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IMPORTANCE OF AMLA VARGA DRAVYAS IN RASASHASTRA: A RREVIEW

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ABSTRACT

Rasashastra is an integral part of Ayurveda that deals chiefly with mercury, metals, minerals and animal origin drugs having therapeutic and alchemicalimportance. Use of mineral and metallic preparations for health care is a unique feature of Rasashastra. Amla varga dravyas are group of drugs that possess most important role in purification of minerals used for therapeutics, which plays a pivotal role in human physiology. Though the mention of therapeutic utility of Amla Ras dravyas in Ayurveda dates back to samhita period; the references of these dravyas are found scattered under different context in literature of samhitas (Ayurveda classics) and Rasashastra. For the first time all Amla Ras Dravyas were exclusively categorized ina single group based on their chemical composition. Though introduced by recent authors, amla vargadravyas have gained therapeutic importance in clinical practice. This article attempts to screen Rasashastra classics for references emphasizing the "Importance of Amla Varga Dravyas in Ras Shastra" and related alchemical aspects of these drugs.

KEYWORDS: Amla varga, Rasashastra.

INTRODUCTION

In Rasa Shastra, all herbal, mineral, and animal origin substances are classified into different groups (Vargas) based on their predominant taste (Rasa) and therapeutic actions. Among them, the Amla Varga refers to the group of drugs that predominantly possess Amla Rasa (sour taste).

The Amla Rasa is formed due to the predominance of Prithvi and Agni Mahabhutas. It is generally Ushna Virya (hot in potency), has Amla Vipaka (sour post-digestive effect), and shows a specific effect on Doshas—it pacifies Vata dosha but tends to aggravate Pitta and Kapha if used in excess.

General Characteristics of Amla Rasa Dravyas
Rasa: Amla (sour), Vipaka: Amla, Virya: Ushna (hot)
Dosha Karma: Vata-shamaka, Pitta-Kapha vriddhikara
General Karma: Deepana (stimulates digestive fire), Ruchikara (improves taste), Hridya (good for heart), Balya (provides strength), Enhances mineral absorption, especially iron. Examples in Rasa Shastra.

The Amla Varga mentioned in Rasa Shastra and Nighantus includes: Amalaki (Emblica officinalis), Nimbuka (Citrus limon), Matulunga (Citrus medica / citron), Amlika (Tamarindus indica), Dadima (Punica granatum), Bilva Phala (unripe fruit in sour form).

These dravyas are used not only in daily diet but also in various Rasa preparations as Anupana (vehicles), Bhavana Dravyas (levigation media), and sometimes as Shodhana Dravyas (purification agents) for metals and minerals. Therapeutic Significance in Rasa Shastra improves Agni (digestion & metabolism) which is essential in Rasaushadhi administration. Acts as a Samskara Dravya (processing medium) to enhance bioavailability of herbo-mineral medicines. Supports absorption of metallic Bhasmas by enhancing assimilation. Commonly used in formulations for digestive, cardiac, and hematinic purposes. In short, Amla Varga Dravyas in Rasa Shastra are a crucial group of substances with Amla Rasa predominance, having both dietary and medicinal utility, and play an important role in Rasaushadhi preparation and therapeutic efficacy.

Defination: अम्ल-आ सम्यक् अम्ला अम्लरसयुक्ता (श.क.द्द)

Mahabhootha Predominance: अम्ल = पृथ्वी+अग्नि-चरक अप्+अग्नि-सुश्रुत

Functions of Amla Rasa

अम्ल रस १- अम्लम् क्षालयेत् मुखम् ॥

हर्षणो रोमदन्तानयक्षिभ्रवनिकोचनः (आ.ह.सु १०/३)

यो दन्तहर्षमुत्पदयति मुखस्रावम् जनयति श्रद्धाँ चोत्पदयति सोऽम्लः। (Su.Su.४२/९)

अम्लस्तु जिह्वामुद्वेजयत्युरः कण्ठं विदहति मुखं स्रावयति अक्षिध्रुवं संकोचयति दशनान् हर्षयतिरोमानि॥

(अ.स.सू१८)

अम्लो रसो भक्तंरोचयति अग्निंदीपयतिदेहंबंहयति ऊर्जयति मनो बोधयति, वातमनुलोमयति हृदयम् तर्पयति आस्यमास्रवयति भुक्तमपकर्षयति क्लेदयति जरयति प्रीणयति लघुरुष्णः स्निग्धश्च॥ (च.सू २६/४३-२)

