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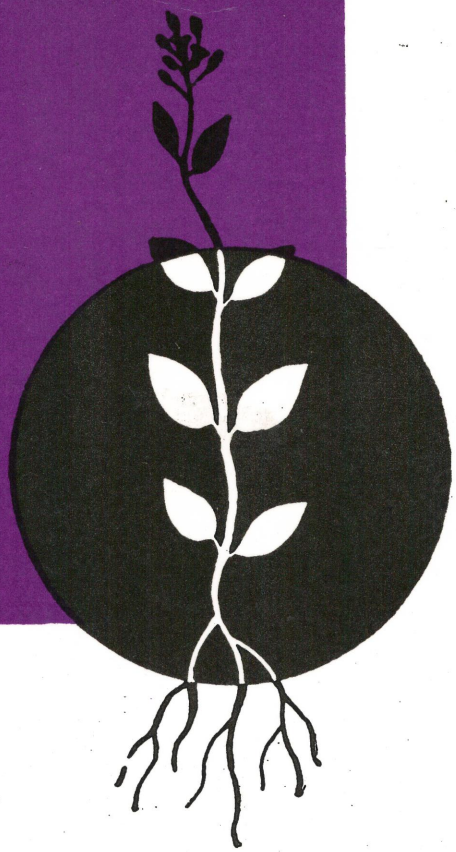

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HINDI

āryavaidyan

सततध्ययनं, वादः परतन्त्रावलोकनम्।
तद्विद्याचार्यसेवा च बुद्धिमेधाकरो गणः ॥

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FROM THE PAGES OF VAGBHATA - LI

Varier, N.V.K.

Abstract: Discussion on the purification of *doshas* by *vasti* begins. Indication, contraindication, preparation of the patient, method of administration, etc. are discussed.

अथातो वस्तिविधिमध्यायं व्याख्यास्यामः ।
इति ह स्माहुरात्रेयादयो महर्षयः ।

(*Athato vastividhimadhyayam*
vyakhyasyamah ।
Iti ha smahuratreyadayo
maharshayah ।)

Now we explain the chapter, titled practice of *vasti*. It is a continuation of the previous chapter, which dealt with the purification of *malas* by emesis and purgation. *Vasti* is called so, because the instrument used is made by the *vasti* or bladder of goats and other animals.

वातोल्बणेषु दोषेषु वाते वा वस्तिरिष्यते ।
उपक्रमाणां सर्वेषां सोऽग्रणीस्त्रिविधस्तु सः ॥ १ ॥
निरूहोऽन्वासनं वस्तिरुत्तरः -

(*Vatolbaneshu dosheshu*
vate va vastirishyate ।
upakramanam sarvesham
so'graneestrividhastu sah ॥ 1 ॥
Nirooho'nvasanam vastiruttarah –)

Vasti is chosen in *dosha* conditions where *vata* is alone and predominant. It is the apex of all forms of treatment. It is of three types. *Nirooha* (*asthapana* or *kashayavasti* or decoction enema), *anuvasana* (*snehavasti* or unctuos enema) and *uttaravasti*.

Nirooha is the *vasti* prepared by medicated *kashaya*, oil, pastes, honey, etc. *Anuvasana* is the *vasti* with unctuous materials as oil or ghee, etc. *Uttaravasti* is done in the urinary path or in the vagina. It is done in the upper outlets above the anus, and hence is termed as *uttaravasti*.

Ashtamgasamgraha states, " *vayu* is the leader of all *doshas*. It is the single causative agent for all the actions of the body. Because of its five fold nature it pervades all the organs and tissues. It is the creator of various external and spiritual faculties. It is the cause of creation, preservation, destruction and is also the cause of diseases that are produced in all three disease-paths external, middle and internal."

- तेन साधयेत् ।
गुल्मानाहखुडप्ळीहशुद्धातीसारशूलिनः ॥ २ ॥
जीर्णज्वरप्रतिश्यायशुक्रानिलमलग्रहान् ।

वर्ध्माश्मरीरजोनाशान् दारुणांश्चानिलामयान् ॥ ३ ॥

(- *tena sadhayet* ।
gulmanahakhudapleeha-
suddhateesarasoolinah ॥ 2 ॥
Jeernajvarapratisyaya
sukranilamalagrahan ।
vardhmasmareerajonasan
darunamschanilamayan ॥ 3 ॥)

The following diseases are cured by *nirooha.*

Gulma, anaha (distention of the stomach), *khuda* (*vatarakta*), *pleeha* (splenic disorders), *suddhaatisara* (*atisara* without *ama*), *soola* (stomach pain), *jeernajvara* (the later stage of fever in which *ama* state is over and has become old or chronic and in which *vata* is more), *pratisyaya* (rhinitis or excessive and continuous cold), *sukragraha* (holding of semen as discharge is blocked), *anilagraha* (holding of flatus), *malagraha* (holding of faeces), *vardhma* (hernia and hydrocoele), *asmari* (calculi), *rajonasa* (absence of menstrual discharge) and terrible *vata* diseases.

अनास्थाप्यास्त्वतिस्निग्धः क्षतोरस्को भृशं कृशः ।
आमातिसारी वमिमान् संशुद्धो दत्तनावनः ॥ ४ ॥
श्वासकासप्रसेकार्शोहिध्माध्मानाल्पवह्नयः ।
शूनपायुः कृताहारो बद्धच्छिद्रोदकोदरी ॥ ५ ॥
कुष्ठी च मधुमेही च मासान् सप्त च गर्भिणी ।

(*Anasthapyastvatisnigdhah*
kshatorasko bhrisam krisah ।
amatisaree vamiman
samsuddho dattanavanah ॥ 4 ॥
Svasakasaprasekarso
hidhmadhmanalpavahnayah ।
soonapayuh kritaharo
baddhacchidrodakodaree ॥ 5 ॥
Kushtee cha madhumehee cha
masansapta cha garbhinee ।)

But patients who have with the following conditions are prohibited from doing *kashayavasti*. The over-unctuous one, one who is with chest trauma, who is excessively lean (emaciated), who suffer from *amatisara*, who have bouts of vomiting, who have done purgation, who is in a state of having undertaken *nasya*. Those suffering from asthma, cough, excessive salivation, piles, hiccups, distended stomach, weak digestive power, swollen anus and rectum are prohibited. One who has just taken meals, and those who suffer with three types of *udaras* (*badhodaram*, *cchidrodaram* and *udakodaram*), with *kushtha* (skin troubles), *madhumeha* (diabetes mellitus) and in pregnancy up to seven months, *kashayavasti* is also prohibited.

According to Ashtamgasamgraha, administration of *nirooha* in contraindicated conditions may cause complications. In the over-unctuous and in condition of excited *doshas*, *nirooha* cause disorder of the *doshas* in the stomach and creates *udaras*, *murccha* and *svayadhu*. In those who are with lesions of the chest and those who are extremely lean, the whole body is tormented by agitation. In those who have undergone *vamana* and *vireka,* the body will burn as the wound is burned with alkalis. (The trouble that occurs if *vasti* is given to one who is not with an empty stomach is explained later). *Snehavastis* slacken the digestive fire immediately and create diseases due to *kapha*. In cases of those who have taken *nasya*, because of the excessive opening of upper channels, *nirooha* causes aberration to the face and *anuvasana* leads to exciting of *doshas*. In those with continuous vomiting, spitting, cough and asthma, the *vayu* thrusts

nirooha upwards. In piles, the path being blocked, the *vasti* does not reach inside and torments the *prana.* Because of the oozing nature of the piles unctuous *vasti* creates inflation of the stomach. In *udara*, the already inflated stomach is further inflated and causes death. In those suffering from *alasaka* (stiffness of the bowels), *vishuchika* (cholera like diseases) and diarrhoea, *amadosha* is increased and serious troubles follow. In disorders as anorexia, slackened digestive fire, swelling of anus, *kushtha* and *meha*, those diseases are aggravated.

आस्थाप्या एव चान्वास्या विशेषादतिवह्नयः ॥ ६ ॥
रूक्षाः केवलवातार्ताः -

(asthapya eva chanvasya
viseshadativahnayah ॥ 6 ॥
Rookshah kevalavatartah –)

All those to whom *nirooha* can be administered are fit for *anuvasana* also; particularly those who are with excessive digestive fire, with dry body, suffering from diseases created by *vata* alone.

- नानुवास्यास्त एव च ।
येऽनास्थाप्यास्तथा पाण्डुकामलामेहपीनसाः ॥ ७ ॥
निरन्नप्ळीहविड्भेदिगुरुकोष्ठकफोदराः ।
अभिष्यन्दिकृशस्थूलकृमिकोष्ठाढ्यमारुताः ॥ ८ ॥
पीते विषे गरेऽपच्यां श्ळीपदी गळगण्डवान् ।

(- nanuvasyasta eva cha ।
yeऽ nasthapyastatha
pandukamalamehapeenasah ॥ 7 ॥
Nirannapleehavidbhedi-
gurukoshthakaphodarah ।
abhishyandibhrisasthoola
krimikoshthadhyamarutah ॥ 8 ॥
Peete vishe gareऽpachyam
sleepadee galagandavan ।)

Those who are unfit for *asthapana* are unfit to *anuvasana* also. Besides, those who suffer from *pandu* (anaemia), *kamala* (jaundice), *prameha* (diabetes), *peenasa* (catarrh), and those who have not taken food, those suffering from spleenopathy, who are having loose motions, who are with heaviness in the stomach, ascitis due to *kapha* vitiation, those who are suffering from *abhishyantam,* those who are lean, those who are obese, those with worms in the intestine, those with *oorusthamba*, those who have ingested poison or artificial poison and those who have *apachi*, *sleepada* and *galaganda* are all unfit for *anuvasana.*

In the diseases mentioned above as *pandu* and others *snehavasti* excites the *dosha*s and causes *udara. Snehavasti* in empty stomach creates similar troubles as mentioned in the disorderly usage of *sneha.* In diseases of spleenopathy it creates blocking and inertia of stomach. In one who is infested with worms, if the worms are not removed earlier, due to lack of expulsion of *dosha*s, the worms are increased inordinately and the heart is strained by tension and vomiting is produced. In *adhyavata* since the *dosha*s are not properly expelled, the disease is aggravated. In the cases of *apachi*, *sleepada* and *galaganda*, the troubles are given in the relevant chapters in *uttarasthana.*

Samgraha says - The *anuvasana* employed in empty stomach goes quickly upwards, because of its fluidity and power of pervasion to distant parts. As it does not remain in the seat of *vata* (*pakvasaya*) the conquest of *vata* is not done. Since it does not return, the extinction of the digestive fire is also done. If food is taken before

anuvasana, its presence in the stomach blocks the upward course of *sneha* which retains in *pakvasaya* thus heals *vata*. And with the digestion of food *anuvasana* is dissipated down. Both *nirooha* and *vata* are quick movers. Their sharpness being augmented by food, comes back quickly with food or goes up with faeces and stays in stomach. Then being fermented with faeces and food destroys the life quickly. So food should be taken before *anuvasana* is done and *nirooha* should be done on empty stomach. In diseases like *pandu* and others, *anuvasana* causes *udara*. In those suffering from *pratisyaya*, it only increases the *dosha*.

तयोस्तु नेत्रं हेमादिधातुदार्वस्थिवेणुजम् ॥ ९ ॥
गोपुच्छाकारमच्छिद्रं श्लक्ष्णर्जु गुळिकामुखम् ।

(*tayostu netram hemadi*
dhatudarvasthivenujam ॥ 9 ॥
Gopucchakaramacchidram
slakshnarju gulikamukham ।)

For *nirooha* and *anuvasana* the *netra* (the enema nozzle) is made from metals like gold, silver, iron, brass, tin, lead, etc., wood like *simsapa* (*Dalbergia sissoo*), bones (bone of elephants) and bamboo. Shape of the nozzle should be like the tail of a cow, without perforations, smooth, straight and the tip shaped like a pill with no sharp end.

The word *netra* means that which leads (नीयते) the contents of *vasti* to the anus.

ऊनेऽब्दे पञ्च,पूर्णेऽस्मिन्ना-
सप्तभ्योऽङ्गुलानि षट् ॥ १० ॥
सप्तमे सप्त, तान्यष्टौ द्वादशे, षोडशे नव ।
द्वादशैव परं विंशाद्वीक्ष्य वर्षान्तरेषु च ॥ ११ ॥
वयोबलशरीराणि प्रमाणमभिवर्द्धयेत् ।

(*oone'bde pancha, poorne'smin-*
nasaptabhyo'ngulani shat ॥ 10 ॥
Saptame sapta, tanyashtau
dvadase, shodase nava ।
dvadasaiva param vimsad-
veekshya varshantareshu cha ॥ 11 ॥
Vayobalasareerani
pramanamabhivarddhayet ।)

For those below one year of age, the length (of the *netra*) is to be five *angulas**. From one year up to seven years of age, it is to be six *angulas*. In the seventh year, the length is seven *angulas*. In twelfth year it is to be eight *angulas*. In sixteenth year it is nine *angulas*. At the age of twenty and above, it should be twelve *angulas*. The length of the nozzle for those who are in the midst of these stages can be increased slightly based on age, strength and body build.

स्वाङ्गुष्ठेन समं मूले स्थौल्येनाग्रे कनिष्ठया ॥ १२ ॥

(*svangushtena samam moole*
sthaulyenagre kanishthaya ॥ 12 ॥)

Its basal orifice should be equal (in diameter) to the thickness of thumb of the patient and the tip equal to the little finger.

पूर्णेऽब्देऽङ्गुलमादाय तदर्द्धार्द्धप्रवर्द्धितम् ।
त्र्यङ्गुलं परमं छिद्रं मूलेऽग्रे वहते तु यत् ॥ १३ ॥
मुद्गं माषं कळायं च क्लिन्नं कर्कन्धुकं क्रमात् ।

(*Poorne'bde'ngulamadaya*
tadarddharddhapravarddhitam ।
tryangulam paramam cchidram
moole'gre vahate tu yat ॥ 13 ॥
Mudgam masham kalayam cha
klinnam karkandhukam kramat ।)

At the age of one year the dimension of the

* one *angula* = a finger's (of the patient) breadth

basal orifice is one *angula*. The dimension is increased by half *angula* yearly, until it reaches three *angulas*, which is the maximum measurement at the base. Similarly, the orifice at the top should be in the size of a greengram (*mudga*), blackgram (*masha*), greenpea (*kalaya*), soaked *kalaya* seed and jujube (*karkandhu*) seed in the order of age.

For children of one year to six years of age, the instrument should have a length of six *angulas*, the size of the orifice at the base is one *angula* and the hole at tip should be in the size of a greengram. For children of seven years to eleven years the length of the instrument is seven *angulas*, one and half *angula* at base and the tip hole should be in the size of a blackgram. In children of eleven years to sixteen years the length is eight *angulas*, the orifice at base is of two *angulas* and the tip hole should be in the size of a greenpea. In sixteen years to twenty-one years of age the length is nine *angulas*, the orifice at the base is two and a half *angulas* and at the tip the orifice should be in the size of a soaked greenpea. In twenty-one years and above the length should be twelve *angulas*, the orifice is three *angulas* at base and hole at tip should be in the size of a jujube seed.

But Arunadatta interprets the word *ardhardhapramana* as to mean one fourth, and suggests increasing the circumference by one fourth of an *angula*. According to him the orifice in the first year is of one *angula*, and this measurement has to be followed until six years of age. From seven years up to the age of eleven years this is to be increased to one and a quarter of an *angula*. From twelfth year until the sixteenth year, the measurement is one and a half *angula*. In the sixteenth year one and three fourth *angula*. In the seventeenth year, two *angulas*. In the eighteenth year two and one fourth *angulas*. In the nineteenth year two and a half *angulas*. In the twentieth year two and three fourth of *angulas*. In the twentyfirst year three *angulas*.

मूलच्छिद्रप्रमाणेन प्रान्ते घटितकर्णिकम् ॥ १४ ॥
वर्त्याऽग्रे पिहितं, मूले यथास्वं द्व्यङ्गुलान्तरम् ।
कर्णिकाद्वितयं नेत्रे कुर्यात् -

(*moolacchidrapramanena prante*
ghatitakarnikam ॥ 14 ॥
Vartyaऽgre pihitam, moole yathasvam
dvyangulantaram ।
karnikadvitayam netre kuryat -)

A *karnika* (a mushroom like ridge) is to be constructed near the orifice at the tip, the dimension of which is equal to that of the orifice at the base. And a *varthi* (roll of thread or a wick) is to be inserted to orifice of the tip. At the base, construct two *karnikas* with two *angulas* as the distance between them.

The *karnika* at the tip is to limit the insertion of *netra* to the anus. At the base the *karnikas* are to help to tie the *vasti* with the *netra*.

- तत्र च योजयेत् ॥ १५ ॥
अजाविमहिषादीनां वस्तिं सुमृदितं दृढम् ।
कषायरक्तं निश्छिद्रग्रन्थिगन्धसिरं तनुम् ॥ १६ ॥
ग्रथितं साधु सूत्रेण सुखसंस्थाप्यभेषजम् ।
वस्त्यभावेऽङ्गपादं वा न्यसेद्वासोऽथवा घनम् ॥ १७ ॥

(- *tatra cha yojayet* ॥ 15 ॥
Ajavimahishadeenam vasti
sumriditam dridham ।
kashayaraktam niscchidra
granthigandhasiram tanum ॥ 16 ॥
Grathitam sadhu sootrena
sukhasamsthapyabheshajam ।

vastyabhaveऽnkapadam va
nyasedvasoऽdhava ghanam ॥ 17 ॥)

In between the two *karnikas*, attach the bladder of goat or sheep, or buffalo, which are made soft, thin and sturdy and made red by tanning with astringent substances (as *hareetaki - Terminalia chebula*). It must be free from perforations, knots, bad odours and thread like veins. The bladder in which the medicated preparations are poured is then attached and tied well. In case of non-availability of bladders, the skin from thighs or legs called *amkapadam* or thick clothes can be used.

निरूहमात्रा प्रथमे प्रकुञ्चो वत्सरे परम् ।
प्रकुञ्चवृद्धिः प्रत्यब्दं यावत्षट्प्रसृतास्ततः ॥ १८ ॥
प्रसृतं वर्द्धयेदूर्ध्वं द्वादशाष्टादशस्य तु ।
आसप्ततेरिदं मानं, दशैव प्रसृताः परम् ॥ १९ ॥

(*Niroohamatra prathame*
prakuncho vatsare param ।
prakunchavriddhih pratyabdam
yavatshatprasritastatah ॥ 18 ॥
Prasritam vardhayedoordhvam
dvadasashtadasasya tu ।
asaptateridam manam,
dasaiva prasritah param ॥ 19 ॥)

The dose (volume) of liquid for *nirooha* at the age of one year is one *prakuncha* (*pala*). Increase the dose by one *prakuncha* for each year until it comes to six *prasrithas* (12 *palas* for 12 years). Then with each year the increase is with one *prasritha* (two *palas*) each. At eighteenth year, the dose comes to twelve *prasrithas* (24 *palas*). Until seventy years this is the measure. After the seventeith year take ten *prasrithas* as the dose.

For children up to the age of six months the dose of *nirooha* is half *pala*; until one year the dose is one *prakuncha*.

यथायथं निरूहस्य पादो मात्राऽनुवासने ।

(*Yathayatham niroohasya*
pado matraऽnuvasane ।)

In *anuvasana* the dose can be considered as one fourth of *nirooha*.

आस्थाप्यं स्नेहितं स्विन्नं
शुद्धं लब्धबलं पुनः ॥ २० ॥
अन्वासनार्हं विज्ञाय पूर्वमेवानुवासयेत् ।
शीते वसन्ते च दिवा रात्रौ केचित्ततोऽन्यदा ॥ २१ ॥

(*asthapyam snehitam svinnam*
suddham labdhabalam punah ॥ 20 ॥
Anvasanarham vijnaya
poorvamevanuvasayet ।
seete vasante cha diva
ratrau kechittatoऽnyada ॥ 21 ॥)

The person to whom *asthapana* is to be administered has to be subjected to *snehana* and *svedana* at first, followed by the purificatory treatments (emesis and purgation) and when strength is regained, after ascertaining his fitness, give *anuvasana* before *nirooha*. According to some *acharyas asthapana* is done in the cold seasons (*hemanta*, *sisira* and *vasanta*) at day-time and in other seasons (summer, rainy season and autumn) it is to be done at night.

Do not employ *anuvasana* at night. This statement in Ashtangasamgraha (su. chapter 8) is based on the opinion of *Dhanwantaras**. Because at night the excitement of *doshas* is experienced. By the vigour of *sneha*, distention of stomach, heaviness and fever will occur.

* Followers of Dhanwantary

अभ्यक्तस्नातमुचितात्पादहीनं हितं लघु ।
अस्निग्धरूक्षमशितं सानुपानं द्रवादि च ॥ २२ ॥

(*Abhyaktasnatamuchitat-*
padaheenam hitam laghu ।
asnigdharookshamasitam
sanupanam dravadi cha ॥ 22 ॥)

At first (before giving *vasti*) the patient's body is to be smeared with oil and given a bath. Then he is fed with wholesome and light food leaving one fourth of the stomach free. The food should not be too unctuous or too dry. *Anupana* with proper liquids should follow.

Here Samgraha says, by taking too much of unctuous food, the *sneha* creates *mada* (drunkenness) *moorcha* (swoon) *agnisada* (slackening of digestive fire) *hrillasa* (nausea) and other troubles. Dry food creates *vishtambha* (obstruction) and loss of strength and complexion. One who has taken only a little liquid diet, one who has not passed the faeces and urine, the food and *sneha* covers mutually and creates troubles.

कृतचङ्क्रमणं मुक्तविण्मूत्रं शयने सुखे ।
नात्युच्छ्रिते न चोच्छीर्षे संविष्टं वामपार्श्वतः ॥ २३ ॥
सङ्कोच्य दक्षिणं सक्थि प्रसार्य च ततोऽपरम् ।

(*Kritachankramanam mukta-*
vinmootram sayane sukhe ।
natyucchrite na choccheershe
samvishtam vamaparsvatah ॥ 23 ॥
Sankochya dakshinam sakthi
prasarya cha tatoऽparam ।)

After taking the food the patient should walk a little.Then having attended to defecation and urination get in the bed comfortably. The bed should not be too high and the pillows not too raised.The patient should be lay on his left side (left lateral position). Fold the right leg and place it over the stretched left leg.

