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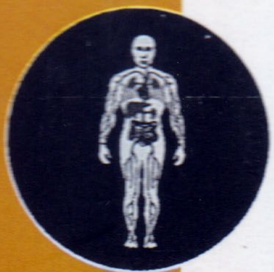
लाभानां श्रेय आरोग्यम्

Of all the gifts,
the most precious is health



Special feature:
Tradition and modernity
K.N. PANIKKAR

Vol. XVI., No. 4
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Aryavaidyan is intended to encourage scientific writing and intellectual interactions among scholars, academicians, practitioners and students of ayurveda and allied subjects like Siddha, Unani, modern medicine, etc.

Vol. XVI., No. 4, May - July 2003.

CONTENTS

From the Editor

Due to unforeseen circumstances we could not include the regular item 'From the pages of Vagbhata' in this issue. 'Impotency' that appears in these pages is the abstract of the essay that stood second in the All India Ayurvedic Essay Competition - 2002 for Vaidyaratnam P.S. Varier prize. The essay adjudged first was published by us in book form. The topic for this year's competition is 'endometriosis'.

The introductory lecture to Tradition & Modernity forms the special feature of this issue. The discussion on tradition and modernity continues in the next issue with the contributions of Ms. Sivasankari, writer and activist, Chennai and Sri Manoj Das, Sri Aurobindo International Centre of Education, Pondichery.

Kottakkal
30.07.2003

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ROLE OF PURE GHEE IN HEALTH AND NUTRITION – EXPLODING MYTH*

P.K. Warrier

Hon'ble His Excellency Sri Sunder Singh Bhandari, Governor of Gujarat, Respected Sri N.K. Chawla, Chairman, Indian Dairy Association, Gujarat Chapter, Respected Dr. V.K. Kurien, Chairman, Gujarat Co-operative Marketing Federation, Principal and Staff of J.S. Ayurveda College Nadiad, Organizers of this Session, Participants, Students and friends,

I sincerely thank the organizers of this important national seminar for inviting me to deliver the keynote address. I take it as an honour conferred on me by the elite body though I am not fully confident of my bonafides to speak in a symposium mainly centred round the topic of dairy-products. I shall safely confine myself to the subject assigned to me – *Role of pure ghee in health and nutrition*. This, no doubt, is a topic very much dear to every Ayurvedic Practitioner.

You are familiar with the popular Sanskrit saying - आयुर्घृतम् (ghee is long life itself). The metaphor identifies ghee with longevity. This maxim sums up the Indian concept of ghee in its relation to health.

The importance of ghee was realized early in the nomadic life. One of our ancient archetypes – *amritamathana* – conveys the image of the mother churning the milk in the morning. Dhanvantari emerges from the milky ocean with ambrosia – *amrita* - in his hands. No wonder *amrita* became the synonym of ghee in Sanskrit. In *vedic* sacrifices, ghee is the precious offering to the Gods!

Ayurveda says that there is three pillars for the edifice of life – diet, sleep and sex. Of these, paramount importance is given to diet.

आहारसंभवं वस्तु रोगाश्चाहारसंभवा: (च. सू)

The role of ghee comes in this context. Classical texts have thus enumerated the properties of ghee -

शस्तं धीस्मृतिमेधाग्निबलायु:शुक्लचक्षुषाम् ।
बालवृद्धप्रजाकान्तिसौकुमार्यस्वरार्थिनाम् ।।
क्षतक्षीणपरीसर्पशस्त्राग्निग्लपितात्मनाम् ।
वातपित्तविषोन्मादशोषालक्ष्मीज्वरापहम् ।।
स्नेहानामुत्तमं शीतं वयस: स्थापनं परम् ।
सहस्रवीर्यं विधिभिर्घृतं कर्मसहस्रकृत् ।।
मदापस्मारमूर्छायशिर:कर्णाक्षियोनिजान् ।
पुराणं जयति व्याधीन् व्रणशोधनरोपणम् ।।

The preventive, protective and preservative properties of ghee are used for promotion of health and cure of diseases. Vagbhata has beautifully described the therapeutic and prophylactic properties of ghee in these verses.

*Paper presented in the National Seminar on "Role of pure Ghee in health and nutrition – exploring myths" organised by Indian Dairy Association, Gujarat.

The properties of *puranaghrita* (old ghee) also are mentioned here. It is indicated in the treatment of alcoholism, epilepsy, fainting and diseases affecting the central nervous system. It cleans and heals wounds. Ghee of hundred and ten years old is termed as *mahaghrita* and is endowed with innumerable wonderful effects.

It is to be noted that the description followed here is not in consonance with the view that ghee is a fat applying the rules of fat digestion and metabolism. Ayurveda starts from the holistic approach and presents the properties looking at the total effect produced. This is derived from experiences of generations goes on to emphasising how ghee is particularly good for intelligence and faculties of mind. Ayurveda dwells on the circumstances and conditions in which it can be effectively used.

All these properties are ascribed to the ghee of the cow. Milk and ghee of cows are considered as the most ideal. Goat's milk is considered to be light, since goats are very agile, always jumping, running, and eating every plant including those with bitter and acrid taste. So its milk and products are very light. But if the goat is kept without allowing such movements and fed artificially, the milk produced will not contain these qualities. The same is applicable to the products from any cattle.

Besides, although dairy products are taken from milk, each product has its own separate properties and different actions. Generally speaking, ghee has properties similar to that of milk. But ghee is with a *prabhava.* Although equal in taste and potency, ghee is *deepana* – promotive of digestion, but milk is not. Curds are prepared from milk but in *vipaka* and *rasa*, it is sour, heavy and hot. It is not good for daily consumption. Buttermilk, on the other hand, is light and is advised to take daily, as it cures all diseases caused by over consumption of fat. *Mastu* (whey water) also is similar to buttermilk. Butter and ghee are of the same potency, but butter is *samgrahi* (constipative) while ghee is not.

In ayurveda, we start from the concept of the balance and imbalance of the *dosha*s - *vata*, *pitta* and *kapha*, as the cause of health and ill health. Treatments are aimed at regaining the lost balance. The speciality of ghee is that though it is particularly indicated in *vata* and *pitta dosha*s, it is used in *kapha* diseases also, if medicated with appropriate *kaphahara* drugs. So, it is one that can be used to treat diseases caused by all the *dosha*s. There are innumerable formulations in Ayurvedic Pharmacopoeia, manufactured with ghee as the vehicle.

When a child is born, the first feed is a mixture of honey and ghee, in equal proportions. Consumption of honey and ghee in equal quantities is *viruddha ahara*, incompatible food, but here it is prescribed as a preventive step in order to create immunity. Consumption of ghee and honey mixed has a rejuvenation effect. *vacha* (*Acorus calamus*) and *kushtha* (*Saussurea lappa)* mixed with honey and ghee are recommended for children in the first year to promote the growth of physique and intelligence. There is a specific prescription to use. *Triphala* (*Terminalia chebula*, *Emblica officinalis* and *Terminalia bellirica*) mixed with ghee and honey in the night to strengthen the eye sight. Preparations like *Kalyanakaghrita*, *Panchagavyaghrita*, *Brahmighrita* and *Guggulutiktakaghrita* are used for the treatment of various chronic psycho-somatic diseases. Ghee has bio-stimulating activity which creates *ojas. Ojas* and ghee have similar properties, both acting against poison and evils of alcohol.

I need not enumerate all the formulations prepared with ghee. But I feel that much research remains to be done in this field to explore the possibilities of the therapeutic value of medicated ghee.

Ghee has another important role in *panchakarma* therapy. *Snehapana* is an important preparatory treatment for *panchakarma.* Here, ghee is administered increasing the dose day by day watching the response of the patient to the maximum tolerable limit. This process helps to dislodge the impurities accumulated in the body tissues which are taken out employing appropriate *panchakarma* techniques.

The scope of *snehapana* can still be extended. *Avapeedaka* recommended for urinary diseases and *adhakayavata* are not very much in practice now. Similarly the *nasya* (nasal administration of medicines) with ghee is an area still to be explored.

I hope that this Seminar will throw light on such hidden potentials of ghee.

Before concluding, I wish to touch upon one more aspect. The aim of this seminar includes 'exploding of myth' also. I think you have in mind the propaganda against the usage of ghee. I presumed this since we have the experience of the vilification campaign against the usage of coconut oil by vested interests charging it as *a fat* that causes heart diseases. Although this was disproved by scientists later, vested foreign interests still insist on lingering on it. In the same way ghee also may be victimised, labeling it as a form of *fat.* Is ghee simply a fat? No, it is one with myriad properties. It is the best antidote against poison. In snakebite poison, the immediate counter step is *hridayavarana* covering or protecting the heart with ghee. Can we expect such a preventive effect from any other *fat*? Remember what Vagbhata says –

सर्वेषु सर्वावस्थासु विषेषु न घृतोपमम् ।
विद्यते भेषजं किञ्चित् विशेषात् प्रबलेऽनिले ।।
(अ.हृ. उ.)

I wish to place on record my full agreement with the aims and objectives of the organizers of this seminar. The real value of this dairy product is not properly assessed in Western countries. I have a personal experience. In the 80's and 90's of the last century we had good interaction with International Association of Ayurveda and Naturopathy with its centre at Italy. International Association of Ayurveda and Naturopathy (IAAN) took initiative to teach the preparation of ghee and distribute it there. It was heartily welcomed by all and soon ghee became very popular. Dr. Rdolph Ballentine, M.D. in his book 'Diet and Nutrition - a holistic approach' has extolled the high qualities of ghee and has exhorted for its propagation. He has given the methods to prepare good ghee quoting from a book which his wife has authored - 'Himalayan Mountain Cookery'. This was a pioneering work to propagate ghee in the West. I think a lot remains to be done in this direction and if done properly the West will surely appreciate this *ambrosia* from the East.

Friends, words fail to express my gratitude for the love and affection you have showered on me.

Thank you all

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IMPOTENCY*

(Part - I)

K. Razeena**

Abstract: Impotency is a common sexual disorder that affects millions all over the world. Classic ayurvedic texts contain detailed descriptions of impotency – its causes, manifestation and treatment. This paper attempts to present the ayurvedic approach and solution to this problem.

Introduction

Impotency is defined as the lack of power, specifically, lack of copulative power in the male due to failure to initiate an erection or maintain an erection, until ejaculation and thus to complete satisfactory sexual intercourse, usually considered to be due to physical (organic) disorder or an underlying psychological (functional) condition. It should be recognised that desire, orgasmic capability and ejaculatory capacity may be intact even in the presence of erectile failure or may be deficient to some extent and contribute to the sense of inadequate sexual function. Or, in other words, men with sexual dysfunction, present with a variety of complaints either singly, or in combination: loss of desire, inability to initiate or maintain an erection, ejaculatory failure, premature ejaculation, or inability to achieve orgasm. Hence, in case of impotence it is essential to evaluate all these aspects (Table 1).

However, the use of the term impotency has often led to confusing and inexplicable in both clinical and basic science investigations. Thus, it is suggested in the N.I.H. Conference 1992 on Impotency that the more precise term erectile dysfunction be used instead to signify the inability of the male to achieve an erection as part of the overall multifaceted process of male sexual function.

In short, impotency is the inability of the male to achieve and/or maintain penile erection and thus engage in copulation. Desire, ejaculation and orgasm may or may not be affected.

History and demographic considerations

Little is known about the natural history of erectile dysfunction. This includes information on the age of onset, incidence rates stratified by age, progression of the condition, and frequency of spontaneous recovery. There are also very limited data on associated morbidity and functional impairment.

* The essay adjudged second in All India Ayu. Essay Competition for "Vaidyaratnam P.S. Varier Prizes" held in 2002.

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Very little is known about variations in prevalence of erectile dysfunction across geographic, racial, ethnic, socioeconomic and cultural groups. Anecdotal evidence points to the existence of racial, ethnic and other cultural diversity in the perceptions in expectation levels for satisfactory sexual functioning. Those differences expected to be reflected in these groups reaction to erectile dysfunction, although few data on this issue appear to exist.

Ayurvedic approach

In ayurveda, sexual dysfunctions, including impotency, lies in close proximity to *sukradhatu* and the factors affecting its health. Thus a sexual dysfunction will surely be resulted from malfunctioning of one and/or another or all of those factors, with the settlement (*sthanasamsraya*) of the ailment in *sukradhatu*

For formulating an ayurvedic perspective, it is essential to search for: 1) Is there any reference for disorders of sexual function in ayurveda? and 2) If yes, is there any identical or similar disease entity to impotency?

An approach in this way led to the finding of an in-depth description of sexual and fertility disorders in the classics. It is assumed that there was a high prevalence of these even in that period as Susruta describes *vajeekaranatantra* which is exclusively developed for curing ailments of *sukradhatu* and improving its health, as the eighth *anga* of ayurveda. The *vajeekarana* formulations are indicated for disorders affecting the whole aspects of sexual function and fertility, like *alpasukrata*, *ksheenasukrata*, (disorders of sperm count and motility), *lingasaithilya* (lack

TABLE 1

Possible aetiology of each associate of erectile failure

1.	Loss of desire	a.	Androgen deficiency arising from either pituitary or testicular disease
		b.	Psychological disturbances
		c.	Some types of prescribed or habitually abused drugs
2.	Premature ejaculation		Usually related to anxiety in the sexual situation, unreasonable expectations about performance or emotional disorder. Behavioural therapy is most successful in this case.
3.	Absence of emission	a.	Retrograde ejaculation following surgery on bladder neck or in diabetic patients
		b.	Sympathetic denervation
		c.	Androgen deficiency
		d.	Drugs
4.	Absence of orgasm		If libido and erectile function are normal, the absence of orgasm is almost always due to a psychiatric disorder. Otherwise it usually occurs as associate of erectile failure or loss of desire.
5.	Failure of Detumescence		Priapism

of penile rigidity), *sukrasrava*, failure of *harsha* etc. Charaka has described *vatikshanda* (anorchia), *pavanendriya* (absence of ejaculation) etc. under congenital sexual abnormalities in *Sareerasthana*. In *Sareera-sthana* of *Susrutasamhita*, *asyeka* (oral sex), *kumbhika* (anal sex) and *irshyaka* (voyeurism), etc. are described as subdivisions of *napumsaka*.

Napumsakata, *shandata* and *klaibya* are used to denote sexual abnormalities in ayurveda. In *Amarakosa*, four words - *shanda*, *panda*, *kleeba* and *napumsaka* - are used to denote a *triteeyaprakruti* neither feminine nor masculine. Table 2 shows the terms with derivations and the meanings. Those in table denote the word meanings, just like 'lack of power or weakness' in case of impotency. The usage in medical science gives a much broader but specific meaning.

Generally in Sanskrit, *shanda* and *kleeba* are used for castrated males and *napumsaka* for a hermaphrodite. But, Apte, in his *Practical Sanskrit English Dictionary*, uses the term *kleeba* to denote the impotent (Table 3). For *shanda* he gives two meaning a castrated male, a neuter gender but not impotent.

Sexual perversions like *asyeka*, *kumbhika*, etc with an associated erectile inability in normal sexual act are described under *napumsaka*s in *Susrutasamhita*. *Shanda* also forms one such division, which is incurable due to absence of sperms or it seems to denote a sterile male presenting a gender identity disorder. In another context, *shandata* is used where *abhighata-lakshana* of *vitapamarma* is explained. From the description, based on position of *marma* in some commentaries it is correlated with spermatic cord injury to which causes a damage to ductus system and testicular function or any one of them. Thus the resultant *shandatva* in *vitapamarmabhighata* points to erectile ejaculatory or fertile failure and even may result in sterility when it causes an extensive irreversible damage to testes.

Though *napumsaka* and *shanda* represent sexual dysfunctions, having an associated inability of penile erection in normal sexual act,

TABLE 2

Terms and derivations

Term	Etymology	Meaning
A. षण्ड	षणु दाने	The person gives gold, etc. to conceal his inability
B. पण्ड	पण्डते–लज्जाया प्रदेशान्तरं गच्छति	He goes away due to shyness
C. क्लीब	i. क्लीब् अधार्ष्ये – क्लीबते अधीरो भवति इति	Not bold
	ii. क्लमु गलानौ क्लाम्यति अप्रजत्वेनेति वा	If the word is taken derived from the root क्लम्, it may mean one who is worried due to absence of progeny
D. नपुंसकम्	न स्त्री पुंसौ इति	Neither feminine nor masculine

the search for an identical or similar disease that pulsates with impotency revolves around a single disease *klaibya*, because it encompasses all the sexual dysfunctions of men but as an associate of penile erectile failure. Table 3 shows the comparison between impotency and *klaibya*. Thus in *klaibya*, the main feature is the erectile dysfunction and in this way it differs from the other two. Dr. Julius Jolly, in his *Indian Medicine*, opines that the word *klaibya* refers to impotency. In *Clinical Methods of Ayurveda*, Dr. Sreekantamurthy endorses this view.

Also, *klaibya* represents a specific clinical entity with specific *nidana*s, clinical types, pathogenesis and therapy in ayurveda. The aetiological classification of ayurveda closely relates to the clinical types of impotency (Table 4).

Most of the *acharya*s, except Vagbhata, describe *klaibya*. *Klaibya* is a symptom of *sukrakshaya*, *kaphakshaya* and *sukravahasroto dushti*. *Apanadushti,* causing *sukrakshaya,* in turn results in *klaibya*. *Vyanadushti* causes *pumstvanasa* – net result of *klaibya*.

