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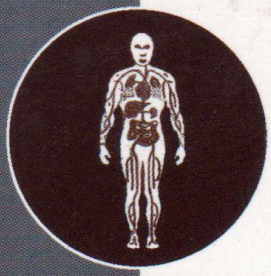
āryavaidyan

लाभानां श्रेय आरोग्यम्

Of all the gifts,
the most precious is health



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Vol. XVII, No. 1
August - October 2003

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THE ARYA VAIDYA SALA - KOTTAKKAL

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तद्विद्याचार्यसेवा च बुद्धिमेधाकरो गणः ॥

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FROM THE PAGES OF VAGBHATA - LXII

N.V.K. Varier

Abstract: *Sastravidhi* continues. Management of leeches in blood-letting, their indications, contraindications, etc. are elaborately discussed in this issue.

जळौकसस्तु सुखिनां रक्तस्रावाय योजयेत् ।

(Jaḷaukasastu sukhināṁ
raktasrāvāya yōjayēt ।)

Leeches are to be employed for bloodletting in delicate persons.

दुष्टाम्बुमत्स्यभेकाहिशवकोथमलोद्भवा: ।। ३५ ।।
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(duṣṭāmbumatsyabhēkāhi-
śavakōthamalōdbhavā: ।। 35 ।।
Raktā: śvētā bhṛśaṁ kṛṣṇā-
ścapalā: sthūlapicchilā: ।
indrāyudhavicitrōrdhva-
rājayō rōmaśāśca tā: ।। 36 ।।
Saviṣā varjayēt -)

Leeches born in dirty water polluted by decayed dead bodies of fish, frogs, snakes, etc. and their castings, are poisonous. They bear red, white and extremely black colours and are with unsteady movements; they are stout, hairy and slimy with extraordinary lines on the body resembling rainbow. All these are poisonous and so they are to be discarded.

– ताभि: कण्डूपाकज्वरभ्रमा: ।
विषपित्तास्रनुत्कार्यं तत्र –

(- tābhi: kaṇḍūpākajvarabhramā: ।
viṣapittāsranutkāryaṁ tatra -)

By using them, troubles as itching, inflammation, fever and vertigo are created. Here treatment is meant to cure the poison and pacify the provocation of *pitta* and *rakta*.

– शुद्धाम्बुजा: पुन: ।। ३७ ।।
निर्विषा: शैवलश्यावा वृत्ता नीलोर्ध्वराजय: ।
कषायपृष्ठास्तन्वङ्ग्य: किञ्चित्पीतोदराश्च या: ।। ३८ ।।

(- śuddhāmbujā: puna: ।। 37 ।।
Nirviṣā: śaivalaśyāvā
vṛttā nīlōrdhvarājaya: ।
kaṣāyapṛṣṭhāstanvaṅgya:
kiñcitpītōdarāśca yā: ।।38।।)

Those born in pure water are free from poison. They are dark brown resembling the green algae in colour; round and rough backsides having blue lines there; with thin body and yellowish belly.

Arunadatta says that leeches from water reservoirs where lotuses of various kinds and free algae are present, are generally free from poison.

ता अप्यसम्यग्वमनात् प्रततं च निपातनात् ।

सीदन्तीः सलिलं प्राप्य रक्तमत्ता इति त्यजेत् ।। ३९ ।।

(Tā apyasamyagvamanāt
pratataṁ ca nipātanāt ।
sīdantīḥ salilaṁ prāpya
raktamattā iti tyajēt ।। 39 ।।)

Due to improper vomiting and frequent application, even nonpoisonous leeches become intoxicated with blood, and they show tiredness when put in water. They are to be rejected.

अथेतरा निशाकल्कयुक्तेऽम्भसि परिप्लुताः ।

अवन्तिसोमे तक्रे वा पुनश्चाश्वासिता जले ।। ४० ।।

लागयेद्घृतमृत्स्तन्यरक्तशस्त्रनिपातनैः ।

पिबन्तीरुन्नतस्कन्धाश्च्छादयेन्मृदुवाससा ।। ४१ ।।

(Athētarā niśākalka-
yuktēऽmbhasi paripḷutāḥ ।
avantisōmē takrē vā
punaścāśvāsitā jalē ।। 40 ।।
Lāgayēdghṛtamṛtstanya-
raktaśastranipātanaiḥ ।
pibantīrunnataskandhā-
ścchādayēnmṛduvāsasā ।। 41 ।।)

Then others which are good, are to be put in turmeric water, *kanjika* (vinegar) or buttermilk. After some time they are to be taken out and put in fresh water for relief. Then prepare the site for sucking by smearing a bit of ghee, mud or breast milk or by producing drops of blood with a knife and apply the leeches there. When they begin to suck properly they raise their shoulders; then cover them with soft cloth.

सम्पृक्तादुष्टशुद्धास्राज्जळौका दुष्टशोणितम् ।

आदत्ते प्रथमं हंसः क्षीरं क्षीरोदकादिव ।। ४२ ।।

(गुल्मार्शोविद्रधीन् कुष्ठवातरक्तगळामयान् ।

नेत्ररुग्विषवीसर्पान् शमयन्ति जळौकसः ।। १ ।।)

(Sampṛktāddusṭaśuddhāsrā-
jjaḷaukā duṣṭaśōṇitam ।
ādattē prathamaṁ haṁsaḥ
kṣīraṁ kṣīrōdakādiva ।। 42 ।।
[Gulmārśōvidradhīnkuṣṭha-
vātaraktagaḷāmayān ।
nētrarugviṣavīsarpān
śamayanti jaḷaukasaḥ ।। 1 ।।])

From the mixture of pure and impure blood, the leeches, at first draw only impure blood, just like the swan takes only milk from the mixture of milk and water.

दंशस्य तोदे कण्डूां वा मोक्षयेत् वमयेश्च ताम् ।

पटुतैलाक्तवदनां श्ळक्ष्णकण्डनरूषिताम् ।। ४३ ।।

(Daṁśasya tōdē kaṇḍvāṁ vā
mōkṣayēt vamayēśca tām ।
paṭutailāktavadanāṁ
śḷakṣṇakaṇḍanarūṣitām ।। 43 ।।)

Withdraw the leeches if pain or itching is felt at the site of sucking. Then they are made to vomit by smearing oil and salt at their mouth and sprinkling powdered rice.

रक्षन् रक्तमदाद्भूयः सप्ताहं ता न पातयेत् ।

(Rakṣan raktamadādbhūyaḥ
saptāhaṁ tā na pātayēt ।)

Since they are to be protected from further intoxication of blood, do not apply them for the next seven days.

पूर्ववत् पटुता दाढ्र्यं सम्यग्वान्ते जळौकसाम् ।। ४४ ।।

क्ळमोऽतियोगान्मृत्युर्वा दुर्वान्ते स्तब्धता मदः ।

(pūrvavat paṭutā dārḍhyaṁ
samyagvāntē jaḷaukasām ।। 44 ।।
Kḷamōऽtiyōgānmṛtyurvā
durvāntē stabdhatā madaḥ ।)

When the leeches have vomited properly, they regain their capability and firmness as before. By excessive vomiting, exhaustion or even death may occur. By improper vomiting, stupidity and intoxicated state prevail.

अन्यत्रान्यत्र ता: स्थाप्या घटे मृत्स्नाम्बुगर्भिणि ।। ४५ ।।
लालादिकोथनाशार्थं, सविषा: स्युस्तदन्वयात् ।
(anyatrānyatra tā: sthāpyā
ghaṭē mṛtsnāmbugarbhiṇi ।। 45 ।।
Lālādikōthanāśārthaṁ,
saviṣā: syustadanvayāt ।)

Keep them in pots filled with soft mud and water. Transfer them to another pot on every third or fourth day in order to save from the filth created by their saliva, excreta, etc. lest they may become poisonous with this pollution.

अशुद्धौ स्रावयेद्दंशान् हरिद्रागुडमाक्षिकै: ।। ४६ ।।
(aśuddhau srāvayēddaṁśān
haridrāguḍamākṣikai: ।। 46 ।।)

If impurities remain, make the site bleed by applying a paste of turmeric powder, jaggery and honey.

शतधौताज्यपिचवस्ततो लेपाश्च शीतळा: ।
(śatadhautājyapicavastatō lēpāśca śītaḷā: ।)

Then a piece of cloth, soaked in *Satadhouta-ghrita*[1], and smeared with a paste made out of *yashti* (*Glycyrrhiza glabra*), *chandanam* (*Santalum album*), *useera* (*Vetiveria zizanioides*), etc. is to be applied to the site.

दुष्टरक्तापगमनात्सद्यो रागरुजां शम: ।। ४७ ।।
(duṣṭaraktāpagamanāt-
sadyō rāgarujāṁ śama: ।। 47 ।।)

By draining out impure blood, the redness and pain are relieved immediately.

अशुद्धं चलितं स्थानात्स्थितं रक्तं व्रणाशये ।
व्यम्ळीभवेत्पर्युषितं तस्मात्तत्स्रावयेत्पुन: ।। ४८ ।।
(Aśuddhaṁ calitaṁ sthānāt-
sthitaṁ raktaṁ vraṇāśayē ।
vyamḷībhavētparyuṣitaṁ
tasmāttatsrāvayētpuna: ।। 48 ।।)

If impure blood, having moved from the seat, still gets retained at the site of the wound, it becomes acidic by stagnation of a single night. So it has to be drained again immediately.

युञ्ज्यान्नालाबुघटिका रक्ते पित्तेन दूषिते ।
तासामनलसंयोगात् युञ्ज्यात्तु कफवायुना ।। ४९ ।।
(Yuñjyānnālābughaṭikā
raktē pittēna dūṣitē ।
tāsāmanalasaṁyōgāt yuñjyāttu
kaphavāyunā ।। 49 ।।)

In cases of vitiation of blood by *pitta*, *alabu*[2] or *ghatika*[3] are not to be employed as they are used only with the association of fire.
Both *alabu* and *ghatika* are used with a burning wick, placed inside. So it may cause provocation of *pitta* and *rakta*. Hence, they are to be used in diseases of *kapha* and *vayu*.

कफेन दुष्टं रुधिरं न शृङ्गेण विनिर्हरेत् ।
स्कन्नत्वात् वातपित्ताभ्यां दुष्टं शृङ्गेण निर्हरेत् ।। ५० ।।
(Kaphēna duṣṭaṁ rudhiraṁ
na śṛṅgēṇa vinirharēt ।
skannatvāt vātapittābhyāṁ
duṣṭaṁ śṛṅgēṇa nirharēt ।। 50 ।।)

If the blood is vitiated by *kapha*, do not try to expel it by using *sringa* (sucking horn) since the blood here is more condensed. In cases of vitiation of blood by *vata* and *pitta*, usage of *sringa* is advisable.

गात्रं बद्ध्वोपरि दृढं रज्ज्वा पट्टेन वा समम् ।
स्नायुसन्ध्यस्थिमर्माणि त्यजन् प्रच्छानमाचरेत् ५१
अधोदेशप्रविसृतै: पदैरुपरिगामिभि: ।
न गाढघनतिर्यग्भिर्न पदे पदमाचरन् ।। ५२ ।।

1. Method of preparation: The water added to well melted *ghrita*, is churned well and kept for overnight. On the very next day morning the *ghrita*, floating over the water is collected and melted again, poured into the water and repeat the process. Since the process of preparation involves a hundred times repetition, it is called *Satadhoutaghrita*.

2. bottle gourd. 3. small earthen pot

(Gātraṁ baddhvōpari dṛḍhaṁ
rajjavā paṭṭēna vā samam ।
snāyusandhyasthimarmāṇi
tyajan pracchānamācarēt ।। 51 ।।
Adhōdēśapravisṛtai: padairuparigāmibhi: ।
na gāḍhaghanatiryagbhirna
padē padamācaran ।। 52 ।।)

For *pracchana* (a technique of making incision on the skin for blood letting) the body part above the site has to be tied tightly, evenly and uniformly, using a rope or fine cloth. Do *pracchana*, avoiding *snayu*s (tendons) *sandhi*s (joints), *asthi*s (bones) and *marma*s (vital points) starting from below and gradually proceeding upwards. The incisions are not to be too deep, heavy, wide or horizontal. Avoid cuts one upon the other.

प्रच्छाननैकदेशस्थं ग्रथितं जलजन्मभि: ।
हरेच्छृङ्गादिभि: सुप्तमसृग्व्यापि सिराव्यधै: ।। ५३ ।।

(Pracchānēnaikadēśasthaṁ
grathitaṁ jalajanmabhi: ।
harēcchṛṅgādibhi: supta-
masṛgvyāpi sirāvyadhai: ।। 53 ।।)

Blood accreted on one spot is to be extracted by *pracchana*. Leeches are to be applied where blood is clotted as in tumours and *arbuda*s. Use *sringa* or *albalu* where sensitivity to touch is lost.

When the impurity of blood pervades the whole body, venesection is the chosen way.

प्रच्छानं पिण्डिते वा स्यादवगाढे जळौकस: ।
त्वक्स्थेऽलाबुघटीशृङ्गम् सिरैव व्यापकेऽसृजि ।। ५४ ।।

(Pracchānaṁ piṇḍitē vā syād-
avagāḍhē jaḷaukasa: ।
tvaksthēऽlābughaṭīśṛṅgam
siraiva vyāpakēऽsṛji ।। 54 ।।)

Or, *pracchana* in conditions of clogged blood, use of leeches in deep-rooted impurities, *sringa* or *alabu* in skin localized impurities and venesection in total body pervasion are the chosen techniques.

वातादिधाम वा शृङ्गजळौकोऽलाबुभि: क्रमात् ।
(Vātādidhāma vā śṛṅga-
jaḷaukōऽlābubhi: kramāt ।)

When impure blood is seen localized at the seats of *vata*, *pitta* and *kapha*, select horn, leeches and bottle gourd respectively.

सुतासृज: प्रदेहाद्यै: शीतै: स्याद्वायुकोपत: ।। ५५ ।।
सतोदकण्डू: शोफस्तं सर्पिषोष्णेन सेचयेत् ।। ५५ १/२ ।।

(Srutāsṛja: pradēhādyai:
śītai: syādvāyukōpata: ।। 55 ।।
satōdakaṇḍū: śōphastaṁ
sarpiṣōṣṇēna sēcayēt ।। 55½ ।।)

Provocation of *vata* may occur as the site is treated with cold anointments or irrigations after blood letting. It may cause pain, itching and swelling; then do *seka* (irrigation) with warm ghee.

इति श्रीवैद्यपतिसिंहगुप्तसूनुश्रीमद्वाग्भटविरचितायामष्टाङ्गहृदयसंहितायां सूत्रस्थाने शस्त्रविधिर्नाम षड्विंशोऽध्याय:।।

(Iti śrīvaidyapatisiṁhaguptasūnuśrīmad-
vāgbhaṭaviracitāyāmaṣṭāṅgahṛdayasaṁhi-
tāyāṁ sūtrasthānē śastravidhirnāma ṣaḍ-
viṁśōऽdhyāya: ।।)

Thus the twenty-sixth chapter of *sootrasthana* of *Ashtangahridayasamhita*, titled as *sastravidhi* composed by Vagbhata, son of Vaidyapati Simhagupta.

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PHARMACOGNOSTICAL STUDIES ON *PLUMBAGO INDICA* LINN.

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

Abstract: *Plumbago indica* Linn. is one of the important raw drugs in Ayurveda which is required in large quantities for the manufacture of various Ayurvedic formulations. Distribution, taxonomic description, pharmacognostic studies, chemical analysis, numerical values in epidermal study and propagation techniques are detailed here.

Introduction

Plumbago indica (*Plumbago rosea*), belonging to the family Plumbaginaceae, is known as Rosy flowered leadwort and fire plant in English; *lalchitra* and *raktachitra* in Hindi; *kotuveli*, *chetikkotuveli* and *chuvanna kotuveli* in Malayalam; *chitraka*, *dahanah* in Sanskrit and *senkotuveli*, *chitramulam* in Tamil. The officinal part is the root and is used in more than 100 ayurvedic formulations like *Ayaskriti*, *Asvagandharishtam*, *Pippallyasavam*, *Dasamoolapanchakoladi kashayam*, *Indukantaghritam* and *Mandooravatakam*, etc. (S.R. Iyer, 1983). The plant has distribution throughout India in moist situations as well as cultivated. In Kerala it is seen naturally growing in Kannoth of Kannur district, Nilambur of Malappuram district, Peechi, Iranikulam and Mala of Thrissur district, Nellimukal and Adoor of Pathanamthitta district, Pulimath of Thiruvananthapuram district and Marayur and Chinnar of Idukki district (Fig.I).

The roots are acrid astringent, thermogenic, anthelmintic, digestive, gastric, sudorific and it is useful in fever, cough, worms, lucoderma, dyspepsia, skin diseases, scabies, vitiated conditions of *vata*, *pitta*, and *kapha* and anemia (Warrier et al, 1995; Narayana Aiyer and Kolammal, 1960). It is narcotic, carminative, antiperiodic, nervous stimulant and rejuvenating and is useful in colic, inflammations, bronchitis, helminthiasis, haemorrhoids, elephantiasis, hepatosplenomegaly, amenorrhoea, odontalgia (Warrier et al, 1995), piles, diabetes and diarrhoea (Narayana Aiyer & Kolammal, 1960).