अथास्य नेत्रं प्रणयेत्स्निग्धे स्निग्धमुखं गुदे ॥ २४ ॥
उच्छ्वास्य वस्तेर्वदने बद्धे हस्तमकम्पयन् ।
पृष्ठवंशं प्रति ततो नातिद्रुतविळम्बितम् ॥ २५ ॥
नातिवेगं न वा मन्दं सकृदेव प्रपीडयेत् ।
सावशेषं च कुर्वीत वायुः शेषे हि तिष्ठति ॥ २६ ॥

(*athasya netram pranayet-*
snigdhe snigdhamukham gude ॥ 24 ॥
Ucchvasya vastervadane
baddhe hastamakampayan ।
prishthavamsam prati tato
natidrutavilambitam ॥ 25 ॥
Nativegam na va mandam
sakrideva prapeedayet ।
savasesham cha kurveeta
vayuh seshe hi tishthati ॥ 26 ॥)

The tip of the *netra* and patient's anus is lubricated with ghee.The bag or *vasti* is filled with suitable medicine and its facial part is tied tightly with a thread to the *netra*. Then enter the *netra* in to the anus along the direction of the vertebral column. The introduction should be very careful without shivering. The insertion is not to be done hastily or taking too much time, too speedily or too slowly. Push the liquid by squeezing the bag in one steady attempt. See that a little of *sneha* is left back in the bag to prevent the entry of *vayu*.

दत्ते तूत्तानदेहस्य पाणिना ताडयेत्स्फिजौ ।
तत्पार्ष्णिभ्यां तथा शय्यां
पादतश्च त्रिरुत्क्षिपेत् ॥ २७ ॥
ततः प्रसारिताङ्गस्य सोपधानस्य पार्ष्णिके ।
आहन्यान्मुष्टिनाऽङ्गं च स्नेहेनाभ्यज्य मर्दयेत् ॥ २८ ॥
वेदनार्तमिति स्नेहो न हि शीघ्रं निवर्तते ।
योज्यः शीघ्रं निवृत्तेऽन्यः स्नेहोऽतिष्ठन्न-
कार्यकृत् ॥ २९ ॥

(*Datte toottanadehasya*
panina tadayetsphijau ।
tatparshnibhyam tatha sayyam
padatascha trirutkshipet ॥ 27 ॥
Tatah prasaritangasya
sopadhanasya parshnike ।
ahanyanmushtinaऽngam cha
snehenabhyajya mardayet ॥ 28 ॥
Vedanartamiti sneho
na hi seeghram nivartate ।
yojyah seeghram nivritteऽnyah
snehoऽtishthannakaryakrit ॥ 29 ॥)

After the administration of *vasti* the patient is to be laid supine, and the physician should tap on the patient's buttocks. Then the patient should tap his buttocks by his own heels. Now, lift the cot from the foot side, three times. Afterwards, he is asked to lie supine, extending (spreading) arms and legs and then give stroke on his heels with fist. Now smear the whole body with oil and massage the painful part. All these steps are done to prevent the immediate return of *sneha*.

If *sneha* returns quickly, administer another *anuvasana* immediately. Because if the *sneha* is not retained for the required time, no action takes place.

दीप्ताग्निं त्वागतस्नेहं सायाह्ने भोजयेल्लघु ।+
(*Deeptagnim tvagatasneham*
sayahne bhojayellaghu ।)

When the *sneha* comes out after being retained for the required time, the patient can be fed (if the digestive fire is well kindled) with light food in the evening.

निवृत्तिकालः परमस्त्रयो यामास्ततः परम् ॥ ३० ॥
अहोरात्रमुपेक्षेत, परतः फलवर्तिभिः ।
तीक्ष्णैर्वा वस्तिभिः कुर्याद्यत्नं स्नेहनिवृत्तये ॥ ३१ ॥

(*nivrittikalah parama-*
strayo yamastatah param ॥ 30 ॥
Ahoratramupeksheta,
paratah phalavartibhih ।
teekshnairva vastibhih kuryad-
yatnam snehanivrittaye ॥ 31 ॥)

The maximum time for the return of the *sneha*, is three *yama*s (nine hours). If the *sneha* is not coming out don't do anything for its expulsion. Wait for a day (same day) and a night. Next day try to bring back the *sneha*, by inserting *phalavarti* [suppository prepared with *madana* (*Catunaregum spinosa*) fruit and jaggery] or with acute *vasti*s also.

The method of preparation and use of *phalavarthi* is presented in the context of *arsochikitsa* (treatment of piles). Acute or sharp *vasti*s are prepared with salt, *aranala* (vinegar), etc.

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PHARMACOGNOSTICAL STUDIES ON *BRAHMI* [*BACOPA MONNIERI* (LINN.) PENNELL]

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Abstract: *Bacopa monnieri* (Linn.) Pennell is an important raw drug used in large quantities in various ayurvedic formulations. In this paper pharmacognostic studies including stomatal index, palisade ratio and vein-islet number are dealt with. Chemical studies and propagation technology through stem cuttings are also detailed here.

Introduction

Bacopa monnieri belonging to the family 'Scrophulariaceae' is known as 'Thyme leaved gratiola' in English; *brahmi* or *jalnim* in Hindi; *brahmi* or *nirbrahmi* in Malayalam and *brahmi* or *sarasvati* in Sanskrit. It is used in more than 22 ayurvedic formulations like *Sarasvatarishtam*, *Chandanadi tailam*, *Brahmi tailam*, *Mahatikta kashayam*, *Patoladi ghritham*, *Abhrabhasmam*, *Brahmeedrakshadi kashayam*, etc (S.R. Iyer, 1983). In all these preparations, the plant as a whole is made use of. The plant is distributed throughout India in wet places up to 1200m particularly in certain places in the state. In Kerala it is naturally seen growing in Veli and Kovalam of Thiruvananthapuram district, Ochira and Sasthamkotta of Kollam district, Ranni of Pathanamthitta district, Thannirmukkam of Alappuzha district, Vaikam of Kottayam district, Chinnar of Idukki district, Pattikkad of Thrissur district, Mully and Anakkatty of Palakkad district, Nilambur of Malappuram district and Kumbala of Kasargode district (Fig.I).

The plant is astringent, bitter, sweet, cooling, purgative, intellect promoting and is useful in vitiated conditions of *vata* and *kapha*, epilepsy, insanity, neuralgia (Warrier et al, 1993; Narayana Aiyer & Kolammal, 1964; Kurup et al, 1979), tumours, makes the voice clear (Narayana Aiyer & Kolammal, 1964; Kurup et al, 1979) and promotes sleep (WHO, 1990; Kurup et al, 1979). It is digestive and useful in splenomegaly, skin diseases, fever, dyspnoea (Warrier et al, 1993; Narayana Aiyer & Kolammal, 1964) and cures convulsions (Warrier et al, 1993; WHO, 1990). It is anodyne, carminative, anti-inflammatory, depurative, diuretic, emmenagogue, sudorific, febrifuge and tonic and is used in biliousness, inflammations, amentia, ulcer, dyspepsia, flatulence, constipation, asthma, leucoderma, erysipelas, syphilis, hoarseness, strangury, elephantiasis, dysmenorrhoea, sterility and general debility (Warrier et al, 1993). It cures diabetes, small pox, boils on the body, cough, pruritus, arthritis, anorexia and emaciation. It dispels poisonous affections and impurity of blood (Narayana Aiyer & Kolammal,

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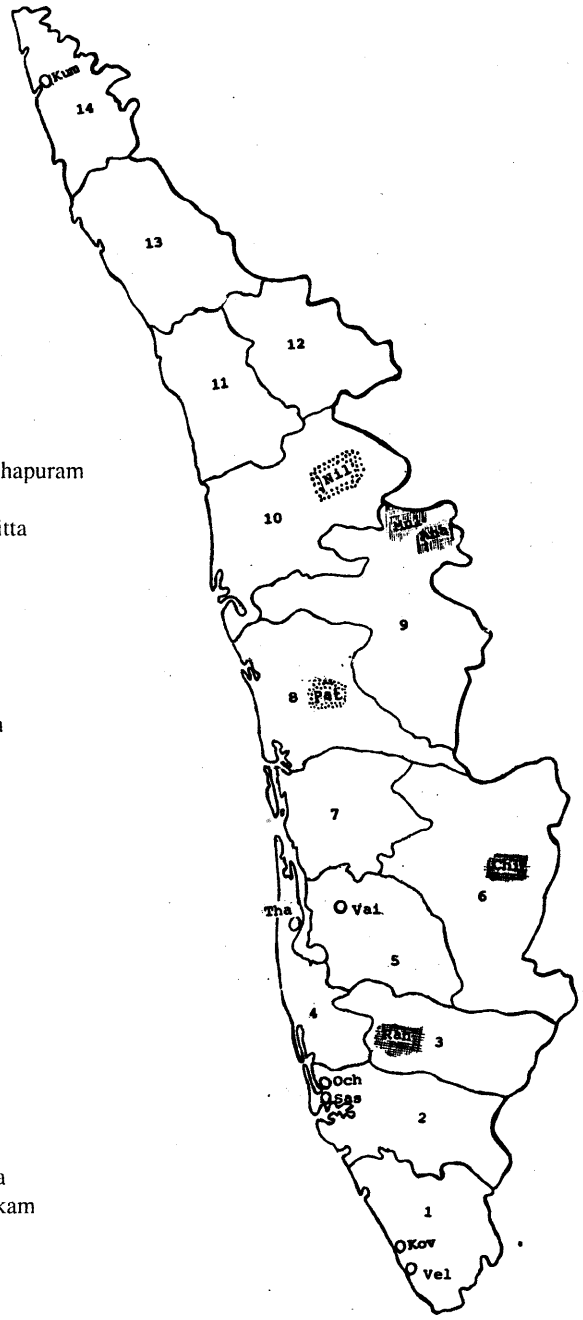
Fig.I. *Bacopa monnieri*(Linn.) Pennell - Location Map



1993). Oil prepared from fresh juice for external application for blackening the hair and to cool the brain (Kurup et al, 1979). It is also used as an antioxidant (Tripathi et al, 1995).

The drug is used for enhancing the power of speech, arresting process of aging and overcoming conditions of stress (Sarin,Y.K. 1996).

Morphological description

A succulent much spreading prostrate or creeping glabrous annual herb with numerous ascending upright branches and adventitious roots at almost every nodes; stems and branches yellowish green, dark green or pink with internodes of varying length; leaves simple, opposite, decussate, almost sessile, spathulate, entire, fleshy, obscurely veined and dotted with minute spots; flowers pale blue or whitish, axillary, solitary on long slender pedicels of varying lengths, usually longer than the leaves; calyx with two lateral adnate bracteoles, glabrous, deeply 5-partite, with three outer unequal ones and two inner linear ones; corolla gamopetalous, pale blue or whitish, about twice as long as the calyx, five lobed, slightly two lipped, the upper two emarginate or two lobed and the lower three lobed; stamens four, didynamous, included, filaments epipetalous, free; anthers two celled; ovary bicarpellary syncarpous, two chambered with many ovules in each cell on swollen placenta; style concave, dialated towards the top and ending in a two lobed stigma. Fruits ovoid, acute, 2-celled, 2-valved capsules, tipped with style base; seeds minute and numerous (Fig.II&III).

Materials and methods

Plant materials for macro and microscopic observations were collected from different parts of Kerala and fixed in F.A.A. Seeds were collected for propagation studies. For anatomical works stained hand sections and macerated materials were examined under compound microscope. Vein-islet number, stomatal index and palisade ratio were found out using samples treated in 5% KOH solution. For determining stomatal index, ten epidermal pealing from both surfaces of a fresh leaf were taken and ten countings were recorded from ten different areas of each piece (ie. number of stomata as well as epidermal cells per 1 sq.mm area). Stomatal index value is then calculated by using the formula $\frac{E}{E+S} \times 100$ where E and S stand for the number of epidermal cells and number of stomata of unit area respectively (Salisbery, 1928). The values are represented graphically. Palisade ratio was determined by using 5 fresh leaves. From each of these four pieces (ie. one from base, one from apex, one from margin and one from centre) were selected. After clearing, washing and staining they were mounted in glycerine. From these 100 readings were recorded, taking 5 counts from each piece. Average of these is the palisade ratio. The values are represented graphically. The report that number of palisade cells per unit area increases successively from base to apex with the ratio always remaining constant (Zorning & Weiss, 1925) holds true in this species also. The vein-islet number is calculated by counting the minute areas of photosynthetic tissue encircled by the ultimate division of the conducting strands per 1 sq.mm of cleared leaf samples taken from 5 different leaves. The values are represented graphically. All these numerical values may be considered as a diagnostic constant and will help for identifying the plant species.

Floral vasculature

The bracteole is linear and is supplied by a

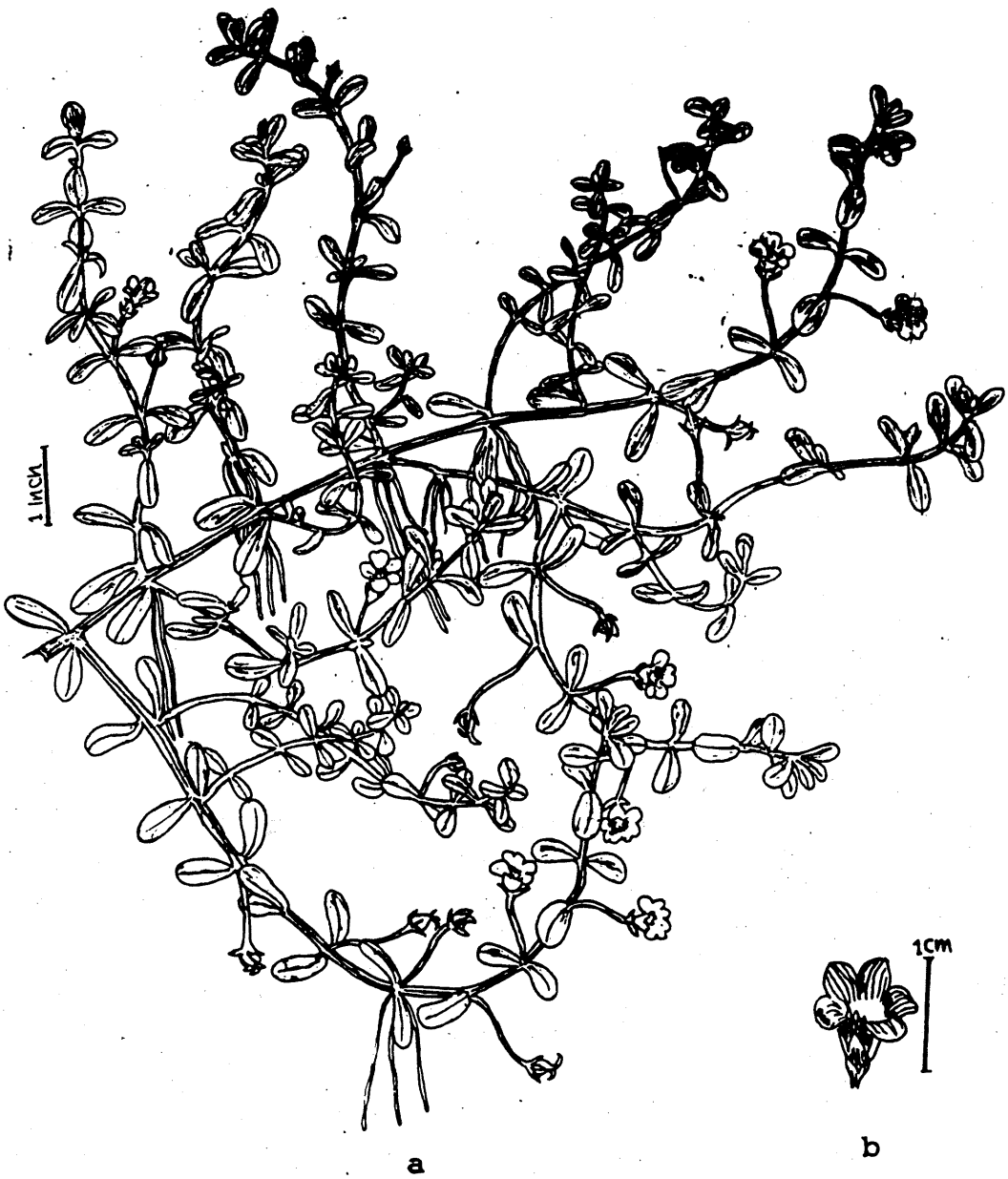


Fig. II **a** & **b** *Bacopa monnieri* (Linn.) Pennell **a**) Habit **b**) Single flower

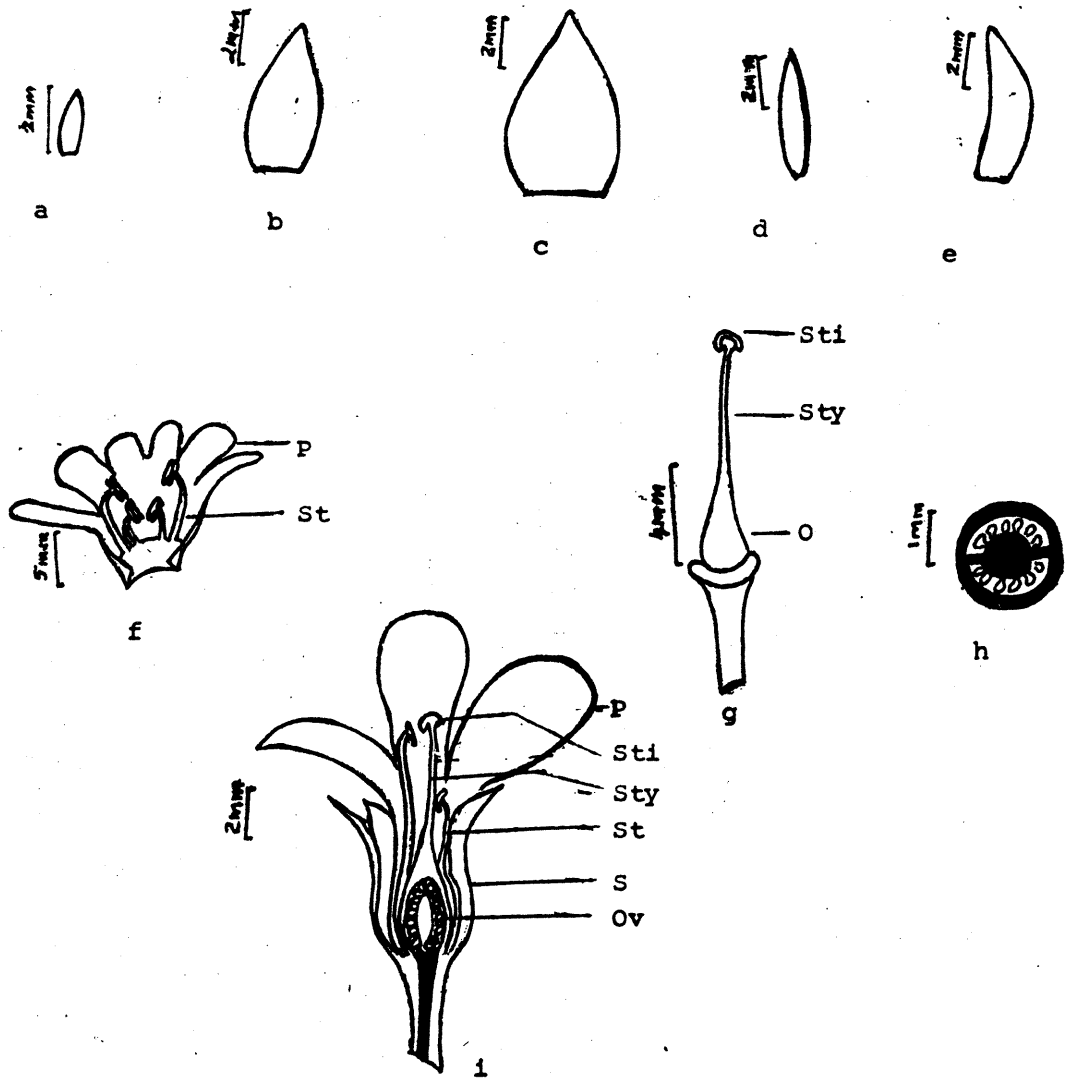


Fig. III. **a - i** *Bacopa monnieri* (Linn.) Pennell **a**) Bracteole **b - e**) Sepals **f**) Corolla with stamen **g**) Gynoecium **h**) Ovary C.S. **i**) Flower L.S.

O. Ovary **Ov**. Ovule **P**. Petal **S**. Sepal **St**. Stamen **Sti**. Stigma **Sty**. Style

solitary median vascular strand. Of the three outer lobes of the calyx, the median one is larger having seven vascular strands. Of these, the median three are stouter and unbranched up to near about the tip. The lateral ones repeatedly branches and forms a network. Of the two other sepals which are slightly smaller, the general pattern of vascular supply is the same except the absence of network formation on one side in one sepal. A single unbranched vascular strand traverses from base to top in the other two linear sepals (Fig.IV a-c).

Three conspicuous vascular strands of each corolla lobe give rise to branches at the region of the union of the lobes, but the branches do not get interconnected. Each epipetalous stamen is supplied with a distinct unbranched vascular strand (Fig.IVf).

The pistil is supplied with two short and stout vascular bundles which give rise to two branches each at the base of the ovary. The outer branch traverses through the ovary wall and abruptly ends at the base of the style after giving rise to a lateral branch. While the inner one straightaway supplies the style and stigma without producing any branches (Fig.IVg).

Anatomy

Stem

In transverse section the stem reveals the following:-

1) The section is circular in outline.

2) The epidermis is uniseriate consisting of cubular cells.

