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REVIEW ARTICLE

Use of Orchids in *Ayurveda*: Is Substitution Scientific and Appropriate?

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Abstract

The concept of substitution, as *Pratinidhidravya*, is profound in the Indian traditional medicinal system, the *Ayurveda*. This science of life mode of holistic medication has been practiced for ages. With the dilution of knowledge in the post-Vedic era and with the discrepancies in documentation processes of several medicinal drugs, there exist tremendous needs to validate the scientific study of substitutes that are mentioned in various standard Ayurvedic references. In addition to government efforts to standardize the drug, it certainly falls into the responsibility and jurisdiction of every herbal scientist and Ayurvedic practitioner to collaborate and rejuvenate this marvelous medicinal goldmine. Often, orchids are very much praised for their medicinal value in *Ayurveda*, and several genera are used in various forms regularly. However, due to mainly over-exploitation, often the original drug is substituted by some either related or unrelated drugs. This review aims to elaborate and, in turn, understand the need, authenticity, and scientific appropriateness of certain herbs which are used to substitute Orchids in *Ayurveda*. A global and standardized approach is needed to understand the need and process of substituting a particular drug in both monoherbal and polyherbal formulations, in order to develop a potent medication for certain diseases.

Keywords: *Ayurveda*, Orchids, Pharmacopoeia, Pratinidhi-dravya, Substitution

1. Introduction

Pro-Dravidian aboriginals of Chotanagpur Plateau of Bengal have been known to use roots of a small epiphytic herbaceous plant, named '*Banda*'. This plant is now adapted for a group of orchids (*Banda* = *Vanda*). The use of orchids in India can be traced back to Vedic age. Our traditional medicinal system, *Ayurveda* has been advocating the use of orchids since Vedic and post-Vedic ages. As many as 40 species are used in indigenous medicinal systems of India. Some of which are even well preserved in documents of *Ayurveda*[1]. *Ashtawarga*, a group of eight plants, are highly praised for tonic, rejuvenators, and other life-saving drugs. This group comprises *Malaxis muscifera*, *Malaxis acuminata*, *Habenaria edgeworthii* and *Habenaria intermedia*, from Orchidaceae family[1,2]. Together with other four plants, this *Ashtawarga* is also useful in promoting body fat, healing fractures, seminal weakness, fever, abnormal thirst, or even diabetic condition. They can be used to cure problems related to *Vata*, *Pitta*, *Kapha*. Due to the high medicinal values, these plants belonging to *Ashtawarga* group are used in several polyherbal formulations, like *taila* (oil), *ghrita* (medicated clarified butter) or *churna* (powder) and *lehya* (*Chyawanprash*)[3].

Indian culture has been using orchids in medicine since ages. Kirtikar and Basu have enumerated uses of several orchids in medicines[4]:

1. *Desmotrichum fimbriatum* is sweet with a flavor, alterative, astringent to the bowel, tonic, expectorant, tonic, useful in asthma, bronchitis, '*Tridosha*', throat troubles, burning sensations, fever, consumption, biliousness, eye-diseases, as per *Ayurveda*.
   - The same orchid, as per *Sushruta*, is effective as an antidote to snake and scorpion sting.

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2. The stems of *Dendrobium* possess tonic, stomachache, pectoral and antiphlogistic properties.
3. *Dendrobium ovatum* juice, obtained from freshly collected plants, is administered to cure all kind of stomachache, excites bile secretion, act as a laxative.
4. Tubers of *Eulophia campestris* are an effective appetizer, tonic, used for stomachache, alterative, aphrodisiac, and in heart problems as it is assumed to purify the blood in *Ayurveda*.
    - In Unani system of medicine, the tubers of the *E. campestris* is used as to treat stomatitis, astringent, tonic, purulent cough, paralytic infections, aphrodisiac.
5. Tubers of *Eulophia nuda* are hot, used as appetizer, as salep, used to treat tuberculous glands in neck, tumour, bronchitis and alleviate *Vata* in *Ayurveda*.
6. *Cymbidium aloifolium* is furnished as salep.
7. *Vanda spathulata* used in Malabar Coast to temper bile and abate enzyme.
    - Golden yellow flowers of *V. spathulata* is powdered and given to treat constipation, mania and asthma.
8. *Vanda tessellata*, one most recognized orchids of *Ayurveda* is advocated for its use as alexiteric, dyspepsia, inflammation, bronchitis, rheumatic pains, diseases of abdomen, hiccough, and is known to heal tremor as per *Ayurveda*.
    - Unani system, on the contrary, use it as laxative, bitter tonic for brain and liver, for piles, lumbago, bronchitis, inflammation, toothache, and to heal fractures.
9. *Saccolabium papillosum* orchid has been advocated for an alternative to *Rasna* (*Vanda tessellata*) and is used to treat rheumatism.
10. *Acampe wightiana* is used as bitter medicine to treat rheumatism.
11. *Zeuxine strateumatica* is used to make salep.
12. *Orchis latifolia* tuber is used as expectorant and astringent.
13. *Habenaria commelinifolia* is furnished as salep.

Table 1. Uses of orchids in traditional medicines of India

Name of orchid	Description of uses
Eulophia campestris Wall. *ex* Lindl.	Pan India; tubers for cough, cardiac and nervine tonic
Eulophia herbacea Lindl.	Salep; Himalaya and Bengal
Eulophia nuda Lindl.	Tropical Himalaya, Nepal; bronchitis, vitiated blood, tumors, scrofulous glands
Eulophia pratensis Lindl.	*Shatavari*; Pasturelands of Deccan from Konkan; for scrofulous glands
Habenaria intermedia D. Don	*Vriddhi* or *Riddhi*; Himalayan region; cardiac and nervine tonic
Habenaria edgeworthii Hook. f. ex Collett	Western Himalaya from Punjab to Kumaon; Nervine and cardiac tonic
Liparis odorata (Willd.) Lindl.	*Jeevaka* or *Rishabhaka*; age-sustaining and invigorating tonic; component of *Chyawanprash*
Malaxis muscifera (Lin.) Kuntze	*Jeevaka* or *Rishabhaka*; Northern Himalaya (1500 to 2800 m); rejuvenating tonic; component of *Chyawanprash*
Microstylis wallichii L.	*Jeevaka* or *Rishabhaka*; Himalaya; rejuvenating tonic
Nervilia aragoana Gaudich.	Tropical Himalaya of Garhwal (1200 – 1500 m); astringent, diuretic, leaf paste in parturition
Orchis latifolia L.	*Saalam-panjaa*; Kashmir Himalaya (2500-5000 m); chronic diarrhea, bilious fever, demulcent, restorative
Orchis mascula L.	*Salep* or *Salabmisri*; stimulant, reinvigorating, improve sexual weakness
Pholidota articulate Lindl.	*Jivanti*; rejuvenating, restorative; bone-healing
Vanda roxburghii R. Br.	*Rasna*; Maharashtra, Kerala, Bengal, Assam, North-East India; anti-inflammatory, liver tonic, laxative
Vanda tessellata (Roxb.) Hook. ex G. Don	*Rasna*; Maharashtra, Kerala, Bengal, Assam, North-East India; anti-inflammatory, liver tonic, laxative
Vanda spathulata (L.) Spreng	*Svarna-pushpa* or *Bandaa*; Kerala; dried flowers for asthma, mood-swing, psychosomatic bursts

On the other hand, recent documentation revealed some other uses of orchids in our traditional medicine, which are summarized in Table 1[5].

Therefore, it is quite an obvious fact that some of the uses of orchids are well documented, while some are not yet. Often orchids are very much praised for their medicinal values in *Ayurveda*, and several genera are used in various forms regularly. However, due to mainly over-exploitation, often the original drug is substituted by some either related or unrelated drugs. More frequently some major disputes are found to remain associated with the specific mentions of orchids in *Ayurveda*. This review tries to bring to the notice of researchers, *Ayurvedic* practitioners and Government authorities to find a potent solution for these existing disputes.

2. Methodology

Search of data for this review was primarily from the standard websites. In order to procure pertinent literature without having any author bias, combinations of keywords like "Orchids", "Orchidaceae", were incorporated with "*Ayurveda*", "*Pratinidhi Dravya*", "Substitution" in Google Scholar, Science Direct, Elsevier, Pubmed Central, BMC. Peer reviewed journal articles, Thesis and dissertations, Abstracts, were in the inclusion criteria for the literature search. Language bias was not incorporated to obtain maximum information available.

3. Discussion

3.1 The Source of Conflict (Dispute)

Ancient India believed in traditional system of schooling (called the *Gurukul* system). However, later socio-political developments and modernization of culture gradually wiped away the tradition. This, eventually, wiped away more practical and less theoretical method of teaching. This might have been a root cause of the confusion created over the period of time to identify the correct plant in the field. Further, support to this dilemma came from the fact that codification was not properly done in the Indian ancient system[3].

