



Traditional methods of purification (detoxification process) for Schedule E poisonous drugs

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Medicinal plants have different types of active phytochemicals, which are still in use, either in their crude form or after proper processing. Though most of the plant drugs are safe, few are poisonous and may cause immediate toxic effect or cumulative toxic effect for human health. There are 25 poisonous or toxic plants in Siddha texts listed in the Schedule E of Drugs and Cosmetics Act 1940. The concept of *Suthimuraigal* in Siddha not only covers the process of purification and detoxification of physical and chemical impurities but also minimizes the side effects and improves the potency/therapeutic efficacy of the purified drugs. The aim of this review is to perceive the importance of the Schedule E drugs through their immense uses to treat diseases and to flourish the knowledge of purification processes to detoxify the poisonous elements, thus enhancing and utilizing them in curing challenging diseases. The distinct purification methods mentioned in Ayurvedic journals have also been reviewed for possible information. Methods of *Suthi* are variable and some of the important Siddha *Suthimuraigal* are reviewed in this paper. The traditional methods of purification may combat the toxic effects like ulceration, swelling, giddiness, skin rashes, pruritis also, thus enhancing the efficacy of the drugs in healing various ailments. Since these poisonous plants have very high potential to treat diseases, the chemical changes which transpired during the *Suthi* are to be revealed in further studies such as quantitative and qualitative analysis after their purification before they are applied in medicines.

Keywords: Purification process, Schedule E drugs, Siddha, *Suthimuraigal*, Toxicity

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Siddha medicine is believed to be originated from Tamilians and Sage Agathiyar is considered to be the principal Siddhar. Siddhars were not only physicians but also social reformers. They were well versed in the field of medicine, natural science, alchemy, astrology, *Kayakarpam* (rejuvenation), etc. The WHO has recognized the vast use of medicinal plants for treating liver, kidney disorders, cough, arthritis, diabetes etc¹. A large number of plants cause adverse effects when ingested or when being handled for some other purposes. Plant toxins include alkaloids, glycosides, amino acids, etc². Several medicinally important compounds have been isolated from Siddha medicinal plants and introduced for the service of mankind; however, most of these medicines have been withdrawn due to their toxicity or adverse effects³. Many of the poisonous plants are herbaceous in nature. Some plants are poisonous to humans only

and some to both humans as well as livestock populations. There are many poisonous plants which have much medicinal value and could find use in treating diseases⁴. These poisonous plants are categorized in Siddha texts as poisonous drugs and are listed in the Schedule E of Drugs and Cosmetics Act 1940⁵. To promote their vast usage in medicine, such plant drugs were instructed to be detoxified or purified as per traditional methods before their use in preparation of medicines. The present review describes information regarding the different process of detoxification in Siddha system of medicine and a view of other systems of medicines. This can uplift the usage of poisonous drugs in medicinal preparations and remove the fear of using these drugs in medicines.

Purification process through detoxification of any drug by removing its toxic materials or property is termed as *Suthimurai* in Siddha. The process is specially designed for the poisonous drugs of herbal,

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mineral, metal and animal origin drugs to remove their *kutram* (impurities or unwanted toxic content). The concept of *Suthimuraigal* in Siddha not only covers the process of purification/detoxification of physical and chemical impurities but also minimizes the side effects and improves the potency/therapeutic efficacy of the purified drugs. It is well known that constituents of a poisonous plant drug may exert severe toxic effects at high concentrations, which is why purification is recommended prior to its use in medicine⁶. The purification processes are basically intended to reduce the toxicity level to the body's sustainable limit and to reduce the toxic constituents to some extent or by potentiating their chemical transformation to nontoxic or relatively less toxic substances by enhancing their biological efficacy. Siddha and Ayurveda emphasized various methods of detoxification to overcome the unwanted effects from various poisonous and non-poisons drugs, involving different media specific to substances such as *pasumchaanam* (cow's dung), *komium* (cow's urine), *erumaichaanam* (buffalo's dung), *arisikaadi* (rice

vinegar), *kasayams* (herbal decoctions), herbal juices, fruit juices like lemon juice, etc. There are various Siddha texts emphasizing different *Suthimuraigal* according to the medicine that is to be prepared.