3) Cortex is well developed and consist of 20-22 layers of parenchymatous cells with large intercellular spaces.

4) The endodermis is single layered and its cells contain plenty of starch grains.

5) The endodermis is followed by 1-2 layered pericycle.

6) Xylem and phloem are arranged collaterally with rather indistinct cambium in between, probably consisting of one to two layers only.

7) A well developed parenchymatous pith having plenty of intercellular spaces (Fig.V).

Root

In cross section the root is circular in outline encircled by a uniseriate epidermis devoid of cuticle. The outer and inner cortex consists of two to three layers of parenchyma. They are connected by uniseriate trabeculae of parenchyma with air chambers in between. The innermost layer of the cortex is the endodermis whose cells are provided with casparian thickenings on their radial walls. Interior to the endodermis is a single layered pericycle. The root is protostelic with 6-7 protoxylem groups alternated by radially arranged phloem patches (Fig.VI).

Leaf

In transverse section the leaf shows common dicotyledonous characters. The epidermis is uniseriate overlined by a thin layer of cuticle. Sunken, spherical, multi-cellular, sessile glandular trichomes filled with yellowish green contents and surrounded by radiating rows of eight cells are seen in the epidermis. Stomata of the Ranunculaceous type are present on surfaces of both the epidermis, though more are seen on the lower epidermis. The palisade tissue consists of two layers of columnar cells compactly arranged. The spongy tissue consists of oval or spherical cells with plenty of intercellular spaces. There

is a central solitary midrib vascular bundle devoid of any strengthening girdles. The bundle is broad c-shaped with poorly developed vascular elements, xylem facing the adaxial surface and phloem the abaxial surface (Fig.VII).

The numerical values like vein-islet number, palisade ratio and stomatal index are significantly diagnostic features of this species. The stomatal index of upper epidermis is 4.71 and lower epidermis is 11.84, the palisade ratio is 1.38 and the vein-islet number is 4.2 (Fig.VIII a&b-X & Table I a&b-III).

Propagation

Stem cuttings are used for propagation. For hardy varieties, occasional watering only is needed. For varieties usually grown in marshy areas and wet fields flooding the area with water is essential. 15 cm. long cuttings can be directly planted in the well-prepared fields at an espacement of 5 cm. The field should be saturated with water throughout. Within a week new roots arise at the nodes. Within a month the plants become well established and the entire field is thus covered over by their thick growth. Manuring with cow-dung powder should be done bimonthly. Weeding should be conducted once in two months. If there is oily appearance over the water surface, lime powder should be applied in the field. The plant can be easily grown in drums containing water, kept in the sun. Every alternate day the water level has to be maintained. Harvesting can be done every two months. This is an economically viable species which produce yield thrice a year.

Chemical studies

Review

The herb contains the alkaloids brahmine, herpestine ($C_{34}H_{46}N_2O_6$, mp. 116-19°), and a mixture of three bases. In therapeutic uses, brahmine resembles strychnine. The herb also contains the saponins, monnierin ($C_5H_{82}O_{21}.3H_2O$, mp. 262-63°); hersaponin [mp. 232-34° (decomp)], bacoside A ($C_{41}H_{68}O_{13}.4H_2O$, mp. 250°) and bacosid B [$C_{41}H_{68}O_3.5H_2O$, mp. 203° (decom)]. Monterin on hydrolysis gave glucose, arabinos and an aglycore ($C_{30}H_{48}O_{41}$, mp. 235-37°) whereas bacosides A&B gave glucose, arabinose and bacogenius A_1, A_2, A_3 & A_4; bacogenius A_1 & A_2 are epimers, & A_4 is an ebelin-ractone. Other constituents present in the plant are D-mannitol, betulic acid, B-sitosterol, stigmasterol & its esters, heptacosane, octacosane, nonacosane, triacontane, heutriacontane, dotriacontane, nicotine, 3 formyl-4-hydroxy-2H-pepain ($C_6H_6O_3$), luteolin & its 7-glucoside. The presence of α–alanine, aspartic acid, glutamic acid and sorine is also reported. Analysis of the leaves and stalks gave moisture, 88.4; protein, 2.1; fat, 0.6; carbohydrates, 5.9; crude fibre, 1.05; ash, 1.9g/100g; calcium, 202.0; phosphorous, 16.0; iron, 7.8; ascorbic acid, 63.0; nicotinic acid, 0.3 mg/100g & energy, 38 cal/100g. The leaves contain a sterol ($C_{26}H_{46}O.H_2O$, mp. 76°) (Wealth of India, 1988).

The major chemical constituents of *Bacopa* are tetracyclic triterpenoid saponins, bacosides[4,5] A&B (crystalline mixture of several saponins). Bacoside A is about 2.5-3.0%. Other constituents include saponins viz., bacosides[6,7] A_1, & A_3, hersaponin[8], betulic acid[9], monnierin[10], alkaloids[11] viz., herpestine and brahmine; flavonoids[12,13] viz., luteolin-7-glucoside, glucoronyl-7-apigenin and glucoronyl-7-luteolin and common phytosterols[14] (Sukhdev et al, 1998).

Based on bacoside A content morphotypes

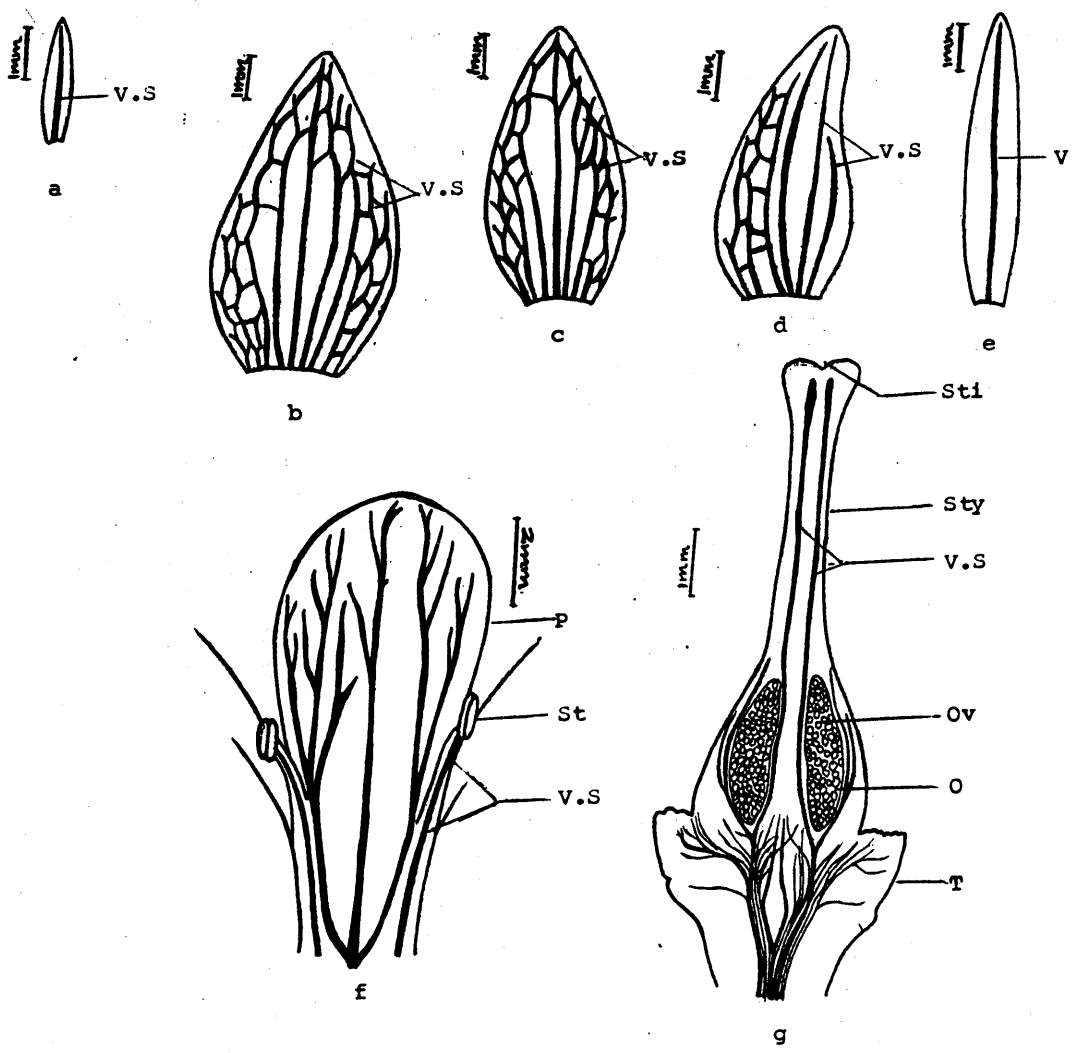


Fig. IV. **a - g** *Bacopa monnieri* (Linn.) Pennell **a**) Bracteole **b - e**) Sepals **f**) Petal with stamen **g**) Gynoecium

O. Ovary **Ov**. Ovule **P**. Petal **St**. Stamen **Sti**. Stigma **Sty**. Style **T**. Thalamus **V.S**. Vascular supply

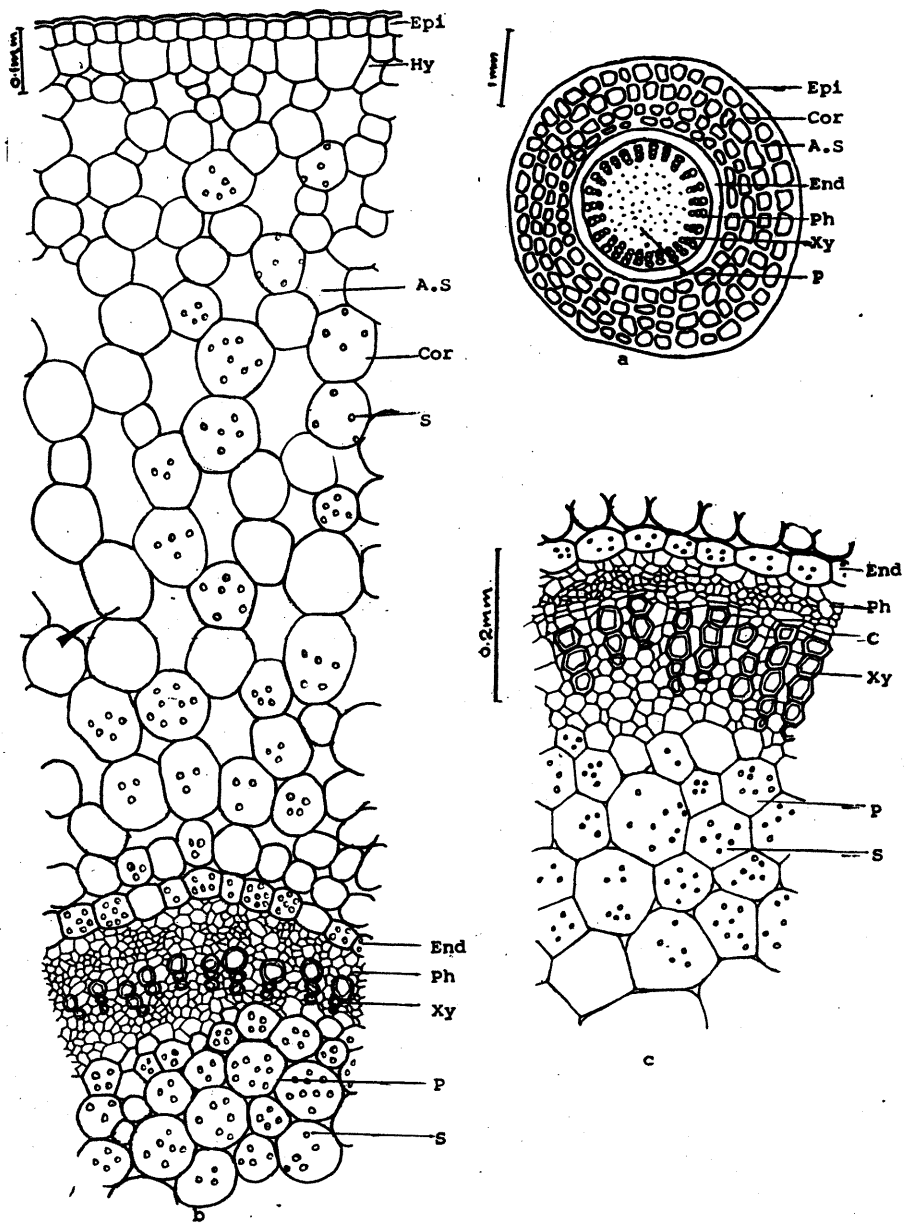


Fig. V. **a - c** *Bacopa monnieri* (Linn.) Pennell **a**) T.S. of stem - Diagrammatic **b**) A portion of stem - enlarged **c**) A portion of stele with prominant cambium - enlarged

A.S. Air space **C**. Cambium **Cor**. Cortex **End**. Endodermis **EPi**. Epidermis **Hy**. Hypodermis **P**. Pith **Ph**. Phloem **S**. Starch grain **Xy**. Xylem

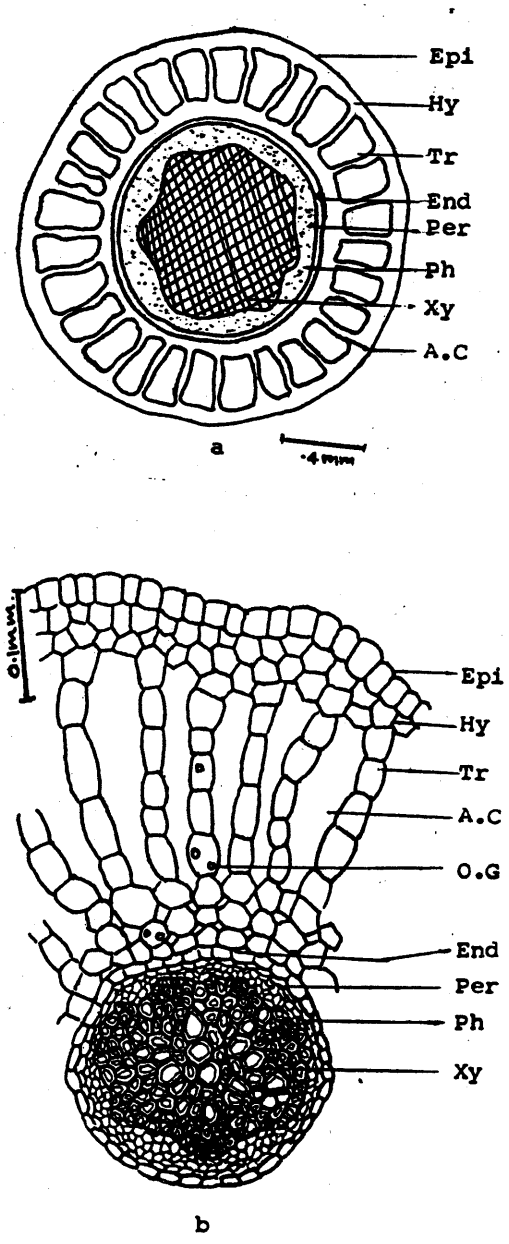


Fig. VI. **a** & **b** *Bacopa monnieri* (Linn.) Pennell **a**) T.S. of root - diagrammatic **b**) A portion of root - enlarged

A.C. Air chamber **End**. Endodermis **Epi**. Epidermis **Hy**. Hypodermis **O.G**. Oil globule **Per**. Pericycle **Ph**. Phloem **Tr**. Trabeculae **Xy**. Xylem

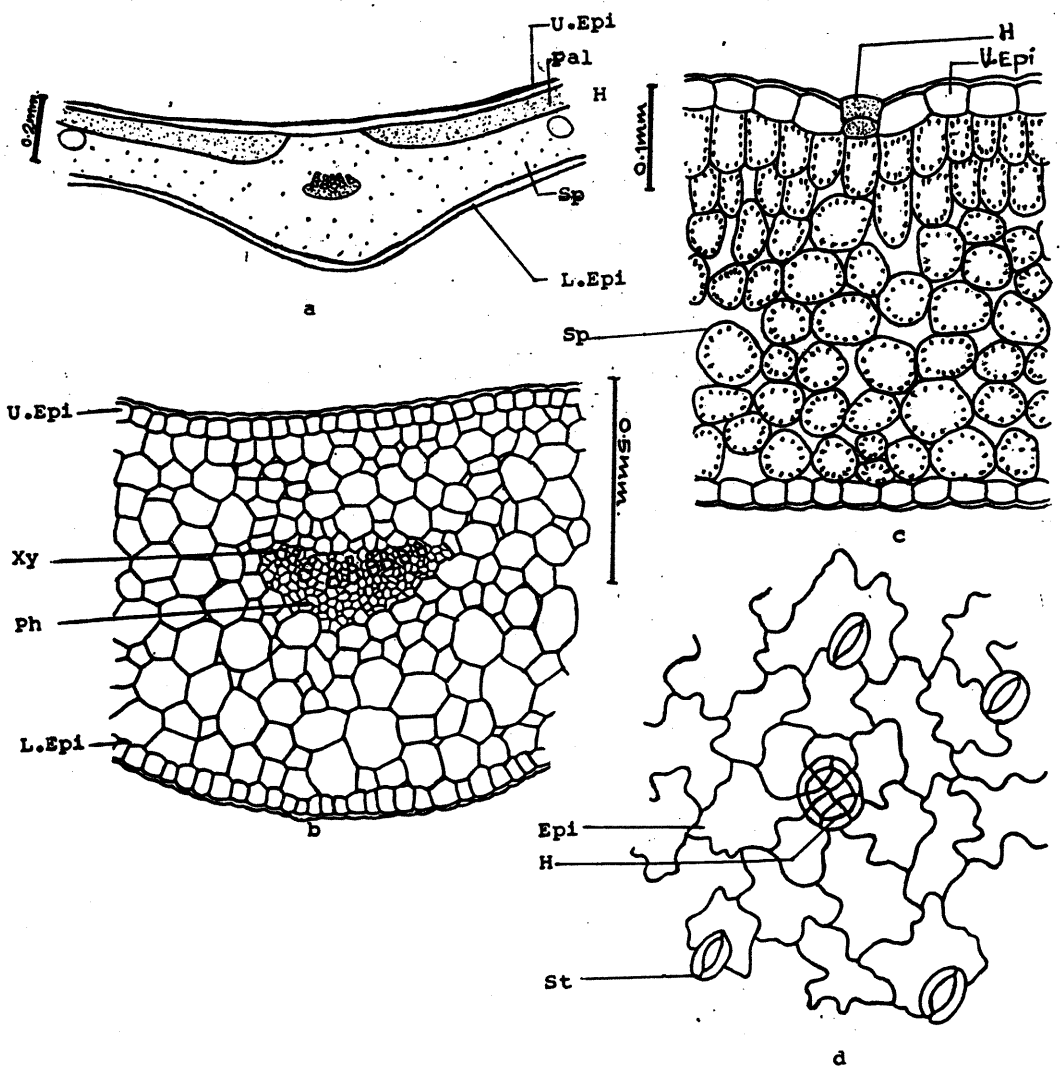


Fig. VII. **a - d** *Bacopa monnieri* (Linn.) Pennell **a**) T.S. of leaf - diagrammatic **b**) T.S. of midrib of leaf - cellular **c**) Detailed T.S. of lamina **d**) Lower epidermis

Epi. Epidermis **H**. Sunken sessile glandular hair **L.Epi**. Lower epidermis **Pal**. Palisade **Ph**. Phloem **Sp**. Spongy cells **St**. Stomata **U.Epi**. Upper epidermis **Xy**. Xylem

Table Ib : *Bacopa monnieri* (Linn.) Pennell - Stomatal index - Upper Epidermis

	I			II			III			IV			V		
	No. of Epi. cells	No. of Stom-ata	Stom-atal Index	No. of Epi. cells	No. of Stom-ata	Stom-atal Index	No. of Epi. cells	No. of Stom-ata	Stom-atal Index	No. of Epi. cells	No. of Stom-ata	Stom-atal Index	No. of Epi. cells	No. of Stom-ata	Stom-atal Index
1	1472	336	18.58	1088	192	15.00	1168	280	19.34	1108	248	18.29	1016	184	15.33
2	1424	288	16.82	1136	160	12.35	1120	296	20.90	736	160	17.86	1092	160	12.78
3	1424	352	19.82	1076	188	14.87	1080	260	19.40	1040	176	14.47	1168	192	14.12
4	1472	272	15.59	1152	208	15.29	1168	200	14.62	1088	168	13.38	1264	160	11.24
5	1448	312	17.73	1152	288	20.00	1156	244	17.43	992	192	16.22	1184	192	13.95
6	1472	280	15.98	1168	224	16.09	1284	236	15.53	1020	188	15.56	1248	160	11.36
7	1516	300	16.52	1136	248	17.92	1268	240	15.92	1088	160	12.82	1216	176	12.64
8	1512	328	17.83	1192	200	14.37	1236	248	16.71	996	200	16.72	992	192	16.22
9	1540	320	17.20	1260	240	16.00	1208	204	14.45	944	208	18.06	1184	176	12.94
10	1480	332	18.32	1136	288	20.22	1080	252	18.92	1076	172	13.78	1152	196	14.54
Average			17.44			16.21			17.32			15.72			13.51

	VI			VII			VIII			IX			X		
	No. of Epi. cells	No. of Stom-ata	Stom-atal Index	No. of Epi. cells	No. of Stom-ata	Stom-atal Index	No. of Epi. cells	No. of Stom-ata	Stom-atal Index	No. of Epi. cells	No. of Stom-ata	Stom-atal Index	No. of Epi. cells	No. of Stom-ata	Stom-atal Index
1	1024	192	15.79	1244	164	11.65	948	184	16.25	1328	184	12.17	928	208	18.31
2	1088	184	14.47	1200	192	13.79	1376	192	12.24	1008	192	16.00	1000	200	16.67
3	1248	160	11.36	1168	224	16.09	1488	192	11.43	976	160	14.08	1012	200	16.50
4	1136	192	14.46	1424	224	13.59	1456	192	11.65	1188	168	12.39	964	188	16.32
5	1152	176	13.25	944	192	16.90	1408	192	12.00	1444	184	11.30	1228	164	11.78
6	1232	176	12.50	1184	208	14.94	1432	192	11.82	1272	160	11.17	1172	172	12.79
7	1192	176	12.87	972	188	16.21	1436	188	11.58	1132	176	13.46	1100	168	13.25
8	1236	168	11.97	1164	200	14.66	1280	160	11.11	1276	164	11.39	1232	164	11.75
9	1168	180	13.35	1024	180	14.95	1260	168	11.76	1420	188	11.69	1204	164	11.99
10	1272	160	11.17	920	196	17.56	1508	188	11.08	1232	164	11.75	1432	184	11.39
Average			13.12			15.03			12.09			12.54			14.08

