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āryavaidyan

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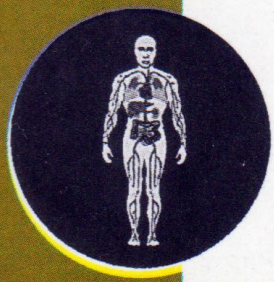

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N.R. MADHAVA MENON

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FROM THE PAGES OF VAGBHATA - LXI

N.V.K. Varier

Abstract: In this issue, an elaborate description regarding various types of *sastra*s (sharp instruments), their size, shape and usage are being discussed.

अथातो शस्त्रविधिमध्यायं व्याख्यास्यामः ।
इति ह स्माहुरात्रेयादयो महर्षयः ।

(*Athato sastravidhimadhyayam*
vyakhyasyamah &$ $
Iti ha smahuratreyadayo
maharshayah &$$)

Now we are going to explain the chapter titled "the order of *sastra* practice (usage of sharp instruments)" – so said the great sages Atreya and others.

षड्विंशतिः सुकर्मारैर्घटितानि यथाविधि ।
शस्त्राणि रोमवाहीनि बाहुल्येनाङ्गुलानि षट् ।। १ ।।
सुरूपाणि सुधाराणि सुग्रहाणि च कारयेत् ।
अकराळानि सुध्मातसुतीक्ष्णावर्त्तितेऽयसि ।। २ ।।
समाहितमुखाग्राणि नीलाम्भोजच्छवीनि च ।
नामानुगतरूपाणि सदा सन्निहितानि च ।। ३ ।।
स्वोन्मानार्धचतुर्थांशफलान्येकैकशोऽपि च ।
प्रायो द्वित्राणि, युञ्जीत तानि स्थानविशेषतः ।। ४ ।।
(मण्डलाग्रं वृद्धिपत्रमुत्पलाध्यर्द्धधारके ।
सर्पैषण्यौ वेतसाख्यं शरार्यास्यत्रिकूर्चके ।। १ ।।
कुशाख्यं साटवदनमन्तर्वक्त्रार्धचन्द्रके(कम्)।
व्रीहिमुखं कुठारी च शलाकाङ्गुलिशस्त्रके ।। २ ।।
बडिशं करपत्राख्यं कर्तरी नखशस्त्रकम् ।
दन्तलेखनकं सूच्यः कूर्चो नाम खजाह्वयम् ।। ३ ।।
आरा चतुर्विधाकारा तथा स्यात्कर्णवेधनी(नम्) ।।)

(*Shadvimsatih sukarmarair-*
ghatitani yathavidhi &
sastrani romavahini
bahulyenangulani shat && 1 && $
Suroopani sudharani
sugrahani cha karayet &
akaralani sudhmata-
suteekshnavartiteSyasi && 2 && $
Samahitamukhagrani
neelambojacchaveeni cha &
namanugataroopani
sada sannihitani cha && 3 && $
Svonmanardhachaturthamsa-
phalanyekaikasoSpi cha &
prayo dvitrani, yunjeeta
tani sthanaviseshatah && 4 && $
[*Mandalagram vriddhipatra-*
mutpaladhyardhadharake &
sarpaishanyau vetasakhyam
sararyasyatrikoorchake && 1 && $
Kusakhyam satavadana-
mantarvaktrardhachandrake (kam) &
vreehimukham kuthari cha
salakangulisastrake && 2 && $

Badisam karpatrakhyam
kartaree nakhasastrakam &
dantalekhanakam soochyah
koorcho nama khajahvayam && 3 && $
Ara chaturvidhakara
tatha syatkarnavedhanee(nam)&&])

*Sastra*s are twenty-six in numbers. They are to be got prepared by expert blacksmiths as per the traditionally destined order. They should be capable of cutting or felling even thin hair. Generally they should be of six *angula*s in length with good form and sharp edges, easy to catch and wield, made of well blown iron, repeatedly hammered to sharpen the edges, with the splendor of blue lotus. Their names are to be agreeing to the forms. They should be always ready at one's own custody. Their faces (cutting edges) are to be one eighth of their size. Such *sastra*s are to be made two or three to make use of at the site of operation. Their names are – *mandalagra, vriddhipatra, utpalapatra, adhyardhadhara, sarpamukha, eshani* (there are two *eshani*s – *gandoo-padamukha eshani* and *soochimukha eshani*), *vetasam, sararimukha, trikoorchaka, kusa, atamukha, antarmukha, vreehimukha, kuthari, salaka, anguleesastraka, badisa, karapatra, kartari, nakhasastra, danta-lekhanaka,* three types of *soochi*s, *koorcha, khaja,* four kinds of *ara* and *karnavedhanaka*.

मण्डलाग्रं फले तेषां तर्जन्यन्तर्नखाकृति ।
लेखने छेदने योज्यं पोथकीशुण्डिकादिषु ।। ५ ।।

(*Mandalagram phale tesham*
tarjanyantarnakhakriti &
lekhane chedane yojyam
pothakeesunthikadishu && 5 &&)

Mandalagra (the *sastra* with round edge at the top) has its blade shaped like the inner part of the nail of the forefinger. It is for *lekhana* (scraping) and *chedana* (cutting or tearing) in diseases like *pothaki* (an eye disease) and *sundhika* (a throat disease).

वृद्धिपत्रं क्षुराकारं छेदभेदनपाटने ।
ऋज्वग्रमुन्नते शोफे गम्भीरे च तदन्यथा ।। ६ ।।
नताग्रं पृष्ठतो दीर्घह्रस्ववक्त्रं यथाश्रयम् ।

(*Vriddhipatram kshurakaram*
chedabhedanapatane &
rjvagramunnate sophe
gambheere cha tadanyatha && 6 && $
Natagram prishthato deergha-
hrasvavaktram yathasrayam &)

Vriddhipatra is like razor in shape. It is used for cutting, splitting and clearing. In elevated and deep-seated swellings, those with straight edges are to be employed. In other forms of swelling, those with edges bent backwards are to be used. These can be with elongated faces or shortened faces according to the sites.

उत्पलाध्यर्धधाराख्ये भेदने छेदने तथा ।। ७ ।।

(*utpaladhyardhadharakhye*
bhedane chedane tatha && 7 &&)

Utpalapatra and *adhyardhadhara* are two types of *sastra*s – the former with long face and the latter with short face. They are used for *bhedana* and *chedana* (splitting and cutting).

सर्पास्यं घ्राणकर्णार्शश्च्छेदनेऽर्धाङ्गुलं फले ।

(*Sarpasyam ghranakarnarsa-*
cchedaneऽrdhangulam phale &)

Sarpasya (having face like a serpent) is used for excision of polyps in nose and ears. Their edges are of half *angula*.

गतेरन्वेषणे श्ळक्ष्णा गण्डूपदमुखैषणी ।। ८ ।।

(*gateranveshane slakshna*
gandoopadamukhaishanee && 8 &&)

The *sastra* named *eshani* (probe) is used for probing the *nadeevrana*s (sinuses). It is smooth and with a face resembling that of an earthworm.

भेदनार्थेऽपरा सूचीमुखा मूलनिविष्टखा ।

(*Bhednartheऽpara soochee-*
mukha moolanivishtakha &)

Another *eshani* is for splitting. It is with needle-like face and a hole made at the root. (The hole is for introducing the thread smeared with alkalis in *ksharasootraprayoga*)

वेतसं व्यधने –

(*vetasam vyadhane* -)

The *sastra*, *vetasam*, shaped like leaves of river reeds, is for perforating.

– स्राव्ये शरार्यास्यत्रिकूर्चके ।। ९ ।।

(- *sravye sararyasyatrikoorchake* && 9 &&$)

Sararimukha and *trikoorcha* are for draining liquids. *Sararimukha* is with a face shaped like that of heron's beak. *Trikoorcha* is a brush with three spikes.

कुशाटावदने स्राव्ये द्व्यङ्गुलं स्यात्तयोः फलम् ।

(*Kusatavadane sravye*
dvyangulam syattayoh phalam &)

Kusapatra and *atamukha* are two *sastra*s meant for draining. The edge of *kusapatra* resembles the sharpness of *kusa* grass. *Atamukha* has its blade like a beak of *ata* (hawk).

तद्वदन्तर्मुखं तस्य फलमध्यर्धमङ्गुलम् ।। १० ।।
अर्द्धचन्द्राननं चैतत् –

(*tadvadantarmukham tasya*
phalamadhyardhamangulam && 10 && $
Ardhachandrananam chaitat -)

The *sastra* named *antarmukha* is also intended for draining. Its edge is of one and a half *angula* in length. Since its face is shaped like half moon, it is also named as *ardhachandrasya*.

– तथाऽध्यर्धाङ्गुलं फले ।
व्रीहिवक्त्रं प्रयोज्यं च तच्छिरोदरयोर्व्यधे ।। ११ ।।

(- *tathaऽdhyardhangulam phale* &
vreehivaktram prayojyam cha
tacchirodarayorvyadhe && 11 && $)

Vreehipatra is with an edge of one and half *angula* length. It is used for venesection and piercing abdomen in ascitis.

पृथुः कुठारी गोदन्तसदृशार्द्धाङ्गुलानना ।
तयोर्ध्वदण्डया विध्येदुपर्यस्थ्नां स्थितां सिराम् ।। १२ ।।

(*Prithuh kutharee godanta-*
sadrisardhangulanana &
tayordhvadandaya vidhyedu-
paryasthnam sthitam siram && 12 && $)

Kuthari is flat having its blade half *angula* length. It resembles the tooth of a cow having a stick-like handle. It is used for piercing the vein on the upper part of the bone. (It is performed by placing the blade on the vein vertically and striking the handle with the middle finger.)

ताम्री शलाका द्विमुखी मुखे कुरुबकाकृतिः ।
लिङ्गनाशं तया विध्येत्

(*Tamree salaka dvimukhee*
mukhe kurubakakritih &
linganasam taya vidhyet -)

The copper *salaka* (rod), having two faces that resembles the bud of *kurubaka* (red flowered Barleria), is used for piercing *linganasa* (the last stage of cataract)

– कुर्यादङ्गुलिशस्त्रकम् ।। १३ ।।
मुद्रिकानिर्गतमुखं फले त्वर्धाङ्गुलायतम् ।
योगतो वृद्धिपत्रेण मण्डलाग्रेण वा समम् ।। १४ ।।
तत्प्रदेशिन्यग्रपर्वप्रमाणार्पणमुद्रिकम् ।
सूत्रबद्धं गळस्रोतोरोगच्छेदनभेदने ।। १५ ।।

(- *kuryadangulisastrakam* && 13 && $
Mudrikanirgatamukham
phale tvardhangulayatam &
yogato vridhipatrena
mandalagrena va samam && 14 && $
Tatpradesinyagraparva-
pramanarpanamudrikam &

sootrabadham galasroto-
rogacchedana bhedane && 15 &&)

Angulikasastra is with a face of half *angula* length as emerging out from a fold (ring). Its shape resembles *vriddhipatra* or *mandalagra*. The ring should be of permitting entrance to the top part of the index finger of the physician. (Tie the ring firmly with the finger, and the end part of the thread used around the wrist of the physician.) It is used for excision and splitting in throat diseases.

ग्रहणे शुण्डिकार्मादेर्बडिशं सुनताननम् ।

(*Grahane sundikarmader-*
badisam sunatananam &)

The *sastra* named *badisa* is for catching *sundhika* (a throat disease) and *arma* (pteregium). It is with a bent face – a hook.

छेदेऽस्थ्नां करपत्रं तु खरधारं दशाङ्गुलम् ।। १६ ।।
विस्तारे द्व्यङ्गुलं सूक्ष्मदन्तं सुत्सरुबन्धनम् ।

(*chedeऽsthnam karapatram tu*
kharadharam dasangulam && 16 &&
Vistare dvyangulam sookshma-
dantam sutsarubandhanam &)

Karapatra (saw) is for cutting bones. It is to be of ten *angula*s in length, two *angula*s in width, hard edge, minute teeth and a firmly fixed handle.

स्नायुसूत्रकचच्छेदे कर्तरी कर्तरीनिभा ।। १७ ।।

(*Snayusootrakachacchede*
kartaree kartareenibha && 17 && $)

Kartari, the *sastra* resembles a scissor, is used for cutting tendons, threads and hair.

वक्रर्ज्जुधारं द्विमुखं नखशस्त्रं नवाङ्गुलम् ।
सूक्ष्मशल्योद्धृतिच्छेदभेदप्रच्छानलेखने ।। १८ ।।

(*Vakrarjjudharam dvimukham*
nakhasastram navangulam &
sookshmasalyodhriticheda-
bhedapracchanalekhane && 18 &&)

Nakhasastra is with two faces – one curved and the other straight. It is of nine *angula*s in length and is used for extraction of minute foreign bodies and for cutting, splitting, scraping and scarifying.

एकधारं चतुष्कोणं प्रबद्धाकृति चैकत: ।
दन्तलेखनकं तेन शोधयेद्दन्तशर्कराम् ।। १९ ।

(*Ekadharam chatushkonam*
prabaddhakriti chaikatah &
dantalekhanakam tena
sodhayeddantasarkaram && 19 &&)

Dantalekhanaka is with one edge and four angles. At one side it is shaped like a bounded one. It is employed for scraping *dantasarkara* (tartar).

वृत्ता गूढदृढा: पाशे तिस्र: सूच्योऽत्र सीवने ।

(*Vritta goodhadridhah pase*
tisrah soochyoऽstra seevane &)

There are three kinds of *soochi*s (needles) for sewing (suturing).

मांसळानां प्रदेशानां त्र्यस्रा त्र्यङ्गुलमायता ।। २० ।।

(*mamsalanam pradesanam*
tryasra tryangulamayata && 20 &&)

One with triangular edge and of three *angula*s in length is to be used for sewing fleshy parts.

अल्पमांसास्थिसन्धिस्थव्रणानां द्व्यङ्गुलायता ।

(*Alpamamsasthisandhistha-*
vrananam dvyangulayata &)

The second one, with a length of two *angula*s, is used at less fleshy parts, bony joints and wounds on joints.

व्रीहिवक्त्रा धनुर्वक्रा पक्वामाशयमर्मसु ।। २१ ।।
सा सार्धद्व्यङ्गुला –

(*vreehivaktra dhanurvakra*
pakvamasayamarmasu
Sa sardhadvyangula - && 21 &&)

The third type of needle called *vreehivaktra*, curved like a bow, two and half *angula*s length, is used for suturing *amasaya* (stomach) *pakvasaya* (intestine) and *marma*s (vital spots).

– सर्ववृत्तास्ताश्चतुरङ्गुलाः ।
कूर्चो वृत्तैकपीठस्थाः सप्ताष्टौ वा सुबन्धनाः ।। २२ ।।
स योज्यो नीलिकाव्यङ्गकेशशातेषु कुट्टने ।

(- *sarvavrittastaschaturangulah* &
koorcho vrittaikapeethasthah
saptashtau va subandhanah && 22 &&
Sa yojyo neelikavyanga-
kesasateshu kuttane &)

A *koorcha* (brush) is with seven or eight needles, totally round, four *angula*s by length, fixed on a circular seat and well fastened. It is used for pricking in *neelika* (blue patches) and *vyanga* (dark patches) on the face and fall of hair.

अर्धाङ्गुलमुखैर्वृत्तैरष्टाभिः कण्टकैः खजः ।। २३ ।।
पाणिभ्यां मथ्यमानेन घ्राणात्तेन हरेदसृक् ।

(*ardhangulamukhairvrittai-*
rashtabhih kantakaih khajah && 23 &&
Panibhyam mathyamanena
ghranattena haredasrik &)

Khaja (churner) is with eight round thorn-like spikes having half *angula* in length. It is used for drawing blood from the nose by churning with hands.

व्यधनं कर्णपाळीनां यूथिकामुकुळाननम् ।। २४ ।।

(*vyadhanam karnapaleenam*
yoothikamukulananam && 24 &&)

Vyadhana is for piercing the earlobes. Its face resembles the bud of *yoodhika* (Needle flower Jasmine)

आराऽर्धाङ्गुलवृत्तास्या तत्प्रवेशा तथोर्ध्वतः ।
चतुरस्रा, तया विध्येच्छोफं पक्वामसंशये ।। २५ ।।
कर्णपालीं च बहळाम् –

(*Araऽrdhangulavrittasya*
tatpravesa tathordhvatah &
chaturasra, taya vidhye-
cchopham pakvamasamsaye && 25 &&
Karnapaleem cha bahalam -)

Ara, (an instrument like a shoemaker awe), is with a round face, half *angula* in size, quadrangular in shape. It is used for puncturing swellings to test whether it is ripe or not. It is used for piercing thick earlobes also.

– बहळायाश्च शस्यते ।
सूची त्रिभागसुषिरा त्र्यङ्गुला कर्णवेधनी ।। २६ ।।

(– *bahalayascha sasyate* &
soochee tribhagasushira
tryangula karnavedhanee && 26 &&)

Karnavedhini, a needle having three *angula*s length and hole in its three parts, is more suitable for thick and fleshy earlobe.

जलौकः क्षारदहनकाचोपलनखादयः ।
अलौहान्यनुशस्त्राणि, तान्येवं च विकल्पयेत् ।। २७ ।।
अपराण्यपि यन्त्रादीन्युपयोगं च यौगिकम् ।

(*Jalaukah ksharadahana-*
kachopalanakhadayah &
alauhanyanusastrani,
tanyevam cha vikalpayet && 27 &&
Aparanyapi yantradee-
nyupayogam cha yaugikam &)

Leeches, *ksharas* (caustic alkalis), fire, glass, stone, nail and similar ones are non-metallic *anusastra*s (accessory instruments). We can imagine and plan to make many other devices, *yantra*s and *sastra*s like this fit for usage in particular situations and sites.

उत्पाट्यपाट्यसीव्यैष्यलेख्यप्रच्छानकुट्टनम् ।। २८ ।।
छेद्यं भेद्यं व्यधो मन्थो ग्रहो दाहश्च तत्क्रियाः ।

(*utpatyapatyaseevyaishya-*
lekhyapracchanakuttanam && 28 &&
chedyam bhedyam vyadho mantho
graho dahascha tatkriyah &)

The performances that can be done by the *sastra*s are - *utpatana* (extraction), *patana* (splitting and clearing), *seevana* (suturing), *eshana* (probing), *lekhana* (scraping), *prachana* (scratching), *kuttana* (pricking), *chedana* (excising/cutting) *bhedana* (breaking), *vyadhana* (piercing), *mandhana* (churning), *grahana* (holding) and *dahana* (burning).

The *sastra*s that can be taken for such actions are – *nakhasastra* (*utpatana*), *vridhipatra* (*patana*), *soochi* (*seevana*), *mandalagra* (*lekhana*), *nakhasastra* (*prachana*), *koorcha* (*kuttana*), *utpalapatra* (*chedana*), *eshani* and *soochikukha* (*bhedana*), *vethasa* (*vyadhana*), *khaja* (*mandhana*), *sndamsa* (*grahana*) and *salaka* (*daha*).