Frequent change in the Taxonomic names while classification of plants (genus name and specific epithet) by taxonomist has added more confusion over the period of time. For a non-taxonomist person, it becomes practically impossible to recollect all the synonyms at any given time. For example, *Vanda roxburghii* has been changed to *Vanda tessellata* in recent years; similarly, *a Habenaria intermedium has* been changed from *Ochyrorchis intermedia*. Updates regarding these changes may be sought in monograph, flora or taxonomic research papers, but little in classical texts.

These, along with the following major factors contribute to a piled-up dispute in the herbal community as far as the use of correct orchids are concerned for a given ailment. Major issues can be summarized as[6]:

1. Vernacular names.
2. Unavailability of plants
3. Lack of standard Pharmacological markers for quality check.
4. Substitution, with or without proper scientific basis.
5. Taxonomic synonyms and updating the classical texts being not very prompt.

3.2 Effect of Vernacular Name

Effects of vernacular name have also been profound on the misnomer or misinterpretation of the authentic drug. For example, *Jeevakamu* (in Telugu) is name for *Jeevaka* (*Malaxis acuminata*) and other related and often unrelated plants like *Vanda, Riddhi* are an orchid where as *Elavalukam*, *Himsara*, *Khubkalan*, *Medasaka*, *Rumimastagi*, *Tailaparnah* are non-orchid plants with vivid potentials, therapeutics, chemical constituents etc[7]. Similarly, other plants, belonging to two different families are considered as *Amarkand*; viz. *Dioscoria* species belong to family Dioscoriaceae, and *Eulophia* species belong to family Orchidaceae, are considered, documented, and used in the name of *Amarkand*[8,9].

3.3 Concept of Substitution (*Pratinidhi*) and its Effects

One important concept we need to imbibe in this context is the concept of substitute ('*Pratinidhi*' drug) in accordance to *Ayurveda*. It is documented that drugs which are available in inadequate quantity within a local area, may be rationally replaced (substituted) by some other drug with similar morphology, therapeutic potentials, chemical constituents etc[7]. However, even though there are various schools of thoughts regarding the use of substitute (PD) in *Ayurveda*, there are piled up controversies and disputes regarding the same.

As documented, original *Ayurvedic Samhitas* (like that of *Charaka* and *Sushruta*) has no direct mention about the list of PD[7]. *Acharyas* of post-*samhita* Era followed by the stalwarts of modern days (practitioners) have emphasized on the substitution. *Yogaratnakar* mentions that if *Rasa*, *Vipaka* and *Virya* of one drug are similar to another, it may be used as substitute, which was supported by *Acharya Vagbhata* and *Acharya Bhavamishra*[7].

Over the period of time, interestingly, the number of *Pratinidhi* drugs increased, for example, from more than 60 in *Bhavaprakash* to more than 110 in *Ayurveda Sarasamgraha*[7]. Frontier *Acharya Bhavamishra* opines that only if the original drug is not available, a substitute may be considered for it, provided it sets in the *Rasapanchaka* system. On the other hand, *Bhaishajya Ratnavali* totally disagrees to substitute a main drug of a polyherbal formulation, under any circumstances[7]. In this context, it is worth understanding that WHO (World Health Organization) has rejected the raw material 'having more that 5% of any other plant part of the same plant such as stem in case of leafy drug'[7]. This, therefore, does not put a clear picture in front of the practitioner, academician or research scholar, whether,

- One must use a substitute for a drug in a monoherbal or polyherbal formulation?
- Whether standard doctrine of *Ayurveda* must be followed or WHO protocol, in order to choose a correct substitute for a drug.

Although the fact that this problem exists for many other plants, this review is stringently restricted the vast discussion with respect to orchids only. Both *Riddhi* and *Vriddhi*, as per *Bhavaprakash*, is substituted by *Varahi Kand* or *Dioscorea bulbifera* of family Dioscoreaceae. While *Jeevaka* is substituted, as per *Bhavaprakash*, by *Vidari Kand* or *Pueraria tuberosa* of family Fabaceae; *Rishbhaka* is documented to be substituted with *Vidari Kand* or *Ipomea digitata* of Convolvulaceae family[10]. There exists a same Sanskrit name (*Vidari Kand*) for two different plants belonging to two altogether different families.

3.4 Erratum Originating During Translation of Original Texts

Another aspect of originating the controversy or dispute is improper translation of the original texts, which appeared in Palm leaves. This has, to some extent, changed the meaning, and the drug. To site an example, it was documented that *Taalavriksha* of *Dhanwantari Nigahntu*, while translation, became *Latavriksha* in another text *Nighantu sesha*[11].

Although, the matter is quite serious and needs immediate action from government, the public and research sectors. As the scope of this review, only orchids, which are used in *Ayurveda* are chosen to understand the depth of the problem. Some section of this part is the outcome of personal level communications with various *Ayurvedic* practitioners, students and research scientists which may not have been documented in the form of manuscript as yet.

3.4.1 Amarkand

The word, *Amar* (meaning immortal) and *Kand* (meaning tuber) together, describes an extremely potent group of medicines, as well as food. Tribal community uses the tubers as a food as well and to better and healthy longevity[8,9].

This is a group of plants, according to ancient texts, which comprises nearly 30 species belonging to Genus *Eulophia* (family Orchidaceae) and one species belonging to Genus *Dioscorea* (family Dioscoreaceae). Herbs like *Eulophia nuda* is called as *Amberkand* (Hindi), *Ambarakand*, *Bhuikakali*, *Manakand* (Marathi), *Balakanda*, *Granthidala*, *Trishikhadala* (Sanskrit)[4]etc. *Ayurveda* prescribes *Amarkand* as expectorant, tonic, diuretic, astringent, digestive, and as soft purgative. Some texts related to *Ayurveda* also advocate the use of this plant (group) for the treatment of ear discharge, blood clotting, joint edema, and debility[8,12].

Traditional belief also suggests the use of *Amarkand* as general tonic in order to promote strength, and to alleviate the three *Dosha*[13,14]. Folk medicine is known to use *Amarkand* in several problems, including heart, scrofulous diseases of the neck, blood diseases, dyscrasia and as a vermifuge[14,15].

A recent endeavor was taken up, to understand and thus, try to resolve the present dispute regarding the exact identity of *Amarkand*[14]. Biochemically and experimentally it was observed that both *Dioscorea bulbifera* and two species of *Eulophia* (*E. ochreata*, *E. leghapanensis*) are found to be equipotent which may be attributing to their medicinal properties[14]. Bulbils of *D. bulbifera* and tubers of *E. ochreata* both significantly showed immunomodulatory activity by potentiating humoral as well as cellular immunity in experimental

animal models. Strikingly, both these plants were also capable of restraining the alteration produced via adjuvant-induced chronic inflammation in animals[14]. However, in this case at least, the orchids (*Eulophia* species) have been shown to possess more or less equal potential in the biochemical and animal model tests with *Dioscoria* species[14].

3.4.2 Riddhi and Vriddhi

Habenaria intermedia (synonym: *Ochyrorchis intermedia*) is called as *Riddhi*[3]. Several plants are called by this name in *Sanskrit viz*. *Habenaria edgeworthii* and *Eulophia nuda* (both belonging to Orchidaceae), *Dioscorea bulbifera* (belonging to Dioscoreaceae family)[3]. The tubers show cooling effects and are used as brain tonic, *Rasayana*, aphrodisiac, and in treating muscular pain, sprains, arthritis, sciatica, insanity, leprosy, skin diseases, anorexia, worms, emaciation etc[3].

Vriddhi, on the contrary, is, according to recent report, *Habenaria edgeworthii* (taxonomic synonym *Platanthera edgeworthii)*[3]. Other plants used in the same name includes *H. acuminata*, *H. goodyeroides* and *H. griffithii* are also equated with *Riddhi*, *Vriddhi*[5,3]. Uncertainty has also been provoked from that fact that, although, *Habenaria intermedia*, in *Ayurveda* refers to *Riddhi*, as per literature, it is called *Vriddhi*[7]. The tubers show cooling effects and are used as brain tonic, *Rasayana*, and in treating burning sensation, excessive thirst, asthma, insanity, leprosy, skin diseases, anorexia, worms, emaciation etc[3].

If we need to enumerate the substitutes of these plants, following confusion may be evoked:

- *Vriddhi* is substituted by *Salam Panja* (*Dactylorhiza hatagirea*), an Orchid, and also by *Sida acuta* (Malvaceae)[16,17].
- *Riddhi* is substituted by *Varahikand* or *Dioscorea bulbifera* tubers (Dioscoreaceae), and also by *Chiriya Musli* or *Asparagus filicinus* (Asparagaceae) bulbs in some parts of India[17], and in some other parts of India, by *Bala* or *Sida cordifolia* (Malvaceae)[7].