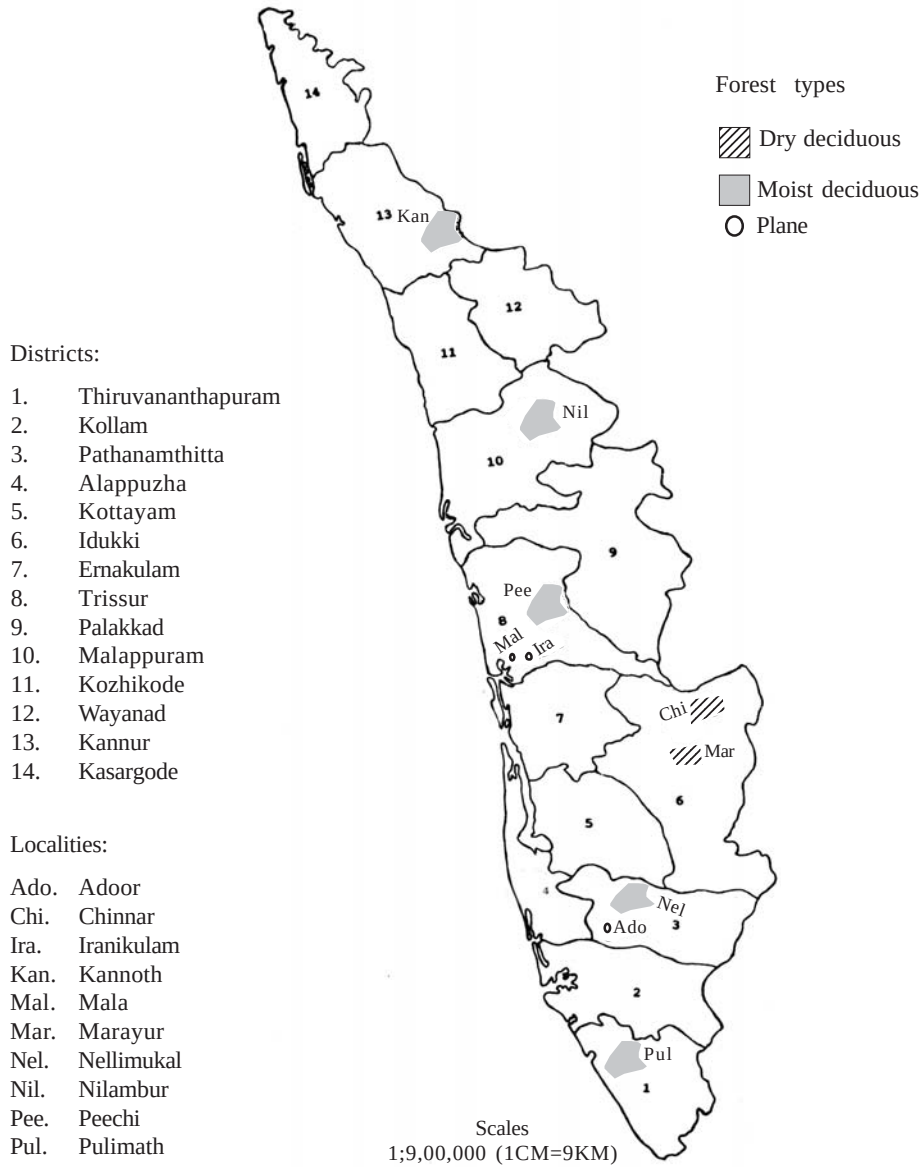
It is learned that in North India roots of *Plumbago zeylanica* are used as *chitraka* in place of *Plumbago indica*.

Morphological description

A perennial pretty scandent shrub, 1-1½ m high, stems woody, straight with flexible branches; leaves simple, alternate, exstipulate, entire, membraneous, wavy, short, cuneate at the base passing into a very short amplexicaul, auriculate, red petiole; roots long, cylindrical,

* *IDRC Project, Arya Vaidya Sala, Kottakkal*

Fig. I *Plumbago indica* Linn. - 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:

Ado. Adoor
Chi. Chinnar
Ira. Iranikulam
Kan. Kannoth
Mal. Mala
Mar. Marayur
Nel. Nellimukal
Nil. Nilambur
Pee. Peechi
Pul. Pulimath

rigid, bent or curved, fairly stout, 1-2 cm thick, 120-180 cm long, lateral branches few, light yellowish brown externally, reddish white internally; flowers scarlet or bright red coloured in long terminal spikes, bracts and bracteoles ovate, nearly equal in size, much shorter than the calyx; calyx greenish red, sub-sessile, short cylindric, acutely five-toothed, five ribbed, covered with stipitate, bifarious and sub-sessile glands; corolla scarlet, corolla tube slender, much longer than the calyx, 5-lobed, stamens five, filaments united at the base forming a nectariferous disc surrounding the ovary, anthers linear, two-cleft at the base; ovary superior, ovate, single-celled and single-ovuled, style filiform, hairy with five stigmatic branches bearing many rows of glands (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 pealings 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 were selected). After clearing, washing and staining they were mounted in 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

From a basal circular vascular strands-complex of the calyx five bundles supply each lobe of the calyx. The three central ones run parallel and supply the mid portion, where as the two peripheral ones supply the glandular hairs. Of the three median strands the central one runs up to the tip of the calyx lobe, where as the two side ones get united with the vascular strands supplying the glands at a region below the tip of the calyx lobe (Fig. IVd).

Corolla

Fifteen vascular strands run through the corolla tube, three supplying each lobe of the corolla. In each lobe the central vascular strand is thick and prominent and the two laterals are very thin (Fig. IVa).

Stamen

In each stamen a single vascular strand runs through the filament and ends in the connective (Fig. IVb).

Fig. II. **a** - **c** *Plumbago indica* Linn.
a) A flowering twig **b**) Single flower **c**) Useful parts - Root

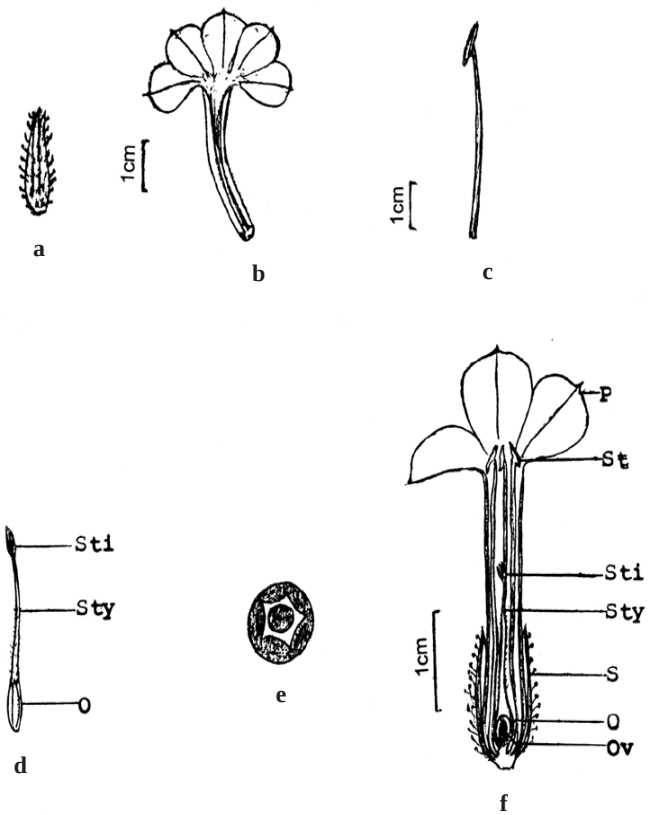


Fig. III. **a - f** *Plumbago indica* Linn.
a) Calyx **b**) Corolla tube split opened **c**) Stamen **d**) Gynoecium
e) Ovary C.S. **f**) Flower L.S.

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

Pistil

The ovary wall is supplied with five prominent vascular strands which, remain unbranched until below the region of the stigmatic lobes, where all of them bifurcate. Of the bifurcations, one supplies the stigmatic lobe where as the other stops at the region of the base of the lobe. Of the five vascular strands supplying the ovary wall, a branch of one supplies the solitary ovule (Fig. IVc).

Anatomy

Stem

The transverse section reveals the following organization of tissues:

i) The single layered epidermis is outlined by a thick layer of cuticle.

ii) The cortex comprises collenchyma, schlerenchyma and chlorenchyma. The cortex is delimited by a continuous schlerenchymatous ring of two to three layers. The chlorenchyma region is seen as isolated patches surrounded by collenchyma as well as schlerenchyma.

iii) Phloem, cambium and xylem regions are very distinct.

iv) Wood region is composed of alternate bands of tracheids and vessels with multiseriate medullary rays.

v) The centre is occupied by a large parenchymatous pith (Fig. Va,b).

Root

The T.S of root is nearly circular in outline with 5-6 layered cork tissue consisting of cubical to rectangular cells with their walls light yellow to yellowish brown in colour. A very wide cortex consisting of cells with yellowish brown content forms the major part of the root. The greater part of the cortex consists of thin walled rounded, polygonal tangentially elongate cells with well defined intercellular space. The cells are normally devoid of starch grains. The innermost rows of cortical cells are nearly regular and rounded. There is no clear demarcation between the cortex and bast. The phloem parenchyma cells are very small, thin walled and polygonal. Most of the cells have yellow contents. No mechanical elements are seen in the bast. The cambium consists of one or two layers. The xylem vessels are arranged mostly in single file in radial rows and are surrounded by mechanical cells. The medullary rays are multiseriate. The root is triarch and protostelic (Fig.Vc,d).

Leaf

T.S of leaf reveals usual dicotyledonous characters. Unicellular hairs mainly confined to the midrib region are present on both lower and upper epidermis. Stomata are of cruciferous type. Mesophyll consists of 2 layered palisade and multilayered spongy tissue. Six to seven scattered vascular bundles of the midrib region are strengthened by collenchymatous girdles on the adaxial surface (Fig. VIc-h).

The T.S of petiole is shield shaped and is provided with a single layered epidermis devoid of any trichomes. Interior to the epidermis are the 3-4 layers of collenchyma followed by 10-12 layers of parenchyma with plenty of intercellular spaces. The vascular bundles in the petiole are many and scattered (Fig. VIa,b).

The stomatal index is 16.7; the palisade is ratio 5.6 and the vein-islet number is 1.49.

Propagation

Stem cuttings are used for propagation. They are obtained at the time of harvest of the roots. Three noded cuttings are selected, the leaves at the lower two nodes are severed off and the lowest node is buried in the potting mixture contained in the poly bags. 2-4 cuttings can be

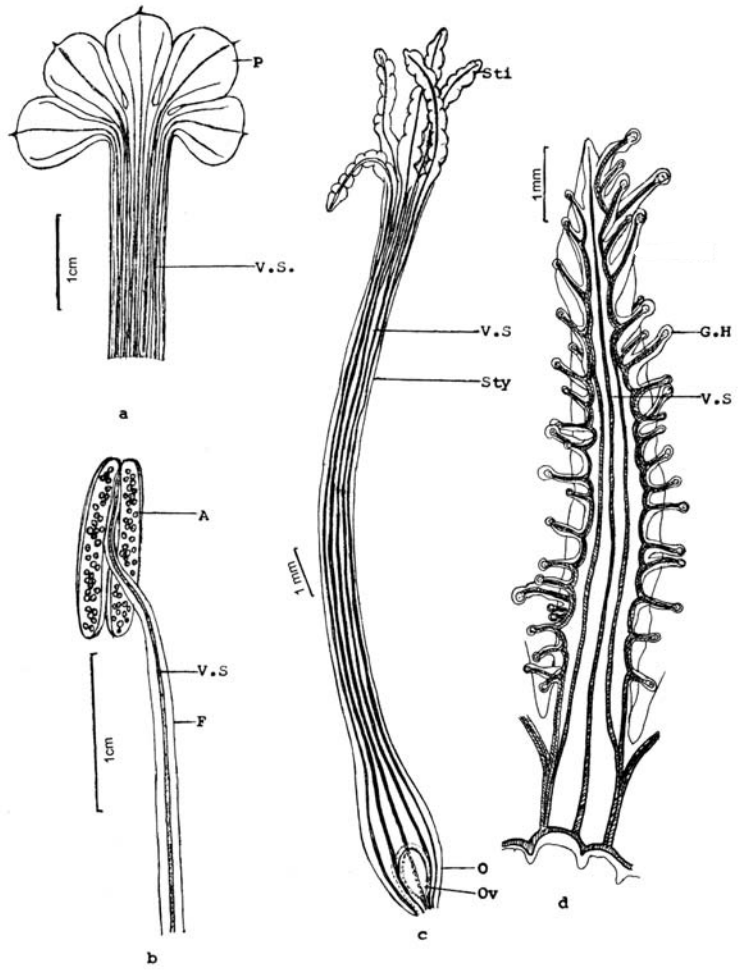


Fig. IV. **a - d** *Plumbago indica* Linn.
a) Corolla tube split opened **b**) Stamen **c**) Gynoecium **d**) Calyx lobe
A. Anther lobe **F**. Filament **G.H**. Glandular hair **O**. Ovary **Ov**. Ovule
P. Petal **Sti**. Stigma **Sty**. Style **V.S**. Vascular supply

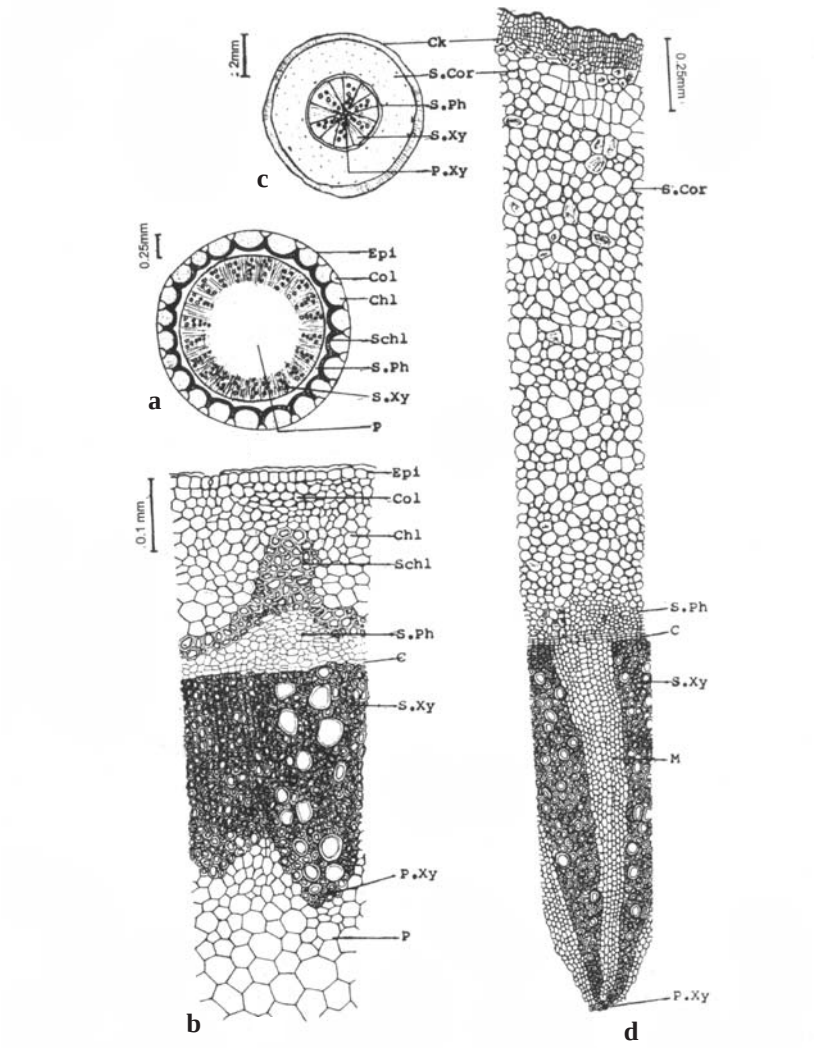


Fig. V. **a - d** *Plumbago indica* Linn.
a) T.S. Stem - Diagrammatic **b**) A portion enlarged **c**) T.S. of root - Diagrammatic **d**) A portion enlarged

C. Cambium **Chl**. Chlorenchyma **Ck**. Cork **Col**. Collenchyma **Epi**. Epidermis **M**. Medullary ray **P**. Pith **P**.**Xy**. Primary xylem **S**.**Cor**. Secondary cortex **Schl**. Schlerenchyma **S**.**Ph**. Secondary phloem **S**.**Xy**. Secondary xylem

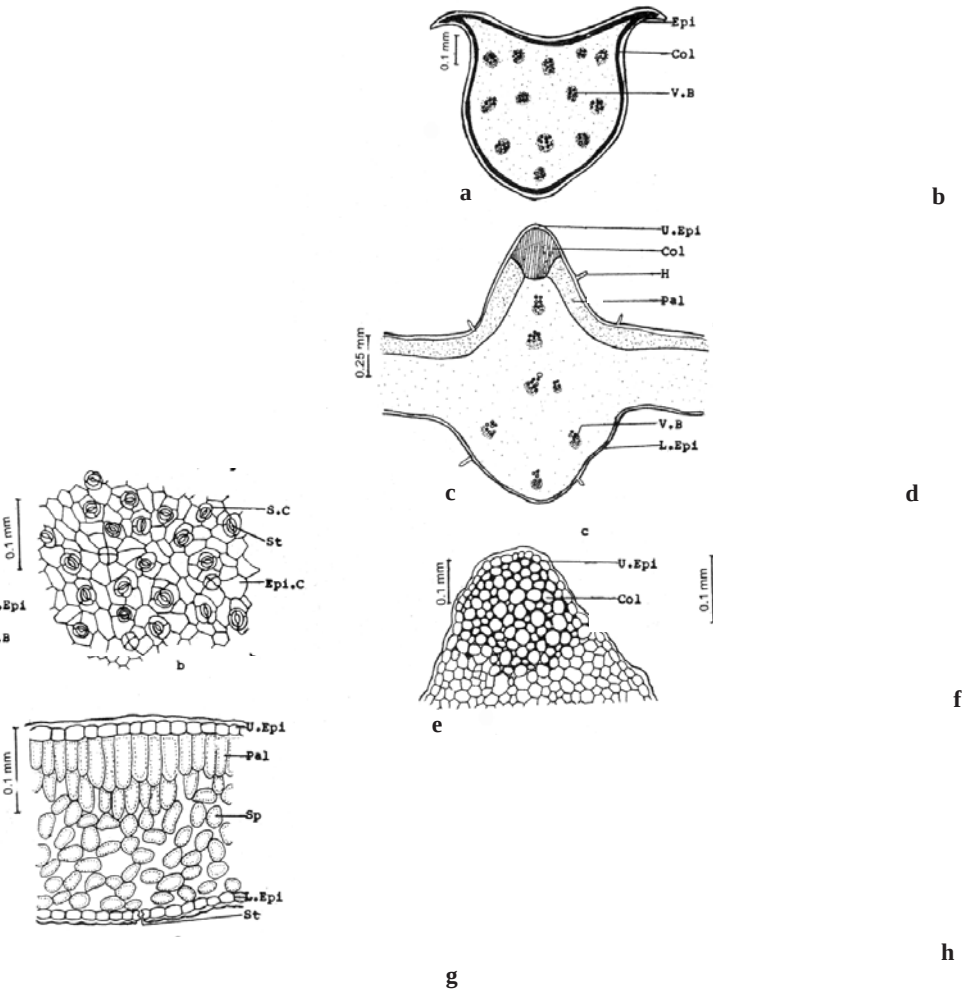


Fig. VI. **a** - **h** *Plumbago indica* Linn.
a) T.S. of petiole - Diagrammatic **b**) Detailed T.S. of petiole showing epidermis and cortex
c) T.S. of leaf through midrib - Diagrammatic **d**) Detailed T.S. of lamina
e) Upper portion of midrib - cellular **f**) Lower portion of midrib - cellular
g) Upper epidermis **h**) Lower epidermis

C. Cambium **Col**. Collenchyma **Epi**. Epidermis **Epi**.**C**. Epidermal cell **H**. Hair
L.**Epi**. Lower epidermis **Par**. Parenchyma **Pal**. Palisade **Ph**. Phloem **S**.**C**. Subsidiary cell
Sp. Spongy cells **St**. Stomata **U**.**Epi**. Upper epidermis **V**.**B**. Vascular bundle **Xy**. Xylem

planted in each poly bag. The bags should be kept in the shade and regularly watered. The sprouting will commence within a weeks time. One month old rooted cuttings can be used for out-planting. Direct planting in the field can also be done with fresh cuttings. In this case there may be up to 30% causality. Root cuttings of 3 cm long when planted in poly bags will give rise to seedlings from the margin of the upper cut ends.