कुण्ठखण्डतनुस्थूलह्रस्वदीर्घत्ववक्रता: ।। २९ ।।
शस्त्राणां खरधारत्वमष्टौ दोषा: प्रकीर्तिता: ।

(*kunthakhandatanusthoola-*
hrasvadeerghatvavakratah && 29 &&)
Sastranam kharadharatva-
mashtau doshah prakeertitah &)

The eight defects of *sastra*s are – 1. bluntness, 2. brokenness, 3. thinness, 4. stoutness, 5. shortness, 6. tallness, 7. curvature and 8. rough-edged.

छेदभेदनलेख्यार्थे शस्त्रं वृन्तफलान्तरे ।। ३० ।।
तर्जनीमध्यमाङ्गुष्ठैर्गृह्णीयात्सुसमाहित: ।
विस्रावणानि वृन्ताग्रे तर्जन्यङ्गुष्ठकेन च ।। ३१ ।।
तलप्रच्छन्नवृन्ताग्रं ग्राह्यं व्रीहिमुखं मुखे ।
मूलेष्वाहरणार्थानि क्रियासौकर्यतोऽपरम् ।। ३२ ।।

(*chedabhedanalekhyarthe*
sastram vrintaphalantare && 30 &&
Tarjaneemadhyamangushtair-
grihneeyatsusamahitah &
visravanani vrintagre
tarjanyangushtakena cha && 31 &&
Talapracchannavrintagram
grahyam vreehimukham mukhe &
mooleshvaharanarthani
kriyasaukaryatoऽparam && 32 &&)

For cutting, breaking and scraping, hold the *sastra* carefully in between the handle and the blade by index and middle fingers and thumb. For draining, catch well at the tip of the handle with index finger and thumb. *Vreehimukha sastra* should be held at its tip covering the handle with palm. For drawing or extracting purpose, catch the instruments at its root; and in other cases, according to the convenient of action.

स्यान्नवाङ्गुलविस्तार: सुघनो द्वादशाङ्गुल: ।
क्षौमपत्रोर्णकौशेयदुकूलमृदुचर्मज: ।। ३३ ।।
विन्यस्तपाश: सुस्यूत: सान्तरोर्णास्थशस्त्रक: ।
शलाकापिहितास्यश्च शस्त्रकोश: सुसञ्चय: ।। ३४ ।।

(*Syannavangulavistharah*
sughano dvadasangulah &
kshaumapatrornakauseya-
dukoolamriducharmajah && 33 &&
Vinyastapasah susyootah
santarornasthasastrakah &
salakapihitasyascha
sastrakosah susanchayah && 34 &&)

A *sastrakosa* (wallet) of twelve *angula*s length and nine *angula*s width is to be made for keeping *sastra*s. It can be made with jute, leaves, wool, silks of various kinds and soft leather having arrangement of tying. It is to be stitched well, provided with separate coverings for each *sastra*, bolted with rods and well-stocked appearance.

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PHARMACOGNOSTICAL STUDIES ON *OROXYLUM INDICUM* (L.) VENT.

V.P. Krishnan Nambiar, A. Jayanthi and T.K. Sabu*

Abstract: Studies based on pharmacognosy, chemical analysis and propagation techniques are included in this paper. Numerical values like palisade ratio, stomatal index and vein-islet number are also considered for the fulfillment of the study.

Introduction

Oroxylum indicum belonging to the family Bignoniaceae is known as Indian trumpt tree in English; *sonapatha* in Hindi; *palakappayyani* and *palakappayyana* in Malayalam; *syonakah* in Sanskrit and *palaiyudachi* in Tamil. The officinal parts are roots, leaves, fruits and seeds. These are used in together or individually in more than 50 ayurvedic formulations like *Amritarishtam*, *Dhanvantararishtam*, *Prabhanjanavimardanam*, *Baladhatryadi tailam*, *Dehaposhanayamakam*, *Vasagulochyadi kashayam*, *Abrabhasmam*, *Brahmarasayanam*, etc (S.R. Iyer, 1983). The plant has natural distribution throughout India in deciduous forests in moist areas. In Kerala, it is growing in Kannoth, Iritty and Alakodu of Kannur Dist.; Dhoni, Mukkali, Kanhirappuzha and Attappady of Palakkad Dist.; Nilambur of Malappuram Dist.; and Peechi, Palappilly and Pattikkad of Thrissur Dist.(Fig I.)

The roots are astringent, bitter, and are useful in curing fever, cough, diarrhoea, anorexia, and rheumatism (Warrier et al, 1995; Kurup et al, 1979; Narayana Aiyer & Kolammal, 1978). It is digestive, cooling, aphrodisiac and anthelmintic (Warrier et al, 1995; Narayana Aiyer & Kolammal, 1978), carminative, diuretic and diaphoretic (Kurup et al, 1979 & Warrier et al, 1995) and is useful in vomiting, leucoderma, skin diseases (Warrier et al, Narayana Aiyer & Kolammal, 1978), abdominal pains, thirst, piles, respiratory disorders, urinogenital disorders and as purgative (Kurup et al, 1979). The roots are sweet, acrid, anti-inflammatory, anodyne, expectorant, anti-arthritic and tonic. They are useful in dropsy, sprains, neuralgia, hiccough, asthma, bronchitis, dyspepsia, flatulence, colic, strangury, gout, wounds and rheumatoid arthritis. The leaves are stomachic and anodyne and are useful in stomachalgia, flatulence, cephalgia, ulcers and splenomegaly. The tender fruits are expectorant, carminative and stomachic and are useful in cough, bronchitis, dyspepsia, flatulence and leucoderma. The mature fruits are acrid, sweet, anthelmintic and

* *IDRC Project, Arya Vaidya Sala, Kottakkal*

Fig. I *Oroxylum indicum* (L.) Vent - Location Map

Districts:

1. Thiruvananthapuram
2. Kollam
3. Pathanamthitta
4. Alappuzha
5. Kottayam
6. Idukki
7. Ernakulam
8. Trissur
9. Palakkad
10. Malappuram
11. Kozhikode
12. Wayanad
13. Kannur
14. Kasargode

Localities:

Ala. Alakodu
Att. Attappady
Dho. Dhoni
Iry. Iritty
Kan. Kannoth
Kah. Kanhirappuzha
Muk. Mukkali
Nil. Nilambur
Pal. Palapilly
Pat. Pattikkad
Pee. Peechi

stomachic. They are useful in pharyngodynia, cardiac disorders, helminthiasis, gastropathy, bronchitis and haemorrhoids. The seeds are purgative (Warrier et al, 1995). The tender fruits are astringent, sweet, light, promote taste and digestive fire and destroy piles and worms (Narayana Aiyer & Kolammal, 1978). Young shoots and unripe fruits are also used as vegetables. Stem bark and fruits are employed as mordants in tanning and dying industries (Krishnamurthy, T, 1993). The root bark is also useful in troubles of bile, cough, dropsy, diarrhoea and dysentery (Sarin, Y.K. 1996).

Morphological description

A medium sized deciduous tree, trunk tall and straight covered with thick, soft, somewhat greyish, spongy bark, branches few, decussate, horizontal; large, broadly elliptic, smooth, slightly sunken scars of fallen leaves are seen on the bark. Leaves very large, opposite, 2-3 pinnate with five or more pairs of primary pinnae; exstipulate, entire, leaflets many, broadly ovate, entire, rounded at the base, obtuse at the apex, glabrous, dark green above and paler beneath with prominent nerves, inflorescence terminal raceme up to four feet long, half of the length at base is nearly quadrangular and flowerless, bracts partially fused with the pedicels. Flowers large and fleshy, dark lurid reddish purple outside, dull or pale pinkish yellow within; calyx large, leathery, oblong, campanulate, truncate, persistent, five lobed; corolla large, whitish to purple, campanulate, tube short, two lipped and five lobed, lobes sub-equal, round, crisped much crumpled in bud and thickly covered on both sides with papillose hairs; stamens five, unequal four large, posterior one smaller, filaments free, inserted near the base of the tube, anthers glabrous, two-celled; cells oblong, parallel, pendulous from the top of connective; ovary surrounded by a large fleshy, cushion-like somewhat pentagonal disc at its base, sub-sessile, glabrous, oblong two-celled with many ovules in each cell, style about the length of the filaments, opening as a funnel shaped mouth between the membraneous slightly incurved semicircular lobes of the stigma; fruit a very large, woody sword-shaped strongly compressed two-valved septifragal capsule (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 i.e. 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 i.e. one from base, one from apex, one from margin and one from centre. After clearing, washing and staining they were mounted in

Fig. II. **a - c** *Oroxylum indicum* (L.) Vent - Habit
a) A twig with fruits **b**) Inflorescence **c**) Root

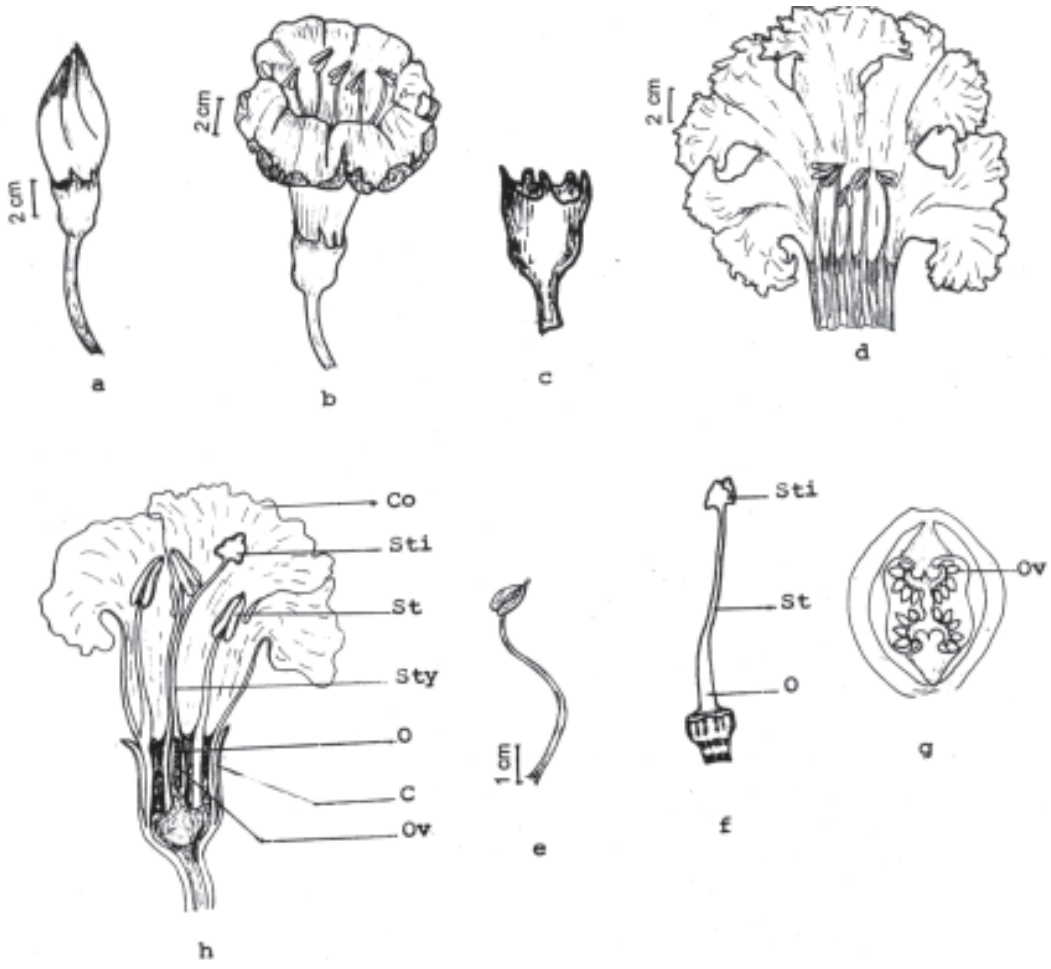

Fig. III. **a - h** *Oroxylum indicum* (L.) Vent - Floral biology
a) Flower bud **b**) Single flower **c**) Calyx **d**) Corolla tube opened
e) Single stamen **f**) Gynoecium **g**) Ovary C.S **h**) Flower L.S.

C. Calyx **Co**. Corolla **O**. Ovary **Ov**. Ovule **St**. Stamen **Sti**. Stigma **Sty**. Style

glycerin. 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

Calyx

Calyx is supplied with five main vascular bundles which produce numerous lateral branches which run parallely upward (Fig. IVa).

Corolla

Five main vascular bundles enter into the corolla and give rise to lateral branches. In-between these five main bundles, five thin vascular strands are also seen which in turn produce lateral branches. Thus, a total of 30 vascular bundles are seen in cross section (Fig. IVb)

Stamen

Each stamen is supplied with two vascular bundles which traverse through the filament and supply the anther lobes (Fig. IVc).

Gynoecium

14 vascular bundles are seen in cross section of the ovary. Of these, two are dorsal in position. These dorsal bundles directly supply the stigma without getting branched. Six peripheral bundles (2 groups of three each on either sides of the ovary) produce lateral branches and supply the ovary wall. There are six ventral bundles which get united to form two bigger bundles, supply the ovules and enter into the style, here they get separated into 6 bundles again. These bundles traverse through the style and enter into the stigma where they get branched (Fig. IVd).

Anatomy

Stem

In T.S., the stem is circular in outline consisting of 5-6 layers of cork cells which are thick walled and tangentially elongated. Phellogen consists of 3-4 layers of rectangular cells. This is followed by a broad zone of cortex whose outer 7-8 layers are polygonal and chlorenchymatous. Below this region, patches of schlereids are prominent. In the inner region of the cortex cells are thin walled and polygonal without any inclusions. Small groups of schlereids are seen at the phloem region. This region is narrow and cambium consists of only 4-6 layers. Secondary xylem consists of xylem tracheids, vessels and parenchyma. Uniseriate medullary rays containing starch grains are very prominent. Medullary rays extend into phloem as phloem rays. In this region, ray cells are larger and contain calcium oxalate crystals. Primary xylem is conspicuous towards the pith. Pith cells are thin walled and have inter cellular spaces (Fig.V).

Root

In T.S., the root is circular in outline. The cork tissue is composed of 6-13 rows of tangentially elongated, narrow, rectangular thin walled cells.

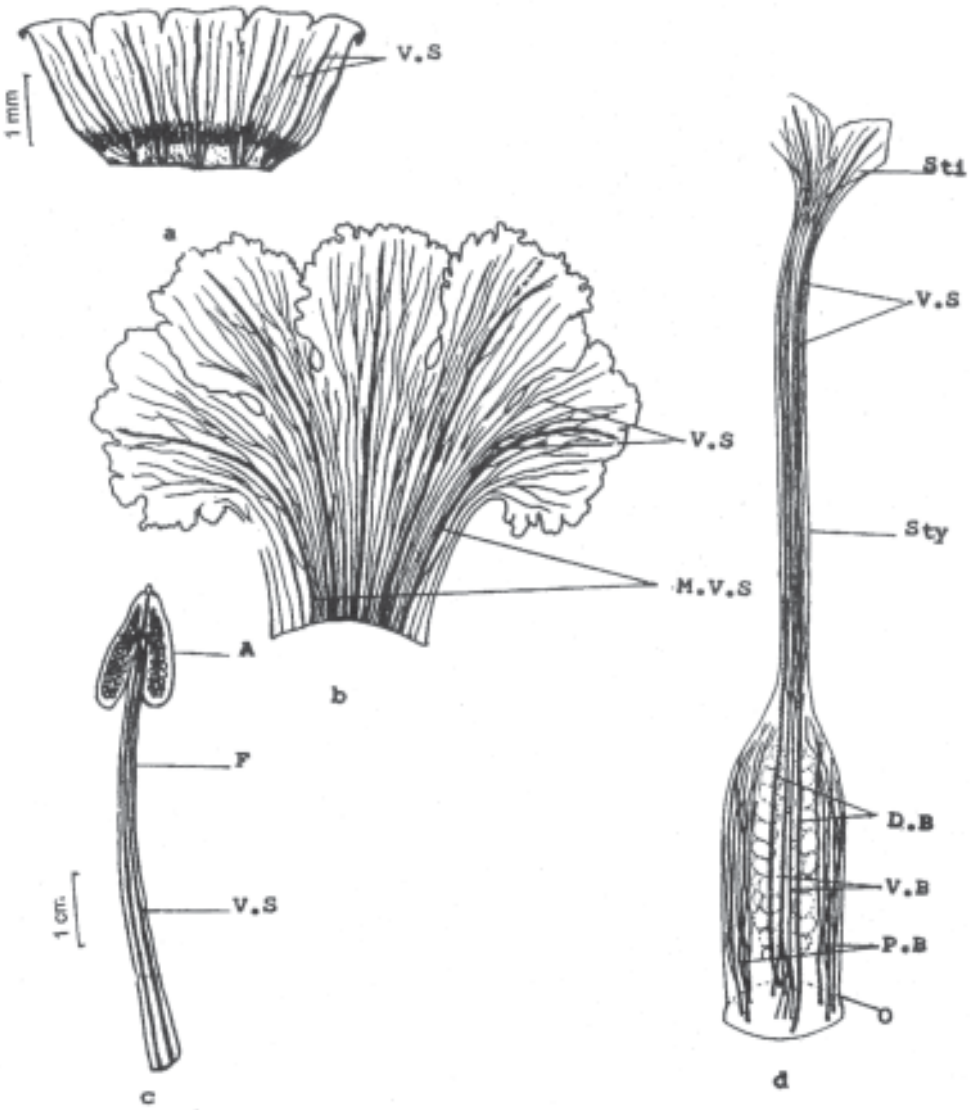

Fig. IV. **a - d** *Oroxylum indicum* (L.) Vent - Floral vasculature
a) Calyx split opened **b**) Corolla split opened **c**) Stamen **d**) Gynoecium

A. Anther lobe **D**.**B** Dorsal bundle **F**. Filament **M**.**V**.**S**. Main vascular supply
O. Ovary **P**.**B** Peripheral bundle **Sti**. Stigma **Sty**. Style **V**.**S** Vascular supply

