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Review Article

Ayurveda Section

Traditional Insights into Male Reproductive Health: A Narrative Review of *Vajikarana Dravyas* (Aphrodisiac Substances) in *Raj Nighantu* (The Royal Ayurvedic Lexicon)

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ABSTRACT

Male reproductive disorders are varied and often inter-related, with prevalence ranging from common sexual dysfunction, infertility to rare congenital anomalies. Conventional therapies, which include hormonal treatment, surgical procedures, and assisted reproductive techniques, often face limitations in cost, accessibility and are associated with side-effects. To combat this, there is a need to identify new herbal sources that are natural, cost-effective, and free from adverse effects, which can be utilised both for prevention and treatment. One of the important Lexicons is Raj Nighantu, as it stands out for its practical relevance and regional adaptability. It offers more detailed entries and a wider range of substances, including many newer plant species. A thorough analysis of Raj Nighantu's Vajikarana medications has been conducted for this purpose, utilising Ayurvedic classic texts, available printed sources and databases such as PubMed, Scopus, and Web of Science. Drugs that affect the male reproductive system have been investigated through experimental research and phytochemical screening. The Ayurvedic concept of Rasapanchaka was used to further confirm their pharmacodynamic activities. About 95 plants with the Vajikarana effect were found in this review; 34 of these have been shown to improve the functioning of the male reproductive system.

Keywords: Male infertility, *Vrishya, Rasapanchaka*, Lexicon

INTRODUCTION

Reproductive health is defined as a condition of total health in all facets of the reproductive system, including mental, social, and physical. According to the World Health Organisation (WHO), it encompasses the ability to lead a fulfilling sex life, the capacity to have progeny, and the right to make informed decisions regarding when and how often to have children. Male reproductive disorders such as erectile dysfunction, oligospermia, and infertility are growing global health concerns, contributing to approximately 40% of infertility cases worldwide [1]. Despite its importance, male reproductive health remains under-represented in both research and public discourse, highlighting the need for increased attention and awareness to address the challenges it presents. Current management of reproductive disorders involves medications, surgical interventions, and the use of Assisted Reproductive Technologies (ART) [2]. These treatments may lead to side-effects and high costs, underscoring the importance of comprehensive care and lifestyle modifications. It is essential to identify and scientifically evaluate key medicinal plants within traditional systems of medicine to ensure their effective integration into modern healthcare.

One such significant yet underexplored classical text from the 15th century CE is *Raj Nighantu*, a comprehensive Ayurvedic lexicon of medicinal plants. Despite its rich content, its potential remains untapped in the context of male reproductive health. In light of the rising incidence of male infertility and associated disorders, there is a need to revisit ancient texts, identify the herbs that have *Vajikarana* (Aphrodisiac) action, and explore their relevance and efficacy through the lens of contemporary science [3]. Therefore, this review aimed to explore the *Vajikarana dravyas* in *Raj Nighantu* action with the help of *Rasapanchaka* viz~ *Rasa* (Taste), *Guna* (Qualities/Attributes), *Virya* (Potency), *Vipaka* (Metabolic effect), *Prabhava* (Unique action) and *Karma* (Action) along with their pharmacological actions.

REVIEW OF LITERATURE

A comprehensive literature review was conducted focusing on *Raj Nighantu* to identify and categorise medicinal plants with *Vajikarana* action. The selected plants were systematically classified based on the Ayurvedic pharmacodynamic attributes, *Rasapanchaka*. Supporting data were compiled from texts of *Dravyaguna Vigyan*, and the scientific nomenclature, along with properties of the selected herbs, were verified and updated using contemporary taxonomic references.

A parallel literature review was undertaken on *Vajikarana* action and pharmacodynamic principle of Ayurveda in light of current scientific understanding, from classical texts of *Brihatrayi* (*Charak*, *Sushruta* and *Ashtanga Hridya*), *Sharangadhara Samhita*, and *Ras Vaisheshika*. This also included a critical evaluation of peer-reviewed articles published in databases such as PubMed, Scopus, and Web of Science, as well as indexed journals in the Ayurveda, Yoga and Naturopathy, Unani, Siddha, and Homoeopathy (AYUSH) Research Portal, over the past decade. Keywords used are *Vrishya*, *Vajikarana*, *Raj Nighantu*, medicinal plants, Ayurveda, and male infertility. All collected data were systematically analysed and interpreted. In-vivo and clinical studies were also being evaluated for action on reproductive function.

