



**SUBSTITUTION, ADULTERATION AND SUFFERING TRIPLE STANDARDIZATION  
SYNDROME -BURNING PROBLEMS OF THE AYURVEDICREJUVENATORS-  
ASTAVARGA PLANTS**

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**ABSTRACT**

Astavarga, group of eight medicinal plants are nature's most extravagant group of flowering plants found in Himalayan region, belonging to Zingiberaceae, Orchidaceae and Liliaceae family viz, Kakoli, Kshirakakoli, Meda, Mahameda, Jeevak, Rishbhaka, Riddhi and Vriddhi. Astavarga is an important constituent of Chyavanprasha rasayan taken as rasayan (Rejuvenation), Brimhanigutika, Ashtavarga churna, and Vajikaraghrita, etc. as it is mostly used to treat sexual disorders, body ache, physical debility, as an immunobooster and as an overall tonic. In present era, Ayurveda as an Indian traditional system of medicine, world is looking towards herbal medicine because of its better efficacy acceptability and safety without harming the body. In India, at the primary health care level, about 80% of the rural population depends on herbal medicines in their day to day life. A large percentage of plants used in herbal industries are subject of controversy. Parallel evolved knowledge systems, Non-availability of plants and poor understanding are some of the reasons attributed to it. The existing practices of polynomial nomenclature system of Sanskrit, vernacular equivalents, different perceptions in various communities, all are cumulative factors for controversy, Adulteration and substitution. "Sandigdha Dravya" is a term used for that type of medicinal plants which are mentioned in Ayurvedic classics but their exact botanical source is unknown. Adulterants and substitutes are the common practices in herbal raw material trade. Adulteration is a debasement of an article. The motives for intentional adulteration are normally commercial that which involves deterioration, admixture, sophistication, inferiority, spoilage and other unknown reasons. Substitution is a replacement of equivalent drugs in place of original drugs. The principles to select substitute drugs are based on similar Rasa, Guna, Virya, Vipaka and mainly the Karma. At present the adulteration and Substitution of the herbal drugs is the burning problem in herbal industry and in Ayurvedic practices. So, it is necessary to develop reliable methodologies for correct identification, standardization and quality assurance of Ayurvedic drugs.

**KEYWORDS:** Controversy, Sandigdha Dravya, CSIR-IHBT, Adulteration, Substitute, Astavarga; Pharmacological Activities; triple standardization.

**INTRODUCTION**

Astavarga is a group of eight drugs which is well known in the ayurvedic profession but unfortunately this group is still controversial and as such, their substitutes are being used at present.

The word astavarga is not found in Brihtrayi and in Astanga Sangraha too. It seems that the astavarga, the group of eight drugs was introduced later.

Paryayaratnamala (9<sup>th</sup> cent.) is the first text where the word astavarga and the drugs of astavarga are found. Madhavakara has described two traditions of astavarga.

In one group he took jivak-rishbhak, meda-mahameda, kakoli-kshirkakoli and jivanti- madhuka, while the second group included Riddhi and vriddhi in place of jivanti and madhuka. In Vrindamadhav, Madanpal Nighantu, Shodhala, Sharangdhara, Raja nighantu and Bhavprakash; Astavagra and jivaniya gana are mentioned separately. Jivkadi gana and jeevniya panchmoola are mention in Dhanvantari Nighantu but there is no description of astavarga in it.

**Carak Samhita**-Jivaniya gana (Ca.S.4/1) with Jivakarishbhak, Meda-mahameda, Kakoli-ksirkakoli, Mudagarni-masaparni, Jivanti-madhuka and Jivaniya

panchmoola Ca.Ci.1/1-44) with Jivaka, Rishbhaka, Meda, Jivanti, shatavari are mentioned in Charak Samhita. Charak have not mentioned Astavarga but its 6 dravyas Jivaka, Rishbhak, Meda, Mahameda, Kakoli, kshirkakoli are mentioned in jivaniya gana.

**Chyavanprash** -Only 5 drugs of astavarga i.e. jivaka, Rishbhaka, Meda, Kakoli, Riddhi are found in chyavanprash. (Ca.Ci.1-(1)-63,64). Jivanti from jivaniya gana is also found in chyavanprasa.