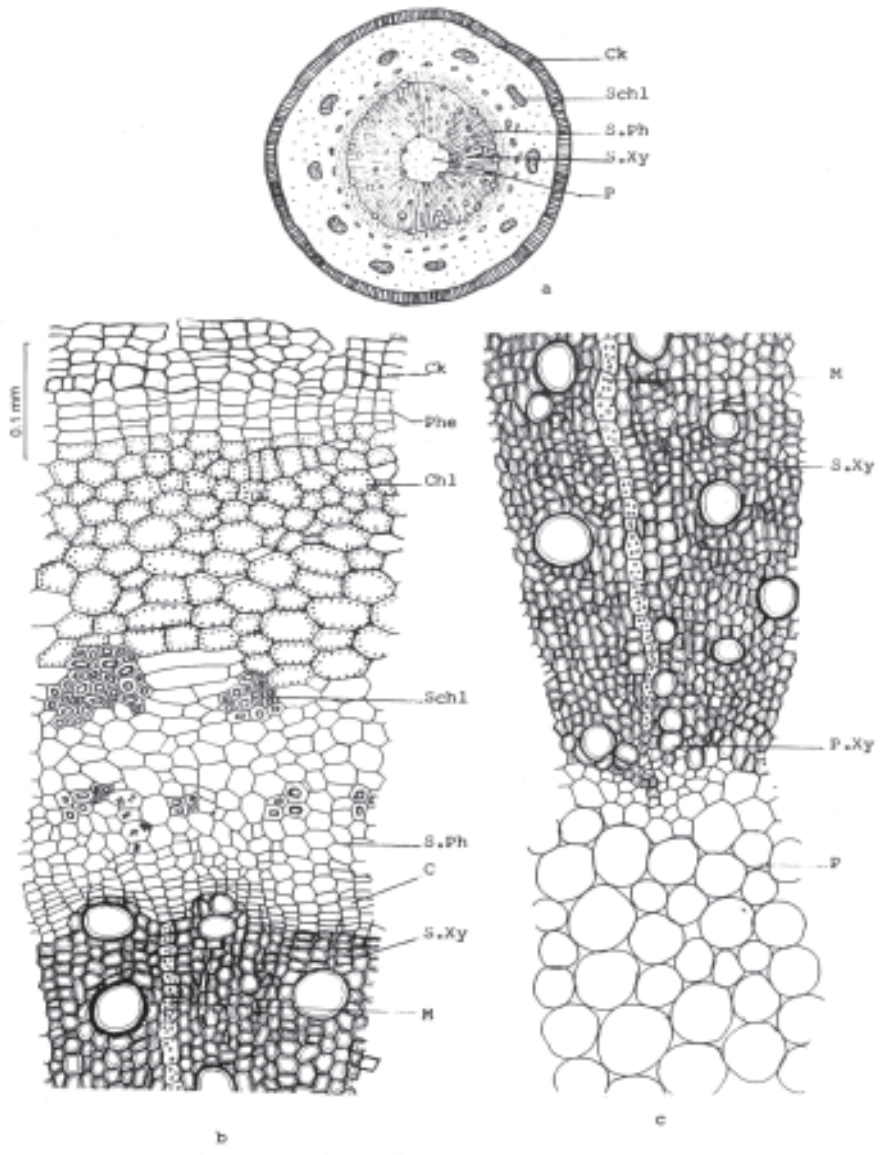

Fig. V. **a - c** *Oroxylum indicum* (L.) Vent
a) T.S. of stem - diagrammatic **b**&**c** A portion of stem enlarged

C. Cambium **Chl**. Chlorenchyma **Ck**. Cork **Cr**. Calcium oxalate crystal
M. Medullary ray **P**. Pith **P**.**Xy**. Primary xylem **S**. Starch grain **Schl**. Schlerieds
S.**Ph**. Secondary phloem **S**.**Xy**. Secondary xylem

Peripheral rows are dark brown while inner rows are brownish in colour. Broad wedges sometimes extend into innermost rows, cutting up the cork tissue into a number of truncate pyramidal projections. Phellogen is not very distinct. Phelloderm consists of 3-4 layers of broadly rectangular tangentially elongated, thin walled cells. In between the periderm and wood, a large zone consisting of polygonal cells is evident. Outer 10-13 layers are comparatively large, thin walled without any inclusions or mechanical cells. Inner to this is a large zone of phloem in which transverse strips of chlorenchyma are seen. In the innermost portion, the schlerenchyma strips are arranged in somewhat concentric rings and are broken at intervals by medullary rays. Cambium is distinct and consists of two layers of tangentially elongated cells. Xylem consists of vessels, parenchyma and feebly developed schlerenchyma which appear as small concentrically arranged patches near the xylem parenchyma. Medullary rays are both uniseriate and multiseriate. Most of them extend up to the bark. Ray cells are rectangular, radially elongated with thick-pitted walls and without any inclusions. The cells in the distal portion of the rays are thin walled larger and tangentially elongated. In the centre, there is a pith composed of round thick walled cells (Fig.VI).

Rachis

In T.S., rachis is somewhat oval in outline with a shallow groove on the upper side. Epidermis is single layered with unicellular hairs. Below the epidermis, 3-4 layers are collenchymatous, followed by a zone of chlorenchyma. In-between phloem and parenchyma, small patches of schlerenchyma are seen. Vascular tissue is seen as continuous ring after secondary thickening. In the centre, large parenchymatous pith is seen (Fig.VIIa,b).

Petiolule

In T.S., petiolule is oval in shape with a shallow groove on the adaxial side. Epidermis is single layered with unicellular hairs. Below the epidermis, 4-5 layers are collenchymatous. Beneath these layers, 3-4 layers are parenchymatous which get extended into phloem at certain areas. In between parenchyma and phloem, schlerenchymatous patches are seen. Secondary phloem and secondary xylem are seen in continuous ring. In the centre, large parenchymatous pith is present (Fig.VIIc,d).

Lamina

In T.S., lamina shows common dicotyledonous characters. Epidermis is single layered over-lined by a thick deposit of cuticle. This is followed by a single layered palisade tissue on the upper side. Spongy tissue is multi-layered with intercellular spaces. In the mid-rib region, 2-3 layers of collenchyma follow epidermis. Rests of the cells are parenchymatous. In the upper portion, 5-7 layers are chlorenchymatous. Vascular bundle is collateral. Stomata are of Ranunculaceous type (Fig.VIII).

Stomatal index, palisade ratio and vein-islet number are 20.66, 5.51 and 2.04 respectively (Fig. IX-XI).

Propagation

Seeds are used for propagation. The dehiscence start along their sutures when the fruits ripe. The fruits collected are kept in poly-bags and exposed in the sun. Within two to three days, the fruits dehisce liberating the thin winged seeds. These seeds should be stored in airtight containers. The seeds are sown on specially prepared sandy beds. Beds should be regularly watered and partially

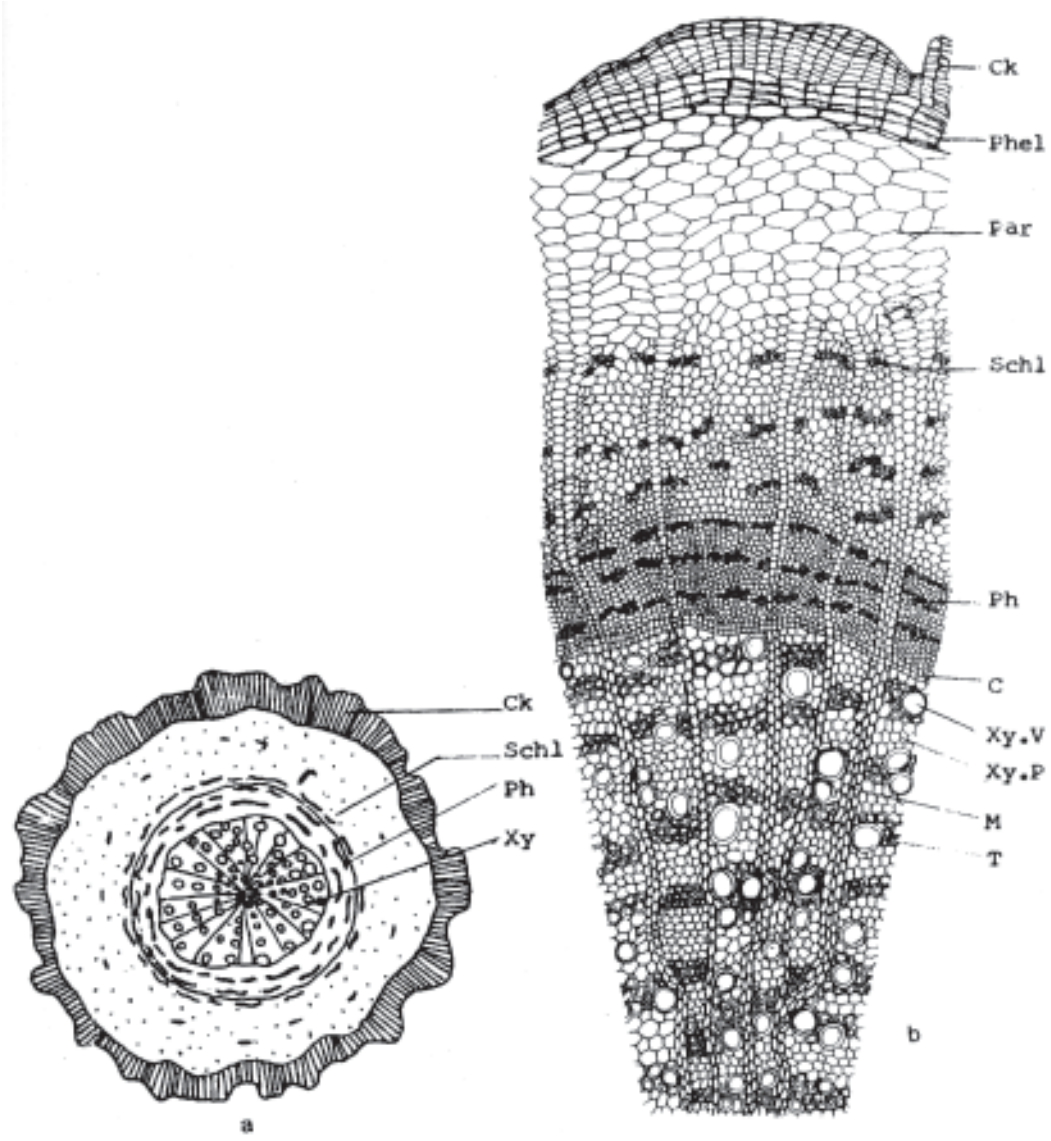

Fig. VI. **a** & **b** *Oroxylum indicum* (L.) Vent
a) T.S. of root - diagrammatic **b**) A portion of root - enlarged

C. Cambium **Ck**. Cork **M**. Medullary ray **P**. Pith
Par. Parenchyma cell **Ph**. Phloem **Phel**. Phelloderm **Schl**. Schlerenchyma
T. Trachied **Xy**. Xylem **Xy**.**P** Xylem parenchyma **Xy**.**V** Xylem vessel

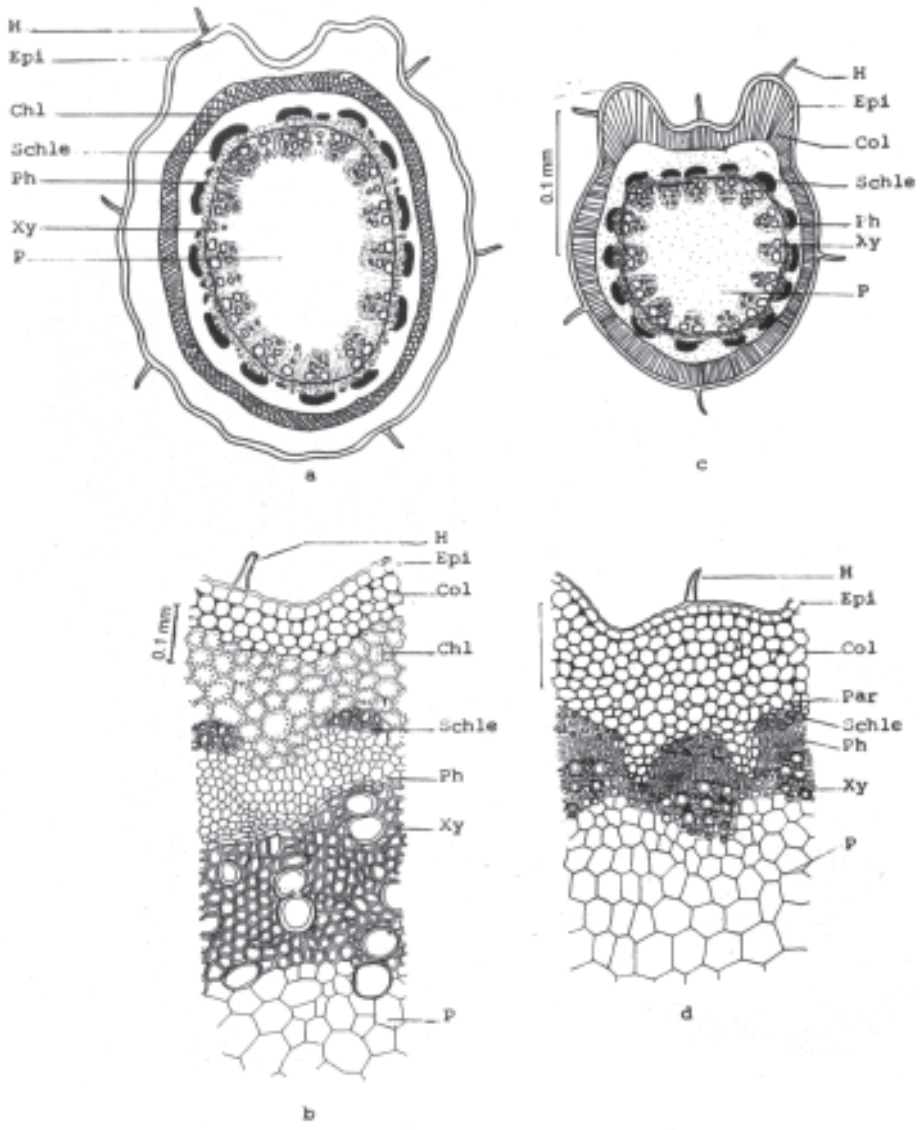

Fig. VII. **a** - **d** *Oroxylum indicum* (L.) Vent
a) T.S. of rachis - diagrammatic **b**) A portion of rachis - enlarged
c) T.S. of petiolule - diagrammatic **d**) A portion of petiolule enlarged

Col. Collenchyma **Chl**. Chlorenchyma **Epi**. Epidermis **H**. Hair
P. Pith **Par**. Parenchyma **Ph**. Phloem **Schle**. Schlerieds **Xy**. Xylem

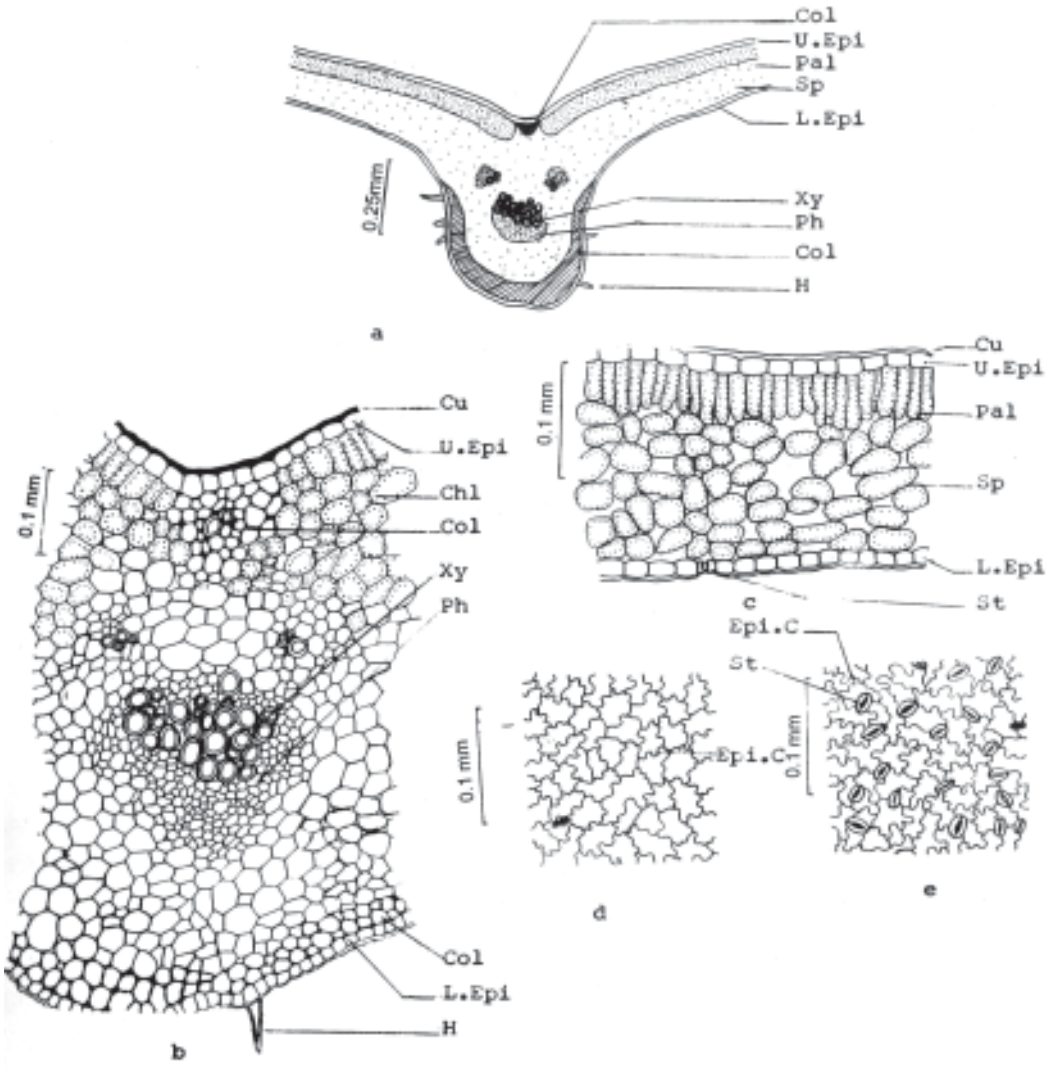

Fig. VIII. **a** - **e** *Oroxylum indicum* (L.) Vent
a) T.S. of lamina through midrib - diagrammatic **b**) Midrib portion enlarged
c) Lamina portion enlarged **d**) Upper epidermis **e**) Lower epidermis

Chl. Chlorenchyma **Col**. Collenchyma **Cu**. Cuticle **Epi**.**C** Epidermal cell
H. Hair **L**.**Epi**. Lower epidermis **Pal**. Palisade cell **Ph**. Phloem
Sp. Spongy cells **St**. Stomata **Xy**. Xylem