Range : 12.09 - 17.44 Mean: 14.71 Standard deviation : 2.58

Fig. VIII-a. *Bacopa monnieri* (Linn.) Pennell - Stomatal index - Upper Epidermis

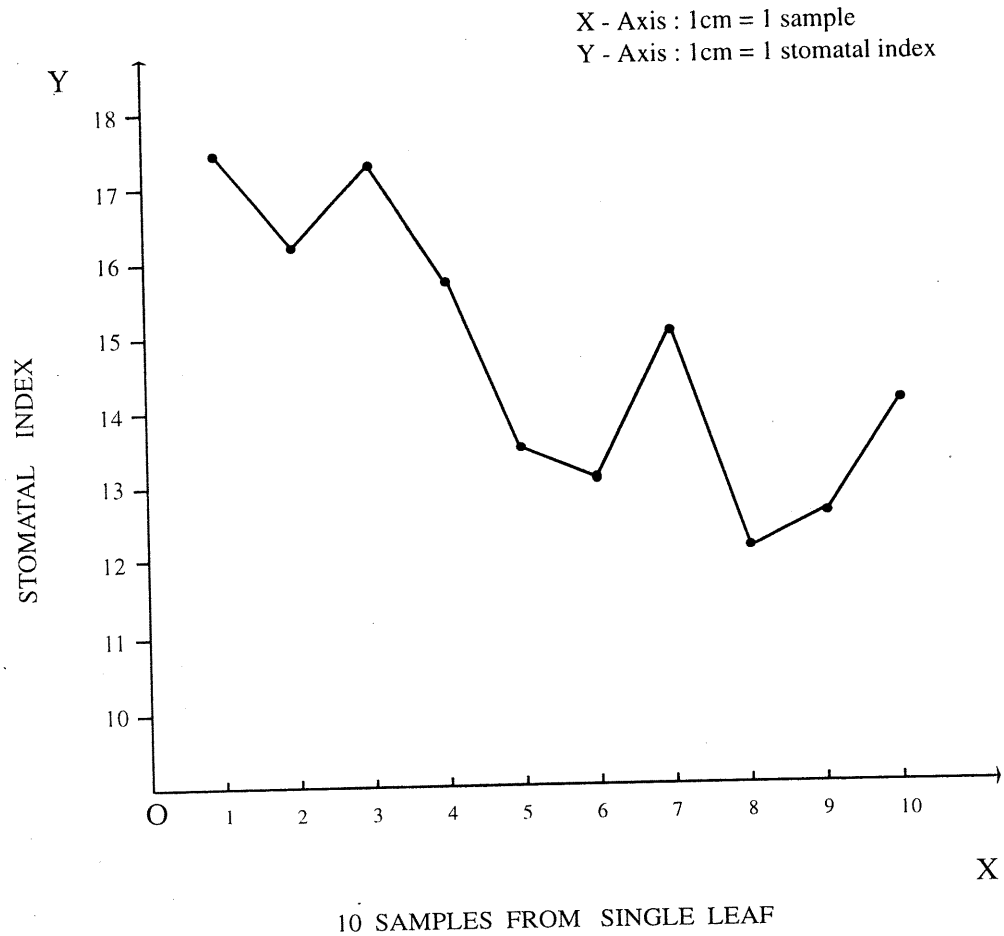


Table Ia : *Bacopa monnieri* (Linn.) Pennell - Stomatal index - Lower Epidermis

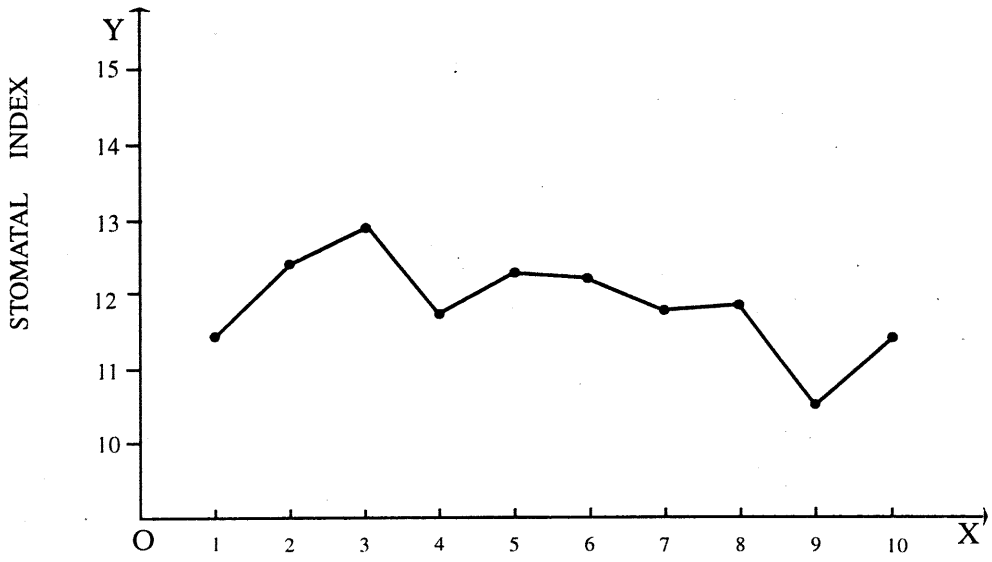
	I			II			III			IV			V		
	No. of Epi. cells	No. of Stom-ata	Stom-atal Index	No. of Epi. cells	No. of Stom-ata	Stom-atal Index	No. of Epi. cells	No. of Stom-ata	Stom-atal Index	No. of Epi. cells	No. of Stom-ata	Stom-atal Index	No. of Epi. cells	No. of Stom-ata	Stom-atal Index
1	1300	156	10.71	704	144	16.98	768	112	12.73	944	112	10.61	884	140	13.67
2	704	144	16.98	816	128	13.56	800	112	12.28	872	136	13.49	908	132	12.69
3	992	144	12.68	736	112	13.21	812	124	13.25	920	120	11.54	956	112	10.49
4	1040	112	09.72	688	112	14.00	760	108	12.44	888	120	11.90	920	108	10.51
5	1064	152	12.50	656	96	12.77	740	116	13.55	944	116	10.94	872	128	12.80
6	1012	140	12.15	708	108	13.24	812	132	13.98	968	100	09.36	836	116	12.18
7	1000	120	10.71	824	128	13.45	824	120	12.71	920	124	11.88	788	112	12.44
8	1380	128	08.49	840	120	12.50	720	84	10.45	924	132	12.50	808	112	12.17
9	1544	156	09.18	800	96	10.71	832	144	14.75	812	108	11.74	784	112	12.50
10	880	112	11.29	1040	32	02.99	916	128	12.26	800	124	13.42	812	124	13.25
Average			11.44			12.34			12.84			11.74			12.27

	VI			VII			VIII			IX			X		
	No. of Epi. cells	No. of Stom-ata	Stom-atal Index	No. of Epi. cells	No. of Stom-ata	Stom-atal Index	No. of Epi. cells	No. of Stom-ata	Stom-atal Index	No. of Epi. cells	No. of Stom-ata	Stom-atal Index	No. of Epi. cells	No. of Stom-ata	Stom-atal Index
1	904	124	12.06	792	108	12.00	824	132	13.81	804	88	09.87	824	124	13.08
2	912	128	12.31	904	116	11.37	800	128	13.79	824	108	11.59	756	116	13.30
3	924	120	11.49	876	120	12.05	872	116	11.74	768	96	11.11	808	116	12.55
4	920	120	11.54	872	120	12.09	828	116	12.29	776	100	11.42	788	104	11.66
5	768	116	13.12	952	96	09.16	876	88	09.13	836	84	09.13	756	88	10.43
6	804	136	14.47	756	116	13.30	832	96	10.34	812	80	08.97	768	84	09.86
7	828	124	13.03	1140	124	09.81	788	108	12.05	776	92	10.59	808	112	12.17
8	908	112	10.98	784	108	12.11	872	120	12.09	828	108	11.54	920	100	09.80
9	792	104	11.61	740	104	12.32	876	116	11.69	872	112	11.38	716	96	11.82
10	804	104	11.45	836	128	13.28	908	116	11.33	804	84	09.46	744	80	09.71
Average			12.21			11.75			11.83			10.51			11.44

Range: 10.51 - 12.84 Mean: 11.84 Standard deviation : 1.81

Fig. VIIIb. *Bacopa monnieri* (Linn.) Pennell - Stomatal index - Lower Epidermis

X - Axis : 1cm = 1 sample
Y - Axis : 1cm = 1 stomatal index



10 SAMPLES FROM SINGLE LEAF

Table II : *Bacopa monnieri* (Linn.) Pennell - Palisade ratio

Leaf No	I				II				III				IV				V			
No. of Pieces	i	ii	iii	iv	i	ii	iii	iv	i	ii	iii	iv	i	ii	iii	iv	i	ii	iii	iv
Readings	2	1	1	1	2	2	2	1	1	2	1	2	1	2	1	2	2	2	1	2
	2	2	2	1	1	1	1	1	2	2	1	1	2	1	2	2	2	1	1	1
	1	1	1	1	1	1	1	2	1	1	2	1	2	2	2	1	2	2	2	1
	1	1	2	1	2	1	1	1	1	1	1	2	2	1	1	1	1	2	1	2
	1	1	1	1	1	1	2	1	1	1	2	1	1	2	1	1	1	1	1	2
Average	1.4	1.2	1.4	1	1.4	1.2	1.4	1.2	1.2	1.4	1.4	1.4	1.6	1.6	1.4	1.4	1.6	1.6	1.2	1.6
Leaf average	1.25				1.3				1.35				1.5				1.5			

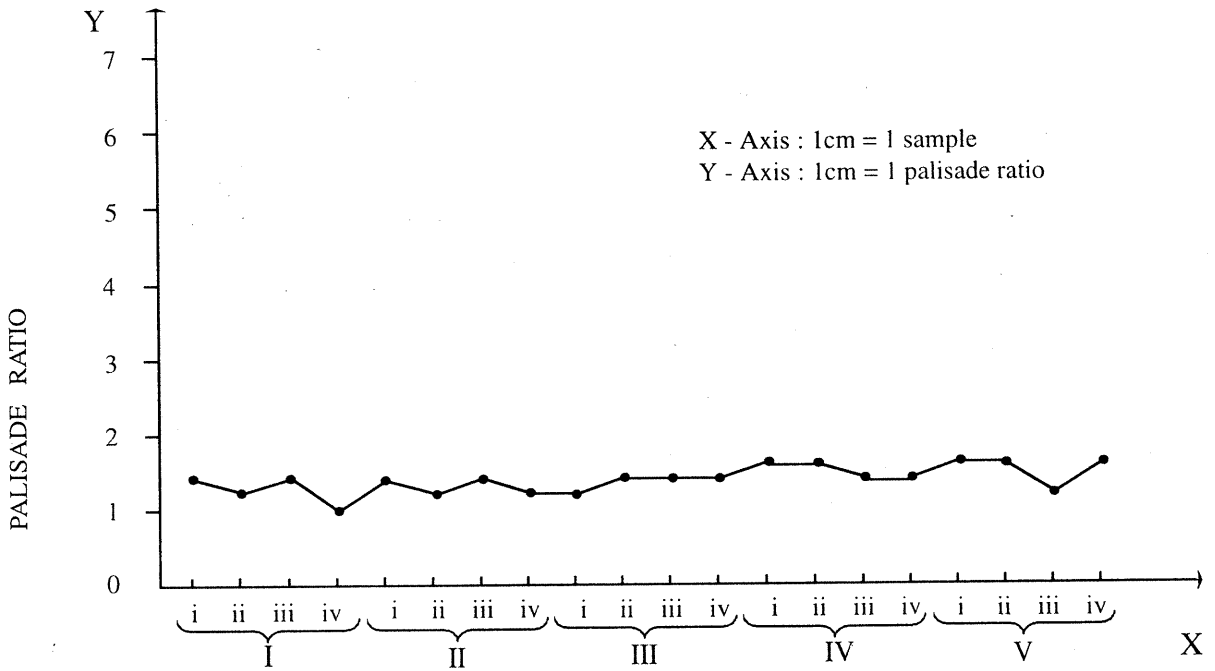
Range : 1.25 - 1.5 Mean : 1.38 Standard deviation 0.49

Table III : *Bacopa monnieri* (Linn.) Pennell - Vein-islet number

Leaf No	I				II				III				IV				V			
No. of Pieces	i	ii	iii	iv	i	ii	iii	iv	i	ii	iii	iv	i	ii	iii	iv	i	ii	iii	iv
Readings	5	4	3	3	1	1	2	4	2	3	2	1	4	2	3	2	1	1	2	1
	4	2	1	2	2	1	1	2	1	2	1	2	2	1	3	2	2	1	2	1
	4	1	0	4	3	2	1	1	1	3	2	3	0	4	1	3	3	2	1	2
	3	2	5	3	2	1	2	3	3	1	2	1	1	3	2	2	3	1	3	1
	6	1	3	2	2	3	2	1	4	2	2	4	1	1	1	1	1	2	1	1
Average	4.4	2	2.4	2.8	2	1.6	1.6	2.2	2.2	2.2	1.8	2.2	1.6	2.2	2	2	2	1.4	1.8	1.2
Leaf average	2.9				1.85				2.1				1.95				1.6			

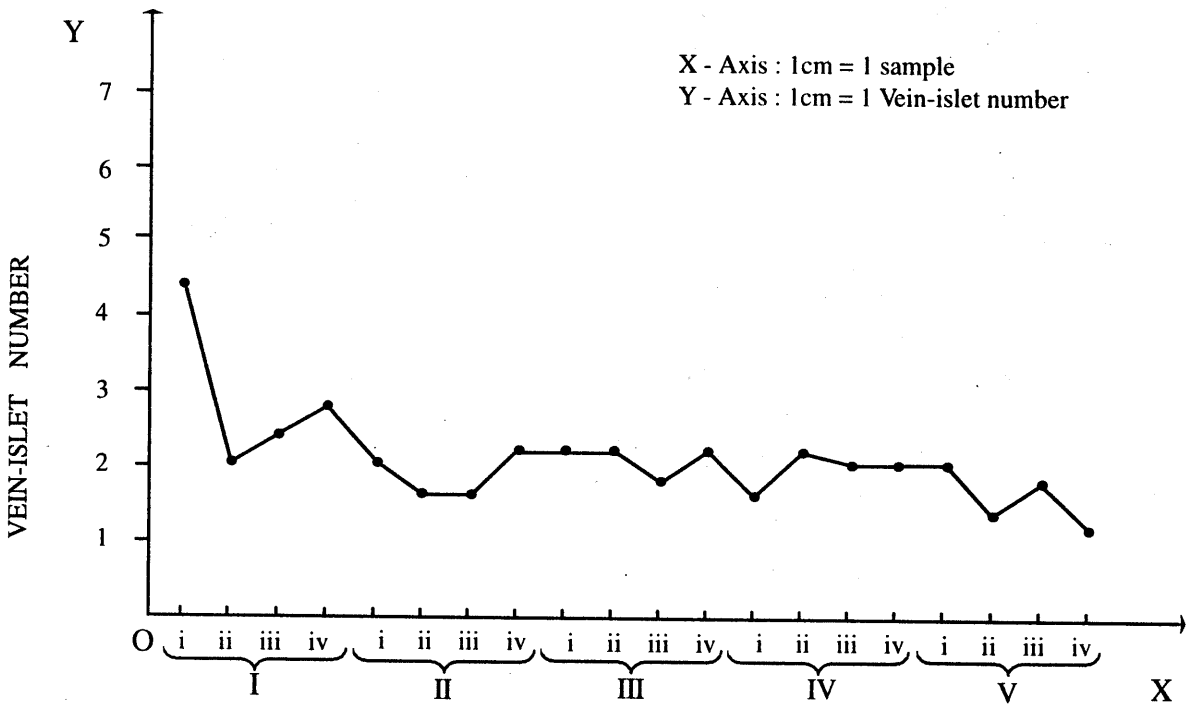
Range : 1.6 - 2.9, Mean : 2.08, Standard deviation 1.14.

Fig. IX *Bacopa monnieri* (Linn.) Pennell - Palisade ratio



20 SAMPLES FROM 5 DIFFERENT LEAVES

Fig. X *Bacopa monnieri* (Linn.) Pennell - Vein-islet Number



20 SAMPLES FROM 5 DIFFERENT LEAVES

of *Bacopa monnieri* have been worked out (Rajesh & Sangwan, 1997).

Result and discussion

In order to satisfy the requirement of this raw drug in large quantities mass scale cultivation has to be under taken. There is a particular variety of this species available in Palghat district, which can grow well even in partially dry land. This variety has erect stems 60-90 cm long. They can be harvested by sickle and are free from mud.

Acknowledgements

The authors are extremely grateful to Dr. P.K. Warrier, The Managing Trustee & Chief Physician (Project Leader) for giving us encouragement and extending the necessary facilities for the work. The constant encouragement and helpful suggestions received from Sri. K.K. Nair I.F.S. (Retd.), Local consultant of the project, Dr. C. Ramankutty, Asst. Factory Manager, A.V.S, Kottakkal, Dr. Indira Balachandran, Research Officer, A.V.S. Herbal Garden, Kottakkal and Dr. G.P. Mukundan, Manager, A.V.S. Herbal Garden, Kanjirapuzha, are gratefully acknowledged. We are thankful to Mr. V.K. Uthaman, Computer Assistant who did the typing work.

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ANTIMICROBIAL ACTIVITY OF *LYGODIUM FLEXUOSUM* SW.

Padhi, M.M., Das, B., Srikanth, N.*, Chopra, K.K. and Mishra, P.R.*****

Abstract: *Lygodium flexuosum* Sw. possesses strong anti-microbial activity against a number of microbes which may be the cause for its action against infective diseases and skin diseases.

Introduction

Lygodium flexuosum Sw. is an annual fern growing in forests, hilly areas, roadsides and rural surroundings. The plant has been described as an expectorant and its root, especially boiled with mustard oil is considered effective remedy for the treatment of eczema and wounds (Kirtikar and Basu, 1935); thus reflecting its activity against microbes which are likely cause of diseases. The paste of its fresh leaves is used by certain traditional practitioners and tribals of western Orissa. It is also reported to be effective in the treatment of eczema (Padhi and Dash, 1993). Its simulation with the nomenclature *rudrajata* is controversial.

On the other hand, among several varieties of eczema; infective dermatitis or microbial dermatitis has been considered to be due to an infective focus produced by bacterial products (Harisson, 1983) and it has also been established that microbes like *streptococci*, *staphylococci*, pathogenic fungi, yeasts, etc. are capable of producing eczematous reaction (Skripkin, 1985). Further, eczema which commences with non-infective status can also acquire secondary infection, especially in persons living in unhygienic conditions and is aggravated due to it. So culture for bacteria, fungus, yeasts, etc. from scrapings of dry eczema and exudates of wet eczema has been considered as one of the important investigations in cases of eczema (Behl, 1990, Davidson, 1997). As such during the course of a clinical study, it was intended to simultaneously conduct an in-vitro study of the anti-microbial effect of the two formulations prepared with this plant.

Materials and methods

Preparation of the drug

The oil meant for topical use in clinical study was prepared using the root of the plant and mustard oil as per principles laid down in

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ayurvedic classics. The second formulation was the alcoholic extract of air-dried fresh leaves of the plant.

Culture and sensitivity study

Method of collection of the sample

Some tubes were sterilised with absorbent cotton attached to a small stick which remains hanging from non-absorbent cotton sealing the tube for collection of exudates in wet eczema. Some tubes were sterilised with non-absorbent cotton sealing the tubes for collection of skin scrapings from dry eczema. The sterilisation was made by keeping these tubes in hot-air oven at a temperature of 170°C for 70 minutes. Each sample was collected in duplicate with all aseptic measures to avoid contamination. The same was transported to the laboratory in thermo-flask with ice.

Culture and identification

Each sample was inoculated in primary isolation media and for bacterial isolation and identification, nutrient broth, nutrient agar, blood agar were used. For fungal isolation Saboraud's agar of pH. 5.8 was used. The skin scrapings were kept in dried condition for nearly 7 days to check bacterial contamination. Then each sample by using nichrome loop were inoculated into duplicate Saboraud's agar slants and one tube was kept at room temperature whereas the other was incubated at 37°C and observed daily for any growth for 7 days prior to declaring it negative.

For the identification of bacteria and fungus the media used for this investigation were nutrient broth, nutrient agar, blood agar, Mac Conkey's agar, brilliant green agar, peptone water, selenite cysteine broth, triple-sugar-iron-agar, simmon citrate agar, Saboraud's agar and for biochemical tests MR, VP, nitrate, malanate and different sugars used for differentiation were lactose, sucrose, raffinose and glucose.

The microbes isolated and identified were *Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Streptococcus* spp., *Corynebacterium pyogenes*, *Klebsiella aeruginosa*, *micrococcus*, *diptheroids*, *Candida albicans* and *Aspergillus niger*.

Testing the efficacy

The prepared oil was coded as 1 and the alcoholic extract was coded as 2 and both these were tested by wet filter paper method and agar cup-plate method as described by Mechant and Packer (1983).

Results

The observation on the effect of the drugs by wet filter paper method revealed that the growth of *Pseudomonas aeruginosa* was arrested after 24 hours in both the groups while none of them exhibited any effect on *streptococcus*, *staphylococcus* as well as mixed fungi.