अम्लोजरण पाचनोदीपनः पवनग्रहणोऽनुलोमनः । कोष्टविदाहि बहिः शीतः क्लेदनः प्रयशो दृध्यश्वेति ॥

(सु.सु.४२/१-२)

अम्लोऽग्निदीप्तकृत् स्निग्धो हृद्यः पाचनरोचनः । उष्णवीर्यो हिमस्पर्शः प्रीणनः क्लेदनो लघुः ॥ करोति कफ पित्ताखं मूढवातानुलोमनः ।। अम्लोऽनिलनिबर्हणोऽनुलोमनः कोष्टविदाहि रक्तपित्तदुष्णवीर्यः शीतस्पर्शी बोधयति इन्द्रियाणि रोचनः पाचनो दीपनो बृंहणस्तर्पणः प्रीणनः क्लेदनो व्यवायि लघु स्निग्धोध्यश्च ।। (अ.सं.सू.१८)

All these qualities have been attributed by our Acharyas for Amla Rasa

क्षारः सर्वे मलं हन्युप्लं शोधन जारणम् । मान्ध्यं विषाणि निन्ध्यन्ति स्नैग्ध्यम् स्नेह प्रकुर्वते ॥(रर.स.११/९७)

In our classics they have mentioned that amla rasa performs the action of Shodhana and Jarana.

Amla varga according to various Authors

अम्ल वर्ग

जम्बीरं नगर्गश्च मातुलुंगाम्लवेतसम् । चांगेरि चनकचुक्रश्च अम्ल वर्ग प्रकीर्तित॥

(पारद संहित)

अम्लवेतसजंबीर निम्बुकं बीजपूरकम्। चंगेरी चनकम्लं च श्ाम्लिकम् कोलददिमम्। अम्बष्टा तिंतिणीकं च नारङ्ग रसपन्त्रिक।। करवन्दं तथा चान्यदम्लवर्ग:प्रकीर्तित।। (र.र.स, र.रा.प्र)

अम्ल गण

अम्लवेतसजंबीरलुङ्गाम्लचनकम्लकाः।

नगरङ्गतिन्तिडीक चिञ्चापत्रञ्च निम्बुकम्।। चांगेरिदाडिमञ्चैव करमर्दम् तथैव च। एष चम्लगणः प्रोक्तौ वेत्तसाम्ल समयुतः ।। (रसेन्द्र सार संग्रह)

जम्बीरं निम्बुकञ्चैवत्वम्लवेतसमम्लिका। नारङ्गदाडिमञ्चैव वृक्शम्लं बीजपूरकम्। चाङ्गेरी चणकाम्लञ्च कर्कन्धुः करमर्द्धः॥ चुक्रिका चेति समन्यदम्लवर्गः प्रकीर्तितः॥ (र.त-२/१३-१४)

According to Raj Nigantu mentioned 2 types of amla panchaka

दाडिम, वृक्षाम्ल, कोल, चुल्लकि (चुक्र) अम्लवेत्तसा जंबीर, बीजपूर, अम्लवेतस, नारंग, तिन्तिडीक

अम्ल पंञ्चक

अम्लवेतसजंबीश्लुङ्गनारङ्गनिम्बुकैः।

फ़लपंञ्चाम्लकं ख्यातं कीर्तितञ्चाम्लपंञ्चर्क। र.त. २/१५

Among Amla Panchaka which is superior?

कोल दाडिमवृक्षाम्लाचाङ्गेरीचिञ्चकरसैः । पंञ्चाम्लर्क समाख्यातं त्वम्लपञ्चकमेव च ॥ सर्वेषांम्ल जातीनां निम्बूक गुणवन्तमम्। अम्लवेतसकं वापि त्वम्लिका वा गुणाधिका ॥

Amongst all sour fruits the lemon is highly esteemed for its sour taste, amlavetasa and amlika are ranked to be sourer amongst all sour fruits next to lemon.

Drug	BOTANICAL NAME	R.R.S	R.Sa.S	R.T	K.R	R.RA.P
AqsÉuÉåiÉxÉ	Garcinia pedenculata	+	+	+	+	+
eÉqoÉÏUÇ	Citrus limonum	+	+	+	+	+
ÌlÉqoÉÔMÇü	Citrus-acida	+	+	+		+
QÉÉiÉÑsÉÑÇaÉ	Citrus medica	+	+	+	+	+
cÉÉÇaÉåËU	Oxalis corniculata	+	+	+	+	+
AÎqsÉM	Tamarindus indica	+	+	+		+
MüÉåsÉ	Ziziphus jujuba	+		+		+
SÉÌQûqÉ	Punica granatum	+	+	+		+
AqoÉ¹É	Cyclea peltata	+		+		+
uÉ×wÉqsÉ	Garcinia indica	+		+		+
cÉÑ¢ü	Rumex vesicarius	+		+	+	+
MÑüUuÉlSÇ	Carissa congesta	+	+	+		+
lÉÉU…¡	Citrus aurantium	+	+	+	+	+
ÍcÉgcÉÉ mÉ§É	Tamarindus indica		+			
UxÉmÉÌ§ÉMü		+				+