Out of these plants, *Bala* and *Chiriya Musli* are not mentioned in the API (Ayurvedic Pharmacopoeia of India). Same is the case with *Vriddhi*. There also exists striking similarities in action of both these plants. According to *Ayurvedic* parameters, both are cooling and spermopoietic in nature; sweet to taste and both are known to pacify *Vata* and *Pitta* and aggravate *Kapha*. Therapeutically, both are used in alleviating diseases of blood[18].

Various properties of these substitutes, for *Riddhi* and *Vriddhi* both, chemical constituents, and pharmacological actions are mentioned in the Table 2 and Table 3[7]:

From these two Tables, following points with respect to *Rasapanchaka* and other standard *Ayurvedic* parameters may be inferred that:

1. While *Riddhi* shares common *Vipaka* properties (*Madhura*) with *Bala* and *Chiriya Musli*, they are not mentioned in API.
2. Standard substitute for this plant, as per API, show difference in *Vipaka* (*Madhura* for *Riddhi* and *Katu* for *Varahi Kand*), *Virya* (*Sheeta* for *Riddhi* and *Ushna* for *Varahi Kand*) as well as *Rasa* and *Guna*.
3. The main drug is known to be *Tridhosha Pittahara*, while all other substitutes are *Vata-Pitta* pacifying.
4. Similar trend is obtained from when *Vriddhi* and its substitutes were compared. The main drug being *Madhura*, *Sheeta* and *Guru* and *Snigdha*, the API accepted substitutes do not comply with the features.
    - Thus, it does not make a clear picture on the mind of an *Ayurvedic* practitioner as well as researcher, how and why this substitution is accepted by API.

3.4.3 Jeevaka or Rishabhaka

Crepidium acuminatum (synonym *Malaxis acuminate* D. Don) is called *Jeevaka* or *Jivaka*. *Lipasis rostrata*, bulbs of *Microstylis wallichi*, and *Malaxis muscifera* are also sold as *Jivaka*[3,5]. Other orchids, found in the North-West Himala, like *Malaxis cylindrostachya*, *Malaxis mackinnoni*, are used under the same name. While some scholars take *Malaxis muscifera* (synonym *Microstylis muscifera*) as *Rishbha*[3].

Major substitutes of these plants can be summarized as under:

- *Rishbhak* is also substituted by *Varahi Kand* or *Dioscorea bulbifera* (Dioscoreaceae), and also by *Lal Behmen* or *Centaurium roxburghii* Druce. (Gentianaceae)[17].
- *Jeevaka* is substituted by *Varahi Kand*, *Guduchi* or *Tinospora cordifolia*. (Menispermaceae) and *Safed Behen* or *Centaurea behen* (Asteraceae)[17].

Table 2. Comparison of *Riddhi* with its substitutes

Common name	*Riddhi*	*Varahikand*	*Bala*	*Chiriya Musli*
API mention	*Riddhi*	*Varahi*	Not mentioned in API	Not mentioned in API
Scientific name and Family	*Habenaria intermedia*; Orchidaceae	*Dioscorea bulbifera*; Disocoreaceae	*Sida cordifolia*; Malvaceae	*Asparagus filicinus*; Asparagaceae
Taxonomic synonym (for Orchid)	*Ochyrorchis intermedia*	……	……	……
Other Orchidaceae members	……	……	……	……
Dosha	*Tridosha Pittahara*	*Vata-Pitta Pacifying*	*Vata-Pitta Pacifying*	*Vata-Pitta Pacifying*
Vipaka	*Madhura*	*Katu*	*Madhura*	*Madhura*
Virya	*Sheeta*	*Ushna*	*Sheeta*	*Sheeta*
Rasa	*Madhura*	*Madhura; Katu; Tikta*	*Madhura*	*Madhura*
Guna	*Guru; Picchala; Snigdha*	*Laghu*	*Guru; Snigdha; Picchala*	*Guru; Snigdha*
Chemical constituent	Starch, minerals with bitter substances; Phenolic compounds	Steroidal saponin, Spiroconasole A; Phenantherens; 2,7-Dihydroxyphenanthrenes; Quercetin; Quescetin-detivatives; Bafoudiosbulbins A, B, C, D, E, F and G	Alkaloids; amine-derivatives; Ephedrine; Pseudoephedrine; Betaphenylamine; Mevalic and Coronic acids; Saponins; Hypaphorine; Indole-alkaloids; β-Sitosterol	Saponins; Steroidal saponins; Sarsapogenin; Glycosides of Quercetin; Sitosterol; Polycyclic alkaloids; Asparagamine; Disaccharides
Pharmacological actions	Brian tonic; Coolant; Blood purifier; Appetizer; *Rasayana* Tonic; Anti-worm; Anorexia; Tonic for general debility	Analgesic; Antidiabetic; Cardiotonic; Cytotoxic; Gastroprotective; Antihelmintic; Antioxidant; Antibacterial; Diuretic	Analgesic; CNS-depressant; Anti-inflammatory; Hypotensive; Anti-microbial; Hypoglycemic; Anti-asthmatic; Anti-Parkinson; Antioxidant	Anti-tumour; Hypoglycemic; Immunomodulator; Hypertensive; Anticoagulant; Antidysenteric; Galactogauge; Antiviral; Antioxidant

Table 3. Comparison of *Vriddhi* and its substitutes

Common name	***Vriddhi***	***Varahikand***	***Salam Panja***	***Pitabala***
API mention	*Vriddhi*	*Varahi*	Not mentioned in API	*Mahabala*
Scientific name and Family	*Habenaria edgeworthii*; Orchidaceae	*Dioscorea bulbifera*; Disocoreaceae	*Dactylorhiza hatagirea*; Orchidaceae	*Sida rhombifolia*; Malvaceae
Taxonomic synonym (for Orchid)	*Platanthera edgeworthii*	……	……	……
Other Orchidaceae members	*Eulophia nuda*; *Habenaria edgeworthii*; *H. acuminata*, *H. goodyeroides* and *H. griffithii*	……	……	……
Dosha	*Tridosha Pittahara*	*Vata-Pitta* Pacifying	……	……
Vipaka	*Madhura*	*Katu*	……	*Madhura*
Virya	*Sheeta*	*Ushna*	……	*Sheeta*
Rasa	*Madhura*	*Madhura; Katu; Tikta*	……	*Madhura*
Guna	*Guru; Snigdha*	*Laghu*	……	*Guru; Snigdha; Picchala*
Chemical constituent	Starch, minerals with bitter substances; Phenolic compounds	Steroidal saponin, Spiroconasole A; Phenantherens; 2,7-Dihydroxyphenanthrenes; Quercetin; Quescetin-detivatives; Bafoudiosbulbins A, B, C, D, E, F and G	Dactylorhins A, B, C, D, E; Volatile oils; Starch, Mucillage	Alkaloids
Pharmacological actions	Emollient; Coolant; Blood purifier; Appetizer; *Rasayana* Tonic; Anti-worm; Anorexia; Tonic for general debility; Spermopoietic; Emaciation; Tonic for skin diseases, leprosy, worms	Analgesic; Antidiabetic; Cardiotonic; Cytotoxic; Gastroprotective; Antihelmintic; Antioxidant; Antibacterial; Diuretic	Antibacterial; Aphrodisiac; Antidiarrhoeal; tonic for general weakness; treatment for fever, cough, stomachache, burns	……

It is also important to note that active ingredients also might differ when a crude drug is adulterated or substituted. Dried pseudobulbs of *Jeevaka* is known to contain alkaloids, glycosieds, flavonoids, β-Sitosterol, Pieritone, Piperitone, O-Methylbatatasin, 1,8-Cineole, Citoenoll, carbohydrates like Glucose, Rhamnose, various alcohols like Ceryl alcohol, eugenol etc. While dried pseudobulbs of *Rishbhaka* is known to contain bitter alkaloids, glycosides, flavonoids and various derivatives[17]. The *Rishbhaka* is used to treat sterility, vitiated conditions of *pitta* and *vata*, seminal weakness, internal and external haemorrhages, dysentry, fever, emaciation, burning sensation etc[3]. The *Jeevaka (Jeevak)* is also used to treat seminal weakness, tuberculosis, dipsia, fever, emaciation, burning sensation etc[3].

Therapeutically, *Jeevaka* is typically recommended for bleeding disthesis, burning sensation, fever, and phthisis[18]. *Ayurveda* states that it is a coolant, febrifuge and spermopoietic, sweet to taste, cold in potency, which is known to pacify *Vata* and aggravates *Kapha*[18].

