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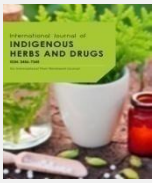

HRISVAPANCHAMOOL: A POTENTIAL AYURVEDIC FORMULATION FOR MANAGEMENT OF BALSHOSHA (PRIMARY ACUTE MALNUTRITION)

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Abstract

Hrisvapanchamool, a classical *Ayurvedic* formulation, has been extensively documented for its therapeutic benefits, particularly in treating conditions related to *Balshosha* (Primary acute malnutrition). *Ayurveda* emphasizes balancing doshas and strengthening *dhatus* for optimal health, especially in diseases like *Balshosha*, where *Kapha* and *Vata* are primarily affected. *Hrisvapanchamool* consists of the roots of five medicinal plants- *Shalparni (Desmodium gangeticum), Prishnaparni (Uraria picta), Brihati (Solanum indicum), Kantakari (Solanum verginianum), and Gokshura (Tribulus terrestris)*. These herbs exhibit properties such as *Deepan* (digestive stimulant), *Pachan* (digestive), *Balya* (strengthening), and *Rasayana* (rejuvenating), making them beneficial for promoting healthy metabolism and immunity in malnourished children. A systematic literature review was conducted using database such as PubMed, Google Scholar, DHARA, and classical *Ayurvedic* texts, including *Charaka Samhita* and *Sushruta Samhita*. Studies on the individual components of *Hrisvapanchamool* indicate their efficacy in addressing inflammation, respiratory disorders, gastrointestinal ailments, and immune deficiencies. Research highlights the phytochemical constituents of these herbs, including alkaloids, flavonoids, and saponins, which contribute to their therapeutic potential. Furthermore, modern pharmacological studies support the formulation's role in enhancing nutritional status and alleviating symptoms of malnutrition. This review underscores the relevance of *Hrisvapanchamool* in pediatric malnutrition management and its potential for integration into contemporary therapeutic approaches.

***Keywords*:** *Hrisvapanchamool, Balshosha,* Primary acute malnutrition, Phytochemical constituents, Pharmacological studies.

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Introduction

Malnutrition is a significant global health concern, particularly affecting children in developing nations. According to NFHS-5 (National Family Health Survey, 2019-2021) 35.5% children were found stunted, 32.1 % underweight, 19.3 % wasted and 7.7% severely wasted in the less than five years age group [1]. Approximately 50 percent of all childhood deaths, including urban and rural or 30,000 deaths each day in children under five years are due to malnutrition [2]. According to UNICEF, in India, around 46 percent of all children below the age of three are too small for their age, 35.7% are underweight and belong to Moderate Acute Malnutrition [3]. Improper weaning and delayed introduction of proper complementary foods when a child has completed 6 months of age abates the infant's growth [4]. In *Ayurveda*, treatment focuses on using medicinal or dietary substances that balance the *doshas*, support the *dhatus*, and harmonize the *Tridosha*, ultimately leading to healthy *dhatus*. In the case of *Balshosha*, the primary doshas involved are *Kapha* and *Vata*, along with weakened *Agni* and blockages in the *Rasdhatuwaha Srotas* [5]. To address

the root cause of the disease, the treatment should include herbs with *Deepan* (digestive stimulant) and *Pachan* (digestive) properties, along with *Santarpak* (nourishing qualities), *Balya* (strengthening), *Brimhan*a (bulk-promoting), and *Rasayana* (rejuvenating), all of which promote healthy *dhatu* formation. The drug should also act as a *Srotoshodhak* (clear obstructions at the micro-cellular level of metabolism). However, it should not possess *Ushna (hot)*, or *Tikshna*(pungent) qualities, as a child's delicate and immature *dhatus* cannot tolerate strong properties. Additionally, the formulation must be palatable to ensure the child can consume it easily. A major issue in malnutrition is weakened immunity, making children more susceptible to infections. There is a need for such a formulation that can be prepared and administered easily.

Hrisvapanchamool, a compound formulation extensively detailed in various *Ayurvedic* classics, boasts many therapeutic properties, including anti-inflammatory, analgesic, rejuvenating, antipyretic, skin disorder-alleviating, and wound-healing effects. *'Hrisvapanchamool'* denotes a blend of roots from five diminutive plants or herbs. However, *Ayurvedic* texts outline two distinct compositions for *Hrisvapanchamool*. The first formulation, as cited in *Charaka Samhita* [6] and other treatises like *Chakradatta* and *Yogaratnakara,* includes the roots of four common plants *Kantakari, Brihati, Shaliparni, and Prinshniparni* along with the entire *Gokshura* plant conversely, the second formulation, referenced in *Sushruta* [7].

