Unveiling the Healing Legacy: A Medico-Historical Review of Sharpunkha (Tephrosia purpurea (Linn.) pers.)

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ABSTRACT

Ayurveda, a traditional system of medicine provides preventive and curative care for diseases. A review of ayurvedic and contemporary literature with the goal of medico-historical aspects and the identity of the herbaceous perennial plant Sharpunkha (Tephrosia purpurea) was carried out. For the retrieval of published articles, a variety of recognized databases were used. Geographical distribution and taxonomical overview, synonyms and vernacular names, classification, Pharmacological properties, and therapeutic indications per Ayurveda literature. Phytoconstituents, the structure of the relevant constituents, and pharmacological properties of the root, bark, seed, and leaf are reviewed in this paper. This review article has delved into the medico-historical background and case studies clear that Tephrosia purpurea has a significant effect on hepatotoxicity, portal hypertension, ureteric stones, and various other diseases.

Keywords: Hepatotoxicity, Ethno-medical, phytoconstituents, hepatoprotective

INTRODUCTION

Herbal medicine has been an integral part of healthcare systems worldwide for centuries, with a rich history steeped in traditional and cultural significance. Ayurveda, a traditional system of medicine provides preventive and curative care from diseases. Sharpunkha has been identified as Tephrosia purpurea pers. (Family: Leguminosae) has a longstanding reputation in traditional medicine for its diverse pharmacological properties and purported health benefits. Despite its historical roots, renewed scientific interest has propelled Sharpunkha into the spotlight, with growing evidence supporting its efficacy in the management of various health conditions.

Our review aims to delve into the multifaceted aspects of Tephrosia purpurea, encompassing its mechanism of action, therapeutic indications, and current research landscape. By synthesizing the latest evidence from observational studies and systemic reviews, we endeavor to provide a comprehensive understanding of Tephrosia purpurea role in contemporary healthcare practice. By shedding light on its pharmacological nuances and clinical relevance, our review aims to inform healthcare providers, researchers and patient alike, facilitating evidence-based decision-making and fostering a deeper appreciation for the therapeutic potential of herbal medicines.

MATERIALS AND METHODS

A review of ayurvedic and contemporary literature with the goal of medico-historical...
aspects and identity of plant Sharpunkha was carried out. For the retrieval of published articles, a variety of recognised database were used. The search was focused on identifying scientific data from the available ethnomedical, clinical reports to understand the role of Tephrosia purpurea in various diseases.

**GEOGRAPHICAL DISTRIBUTION/TAXONOMICAL OF TEPHROSIA PURPURA**[1]:

- **Plant type:** herbaceous perennial
- **Height:** typically 30-60 cm tall, but can reach up to 150 cm.
- **Stems:** woody base, many branched and ridged.
- **Leaves:** compound with 9-7(-21) leaflet, arranged along a rachis. Leaflet blades are oblong-elliptic, oblanceolate-elliptic, or obovate-elliptic, with secondary veins 7-12 on each side of the midvein. Leaflet base is narrowly rounded, and apex is obtuse, truncate, or retuse and cuspidate.
- **Flowers:** mauve in color, with a standard (upper petal) that is orbicular and white puberulent, typically around 8mm in size, flowering Mar-Oct.
- **Inflorescence:** pseudo racemes are terminal, appearing opposite to a leaf or axillary near the apex or branchlets, about 2 or 10-15 cm in length.
- **Fruits:** legume is linear, measuring 3-5 cm ×3.5-4(-6) mm, with sparse appressed trichomes, and slightly curved the apex. Fruits Sep-Dec.
- **Seeds:** usually around 6 per legume, greyish-brown, ellipsoid, approximately 3×1.5 mm in size, with or without spots, and can be smooth or rough.