Klaibya and impotency

Though, in some Sanskrit lexicons, *kleeba* means a castrated male, in ayurveda the disease *klaibya* does not limit to impotency resulted from castration. The word *vrishana* was in use for testes in those periods also. Charaka has

TABLE 3

Klaibya vis-a-vis impotency

KLEEBA	IMPOTENT
a. क्ळीब: स्याद् सुरताशक्त: One who is unable to engage in sexual intercourse	a. One who is unable to copulate or unable to have full sex or reach an orgasm
b. मेढ्रश्चोन्माद् शुक्राभ्यां हीन: स: कलीब: उच्यते: । If a person fails to get an erection and fails to ejaculate	b. One who is unable to engage in sexual intercourse, especially because of an inability to have an erection
KLAIBYA	IMPOTENCY (IMPOTENT)
a. तद् भाव: क्लैब्य उच्यते । (क्ळीबस्य भाव: क्ळैब्यम्)	a. The condition of being impotent is impotency
b. सङ्कल्पप्रवणो नित्यं प्रियावश्यमपि स्त्रियम् । नयति लिंगशैथिल्याद् कदाचिद् याति वा यदा ।। श्वासार्त: स्विन्नगात्रश्च मोघसङ्कल्पचेष्टित: । म्ळानशिश्नश्च निर्वीर्य: स्यातेतद् क्ळैब्यलक्षणम् ।। Under favourable conditions, with an intact desire and desired partner, the person does not get an erection and if he gets he cannot maintain it and ejaculate. He may feel physical hurdles like dyspnoea or increased perspiration.	b. Lack of power, specifically lack of copulative power in the male, due to failure to initiate an erection or to maintain an erection until ejaculation.

TABLE 4

A comparison of clinical types of impotency

Sl. No.	Clinical types in ayurveda	Possible correlations from modern literature
1.	*Sahajaklaibya*	Primary impotency
2	*Manasikaklaibya*	Psychogenic impotency
3. 4.	*Medrarogaja klaibya* and *Dhvajabhangaja klaibya* (Charaka)	Impotency secondary to local penile diseases
5.	*Jarajanyaklaibya*	Senile impotency
6.	*Beejopakhataja klaibya*	Impotency secondary to diseases affecting both potency and fertility
7.	*Pittajaklaibya*	Alcoholic impotency comes under this
8.	*Sukrakshayaja*	Susruta's view: Simple virile impotency Charaka's view: Impotency secondary to severe nutritional deficiencies or debilitating diseases

mentioned the incurability of *vrishanotpadanajaklaibya* (impotency resulted from castration) specifically. Dr. Julius Jolly emphasizes that Narada described fourteen types of *klaibya* of which seven are curable and seven incurable, including *klaibya* caused by castration in the latter group. Thus it is clear that *kleeba* in ayurveda is not limited to castrated male.

Dvajabhanga and *klaibya*

*Acharya*s use the term *dhvajabanga* as a variety of *klaibya*, as the main symptom of *klaibya* and as equivalent to *klaibya*.

As a variety of *klaibya*

In this context, *dhvaja* means *mehana* (penis)[1]. *Bhanga* usually means a lack of continuity, a fracture, wound or even an abrasion on the surface skin. In this way *dhvajabhanga* means a local affection of the penis. Charaka has described *dhavajabhangaja* or *dhvajopakhataja* variety of *klaibya* from local penile diseases, which is characterized by external wounds or skin affections. In short, *dhvajabhangaja klaibya* is that which is characterized by a disruption of *dhvajocchraya* resulted from local diseases of *dhvaja*.

As the main symptom of *klaibya*

Some *acharya*s used the term in another sense. *Dhvajabhanga* refers to the lack of erectile power, which is the symptom of *klaibya*. Though *dhvajabhanga* is the main symptom of *klaibya*, which may include lack of power of ejaculation, *alpasukrata*, etc. also. Or, even the person may get *dhvajocchraya*, but fails to maintain it. Likewise, Susruta and his followers have used the word to represent the lack of power of erection; i.e. they have used it as the symptom of *klaibya*. Susruta has used the word while describing *sukrakshayahetuja klaibya*

1. द्रज चिह्ने पताकायां मेहने षौण्डिके पि च । (*Visvaprakasam*)

TABLE 5

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 tumours, Amyotrophic lateral sclerosis, Peripheral neuropathies, General paresis and Tabes dorsalis.
III.	Vascular disease	Aortic occlusion (Leriche syndrome), Atherosclerotic occlusion or stenosis of the pudental and/or cavernosal arteries, Venous leak and 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	Peyronie's disease, Previous priapism and Penile trauma
VI.	Surgical procedures	Perineal prostatectomy, Abdominal - perineal colon resection, Sympathectomy (frequently interferes with ejaculation), Aortoiliac surgery, Radical cystectomy and Retroperitoneal lymphadenectomy.
VII.	Miscellaneous	Radiation therapy, Pelvic fracture and any severe systemic disease or debilitating condition.

TABLE 6

The ayurvedic clinical types forming the aetiological classification of *klaibya*

Name	C.S.	S.S.	B.P.	Y.R.	B.R.
Sahajam	-	+	+	+	+
Manasikam	-	+	+	+	+
Sukrakshayajam	+	+	+	+	+
Sukrastambham	-	+ *Kharasukrajam*	+	+	+
Pittajam	-	+ *Pumstvaupakhatajam*	+	+	+
Upakhatajam	-	+ *Pumstvaupakhatajam*	+	+	+
Medrarogajam	-	+	+	+	+
Jarajanyam	+	-	-	-	-
Beejopaghatajam	+	-	-	-	-
Shvajopakhatajam	+	-	-	-	-

C.S. *Charakasamhita,* S.S. *Susrutasamhita,* B.P. *Bhavaprakasam,* Y.R. *Yogaratnakaram,* B.R. *Bhaishajyaratnavali*

As equivalent to *klaibya*

Acharya Govindadas in *Bhaishajyaratnavali*, uses this word to denote all the varieties of *klaibya*. He has described *klaibya* under the heading *Dhvajabhangachikitsitam* showing that *dhvajabhanga* can be used synonymous to *klaibya*.

It can be seen as an advancement of using the term, which is more precise and less confusing to signify the inability of the male, to achieve erection, as part of the overall multifaceted process of male sexual function. It is just like the usage of erectile dysfunction instead of impotency. However it should be recognized that, the other factors like desire, orgasmic capability, and ejaculatory capacity may be intact or even deficient in the presence of *dhvajabhanga*.

The aetiologic factors

The occurrence of Psychogenic impotence vs. Organic is still debated, the common psychic causes of impotence are – 1) affective disorders like depression, mania, schizophrenia, hysteria and antisocial personality, 2) alcoholism and other drug addictions, 3) organic brain syndromes, 4) personality disorders and 5) transsexualism (a strong desire to change to the opposite sex).

Ayurveda also recognizes *bhaya* (phobia), *soka* (dejections), *streedoshadarshana* (sexual act with disagreeable woman), *streenam akousala* (unskilled in copulation, performance anxiety), *abhichara*, *kopa*, etc. as the causes, which results in *manasikaklaibya*. Vagbhatacharya in *Ashtangasamgraha* opines that these can cause sexual failure (*streeyoga asakti*).

The likelihood of erectile dysfunction increases with age, but is not an inevitable consequence of ageing. Ayurveda also include, decrepitude among the causatives. The organic causes of erectile impotence form a major group. The diseases commonly implicated in erectile dysfunction are represented in Table 5. The *ayurvedic* clinical types forming the aetiological classification of *klaibya* which is shown in Table 6. Charaka has mentioned the causes of *sukrakshaya* [*jara* (oldage), excessive *chinta* (worries and anxieties), *vyadhi*s (diseases), *karshanakarmas* (excessive manual work resulting in ill health)] which in turn can result in *klaibya*, those are all included in different clinical types of *klaibya*. Vagbhata includes *atisthoulya* among the causatives.

(To be concluded)

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PHARMACOGNOSTIC STUDIES ON *ZINGIBER ZERUMBET* (L.) SM.

A.K. Srivastava*

Abstract: *Zingiber zerumbet* (L.) Sm. is an important medicinal plant employed to cure various diseases and possess a number of biological activities. The present investigation deals with pharmacognostic studies including botanical description, macro and microscopic characters of rhizome, root, physical constants, colour reaction, powder study and fluorescent analysis.

Introduction

Zingiber zerumbet (L.) Sm. (Zingiberaceae) commonly known as *kachur* or *narkachur* is being used in India since time immemorial. The plant is widely cultivated in India[1] and is of both pharmaceutical and medicinal interest. The rhizomes are employed as hot remedy for cough, asthma, worms, leprosy and other skin diseases[2]. In Philippines, the pulverized rhizomes are administered as antidiarrhoeal agent[3]. Since the isolation of anti HIV[4], antitumor[5] and cytotoxic agent[6], the plant finds prominent importance in modern medicine.

Significant morphological and anatomical differences between *Zingiber zerumbet* and its proposed variety (Philippines origin) have been worked out[7]. The essential oil of Indian, French, Polynesian, Vietnamese and Malay origins have been investigated in detail for their chemical composition and bioactive constituents. Curzerone, zerumbone, camphor, isoborneol and 1,8-cineol were found as major compounds[8].

Materials and methods

Authentic material for the present study was collected from cultivated field of Maharajganj (Siwan district), Bihar. Commercial material (rhizome) was procured from local market of Lucknow. Samples were deposited in herbarium, Botany and Pharmacognosy Division, CIMAP, Lucknow.

The material were fixed in formalin-aceto-alcohol (F.A.A) for 48h and stored in 70% ethanol. Pieces of suitable size of samples were dehydrated in tert-butyl alcohol series. Paraffin blocks were prepared and 10-20 μm thick sections cut with a rotary microtome. Sections were stained in Safranin and fast green. Hand sections of fresh as well as preserved materials were cut to carry out various historical tests as per schedule of Johansen[9]. Microphotographs were taken with the help of optiphotpol microscope.

Rhizome powder in various solvents was exposed to U.V. light. The colour charts

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provided in the Pictorial Cyclopaedia of Exotic Plants[10] was used to indicate the colour. Total and acid insoluble ash value was determined by Indian Pharmacoepia (1966)

Botanical description of aerial parts

Zingiber zerumbet (L.) Sm. is an erect, herbaceous, perennial plant, 1-1.7 m high. The leaves are 20-30 cm long and 5-7.5 cm wide, sessile, oblong-lanceolate, acuminate, glabrous, base narrowed, ligule 1-2 cm long, truncate, membranous. Flowering stem 30-35 cm long, usually flexuous, clothed with long appressed obtuse sheaths. Flowers pale sulphur yellow, in conico-oblong or ovoid obtuse, spikes 7.5-10 cm, bracts 2.5-4 cm long, closely embricate, ovate-oblong or obovate with rounded apex and pale membranous margins, bright green at first but become red in fruit. Calyx tube 2.5 cm long appressed to the corolla tube, 3 toothed, glabrous. Corolla tubes 3 cm long, lobes ovate lanceolate, acuminate, the lateral smaller, adnate to the base of the tip. Lip shorter than the corolla-lobes and of a darker yellow, 3-fid; lobes obtuse, the mid-lobe the longest. Anther glabrous, large and pale yellow. Style glabrous; stigma minute, funnel shaped with ciliate mouth. Capsule ellipsoid, 2.5 cm long, white thin-walled, glabrous, dehiscent. The seeds are numerous, ellipsoidal, black, 4 mm long and covered with white aril. (Fig. Ia)

Macroscopic characters

Rhizome

Rhizome 7-15 cm long and 1-2.5 cm broad, irregularly branched with node and internodes. Scale leaves are present at the nodal region. The outer surface of the rhizome is smooth and light grey in colour, internally light yellow. In commerce, the rhizome is found in pieces, 4-7 cm long, irregular, brownish end, wrinkled outside, showing a large central pith. The drug is hard and brittle, breaking with a short fracture, odour fragrant, taste aromatic, spicy and slightly bitter (Fig. I b&c).

Root

The roots are 1.3-15.5 cm long and 0.65 - 2.5 mm in diameter, thin, smooth and brown in colour. The root arises from the rhizome. The shape is slightly curved or straight. Fracture is tough, odour fragrant, taste spicy and bitter. (Fig Ic)

Microscopic characters

Rhizome

A transverse section of the rhizome shows single layered epidermis having rectangular and elongated cells (40-70 x 10-20 .00m). Below the epidermis, there are thin walled cork cells of 7-10 layers, irregularly elongated (50-130 x 20-70 .00m). Cortex is composed of several layers parenchymatous cells (60-130 x 60-110 .00m) with intercellular air spaces and containing starch. Oil cells present in cortex and central cylinder region containing a yellow to orange coloured oleo-resin (cells 50-80 x 50-80 .00m). The frequency of oil cells is more in central cylinder region. Endodermis consists of single layer of cells (20 - 60 x 20 – 40 .00m), the radical wall of which is suberized. Stele consists of a broad central zone of ordinary parenchyma cells. Closed, collateral vascular bundles are found in a circle in the region just inside the epidermis. Throughout the remainder of the stele, larger, closed, collateral bundles with more or less rounded form with sclerenchymatous fibres partially covered them found scattered. The starch grains are globose, ovoid and irregularly rounded (5-50 x 10-30 .00m). The tracheids are non lignified and have reticulate, spiral or scalariform thickening on the walls (200 - 520 x 20-35 .00m).

Root

A transverse section of root shows the presence of singe-layered epidermis (cells 20-40 x 10-50 .00m) followed by four-layered cork cells (20-35 x 10-20 .00m). The cortex is composed of thin walled, hexagonal round and flattened parenchymatous cells (20-60 x 20-70 .00m) with small intercellular spaces. Air canals are composed of elongated parenchymatous cells (40-70 x 30-70 .00m). Oil cells present in cortical region are ovoid to spherical, occurring single or in small groups, containing yellow substances (30-50 x 40-60 .00m). The endodermis cells (20-60 x 20-40 .00m) is very thick on the inner side (U-shape thickening). The pith is composed of thick walled cells which is a characteristic feature for identification. The parenchymatous cells are filled with starch granules, mostly simple, fairly large, flattened, oblong to sub-rectangular to oval in outline with a small point hilum situated at the narrow end. Fibres usually occur in-groups and also found associated with the vessels; they are fairly large and one wall is frequently dentate, very thin transverse septa occur at intervals. Vessels are large and usually occur in small groups associated with the fibres; they are recticulately thickened, regularly arranged rectangular pits, a few smaller. Spirally or annularly, thickened vessels also occur (300-750 x 50-100 .00m) (Fig. Id-f).

Powder study

The rhizome powder is butter yellow in colour and possesses a feeble camphoraceous aroma and acrid taste. Tissue element and their content are showed presence of starch grains in parenchymatous cells. The starch grains are simple, globose, ovoid or irregularly rounded and a distinct hilum is situated at narrow end. Fibres are seen in groups and also associated with the vessel; vessels are large and present in small groups. Smaller, spirally and annularly, thickened vessels also occur. The parenchymatous cells are thin walled rounded to oval in outline. The wall of parenchyma is characteristically wrinkled. Thin walled unicellular trichomes are frequently present. Parenchymatous cells containing prismatic crystals are seen (Fig. IIa-k).

Physico-chemical properties

Determination of physical constants of rhizomes of *Zingiber zerumbet* and colour reactions on treating the rhizome powder with chemicals at room temperature are detailed in Table 1&2. Powder was separately kept in water, hexane, chloroform, methanol and acetone for 2h and the fluorescence of their filtrates observed under U.V. light. The characteristic fluorescence exhibited by them was used as a tool in identification. Fluorescent analysis of the extract of the rhizome powder in various solvents under ultraviolet light (365 nm) is detailed in Table 3.