The field for planting should be prepared before monsoon by digging or ploughing. Rooted or fresh cuttings can be planted at an espacement of 15-30 cm in this bed. Cuttings can be planted on mounds also. 3-4 cuttings can be planted in each mound. No watering is needed if the planting is done during the onset of monsoon. Weeding should be done at proper time. Alkaloids present in the roots will cause burns on the hand at the time of harvesting. So, precaution should be taken by using gloves or by applying coconut oil on the hand. After harvesting the roots should be thoroughly washed and treated in clear lime water which will turn red after sometime. This is a good economically viable species for cultivation.

Chemical studies

The root bark contains an orange yellow pigment named plumbagin (2-methyl-5-hydroxy-1,4-naphthoquinone, $C_{11}H_8O_3$, mp. 77-78º), a sitosterol glycoside ($C_{33}H_{56}O_6$, mp. 259-60º), a sitosterol, a fatty alcohol, probably arachidyl alcohol, tannin and an amorphous brown pigment. Fresh roots give much higher yield of plumbagin. The flowers contain 3-rhamnosides of pelargonidin, cyanidin, delphinidin (Wealth of India, 1969).

Result and discussion

Based upon the pharmacognostic studies, it is possible to distinguish the root of *Plumbago indica* from that of *Plumbago zeylanica*. Being a species, which is consumed in huge quantities an attempt for large scale cultivation of this species is inevitable.

Acknowledgements:

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IMPOTENCY
(Part - II)

K. Razeena*

Abstract: Continued from the previous issue. This part deals with the classifications of impotency and descriptions of clinical types.

Classification

Generally, impotency can be classified into three groups:

Primary and secondary

In primary impotency (life long type), one has never been able to obtain erection, sufficient for vaginal insertion. Ayurveda refers to this as *sahajaklaibya*. Secondary impotence (acquired type) refers to loss of ability to normal erection that was present at one time or, one who has successfully achieved vaginal penetration at some time in his sexual life, but later unable to do so.

Generalised and selective

General impotency is that in some, the dysfunction persists in all sexual situations. Selective impotency is also known as situational impotency. Here, one is able to have coitus in certain circumstances, but not in every situation. For example, one may be efficient with a harlot but not so with wife. The etiology in most cases is psychogenic.

Organic and functional

Impotency caused by some physical disorders is called organic impotency; it is usually sub-classified as vasculogenic, neurogenic, endocrinologic, drug induced, etc. Functional impotency, also called as psychic impotency or psychogenic impotency, is caused by some psychological condition - *manasikaklaibya.*

Description of the clinical types

This is having a bad prognosis. Traditionally, primary impotency is considered to be related to deep seated psychiatric problems, or congenital disorders causing hypogonadism. More recently newer testing techniques have shown that many patients with primary impotence have an underlying traumatic vascular injury suffered in childhood or early adolescence. *Sahajaklaibya* seems to be an identical terminology.

Susruta states that *sahajaklaibya* is *janmaprabhrtijaklaibya* – i.e. the patient would be *kleeba* (impotent) from birth which is incurable. Charaka has given a possible explanation for this type while dealing with *dooshitakarana* of *srotas* where he says that an offspring of a *kleeba* may be impotent or with serious genetic

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or physical abnormalities, or even may have a very short span of life. *Sareerasthana* further explains this. The vitiated *sukra* also vitiates the *veerya* and *beeja*; consequently, the offspring will be a victim of congenital disorder.

Trnaputrika described by Vagbhata denotes a congenitally impotent male with an intact libido. Charaka has described the abnormalities; some are associated to erectile failure and/or ejaculatory failure, others to abnormalities of sexual differentiation like hermaphroditism.

The *napumsaka*s referred to by Susruta fail to get erection in normal sexual act, but attains it through pervasive acts. This comes under *manasikaklaibya* as they do have no organic disease.

Cases of primary impotency are rare compared to secondary impotency. Based on the aetiologic factors many clinical types are seen in secondary impotency. Here is a brief description of such type.

Generally, three distinct endocrinologic syndromes have been associated with impotency:

a. Hypogonadotrophic hypogonadism resulting from pituitary failure of luetinising hormone secretion.
b. Hypergonadotrophic hypogonadism resulting from primary failure of testosterone secretion by the tests
c. Hyper prolactinaemia resulting from prolactin secreting pituitary tumor.

ORGANIC CAUSES OF IMPOTENCE

I.	Endocrine causes: Testicular failure (Primary or Secondary hypogonadism) and Hyperprolactinemia
II.	Neurological disorders: Multiple Sclerosis, Transverse myelitis, Parkinson's disease, Temporal lobe epilepsy, Traumatic or neoplastic spinal cord disease, Central nervous system tumors, Amyotrophic lateral sclerosis, Peripheral neuropathies, General paresis and Tabes dirsalis.
III.	Vascular disease: Aortic occlusion (Leriche syndrome), Atherosclerotic occlusion or stenosis of the pudental and/or cavernosal arteries, Venous leak, Disease of the sinusoidal spaces.
IV.	Pharmacological contributants: Alcohol and other addictive drugs (heroin, methadoine, morphine, cocaine, amphetamines and barbiturates). Prescribed drugs (Psychotropic drugs, antihypertensive drugs, estrogens and antiandrogens).
V.	Penile diseases: Peoyronie's disease, Previous priapism, Penile trauma.
VI.	Surgical procedures: Perineal prostatectomy, Abdominal-perineal colon resection, Sympathectomy (frequently interferes with ejaculations), Aortoiliac surgery, Radical cystectomy, Retroperitoneal lymphadenectomy,
VII.	Miscellaneous: Radiation therapy, Pelvic fracture, Any severe systemic disease or debilitating condition.

Patients with hypothalamic pituitary disorders will have reduced serum testosterone levels and inappropriately low gonadotrophin levels. Reduced testosterone levels would be expected to result in an increased pituitary luteinising hormone (L.H.) secretion if the hypothalamus and pituitary were functioning normally. Therefore, when L.H. levels are normal or decreased in the face of abnormally low serum testosterone levels, one must rule out the possibility of an underlying hypogonadotrophic hypogonadism. This usually includes congenital disorders like Kallman syndrome, Prader – willi syndrome, Laurence – Moon – Biedl syndrome. Endocrinologic impotence most commonly originates at the gonadal level, primary gonadal failure resulting in a reduced circulating testosterone level and an appropriately elevated Serum L.H. level. This disorder is termed as hypergonadotrophic hypogonadism.

Acquired disease of the hypothalamic pituitary system will usually be due to an underlying pituitary tumour. Most commonly, a prolactin secreting tumour may cause impotency, but may not be obvious on physical examination. Hyper prolactinaemia suppresses the production of luteinising hormone regulating hormone (L.H.R.H.) and thus causes low or low normal levels of plasma gonadotrophin and testosterone. Examples of other hypothalamic syndromes causing hypogonadism are idiopathic variety, various infiltrative disorders including sarcoid tuberculoid and oesinophilic granulomas as well as cysts within the area. Hyper and hypothyroidism have been associated with a decrease in potency. In some series, a decrease in libido is seen in a majority of patients with hyperthyroidism with a surprisingly normal serum testosterone levels. In contrast serum testosterone is decreased in hypothyroidism.

From ayurvedic classic references, Charaka's description of *beejopagkhataklaibya* seems to refer to a clinical entity that resulted in impotency from impaired production of androgens along with impaired spermatogenesis.

The *upakhata* or destruction of *beeja* and the resultant *klaibya* is due to the persistent abnormalities of the functions of *vrshana* (tests) as *veerya* (semen) is produced by it. Most of the causes of abnormal testicular functions in adults affect both spermatogenesis (production of *beeja*) and leydig cell function (androgen production). It should be noted that, most of the systemic illnesses those associating with *beejopaghata* and *klaibya* are included in this division i.e. hypogonadism associated with system illnesses.

Beejopaghatajaklaibya

Charaka explains this as the resultant *klaibya* from other diseases (systemic) or debilities those cause a destruction of *purushabeeja* (sperm). But the aetiology seems that it does not include any congenital abnormalities. It may be caused by dietary factors like increased intake of *vata* vitiating foods, *vishamasanam*, etc., excessive sexual indulgence, psychic ailments, chronic illnesses, *panchakarma mithyayoga* and general debility (*rasadidhatukshaya*). All these adversely affect the *sukradhatu* and vitiate it. The symptoms of *beejanasaklaibya* includes the general debility, lassitude, pallor, jaundice, emesis, cough, fever, etc., and one who having these symptoms may develop loss of sexual desire along with the erectile incapacity, which is very particular in endocrine dysfunction causing impotency.

The causatives of hypogonadism are all associated with general debility, and produce various symptoms based on the variations in their pathogenesis. The aetiology of testicular abnormalities in renal failure is not well understood. But about half of men with renal failure, on dialysis experience loss of desire and erectile dysfunction.

In cirrhosis of liver a combined testicular and pituitary abnormality leads to testicular atrophy and gynaecomastia in half of men affected and many such men are impotent. This is independent of direct toxic effects of ethanol.

Abnormalities in leydig cell function, frequently accompanied by decreased sperm density, have been noted in systemic diseases like PEM, advanced Hogkins disease and amyloidosis. Granulomatous diseases (commonly leprosy) can destroy testis. The seminiferous tubules are involved initially followed by endarteritis and destruction of leydig cells. The most common cause of acquired testicular failure in adults is viral orchitis-mumps virus, echovirus, group B-arbovirus and lymphocytic choremeningitis virus.

Neurogenic impotence

Many types of neurologic disorders cause impotence, including lesions in the anterior temporal lobe, spinal cord disorders, insufficiency of sensory output as in Tabes dorsalis or damage to parasympathetic nerves such as following surgical procedures like radical prostatectomy and cystectomy.

Most patients with myelodysplasia and extensive spina bifida will be completely impotent. Acquired medical diseases of the cord or peripheral nerves may impair the power of erection or emission. Usually, if spinal cord injury is above the sacral region, reflex erections may occur whereas diffuse injury of the sacral spinal cord results in total impotency.

Impotence due to posterior nerve root involvement occurs in cauda equina lesions. The pathways concerning sexual and bladder functions ascend and descend in the lateral column of spinal cord and may be involved in trumatic paraplegia, multiple sclerosis, Tabes dorsalis, syringomyelia, Freiderick's ataxia and spinal cord tumors. Impotence without apparent impairment in libido has been described in patients with temporal lobe lesions.

SOME CAUSES OF HYPOGONADISM

Endocrine disorders	Nutritional Deficiencies	Viral infection
Hypopituitarism	Protein energy malnutrition	Mumps
Hyperprolactinaemia	Anorexia Nervosa	Lymphocytic Choreomeningits
Oestrogen excess	Chronic Systemic Illness:	Malignancies:
Cushing's syndrome	Chronic liver cirrhosis	Hodgkin's disease
	Chronic renal failure	Testicular tumour

If impotence is associated with urinary symptoms, there should be a suspicion of the involvement of the autonomic fibres as in diabetes, Tabes dorsalis, or autonomic neuropathy. Several factors contribute to neuropathic impotence, including abnormalities in afferent sensory pathways, motor neuropathy in the cavernosa nerves, and decreased level of neurotransmitters in the corpora cavernosa. In addition, denervation of the sinusoidal smooth muscles leads to a loss of contractile elements and fibrosis which limits dilatation of the spaces.

As already mentioned, the sacral spinal cord can be considered as equivalent functionally to *apana vata* including the afferent sensory pathways through pudendal nerve, and motor pathway through convernosa nerves. The vitiation of *apana* results in *sukradushti* and *dushtasukra* fails to perform properly. Neurosurgical procedures causing impotence are described under surgical division of iatrogenic impotence.

Vasculogenic impotence

Organic impotence resulting from some disorders (usually insufficient flow of penile arteries or abnormal venous outflow) are called vasculogenic impotence. Men with vasculogenic impotence may present with total erectile impotence, decreased penile rigidity or loss of erection during intercourse. Vascular insufficiency may be due to aortic occlusion (Leriche syndrome) or to more distal atherosclerotic disease in the hypogastric, pudendal and cavernosa arteries.

Leriche (1923) first described arterial occlusive disease within the abdominal aortic bifurcation as a cause for erectile dysfunction. In this case erection if gained could not be retained. Since then numerous studies have been taken place showing that large vessel aortoiliac disease may be the basis of pelvic vascular insufficiency in secondary impotence. But the studies conducted by Michael about the penile vasculature revealed that all the abnormalities in other small vessels like atherosclerotic narrowing, stenosis, aneurysmal dilatation and so forth could also be appreciated in the smaller pudendal-penile circulation.

Generalised arteriolar sclerosis, involving the vessels to the penis may preclude their dilatation. The function of the sinusoidal tissue itself may be adversely affected by atherosclerosis, and by the use of tobacco products which contain a variety of vasocontractile agents. Significant disease in the pudendal and cavernosa arteries can occur in the absence of other clinical manifestation of peripheral vascular disease.

Abnormalities in venous occlusive mechanism can cause impotence due to venous leak but are usually the result of abnormalities in sinusoidal smooth muscle function or impaired arterial inflow rather than venous abnormalities. Ebbehoj and Wagner have described abnormal venous drainage of the corpora due to the fistulas between distal corpus and glans. When surgery was performed to obliterate these abnormal connections, potency was restored.

Diabetic impotency

In a chronic disease such as diabetes, any of the factor on which erectile function is dependent (vascular, neurogenic, etc.) may be altered. Large vessel and small vessel diseases have been strongly associated with diabetes. Studies conduced in diabetic impotents showed alterations in nerve fibres, neurogenic detrusor

areflexia and prolonged S.E.P. when compared to normal men. Based on urinary excretion levels of pituitary gonadotropins, it was felt that hypogonadotrophic hypogonadism was a leading cause of diabetic impotence. However, with the recent advent of radio immune assay techniques, no endocrine abnormalities in significant numbers have been reported.

Post surgical impotence

This comes under iatrogenic impotence. This section will deal with the surgical manipulations that leads to impotence and also with the relationship of radiation therapy to the development of sexual dysfunction.

Neurosurgical procedures

Neurosurgical procedures, especially those developed to control myoclonus have been associated with impotence. Spinal procedures to treat cervical spondylitis, cervical lumbar disc disease, tumors of the spinal cord or spinal cord infraction secondary to aortic aneurysm repair have also been associated with impotence.

The incidence of impotence after abdominal perineal resection varies between 50 to 100 percent. In case of benign diseases it is rare, as the procedures spare the pelvic para-sympathetic nerves. But for malignancies injury to these nerves often result from a wider dissection, there by causing a high incidence of erectile dysfunction. Impotency associated with radical prostatectomy appears to be primarily neurologic, as periprostatic autonomic plexus is usually injured. Radical cystectomy produces both neurologic and vascular insufficiency of the penis.

Arterial procedures

It was only recently, that attention has drawn to the occurrence of impotence following aortoiliac or aortofemoral bypass procedures that reduces hypogastric blood flow.

a. **Renal Transplantation**

Renal transplantation is usually carried out using an end-to-end anastomosis between the hypogastric artery and the donor renal artery. In some cases impotence may result on the basis of severely reduced penile blood pressure.

b. **Operation for Priapism**

Most procedures used in the treatment of priapism involve an increase in venous run off from the corpora. But in this case usually potency will be restored after a suitable post operative period has elapsed; probably a consequence of spontaneous closure of the shunt that has been created.

Transurethral external sphineterotomy transurethral prostatic resection, transurethral direct-vision urethrotomy have also been associated with impotence, the exact cause of this is still being debated. It can be speculated however that, vascular and neurologic injury may result from the coagulating current.

Pelvic irradiation

External beam irradiation has been used in treating bladder, prostate and colon malignancies. The incidence of impotence is common in most of the cases, and the clinical studies support the concept of vascular damage causing it, with vascular risk factors such as hypertension and smoking playing a supporting role.

One cannot exclude psychologic factors resulting from many of these procedures, especially those in which a stoma for either stool or urine is created. There is little doubt that the change in self-esteem and body image can easily lead to erectile dysfunction.

Charaka states that the vitiation of *sukravaha-*

srotus can be due to *sastra, kshara* and/or *agnikarma*s, which in turn can lead to *klaibya.* Susruta has included *marmacchedaja klaibya,* which is incurable. In later texts the term is replaced by *siracchedaja* or *upaghataja*. This may be considered as a similar entity causing a neurologic or vascular insufficiency to the penis either by injuries or even by surgical intervention. It seems the *marmacchedaja* division included by Susruta denotes some vasculogenic or neurologic causes.

Marmacchedajaklaibya

While describing *klaibya* Susruta has not specified *marma* the heart wherein causes *klaibya.* But in *Marmavijnan* of *Sareerasthana* he describes the *marma*s related to the lumbar and sacral region and the pelvis. Among them *vitapamarma* has to be considered first.

Vitapa is termed as *shantatakaramarma* by Vagbhata. Susruta adds *appasukrata* too in its ill effects. Based on the position of *marma* it is correlated with spermatic cord in some commentaries.

An injury to the spermatic cord, results in a failure to the testicular function or an ejaculatory failure. Damage to the *vrshana*s destroys both leydig cells and seminiferous tubles. This makes one sterile and impotent.

The correlation of the *marma*s to the anatomical structures based on the ancient descriptions seems difficult as the exact location is not stated in most cases. Thus, the related structures to each *marma* is accepted, considering the position and the effect of *marmabhighata.*

(to be concluded)

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HISTORY OF INDIAN MEDICINE AND PHARMACOPOEIA

Dr. Anil K. Dhiman*

Abstract: This paper gives a brief history of the development of ayurveda over the centuries. An attempt has also been made to incorporate the details regarding documents and literature in this field.