It is interesting to note that *Rishbhaka*, as per some documents, is also holding the same properties, same actions and the therapeutic potentials are also identical to *Jeevaka*[18]. Table 4 and Table 5 summarize the various potentials of these two groups of plants with respect to their substitutes, API acceptance and pharmacological profiles[7].

As mentioned, that Pratinidhi drugs are documented in *Bhavaprakash* and many other texts of *Ayurveda*. Some texts have also tried to mention a typical plant with similar mode of action as a *Pratinidhi* drug. This concept can be extrapolated in these two groups, *Riddhi-Vriddhi* and *Jeevaka-Rishabhaka* of *Ashtawarga* plants. The *Ayurvedic* dynamics these two groups are summarized in Table 6. Giri, in the elaborative review about the *Pratinidhidravyas* in *Ayurveda*, has mentioned for all substitutes of *Bhavaprakash*[10].

It might be noted that *Varahikand*, unlike *Vidarikand*, differs in some *Ayurvedic* dynamics, like that of *Vipaka*, *Veerya* and *Doshaghanata* with its

Table 4. Comparison of *Rishbhaka* and its substitutes

Common name	*Rishbhaka*	*VidariKand*	*Lal Behman*
API mention	*Rishbhaka*	*Vidarikanda*	Not mentioned in API
Scientific name and family	*Microstylis muscifera*; Orchidaceae	*Pueraria tuberosa*; Fabaceae	*Centaurium roxburghii*; Gentianaceae
Taxonomic synonym (for Orchid)	*Malaxis muscifera*	……	……
Other Orchidaceae members	……	……	……
Dosha	*Vata-Pitta Pacifying*	*Vata-Pitta Pacifying*	……
Vipaka	*Madhura*	*Madhura*	……
Virya	*Sheeta*	*Sheeta*	……
Rasa	*Madhura*	*Madhura*	……
Guna	*Guru; Snigdha*	*Guru; Snigdha*	……
Chemical constituents	Bitter alkaloids; Glycosides; Flavonoids and Flavonoid-derivatives	Pterocarpan; Pterocarpanone; Pterocarpenes; Isoflavones; Coumestan	Mainly Alkaloids
Pharmacological actions	Aprhodisiac; Antidiarroeal; Antipyretic; Improve seminal weakness; Antidysentery; Fabrifuge	Anti-inflammatory, Antispasmodic, Hepatoprotective, Antioxidant, Cardioprotective, Antihyperglycemic, Hypolipidemic, Anti-ageing	Bitter tonic, useful in the loss of appetite and peptic discomfort

Table 5. Comparison of *Jeevaka* and its substitutes

Common name	*Jeevaka*	*Vidarikand*	*Safed Behmen*	*Guduchi*
API mention	*Jivaka*	*Vidarikanda*	Not mentioned in API	*Guduchi*
Scientific name and family	*Malaxis acuminata*; Orchidaceae	*Pueraria tuberosa*; Fabaceae	*Centaurea behen*; Asteraceae	*Tinospora cordifolia*; Menispermaceae
Taxonomic synonym (for Orchid)	*Crepidium acuminatum*	……	……	……
Other Orchidaceae members	*Lipasis rostrata*; *Microstylis wallichi*; *Malaxis muscifera*[3,5]	……	……	……
Dosha	*Vata-Pitta Pacifying*	*Vata-Pitta Pacifying*	……	*Tridoshic*
Vipaka	*Madhura*	*Madhura*	……	*Madhura*
Virya	*Sheeta*	*Sheeta*	……	*Ushna*
Rasa	*Madhura*	*Madhura*	……	*Tikta, Kashaya*
Guna	*Picchala, Snigdha*	*Guru, Snigdha*	……	*Laghu*
Chemical constituents	Alkaloids; Sugars; Diterpenes; Sterols; Monoterpenes; Cyclic terpenes; Glycosides; Flavonoids; Methylbatatasin	Pterocarpan; Pterocarpanone; Pterocarpenes; Isoflavones; Coumestan	Saponins; Steroids; Alkaloids	Terpenoids; Alkaloids
Pharmacological actions	Antirheumatic; Analgesic; Anti-inflammatory; Emaciating; Aphrodisiac; treatment for general debilities, fever, seminal weakness, burning sensation	Anti-inflammatory, Antispasmodic, Hepatoprotective, Antioxidant, Cardioprotective, Antihyperglycemic, Hypolipidemic, Anti-ageing	Anti-inflammatory; Aphrodisiac; Hepatoprotective; Cardiotonic; Antiaxiety; Memory enhancer; relieve seminal fluid thickness	Anti-inflammatory; Hepatoprtective; Antileucerogenic; Hypoglycemic; Antimicrobial; Diuretic; Anticancer; Antistress; Expectorant; Antiallergic

original plants. Besides, the *Rogaghnata* (potential to alleviate a disease or disorder) also differs slightly, as only *Rasayana* and *Raktadosha* are similar[10].

3.4.4 Rasna

Rasna is an important *Ayurvedic* drug which is widely used in indigenous medicines in rheumatism and allied disorders, diseases of the abdomen, dyspepsia, bronchitis and inflammation[19,20]. This plant in our traditional system is known for its extensive usage in several poly-herbal formulations like *Maha-Rasnadi Quath*, *Maha-Rasnadi Pachan* etc. to name a few. Thumb rules regarding *Rasna* can be traced back at least to the year 1943. In that year, a book was published in regional language of Orrisa state of India (Oriya) on the Materia Medica of *Ayurveda* and it (*Dravyaguna Kalpadruma*, by *Kaviraj Brajabandhu Tripathy*) said the following about *Rasna*: "*is of three types, viz., Mularasna, Patrarasna and Kandarasna, obtained from the roots, leaves and tuber. Of these three types, the first two are the best. Gandha Rasna is a type of Kandarasna and is used to treat cases of poisoning. Ophioxylon serpentinum, is also recognized by Ayurveda to belong to the 'Rasna* family*' and is known as 'Gandha-Rasna'; but it is not indicated for the treatment of rheumatism*"[21]. Similar trend is found in some documented *Ayurvedic* textbook. For example, *Raja Nighantu* has mentioned three types of *Rasna*, namely, *Moolarasna*, *Patrarasna* and *Trinarasna*, belonging to the genera *Rauwolfia serpentina*, *Lochnera rosea* and *Vanda roxburghii*, respectively. Previous texts like those

Table 6. Comparison of mentioned *Pratinidhi dravyas* with respect to *Rasapanchaka*

Plant	Guna	Rasa	Vipaka	Veerya	Doshaghnata	Karma	Rogaghnata
Jeevaka-Rishabhaka group							
Jeevaka	*Guru, Snigdha*	*Madhura*	*Madhura*	*Sheeta*	*Pitta-Vatahara; Kaphahara*	*Balya; Shukrala*	*Daha; Raktavikara; Karshya; Kshaya*
Rishabhaka	*Guru, Snigdha*	*Madhura*	*Madhura*	*Sheeta*	*Pitta-Vatahara; Kaphahara*	*Balya; Shukrala*	*Daha; Raktavikara; Karshya; Kshaya*
Vidarikand	*Guru, Snigdha*	*Madhura*	*Madhura*	*Sheeta*	*Pitta-Vatahara; Kaphahara*	*Rasayana; Mutral; Balya; Jeevan; Varnya; Brimhana; ShukralStanyajanan*	*Daha; Raktavikara; Karshya; Kshaya*
Riddhi-Vriddhi group							
Vriddhi	*Guru, Snigdha*	*Madhura*	*Madhura*	*Sheeta*	*Tridoshhara; Pittahara*	*Shukrala; Prankari; Garbhaprada; Aishwarya; Vrishya*	*Murchha; Rakta-pitta; Raktadosha; Kshaya; Kshata*
Riddhi	*Guru, Snigdha*	*Madhura*	*Madhura*	*Sheeta*	*Tridoshhara; Pittahara*	*Shukrala; Prankari; Garbhaprada; Aishwarya; Vrishya*	*Murchha; Rakta-pitta; Raktadosha; Kshaya; Kshata*
Varahikand	*Guru*	*Madhura*	*Katu*	*Ushna*	*Kapha-Vatahara; Pittakara*	*Sukrala; Swarya; Varnya; Rasayana; Agnibala*	*Meha; Kshata; Krimi*

of *Charaka*, *Sushruta* and *Vagbhata* do not have any such mention with such a distinction about *Rasna* in their elaborative texts[11].

Similar trends are found in documentation in the modern days. Wealth of India, one of the most authentic books for raw material, drugs of Indian continent, believes that *Rasna* and *Kulanjana* (*Alpinia galanga*) are same, while *Raja Nighantu*, *Nighantu Ratnakar* and *Bhavaprakash Nighantu* considers them to be separate plants, with different therapeutic potentials and properties[11].