**Sushrut Samhita**-Kakolyadi gana of Susrut Samhita contains (S. Su 38/35) Jivak- rishbhak, Meda-mahameda, Kakoli-kshirkakoli, Riddhi-vriddhi, Jivanti-madhuka, Mudagparni-masaparni, Amrita, Karkatshringi, Vamsalocana, Padmaka, Prapoundarika, Mridvika. Kakolyadi gana contains all the eight drugs of astavarga.

This gana is also known as jivaniya gana or madhuradi gana.

**ASHTANG HRIDYA**-Padmkadi gana of AH includes all the drugs of jivaniya gana like Jivak-Rishbhaka, Meda-Mahameda, Kakoli-Khirkakoli, Mudakparni-Masparni, Jivanti- Madhuka and Padmak, Poundrak Vriddhi, Riddhi, Tugakshiri, Karkatshringi, Guduchi.

These plants have been excluded from the modern research because of confusion on their identity and difficulty in availability of sufficient drug material.

In Nighantu (an Ayurvedic treatise), various authorities and commentators made it clear that the Astavarga is even rare to kings and that's why the use of substitutes has been suggested.

राजामप्यष्टवर्गस्तु यतोऽयमतिदुर्लभः ।  
तस्मादस्य प्रतिनिधिं गृहणीयात्तद्गुणं भिषक् ॥१२६॥  
(भावप्रकाश-पूर्वखण्ड-मिश्रप्रकरण/२. हरीतक्यादिवर्ग)

This suggestion put forth full stop on further efforts to explore these plants in their habitats. After independence, revival of interest in Ayurveda provided the necessary

enthusiasm and taxonomic system of plant classification that facilitated the task of correct identification of Ashtavarga plants.

#### Description

##### अष्टवर्ग

जीवकर्षभकौ मेदे काकोल्यौ ऋद्धिवृद्धिके ।  
अष्टवर्गोऽष्टभिर्द्रव्यैः कथितश्चरकादिभिः ॥१०७॥  
अष्टवर्गो हिमः स्वादुर्बृहणः शुक्रलो गुरुः ।  
भग्नसन्धानकृत्कामबलासबलवर्धनः ।  
वातपित्तास्रतृडाहज्वरमेहक्षयप्रणुत् ॥१०८॥  
(भावप्रकाश-पूर्वखण्ड-हरीतक्यादिवर्ग)

Astavarga includes eight plants as jivaka, rishbhaka, meda, mahameda, kakoli,

kshirkakoli, Riddhi, vriddhi.

##### अष्टवर्गप्रतिनिधिद्रव्य

मेदाजीवककाकोलीऋद्धिद्वन्द्वेऽपि चासति ।  
वरीविदार्यश्वगन्धावाराहीश्च क्रमात् क्षिपेत् ॥१२७॥  
मेदामहामेदास्थाने शतावरीमूलं ।  
जीवकर्षभकौस्थाने विदारीमूलं ।  
काकोली क्षीरकाकोलीस्थाने अश्वगन्धामूलं ।  
ऋद्धिवृद्धिस्थाने वाराहीकंद गुणैस्ततुल्यं क्षिपेत्

**Medamahameda-Shatavari mula**

**Jivakrishbhaka-vidarimula**

**Kakolikshirkakoli-aswagandhamula**

**Riddhivriddhi-varahikand**

## Medamahameda and Shatavari

Medamahameda	Shatavari
Origin-Nepal Part used- कन्द गुरु स्वादु वृष्यं स्तन्यकफावहम्   बृंहणं शीतलं पितरक्तवातज्वरप्रणुत् Guna- गुरु Ras-स्वादु Veerya- शीत Swarup- लताजातः	1)Gana-Balya,vayasthapan,madhurskandha by charak. Pittaprashamana by susrut. शतावरी गुरुः शीता तिक्ता स्वादवी रसायनी   मेधाऽग्निपुष्टिदा स्निग्धा नेत्र्या गुल्मातिसारजित्   शुक्रस्तन्यकरी बल्या वातपितास्रशोधजित् 2)Habit and habitat-creeper , at Himalaya upto height of 4000ft. 3)Part used- कन्द 4)Guna-guru,snigdha ras-madhura,tikta vipaka-madhura veerya-sheeta