In agar cup-plate method, it was evident that extract of leaves inhibited growth of all the bacteria isolated and to a lesser extent of fungi. The inhibition zone was greater against *Staphylococcus aureus* as shown by the extract of leaves. While a comparative study was made by putting 2 drops of extract and phenol in different percentage (10%, 5%, 2.5%, 1.25% and 0.625%); the inhibition zone shown by the extract of leaves was comparable with phenolic co-efficient between 5% to 10%.

Discussion

In order to assess possible bactericidal or fungicidal action of the plant *Lygodium flexuosum*, an in-vitro study was conducted by testing alcoholic extract of air-dried fresh leaves and oil boiled with its root as per ayurvedic method against various bacteria, fungi and yeasts. Though some variations were marked in various methods of testing the drug, it was evident that the plant has got definite action against a number of microbes which play a major role in infection of eczematous wound including the test organism *Staphylococcus aureus*. However, it has got little or no action against the fungi.

Acknowledgement

The authors are extremely thankful to Dr. M.S. Badpanda, Principal cum Professor and Dr. N.C, Dash, Lecturer, P.G. Department of Kaya Chikitsa, G.A.M. Puri for their valuable suggestions and guidance in conducting the study.

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A STUDY ON THE ANTIPYRETIC ACTIVITY OF *RUNGIA REPENS* (L.) NEES IN RATS

Arivukkarasu, R.*, Moorthy, P. and Venkatapiah, V.**

Abstract: The different extracts of the aerial parts of the plant *Rungia repens* (L.) Nees was tested for its antipyretic activity in rats. Yeast was used to induce pyrexia. Acetyl salicylic acid was chosen for comparison and control studies were made simultaneously. The extract was given orally 600-mg/kg body weight. There is significantly better antipyretic activity (84.6%) compared to acetyl salicylic acid.

Introduction

Rungia repens (L.) Nees Family: Acanthaceae popularly known in Tamil as *kodagasalai* and in Sanskrit as *parpata* is a herb. Stem is decumbent rooting near the base, leaves are opposite decussately arranged and often found growing as a shade loving weed in moist places, sides of water channels, bunds of paddy fields and also under the shadow area of coconut tree. *Rungia repens* (L.) Nees has been said to be useful as an internal and external remedy as antipyretic, diuretic, vermifugal and applied to the scalp in cases of *tinea capitis*[1,2].

Materials and methods

Preparation of extract

The *Rungia repens* (L.) Nees herb was collected from the moist places near Madurai in paddy fields, sides of water channels and shadow areas of coconut tree. It was identified by Department of Pharmacognosy, K.M. College of Pharmacy, Madurai. After collection of the plant, the root was removed, the aerial part was washed thoroughly in tap water and dried in shade for about 10 – 15 days. This dried plant was powdered and stored in a well closed container for further use. The powdered drug was subjected to successive solvent extraction using petroleum ether, benzene, chloroform, alcohol and water in a soxhlet extractor and decoction was also prepared. Various extracts of the above powder in 0.5% w/v sodium lauryl sulphate were used in the present study. The 0.5% w/v sodium lauryl sulphate served, as control.

Animals[3]

Male wistar strain rats (200 – 250 g) were

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used. The animals were maintained on standard laboratory animal feed for rat (Gold Mohur Feeds, Hindustan Lever Limited), and freshly boiled and cooled water was given. Animals were divided into eight groups consisting six rats each.

Pyrexia induction[4]

Yeast (Tower, Burns Philip India Ltd.) 12% suspension of 1 ml/100g body weight were injected subcutaneously.

Antipyretic activity

Group I was served as control. Animals of Group II received orally 300 mg/kg of body weight of acetyl salicylic acid in suspension and served as standard. Suspension of various extracts & decoction were fed orally at a dose of[5] 600mg/kg body weight to Group III to VIII.

After induction of pyrexia, rectal temperature was recorded 10 hrs later by introducing a clinical rectal thermometer one inch into the rectum and keeping it inside for one minute. The temperature recorded first after 10 hrs of yeast administration was taken as zero hour recording. The control, standard and test substances were given to the animals by gastric tube. After the drug was administered, the temperature of all the rats in each group were recorded at an interval of 1 ½ hrs, 3 hrs and 4 ½ hrs. The mean temperature was found out for each group and compared with the standard drug. The standard error was found out and tabulated (vide Table I.)

Table I. *Rungia repens* (L.) Nees - antipyretic effect of the various extracts compared with acetyl salicylic acid.

Drug	Initial Normal Mean Temperature	Temperature in °C after hour shown (± SE)			
		0hr	1 $^1/_2$hr	3hr	4 $^1/_2$hr
Control	37.6 ± 0.02	39.0 ± 0.08	39.1 ± 0.06	39.2 ± 0.06	39.3 ± 0.05
Standard	37.3 ± 0.18	38.9 ± 0.28	38.4 ± 0.15	37.8 ± 0.23	37.6 ± 0.17
Petroleum ether extract	37.7 ± 0.07	38.8 ± 0.05	38.7 ± 0.09	38.6 ± 0.05	38.4 ± 0.05
Benzene Extract	37.4 ± 0.10	39.2 ± 0.04	39.0 ± 0.06	38.8 ± 0.07	38.7 ± 0.10
Chloroform extract	37.5 ± 0.06	39.0 ± 0.10	38.8 ± 0.02	38.8 ± 0.04	38.5 ± 0.04
Alcohol extract	37.6 ± 0.04	38.9 ± 0.11	38.7 ± 0.07	38.6 ± 0.09	38.3 ± 0.12
Aqueous extract	37.6 ± 0.04	39.0 ± 0.19	38.5 ± 0.16	38.3 ± 0.15	37.9 ± 0.14
Decoction	37.7 ± 0.06	39.0 ± 0.11	38.7 ± 0.11	38.4 ± 0.07	38.2 ± 0.13

± SE Standard Error

Results and discussion

Table I shows the data of different extracts studied for their antipyretic activity. It was found that aqueous extract was showing maximum antipyretic activity (84.6%) when compared to acetyl salicylic acid used as standard. The bioactive principle present in the aqueous extract may be responsible for this effect.

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THE ROLE OF *NASYA* AND *DHOOPA* IN DEMENTIA AND ALZHEIMER'S DISEASE

Madhavikutty, P.*

Abstract: Quite often ayurvedic physicians find themselves obliged to treat diseases like Dementia and Alzheimer's disease. But, it seems that, it is not possible to report any hopeful results. Here an attempt is made to change this impasse as far as possible by a scrutinised investigation into our old techniques of treatments and their evaluation based on the current understanding of the development of nervous system.

Introduction

Diseases manifest when changes take place in the mode of life, environment and social order at different times with predominance of particular symptoms and of various virulence. Whatever may be the disease, when it becomes extensively widespread, it becomes a major problem for science and society. The prevalence of diseases associated with ageing today also seems to have become such a problem. All countries of the world now record an inordinate increase in the number of old people. Since ageing is accompanied by progressive degeneration, the main features in almost all diseases that occur in this stage are loss of vitality (*ojakshaya*) and tissue atrophy (*dhatukshaya*). When this natural, slow degeneration associated with ageing is intensified by long-standing degenerative diseases, both treatment and nursing are made more difficult. Alzheimer's disease is such a disease that creates embarrassment to all systems of medicine and it has so far evaded any proper remedy.

The Malayalam weekly '*Desabhimani*' (issue 44, 9.4.2000) published an article on diseases associated with ageing of the present times, and particularly on Alzheimer's disease. After describing the various aspects of the disease and contemplating on our incapacity to find out a reliable way to deal with this complicated disease, the writer points out to certain developments in research which sheds a ray of hope. In spite of these conditions says the writer, "there is also a ray of hope now looming in the horizon of expectation. Researchers now find that effect can be produced if medicines are administered via nasal cavity." Delivery of medicines through nose (*nasya*) is a traditional ayurvedic practice in treating many diseases associated with eye, nose, ear, throat as well as brain. Therefore

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the compelling question of ayurvedic practitioners today is how to fully utilise the treasury of knowledge in ayurveda to develop an intelligent regimen of treatments to control complex degenerative diseases such as Alzheimer's disease.

"नासा हि शिरसो द्वारं.." (Nose is the opening to head) is an old dictum proclaimed by our *acharyas*, thousands of years earlier. Head is reckoned as the most important part of the body, since the five sense organs and *prana* have their base there and so addressed with the attribute "*uttamanga*" (most elevated). Not only that they consider man, *purusha*, as a tree with its root on the top and branches spread downwards, if the roots are destroyed the whole tree is lost. So the diseases that hamper the head are to be dealt with quickly and eradicated completely.

Out of the 107 *marmas* described in ayurveda, Charaka selects three as the most important ones. They are *siras* (head), *hridaya* (heart) and *vasti* (urinary path). Again, amidst these three *marmas*, the *mahamarma* is head. And for diseases based on it, the most effective remedy is administration of medicines through the nose, *nasya*. The explanation as to how this works, given in Ashtamgasamgraha, demands special attention.

नासा हि शिरसो द्वारम्। तत्र अवसेचितं औषधं स्रोतः शृङ्गाटकं प्राप्य, व्याप्य च मूर्धानं नेत्रश्रोत्रकण्ठादिसिरामुखानि च मुञ्जादिषीकामिवासक्ताम् ऊर्ध्वजत्रुगतां वैकारिकीं अशेषां आशु दोषसंहतीं उत्तमाङ्गादपकर्षति। (अ.सं. सू. 29/2)

The medicine applied through the nose pervades to *sringataka* and by that route the head and openings of *siras* (eyes, ears, neck) and eradicates all accumulated *doshas* that cause diseases of the upper part of the body above neck. The term *sringataka* indicates the spot where four paths converge. What is intended here is the junction of the four paths that come from tongue, eyes, nose and ear. The term *marma* has its derivation from the fact, that injury to certain parts of the body may easily become fatal. But *marma* is a point that can promote vitality also. As it turns to be lethal when hurt, application of light stimulation can create positive enlivening impulses also. Our nervous system is capable of responding to stimulation of pleasure (*preenana*) cleansing (*sodhana*) pacifying (*samana*) and others in a proper manner. So we usually employ varieties of suitable medicines in the forms of *nasyas* (medicated errhines) to meet with different conditions of the *doshas* in diseases of the head.

The current understanding of neuronal development and differentiation as well as how pathogenic microorganisms enter neuronal cell body, probably offer an explanation also for how treatments such as *nasya* become effective in treating brain disorders. The ability of axonal retrograde transport to carry materials (ranging from small molecular to complex microorganisms such as viruses) applied next to the nerve terminals to the cell body of neurons located in brain or spinal cord is well established. For example, the nerve growth factors supplied by the innervated tissue play a crucial role during development and differentiation of neurons. This is well established by several classic experiments using fetus (chick) that show (a) lack of a protruding limb (such as a leg or wing) causes neuronal cell death in the corresponding area of the spinal cord and (b) addition of an extra limb increases the number of neurons at the corresponding area of spinal cord. Therefore it is not surprising that rejuvenating or life-sustaining

molecules that may be present in the medicines administered in the areas of body close to brain (eye, ear, nose, throat, etc.) may get picked up by the neighbouring nerve terminals and get transported to the neuronal cell body by axonal retrograde transport. In fact, the potential of such a treatment in successfully delivering medicines to brain is commendable, since the blood-brain barrier normally imposes severe restraints on what types of molecules can be delivered into neurons, thus making the traditional delivery methods (oral, intravenal, etc.) often unsuccessful.

It is also possible that the molecules in the medicines used may stimulate various receptors present on the nerve terminals and, they in their turn may activate a cascade of events that lead to changes in the functions of neurons. In this respect according to ayurveda the palate (*talu*) in which the *sringataka marmas* are situated hold a special significance. It is the basic site (*moola*) of all *udakavaha srotas* (water bearing body pores) which control the life inspiring processes. (Note that *jeevana*, life giving, is the *karma* of water and *jeevana* is a synonym of water). The stimulation that reaches palate by the nasal route also may have caused neuronal activation which leads to liquid discharge from the mucosal layer. Such liquid discharge is appropriate for cleansing or nourishing the head which bears those organs. Ayurvedic physicians who treat jaundice would have often noted that in extremely aggravated cases when the patient is unconscious, the medicine employed through nasal cavity (powder of the *devadali* (*Luffa echinata*) seed or 8 drops of the juice of its tender fruit strained in breast milk) works causing the discharge of *pitta* and so curing the disease.

Although past few decades have seen unprecedented progress in our understanding of the brain, the brain is still a last frontier. While the wonderful network of communication maintained by brain is highly fascinating, we still have a long way to go to elucidate precisely how this network functions. Though we do know several neurotransmitters and neuromodulators play an important role in this communication network, how the production and distribution of these molecules are regulated to ensure efficient functioning of this communication network is also not clear. It is this lack of knowledge that makes it difficult to treat diseases such as Alzheimer's disease. For example, we do know patients suffering from Alzheimer's disease have loss of cholinergic neurons that result in a severe decrease in one of the neurotransmitters, aceytylcholin. This neuronal loss is severe in regions of brain such as hippocampus and cerebral cortex that are important for memory and learning. We also see the overproduction of an abnormal protein called Beta-amyloid and formation of amyloid plaques which consists of degenerating axons and fibrils of Beta-amyloid. Another abnormal protein, A68, which appears to be an altered version of the 'tau' protein that plays a role in maintaining cytoskeleton is also seen in the 'neurofibrillary tangles', the abnormal bundles of protein filaments, found in the neurons of Alzheimer's disease patients. Thus in summary, several abnormalities that can distruct or obstruct the communication network of neurons are evident in Alzheimer's disease patients. It is very difficult to point out a disease in ayurvedic studies that agree with the symptoms of this malady. But it seems that if we could grasp the nature of the *dosha* provocation and the specific conditions we can formulate

some plans to arrest the course of disease.

"नास्ति रोगो विना दोषैः यस्मात्तस्माद्विचक्षणः ।
अनुक्तमपि दोषाणां लिङ्गैर्व्याधिमुपाचरेत् ॥ "
(सु.सं. सू. 35/19)

Acharya says pointing to such condition.

We have noted that what is happening in this disease is the loss of communication between neurons that affect not only the functions of the post-synaptic neurons (that may not receive sufficient acetylcholin) but also the functions of other neurons to which the above post-synaptic neurons make afferent connections. Thus many regions of this communication network of brain start malfunctioning, even if only a few neurons of particular kind are lost. In all such contexts, the common measures of treatment suggested by ayurvedic texts are *dhoopana* (exposing to fumes), *nasya* (errhines with medicine), *anjana* (applying collyriums) and administration of old ghees.

Many are the formulae suggested for *dhoopana*. Varieties of *dhoopanas* are seen prescribed in a number of diseases as *unmada* (insanity), *apasmara* (epilepsy), *bhoota* affections, wounds, fever, etc. *Dhoopana* is prescribed as the best remedy, to remove the looseness and hardness in wounds. A particular *dhoopana* prescribed in the treatment of *jvara* (fever) has to be deemed as of special significance.

पुरध्यामवचासर्जनिम्बार्कागुरुदारुभिः ।
धूपो ज्वरेषु सर्वेषु प्रयोक्तव्योऽपराजितः ॥
(अ.हृ. चि. 1/161)

Here what is pointed out is that it is good for all *jvaras*. The word *jvara* is a synonym of disease in ayurveda. It has to be taken as to mean that it is good for treating all diseases except those where *dhoopana* is contraindicated. In diseases of the head (ear, nose, throat and eye) various types of *nasyas*, *anjanas*, *gandushas* (filling of the mouth, gargling) are prescribed. *Purana ghritas* (old ghees) are also prescribed.

In the context of the treatment for diseases due to *vata* affecting the head, one of the prescriptions is a particular *nasya*.

बलाविल्वशृते क्षीरे घृतमण्डं विपाचयेत् ।
तस्य शुक्तिः प्रकुञ्चो वा नस्यं वाते शिरोगते ॥
(अ.हृ. चि. 21/62)

This *yoga* deserves special attention. This is prepared not with ghee as it is, but by taking the upper layer of the ghee (घृतमण्डम्). The upper layer is the unsolidified layer of the melted ghee that is very clear (transparent). This is also the lightest part of the ghee. According to the author of Ashtamgasamgraha, this layer of ghee (*ghrita manda*) is equal to old ghee. This is *rooksha* (dry) *teekshna* (acute) and *tanu* (thin). *Purana ghrita* is reputed in diseases as *unmada*, *apasmara*, *moorcchayam* (swoon due to *mada*), etc. that hamper consciousness and in all diseases of head, eyes, nose and ear. More than that, it has the properties of purifying and healing wounds. It removes the toxins produced by decayed and dead cells, purifies the wound and helps promotion of new healthy cells that can redress the wound. The *acharyas* give so much importance to *purana ghrita* because they have firm conviction that as in the case of the cells of the other parts of the body, that of the *uttamanga*, the brain, the base of intelligence, also can be regenerated by the use of *purana ghrita*. The best medicine for it they believe is *ghrita* (ghee,

particularly old ghee). According to them, *mastishka* or *mastulunga*, is *kapala majja* (the *majja* – marrow inside the skull). They refer to it as of two types like solid ghee (स्त्याम घृताकारं) and melted ghee (विक्रीतघृताकारम्). We see in Charaka samhita, although with somewhat indistinctness some statements regarding the form, content and action of *mastishka* (brain) which agree with these references (vide *Siddhi sthana*, nineth chapter). When describing *sooryavartta*, Charaka says.

सन्धारणादजीर्णाद्यैर्मस्तिष्कं रक्तमारुतौ ।
दुष्टौ दूषयतस्तच्च दुष्टं ताभ्यां विमूर्च्छितम् ॥
सूर्योदयेऽशुसंतापाद्द्रवं विष्यन्दते शनैः ।
ततो दिने शिरःशूलं दिनवृद्ध्या विवर्धते ॥
दिनक्षये ततः स्त्याने मस्तिष्के संप्रशाम्यति ।
सूर्यावर्तः स.....॥

(च.सं. सिद्धि. 9/79-81)

"By the blocking of natural urges (*vegarodha*) and by indigestion or other troubles, *vata* and *rakta* get vitiated and vitiate the brain. After sunrise, because of the heat of the rays the brain which is already vitiated by *vata* and *rakta*, being melted, starts to discharge liquid. Then headache starts and as the heat of the sun increases, the pain also increases. After the noon, when the heat gets abated, the brain becomes bland (solid) and the pain gradually reduces. This is the malady named *sooryavartta*. Here although the description that like ghee on conduction of heat, the brain gets melted and when heat is gone it is solidified, may sound a little bit fanciful, the rest catch our attention. Since the impurities created during the processes of the metabolism in brain are transferred at first to the cerebro-spinal fluid and from there to the circulatory system of the blood, the purificatory process is continued. In the ordinary course we are not aware of these happenings. But due to malpractices such as holding of the natural impulses and indigestion and others, *rakta* and *vata* get vitiated. This leads to the vitiation of the brain also and the quantity of the impurity that is ejected to the cerebro-spinal fluid elevates causing severe headache. Since *rakta* and *pitta* are inseparably interconnected the pain becomes extreme at noon which is the time of *pitta*.

The similarity in the form between ghee and brain, as well as the discovery that ghee improves intelligence (an idea supported by the experience of series of generations) may have led our preceptors to the notion that in diseases related to head, ghee, particularly old ghee, can be the best medicine.

But in all these contexts, usually old ghee (*purana ghrita*) is seen suggested for intake (drinking), although *abhyanga* (inunction) and *nasya* also are suggested. But the medicated ghee, *Balavilvadi*, mentioned earlier is indicated only for *nasya*, that too in the highest dose (as *sukti* or *prakuncha* – one *palam*). Oil is the topmost medicine for *vata*. But in contexts when *vata* affects the head, which is the seat of *kapha* (वाते शिरोगते), what is prescribed for *nasya*, is ghee, which is not the best medicine either to *vata* or *kapha* since ordinary ghee by properties is mild, smooth and with cold potency and also creating exudation of *kapha*, it is not sufficiently efficient to remove the blockage of the body channels (*srotorodha*). And since the old ghee is with sharp and offensive smell and with acrid and bitter tastes, it may provoke *vata* and create emaciation. Now it seems that in formulating the above described combinations care is taken

not to provoke the *dosha* (*sthani dosha*) but helps to tonify the brain. When it is described that the *ghrita manda* is harsh and acute, the comparison is only with the property of *ghrita* (ghee). We can try such preparations, in condition of decrease or loss of brain cells.

At the end of all operations as *vamana*, etc. the use of *snehas* are advised to strengthen the weakened tissues and compensate the decreased aspects (स्नेहमन्ते बलाय च). Even after *samyakyoga* of *nasya*, Susruta suggests to administer a *nasya* with ghee (सर्पिर्नस्य). This points to the potential power of ghee to improve the strength of the brain.

Thus in summary, ayurveda does offer a series of treatments, to abate or even cure the diseases that afflict the upper parts of the body (including brain) and that create clouded consciousness. The most prominent methods are *nasya, dhoopana* and the use of old ghee. The strength of these treatments lies in the existence of natural routes to brain for the delivery of rejuvenating and life-sustaining molecules in the medicines that may command the afflicted cells to change their ways, to stop the production of abnormal proteins and to exert regulations in their functions. Axonal retrograde transport is an existing pathway that is used by neurons to obtain nerve growth factors. Similarly, the existence of various receptors at the nerve terminals they may get activated by the application of medicines is also a natural mechanism. Activation of these receptors may initiate a cascade of events (also called signal transduction) that may send direct message to the nucleus of the neuronal cell and change the pattern of gene expression and protein production. While which specific molecules in these medicines are responsible for their beneficial effects in diseases associated with head is a question for intense research, natural pathways exist for them to exert their effects on neurons is an accepted fact. That is why I believe the statement in Kasyapasamhita that "the lord of fire (*Agnideva*) told the sages that worshipping him (*dhoopanam*) will cure all diseases" cannot be just a myth. Today, it is an accepted fact that gases (such as nitric oxide) can function as neurotransmitters and neuromodulators. They are more potent than the traditional neurotransmitters such as acetylcholin that can pass from one neuron to another only via synapse. The gases, being small molecules, are capable of passing through cell membrane and therefore have the ability to enter into many neurons and exert their effects at the same time. That may be why gases generated by burning medicinal herbs can find their way to neurons without any difficulty and regulate their functions. Again which gases are being produced during the burning of medicinal herbs and how they alter the cellular and molecular mechanisms of neurons is a question yet to be answered. Nevertheless, the fact remains that ayurveda can offer a regimen of treatments that have high potential in abating (even curing) the difficulties of Alzheimer's disease patients.