Methodology

Traditional books and Siddha classical texts available in the library of Siddha Central Research Institute were used to collect the various purification processes for Schedule E Siddha drugs. Databases like Google scholar, Research Gate and PubMed were also used to derive other Ayurvedic purification methods for those plants. We used the terminologies *Suthi*, *Shodhana*, poisonous plants and Schedule E plants for collecting the information regarding purification methods to convert the poisonous plants into medicines with more efficacy.

The Drugs and Cosmetics Act 1940 categorized some of the Siddha plant drugs under Schedule E (Table 1) so that these drugs are to be handled with care and precaution when they are used for medicinal preparations⁷.

Table 1 — Schedule E (1) Plants in Siddha system of Medicine.

S N	Siddha poisonous drugs	Parts used	Pharmacological activities	Therapeutic uses	Important Siddha medicines containing Schedule E drugs as ingredients	Contra-indications
1	<i>Abini</i> <i>Papaver</i> <i>somniferum</i> L.	Flower, Latex	Analgesic, antispasmodic, antiphlogistic, diaphoretic, diuretic, expectorant, styptic, hypnotic narcotic soporific, antisoporific, sedative, stimulant.	Ulcers, <i>vatha</i> diseases, tooth ache, ear diseases, nasal diseases, diarrhea, bone disorders ⁸ .	<i>Kattuvaathi Kuligai</i> — used for diarrhea and nasal diseases, dysentery. Abini Ennai-used for the treatment of ear diseases ⁸ . <i>Kabaada Mathirai</i> — used for diarrhea and dysentery ⁹ .	Nil
2	<i>Azhavanam</i> <i>Lawsonia inermis</i> L.	Leaf, root, seed	Astringent, deodorant, detergent, refrigerant, soporific. It has antiurolithiatic, anticonvulsant, anthelmintic, antibacterial, antidiabetic, antioxidant activities, trypsin inhibitory activity, hepatoprotective activity and abortifacient activity ¹⁰ .	Externally used for the treatment of osteoarthritis, headache, general body pain and insomnia ⁸ . The henna leaves are used as a prophylactic against skin diseases ¹¹ .	The paste of <i>Azhavanam</i> leaves are used for the purification of <i>Gandhagam</i> (sulfur) ¹² . The root of <i>Azhavanam</i> is used in the preparation of <i>Abraga Parpam</i> ⁹ .	Nil
3	<i>Alari</i> <i>Nerium indicum</i> Mill.	Root	Emetic, purgative, anthelmintic.	Fever, leprosy, hematoma and pitha disorders ⁸ .	The oil prepared by the root of <i>Alari</i> is used for ear diseases and leprosy ⁸ .	Nil

(Contd.)

Table 1 — Schedule E (1) Plants in Siddha system of Medicine — (Contd.)