Description of Drugs

Jambhira: Citrus limonum-

Family: Rutaceae

Rasa : Amla

Guna: Guru, Teekshna

Veerya: Ushna

Vipaka: Amla

Chemical constituents: Abscisic acid, abscissis 11,

Limone, limonene, poncrin.

Amlavetasa: Garcinia pedenculata.

Family:-Guttiferrae

Rasa: Amla

Guna: Laghu, Ruksha, Teekshna

Veerya: Ushna

Vipaka: Amla

Chemical constituents: Pedunculol, garcinol, cambogin, Malic acid

Nimbooka: Citrus limonum(acida)

Family: Rutaceae

Rasa: Amla

Guna:Guru, Teekshna

Veerya: Ushna

Vipaka: Amla

Chemical constituents: Citric acid 10%, phosphoric acid, 4%, sugar 10.9%. Cellulose, vit-A, vit-C, citrine, 76%, citrol&.8%, sulphuric acid, Abscisic acid, abscissis 11, Limone, limonene, poncrin.

Matulunga: Citrus medica

Family:- Rutaceae

Rasa : Amla

Guna: Guru, Teekshna

Veerya:Ushna

Vipaka: Amla

C.C:citrene, citrol, cymene, citronellal

Changeri: Oxalis corniculata

Family:-Oxalidaceae

Rasa : Amla

Guna: Laghu, Ruksha

Veerya: Ushna

Vipaka: Amla

Chemical constituents: Potassium and oxalic acid

Amlika: Tamarindus indica

Family: Caesalpiniaceae

Rasa : Amla

Guna: Laghu, Ruksha

Veerya: Ushna

Vipaka: Amla

Chemical constituents: Hordenine, Tamarandenol, seed-a polysacharide.

Kola: Ziziphus jujuba

Family:-Oxalidaceae

Rasa : Amla

Guna: Laghu, Ruksha

Veerya: Ushna

Vipaka: Amla

Chemical constituents: Leucocyanidis, mauritines, Frangofolin

Daadima: Punica granatum

Family:-Punicaceae

Rasa: Madura, Amla, Kashaya

Guna: Laghu, Snigdha

Veerya: Anushna

Vipaka: Madhura

C.C: Potassium, phosphorus, calcium, chlorine, sulphur, nicotin, vit-c, pelleterine,

Ambhasta : Cyclea peltata

Family:-Menispermacea

Rasa : Amla

Guna: Laghu, Ruksha

Veerya: Ushna

Vipaka: Amla

C.C: Fangchinoline, cycleapeltine, cycleadrine, isotetradrine, cyclea mine

Name of Rasoparasa	**Uses in different Samskaras**	**Procedure adopted**	**Drug used**	**Reference**
Parada	Uttapana, Deepana Niyamana, Bodhan	Bhavana	Nimbuka	**R.R.S 11/48-49**
	Dosha nirharana	Bhavana	Nimbuka	
It is given so as to remove Naga Dosha Of Parada				
Hingullotha parada nirmana		Bhavana	Nimbuka	**R.R.S-2/67**
Vaikrantha	Shodhana	Swedhana	Nimbuka	
Swarna **m**akshika	Shodhana	Bhavana	Nimbhu	**R.R.S-2/83**
Vimala	Shodhana	swedana	Nimbhu	**R.R.S-2/98**
Sasyaka	Shodhana	3Bhavana	Nimbhu	**R.R.S-2/147**

Vrikshamla: Garcinia Indica

Family: Guttiferae

Rasa : Amla

Guna: Laghu, Ruksha

Veerya: Ushna

Vipaka: Amla

C.C-Malic acid

Kuravanda: Carissa congesta

Family :-Apocynaceae

Rasa : Amla

Guna : Guru

Veerya: Ushna

Vipaka: Amla

Chukra: Rumex vesicularis

Family :-Polygonaceae.

Rasa : Amla

Guna : Guru

Veerya: Ushna

Vipaka: Amla

C.CAnthiaquinone, glucoside, aminoacids, vitamins, cystine glutamic acid histidine etc.

