolochia indica</i>	
	<i>Indigofera tinctoria</i>	
	Goat's urine	

5. Research studies on ayurvedic medicine (Vilwadi gutika)

5.1 Animal studies

A study conducted in male Wistar rats indicate that, this ayurvedic medicine reduces gentamycin-induced nephrotoxicity by significantly regulating the levels of serum creatinine, urine creatinine, and urine potassium, due to the anti-inflammatory, immunomodulatory, diuretic and antioxidant properties of the individual drugs (Kanna *et al.*, 2015). It is also observed that, Vilwadi gutika when administered in higher dose produced moderate reversal of toxicant induced changes in liver, due to its hepatoprotective property (Neeraj *et al.*, 2018). In another study conducted in Wistar albino rats, this ayurvedic medicine showed significant reversal of toxicity in lead induced toxicopathological condition (Shubha *et al.*, 2018).

5.2 Clinical studies

Studies reveal that this ayurvedic medicine when administered in autistic children along with dietary guidelines and multidisciplinary treatment interventions relatively reduces the abundance of *E. coli* and *Shigella* in them (Dinesh *et al.*, 2022). Moreover, it is also proven to be effective in latent toxicity (dooshivisha) exhibiting the signs and symptoms of skin disorder including psoriatic lesions (kitibha kushta) (Deepthi, 2009; Shirwar and Bharati, 2022). It is also found that Vilwadi gutika, when administered internally, is effective in the management of mild scorpion sting (Kumar *et al.*, 2021). It is observed that Vilwadi gutika when administered along with other suitable ayurvedic interventions is effective in Post-operative Ayurvedic management of non-healing idiopathic granulomatous mastitis with lesser adverse effects than conventional medicines and surgery and preventing recurrence (Maya and Shibila, 2021).

Vilwadi gutika was widely administered by the central and state government of Kerala to the public through various program during the outbreak of COVID-19 and was found to be effective in managing mild to moderately severe cases. This ayurvedic medicine can be considered as a drug of choice in controlling the progress of COVID-19, into further stages, and also as a preventive medicine (Varun and Anitta, 2020).

6. Conclusion

Vilwadi gutika is an amazing polyherbal formulation from the field of ayurvedic toxicology which is widely applied in the treatment of a wide range of disorders by clinicians all over the country in their daily clinical practice. It is widely available in the market from various pharmacies across India due to its wide utility. Not only the formulation is effective in all kinds of bites, but it is also helpful in treating a wide range of diseases with known and unknown etiological factors. In short Vilwadi gutika can be said addressed rightly as a miraculous boon from the field of ayurvedic toxicology to society.

Conflict of interest

The authors declare no conflicts of interest relevant to this article.

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- Citation** **K. M. Divya, Allam Ramakrishna, S. Balasundar and Govardhan Sahani (2023).** A review on an ayurvedic medicine, *Vilwadi gutika* used in the management of toxicity. *Ann. Phytomed.*, **12**(2):161-168. <http://dx.doi.org/10.54085/ap.2023.12.2.18>.