The *Ayurvedic* text *Astanga Hridaya* recommends *Hrisvapanchamool Siddha Ksheerpaan* for infants when a mother's milk or a wet nurse is unavailable. [8] This formulation includes the roots of *Shalparni* (*Desmodium gangeticum*), *Prishnaparni* (*Desmodium gangeticum*), *Brihati* (*Solanum indicum*), *Kantakari* (*Solanum surratense*), and *Gokshur* (*Tribulus terrestris*), collectively known as *Hrisvapanchamool*. The main classical texts of *Ayurveda,* mention *Hrisvapanchamool* as a *Rasayana formulation* [9] and useful in treating *Sotha)* [6], *Jwara* [7], *Raktapitta,* [10], *Gulma* [11], *Kustha* [12], *Vrana,* [13] *Vatavyadhi* [14] and *VataSonita* [15], *Swasrog* [16], *Rajyakshma* [17], *VataKapha Shaman* [18] *VataVyadi* [19] *Kustha* [20]. *Hrsvapanchamool* possesses Antioxidant, wound healing and antimicrobial activities that could be due to the presence of flavonoids, alkaloids, essential oils, saponins and tannins present in it [21]. All these five drugs have high nutritive value. Root powder of *Shalparni* has protein of 8.63% and crude fat of 0.73%. Moreover, the crude fibre (49.83%) and carbohydrate (74.44%) were found to have the highest percent [22]. The root decoction of *Prishnaparni (U. picta)* is used to treat cough, cold, fever, chill, antiseptic and general healing [23]. Prisniparni (U. picta) seed protein concentrate (SPC) is a rich source of essential amino acids, starch, sugar, fiber, phosphorus, and calories. It is a cost-effective protein source with potential use in addressing protein deficiency [24].

Aqueous extracts from the fruit powder of *Solanum virginianum* have demonstrated anthelmintic activity [25]. The fruit of *Solanum virginianum* has hypoglycemic potential activity [26]. It also has potential natural antioxidants and can be used as a medicine against diseases caused by free radicals [27]. The nutritional potential and antioxidant content of *Brihati* was found high when compared to vegetables and fruits known for high nutritive and antioxidant contents [28]. *Gokshur* was found significant in improving muscle strength and have anabolic properties [29]. The literature search was conducted using databases such as PubMed, Google Scholar, and *Ayurvedic* research-specific databases like DHARA (Digital Helpline for Ayurveda Research Articles). Additional sources included classical *Ayurvedic* texts *Charaka Samhita, Susruta Samhita AstangaSamgraha, and Astangahridaya* as well as *Ayurvedic* pharmacopoeias and government publications. The search utilized keywords including "*Hrisvapanchamool" "Shalparni," "Prishnaparni," "Brihati," "Kantakari," "Gokshur*," "*Desmodium gangeticum" "Solanum indicum", "Solanum surratense", "Tribulus terrestris*" *and "Ayurveda*," "pharmacology," "therapeutic uses," "nutritive value", Boolean operators were employed to combine terms, such as "*Hrisvapanchamool* AND pharmacology" and "*Ayurvedic* treatment AND efficacy. Studies included published Articles, as well as classical Ayurvedic texts. Only peer-reviewed articles, government publications, and articles in English were considered. Out of 50 articles 20 articles was selected Studies without full-text access, conference abstracts, and articles unrelated to the specific formulation were excluded.

Botanical description and Pharmacological Properties of Individual Herbs

1. *Shalparni*

Shlaparni is a nearly erect undershrub, ranging from 0.6 to 2 meters in height, found growing wild across most of India, including the plains, the Western Ghats, and up to an altitude of 1500 meters in the northern regions, extending to Sikkim. The plant is used in its dried, whole form.

- **Botanical name**: *Desmodium gangeticum*
- **Family:** *Fabaceae*
- **Hindi Name-***Sarivan*
- **Sanskrit Name-***Shalparni*
- **Synonyms:** *Vidarigandha, Anshumati, Sudala, Kumuda, Atiguha, Tanvi, Supatra, Peevara, Parni, Sthira, Dirghamula, Soumya*.