**Botanical name:** Tephrosia purpurea (Linn.) pers.

- **Kingdom:** Plantae
- **Family:** Leguminosae
- **Group:** Angiosperms
- **Common name:** Common Tephrosia
- **Synonymous names:** Tephrosia hamiltonii, Tephrosia wallichi, Tephrosia purpura, Cracca purpurea
- **System of medicine:** Ayurveda, Siddha, Unani

Images 3. (a) flowers, (b) fang like leaflet, (c) root, (d) pods, (e) leaves, (f) stem
SYNONYMS AND VERNACULAR NAMES USED FOR TEPHROSIA PURPERA [2]

| Arabic (3) | sarboka, sarphonka, sufuru |
| English (1) | wild indigo |
| Hindi (16) | ban-nil, bisoni, biyani, boyonia, dhamaasia, pal, saphanko, sar punkha, sarpanka, sarphanka, sarphankha, sarphanko, sarphenna, sarphoka, sarphonka, sarphonka |
| Kannada (19) | adavi hurali, adavi neeli, em puli, honnaaravike, kaggi, koggali, kogge, koggi, kogilu, kolinji, kolunji, marali gida, phanike, phankee gida, phanks, punike, vajarani, vajra neeliguda, vajradanali |
| Malayalam (10) | colini, kattamari, kazhinnila, kazhunnila, kolumi, kolula, korini, kotakolunna, kozhunna, kozhunnila |
| Marathi (8) | sarpanka, shrapunika, sirapunka, udha, uruha, unha, unihali, untoali |
| Persian (1) | Sarphoka |
| Sanskrit (21) | banah, banankedha, banankephal, ishupunkha, kalashaka, kalika, kandapunkha, kriti, neelabralakrati, nilavriksha, nilavrikshaki, pithari, pithasatru, pulchechtree, sarapunkha, sarapunkhah, sayapunika, sharapuchchha, sharapunika, poonkhiu |
| Tamil (30) | carapunka 2, cimmantukacetti, cimmantukam, kat-kolangi, kuttukkolincai, kuttukkoluncai 3, kavali, kayvela, kolunci 2, koluni, kollila, kollilaacetti, kollilacetti, kolluk-kay-velai, kolluk-kay-welai, kollukka, kollukkai velai, kollukkay velai, kollukkayvelai, kollunchi, kolunci, kozhungi, kumpuranacetti, kumpuranam, muka velai, nalicacetti, nalicam, tilapavi, caat kolingi, kallu-k-kay-velai, koolingie |
| Telugu (10) | bonta vempali, bonta vempali, bontavempali, karusembai, pamparachettu, tella vempali, tellavempali, thellavempali, vaynpai, vempali |
| Urdu (4) | sarabbiuka, sarphoka, sarphonka, sarphuka |

ETYMOLOGY OF SHARPUNKHA [3]
Sharpunkha is derived from sanskrit words “sharasya punkheva akrutirtasya” means arrow like leaflet and mentioned kandpunkha, banpunkha, ishupunkha, shyakpunkha and ishupunkhika as synonyms of sharpunkha.

CLASSIFICATION OF TEPHROSIA PURPUREA ACCORDING TO VARIOUS AYURVEDA TEXTS-

<table>
<thead>
<tr>
<th>Ayurveda Classics</th>
<th>Class (Ghana/varga)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sushrut Samhita [4]</td>
<td>Sarsudi</td>
</tr>
<tr>
<td>Sodhala nigantu [5]</td>
<td>Lakshmanadhi</td>
</tr>
<tr>
<td>Raj nigantu [8]</td>
<td>Shilahvadi</td>
</tr>
<tr>
<td>Shaligram nigantu [9]</td>
<td>Guduchyadi</td>
</tr>
<tr>
<td>Hridya deepaka [10]</td>
<td>Ekaam</td>
</tr>
<tr>
<td>Madhava Dravyagunha [12]</td>
<td>Shvak</td>
</tr>
<tr>
<td>Nigantu Adarsha [13]</td>
<td>Plashadi</td>
</tr>
</tbody>
</table>