S N	Siddha poisonous drugs	Parts used	Pharmacological activities	Therapeutic uses	Important Siddha medicines containing Schedule E drugs as ingredients	Contra-indications
4	<i>Aattru Thummatti</i> <i>Citrullus colocynthis</i> leaf (L.) Schrad.	Fruit, seed,	Low dose: expectorant, alternative activity. Medium dose: hydragogue and diuretic. High dose: emetic and gastrointestinal irritant.	Immobility of the joint due to <i>vatha</i> disorders; amenorrhea, menorrhagia and uterine disorders ⁸ .	<i>Kalingaathi Thylam</i> — used for female infertility ¹³ . <i>Nava Uppu Mezhughu</i> — mainly used for all types of <i>vatha</i> disorders ¹³ .	This medicine is not recommended for pregnant ladies and patients suffering from acid peptic disease ⁸ .
5	<i>Rattha Polam</i> <i>Aloe barbadensis</i> Mill.	Latex	Tonic, stimulant, stomachic, cathartic, emmenagogue	It is medicinally used for the treatment of chest pain, inflammations, stomach ache, prolonged <i>vatha</i> disorders, amenorrhea and jaundice. It is the best medicine for severe head ache caused by the sudden arrest of bleeding from bleeding piles and menorrhagia conditions ⁸ .	<i>Kariyapola Maathirai</i> — used for jaundice, amenorrhea ⁸ . <i>Moosamparapatru</i> — both medicines are mainly used for lumbar pain, angina pain, and fever with lymphadenitis ⁹ .	This medicine is not recommended for pregnant ladies.
6	<i>Oomatthai</i> <i>Datura stramonium</i> L.	Fruit, seed	Emetic, anti-spasmodic, anodyne, narcotic.	Medicinally it is used for the treatment of ulcers due to dog bite and chronic ulcer varieties, antidote, asthma and leprosy ⁸ . The roots are used for bites from mad dogs, epilepsy and insanity and in inflammations ¹⁴ .	<i>Mathan Thylam</i> — used for the treatment of all types of non-healing ulcers. <i>Pancha Lavana Parpam</i> — used for gunnam, diarrhea, <i>Pun Podi</i> — used for scabies and skin ulcers ⁹ .	Nil
7	<i>Etti</i> <i>Strychnos nux-vomica</i> L.	Seed	Anti-septic, carminative, purgative, tonic, stimulant, diuretic, delirium	Medicinally it is used for the treatment of delirium, poisonous bite, eczema, fatigue, sinusitis, tooth disease ¹³ .	<i>Rasagandhi Mezhugu</i> — used for all types of non-curable diseases ⁹ . <i>Vidamutti Thylam</i> — The medicine should be warmed and then used for massage ⁹ . <i>Nandhi Mezhugu</i> — used for all types of chronic disorders like cancers and leprosy ⁹ .	This drug is not recommended for hemiplegia patients. This drug interacts with mercury and mercury subchloride.
8	<i>Ganja</i> <i>Cannabis sativa</i> L.	Leaf, flower	Anodyne stimulant, hypnotic, narcotic, soporific, astringent, aphrodisiac, antispasmodic, diuretic, putrefacient activities.	Medicinally its used for the treatment of alcoholism, ulcer, various types of pricking pains, dysuria, vomiting, menorrhagia, osteoarthritis, asthma, dysentery varieties, migraine head ache, whopping cough, stomach ache ¹³ .	<i>Vaalaipoo Vadagam</i> — used for menorrhagia, (perumpaadu) ⁹ . <i>Ooli Maathirai</i> — used for cholera ⁹ . <i>Kabada Maathirai</i> — used for the all types of diarrhea and dysenteries ¹⁵ .	Nil

(Contd.)

Table 1 — Schedule E (1) Plants in Siddha system of Medicine — (Contd.)