Salient Features of *Raj Nighantu*

The *Raj Nighantu*, authored by Narhari Pandit, is a vital text in Ayurvedic literature and is a glossary of medicinal plants. Narhari Pandit, was an esteemed scholar with expertise in Sanskrit and regional languages. It was initially named as *Abhidhan Cudamani* or *Dravyabhidhana-Gana-Sangraha,* but on completion of the work, the author felt that this *Nighantu* would be much superior to other *Nighantus* and named it as *Raj Nighantu*, "The king among Nighantus". It's a bridge between classical Sanskrit pharmacology and local traditional knowledge. The text is divided into 23 *Vargas*, out of which ten are dedicated to the description of almost all kinds of *Dhanya*, vegetables, as well as herbal drugs [4]. In total, about

845 drugs of different origins are mentioned in various chapters [5]. *Raj Nighantu* is the first work to incorporate the information about *Nakshatravriksha* (trees with specific affinity to twenty-seven stars according to Indian Astrology). *Dravyaguna* and *Roganidana* have been enumerated under *Ashtanga* Ayurveda by the author of *Raj Nighantu*. The concept of coining synonyms for a drug is also explained first in it [6]. It highlights the properties and therapeutic actions of medicinal plants, emphasising regional identification for proper usage while excluding less significant drugs found in other texts. This *Nighantu* is more popular since it helps in better identification of drugs with a scientific explanation.

Aphrodisiac Drugs

An aphrodisiac is a food/drug that increases both sexual desire and performance [7]. These include increased weight and size of testicles, increased spermatogenesis and growth of testosterone-producing leydig cells. They exert their physiological effects by modulating neuroendocrine and biochemical pathways. Based on these actions, Aphrodisiac drugs are divided into three groups. Hormonal modulators affect the Hypothalamic-Pituitary-Gonadal (HPG) axis, stimulating the anterior pituitary to release Follicle-Stimulating Hormone (FSH) and Luteinizing Hormone (LH). LH acts on leydig cells to increase testosterone synthesis, while FSH supports spermatogenesis via sertoli cells. Neurotransmitter modulators influence the limbic system and hypothalamus, which are central to sexual behaviour and desire. By enhancing dopaminergic activity, these drugs stimulate arousal. Vasodilator-type aphrodisiacs act on the NO-cGMP pathway in penile tissue, leading to smooth muscle relaxation in the corpora cavernosa and increased penile blood flow, thereby facilitating erection [8].

Mechanism of Action of *Vajikarana* (Aphrodiasic) *dravyas* in Ayurveda

According to Ayurveda, *Vajikarana* therapy strengthens the reproductive system. Proper use of *Vajikarana* formulations endows the individual with enhanced physical strength and libido. They are beneficial in conditions such as infertility, oligospermia, premature ejaculation, and erectile dysfunction [9]. *Vajikarana* drugs are broadly categorised into two groups: one that directly improves semen quality and volume, and another that enhances reproductive health by positively influencing mental well-being and emotional stability. *Vajikarana* drugs qualities are *Madhur* (sweet), *Snigdha* (unctuous), *Guru* (heavy), *Jeevana* (promotes life), *Brihana* (nourish), and *Harshan* (excitement). The qualities of *Shukra* (semen) are described in classical texts as *Bahala* (thick), *Madhura*, *Snighdha*, *Avisra* (without putridity), *Pichilla* (slimy), *Guru*, *Shukla* (white), and *Bahu* (more in quantity). This shows that, according to the concepts of *Samanya Vishesh Siddhanta* (Generic concomitance and variant factor), drugs possessing similar *gunas* (qualities) will be identified as *Vajikaraka* drugs [10].