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RASAVAISESHIKA - XX

Raghavan Thirumulpad, K.*

Abstract: In the second chapter, which deals with *dravya* elaborately, in the context of *rasa* it was postponed as it has to be described more elaborately (परस्तादुपदेक्ष्यन्ते रसाः). Now in the third chapter, *rasa* is discussed in its all aspects. Here, Bhadanta Nagarjuna explains why *rasa*s are considered as six in number. Elaborating the *sootra*s with the help of judicious supporting arguments, he establishes that *rasa*s are six only.

01. रसगतो विचारः प्रस्तूयते ॥

रसगतः विचारः प्रस्तूयते ।

(Here the subject of *rasa* is being introduced.)

02. मधुराम्ळलवणकटुकतिक्तकषायाः षड्सा: ॥

रसाः मधुराम्ळलवणकटुकतिक्तकषायाः
षट् भवन्ति ।

[*Rasa* (tastes) are *madhura*, *amla*, *lavana*, *katu*, *tikta* and *kashaya*, six in number.]

The number is specified as six to repudiate other opinions such as seven, eight etc,

03. क्षारमेके सप्तमम् ॥

एके क्षारं सप्तमं रसं मन्यन्ते ।

(Certain authorities consider *kshara* as the seventh *rasa*.)

When evaluating *dravya*, *kshara* is included as a quality (*guna*). *Oudbhida* is a little *tikta*, *katuka* and *kshara*, *teekshna* and *utkledi*.

04. अव्यक्तमष्टममित्येके ॥

एके अव्यक्तं अष्टमं रसं आहुः ।

(Certain *acharya*s consider *avyakta* as the eighth *rasa*.)

तन्वव्यक्तरसं मृष्टं शीतं लघ्वमृतोपमं ।
गंगाम्बु नभसो भ्रष्टम्.....

The rain water, which drops from the sky which is called *gangambu* is not contaminated by the aspects of the surroundings, is very light, *seeta veerya*, pleasing, just like nectar and *avyakta* in taste.

05. षट् सूत्रकारप्रामाण्यादास्वादाच्च ॥

सूत्रकारप्रामाण्यात् आस्वादात् च रसाः षट् ।

(On the authority of the *acharyas* who wrote the scriptures and in the experience of the taste, *rasa*s are six in number.)

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Aptavakya is considered as the final authority in *sastra*. It is the scriptural evidence. It is traditional authority. Tradition is the sum total of the experience of ages. We can differentiate between *rasa*s; each *rasa* is associated with its particular *guna*s and *karma*s. By identifying with particular *guna* and *karma* there are only six *rasa*s. The six *rasa*s are separately identified and where *rasa* is not particularly identified, it is *avyaktarasa,* a particular *rasa*. As there are such *dravya*s also in experience, some argue that *avyaktarasa* is a particular *rasa*. But *avyaktarasa* does not mean that it is tasteless. It means only that the taste is not particularly identified or enjoyed. *Dravya* is said to be द्रव्यमाश्रयलक्षणं पञ्चानाम्.

Dravya is something which possesses the other five *padartha*s, *rasa, guna, vipaka, veerya* and *karma*. If something is tasteless, it cannot be identified as *dravya* – so no *dravya* can be called tasteless. Every *dravya* has its *rasa*, but in some *dravya* the taste is not clear, *avyakta*. In them, the taste can only be said to be not differentiated. Light is understood by the eyes and its absence, darkness, also can be understood by the eyes. Anything that is understood by the tongue, *asvada* is *rasa*. So *avyakta* also is strictly speaking a *rasa*. Actually, it is not the absence of any *rasa,* but it means only that in it the *rasa* is not manifested as to be identified. Here a doubt is raised:

06. तत्रैकैकत्र प्रसक्तमनेकत्वम् ॥

तत्र एकैकत्र अनेकत्वं प्रसक्तं ।

(Here in every *rasa* there can be multiplicity.)

There are many sweet things in this world, and the sweetness of each sweet thing is distinguishably different in taste. That is the case with other *rasa* also.

07. तीव्रमन्दविशेषात् ॥

तीव्रमन्दविशेषात् ।

(Because of the difference due to being more predominant and less predominant.)

Sweetness of some sweet *dravya* is severe, and of some mild, such differences also cause multiplicity in each *rasa.*

08. आस्वादविशेषात् ॥

आस्वादविशेषात् ।

(Due to difference in experience of the taste.)

Jaggery is sweet, sugar is sweet but the difference in sweetness is distinguishable in actual taste. It is not just severity, or mildness. Actually the taste is different, though all these things are said to be sweet.

09. संसर्गविशेषात् ॥

संसर्गविशेषात् ।

(Due to the difference in *samsarga.*)

Visesha means difference. *Samsarga* means the different parts of the very same thing. The sweetness of each part of sugarcane is different.

10. द्रव्यविशेषात् ॥

द्रव्यविशेषात् ।

(Due to difference of the *dravya.*)

Each *dravya* has its own taste (sweetness, etc.).

11. गुणविशेषात् ॥

गुणविशेषात् ।

(Due to the difference in the associated *guna.*)

Milk is sweet, *yashtimadhuka* also is sweet. Each sweetness is different. Milk is *guru* but *yashtimadhuka* is *laghu*. So *madhura* in association with the *guru guna* is different and the *madhura* in association with *laghu* is different in action also.

12. वीर्यविशेषात् ॥

वीर्यविशेषात् ।

(Because of the difference in *veerya.*)

Veerya is *karmalakshana*. *Veerya* is inferred with action of the *dravya – amla kapitha* is constipating, but *amla amalaka* is laxative. Constipating denotes the *veerya* of *kapitha* and laxative denotes the *veerya* of *amalaka* – though with the same *rasa,* the *veerya* makes the difference in the action of the two *dravyas*.

13. विपाकविशेषात् ॥

विपाकविशेषात् ।

(Because of the difference in the *vipaka.*)

Just like *veerya*, the associated *vipaka* also makes difference in the taste. *Vipaka* is said to be of two kinds, *guru* and *laghu*. *Guruvipaka* causes indigestion and *laghuvipaka* promotes digestion. Milk, though sweet is *guru* in *vipaka;* ghee also though sweet is *laghu* in *vipaka.*

14. कर्मविशेषात् ॥

कर्मविशेषात् ।

(Due to the difference in action.)

Milk promotes longevity and is tissue building. *Puranaghrita* (ghee kept for many years) is *lekhana*, reduces fat. Both are sweet. The difference is in the associated *karma*.

15. विदाहविशेषात् ॥

विदाहविशेषात् ।

(Due to the difference in fermentation.)

The sweetness in the fish causes fermentation, but the sweetness in milk does not cause fermentation. That shows the difference in *rasa* caused by fermentation, *vidaha.*

16. उपरसविशेषात् ॥

उपरसविशेषात् ।

(Due to the difference in the associated *rasa.*)

The *dravya* will have a particular *rasa*, some *dravya* may have *anurasa. Anurasa* is *rasa* manifesting subsequently, or not prominently. Honey is sweet, but it has *kashaya* as *anurasa. Anurasa* is not as prominent in action as the predominant *rasa*. Because of these differences, it is argued that we cannot strictly and definitely say that *rasas* are six in number.

17. दृष्टमेभिर्विशेषणम् न रसान्तरम् ॥

एभिः विशेषणं दृष्टं न रसान्तरं ।

(With these particulars, only the difference is seen, not particularity of *rasa.*)

When we are asked to bring something sweet, we can bring sugar, jaggery, honey, etc., anything sweet. Sugar, jaggery, honey, etc., each has its particularity, but the particularity does not indicate that it is not sweet.

18 रसत्वसामान्यादेकत्वमेव न षट्त्वम् ॥

रसत्वसामान्यात् एकत्वं एव, न षट्त्वं ।

(Due to the common aspects that the six *rasas*

are *rasas*, *rasa* is one, not six.)

Madhura, etc. are *rasas*, appreciated by the tongue as such *rasa* is only one. रस्यते गृह्यते रसनयो इति रसः. The argument is answered thus.

19. गुणत्वसामान्ये सत्यपि गुणभेदवद् रसभेदः ॥

गुणत्वसामान्ये सति अपि गुणभेदवत् रसभेदः ।

(Even though all *gunas* just as the difference in *gunas* these difference in *rasa*.)

The *gunas*, *sabda, sparsa, roopa, rasa* and *gandha* are all *gunas* being grasped by the *indriyas* (senses). But each *guna* is different in experience.

20. भिन्नेन्द्रियग्राह्यत्वात् ॥

भिन्नेन्द्रियग्राह्यत्वात् ।

(The *gunas* are different because each *guna* is grasped by its own *indriya*.)

Gandha (smell) is grasped by the nose, *rasa* (taste) by the tongue, *roopa* (colour) by the eyes, *sparsa* (touch) by the skin and *sabda* (sound) by the ears. The particular *guna* is grasped by the particular sense organ. So there is difference in *guna*. Though all these *gunas* are grasped by the *indriyas*, each *guna* is grasped by a separate *indriya*. Each *indriya* can grasp only its particular *guna*. So each *guna* is particularly different from the other *guna*.

21. कारणभेदात् ॥

कारणभेदात् रसभेदः ।

(Because of the difference in the causative element, there is difference in *rasas*.)

Madhurarasa is caused by the predominance of *bhoomibhoota* and *jalabhoota* in the *dravya* when it is formed. *Amlarasa* is caused by the predominance of *bhoomibhoota* and *agnibhoota*, etc. Because of the difference in the causative factors, the *rasas* are different in nature.

22. मूर्छनभेदात् ॥

मूर्छनभेदात् रसभेदः ।

(Because of the difference in *moorcchana* there can be different *rasas*.)

Moorcchana can mean fermentation, the opposite of fermentation is pacification.

कट्वम्ळलवणा वैद्यैर्विदाहिन इति स्मृताः ।
स्वादुतिक्तकषाया स्युर्विदाहरहिता स्मृताः ॥
विदाहिनो रसा मूर्छा जनयन्तीति निश्चिताः ।
अविदाहिनस्तच्छमना कीर्तिता भिषगुत्तमैः ॥

The *rasas katu* and *lavana* cause fermentation and vitiation. Three *rasas* - *madhura, tikta* and *kashaya* control fermentation and pacify. Here specific action is attributed to the *rasas*, the difference in action denotes variety in *rasa*.

23. परिणामभेदात् ॥

परिणामभेदात् ।

(Because of the difference in *parinama, paka*, there have to be difference in the *rasas*.)

There are two kinds of *paka* (*vipaka*), *laghuvipaka* and *guruvipaka*. *Laghuvipaka* gets easily digested and *guruvipaka* is not easily digested. *Katu, tikta* and *kashaya rasas* are *laghuvipaka* and *madhura, amla* and *lavana rasas* are *guruvipaka*. Such experience also indicates that there is difference in *rasa*.

24. लिङ्गभेदात् ॥

लिङ्गभेदात् ।

(Because of the difference in particulars.)

Particulars are specific actions. Each *rasa* in the *dravya* generates its own particular action. We can distinguish the *rasa*s because of their particular actions.

25. लिङ्गं पुनर्मधुरस्य ह्लादनं श्लेष्मजननं कण्ठतर्पणम् । हृद्यत्वं दन्तहर्षः प्रस्रावणं प्रक्लेदनं चाम्लस्य लवणस्य विसरणमुष्णत्वं प्रसेचनं च । कटोर्जिह्वाघ्राणबाधः उद्वेगः नासास्रावः शिरोग्रहश्च । तिक्तस्य हर्षणं हरिमता शैत्यमास्य गळद्वारशोषणं च । कषायस्य मुखपरिशोषः श्लेष्मसंवृत्तिः गौरवं स्तंभश्च ।

लिङ्गं पुनः मधुरस्य ह्लादनं श्लेष्मजननं कण्ठतर्पणं च । अम्लस्य हृद्यत्वं दन्तहर्षः प्रस्रावणं प्रक्लेदनं च । लवणस्यविसरणं उष्णत्वं प्रसेचनं च । कटोः जिह्वाघ्राणबाधः उद्वेगः नासास्रावः शिरोग्रहः च । तिक्तस्य हर्षणं हरिमता शैत्यं आस्यगळद्वारशोषणं च । कषायस्य मुखपरिशोषः श्लेष्मसंवृत्तिः गौरवं स्तंभनं च ।

(As to the particular actions of the *rasa*s, the particularity of *madhura* is *hladana, sleshmajanana* and *kanthatarpana.* Of *amla* is *hridyatva, dantaharsha, prasravana* and *prakledana*, of *lavana* is *visarana, ushnatva* and *prasechana*, of *katu, jihvaghranabadha, udvega, nasasrava* and *sirograha*, of *tikta harshana, harimata, saitya* and *asyagaladvarasoshanam*, of *kashaya mukhaparisosha, sleshmasamvritti, gaurava* and *stambhana.*)

Hladana is pleasing. Tasting something sweet is pleasing not only to the tongue, but to the mind also. It increases *kapha*, particularly in the throat. *Kanthatarpana* is satisfying the throat. All these particulars happen even at the time of enjoying the *rasa*, need not wait till it is digested and assimilated. *Kanthatarpana* is a condition when it is felt as if the throat is full of it. *Hridya* means beneficial to the heart, as well as soothing to the mind. *Dantaharshana* is that which benumbs the teeth. *Prasravana* is oozing of water in the mouth. *Prasravana* causes moistening the mouth, throat, etc. *Prakledana* can mean that even by seeing someone else chewing *amladravya*s, the mouth waters. *Lavana* has *visarana* which means that it quickly spreads throughout the system. Anything taken with salt is easily digested and assimilated. *Ushnatva* means heat producing. *Prasechana* means irrigating with water oozing into the mouth, throat, etc. *Katu* irritates the tongue and nose (*jihva* and *ghrana*). *Udvega* means hate, cannot take too much. *Nasasrava* is oozing through the nose. *Sirograha* is steadiness of the head, the head not being able to turn one way or other, as if firmy held causing pain. *Tikta* causes *harshana*, numbness, *harimata* - the smell of turmeric, in the palate. It makes the mouth feel cold, dries the throat. *Kashaya* causes dryness in the mouth, solidification of *kapha* (*sleshmasamvritti*), heaviness in the face area, inability of the tongue. These are the symptoms (*lakshana*) of each of the six *rasa*s. The *rasa*s are six in number, as in experience, only six kinds of combinations of symptoms are experienced with the use of the *rasa*s. These symptoms are experienced with the use of the *rasa*s. These symptoms can be explained with the particular *bhoota*-combination in the manifestation of the particular *rasa*.

26. तीव्रमन्दत्वादौ सत्येकत्वमवियोगात् ॥

तीव्रमन्दत्वादौ सति अपि अवियोगात् एकत्वं ।

(Even though there is difference with regard to intensity as to *teevratva* and *mandatva* due to the taste being not changed, the sameness of the particular *rasa* can be understood.)

The taste, sweetness, etc. can be intense or light but it is the same. The taste can be differentiated by the symptoms, even if there is difference in the intensity, the same *rasa* has the same symptoms, *lakshanas*. If by intensity or lightness, the *rasa* becomes different, it will not be possible for us to say, for example, "please add a little more sugar to make the coffee sweeter".

27. इतरेतरप्राधान्यात् ॥

इतरेतरप्राधान्यात् मधुरादीनां एकत्वं ।

(Because of mutual importance, *madhura,* etc. has to be the same.)

Itaretara means *anyonya, paraspara,* mutual. The sweetness of this *dravya* is more intense than that of that *dravya.* Milk is sweet, and sugar is also sweet. But the sweetness of milk is lighter than that of sugar. That is why sugar is added to milk to make it sufficiently sweet to be enjoyable to the tongue. If lightness or intensity makes some other *rasa,* that cannot be possible. So intensity or lightness has to be of the same *rasa.* So there are only six *rasas.*

28. लोकोपचारात् ॥

लोकोपचारात् मधुरादीनां एकत्वं भवति ।

(Because of the habit of the common people, in spite of the difference in intensity, etc., *madhura* is one *rasa,* so are the other *rasas.*)

In the world, common people understand *madhura,* etc. as one *rasa* in spite of the difference in intensity. They consider and say sugar is sweet, jaggery is sweet. But there is difference in the intensity of the sweetness in sugar and jaggery. They say *saindhava* (rocksalt) is salty, *samudra* (common salt) is salty, in spite of the difference in intensity.

29. प्रतिनिधिकरणात् ॥

प्रतिनिधिकरणात् मधुरादीनां एकत्वं भवति ।

(Using instead *madhura,* etc. are one and the same.)

We add sugar to make the drink sweet. But we use jaggery for sweetness, if sugar is not available. Thus we know that in spite of the difference in intensity, etc. sweetness is sweetness whether in sugar or in jaggery or in honey.

30. अविशेष्योपदेशात् ॥

अविशेष्योपदेशात् मधुरादीनां एकत्वं भवति ।

(As the texts indicate the symptoms and actions of each *rasa* without differentiating the difference in intensity, etc., *madhura,* etc. are each one *rasa,* in spite of the difference in intensity.)

षड्रसं मधुरप्रायं - the food should contain all the six *rasas,* with predominance of *madhura.* In the texts, the symptoms and actions of each *rasa* are explained generally, not according to its intensity. *Teevramadhura* (intense *madhura*) and *mandamadhura* (light *madhura*) are not explained with regard to symptoms and action. The difference is only in the reaction created in the body. Here *madhura* signifies starch, cereals, rice, etc.

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AYURVEDA – AN EXPOSITION

Nagaratnam, A.*

Abstract: Ancient Hindu knowledge, in the field of medicine is termed ayurveda. "There was really no *veda* called ayurveda. Its existence is a myth. Susruta calls it an *upanga* of the *Atharvaveda*. It was raised to the status of a *veda* and appended to the *Atharvaveda* to give the science of medicine the necessary sanctity and authority". In this article, the author, with sufficient examples, establishes that the contents of the *samhitas* are scientific and more advanced and authoritative than the present day knowledge of modern medicine. Ayurveda is a real *veda* and contains eternal 'Truths' only. *Veda* is the direct knowledge and the present day sciences are the result of indirect knowledge.

Introduction

Ancient Hindu civilization is one of the oldest civilisations. Before it went into quiescence due to unknown reasons, they left evidences to make us understand that, they reached the Zenith of knowledge in all the fields of science, technology, language, art and culture. Ayurveda is one such knowledge.

Charakasamhita and Susrutasamhita are the only two compendiums, preserved, and handed over, at least in apparent completeness, in the first century A.D. Up to the late nineteenth century, these two books have been copied down, commented upon and thus propagated. Later authors like Vagbhata the elder, and the younger wrote separate treatises on ayurveda. They are Ashtangasangraha and Ashtangahridaya respectively. Then came a series of treatises both in the north and south. Unfortunately none of these treatises were able to shed any light on the obscurities and hidden truths contained in the Charaka and Susruta *samhitas*. Also no additional information or improvements over the theory or practice of ayurveda have been made by the later authors. *Rasatantra*, a new method of therapeutics has been added to ayurveda at the beginning of the Christian era.

During the later half of the nineteenth and twentieth century, a number of foreign and Indian scholars took interest and made a critical study on the ayurvedic literature and published many books. The general opinion is that ayurveda is based on the philosophical and

* *24/150, Mulapet, Nellore, A.P.*

magico-religious tenets of ancient India, which are no match to the twentieth century technology and science. But they do say that the knowledge of *marma,* the surgical procedure of cataract and rhinoplasty and the method of studying anatomy by dissection, as enumerated in Susrutasamhita are a few thousand years ahead of the age in which it was composed. Thus ayurveda is described as a primitive medical science with some rare points of elegance.

Of all these opinions, that given by H.W. Rawlinson in his 'India in European Literature and Thought' is worth noting. According to him "India, suffers today in the estimation of the world, more through the world's ignorance of her achievements than in the absence or insignificance of these achievements".

This statement is well borne out in the case of ancient Indian Medicine. The achievements of Indians in the field of medicine are but imperfectly known to the world even today, writes Dr. P. Kutumbayya in his 'Ancient Indian Medicine'.

We have reached the 52nd year of independence. If we review the status of ayurveda in spite of nearly forty or even more of post-graduate institutions teaching ayurveda, we are ashamed to note that no attempt is made to give a perfect picture of ayurveda to the world. On the other hand, ayurvedic texts are tortured to read into them modern teachings through forced comparisons and fanciful interpretations. Hence captain G. Srinivasa Murthy opined that "Where the import of the ayurvedic texts, as understood in their ordinary and natural meaning, is in harmony with the teaching of modern allopathy on a particular topic, well and good; we will do well to follow the lines of such fruitful studies and investigations. That would be a real service to both ayurveda and allopathy".

"Where however, the harmonising of the two teachings is not yet possible in regard to any particular topic when the relevant ayurvedic texts are understood in their own natural and ordinary meanings, we must not proceed to have recourse to forced and fanciful interpretations as though the final test of the validity of an ayurvedic teaching is its agreement with the allopathic teaching on the topic. The ultimate test as to which of the two different teachings on any particular topic should be more acceptable to us should surely be not what label of allopathy or ayurveda it bears but which of them explains better the facts of experience and works better when applied to problems of health and ill-health".