S N	Siddha poisonous drugs	Parts used	Pharmacological activities	Therapeutic uses	Important Siddha medicines containing Schedule E drugs as ingredients	Contra-indications
9	<i>Kalappai Kizhangu</i> <i>Gloriosa superba</i> L.	Root	Alternative, anti-pyretic, purgative	Used to treat ulcers, leprosy, inflammations, intestinal worms, bruises, infertility and skin problem ¹⁶ . Colchicinean important constituent is approved to treat gout ¹⁷ .	<i>Rasa Parpam</i> <i>Seena Paagu Rasagandhi</i> <i>Mezhugu</i> — these are the important medicines mainly used in the treatment of psoriasis, leukoderma, cancer and many chronic disorders ¹⁸ .	Nil
10	<i>Kattamakku</i> <i>Jatropha glandulifera</i> Roxb.	Seed, Latex	Galactagogue, homeostatic, vermifuge, spermatogenic activities	Medicinally used for the treatment of diabetic ulcers, splenomegaly, internal hemorrhoids, head disorders, tooth ache, leukorrhea and kabhavatha disorders ¹³ . The seed oil can be applied to treat skin diseases like eczema and to treat some other rheumatic pain ¹⁹ .	<i>Mega Naatha Kuligai</i> — used for the treatment of Gunmam (APD), constipation, abdominal pain and discomfort ²⁰ .	Nil
11	<i>Kundrimani</i> <i>Abrus precatorius</i> L.	Seed	Laxative, antiphlogistic, expectorant, purgative, tonic, emetic, expectorant action.	It is medicinally used for the treatment of eye diseases, pithadiseases, jaundice, fever with severe sweating, kabha diseases, as an aphrodisiac, for edema, arthritis and hair fall ¹³ .	It is specially called as <i>Vidathaari</i> , which means it is specifically used for the poison of snake bites and scorpion bites ⁸ . <i>Purusa Rathna Thylam</i> — important drug used for male infertility and hemiplegia. <i>Kundri Patru</i> — externally used for pain and swelling of the legs during pregnancy ⁹ .	This medicine is not recommended for pregnant ladies. It may cause abortion.
12	<i>Serankottai</i> <i>Semicarpus anacardium</i> L. f.	Seed	Alternative, caustic activities.	It is medicinally used for the treatment of leprosy, tuberculosis, poisons, all type of pricking pains, leukoderma, hemorrhoids, acid peptic disease, chronicvatha diseases ¹³ .	<i>Rasagandhi Mezhugu</i> — used for all types of non-curable diseases ⁹ . <i>Nandhi Mezhugu</i> — used for all types of chronic disorders like cancers and leprosy ⁹ . <i>Idi Vallathi Mezhugu</i> — severe vatha diseases like rheumatoid arthritis and hemiplegia ⁹ . <i>Neeradimuthu Vallathi</i> — all types of skin diseases like psoriasis and leukoderma. <i>Gandhagarasayanam</i> — skin diseases, venereal diseases, UTI ¹² .	Nil

(Contd.)

Table 1 — Schedule E (1) Plants in Siddha system of Medicine — (Contd.)

S N	Siddha poisonous drugs	Parts used	Pharmacological activities	Therapeutic uses	Important Siddha medicines containing Schedule E drugs as ingredients	Contra-indications
13	<i>Nabi Aconitum ferox</i> Wall. ex Ser.	Root	Diaphoretic, diuretic, anti-periodic, narcotic, anodyne, antiphlogistic, antipyretic, sedative activities.	It is medicinally used for the treatment of arthritic pain, leprosy, kabha disorders, acid peptic diseases, urticaria, pricking pain, fever, delirium, hepatosplenomegaly ¹³ .	<i>Sivanar Amirtham</i> — used in skin diseases and emergency conditions in allergic diseases ⁹ . <i>Biramaanantha Bhiravam</i> — used for fever and delirium ⁹ .	Nil
14	<i>Thillai Excoecaria agallocha</i> L.	Latex	Vesiculate and purgative activities	Used for the treatment of all types of poisons, 80 types of vatha diseases including hemiplegia, leprosy and kabha diseases ¹³ .	-	The latex smell of the <i>Thillai</i> causes halitosis, oral ulcer, and ulcerative inflammation in GIT ²¹ .
15	<i>Nervalam Croton tiglium</i> L.	Seed	Purgative and rubefacient.	It is a major drug used to neutralize the all vatha, pitha, kabha through purgation ¹³ .	<i>Agathiyar Kuzhambu</i> — indicated for the treatment of 54 chronic diseases through purgation ²² . <i>Sanjeevi Maathirai</i> — 10 types of TB, hemorrhoids ²³ .	It is not recommended for diabetic and venereal diseases patients.
16	<i>Pugailai Nicotiana tabacum</i> L.	Leaf	Anti-spasmodic, emetic, diuretic, laxative, sedative, sialagogue, narcotic, antiseptic.	It causes dryness of mouth, pitha disorders, weakness and impotence and cardiac diseases so it is not used in Siddha drug preparations ¹³ .	-	It is not recommended for internal medicinal uses and it is not used for old age people, most lean persons and pediatric cases.
17	<i>Marukkarai Randia dumetorum</i> (Retz.) Lam.	Leaf, root	Emetic, diaphoretic, antispasmodic, astringent, expectorant, carminative.	It clears out the kapam (sputum) by stimulating vomiting, it acts like ipecac so it is used for dysenteries ¹³ .	<i>Marukkarai Kudineer</i> — the decoction prepared by using the root bark is used for the treatment of teeth and gum problems ⁸ .	The fruit of the <i>Marukkarai</i> cause abortion so it is not good for pregnant ladies.
18	<i>Kalli Euphorbia sp</i>	Latex	Rubefacient. expectorant, purgative.	The juice used for eczema and respiratory disorders. The milk of kalli is externally used for warts ¹³ .	<i>Veezhi Nei</i> — used for the treatment of female infertility ¹⁸ . <i>Pancha Lavana Parpam</i> — used for Gunmam, diarrhea ¹⁵ .	Nil