It is also interesting to mention here, a clear-cut geographical separation of use of plants in parts of India. It is documented by Girija and Rama Shree, in their review, traditional *Ayurvedic* practitioners, called *Vaidyas*, of Northern India uses *Pluchea lanceolata* as *Rasna*, while those of Kerala and Andhra Pradehs (Southern India) prefers *Alpinia galanga*, *Alpinia calcarata* of Zingiberaceae family[22]. In Kashmir and Nepal, *Viscum album* (family Loranthaceae) is taken as *Rasna*, while some *Vaidyas* of Kashmir, also suggests *Inula racemosa* (family Asteraceae). In Punjab side of Northern India, *Withania coagulens* (family Solanaceae) is considered as *Rasna*[11].

While *Charaka Samhita* sets *Rasna* as in adjunctive oily enema therapy (*Anuvasanopagmahakashya*), it is also mentioned in tikta *dravya* (bitter drugs) with *Guduchi, Nimba, Kutaki, Patola etc., Sushruta Samhita* sets this group of drugs in *Arkadigana* and *tiktadravya* which is considered usually a shrub[23].

Various texts, mentioned in Sanskrit and other regional languages of India, have mentioned many names of plants belonging to Orchidaceae family to assign *Rasna*, namely (i) *Vanda tessellata* (Syn. *Vanda roxburghii*), and (ii) *Acampe papillosa* (Syn. *Saccolabium papillosum*), and one plant other than this family is *Pluchea lanceolata*, which belongs to family Asteraceae[21,24]. Besides, *Acampe carinata*, *A. praemorsa*, both belonging to family Orchidaceae are sometimes treated as *Rasna*.

Among these plants, *Vanda tessellata* has been shown to be a potent aphrodisiac and fertility booster[25].

According to *Ayurvedic* literature, leaf-paste is applied on the entire body during fever, juice of leaves are drop-wise applied on the ear during bleeding from the ears, and also the oil made with this plant is topically applied in rheumatism[28]. Some traditional *Ayurvedic* practitioners in India have used the same plant for limb fracture or to treat rheumatism[21]. In India, *Vanda* is also shown to possess antiproliferative effects against various types of cancers, including those from choriocarcinoma (cancer of germ cells), lung cancers, and stomach cancers[26,27].

While there are three main names that appear in the *Ayurvedic* texts, very less is known about the other two plants that are also mentioned as *Rasna* in many ancient texts. To some extent, similar activities are mentioned for the plant *Acampe papillosa* (Syn. *Saccolabium papillosum*). This plant is also utilized by some practitioners during rheumatism. The leaf-juice mixed with honey is drop wise applied to ear during earache[28].

Some of the common names, used in Sanskrit texts, to describe *Rasna* plant and their meanings are documented hereunder[29]:

- *Elapani* – The leaf resembling that of Cardamom plant.
- *Gandhanakuli, Gandhamoola, Sugandha, Surabhi* – Plant (or plant parts) are with pleasant aroma or smell.
- *Yukta, Yuktarasa* – The plant can be used to treat several diseases.
- *Rasadya, Atirasa, Rasya, Surasa, Rasana, Rasna* – Plant which increases the *rasadhatu* in our body.
- Documented uses of *Rasna* in *Ayurved* can be shortlisted like:
- The paste of leaves of *Rasna* is applied over the body to increase body temperature during cold climatic conditions in colder areas.
- The rhizome paste is topically applied over affected joints to alleviate joint-pain.
- Cold infusion prepared from leaves and rhizomes of *Rasna* is used to treat asthma and persistent cough.
- Decoction obtained from the plant is a potent blood-purifier.
- Decoction of leaves and rhizomes is used as anti-dote for plant poisons.
- Decoction prepared from rhizomes of *Pluchea lanceolata* plant is consumed to treat abdominal pain, fever arising due to indigestion, ingestion-related problems.

Thus, it becomes extremely difficult to understand, for a nonprofessional, as well as for a trained practitioner, the proper identity of the plant.

The deep-rooted problem was aggravated by the trivial name '*Sugandhi*', as documented by Sreelekshmi and colleagues. As this name being common, has been given to more than one (often unrelated) plants. Whether or not, the cause of this type of misinterpretation may be falling on the inadequate knowledge of the translator[11].

Ayurvedic texts viz. *Dhanvantari Nighantu* or *Raja Nighantu*, describes *Rasna* from vivid points. The author has tried to encompass some of these textual contents, for the voracious readers, for reference and tried to elucidate (as far as possible) in simple forms (translation into common language). According to *Dhanvantari Nighantu*, '*Sugandhamula atirasa saiva putirasa smrita. Dh. Ni.* 300: (literal meaning, *sugandamula, atirasa* and *putirasa*, are the few names of *Rasna*). Further, *Dhanvantari* describes the properties and effects of this plant, like '*raasna tikto shna gurviisyaadvishavaataasrakaasajit. Shopha kamp odara shleshma shamanya amasya paachanii. Dh. Ni.* 301': (literal meaning, *Rasna* is bitter to taste, hot in potency, heavy in acceptance, and it can alleviate *vata, kampa, shopha, shleshmaa* etc., additionally, it is digestive)[30]. According to *Bhavaprakasha Nighantu*, '*Raasna amapaachanii tiktaa guru shnaa kapha vaatajit. Shotha shwasa samiraasra vaata shul odarapahaa. Kaasa jvara vishaa shiitivaati kaamaya sidhmahrit. Bha. Ni.* 144[31]. The simple meaning of these *shloka* goes like, *Rasna*, the name, is digestive-promoting, bitter, heavy and can alleviate *kapha* and *vata*. Additionally, it is helpful in *shotha*, breathing problems, *shula*, and problems related to stomach, fever, toxic substances etc. And, as mentioned earlier in this section, *Raja Nighantu* classified *Rasna* into three categories, stating *Mula Rasna* is the best amongst all. The potentials of the same and *guna* or the features of the same are similar in all three quotes. (i) '*Raasnaa tu trividhaa prokta mulam patram trunam tathaa. Jethe mula dale shreshthe truna raasnaacha madhyamaa. Ra. Ni. 51'*. (ii) '*Raasnaa gurushcha tiktoshnaa visha vaatasra kaasajit. Shopho*

kamp odara shleshmashamanii paachanichasaa. Ra. Ni. 52[32]. According to *Kaiyadeva Nighantu, 'Raasnaa tiktaa guru shnaa paachanii kapha pittahaa. Nihanti shophaa vaata asrashwaasa kaasa visha jvaraan. Kai. Ni*. 1043' and '*Hidhmaashiitaamavaata adhyavaatashulodaraanicha. Kai. Ni*. 1044'. Each of these three varieties is supposed to have some potency to cure rheumatism (*Vaata*). Only, *KaiyadevaNighantu* mentioned the alleviation of *Pitta*-related problems, while other *Nighantus* did not mention about the same! The characteristics, like that of Heavy (*Guru*), Bitter (*Tikta*) and Hot (*Ushna*) remains the same for all sorts of descriptions found in most of the standard sacred texts.

Following Table 7 will give an idea about various plants which are called as '*Rasna*' and their major pharmacological activities[23,34].

3.4.5 Jivanti

Jivanti is also mentioned as *Jiwanti* or *Jeevanti*. Out of the ten drugs, according to *Vagbhata*, that constitute the *Jivaniyagana* drugs, *Jivanti* (*Jiwanti*) is one important. *Charaka* has emphasized this drug as an important *Rasayana*, capable of maintaining the vigour, strength and youthfulness of the individual[35]. The word, *Jivanti*, been described commonly as, a drug which maintain healthy state of human[36]. The drug, might be based on its potential, has been categorized in *Vayasthapana Gana* (a group of Anti-ageing drugs), *Jeevaniya Gana* (a group of rejuvenating drugs), *Shakavarga* (a group of vegetables), *Madhura Skandha* (a group of drug having sweet properties) and many other places as per our sacred *Ayurvedic* texts[36].

As per standard Lexicon and dictionaries of *Ayurveda* and Sanskrit language, several synonyms have been attributed to this name, which partially or totally, describes the morphology and pharmacological potential of the drug *Jivanti*. Some documents suggests that as many as 40 odd numbers of synonyms have been ascertained[36]. It must be interesting to know various names and their meanings which try to describe the drug. Naik and Acharya, in their fascinating review on *Jivanti*, has mentioned the names and their roots and meaning in great detail as given in Table 8[36].