Ayurveda highlights seven key functional categories of *Vajikarana* drugs which depicts the mode of action of drugs in male reproductive disorders viz *Shukra-janak*, *Shukra-pravartak/strutikar*, *Shukra-vridhikar*, *Shukra-rechaka*, *Shukra-sthambhana*, *Shukra-shoshaka* and *Shukra-shodhak*. *Shukra-janak* are the drugs which help in spermatogenesis. They help in the regeneration and maturation of spermatozoa. *Shukra-pravatak* are the drugs which may aid spermiosis and help the emission phase of the ejaculation, during which the sperm and seminal fluid are moved to the prostatic urethra and collected there. Milk, Black gram, and *Bhallatak phala majja* (fruit pulp of *Semecarpus anacardium L*.) are examples of *Shukra-janak* and *Shukra-pravartak drugs. Shukra-vardhaka/ Shukral* increases the sperm count as well as the quantity of semen. *Ashwgandha, muesli, sarkara and shatavari* are placed in this category. These drugs may be effective in oligospermia and hypospermia. *Shukra-rechaka* drugs are considered to affect the expulsion phase of ejaculation, which involves the forceful ejection of semen from the urethra, like *Brihati phala* (*Solanum indicum Linn*.) Another important category is *Shukra-stambhaka,* which comprises drugs that help in delaying the latency time, including intravaginal ejaculatory latency time and are effective in premature ejaculation; e.g. *Nagbala (Grewia hirsuta Vahl), Ahiphena (Papaver somniferum L.) and Bhanga (Cannabis sativa L.). Shukra-Shoshaka* are drugs which increase the density of semen by either reducing the quantity of seminal fluid or increasing the quality of semen or increasing sperm count. Such drugs may be helpful in hyperspermia, oligospermia and watery semen example, *Haritaki* (*Terminalia chebula Retz*.) [11]. *Shukra-Shodhaka* (semen-purifying) drugs play a preparatory and supportive role in *Vajikarana* therapy. These herbs purify *shukra*, enhancing its quality and functional integrity, thus improving fertility [10]. Anatomical and physiological defects of *shukra* can be corrected with the help of these drugs.

Ayurvedic Pharmacodynamics of *Vajikarana* Dravyas in Management of Reproductive Disorders

Rasapanchaka plays a pivotal role in determining the pharmacological action of the drug. Among these, *Prabhava* is most important, but the pharmacodynamics of a drug may depend on either of these five principles [12].

The substances with *Madhura*, *Amla*, *Lavana rasa* exhibit *Jeevaniya, Brihaniya* and *Vajikarana* properties, contributing to *Shukra-janak* and *Shukra-pravartak* action [13]. *Madhura rasa* nourishes and promotes the development of *Rasa* (primary product of digested food), *Rakta* (blood), *Mamsa* (muscular tissue), *Meda* (fat), *Asthi* (bone), *Majja* (bone marrow), *Shukra Dhatus* (reproductive tissues) and *Ojas* (essence of all dhatus) [14]. Substances that predominantly possess *Madhur rasa* exhibit *Shukra-vriddhikara* (semen-enhancing) properties. It is also *Sheet* and *Guru*, which aligns with the need to balance disorders of *Vata* and *Pitta* in reproductive health. *Amla rasa* stimulates the digestive fire *(agni)*, promotes tissue formation, invigorates the body, strengthens the sensory organs, and facilitates the normal movement of *vata* (*vatanulomana*). *Lavana rasa* acts as a mild laxative, spreads rapidly within the body, facilitates secretion, creates space within tissues, and helps in cleansing bodily channels. It is expected to have *Shukra-Strutikara* (discharge-promoting) properties. *Katu rasa* stimulates the sense organs, alleviates obstructions, and opens up the bodily channels. Substances rich in it may function as *Shukra-Strutikara* and *Shukra-shodhana dravyas* (seminal purifying agents). *Tikta rasa* imparts firmness to the skin and muscles, purifies bodily channels, and may support the action of *Shukra-shodhana dravyas* (purifiers of reproductive fluids). *Kashaya rasa* absorbs bodily fluids and exhibits *Shukra-stambhana* (semen-retentive) properties, making it beneficial in conditions such as premature ejaculation [12]. The *Guna,* which is similar to that of *Shukra*, will enhance its quality and quantity. In Ayurveda, potency—also known as *Virya*—is one of the key components that make up a drug's pharmacology. Substances have either *Sheet Virya* or *Ushna Virya* (show endothermic/exothermic reactions) [15]. The *Sheet Virya* have *Prahladana* (soothing), *Vishyandana* (secretagogue), *Sthirikarana* (stabilising effect), *Jeevaniya* (enhances life expectancy), *Stambhana* (styptic), *Raktaprasadana* (enhances the quality of blood), and *Balyam* (strengthening) effect. The systemic effect of *Ushna Virya* is *Deepana* (appetiser), *Pachana* (promotes digestion), *Virechana* (purgative), *Ashupaaka* (quicker digestion and suppuration), and *Avrishya* (decreases fertile strength) [16]. *Raj Nighantu* provides detailed descriptions of medicinal plants along with their therapeutic properties based on *Raspanchaka*. Out of the 95 *Vajikarana* dravya, 10 herbs from *Guduchyadi Varga*, nine from *Shatvahayadi Varga*, six from *Parpatadi Varga*, five from *Pippalyadi Varga*, nineteen from *Mulkadi Varga*, eight from *Shalmalyadi Varga*, five from *Prabhadradi Varga*, three from *Karviradi Varga,* 27 from *Aamradi Varga*, and three from *Chandanadi Varga* are attributed to have *vrishya* properties [Table/Fig-1][4-6].