TABLE 1

Determination of physical constants of rhizomes

Moisture	3.85%
Ash value	6.99%
Acid insoluble ash	2.08%

TABLE 2

Colour reactions on treating the rhizome powder

Rhizome powder	Colour produced
20% Sulphuric acid	Orange white
Conc. Sulphuric acid	Light brown
20% Nitric acid	Yellowish white
Conc. Nitric acid	Light yellow
20% Hydrochloric acid	White
Conc. Hydrochloric acid	Greyish red
10% KOH	Light yellow
5% $FeC1^{3}$	Yellow

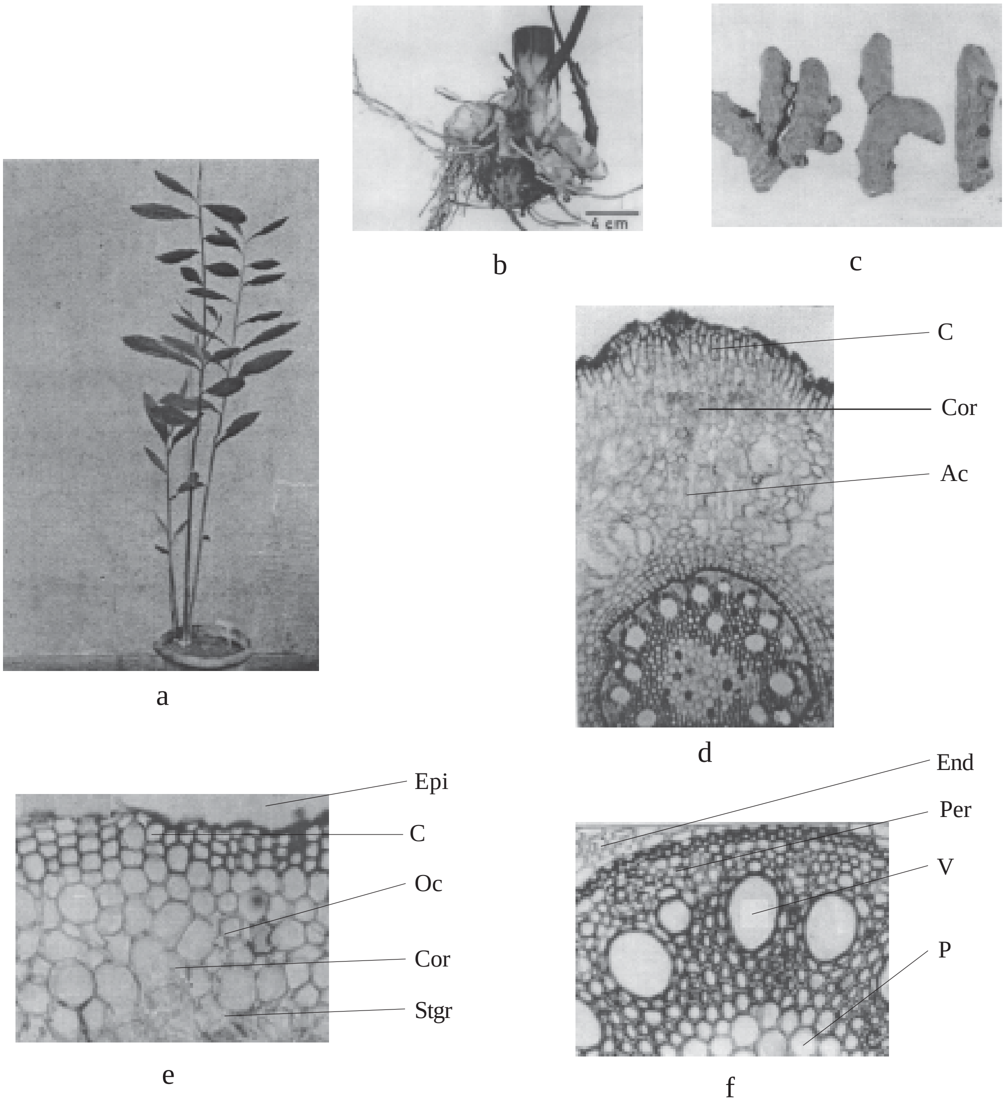

Fig. I. **a - f** *Zingiber Zerumbet* (L). Sm

a) A potted plant in vegetative phase **b**) A clump of underground rhizome **c**) Market sample (dried) **d**) T.S. of root as seen under low magnification (x40) **e**) A portion of cork cells and cortex, cells of cortex are seen containing starch grains (x100) **f**) T.S. showing a portion of cortex, endodermis, pericycle enclosing vascular bundles and central slender (x100).

C. Cork cell **Cor** Cortex **Ac**. Air canal **Epi**. Epidermis **Oc**. Oil cell **Stgr** Starch grain **End**. Endodermis **Per**. Pericycle **V**. Vessel **P**. Pith

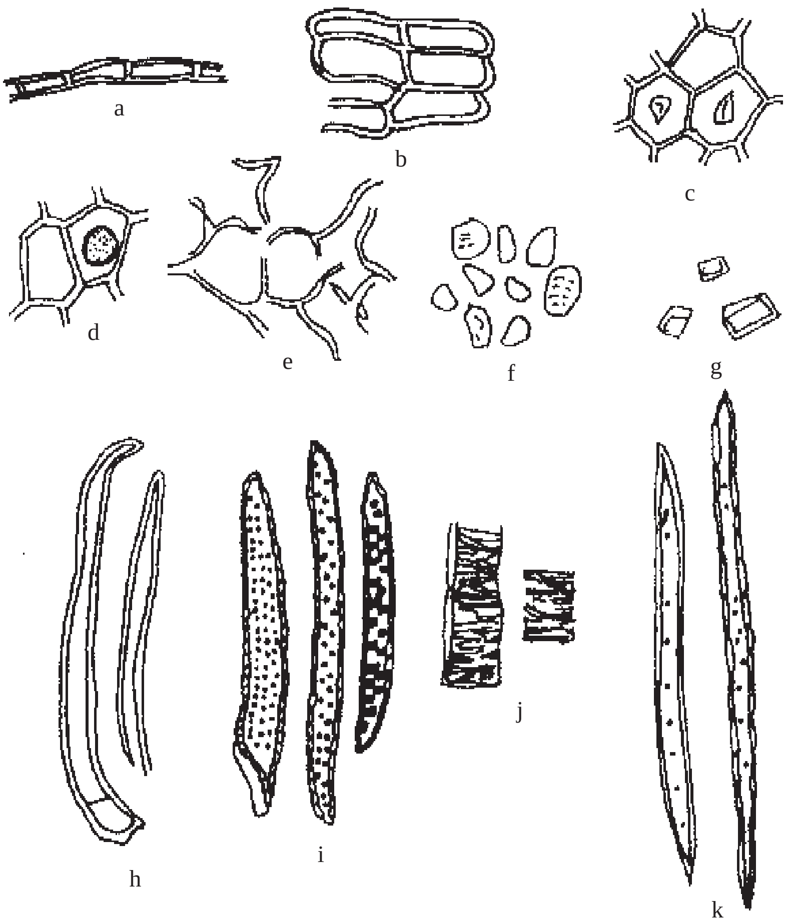

Fig. II. **a - k** *Zingiber zerumbet* (L). Sm - Fragments of the powdered rhizome (x 100)

a) Epidermis **b**) Cork cells **c**) Parenchyma containing starch grains **d**) Fragments of parenchymya with oleoresin **e**) Parenchyma cells showing wrinkled walls **f**) Starch granules **g**) Ca-oxalate crystals **h**) Unicellular trichomes **i**) Isolated vessels **j**) Isolated tracheids **k**) Isolated fibres

TABLE 3

Fluorescent analysis of the extract of the rhizome powder

Sl. No	Solvent used	Original colour before irradiation	Colour after irradiation
1.	Rhizome powder as such	Butter yellow	Pastel yellow
2.	Aqueous extract	Orange white	Yellowish white
3.	Chloroform extract	Pale yellow	Pale yellow
4.	Hexane extract	White	Yellowish white
5.	Methanol extract	Yellowish white	Pale white
6.	Acetone extract	Orange white	Pastel yellow

Results and discussion

On comparing commercial rhizome sample of *Zingiber zerumbet* with an authentic sample, it is found that both the drugs were similar in their morphological and histological characters. It is observed that the structure of cells in both samples comparing the different tissues, shape and size of oil cells and starch grains are found identical. Apart from the above, physical constants and powder study of both the samples are also found similar.

On the basis of above pharmacognostic study, it may be concluded that both the samples were having similar identity and the market sample can be used as a real drug.

Acknowledgement

The author is grateful to Dr. Sushil Kumar, Director and Dr. R. Luthra, Head, Biochemistry Division, CIMAP, Lucknow for providing working facilities, constant encouragement and co-operation in this investigation.

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EFFECT OF *LASUNA* (*ALLIUM SATIVUM* LINN.) ON SERUM LIPID PROFILE – A CLINICAL STUDY

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Abstract: Increase in serum cholesterol levels has been quoted as the main cause of atherosclerosis and coronary artery diseases. In this paper, the authors attempt to assess the effectiveness of *lasuna* (*Allium sativum*) on serum lipid profile.

Introduction

Hypercholesterolaemia is a known risk factor for coronary artery disease. Therefore, it is imperative that both primary and secondary prevention of coronary artery disease must include measures to treat hypercholesterolaemia. Dietary therapy has been the main stay to which additional measures should be added if serum cholesterol fails to respond adequately. Considering the continuing debate on the effectiveness and possible adverse effects of many synthetic cholesterol-lowering drugs, addition of *lasuna* (*Allium sativum*) *kalka* to the dietary management has been suggested as an alternative to help reduce serum cholesterol.

The beneficial effects of *lasuna* in a standard dose (30g/chick) have been identified to prevent the rise in serum cholesterol level and significantly lower the raised blood phospholipids when given along with atherogenic diet. The aqueous extract of *lasuna* after long-term feeding (1 ml / 100 gm) for two months lowered protein and lipid levels and increased free amino acid levels of serum and liver in albino rats. The juice as well as essential oil of garlic studied against hyperlipidaemia induced by feeding 100 gm of butter on healthy subjects that exhibited hypolipidaemic activity. 10 ml garlic juice administered orally on atherosclerotic rabbits (produced by 0.5 gm cholesterol in 5 ml of olive oil) for a long period and estimation of blood after four weeks, for 16 weeks, exhibited decrease in serum lipid, accumulation of cholesterol in aorta and liver and suggested hypolipidaemic action. Hyperlipidaemia was induced in rabbits by cholesterol feeding and administration of garlic for 12 weeks exhibited reduction in cholesterol, triglycerides and beta lipoprotein of serum, which suggested that garlic is helpful in reducing hyperlipidaemia.

Materials and method

The aim of the study was to examine the effect of *lasuna kalka* on serum lipid profile (total cholesterol and triglycerides). Fifty-six adult patients with hypercholesterolaemia were

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studied. The patients were of both sexes up to the age of 65 years. The selected patients were those who had total serum cholesterol level >250 mg/dl or low-density lipoprotein cholesterol (LDL-C) > 160 mg/dl and serum triglyceride level (TG) > 200 mg/dl.

A complete medical history was obtained including the assessment of coronary risk factors. The criteria for evaluating the presence and absence of coronary heart disease was based on checking previous reports of ECG/ treadmill ECG or coronary angiography. Patient with history of recent myocardial infraction, unstable angina, congestive heart failure and those requiring treatment with betablockers, diuretics, oral contraceptives, corticosteroids or lipid lowering drugs were not included in the study. A complete physical examination as well as laboratory analysis was done and the lipids assessed were Total Cholesterol (TC), low-density lipoprotein cholesterol (LDL-C), High-density lipoprotein cholesterol (HDL-C) and Triglycerides (TG). The TC, TG and HDL-C were estimated by enzymatic kits on Hitachi704 Auto Analyser. LDL-C was estimated by Fedrickson's & Friedwalds formula (LDL-C=TC-(1/5TG+HDL-C).

The patients were divided into two groups i.e. 1st half as *lasuna* group and 2nd half as control group. Patients belongs to both groups were kept on Step I Hypolipidaemic Diet i.e. - a) 30% of total energy as fat, 55% as carbohydrate and 15% as protein; b) not more than 300 mg of dietary cholesterol.

The patients included under *lasuna* group received 20 gm of *lasuna kalka* twice daily after food along with hypolipidaemic diet. Lipid profile was done at 0 and after 12 weeks of therapy to find the effect of *lasuna kalka* in reducing blood cholesterol.

Observations and results

Both the *lasuna* and control groups had complete haemogram, FBS, Blood Urea, serum creatinine phosphokinase (CPK), serum alkaline phosphotase, serum aspartate transminase (AST) and serum alanine transaminase (ALT) within normal range.

The therapy with *lasuna kalka* for 12 weeks decreased the total mean cholesterol level from 308 mg/dl with an average decrease of 60 + 4.47 mg/dl, which was statistically highly significant. Similarly, the mean blood cholesterol level of the patients belongs to control group decreased by 10 + 27.2 mg/dl after 12 weeks of dietary management, was statistically not significant (Table 1). Therapies on low-density lipoprotein cholesterol in mg/dl infer highly significant reduction in *lasuna* group. The mean initial LDL cholesterol was 198 mg/dl and 151 mg/dl in this group. The decrement after 12 weeks was 47 + 6.8 mg/dl. The LDL cholesterol in control group also found little reduction but insignificant (Table 2). Both the *lasuna* group and control group did not show any significant improvement in terms of lowering of HDL cholesterol even after completion of trial period (Table 3). When compared with control group,

TABLE 1

Effect of therapies on total blood cholesterol (in mg / dl)

Statistical nomenclature	Control group (n=28)	*Lasuna* group (n=28)
Before treatment	291	308
After 12 weeks	281	248
Mean difference	10	60
S.D. (+)	27.2	4.47
S.E. (+)	5.14	0.84
t	1.94	70.9
p	>0.05	<0.001

TABLE 2

Effect of therapies on low-density lipoprotein (LDL) cholesterol (in mg/dl)

Statistical nomenclature	Control group (n=28)	*Lasuna* group (n=28)
Before treatment	175	198
After 12 weeks	167.6	151
Mean difference	7.4	47
S.D. (+)	21.72	6.8
S.E. (+)	4.1	1.28
t	1.8	36.43
p	>0.05	<0.001

TABLE 3

Effect of therapies on high-density lipoprotein (HDL) cholesterol (in mg/dl)

Statistical nomenclature	Control group (n=28)	*Lasuna* group (n=28)
Before treatment	41.6	46.6
After 12 weeks	42.8	48.2
Mean difference	1.2	1.4
S.D. (+)	10.12	11.78
S.E. (+)	1.91	2.26
t	0.62	0.62
p	>0.10	<0.10

lasuna group showed highly significant reduction on very low-density lipoprotein (VLDL) cholesterol. The mean fall of VLDL cholesterol in *lasuna* group was 16 + 2.4 mg/dl which was statistically highly significant and on the other hand in control group was insignificant (Table 4). In *lasuna* group, the LDL/HDL ratio yielded highly significant diminution and moderate reduction in triglyceride level compared with control group (Table 5&6).

Discussion

The result of the study indicates significant

TABLE 4

Effect of therapies on very low-density lipoprotein (VLDL) cholesterol (in mg/dl)

Statistical nomenclature	Control group (n=28)	*Lasuna* group (n=28)
Before treatment	71	76
After 12 weeks	70	60
Mean difference	1	16
S.D. (+)	14.3	2.4
S.E. (+)	2.7	0.45
t	0.36	35.2
p	>0.10	<0.001

TABLE 5

Effect of therapies on LDL/HDL ratio (in mg/dl)

Statistical nomenclature	Control group (n=28)	*Lasuna* group (n=28)
Before treatment	4.8	4.6
After 12 weeks	4.1	3.3
Mean difference	0.9	1.3
S.D. (+)	4.01	0.45
S.E. (+)	0.75	0.08
t	1.18	14.7
p	>0.10	<0.001

TABLE 6

Effect of therapies on Triglycerides level (in mg/dl)

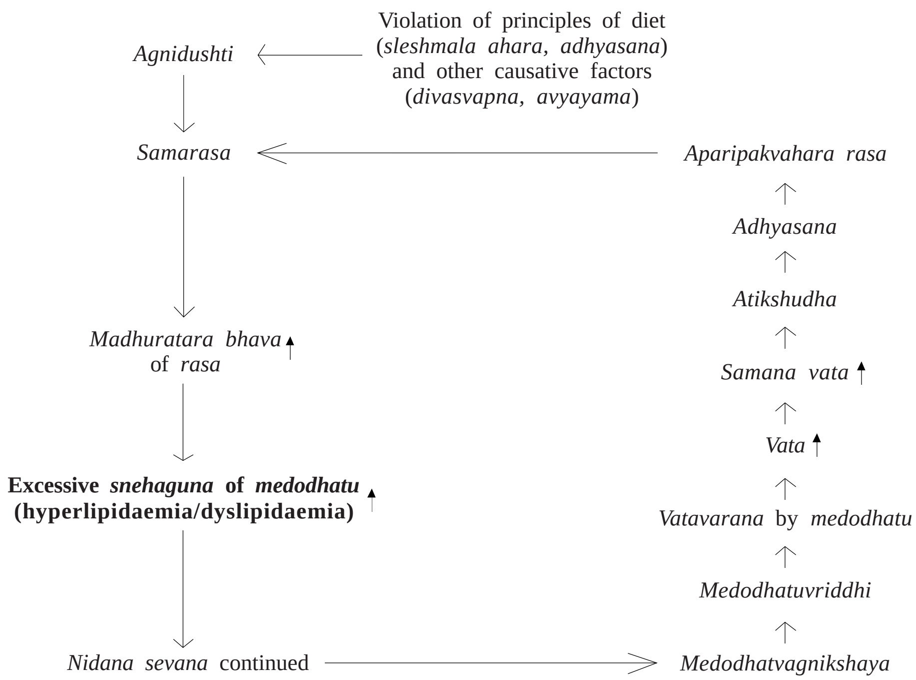
Statistical nomenclature	Control group (n=28)	*Lasuna* group (n=28)
Before treatment	284.4	246
After 12 weeks	272	198
Mean difference	12.4	48
S.D. (+)	82.7	122.72
S.E. (+)	15.6	23.19
t	0.79	2.06
p	>0.10	<0.01

decrease in the total cholesterol, LDL cholesterol and VLDL cholesterol in the *lasuna* group. The triglycerides decreased moderately but the HDL cholesterol level was not significantly altered. However, there was no appreciable change in any aspect of lipid profile in the control group.

The result may be attributed on the basis of various trials demonstrated that inhibitors of 3Hydroxy 3Methyl Glutaryl Co-enzyme A (HMG-COA) reductase inhibited the rate limiting step of cholesterol synthesis in the liver. This in turn decreased hepatic production of low-density lipoprotein and up regulated the regulation of hepatic LDL receptors, thus lowering concentrations of circulating LDL. The *lasuna kalka* might be targeting the key rate controlling enzyme for total cholesterol synthesis hence lowered the elevated plasma lipid profile level.