RASA PANCHAKA OF SHARPUNKHA-

<table>
<thead>
<tr>
<th>Ayurveda Classics</th>
<th>Rasa</th>
<th>Ghana</th>
<th>Vriva</th>
<th>Virya</th>
<th>Vipaka</th>
<th>Prabhavya</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bhavprakasha Nigantu</td>
<td>Tikta Kasha</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Inkrapilihagulavishapah</td>
</tr>
<tr>
<td>Madanpal Nigantu</td>
<td>Tikta Kasha</td>
<td>Laghu</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Plechah</td>
</tr>
<tr>
<td>Raj Nigantu</td>
<td>Katu</td>
<td>-</td>
<td>Ushna</td>
<td>-</td>
<td>-</td>
<td>Krinnivatsapah</td>
</tr>
<tr>
<td>Madhava Dravyagunhaa</td>
<td>Katu</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Raj Vallabha [14]</td>
<td>Katu</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Dravya ghun vigyana [15]</td>
<td>Tikta Kasha</td>
<td>Laghu, Raksha, Tikshna</td>
<td>Ushna</td>
<td>Katu</td>
<td>-</td>
<td>Plechghna</td>
</tr>
</tbody>
</table>

3. **Ashtang hridya** [17] - a formulation with Sharpunkha seed powder beneficial in mushika visha (Rat bite poisoning).
4. **Chakradutt** [18] - Acharya Chakrapani mentioned Sharpunkha paste in plihayukrut chikitsa (spleen and liver disorders).

THERAPEUTIC USES OF TEPHROSIA PURPUREA -

1. **Charaka Samhita** [16] - Sharpunkha is named as *Kalshaak* mentioned pathya shaak for *Udarrogi* in *Udar Roga Chikitsa*.
2. **Shushruth Samhita** - Sharpunkha is mentioned under *Sursadi Gana*. Acharya Shushruth also mentioned root of Sharpunkha in *Alarka visha* as mix with equal quantity of *Shudha Dhatura*.  

*Sharpunkha* is described under various classes according to different ayurveda texts as per its different uses and properties.
7. Bhaishjaya Ratnavali [21] - Sharpunkha is mentioned as Sharpuhkadhi lepa in sadhyovrana chikitsa and it is also used as ingredient in Raktpdadahara yoga.

8. Nigantu:
8.1. Sodhala nigantu - Sharpunkha is included in lakshmanadhi varga and described as two synonyms Sharpunkha and bhaanpukhha with vrushdana and varini properties.

8.2. Madanpal nigantu - Sharpunkha is included in abhyadhi varga. It is mentioned as two synonyms Sharpunkha and Kalashaka. It is described as pleehari (beneficial in splenomegaly) and also beneficial in liver disorders, dusta vrana (non-healing ulcer), poisoning, respiratory disorders.

8.3. Bhavprakash nigantu - Sharpunkha is included in guduchyadhi varga. It is mentioned as plehasanthu (effective in splenomegaly), neelvrukshakrithi due to its blue-coloured flowers, beneficial in liver disorders, worm infestation, bloating, poisoning and also contain wound healing property.

8.4. Raja nigantu - Sharpunkha is included in Shtavadhi varga and mentioned six types of Sharpunkha. Sharpunkha is refers as beneficial in worm infestation, itching and also vatadosahara effect.

8.5. Madav Dravya Ghuna - Sharpunkha is named Kaalshaka and beneficial in poisoning, kaphadosha and also containing anti-inflammatory and deepan properties (digestive enzymes stimulator).