Name of Rasoparasa	Uses in different Samskaras	Procedure adopted	Drug used	Reference
Sasyaka	Shodhana	Bhavana	Lakucha drava	R.R.S-2/147
Sasyaka	Satwapatan		Nimbhu	R.R.S-2/122
Shilajathu	Shodhana	Kshalana	Nimbhu	R.R.S-2/116
Shilajathu	Satwapatan		Nimbhu	R.R.S-2/122
Chapala	Shodhana	Bhavana	Nimbhu	R.R.S-2/148
Gairika	Satwapatan		Nimbhu	R.R.S-3/150
Kasisa	Shodhana	Bhavana & swedana	Nimbhu	R.R.S-3/150
Haratala	Shodhana	Kshalana & swedana	Jambheer & Aranala	R.R.S-3/83
Manashila	Shodhana	Bhavana	Matulunga	R.T.11/114
Kankshi	Satwapatan		Nimbhu	R.R.S-3/65
Kaparda	Shodhana	Swedana	Nimbhu	R.T-2/80-89
Mriddarasringa	Shodhana	Marana	Nimbhu	R.Y.S
Manikya	Shodhana	Marana	Lakucha	R.R.S-4/60
Gomeda	Shodhana	swedana		R.T-23/123
Rajavarta	Shodhana	Swedana & Marana	Jambheera	R.T.-23/193
Phirojaka	Shodhana	Swedana & Marana	Jambheera	R.T.-23/193

Spatika	Shodhana	Swedana & Marana	Jambheera	R.T.-23/193
Jasada	Shodhana	Bavana & Marana	Nimbhu	R.C 575
Naga	Shodhana	Marana	Jambheera	R.R.S-5/181-83
Tamra	Shodhana	Aavapa & marana	Kaanji	R.R.S-5/50
Godanti	Shodhana	Swedana	Nimbhu	R.T-11/239
Shuktika	Shodhana	Swedana	Jayanti	R.T-12/65
Shankha	Shodhana	Swedana	Kaanji	R.R.S 4
Samudraphena	Shodhana	Bhavana	Nimbhu	R.C-72
Jayapala	Shodhana	Swedana	Nimbhu	R.C 575

Amla varga mentioned in different sanskaras of parada

मर्दन संस्कर

उदितैरौषधैसार्धं सर्वाम्लैः काञ्जिकैरपि ।

पेषणं मर्नाख्यं स्याद् बहिर्मल विनाशनम्।। र.चु.४/८३

Deepana samskara

त्रिक्षारसिन्दुखगभूशिखिशित्रुराजीतीक्ष्णाम्लवेतसमुखैर्लवणोषणाम्लैः। नेपालताम्रदलशोषितमारनार्ले साम्लासवाम्लपुतितंरसदीपन तत्।। र.र.स ११/४८-४९

The plant and mineral substance are to be intimately mixed together and it is to be coated over a sheet of Nepali type of copper. afterwards this sheet is to be submerged into kaanji which afterwards become too much sour. This very sour kanji is to be used for steam heating. such steam heating for 3 days makes the mercury grasrthi.

अनुवासन

दीपितं रराजं तु जम्बीररस संयुतम्। दिनैकं धारयेद् धर्मो मृत्पात्रे वासितो भवेत्॥ अथानुवासन कर्म मृत्पात्रे दिपितरसम्। क्षिप्त्वा जम्बीरजद्रवैः तीव्र घर्मोऽनुवासयेत्॥ (आनन्दकन्द)

Mixing of mercury with lime juice and drying it in hot sunlight for a day

स्वेदन संस्कार

क्षाराम्लैरओषधैर्वाऽपि डोलायन्त्रे स्थितस्य हि । पाचनं स्वेदनाख्यं स्यान्मलशैथिल्यकारकम् ॥

(र.र.स.८/३९)

Uttapana sanskara

The solid or semisolid form obtained after the third procedure is mixed with sufficent quantity of lemon juice in a stone mortar it is kept in intense sunlight and tirtutrated.

Naga Dosha

1/16th part of केन भस्म, brick powder, हरिद्र, गुहधूम all are taken in tapta karala, bavana is given for 1 day with nimbhu svarasa after this parada is washed with kanji.