Introduction

India is rich in her plants. People, from very early time depended on nature and plants for sustenance. They knew by experience to alleviate the pain with the help of plants growing around. Many drugs of today were already in use in ancient times. The Indian Materia Medica is more extensive than their counterparts from the Greeks, Romans, Egyptians, Babylonians, Persians, Chinese and Arabians. The development of Indian medicine and Indian botany can be studied under various heads.

i. **Vedic period**

The *Rgveda*, perhaps one of the oldest repositories of human knowledge refers to 99 medicinal plants and the *Yajurveda* 82 and *Samaveda* enlists many plants mentioned in *Rgveda* including *soma* plant. *Atharva* deals with 288 plants, almost all have medicinal ingredients and were used to cure deadly diseases. The *Brahmana*s deal with 129 plants and *Kalpasootra*s describes about 519 plants.

ii. ***Samhita* period**

Ayurveda considered to be an *upaveda* contains detailed accounts of many drugs and their uses. The comprehensive works of Charka and Susruta give detailed descriptions of the Mateia Medica. *Charkasamhita* is the edited version of the old scientific treatise by Agnivesa who wrote on ayurvedic medicine based on the teaching of his preceptor, Atreya. This work deals primarily with medicines and its seventh chapter is entirely devoted to the description of purgatives and emetics. There were six disciples to *acharya* Punarvasu viz. Agnivesa, Jatukarna, Parasara, Ksharapani, Bhela and Hareeta[1]. Bhela presented his thoughts in *Bhelasamhita*, which is available now in parts. Hareeta, another disciple of Punrvasu, wrote *Hareetasamhita* which is available today. But, Sharma opines that the *Hareetasamhita* available today is not the original because the methodology followed is not on par with the other *samhita*s[2]. Many *samhita*s like *Agnivesasamhita*, *Jatukarna-samhita*, *Parasarasamhita* and *Ksharapani-*

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samhita are extinct today. *Kasyapasamhita* or *Brihat Jeevakatantra,* is available only in parts. *Susrutasamhita* though concerned mainly surgery, also deals with therapeutics. It describes the medicinal properties of about 385 plants (*vanaspati*). Vagbhata composed the works *Ashtangahridaya* and *Ashtanga-sangraha* later.

The above three works are known as *brhatrayi* of ayurveda and the period of their composition is considered as the golden era in the Indian system of medicine. Another triad known as *laghutrayi* of ayurveda is *Madhavanidana* of Madhavakara (12 c.) which deals with diagnosis; *Sarangadharasamhita* of Saranga-dhara (14 c.) a systematic ayurvedic material medica; and *Bhavaprakasa* of Bhavamisra (15 c.) which contains more than 600 drugs including some foreign drugs. The *Vangsenasamhita* of *achayra* Vangasena contains information on various ayurvedic formulations.

iii. **Period of *nighantu***

The oldest *nighantu* is *Dhanvantarinighantu.* The another well known *nighantu* is *Rajanighantu,* in which, about 400 herbs have been described and later many authors have drawn upon this source. *Charuamani* of Narhari Pandit, a native of Singhpur of Kashmir, is another lexicon on medicinal herbs. *Shivkosh* of Shivdutt Misra, written in 1677, describes about 4860 synonyms out of which 2860 are ayurveda-related. *Gadanigraha* is another work by Sodhala which contains information on more than 585 ayurvedic formulations. *Madanapala-nighantu* was written by Madanpala[3].

During this period, the chemistry of natural products isolated both from flora and fauna were well understood. Nagarjuna was the inventor of *kajjali* (a compound of sulphur and mercury) and art of calcinations (*bhasma*). He was not only a physician but was an authority on astronomy, chemistry and magic as well. Born in a poor brahmin family, he wrote *Rasaratnakara, Arogyamanjari* and *Kakshaputa*. *Bhojaprabhanda,* a treatise written about 980 AD contains a reference to inhalation of medicaments before surgical operations and an anesthetic called *Sammohini,* which is said to have been used during the time of Buddha. The other Vagbhata, in 13th century has written *Rasratanasamuchaya*, which deals with the chemistry of many ayurvedic formulations and information on medicinal plants.

Mughal period

From this period down to Mohammedan invasion on India, ayurveda declined because no original work could be done during this time. The Buddhist doctrine of *ahimsa* also influenced the work as no work could be done in surgery. The thinking and study and practice of the healing art led the pollution and 'to touch the body is sinful' etc. influenced medicine. However, Greeks, Scythians and Mohammedans invaded India successively and enriched their Materia Medica.

With the decline of Buddhism, degeneration set all around in knowledge, learning and practice of both medicine and surgery and process of decay was hastened about the time of the Mohammedan invasion. This decline became more rapid because invaders brought their own healing system which was well advanced for that period. The Arabic or Unani system of medicine was introduced which became the state system. The history of Unani system of medicine can be studied under two

parts; Pre-mughal period and Mughal period. During Alauddin Khilji regime, Hakim Sabruddin Damishqui and Hamid Motraz occupied a high rank. The system existed during the reign of Sultan Altamish also. Hakim Zia Muhammad was the court physician of Muhammad Bin Tuglaq. The famous works on *unani* system of medicine like *Tibb-e-shahabi, Kafaya Mujahidiya* and *Madan-ush-shifa Sikander* were published during the pre-mughal period. In Mughal period, Hakim Ali Geelani, Hakim Anaullah Khan, Mirza Muhammad was the court Physicians of Akbar, Jahangir and Muhammad Sher respectively. The famous books like *Ummul Hag, Mizanut Tibb, Qurabadeen-e-quadri, Sha-e-geelani* were published in this period. *Unani* or Arabian medicines were prevalent during the reign of Pathan and Moughal dynasties but with the fall of Moughals it too decayed. Although the British's looked down upon this system of medicine, the Nawabs of some states patronized it. Important among them were, Nizam of Rampur, Nawab of Tonk and Maharaja of Patiala. Besides, Hakims of Delhi, Lucknow and Hyderabad also concentrated on measures to stop the decay and decline of this system of medicine. But during the intimate contact between these two systems each utilized the Materia Medica of the other. Opium was included in *nighantu*s for the first time. The *nighantu*s prepared by Hakkim contained details regarding Indian medicines and those from Arab and Afghanistan. Some important contributions of this period include *Taleem a Sharir Abyunsur - Maffakkas* and *Dakhir – A - Khajarmushahi*. The occupation of Portuguese, French and England further caused decline to the Indian Systems. Dr. Garcia D'orta who came in India in 1534, perhaps was the earliest European Physician to describe some Indian drugs. He was appointed medical adviser to the Portuguese Viceroy during 1554-55 and travelled all over India and studied the qualities of plants growing there. He published a treatise on drugs used in Indian Medicine in Dutch language in 1563 in Goat which later on was translated into English[4,5].

British period

Westerners introduced modern system of medicine which was appreciated and accepted by people due to its advanced technology, especially due to its surgical achievements. They brought their own Materia Medica and there was further amalgamation and use of new medicinal plants, but some use relating to ayurvedic and its related concepts also came in British period too. The important among them include 3-volume treatise entitled *Hikmat Prakash* of Mahadev written in 1773. This work is in Sanskrit language and had many *unani* formulations, which he translated from *Hikmat* of Farsi language. This work consists of three parts; the second part of which dealt with pharmacology. Vishnu Vasudev Godbole in 1867 published another important treatise under the title *Nighantu Ratnakar* in two parts[2]. Shaligram of Moradabad in 1896 published *Shaligram Nighantu* and it is supposed to be the last *nighantu* as after this no *nighantu* published ever.

However, the very fact that the Indian System of Ayurvedic Medicine survived all trials and tribulations through centuries bears enough testimony to the efficacy of this indigenous system of medicine. Hence, the Western scholars and medical practitioners could not ignore it. William Jones perhaps was the earliest contributor who wrote a memoir *Botanical Observations on Selected Plants*[6]. This was

followed by Flemming's *Catalogue of Indian Medicinal Plants and Drugs*[7]; Ainsile's *Materia Medica of Hindoostan*[8]; Roxburgh's *Flora Indica*[9]; Shaughnessy's *The Bengal Dispensatory*[10]; and Drury's *Useful Plants of India*[11] - later revised in 1873; and *Hand Book of the Indian Flora*[12]. Hooker and Thomson[13] were the first who could describe botanically the plants of India in their work *Flora Indica.* Later, Hooker explored the plant wealth of India and published a monumental work *Flora of British India* in seven volumes[14]. This work is considered a milestone in the floristic history of India. Waring[15] was first to publish *Pharmacopoeia of India* supplemented by Mohidden Sheriff in 1869 and later by Dymock, Warden and Hooper[16]. It is most careful and useful compilation containing a mass of information regarding the uses of the indigenous Materia Medica in the Eastern and Western medicine, Waring[17] compiled another work *Remarks on the uses of some of the Bazar Medicines and Common Medical Plants of India* which gives information on the various medicinal uses of plants of Indian subcontinent. The other document *The Dictionary of Economic Products of India*[18] was originally projected by J.N. Mukherji, but subsequently completed by Dr. George Watt, the Reporter to Economic Products to the Government of India during 1889-1904. This work is considered as most important, it also not only incorporated the earlier work on the indigenous plants but also utilization of the new results on clinical trials by various medical authorities, besides cultivation and economic importance of many of them with reference to their inland and export trade records. Later works, such as *Indigenous Drugs of India* of Dey[19], *Materia Medica of India and their Therapeutics* of Khory and Katrak[20] and *Indian Medicinal Plants* of Kirtikar and Basu[10,11] were mostly summaries and compilations from the above-mentioned works. The latter work is supplemented with the illustrations, which greatly help the workers in differentiating them from plants, which they were not aware of. Its revised and almost completely rewritten edition by Blatter *et al*., was published in 1935[21]. Dutt[22] published *The Materia Medica of Hindoos* in which various information regarding medicinal plants were given. Sanyal[23] wrote on the medicinal uses of the plants in his work *Vegetable Drugs of India, Bharat Bhaisajya Ratnakar* compiled by Nagin Das Chagan lal Shah during 1924-37[24] is another important compilation of various ayurvedic formulations referred to in different ayurvedic books. Another work *Vanaspati,* of Majumdar[25] described the uses of plants and their uses in Indian sub-continent. Chopra started a project at Calcutta School of Tropical Medicine, Calcutta, which resulted in the publication of a useful and informative volume on *Indigenous Drugs of India*[26], which was later revised in 1958[27] by the same author with his colleagues. Meantime, Roberts[28], also wrote on different medical aspects of plants and their products in his work. *Vegetable Materia Medica of India and Ceylon* and Bose[29] in *Pharmacopoeia Indica* about the latest discoveries of that time on medicinal plants. Swamy[30] published *Sandigdh Nirnay Vanoushdhi Shastra* in 9 volumes in which he had described various controversial plants with their medicinal uses. Besides, Nadkarni in 1908 wrote a treatise, on *Indian Plants and Drugs* which later in 1927 was modified and published as *Indian Materia Medica* and has been revised in 1954[31] provides information on 2671 medicinal plants. Vaish (1940), published, *Abhinav Booti Darpan*

which is an illustrated work and is considered another very important treatise in the field of Ayurveda[32].

Modern period

This period can be subdivided into the Personal Efforts and Government Activities of the post-independent era.

i. **Personal efforts after independence**

After independence, Bhandari[33] published *Vanoushdhi chandrodaya* : *An Encyclopedia of Indian Botanies and Herbs* which in addition gives information on important preparations of Indian drugs made from the plants besides their medicinal uses. This work was revised and its new edition, which was published in 1993, had updated information in the medicinal field. Singh[34] prepared a guidebook *Vanoushdhi Darshika* for the students of botany and forestry and later he surveyed the forest of Bihar and published his work under the title *Bihar Ki Vanaspatiyan*[35]. Singh[36] published *Vanoushdhi Nirdeshika* (Ayurvedic Pharmacopoeia) which was revised later in 1983. This provided much information about the adulteration of the drugs including main preparations made from the plant products. The recent works include Sharma's five volume work[2] *Dravaya Guna Vigyan*; Jain and De Filipps's *Medicinal Plants of India*[37]; a voluminous work of Warrier[38] on *Indian Medicinal Plants*; Sharma's[39] *Classical uses of Medicinal Plants;* Agarwal's[40] *Drugs Plants of India'* and of Kaushik and Dhiman's *Medicinal Plants and Raw Drugs of India*[41]. The latter work also lists important Ayurvedic and *unani* preparations made out of these plants.

ii. **Government initiatives after independence**

As far as the government activities after independence are concerned, Council of Scientific and Industrial Research (CSIR), New Delhi, during 1948-1976 published *Wealth of India*[42], which is considered an updated edition of the Dr. Watt's work of 'The Dictionary of Economic Products of India'. The addition of illustrations and plates makes the work more useful. The work is being revised and three volumes have already been published. Chopra *et al*.[43] work on *Glossary of Indian Medicinal Plants*; Chopra *et al*'s *Supplement to Glossary of Indian Medicinal Plants*[44]; Asolkar *et al*,[45] *Second Supplement to Glossary of Indian Medicinal Plants with Active Principles*[46] and Chatterjee and Pakrashi's [47] *The Treatise on Indian Medicinal Plants* have been brought out by the CSIR, New Delhi. Besides, Atal and Kapoor's work on *Cultivation and Utilization of Medicinal Plants*[48] has been published by Regional Research Laboratory, Jammu. In 1962, Government of India constituted Ayurveda committee with a view to maintain the uniform standards in preparation of drugs and to prescribe working standards for compound formulations including tests for identifying purity and quality of the drugs. Central Institute of Medicinal and Aromatic Plants (CIMAP) at Lucknow is serving in this field. Pharmacopoeial Laboratory for Indian Medicines, established at Ghaziabad is serving as a centre for standard setting cum-drug testing laboratory for Indian medicine including ayurveda, *siddha* and *unani* System of Medicines. Under this centre, Amchi research unit has been set up also to carry out clinical researches and survey of local drug potentials of Tibetan System of Medicine (Amchi System), which is in vogue in Ladakh, Lahul and in some other regions. Similarly, Central Council of Indian Medicine was established for working in Ayurvedic, Siddha

and Unani system of medicines. National institute of Ayurveda was established in 1976 at Jaipur (Rajasthan) in collaboration with Government of Rajasthan, which is working as a national centre for promoting Ayurveda. Besides, Central Council for Research in Ayurveda and Siddha was constituted in 1978 to initiate, aid, guide, develop and coordinate scientific research in different aspects of fundamentals of ayurvedic and *siddha* system of medicine. Institute of History of Medicine and Medical Research, Delhi and Central Council for Research in *unani* Medicine (CCRUM) established in 1979 are working for the coordination and scientific research in Unani Medicine which in fact indirectly incorporate Ayurveda. The National Botanical Research Institute, Lucknow, has also published Kapoor and Mitra[49] work on *Herbal Drugs in Indian Pharmaceutical Industry.* Besides, the Indian Council of Medical Research, New Delhi, is also working towards the development and research in the field of medicines and two volumes of Satyavati, *et al*.[50,51], on *Medicinal Plants of India* have already been brought out by the Indian Council of Medical Research, New Delhi.

Conclusion

The Indian system of medicines had many ups and downs in the course of its development. Now it is flourishing well. The awareness that ayurvedic treatment does not have side effects, has attracted many patients and made its votaries. Due to this, developed countries are promoting research on herb-based drugs and medicines.

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MANAGEMENT OF ABNORMAL INVOLUNTARY MOVEMENTS OF EYE LIDS - A CASE REPORT

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Abstract: Derangement of *vyanavayu* is said to be one of the causes for the abnormal involuntary movements of eyelids. This paper discusses the promising therapeutic procedures like *tarpana, nasyakarma,* etc. in the management of such cases.

Introduction

Blinking is a physiological phenomenon. Rate of normal blinking is on an average 3 - 7 times per minute. Blinking may be reflex, spontaneous, voluntary and spasmodic. Reflex blinking may be sensory reflex and optical blink reflex. Spontaneous blinking occurs in waking hours. Voluntary blinking or winking is usually uniocular. The orbicularis muscle assists it. Increased blink reflexes are due to inflammation, fatigue, strenuous close work, psychopathic tic and blepharospasm. Decreased blinking occurs in dysthyroid ophthalmopathy and Parkinsonism. The causes of abnormal lid movements are: blinking, squint, tic, blepharospasm, blepharoclonus, lid retraction, lid lag and Bell's phenomenon.

Tic

This involves clonic contactures of isolated orbicularis fibres.

Blepharospasm

This is an involuntary, persistent and strong orbicularis spasm causing firm closure of the eyelids lasting from a few moments to a few days. The causes include: a) the reflex sensory irritation through the trigeminal, b) stimulation of the facial nerve or its central connections and c) hysteria.

Blepharoclonus

This is the involuntary rhythmic contraction of the orbicularis fibres. It may involve the whole of the orbicularis oculi or some of its fibre bundles. When fibrillar twitching occurs in some fibre bundles especially near the outer canthus, the condition is termed as myokymia.

Modern line of management is always difficult and may need canthotomy or canthoplasty, injection of alcohol into the orbicularis, neurectomy of branches of the facial nerve

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and resection of a band, about 8 mm of the orbicularis. (Ahmed E. 1993, Newell, 1983).

According to Ayurveda, *vyanavayu*, one of the five varieties of *vata*, controls all voluntary and involuntary movements of the body (*Charakam*, *chikitsa* 28/9; *Susrutam nidanasthana* 1/17-18; *Ashtangahridaya, sootrasthana* 12/7). Authors of classical Ayurvedic texts attribute physiology of blinking (*unmesha* and *nimesha*) to the functions of *vyanavayu*. The above said abnormal conditions are comparable to deranged function of *vyanavayu.*

Clinical Profile of the patient:

Name	:	Y.P.S.
Age	:	37 years
Sex	:	Male
IPD No.	:	MRD 36 CRIA, N.D.
Diet	:	Mixed
Occupation	:	Business

Case presentation and clinical examination

The above said patient was brought with history of abnormal involuntary movements of left eyelids since last 6 years. Patient had treatment for the same from different systems of medicine. No test history of injury; no addiction to alcohol, tobacco or cannabis. He did not have symptoms of diabetes, hypertension or any neurological disorders.

General examination and examination of CVS, RS, UGS, GI and Endocrine system revealed no abnormality. No neuro deficit found on examination of nervous system. A careful examination of ocular system revealed eyeball normal in size, shape and position; lacrimal system was normal. There were no signs of conjunctival inflammation or hemorrhage, scleral changes viz. pigmentation, nodule or congestion. Cornea - normal size and shape; no opacity, no neo vascularisation and normal corneal reflex. Aqueous clear, normal iris pattern, no new vessels, no adhesions. Lens - transparent. Direct and consensual pupil reflex present. Normal pupil reaction. VA of both Eyes was 6/60. No heterophoria, nystagmus or strabismus. All biochemical and haematological parameters were with in normal limits.