S. No.	Sanskrit name	Latin name and Family	Properties
GUDUCHYADI VARGA (10 herbs)			
1.	*Kakoli*	*Roscoea procera wall.*	*Madhur, snigdh, shukravardhini*
2.	*Mashparni*	*Teramnus labialis (L.)*	*Tikta rasa, vrishya, shukravridhikar*
3.	*Mudgaparni*	*Phaseolus trilobus Ait.*	*Hima, shukravridhikar*
4.	*Jivanti*	*Leptadenia reticulata (Retz.) Wight & Arn. (Apocynaceae)*	*Madhur, Sheet, viryavardhini*
5.	*Swarna Jivanti*	*Dendrobium macraei Lindl.*	MSV
6.	*Kapikacchu*	*Mucuna pruriens (L.)*	
7.	*Akashvalli*	*Cassytha filiformis Linn.*	Katu, MV, rasayana
8.	*Murva*	*Marsedenia tenacissima W. & A.*	MV, *Kashaya*
9.	*Vatsadani*	*Cocculus hirsutus (L.)*	MV
10.	*Kaivartika (Jalmusta)*	*Cyperus platystilis Br.*	*Laghu, Kashaya, vrishya*
SHATVAHADI VARGA (9 herbs)			
11.	*Mahanili*	*Indigofera tinctoria Linn.*	Katu, Tikta, Ushna , *Suviryada*
12.	*Bala*	*Sida cordifolia Linn.*	*Tikta, Madhur rasa, Madhur vipaka, Bala -viryaprada*
13.	*Mahabala*	*Sida rhombifolia Linn. Mast.*	*shukravridhikar*
14.	*Shatavari*	*Asparagus racemosus Willd.*	Tikta, MSV
15.	*Mahashatavari*	*Asparagus sarmentosus L.*	
16.	*Khaskhas*	*Papaver somniferum Linn.*	*Madhur vipaka, viryaprada*
17.	*Kokilaksha*	*Asteracantha longifolia Nees.*	MSV
18	*Shwetaamli*	*Unknown botanical source*	*MV pitta shamaka*
19.	*Ghinghirita*	*Triumfetta rhomboidei Jack.*	*Katu, kashay, katu , SV*
PARPATADI VARGA (6 herbs)			
20.	*Jivaka*	*Microstylis musifera Ridley*	*Madhur, sheet, shukravardhak*
21.	*Rishabhaka*	*Microstylis wallichii Linn.*	
22.	*Mahameda*	*Polygonatum cirrhifolium (Wall.) Royle*	*Sheet, shukravardhak*
23.	*Vandaka*	*Loranthus longiflorus Desr.*	*Tikta, kashay, SV*
24.	*Pandura fali*	*Stereospermum Suaveolens*	SV, *pittahara*
25.	*Gorakshdugdhi*	*Anisophyllum thymifolium(L)*	MSV
PIPPALYADI VARGA (5 herbs)			
26.	*Pippali*	*Piper longum L.*	*Snigdh, Katu, Tikta, Ushna, vrishya*
27.	*Shwet Vacha*	*Iris versicolor/Iris insata L.*	*Tikshn, Katu, Ushna, vrishya*
28.	*Klitanaka*	*Glycyrrhiza glabra L.*	*Guru*, MSV
29.	*Ahiphena*	*Papaver somniferum L.*	*vrishya*
30.	*Dalchini*	*Cinnamon zeylanicum Blume.*	*Laghu, Katu, Sheet, Shukradosh shamak*
MULAKADI VARGA (19 herbs)			
31.	*Shringataka*	*Trapa natans Linn.*	*Laghu, Sara, vrishyotam*
32.	*Rason*	*Allium sativum L.*	*Guru, Snigdh, Picchil, Ushna , Katu, MV*
33.	*Palandu*	*Allium cepa L.*	*Guru, Snigdh, Katu,vrishya*
34.	*Pindalu*	*Dioscorea alata L.*	*Guru*, MSV
35.	*Raktpindalu*	*Batata edulis Thunv.*	*Guru*, amla, MSV
36.	*Varahikand*	*Dioscorea bulbifera L.*	*Tikta, Katu rasa, vrishya, rasayan*
37.	*Vidarikand*	*Pueraria tuberosa DC*	*Guru, Snigdh*, MSV
38.	*Musalikanda*	*Curculigo orchicides Gaertn.*	*Picchil*, MSV
39.	*Guchhava-kand*	*Unknown botanical source*	MSV
40.	*Mulapoti (Upodika bheda)*	*Variety of Basella alba L.*	*Laghu, Balya, vrishya*
41.	*Jeevanti*	*Leptadenia reticulata W.* and *A.*	MV, Balya
42.	*Kushmanda*	*Benincasa hispida Thunb.*	MV
43.	*Kumbha tumbi*	*Lagenaria siceraria (gola lauki)*	*Guru*, MSV
44.	*Kshir kumbi*	*Cucurbita lagenaria L.*	*Snigdh*, MV
45.	*Kalinga*	*Citrullus vulgaris Schrad.*	MSV
46.	*Baladangarika*	*Variety of Cucumis Utilissimus Roxb.*	
47.	*Dharakoshataki*	*Luffa acutangula Roxb.*	Snigdh, MV
48.	*Hastikodhataki*	*Luffa aegyptiaca Mill.*	
49.	*Kharbuja*	*Cucumis melo Linn.*	Tikta, amla, MV
SHALMALYADI VARGA (8 herbs)			
50.	*Shalmali*	*Bombax malabaricum DC*	*Laghu, snigdh, picchil, Kashay*, MSV
51.	*Shar*	*Saccharum officinarum Linn.*	MV, *Tikta, slightly ushna, balya*
52.	*Kasa*	*Saccharum spontaneum Linn.*	*balya*, SV
53.	*Nala*	*Phragmites kirka Trin. Ex Steud*	*Kashay*, MSV ak
54.	*Devnala*	*Lobelia nicotianaefolia Heyne.*	
55.	*Gomutrika*	*Unknown botanical source*	MV
56.	*Shilpika*	*Unknown botanical source*	MSV
57.	*Manthanak*	*Chloris incomplete Roth.*	*Snigdh*, MV
PRABHADRADI VARGA (5 herbs)			
58.	*Tula*	*Morus indica Griff.*	*Sara, Amla, Kashaya*, MV
59.	*Tamala*	*Garcinia morella Desrous.*	*Guru*, MSV
60.	*Kadamba*	*Anthocephalus cadamba Miq.*	*Tikta, katu, kashyay*, SV
61.	*Dhara, dhuli, bhumi*	*Dhuli- Mytragyna pavifolia Korth Dhara- Adina cordifolia benth.* and *Hook.f.*	
62.	*Putrajiva*	*Putranjiva roxburghii Wall.*	SV
KARVIRADI VARGA (3 herbs)			
63.	*Ushtrakandi*	*Echinops echinatus Roxb.*	MSV
64.	*Vandavana*	*Artemisia vulgaris Linn. Asteraceae*	*Tikta, kashay, Katu, Sheet, shukrastambhak*
65.	*Kokanada*	*Nelumbium speciosum Willd.*	*Katu, Tikta,* MSV
AMRADI VARGA (27 herbs)			
66.	*Rajamra*	*Mangifera Indica Linn.*	*Guru*, MSV
67.	*Kakajambu*	*Eugenia rubicunda L.*	*Guru, Kashay, Amla rasa, Madhur vipak, vrishya*