Review on aetio-pathogenesis of hyper-lipidaemia (*rasanimittaja sthaulya*), according to ayurveda, implicates that the roles of diet (*sleshmala ahara, adhyasana*) and lifestyle (*divasvapna, avyayama*) are the contributory factors. Such factors aggravate the *dosha*s vitiating the *rasa* (specific *dooshya*). In turn, increases the *madhuratarabhava* of

Schematic representation on aetiopathogenesis of *Rasanimittija sthaulya*



rasadhatu forms the *sama rasa* and spreads all over the body. Ultimately, *sama rasa* increases the excessive *sneha guna* (hyperlipidaemia / dyslipidaemia) of *meda*s. This in turn leads to *sthaulya* if the pathogenesis is not checked in time.

Lasuna is a proven drug with anti-hyperlipidaemic activity that may be attributed to its affects as increasing *rasa, medo dhatvagni* and *sroto sodhana* by means of its *katurasa, katuvipaka* and *ushnaveerya*. Because of these properties, this drug is useful in breakdown of pathological events (*samprapti vighatana*) thereby helping in reducing elevated lipid profile. In this study, *lasuna* was given together with dietary management which helps for *nidana parivarjana* hence preventing the initiation of further pathological sequence. In contrast, dietary control alone would not show any significant effect on lowering lipid levels because the measures are inadequate to breakdown the pathogenesis (*samprapti vighatana*) although sufficient to avoid the initiation for further pathological sequence by means of avoiding contributing dietary factors (*nidana parivarjana*).

Conclusion

From the study, it may be inferred that dietary management *(nidana parivarjana*) alone is not sufficient in bringing down the elevated serum lipid profile to normal level. Further, the results are promising when the dietary management is clubbed with *lasuna*. Hence, it may be concluded that *lasuna kalka* along with dietary management is superior in decreasing the elevated serum profile thereby reducing the incidences of potential risk of ischemic heart disease and thus its use as a primary line drug in the management of hyperlipidaemia was recommended.

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DIETARY AND OTHER RELATED PRACTICES DURING COMMON AILMENTS

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Abstract: In India, in spite of many spectacular advances in modern medicine, a large section of the population gets the benefits of native system of medicines. Health, religion and social traditions are inseparable in Indian way of life. In this paper, the authors attempt to make a comparative assessment among various systems of treatment and food practices for common ailments.

Introduction

One of the most challenging pursuits in the realm of pharmaceutical and medical sciences is the search for newer and more potent drugs with selective therapeutic properties and little toxic effects. In spite of many spectacular advances in modern medicine, a large section of population, especially in the developing countries, gets the benefits of a native system of medicine (Sankara and Subrahmanian, 1982). In India, apart from modern medicine there are many other systems of treatments such as ayurveda, homeopathy, *unani*, *tibbi*, naturopathy, *reiki* and accupressure, etc. Amongst them, ayurveda, which relies greatly on therapeutic value of foods, is the most ancient system. Although modern system of treatment is prevalent in India and a large part of healthcare budget is allocated to it, holistic approach to medicine is an integral part of Indian psyche. Health, religion and social traditions are inseparable in the Indian way of life.

Materials and method

A questionnaire was devised to assess the dietary practice and information sought including socio-economic data such as age, occupation, family income, type of family, etc. The second part of the questionnaire contained the system of treatment followed, the reason for choosing the treatment and the foods specially used during common ailments.

The study included 53 subjects from Bangalore urban, aged 20-50 years. The information collected was through personal interview method. The respondents were classified into two groups as <40 years (group – 1) and >40 years (group – 2) consisting of 36 and 17 subjects respectively. Among 53 respondents

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36 were students, 5 were housewives and 12 were employed (Table 1). Data was consolidated and analyzed according to standard procedures.

Results and discussion

Table 2 shows that most common type of therapy followed was allopathic (88% in both the groups). Fast recovery was the commonest reason stated for using allopathic medicine (75% and 82% in group I & II respectively), while ayurvedic system of treatment was chosen for reason such as "it has no side effects" and "it offers permanent cure". Similarly 36% of the subjects (<40 years group) followed home remedies because of easy availability and 23.5% of the subjects (>40 years age group) practiced home remedies because of reason such as "it has no side effects" and their strong belief in this form of therapy (Table 3). The type of therapy followed for different types of common ailments is depicted in Table 4 and the results are discussed as follows.

TABLE 2

Respondents following different type of therapies for common ailments

Type of therapy	No. of respondents	
	<40 yrs n (%)	>40 yrs n (%)
Allopathic	32 (88.8)	15 (88.2)
Ayurvedic	08 (22.2)	12 (70.5)
Homeopathic	-	2 (11.7)
Home remedies	24 (66.6)	15 (88.2)

Anemia and menstrual problems

For anemia, 47% (group I & II) of subjects used iron tablets. Special foods commonly consumed were green leafy vegetables followed by milk, fruits, egg, fish, jaggery, *ragi* and

TABLE 1

Background of respondents participated in the study

Details	Group I - (<40 yrs) n=36	Group II - (>40 yrs) n=17	Total n=53
OCCUPATION			
House wives	-	5	5
Employed	-	12	12
Students	36	-	36
FAMILY			
Joint	3	1	4
Nuclear	33	16	49
Monthly income:			
<5000/-	5	-	5
5000/- - 12000/-	18	6	24
>12000/-	13	11	24
EDUCATION			
High school	-	5	5
Graduate	18	7	25
Post-graduate / Professional	18	5	23

TABLE 3

Reason for following different type of therapies for common ailments

Ground	Allopathic		Ayurvedic		Home remedies	
	<40(I)n%	>40(II)n%	<40(I)n%	>40(II)n%	<40(I)n%	>40(II)n%
Fast recovery	27 (75)	14 (82.3)	-	-	-	-
Easily available	11 (30.5)	03 (17.6)	-	-	13 (36.1)	2 (11.76)
Safe	-	-	3 (8.3)	-	5 (13.9)	-
No side effects	-	-	8 (22.2)	1 (5.9)	7 (19.4)	4 (23.5)
Permanent cure	-	-	-	5 (29.4)	-	-
Less expensive	-	-	1 (2.7)	1 (5.9)	2 (5.55)	1 (5.88)
Belief/practice	-	-	-	4 (23.5)	-	4 (23.5)

mutton. Green leafy vegetables are rich sources of iron and the modern diet therapy recommends the use of green leafy vegetables. Ayurveda system of treatment also recommends the use of green leafy vegetables. This study reveal that people are aware of the nutritive value of green leafy vegetables. Menstrual problems are common among women belonging to the reproductive ages. Foods mentioned by the respondents were ginger, vegetables and fruits. In addition they prefer to consult allopathic doctors and take medicines as per the prescription.

Disturbances of gastro intestinal tract

For dyspepsia, majority of subjects belonging to group I preferred bland diet and group II preferred cumin seed water. The modern living style imposes lot of stress on almost all categories of people and as a result, acidity has become a very common problem. Majority of respondents have expressed bland diet as a remedial food (11% in group I and 29% in group II). Bland diet is one of the recommendations in ayurveda and as well as in modern diet therapy. Constipation is another ailment especially among children, pregnant ladies and old age people. Majority of ladies consume banana fruit during constipation as shown in the Table. For diarrhoea, 31% from group-I and 12% from group-II opt for allopathic system of treatment. The common special foods mentioned were fenugreek seed powder in buttermilk, followed by fruit juice, *ganji*, bread and biscuit, tender coconut water (highest in group II) arrowroot and pomegranate rind. People usually go for de-worming tablets for worm infestation (19% in group I & 23.5% in group II). The common special foods were raw papaya, neem water, *kodasga* (root), *ajvan* and sandal wood powder according to the preference. Among the special foods mentioned by the respondents *ajvan* and sandal wood powder were recommended in ayurveda system of treatment.

Upper respiratory infection

It is found that people who commonly prefer and use antibiotics of allopathy and *asava*s of ayurvedic systems to over come upper respiratory infections, also choose special foods. Around 23.5% subjects belonging to group II, had stated that they use pepper

TABLE 4

Type of therapy and special food followed for different types of common ailments

Ailment	ALLOPATHIC Types mentioned	ALLOPATHIC Group-I <40 yrs (%)	ALLOPATHIC Group-II >40 yrs (%)	AYURVEDIC Types mentioned	AYURVEDIC Group-I <40 yrs (%)	AYURVEDIC Group-II >40 yrs (%)	SPECIAL FOODS Types mentioned	SPECIAL FOODS Group-I <40 yrs (%)	SPECIAL FOODS Group-II >40 yrs (%)
Aneamia	Iron tablets	47.2	47.0	-	-	-	Green leafy	58.3	35.3
							Fruits	11.1	17.6
							Ragi	8.3	5.9
							Egg	-	11.8
							Fish	-	11.8
							Mutton	-	5.9
							Jaggery	8.3	11.8
							Milk	-	35.3
Dyspepsia	Eno	8.3	11.8	-	-		Bland diet	5.6	-
							Carbonated beverage	2.8	5.9
							Cumin-seed water	-	35.3
							Ginger	-	17.6
							Asafoetida+buttermilk	-	5.9
Acidity	Rantac	36.1	29.4	-	2.8	5.9	Bland diet	11.1	29.4
							Butter milk	8.3	-
							Cold milk	11.1	11.8
							Ginger	-	11.8
							Ajvan	-	5.9
Constipation	Not specified	8.3	5.9	*Triphala*	-	5.9	Cumin-seed water	-	5.9
							Banana	38.9	52.9
							Raw vegetable	8.3	11.8
							Lemon + hot water	2.8	23.5
Diarrhoea	Dependol/ Metroquin	30.6	11.8	-	-	-	Buttermilk + *methi*	22.2	23.5
							Fruit juice	16.6	11.8
							Arrowroot	2.8	23.5
							Pomagranate rind	2.8	17.6
							Tender coconut	5.6	29.4

Cont...

Table 4 Cont...

Ailment	ALLOPATHIC Types mentioned	ALLOPATHIC Group-I <40 yrs (%)	ALLOPATHIC Group-II >40 yrs (%)	AYURVEDIC Types mentioned	AYURVEDIC Group-I <40 yrs (%)	AYURVEDIC Group-II >40 yrs (%)	SPECIAL FOODS Types mentioned	SPECIAL FOODS Group-I <40 yrs (%)	SPECIAL FOODS Group-II >40 yrs (%)
Worm infestation	Deworming	19.4	23.5	-	-	-	Raw papaya	2.8	17.6
							Turmeric	2.8	-
							Ajvan	-	11.8
							Sandal powder	-	11.8
							Neem water	-	17.6
							Kodasga	-	5.9
Upper respiratory infection	Antibiotics	11.1	11.8	*Asavas*	-	17.6	Pepper milk	2.8	23.5
							Ginger	-	11.8
							Tulasi water	-	17.8
							Turmeric	-	11.8
							Coriander seed water	-	11.8
							Lime	-	5.9
							Onion	-	5.9
Jaundice	Not specified	2.8	5.9	-	-	-	Sugarcane juice	25.0	41.2
							Special green leafy	5.6	29.4
Diabetes	Not specified	19.4	5.9	-	-	11.8	*Ragi* ball	16.7	23.5
							Fenugreek powder	13.9	41.2
							Bitter gourd	13.9	41.2
Hypertension	Not specified	11.1	-	-	-	11.8	Salt-free diet	13.9	11.8
							Ragi ball	8.3	-
							Knol-khol	8.3	17.6
							Garlic	-	11.8
							Meditation	-	17.6
Menstrul problems	Prescribed medicine	5.6	-	Prescribed medicine	-	11.8	Vegetables+fruits	16.7	5.88
	Brufen	5.6	-				Ginger	-	11.8
	Pain killer	11.1	-				Homemade preparation	8.3	5.9

powder boiled in milk whereas 18% has mentioned that they consume *tulasi* leaves boiled in water.

Jaundice

During jaundice, respondents mainly used sugarcane juice, which is recommended in the science of ayurveda as well as in modern diet therapy.

Diabetes mellitus

Over 30 million people in India are suspected to have diabetes mellitus. The subjects in the study have stated the use of *ragi* balls, fenugreek seed powder and bitter gourd in their dietary regime. Fenugreek seed powder is mentioned along with high fibre diet in the modern diet therapy. The ancient ayurveda system also recommends the use of fenugreek powder as it has bitter principle.

Hypertension

Hypertension is a common disorder occurring among the middle and old age groups. The pre-disposing causes are heredity, obesity and stress of modern life. Salt-free diet and high fibre diets are prescribed to hypertensive patients. Accordingly, in the present study, the subjects have mentioned the use of salt-free diets, *ragi* balls, raw vegetables especially *knol-khol*, garlic and meditation.

In general, the results depict that subjects of more than 40 years age group were aware of various special foods and they were using them for different ailments compared to subjects below 40 years of age. It may be attributed to the fact that, elders of our society are more exposed and experienced in the usage of home remedies and they may be more prone to these ailments also (Jayadeva Yogendra, 1980). The above information has implications in diet counseling.

Conclusion

The study concludes that people in India strongly believe and practice not only allopathic but also other systems of treatments. The food choices and preferences during common ailments resemble the ancient ayurveda system and they also follow the modern dietary principles to a considerable extent. However, there is room for education of proper nutrition especially during ailments.

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IN-VITRO ANTIBACTERIAL EVALUATION OF *BALANITES AEGYPTIACA* AND *MUSA PARADISIACA* EXTRACTS

S.R. Rajurkar and V.P. Vadlamudi*

Abstract: The use of antibiotics as therapeutic agent amplifies the problem of resistance of pathogenic bacteria. This paper assess the antibacterial properties of the extracts *Balanites aegyptiaca* and *Musa paradisiaca* by disc diffusion and tube dilution methods against the common pathogenic organisms viz. *Escherichia coli*, *Staphylococcus aureus* and *Salmonella gallinarum.*

Introduction

The widespread and indiscriminate use of antibiotics as therapeutic and prophylactic agents has increased the problem of resistance of pathogenic bacteria. This has necessitated the use of modern broad-spectrum antibiotics at exorbitant cost. Accordingly, the search for effective and economically viable alternatives to expensive antibiotics is being pursued. The voluminous literature on Indian Medicinal Plants illustrates the antibacterial values and utility of herbs in the treatment of a variety of infectious diseases (Kirtikar and Basu, 1935; Nadkarni, 1954; Chopra et al, 1956; Sarwant, 1974; Ogale, 1986; Deshpande et al, 1989). This investigation includes *in-vitro* evaluation of stem extract of *Balanites aegyptiaca* and fruit-skin extract of *Musa paradisiaca* for antibacterial activity against some common pathogenic bacteria.

Materials and methods

Freshly collected stem of *Balanites aegyptiaca* and fruit-skin of *Musa paradisiaca* were ground into a paste. The paste (100 gm) macerated in one litre distilled water, ethyl acetate, methanol and chloroform separately. The contents were filtered after 48 hours first through cloth followed by Whatman No. 1 filter paper and the filtrates so obtained were placed in evaporating dishes and air dried for evaporation. After evaporation, the residues/extract were taken in airtight screw-cap vials.

The pathogenic bacterial isolates *Escherichia coli*, *Staphylococcus aureus* and *Salmonella gallinarum* were obtained from the Disease Investigation Section, State Department of Animal Husbandry, Pune. The organisms were sub-cultured in nutrient agar and maintained at $4^{o}C$ for antibacterial screening of the extracts. The antibacterial activity of the extracts was

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assessed by using disc diffusion and tube dilution tests as per the method suggested by Cruickshank (1975).

The sensitivity discs of 6.5 mm diameter punched from a blotting paper and sterilized by dry heat (at 100°C) were stored in sterile screw-cap vials and impregnated with the extracts. The 24 hours old cultures in nutrient broth were diluted to 10^{-3} in broth. Drug sensitivity test was conducted using the earlier prepared discs of the four solvent extracts as per the method of Cruickshank (1975). All the plates were incubated at 37°C for 24 hours. The plates then removed to assess the antibacterial pattern of the four extracts and the zones of inhibition were measured.

To 3ml nutrient broth, cultures of 24 hours' old was added and incubated for four hours at 37°C and diluted further up to 19^{-5}. Different dilutions (10^{-3} to 10^{-5}) were made and to each dilution, triplicates of each one of the extracts of both the herbs added and incubated for 24 hours. The bacterial growth observed by plating the broth cultures on nutrient agar plates and 10^{-5} dilution was standardised for final observation. The cultures so diluted in triplicate, added with two discs of each solvent extract and incubated at 37°C overnight, were poured on nutrient agar plate. The excess broth was discarded after soaking for 3 minutes, and after 24 hours' incubation the colony counts were recorded.

Results and discussion

The antibacterial assay was graded based on the zone of inhibition around the disc. All the three extracts of *Balanites aegyptiaca* failed to produce antibacterial activity against any of the three bacteria in disc diffusion technique. However, the ethyl acetate, methanol and chloroform extract of *Musa paradisiaca* showed moderate zones of inhibition (++) against *Staphylococcus aureus* (Table 1). All the four extracts of the stem of *Balanites aegyptiaca* had no effect on the colony counts of any of the three bacteria. The aqueous extract of *Musa paradisiaca* was found to be ineffective against any of the three organisms.