Material and methods

Type of study was simple observational on OPD/IPD level. Drugs selected for the study were *Patoladighrita* (for *tarpana), Ksheera-balataila* (for *nasyakarma* and internal use), *Ekangavirarasa* and *Asvagandhachoorna* (for internal use).

Treatment and dosage schedule: *Tarpana* with *Patoladighrita* was scheduled for 5 days. After an interval of 5 days, *nasyakarma* conducted for 7 days with *Ksheerabalataila* followed by internal administration of *Ksheerabalataila* (101) 5 ml OD with milk; and *Ekangavirarasa* 125 mg BD and *Asvagandhachoorna* 5 gm BD with milk for one month.

Procedure of *tarpana*: The patient should be made to lie down in supine position in a chamber free from dust, sunrays and wind. Local application of *Tilataila,* around the eye orbit followed by mild sudation should be given as *poorvakarma.* Concentric boundary should be made around each orbital fossa (*netrakosa*) with a paste made out of *Mashachoorna* (powder of *Phasleous mungo*). 20 ml of lukewarm medicated ghee (melted in lukewarm water) should be filled and allowed to retain in the boundary for 20 minutes. After the prescribed period, ghee should be taken out with cotton pads and followed by removal of the boundary.

Observations and Results

Patient was subjected to the above treatment for one month and follow up study was conducted for six months. Complete disappearance of abnormal involuntary movements of the left eyelid was noticed after one month. Follow up observations did not reveal any recurrence.

Discussion

Vyanavayu is responsible for normal physiology of blinking *(unmeshana* and *nimesha)* and derangement of this functional component is responsible for abnormal involuntary movements of the eye. The principle of management of such condition involves restoration of normal physiology of *vyanavayu.* The schedule of *sodhana* and *samana* therapies alleviate pharmacological actions responsible for the pathological phenomenon.

Snehadravyas [*Patoladighrita,* (for *tarpana*), *Ksheerabalataila* (for *nasyakarma* and internal use)] alleviate deranged *vayu* and relieve the obstruction of channels (*srotorodha*) - the prime factors responsible for the causation of the condition.

Tarpana has been mentioned as the promising therapeutic procedure for the management of all pathological ocular conditions by Vagbhata. *Nasyakarma* is the prime line of treatment for the management of pathological condition afflicting the organs above clavicle. *Ekanga-virarasa* and *Asvagandhachoorna* possess *rasayana* property and *vatahara* action.

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PHARMACOGNOSTICAL STUDIES ON THE MEDICINAL FERN *PARAHEMIONITIS CORDATA*

V. Irudayaraj and R. Senthamarai*

Abstract: Pharmacognostical studies have been carried out in the medicinal fern *Parahemionitis cordata* (Roxb. ex Hook. & Grev.) Fras. - Jenk. which is used to cure various diseases of human beings and domestic animals. Morpho-anatomical and physico-chemical standards will be useful to identify this species which is usually adulterated with *Merremia tridentata*.

Introduction

Pharmacognostical studies play an important role in evolving standards for single drugs so that genuine and authentic drug materials can be made available for researches and pharmaceutical industry. With this scope many medicinal plants have been pharmacognostically studied. When compared with flowering plants, pharmacognostical studies on medicinally important non flowering vascular plants (ferns and fern allies) are very little. In the present study pharmacognostical analysis has been carried out on a medicinal fern *Parahemionitis cordata* (Roxb. ex Hook. & Grev.) Fras.-Jenk. which is used to cure various diseases of human beings and domestic animals. It has also been reported that in Kerala, this plant is adulterated with *Merremia tridentata* (L.) Hallier f. which is used in rheumatism, piles and urinary disorders and also used as tonic and laxatives.

Material and Methods

Materials were collected from Neyyar Dam, Kerala and anatomical studies carried out by taking hand sections. Stomata were studied by taking epidermal peelings from fresh leaves and physico-chemical studies carried out by standard methods.

Observations

Systematic Position

Species : *Parahemionitis cordata* (Roxb. ex Hook. & Grev.) Fras.-Jenk

Family : Hemionitidaceae (Pteridophyta)

Synonyms : *Parahemionitis arifolia* (Burm.f.) Panigrahi

Hemionitis arifolia (Burm f.) T.Moore

Medicinal uses

This fern is used in the treatment of ear aches and as a vermifuge (Dixit & Vohra 1984).The ethno-medicinal survey on Kallar, Agasthiar hills, Western Ghats shows that the leaf paste is given along with meals to cure fever and cold in dogs.

Morphology

Small herb with few inches in height. Rhizome erect or short creeping, densely covered by scales; Stipes black or dark brown, polished, brittle, up to 33 cm long in fertile fronds and up to 23 cm in sterile ones, scaly allover. Lamina

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simple, dimorphic, cordiform, up to 9 x 6 cm, fertile ones up to 7 x 10 cm, deltoid, trilobed, entire, densely scaly, below veins anastomosing. Sori continuous along the veins filling the entire surface of the lamina when mature, intermixed with hairs and scales, spores trilete with minutely reticulated exine (Fig.1)

Ecology

Common in Eastern Ghats and Western Ghats; low altitude fern frequently growing on exposed rocks along roadsides.

Cytology

South Indian population is triploid apogamous with n = 2n=90 (Abraham *et. al*, 1962, Irudayaraj & Manickam 1987).

Anatomy

The T.S. of petiole shows the presence of horse shoe shaped protostcle, in the homogenous prosenchymatous ground tissue. The rhizome is also with protostcle interrupted with the lignified parenchymatous cells. The stomata are sepcopolocytic with 3-4 subsidiary cells.

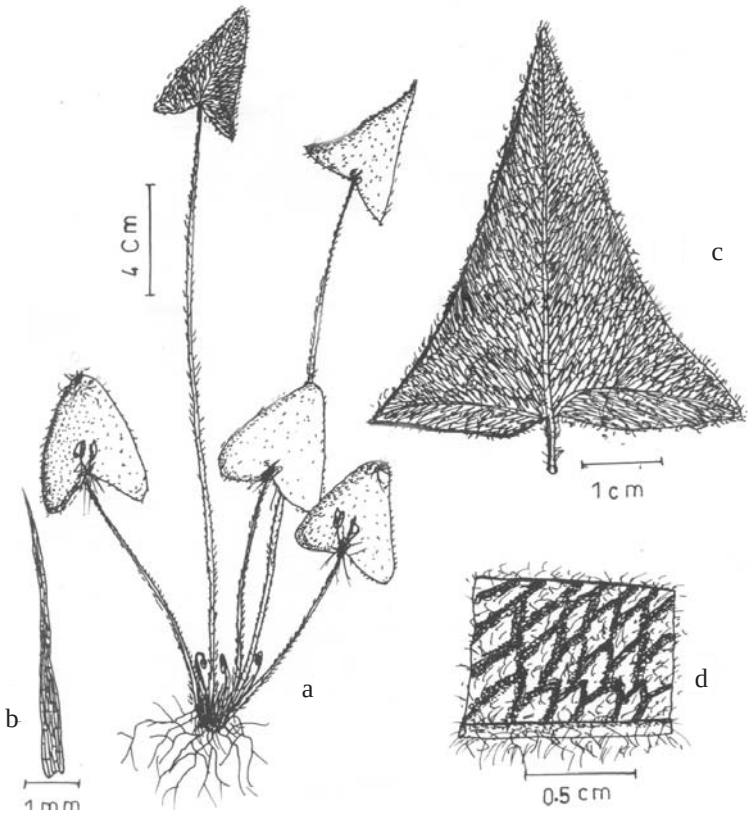

Fig. 1

Parahemionitis cordata (Roxb. ex Hook. & Grev.) Fras.-Jenk

a Habit **b** Rhizome scale **c** Fertile leaf **d** Sori

The epidermal cells are with highly undulated margin (Fig. 2).

Physico-chemical analysis

The extractive values and the results of flourescence analysis observed as detailed in tables 1 & 2. The preliminary phytochemical screening shows the presence of steroid, saponin, phenolic groups, tannin and catechin and absence of alkaloid.

Discussion

The results of morpho-anatomical and physico-chemical studies on this fern will be useful to differentiate from *Merremia tridentata*. The dried plant can be distinguished by macro morphology. The powdered drug can be identified by the presence of multicellular scales and trilete spores. Physicochemical results will give further confirmation.

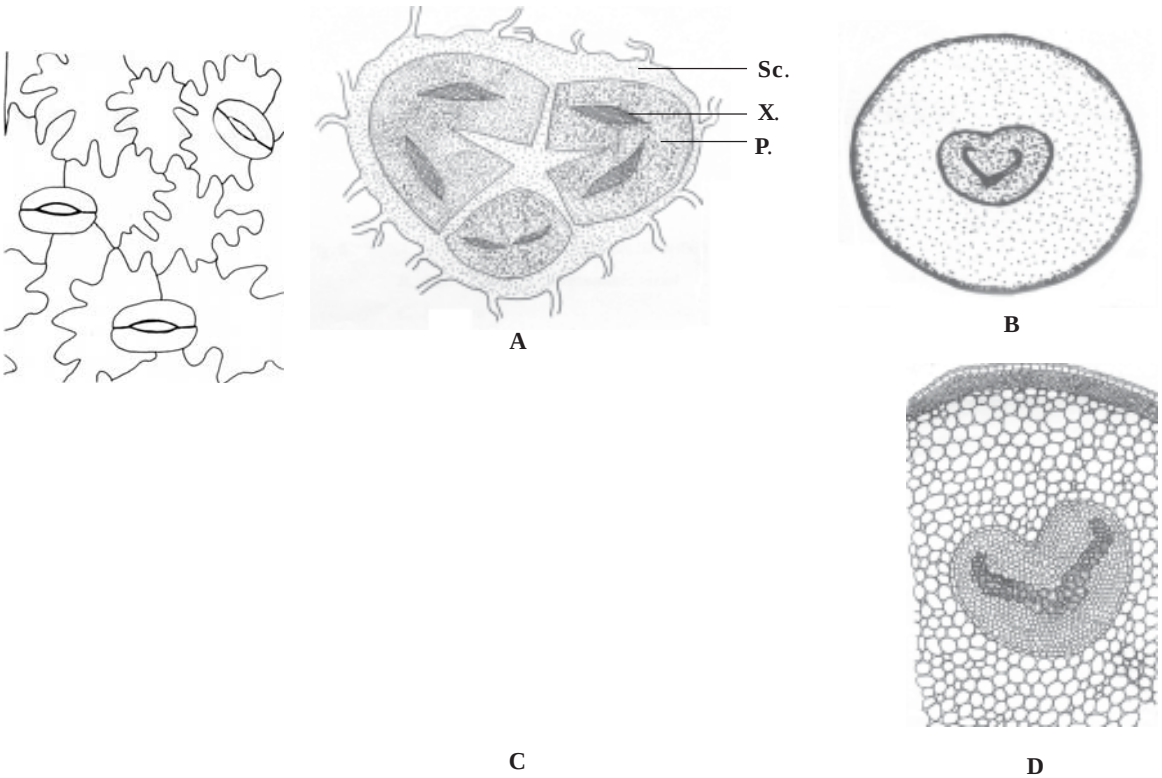

Fig. 2

Parahemionitis cordata (Roxb. ex Hook. & Grev.) Fras.-Jenk

A T.S. of rhizome **B** T.S. of petiole - Diagrammatic **C** Stomata **D** T.S. of petiole - A portion enlarged

Sc. Sclerotic cells **X**. Xylem **P**. Phloem

TABLE 1

Parahemionitis cordata (Whole plant)

Flourescent analysis and extractive values in various organic solvents.

Sl. No.	Solvent	COLOUR UNDER		Extractive value
		Ordinary light	U. V. light	
1.	Distilled Water	Dark YeIlowish brown	Green	8.4%
2.	Acetone	Dark brown	Black	4.95%
3.	Ethyl acetate	Green	Dark green	1.23%
4.	CCl4	Greenish brown	Dark brown	2.55%
5.	Benzene	Greenish brown	Black	1.65%
6.	Pet. ether	Pale green	Black	6.5%
7.	Ethanol	Bus green	Black	6.5%
8.	Chloroform	Dark brown	-	2.85%

TABLE 2

Flourescent analysis in various inorganic solvents

Chemicals	Colour under U. V .light
Powder + 1N HCl	Brown
Powder + Aq.1N NaOH	Pale green
Powder + 1N NaOH in Methanol	Dark green
Powder + 50% HNO_3	Pale green
Powder + 50% H_2SO_4	Dark green

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SOME VIEWS ON RESEARCH IN AYURVEDA

B. Rama Rao*

Abstract: The methodology followed for research in ayurveda is the same as that of modern medicine. This does not contribute anything to ayurveda. Research has to be undertaken using the parameters of ayurveda. A new methodology has to be developed for fundamental research in ayurveda.

Research activities are going on in the field of ayurveda both by Government and non-Government organizations in a big way. Central Council for Research in Ayurveda and Siddha (CCRAS) under Ministry of Health and Family Welfare of Government of India is the premier institution conducting research in ayurveda at different centres throughout the country. Several private and quasi governmental organizations are also involved in research activities. The pattern is the same in all these fields. All follow the methodology of modern medicine. The disease is diagnosed on the parameters of modern medicine and the results are also assessed accordingly. The drugs used in the trials are those commonly used in ayurveda. During my tenure in CCRAS at Chennai, I was associated with the trial of an ayurvedic drug Ayush 64 in collaboration with NMEP (National Malaria Eradication Programme). Though the fever was categorized as *vishamajvara* according to ayurveda it was confirmed by the presence of malarial parasites in the blood smear. The cure or failure was also decided by the absence or presence of the parasites. All research programmes are also undertaken in the same pattern. It may be interesting to note here that the NMEP insisted on giving the medicine only for three days because chloroquine is given for three days and after three days of treatment even though the parasite count came down considerably the cases were considered as failure. Due to this the result came down from 75% to 60%.

The main drawback is that research organizations do not bestow attention to the holistic approach of ayurveda. According to ayurvedic principles of treatment, medicine for a disease is to be decided after considering several factors such as – vitiated humours, their degree of vitiation, age of the patient, food habits, physical strength, mental setup, region, seasons, *prakriti* (constitution) and so on. The following passage from *Ashtangahridaya* explains this:

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> The physician should examine the patient thus before starting the treatment of the disease. In which country or region was he born? Where was he brought up? Where he developed the disease? (In that region) which are the type of food and activities? What is the physical strength and mental setup or attitude? Which are the wholesome or accustomed things and likes and dislike? What are the common diseases?
>
> *Ashtangahridaya* further explain thus: The physician does not fail anytime in his treatment, if he considers the following for deciding the medicine for the vitiated *dosha* responsible for the disease – *dooshya* i.e. *dhatu*s (seven bodily elements) and *mala*s (excretions), *desa* (body as well as region), physician strength, time (of the day), season, *anala* (digestive fire and metabolic activities), constitution, mental setup, age, wholesome and unwholesome things, food habits and degree of vitiation.

In all ayurvedic works one can find that while describing the treatment and giving recipes for the disease, good number of prescriptions are given. They are of different forms like decoctions, *asava*s, *arishta*s, powders, *rasa* medicines and many others. The physician has to select suitable medicines from among them considering the above factors of the disease and the patient. This includes that the medicine need not be the same for different patients suffering from the same disease as diagnosed by modern methods. If we consider these aspects, it clearly shows that the present research activities going on do not conform to ayurvedic principles and fundamentals of holistic approach. However, there may be instances like epidemics and endemic diseases where the drug plays an important role over other factors and the drug may not be required to be changed on the above factors. There are many instances where ayurvedic treatment for chronic diseases like diabetes does not have the same effect on all the patients.

It may be stressed here that all systems have effective measures of treatment in certain areas and may not have any remedies in certain cases. The best thing in the interest of both the practitioner and the patient would be to refer to the other system if his system has no remedy.

Let us examine the common practice of cross prescription prevalent now. Practitioners of ayurveda and other systems can be classified into two categories. The practitioners of the first category sincerely practice ayurveda (or *siddha*) and take up the cases for which they are sure and hopeful of relief. They also diagnose and treat the patients fully on the basis of the principles and concepts of ayurveda. They do advise the necessary modern investigation but that is mainly to rule out any serious problems, which may be out of their purview. They refer the patients to other systems without any hesitation and thus do justice to the patient, themselves and the science.

The second category of practitioners does not have good faith, experience or commitment to ayurveda and they prescribe modern medicine drugs after getting some working knowledge of modern medicine. The curriculum of ayurveda degree BAMS has only some basic and fundamentals of anatomy, physiology and some other topics of preventive medicine, etc. but not pathology and medicine.

When we come to the practitioners of modern medicine prescribing ayurvedic drugs, I feel that their actions are not very much objectionable as those of others.

Presently many pharmacies are manufacturing and marketing several ayurvedic patent medicines and the practitioners of modern medicine prescribe these patent drugs. Normally they do not prescribe the traditional preparations. The pharmacies undertake clinical trials of these patent drugs in their own hospitals or in some other research hospitals and the results are assessed and the information provided to all the practitioners through their representatives and literature. The diagnosis and the assessment of cure in these trials are made on the parameters and investigations of modern medicine.

The difference between the concepts and fundamentals of ayurveda and modern medicine is to be noted here while dealing with research now going on under the banner of ayurvedic research or – to be more specific – research of ayurvedic drugs.

It is high time that research organizations – public and private – bestow attention on fundamental research. *Dosha*s, *dhatu*s, *rasa*, *veerya* and *vipaka* and many other concepts of ayurveda are to be studied, examined and experimented with the facilities of modern technology. Modern scientists with highly specialized training in related fields and interest should work in collaboration with ayurvedic research workers with good knowledge of fundamentals of ayurveda and experience in applied aspects as well. This is the basic requirement for research in ayurveda. I hope the ayurvedic world ponders over the necessity of this aspect of research on fundamentals of ayurveda and takes concrete steps.

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EXCERPTS FROM CHIKITSAMANJARI – XLII

Unnikrishnan, P.*

Abstract: In this issue, the manifestation, symptoms and different classifications of *sopha* (oedema) are described. Various therapeutic approaches for the cure of oedema are also dealt with.

TREATMENT OF *SOPHA*

Polluted *vata* vitiates *pitta*, *rakta* and *kapha*, leads them to superficial vessels, creates blockage for free passage and creates an elevated and consolidated lesion based on the skin and muscle tissue, termed *sopha* or oedema. Depending upon the *dosha* causing them, they are divided into nine viz. *vatasopha, pittasopha, kaphasopha, vatapittasopha, vatakaphasopha, pittakaphasopha, vatapitta-kaphasopha, abhighatajasopha* (oedema secondary to injury) and *vishajasopha* (oedema secondary to toxicity).