68.	*Bhujambu*	*Eugenia operculate Roxb.*	*Kashay*, MV
69.	*Katahal*	*Artocarpus integrifolia Linn. F*	*Guru, Picchil,* MV
70.	*Kadali*	*Musa sapientum Linn.*	*Guru, Kashay,* MSV
71.	*Girikadali*	*Variety of Musa paradisiaca L.*	*Guru*, MSV
72.	*Suvarnkadali*	*Variety of Musa sapientum L.*	
73.	*Narikela and Madhunarikela*	*Cocos nucifera L. and its variety*	*Guru, snigdh,* MSV
74.	*Kharjur*	*Phoenix sylvestris Roxb.*	*Kashyay, vrishya*
75.	*Madhurkharjur*	*Variety of Phoenix sylvestris Roxb.*	MSV
76.	*Rajkharjur*		*Guru*, MSV
77.	*Pindkharjur*	*Phoenix dactylifera Linn.*	*Guru, snigdh,* MSV
78.	*Priyal*	*Buchanania latifolia Roxb.*	*Guru, Amla,* MV
79.	*Rajadani*	*Mimusops hexandra Roxb.*	*Snigdh,* MV
80.	*Brihatpilu*	*Salvadora oleoides Decne.*	*Madhur,* MV
81.	*Kapitha*	*Feronia elephantum Correa*	*Guru, Madhur, amla, kashyay, Tikta, SV*
82.	*Madhuk*	*Bassia latifolia Roxb.*	MSV
83.	*Jalamadhuk*	*Bassia longifolia L.*	
84.	*Draksha*	*Vitis vinifera Linn.*	*Excessive Madhur, amla slightly*, SV
85.	*Amalaki*	*Emblica officinalis Gaertn*	*Laghu, Kashay, amla,* MSV, *rasayan*
86.	*Rajbadar*	*Ziziphus sativa Gaertn.*	MSV
87.	*Madhujambir*	*Citrus limettioides Tanaka*	
88.	*Madhubijpur*	*Citrus decumana L.*	*Guru,* MSV
89.	*Jambir*	*Citrus limon Linn.*	*Amla, Madhur, viryavardhak*
90.	*Nagavalli saptasira*	*Piper betel Linn.*	*Tikshna, tikta, katu,* MV
91.	*Parewat*	*Unknown botanical source*	*Snigdh,* MV
92.	*Mahaparewat*		
CHANDANADI VARGA (3 herbs)			
93.	*Sweta Chandan*	*Santalum album L.*	*Katu,Tikta, Kashay,* SV
94.	*Tuni*	*Cedrela toona Roxb.*	
95.	*Jatiphala*	*Myristica fragrans Houtt.*	*Laghu, Kashay, Katu, Ushna, vrishya*