The mean colony counts of bacteria following tube dilution technique are detailed in Table 2 and 3. All the four extracts of *Balanites*

TABLE 1

Antibacterial activity of extracts by disc diffusion method

Extracts	*E.c.*	*S.g.*	*S.a.*
Balanites aegyptiaca			
Aqueous	R	R	R
Ethylacetate	R	R	R
Methanol	R	R	R
Chloroform	R	R	R
Musa paradisiaca			
Aqueous	R	R	R
Ethylacetate	R	R	++
Methanol	R	R	++
Chloroform	R	R	++

E.c. Escherichia coli; *S.g. Salmonella gallinarum*; *S.a. Staphylococcus aureus*; *R. Replication*

TABLE 2

Antibacterial pattern of *Balanites aegyptiaca* extracts by tube dilution method

	Mean colony count + S.E.		
Extracts	*E.c.*	*S.g.*	*S.a.*
Control (nil)	244.67 + 25.52	244.67 + 25.52	244.67 + 25.52
Aqueous	229.00 + 26.59	225.33 + 17.31	249.33 + 12.43
Ethylacetate	237.00 + 19.38	216.67 + 13.69	236.00 + 16.23
Methanol	239.67 + 14.21	240.33 + 15.68	208.33 + 21.02
Chloroform	245.00 + 18.38	226.67 + 24.98	236.67 + 14.88

TABLE 3

Antibacterial pattern of *Musa paradisiaca* extracts by tube dilution method

Extracts	Mean colony count + S.E.		
	E.c.	*S.g.*	*S.a.*
Control (nil)	224.33 + 28.06	212.67 + 30.79	257.00 + 17.01
Aqueous	236.33 + 13.94	216.33 + 12.57	224.67 + 18.20
Ethyl acetate	263.67 + 4.75	247.67 + 20.07	74.67 + 5.98
Methanol	209.67 + 4.75	238.00 + 12.24	52.67 + 12.10
Chloroform	226.00 + 15.79	249.00 + 13.46	71.33 + 5.94

E.c. Escherichia coli; *S.g. Salmonella gallinarum*; *S.a. Staphylococcus aureus.*

aegyptiaca had no effect on the colony counts of any of the three bacteria. The ethyl acetate, methanol and chloroform extract of *Musa paradisiaca* moderately inhibited the growth and multiplication of *Staphylococcus aureus* compared to the aqueous extract where the colony counts were similar to that of untreated control.

The aqueous extract observed ineffective in inhibiting the growth of *Staphylococcus aureus*, whereas ethyl acetate, methanol and chloroform extracts significantly inhibits the growth. The mean colony was observed to be 74.67 + 5.98, 52.67 + 12.10 and 71.33 + 5.94 in ethyl acetate, methanol and chloroform extracts respectively as compared to that of control group.

Since the number of replications in the study were limited, it may not be appropriate to draw final conclusion on sensitivity of each bacterial culture to the compound tested.

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STUDIES ON *TRAGIA INVOLUCRATA* LINN.

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Abstract: *Tragia involucrata* Linn. (Family - Euphorbiaceae) is traditionally used as indigenous drug in ayurveda, siddha and other folklore medicines. This paper deals with pharmacogonostic study of the leaves and root of *Tragia involucrata* and its various medicinal uses in the indigenous system of medicine.

Introduction

Tragia involucrata Linn. is a perennial, evergreen twiner, more or less hispid herb with scattered stinging hairs found in dry places throughout India ascending up to 750 m from Punjab and lower Himalaya of Kumaon, eastwards to Assam and Burma, southwards to Travancore and Ceylon[1-4]. The plant is also found in N. Circars, Deccan, Carnatic, the Western Ghats and Kerala[5]. The plant is known as *duralabha* in Sanskrit.

The root of *Tragia involucrata* is popular for various medicinal uses in the indigenous system of medicine. The roots are bitter, acrid, sweet, cooling, diuretic, diaphoretic, antiperiodic, depurative and alterant. They are useful in pruritic skin eruptions, venereal diseases, haemorrhoids, gastropathy, guinea worms, blood impurities, dipsia, vomiting, giddiness, vitiated conditions of *pitta*, melalgia and brachialgia[3]. An infusion of the roots is given in ardent fever and infection of the skin. The root is also given when the extremities are cold during fever; also for pain in legs and arms. The root also forms the basis of an external application in leprosy[1,2,7]. The root is also used in old venereal complaints and as a blood purifier[4]. The leaves are also reported to be used for headache[1,2] and are good for cephalagia[3]. Jain et al. reported that the hot water extract of the leaves is used orally to treat male impotency and labour troubles by *santals* in India[8].

The root system forms the official part in ayurveda[9]. The important formulations using this drug are *Duralabharishtam*, *Dasamula-rishtam*, *Rasnadi kashayam*, etc. The drug is also found to be used in siddha system of medicine in preparations like *Cirukancnri ver*[6].

Materials and methods

The leaves and roots were collected from young matured plants from Salipur, in early summer and authenticated. A herbarium of the plant is preserved in the Institute of Pharmacy and Technology, Salipur for further reference. The

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collected plant materials were washed under running tap water followed by rinsing with distilled water, dried in shade and powdered. For the macroscopial and microscopial studies, fresh plant materials were collected as and when required. All the chemicals used were of analytical grade obtained from M/s Thomas Baker, Mumbai, SD Fine Chem Ltd., Mumbai, Qualigens Fine Chemicals, Mumbai, and Bengal Chemicals and Pharmaceuticals Ltd. Kolkata.

The macroscopic and microscopic characteristics of the leaves and roots were observed[10]. The ash values, ethanol soluble and water soluble extractive values were determined as per Indian Pharmacopoeial methods[11]. The behaviour of the powdered roots and leaves with different chemical reagents were observed under daylight and ultraviolet light separately at short and long wavelengths[12]. The dried root powder was successively extracted by soxhlet extraction apparatus with various solvents with increasing order of polarity viz. petroleum ether (60-80^{o}C), chloroform, ethyl acetate, methanol and water. The dried extractives were obtained after evaporation of the solvents under reduced pressure. The colour, consistency and extractive values of the extracts were studied. The fluorescence characteristics of all liquid extracts were studied under ultraviolet light at different wavelengths. Preliminary phytochemical tests of different extracts were performed by using specific reagents through standard procedures[13,14]. The leaf constants were studied and the trichomes measured[13].

Results and discussion

The transverse section of the leaf and root was studied separately. The macroscopic characters reported are as follows:

Root

Colour - grey; length - 4.5 cm to 28.5 cm; width - 0.1 cm to 1.8 cm; condition - fresh; shape - cylindrical, tortuous; branching - tap root branching; rootlets - present, of true kind, thick and wiry. Rootlets are scattered profusely in the soil around the main root; direction of growth - vertical (positively geographic); surface characters – lenticles; textures - fibrous; fracture - fibrous; odour - pungent; taste – pungent.

Leaves

Colour - green; length - 2.5 cm to 11.0 cm; width - 1.5 cm to 6.0 cm; condition - fresh; venation - acuminate; margin - serate; apex - acute; base - broadly ovate; surface - hairy; texture - glabrous; petiole -1.8 cm to 5 cm; phyllotaxy - solitary petiolate; odour - characteristic leafy odour.

T.S. of leaf

Upper and lower epidermis consists of wavy walled compactly arranged cells covered by thin cuticle. Rubiaceous or parallel celled stomata are seen on both lower and upper epidermis. Numerous non-lignified, uniseriate covering trichomes are seen on both surfaces. Lamina region is differentiated into palisade and spongy parenchyma. Transverse section of the mesophyll shows it is a dorsiventral leaf and consists of two layers of elongated upper palisade parenchyma arranged below the upper epidermis without intercellular space. The tissue which is present below this is made up of isodiametric spongy parenchyma arranged with intercellular space in 3-5 rows. Midrib continuation of both upper and lower epidermis is seen. However, there is a discontinuous of palisade cells, which is substituted by thick walled collenchymatous cells. The collenchymatous cells are also present above lower epidermis and give support to the midrib region. In the vascular bundle, the xylem vessels are surrounded by the phloem fibres. Above the vascular bundle and below the upper epidermis, a group of lignified tissues are seen. (Fig 1).

Root

T.S. of a young plant root

Epiblema is single layer of thin walled cells. Outer walls of most of these cells extend outwards and form unicellular root hairs. Cortex consists of many layers of thin walled rounded cells with numerous intracellular spaces among them. Endodermis is a single circular layer of small thin walled barrel shaped cells which are closely packed without intercellular space. Pericycle lies internal to the endodermis and is single layered thin walled cells. Conjuctive tissues are prenchymatous cells lying in between the xylem and phloem bundles. Pith occupies only a small area in the center of the

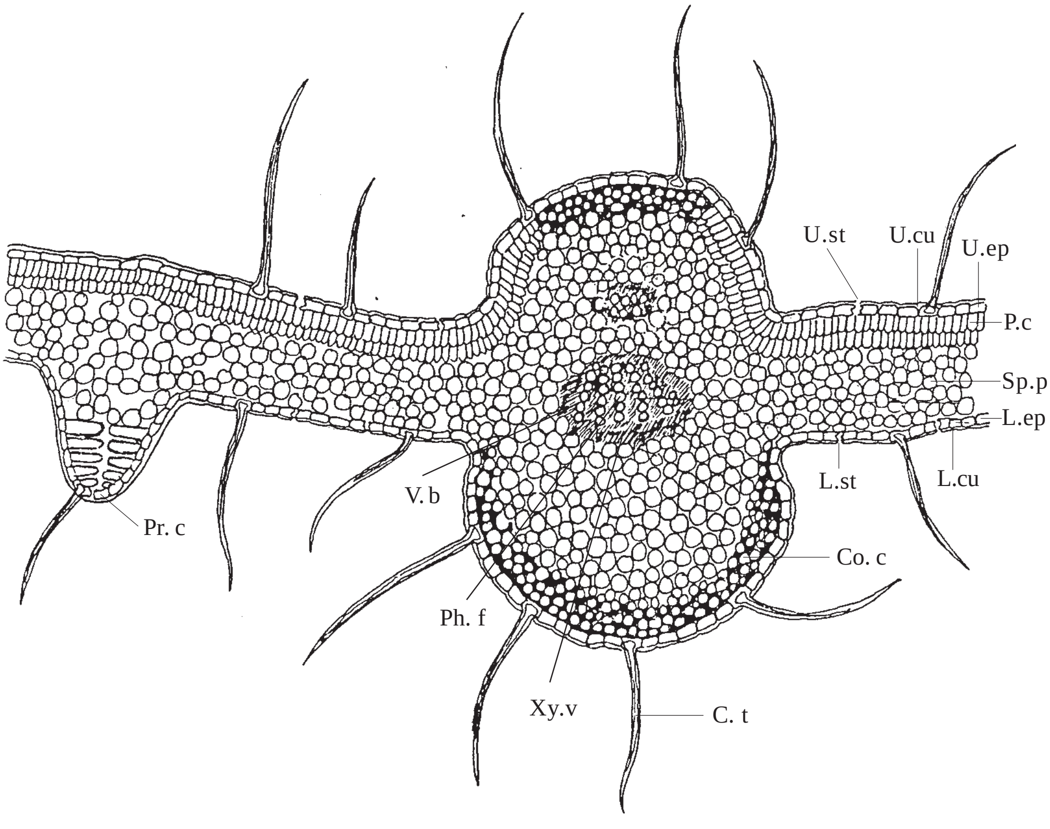

Fig. I. *Tragia involucrata* Linn. - T.S. of leaf

U.st Upper stomata; **U.cu** Upper cutcle; **U.ep** Upper epidermis; **P.c** Palisade cells; **Sp.p** Spongy Parenchymatous; **L.ep** Lower epidermis; **L.cu** Lower cuticle; **L.st** Lower stomata; **Co.c** Collenchymatous cells; **C.t** Covering trichomes; **Xy. v** Xylem vessels; **Ph. f** Phloem fibres; **V. b** Vascular bundles; **Pr. c** Primary collenchymatous cells root. Xylem consists of protoxylem which lies towards periphery and metaxylem towards the center. Protoxylem is composed of small vessels (annular and spiral) and metaxylem of bigger vessels (reticulate and pitted). Pholem consists of sieve tubes, companion cells and phloem parenchyma. The primary phloem contains vessels. (Fig II A)

T.S. of a matured plant root

Cork is stratified with about 1 to 7 layers of unlignified cells and phellogen is indistinct. Phelloderm is 8 to 10 rows of tangentially elongated to isodiametric paranchymatous cells. Unlignified cells containing sieve tubes, companion cells and phloem parenchyma. Tannin cells are present at the periphery of the phloem region. Medullary rays run radically from the centre to the cortex through the phloem, 1 to 6 lignified cells in width, narrow in the xylem region and wider in the phloem region. Vessels are thick, yellow, pitted or reticulately thickened walls. Xylem fibres are lignified and xylem parenchyma moderately thick, lignified and pitted walls. Pith is absent. (Fig. II B)

Physical constant values include total ash, acid insoluble ash, water soluble ash and sulphated ash are reported in Table 1. The water soluble and ethanol soluble extractive values are reported in Table 2. The water soluble extractive was found to be more than ethanol soluble extractive.

TABLE - 1

Ash-values

Type of ash	Percentage (w/w)	
	Roots	Leaves
Total ash	9.73	9.63
Acid insoluble ash	2.73	3.7
Water soluble ash	2.23	3.3
Sulphated ash	12.16	11.4

TABLE - 2

Extractive values

Type of extractive	Percentage (w/w)	
	Roots	Leaves
Water soluble	4.08	3.4
Ethanol soluble	2.16	2.5

The behaviour of the powered roots and leaves upon treatment with different chemical reagent was observed separately under day light and ultraviolet light and the change in colour was noted and tabulated (Table 3&4). The colour, consistency and extractive values of the roots after successive extraction are reported in Table 5. The aqueous extract shows maximum extractive value and the ethyl acetate extract shows the minimum. The results of the preliminary phytochemical tests of different extracts of the root shows presence of alkaloids, steroids, flavonoids, saponins, tannins, proteins and reducing sugars in the root (Table 6). The fluorescence characteristics of different liquid extracts shows no fluorescence in any of the extracts under either day light or ultraviolet light, thereby confirming to absence of any fluorescent compound in the extracts under study (Table 7). The various leaf constants are reported in Table 8; and length (78$^{.00}$m – 456.71$^{.00}$m – 1404 $^{.00}$m) and width (13$^{.00}$m – 41.77$^{.00}$m – 78$^{.00}$m) of leaf chromosomes were identified.

Conclusion

The plant *Tragia involucrata* Linn. finds its application in ayurveda, siddha and other traditional systems of medicine. The macroscopial and microscopial findings will help the future investigators for proper identification of the plant and also enable pharmacognostical standardization of the plant material.