Results and Discussion

The holistic approach of the Siddha system in treating diseases with its herbal and herbomineral preparations inclusive of 32 types each in internal and external medicines is credible. Plants form the basis in biodiversity to maintain the ecosystem. Hence, the plant resources must be utilized properly and appropriately³⁶. The *Abrus precatorius* seeds were given to cattle for constipation in Aravalli hills of Rajasthan, but it creates nausea, vomiting and

gastrointestinal irritations³⁷. Furthermore, these poisonous plants contribute more in treating life-threatening and chronic diseases like cancer, autoimmune diseases, respiratory illness, skin diseases, etc. To overcome the adverse effects, these drugs have to be mandatorily purified before their usage in medicines in Siddha and Ayurveda. Many chemical changes have been documented during the process of purification and hence their toxicity may be reduced. For example, strychnine content has been

reduced in different media was 0.52% in cow's milk and 0.62% after cow's urine, milk and ghee is, when compared to 0.63% for unpurified *Strychnus nuxvomica* seeds. Brucine also reduced from 0.77% to 0.57% after purification in cow's urine, milk, and ghee. Hyocyanine content was reduced from 17.67% to 3.71% and scopolamine from 6.86 to 3.2% in purification of *Datura metal* Linn.³⁸. During the purification of *Semecarpus anacardium*, it has been documented that more toxic anacardic acid was converted to anacardol and reduction in the tarry oil content was the reliable change in the purification process³⁹. Urushiol and anacardic acid are the major

constituents responsible for blisters and erythematous skin allergy. Anacardol content increases as a result of another purification process and hence the chance of blisters is reduced by purification⁴⁰. Hence, as per the above scientific validations, the toxic contents are reduced after the purification process, and they have added evidence for the detoxification methods that are used in traditional practices to eliminate the toxic effects of such poisonous drugs Table 2. These toxins have to be validated to justify the purification processes through chemical analytical methods.

As per the concept of Siddha, "even a strong poisonous drug can be converted to an excellent