## Kakolikshirkakoli and Ashwagandha mula

Kakolikshirkakoli	Aswagandha
काकोलीयुगलं शीतं शुक्रलं मधुरं गुरु   बृंहणं वातदाहासकपित्तशोषज्वरापहम् गुण- गुरु, स्निग्ध रस- मधुर विपाक- मधुर वीर्यं -'शीत Part used- कन्द VP shamak शुक्रलं	अश्वगन्धाऽनिलश्लेष्मशिवशोधक्षयापहा   बल्या रसायनी तिक्ता कषायोष्णाऽतिशुक्रला   १६२   गण-बल्य ,बृंहणीय, मधुरस्कंध (च) VK shamak गुण- लघु,स्निग्ध रस- तिक्त ,कटु ,मधुर विपाक- मधुर वीर्यं -उष्ण Part used- मूल शुक्रलं

## Jivakrishbhaka and vidarimula

Jivakrishbhak	Vidarimula
जीवकषिभको बल्यो शीतो शुक्रकफप्रदो   मधुरो पित्तदाहासकपित्तशोषवातक्षयापहो   गुण- गुरु, स्निग्ध रस- मधुर विपाक- मधुर वीर्यं -'शीत Vidarimula	विदारी मधुरा स्निग्धा बृंहणी स्तन्यशुक्रदा   शीता स्वर्या मूत्रला च जीवनी बलवर्णदा   गुरुः पित्तास्रपवनदाहान् हन्ति रसायनी   १५५   गण-बल्य ,बृंहणीय, मधुरस्कंध (च) स्वरूप- लता गुण- गुरु, स्निग्ध रस- मधुर विपाक- मधुर वीर्यं -'शीत

## Riddhivridhi and Varahikand

Riddhivridhi	varahikand
ऋद्धि बल्या त्रिदोषघ्नी शुक्रला मधुरा गुरुः   प्राणेश्वर्यकरी मूच्छर्ष रक्तपित्तविनाशिनी    बृद्धि गर्भपदा शीता बृंहणी मधुरा स्मृता   वृष्या पित्तास्रशमनी क्षतकासक्षयापहा   गुण- गुरु, स्निग्ध रस- मधुर विपाक- मधुर वीर्यं -'शीत Part used- कन्द RP shamak,VPK shamak	गुण- लघु,स्निग्ध रस- कटु तिक्त,मधुर विपाक- कटु वीर्यं -उष्ण Part used- कन्द

Table: Status of Aṣṭavarga

Sr.no.	Botanical name	Status
1.	Roscoeia purpurea Smith (Kakoli)	Common
2.	Lilium polyphyllum D. Don (Kshirkakoli)	Endangered
3.	Crepidium acuminatum (D. Wear) Szlach(Jeevek)	Rare
4.	Malaxis muscifera (Lindl) Kuntze (Rishbhaka)	Rare
5.	Polygonatum verticillatum (L.) Allioni (Meda)	Threatened
6.	Polygonatum cirrhifolium (Wall.) Royle(Mahameda)	Rare
7.	Habenaria intermedia D. Don (Riddhi)	common
8.	Habenaria edgeworthii Hook.f. ex Collett(Vridhi)	Rare

### Conservation of Rare, Endangered and Threatened plant species at COUNCIL OF SCIENTIFIC AND INDIAN RESEARCH-INSTITUTE OF HIMALAYAN BIORESOURCETECHNOLOGY (CSIR-IHBT)



#### Micropropagation

1. *Malaxis acuminata* (Jivak) -*M. acuminata* is an endangered terrestrial orchid of Himalayas popularly used to treat various chronic ailments.
2. The plant is facing the risk of habitat destruction and eventually extinction because of its extensive use in traditional systems of medicine including "Ayurveda". Moreover, *M. acuminata* has extremely poor and slow germination (<3%) due to the lack endosperm (source of nutrition). Hence, work on micropropagation of the plants was initiated for rehabilitation and sustainable utilization.
3. Seeds of pods collected from different geographical locations were inoculated on Murashige and Skoog (MS) medium containing 1.0 mg/L meta-topolin (mT), an aromaticcytokinin, 0.5 mg/L indole butyric

4. acid (IBA) and the phenolic elicitor-phloroglucinol. A high frequency of germination was recorded, and well-developed plantlets within 7-8 months under in vitro conditions.
5. Adventitious shoots developed and protocorm like bodies (PLB) proliferated on medium containing mT and IBA.
6. Successful branched rooting was achieved on medium containing IBA. The plants were also hardened, acclimatized successfully and are now being maintained at CSIR-IHBT.
7. The time span for total cycle of propagation was also reduced to approximately seven months under in vitro conditions as opposed to 18 months under natural conditions.