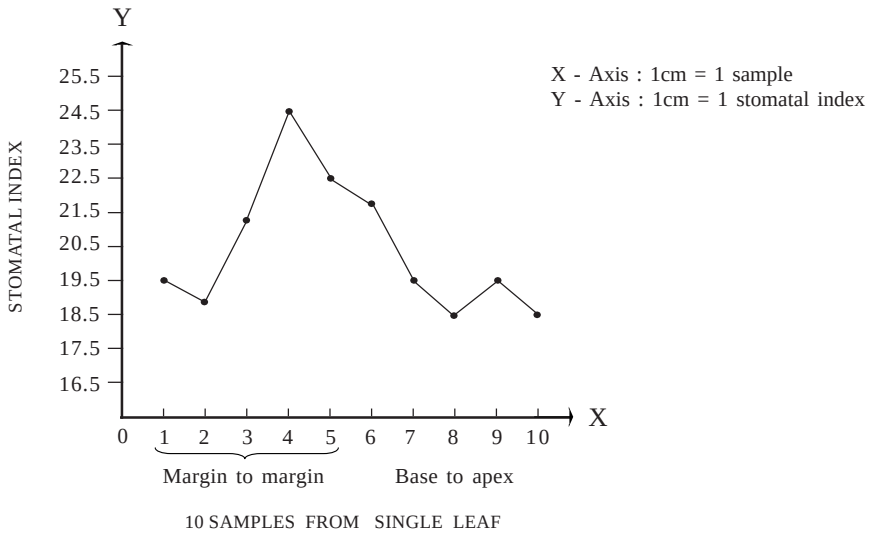

Fig. IX. *Oroxylum indicum* (L.) Vent - Stomatal index - Lower Epidermis

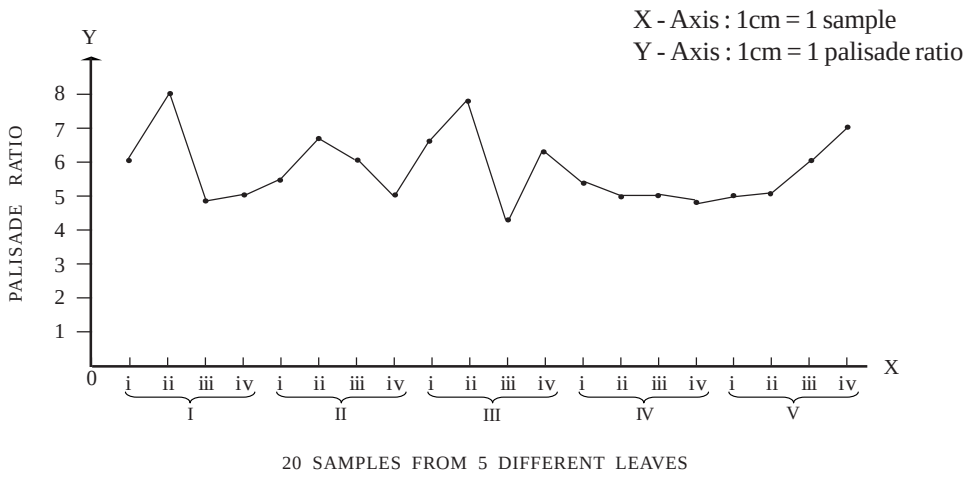

Fig. IX. *Oroxylum indicum* (L.) Vent - Palisade ratio

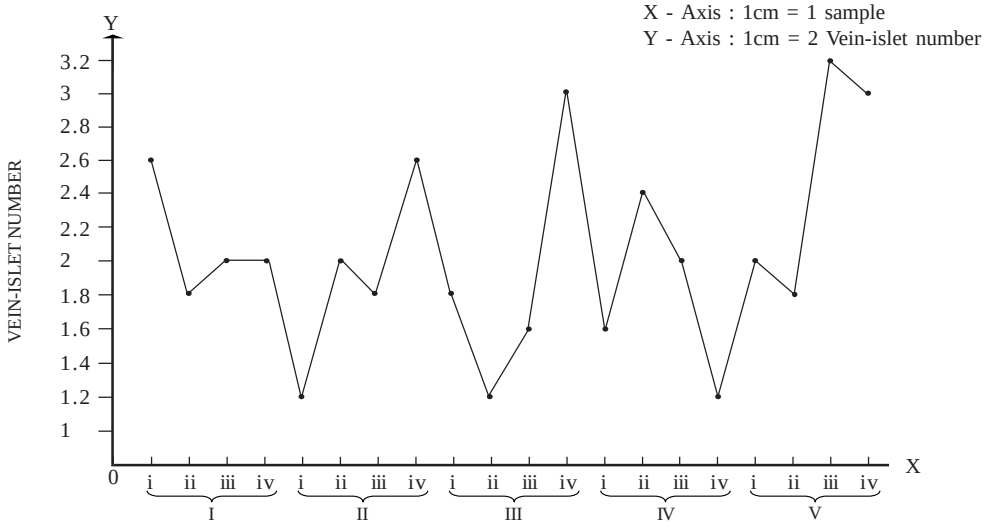

Fig. XI. *Oroxylum indicum* (L.) Vent - Vein-islet Number

shaded. Germination commences on the 8th day and complete within 20 days. Around 87% of germination is recorded. 4-leaved seedlings can be transplanted into poly-bags containing potting mixture. After two months, the seedlings can be transplanted into the field. They can be cultivated either as pure crop or as intercrop in between *Aegle marmelos* and *Premna serratifolia*. 30 cm. cubic pits may be taken at an espacement of 2.5 m. The pits may be filled with green manure and cow-dung and cover with topsoil. After two weeks, the seedlings can be planted on the mounds. Other than initial weeding, no cultural operations are required. Four-year-old plants can be used as excellent standards for pepper. Harvesting can be done after six years onwards.

Chemical studies

Review

The stem and root barks contain three flavone colouring matters viz., oroxylin-A (stem bark, 0.65%, root bark, 0.86%), baicalein (Stem bark, 0.5%) and chrysin (stem bark, 0.35%). Oroxylin-A is the 6-methyl ether of baicalein and has been synthesised. The bark contains traces of an alkaloid, tannic acid, sitosterol and galactose. The seeds on extraction with petroleium ether yield C.20% of a non-drying, bright yellow oil. The mixed fatty acids contain 80.4% oleic acid and 19.6% saturated acids (palmitic, stearic & probably lignocerie and higher acids). The seeds contain a yellow crystalline principle & baicalein and its glucoside named tetuin (baicalein-6-glucoside).

Result and discussion

Large-scale cultivation and planned scientific extraction are the only solution to overcome the scarcity of the drug in the market. The root is the main ingredient in ayurvedic formulations. Dwindling resources of the raw drug tempt the traders to adulterate the drug with similar looking ones. So, manufacturers should develop standardisation technology for screening the raw drugs which will certainly help to improve the quality and efficacy of the finished product.

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AGNI AND DEGENERATIVE DISEASES

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Abstract: The digestion, absorption, assimilation and utilization of food is carried by proper functioning of *agni* and it is one of the *lakshana*s of health also. Many of the causes of degenerative diseases act by impairing the function of *agni*. The paper details the importance of *agni* in bodily activities

Body is nothing but food transformed. After *bijasamyoga* (fertilization), *garbha* (foetus) is almost of the size of an *anu* (atom). From this, a body with all the external and internal organs is developed by the *annarasa* of the *garbhini*[1] (pregnant woman). So, in a sense, body is made up of food. In fact, the term *kaya* is indicative of this. After birth, *bala* (strength) *upachaya* (growth and repair) and *ojas* (immunity) depend upon the intake of adequate quantity of food of quality[2]. The *vimsatiguna*s (*guru*, *manda*, etc.) have a common factor, residing in *dravya* and body. Food-body relation can be well explained by this *samanya* also. So, *sthiti* (Stability) *vridhi* (growth) *kshaya* (degene-ration) are truly caused by food[3].

Without proper functioning of *agni*, food can not be utilized. Nothing can be derived from undigested food[4]; it is really a *salya*. In a way, *agni* converts food into body. Improper *agni* is in the *samprapti* of all the disease. Hence, *agni* is clinically very significant. *Agnibala-pareeksha* is necessary in every clinical examination.

In fact, the role of *kayagni* is an intermediate one. The *bhootagni*s, disintegrate the food and differentiate the particular *bhautic* portions. This is made available to *kayagni*. *Annagraha*, *pachana*, *vivechana* and *mochana* are the functions of *kayagni*[5]. It receives the food first. Only *satmya* food is accepted by the *agni*. The body, through vomiting rejects *asatmya* or *anishta* (averse) food. Certain *dravyas* are *apaki* (indigestable). Such foodstuffs are not accepted by the *agni*. *Annapachana* is the major function of the *agni*. It transforms the food materials into bodily parts. *Agnipaka* identifies and processes the portion of food congenial to body. Processing is making fit for utilization. Separation of the residual and uncongenial part is *sarakitta-vivechana*. Later, both *sara* and *kitta* are released (*mochana*); *sara* for *dhatvagnipaka* and *kitta* for excretion. *Dhatvagni*s are collateral to *kayagni*, existing in particular *dhatu*s. They take up *annarasa*. After *paka* and *sarakittavibhaga* at *dhatvagni* level, *annarasa* nourishes the particular *dhatu*.

Thus, *kayagni* is at the centre of all bodily functions. *Agnivyapara* is not just digestion, but absorption, assimilation and utilization of

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food. Functions of *agni* are considered among the *lakshana*s of health[6]. Along with *samadosha*, etc. *samagni* is also a feature of *svastha*. Though *dosha*s are the primary morbid factors, *agni* is also affected immediately by unwholesome food. So, *agnimandya* is a *nidana*, *lakshana* or even a part of *samprapti*.

Degeneration, in simple term, is the change of tissue to a less functionally active form. This can be conceived as *kshaya* of one or more *dhatu* associated with several diseases. *Rajayakshma*, *prameha* and *kushta* are some examples.

Many of the causes of degenerative diseases act by impairing *agni* function. *Ahara* as a *nidana* for degenerative diseases is to be considered. *Ahara* in *heenamatra* will not provide enough *bala*, *upachaya* and *ojas* and this will lead to degenerative disorders[2]. *Heenamatra* is causative of *agnimandya* also[7]. That is why *peyadikrama* is advised after long-term *abhojana* (*langhana*). So, in these circumstances, supplementation of food is not enough. *Deepana* is also to be incorporated in the treatment. *Heenamatra* can be in *sarvagraha* and *parigraha*. *Sarvagraha* is the total quantity and the *parigraha* is the quantity of constituents – *anna, soopa, jala* or *madhura, amla, lavana,* etc. In *heenamatra* of *parigraha*, supplementing the constituent in isolation is not advisable. It is better to administer the same, along with the normal constituents of food, for a better *agnivyapara*.

Atibhojana may be manifested as *atibrimhana* in early stages, but later it will lead to aggravation of particular *dhatu*, resulting in the decrease in other *dhatu*s, causing degenerative diseases. For example, *atibhojana* of fatty foods will increase *medas* causing *medoroga*. Availability of *annarasa* to other *dhathu*s is reduced. Due to diminished *dhatvagnivyapara*, *kshaya* occurs to the concerned *dhatu*s.

Soka (grief) is one of the important psychic factors involved degenerative disorders. Though it acts causing *ojakshaya*, *agni* can be a part of this genesis, as it is easily affected by psychic factors[8].

All the three views of *dhatuparinama* is to be considered while discussing the role of *dhatvagnis* in degenerative disorders.

According to *ksheeradadhinyaya*, the preceding *dhatu* is utilized by the *agni* of each *dhatu* for its nourishment. So, *kshaya* of one *dhatu* will lead to the same change in the later *dhatu*s. This is well evident in *prameha-samprapti*. In the pathological sequence of *prameha*, deeper and deeper *dhatu*s get involved. So, *agnimandya* is spread from one *dhatu* to the next. Somehow, in certain situations, *dhatvagni* may not reciprocate to *kayagni*, and the patient may feel appetite, while *dhatu*s degenerating.

Kedarakulyanyaya, highlights the role of *srotas* in *dhatuparinama*. Some particular type of *srotodushti* is involved in all the *samprapti*. In *kayagnimandya*, the precipitant *kapha*, produces *upalepa srotas*. This causes non-availability of nutrients to the already deranged *dhatvagni*s. This kind of degeneration occurs in *rajayakshma*. *Kayagni* cannot do the specialized functions of different *dhathvagni*s i.e. to identify and separate the nutrients specific to each *dhatu*. So most of the food consumed is converted to *mala*, thus loosing the *sara* meant for *dhatu*s[9].

Khalekapotanyaya emphasizes the specificity of nutrients. Each kind of bird takes the needed food from the field. Likewise, each *dhatu*

consumes specific, structurally and functionally required, nutrition from the *annarasa*, by virtue of its *dhatvagni*. Apart from the non-availability of the nutrient, derangement of particular *dhatvagni* also causes degeneration of that *dhatu*. These can be cause of diseases pertaining to the *kshaya* of one single *dhatu*.

Thus, *dhatvagni*s have a lead role in the *samprapti* of degenerative diseases, due to errors in *dhatuparinama*. Hence, degenerative diseases, in fact, are due to the degeneration of *agni*.

Therefore, in the management, *agni* is to be given prior consideration. The *doshic* conditions may necessitate *sodhana*, which is also promoting *agni*, but practically it is less possible due to *vridhavastha* or *daurbalya*. Basically, *brimhana* therapy is ideal in degeneration but it can do harm as *agni* is improper. So, *deepana* followed by *brimhana* is recommended. Usually drugs cannot influence *dhatvagni*s directly. Hence *kayagni-deepana* is the only way.

Even during *brimhana*, *deepana* should not be withdrawn. Medicines of both the properties can also be chosen. *Sarpigudas* are ideal examples[10]. These are *ghrita*s, with *churna*s of *deepana* property, added during preparation, so that bio-availability is enhanced. As milk is the recommended *anupana*, there is a combination of *ksheera* and *ghrita*, famed for anti-degenerative properties. *Deepana* - *brimhana* combination is also advised in the treatment of *rajayakshma* and *kshayakasa*. Administering medicine along with food is also recommended for *mandagni*s.

Snehana, not as a *poorvakarma* but in *vicharana* doses have a role in the management of degenerative diseases. It is noteworthy that *snehana* is advised in *vatavyadhi*s, as *dhatuposhana*. Apart from that, *snehana* stabilizes normal *agni*, though it is contraindicated in *agnimandya*. Use of *snehadravya* along with food or *lavana* is another method to have its benefits without adverse effects.

Ahara, during treatment, is to be correct in *matra* as only *samyakmatra* is promoting *agni*. *Ahara* should be wholesome. *Lughu* and *ushna* are to be the other properties. A balanced mind and necessary *vyayama*s also form the regimen in the treatment of degenerative diseases.

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HYPOTHYROIDISM IN ADULT (MYXEDEMA) VIS-A-VIS A STUDY OF *KAPHA-VATAJA SOTHA* AND ROLE OF *SOTHAHARA MAHAKASHAYA* (*DASAMOOLA*)

Asit K. Panja* Mohan Lal Jaiswal**

Abstract: In this paper brief classical evidences have been emphasized and the mode of action of commonly used drug *Sothahara mahakashaya* i.e *Dasamoola* in hypothyroidism has been discussed.

Introduction

Thyroid disorders specially hypothyroidism is one of the most important challenging disease in the present century. This entity is generally increasing now a days due to improper food habits, irregular day-to-day activity and mental imbalance. Ayurveda did not mention the present terminology but by the virtue of unquestionable knowledge of sages indicated the proper pathway to treat this condition.

Aims and objects

The aims and objects of the study were - a) to compare symptomatology of hypothyroidism in adult (myxedema) and *kapha vataja sotha* and b) to evaluate the role of *sothahara maha-kashaya* i.e *Dasamoola* in hypothyroidism.

Comparative symptomatology

Hypothyroidism can result from any of a variety of abnormalities that lead to insufficient synthesis of thyroid hormone. Hypothyroidism dating from birth and resulting in developmental abnormalities is termed as cretinism where as the term myxedema connotes hypothyroidism in adults (Table 1)

Based on the features detailed in table 1, we can consider hypothyroidic state (myxedema) as *kapha vataja* variety of *sotha* i.e. *dvandaja*. Because, in *kapha vataja sotha* not only the features of *vataja* and *kaphaja sotha* are present but also general features of *vata* and *kapha* vitiation might be present.

The evaluation of *Sothahara mahakashaya* in hypothyroidism is detailed in Table 2.

Discussion

Patala (*Stereospermum suaveolens*) has the *kapha samaka* and *vata samaka* property due to its *rooksha laghu guna* and *ushna veerya* respectively. Similarly, *agnimandha* (*Premna integrifolia*) acts as *vata kapha samaka* by its *ushna veerya. Vilva* (*Aegle marmelos*), by virtue of its *rooksha laghu guna*, *tikta rasa* and *ushna veerya*, acts as *kapha samaka* and *vata samaka*

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respectively. *Syonaka* (*Oroxylum indicum*) and *kasmari* (*Gmelina arborea*) individually has *kapha-vata samaka* properties due to *ushna veerya*. Identically due to their *ushna veerya, kantakarika* (*Solanum surattense*) and *brihati* (*Solanum indicum*) are *kapha vata samaka. Vata* and *kapha samana* property of *saliparni* (*Desmodium gangeticum*) can be explained by its *snigdha-ushna guna* and *tikta rasa* respectively. *Prisniparni* (*Uraria picta*) serves as *vata* and *kapha samaka* by virtue of its *snigdha guna* and *ushna veerya* respectively. Finally, *gokshura* (*Tribulus terrestris*) attains its *vata samana* property by *snigdha guna* and *madhura rasa*.

Each constituent of *dasamoola* [*Patala* (*Stereospermum suaveolens*), *agnimandha* (*Premna integrifolia*), *Vilva* (*Aegle marmelos*), *Syonaka* (*Oroxylum indicum*), *kasmari* (*Gmelina arborea*), *kantakarika* (*Solanum surattense*), *brihati* (*Solanum indicum*), *saliparni* (*Desmodium gangeticum*) *Prisniparni* (*Uraria picta*) and *gokshura* (*Tribulus terrestris*)] has the property of *vata samana* or *kapha samana* or both. Four from *brihat panchamoola* and two from *laghu panchamoola* individually has the specific property of *sothahara* viz. *agnimandha, patala, vilva, gambhari, saliparni* and *gokshura*. Charkapani Dutta has mentioned *dasamoola* as *sothagna*[7]. Vridha Vagbhata also gives specific

TABLE 1

Comparative symptomatology

Sl. No	Symptoms of hypothyroidism	Ayurvedic view
1. 2.	Lethargy Anorexia	These are basically due to vitiation of *kapha*[1,5]
3.	Cold intolerance	This is due to vitiation of *kapha* and also due to vitiation of *vata* where there is desire of *ushna*[2,6]
4.	Excess sleeping	It is again one of the important manifestations of *kapha* vitiation
5.	Constipation	This manifestation is due to *vata* vitiation
6. 7.	Mental sluggishness Reduced quality and desire of speech	These are important features of *vatavrddhi*[2]
8.	Non-pitting type of oedema	It is basic feature of *vatika sotha*[3]
9.	Persistent oedema	Features of *kaphaja sotha*[6]
10.	Dry, thicken and coarse skin	It is the characteristic feature of *vatika sotha*[4,6]
11.	Depressed growth and loss of hair	Mixed manifestation of *vata* and *kaphaja sotha*[4,6]
12.	Low body temperature	Manifestation of *kaphaja sotha*[6].