Fig: 01

Classical Categorization

- ***Charak:*** *Angmardprashamana, Sothhara, balya, Snehopag, Madhurskandha*
- ***Shusrut:*** *Vidarigandhadi, lagupanchmula*
- ***Vagbhatt:*** *Viadariyadigana.*

Botanical Description: The plant has an underdeveloped taproot with lateral roots measuring 15–30 cm in length and 0.1–0.8 cm in thickness. These roots are cylindrical, branched, smooth-surfaced with light brown lenticels, and often contain bacterial nodules. They are light yellow with a fibrous fracture, no distinct odour, and a sweetish, mucilaginous taste. The slender, branched stems are up to 1 cm in diameter, somewhat angular, and covered with appressed greyish hairs. Externally, they are brown, while the inner part is pale yellow, with a short fracture and a slightly bitter taste. The leaves are unifoliate, petiolate, and stipulate, with a linear-oblong shape, striated base, and slightly wavy margins. They range from 6 to 13 cm in length and 3.5 to 7 cm in width. The upper surface is glabrous and green, whereas the lower surface is pale and densely covered with soft, whitish hairs.

Chemical Constituents: N, N-Dimethyltryptamine, 5-Methoxy-N, N-dimethyltryptamine, N b methyltetrahydroharman, N-methyltyramine, 6-Methoxy-2-methyl-β-carbolinium derivative, N b-methyltetrahydroharman, Hypaphorine, Hordenine, Caudicine, β-Phenylethylamine, Gangetin (7,12α-dihydro-13-methoxy-3,3-dimethyl-11-13-methyl-2-butenyl)-3H,7H benzofuro [3,2-C] pyrano [3,2-g] [30]

Properties and action: It has *Tikta* (bitter) and *Madhur* (sweet) *Rasa* (taste), *Guru* (heavy), *Snigdha Guna* (unctuous qualities). It has *a UsnaVirya* (hot potency) and Madhur (sweet) Vipaka (post-digestive effect). Its therapeutic actions include *Balya* (strength-promoting), *Brimhana* (nourishing), *Mutrala* (diuretic), *Rasayana* (rejuvenation), *Tridosahara* (balancing all three *doshas*), *Vatahara* (pacifying *Vata*), and *Vrishya* (aphrodisiac effects).

- **Part Used:** Whole Plant and Root
- **Important Information-** *Dashmularishta, Dashmulakwatha*
- **Therapeutic Uses:** *Arsa*, *Atisara*, *Chardi*, *Jwar*, *Kasa*, *Krmi*, *Ksata*, *Mutrakrcchra*, *Prameha*, *Santapa*, *Sotha*, *Sukradaurbalya*, *Swasa*, *Vataroga*, *Visamjwara*, *Visavikara*.

Dose

- *Churna* (Powder): 6 to 12 g.
- *Kwatha* (Decoction): 50 to 100 ml [31]

Research Work

- The phytochemical profiling revealed that the ethanolic extract of the aerial part of *Desmodiumgangeticum* contained glycoside, amino acid, phenols, alkaloids, flavonoids, and coumarins, while the ethanolic root extract showed the presence of glycoside, amino acid, phenols, alkaloids, flavonoids, coumarins, and triterpenoids.[32]It also contains alkaloids, vitamins, oils, and essential minerals such as calcium, phosphorus, and magnesium [33], with its roots exhibiting antioxidant, anti-inflammatory, analgesic, and free radical scavenging activities, particularly aiding in revascularization. Furthermore, the chloroform, water, and ethanolic extracts of its dried roots demonstrate anti-asthmatic properties [34]. Additionally, it has been shown to possess anti-inflammatory, antioxidant, antileishmanial, immunomodulatory, cardioprotective, anti-ulcer, anti-writhing, renal protective, anti-diabetic, hepatoprotective, and wound healing properties [35].