8.6. Shaligram Nigantu

11. Rasatarangini [23] - Rasatarangini mentioned equal quantity of Sharpunkha powder with yava kshara beneficial in gulma and pleeha roga. (13th chapter verse 12). Another reference of Sharpunkha kshar with tilakshar used for gulma roga chikitsa also found. (14/90) It is named as plehashta mentioned in plehuvrdhi (splenomegaly) with powder of shudha kasis and anupana of hot water or juice of aloe vera. (15/243)

### PHYTOCHEMISTRY OF TEPHROSIA PURPUREA [24]

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Plant Part</th>
<th>Chemical Constituents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Flower</td>
<td>Delphinidin, Cyanidin Chloride</td>
</tr>
<tr>
<td>2.</td>
<td>Fruit</td>
<td>Purpurin A, Vilinpin, Vilisomin, Villozone, Villosin, Villosol, 1-Triacontanol, Tephron, Beta- Sitosterol</td>
</tr>
<tr>
<td>4.</td>
<td>Root</td>
<td>2-Phenyliufo[2,3-H]Chromen-4-One, Karanjin, Purpurenone, Kanjone, O-Methylpongamol, Lanceolatin A, Tephrinsole, Rotenone, Anhydropisatin, Flemichapparin C, (-)-Isolonchocarpin, Tephroglabrin, Maackiain, Tephrosin, Beta-Sitosstrol,</td>
</tr>
<tr>
<td>5.</td>
<td>Seed</td>
<td>2-Phenyliufo[2,3-H]Chromen-4-One, Purpuritenin A, Karanjin, Purpuritenin B, Lanceolatin A, Purpurin, (+)-Isolonchocarpin, 1,3- Propanediolone, Caffeic Acid, Beta-Sitosstrol</td>
</tr>
<tr>
<td>6.</td>
<td>Wood</td>
<td>Rutin</td>
</tr>
<tr>
<td>7.</td>
<td>Whole Plant</td>
<td>(+)-Tephrosone, Kanjone, Tephrinsole, Delphinidin, Rotenone, Purpurin, Anhydropisatin, Flemichapparin C, 7,4-Dihydroxy-3,5-Dimethoxyisoflavone, Cyanidin Chloride, (+)-Isolonchocarpin, (+)-Tephropurpurin, Tephroglabrin, Alpha-Spinasterol, Ursolic Acid, Betulnic Acid, 12a-Hydroxyrotenone, Tephrosin, Lupeol, Beta-Sitosstrol, Rutin</td>
</tr>
</tbody>
</table>
Chemical constituents: (a) Purpurin A (b) Purpurin B (c) Karanjin (d) Tephrone (e) Delphinidin (f) Rotenone (g) Ursolic acid (h) Tephroglabrin (i) Rutin

**PHARMACOLOGICAL ACTIONS OF TEPHROSIA PURPUREA**

<table>
<thead>
<tr>
<th>Plant Part</th>
<th>Therapeutic use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Root</td>
<td>Abdominal pain, acne vulgaris, anaemia, anthelmintics, antirheumatic, asthma, bronchitis, colic, diarrhoea, dysmenorrhea, dyspepsia, elephantiasis, fever, fishes poisonous, flatulence, gingivitis, hemorrhage, hepatomegaly, inflammation, liver diseases, otitis media, skin diseases, hydrocele, toothache, tuberculosia, urination disorders</td>
</tr>
<tr>
<td>Seed</td>
<td>Anthelmintics, eczema, leprosy, scabies,</td>
</tr>
<tr>
<td>Stem</td>
<td>Toothache</td>
</tr>
<tr>
<td>Whole plant</td>
<td>Anthelmintics, antirheumatic, attention deficit disorder with hyperactivity, diuretics, fibrosis, jaundice, laxatives, liver disorder</td>
</tr>
</tbody>
</table>

Tephrosea purpurea shows hepatoprotective, antiulcer, anti-inflammatory, antimicrobial, antianxiolytic, antioxidant, cytotoxic, anti-allergic, antiviral, antituberculosis, spasmolytic, antiepileptic and nephroprotective activities. Rakesh Pundir et al., (2009) studied alkaline preparation of Tephrosia purpurea is used in treatment of liver and spleen diseases. It is protective against CCl4 and D-galactosamine poisoning. A case study on liver cirrhosis with ascites reveals that Sharpunkha (Tephrosia purpurea) removes portal hypertension. It is specifically considered for the treatment of inflammation of spleen and liver. Powdered aerial parts prevent an elevation of SGOT, SGPT and bilirubin levels. Tephrosia purpurea controls the bleeding through its
hot, pungent, bitter properties, and pleehaghna prabhav. Tephrosia purpurea is more over acts on detoxification and purification of blood reservoir organs like liver and spleen. It stops the aggravation of vitiated pitta and rakta and breaking the etiopathogenesis of Rakta pradar.