[Table/Fig-1]: Latin name and properties of Vajikarana herbs mentioned in different varga of Raj Nighantu. [4-6]
MSV : Madhur rasa, Sheet virya, Vrishya ; MV: Madhur rasa, Vrishya; SV: Sheet, Vrishya

In alignment with Ayurvedic pharmacodynamic principles, particularly the concept of *Vajikarana* action, authors identified 34 drugs with available in-vivo studies and analysed their pharmacodynamic actions [Table/Fig-2][17-51. They could be meaningfully classified into seven distinct categories. These herbs are recognised for their *Vajikarana* properties, enhancing *Shukra dhatu* both quantitatively and qualitatively, thereby supporting male fertility, vitality, and reproductive health. Their action supports both detoxification and rejuvenation of the reproductive system, contributing to improved fertility outcomes.

Vipaka of a drug plays a pivotal role in deciding the mechanism of action of a substance. As explained in the *Charak Samhita, Madhura Vipaka* is *Sukrala* (enhancing production of semen) in nature, and *katu Vipaka* is *Shukrakshaya* (decline in quantity or quality of semen). But after analysing the properties of *katu vipaka* showing *Badh-vita-mutra* effect (obstructed defecation and micturition), they may act as *Shukra-sthambhaka*. The substance having *Amla Vipaka* helps in removing obstruction and clearing the passages of excretory waste from the body [12]. This may support *Shukra-Pravartak/ Strutikar* action. The substance having the aforementioned properties as well as pharmacological actions can affect the vitiated *Dosha* (Fundamental functional principles) and optimise reproductive health.

Many plants mentioned in classical Ayurvedic texts, particularly in *Raj Nighantu* under the *Vajikarana* category, still lack proper botanical identification. This gap is a significant scope of further conducting literary, pharmacognostical and pharmaceutical research. Moreover, many identified plants with classical references to *Vajikarana* properties have not yet undergone in-vivo or clinical evaluation. Even for those few that have been studied, there is a need to conduct toxicological studies and large-scale standardised clinical trials to establish their efficacy and safety in modern therapeutic contexts.

CONCLUSION(S)

The herb used in Ayurveda often has multiple roles, balancing the *Dosha*s, nourishing the reproductive tissues and enhancing vitality. Ayurveda provides a framework for selecting and using herbs based on individual constitution and *Dosha* imbalances. Modern pharmacology explains how these herbs interact with hormones, neurotransmitters, and physiological processes. Many *Vajikaraka* plants are mentioned in the *Raj Nighantu*, some of which still require appropriate identification, experimental validation, and clinical research. Investigating these could lead to new opportunities for enhancing reproductive and sexual health. This integrated view of aphrodisiac herbs provides a richer, more balanced perspective on how these plants work in the body, offering a holistic path to improving sexual health that bridges ancient and modern knowledge.