2. *Prisniparni*

It is an erect undershrub that grows up to 90 cm in height and is found widely nationwide**.**

- **Botnical Name:** *Uraria picta*
- **Family:** *Fabaceae*
- **Hindi Name:** *Pitthvan*
- **Sanskrit:** *Citraparni, Kalasi, Dhavani, Prthakparni, Shrigalavinna*
- **Synonyms:** *Pristaparni, Krostapuccha, Dhavani, Kalasaruha, Srgalvrtta, Ahitila, Prthakparni, Parnika***.**

Fig: 02

Classical Categorization:

- ***Charak:*** *AngmardPrashamana, Sothhara, Sandhaniya*.
- ***Susrut:*** *Vidargandhadi, Haridradi.*
- ***Vagbhatt:*** *Haridradi*

Botanical Description: The root is tough, woody, and cylindrical, tapering gradually with a thickness of 1 to 2 cm, light yellow to buff externally and pale yellow internally, featuring fine striations and a splintery fracture with a slightly acrid taste. The stem is cylindrical, branched, and pubescent, measuring 8 to 16 cm in length and 0.2 to 0.4 cm in diameter, with a light yellow to brown external surface, a buff-white smoothened cut surface, and a mature stem that is longitudinally wrinkled with leaf scars at the nodes and a fibrous fracture. The leaf is highly variable, imparipinnate, and up to 20 cm long, with upper stem leaflets ranging from 5 to 7, being rigid, linear-oblong, and marked with white blotches, while the lower stem leaflets range from 1 to 3 and are sub-orbicular or oblong, with the upper surface glabrous and finely veined and the underside minutely pubescent.

Chemical Constituents: Albumin-like proteins and various fatty acids, including linoleic acid (38.9%), palmitic acid (14.2%), linolenic acid (11.3%), and oleic acid (11.1%).

Properties and Action: It has *Madhur* (sweet), *Katu* (pungent), *Amla* (sour), and *Tikta* (bitter) *Rasa* (taste), *Laghu* (light) and *Sara* (fluid) *Guna* (qualities). It has a *Usna Virya* (hotpotency) and *Madhur* (sweet) *Vipaka* (post-digestive effect). Its therapeutic actions include

Tridosahara (balancing all three doshas), *Vrishya* (aphrodisiac), *Dipana* (digestive stimulant), *Samgrahi* (absorbent), *Vatahara* (pacifying Vata), *Sothahara* (anti-inflammatory), *Angamardaprasamana* (relieving body aches), *Sandhaniya* (promoting tissue healing), and *Balavardhaka* (strength-enhancing).

- **Part used:** Whole Plant, Root.
- **Important formulations:** *Angamarda Prasamana Kasaya Churna, Amrtarista, DasamulaTaila, Vyaghri Taila, Madhyama Narayana Taila, SirahSuladi Vajra Rasa, Dasamularista*
- **Therapeutic Uses:** *Daha, Jwara, Swasa, Raktavikara, Vataroga, Unmada, Chardi, Kasa, Raktatisara, Atisara, Vrana, Raktarsa, Kaphaja-madatyaya, Thrisna, Vatarakta, Pilla (Netra Roga), Asthibhagna*
- **Dose:** 20-50 gm powder for decoction [36].

Research Work

Phytochemicals along with macro elements such as sodium, potassium, calcium, magnesium, and phosphorus were detected in the leaves of the plant [37]. Methanolic extracts of callus exhibited strong antibacterial activity against pathogenic bacteria compared to leaf and root extracts [38]. The root decoction of Prishnaparni is traditionally used for treating cough, cold, fever, chills, and as an antiseptic for general healing [39]. U. picta was analyzed for its seed protein concentrate (SPC), assessing its amino acid profile, ash content, starch, sugar, fiber, phosphorus, ether extractives, and calorie content [40].

3. *Brhati*

Brhati is a thorny, highly branched perennial shrub that grows up to 1.8 meters tall. It is commonly found in the warmer regions of the country, thriving at elevations up to 1500 meters.

- **Botnical Name –** *Solanum indicum*
- **Family-** Solanaceae
- **Hindi Name -***BadiKateri/Bankanta*
- **Sanskrit name-***Brihati, Kshudrabhantaki.*
- **Synonyms -***Duspradharsini, Mahati, Vartaki, Vimhi, Hinguli*.