Dendrobium ovatum is common orchids of Western Ghats of India and are collected and treated as *Jivanti*. Juice of fresh plant is known for treating stomachache, used as carminative, antispasmodic, laxative, liver tonic. The plant product (especially the juice of leaves and fresh plant is believed to excite the bile secretion. Another related species, *D. crumenatum*, which occurs in Andaman Islands is also known for its medicinal values. Pounded leaves of *D. crumenatum* are used in Malaya for poulticing boils and pimples. Traces of alkaloids have been reported to be present in the pseudobulbs and leaves[5]. *D. macraei* and *D. normale* are also known as *Jivanti*[5,37]. Out of these two orchids, *Dendrobium macraei*, also called by various names like *Jivanti*, *Jevajevaniya*, *Yasasvini*, *Jivabhadra* in different Sanskrit texts, is also described as '*Sakashreshtha*', which literally means, 'best amongst the vegetables herbs'[13]. Another plant which is believed to be *Jivanti* is *Pholidota articulata*, which is known for its restorative properties[5]. While some authors support *Flickingeria macraei* as *Jeewanti*, some others consider *Dendrobium alpestre, Dendrobium macraei, Dendrobium normale* under the same name[13,36,38-40]. While some documents also suggests that *Flickingeria nodosa* is one of the botanical sources of *Jeevanti* plant[41]. *Coelogyne cristata* (synonym *Cymbidium speciosissimum*; *Pleione speciosissima*), commonly known as "*Jibanti*", is an Indian medicinal plant which is mostly used for treatment of fractured bones in folk tradition of Kumaon Himalayas, Uttarakhand[42]. Yet another orchid, *Desmotrichum fimbriatum* of family Orchidaceae, (synonym *Dendrobium macraei*) called by various names, like *Jibai*, *Jibanti* (Bengali); *Jiban*, *Joivanti*, *Sag* (Hindi); *Bhadra*, *Jiva*, *Jivani*, *Jivanti* (Marathi) in various parts of Indian subcontinent, has also been praised by *Sushruta*, one of the great ancient scholar for Indian traditional medicinal system[13,43,44]. Several other plants, belonging to altogether different families of Angiosperm, are also regarded as *Jivanti*. *Cimcifuga foetida* (family Rannunculaceae), *Holostemma rheedii* and *Dregea volubilis* (both belonging to family Asclepiadaceae) are few of them which are taken as *Jivanti*[35].

Another similar name appears to be important to be discussed hereunder. *Ayurvedic* texts also describe a plant called '*Swarna Jivanti*' (*Swarna* means golden) in its classical texts. The description, an epiphyte with a creepy stem and pseudobulbs, attracts various members of the Orchidaceae family[45]. Although *Dendrobium macraei* is the important botanical source of this drug, other plants of Orchidaceae family such

Table 7. Rasna-Identity and their pharmacological activities

Name	Family	Distribution (as Rasna)	Pharmacological activities
Vanda tessellata	Orchidaceae	Bengal, Chota Nagpur, Bihar, Part of Orissa	Anti-rheumatic; for Fever; Aphrodisiac; Anti-inflammatory; whole plant in dyspepsia, inflammations, bronchitis, rheumatic pains, sciatic, tumors, hiccough and disease of the abdomen; Analgesic, Nervine tonic; Piles, Secondary Syphilis; antidote for Scorpion sting.
Pluchea lanceolata	Asteraceae	Rajasthan, Upper Gangetic Plain	Anti-inflammatory; Muscle relaxant; decoction for Muscular pain, Rheumatism, Oedema, oil massage; Leaves Analgesic, Antipyretic, Laxative.
Viscum album	Loranthaceae	Himalayan Terrain; Upper parts of Madras Presidency	Contraceptive; act as Ergot on Uterus; used in Anxiety, High BP, Headache, loss of energy, Dizziness, Irritability; used in Convulsive cough, Bronchial Asthma; in Gout, Leuchorrhoea and Sciatica.
Aristolochia indica	Aristolochiaceae	Kanakeshwar near Mumbai; Pan India	Used in skin diseases and as anti-arthriac; also used in skin diseases.
Rauwolfia serpentine	Apocyanaceae	Pan India considered as Nakuli or GandhaNakuli	Anti-diarrhoea; antidote for snake bite, for High BP; in Schizophrenia, Epilepsy, Seizure and Bipolar disorders; in improving psychogenic and pruritic dermatoses.
Inula recemosa	Asteraceae	Himalaya; Kashmir; Arabic Rasna	Jaundice and fever; As expectorant; root used in cough, Asthma, Pleurisy, Tuberculosis; in Liver problem and Rheumatism; component for polyherbal formulations for Cardiac and inflammatory problems; leaves used in acute Bronchitis, Respiratory problems; Anti-diarrhoea, Anti-dysentery.
Alpinia galangal	Zingiberaceae	Pan India	Tuberculosis and cough; as Carminative, Anti-emetic, digestive tonic; rhizome exhibits hypothermia, anti-tubercular activity, tonic, bronchial catarrh, stomachache and stimulant; used in Burning liver, chest pain, rheumatic pain, kidney diseases; improves Appetite, healing potential.
Withania coagulans	Solanaceae	Punjab; Sindh; Baluchisthan; Afganisthan;	Various disorders; Hepatoprotective; in Liver complains, Asthma, Disability, Insomnia; used in flatulent colic, dyspepsia, other intestinal infections; teeth cleaner and in toothache.
Tylophora india	Asclepiadaceae	Sandy areas of Bengal; Eastern India; Orissa; Assam	Bronchial Asthma; Anti-inflammatory; Anti-tumour; Dermatitis; in Allergy, Bronchitis; used in Hay fever, cold, Dysentery, Arthritis; Expectorant in Whooping cough.
Lochnera rosea	Apocyanaceae	Pan India	Anti-diabetic; Anti-hypertensive, sedative and with tranquilizing properties; CNS stimulation; Pain reliever; Anti-cancer; in Sore throat, bleeding gum, bleeding nose; Mouth Ulcer; in Diarrhoea, Cystitis, Memory loss; Gastritis, in raised Blood sugar.
Enicostema littoral	Gentianaceae	Punjab; Mumbai	Anti-diabetic; Laxative; Anti-inflammatory; Anti-oxidant.
Saccolobium papillosum	Orchidaceae	Pan India	Rheumatism
Dodonea viscose	Sapindaceae	Tropical and Subtropical Africa; Temperate zone of World	Anti-bacterial; Anti-ulcer; for Fracture; Skin infection, diarrhoea; stomachache; leaf infusion for rheumatism and gout; hepatic pain, uterine pain; smooth muscle related problems; also in dermatitis and haemorrhoids; sore throat .

Table 8. Synonyms describing *Jivanti* and their explanation

Synonym	Explanation	Root of origin/ Basis
Nagavalli	Creeping or twinning habit like that of a snake	Morphological and Pharmacological
Arkapushpi	Plant with flower like *Calotropis* (*Arka*)	Morphological and Pharmacological
Shrangati; Doda	Follicles are curved slightly, like horn	Morphological and Pharmacological
Payaswini; Ksheerini; Madhusrava	Herb with a milky exudation	Morphological and Pharmacological
Balavardhini	A drug improvising strength	Action (Karma)
Jeevanti	A drug maintaining healthy state	Action (Karma)
Jeeva; Jeevani; Jeevada	Providing *Rasayana* action for long duration	Action (Karma)
Jeevanneya	Drug as a potent tonic	Action (Karma)
Jeevavardhini	Providing healthy longevity	Action (Karma)
Garahrit	Drug to treat *Gara* or *Visha*	Pharmacological action
Bhadra; Mangalya; Sukhamkari	Drug showering bliss and happiness	General
Yashashkari; Yashasya	Bestowing fame	General

as *Desmotrichum fimbriatum*, *Flickingeria macraei*, *Flickingeria fimbriata*, *Ephemerantha macraei*, *Callista macraei*, *Flickingeria rabanii*, *Dendrobium nodosum* are used as *Swarna Jivanti*[45].

Jivanti, as well as *Swarna Jivanti*, according to *Ayurveda* is a coolant, sweet to taste, astringent to the bowel, health tonic, aphrodisiac, and a good expectorant[45]. It is useful in treating asthma, bronchitis, throat troubles, burning sensations, diseases of eye and blood[38,45]. Precisely, it is useful in pacifying '*Tridosha*'[35,45]. Phytochemical analysis, at different and independent efforts, have suggested that this group of drug contains Jebantine, an alkaloid, which is used as tonic[39,40]. Apart from alkaloids, the plants, like *D. macraei* and *F. nodosa*, are also known to contain flavonoids, carbohydrates, steroids, tannins and several phenolic compounds[45]. Jibantine, resinous principles like that of α- and β-Jibantic acid and diosgenin derivatives like Denfigenin and Defuscin as steroids are reported as chief constituents in *Dendrobium macraei*[45].