TABLE - 3

Behaviour of powdered roots on treatment with different reagents

Reagents	Colour		
	Day light	Short uv	Long uv
Saturated picric acid solution	Yellow	Pale green	Dark green
Nitric acid (sp.gravity 1.42)	Pale yellow	Pale green	Dark green
Hydrochloric acid (sp.gravity 1.16)	Pale yellow	Pale green	Pale brown
Sulphuric acid (80%)	Black	Blue	Black
Glacial acetic acid	Grey	Pale green	Grey
Sodium hydroxide (5N aq.solution)	Pale yellow	Pale green	Pale green
Iodine (N/20 aqueous solution)	Yellowish black	Greenish black	Black
Ferric chloride solution (5% w/v aq. solution)	Grey	Bluish black	Black
Powder as such	Grey	Pale green	Buff

TABLE - 4

Behaviour of powdered leaves on treatment with different reagents

Reagents	Colour		
	Day light	Short uv	Long uv
Saturated picric acid solution	Green	Pale yellow	Yellow
Nitric acid (sp.gravity 1.42)	Greenish yellow	Pale green	Green
Hydrochloric acid (sp.gravity 1.16)	Greenish yellow	Pale green	Green
Sulphuric acid (80%)	Brown	Blue	Brown
Glacial acetic acid	Green	Pale green	Green
Sodium hydroxide (5N aq.solution)	Yellowish green	Pale green	Green
Iodine (N/20 aqueous solution)	Bluish green	Bluish black	Blue
Ferric chloride solution (5% w/v aq. solution)	Green	Green	Green
Powder as such	Green	Green	Green

TABLE - 5

Colour, consistency and extractive values of the root upon successive extraction

Solvent	% of extractive (w/w)	Colour	Consistency
Petroleum ether (60-80^{o}C)	1.417	Yellowish green	Greasy
Chloroform	1.482	Deep brown	Greasy
Ethyl acetate	0.72	Yellowish brown	Greasy
Methanol	3.248	Reddish brown	Greasy
Water	4.251	Deep brown	Sticky

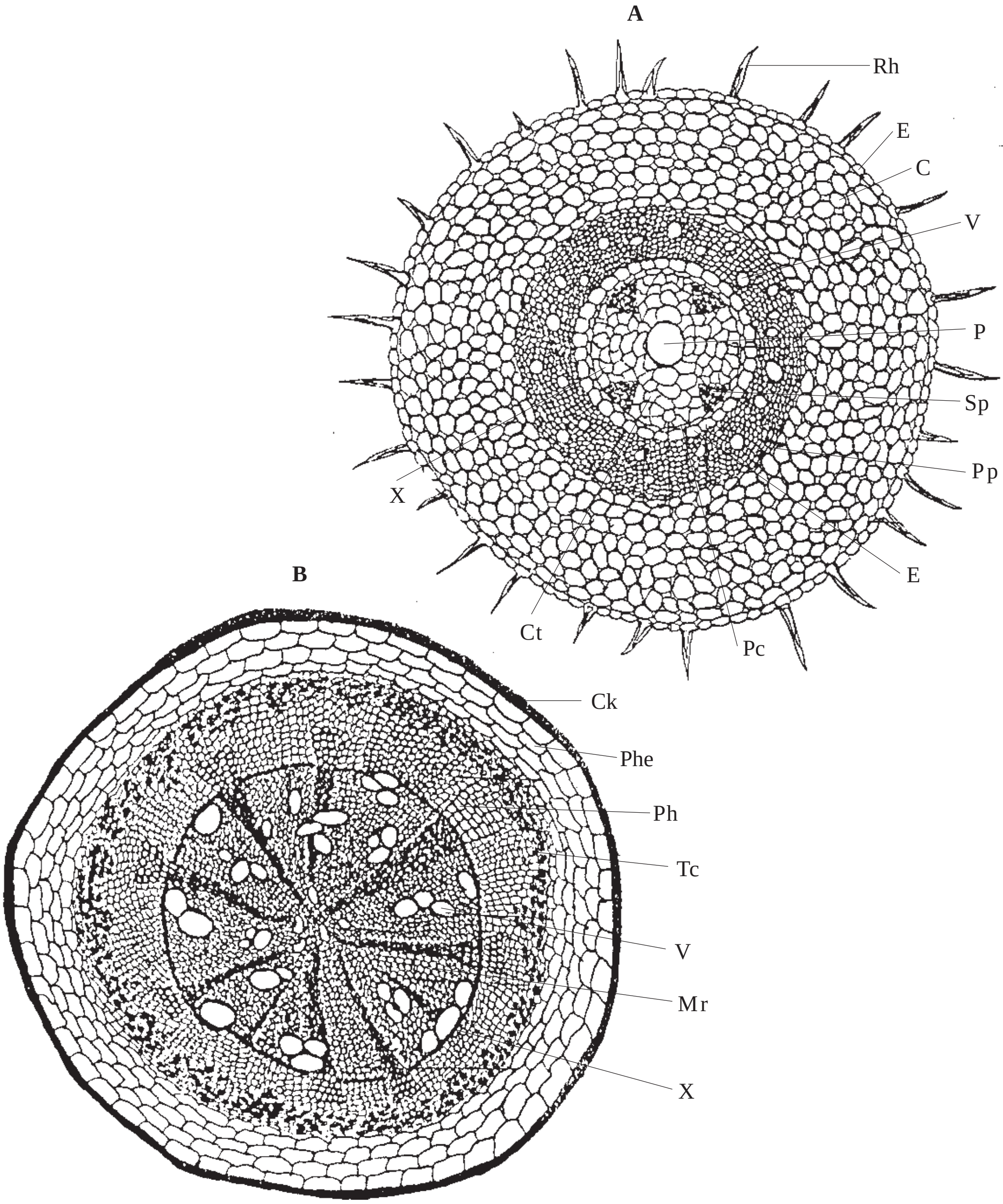

Fig. II. **A**-**B** *Tragia involucrata* Linn. - **A** T.S. of young plant root; **B** T.S. of matured plant root

Rh Root hair; **E** Epiblema; **C** Cortex; **V** Vessels; **P** Pith; **Sp** Secondary phloem; **Pp** Primary phloem; **E** Endodermis; **Pc** Pericycle; **Ct** Conjuctive tissue; **X** Xylem; **Ck** Cork; **Phe** Phelloderm; **Ph** Pholem; **Tc** Tannin cells; **Mr** Medullary rays

TABLE - 6

Preliminary photochemical tests for presence of phytoconstitutents in the roots

Extract	Alkaloid	Reducing sugar	Tannin	Protein	Flavonoid	Steriod	Saponins	Anthra-quinone
Petroleum ether (60-80°C)	-	-	-	-	-	+	-	-
Chloroform	+	-	-	-	-	+	-	-
Ethyl acetate	+	-	-	-	-	-	-	-
Methanol	-	+	+	-	+	-	+	-
Water	-	+	+	+	+	-	+	-

+ present, - absent

TABLE - 7

Fluorescene characteristics of liquid extracts of root under ultraviolet light

Reagents	COLOUR		
	Day light	Short uv	Long uv
Petroleum ether (60-80°C)	Yellowish green	Greenish yellow	White
Chloroform	Pale green	Greenish yellow	White
Ethyl acetate	Pale yellow	Greenish yellow	White
Methanol	Brownish yellow	Greenish yellow	White
Water	Deep Brown	Green	Greenish white

TABLE - 8

Leaf constants

Sl. No	Leaf constants	VALUE		
		Upper epidermis	Lower epidermis	
1.	Stomatal number	92.0	208.33	
2.	Stomatal index	11.23	26.18	
3.	Vein islet number			7.0
4.	Veinlet termination number.			16.0
5.	Palisade ratio			9.67

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INVESTIGATIONS ON BIOACTIVE COMPOUNDS OF *PREMNA INTEGRIFOLIA* LINN.

K.V. George, K. A. Samuel, J. Abraham and B. P. George

Abstract: *Premna integrifolia* Linn. is an important medicinal plant having potential curative properties. Investigation reveals that its leaves are rich in phytochemicals like steroids, flavonoids and alkaloids. In this paper, an attempt has been made by the authors to isolate and characterise the bioactive compounds of the leaf extract of the plant.

Introduction

Premna integrifolia Linn. (*Premna serratifolia* Linn.) belongs to the family Verbenaceae. Almost all parts of the plant i.e. root, leaf and bark have tremendous medicinal value. The roots are astringent, sweet, thermogenic and anti-inflammatory, cardiotonic, digestive, stomachic, carminative, anti-bacterial and tonic. They are used in vitiated conditions of *vata* and *kapha*, neuralgia, inflammations, cardiac disorders, cough, asthma, bronchitis, leprosy, skin disorders, dyspepsia, flatulence, constipation, fever, diabetes and anorexia (Sudo et al, 2000). As reported by Chopra (1969), the bark juice is used as powerful anti-malarial agent. It is also reported that stem bark contains alkaloid *premnine*, which decreases forces of contraction of hearts and produces dilation of pupils (Chopra et al, 1956). Indigenously, the leaves along with pepper are administered in the treatment of cold and fever.

Premna integrifolia Linn. locally known as *munna*, has a prominent place in ayurveda. Its root extract is an active ingredient of many ayurvedic preparations like *arishtam*, *avaleham*, *kvatham*, *ghritam* and *tailam*.

The objectives of the study are to isolate the chemical compounds present in the leaves using solvent extraction followed by TLC and to characterise the chemical compounds by UV spectroscopy.

Materials and methods

The leaves collected from Kumarakom, in Kottayam district of Kerala were cleaned well in tap water and dried in shade. The powdered leaf was used for the extraction of bioactive compounds.

About 20 g of dried leaf sample was extracted with 200 ml of petroleum ether (60-80^{o}C) for 48 hours in a soxhlet extraction unit. This extract was concentrated under vacuum and a portion

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used for detection of triterpenoids and steroids. Libermann-Buchard test was conducted for the detection of steroids. The standard separation procedure (TLC) developed by Harborne (1973) was employed for further separation of remaining part of the petroleum ether fraction. The solvent used was benzene-ethyl acetate (9:1). The separation carried out in standard sized plates (20x20 cm) and the plates after run were dried and sprayed with concentrated H_2SO_4 and heated to 100°C for 30 minutes. The spots after heating were studied. 1% $KMNO_4$ and 1% $FeCl_3$ in methanol were also used as other detection reagents. Three replications were used and the R_f values calculated.

The petroleum ether extraction was followed by further extraction in 70% ethanol and the concentrated extract analysed by two-dimensional paper chromatography followed by TLC. The paper chromatographic techniques developed by Mabry et al (1970) and Markham (1982) using solvent system (n – Butanol: Acetic acid: Water – 4:1:5 and 5% acetic acid) was employed for this purpose. The chromatograms were dried and observed under long UV light (360 nm) both before and after exposure to ammonia vapour. The R_f values were calculated as the mean of three replications. The solvent used for TLC was Benzene:Ethyl acetate (9:1). The plates were developed in iodine chamber. The leaf material extracted with 70% ethanol was also tested for the presence of falvonoid compounds.

For the separation of alkaloids, 10 g of powered leaf was extracted with 10% ammoniacal ethanol for 48 hr. The extract was filtered and concentrated. To the resultant extract, 25 ml of 0.1 N H_2SO_4 was added. Then the extract was basified with sodium hydroxide and further extracted with chloroform in a separating funnel. The concentrated extract then tested for the presence of alkaloids using alkaloidal reagents.

The compounds separated by TLC of both petroleum ether and ethanolic fractions were scraped out and dissolved in spectroscopic methanol and subjected to spectral analysis. The spectra of these compounds were recorded in Shimadzu UV – 160 A spectrophotometer.

Observations and results

A total of five spots were observed in TLC of petroleum ether extract. The R_f values and the UV spectral details are detailed in Tables 1&2.

TABLE 1

TLC analysis of petroleum ether fraction

Sl. No.	Compounds seperated from Petroleum ether (triterpenoids/steriods)	R_f Values (cms)
1.	Fraction J - Compound I	0.32
2.	Fraction K - Compound II	0.41
3.	Fraction L - Compound III	0.23
4.	Fraction M - Compound IV	0.51
5.	Fraction N - Compound V	0.79

A portion of the petroleum ether extract was tested with Libermann-Burchard reagent to confirm the presence of steroidal compounds present in it. A play of colours observed ranging from yellow, green, brown to black indicated the presence of steroids. Similarly, 70% ethanolic extract was subjected to confirmatory tests of flavonoids (Table 3). When the ethanolic extract was subjected to two-dimensional paper chromatography, four major spots were obtained with R_f values (Table 4a). In TLC analysis also four spots

TABLE 2

Spectral details of compounds separated from petroleum ether by TLC

Sl.No.	Compounds separated	2)21$_{max}$ in Methanol (nm)	Absorbance
1.	Fraction J - Compound I	260, 330, 410, 470, 500, 670.	1.669, 1.057, 2.727, 0.422, 0.187, 0.932.
2	Fraction K - Compound II	200, 220, 250, 290, 330, 400, 470, 490, 670.	1.632, 1.988, 1.989, 1.315, 0.663, 1.706, 0.437, 0.289, 0.316.
3.	Fraction L - Compound III	200, 220, 250, 290, 490.	1.673, 2.686, 1.957, 1.197, 0.387.
4.	Fraction M - Compound IV	200, 220, 250, 330, 440, 480, 690.	1.643, 1.978, 1.767, 0.172, 0.520, 0.349, 0.642.
5.	Fraction N - Compound V	190, 210, 240, 410, 430, 470, 600.	1.676, 2.192, 1.983, 0.408, 1.222, 0.460, 0.416.

TABLE 3

Test for the detection of flavonoid in ethanolic fraction

Sl. No.	Test solution	Reagents used	Observation	Inference
1.	Ethanolic Extract	Ammonia	Colour of the test solution is diminished	Presence of flavonoids
2.	-do-	Few Crystals of F_eCl_2	Presence of green colour	-do-
3.	-do-	Na OH+HCl	Colour is intensified when NaOH is added which disappears with the addition of HCI	-do-

were observed with R_f values (Table 4b). The details of the UV spectral analysis of these compounds are presented in Table 5.

The alkaloidal sample extracted from 10% ammoniacal ethanol, finally extracted in chloroform was subjected to various confirmatory tests using various alkaloidal reagents (Table 6).

Discussion

Phytochemical investigations of the leaves revealed that the plant is rich in many bioactive compounds viz., steroids, flavonoids and alkaloids. Five major compounds from the petroleum ether fraction and four major compounds from ethanolic fraction were identified with characteristic R_f and 2)21$_{max}$. The characteristic peaks above and around 300 and 400 nm suggest the probable presence of carbonyl group, aromatic ring, other chromophores and conjugation of double bonds. Hence, the compounds identified must have the chemical characteristics of one or more of the above-mentioned moieties. Steroidal

TABLE 4a

Paper Chromatographic analysis (two-dimentional) of ethannolic fraction

Compounds seperated	R_f Values (cm)
Compound A	0.787
Compound B	0.848
Compound C	0.424
Compound D	0.666

TABLE 4b

Details of TLC analysis of ethanolic fraction

	Compounds separated from Ethanol	R_f Values (cm)
1.	Fraction E - Compound VI	0.37
2.	Fraction F - Compound VII	0.77
3.	Fraction G - Compound VIII	0.51
4.	Fraction I - Compound IX	0.89

detection test revealed that the leaves are rich source of steroid compounds. In a study conducted by Rastogi and Mehrotra (1991), □ -sitosterol and betulin were isolated from the leaves and stem bark of *Premna integrifolia* Linn. Besides, its leaves were also found to be rich in alkaloids. In 70% alcoholic extract of its leaves, flavonoids were also detected.

A novel diterpenes (5R, 8R, 9S, 10R) – 12-oxo-ent-3, 13(16)-clerodien-15-oic acid has been isolated from the leaves of *Premna schimperi* by Habtemariam et al (1990), using an antimicrobial bioassay guided isolation procedure. This compound is found to be active against bacteria *Staphylococcus aureus* and *Bacillus subtilius* in the concentration range 20-25 microgram ml 1^{-1}.

In a Chinese study, conducted by Wei et al (1990) on the stem of *Premna crassa*, four major chemical constituents viz., friedelin, epifriedelenol, steric acid and □-sitosterol were identified. A novel sesquiterpene 7 alpha hydroxy – 6,11 – cyclo – farnes – 3 (15) – en – 2 (1), has been isolated from the aerial parts of *Premna oligotricha* (Habtemariam et al 1993). In another study, Sudo et al (2000) isolated six major compounds from the leaves of *Premna subscandens*. Habemariam, Gray and Waterman (1992) isolated antibacterial diterpenes from the aerial parts of *Premna oligotrihca*. Habtemariam (1995) also studied the cytotoxicity of diterpenes from *Premna schimperi* and *Premna oligotricha* using MTT assay. In another study conducted by Sudo et al (1999) the n-butanol soluble fraction of methanol extract of the leaves of *Premna subscandens* exhibited promotion of collagen network formation by M-cells. Narayanan et al

TABLE 5

Spectral details of compounds separated by TLC from ethanolic fraction

Sl.No.	Compounds separated	2)21$_{max}$ in Methanol (nm)	Absorbance
1.	Fraction E - Compound VI	200, 220, 250, 290	1.677, 3.298, 3.962, 2.462
2	Fraction F - Compound VII	200, 220, 250, 290, 310, 400.	1.797, 3.251, 2.369, 1.239, 0.327, 0.423.
3.	Fraction G - Compound VIII	200, 240, 300, 430	4.185, 3.253, 3.093, 1.416
4.	Fraction I - Compound IX	190, 220, 260, 280, 330, 420, 450, 480.	2.383, 3.096, 1.927, 1.168 0.228, 0.519, 0.570, 0.464

TABLE 6

Qualitative tests for the detection of alkaloids

Sl. No.	Test solution	Reagents used	Observation	Inference
1.	Chloroform fraction	Dragendroff's reagent	Red ppt	Presence of alkaloids
2.	-do-	Mayer's reagent	White ppt	-do-
3.	-do-	Wagner's reagent	Brown crystalline ppt	-do-
4.	-do-	Marme's reagent	Blue green ppt	-do-

(2000) investigated the antipyretic, antinociceptive and anti-inflammatory activity of *Premna herbacea* roots in animal models.

Conclusion

The study has brought to light the fact that *Premna integrifolia* Linn. is rich source of many bioactive compounds. About ten bioactive compounds were extracted from this plant. Qualitative detection tests revealed that the leaves of this plant are rich in steroids, flavonoids and alkaloids. It is believed that many of the curative properties attributed to this plant may be due to the presence of these phytochemicals. Further studies are needed to pinpoint the pharmacological action of these phytoactive compounds in animal models.

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EXCERPTS FROM CHIKITSAMANJARI – XLI

Unnikrishnan, P.*

Abstract: In this issue, an elaborate description regarding the treatment of *kamila* is mentioned. Famous preparations like *Kalyanakaghrita, Dasasvarasaghrita,* etc. are also mentioned.

TREATMENT OF *KAMILA*

When a person suffering from *pandu* consumes food that excessively vitiates *pitta* and indulges in activities that result in destabilization of *pitta*, causes *kamila*. *Pitta* present in the gut, due to this vitiation, burns the skin and muscles, giving rise to symptoms such as yellow colour of urine, sclera, skin, nails, mouth and feces. Characteristic features of the disease are generalized burning, thirst, insufficient digestion, debility and emaciation to the whole body with enlarged abdomen, which looks like that of a frog. *Kamila* may precipitate even in the absence of *pandu* if the patient of *pitta* constitution (nature) goes on consuming foodstuffs rich in *pitta* that, in turn, are capable of denaturing normal *pitta*. If this condition is not properly attended to and treatment not initiated, a graver condition termed *kumbhakamala* may supervene.