TABLE 2

Evaluation of *Sothahara maha kashaya*

Herbs	Latin name	*Gunakarma*	*Doshakarma*	*Samstanika karma* (Systemic action)
Patala	*Stereospermum suaveolens* DC	G - *Laghu, rooksha* R - *Tikta, kashaya* Vk - *Katu,* Vy - *Ushna*	*Tridosha samaka*	CVS - *Sothahara* UT - *Mootrala*
Agnimantha	*Premna integrifolia* Linn.	G - *Rooksha, laghu* R - *Tikta, katu, kashaya* Vk - *Katu,* Vy - *Ushna*	*Kapha vata samaka*	Ext - *Sothaghna*
Vilva	*Aegle marmelos* Corr.	G - *Rooksha, laghu* R - *Kashaya, tikta* Vk - *Katu* Vy - *Ushna*	*Kapha vata samaka*	Ext - *Sothahara* CVS - *Sothahara* RT - *Kaphaghna* GT - Eradicate uterine swelling
Syonaka	*Oroxylum indicum* vent	G - *Laghu, rooksha* R - *Tikta, kashaya* Vk - *Katu,* Vy - *Seeta*	*Tridosha samaka*	Ext - *Sothahara* CVS - *Sothaghna* UT - *Mootrala*
Kasmari	*Gmelina arborea* Linn.	G - *Guru* R - *Tikta, kashaya, madhura* Vk - *Madhura,* Vy - *Ushna*	*Tridosha samaka*	CVS - *Sothahara* UT - *Mootrajanana*
Kantakarika	*Solanum surattense* Burm.f	G - *Laghu, rooksha, teekshna* R - *Tikta, katu* Vk - *Katu,*Vy - *Ushna*	*Kapha vata samaka*	Ext - *Sothahara* CVS - *Sothahara* UT - *Mootrala*
Brhati	*Solanum indicum* Linn.	G - *Laghu, rooksha, teekshna* R - *Katua, tikta* Vk - *Katu,* Vy - *Ushna*	*Kapha vata samaka*	CVS - *Sothahara* UT - *Mootrala*
Saliparni	*Desmodium gangeticum* DC	G - *Gruru, snigdha* R - *Madhura, tikta* Vk - *Madhura,* Vy - *Ushna*	*Tridosha samaka*	CVS - *Sothahara* UT - *Mootrala*
Prisniparni	*Uraria picta* Desv	G - *Laghu, snigdha* R - *Madhura, tikta* Vk - *Madhura,* Vy - *Ushna*	*Tridosha samaka*	CVS - *Sothahara* UT - *Mootrala*
Gokshura	*Tribulus terrestris* Linn	G - *Gruru, snigdha* R - *Madhura* Vk - *Madhura,* Vy - *Seeta*	*Vata pitta samaka*	CVS - *Sothahara* UT - *Mootrala*

G - Guna; R - Rasa; Vk - Vipaka; Vy - Veerya; Ext - External; CVS - Cardiovascular system; UT - Urinary tract; RT - Respiratory tract; GT - Genital tract

indication of *dasamoola* in *sotha*[8]. It also has the property to rectify the other constitutional symptoms. For example, *vilva*, *gambhari*, *prisniparni* and *brhati* have *deepaneeya* and *pachaneeya* character hence rectify anorexia. *Patala*, *syonaka* and *kantakari* also do that due to their *aruchi nasana* property. *Agnimandha*, *gambhari* have *vibandha nasana* property and *vilva*, *kantakari* have *anulomana* property hence normalize the bowel movement. *Vilva* rectify the lethargic condition and dryness of the skin due to its *balya, rasayana* and *snigdha guna* respectively. *Saliparni* and *gokshura* also rectify the lethargic condition by their *balya karma* and *kasmarya* by its *rasayana* property.

Conclusion

From the above it is clear that *Sothaharamaha kashaya* i.e. *dasamoola* act as both *dosha vipareeta* and *vyadhi vipareeta aushadha* (i.e. *hetu vyadhi paratyaneeka*). According to Charaka, *dravya* can act by *dravyaprabhava, gunaprabhava* or both *dravya-guna-prabhava* as per *kala* and *adhikarana*[9]. Here, we get all three actions. So, it is the most potent *aushadha* to treat the hypothyroidism in adult (myxedema) i.e. *kapha vataja sotha*.

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THERAPEUTIC IMPORTANCE OF *RASAYANA* DRUGS WITH A SPECIAL REFERENCE TO THEIR MULTI-DIMENSIONAL ACTIONS

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Abstract: *Rasayana* is a specialized branch of ayurveda. *Rasayana* drugs act inside the human body by modulating the neuro-endocrino-immune systems. They have been found to be source of anti oxidant drugs. Properties like delayed ageing, improving mental and cognitive functions have been attributed to this[1]. This paper evaluates the therapeutic importance of *rasayana* drugs.

Modulation of psycho-neuro-endocrino-immune systems

It has been found that nervous, endocrine and immune systems are interrelated. The nervous system senses the cognitive stimulis while the immune systems recognize the non-cognitive stimulis like viruses, bacteria and other antigens. Immune products like various cytokines have been found to stimulate the hypothalamus - pituitary - adrenal axis. Elevated level of cytokines in blood has been found to stimulate the median eminence containing corticotrophin release factor (CRF)[2] which ultimately enhances the production of adrenal corticotrophin hormone (ACTH). ACTH has been found to stimulate the secretion of glucocorticoids. Glucocorticoids have overall suppressive effect on the immune system[3]. Immune system has a strong connection with the cognitive and mental performances. Cyclosporin, an immune suppressive drug and Freund's adjuvant, an immune-stimulating drug have respectively decreased and increased the metal as well as the cognitive functions[4]. Cholinergic receptors are found in the cells of thymus and bone marrow. Also for cytokines, receptors are demonstrated in brain and pituitary and for different hormones in lymphoid cells[2].

The homeostasis of this multidimensional system is completely deranged due to various stress factors like heat, cold, noise, environmental poisons, heavy bleeding from wounds, bacterial toxins and strong emotional reactions. Stress causes enhanced sympathetic and hypothalamus-pituitary-adrenal activities[5]. It also degenerates hippocampal neurons responsible for the memory and cognitive

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processes[6]. Apart from this it helps to generate a number of free radicals[7]. Cognitive and mental function impairments are also associated with chronic stress[8].

Rasayana drugs as anti-oxidants and neuro-endocrino-immune modulators

Drugs like *asvagandha* (*Withania somnifera*), *tulasi* (*Ocimum sanctum*), *guduchi* (*Tinospora cordifolia*), *silajit* (*Asphaltum punjabianum*), etc. are potential *rasayana* drugs that have already been evaluated to antagonize the stress related problems. They work in the body by modulating the neuro-endocrino-immune systems and diminishing the oxidative stressors in the body.

Asvagandha (*Withania somnifera*) modulates various cytokines levels[9]. It also increases the acetylcholine activities thereby increasing the mental and cognitive functions[10]. The drug decreases the stress-induced elevation of cortiocosterone level[11]. The antioxidant effect of *asvagandha* has been characterized by its significant increasing capacity of antioxidant enzymes like GSH, GST & GPO and decreasing ability of lipid peroxidation[12].

Guduchi (*Tinospora cordifolia*), another *rasayana* drug, has found successfully protecting the hippocampal neurone degeneration by cyclosporin[4]. It prevents stress-induced elevation of plasma cortisol[14]. The drugs have been found to increase the synthesis and activities of acetycholine thus indicating its nootropic activity[4]. The drug also stimulates the macrophage function and the cytokines like granulocytemacrophage colony stimulating factors (GM-CSF)[14].

Tulasi (*Ocimum* sanctum), a common shrub found in every Indian house yards, has shown potential anti-stress effect by preventing the hippocampal neurone degeneration in rats' brain[15]. It also alters the plasma corticosterone elevated by noise stress[16]. The drug possesses significant immuno-modulatory and radio protective effects[17]. Increases the antioxidant enzymes viz. superoxide dismutase (SOD), catalase (CAT) and glutathione peroxidase (GPX) concentrations indicates the antioxidant property of *tulasi*[18].

Silajit (*Asphaltum punjabianum*), a mineral origin *rasayana* drug, has given rise to remarkable increase in dopaminergic activity and reduced 5-HT turn over in experimental animals[7]. The drug activates the peritoneal macrophages to secrete various cytokines in mice. It has antioxidant properties by its ability to enhance antioxidant enzymes like SOD, CAT and GPX in animal models[7].

Therapeutic importance of *rasayana* drugs

The above drugs have been considered here as model examples; similar kind of activities can be expected from other *rasayana* drugs. Different studies make clear that *rasayana*s in ayurveda act simultaneously on different systems viz. the neuro-endocrino-immune systems. Apart from this, they have also antagonistic actions on the oxidative stressors giving rise to the formation of different free radicals. Therefore, the therapeutic indications of these drugs can include the diseases relating to all the above systems. Their anti-stress/ adaptogenic actions have made them therapeutically far more important.

The immuno-modulators can be expressed in terms of immuno-stimulants, immuno-adjuvant and immuno-suppressants. The immuno-

stimulants are applied to enhance body's resistance against infections (both viral and bacterial). They can act on both innate and adaptive arms of the immunity. In case of healthy persons, these drugs can act as prophylactic or promotive agents. These drugs have an excellent applicability in the immune comprised conditions like primary (humoral, cellular or combined immuno-deficiency syndromes) and secondary immune deficiency conditions (AIDS, cancer chemotherapy, steroids therapy). They can also be used in case of chronic or persistent infections (viral, bacterial, etc.) with or without chemotherapeutic agents. The immuno-suppressants have a wide range of application in case of graft rejection in transplantation surgery.

As discussed earlier, stress causes an elevation of glucocorticoids, specifically the cortisol. Most of the *rasayana* drugs have their inhibitory effects on the glucocorticoids. Excess amount of cortisol causes muscle-wasting, arrest of growth in children, osteoporosis (if vertebral bodies are involved), insomnia, excitability, euphoria and psychotic depression[20]. Therefore, *rasayana* drugs having cortisol inhibitory effect can be indicated in all the above conditions. Disease related to stress like gastritis, ulcerative colitis, irritable bowel syndrome, peptic ulcers, hypertension, asthma, headache, anxiety and depression are very much common. Even in cancer, stress plays a significant role in the progression and regression of malignancy. Perhaps, being potential antistress agents, *rasayana*s in ayurveda can be extremely beneficial in these stress related problems[13].

While considering their activities on the cognitive functions, it has been observed that all the above-mentioned drugs exhibit either nootropic or neuro-protective actions. This suggests that *rasayana*s can be indicated as potential medicaments in different demential and neuro-degenerative conditions like old age. They can make promising results in case of senile dementia and pre-senile dementia like Alzheimer's disease.

Recently it has been found that stress causes the generation of various free radicals in the body. Role of free radicals causing diseases like artherosclerosis, cancer, chronic bronchitis, rheumatoid arthritis, etc. has been reported. Most of the *rasayana* drugs viz. *asvagandha*, *guduchi*, *tulasi*, etc. and formulations like *Chyavanaprasam*, *Brahmarasayanam*, etc. have been reported to possess significant antioxidant effect. Other drugs also mentioned in the context of *rasayana* need to be evaluated for the above activities.

Conclusion

From this review, it can be concluded that *rasayana* drugs in ayurveda express their actions by modulating the psycho-neuro-endocrino-immune systems. They have been found to have tremendous therapeutic potentials. All ayurvedic classics are emphasizing the magnificent effect of *rasayana*s. Their importance has been significantly experienced in the present lifestyle.

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POTENTIALITY OF SOME VIRICIDAL AYURVEDIC HERBS IN ANTI-ORTHOPOX VIRUSES (*VARIOLA - VACCINA*)

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Abstract: Some medicinal plants having the viricidal action against orthopox viruses viz. *variola* (smallpox) and *vaccinia* used by various tribes in India for the treatment of smallpox epidemics are reviewed in this paper. Some other herbs which have experimentally shown working against *variola* and *vaccinia* are also documented.

Introduction

Many Indian plants are potential source of medicines and are used in the ayurvedic medicinal system of treatment from ancient times. Various products and extracts of medicinal plants can be explored for further drug discovery for the treatment of *variola* and *vaccinia* infections in human and other animal pox epidemic like monkey pox and buffalo pox which are of zoonotic and public health importance.

The aim of the study was to find out the use of 'time-tested' anti-orthopox virus herbal drug for the treatment of pox virus epidemic in man and animal.

Some viricidal plants used as traditional medicines by various tribes in India for the treatment of smallpox (*variola* virus) are detailed below:

1. *Pithecellobium dulce*

Family : Leguminosae
English : Madras thorn, Manila tamarind
Hindi : *Vilayati babul*
Malayalam : *Korukapulimaram*
Tamil : *Kodukkapuli*

In the case of smallpox, a paste of its root is used as a poultice on the vesicles. The same preparation is used as poultice in boils. For other skin disease, a decoction of the bark is used as astringent. The *garo* tribes of Meghalaya (India) use the bark powder mixed with coconut oil in various skin diseases (Ved Prakash and Mehrotara, 1991).

2. *Ensete superbum*

Family : Musaceae
English : Wild banana
Hindi : *Banakadali*
Malayalam : *Kalluvazha*

The anti smallpox activity is extracted from the seeds of three varieties of banana i.e. *Ensete superbum, Musa superba* and *Musa acuminata.* Experimentally all the three frac-

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tions (VIDR-2T, VIDR-2GC and VIDR-2GD) isolated from the seeds of *Ensete superbum* prevented the growth of *vaccinia* and *variola* viruses on the chick chorioallantoic membrane (CAM). The same extracts prevented the disease appearance in the mice infected with *variola* virus. It is interesting to note that it also significantly cured the infected mice even when the treatment started after the infection (Datta et. al., 1968). Thus, the drug prepared from the seeds of *banakadali* finds high effective in smallpox epidemic.

3. *Azadirachta indica*

Family : Meliaceae
English : Neem, Margosa tree
Hindi : *Nim, Nimb*
Malayalam : *Aryaveppu*
Tamil : *Veppamaram*

A 10% water extract of the leaves was found to possess antiviral properties. It prevented plaque formation of *vaccinia* virus in tissue culture. The experiment on the skin of rabbits and monkeys showed the antiviral effects of the leaf extract (Rao et al., 1969).

4. *Ichnocarpus frutescens*

Family : Apocynaceae
English : Black creeper
Hindi : *Kalidudhi, Simalata*
Malayalam : *Palvalli*
Kannada : *Kareambu*

The plant is used by tribals (*santals*) for smallpox and measles (Jain and Tarafder, 1970). However, according to Dhar et al., (1968) it has antiviral activity for *ranikhet* disease (Newcastle disease – Poultry disease) virus but was inactive against *vaccinia* virus.

5. *Kirganelia reticulata*

Family : Euphorbiaceae
English : Panjoli
Hindi : *Panjul, Buinowla*
Malayalam : *Kilaneli, Niruri, Niroli*
Tamil : *Nirppulanji*

The whole plant is used in smallpox and syphilis in India as traditional medicine (Satyavati et al., 1987).

Some other medicinal plants that showed anti-*vaccinial* and other viricidal effect are: –

1. *Amoora rohituka*

Family : Meliaceae
English : Rohituka tree
Hindi : *Harinhara*
Malayalam : *Chemmaram*
Tamil : *Semmararam*

The alcoholic extract of the stem possessed antiviral activity for *vaccinia.* It also showed antiviral activity for *ranikhet* disease virus (Newcastle disease - virus of poultry) and *friend* virus leukemia in mouse (Dhar et al., 1968).

2. *Caesalpinia bonducella*

Family : Caesalpiniaceae
English : Moluca bean
Hindi : *Kat-karamj*
Malayalam : *Kazhanchikkuru*
Tamil : *Kazhachchikkai*

The alcoholic extract of the root and stem showed antiviral activity against *vaccinia* (Dhar et al., 1968). However, the alcoholic extract of the root of *Caesalpinia sepiaria* exhibited antiviral activity against both *vaccinia* and *ranikhet* disease viruses (Bhakuni et al., 1969).

3. *Cassia auriculata*

Family : Leguminosae
English : Avaram
Hindi : *Tarwar*
Malayalam : *Aveeram, Uratakara*
Tamil : *Avaram*

The alcoholic extract of the root and aerial parts exhibited antiviral activity against both *vaccinia* and *ranikhet* (Newcastle disease) viruses (Dhar et al., 1968)

4. *Cassia fistula*

Family : Leguminosae
English : Indian laburnum
Hindi : *Sonhali*
Malayalam : *Kanikonna*
Tamil : *Sharakkonnai*

The alcoholic extract of the pods and stem bark showed antiviral activity against both *vaccinia* and *ranikhet* disease viruses (Dhar et al., 1968)

5. *Cassia tora*

Family : Leguminosae
English : Foetid cassia
Malayalam : *Takara*
Tamil : *Tagarai*

The alcoholic extract of the whole plant showed antiviral activity against both *vaccinia* and *ranikhet* disease viruses (Dhar et al., 1968).

6. *Cynodon dactylon*

Family : Gramineae
English : Dhub grass, Bermuda grass
Hindi : *Dhub*
Malayalam : *Karuka*
Tamil : *Arugampullu*

The alcoholic extract of the whole plant is having antiviral activity against *vaccinia* virus (Dhar et at., 1968).

7. *Indigofera cassioides*

Family : Papilionaceae
Hindi : *Sakena*
Malayalam : *Manali*
Tamil : *Narinji*

The extract of the root showed antiviral activity for both *vaccinia* and *ranikhet* disease viruses at a dose of 80 ug/ml inhibited the multiplication of viruses in cell culture (Dhar et. al., 1968). The extract of the aerial parts of *Indigofera mysorensis* showed 75 to 25 percent of inhibition in replication of both *vaccinia* and *ranikhet* disease viruses. The plant also exhibited interferon like inhibition against both the viruses (Babbar et al., 1979)

8. *Laggera pterodonta*

Family : Asteraceae

The 50% ethanolic extract of the plant exhibited antiviral activity against *vaccinia* virus (Bhakuni et al., 1971).

9. *Limnophila racemosa*

Family : Scrophulariaceae
English : Kuttara
Hindi : *Kuttra*
Malayalam : *Manganari*

The 50% ethnolic extract of the whole plant showed antiviral activity against *vaccinia* virus (Bhakuni et al., 1969).

10. *Maesa indica* var. *augustifolia*

Family : Myrsinaceae
English : Maesa
Malayalam : *Kirithi*

The 50% ethnolic extract of the whole plant excluding roots exhibited antiviral activity against *vaccinia* virus (Bhakuni et al., 1969).

11. *Mimosa pudica*

Family : Mimosaceae
English : Sensitive plant
Hindi : *Lajjalu*
Malayalam : *Totalvati*
Tamil : *Thottamvati*

The 50% ethnolic extract of the whole plant showed antiviral activity against *vaccinia* virus (Bhakuni et al., 1969).

12. *Moringa oleifera*

Family	:	Moringaceae
English	:	Drumstick
Hindi	:	*Soanjna*
Malayalam	:	*Muringa*
Tamil	:	*Murungai*

The 50% ethnol extract of root and bark showed antiviral activity against *vaccinia* virus (Dhar et al., 1968). But Babbar et al., (1970) studied the root extract of the plant and found better antiviral action for *vaccinia* and also for *ranikhet* disease viruses.