The same opinion is expressed by Dr. P. Kutumbayya. "No doubt there is a temptation, a very strong one at the present time to make too much of the ancient inchoate notions; not only to interpret them in the light of modern opinions but also to model them on modern patterns and to read into them notions them undiscernible. They are making an attempt to reinterpret the old ayurveda, model it on modern patterns, and thus create a neo-ayurveda, not based on the real ayurvedic conceptions, but on their own conceptions of what ayurveda should be. They are attempting to face-lift the old ayurveda and give it a "new-look". Ayurveda looks very venerable and dignified in her own ancient lineaments but with this "new-look" given to her she looks like a flirt coquetting

with modern medicine for petty favours and recognition". Dr. R. D. Lele in his 'Ayurveda and modern medicine' said that his approach to the study of ayurveda had been guided by the quotation of Thomas Henry Huxley in 1881, which is as follows. "It is easy to sneer at our ancestors – but it is much more profitable to try to discover why they, who were really not one whit less sensible persons than our own excellent selves, should have been led to entertain views which strike us as absurd". To this Dr. Lele has not given any answer in his book. But in my opinion our ancestors are more sensible in what they said.

Pandit Jawaharlal Nehru once said that the only right approach has to be one of science. Then what is this thing called science? The question "What ? How? and Why?" are being asked constantly and sought to be answered by science, which is a system of accurate and related knowledge. Science is a structure built on facts. Scientific knowledge is proven knowledge, hence reliable knowledge; it is objective and verifiable knowledge. Endeavour of science has been to bring man's study of nature into the realm of rational and experimental analysis away from the supernatural. It is essential to understand science as a historically evolving body of knowledge. The scientific method essentially consists of four steps; 1) Observation, 2) Hypothesis formulation, 3) Hypothesis testing by experiment and 4) Induction. Derive general principles from observations, and apply these principles to make predictions.

With the above background let us verify whether ayurveda is fit to be called a science; whether it contains ancient inchoate notions; whether it requires face-lifting; and whether the views entertained by our ancestors are absurd.

Nomenclature

The knowledge about all the aspects of "Life" which forms a part of the prehistoric Hindu civilization is named "Ayurveda".

Dr. P. Kutumbayya in his 'Ancient Indian Medicine' says, "There was really no *veda* called ayurveda. Its existence is a myth. Susruta calls it an *upanga* of the *Atharvaveda*. It was raised to the status of a *veda* and appended to the *Atharvaveda* to give the science of medicine the necessary sanctity and authority. In accordance with the traditional origin of the *veda*s, it was supposed to have been divinely revealed to the sages. There are two versions of its origin. The medical school traces its origin to Bharadhvaja, who received it from the God Indra. The surgical school traces its origin to Dhanvantari who received it also from this God."

The authors of the *samhita*s called the knowledge of life, which they recorded, as ayurveda since it is the *veda* of *ayus* (life). They would have called it the *sruti* of *ayus, amnaya* of *ayus*, science of *ayus*, *tantra* of *ayus, sastra* of *ayus* or with some such other names. But they preferred to call it a *veda* of *ayus* and why is it so called? If this is answered, it clears many questions about the scientific validity of ayurveda.

The first human originator of this knowledge about 'Life' was a *rishi*. The name of the knowledge, *veda,* is the received name for the highest spiritual truth of which the human mind is capable. According to Sri Aurobindo "*Veda*,

then is the creation of an age anterior to our intellectual philosophies. In that original epoch thought proceeded by other methods than those of our logical reasoning and speech accepted modes of expression. This, in our modern habits, would be inadmissible. The wisest then depended on inner experience and the suggestions of the intuitive mind for all knowledge that ranged beyond mankind's ordinary perceptions and daily activities. Their aim was illumination, not logical conviction, their ideal the inspired seer, not the accurate reasoner. Indian tradition has faithfully preserved this account of the origin of the *vedas*. The *'rishi'* was not the individual composer, but the seer (*drasta*) of eternal truth and impersonal knowledge."

Thus veda is a record of a great advance made by humanity by special means at a certain period of its collective progress. But modern civilization calls it a colossal fiction.

Thus knowledge acquired by meditation is *vedic* knowledge. In the Samhita, it is said that the knowledge of life is with Indra, the king of *devas*. If we overlook mythology, then it is said that the human mind (*manas*), the instrument of the subjectivity or the I-ness, to know about the divine knowledge it has to pass through the realm of pure intelligence and that intelligence is Indra. Hence the *rishi* went to Indra (an allegory) and through him learnt the divine knowledge of 'Life'. This explanation is a little bit difficult to accept unless a good example, which is given below, is understood.

"We all know that the building blocks of matter are subatomic particles like electrons, protons, neutrons, etc. Originally the atom was considered indivisible, but later it became divisible. But until recently the sub-atomic particles are considered to be elementary particles. But with the origin of quantum chromodynamics, it was found that protons and neutrons are not homogeneous elementary particles. They are structured and composed of different quarks. Now the constitution of proton and neutron is as follows: Proton = 2 u-quarks + 1d-quark; charge +2/3+2/3-1/3 = +1. Neutron = 2 d-quarks + 1 u-quark; charge –1/3-1/3+2/3 = 0. The quark was discovered in the Fermi Laboratory on the 2nd of March 1994".

Regarding this discovery Sri. H. J. Arnikar, Professor – Emeritus, Department of Chemistry, University of Pune, remarks in a lecture "A peep into the world of Quarks" as follows.

"It is amazing to learn of the contributions of the occult chemists Dr. Annie Besant and Bishop C.W. Leadbeater, to the subject of atomic structure, specially on the composite nature of the proton and the neutron. Their results were published in 1895 in the British Journal Lucifer and in the occult chemistry, now in its III edition. They reported the existence of quarks and their fractional charges. The fact that the methods adopted by Besant and Leadbeater were unconventional being based on occult powers stated to have been mastered by them, including associated faculties, such as clairvoyance, extra sensory perception and micropsi, is irrelevant to the importance of the results published in the occult chemistry, specially when they are in full agreement with the results of modern science of the past 30 years".

"The occultists go a step further when they talk of particles smaller than quarks. The sub-

quark is designated the ultimate atom, the UPA, or the *anu*. The heart shaped *anu* exists in two chiral forms, the positive *anu* of charge +5/9 and the negative *anu* of charge – 4/9, as suggested by Phillips. Thus the 'U' quarks are made of 2 positive and 1 negative *anu*, while the 'd' quark is made the other way. The values of the atomic mass for all the elements are tabulated in the occult chemistry". He concludes that modern science is yet to catch up with the concept of the sub-quark or *anu* of charges either +5/9 or -4/9.

This narration is made to show that to acquire any knowledge there is an alternative method, other than the research methodology followed by modern science. It is called meditation. This is followed by all the *rishi*s and sages like Bharadhvaja and Dhanvantari Divodasa to know the knowledge of 'Life'. If Anne Besant and Leadbeater with their limited spiritual *sadhana,* are able to perceive the quark and *anu,* what about the capabilities of Bharadhvaja and Dhanvantari, who are *rishi*s of perfection. Any knowledge acquired by meditation is *veda*. Hence the opinion of the modern scientist about the contents of the *samhita*s is wrong and the modern scientist is yet to catch up with the ayurvedic concepts. The knowledge of *ayus* is aptly named as ayurveda and the comment of Dr. P. Kutumbayya is baseless.

Sage Bharadhvaja and Dhanvantari Divodasa are the originators of *guru sishya paramparanugata* educational system. They acquired the knowledge by meditation. "*Maharshayaste dadrisah yathavat jnana chaksusha*". Masking scientific knowledge in mythological garments is quite common in Hindu culture. It is our duty to separate them and to interpret mythology in terms of science.

As long as the knowledge of life is transmitted from *guru* to *sishya* (teacher to student) it remained intact and original. It fell from the teacher to the *pandit*, who recited it without practical knowledge and finally the scribe added his part in confusing the original meaning. Commentators did a mechanical job.

The Materia Medica is composed only by the *yogic* method. If we are given a new drug we are unable to evaluate its *rasa, guna, veerya, vipaka* and *prabhava*, since we are incapable and not trained for the job. The basic principles are so universal, that they will not change with time. It is the duty of the future generation of research workers in the field of ayurveda, to unravel the secrets hidden in the *samhita*s.

An in-depth study of the *samhita*s gives us scope for the following concepts:

i) *Vata, pitta* and *kapha* are generic names and our body has three different sets, by the same names. Their group names are different and represent their functions. Thus *tridhatu, tridosha* and *trimala* are different triads and not the same triad with different terms when its function is altered. *Tridhatu*s are responsible for the *prakriti* or constitution of the body, by birth, and they have no independent existence in our body and no function to perform. They shape the *prakriti* which is constant and unchanging till death. They are *achetana dravya* metamorphosing to the *chetana* at the very beginning of the biosphere. *Tridosha*s are formed from food, inside the *kostham* by the action of *pachakagni.* They are essential to perform and maintain all

the biological activities of *chetana* (man). Their equipoise is health and vitiation is disease and restoration is treatment. *Trimala*s are formed during the metabolic synthesis of the *dhatu*s. They have their respective storage organs called *asaya*. They are excreted along with the conventional *mala*s viz. faeces and urine. Though they are *mala*s, they are not counted as *mala*s since they are not eliminated as such.

ii) *Saptadhatu*s are not the tissues but building blocks of the living cell. They are biochemical monomers and polymers. All are formed from the essence of the food we eat, at different bio-laboratories named *kala* in ayurveda. Their formation follows a sequence and cell division and growth is effected only when all the seven *dhatu*s are present.

iii) The essence of the food formed after digestion is called *rasa*. It has two fractions. The first fraction nourishes the *indriya*s by 24 *dhamani*s through the agency of *hridaya* (not heart). The second fraction nourishes the *saptadhatu* by entering the blood circulation from *nabhi* (not umbilicus) by a set of vessels called *sira*. The pumping organ is *raktasaya* (heart of modern anatomy).

iv) *Sonita* is tissue blood. One of its components is *raktadhatu*. Menstrual blood is *sonita* which is called *rajas*. Similarly, *arttava* is not *sonita*. The above terms are loosely used in the present editions and they are to be corrected.

v) *Sukram* (sperm) is not *sukradhatu*. But *sukradhatu* is a component of the sperm.

vi) Pathology and treatment are purely based on biochemistry and bioenergetics.

vii) The ninth chapter in Susruta *Sarirasthana* is spurious and hence ought to be deleted.

viii) Identification of *ama* and interpretation by the commentators and translators and independent workers is incorrect. There are two substances which are called as *ama*. In spite of the fact that Charaka and Susruta gave us perfect knowledge of 'Life', we missed it partly due to faulty preservation and transmission and mostly due to our slavery towards modern science. "Better late than never", and it is the right time, at least after fifty years of independence. Let us awake and know our real heritage, knowledge and wisdom transmitted to us through various masterpieces on art, science and literature.

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Book Review

SCIENCE OF *MARMA* (IN AYURVEDIC DIAGNOSIS & TREATMENT)

Raghunathan, A.*

Today we see the increasing number of best seller books in the western markets from Indian authors. It is true that the west now turned face towards the east regarding different branches of knowledge but all the movements in this trend are not fully positive. There are a lot of authors in ayurvedic subjects now-a-days, who do write scientific explanations unhygienically amalgamating these with certain views that will provoke and satiate a western reader. But the book, Science of *Marma* by Dr. S.H. Acharya is not of that kind. It tries to establish the scientific basis purely on ayurvedic grounds on 107 *marmas*.

One cannot expect separate medicines or medicaments for each *marma*-site from this work, but a scientific out look regarding the use of their knowledge will enable a physician to protect the *marma* sites in the diseased conditions of a patient, especially if his illness is grave, to keep these vital sites in better health and to cure the possible complaints occurring over *marma,* as these are three objectives of *marmachikitsa* according to Charakasamhita, and are the core of the treatment chapter of this work.

This book stands not only with treatise based descriptions. The author has taken pain to include his own clinical experiences, analysing the involvement of particular *marmas* in particular diseases. These studies, though based on a small number of cases, are not to be considered unimportant clinical data, because these render a guideline for the further workers on the subject of *marma*. Involvement of the affliction of *indravasti* and *nitamba marmas* in lumbago and the former in the cases of leg-pain and the coincidence of the affliction to *kshipramarma* and increased ESR are some of the important clinical observations.

This work is presented in 4 chapters. The first chapter 'Context of *prana*', explains the core point of *marma* i.e. *prana* and its relationship with *marma*. Along with the description of *prana* certain details of *chakras* and pulse reading similarities with acupuncture are also given. The second chapter of this book is named *marma*, and given details of classification and the description

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of each *marma*. One of the specialities of this book is in the description of each *marma*-palpation method and photographs of possible *marma* are given to illustrate these nicely. In the next chapter, aspects of *marma* in relation to surgery are just mentioned mainly depending on Susrutasamhita. *Nidana* and *chikitsa* of the *marma* disturbances are seen in the final chapter mainly based on Charakasamhita along with the clinical study conducted at the OPD and IPD of I.P.G.T. & R, Jamnagar. A technical word assistance is annexed to this work.

Regarding the language, the book needs further modifications as a lot of spelling mistakes, grammatical errors and a few faulty explanations have crept in. To give one example, on describing the *vidhuramarma* near the ears, the author gives it as *vidura* and points out its meaning basing a Mahabharata character, Vidura. He further explains to support this, quoting a peculiar capacity (i.e. *dooradrishti*) described in the epic, which is not in regard to Vidura but to Sanjaya and that divine capacity is also explained in a distorted way.

When compared with the merits of this work, these blemishes are not so great. The attempt of the author to explain the scientific background of *marma* studies purely based on ayurvedic outlook is a positive one. Many appreciable statements are seen done by the author. Literary collection about *ida* and *pingala nadi*s, comparison of Qi (chi) of acupuncture with the ayurvedic concept of *lokavata* are examples. Despite merely relating the *panchamahabhuta* theory and five elemental theory of acupuncture, the statement showing the differences of both indicates the ayurvedic approach of the author. The explanation regarding the differences between *sadyahpranahara* and *kalantarapranahara marma*s stressing upon the *prana* concept is noteworthy. The practical use of *marma vignana* in today's clinical routine is stressed in connection with the care of *visalyaghna marma* in the diseased condition of a general patient.

Surely the Science of *Marma*, as Dr. P.N.V. Kurup points out in his foreword, is the effort of the author to introduce a standard book on *marmavignana.*

SCIENCE OF *MARMA*
(In Ayurvedic Diagnosis & Treatment)
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Publishers : Agnivesh Pharmaceuticals Ltd.
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वीर्य

शंकुण्णि वारियर, ई.

Abstract: Every *dravya* has its own *rasa, guna, veerya* and *vipaka.* But *seeta* and *ushna,* the two *veerya*s, determine the action of a drug. Here, the author discusses the diverse opinions in this regard. This article by Sankunni Varier published in Dhanwantary (Vol. 14, No. 12) is reproduced here in translation.

वैद्यविज्ञान में द्रव्य का विभाजन शमन, कोपन, स्वस्थहित आदि तीन प्रकार से किया गया है। आचार्यों का सिद्धांत है कि द्रव्य उसके स्वभाव के अनुसार काम करने का कारण उसमें स्थायी रहनेवाले कुछ धर्मों के कारण हैं। ऐसा माना गया है कि ऐसे धर्मों में से प्रमुख एक है वीर्य।

'वरत्वाद्वीर्यम्' और 'विशेषेण ईरयति, प्रेरयति, स्वकर्मकरणसमर्थं करोति इति वीर्यं' इस प्रकार विज्ञानों ने इस पद की व्युत्पत्ति दो प्रकार की मानी हैं। तो भि ये दो प्रमाणों से निर्णय कर सकता है कि बाकि सारी धर्मों में श्रेष्ठ धर्म ऐसी नाम से सूचित किया है। फिर भी यह अब भी तय नहीं हुआ है कि यह वीर्य द्रव्यनिष्ठ किसी धर्म में अंतर्लीन है या उससे भिन्न है।

प्रारंभ में हरेक द्रव्य के स्वभाव का निर्णय उसके स्वाद के आधार पर होगा, यह मानने के आधार है। क्योंकि, इसलिये सभी आचार्यों ने इस कि प्रथम के रूप में चर्चा की है। हर द्रव्य पंचभूतमय तो है न। उसके मिलने की तुलना के आधार पर हर वस्तु हमें भिन्न लगता है। इसी तरह द्रव्यनिष्ठ रस द्रव्यारंभक भूत आदि के मिलन के अंतर के कारण हम अलग पहचान सकते है; यह रसभेदीय में बताया गया है। औषधों के बाह्यप्रयोग के बहुत पहले ही पूर्वजों ने आंतरिक उपयोग शुरू किया होगा। उसमें प्रत्यक्ष दिखनेवाला अवश्य स्वाद ही होगा। यह मानने में कोई आपत्ति नहीं होगी कि उसी स्वाद के अनुसार शरीर में कुछ परिणाम देखने और उसके कारण स्वाद के अंतर के अनुसार द्रव्य के कार्यभेद को प्रत्यक्ष या अनुमान से धीरे धीरे तय करने लगा। ऐसा नहीं कि अच्छी पदार्थ खाने से ही यह होगा। वनचारि के रूप में भटकते समय किसी कंद, मूल या फल खाने के गुण या दोष का अनुभव से भी यह ज्ञान प्राप्त हो सकता है। जो भी हो उसके स्वाद के अनुसार ही प्राचीन लोगों ने द्रव्यों का गुणदोष विवेचन पहले ही शुरू किया है।

मीठा, खट्टा, नमकीन, कषाय, तीखा, तिक्त आदि स्वादों को पूर्वजों ने अलग पहचानने के बाद पहले ही यह सिद्ध किया कि पहले तीन स्वादों वात रोग का शमन करेगा और बाकि उसे बढायेगा, कषाय, तीखा और तिक्त कफ का शमन करेगा, पहलेवाले तीन उसे बढायेगा, मीठा, कषाय और तिक्त पित्त का शमन और शेष उसको बढाया

अनुवादः प्रमोद कोव्वप्रत, हिन्दि विभाग, डब्ल्यू.एम.ओ. आर्ट्स एण्ड साईंस कालज, मुटिल, वयनाड ६७३ १२२.

भी जाएगा। इस तरह तय करने के और भी कारण हैं। इसमें प्रमुख है कि स्वाद शरीर की अवस्था पर भी आधारित है। जिसे कफ ज्यादा है उसे मीठे में इच्छा नहीं होगी, लेकिन और भी तीखे स्वाद में आग्रह भी होगा। इसलिये प्रकृति पर ज्यादा ध्यान देनेवाले यह समझ सकते है कि मीठा कफवर्द्धक है और तीखा रस तच्छमन है। इस अनुभव और तर्क के आधार पर पूर्वजों ने प्रकृति में मिलनेवाले साधारण पदार्थों को जाँचा और रस के अनुरूप कार्य करनेवाले को एक एक स्कन्ध के रूप में अलग भी कर रखा। अगर इस नियम में कोई अंतर है तो वह भी उन्होंने बताया है।

लेकिन जाँच में शायद आस्वादकों के पास के रस से भिन्न कुछ फल भी देखा होगा। इसका मूल सोचने पर देखा कि भोजन के बाद खानेवाले पदार्थों को कुछ विशेष कारणों से रस में अंतर आता है, पाचन के समय कोनसा रस प्रमुख रूप में विद्यमान रहता है उसी के अनुसार कार्य भी बेहत्तर होता है। इसे फिर से जाँचने पर देखा कि मीठा और लवण प्रायः मीठा, अम्ल अम्ल के रूप में, तिक्त, तीखा और कषाय तीखा रस रूप में पाचन समय में बदलेगा, इस तरह ये छे रस तीन रूप में अलग होता है; इस तत्व पर टिका इसे विपाकरस नाम भी दिया है। इसलिये सहजरूप से आस्वाद के रस और उसे पाचनसमय के अंतर आने पर विपाकरस को भी अनुसार कार्य होता है। दोनों होने पर भी यह सिद्धांत रस के आधार पर निश्चित होने के कारण थोडा सा अंतर होने पर भी सचमुच एक ही कह सकते हैं।

फिर से हरेक द्रव्य के प्रयोग करने पर कुछ अंतर दीखने लगा। क्योंकि ये रस और भी कुछ धर्मों के साथ मिलने पर ही निश्चित कार्य करने में समर्थ हो सकते हैं। इसलिये कि, वातशमन के रूप में बताए गये मीठा आदि रसवाले द्रव्यों में तुर्शता, लघुत्व, शैत्य आदि के होने पर या तो स्निग्धता, गुरुत्व, उष्णत्व नहीं है तो वे रस वात के शमन के लिए सक्षम नहीं हो सकते। इसी तरह जिन रसों को पित्तशमन बताया गया है वे मंद, शीत, गुरुत्व के साथ नहीं मिले तो उद्दिष्टकार्य को नहीं कर सकते। फिर कफशमन के लिए बताए गये रसों के साथ तुर्शता, लघुत्व, उष्णत्व आदि न हो तो वे कफ का शमन नहीं कर सकते। इसलिये केवल रस के आधार पर कार्य के निर्णय करने की वजह न होने के कारण द्रव्यनिष्ठ अन्य धर्मों को भी जाँचकर तय करना पडा। इसलिये गुरु, मन्दं, हिमं आदि २० गुणों को भी द्रव्य के कार्यकरण के लिए उपयोगी है - ऐसा अचार्यों ने स्वीकार किया। ये गुण और तार्किकों द्वारा बताये जानेवाले गुणों में कई अंतर है। शमनादिक्रिया करने में समर्थ लगे गुरुत्व आदि को ही वैद्यों ने गुणत्वेन स्वीकार किया है। तार्किकों ने जिसे गुण के रूप में मंज़ूर नहीं किया है उसमें से कुछों को भी इन्होंने स्वीकार किया है। गुरुत्व, मन्दता, शैत्य, स्निग्धता, श्लक्ष्णता, सांद्रता, मार्दव, स्थिरता, सूक्ष्मता, वैशद्य आदि दस और इसके विपरीत लघुता, तीक्ष्णता, उष्ण, तुर्शता, द्रवत्व, खरत्व, काठिन्य, सरतत्व, स्थौल्य, पिच्छिलता आदि दस मिलाके बीस गुणों को लिया हैं। रस को ऐसे गुणों की सहायता भी है तो ही हरेक के कार्य करने में सक्षम हो सकता; ऐसा होने के कारण रसविपाकों की अपेक्षा इन गुणों को ज्यादा प्रमुखता है, इसलिये 'वरत्वाद्वीर्यम्' नाम व्युत्पत्ति इसमें अनुगतार्थ है। इसलिये कुछों का मानना है कि गुण और वीर्य एक है।