Different procedures for Hingula Shodhana mentioned in our classics

1) Hingula is to be tirturated with Paribadra Svarasa or Jambheera for 1 day-……..Ra.Pa.Su-14/68
2) Hingula is to betirturated with amlavarga dravya for 1 day and by the end of the day patana is done with patana yantra to get parada-……..Ra.Ratnakar
3) Hingula is tirturated with Nimbu svarasa orNimbha patra rasa for 1 yama then with damaru yantra parada is extracted.-……..Ayu.Saa.Sam

It has technical advantage of combative with possible acid impurites which may be present in hingula

Amla (P+A) + Hingula(pritvi)

Amla is also having properties like ushnaveerya of hingula is amplified by agnimahabhoota present in Nimboo svarasa

Shodhan of swarna makshika

एरण्डतैललुङ्गाम्बुसिद्ध शुद्धयति माक्षिकम्। सिद्ध वा कदलिकन्दतोयेन घटिकाद्ध्यम्॥ तप्तंक्षिप्तं वराक्वाथे शुद्धिमायाति माक्षिकम्॥ ररस २/८३

Swarnamakshika is purified by rosting it in castor oil i.e eranda taila/juice of matulunga/juice of rihzhome of kadali for 48 min.

Makshika which contains more quantity of copper is purified by rubbing makshika powder 3 parts, along with 1 part of saindhav lavana and then mixed with matulunga juice and jambheera juice this mixture is then heated till the container becomes red hot, after swanga sheetha it is to be washed with water and then dried.

Purification of Tamra

ताम्रानिर्मलपत्राणि लिप्त्वा निम्बम्बुसिन्धुना ध्मात्वा सौवीरकक्षेपाद्विशुद्यत्यष्टवारतः॥ र.र.स ५/५०

मारण जम्बीर रस सम्पिष्ट रस गन्धाकलेपितम्। शुल्बपत्रं शारावस्थं त्रिपुटैर्याति पञ्चताम्॥ र.र स ५/५७

The copper ssheets are coated with the paste of limeon juice and rock salt and heated on fire and dipped in sour gruel this procedure is repeated for 8 times.

Haratala shodhana

तालकं कणशः कृत्वा दशांशेन च टंकणं। जम्बिरोत्थद्वै क्षाल्यं काञ्जिकै क्षलयेत्तथा वस्त्रे चातुर्गुणे बद्ध्वा डोलायन्त्रे दिनं पचेत्। सचूर्णेनारनालेन दिनं कूष्माण्डजे रसे। स्वेद्य वा शाल्मलीतोयैस्तालकं शुद्धिमाप्नुयात्। र.र.स ३/८३

Small pieces of haratala and 10 parts of tankana is added it is done kshalana with jambheera drava and svedana is given in dolayantra with kaanji, shalmali toya haratala get shuddha.

Incineration

Kajjali is prepared by rubbing शुन्द्र पारद, गन्धक and the fruit juice of jambheera is added to it

It is prepared in a form of paste and is coated on the thin sheets of copper. The sheets are then properly sealed in sharava samputa and subjected to 3 gaja puta.

During heating process at the time of first puta the proportion of mercury, sulphur and copper should be equal, at the end of first puta copper get transformed into fine powder. At second puta this copper powder is mixed with 14 th quantity of each mercury and sulphur then the mixture is given bhavana with the juice of jambeera and chakrika formed and subjected to 2nd gajaputa.

पित्तल भस्म

निम्बुरसशिलागन्धवेष्टिता पुटिताऽष्टधारीतिरायाति भस्मत्वं ततो योज्यो यथायथम्। ताम्रवन्मारण तस्याः कृत्वा सर्वत्र योजयेत्।। रर.स-५/१९८-९९

The paste of pure sulphur and pure realger rubbed in lemon juice is prepared .it is coated on the purified sheets of brass and subjected to putapaka. after repeating the procedure for 8 times marana is carried out.

निम्बुस्वरस स्नेह दोलायन्त्रे विधानतः परिस्विन्नं यमैकं शुद्दिमायात्यनुत्तमाम्॥

Hessonite is purified by steaming in lemon juice for 3 hrs with the help of dolayantra.

Tuttha shodhana

Nirmalikrita Tutta was taken in a Kalwa Yantra and powdered. It was added with sufficient quantity of Nimboo swarasa tirturated for 3 hours and kept overnight. Next day tirturation was continued for another 3 hours by adding sufficient quantity of Nimboo Swarasa

Shankh Shodhan

अम्लै सकब्जिकैश्चैव दोलस्विन्न से शुद्धति । रर.स-४

Small pieces of conch shells are put I cloth pouch and steamed with lemon juice in dolayantra for 12 hours and then washed with hot water.

Jayapala shodhana

The rind of the seeds is removed and then boiled in cow's milk for 1-2 hours, the seeds are then washed with hot water and triturated with lemon juice. Finally they are dried in sunlight and preserved for use.