Classification based on origin: *Sopha* again is subdivided into that caused by reasons within the body, *nija* (endogenous) and that caused by external factors *agantu* (exogenous) such as injury, trauma, etc.

Classification based on site: When localized, it is termed *ekangaja* - affecting on region or organ of the body and when it is generalized is termed as *sarvangaja.*

Classification based on nature: Depending upon consistency it is again subdivided into three: *prithu* (isolated), *unnata* (elevated or raised from the body) and *gratita* (hard in nature).

Oedema of recent origin and uncomplicated can be cured easily whereas chronic, extensive and complicated oedema has bad prognosis. Oedema associated with other diseases affecting both feet in males, and that affecting the face in females, is fatal. Oedema involving the abdomen and genitals in both sexes also will hardly respond to treatment. A patient of fever, dyspnoea or diarrhea who vomits fluid containing colored lines or appearance of oedema at the final stages of fever or oedema, or formation of oedema after the cure of fever or diarrhea is fatal, especially for the debilitated.

The initial treatment of generalized oedema is administration of castor oil mixed with milk, cow's urine or soup. Water mixed with fine powders of *sundhi* (*Zingiber officinale*), *punarnava* (*Boerhaavia diffusa*), *eranda* (*Ricinus communis*), *brihatidvaya* (*Solanum xanthocarpum*, *Solanum indicum*), *amsumati-dvaya* (*Pseuda-rthria viscida, Desmodium gangeticum*) and *gokshura* (*Tribulus terrestris*) relieves oedema caused by vitiated *vata*. Water

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medicated with *musta* (*Cyperus rotundus*), *udeechya* (*Plectranthus vettiveroides*), *sthira* (*Desmodium gangeticum*) and *akhila* (*Zingiber officinale*) relieves vitiation caused by *pitta* and that medicated with *svadamshtra* (*Mucuna pruriens*), *ardraka* (*Zingiber officinale*), *dhanyaka* (*Coriandrum sativum*), *pippali* (*Piper longum*) and *suradaru* (*Cedrus deodara*) relieves vitiation by *kapha*. Honey should be added to these preparations and they are to be kept overnight. Sudation shall be done with *dhanyamla* on alternate days.

Manibhadram gulika (cross ref. *Virechana-dravyadhikaram* – 7-8) shall be given to purge. *Amritottaramkashayam* shall be consumed with the addition of suitable amount of castor oil (10 to 15 ml) for purgation. *Gandharva-hastadikashayam* shall be prepared excluding *kotuveli* (*Plumbago indica*) and taken with castor oil. *Punarnnavadikashayam* as given below shall be taken with castor oil.

Punarnnavadikashaya:

Punarnava	*Boerhaavia diffusa*	7 parts
Nimba	*Azadirachta indica*	
Patola	*Trichosanthes lobata*	
Sundhi	*Zingiber officinale*	
Tikta	*Andrographis paniculata*	
Amrita	*Tinospora cordifolia*	
Darvi	*Coscinium fenestratum*	
Abhaya	*Terminalia chebula*	
		1 part each

A *kashaya* prepared from the following relieves oedema of even terminal stages like the life of one who has surrendered his life to Lord Siva, the god of death.

Pathya	*Terminalia chebula*
Punarnava	*Boerhaavia diffusa*
Nisa	*Curcuma longa*
Kanamoola	*Piper longum* (root)
Vahni	*Plumbago indica*
Visva	*Zingiber officinale*
Abda	*Cyperus rotundus*
Jeerakam	*Cuminum cyminum*
Suradruma	*Cedrus deodara*
Magadhi	*Piper longum*

Chukkonnukashaya (cross ref. *Mahodara-chikitsa* -8), detailed earlier, is very effective. A *kanji* (gruel) prepared with *Parinatatumbee-latakvatham* (cross ref. *Mahodarachikitsa* - 9), earlier detailed is also good. The *kashaya* alone mentioned here to prepare *kanji* is to be taken in the evening. *Chukkuchundadi-kashaya* (cross ref. *Mahodarachikitsa* – 19) earlier stated can also be consumed. *Pana-viraladi Bhasma* (cross ref. *Mahodara chikitsa* - 9), mixed with *kanji* is effective in relieving *sopha*.

A *kashaya* prepared from the following, consumed in the morning and evening, relieves oedema.

Punarnava	*Boerhaavia diffusa*
Abhaya	*Terminalia chebula*
Sundhi	*Zingiber officinale*
Kalasaka	*Murraya koenigii*

The following *kashaya* is capable of relieving oedema.

Pathya	*Terminalia chebula*
Punarnava	*Boerhaavia diffusa*
Kana	*Piper longum*
Kariveppu	*Murraya koenigii*
Konna	*Cassia fistula*
Chukku	*Zingiber officinale*
Ambu	*Plectranthus vettiveroides*
Jeerakam	*Cuminum cyminum*
Suradru	*Cedrus deodara*
Churakkatandu	*Lagenaria siceraria*

A *kashaya* prepared from the following, termed *Ardhavilvamkashayam* relieves *sopha*.

Ardhavilvam kashayam:

Chukku	*Zingiber officinale*	
Chunda	*Solanum indicum*	
Katalati	*Achyranthus aspera*	
Toova	*Tragia involucrata*	1.5 *kazhanju*[1] each
Vilva	*Aegle marmelos*	6.0 *kazhanju*

Water should be boiled with the following, decanted and drunk. Alternatively, the liquid may be added with *kanjitteli* (the supernatant solution of *kanji*) and drunk for the relief of *sopha*.

Chunda	*Solanum indicum*
Tavizhama	*Boerhaavia diffusa*
Sundhi	*Zingiber officinale*
Duralabha	*Tragia involucrata*
Chulli	*Hygrophyla auriculata*

Kanji may also be prepared using water boiled with *cherupanchamoola* (*Desmodium gangeticum, Pseudarthria viscida, Solanum indicum, Solanum xanthocarpum* and *Tribulus terrestris*) or *dasamoola* mixed with *chukku.*

The following *kashaya* relieves *sopha*, increases appetite, improves digestion and reduces *kapha*.

Cheru-vazhutinaver	*Solanum indicum*
Velvazhutinaver	*Solanum xanthocarpum*
Orilaver	*Desmodium gangeticum*
Moovila	*Pseudarthria viscida*
Gokshura	*Tribulus terrestris*
Kumizhinver	*Gmelina arborea*
Koovalaver	*Aegle marmelos*
Patiriver	*Stereospermum colais*
Palakappayyani	*Oroxylum indicum*
Munjaver	*Premna corymbosa*

A *kashaya* prepared from the following should be used to prepare *kanji* and this medicated *kanji*, taken at night relieves oedema.

Chukku	*Zingiber officinale*
Chunda	*Solanum indicum*
Churavalli	*Lagenaria siceraria*
Chulliver	*Hygrophyla auriculata*

Generalized oedema is relieved by the consumption of the burnt ash of *tavizhama* (*Boerhaavia diffusa*) and *gokshura*, mixed with milk.

The above ash should be tied in a cloth bundle, put in a vessel containing water and boiled. This water shall be consumed with the addition of milk and *chukku*.

Ashes of *mayoora* (*Achyranthus aspera*), *ghananada* (*Cyperus rotundus*) and *punarnava* should be mixed with a small quantity of *chukku*, tied to a bundle and boiled in water. Consumption of this *kashaya* for a period of four days relieves flatulence, oedema, ascites, etc.

Kanji should be prepared with water to which ash of the following is dissolved. This *kanji*, mixed with milk or sour buttermilk relieves flatulence and ascites.

Aviltol	*Holoptelea integrifolia*
Katalati	*Achyranthus aspera*
Danti	*Baliospermum montanum*
Tavizhama	*Boerhaavia diffusa*
Chitraka	*Plumbago indica*
Kalliver	*Euphorbia ligularia*
Konnattol	*Cassia fistula*
Chulli	*Hygrophyla auriculata*
Panavazhakka	*Borassus flabellifer*
Rambhagra	*Musa paradisiaca*

Oil should be medicated with expressed juice of *tavizhama* as liquid component and it's roots as solid component. Application of this oil on the head and body relieves oedema.

1. one *kazhanju* = 4 g

Another oil prepared from the juice of *aimpuli* (*panchamlam*: *Tamarindus indica, Solena amplexicaulis, Spondias pinnata, Hibiscus furcatus* and *Garcimia gummi-gutta*) as liquid component and roots of *tavizhama* as solid component also has similar effects. Drugs of *Triphaladi* crushed and mixed with milk shall be applied on the head.

Oil should be medicated with *dhanyamla* and curd to which, *kashaya* prepared from the following, and expressed juice of *mridu-kunchika* (*Physalis minima*) is also added.

Erukku	*Calotropis gigantia*
Puli	*Tamarindus indica*
Jambira	*Citrus lemon*
Avanakku	*Ricinus communis*
Avil	*Holoptelea integrifolia*
Ampazham	*Spondias pinnata*
Jnerinjampuli	*Solena amplexicaulis*
Pungu	*Pongamia pinnata*
Papphanam	*Morinda pubescens*
Panichikam	*Hibiscus furcatus*

Alternatively a *kashaya* prepared from the above, mixed with *dhanyamla* and warmed suitably shall be used for irrigation of the body or fumes arising from the above boiling mixture shall also be used for sudation.

Expressed juice of *puliyila* (leaves of *Tamarindus indica*) should be added with *kati*, boiled and when sufficiently warm, used for irrigation on portions of the body below neck. Before irrigation, suitable medicated oil shall be applied on the head. Medicated oil shall be prepared with the juices of *erukku* (*Calotropis gigantia*), *puliyila* (leaves of *Tamarindus indica*), *jambira* (*Citrus lemon*) and *avanakkila* (leaves of *Ricinus communis*) as liquid component and the drugs detailed in *Triphaladi* as solid component.

Medicated oil shall be prepared from the juices of *erukkila* (*Calotropis gigantia*), *puliyila*, *jambira*, *avanakkila*, *avalila* (leaves of *Holoptelea integrifolia*), *ampazhatila* (leaves of *Spondias pinnata*), *njerinjampuli* (*Solena amplixicaulis*), *pungila* (*Pongamia pinnata*), *papphanam* (*Morinda pubescens*), *panichika* (*Hibiscus furcatus*), *mridukunchikarasa* (juice of *Physalis minima*), curd and *dhanyamla* as liquid component and *muringatol* (*Moringa oleifera*) ground to a paste as solid component. Application of this oil relieves oedema.

A *kashaya* prepared from the above shall be used for irrigation up to the level of neck for irrigation or the fumes arising from the boiling liquid shall be used for sudation to relieve oedema and pain.

Mix the juice of *puluyila* and *kati* together, boil and use it for irrigation when sufficiently warm. This procedure also reduces oedema.

Medicated oil prepared from the expressed juices from the leaves of *erukku, puli, jambira, avanakku* and milk as liquid component, fine powder of *Triphaladi* as solid component, applied on the head, relives oedema. The vapor arising from water boiled with these medicines can also be used for sudation. *Manibhadra-gulika,* etc. shall be administered for purging on alternate days.

Devatara (*Cedrus deodara*) shall be ground to a fine paste in the *kashaya* of *dasmoola* and applied locally for the relief of oedema.

Medicated oil shall be prepared from the *kashaya* of *dasamoola* as liquid component and paste of *devatara* as solid component. Internal administration and external application of this oil relieves oedema. Addition of the juice of *tavizhama* in this oil potentates the effect.

Chinchaditaila:

Oil should be medicated with the juices prepared from the following as liquid component.

Chincha	*Tamarindus indica*
Aamandaka	*Ricinus communis*
Sarini	*Merrenia tridentata*
Varanaka	*Crataeva magna*
Amleeka	*Oxalis corniculata*
Bala	*Sida rhombifolia* ssp. *retusa*
Asphotakee	*Clitoria ternatea*
Jambira rasa	*Citrus lemon* (juice)
Ravirasa	*Calotropis gigantia* (juice)
Somarasa	*Sarcostemma acidum*
Grinjanarasa	*Allium cepa*
Dadhi	curd
Amlasukta	*chuttapuli*

The solid component for the oil should be the fine powders of the following.

Siddhartha	*Brassica juncea*
Akhila	*Zingiber officinale*
Daru	*Cedrus deodara*
Sigru	*Moringa oleifera*
Satapushpa	*Anethum graveolens*
Ratri	*Curcuma longa*
Rasna	*Alpinia galanga*
Patu	Rock salt

The medicated oil, termed *Chinchaditaila*, cures almost all the eighty types of diseases caused by deranged or polluted *vata*.

One *kamsa* (3.072 l) *kashaya* should be prepared from the following to which one hundred *pathya* (*Terminalia chebula*) and one *tulam* (4.800 kg) jaggery are added and the contents reduced to form a semisolid consistency.

Dvipancha-moola	*Gmelina arborea*
	Aegle marmelos
	Stereospermum colais
	Oroxylum indicum
	Premna corymbosa
	Desmodium gangeticum
	Pseudarthria viscida
	Solanum indicum
	Solanum xanthocarpum
	Tribulus terrestris
Ardraka	*Zingiber officinale*
Chavya	*Piper brachystachyum*
Daru	*Cedrus deodara*
Punarnava	*Boerhaavia diffusa*
Grandhi	*Piper longum* (wild var.)
Krisanu	*Plumbago indica*

When warm, add the fine powders of the following:

Katutrayam	*Zingiber officinale*	
	Piper longum	
	Piper nigrum	48 g each
Trijata	*Elettaria cardamomum*	
	Cinnamomum verum	
	Cinnamomum tamala	
		36 g each
Kshara	Carbonate of potash	12 g

When the contents cool down, add two *kuduba* (384 ml) of honey.

Eat an *abhaya* (*Terminalia chebula*) from the above preparation daily for the relief of oedema, fever, flatulence, colic, discoloration of the body, diseases of the urinary tract and formation of urine, diseases affecting the male genital system, dyspnoea, anorexia, ascites, splenomegaly and toxic manifestations.

Gomutraharitaki mentioned earlier (cross ref. *Mahodarachikitsa* – 11) is also effective for oedema, fever, flatulence, colic, etc.

The following should be ground to a paste, mixed with butter and applied over oedema.

Katukka	*Terminalia chebula*
Tavizhama	*Boerhaavia diffusa*
Chullipallava	*Hygrophyla auriculata* (leaf)
Chulliver	*Hygrophyla auriculata* (root)

Crush *nonganampullu* (*Heydyotis herbacea*), boiled in *kati* (sour gruel) or buttermilk, apply over the oedema, cover and tie up the area with leaves or cloth (*upanaha*). This procedure relieves oedema caused by *vata.* Buttermilk medicated with *devataram* shall be taken. Buttermilk medicated with *chulliver*, *tavizhamaver* and *chukku* shall be taken along with food. Consume milk medicated with these drugs at night.

Milk medicated with *lasuna* (*Allium sativum*), *punarnava* and *visva* (*Zingiber officinale*), on consumption, relieves oedema. *Kanji* shall be prepared with the following and the supernatant clear liquid shall be taken for the relief of oedema.

Orila	*Desmodium gangeticum*
Moovila	*Pseudarthria viscida*
Churalata	*Lagenaria siceraria*
Varshabhoo	*Boerhaavia verticillata*
Gokshura	*Tribulus terrestris*
Eranda	*Ricinus communis*
Chukku	*Zingiber officinale*

Drug combinations indicated for anemia (*pandu*) and ascites (*mahodara*) can also be used for the relief of oedema. The drug of choice in oedema is *punarnava.*

A *kashaya* prepared with ten *kazhanju* of *churatandu* and two *kazhanju* of *jeeraka* shall be taken if dyspnoea occurs. Fine powders of *avanakkinver* or *chundaver*, mixed with fine powder of *jeeraka* shall be consumed in ripe coconut milk.

Fine powders of the following shall be taken mixed with warm water for the fast relief of oedema.

Krishna	*Piper longum* (wild var.)
Agni	*Plumbago indica*
Vilva	*Aegle marmelos*
Ghana	*Cyperus rotundus*
Jeerakam	*Cuminum cyminum*
Devataram	*Cedrus deodara*
Pathya	*Terminalia chebula*
Punarnava	*Boerhaavia diffusa*
Nisa	*Curcuma longa*
Magadha	*Piper longum*
Ajjhata	*Phyllanthus amarus*

Vata gets vitiated due to trauma, combines with blood and causes inflammatory oedema. Here the treatment of eczema (*veesarpa*) is indicated. Drugs shall be given for the normalization of *vata*. In toxic oedema, drugs shall be given for detoxification. Measures for the purification of the body, *vasti*, sudation, external application of oil, immersion bath, etc. can be done depending upon the conditions of the patient and the disease.

VISHANARAYANEEYAM

C.K. Krishnan Nair*

Agadatantra is one of the main branches of the octave ayurveda. It deals with the study of sources, bodily effects and treatment of different types of poison which we frequently come across in our day-to-day life. The practice of *agadatantra* comprises of two concomitant parts i.e. *vishavidya* and *vishavaidyam*. *Vishavidya* means the usage of *mantra*s and *tantra*s in alleviating the effects of poison whereas *vishavaidyam* is the treatment by the application of medicines.

There are seven important works which are studied and followed by the ancient practitioners of *agadatantra* in Kerala. They are -. 1. *Narayaneeyam,* 2. *Uddeesam*, 3. *Ulpalam*, 4. *Haramekhala*, 5. *Lakshanamrtam,* 6. *Ashtangahridayam* and 7. *Kalavanchanam*; all in Sanskrit. Among these, *Narayaneeyam* is popularly known as *Vishanarayaneeyam* to distinguish it from the devotional epic of the same name by Melputtur Narayana Bhattatiri. Narayana, the author of *Vishanarayaneeyam,* hails from Sivapuram, near the banks of river *Nila*. It was published by the Chowkhambha Sanskrit Prathishtan, Delhi under a different title *Tantrasarasamgraham.*

Vaidyaratna Pandit M. Duraiswamy Aiyangar, an ayurvedic scholar from Chennai, tells in his editorial note that the title *Vishanarayaneeyam* is a misnomer as the contents deals mostly with *tantric* modalities. His source was the manuscript of Govt. Oriental Manuscript Library, Chennai. Several manuscripts were available in the library; some were incomplete. He points out that a manuscript in Malayalam contains only up to the 10th chapter. The text actually has 32 chapters; the first 10 devoted to poison. Pandit Aiyangar gives three reasons to support his contention – 1. the author does not give any hint in the text to show the *Vishanarayaneeyam,* 2. only the first ten chapters, quarter of the contents, deal with poison and 3. all the topics of *agadatantra* are not covered as poison of plant origin is not mentioned.