13. *Myrica esculenta*

Family	:	Myricaceae
English	:	Box berry
Hindi	:	*Kaiphal*
Malayalam	:	*Maruta, Cherukumizhu*
Tamil	:	*Marudam*

The 50% ethnol extract of stem and bark showed marked inhibition of the multiplication of *vaccinia* virus on CAM. It also inhibited the multiplication of *ranikhet* disease virus in monolayer culture (Babbar et al., 1970; Dhar et al., 1968).

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EXCERPTS FROM CHIKITSAMANJARI – XL

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Abstract: Usually, the drugs that cause purgation, in smaller doses act as laxative. This chapter deals with drugs used for purgation and laxation. And also deals with the causes and treatments of *pandu* (anaemia)

DRUGS CAUSING PURGATION

For mild purgation, *Amritottaram kashayam* (detailed in *Jvaradhikaram*) 10 to 15 ml with sugar as additive and suitable quantity of castor oil has to be taken before the consumption of *Avipatti choornam.*

The *kashaya* detailed below can purge vitiated *pitta*, fecal matter and is also effective in the treatment of piles (*arsa*).

Karimpu	*Saccharum officinarum*
Kalli	*Euphorbia ligularia*
Chikkatakka	*Areca catechu* (tender)
Phalatraya	*Terminalia chebula* *Emblica officinalis* *Terminalia bellirica*
Trivrit	*Operculina turpethum*

Consumption of fine powder of *siva* (*Terminalia chebula*) prepared in the form of *putapaka*, mixed with coconut water clears bowels and urine immediately.

Three *kana*s** of *Aavanakkenna* (castor oil), mixed with *uzhakku* (96 ml) milk, when consumed clears fecal accumulation and relieves colic, anaemia, piles and edema.

Tender shoots of *konna* (*Cassia fistula*) tied into a bundle should boil with milk and use the milk so boiled to prepare a *kanji.* Consumption of this causes purgation. Fine powder of *katukka* (*Terminalia chebula*), consumed with curd is capable of causing purgation.

A *kashaya* prepared from the following drugs each 10 *kana*s when taken with a little jaggery causes purgation without griping.

Mukka	*Terminalia chebula* *Emblica officinalis* *Terminalia bellirica*
Tippali	*Piper longum*
Yashtyahva	*Glycyrrhiza glabra*

A pill rolled from the fine powders of the following, mixed with jaggery is effectual for smooth purgation.

Trikolppa-kkonna	*Operculina turpethum*	2 parts
Katukka	*Terminalia chebula*	1 part
Vizhalari	*Embelia ribes*	1 part
Jaggery		2 parts

Intake of *Gandharvahastadi kashaya*, detailed below, with a small quantity of rock salt and

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**1 *kana* = 0.400 ml./ 40 mg

sufficient quality of castor oil cures colonitis, piles and indigestion.

Gandharvahasta	*Ricinus communis*
Chiruvilva	*Holoptelea integrifolia*
Hutasa (purified)	*Plumbago indica*
Visvam	*Zingiber officinale*
Pathya	*Terminalia chebula*
Punarnava	*Boerhaavia diffusa*
Yavashaka	*Tragia involucrata*
Bhoomitala	*Curculigo orchioides*

Consume fine powder of the following mixed with 12 *palas** of jaggery for a period of one month maintaining strict dietary restrictions such as avoiding excessive sour, salt, spicy and pungent materials.

Vidangasara	*Embelia ribes*	
Aamalaka	*Emblica officinalis*	
Abhaya	*Terminalia chebula*	
		1 *pala* each
Kumbha	*Operculina turpethum*	
		3 *palas*

This preparation, known as *Manibhadragulam*, relieves *kustha* (various skin diseases), *svitra* (vitiligo), *svasa* (asthma), *kasa* (cough), *udara* (ascitis), *arsa* (piles), *meha* (diabetes), *pleeha* (splenomegaly), *grandhi* (growths such as neoplasms), *ruk* (pain), *janthu* (growth of organisms in wound, etc.) and *gulma* (flatulence).

The root bark of *ilakkalli* (*Euphorbia ligularia*) mixed with warm water is effective for the free passage of fecal matter. Alternatively the bark powder can also be consumed mixed with honey. This preparation cures haemorrhoids also. Intake of *kampillakam* (*Mallotus philippensis*) with hot water induces purgation. Application of the powder of *kampillakam* on the abdomen of the infant causes purgation.

Intake of *avilkurunnu* (*Holoptelea integrifolia*), *ayamodakam* (*Trachyspermum roxburghianum*), *katukka* (*Terminalia chebula*), etc. (cross ref. *Arsadhikaram* 36) ground well and mixed in buttermilk induces purgation.

Milk, mixed with one-sixtieth part of the milky latex of *kalli* (*Euphorbia ligularia*) when turns to sour should be used to prepare butter. This clarified butter, mixed with *trikatu* (*Zingiber officinale*, *Piper nigrum* and *Piper longum*) is used to induce purgation. Simultaneously, this buttermilk can also be consumed. Ghee prepared with *nagadanti* (*Baliospermum montanum*) as *kalka* (12 g), mixed with coconut milk induces purgation.

Express ripe coconut pulp to collect coconut milk and add one fourth or half *plavila* (a conical liquid container prepared from jack tree leaf) i.e. about 25 to 30 ml of milky latex of *kalli* (*Euphorbia ligularia*) to it. Reduce the mixture to coconut oil by boiling. Consume about 30 ml of this oil for purgation.

The dose given above is for severely constipated individuals. An excess dose may cause vomiting and uncontrollable purgation. When the patient becomes weak due to excessive purgation, irrigate his head with cold water. If purging is still uncontrollable, clarified butter mixed with cold water may be given.

This purgative is recommended in flatulence (*gulma*) and piles (*arsa*) to clear the fecal matter only as a last resort when the patient is not responding to other purgatives. This is a very

* 1 *pala* = 48g

powerful purgative that may disable the patient. In such case, irrigation on the head with milk, application of *Aarukaladi tailam* on the head, application of a mixture of sesame oil and clarified butter all over the body, consumption of milk and *kanji* medicated with *techiver* (root of *Ixora coccinia*), *cherupoola* (*Aerva lanata*), etc. are advised.

This preparation is contraindicated for children, aged, debilitated and obese patients. Even in the healthy, the dose has to be carefully monitored.

The following drugs (*Nikumbhadigana*) cause purgation.

Nikumbha	*Baliospermum montanum*
Kumbha	*Operculina turpethum*
Triphala	*Terminalia chebula* *Emblica officinalis* *Terminalia bellirica*
Gavakshi	*Cucumis trigonus*
Snuk	*Euphorbia ligularia*
Sankhini	*Canscora decusseta*
Nilini	*Indigofera tinctorea*
Tilvakani	*Excoecaria agallocha*
Syamaka	*Cassia fistula*
Kampillakam	*Mallotus philippensis*
Hemadugdha	*Argemone mexicana*
Dugdham	Milk
Mootram	Urine

A *kashaya* prepared from the following clears accumulated fecal matter and the passage of urine within 48 minutes.

Muttanga	*Cyperus rotundus*
Kotuveli	*Plumbago indica*
Muntiringa	*Vitis vinifera*

Expressed juice of *tirutali* (*Ipomoea sepiaria*) mixed with oil has similar action.

Prepare *Jepala* (*Croton tiglium*), covered with the paste of *amrita* (*Tinospora cordifolia*), as *putapakavidhi,* and the *jepala*, rolled into a pill, should be given with warm water to the patients suffering from constipation and dysurea to induce purgation.

Boiling in the fluids of *chillee* (*Chenopodium album*), *kanya* (*Aloe barbedensis*), *vara* [*katukka* (*Terminalia chebula*), *nellikka* (*Emblica officinalis*) and *tannikka* (*Terminalia bellirica*)], *dugdham* (milk), *koosmanda* (*Benincasa hispida*) and buffalo's dung purifies *japala*. After each boiling, dry it in the sun. Consumption of tender leaves of *pooteekaranja* (*Holoptelea integrifolia*) fried in ghee, pasted with milk and rock salt relieves chronic fecal accumulation.

Trivrit (*Operculina turpethum*) causes smooth purgation and *snuhiksheeram* (latex of *Euphorbia ligularia*) create drastic purgation.

Lasunerandadi

Prepare a *kashaya* with 4.800 kg of *lasuna* (*Allium sativum*) in 76.800 litre of water and reduce to 19.200 litre. Add 48g each of *sauvarcehla* (Sodium sulphate mixed with Sodium chloride), *vilanga* (*Embelia ribes*), *kana* (*Piper longum*), *dipyaka* (*Trachyspermum ammi*) and 288g of *trivrit* (*Operculina turpethum*) as *kalka* mixed with 3.072 litre of *Chitratailam* (castor oil). Consumption of this relieves *gulma,* ascites, *vata* vitiation, *pleeha roga, ashtila, vriddhi, soola* (colic) and *agnimandyam*.

Boil 792g *ulli* (*Allium sativum*) and 408g *tavizhama* (*Boerhaavia diffusa*) in 16.75 *edangazhi** of water and reduce to one-fourth.

* 1 *edangazhi* = 768 ml

The drugs should be pressed well and filtered. Add three *nazhi** of castor oil and one *nazhi* of ghee, and the following drugs as *kalka* to prepare the medicated oil. The dose of the preparation may be regulated suitably.

Tuvarchila-kkaram	Sodium sulphate mixed with Sodium chloride
Vizhalari	*Embelia ribes*
Attittippali	*Scindapsus officinalis*
Ayamodakam	*Trachyspermum roxburghianum*
	3 *kazhanju*** each
Trikolppa-kkonna	*Operculina turpethum*
	16 *kazhanju*

The preparations for purgation and laxation mentioned in *gulma,* flatulance, etc. are also suitable in this condition.

TREATMENT OF *PANDUROGA* (ANAEMIA)

Panduroga (anemia) is caused by the vitiation of *vata*, *pitta*, *kapha*, *sannipata* (the combination of the three) and also due to the habit of eating soil.

Oedema, yellowish colour to the sclera and nails, malaise, burning sensation, anorexia, vomiting, flatulence, diarrhoea, purging and transient unconsciousness are the characteristic features of this disease. Advanced stages can even be fatal. The treatment should start with sudation, unction, etc.

Unction with *Kalyanaka ghrita*, *Mahatiktaka ghrita*, *Aragvadhadi ghrita*, or *Dhatryadi ghrita* added with the fluids mentioned in *Dasasvarasa ghritam* as additional *drava* is advised as the first line of treatment.

In *pandu* caused by the derangement of *pitta*, the following mixed and boiled with buttermilk is very effective.

Ellu	*Sesamum indicum*
Kanjunni-kkazhutu	*Eclipta prostrata*
Puranakittam	Ferric oxide

A *kashaya* prepared from the following relieves *pandu*.

Karimpu	*Saccharum officinarum*
Irumpinpoti	Iron powder
Pathya	*Terminalia chebula*
Changalam-paranta	*Cissus quadrangularis*
Kolpuli	*Tamarindus indica*
Nilamparanta	*Desmodium triflorum*
Tavizhama	*Boerhaavia diffusa*
Kuruntotti	*Sida rhombifolia* ssp. *retusa*

Another *kashaya*, prepared from the following drugs is also very effective.

Irumpani	Iron / nail
Karimpu	*Saccharum officinarum*
Katukka	*Terminalia chebula*
Tavizhamaver	*Boerhaavia diffusa* (root)
Vilva	*Aegle marmelos*
Pulinarampu	*Tamarindus indica*

If the patient does not purge, add *trikolppa-kkonna* (*Operculina turpethum*) to this *kashaya*.

Consumption of *Punarnavanimbadi kashaya*, detailed below is also effective.

Punarnava	*Boerhaavia diffusa*
Nimba	*Azadirachta indica*
Patola	*Trichosanthes lobata*

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*1 *nazhi* = 192 ml; ** 1 *kazhanju* = 4 g

Sundhi	*Zingiber officinale*
Tikta	*Andrographis paniculata*
Amrita	*Tinospora cordifolia*
Darvi	*Coscinium fenestratum*
Abhaya	*Terminalia chebula*

The *kashaya* detailed below relieves *pandu* and *kamila*.

Triphala	*Terminalia chebula* *Emblica officinalis* *Terminalia bellirica*
Amritu	*Tinospora cordifolia*
Atalotakam	*Justicia beddomei*
Tikta	*Andrographis paniculata*
Ardraka	*Zingiber officinale*
Parantayugma	*Desmodium triflorum* *Cissus quadrangularis*
Tavizhama	*Boerhaavia diffusa*
Loha	Iron

Depending up on the health of the patient, emesis and purgation can also be done.

The following drugs cooked in buttermilk and made to a paste may be consumed.

Kotuveli	*Plumbago indica*
Puranakittam	Ferric oxide
Ellu	*Sesamum indicum*
Ardraka	*Zingiber officinale*
Bhringaraja	*Eclipta prostrata*

Another *mukkuti*[1] prepared from the following is also effective.

Changalam-paranta	*Cissus quadrangularis*
Ellu	*Sesamum indicum*
Kanjunni-kkazhuttu	*Eclipta prostrata*
Katukka	*Terminalia chebula*

Consumption of a pill prepared out of the following drugs mixed with buttermilk in the early morning cures *pandu.*

Puranakittam	Ferric oxide
Mulaku	*Piper nigrum*
Katukka	*Terminalia chebula*
Madhupa	*Eclipta prostrata*
Muttil	*Centella asiatica*

The following drugs mixed with buttermilk may be consumed in the morning for the cure of malaise, jaundice (*kamila*) and *pandu*.

Mandooram	Ferric oxide
Ellu	*Sesamum indicum*
Tavizhama	*Boerhaavia diffusa*
Muttil	*Centella asiatica*
Karintakkali	*Solanum nigrum*
Agnimandha	*Premna corymbosa*
Bhringi	*Eclipta prostrata*
Elantapatram	*Ziziphus mauritiana*
Katurohinee	*Picrorhiza scrophulariiflora*
Deepyam	*Trachyspermum ammi*
Saindhavam	Rock salt
Chukku	*Zingiber officinale*

Consumption of buttermilk medicated with *mandoora* (Ferric oxide), *ayoraja* (iron powder) and *pathya* (*Terminalia chebula*) in the morning for a period of twelve days relieves *pandu*. Method of preparation of the medicine is given below.

Urukkupodi (iron powder) - *uri* (96g), seed-discarded *katukka* (*Terminalia chebula*) 30 Nos. and powdered *puranakittam* (Ferric oxide) put in a clay pot and add *nazhoori* (288 ml) buttermilk to it. On the next day morning,

[1] A liquid preparation in which drug/drugs cooked in butter milk, churned well and boiled.

consume *uri* buttermilk from the pot adding a small quantity of jaggery. An equal quantity of buttermilk is to be replaced in the pot and kept overnight. Repeat this process for twelve days.

The following drugs put in buttermilk on consumption relieves all types of *pandu*.

Pathya	*Terminalia chebula*	
Punarnava	*Boerhaavia diffusa*	
Mahaushadha	*Zingiber officinale*	
Bhringaraja	*Eclipta prostrata*	
Karkan-dupatra	*Ziziphus oenoplea*	
Tila	*Sesamum indicum*	
Deepya	*Trachyspermum ammi*	
Bala	*Sida rhombifolia* ssp. *retusa*	
Anala	*Plumbago indica*	
		1 part each
Lohakittam	Ferric oxide	9 parts

If Ferric oxide is not available, iron powder can be used.

All the above, including iron powder, finely powdered and mixed with *kanjunnineer* (water extract of *Eclipta prostrata*), rolled to a pill, can also be consumed in buttermilk.

Fine powder of the following mixed with honey relieves *pandu* caused by vitiated *pitta*, *udara* (ascites), *arsa* (piles), *pleeha* (splenomegaly), *anaha* (flatulence) and *bhagandara* (fistula).

Tila	*Sesamum indicum*	1 part
Pippali	*Piper longum*	1 part
Bhadra	*Aerva lanata*	1 part
Makshika	Chalcopyrite	2 parts
Ayas	Iron	3 parts
Bheshajavara	*Zingiber officinale*	4 parts
Sita	Sugar	4 parts

The proportion of *chukku* (*Zingiber officinale*) may be increased to 1/2 and 1/3 of the total quantity of the other powders. The iron powder ground well for 3 hours in *kanjunnineer* (water extract of *Eclipta prostrata*) is to be pasted on a wooden plank. On drying, mix this preparation with fried sesame seeds and sugar and consume with honey. Chalcopyrite should be powdered after bundling it in a cloth. This powder is known as *Indrasanee.* It is also used admixed with *Guggulupanchapala choorna*, *Yogaraja choorna* or *Hutabhugadi*.

Consumption of fine powder of the following, mixed with *takra* (buttermilk), *madhu* (honey), *ajya* (ghee) *koshnatoya* (warm water) or *paya* (milk) relieves *kamila* (jaundice), *pandu* (anemia), *hridroga* (diseases of the heart), *kushtha* (skin diseases), *arsa* (piles) and *meha* (diabetes).

Vyosha	*Zingiber officinale*	
	Piper nigrum	
	Piper longum	
Agni	*Plumbago indica*	
Vella	*Embelia ribes*	
Triphala	*Terminalia chebula*	
	Emblica officinalis	
	Terminalia bellirica	
Musta	*Cyperus rotundus*	
		1 part each
Ayoraja	Iron powder	9 parts

Fine powders of the above, made to a paste in the juice of *bhringaraja* (*Eclipta prostrata*) should be spread on a wooden plank. When dried, scrap and powder it again and consume with buttermilk. This powder is known as *Navayasa.* Consumption of this alleviates piles and diseases caused by vitiated *pitta.*

Mukka	*Terminalia chebula* *Emblica officinalis* *Terminalia bellirica*
Mukkatu	*Zingiber officinale* *Piper nigrum* *Piper longum*
Chavya	*Piper brachystachyum*
Chitraka	*Plumbago indica*
Vizhalari	*Embelia ribes*
Makkeeram	Chalcopyrite
Darvi	*Coscinium fenestratum*
Maram	*Cedrus deodara*
Tvak	*Cinnamomum veram*
Grandhika	*Piper longum* (wild var.)
Jalada	*Plectranthus vettiveroides*
Mandooram	Ferric oxide

Fine powder of the above drugs boiled in cow's urine and reduced to a mass should be rolled into pills. Consumption of this relieves jaundice, oedema, *kushtha, meha* and pain on the anal region. (If Ferric oxide is not available use iron powder)

Fine powder of the following should mix with the juice of *tekaraja* (*Eclipta prostrata*) and desiccate in the sun. Mix it again in the juice of *shatpada* (*Eclipta prostrata*) and roll into pills in the size of one *aksha* (*Terminalia bellirica*). This pills shall be consumed mixed with *udasvit* (curd with one-fourth of water).