Classical Categorization

- ***Charak:*** *Kanthya, Hikkanigrhana, Sothohara, Angmardaprasamana.*
- ***Shusrut:*** *Brihatyadi, laghupanchmula*
- ***Vagbhatt:*** *Brhatyadi*

Fig: 03

Botanical Description

The root is well developed, woody, pale yellowish-brown, 1–2 cm in diameter, with ribbed, rough-textured surfaces due to longitudinal striations and root scars, having no distinct taste or odour and a splintery fracture. The stout, often purplish stems are covered with stellate hairs and bear large, sharp prickles with a compressed base. The ovate leaves measure 5–15 cm in length and 2.5–7.5 cm in width, with acute tips, subacute lobes, and a cordate, often unequal-sided base. They are sparsely prickly on both sides, with petioles 1.3–2.5 cm long that also bear prickles.

Chemical Constituents: Solanine, Carotene, Caterol, Carpesterol, Solanocarpone, Diosogenin, Beta-Sitosterol, Lanosterol, Solasonine, Solamargine, Solasodine, Vit C, Alkaloide, Steroids.

Properties and Action: It has *Katu* (pungent) and *Tikta* (bitter) *Rasa* (taste)**,** *Laghu* (light) *Guna* (quality)**,** *UsnaVirya* (hot potency) and *Katu*(pungent) *Vipaka* (post-digestive effect). Its therapeutic actions include *Vatahara* (pacifying Vata), *Kaphahara* (reducing Kapha), *Dipana* (enhancing digestion), *Pachana* (promoting digestion), and *Hridya Grahi* (beneficial for heart health and absorption)**.**

- **Part Used:** Whole Plant, Root
- **Important Formulations:** *Dasamula Ghrita, Dasamularista*
- **Therapeutic Uses:** *Hridroga, Jwara, Swasa, Sula, Agnimandya*
- **Dose:** 10-20 g of the drug for decoction. [41]

Research Work

Catechol, a compound with antioxidant, antiplatelet, and antimicrobial properties, is present in both the leaves and roots of *Solanum indicum* [42]. The plant serves as an excellent natural source of antioxidants, with its root aqueous extract exhibiting the highest concentrations of phenols, tannins, flavonoids, and Vitamin C, demonstrating superior DPPH scavenging and anti-inflammatory properties compared to the leaves and stems, while the stem displayed stronger antimicrobial activity [43]. Additionally, *Solanum indicum* contains β-carotene, ascorbic acid, protein, lipids, and fiber, with minimal impact on its mineral levels, remaining rich in protein, potassium, and magnesium but low in fiber and calories [44].

4. Kantakari

Kantakari consists of the mature, dried whole plant of a perennial, very prickly, and diffuse herb found in wastelands throughout India.

- **Botnical Name –** *Solanum Virginianum*
- **Family-** *Solanaceae*
- **Hindi Name -***ChotiKateri/ bhatkateya*
- **Sanskrit Name:** *Duspradharsini, Kshudra, Vyaghri, Nidigdhika.*
- **Synonyms -**, *Mahati, Vartaki, Simhi, Hinguli.*

Classical Categorization

- ***Charak:*** *Kanthya, Hikkanigrhana, Sothohara, Angmardaprasamana.*

- ***Shusrut:*** *Brihatyadi, laghupanchmula.*
- ***Vagbhatt:*** *Brhatyadi.*

Botanical Description

The root is 10–45 cm long, cylindrical, tapering, and marked by fine longitudinal wrinkles, transverse lines, and occasional scars, with a thin bark, compact wood, a short fracture, and a bitter taste. The herbaceous, prickly stem has prominent nodes and internodes, appearing green when fresh, with hairy young branches that become glabrous as they mature. When dry, it turns yellowish-green, with a thin bark, prominent wood, and a large or hollow pith. The leaves are petiolate, ovate-oblong or elliptic, sinuate or sub-pinnatifid, sub-acute, and hairy, measuring 4–12.5 cm long and 2–7.5 cm wide, with sharp prickles along the veins and midrib, and no distinct odour or taste.

Chemical Constituents: Ascorbic acid, Torvoside K, Torvoside L, Sterols, Flavonoids and their Glycosides, Aculeatiside A, and Solamargine.