As an antidote in

तुत्थ जन्य विकर – शन्ति उपाय जम्बीर रसमादाय यः पिबेच्च दिनत्रयम्। तस्य तुत्थकशान्तिस्य तत् लाजेन वारिणा। -बृहद् रसराज सुन्दर

If chardi branti is present then for 3 days jambheera nimbhu rasa opr dhanyaka lajamanda is taken

कांजि

Charaka grouped it under Amlaskandha, Sushruta grouped it in Arnla Varga

Utility of Kanji In Parada Samskara

Swedana -as a media for Swedana

Mardana - is done with kanji and other drugs

Murchana -Mardana is done with Kanji

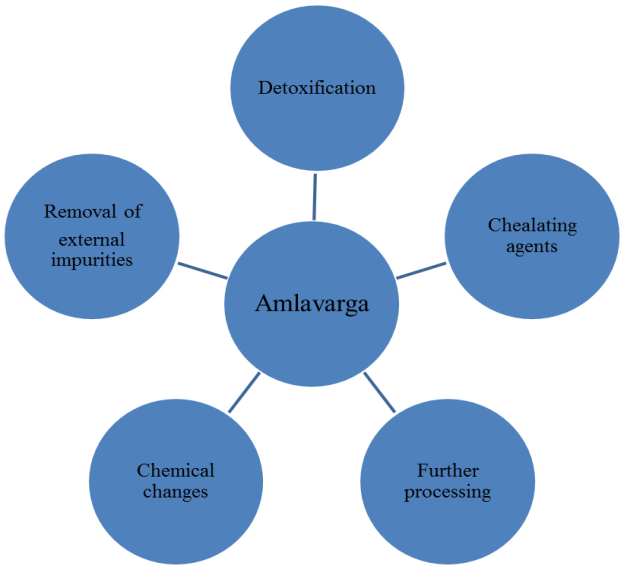
Utthapana-for washing of Parada

Patana -In Tiryak Patana Kanji is used as and when required

Niyamana -As a media for Swedana

Dipana -As a media for Swedana

Probable Mode Of Action Of Amla Rasa



Ashoditha **Hingula** was taken and subjected for tituration with Nimbhu Svarasa during trituration it was observed that heat was liberated, It may be inferred that the exothermic reaction might had taken place between HgS and citric acid (two hydroxy 1,2,3 tricarboxylic acid). This might had given rise to mercuric citrate (a type of mercuric salt)

HgS +(R-COOH)3 ---------->HgS(unreacted)+Hg

citric acid citrate

This reaction might have helped in extraction of chemically detoxifiable impurities from Hingula Nimbu rasa contains not only citric acid but also calcium phosphorus, iron, potassium, sodium, sulphur, folic acid, and panthothenic acid. All these might be having some role in dissociation of mercury from HgS, it might be doing chemical detoxification and purifaction by forming complex.

Suvarna makshika Shodhana

1) Here Svarna makshika when fried with nimbhu swarasa in presence of oxygen here there is fair chance of reaction to occour resulting in chemical changes in Svarna makshika volatile impurities may get evoperated resulting in detoxification of Svarna Makshika. Nimbu svarasa might have given some organic qualities to the SvarnaMakshika and enhance the therapeutic quality of Svarna Makshika.

2) When heated the fumes start coming out and sulphur catches fire and gets burnt out .It indicates that in this procedure the intention of our acharyas is to reduce the copper element and eliminate the sulphur from chalcopyrite during purification.

3) By roasting Svarna Makshika choorna with the acids present in the citrus juice and get converted to form respective salts which are water soluble resulting in the decrease of Cu%, iron% and sulphur was also considerable decrease due to more quantity of heat.

4) Svarna makshika when fried with nimbhu swarasa and salt there is a chance of formation of hydrochloride acid in the minute quantity and by heating the impurities like carbonate etc may get destroyed By continious stirring and heating the arsenic impurities may get evoperated resulting in detoxification of Svarna makshika.

Matulunga Svarasa may give some organic qualities to svarnamakshika resulting in the potentisation and water soluble impurities formed as a chemical reaction may get dissolved in water and removed after the barjana colour of the svarna makshika choorna changed to red at the end of the procedure, there is chance of formation of iron oxide as barjana done in the presence of oxygen.

Haratala shodhana

The bhavana dravyas contain Calcium, phosphorus, Iron, sodium and Potassium.

Among them Ca is antagonist of arsenic and it reduces the toxicity of arsenic.