(a-d)—Different stages of immature seed germination and plant regeneration of *M. acuminata*: a. germination of immature seeds and formation of protocorm-like bodies (PLBs-tuber shaped body, embryoid like structure); b. Regeneration of rooted plants and multiple shoots on regeneration medium; c. Multiple shoot buds and plantlet formation on enriched medium; & d. Some potted plants ready to be transferred to the wild.

#### Pharmacological Activities

a. **Aṣṭavarga** is Sweet, aphrodisiac, haemostatic, anti-diarrhoeal, styptic, antidysenteric, febrifuge, cooling and tonic. It is useful in sterility, vitiated conditions of pitta and Vāta, semen related weakness, internal and external hemorrhages, dysentery, fever, emaciation, burning sensation and general debility.

b. **Jivaniya (Vitality promoter)**- This medicinal plant is vitality promoter, maintain the balance between three doṣa of Vāta, Pitta and Kapha. This

increases the energy, body strength, glow and other properties of the body.

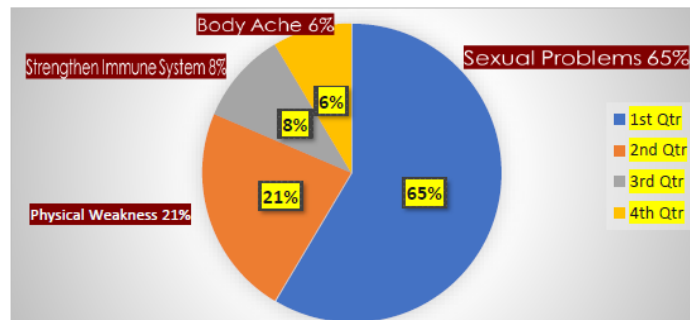


Figure 1: Usage value for Astavarga plants based on a field survey.

### Types of adulterations in endangered and costly herbal drugs:

Crude drugs, used by herbal based pharmaceutical industry, are generally substituted or adulterated with substandard, inferior or artificial drugs. Substitute or adulterants may be following type:

1. Using substandard commercial varieties: This is the most common type of adulteration. In this adulterant have a morphological and chemical resemblance to the original drug however it is therapeutically substandard in nature and less expensive.
2. Using superficially similar inferior drugs: Inferior drugs resemble morphologically with Original drug which may or may not have any therapeutic value. Due to its resemblance, they are used as adulterants.
3. Using artificially manufactured substance: This technique is very commonly followed for the costly drugs. The drug is adulterated with the artificially prepared substance that resembles the original drug.
4. Using exhausted drug: Pre extracted drugs devoid of medicinally active constituents are admixed. Mainly volatile oil containing herbs like clove, coriander, fennel, caraway is adulterated by this intention. The loss of color and taste of herbs, due to extraction, is manipulated with additives to maintain natural color and taste.
5. Use of synthetic chemicals to enhance natural character: Synthetic chemicals are used to develop natural characteristics of the exhausted drug. Examples: Citral is added to citrus oils like lemon and orange oils.
6. Presence of vegetative matter of same plant: Some miniature plants growing along with the medicinal plants are added due to their color, odor and constituents.

### Reasons for adulterations of ASU herbal drugs.

- Lack of patriotism and sympathy.
- Confusion in vernacular names.
- Lack of standard chemical marker.
- Carelessness in collection.
- Similarity in colour.
- Lack of authentic plant.
- Lack of knowledge about authentic source.