Properties and action: It has *Katu* (pungent) and *Tikta* (bitter) *Rasa* (taste)**,** with *Laghu* (light) and *Ruksa* (dry) *Guna* (qualities)**,** *Usna* (hot) *Virya* (potency) and *Katu* (pungent) *Vipaka* (post-digestive effect)**.** Its therapeutic actions include *So thahara* (anti-inflammatory), *Dipana* (digestive stimulant), *Pachana* (digestive aid), *Amadoshara* (removing toxins), and *Kanthya* (beneficial for throat health)**.**

- **Part used:** Whole Plant and Root.
- **Important formulations:** *Kanakaryavaleha, Panchatiktaka Ghrita, Vyaghriharitaki*
- **Therapeutic uses:** *Aruchi, Swasa, Jwara, Kasa, Pinasa, Swarabheda, Parswashula*
- **Dose:** 20-30 g of the drug for decoction. [45]

Research work

Aqueous extracts from the fruit powder of *Solanum verginianum* have demonstrated anthelmintic activity [46]. While its fruit also possesses hypoglycemic potential in diabetic rats. Additionally, *Solanum verginianum* is a rich source of natural antioxidants, making it a potential medicine against diseases caused by free radicals [47]. Furthermore, its fruit extract exhibits diuretic properties and plays a role in regulating serum electrolytes [48].

5. Gokshur

Gokshura consists of the roots of an annual prostrate herb, occasionally perennial, commonly found as a weed in pastures, along roadsides, and in other wasteland areas. It primarily thrives in hot, dry, and sandy regions across India, including elevations up to 3,000 meters in Kashmir.

- **Botnical name:** *Tribulus terrestris*
- **Family:** *Zygophyllaceae*
- **Hindi Name:** *ChhotaGokhru, Gokhru*
- **Sanskrit Name:** *Gokhura, Gokshura, Kantaphala*

Classical Categorization:

- ***Charak:*** *Mutravirachiniya, Sothhara, Krimighna Anuvasnopag.*
- ***Shusurut:*** *Laghupanchmulal, Vidargandhadi, Kantakpanchmula, Veeratvadigana.*
- ***Vagbhatt:*** *Veeratvadigana.*

Fig: 04

Botanical Description

The root, measuring 7–18 cm long and 0.3–0.7 cm in diameter, is slender, cylindrical, fibrous, and frequently branched with numerous small rootlets, exhibiting a tough, woody texture with a rough, nodule-covered surface, a fibrous fracture, an aromatic odour, and a sweetish, astringent taste. The leaves are opposite, abruptly pinnate, with one leaf in each pair smaller than the other, lanceolate stipules, and 3–6 pairs of oblong, mucronate leaflets covered in appressed hair on both surfaces, supported by short, pilose petioles. The flowers are solitary, axillary, with slender, hairy pedicels measuring 1.2–2 cm, lanceolate sepals of 6 mm, oblong-ovate petals of about 1 cm, a bristly ovary, and a short, stout style ending in a stigma with long lobes. The fruit is globose, consisting of five hairy, muriculate, woody cocci, each bearing two pairs of sharp spines, with one pair longer, and each coccus containing several seeds separated by transverse partitions.

Chemical Constituents: Steroids, saponins, flavonoids, sterols, Harman alkaloids, minerals, lignan amides, and cinnamic acid amide.

Properties and action: It has *Madhur* (sweet) *Rasa* (taste), with *Guru* (heavy) and *Snigdha* (unctuous) *Guna* (qualities), *ShitaVirya* (cooling potency) and Madhur (sweet) *Vipaka* (post-digestive effect). Its therapeutic actions include *Mutrala* (diuretic), *Vrishya* (aphrodisiac), *Vatahara* (pacifying *Vata*), and *Brimhana* (nourishing and strengthening the body).

- **Part used:** Whole Plant, Seed, Root.
- **Important formulations:** *Sahacharadi Taila, Dasamula Kwatha, Dasamulapanchakoladi Kwatha.*
- **Therapeutic uses:** *Swasa, Hrdroga, Kasa, Vataroga, Sularoaga, Miitrakricha, Asamari*
- **Dose:** 20-30 g of the drug for decoction [49].

Research Work

Tribulus terrestris has been found to possess anthelmintic properties, effectively expelling parasitic worms (helminths) and other internal parasites from the body. The anthelmintic effect is attributed to compounds like beta-sitosterol D-glucoside and tribulosin extracts from the

plant [50]. Its hydroalcoholic seed extract has demonstrated anthelmintic activity against the adult Indian earthworm *Phertimaposthum* [51]. Additionally, the methanolic extract of *Tribulus terrestris* fruits exhibits strong antibacterial activity against both gram-positive and gram-negative bacteria [52]. While its saponins show antifungal properties by damaging the cell membrane, reducing virulence, and ultimately killing *Candida albicans* [53].