The initial treatment of *kamila* is aimed to soothe the vitiated *pitta* and to restore it to normal functioning. However, in the second stage, drugs that reduce *kapha* are to be administered as the block in the channels of *pitta* is caused by *kapha*. The basic effort should be to stabilize vitiated *pitta* by the administration of drugs. These drugs should not contravene the treatment of *pandu*. *Kamila* is to be treated with drugs that relieve *pitta* without contradicting to *pittapandu*; mild purgation is also advised.

A *kashaya* prepared from fine powders of the following can be used for purgation. This *kashaya* causes no adverse effects.

Triphala	*Terminalia chebula* *Emblica officinalis* *Terminalia bellirica*
Trivrit	*Operculina turpethum*

Alternatively, *Avipattichoorna*, detailed in earlier chapter (drugs causing *virechana*) with juice of *mridveeka* (*Vitis vinifera*) can also be taken.

A *kashaya* prepared from the following also causes purgation.

Trivrit	*Operculina turpethum*
Ayviral	*Ricinus communis*
Chikkatakka	*Areca catechu*
Karimpu	*Saccharum officinarum*
Mukka	*Terminalia chebula* *Emblica officinalis* *Terminalia bellirica*
Muntiringa	*Vitis vinifera*

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Prepare a *kashaya* with two *pala*s[1] of *trikolppakonna* (*Operculina turpethum*) in two *edangazhi*[2] of water and reduce to one fourth. Add two *pala*s of sugar and reduce further to form a thick syrup. Add fine powders of the following to this syrup and consume three *kazhanju*[3] of the plain syrup or mixed with honey.

Trikolppakonna	*Operculina turpethum* 0.5 *pala*
Ela	*Elettaria cardamomum*
Ilavanga	*Cinnamomum verum*
Pachila	*Cinnamomum tamala* 2 *kazhanju* each

Also, *urukkupoti* (powdered iron), made to a paste in *kanjunnineer* (expressed juice of *Eclipta prostrata*), desiccated and powdered, can be consumed added with sugarcane juice, honey and one-fourth sugar.

Consumption of ground tender leaves of *mavu* (*Mangifera indica*) or roots of *tavizhama* (*Boerhaavia diffusa*) in tender coconut water relieves *kamila*. Also, the root bark of *velutta techi* (*Ixora coccinia* white) mixed with raw buttermilk, on consumption, relieves *kamila*. A *kashaya* prepared from the following cures *kamila*.

Namulla	*Jasminum sambac*
Vankuruntotti	*Sida rhombifolia*
Tartaval	*Spermacoce hispida*
Punarnava	*Boerhaavia diffusa*
Cherupoola	*Aerva lanata*
Chukku	*Zingiber officinale*

Water medicated with sugarcane and *amrita* (*Tinospora cordifolia*) relieves *kamila*. A *kashaya* prepared from *draksha* (*Vitis vinifera*), *amrita* (*Tinospora cordifolia*) *Ikshu* (*Saccharum officinarum*) and *bhadra* (*Aerva lanata*) is effective in *kamila.*

Another *kashaya* prepared from the following alleviates *kamila.*

Vasa	*Justicia beddomei*
Nimba	*Azadirachta indica*
Amrita	*Tinospora cordifolia*
Yashti	*Glycyrrhiza glabra*
Dhatri	*Emblica officinalis*
Kataka	*Strychnos potatorum*
Gokshura	*Tribulus terrestris*
Valaka	*Plectranthus vettiveroides*

Consumption of a *kashaya*, prepared from *muntiringa* (*Vitis vinifera*), added with fine powder of *trikolppakonna* (*Operculina turpethum*), clears the bowels.

Two *kazhanju* of the following drugs, finely powdered and mixed together, on consumption with honey relieves *kamila.*

Varahi	*Curculigo orchioides*
Tuka	*Maranta arundinacea*
Chitta-mritin noor	*Tinospora cordifolia* (*ooral*[4])
Kana	*Piper longum*
Maramanjal	*Coscinium fenestratum*
Tuti	*Elettaria cardamomum*
Sita	Sugar

Eight *pala*s of *sita* (sugar) mixed with one *prastha*[5] of the juice of *satavari* (*Asparagus racemosus*) and one *nazhi*[6] of clarified butter should be boiled and reduced to syrup. To this, finely powdered (three *kazhanju* each) of the following medicines, sugar (three *pala*s) and one *nazhi* of old *koova* (*Maranta

1. one *pala* = 48g; 2. one *edangazhi* = 768 ml; 3. one *kazhanju* = 4 g;

4. Preparation of *ooral*: The prescribed drug is ground well, dissolved in water, filtered and allowed to settle down in a vessel. When the sedimentation is complete, the supernatant liquid discarded, shade-dried and used.

arundinacea) are to be added and mixed well to formulate a semisolid form. This medicine has to be stored in a clay pot; consumption of this in the morning relieves all types of diabetes, *rakttapitta*, *haleemaka*, colic, unconsciousness and leucorrhoea.

Chukku	*Zingiber officinale*
Tippali	*Piper longum*
Yashti	*Glycyrrhiza glabra*
Elattari	*Elettaria cardamomum*
Njerinjil	*Tribulus terrestris*
Kashayakkallu	Red ochre
Bhutalakandam	*Curculigo orchioides*
Tartaval	*Spermacoce hispida*
Patha	*Cyclea peltata*
Vidari	*Pueraria tuberosa*
Nannari	*Hemidesmus indicus*
Parvalli	*Ichnocarpus frutescens*
Kizharnelli	*Phyllanthus amarus*

Powdered *koova* (*Maranta arundinacea*) is to be added only when the mixture is cold otherwise it will have bitter taste. This medicine is contraindicated in indigestion, piles and hernia; hence the dose of the medicine has to be reduced if it is inevitable. Those who consume this, strict diet restrictions are to be followed as indicated in unction (*snehapana*).

Fine powders of the following mixed together, on consumption with ghee butter and honey relieves diseases caused by the vitiation of *pitta* and is also an aphrodisiac.

Amrita	*Tinospora cordifolia*
Musali	*Curculigo orchioides*
Sita	Sugar
Upakulya	*Piper longum*
Tuti	*Elettaria cardamomum*
Koosmanda	*Benincasa hispida*
Tuka	*Maranta arundinacea*
Mahaushadha	*Zingiber officinale*

Ingestion of *Indrasani* powder (cross ref. *panduroga chikitsa*) is highly effective. This powder can also consume mixed with *Amritadichoornam* or *Tukadichoornam* (earlier mentioned). *Meenangani* (*Alternanthera sessilis*) mixed with fresh milk can be taken and consumption of juice of *muttil* (*Centella asiatica*) mixed with milk or honey in the morning also assuages *kamila*.

Sankha (conch), ground in fresh milk, on consumption for seven days relieves *kamila*; this preparation is highly effective in *karinkamala* (hemolytic jaundice).

Ingestion of finely powdered of the following, cooked in sour buttermilk, during daytime and dines with milk at night, alleviates *kamila*.

Tartaval	*Spermacoce hispida*
Nilamparanta	*Desmodium triflorum*
Kizhaphalamalaka	*Phyllanthus amarus*
Amalaka	*Emblica officinalis*
Muttil	*Centella asiatica*

Drinking milk medicated with powdered *nagara* (*Zingiber officinale*) relieves *kamila* and restores the life even from the knot of death.

Fine powder of the following drugs, on consumption with sour buttermilk or tender coconut water, cures *kamila*.

Kotuveli	*Plumbago indica*
Nisa	*Curcuma longa*
Musta	*Cyperus rotundus*
Puranakittam	Ferric oxide
Jeerakam	*Cuminum cyminum*
Chootapallavam	*Mangifera indica* (tender leaves)
Kattutippali	*Piper longum* (wild var.)
Tutaree-moolacharma	*Ziziphus oenoplea* (root bark)

5. one *prastha* = 1536 ml; 6. one *nazhi* = 192 ml

Also, add roots of *tavizhama* (*Boerhaavia diffusa*) and *tartaval* (*Spermacoce hispida*) to the above preparation for enhanced effect. *Peruntutariver* (*Ziziphus jujuba*) with all the above medicines ground to a paste in coconut water should be smeared on a wooden plank and dried; consumption of this powder mixed with fresh buttermilk alleviates *kamila*; juice of *chonakanaranga* (*Citrus medica*) mixed with sugar also is effective.

Fine powder of the following, ground well and cooked in fresh buttermilk, if taken for three consecutive days relieves vertigo caused by vitiated *pitta*.

Muttil	*Centella asiatica*
Karintakkali	*Solanum nigrum*
Nilamparanta	*Desmodium triflorum*
Jeerakam	*Cuminum cyminum*
Inchi	*Zingiber officinale*

Dhatryadi ghrita:

Ghee medicated with the following liquids and solid components relieve menorrhagia, anemia and flatulence caused by vitiated *pitta*, and leucorrhoea, sub-fertility, unconsciousness, toxic conditions, insanity, alcoholism and other disorders caused by deranged *pitta*.

Juices of:

Dhatri	*Emblica officinalis*
Vidari	*Pueraria tuberosa*
Ikshu	*Saccharum officinarum*
Satavari	*Asparagus racemosus*
Koosmanda	*Benincasa hispida*

Each of the above liquid components should be four times than that of ghee. The solid components, given below, in total, shall be one-fourth of the weight of ghee.

Mridveeka	*Vitis vinifera*
Yashtyahva	*Glycyrrhiza glabra*
Chandanam	*Santalum album*
Milk	

Consumption of the medicated ghee so prepared, with sugar is very effective. A variation of this ghee can also be prepared with the above mentioned solid components and the components of *Kalyanaka ghrita* as *kalka*; for those who suffering from piles, addition of a *kashaya* prepared with *kotutoova* (*Tragia involucrata*) is effective.

Kalyanaka ghritam:

Vara	*Terminalia chebula* *Emblica officinalis* *Terminalia bellirica*
Visala	*Citrullus colocynthis*
Vadraila	*Amomum subulatum*
Devataru	*Cedrus deodara*
Elavaluka	*Piper cubeba* (Sub.)
Dvisariba	*Hemidesmus indicus* *Ichnocarpus frutisence*
Dvirajani	*Curcuma longa* *Coscinium fenestratum*
Dvisthira	*Desmodium gangeticum* *Pseudarthria viscida*
Phalini	*Callicarpa macrophylla*
Natha	*Nardostachys grandiflora*
Brihati	*Solanum indicum*
Kushtha	*Saussurea lappa*
Manjishta	*Rubia cordifolia*
Nagakesara	*Mesua nagassarium*
Dadima	*Punica granatum*
Vella	*Embelia ribes*
Taleesapatram	*Abies spectabilis*
Ela	*Elettaria cardamomum*
Malateemukula	*Jasminum grandiflorum* (buds)
Utpala	*Kaempferia rotunda*
Dantee	*Baliospermum montanum*
Padmaka	*Prunus cerasoides*
Hima	*Santalum album*

Dasasvarasa ghrita:

Intake of ghee, medicated with expressed juice of the following as *drava* and *kalka* as that of *kalyanaka ghrita* or *Drakshatukaksheeradi* (mentioned earlier in *Jvarachikitsa*), is also effective.

Drava:

Satavari	*Asparagus racemosus*
Muttil	*Centella asiatica*
Karintakkali	*Solanum nigrum*
Mutukku	*Pueraria tuberosa*
Nakta	*Curcuma longa*
Ardraka	*Zingiber officinale*
Vajravalli	*Cissus quadrangularis*
Tripadi	*Desmodium triflorum*
Koosmanda	*Benincasa hispida*
Karimpu	*Saccharum officinarum*

Sour buttermilk, cooked with *kizharnelli* (*Phyllanthus amarus*), or *kizharnelli* ground in fresh milk can be taken.

Powdered iron shall be ground in the expressed juice of *kanjunni* (*Eclipta prostrata*); consumption of this with its double quantity of sugar for seven days relieves *kamila*.

Amrapallavadi kashaya (detailed earlier in *Arochakachikitsa*) should be given to those who are disinterested in food; also, drink milk in the evening.

A *kashaya* prepared with *techiver* (*Ixora coccinia*), *cherupoola* (*Aerva lanata*), *chukku* (*Zingiber officinale*), *moovila* (*Pseudarthria viscida*) and *yavashaka* (*Tragia involucrata*) should be used to make a liquid preparation with rice (*kanji*) and green gram; consumption of this restores appetite. *Inchi* (*Zingiber officinale*), *Kadalivazhamanam* (inflorescence of *Musa paradisiaca*) and *manganari* (*Limnophila aromatica*) should be cooked in water, fried in ghee, ground in sour buttermilk and boiled. Intake of this buttermilk relieves *kamila*.

Irrigation, after application of *Aarukaladi*, *Chandanadi* or *Tungadrumadi tailam* on the head, is desirable. In case there is no oedema, irrigation with milk is also good; application of *Lakshadikuzhampu* on the body is advisable. Consume *Avipattichoorna* mixed with honey in case of gastric burning persists. Apply butter on the head in case of burning sensation in head; the *Darveechandanadi tailam* can also be applied.

Ghee medicated with the expressed juices of *kozhuppa* (*Portulaca oleracea*) and *karuka* (*Cynodon dactylon*) mixed in coconut water as *drava* and powders of *yashtimadhu* (*Glycyrrhiza glabra*) and *chandana* (*Santalum album*) as *kalka,* while becomes mild *paka* (*chikkana*), should be filtered to a vessel containing bee's wax. When the ghee cools down to room temperature, powdered *koova* (*Maranta arundinacea*) and *vedhi* (*Ferula asafoetida*) should be added and preserve the mixture in a baked earth vessel. This *kuzhampu* relieves diseases of the head including burning sensation.

The following drugs boiled in milk, ground to a paste, can apply on the head mixed with *chandana* (*Santalum album*) and butter for the relief of burning sensation.

Kozhuppa	*Portulaca oleracea*
Tengin-pookkula	*Cocos nucifera* (inflorescence)
Jala	*Cyperus rotundus*
Dhatri	*Emblica officinalis*
Valaka	*Plectranthus vettiveroides*
Bala	*Sida rhombifolia* ssp. *retusa*
Amrita	*Tinospora cordifolia*
Tila	*Sesamum indicum*
Doorva	*Cynodon dactylon*

Kamila caused by deranged *pitta* is characterized by weakness of hands and feet, yellow hue of sclera, tinnitus, haematuria, restlessness and fever at midnight, intermittent hunger and burning sensation, and desire for bitter substances.

Mechakakkamila, caused by deranged *vata* and *kapha*, may cause severe pain all over the body, thirst, cough, generalized oedema and malaise. The treatment should be aimed to normalize the vitiation.

Dasasvarasa ghrita, detailed earlier, is effectual in *karinkamala* - a condition where the body attains a dark hue.

All the above types of *kamila,* if left untreated or ignored, will result in *kumbhakamila* - a condition characterized by extensive oedema. Consumption of *Amritottaram kashayam* added with castor oil relives *kumbhakamila*.

Buffalo's ghee should be medicated with an equal quantity of milk and the following drugs as *kalka* and in the expressed juice of *chinnaruha* (*Tinospora cordifolia*) as *drava*; consumption of this ghee for 5 to 6 days relieves *kamila*.

Darvi	*Coscinium fenestratum*
Chandana	*Santalum album*
Valaka	*Plectranthus vettiveroides*
Utpala	*Kaempferia rotunda*
Bala	*Sida rhombifolia* ssp. *retusa*
Vasa	*Justicia beddomei*
Sthira	*Desmodium gangeticum*
Sariba	*Hemidesmus indicus*
Yashti	*Glycyrrhiza glabra*
Nimba	*Azadirachta indica*
Phalatraya	*Terminalia chebula* *Terminalia bellirica* *Emblica officinalis*
Ambhuda	*Cyperus rotundus*
Kana	*Piper longum*
Kaleya	*Santalum album* (sub.)
Pundra	*Nelumbo nucifera* (rhizome)
Ajjhata	*Phyllanthus amarus*

A medicated ghee, prepared out of expressed juices of *inchi* (*Zingiber officinale*), *manjal* (*Curcuma longa*) and milk as *drava*, and fine powders of *katukka* (*Terminalia chebula*), *trikolpakkonna* (*Operculina turpethum*) and *nagadantiver* (*Baliospermum montanum*) as *kalka*, on consumption in small doses relieves *kumbhakamila*. If the patient drastically purges, the ghee shall be given on alternate days. *Amritottaram kashayam* shall be taken after taking ghee (*anupana*). Intake of *Panaviraladi bhasma*, detailed earlier, mixed with *kanji* is effective.

A variation of *Punarnavadi kashaya*, as detailed below, shall be consumed added with castor oil if necessary.

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, consumed with small quantities of honey, *pippali* (*Piper longum*) and *girijatu* (asphalt) relieves *kumbhakamila* within five to six days.