Iron form an insoluble precipitate with arsenites and thereby reducing the arsenic toxicity.

Phosphorus and arsenic belong to same group hence arsenic interfere the phosphorus function in the body so by supplementing extra phosphorus by shodhana might compensate the harm caused by the arsenic.

Na and K in presence of H2O will form a alkaline solution where in arsenic triosulphate is soluble and the original state can be regained by acidification both drugs have acidic ph Haratala attains the original state by this method other impurities present in Haratala separate easily.

Svedana Samskara

When the procedure was repeated for 7 times Here the process taking place may be diffusion .The time fixed for the process is based on Ficks law of diffusion (it states that diffusion between 2 planes X and Y in a non homogeneous solution can be expressed quantitatively as follows)

Ds/dt = Da(dc/dx) where

Ds/dt is the rate of movement of solution,

D=diffusion constant,

A=the area of plane,

dc/dx-the concentration gradient i.e difference between concentration between X and Y)

So in this process the solute travel from Haratala to solution in the same time.

CHELATING AGENTS

Chelation is the binding or complexation of a bi- or multi dentate ligand. These ligands, which are often organic compounds, are called chelants, chelators, chelating agents, or sequestering agent.

The ligand forms a chelate complex with the substrate. The term is reserved for complexes in which the metal ion is bound to two or more atoms of the chelating agent, although the bonds may be any combination of coordination or ionic bonds.

In chemistry, a ligand is an atom, ion, or molecule that generally donates one or more of its electrons through a coordinate covalent bond to, or shares its electrons through a covalent bond with, one or more central atoms or ions.

Chemicals that combine with metal ions and remove them from their sphere of action are called chelating agents, also called sequestrants. They are used in food manufacture to

remove traces of metal ions which might otherwise cause foods to deteriorate and clinically to reduce absorption of a mineral, or to increase its excretion; e.g. citrates, tartrates, phosphates, and

EDTA.

► {E(thylene)D(iamine)T(etraacetic) A(cid).]

A crystalline acid, C10H16N2O8, that acts as a strong chelating agent. The sodium salt of EDTA is used as an antidote for metal poisoning, an anticoagulant, and an ingredient in a variety of industrial reagents.}

So in body chelating agents forms a bonding and reduces the untoward effect by absorption of the metal, and helps in its elimination from the body.

Tamra shodhana

Heating and quenching in the medias not only transfer their effect to the metals, but also potentiate to obtain acclaimed benefits. The quenching media enters minutest pores of copper and starts affecting the grain boundary and removes the foreign materials or any adulterant in this location.

The citric acid will lower the pH of the bath slightly (making it more acidic). Under these conditions, the Cu2+ is unlikely to form an insoluble salt (such as copper hydroxide - Cu(OH)2) and thus will be more soluble.

The Cu2+ will have a tendency to form a complex with citric acid as it is released from the surface of the metal, also increasing its solubility.

Tuttha shodhana

Nimboo Swarasa was used for Tuttha shodhana it might have helped in detoxification of Tuttha and due to its Amla rasa Deepana, Pachana property it may be helping in increasing the therapeutic value of Tuttha.

After Shodhana the colour of Tuttha change as follows

Phirozi-------→Sky blue(day 1)-----→ Satin Blue

May be as the concentration of the copper increase stronger it will be an oxidizing agent.

Jayapaala shodhana

In jayapala substances are triturated with liquids having opposite properties e.g: JAIPAL has very strong purgative action, but at the same time it possesses the property of producing severe spasm in intestine. For purification the seeds are triturated with lemon juice which possesses "Antispasmodic Property".

Jayapala contains fixed oil 30-45% 1-3% resin(toxic-it can cause blisters in the skin) due to acidic property this may get removed.

Role of Bhavana

When bhavana Is given it will help in wet grinding of material and at the same time it will form an organo-metallic complex with main drug. According to latest research all most all elements are found in human body in trace level but not be able to absorb in to body in their elemental form. plants are having capacity to transfer them into readily absorbable form.

Shankha shodhana

Media used in the shodhana procedure is either nimbhu svarasa/kaanji. As nimbhu svarasa is having deepana pachana propertys and amla rasa is having kshalana and bhedhana properties it may be used to break up the active constituent of the drug.

CHEMISTRY OF KANJI

Fermentation is the anaerobic metabolic break down of a nutrient molecule such as glucose without net oxidation, done with the help of zymase enzymes.

TYPES OF FERMENTATION

Lactic Acid Fermentation

Alcohol Fermentation

Acid Fermentation

ACETIC FERMENTATION

Less Duration.