Other reasons for adulteration of ASU herbal drugs

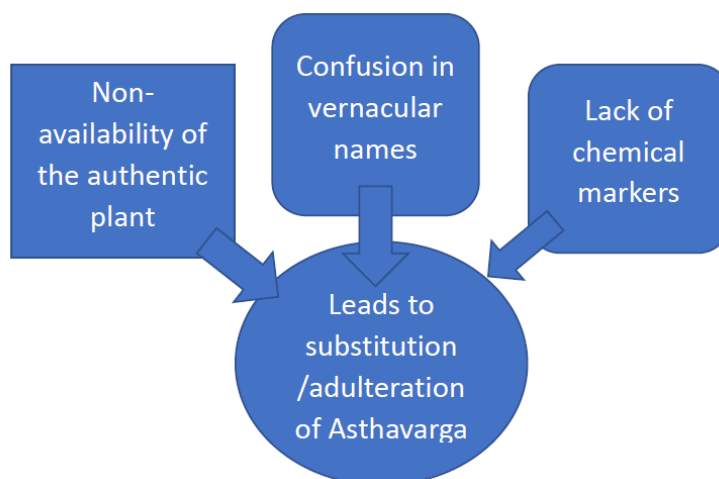
1. Lack of patriotism and sympathy towards Indian System of Medicine Manufacturers are business oriented and forget that adulteration with spurious/substandard drugs will affect the efficacy of the drugs hence finally affecting the authenticity of Indian System of Medicine.
2. Confusion in vernacular names In Ayurveda, *Habenaria intermedia* refer to Riddhi whereas as per available literature survey, *H. intermedia* refers to *Vridhhi*. Similarly, *Kshirakakoli* is also known as *Kshira* and *Kakoli* in Hindi. However as per Ayurvedic pharmacopoeia of India, *Fritillaria roylei* and *Lilium polyphyllum* are the botanical names of *Kshirakakoli* and *Kakoli*, respectively but research literature listed *L. polyphyllum* and *Roscoea purpurea* as *Kshirakakoli* and *Kakoli*, respectively. Due to the similar or controversial names, the herbs are often interchanged or adulterated.
3. Lack of knowledge about authentic source- Majority of plant collectors/folk drug suppliers lack knowledge about authentic source of the concerned plant. Many plants have not been described in Ayurvedic literature and were identified on the basis of superficial characters like morphology. For example, *Shatavari* (Root of *Asparagus racemosus*) had been used in place of *Meda* and *Mahameda*. One more illustration is *Vidari kand* (*Pueraria tuberosa*) being used in place of *Jeevaka* and *Rishbhaka*. Another endangered gymnosperm *Cycas circinalis* is sold as *Vidari kand* because cultivars, suppliers and vendors are unqualified and they are not familiar with authentic source.
4. Lack of authentic plant -Due to lack of authentic plant, some other plant is used as a substitute. In case of non-availability of *Kakoli* (rhizomes-modified plant stem that sends out roots and shoots from its nodes. eg turmeric) and *Kshirakakoli* (bulbs), *Ashwagandha* (root) is used as substitute.
  - Similarity in color- Some miniature plants growing along with the medicinal plants are inadvertently or deliberately added due to similarity in color of raw drugs

5. Carelessness in collection -Due to lack of skilled labor, some medicinal plants growing along with the desired medicinal plants are inadvertently collected along with the desired of raw drugs. Sometimes plant collectors may collect the raw drugs at an early stage and plant may not have desired active content. Pesticide treated plants may be collected along with the desired medicinal plants due to ignorance or negligence of plant collectors.
6. Lack of standard chemical markers for most of the plants The manufacturers are aware of the lack of chemical markers for these plants and inability of regulatory authorities to establish the presence of authentic plants. No standard chemical markers are available till date for Ashtavarga plants. Hence manufacturers take the liberty to use substandard drugs or substitutes.
7. Unknown reasons- There could be some other reasons of adulteration that are neither in notice of

researchers nor in view of authorities.

#### “Triple Standardization Syndrome”

1. There are seven major standards against which adulteration in most of raw drugs is evaluated. Out of seven major standards, most of Astavarga plants fail in three very common above- mentioned standards.
2. From the analysis it can be easily concluded that Astavarga species are suffering from three common standardization quality parameters hence “triple standardization syndrome”.
3. There is a great need to encourage the cultivation of these plant species with proper taxonomical identification by experts.
4. There is also a dire need of developing chemical markers for the raw drugs of Astavarga that can be used for regulating intentional and unintentional adulteration/substitution.



**Three standard reasons for substitution/adulteration of Astavarga plants.**

#### CONCLUSIONS

The information collected in the present study, especially new reports on uses of Astavarga plants in traditional medical knowledge, may help researchers and scientists to investigate novel phytochemical and pharmacological properties. Moreover, *L. polyphyllum*, *M. muscifera* and *Habenaria* species having medicinal uses in TSM in India should be further examined for therapeutic use. It is essential to assess Astavarga plants for phytochemical content and ethnopharmacological use to validate the efficacy of this indigenous herbal medicine.

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