Mixed with other traditional plant-based drugs, this orchid is praised to be used as the standard antidote to snake and scorpion sting[15,39]. Other Sanskrit scholars and texts apparently have also described this orchid as cold, mucilaginous, light strengthening as well as for the treatment of various disorders related to blood, bile and phlegm[15]. Several reports suggests a wide range of pharmacological activities of *Jivanti*, like that of promoting life and vigour, improving voice quality, curing eye diseases, cough, haemetemesis, dyspnoea, night-blindness, emaciation to name a few. Some reports also suggests it as a stimulant, galactagogue, eye tonic, astringent, prolapse of uterus, vagina, controlling habitual abortion and maintain pregnancy[35]as summarized in Table 9.

In this context of *Jivanti*, it is also worth mentioning here that several standard texts have mentioned about the same plant in various categories. Naik and Acharya, in their spectacular review have listed, after taking a hard toil, various sacred *Ayurvedic* texts and the categorization of this plant. It is interesting to note that the plant has, although well praised throughout, been categorized differently by different ancient scholars of our Traditional system (Table 10)[36].

4. Inference

A very serious drawback of the *Ayurvedic* system at present is the difficulty in identifying the genuine medicinal herbs prescribed by the founders of the system. *Ayurvedic* texts, which are elaborative in Sanskrit language, do not deal with the medicinal plants with scientific precision. Since there was lack of definitive rules for nomenclature, single plant, as we have seen, has been described in several names, which becomes difficult ascertain a correct botanical name easily. Compounded to this already existing confusion is the effect of vernacular names of a given plant[7]. Thus, in might be concluded that any attempts for the standardization and quality control of these disputed

Table 9. Comparison of *Jivanti* with its substitutes[36,41,46,47]

Properties	Jivanti	Jivanti	Jivanti
Botanical name	*Flickingeria nodosa*	*Leptadenia reticulate*	*Holostemma ada-kodien*
Family	Orchidaceae	Asclepiadaceae	Asclepiadaceae
API acceptance	Not as per API	Accepted	Not as per API
Taxonomic synonym (for Orchid)	*F. macraei*; *Dendrobium nodosum*; *D. macraei*; *Desmotrichum fimbriatum*; *Ephimerantha emacraei*	……	……
Other Orchidaceae members	*Dendrobium crumenatum*; *D. normale*; *D. oavtum*; *D. alpestre*; *D. fimbriatum*; *Pholidota articulata*; *Coelogyne cristata*	……	……
Part used	Pseudobulbs and stem	Root	Root
Chemical constituents	Alkaloids, Jibentine; α- and β-Jibentic acid and its derivatives	Sterol in stem and root; Fructosandeivatives (inulin type) in roots; α-amyrin, β-amyrin, ferulic acid, luteolin, diosmetin, rutin, β-sitosterol, stigmasterol, hentricontanol, a triterpene alcohol simiarenol, apigenin, reticulin, deniculatin, and leptaculatin	Lupeol; β-Sitosterol; α-Amyrin; various amino acid derivatives
Pharmacological potentials	*Rasayan* drug; Tonic; Aphrodisiac; in Bronchitis, Asthma, Fever; Diseases of eye and blood; Cooling and Sweet to taste; to treat throat troubles, burning sensations; *Tridosha*	Hematopoiesis, Emaciation, Cough, Dyspnea, fever, Burning sensation, Night blindness, and Dysentery; used as Antioxidant, Antibacterial, Vasodilator, Galactogogue	*Rasayana* drug

Table 10. Text and categorization of *Jivanti*

Text name	Category
Charaka Samhita	*Jeevaniya Gana; Snehopaga Gana; Vayasthapana Gana; Swasahara Gana; Shaka varga; Madhura Skandha.*
Sushruta Samhita	*Kakolyadi Gana; Shaka varga; Kashaya Varga.*
Ashtanga Samgraha	*Shakavarga; Jeevaniya Panchamula; Snehopaga; Jeevaniya Gana; Swasahara; Vayasthapana Gana.*
AstangaHriday	*Shaka varga; Jeevaniya Panchamula; Madhura Skandha; Jeevaniya Gana.*
Dravyaguna Samgraha	*Shaka varga*
Nighantu Shesha	*Shakha Khanda*
Madhava Dravyaguna	*Vividhoushadhi Varga*
Shabda Chandrika	*Vrikshadi Varga*
Shodhala Nighantu	*Guduchyadi Varga*
Dhanwantari Nighantu	*Guduchyadi Varga*
Madanapala Nighantu	*Oushadhi Varga; Jeevaniya Gana; Shaka varga.*
Kaiyadeva Nighantu	*Jeevaniya Gana*
Bhavaprakash Nighantu	*Guduchyadi Varga*
Raja Nighantu	*Guduchyadi Varga*
Priya Nighantu	*Shatapushpadi Varga*
Shaligrama Nighantu	*Guduchyadi Varga; Jeevaniya Gana.*
Amarakosha	*Vanoushadhi Varga*
Nighantu Adarsh	*ArkadiVarga*

Traditional medicines will be 'an exercise in futility until the genuine drug plants are botanically identified beyond all doubts and such plants alone are used to prepare the medicines[11].

Thus, in conclusion, we might summaries some of the facts that:

- Even though there exist a tremendous potential of use of Orchids in curing, combating or alleviating certain pathophysiological conditions, there remains huge forbidden gap.
- The names of standard *Ayurvedic* texts do not provide ample identification criteria, with respect to standard taxonomic protocol and thus, there are good deals of controversies.
- Vernacular language and their synonyms in various dialects have worsened the situation over the period of time.
- The concept of substitution, although mentioned in modern *Ayurveda*, is not strict and not as per certain standardized procedure.
- Substituted drugs might not be 'as efficient as' the substituent drug and thus, the overall potential of this unfathomably deep system of medicine is gradually becoming shallow and eventually, people are losing hope.
- There is need of immediate research, by the *Ayurvedic* scholars, in combination with reputed taxonomists and scientists in order to bypass this dispute of name, identity, efficacy and etc.
- Regular updating of ancient texts, revision, elaboration and re-visit with modernization, keeping the original meaning and aesthetics intact are in immediate need.

5. Possible Outcome

From the above discussion, it is evident that some immediate measurements need to be taken both by Government and *Ayurvedic* scholars to address and thus alleviate the serious issue. Following steps might be undertaken:

- The concept of substitution in *Ayurveda* needs to be updated as per some norms set by National and/or International rules.
- More research programmes, using sophisticated systems must be added to the herbal drug division to understand the possible outcomes of a substitute, when it is used in monoherbal or polyherbal combinations.
- More and more elucidation of pharmacokinetics and pharmacodynamics of original drug and its (all possible) substitutes must be accomplished in both in vitro and in vivo scenarios. This might help in bringing a more potent substitute if it is absolutely needed.
- More in situ and ex situ conservation sites might be made to make the original drug available based on its demand, if it cannot be substituted under any circumstances.
- Value-added campaigns must be done at grass-root level to make local collectors aware about the possible deleterious effects of wrong or cheap substitutes of a valued original drug. This must be done to enrich the regional people to refrain from over-exploitation and to incur conservation for future.

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7. References

1. Jalal J, Kumar P, Pangtey Y. Ethnobotanical orchids of Uttarakhand, Western Himalaya. Ethnobotanical Leaflets. 2008; 12:1227–30.
2. Singh A, Duggal S, Medicinal orchids: An overview. Ethnobotanical Leaflets. 2008; 13:351-63.
3. Balkrishna A, Srivastava A, Mishra R, Patel S, Vashistha R, Singh A, Jadon V, Saxena P. Astavarga plants – Threatened medicinal herbs of North-West Himalaya. International Journal of Medicinal and Aromatic Plants. 2012; 2(4):661-76.
4. Kirtikar R, Basu B. Indian Medicinal Plants, in 2nd Ed. Vol. IV. C. Lalit Mohan Basu, Allahabud, India, 1935.
5. Khare C. Indian medicinal plants: An illustrated dictionary. Springer, New Delhi, India, 2007. https://doi.org/10.1007/978-0-387-70638-2 PMCid:PMC2705749
6. Virk J, Gupta V, Kumar S, Singh R, Bansal P. Ashtawarga plants Suffering a triple standardization syndrome. Journal of Traditional and Complementary Medicine.