Refermentation Resulting Acetic

Acid Formation

Keeping Longer Period Leads To

Alcohol Fermentation

$$C_6H_{12}O_6 \text{ ----------> } 3CH_3COOH$$

Yava is a starch substance when it undergoes the fermentation process itr may get converted into glucose by yeast bacteria and followed by the enzymatic reactions, it may give rise to ethanol co2,H20 and partially hydrolysed starch. Bubbles were seen which may be due to formation of Co2. After completion of fermentation process Co2 formed may dissolve in water and may form carbonic acid (H2CO3). Thus Aranaala/Kanji is nothing but a mixture of ethanol and Carbolic acid the Ph of Aranala is 4 which is acidic in nature. Probable reactions as follows.

(Diastase enzyme)

Starch -----(yeast)→ glucose—(zymase enzyme)→

C2H5-OH +Co2+H2O+Hydrolised starch.

CO2+H2O---→H2CO3(Carbonic Acid)

Acharya Charaka described the properties of Amla rasa as kledayati and jarayayi.

Amla rasa having dissociate property softens the drug due to its "mukham apakarshayati" property Amla rasa is having capacity to open minute pores of the drug by its teekshna guna to remove the impurities. Due to jaarana, Teekshnatwa, kshalana properties of Amlarasa kanji helps in reduction of Hardness, Particle size and to develop brittleness.

Due to amlatva & amla vipaka-Penetrates metal surface to shoot out impurities.

Hence Shodhana in Amlavarga may be effective upon due to the physico-pharmacological effects of Amlarasa such as Apakarshna, Jarayana etc, leading to increased laxity of molecule and for dissociation and also the inter molecular space of the metal is pierced by the effect of Amla rasa under the temperature and pressure.

- Due to repeated contact with heat & some organic liquid, which most of time is acidic in nature, the substance is converted in to some Herbo-mineral compounds
- Toxic substances like Arsenic compounds are boiled in various liquids so as to reduce its toxicity
- Hingula are triturated with liquids having similar properties for purification so as to enhance & augment its original properties

DISCUSSION

In Ayurveda, dravyas (substances) are classified into different Vargas (groups) according to their rasa (taste), guna (properties), virya (potency), vipaka (post-digestive effect), and

prabhava (special action). Among these, the Amla Varga includes dravyas that predominantly possess the Amla Rasa (sour taste).

In Rasa Shastra, which deals with the pharmaceutical processing of metals, minerals, and herbo-mineral preparations, these dravyas hold great significance for shodhana (purification), marana (incineration), samskara (processing), and therapeutic use.

Importance in Rasa Shastra

1. Shodhana (Purification of Metals and Minerals)
2. Many Amla varga dravyas like Kanjika (fermented sour gruel), Takra (buttermilk), Dadhi (curd), Kanji, Nimbu (lemon juice), Amlika (tamarind) are used in the purification of metals (e.g., Shodhana of Tamra, Naga, Vanga, etc.). The acidic nature helps remove impurities and toxic elements, making metals safe for internal use.
3. Marana (Calcination / Incineration): Substances like lemon juice, Kanji, and Amlika are used for bhavana (trituration) and putapaka (calcination) processes. They enhance the fineness and bioavailability of bhasmas (ash preparations).
4. Samskara (Processing / Potentiation) : Repeated bhavana with Amla dravyas increases the yogavahi guna (catalytic property) of minerals and enhances drug potency. Example: Use of Nimbu Swarasa in processing Kajjali improves its Rasayana (rejuvenative) effect.
5. Therapeutic Action: Amla varga dravyas help in Agni deepana (improving digestion) and Aam pachana (removing metabolic toxins), which is essential in Rasaushadhi administration. They balance Vata dosha, which is often aggravated by mineral drugs. They also aid in the anupana (vehicle) for drug administration.
6. Rasayana (Rejuvenation) and Balya (Strength-promoting) : Some Amla dravyas like Amlika, Dadhi, and Takra are beneficial in nourishment and rejuvenation, complementing the Rasayana property of Rasaushadhis.

CONCLUSION

The Amla Varga Dravyas in Rasa Shastra are indispensable for their acidic, cleansing, and potentiating properties. They not only make metals and minerals safe for internal administration but also enhance their therapeutic efficacy. By facilitating Shodhana, Marana, Samskara, and Rasayana action, they form a crucial bridge between Ayurvedic herbal pharmacology and Rasa Shastra pharmaceutics, ensuring both safety and potency of Ayurvedic formulations.

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