A case report of urolithiasis with bilateral ureteric stone affected patient produced complete relief in pain and urinary obstruction with complete expulsion of both ureteric stone at the end of three months when treated with kulatha kwatha with the anupana of sharpunkha and sendha namak (rock salt).

**DISCUSSION**

Sharpunkha is widely used plant in Ayurveda classics for the treatment of various diseases. This study shows that all parts of Sharpunkha have been used for medicinal approach. Most of its synonyms contains word punkha in it. The review clearly stated that sharpunkha is designated as yukrutplehari (acts on liver and spleen), beneficial in gula roga, visha (poisoning) and works on wound healing. Its pungent, bitter and astringent taste and having laghu, ruksha, deepan and Tikshna properties with hot potency pacifies vata and kapha dosha. Sharpunkha also having properties to treat female infertility, ashamri (calculi) and swasa roga (respiratory disorders). Pharmacological profile shows its hepatoprotective, anti-helminthic, antiulcer, antirheumatic and digestion stimulant activity.

Review of Previous research and case study clears its significant effect in hepatotoxicity, portal hypertension, ureteric stone and various other diseases. Kim et al., (2023) studied that Tephrosin reduced the expression of the anti-apoptotic factor XIAP. This study demonstrates that tephrosin is a potent antitumor agent that can be used in the treatment of paclitaxel-resistant ovarian cancer via the inhibition of the FGFR1 signaling pathway. Another research by Du J et al., (2021) reveals that Tephrosin significantly inhibited the proliferation of pancreatic cancer cells and induced mitochondrial-related apoptosis. ROS are required for tephrosin to exhibit antiproliferative activity and trigger apoptosis in pancreatic cancer cells. Tephrosin significantly inhibited the growth of pancreatic cancer cells in vivo and has no observable toxicity, indicating that tephrosin is a potential anticancer agent, and deserves further development as a new therapy for pancreatic cancer. A study in which, assessed the effect of Tephrosia purpurea on 12-O-tetradecanoyl phorbol-13-acetate (TPA; a well-known phorbol ester) induced cutaneous oxidative stress and toxicity in murine skin. The pre-treatment of Swiss albino mice with Tephrosia purpurea prior to application of croton oil (phorbol ester) resulted in a dose-dependent inhibition of cutaneous carcinogenesis. opical application of Tephrosia purpurea 1 h prior to each application of croton oil (phorbol ester) resulted in a significant protection against cutaneous carcinogenesis in a dose-dependent manner. The animals pre-treated with Tephrosia purpurea showed a decrease in both tumor incidence and tumor yield as compared to the croton oil (phorbol ester)-treated control group. In addition, a significant reduction in TPA-mediated induction in cutaneous ornithine decarboxylase (ODC) activity and [3H] thymidine incorporation was also observed in animals pre-treated with a topical application of Tephrosia purpurea.

**CONCLUSION**

This review article has delved into medico-historical background and contemporary aspects related to drug Sharpunkha (Tephrosia purpurea). Through studying, we have gained a deeper understanding of drug activity and pharmacological actions of tephrosia purpurea. Overall, it is evident that sharpunkha has good hepatoprotective activity. However, this review only based on ayurveda literature and contemporary research related to sharpunkha, there is also scope of further clinical trials related to drug action and efficacy.
Dr. Manisha Goyal et.al. Unveiling the healing legacy: a medico-historical review of Sharpunkha (Tephrosia purpurea (Linn.) pers.)

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29. Richa Sharma. A case report of urolithiasis of patient with bilateral uretric stones

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