2017; 7:392- 9. https://doi.org/10.1016/j.jtcme.2016.12.011 PMid:29034185 PMCid:PMC5634727
7. Virk J, Gupta V, Kumar S, Singh R, Bansal P. Lack of pharmacological basis of substitution of an endangered plant group "Ashtawarga"¸ A significant ingredient of polyherbal formulations. American Journal of Phytomedicinal and Clinical Therapeutics. 2015; 3(12):690-712.
8. Narkhede A, Kasote D, Kuvalekar A, Harsulkar A, Jagtap S. Amarkand: A comprehensive review on its ethno pharmacology, nutritional aspects, and taxonomy. Journal of Intercultural Ethanopharmacology. 2016; 5(2):198-204. https://doi.org/10.5455/jice.20160324054420 PMid:27104043 PMCid:PMC4835997
9. Jagtap S, Deokule S, Bhosale S. Some unique ethnomedicinal uses of plants used by the Korku tribe of Amravati district of Maharashtra, India. Journal of Ethnopharmacology. 2006; 107:463–9. https://doi.org/10.1016/j.jep.2006.04.002 PMid:16713158
10. Giri C. Concept of *Abhava Pratinidhi Dravyas*, a rational substitution of drugs - A review. International Journal of Advanced *Ayurveda*, Yoga, Unani, Siddha and Homeopath. 2013; 2(1):148-161.
11. Sreelekshmi M, Vimala K, Paul R, Chandran N. Controversy in medicinal plants: A review. International Journal of Ayurvedic Medicine. 2017; 5(7):1-7.
12. Vaidya B. Nighantu Adarsha, Varanasi, India: Sarva Seva Sangha, 2004. https://doi.org/10.1016/j.fitote.2010.09.007 PMid:20851751
13. Hossain M. Therapeutic orchids: Traditional uses and recent advances - An overview. Fitoterapia. 2011; 82(2):102-140.
14. Narkhede AN. Studies on Amarkand - Traditionally used tuberous plants with respect to their pharmacological activities, PhD Thesis., Bharati Vidyapeeth Deemed University, Pune, India, 2017.
15. Dhiman AN. Ayurvedic Drugs Plants, Delhi, India, 2006.
16. Khajuria A, Kumar G, Bisht N. Diversity with ethnomedicinal notes on Orchids: A case study of Nagdev forest range, Pauri Garhwal, Uttarakhand, India. Journal of Medicinal Plants Studies. 2017; 5(1):171-174.
17. Sagar PK. Adulteration and substitution in endangered, ASU herbal medicinal plants of India, their legal status, scientific screening of active phytochemical constituents, International Journal of Pharmaceutical Science and Research. 2014; 5(9):4023-39.
18. Singh AP. Ashtavarga - Rare medicinal plants. Ethnobotanical Leaflets. 2006; 10:104-8.
19. Chopra H, Nayar S. Chopra J. Glossary of Indian medicinal plants, CSIR, New Delhi, India, 1956.
20. Dwivedi V. Bhavaprakash Nighantu (Hindi translation), Motilal Banarasi Das, Banaras, India, 1949.
21. Rath B, Nanda P. Local thumb rules of herbs extraction, Vasundhara, Bhubaneswar, Orissa, India, 2001.
22. Girija TA, Rama Shree. Comparative anatomical and histochemical characterization of the source plants of the *Ayurvedic* drug Rasna. International Journal of Herbal Medicine. 2014; 2(2):38-46.
23. Mandal P, Kumar V, Kumar S, Mayura S, Nandi M, Damiki L. A controversial medicinal plant 'Rasna': An overview, proceeding of International Conference on Global Scenario of Traditional System of Medicine, Ayurved, Agriculture and Education, RGSC, Barkachha, BHU', India, 2013.
24. Anonymous: Pharmacopoeia of India, 2nd edn. Manager of Publications, New Delhi, India, 1966.
25. Kumar P, Subramoniam A, Pushpangadan P. Aphrodisiac activity of *Vanda tessellata* (Roxb.) Hook. Ex don extract in male mice. Indian Journal of Pharmacology. 2000; 32:300-4.
26. Dash P, Sahoo S, Bal S. Ethnobotanical studies on orchids of Niyamgiri Hill Ranges, Orissa, India. Ethnobotanical Leaflets. 2008; 12:70-78.
27. Ho C, Chen C. Moscatilin from the orchid *Dendrobium loddigessi* is a potential anticancer agent. Cancer Investigation. 2003; 21(5):729-36. https://doi.org/10.1081/CNV-120023771 PMid:14628431
28. Pandey G. Bhavaprakash Nighantu of Sri Bhavamishra. Chaukhamba, Bharati Academy, Varanasi, India, 2002.
29. Patil S, DJVH. Rasna *Pluchea lanceolata*, *Vanda roxburghii*, *Alpinia Galanga* uses, research. Easy *Ayurveda*. 2022 [cited 2022Sep30]. Available from: https://www.easyayurveda.com/2016/11/11/rasna-pluchea-lanceolata-vanda-roxburghii-alpinia-galanga/
30. Dhanvantarinighantu [Internet]. Nic.in. [cited 2022 Sep 30]. Available from: https://niimh.nic.in/ebooks/e-Nighantu/dhanvantarinighantu/?mod=read&h=rAsnA
31. Bhavaprakashanighantu [Internet] Nic.in. [cited 2022 Sep 30] Available from: https://niimh.nicin/ebooks/eNighantu/bhavaprakashanighantu/?mod=read&h=rAsnA
32. Rajanighantu [Internet]. Nic.in. [cited 2022 Sep 30]. Available from: https:l/niimh.nicin/ebooks/eNighantulrajanighantu/?mod=read&h=rAsnA
33. Kaiyadevanighantu [Internet]. Nic.in. [cited 2022 Sep 30] Available from: https://niimhnic.in/ebooks/eNighantulkaiyadevan ighantu/?mod=read&h=rAsnA
34. Mondal S, Kundu M. Rasna: A controversial medicinal plant. Indian Journal of Ethnophytopharmaceuticals. 2018; 4(1):20-30.
35. Kasera P, Shukla J. Bio-medicinal properties and cultivation of *Leptadaenia reticulata* (Jivanti) – An endangered plant of the Thar Desert, India. Current Science. 2003; 87(3):1-3.
36. Naik R, Acharya R. A review of therapeutic potential of *Jivanti* in *Ayurveda*. Anveshana *Ayurveda* Medicinal Journal. 2015; 1(6):442-9.
37. Pant V. Medicinal Orchids and their uses: Tissue culture a potential alternative for conservation. African Journal of Plant Science. 2013; 7(10):448-67. https://doi.org/10.5897/AJPS2013.1031

38. Lam Y, Ng T, Yao R, Shi, Xu K, Sze S, Zhang K. Evaluation of chemical constituents and important mechanism of pharmacological biology in *Dendrobium* plants. Evidence Based Complementary and Alternative Medicine. 2015; 841752:1-25. https://doi.org/10.1155/2015/841752 PMid:25945114 PMCid:PMC4402476
39. Khasim S, Rao P. Medicinal importance of Orchids. The Botanica. 1999; 49:86–91.
40. Chattopadhyay P, Banerjee N, Chaudhary B. Genetic characterization of selected medicinal *Dendrobium* (Orchidaceae) species using molecular markers. Research Journal of Biology. 2012; 2(4):117-125.
41. Madhavan V, Omar G, Yoganarasimhan S, Gurudeva M. Pharmacognostical studies on *Flickingeria nodosa* (Dalz.) Seiden f. stem and pseudobulbs – A botanical source of the Ayurvedic drug Jivanti. Journal of Natural Products and Resources. 2010; 1(1):22-8.
42. Pramanick D. Pharmacognostic studies on the pseudobulb of *Coelogyne cristata* Lindl. (Orchidaceae) - An epiphytic orchid of ethno-Medicinal importance. J Pharmac Phytochem. 2016; 5(1):120-3.
43. Kirtikar K, Basu B. Indian Medicinal Plant. International Book Distributors, Dehradun, India, 1981.
44. Chakrabarty M, Datta G, Ghosh S, Debnath P. Induction of antioxidative enzyme by the Ayurvedic herb *Desmotrichum fimbriatum* Bl. in mice. Indian Journal of Experimental Biology. 2001; 39:485-6.
45. Esha V, Shilpa C, Bharat P, Neeru P. Physico-Chemical and phytochemical evaluation of *Dendrobium macraei* Lindl. (Whole Plant). International Journal of Pharmacognosy and Phytochemical Research. 2016; 8(11):1801-11.
46. Mohanti S, Swamy M, Sinniah U, Anuradha M. *Leptadenia reticulata* (Retz.) Wight and Arn. (Jivanti): Botanical, agronomical, phytochemical, pharmacological, and biotechnological aspects. Molecule. 2017; 22:1019-45. https://doi.org/10.3390/molecules22061019 PMid:28629185 PMCid:PMC6152761
47. Pal A, Sharma P, Pandya T, Acharya R, Patel B, Shukla V, Ravishankar B. Phytochemical evaluation of dried aqueous extract of Jivanti [*Leptadenia reticulata* (Retz.) Wt. et Arn]. AYU. 2012; 33(3):557-60. https://doi.org/10.4103/0974-8520.110525 PMid:23723676 PMCid:PMC3665201