Moreover, another manuscript with the same contents bears the name *Mantrasarasamgraham*. However, the author names his book as *Tantrasarasamgraham,* as he ends each chapter with the colophon *iti narayaneeye tantrasarasamgrahe pradhamah patalah samaptah* etc. Other references of titles like *Sarvamantrarthakosa* and *Shatkarmikatantra* are also can be seen. The title *Tantrasarasamgraha* connotes that it is a collection of very important *tantra*s from many other works and compiled together. In the first chapter the author even mention this fact as –

यावत् समर्थ्यं अस्मभिः सर्वलोकहितैषिभिः ।
सिद्ध योगादि तन्त्रेभ्यः क्रियते सारसंग्रहः ।। (1/2)

The content can be summarized as – 1. *visha* (toxicology), 2. *graha* (mental diseases), 3. *amayadhvamsa* (general diseases), 4. *kshudra* (black magic), 5. *narma* (magic) and 6. *kamika* (satisfaction).

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The author describes the preliminaries which are needed for the proper understanding of *tantric* procedures in the first chapter. The next nine chapters are devoted for the treatment of various aspects of *visha*. From 11 - 14 give an account of the *grahapeeda* and their management. The 14th chapter is about *unmada*. The 15th chapter, named *amayadhvamsapatala* describes *tantric* treatments for various bodily ailments. The application of different herbs is narrated in the 16th chapter named *oushadhapatala.* The next two chapters are earmarked for discussing *kshudrakarma*s (black magic) and measures to counter their effects. Here we can see descriptions of seven types of *kshudrakarma*s. At the end of the 17th chapter, trees attributed 27 stars are enlisted with the instruction that one should protect his star-tree for well being. The 19th chapter called *narma* gives the details of some magical procedures that satisfy the material interests.

कर्पूरं जळूक भेक तैलं पाटलिमूलयुक् ।
पिष्ट्वा लिप्य पदद्वन्द्वे चरेत् अङ्गारके नरः ।। (19/39)

Make a paste with camphor, leech, frog, oil and root of *patali* apply over the feet and one can walk through the fire without being hurt!

The rest of the book (chapters 20 – 28) is solely devoted to the worshiping of various deities with respective *mantra*s. *Vasyadipatala*, the 29th chapter, contains references pertaining to ancient sexology and methods of seduction. The next chapter called *streepatala* contains treatments for threatened abortion and certain procedures for begetting progeny of the desired sex (*pumsavanakriya*). The 31st chapter describes various ailments of cows and their treatment mostly with *mantra*s than medicines. Modalities for examination of life span (*ayu:pareekshavidhi)* are narrated in the last chapter. Also some haemostatic measures to arrest the bleeding while engaging in close fighting with the enemies are given.

The commentary of this work gives a lot of information. Very often the commentary gives word meaning either in Sanskrit, Malayalam or Tamil especially when dealing with drugs in the chapters 5 & 6. Even when Tamil script is used, the words are Malayalam. Also, a lot of freely available native drugs are recommended in treatment of snake poisoning. It is believed that the commentary was done by the author himself. The author gives details of his personal life at the end the text:

ग्रामो यस्य शिवास्पदं शिवपुरं श्लाघ्यो निळातीरजो ।
नाथो मुण्ड मुखालयस्य जनको नारायणो वेदविद् ।।
यस्योमा जननी पतिप्रियगुणा यस्यपि गौरी स्वसा ।
तत्तुल्यः परमेश्वरः शिवपुरे यस्याभवान्मातुलः ।। (32/69)

The author shows special interest in including drugs that are freely available in Kerala. Very simple and practical drug combinations are prescribed in *vishavaidyam*. This may be the reason for its popularity. The author refers to the composition as *Tantrasarasamgraham*, *Shatkarmikatantram*, *Mantrasarasamgraham* and *Sarvamantrarthakosa*; never does he call it *vishanarayaneeya*. The title was attributed by the practitioners.

MEDICINAL PLANTS RESEARCH

The Arya Vaidya Sala has initialized a Centre for Medicinal Plant Research (CMPR) by the generous funding from Sir Dorabji Tata Trust, Mumbai. The medicinal plant resources are being used up in an unsustainable manner and as a stake holder, AVS felt the urgency for such an initiative.

Why CMPR

According to WHO estimates, almost 80% of the population of developing countries depends on traditional medicines, mostly plant drugs, for their primary healthcare needs. In the recent past there is a discernable shift, the world over, towards natural healthcare products. There is a consequent upsurge in herbal medicine market and a resultant stress on the resource base. Over 800 species of medicinal plants are used in the production of traditional medicine. Of these less than 20% are farm produced and the rest collected from the wild, mostly in a destructive manner. Plant resources have dwindled drastically, and many are on the verge of extinction.

The traditional nature of the herbal drug industry has given rise to regional variations and it now faces the problem of non-standard herbs. The Government has brought out volumes of herb standards but they contain discrepancies and give rise to controversies. The scenario calls for concerted studies for establishing objective standards of herbs.

The opening up of global economy has resulted in the entry of divergent interests into the herbal health care sector. There is a mad rush to patent traditional knowledge, often to the detriment of national interest. One way to thwart such unscrupulous moves is by generating and documenting scientifically validated data on herbs. For this we have to study the medicinal plants in all its aspects - botanically, chemically, molecularly and pharmacologically. Such studies will also be useful in establishing quality equivalence of substitutes. Phytoprospecting is another area of supreme importance, for isolation of new bioactive molecules and their commercialization. New products and new formulations are all areas of great significance to healthcare industry. CMPR aims at research programmes for saving the medicinal plant resources, for saving the medicinal plants from biopiracy and for healthcare.

The mandate of CMPR is to function as a pioneer institute in the area of research, conservation and popularisation of Ayurvedic medicinal plants.

CMPR -Thrust areas

- Survey, collection, conservation and documentation of medicinal plants of Kerala and neighbouring regions.
- Resource mapping of rare, endangered and threatened medicinal plants.
- Detailed investigations of crude drugs and their plant sources to establish the genuineness of the source and to evolve standards.
- Botanical, pharmacognostic, phytochemical and pharmacological profiling of medicinal plants.
- Molecular profiling of important medicinal plants.
- Rapid tissue culture propagation of important and recalcitrant medicinal plants with a view to widen the resource base of ayurvedic industry and also to repopulate the forest niches.
- Analysis, extraction, identification, study and utilization of the bioactive principles from medicinal plants.
- Screening of germ plasm of important medicinal plant species for locating superior chemotypes and genotypes.
- Processing and value addition of medicinal plants for export.
- Popularization of medicinal plant cultivation on a large scale and the supply of genuine planting material for commercial cultivation to the people of the rural areas.
- Establishing a data bank on the medicinal plants of Kerala.

HEALTHCARE AND TRADITIONAL KNOWLEDGE

Inaugural address delivered by

His Excellency Dr. A.P.J. Abdul Kalam

the President of India, on 25th September 2003 at the inauguration of the Arya Vaidya Sala's Centre for Medicinal Plants Research at Kottakkal

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TRADITION AND MODERNITY

Colloquium on Tradition and Modernity – papers presented in connection with the Valedictory Function of Centenary Celebrations held at Kottakkal on 29.01.2003

The Positive aspects of tradition

SIVA SANKARI

The fourth dimension of human self

MANOJ DAS

We are privileged to have one of the leading scientists of our time to inaugurate the research centre. Considered as the rightful heir of Homi Bhabha and Vikram Sarabhai and described as the inspiration behind the creation of a solid technology-base for India's future aerospace programmes, Dr. Kalam is a legend in his own time. The very fact that we stand close to the man of AGNI with wings of fire ignites our hearts. The story of his journey from the shores of Rameswaram in the Coramandalam coast to the Rashtrapathi Bhavan will inspire many a soul in our time and generations to come

Dr. P.K. Warrier, welcoming the President

An awareness on social issues; a special sensitivity to social problems; a commitment to set people thinking – these are the unique characteristics of Sivasankari, the writer activist. Hers has been a career devoted to touching the hearts of people through in-depth research. Her works include more than 150 Short stories, 30 Novels, 13 travelogues and many biographies.

Manoj Das is acknowledged as one of the ablest interpreters of India's literary and cultural heritage. Mr. Das is widely known as one of the best-loved and serious among the Indian writers in English. He is also probably the foremost successful bi-lingual writer in the country, writing with equal ease in his mother tongue Oriya and in English. Manoj Das has made Aurobindo Ashram at Pondichery his permanent abode since 1963. He has been conferred the honour of Padmasree. He is also the recipient of Saraswati Samman.

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HEALTHCARE AND TRADITIONAL KNOWLEDGE

I am indeed delighted to be here at Kottakkal to inaugurate the Centre for Medicinal Plant Research of Arya Vaidya Sala. My greetings to Dr. P.K. Warier, distinguished physicians, researchers, staff, students and all those associated with the Arya Vaidya Sala for their excellent contribution for promoting the cause of holistic medicine for removal of human misery and pain.

The Kottakkal Arya Vaidya Sala has made significant contributions in reforming and revitalizing ayurveda, our ancient system of medical care, for the benefit of the suffering humanity. Ancient knowledge is a unique resource of India, for it has the treasure of a minimum of 5000 years of civilisation. I am also delighted to note that the Arya Vaidya Sala has opened a number of Centers across the country and its wide range of about 500 classical medicinal products which are manufactured according to the traditional ayurvedic prescriptions under the supervision of qualified and quality driven ayurvedic physicians. The contributions made by the Vaidya Sala in providing effective remedies for various kinds of ailments such as chronic arthritis, paralysis, ulcers, discogenic diseases, degenerative diseases of central nervous system, neuro-muscular disorders, allergic diseases, eye diseases, psoriasis, psychiatric ailments, geriatric ailments, etc. are indeed noteworthy and have achieved international recognition, which is evident from the fact that nearly 25% of the inpatients in the Ayurvedic Hospital and Research Centre at Kottakkal hail from other countries. Distinguished dignitaries and eminent personalities from within and outside the country have already been benefited. Free patient consultations at all the branches in the country, online consultation through website, around 1200 exclusive authorized distributors spread over the country and authorized distributors in some countries like UAE, Kuwait, Bahrain, Singapore and Malaysia, cultivation of herbs and rare medicinal plants over a vast acres of land, are some of the remarkable services offered by the Arya Vaidya Sala.

The Arya Vaidya Sala was consulted for treating patients affected due to radiation in Chernobyl nuclear accident in Russia. In this sense the doctors from the Arya Vaidya Sala have become world citizens trying to alleviate pain and suffering of people with universal love and compassion.

Bio-diversity in India

India is blessed with more than 16 bio-climates which enable us to produce a variety of herbal plants. A contented combination of ayurveda and modem biotechnology with the rich natural diversity could produce excellent results that will extend far beyond the borders of this country. The biggest resource, apart from this, is the highly trained manpower that is available in ayurveda and other systems of medicine. That resource itself is good enough to

guarantee the success of a clean industry dependent on biotechnology which will be one of the primary engines of growth and prosperity for the nation. I have absolutely no doubt that the strategies evolved in this regard would place adequate emphasis on having good value addition which alone will give meaning and substance to any such venture.

Bio-diversity - technology prosperity matrix

One of the core competences of India is Bio-diversity. Bio-diversity and technology combined will yield value added products. In biodiversity, a few countries like India, China, Brazil, Indonesia and Mexico are very rich. Technology is needed for developing a genetically engineered seed or transforming a molecule extracted from the herb into a drug. Today technologically advanced nations in this field are USA, Japan, France, Germany and UK. Integration of high productivity in farming, biodiversity material and technology is required. There are some regions in desert nations where biodiversity and technology are poor. Today there is no nation having rich bio-diversity and high technology together. Therefore the challenge is Integration of technological best and abundant biodiversity of India. Kottakkal Arya Vaidya Sala can provide leadership for this mission.

Value addition

I would like to recall the report of the sub-committee of Scientific Advisory Committee to the Cabinet (SAC-C) on herbal and natural products and flori-culture with Mrs. L.F. Poonawalla as chairperson. One of the major highlights of the report is short listing seven herbal plants (*Aloe vera, Rauwolfia serpentina, Centella asiatica, Bacopa monnieri, Taxus baccata, Artemisia annua, Catharanthus roseus*) which are very important in view of their application as a drug, national and international demand and also economic benefits.

India is rich in herbs, germ plasm and micro organisms. Industrially developed countries are importing these bio-resources in the raw forms and adding value to them for export to developing countries including India as special seeds, medicines and bio-materials, fully protecting patents of these products. Instead of allowing export of such resources and importing value added products at high cost, India must add its own technology for conversion of such resources to value added products for domestic requirements and also for export.

Biotechnology in healthcare

I would like to share my experiences that I had while I was in Anna University, Chennai. One of them resulted in getting a patent for a new molecule discovered from a herb as an anti-cancer drug. This came out of the fusion of two great minds, one was a bio technologist and the other was a traditional *siddha* medical practitioner. The traditional system of medicine like ayurveda, *siddha*, etc. have advocated and practiced preventive and curative medicinal recipes specific to individuals. The body, mind, food and environment were looked at holistically to suggest a preventive or curative approach to health. New technologies as evidenced by human genome sequencing, proteomics, chemogenomics, ultra high throughput screening is revolutionizing drug discovery.

Medicinal plants offer enormous scope for development of drugs. We need to create database of traditional medicinal plants for specific bioactivity and lead for development

of new drugs. India has got tremendous opportunities for herbal farming and research with focus on the following components:

- Development of *in vitro* propagation methods for understudied and unstudied plants.
- Development of an effective network for dissemination of information, training and technology transfer and post harvest technology.
- Creation of Technology parks and demonstration units.
- Development of industries near-farming areas for value added products.
- Consortium for collection of raw materials processing and marketing.
- Standardization of quality parameters. Centralized clinical trials and toxicological studies.

Bioinformatics

The convergence of bioscience and IT into Bioinformatics has given the thrust to researchers for genomics-based drug discovery and development. Pressure is mounting over the pharmaceutical companies to reduce or at least control costs, and have a growing need for new informatic tools to help manage the influx of data from genomics, and turn that data into tomorrow's drugs.

Bioinformatics data play a vital role and emerging as a business model for the medical and pharmaceutical sector. Key areas such as gene prediction, data mining, protein structure modelling and prediction, protein folding and stability, macromolecular assembly and modelling of complex biological systems are thriving and IT has major role to play in these areas in bringing the tools to manage the high throughput experiments and the data they generate, and sharing and integrating all the data in a meaningful way resulting into the detailed models of complex systems, particularly biological pathways.

Networking the institutions

Our country is rich in human resources, particularly of scientists, doctors, technologists and engineers. The basic infrastructure is available for advanced research. The need of the hour is to network the existing facilities and expertise with commitment and conviction to augment and facilitate the pace of research and development. There are tremendous opportunities for technologists to work for an *Integrated Health for All* in a mission mode which can be suitably evolved for implementation. I am glad to know that the Arya Vaidya Sala is doing collaborative research programmes with renowned national and international research institutions. The Vaidya Sala can further extend their scope of collaboration in the area of clinical research and drug development / certification, by taking lead in forging greater coordination between ICMR, National Board of Examinations (NBE), R & D laboratories, pharmaceutical industries and clinicians.

In India we have rich clinical data which are getting generated from our various healthcare centres. We have only a few medical research institutions in India. The objective of research gets sidelined as these institutions need to cater to increased patients flow for treatment. Time has come to establish full fledged research centres leading to new discoveries of prevention and treatment methodologies using modern methods and heritage healing in an integrated manner. Such centers can play a vital role in fruitful integration of our ancient system of medical care and the advance

research technologies for the larger benefit of mankind.

Mobile clinics

In some parts of our country, Mobile Clinics and Research Centers are deployed to provide healthcare at the doorsteps of rural people through diagnosis and treatment. Such facilities, through collaborative efforts of research institutions, medical colleges, government agencies and NGOs should increase in number to provide healthcare services through mobile clinics with latest equipment for common treatment to those who are mostly unreached and cannot afford the medical facilities available in cities. I have seen such a mobile clinic equipped with modern equipment and onboard facilities supported by a team of doctors including a Lady Medical Officer and Paramedics. The Arya Vaidya Sala can also explore the possibility of extending its valuable services to the needy in remote areas through ayurvedic mobile clinics using the widespread network of its authorized dealers.

HIV / AIDS - major thrust area

In spite of the fact that the average lifespan of population has significantly increased in the recent years including those in developing nations like India, the overall health profile has shown a decline with emergence of new threats like HIV /AIDS and resurgence of eradicated diseases like small pox and controlled diseases like malaria showing virulence due to drug resistance and mutation of different strains. All systems of medicines should work together to develop effective vaccines for controlling the menace of such major health problems. In our national context HIV, TB and Malaria need special attention. Can we evolve an empowered consortium and integrated approach to find permanent and long lasting solutions? Incidents of non-communicable, stress related and psychosomatic diseases are showing a steep rise due to life style changes of modern human being. The mind-body-spirit in the control and management of such illness may be more effective. Bio-medical scientists can collaborate with the Arya Vaidya Sala for providing integrated approach to health care delivery.

Doctors as health awareness creators

Since every one of you is involved in the noble profession of removing the pain of the people, you can also play a vital role in preventing ailments through proper health education to the patient as well as to his or her relatives and friends through life style intervention. This can consist of a proper diet with low fat and high fibre, regular aerobic exercise like walking and stress management through Yoga, meditation and other methods. This can help in preventing the recurrence of the disease in the patient as well as promoting health awareness at all levels. When you remove the pains of the people, the patient becomes part and parcel of you and considers you almost as God. Hence, the patient will definitely accept your health education considering you as the most respected *guru.* Every patient receives his family members, relatives and friends when he is receiving healthcare in the hospital. That is the occasion where you can give this message of a healthy life style to all of them.

My best wishes to all of you.

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THE POSITIVE ASPECTS OF TRADITION

Siva Sankari

The Arya Vaidya Sala, a small one when started, has grown to such a huge institution that becoming a landmark not only in India but internationally. The founder was a great visionary and I am happy to be here.

I have had occasion to visit Kottakkal earlier. I have heard so much about Kottakkal - the Kottakkal preparations, *Kathakali*, etc. - from my childhood itself. I went through Arya Vaidya Sala's Hospitals, Factory, etc. and felt that the whole place is fully governed with much discipline, cleanliness and lot of concern. And I wish to come here again as a patient not as a sick one but to rejuvenate myself. If presidents can come, why cannot we come? I want to come in the near future and I am really looking forward to it.