S. No.	Plants of Raj Nighantu on which activity is reported	Active chemical constituents	Ayurvedic -pharmacodynamic action	Mechanism of action of aphrodisiac drugs on basis of reported pharmacological activities on reproductive system
1.	Mashaparni	L-Dopa	Shukra-vridhi-shodhana	Enhances Luteinising hormone which stimulates testosterone, thus improves the quality of semen and sexual drive.[17]
2.	Mudgaparni	Quercetin, Vitexin	Shukra-vridhi-shodhana	Vitexin improves sexual dysfunction and fertility impairments and Quercetin improves sperm morphology and functions [18,19] .
3.	Jivanti	Hetriacontanol, alpha and β amyrin, stigmasterol, β sitosterol, flavonoids, diosmetin, luteolin	Shukra-vridhi	Improves Ejaculatory functions, increase in mount, intromission interval, number of ejaculations and increases post ejaculation time. Weight gain in gonads and accessory sex organs [20] .
4.	Kapikacchu	Betacarboline, β-sitosterol, cysteine, dopamine, lysine, tryptamine, genistein, glutamic acids, L-DOPA, serotonin, mucunain, arachidic acid, behenic acid, and riboflavin	Shukra-vridhi-shodhana	Improve Spermatogenesis. Ethanolic extracts of seeds reduce mounting latency, post-ejaculatory interval, interintromission interval, and mounting latency while increasing mounting frequency, intromission frequency, and ejaculation delay [21] .
5.	Vatsadani	Jasminitine, hirsutine, cohirsitine, flavonoids, triterpene	Shukravridhi-Strutikar	By increasing spermatogenesis weight of reproductive organs, anogenital sniffing and mounting behaviour [22].