Discussion

Properties of *Hrisvapanchamool* include *Madhura (sweet) Kashaya (astringent), and Tikta (pungent),* in *Rasa (taste)* as having *Vataghna (pacifying vata, Pittashamana (pacifying pitta), Brimhana (nourishing)*, and *Balavardhana (enhancing strength)* properties to ensure proper nourishment and immunity enhancement for malnourished children. *Hrisvapanchamool*is described in both *Ashtanga Sangraha* and *Ashtanga Hridaya*. It has *Madhura Rasa* (sweet taste) and *Madhura Vipaka* (sweet post-digestive effect). Its potency is balanced, meaning it is neither *Atiushna* (excessive hot) nor *Atishita* (excessively cold). It also has *Sarvadoshahara* action, which helps pacify all three doshas effectively.

The *Hrsvapanchamool* has *Madhura (sweet), Tikta (pungent)* and *Kashaya (astringent) Rasa. Tikta Rasa* (pungent taste) is predominant in *Akasha (earth)*, *Vayu (air) Mahabhuta (element)* and *Laghu (light) Guna* (qualities), which is essential to break down the pathogenesis of *Balsosha. Balsosha* is a *Kapha* predominating disease in which the *Tikta Rasa (pungent taste)* and *ushna*guna help break down the etiopathogenesis by its opposite property of *Kapha*. Other probable actions of Tikta rasa are *Arochakaghna* (treats loss of appetite), *Agnidipana* (increases metabolism) and *Aharapachana* (helps in digestion). *Madhur Rasa* has *Prathivi (earth)* and *Jala (water) Mahabhuta (element).* It is a homologue to the body constitution thus increasing the *Rasa, Rakta, Mamsa, Medo, Asthi, Majja, Oja and Shukrabhivardhana* (increase the proper Dhatu formation). It is also *Ayushya* (longevity) and *Sadindriyaprasadanam* (satisfied and make happy to all *indriyas*), *Balyam* (strengthen), *Preenam* (nourishing all *dhathu*), *Jeevanam* (provide vitality to the body), *Tarpanama* (satisfy all *dhatus* at somatic and mental level), *Bringhan* (increased all Dhatu by improving cellular nourishment), *Sthairakara* (strength) and *Ksheeran kshatsandhankara* properties (destroy the weakness by providing good nourishment at all level after the break down of pathogenesis and do the proper formation of all *dhatu*). It works synergistically to promote the *Dhatus* (regeneration of tissues), especially the muscle and fat tissues that are depleted in malnutrition. Its nourishing properties help to rejuvenate the body, stimulate tissue growth, and support overall bodily strength.

The formulation is also known for its *Rasayana* (rejuvenating) action, making it particularly beneficial in rebuilding the strength of weakened tissues and restoring vitality in debilitated individuals. *Shalparni* (*Desmodium gangeticum)* contains glycosides, amino acids, phenols, alkaloids, flavonoids, coumarins, and triterpenoids. Its roots have antioxidant, anti-inflammatory, analgesic, and free radical scavenging properties, aiding revascularization. The plant also shows anti-asthmatic effects and possesses a wide range of therapeutic activities, including anti-inflammatory, antileishmanial, immunomodulatory, cardioprotective, anti-ulcer, anti-diabetic, hepatoprotective, and wound healing properties. Additionally, it is rich in vitamins, oils, and essential minerals like calcium, phosphorus, and magnesium. *Prishnaparni (uraria picta)* leaves contain phytochemicals and macro elements like sodium, potassium, calcium, magnesium, and phosphorus. *Uraria picta* was analyzed for its seed protein concentrate, revealing its amino acid profile, starch, sugar, fiber, and nutritional content. *Brihati (Solanum indicum)* exhibits antioxidant, antimicrobial, and anti-inflammatory properties, while *Kantkari* (*Solanum verginianum)* shows anthelmintic, hypoglycemic, and diuretic effects. *Gokshur (Tribulus terrestris)* is effective against parasitic worms, bacteria, and fungi.

Conclusion

Hrisvapanchamool is a promising Ayurvedic formulation for childhood malnutrition management. Its diverse pharmacological properties align with Ayurvedic principles, promoting digestion, dhatu nourishment, and immunity enhancement.

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Conflict of Interest

Nil

Informed Consent and Ethical Statement

Nil

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