When we were young, my mother used to give us *inchisvarasum*, made out of ground *inchi* (ginger) and lemon with *kottamalli*. It was for stomach upsets. And if we were afflicted of minor cold and temperature she would give *mulakukashayam* made out of fried black pepper, and to remove the hook worms from the stomach, I remember, my grand mother would grind the neem leaves and mixed with curd give to us. And when we had oil bath, oil boiled with *vettala, molaku, mindium*, a ritual one through out the life time, they wash it off with herbs grown at home such as the dried leaves and flowers of hibiscus, etc. All those things have became obsolete and people prefer now modern stuffs like shampoo, etc. You know *kathali* (*Aloe vera*) which our grandmothers used for various ailments and everyone of us, when we were young, used *mehandi* for manicuring, and so also our forefathers and elders for centuries. But it is paradox that when all these things remoulded in western country and come back, our people receive it with open hands thinking something special about it!

The tradition has changed not only in medicine. When we were all young, the elder lady of the house, probably the grand mother, would mix rice with *sambar* or *kuzhampu*, or whatever it is, in a huge vessel and cover it with a plantain leaf so that no evil eye falls on it; all the children will sit around, their hands out, and the grandmother would tell stories from Ramayana or Mahabharata. Once she tells the story, the food would come into the hand and to mouth; hearing such nice things we all would eat so much. Today in which house the mothers have time to tell the stories like this? Some of the mothers don't know how to tell stories. They all put the children in front of the television. Televisions have become surrogate mothers these days. Mother and children sit together and watch the programme, and to eat they all switch on some cartoon or some thing. I am not complaining; they are missing what we have all gone through - things which created lovely relationships and bondage between elders as a joint family. Whenever there is a wedding or social festivals, we used to get-together; people believed in visiting each other. Today you go and tell a child of yours, 'let us go, and visit our uncle' and all they may say 'Oh! God, we don't want to come'. They want to do something else probably, for it is a change. Their priorities have changed! I am not complaining my friends. I am just pointing out

the changes, whether it is deterioration or growth that we have to decide later. What is the reason for all this?

This shift, giving up the tradition for modernization, has taken place in most of the houses; because most of us unfortunately think that modernization means westernization. Modernization is not westernization. It is very sad that to become modern, some people try to ape western thinking, their living and behaviour. Modernity, dictionary says, is something characteristic of present or recent time. So you keep updating yourself. This means knowledge-wise we should update ourselves constantly. If one wants to be successful one have to lead a meaningful life.

But how do we become modern otherwise at the cost of giving our tradition as a price? Giving up our tradition as price is equivalent to giving our identity as a price. There is a saying in Tamil *kanrai vittu chittiram vanguvatu*. To buy the best painting, if you are going to give your eye sight as a price, is it worth? We must have painting, we must have modernity, we must have modern thing which we have to practice wherever it is necessary, to improve our life qualitatively. To achieve the painting, if we are going to give the eyesight, what is the point in having it? Tradition is a huge tree's root; modernity is its branches. The stronger we have our roots the stronger the trunk; branches can spread anywhere and get anything. But the tree should not become rootless. That is very important. When you are talking about tradition it should change by generation or capable of changing lest it should be static; the definition for tradition is a tale, a belief, a practice handed down or transmitted from generation to generation. So what is given to me by my parents, what is given to my parents by their grand parents should it not go through any change? No, it should. If you refuse to have any change you become stagnated. You must have changes, but withal, see whether the change is towards growth or deterioration.

What is the answer as to whether the tradition should change or not. To explain this I would like to draw an example from our epics. You all know the story of Jamadagni and Renuka. Jamadagni was a great sage and his wife Renuka was so chaste. She used to go to riverbed every day and take the sand; a pot will come of it! She used to bring water in that pot for her husband's *poojas* and rituals. She was such a chaste and morality was so high that even the sand obeyed her. One day when she was on the riverbed and about to make the pot, the shadow of a celestial being that was flying on top reflected in the water; she saw the shadow and told, *Oh! God how handsome!* Finished! Her chastity gone, she could not make the pot that day. She came back. Jamadagni asked the son Parasurama to behead the mother.

If that was the yardstick applied to measure a woman's chastity and morality just for innocently appreciating the shadow of a good-looking man on that day, my dear friends, I don't think any woman will get a pass. We are all learned to appreciate beauty innocently without any inner motive, we all learned to say "look at Mohanlal, he looks so handsome"! We are learned to appreciate beauty. So times are changing. We are also supposed to change. The tradition and culture also changes from generation to generation. That's to become modern. But at the same time, in this process we can't throw our roots away.

We should use our intelligence to distinguish between the positive and negative aspects in our tradition; which are all the positive aspects of the tradition and which are negative? For e.g., keeping women as underprivileged, I am not speaking as a feminist; No! I am talking as a humanist. We are keeping women as

underprivileged class for centuries; even refuse to give her education and equality. Why dual standard for a man and a woman? In Tamil Nadu, in old times i.e. 50 - 60 years before, when a man looses his wife and he goes to cremate her, then the relatives will come and say - 'don't worry, we will remarry you, because you can't live without a companion'. They say that a man cannot live without a companion. But when a woman looses her husband what happens? They disfigure her, they tell her that you are inauspicious, don't come in front even when her son's wedding takes place. A widower-father can sit in the front-row but the widow-mother, who borne the child for ten months and given birth, cannot come in front. These are all the negative aspects of our culture and tradition. Thank God! It's all changing. We should fight to remove them. Any negative aspect should go but any positive aspect for e.g. joint family system, the way we used to respect elders, the way we respected *mata, pita, guru, daivam*. The God is given the forth place. Look how the idea is formed – one, who opens your intellectual eye, is *guru*. The one who gives you birth and teaches all the values in life, your father and mother, are the first Gods; that's what we were asked - respect elders; care and share, never we were asked to eat alone, we were always told good stories, stories about our tradition. There is a story about the *gurukulam* life. The master and 20 students were there and one student was extra brilliant and the other students were jealous of him. They thought that the master is always partial to him. So the master wanted to prove this boy is a different type. One morning he called all the 20 boys and gave them each a banana and said to go and eat it where nobody can see them. All the 20 children ran away. Within 5 minutes one boy came and said – 'Sir, I ate it behind the tree and nobody saw me'; another said, 'I covered myself under a bed sheet nobody saw me', all the 19 came but this boy did not come back. Morning, afternoon, all went. When the sun was setting the boy came. All completely tired; because he had not eaten anything; the banana still in his hand. The master asked what happened, where did you go? The boy replied - Sir you wanted me to eat this banana where nobody looks at me. Sir but wherever I go God is looking at me!

This is the tradition where people taught how to respect elders and the God is omnipresent. You need not have to put the God give a name or anything; nature, or anything. The superpower is watching you. In this way they draw some discipline. This is the system. We have to be proud of this tradition.

I wrote a novel called *Palangal*. That has a translation in Malayalam too. It describes the changes undergoing in the community over almost 100 years. The story starts from 1902, in a village near Thanjavoor where the whole village is a world at that time; they have so much of time to do everything; they will wake up at 3.30 in the morning and the rituals are followed so beautifully. And the whole village is like a family. The second generation, shifted to Madras, starts from 1940 onwards. It describes the 3rd generation that shifted to Bombay and Delhi. There they have inter-caste marriage, etc.; the children don't know even to speak Tamil. To the first generation, making a coffee was 45 minute processes i.e. prepare the stove by the mud smeared with cow dung, fry the coffee beans, grind it with stone, boil the water and milk, and make coffee. In the second generation the kerosene stove has come, coffee filter is there and a coffee is ready within 15 minutes. The 3rd generation, who live in Bombay, has only to turn the knob of gas, the flame comes automatically; it is instant coffee. All these changes take place in every family. I can't say today that I will only travel by a bullock cart because my forefathers did so.

You have to adapt yourself to the modern development. We have to adapt everything that makes our life easy; but without loosing our identity. Now people say save the forest, save the greenery, save this, save that, etc. But our elders had thought all these things long before; when you get up, put up *rangoli* in front of the house with rice so that ants and birds can eat; and before you eat, go and feed the crows and birds and worship banyan tree, neem tree, etc. This is the universe where *sarvajana sukhino bhavantu* - let all human beings live happily. When I met Sivaram Karanth we were talking about environmental deterioration and he said man is selfish that's why these are all happening. He added that we believe *sarvejanah sukhino bhavantu*, instead, we should have prayed – *sarve jeeve sukhino bhavantu* - let all living organism be happy. That was an eye-opener to me. Ever since, I go and pray *sarve jeeve sukhino bhavantu*. In our country we have such wonderful tradition. In Tamil Nadu there is a system in the month of *margazhi* (December 15 to January 15), the month is said to be most auspicious. The myth is that Lord Vishnu said 'I am the month of *margazhi*'. That is why people adore *margazhi* month, which is beautiful climate-wise also. They say all women should getup in the early morning and put good *rangoli.* The bigger you put, the nicer; Lakshmi will come and sit on it. Make all men go out to street singing the names of Gods. They said if you do this, prosperity will be there; because this is Vishnu's favourite month. Now that is not the reason. In India, between December 15 and January 15, the ozone comes very much close to the earth at *brahmamuhurtta* i.e between 4.30-6.00 in the morning. Ozone is very good to activate your brain and health. If we say to the illiterate people that ozone is coming in plenty in the *margazhi* months and to go out at *brahmamuhurtta* to inhale, nobody would have believed it because they would not understand it. Hence the ancients tied it to religion. So the people went out, saw to that every man and woman is outside, inhaling the air that is filled with ozone. So let us try to understand why elders did all these things.

It is important that we should grow as good human beings. In the University of California they did an experiment twice. One was just three years before and the previous one thirty years before. Thirty years before, University asked the students who prepared to go out after completing their course - *how do you want your life to be?* They all took one day's time and came back and said, 'Sir, we all want a *meaningful life*'. The same question when asked three years before, they said they want to lead a *comfortable life*. Span magazine that published this has been raising a pertinent question. The shift from *meaningful life* to *comfortable living* has taken place. Who and what are responsible for this shift? One of the reason is we don't have good role models. If a father is going to sit in the cloud of a smoking, and tell – 'son, don't smoke', how the son listen to him? If a mother is to have double standards, then how is it going to function? How the next generation will conceive what is right and what is wrong? So, it is important we become good role models.

First of all we have to accept the positive aspects of our tradition to update ourselves without throwing our identity; adaptability is modernity. Wherever I go, I must have my roots; I can send my branches to bring anything from anywhere. We must realize the greatness of our country, greatness of our tradition, and without giving our identity we have to conquer the modern thinking. We need not become a westerner; westernization is not modernization. Modernization is retaining your traditional individuality at the same time updating your knowledge.

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THE FOURTH DIMENSION OF HUMAN SELF

Manoj Das

We are in an institution which has resurrected tradition and which had diametrically made a progress. It could not have done so, if it had not kept pace with modernity, with the demands of modern ideas. Hence the tradition and modernity as presented often are not antonyms, are not ideas which push each other, there can be synthesis and there is synthesis here. By recalling tradition we mean something belonging to the past. There is a chorological calendar; a calendar of time. There is another calendar, the calendar of consciousness; a different calendar something may come into consciousness.

Some months ago when I was in America to attend a conference, a scientist asked me, (at that time the patent of neem had become a problem, regarding the patent right there was a controversy between India and certain other countries) very innocently -

> When I see when the qualities of neem and *brahmi* recorded in classical texts like *Charakasamhita,* it agrees 70% - 75% of the qualities discovered in our ultra modern laboratory. Now, what kind of laboratory 2000 years ago Charaka might have used/ Can you tell me something about it?

I told him I don't know and I do not believe that any Indian historian could either enlighten you on this subject. All that I can say is that there is a laboratory of consciousness. There is a process through which the speaker could completely identify himself with the object about which he tries to know, or he wants to know and when this identification gets established a truth of the object automatically flews to the speakers consciousness. But the process of identification to be possible, you have to know there is a faculty within man, much deeper and much more original in mind with the emotional being of the intelligence which we call soul.

A few years ago the director general of health services Govt. of India received a communication from the Director General of WHO. It was a very technical communication, but the summary of which is like this. Suppose, (I am putting it into a layman's language), two persons admitted into a mental asylum showing the same symptoms, both belong to the same age group and both came out with the same cultural and educational background; treatments are given to their body - that emotional self in their mind, both psychiatrical treatment and physical treatment. The records of the treatment are also very meticulously preserved. Both the patients are showing the same response. But one day suddenly it is seen one of the patients was fully recovered. The other has not recovered. Does it mean

that there is something more than physical body, mind and the emotional self? Those who received treatment or something else want to listen suddenly a piece of music, remember something, meeting an old friend; all which responded and helped the process of recovery! Is there something more than this body, mind and the emotional self which you Indians call soul? India's National Institute of Mental Health and Neuro Sciences, Bangalore convened a meeting of India's leading psychiatrists, neuro surgeons, neurologists, physicians; some of the students of mysticism were also invited to participate and interact among them. Swami Rangaram, the present president of Rama Krishna Mission, was there who else from Kerala, late M. Pandit was there and I also happened to be there. Naturally it was not an occasion to present a detailed record or report of the discussion. But we all agreed including the scientists that it is time for an objective assessment of human personality to take a lot of, a fourth dimension of human self.

It is a very arbitrary division between tradition and modernity. Here, today Siva Sankariji spoke about the oppression of the feminine section of the society. It is a fact of life. For hundreds of years that went on. But remember, the first feminist movement started in India, where they get physically tied. All the daughters of a Daksha were married to great princes; but the last daughter Sati did not agree to marry anybody except Lord Siva. Siva had no home, dressed in a bohemian way and he did not have any roof over his head. How can the king give his daughter to such kind of a person? But Sati revolted and went away married to Siva. The rest of the story you all know. Take the case of Savitri, the princess of Madura. She had decided to marry Satyavan, knowing fully that he will die after one year. She went and lived in the forest in the dilapidated hut of Satyavan; did he carry a dowry with her. Who can speak of feminism better than Sati and Savitri.

Anything that becomes old does not cease to be modern. When you go to the Himalayas do you speak more on the beauty of Himalayas simply because they were beautiful 5000 years ago, 10,000 years ago? When we stay in front of the sunset or sunrise, do they loose their charm simply because they have ancient phenomena of nature, they do not. There is really no kind of water tight compartments. There is not any stone wall between yesterday and today, much depend on the attitudes. We must remember the human emotions have not become radically or qualitatively different from the emotion that prevailed thousands of years ago. A mother's love for the child has not been modernized. It is the mother's instinct to love the child. The child's instinct for survival needs demands that love. Some times I wonder what it that makes the two epics of India is! In ancient world we see four epics, Iliad and Odyssey by Homer, Ramayana and Mahabharata by Valmiki and Vyasa. Certainly Iliad and Odyssey are great epics. But they have not exercised that kind of influence on the life of the nation as Ramayana and Mahabharata did on the life of the people of the sub-continent. In my home state Orissa Ramayana is celebrated every year. You will be surprised to know the entire work is done by the Muslim community. All the dresses are made by them; all the roles are played by them. I do not know for how many centuries this tradition has prevailed. To them 'Ramayana

and Mahabharata' are not Hindu epics or mythology. It does not seem to be our national heritage. Why Ramayana and Mahabharata move the people? What is the magic spell of this? I will narrate you an incident which took place in Bombay a few years ago. There was a young man, an industrialist in his mid thirties. Everyday he comes home after his office hour. He talks to his little child and either asks him what you learned in the School. One day the child replied you will not be interested in what I learned today; father compelled him to tell it frankly. Boy said - my teacher told me a story called the Ramayana. It's a beautiful story. Father asked - beautiful story? Why don't you narrate it to me? The boy was reluctant to tell the story. The father went on insisting. The boy said - *hero and heroine went to the forest for a picnic, and heroine was stolen by the villain. The hero sent an S M S to his friend, the friends got the message, and rescued the heroine.* The father is terribly disappointed. 'This is the story your teacher told you, about Ramayana?' The son laughed and said "Father! You can't appreciate it, if I narrate the story as the teacher told it. It's a beautiful story; I edited it for your sake". Father thinks the son might have lost interest in Ramayana. The little child thinks the father being very modern, an industrialist who goes to abroad every now and then now he can't appreciate Ramayana. So the boy edited the story for the benefit of the father. But both are in love with the same story.

What is it that the spell of this great epic which breaths traditions even with modern mind. Nothing is very complex. Epic is latent in all human beings. In this world nobody can survive without corruption. In the heart of our hearts we know that it is wrong to be corrupt. It is bad to be evil, it is bad to be wicked. We never say in public what a wonderful wicked man he is. We don't say what a beautiful corrupt man he is. We still say what a wonderful courageous man he is. In the heart of our hearts we can not loose our inner respect the evolutionary pause, which is there in every body to appreciate that good and the noble and the courageous and it is because of this inherent elegance, truth of life, certain emotions of life that this great epic continues to hold its spell over the entire human relations.

We have to use our rational process with the light of something more than reason, probably a truth which lies hidden, within ourselves. I had narrated a story from Indian folk tales; you see in Indian traditional head there are two parallel developments of literature, one vedas, *upanishad*s, epics, *purana*s, etc; then the pragmatic prangs of literature like *Kathasaritsagar*, a collection of fictions, *Panchatantra*, the first collection of fables; in *Kathasaritsagar* you will find an interesting story: One young man with settled merits, and his wife's brother came to their house for a festival. So the husband, wife and wife's brother, the three are walking through the forest. Inside the forest there was a deserted temple dedicated to some divinity but abandoned. Now the hero he suddenly feels an inspiration to enter the temple. In his young days he wanted to become a saint. But due to some peculiar circumstances he got married. Now once inside that temple suddenly a strange sense of renunciation overwhelms him. He feels repentant. Why should I worry? I should have become a *sadhak* in all days. What is the use of this life? In his folly he picked up the sword

of the divinity and beheads himself. After sometimes, his brother-in-law, the lady's brother; enters the temple and sees that his brother-in-law has beheaded himself. How can I show my face to my sister? He also beheaded himself. After a while the lady enters the temple. She is horrified to see both her husband and brother lying with their heads detached from their bodies. Why should I live in this life at all? Necessarily a terrible emotion overtakes her. She also picks up the sword. Suddenly she hears her voice. "Do not be stupid like your brother and husband". The girl asks what she should do. The voice of divinity tells her to put the heads and bodies together and sprinkle the water given to her; they will come back to life. She does so. The next moment the husband and brother came to their lives. After sometimes the lady discovers to her great horror that by mistake she had put husband's head on her brother's body and brother's head on the husband's body. In the *Kathasaritsagar* the *vetala* asks king Vikramaditya - whom should take her husband - the one with brother's body or one with husband's body and brother's head? King answers - the one with the husband's head because it is the head which determines the personality of a human being.

This is not a great spiritual revelation; but a folk wisdom which reminds us of the tremendous amount of sound commonsense which prevailed even in such a level.