Table 2 — Purification Process for Schedule E Drugs in Siddha and Ayurveda

S N	Schedule E Plants	Purification Method in Siddha	Purification Method in Ayurveda
1	<i>Abini</i> <i>Papaver somniferum</i> L.	<i>Abini</i> can be purified by dissolving in water, kept for one day and the water should be filtered. This process should be repeated 3 times and the filtered water collected every time should be added and boiled until its consistency becomes a paste ⁸ . <i>Abini</i> is kept inside an onion after piercing it and the whole onion is sealed and boiled. Then the <i>Abini</i> is collected by cutting the onion ²⁵ .	<i>Abini</i> can be purified by triturating with ginger juice and the same process is repeated 21 times ²⁴ .
2.	<i>Azhavanam</i> <i>Lawsonia inermis</i> L.	Leaves of <i>Azhavanam</i> should be soaked in nisineer (fermented rice water) for 12 h. Then it should be washed ⁸ .	-
3.	<i>Aatru Thummatti</i> <i>Citrullus colocynthis</i> (L.) Schrad.	The fruit of <i>Aatru thummatti</i> is placed in the midst of dry hay and boiled, until the fruit becomes soft and then the skin is peeled off and the flesh and seeds are collected for medicinal purpose ¹³ .	
4.	<i>Aanai Kundri</i> <i>Abrus precatorius</i> L.	The seeds of the <i>Aanai kundri</i> should be soaked in water over night and the outer skin should be removed. The seeds are then allowed to dry and are collected for medicine preparation ²⁶ .	The Potali containing <i>Aanai Kundri</i> is placed in iron pot holding cow's milk. It is boiled for 6 h to aid the <i>Swedana</i> process. The process of <i>Shodhana</i> in Kanji is similar to that of milk except that the boiling time is 3 h instead of 6 h ³⁴ .
5.	<i>Rattha Polam</i> <i>Aloe barbadensis</i> Mill.	<i>Kariyapolam</i> or <i>Rakthapolam</i> is boiled along with <i>Annakaadi</i> (rice vinegar), then allowed to dry ¹³ . <i>Kariyapolam</i> or <i>Rakthapolam</i> is triturated along with <i>Annakaadi</i> (rice vinegar) for 3 h and then allowed to dry ¹³ .	-
6.	<i>Gomatthai</i> <i>Datura stramonium</i> L.	Gomatthai seeds are purified by soaking in lemon juice for 3 h ²⁵ . Gomatthai seeds are soaked in the water for 3 h ³⁴ . Gomatthai seeds are boiled in lemon juice and butter milk respectively for 3 h ²⁵ .	The purification of <i>Datura</i> seeds can be done in <i>Dolayantra</i> and <i>swedana</i> using cow's milk for 1 yama (3 h). The purification can be done using cow's urine for 1 yama (3 h) and triturated in <i>Khalvayantra</i> and filtered through cloth ²⁸ . <i>Datura</i> seeds are soaked in cow's urine for 12 h, then in <i>dolayantra</i> containing cow's milk for 3 h ²⁷ .
7.	<i>Etti</i> <i>Strychnos nuxvomica</i> L.	Seeds of <i>Etti</i> are cut into 2 parts, then soaked into the juice of Thetran (<i>Strychnus potatorum</i>) and then seethed until the seeds soften ²⁵ . Seeds of <i>Etti</i> are cut into 2 equal parts, then soaked in <i>Anna kaadi</i> (rice vinegar) for 3 days, followed by rubbing with gunny and finally allowed to dry it in sunlight ²⁶ .	Seeds of <i>Strychnus nuxvomica</i> are soaked in cow' urine for 7 days, followed by <i>swedana</i> with cow's milk for 3 h ²⁸ .

(Contd.)

Table 2 — Purification Process for Schedule E Drugs in Siddha and Ayurveda — (Contd.)