Lohakitta	Ferric oxide
Vara	*Terminalia chebula* *Emblica officinalis* *Terminalia bellirica* 1 part each
Vatacchada-bhasma	Ash from the burned leaves of *Ficus benghalensis* 4 parts

Another mode of preparation is detailed below.

Fine powders of *puranakitta* (Ferric oxide) and *triphala* (*Terminalia chebula, Emblica officinalis* and *Terminalia bellirica*) - one *nazhi* each - should be mixed with four *nazhi* of the juice of *bhringaraja* (*Eclipta prostrata*) and dried in the sun. Mix this with two *nazhi* ash made of the leaves of *peral* (*Ficus benghalensis*) burned in a clay pot and again mix in the juice of *kanjunni* (*Eclipta prostrata*). This may be made to a paste and rolled into pills. Consumption of this pill mixed in raw buttermilk relieves *pandu*.

The following powder mixed with jaggery may be taken for the relief of *pandu* and *kasa* (cough).

Puranakittam	Ferric oxide
Ellu	*Sesamum indicum*
Chukku	*Zingiber officinale*
Irattimadhuram	*Glycyrrhiza glabra* 1 part each
Pippali	*Piper longum* 2 parts

Nalikera rasayana may be consumed; the preparation is given below.

Puranakitta (Ferric oxide) and iron put in cow's urine for 21 times and reduce to powder form. Repeat this process in the juice of *bhringa* (*Eclipta prostrata*), *dhatri* (*Emblica officinalis*), *triyama* (*Curcuma longa*) and *parvika* (*Cayratia carnosa*) also; and the residue so obtained is to be finely powdered. Then, make powder from one *karsha** each of the following drugs.

Triphala	*Terminalia chebula* *Emblica officinalis* *Terminalia bellirica*

* 1 *karsha* = 12 g

Vyosha	*Zingiber officinale* *Piper nigrum* *Piper longum*
Makshika	Chalcopyrite
Varshabhoo	*Boerhaavia verticillata*
Rajani	*Curcuma longa*
Maramanjal	*Coscinium fenestratum*
Jeerakadvaya	*Cuminum cyminum* *Foeniculum vulgare*
Deepyaka	*Trachyspermum ammi*
Chavya	*Piper brachystachyum*
Tamalaki	*Phyllanthus amarus*
Bharngi	*Clerodendrum serratum*
Ghana	*Cyperus rotundus*
Karkandu	*Ziziphus oenoplea*
Shatpada	*Eclipta prostrata*
Mandookaparni	*Centella asiatica*
Dahana	*Plumbago indica*
Lavanga	*Syzygium aromaticum*
Gajapippali	*Scindapsus officinalis*
Ela	*Elettaria cardamomum*
Pippalimoolam	*Piper longum* (wild var.)
Dhanyaka	*Coriandrum sativum*
Devataru	*Cedrus deodara*
Patha	*Cyclea peltata*
Vilanga	*Embelia ribes*
Dusparsa	*Tragia involucrata*
Hapusha	*Sphaeranthus indicus*
Gajakarnika	*Leea indica*
Hastivaktra	*Clerodendrum viscosum*
Parvika	*Cayratia carnosa*
Bhringaraja	*Eclipta prostrata*

Fine powder of *trivrit* (*Operculina turpethum*) - 2 *karsha*; and *lohachoorna* (powdered Iron) - 38 *karsha* should be mixed with the above powder. Add the powder prepared earlier to it and made to a paste in the juice of *jambeera* (*Citrus lemon*). Heat an iron pot smeared with the above powder and the powder so burned should be scraped and collected; the vessel should replace with fresh paste. When all the paste powdered this way, make it to another paste in the juices of *bhringaraja* (*Eclipta prostrata*), *ardraka* (*Zingiber officinale*), *ikshu* (*Saccharum officinarum*), and coconut water. Smear this paste on a clay pot of neither very old nor new and dry it in shade. Then, filled with coconut water, closed and sealed its mouth with a cotton cloth, keep it in the heap of grain.

Based on the appetite, patient can take the above liquid in modulated doses. Intake of this preparation viz. *nalikerarasayana* relieves all types of *pandu*, *gulma* (flatulence), *udara* (ascites) and *durnama* (piles).

Consumption of fine powder of the following drugs made to a paste with water and kept in a baked earth vessel filled with coconut water for a period of four to five days relieves *kamila* (jaundice).

Mandooram	Ferric oxide
Tavizhama	*Boerhaavia diffusa*
Muttil	*Centella asiatica*
Kutakan[2]	*Centella asiatica*
Kayyenni	*Eclipta prostrata*
Dipyaka	*Trachyspermum ammi*
Hamsapadi	*Adiantum lunulatum*
Triphala	*Terminalia chebula* *Emblica officinalis* *Terminalia bellirica*

The root bark of *njaral* (*Syzygium cumini*) made to a paste should be applied in an iron

[2] Both *muttil* and *kutakan* are one and the same; its separate reference made by the author is inexplicable.

vessel and keep as such filled with buttermilk for a period of three to four days. Consumption of this medicated buttermilk relieves *pandu* (anemia), *udara* (ascites) *kamila* (jaundice), *kumbhakamila* (chronic jaundice), edema and diseases caused by vitiated *pitta*.

Intake of buttermilk medicated with *tila* (*Sesamum indicum*), *deepyaka* (*Trachyspermum ammi*), *pathya* (*Terminalia chebula*), *alee* (*Eclipta prostrata*), *kitta* (Ferric oxide) and *bharngi* (*Clerodendrum serratum*) relieves *pandu*.

Fine powder of *pathya* (*Terminalia chebula*) and *deepyaka* (*Trachyspermum ammi*) made to a paste in the juice of *parvika* (*Cayratia carnosa*) and add milk to it; the ghee so prepared on consumption relieves *pandu*.

Consumption of the ghee medicated with the juices of *satavari* (*Asparagus racemosus*), *muttil* (*Centella asiatica*), *karintakali* (*Solanum nigrum*), *mutakku* (*Pueraria tuberosa*), *nakta* (*Curcuma longa*), *ardraka* (*Zingiber officinale*), *vajravalli* (*Cissus quadrangularis*), *tripadi* (*Desmodium triflorum*), *koosmanda* (*Benincasa hispida*) and *karimpu* (*Saccharum officinarum*) as *drava*; and *kalka* as that of *Kalyanaka ghritam*, relieves *kamila* (jaundice) and *pandu* (anemia). This preparation is known as *Dasasvarasa ghritam*.

Svaduchatushka ghritam is also effective. The *kalka* of *Kalyanaka ghrita* is suitable for this. Consumption of *Tiktaka ghrita* is also effective.

Intake of medicated ghee prepared with *kotuveli* (*Plumbago indica*) and rock salt as *kalka* and juice of *inchi* (*Zingiber officinale*) as *drava* alleviate *pandu*.

Ghee medicated with the juices of *inchi* (*Zingiber officinale*), *muttil* (*Centella asiatica*), *nilamparanta* (*Desmodium triflorum*), *Changalamparanta* (*Cissus quadrangularis*) and milk as *drava* and fine powder of *kotuveli* (*Plumbago indica*), rock salt, *tippali* (*Piper longum*), *irattimadhuram* (*Glycyrrhiza glabra*), *muntiringa* (*Vitis vinifera*), *chandanam* (*Santalum album*) and *njerinjil* (*Tribulus terrestris*) as *kalka* on consumption relieves *pandu*.

Pandu caused by the intake of soil has to be treated with drastic purgation. Give medicated ghee after sudation, purgation and emesis, thereby expunge the soil eaten and restore the normalization of digestion. *Dasasvarasa ghrita* prepared with the *kalka* of *Kalyanaka ghrita* is also effective.

Mud soaked and dried in the water-extract of the leaves of *vella* (*Embelia ribes*), *agni* (*Plumbago indica*) and *nimba* (*Azadirachta indica*) shall be given to eat to make repugnant of eating soil.

Ghee prepared with milk of she-buffalo as *drava* and the following as *kalka* cures *kamila* and *pandu*.

Ela	*Elettaria cardamomum*
Dvirajani	*Curcuma longa* *Coscinium fenestratum*
Yashti	*Glycyrrhiza glabra*
Triphala	*Terminalia chebula* *Emblica officinalis* *Terminalia bellirica*
Arishta	*Azadirachta indica*

Juices of *muttil* (*Centella asiatica*) and *karintakali* (*Solanum nigrum*) can also add as *drava* in the above preparation.

Water medicated with *laghupanchamoola* (detailed below) can take or use to prepare food.

Orilaver	*Desmodium gangeticum* (root)
Moovilaver	*Pseudarthria viscida* (root)
Cheruvazhu-tinaver	*Solanum indicum* (root)
Velvazhu-tinaver	*Solanum xanthocarpum* (root)
Njerinjil	*Tribulus terrestris*

In *pandu* and *kamala*, juices of *amalaka* (*Emblica officinalis*) and *mridveeka* (*Vitis vinifera*) are very effective.

Thus the treatment procedure of *panduroga* is almost detailed. According to the vitiation of *dosha*s, in *vataja pandu*, application of *sneha* (unction) is most suitable. In *pittaja pandu*, the medicines that which are bitter in taste and cold in potency are more suitable. In *kaphaja pandu*, the medicine which are acrid in taste, dry and hot in potency are ideal. In *sannipata pandu*, a combined treatment mentioned for *vata*, *pitta* and *kapha* are more advisable.

Ghee prepared from the milk of she-buffalo is apposite in all types of *panduroga*.

The drug combination of choice in *pandu* is powdered iron and *pathya* (*Terminalia chebula*).

Pathyadi tablet, detailed earlier, made to a paste in the juice of *kanjunni* (*Eclipta prostrata*) and *chonakanaranga* (*Citrus medica*) rolled into pills may be consumed in buttermilk. *Kalyanaka ghritha*, mentioned earlier, prepared in the juices of *inchi* (*Zingiber officinale*), *manjal* (*Curcuma longa*) can be taken. Intake of this for a *mandalam* (41 days) will eliminate worms. The quantity of ghee for 41 days is 960 ml.

Pathyadi tablet is more effective if it is cooked and grind in the juice of *chonakanaranga* (*Citrus medica*).

Cherupayar	*Vigna radiata*
Nellikka	*Emblica officinalis*
Iratti-madhuram	*Glycyrrhiza glabra*
Techiver	*Ixora coccinia*
Amritu	*Tinospora cordifolia*
Muntiringa	*Vitis vinifera*
Shadanga	*Cyperus rotundus* *Santalum album* *Zingiber officinale* *Plectranthus vettiveroides* *Hedyotis corymbosa* *Vetiveria zizanioides*

A *kashaya* prepared from the above drugs clears *pittapandu*, *kamila*, fever and haematuria.

BASAVARAJEEYAM
- A RARE AYURVEDIC TEXT IN TELUGU

M. Suryanarayana Raju*

This is a 16th century treatise in Telugu on ayurveda. Its author Basavaraju was a native of Kotturu village near Ballari, Andhra Pradesh. He was a poet, scholar, astrologer and statesman. He was also a reputed physician. He has introduced many unique formulations using snake venom, mercury, etc. He claims his work to be the classic of *kaliyuga.*

कृते तु चरकं प्रोक्तं, त्रेतायान्तु रसार्णवम् ।
द्वापरे सिद्धविध्याभुः कलौ बासवकं स्मृतम् ।।

The text has twenty-five chapters. It deals with thirty diseases, selectively compiled and explained with its cause, symptoms and curative medicines. About 880 medical preparations are prescribed for various ailments by using plant (*udbija*), animal (*jantava*) and mineral (*khanija*) substances. The author has frequently used 40 medicinal plants, 3 animals and 3 minerals, and his procedure of treatment follows *rasatantra* and *rasavaidyavidhanam*. He describes rare formulations like *brahmastrarasam, suchikamukharasam, suchikabharanam,* etc. Most of the medicinal herbs referred to are available in Andhra Pradesh.

Basavarajeeyam refers to the method of *raktabeshaja samparka vidhanam* (injecting medicine directly into blood) especially in *sannipatajvara* (pneumonia). It also mentions several techniques of antidote treatments. Basavaraju emphasizes the importance of testing pulse and urine in diagnosing various diseases. According to him, a physician can understand whether the disease is curable, acute or chronic by simply examining the urine. Basavaraju points out eight *nadisthana*s in human body and instructs to examine these points for proper diagnosis. These eight nerve-points, known as *asthadhatusthana*s are – two each from wrists, from ankles, from either side of the neck and from either side of the nose. He also stresses the need to examine *chatusthana* i.e. *nadi* (pulse), *sparsa* (touch), *roopa* (appearance) and *sabda* (sound) of a patient.

Basavarajeeyam prescribes slow acting and fast acting drugs for the treatment of fevers. Slow acting drugs are applicable for fever that occurs while *vatadosha* is low - eg. *anandabhairavi, svacchandabhairavi, vaishnavirasam, mrtyunjayarasam,* etc. When *vata* is high, fast acting drugs like snake venom, *mrtasanjeevanirasam, atrunarkam, mahatarunarkam, kalagnirudrarasam, samagaralatarunarkam, soochikabharanam, soochikamukharasam* are to be applied. Life saving drugs are classified into two - medicines prepared with snake venom like *simhapratipalanam, tarunarkam, mahatarunarkam, samagaralatarunarkam* and medicines prepared with *pittarasa* like *brajmastrarasam, sochikamukharasam*. Chapter-wise details of the text are appended for further study.

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Chapter	Description	Formulations
1	Origin and treatment of *jvara*s (fevers), *nadee pareeksha* (examination of pulse), difference between *vata, pitta* and *sleshma nadi,* smallpox fever, *vishoochika* (cholera), etc.	*Pasupatastrarasam, Mahapasupatastrarasam, Jvaramkusam, Mahadagnirasam, Jvaramurai, Panchananarasam, Narasimharasam, Jvaranasanarasam, Kalagnirudrarasam, Siddagnikumaram, Anandabhairavam, Mrtyunjayarasam, Agnikumararasam, Chintamanirasam, Dasamula kashayam, Panchabhadra kashayam, Guduchyadi kashayam, Sudarsana-choornam, Eladichoornam, Bhutankusa tailam, Lakshadi tailam,* etc.
2	*Tridosha* theory, typhoid and pneumonia.	*Kalakootarasam, Mahatarunarkarasam, Rajagnirasam, Pratagnirasam, Amritasanjeevanirasam, Sitamsurasam, Rasarajedrarasam, Anandabhairavirasam,* etc.
3	*Mootra pareeksha* (examination of urine), general treatment mental disorders.	
4	*Rajayakshma* (tuberculosis)	*Poornachandrodayam, Mahadagni kumararasam, Mandoorachoornam, Kantavallabharasam, Lokhandharasam.*
5	*Panduroga* (anaemia), *kamala* (jaundice) *kumbha kamala* (nephritis) *sotha* (oedema and dropsy).	*Rasasindoora bhooshanam, Hamsamandooram, Siddhamandooram, Mahanimbadi leham, Triphalayachoornam, Poornachandrarasam, Trilokyasundararasam, Vajramandooram, Kittadi kashayam,* etc.
6	80 type diseases caused by *vata* i.e. *ekangavata* (monoplegia), *gridhrasi* (sciatica), *sootikaroga* (puerperal disease) *timira* (cataract), etc.	*Vatankusarasam, Vatamudgararasam, Badabanalarasam, Erandamoola choornam, Vatakesarirasam, Agnikumararasam, Mashatailam, Veerabhadratailam, Kanakasundararasam,* etc.

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Chapter	Description	Formulations
7	*Chardi* (vomiting), *moorcha* (fainting) and 24 types diseases caused by *pitta*.	*Paityantakarasam, Badabagnirasam, Gajakesarirasam,* etc.
8	*Kasaroga* (cough), *hikkaroga* (hiccough) and 20 types of diseases caused by vitiation of *kapha*.	*Tiladi leham, Chitrakadi leham, Bhutankusarasam, Vijayabhairavarasam, Sooryarasam, Chandramritarasam, Neelakantharasam, Kaphakesari, Agnirasam, Sooryavartana-rasam, Udayabhaskararasam,* etc.
9	*Somaroga* (diabetes), *mootrakricchra* (dysuria), *mootraghata* (obstructed micturition), *asmari* (stone and gravel in urinary passage) and urine examination.	*Mehakulantakarasam, Chandraprabhavati, Vasantakusuma-kararasam, Mahavangesvararasam, Panchaloharasayanam, Tiladiksharam,* etc.
10	*Pravahika* (dysentery) and *atisara* (diarrhoea).	*Kutajadyavaleham, Anandarasam, Mritasanjeevanirasam, Kanakasundararasam, Arkalokesvararasam,* etc.
11	*Udararoga* (abdominal diseases), *vrana* (abscess), *antra avarodha/udavartha* and *anaha* (intestinal and other kinds of obstructions)	*Agnikumararasam, Trilokyasundararasam, Vangesvararasam,* etc.
12	*Trishna* (thirst), *hridroga*s (heart diseases) and *agnimanda* (loss of appetite)	*Rasadichoornam, Trishnaharayogam, Chandrakalarasam, Karjuradichoornam,* etc.

Cont...

Chapter	Description	Formulations
13	*Kushtha* (leprosy), *svetakushtha* (leucoderma), *visarpa* (erysipelas) and *tvakvikara*s (skin diseases).	*Bhetalarasam, Badabanalarasam, gandhakarasayanam, kalagnirudrarasam, Amritadikashayam, Bhunimbadi kashayam, Vajrapanirasam, Paradadilepam, Karanja-tailadilepam,* etc.
14	*Arsa* (piles), *andakoshavikara*s (hydrocele), and other diseases of the male genital organs.	*Rajavallabharasam, Nimbadilepam, Arkadilepam, Bhallathakamritam, Lakshadilepam, Paradadilepam*, etc.
15	Month-wise treatment during pregnancy, *vandhyatva* (sterility), *garbhasaya soola* (pain in uterus) *streeroga*s (diseases in women), *sukradosha* (disorders of semen) and *gudabhramsa* (prolapse of the anus and rectum) in men.	*Dhatriphaladiyogam, Kalyanaghritam, Manjishthadighritam, Badabanalarasam, Mahadrakshadi choornam,* etc.
16	*Yoniroga* and *vyapat* (diseases of vagina and uterus), *asrigdara* (menorrhagia), *garbhasrava* (abortion) and *garbhapata* (miscarriage)	*Balasooryodayam, Chandrakalarasam, Baladi kashayam, Krishnadilepam, Matulungalepam, Garbhachintamanirasam, Sootikahararasam,* etc.
17	*Netraroga*s (eye diseases)	*Garudanjanam, Nayanamritam, Netranjanam, Narikelanjanam,* etc.
18	*Sthaulya* (obesity), *nasaroga*s (diseases of nose), *sirorogas* (diseases of head) and *udara, antra granti* (abdominal and other intestinal tumours)	*Trimoortirasam, Badabagnirasam, Vidangadi choornam, Vidangadi tailam, Marichadilepam, Sooryavartarasam,* etc.

Cont...