इतरे पक्ष के लोगों का कहना है कि सारे गुणों को वीर्यों के रूप में नहीं स्वीकार करना चाहिए, उसमें प्रमुख गुरुत्व, स्निग्धता, शैत्य, मन्दता आदि को और इसके विपरीतक लघुत्व, तुर्शता, उष्णत्व, तीक्ष्णता आदि को भी मिलाके आठ को ही वीर्य संज्ञा के रूप में बताना चाहिए। सभी गुणों से अमुक कार्यकरण सामर्थ्य होने पर भी उसमें प्रमुख उपर्युक्त गुरुत्व आदि आठ को है और स्थायी रहनेवाले और अधिक सशक्त रहनेवाले भी वे है, यही इनका तर्क है। लोकव्यवहार में इसे प्रमुखता है और पूर्वज आचार्यों में से कई इन्हें प्रथम के रूप में दिखाया है,

यही भी उनका तर्क है ।

तब कुछों का वाद है कि ऐसा है तो वीर्य दो प्रकार का काफी है । याने उष्ण और शीत । द्रव्य कई प्रकार होने पर भी अग्नि, सोम आदि का अतिक्रमण करनेवाला कुछ नहीं है, रस या तो और कोई गुण हो सब या तो सौम्य याने शीतवर्गवाले या तो आग्नेय याने उष्णवर्गवाला । इस प्रकार दो प्रकार से भिन्न कुछ नहीं है, और इतनी शक्ति किसी का नहीं है यही इनका सबल तर्क होगा । लगता है कि लगभग वाग्भटाचार्य ने भी इसी राय के पक्षधर है । क्योंकि सूत्राध्याय में 'उष्णशीतगुणोत्कर्षात् तत्र वीर्यं द्विधा स्मृतम्' नामक एक ही राय उन्होंने प्रकट किया है । वास्तव में सभी रसों और अन्य गुणों को इन दोनों में से एक में डालने में दिक्कत नहीं । अर्थात्, पित्त शमनवाले मीठा, तिक्त, कषाय सौम्य और बाकी तीन आग्नेय हैं । इसी तरह वीर्य संज्ञा से बताये गये गुरुत्व, स्निग्धता, शैत्य, मन्दता आदि को स्वभाव से सौम्य वर्ग में और बाकी चार को आग्नेय वर्ग में डालने में कोई न्यायविरोध नहीं है । इसलिये यह मान सकते है कि कुल मिलाकर उष्णत्व और शीत दूसरों की अपेक्षा बलाधिक्यवाला है । तो भी इन दोनों को गुणों के साथ पढने के कारण, उद्देश्य पूर्ति कर पा सकने के कारण इतनी तकलीफ उठाकर उसे वीर्य साबित करने की आवश्यकता क्या है यह सोचना ही पड रहा है । गुरुत्वादि अन्य गुणों को भी वीर्यत्वेन स्वीकार करने में इस अनुपपत्ति का जवाब देना ही होगा । चाहे उष्णशीत हो या गुरुत्वादि आठ गुण हो वीर्य यह स्पष्ट कहने पर गुण बीस है नामक संख्या को घटाना भी पडेगा न । नहीं तो, दो या आठ वीर्य बीस गुणों के ही अलावा द्रव्य में होने को प्रमाणित करने पर गुण भिन्न रूप से वीर्य नामक चीज़ को साबित किये बिना नहीं रह सकता । इसका मार्ग दुर्लभ ही है ।

याद रखना कि वाग्भटाचार्य ने इस प्रश्न का उत्तर दिया है । 'उष्णशीतगुणोत्कर्षात्' कहने के कारण इसे उत्कर्ष होने पर वीर्यसंज्ञा और स्वभाव के अनुसार गुणसंज्ञा भी होता है; ऐसी उनकी राय नहीं है ऐसा नहीं मान सकता । 'बृहत्पंचमूल' कषायतिक्त रस होने के कारण न्याय में वह वात को बढाना चाहिए । लेकिन ऐसा न करना ही नहीं, वह वातशमन भी करता है । इसका कारण द्रव्य का उष्णवीर्य है । इसके कारण रस से भिन्न एक कार्य यहाँ हुआ । तब उसके उष्ण को रसादियों के अनुकूल स्थिति से बढकर शक्ति ज़्यादा मानने में कोई आपत्ति नहीं । सो वह वीर्य भी हो गया । इस तर्क के अनुसार गुरुत्वादियों में वीर्यसंज्ञा ला सकता है । तो भी वह रस से भिन्न रहने के कारण बहुत विरला हो सकता है । इसलिए जहाँ तक हो सके इसे सोचित से पटना ही भला हमारे लिए । फिर और एक बात सोचनी है । यानी कि, उष्णशीतों को गुणत्वेन स्पर्श में कहते हैं । तो वीर्यत्वेन कार्यस्वभाव के आधार पर ही मानना । तो तर्कभंग को कमी कर सकता, ऐसा लगता है । हम उष्णवीर्य कहनेवाले द्रव्यों को साधारण तौर पर छूने पर गरमी नहीं होती । यह विख्यात है कि हरड उष्णवीर्य का है, मगर छूने में ठंडा है, यह सब जानते है । यही नहीं, उष्णवीर्य और शीतवीर्य कहनेवाले द्रव्य दोनों स्पर्श में नहीं जानता तो कोई भी अंतर को स्पष्ट नहीं करता । चाहे तो उष्णवीर्यवाले द्रव्य को स्पर्श शीत या शीतवीर्य को स्पर्शोष्ण के रूप में उपयोग कर सकता । तो भी उसे वीर्य से कहनेवाले फल को ज़्यादा अंतर नहीं दीखता । इसलिए कुल मिलाकर वीर्य गुण से भिन्न एक धर्म है । ऐसा मानता ही हमें अधिक युक्तिसंगत लगता है । इस विषय पर और भी विशेष रूप से कई बातें सोचने की है ।

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जल की उपयोगिता

वैद्यरत्नं पि.एस. वारियर

Abstract: Water has a big role in keeping homeostasis of a living being. Ayurveda gives specific instructions regarding the use of water in healthy as well as diseased conditions. This article contained in the Dhanwantary (Vol. 5, No. 1) describes about the intake of water in various conditions.

जल किसी भी तरह का हो, निम्नलिखित बीमारियों में अधिक मात्रा में पीना मना है। बहुत ज़रूरी है तो थोडा थोडा करके पिया जा सकता है। रुचिक्षय, पीनस, प्रसेक (मुँह में हमेशा लार भरे रहना), शोफ, राजयक्ष्मा, अग्निमान्द्य, महोदर, कुष्ठ, ज्वर, नेत्ररोग, व्रण, प्रमेह आदि बिमारियों में उपरोक्त नियम लागू होता है।

अरोचके प्रतिश्याये प्रसेके श्वयथौ क्षये।
मन्देग्नावुदरे कुष्ठे ज्वरे नेत्रामये तथा॥
व्रणे च मधुमेहे च पानीयं मन्दमाचरेत्। (सुश्रुतं)

वाग्भटाचार्य ने कुछ अन्य बीमारियों में भी पानी पीने पर प्रतिबन्ध लगाया है, जैसे अग्निमान्द्य, गुल्म, पाण्डु, उदर, अतिसार, अर्श, ग्रहणि, शोफ आदि। अनिवार्य होने पर इन बीमारियों में भी बहुत कम मात्रा में पीने की अनुमति है।

नाम्बुपेयमशक्त्यां वा स्वल्पमल्पाग्निगुन्मिभिः।
पाण्डूदरातिसाराार्शो ग्रहणीदोषशोफिभिः॥

अष्टाङ्गहृदय में बताया गया है कि पानी पीने के मामले में कालानुसार परिवर्तन लाना आवश्यक है। शरत और ग्रीष्म ऋतुओं में ज्यादा पानी पिया जा सकता है, लेकिन शेष चारों ऋतुओं में कम ही पीना चाहिए।

ऋतेशरन्निदाघाभ्यां पिबेत् स्वस्थोपि चाल्पशः

संग्रह में इस बारे में और भी कुछ नियम बताये गये हैं, जो इस प्रकार है - एक प्रदेश का पानी जब तक हज़म न हो जाए, तब तक दूसरे प्रदेश का पानी नहीं पीना चाहिए। इसलिए एक कुएँ के जल के पचने के पहले दूसरे कुएँ का जल पीना मना है। अर्थात् एक तरह के जल के पचने के बाद ही दूसरे प्रकार का जल पीना चाहिए। इस तरह नदी जल के पचने के बाद ही कुएँ या झरने का जल पिया जा सकता है। एक ही प्रकार के जल में भी अंतर कर दिया गया है। साधारण जल के पचने के पहले उबला पानी नहीं पीना चाहिए। उबाल कर ठंडा किये जल के हज़म होने के बहुत समय के बाद ही साधारण जल पीना चाहिए। गरम पानी पीने के बाद साधारण जल या उबाल कर ठंडा किया जल पीना मना है। लेकिन गरम पानि पीने के पहले साधारण जल या ठंडा जल पीने पर मना ही नहीं है।

पानीयं न तु पानीयं पानीयेऽन्यप्रदेशजे।
अजीर्णे क्वथितञ्चामे पक्वे जीर्णेऽपि नेतरेत्॥

अनुवादः डॉ. पी. के. राधामणि, मलबार कृस्त्यन कोलज, कालिकट ६७३ ००१.

शीते विधिरयं; तप्तेत्वजीर्णेशिशिरं त्यजेत् । (वाग्भट)

अब एक प्रश्न यहां उठता है कि पानी के पचने में कितना समय लगता है ? इस प्रश्न का सही जवाब देना कठिन है । क्योंकि, जल के प्रकार, मनुष्य की शारीरिक स्थिति और ऋतुभेद के अनुसार पचने का समय भी बदलता रहता है । फिर भी, नीचे बताया हुआ नियम को ध्यान देना हि है । एक स्वस्थ व्यक्ति साधारण काल में सामान्य रूप से गुण होने वाले स्वच्छ भौम जल पीने से, वही पानी दो यामों में (छः घंटे) पचता है और उबाल कर ठंडा किया जल एक याम में (तीन घंटे) पचता है और गरम पानी आधे याम में (डेढ घंट) पचता है ।

आमं जलं जीर्यति यामयुग्मा-
द्यामैकमात्रेण शृतं कदुष्णं
तदर्धमात्रेण शृतं कदुष्णं
पयः प्रपाके त्रय एव कालाः ॥
(विनोदलाक सेनन्)

जलपान के समयभेद पर भी उनका गुणभेद बताया गया है । भोजन के पहले (खाली पेट) पानी पीने से परेशानी होती है । कुछ लोगों के अनुसार इससे अग्निमान्द्य आदि दोषों का डर है । भोजन के बाद पानी पीने से शरीर मोटा होता है । इससे कफ और चर्बी अधिक होती है । भोजन के बीच में पानी पीना निर्दोष है ।

समस्थूलकृशाभक्त मध्यान्तः प्रथमांबुपाः
(अष्टाङ्गहृदयं)

उपरोक्त सभी नियम उबले या ना उबले पानी के संबन्ध में है । लेकिन पीने का जल कुछ दवाओं से संसाधित करके किसी भी बीमारी में पीने लायक बनाया जा सकता है । यही नहीं बीमारी की बिगडी हालत में ऐसा जल हितकारी भी हो सकता है । इसके लिए दवाओं के साथ पानी को पकाना आवश्यक है । कभी कभी दवा मिलाकर बिना पकाये भी पिया जाता है । पानी को संसाधित करने की रीती नीचे दी जाती है ।

तीन *कष़ञ्जु* [1] पिसी हुई दवा कपडे में लपेट कर चार *नाष़ि* [2] पानी में डालकर पानी के आधा होने तक उबाल लें और उसमें से ज़रूरत के अनुसार गरम या ठंडा, थोडा या ज्यादा यथोचित पी लें ।

कर्षं गृहीत्वाद्रव्यस्य तोयस्य प्रस्थमावपेत् ।
अर्द्धावशेषन्तत् ग्राह्यं तोयपाकेत्वयं विधिः ॥
(अष्टाङ्गहृदयं)

पुराने चिकित्सकों ने इस तरह बनाये जानेवाले पानी को 'पानीयम्' नाम दिया है । विभिन्न बीमारियों में अलग अलग तरह से पानीय बनाया जाता है । वही संक्षिप्त रूप में नीचे दिखायी है ।

ज्वर :- कफ या वात के कारण बुखार हो जाए तो सोंठ के साथ उबला पानी गरम गरम से थोडा थोडा पीना चाहिए । पित्त की अधिकता से होनेवाले बुखार में षडंग की दवाओं (मुस्ता, चन्दन, सोंठ, ह्रीबेर, पर्पटक, उशीरः) के साथ उबला पानी ठंडा करके पीना चाहिए । इन में से किसी एक दवा का पानिय भी लिया जा सकता है । पित्त में ही नहीं विष, शराब, रक्तदोष आदि कारणों से होनेवाले सभी प्रकार के ज्वरों में यह पानीय हितकर है । बुखार के साथ अतिसार हो तो भी यही पानी उत्तम है ।

रक्तपित्त :- यहाँ भी 'षडंग पानीयम्' का उपयोग हो सकता है । एक *पलं* [3] दीमक की मिट्टि लाल होने तक भूनना उनके बाद उसे एक *नाष़ि* पानी में डालकर पानी के आधा होने तक उबाल लें और उसमें आधा लेकर आधा *कष़ञ्जु* पिसे हुए चन्दन, उशीर, कमल दला आदि डाल कर छान लें । यह पानीय ज्यादा अच्छा है ।

कास :- सोंठ, मरिच, पिप्पली इनमें से किसी एक के साथ उबला पानी गरम गरम पीना अच्छा है । ग्यारह *आउनस* [4] ठंडेपानी में एक *पणमिटा* [5] कर्पूर मिला कर

[1] *एक कष़ञ्जु* = 4.86 g [2] *एक नाष़ि* = 300 ml [3] *एक पलं* = 58.3 g [4] *एक आउनस* = 30 ml [5] *एक पणमिटा* = 81mg

पीना भी लाभदायक है ।

श्वास :- जीरा पानी बहुत फयदेमंद है । बनाने की रीती पहले दी गयी है । बला, जीरा, सोंठ आदि के साथ उबला पानी भी अच्छा है ।

हिध्मा :- दमे में बताया गया पानीय यहाँ भी ठीक बैठता है । लेकिन यहाँ सब ठंडा करके पी लेना चाहिए । चीनी या मिस्री मिलाकर पीने में अधिक फायदा है ।

राजयक्ष्मा :- धान्यक, सोंठ आदि का पानीय उचित है । कास, श्वास, हिध्मा आदि बीमारियों में बताया गया पानीय भी यथोचित पिलाया जा सकता है ।

उलटी :- मूगँ उबला पानी हितकर है । विल्वमूल, सत्तू, सोंठ आदि का पानीय भी अच्छा है । विल्वमूल, धान्यक, बला, सोंठ, मूँग, सत्तू आदि से संसाधित पानी भी लिया जा सकता है ।

तृष्णा :- ठंडे गंगाजल में मधु मिलाकर पीना चाहिए । स्वच्छ भौम जल भी पिया जा सकता है । रेत या दीमक की मिट्टी भूनकर पानी के साथ उबालने के बाद छान कर पीना भी अच्छा है । इन सब में थोडा चीनी मिलाकर भी पिया जा सकता है । ठंडा नीम्बू पानी चीनी मिलाकर पीना अति उत्तम है । तृणपञ्चमूल याने दर्भमूल, मुञ्जमूल, काशमूल, इक्षुमूल, नीवारमूल आदि से बना पानीय पथ्य है ।

दिव्यांबु शीतं सक्षौद्रं तद्वत् भौमञ्च तदुणम् ।
निर्वापितं तप्तलोष्टकपालसिकतादिभिः ॥
सशर्करं वा क्वथितं पंञ्चमूलेन वा जलम् ।
दर्भपूर्वेण..... (अष्टाङ्गहृदयं)

मदात्यय :- ह्रस्वपञ्चमूल अथवा सोंठ और धान्यक से बना पानीय पीना चाहिए । बीमारी की अवस्था के अनुसार तृष्णा में बताया गया पानीय भी लिया जा सकता है ।

अर्श :- धान्यक या धान्यक और सोंठ के साथ उबला पानी पथ्य है । लेकिन कुछ लोगों में ऐसे नज़र आति है कि सोंठ से बीमारी खराब होती है । ऐसे लोगों को सिर्फ धान्यक पिलाना चाहिए । कण्टकारी से बना पानीय भी बहुत अच्छा है ।

अतिसार :- बाच्च, अतीस, मुस्ता, पर्पटक, हीबेर, सोंठ इनमें से किसी एक का पानीय हितकर है । शालपर्णी भी उचित है ।

वचा प्रतिविषाभ्यां वा मुस्तापर्पटकेन वा ।
हीबेरनागराभ्यां वा विपक्वं पाययेज्जलम् ॥
(अष्टाङ्गहृदयं)

ग्रहणी :- मुस्ता डाल कर उबला पानी ही उत्तम है । अतिसार में बताया गया पानीय और धान्यक, अजमोदा आदि से बना पानीय यथोचित पिलाने से फायदा हो सकता है ।

मूत्रकृच्छ्र :- ह्रस्वपञ्चमूल की दवाओं में से गोक्षुर के दो हिस्से और बाकी सबका एक एक हिस्सा डाल कर उबला पानी पीना चाहिए । पिसा हुआ धान्यक पानी में डाल कर एक दिन के बाद छान कर, चीनी मिला कर पीना भी अच्छा है ।

प्रमेह :- स्वच्छ जल में मधु मिला कर पीना चाहिए । असन, खदिर आदि का पानीय भी ठीक रहेगा । आमला भी बहुत अच्छा है । सप्तचक्र, कतक आदि अन्य कई दवाओं का भी उपयोग हो सकता है ।

गुल्म :- वाताधिक्य गुल्म रोग में धान्यक का पानीय पीना चाहिए । (तप्तं वा धान्यकैर्ज्जलम् - वाग्भट ।) पित्तगुल्म में बला या ह्रस्वपञ्चमूल के साथ उबला पानी उचित है । (योज्यं पानेम्बुबलया बृहत्यादयैश्च साधितम् - वाग्भट ।) कफगुल्म में पञ्चमूल (गम्भारी, विल्व, पाटला, श्योनाक और अग्निमन्थ) के साथ उबला पानी ज्यादा अच्छा है । भूने हुए घुड-सेम (कुलथी) से बना पानीय भी उत्तम है । कभी कभी सोंठ, जीरा, अजमोदा आदि का भी उपयोग होता है ।

महोदर :- पुनर्नवामूल, भूना हुआ कृष्णबीज, इक्षुरमूल -

इनमें से किसी एक का पानीय इस बीमारी में पथ्य है।

पाण्डुरोग :- ह्रस्वपञ्चमूल डाल कर उबला पानी पीना चाहिए। (कनीयः पञ्चमूलाम्बु शस्यते पानभोजने - वाग्भट।) पुनर्नवा, सोंठ, बृहती आदि भी यथोचित लिया जा सकता है।

शोफ :- उदर रोग में जिस पानीय की चर्चा हुई है, वह यहाँ भी लायक है। इक्षुरमूल और पुनर्नवामूल डाल कर बना हुआ पानीय हित है। पनविरलादि भस्म अथवा आविलतोलादि भस्म घोल कर छान कर पीना भी हितकर है।

विसर्प :- नीलोत्पल कन्द, नैतल (उल्पल भेद) कन्द, भूमिचम्पका कन्द, इन्दीवर कन्द, पद्मविस, चन्दन - इनमें किसी एक का, या सब मिलाकर बना पानीय लाभकारी है। उसके अलावा रक्तपित्त में बताया गया पानीय भी उचित है।

कुष्ठ :- खदिर, बाकुची, शारिबा, आमला आदि के साथ उबला पानी अच्छा है।

कृमिरोग :- विडङ्ग, कारवी, तुलसी के पत्ते, द्रोणपुष्पी, काकोदुम्बारिका त्वक् - इनमें से किसी एक से बना पानीय अच्छा है।

वातरोग :- दशमूल, बला, सहचर, रास्ना - इनमें से किसी एक का बना पानीय उचित है।

रक्तवात :- रास्ना, शारिबा या इक्षुरमूल का पानीय बनाया जा सकता है।

नेत्ररोग :- साधारणतया आँख की सभी बीमारियों में त्रिफला या आमला का पानीय उचित है।

हरेक बीमारी को प्रत्येक लेकर विस्तार देने की ज़रूरत नहीं है। उपरोक्त दवाओं को आधार मान कर अवसरोचित पानीय का अंदाज़ लगाया जा सकता है।

संक्षेप में कहें तो वातरोग में बला, पित्त में भूनी मूँग और कफ में सोंठ आदि से बना पानीय अच्छा है। जीरा पानी तीनों दोषों में हितकर है।

उपरोक्त बीमारियों में पीने लायक और भी दवाएं बतायी जा सकती हैं। लेकिन वे इतने स्वादिष्ट नहीं है। इसलिए यहाँ उनका विवरण नहीं दिया जाता है। यह भी नहीं समझना चाहिए कि इन बीमारियों में उपरोक्त पानीय ही श्रेयस्कर है। कहने का मतलब सिर्फ इतना है कि ज़रूरी होने पर उपरोक्त तरह से पानीय तैयार करके पी लेना ही उचित है। कुछ बीमारियों में मट्ठा उत्तम पेय है। अन्यत्र दूध ही उचित है, और कहीं 'अरिष्ट' लागू होता है। इस प्रकार अलग अलग बीमारियों में यह बदलता रहता है। इसलिए सब कुछ सोच समझकर यथोचित कार्य करना चाहिए।

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