S N	Schedule E Plants	Purification Method in Siddha	Purification Method in Ayurveda
		<p>The seeds of <i>Etti</i> are soaked in the juice of <i>Sirukeerai</i> (<i>Amaranthus dubius</i>) root for 3 h and then seethed until the seeds soften²⁵. The seeds of <i>Etti</i> are soaked in the juice of <i>Kuppaikerai</i> (<i>Amaranthus viridis</i>) and boiled for 3 h²⁵.</p> <p>The seeds of <i>Etti</i> are boiled along with the juice or root of the <i>Thetran</i> (<i>Strychnus potatorum</i>) for 48 min²⁵.</p> <p>The seeds of <i>Etti</i> are placed in the midst of rice and rice husk and boiled in the warmth, then soaked in the juice of <i>Sirukeerai</i> (<i>Amaranthus dubius</i>) for 3 h, then finally boiled in the juice of <i>Thetran</i> (<i>Strychnus potatorum</i>) for 3 h²⁵.</p>	
8.	<i>Ganja</i> <i>Cannabis sativa</i> L.	The foreign matters like dust are removed and soaked in salt mixed water and kept for 1 day. The water is drained and the seeds are washed with fresh water. The process is repeated for 7 to 10 times and dried in sun light. After drying, it is fried in cow's ghee and used for medicinal purposes ⁸ .	<i>Ganja</i> is purified by boiling with <i>Babbula Tvakkvātha</i> for 3 h and then triturated with <i>Godugdha</i> ²⁹ . It can also be purified by triturating with <i>Babbula Tvakkvātha</i> and then fried in cow's ghee ²⁹ .
9.	<i>Kalapaikizhangu</i> <i>Gloriosa superba</i> L.	The root of the <i>Kalapaikizhangu</i> are cut into small pieces, soaked in the salt added butter milk for one full night and allowed to dry in sunlight. The same process is repeated for 7 days and then they are washed and allowed to dry ⁸ .	Roots of <i>Gloriosa superba</i> is soaked in cow's urine for 1 day for purification process ³⁰ . Cut pieces of <i>Gloriosa</i> roots should be kept in sour butter milk for 7 days in an earthen pot and dried in sunlight ³¹ .
10.	<i>Kattamanakku</i> <i>Jatropha glandulifera</i> Roxb.	The seeds of <i>Jatropha glandulifera</i> are boiled in the tender coconut, then washed in running water and allowed to dry ²⁵ .	-
11.	<i>Seran Kottai</i> <i>Semecarpus anacardium</i> L. f.	<p>The cotyledons of the <i>Semecarpus anacardium</i> nut should be removed and placed in between <i>Karchumambu</i> (lime stone). The palm toddy or rice vinegar should be poured over the lime stone. The nuts should be taken and washed in running water. This process is repeated for six times⁸.</p> <p>First the cotyledons removed <i>Semecarpus anacardium</i> nuts should be boiled in tamarind leaf decoction, <i>Butea monosperma</i> flower decoction, cow dung water and <i>Aloe vera</i> juice respectively⁸.</p> <p>The nuts of <i>Semecarpus anacardium</i> will be soaked in the mixture of palm toddy and curd obtained from the milk of red-colored cow, then it will be allowed to dry in sunlight for 9 days⁸.</p> <p>The nuts of <i>Semecarpus anacardium</i> will be soaked in the mixture of kadhuneer (rice water) and buffalo milk and kept for 3 h and then the nuts will be taken and washed in water²⁵.</p> <p>The nuts of <i>Semecarpus anacardium</i> are boiled in the cow dung water for 3 h. The process is repeated for 7 days. Then the nuts are soaked in the tamarind leaf juice for 1 day and are boiled. The same process is carried out by using cow's milk, aloe juice and tender coconut²⁵.</p>	<p>The fruits of <i>Semecarpus anacardium</i> were mixed with finely powdered brick powder and rubbed thoroughly by covering it with thick cloth till the outer covering is removed. Then it is kept for 3 days in brick powder till the oily part is absorbed. Then washed with hot water³².</p> <p>The nuts are subjected to fresh cow urine daily for 7 days followed by cow milk daily for 7 days followed by rubbing thoroughly with brick powder for 3 days. It should be repeated three times²⁸.</p> <p>The seeds are fried on fire²⁹.</p>

medicine if processed and administrated properly; on the other hand, even the most useful medicine may become a poison if handled incorrectly". Hence,

these methods can be followed for the use of the poisonous drugs as potent ingredients in medicine preparation.

Conclusions

The scientific validation of toxic constituents in the poisonous drugs, eg., anacardic acid in *Semecarpus anacardium* L. is essential for the development of safe traditional medicines. The traditional purifications may influence the phytochemical, pharmacological and toxicological profile of the plant drugs and thereby enhance the safety profile and efficacy of the drugs. It is worthwhile to adopt the detoxification process as per the Indian system of medicine in the development of traditional formulations and with application of modern technology to assess its safety and efficacy. The above explained purification process can be employed to promote the medicines with Schedule E ingredients and hence these poisonous drugs can be widely used for medicine preparations.

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Conflict of interest

The authors declare no conflict of interest.

Author(s) contributions

LJ, SK: Conceptualization; KK, PS: Project monitoring and supervision; LJ, SK: Writing—original draft; SKN, PS, VA, VLR: Writing—review and editing.

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