Chapter	Description	Formulations
19	*Gulma* (cyst), *udarasoola* (abdominal pain), *udararogas* (diseases of abdomen)and diseases caused by the sins from the previous birth and their remedies through astrology.	*Udayabhaskararasam, Gajakesarirasam, Dandamararasam,* etc.
20	*Manasikarogas* (insanity) caused by evil spirits.	*Bhootabhairavarasam, Apasmaragajankusam, Brahmighritam, Vijayaghritam,* etc.
21	*Bhagandara* (fistula), *vrana* (wounds), *vidradhi* (abcess), *granthi* (tumour), *dantaroga* (diseases of teeth), *jihvaroga* (diseases of *tongue*), *kantharoga* (diseases of throat), *chardi* (vomitting) and *gandamala/apachi* (scrofula)	*Nirgundeetailam, Mandooraloham, Raudrarasam, Narastitailam, Yogarajaguggulu, Kalagnirudrarasam, Tumbitailam, Apamargatailam, Gandhakatailam, Satavaree-tailam,* etc.
22	*Arbuda/valmikam* (cancer), *indralupta* (alopecia) and *bhootavaidyam* (demonical diseases), etc.	*Karanjadilepam, Madanadilepam, Bhringarajatailam, Nilotpaladitailam, Manjishsthaditailam, Bhallatakaditailam,* etc.
23	*Agadatantram* (toxicology), *vishapatrika* (antidotes to poison) and *vamakayogas* (emetics). Antidotal treatment to dog bite (rabies), scropion and centipede sting and snake bites.	
24	*Jvara* (fever), *arsa* (piles), *panduroga* (anaemia), *kamala* (jaundice), *rajayakshma* (tuberculosis) and *kasaroga* (cough), paralysis, *karnasoola* (ear ache), *aruchi* (anorexia) *chardi* (nausea) tetanus, etc.	
25	Description of extraction of mercury and purification of metals, minerals, gems and plants.	

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Inaugural Lecture delivered on 30.01.2003 in connection with Founder's Day Celebrations held at Kottakkal.

A GLORIOUS ENTERPRISE IN HEALTHCARE FOR ALL - STORY OF A VISIONARY AND HIS MISSION

N.R. MADHAVA MENON

'If science is what is observed in nature and is manifested in experience, there is no better science known to man than ayurveda. It provides for treatment of the body, mind and soul thereby taking science to the world of infinity, the higher levels of consciousness where unity prevails in every living creature and science merges with philosophy.'

Dr. Menon, a 'living legend' in law and legal education, is Vice Chancellor, National University of Juridical Sciences, Kolkata. His services to legal profession has been appreciated and admired internationally.

Dr. Menon is presently serving as a Member in two Committees appointed by the Government of India - one the Civil Services Examination Review Committee (U.P.S.C.) and the other the Criminal Justice Reform Committee (Ministry of Home Affairs). He is also the National Co-ordinator of the Ministry of Finance Project on "Law Reforms for Economic Reform Process". He is Chairman of the Centre for Development Studies, Thiruvananthapuram, and also Chairman of Indian Statistical Institute, Kolkata.

The president of India conferred on him Padmashri on the Republic Day this year for his contributions to Law and Public Affairs.

A GLORIOUS ENTERPRISE IN HEALTHCARE FOR ALL - STORY OF A VISIONARY AND HIS MISSION

N.R. Madhava Menon

If Kerala is God's own country as claimed by the State and its people, the tiny village of Kottakkal is indeed God's permanent abode at least since 1902 when the late Vaidyaratnam P.S. Varier started his eternal journey to bring the knowledge of the *vedas* to ameliorate the condition of the suffering humanity through the art of healing. Thanks to the initiative of Aryavaidyan P.K. Warrier, the story of this arduous, yet glorious journey during the last 100 years and more, is now well documented and widely appreciated. An idea of what health is all about in the vision of its founder and how a physician should go about organising the services in the true spirit of a *karmayogi* are vividly explained in *The Re-discovery of Ayurveda – The story of Arya Vaidya Sala, Kottakkal* (M.R. Raghava Varier, Viking 2002). Reading it makes one proud of the rich traditions of this land and of the great men and women who traversed it making their distinctive contributions to its much splendored glory. The institution whose centenary celebrations are being concluded today is a standing testimony to such a glorious enterprise which spread far and wide under the inspiring leadership of Vaidyaratnam P.S. Varier and his descendants and disciples. I have been a beneficiary myself to the services of this great institution. I feel greatly privileged to have been asked to inaugurate the commemorative meeting being held in honour of that saint and soldier of the ayurvedic tradition, the founder of Arya Vaidya Sala, the one and only Vaidyaratnam P.S. Varier who became a legend in his own lifetime. I must respectfully pay my humble tributes to the great *acharya* whose presence is left even today in the corridors and bylines of Kottakkal. I thank the Board of Trustees and the revered Dr. P.K. Warrier, the Managing Trustee for the honour extended to me in this regard.

The vision – a flashback over 100 eventful years

Founder's Day is an occasion to take note of the vision in all its dimensions, to assess the progress made in the realization of that vision and to reflect on the path ahead for the institution and all those associated with it. The various sessions of the two-day programme project the different dimensions of the enterprise and their relevance in contemporary times. It does provide a veritable feast of ideas and experiences based on ayurveda around the theme *Health for All.* Even the cultural and literary dimensions on which the founder laid great emphasis have been given due importance amidst scientific and intellectual themes. When the modern history of ayurveda is

written, the contribution of this great institution and its founder will certainly find a prominent place in it. Rarely in the history of a colonised and suppressed country would one find an individual initiative assuming the dimensions of a popular movement in health, education, culture and science. What is the secret of this success story?

Of course, the vision and leadership of its founder had been the jumping pad and the catalytic agent in its early years. But to sustain an institution in its chosen path without dilution of the quality of services is not an easy task particularly when the mentor is no more present in the scene. Anyone who stayed even for a short period in Arya Vaidya Sala will be struck by the dedication and work culture of its staff who are not just paid employees, but soldiers of a common cause imbibed with the spirit of compassion and empathy towards the suffering. There is a value system, a professional ethic which informs thought and action of everyone of the Arya Vaidya Sala family which make it a unique place of its kind. Work is worship here in a true sense of the term. Healing is a process beginning with feeling to those seeking succour from this place. The *karanavar* of this *taravad,* Dr. P.K. Warrier is a *karmayogi* who religiously takes his rounds of the wards everyday offering a word or two of consolation to every patient. There is infinite faith in the people on the quality of medicines produced and dispensed from here. At any given point of time one finds patients from different countries getting all kinds of treatment here and people seem to enjoy their stay here! A rare phenomenon in hospitals! They talk of similar sentiments and experiences in Arya Vaidya Sala irrespective of the region or country they came from which qualifies it as the first global hospital in this part of the world. The regular *pujas* in the *Visvambhara* temple located at the centre of the hospital complex, the occasional cultural programmes put up by the PSV Natyasangham and the constant smell of rich ayurvedic medicines processed in the neighbouring factory give one a flash back into history of this place and the meticulous planning which would have gone into the making of Arya Vaidya Sala by its veteran founder, Vaidyaratnam P.S. Varier.

If science is what is observed in nature and is manifested in experience, there is no better science known to man than ayurveda. It provides for treatment of the body, mind and soul thereby taking science to the world of infinity, the higher levels of consciousness where unity prevails in every living creature and science merges with philosophy.

Holistic treatment is current coin in the Western World. A study of ayurveda will lead one to the inescapable conclusion that maintaining the natural equilibrium of *panchabhoota* (man-in-universe including its vegetation, minerals, etc.) in the human body has been the foundation of ayurvedic treatment since ages. The relationship between the doctor and the patient is as important as the relationship between the patient and the medicines in the treatment protocol. If science is what is observed in nature and is manifested in experience, there is no better science known to man than ayurveda. It provides for treatment of the body, mind and soul thereby taking science to the world of infinity, the higher levels of consciousness where unity prevails in every living creature and science merges

with philosophy. It is into that world of pure knowledge that the great men like the late Vaidyaratnam PS Varier took his followers in a spirit of humility and service. On this day of remembrance when we pay our tributes to the Founder, let us take a pledge not to become mindless purveyors who sell away such precious inheritance of this ancient land to people who cannot appreciate the philosophical and cultural foundations of this knowledge, without which it is an empty shell of packaged information of uncertain value.

Law and medicine

As a student of law, addressing a gathering of physicians and scientists, I must present a few thoughts on this occasion on the uneasy relationship between our two professions, both considered noble and learned once upon a time. It is uneasy relationship because both have lost its shine in people's perception and both are increasingly being practised on commercial lines without maintaining the element of ethics and service which put them in the status of noble professions. If there is one thing above all for practitioners of the profession to learn from Kottakkal, it is this value of service and the ethics of its delivery. Part of the healing process is this attitude itself.

Ladies and Gentlemen, the crisis of character which permeates every aspect of life today is the single most important problem that keeps our society backward and under-developed. India is not a poor country; it is a rich country inhabited by lots of poor people who seem to have lost the capacity to dream of ideas and to work hard for their realisation. How do you otherwise explain the continued suffering of a billion plus people, one sixth of humanity, living in a country which was once the seat of vibrant civilisation blessed with natural resources and an army of saints, scholars and scientists. The pervasive cynicism and sense of frustration that is evident in Indian society today particularly among the youth is the greatest barrier to progress. Finding corruption, indiscipline and violence prevailing even among the leaders and better-off sections of people, the youth seem to be losing their faith in future and looking for opportunities elsewhere. We do not have leaders like Swami Vivekananda or Subash Chandra Bose or Mahatma Gandhi who can mobilize the innate strength in the people for nation-building activities through pursuit of knowledge, discipline and sustained work. The *knowledge society* of contemporary times is looking for people who command information and intelligence and who have the capacity to convert them into wealth and happiness. Educational institutions are unable to make people dream or cope up with the explosion in knowledge. We seem to be heading for a sick society for which there is no remedy perhaps even in ayurveda. We need men and women of character in every field to change the trend and direct progress towards sustainable development. In this process, law and ethics have a definitive role of moderation, humanization and sensitization to eternal values.

We seem to be heading for a sick society for which there is no remedy perhaps even in ayurveda. We need men and women of character in every field to change the trend and direct progress towards sustainable development.

In the National University of Juridical Sciences at Kolkata, we have set our goal to bring law and

life closer to realise justice in society and to transform legal education into what I would call *justice education*. As physicians are concerned more with health rather than with diseases only, lawyers ought to be worrying more about justice rather than with conflicts and disputes only. This would mean a change of perception, attitude and behaviour on the part of law persons who expect law to promote justice in society. Essentially, law is concerned with managing resources, human and material, in a manner that gives maximum happiness to the maximum number of people. In the process, law has to mediate and settle disputes in a manner that is fair to all concerned. Looked at from this perspective, there is a lot in common between law and medicine. The services of law are not to be sought only when problems arise; on the contrary it must inform and illuminate every action because it is supposed to maximise human happiness and justice in society which is the ultimate goal of life itself.

While articulating such a dream role for law education we endeavour to build partnerships with other professions and services in pursuit of common agendas for common good. It is too big and complex a subject to be addressed on this occasion. Nevertheless, I would like to place before you one element of this common agenda of Law and Medicine for your consideration particularly because the founder of Arya Vaidya Sala, if he were alive today would have been very much worried himself about his mission in the troubled times of contemporary world.

Globalised trade and public health issues

Thanks to the information and communication revolution, we live today in a global village. Globalisation means many things to many people. Some developed countries perceive it as opportunity to exploit and impoverish their former colonies without appearing to be doing so. They seek the help of science and the global order to advance and legitimise their action. They call it international co-operation and international trade. They make the rules of the game in such a way that it results in a win-win situation for them in utter disregard of the justice and equity of the deal. Given the power relations and wealth distribution of the post-Soviet Union era, there is no way that developing countries can influence the game to their advantage excepting to play it as dictated by the powers-that-be. In no area of legal ordering is this dilemma more evident than in the Agreement on Trade-Related Intellectual Property Rights or TRIPS which is part of the WTO arrangement.

Given the power relations and wealth distribution of the post-Soviet Union era, there is no way that developing countries can influence the game to their advantage excepting to play it as dictated by the powers-that-be.

Biological diversity is a fact of Nature with intrinsic value for life and life-supporting systems. Its conservation is a common concern of mankind though individual countries have sovereign rights over their own biological resources. Sharing equitably biological resources and inventions based on them while conserving bio-diversity and generating resources with the help of transfer of technologies for the benefit of present and future generations have been the twin objectives of

the U.N. Convention on Biological Diversity, 1992. It is too important a document to be left to governments alone for implementation. But the problem is the global consensus underlying the convention are not always in tune with two other treaties relevant on the subject namely Annexure IC to GATT i.e. TRIPS and the Convention facilitating proprietary protection over biotechnology (UPOV).

Biotechnology, a relatively recent development in life sciences, deals with the application of bio-diversity and biological systems to industrial and technical activity. The discovery of DNA and the sequencing of human genome have given a tremendous boost to the biotech industry and perhaps half the scientific establishment across the world today are in hot pursuit of biotechnology inventions in relation to agriculture, medicine and industry. Countries with rich bio-diversity reserves and abundant technical talents have suddenly discovered a sector of immense growth potential if the right policies are adopted in right time to make it happen. The potential economic value of biotech inventions coupled with the rich bio-diversity and traditional knowledge systems found in developing countries have generated a variety of concerns and apprehensions in developing countries mainly around intellectual property rights under TRIPS and the convention for protection of New Varieties of Plants in the context of the bio-diversity convention. Further, there are fears arising from the unknown. Do GM crops pose serious risks to health and security? What are the consequences of gene transfer and genetic manipulation? Given the lax regulatory system in place and the lack of appropriate standards in emerging areas of bio-technology, the fear of risks inhibit scientific research and its industrial/agricultural use. The controversy on the trial of Bt. Cotton is a case in point. GM crop or for that matter, use of transgenic in agriculture is believed to be inimical to natural bio-diversity and instrumental to environmental degradation. On the one hand, transgenic varieties give increased productivity and efficiency in agriculture while on the other; people think that it might lead to serious health and environment risks in the long run. Governments will have to necessarily follow the *precautionary principle* and regulate biotechnology in such a context of widespread concerns, genuine and imaginary. At the same time, pressure and propaganda are mounted by those who stand to gain by accepting or rejecting the GM crops. According to a recent report, the Government of India has decided to ratify the Cartagena Protocol on bio-diversity which seeks to protect biological diversity from the potential risks posed by living modified organisms (LMOs) and establish procedures to ensure that countries are able to take informed decisions on import of GM products.

Governments will have to necessarily follow the precautionary principle and regulate biotechnology in such a context of widespread concerns, genuine and imaginary.

TRIPS – A potential threat to indigenous systems ?

Agreement on Trade-related Intellectual Property Rights (TRIPS) is a treaty of far-reaching importance to developed and developing countries. TRIPS extend the items eligible for IPR protection. Plant

varieties, animal cells and micro-organisms which were outside patent law till recently in most countries of the world are now brought under IPR regime. TRIPS increased the duration of patent protection to 20 years. It guarantees most-favoured nation treatment on the basis of equality to nationals of every member country and provides variety of remedies against defaulting States. Once in two years the TRIPS agreement will be reviewed. Meanwhile, at the fourth Inter-Ministerial Conference at Doha (November 2001), a Declaration on TRIPS and Pubic Health was adopted which enabled countries to modify intellectual property rights if health care and public health so warranted. Some developing countries and many people in them still believe that TRIPS is a *loose all* situation for them, and a *win all or loose nothing* situation for most developed countries despite Article 27 (2) and (3) which allows member countries to exclude certain inventions from patentability on the ground of public order or morality or public health or environment. The full scope of this Article is still not clear. Public order is supposed to cover public security and the physical integrity of individuals as part of society. Unless an invention seriously undermines the general public sentiments (morality) or the environment, it will not fall within the non-patentability of subject matter. It is the perception of the members of the Dispute Settlement Body under Article 64 of TRIPS agreement which will finally decide on what constitutes public order or moral standards in a given country to avail of the exception provided.

Unless an invention seriously undermines the general public sentiments (morality) or the environment, it will not fall within the non-patentability of subject matter.

Given the enormously rich bio-diversity of India and a bewildering variety of traditional knowledge systems based on such diversity which are not even documented as yet, what should be the scope of IP protection of bio-resources? Should public (national) interest safeguard the exclusion of product patents, wider use of compulsory licensing, exception for experimental use and invocation of price controls be put into the IP legislation? What is to be the status of *informed consent* of the alleged stakeholders in the bio-prospecting operations? What is the appropriate regulatory framework which can ensure a fair scheme of benefit sharing not only in profits but *also in the research and technology development process*? Would the modern IP regime evolved in the context of industrial development suit the grass root level innovations based on traditional knowledge developed by small local communities in response to local needs with complete disregard of the element of monopoly? Is it reasonable to expect thousands of such communities whose inventions might qualify for IP protection to really seek the same all of a sudden or to protect their IP assets from unfair exploitation by commercial interest groups? Would a uniform regulatory regime be appropriate for all types of biotech enterprises

Would a uniform regulatory regime be appropriate for all types of biotech enterprises whether they relate to fisheries, agriculture or biotech drugs as distinguished from chemical drugs?

whether they relate to fisheries, agriculture or biotech drugs as distinguished from chemical drugs? Bio-piracy or misappropriation of bio-resources is another issue of serious concern in the regulatory regime based on monopoly rights.

Yet, given the diverse pool of scientific talent in India, the relatively easy and less expensive access to clinical trials and consequent cost-effective research capability, no pharmaceutical company can afford not to invest in India. What seems to be happening now is high pressure lobbying by these companies to compel India to change quickly its patent law in terms of TRIPS obligations, extend data exclusivity (confidentiality) rights in clinical trial of drugs through protective legislation under Article 39.3 of TRIPS, narrow the compulsory licensing provisions of the law, abandon the rule against importation of under-patent drugs, etc. There are differences in perception between governments and pharmaceutical companies as to what are genuine *public health* concerns to claim exemption from TRIPS obligations.

My idea in raising this issue here is to demonstrate the future role of law and legal institutions in managing our precious natural resources including ayurveda and bio-diversity in the context of highly competitive, cruelly commercialized world. The hope lies in rule of law and human rights which possibly shall govern the social and international order in the future. I am glad Dr. Warrier has invited a speaker, Dr. Vandana Shiva, most knowledgeable on the subject to address us on these and other issues. On my part I would like to assure the Board of Trustees of this great institution that myself and my colleagues in the West Bengal National University of Juridical Sciences will be more than willing to extend whatever legal support services we are capable of in advancing the mission of Vaidyaratnam P.S. Varier's Arya Vaidya Sala. This institution has to assume a pro-active and lead role in this critical juncture. If such a plan of action is readied and put in place by the Board of Trustees, I believe it will be the greatest tribute that we can offer to the Founder, the one and only Vaidyaratnam P.S. Varier.

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Tradition and Modernity
- Abstracts of papers presented in a colloquium

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