6.	Viruddha daruk	Epifriedelinol, ergine, isoergine, panniclavine, ergometrine, caffeic acid, ergoline, lysergic, isolysergoic acid, querctin, β sitosterol,	Shukra-vridhi-shodhana	Alcoholic extract of Root and flowers increases mounting behaviour in mice [23].
7.	Bala	Ecdysone, specifically sidasterone A and B, β sitosterol, stigmasterol, ephedrine, vasicine, vasicinol, vasicinone, and N-methyl, Tryptophan	Shukra -vridhi	Enhances sperm parameters (count, motility, viability) [24].
8.	Shatavari	Saponins, carbohydrates, glycosides, and mucilages have been reported from the root. Shatavarien IV, Saponins, steroids, flavonoids	Shukra-vridhi-shodhana	Aqueous extract of root improves sexual behaviour by increase in number of mounts and mating performance. Weight of reproductive organs were increased Significantly [25].
9.	Kokilaksha	Linoelic acid, oleic acid, histidine, lysine, palmitic acid, uroric acid, saponin, betulin, lupeol,nicotinic acid	Shukra-vridhi-shodhana	Ethanolic extract of seed improves sexual behaviour (increased mating performance), increases sperm count, fructose content in seminal vesicle and weight of reproductive organs [26].
10.	Pippali	Piperine, piplantin, piperlongumine	Shukra-vridhi-shodhana Shukra-shtrutikar	Ethanolic extract of fruit enhance serum testosterone level and improves sperm parameters (count, motility) [27].
11.	Klitanaka	Phenolic acid, ascorbic acid, flavonoids	Shukra-vridhi	Aqueous Extract of root improves sexual performance by reducing ML (Mounting latency) and IL (Intromission Latency) and increasing MF (Mounting Frequency and IF [28].
12.	Dalchini	Cinnamaldehyde, eugenol, caryophyllenecinnamyl acetate, cinnamic acid	Shukra-vridhi-strutikar, shodhana	Improves erectile function by inhibiting arginase enzyme and increasing the smooth muscle-collagen ratio in penile tissue. Methanolic extract of cinnamon improves sexual behaviour [29].
13.	Rason	Peptides, sulfated substances, steroids, flavonoids, volatile oils containing sulfated substances such as ajoenes, alliin, minerals, vitamins, and enzymes	Shukra-shodhana	Petroleum ether extract of bulb increases sperm count and improves sexual behaviour [increases MF, IF, EL and decreases ML, IL, and Post ejaculatory interval (PEI)] [30].
14.	Palandu	Flavonoids, sulfur compounds	Strutikar	Administration of onion juice in dose of 0.5g/rat and 1 g/rat enhance testosterone level and improves sperm parameters (number, percentage viability and motility) [31] .
15.	Varahikand	Secondary metabolites	Strutikar	Ethanolic extract of tuber improves spermatogenesis, enhance serum hormonal levels, sperm concentration and motility parameters [32].
16.	Vidarikand	Puerarin, daidzein, biochanin, formononetin	vridhikar	Improves sexual performance, enhances sperm production and increases TSH, FSH, LH, sperm count, fructose content and weight of reproductive organs [33].
17.	Musalikand	2,6 dimethoxy benzoic acid, curculigoside A & B, curculigine A & D	Shukra-vridhi	Ethanolic extract of rhizome exhibit improved spermatogenesis, and Orientational activities (increases MF and anogenital sniffing) [34].
18.	Kushmanda	Galantamine, Quercetin, Kaempferol, Allicin	vridhikar	Ethanolic extract of seeds in higher dose of 1400 mg/kg bwt. exhibits improved mating behaviour [35].
19.	Kalinga	Lycopene, arginine, citrulline	vridhikar	Seed extract increases sperm count, motility and viability [36].
20.	Kharbuja	Thioesters, cucurbitacin B&E, saponin, leptodermin	Vridhikar, shodhana	Increases sperm production and improves its quality [37].
21.	Shalmali	Saponins, tannins, gums.	Vridhikar sthambhana	Roots extract tablet (400 mg/kg bw) Increase and improve sexual performance [38].
22.	Putrajiva	Isopropyl, 2 butyl isothiocyanates, saponin,glucoputrajinn, glycococchlearin, beta- amylin, mannitol	vridhikar	Ethanolic extract of seeds improves sperm parameters [39].
23.	Kokanada	Garcinol, hydroxy citric acid, anthocyanin.	Vridhikar-strutikar, Shodhana	Ethanolic extract of leaves improves in copulatory sexual behaviour parameters MF, IF, Ejaculatory Latency (EL) and reduction in ML, IL, and PEI. Enhances orientational activities, sex organ weight, libido, and potency [40].
24.	Rajamra	Mangiferin, Carotenoids, Phenolic acids, Terpenoids, Vitamin A, B, C, D	Vridhikar-sthambhana	Promotes spermatogenesis Ethanolic extract of stem bark enhance production of FSH, LH Testosterone level and improves sperm parameters [41].
25.	Kakjambu	Tannins, Flavanoids, Myricetin, Kaempferol	Vridhikar, sthambhana	Improves testicular dysfunctions [42].
26.	Rambha	Alkaloids, Flavonoids	Vridhikar	Improves sperm parameters (count, motility & morphology at low dose) [43].
27.	Girikadli	Dopamine, dopa nor-adrenaline, phenolic acids, sterol glycosides, polyphenols	Shukra-janak	Aqueous extract of root increases concentration of testicular testosterone, testes-body weight ratio, total protein, sialic acid, glycogen, cholesterol [44] .
28.	Pindkharjur	Sterols, carotenoids Oleic acid, sugars, protein, vitamins	Shukra-janak	Regulate testicular function, improves sperm production. On consuming date palm pollen suspensions, the weights of the testicles and epididymis increased along with improvements in sperm count, motility, morphology, and DNA quality [45].
29.	Narikela	steroids, sterols, flavanoids, proteins, carbohydrates, gums, mucilage, saponins, terpenes.	Shukra-janak	Hydroalcoholic extract of apical bud improves sexual behaviour, increases testosterone and regenerate germinal epithelium of testis [46] .

30.	Madhuk	Carbohydrates, Fatty acids, tri-terpenoids, Quercitin	Vridhikar	Ethanolic extract of flowers increases sperm concentration, live spermatozoa and semen volume [47].
31.	Draksha	Malic, tartaric and oxalic acid, tannins	Shukrajanak	Fruit juice improves spermatogenesis, increases sperm count and density [48].
32.	Jambir	Vit C, D-limonene	Vridhikar-strutikar	Lemon juice extract in concentration of 25% improves quantity and quality of sperm (motility, viability) [49].
33.	Chandan	Sesquiterpenes, Triterpenoids, Flavanoids, Phenolic acids	Shukra-shodhan sthambhaka	Sandalwood oil 100 mg/kg bw increases serum testosterone level and regenerate epithelial architecture of testis, epididymis and seminal vesicle [50].
34.	Jatiphala	Terpinen-4-ol, B-pinene, limonene, lignans and neolignans	Shukra-shodhan sthambhaka	Improves Sexual behaviour by reducing ML and PEI and increasing mating performance. Aphrodisiac action of nutmeg's 50% ethanolic extract stimulates nerve, thus increasing libido and potency [51].

[Table/Fig-2]: Mechanism of action of Vajikaran drugs of Rajnighantu reported in pharmacological researches and their equivalent Ayurvedic Pharmacodynamic action.

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