Nimbatvak	*Azadirachta indica* (bark)
Triphala	*Terminalia chebula* *Emblica officinalis* *Terminalia bellirica*
Patola	*Trichosanthes lobata*
Rajani	*Curcuma longa*
Vasa	*Justicia beddomei*
Amrita	*Tinospora cordifolia*
Sariba	*Hemidesmus indicus*
Syama	*Operculina turpethum*
Tamalaki	*Phyllanthus amarus*

Palamkasha	*Commiphora mukul*
Bala	*Sida rhombifolia* ssp. *retusa*
Neeli	*Indigofera tinctorea*
Sthira	*Desmodium gangeticum*
Yashti	*Glycyrrhiza glabra*

Tender leaves of *kritamala* (*Cassia fistula*), cooked in milk, on consumption in the morning relieve *kumbhakamila.*

In case of extensive oedema, *Puliyenna* (mentioned earlier in *Mahodarachkitsa*) should be applied on the body. One *nazhi* milk, *varattu tengappal* (milk extracted from four coconuts) and half *nazhi* of *kallippal* (milky latex of *Euphorbia ligularia*) shall be reduced and kept in powder form. Prepare a *kashaya* from the roots of *Chulliver* (*Hygrophyla auriculata*) and *Valiya katalati* (*Achyranthus aspera*) – [*tavizhamaver* (*Boerhaavia diffusa*) can also be included]. Consume this *kashaya* added with the above powder in small quantity.

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Book Review

THE LEGACY OF CARAKA

Author	: Dr. M.S. Valiathan
Published by	: Orient Longman Private Limited 160, Anna Salai, Chennai.
Price	: Rs. 550/-
No. of pages	: 634
Ist Edition	: 2003

K. Rajagopalan*

Carakasamhita is considered to be the oldest compendium on ayurveda. It is venerated as the most authentic text as far as the ayurvedic principles and practices are considered. The basic principles of ayurvedic therapy are extensively described in the *Sutrasthana* and some of them are repeated, as and when necessary, in *Cikitsasthana*.

The ayurvedic science has its roots in the concepts enunciated in various systems of Indian philosophy. Such philosophical connections are described in detail in chapters like *Kathitapurushiyam* and *Tisraishaniyam*. Caraka uses a language which is tougher than those of his peers and followers. Some of the modern views on cell division and the importance of vital organs like the head, the heart and the urinary system are found mentioned in the seventh chapter of *Sarirasthana* and in the *Trimarmiyasiddi* of *Siddisthana* respectively. The four components of life namely *sarira* (the body), *indriya* (the sensory organs), *satva* (the mind) and *atma* (the soul) have been described by Caraka with reference to their combined influence in maintaining health. The eight major divisions of ayurveda i.e. general medicine, pediatrics, mental diseases, diseases of the ear, the nose, the throat and the eye, surgery, toxicology, rejuvenant therapy and virile therapy are properly detailed. Caraka's focus is on medical treatment of various diseased conditions. Under unavoidable circumstances, cases are referred to a surgeon. These are some of the main features of this great *Samhita*.

The study of *Carakasamhita* is not an easy task. There are instances when reputed scholars and commentators are found to differ while giving meanings and interpretations. For a proper study of this *Samhita*, good knowledge of Sanskrit language and Indian philosophy is a necessary accomplishment. Additionally, one may require the help of a well-experienced *guru* (teacher) to obtain the full meaning of Caraka's statements.

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It is in this context that the book under review acquires a preeminent stature as an authoritative and authentic presentation of Caraka and his concepts. 'The Legacy of Caraka' by the reputed surgeon and academician, Dr. M.S. Valiathan is just not a translation or a commentary of *Carakasamhita*; but it is an appreciative and understanding voyage by a competent modern medical professional through the various streams of ancient health care principles and practices as enunciated by this Indian sage in his reputed compendium. The author rightly says that Caraka's system of medicine is more than just a manual of medicine, whereas, it is a system built upon a strong and stable philosophical foundation. Dr. Valiathan has never let this philosophical perspective to waver while organising the varied practical aspects of the original text. In this painstaking effort, he has been quite faithful to Caraka and has not missed out any important components. The author has, in fact, retold the *Samhita* in a new scheme which is meticulous in approach and organised in structure. The author has himself described his method: "instead of adhering to the sequence of *sthana*s in the original, I have retold the *Samhita* through thematically structured chapters, which would be easier on modern readers. It has involved some degree of restructuring and condensation but has ensured that whatever is stated can be traced back to the original and that no chapter in the eight *sthana*s of the original has been left out."

Dr. Valiyathan has approached *Caraka* with a new refreshing sense of professionalism. The thematic organisation of information helps the reader to get a comprehensive view of *Caraka* and it enables him to search and find information and data of his interest and their reference citations with ease. This is a great advantage when compared to the classical method of narrative description and passive and non-specific referencing. The many tables and illustrations add to the utility of the volume. This method has resulted in rendering the book quite useful to modern medical professionals as well, who have a benign inclination towards other streams of health care knowledge.

To cite an example of the thoroughness of the approach of the author, reference can be made to the observation made on the epidemiological trends of western India during Caraka's time. Similarly, the glossary of the ayurvedic terms and of medicinal plants given at the end is extremely useful to the serious reader as a source of specific and reliable support data. One must also comment upon the precise and specific language of the author which leaves no cause for confusion and, in fact, amplifies the inner meaning. He has presented *Caraka* in all his pristine authenticity and philosophical uprightness.

The arrival of this book is at a very opportune time because it provides a balanced and thorough framework for the academic understanding of the fundamentals of ayurveda in the midst of the empty hyperboles being offered in response to the enhanced global awareness of ayurveda. It also provides a very useful reference manual to the ayurvedic students for whom *Carakasamhita* is a basic component of their syllabus. This book opens a very refreshing window on to the ayurvedic knowledge base and I am certain that its publication will be welcomed by students and professionals who are interested in the wider development of health care schemes for the global man. More importantly, one hopes that this book will inspire scholars to follow suit and attempt similar works on other classics.

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Colloquium on Tradition and Modernity – Inaugural Lecture delivered on 29.01.2003 in connection with the Valedictory Function of Centenary Celebrations held at Kottakkal.

TRADITION AND MODERNITY

K.N. PANIKKAR

'One of the significant things that happen when a society looks for its roots is *selection* - selection because of the question of power. In the times of transitions of that nature, tradition becomes a source of power because it can be used as an ideology for mobilisation. You can see that in any society tradition is invoked in periods of uncertainty, in periods of doubt so that certain things are put to the people in an acceptable manner. That is why tradition becomes a source of rationalisation – justification.'

Dr. K.N. Panikkar, a historian of international repute, is Vice Chancellor, Sree Sankaracharya University of Sanskrit, Kalady. He has established himself as original and authentic in his views on the Medieval and Modern History of India and the World. An outstanding academic luminary, he holds prestigious Visiting Professorships in many Universities in India, Europe and America. As an acknowledged Scholar and Resource Person of History, he has been officiating as the Chairperson of Expert Committees and Councils of establishments and institutions as varied as IGNOU, ICHR, World Book Encyclopedia, JNU, Gazetteers and National Archives. A life-long student and researcher in the historical discipline, he has been very prolific as an author as well. His latest work "Before the Night Falls" is hotly discussed all over.

TRADITION AND MODERNITY

K. N. Panikkar

We often tend to see the regeneration of our society during the 19^{th} and 20^{th} centuries in very limited terms and very rarely we look upon the intellectual cultural processes as a whole which led to the regeneration of our society. If we take a broader view of this regeneration, this institution and its progenitor, Vaidyaratnam P.S. Varier, has played a very major role in it. I have called him during my enquiry into the *History of Aryavaidyam* in the last century as a renaissance man. He, in fact, embodied and later the institution embodied in it, the best of elements of the renaissance which, I need not tell you, was the beginning of modernity in our society. Therefore, I think it is very satisfying for a person like me, a student of history, a student of social and cultural movements, to have this opportunity to be part of the centenary celebration of this institution.

It is appropriate that we are discussing the relationship between tradition and modernity on this occasion. Because the life of Vaidyaratnam and the history of this institution can really be seen in the light of this relationship. I recall that Vaidyaratnam wrote a series of articles in *Dhanvantari* on *what is science*? The focus of this series of articles was on the relationship between tradition and modernity. In fact, many of the issues which were discussed broadly in the context of the emerging modernity in the 19^{th} century and the relationship between the West and the East and the role of science in it, P.S. Varier has discussed in an extremely interesting fashion. There are several aspects of P.S.Varier's life reflective of the relation between tradition and modernity. In many aspects of his life, especially from the attitude towards *aryavaidyam* to the general social problems, he was always a person who was trying to reconcile these two elements - tradition and modernity. I don't want to go into the details of his life, particularly because all of you know about it.

In India, modernity arose not really out of an ongoing historical process of transformation which was a voluntary transformation, but there was certain element of forced beginning of modernity.

The question that we should be addressing today is what is the role that we assign to tradition in a society like ours? To answer that one has to go into the history of modernity in India. In India, modernity arose not really out of an ongoing historical process of transformation which was a voluntary transformation, but there was certain element of forced beginning of modernity. That is modernity which came to India or the way we see it as a stage in the history of India, was a modernity which emerged out of the womb of *colonialism*. And since it was a time when culturally Indians were besieged by colonial culture, it is imperative that people tried to locate their roots. This question of asking about one's own identity, 'Who am I', is a process from which the transformation, the intellectual and cultural transformation, leading to modernity had arisen. I want to submit to you that this happened in India in a very very innovative fashion. It was not in a fashion by which tradition was rejected or modernity was embraced, particularly modernity as received from the West. On the other hand, it was a result of what I would call a dual struggle in Indian society. The way tradition was perceived was not simple acceptance. The way that modernity or western ideas were accepted in India was also not uncritical. On the other hand, there was a selective approach. The selective approach reflected an internal struggle that was going on in our society - a struggle both against the traditional cultures and certain elements of tradition which was conceived as backward. At the same time critically approaching and struggling against certain elements of the colonial culture. If either of them were accepted, that is if tradition was accepted uncritically then perhaps India would have tried to replicate a past and if we had accepted culture from the West which was then called modern, then possibly we would have been westernized. In fact it was not so. One of our great renaissance thinkers Mahadeva Govinda Ranade said that there is nothing like revival, what has happened has happened. But there are certain elements of tradition which are considered to be important for the society which are critically accepted. It is a selective process. What I am trying to say is that there is an organic process by which tradition and modernity react on each other to produce a new ethos in society. This organic process is one in which people are not really very conscious about what constitute the totality of tradition; in fact no society, no group of people are aware of that totality because in every society there is more than one tradition. And traditions co-exist and therefore part of those traditions are there in the life of people. At the same time besieged with the ideas that come to them from outside people critically look at those new ideas and try to integrate them. This organicity of the process is somewhat crucial. And that is when people start asking about their identity as Nehru did. He described himself as an enigma. Ram Mohan Roy described himself in a very very interesting fashion. Ram Mohan, as you know, is considered as the father of Indian modernity. He had two houses, and it is said that in one house everything was Indian except Ram Mohan and in the other

..........there is nothing like revival, what has happened has happened. But there are certain elements of tradition which are considered to be important for the society which are critically accepted. It is a selective process.

house it is said that everything was English except Ram Mohan. In one he lived like a traditional Indian, in another he lived like a westerner. This is precisely the sense of crisis, the sense of identity, the sense of uncertainty, that besieged people, when various cultural intellectual forces impinge upon them. And it is because of that people started asking in the early part of the 19th century about their identity and about tradition.

People went back in history to identify their roots. It is because of that in the early part of the 19th century the *Upanishad*s were translated into various Indian languages. And many sought an answer to the problems they are facing in *Upanishad*s or in other aspect of Indian tradition. And this was not done purely by the Hindus alone. It was done by a variety of people; several of them, Muslims, who, as Amir Khusru said believed that the totality of tradition goes back to the ancient days. So there is this critical introspection about the past, about the tradition through which people were trying to find their roots and find where they stand. That is the process through which it starts. But then this process, which started in the 19th century as part of colonial experience, developed in a way that several things were discarded and several things were accepted.

Question obviously arises - how was this plurality of tradition imbibed and developed over a period of time? One of the significant things that happen when a society looks for its roots is *selection* - selection because of the question of power. In the times of transitions of that nature, tradition becomes a source of power because it can be used as an ideology for mobilisation. You can see that in any society tradition is invoked in periods of uncertainty, in periods of doubt, so that certain things are put to the people in an acceptable manner. That is why tradition becomes a source of rationalisation - justification. You might recall that when Indians started social reforms, changing the cultural practices, changing the social practices, in the early part of the 19th century, when they tried to change the custom of *sati* and widow re-marriage, there was a debate on whether they should be done or not. What is the rationale they sought? What is the justification they sought? They all found justification in tradition. Interestingly enough, if you take the debate on *sati*, if you take the debate on widow marriage, you will find both those who supported it as well as those who opposed it almost quoted the same sentences from the scriptures. A person like Vidya Sagar, perhaps the greatest humanist that India ever produced, said that I have never taken up my pen in support of widow remarriage till I was convinced that it had the sanction of tradition. So tradition becomes a justification - a rationalisation, and that is one of the reasons why it becomes a source of power, a source of mobilisation.

Today Indian society, as I would describe it, is a society in the grip of uncertainty. Certain uncertainty in almost all spheres of life and this uncertainty leads to a question of what is the alternative to what we are going through.

Today Indian society, as I would describe it, is a *society in the grip of uncertainty*. Certain uncertainty in almost all spheres of life and this uncertainty leads to a question of what is the alternative to what we are going through. If what we are going through is modernity, then what is the alternative to it? Let us first ask this question - are we going through process of modernity? Modernity can be described differently. Kerala is a society in which modernity is generally understood only in terms of literary movements. Modernity and literary movements, one should be very clear, are part of a social process, part of a cultural process. The question of modernity, if you simplify it, or put it crudely, it is actually the way we organize ourselves, the way our minds are ordered or our minds are set to work in a process of cultural upliftment in which rationality is an extremely important question. Obviously, the idea of rationality is not without any qualifications. The rationality of one or a dominant group is not really the rationality of an entire society. Rationality is also used for domination and therefore the idea of modern can be used not only to suppress, to marginalise others, but it can also be used for self-justification of a group within the society. When that happens the inevitable approach or response to it is to look for justifications from the past. And then the tradition is invoked.

Now we are going through a time in our history when the invocation of the past, the idea of the past, the idea of tradition, has become sacrosanct. There is a romanticization of tradition and this has led to a process by which the organic relationship, that should necessarily be there, between tradition and modernity is overlooked. The question is, first to determine what is meant by tradition? When people talk about an authentic tradition, I think, the authenticity is a major problem; because in no society you can really determine what is authentic, because the authenticity of whom? In a society like ours authenticity of which tradition are you talking about? The authenticity of tradition sometimes happens to be the authenticity of those who wield power, authenticity of those who are able to establish the hegemony in society. And therefore, authenticity becomes a problem, and as a result of that the question of tradition has to be opened up today for a very serious debate and that opening of tradition also means the dissemination of tradition and create opportunities for gaining acess to tradition.

There is a romanticization of tradition and this has led to a process by which the organic relationship, that should necessarily be there, between tradition and modernity is overlooked.

One of the problems that the Indian society is facing is the lack of dissemination of traditional knowledge, that is, what constitutes tradition is not part of our social knowledge. Look for instance our education system. In our education there is not enough, which tells us what is the traditional cultural resources. It is not part of the system of education; that information is not given. But giving information and being integral to an education process are two different things. In India the later has not taken place. Therefore you have generations and generations of students coming out from educational institutions who have only very vague notions about what constitute their tradition. It is this ignorance that is being exploited by obscurantist and communal forces. We interpret tradition in a fashion, which is not real at all. Therefore the generation of social knowledge about tradition is important, if the society is to make a choice or society is to understand the way tradition merges with modernity. It is a different matter whether one accepts the notion of modernity. But then that relationship has to be understood.

One of the problems that the Indian society is facing is the lack of dissemination of traditional knowledge, that is, what constitutes tradition is not part of our social knowledge.

Before I close, I want to bring to your notice another thing. I spoke about the organicity between tradition and modernity. There is the predominant thinking in our society today by very established scholars, very good social scientists that modernity is borrowed, since modernity has emerged first in Europe as a part of the social and economic transformation that has taken place there. They assert that Indian modernity is nothing but borrowed. I think this is a proposition which needs to be closely examined. If you go into the history of India, particularly the 18th and 19th centuries, you can see the process by which people were struggling to take the society forward in certain aspect of their existence. Particularly so in the ideological, intellectual and cultural spheres of the society, despite the so-called theory of stagnation. And as a part of it, the acceptance of new ideas, not only the enlightenment ideas in the 19th century of humanism, rationality and universalism, etc., but there is also an internal churning that was taking place. If P.S.Varier was able to question the idea of science as western, if the Chinese were able to assert that science was universal and even refused to accept the text books because they were described as western science, they indicate not slavish acceptance of the West but an ability to be critical. I don't know what should be called modern. Even when we were subject to colonial modernity, there were attempts to evolve an alternate form of modernity. Just as we call our 19th century regeneration as renaissance we have illusions about what happened in other societies. If you overcome these illusions and look at the transformation in our society perhaps an entirely different picture would emerge and it is a time therefore to examine or re-examine the relationship between tradition and modernity. And while re-examining it, it is necessary that we take into account the contribution of people like P.S. Varier or Lakshmipati and a whole host of people who lived in the second half of the 19th century and looked inward in their cultural endeavours.

1880's in Indian history was an important decade. In the history books that you read, this decade is seen normally as a period in which nothing happened in India. Because it was not a period in which political activity was very strong. Since we look upon politics as the prime concern we dismiss these ten years, as an inconsequential period in Indian history. But in fact this is a very important period in the history of modern India. This was a time in which the Indians went into the question of what our tradition is and examined the strength and weaknesses of our tradition - went into traditional music, literature, science, ayurveda, astronomy etc., so many areas. They were able to talk about the weaknesses of Indian tradition, they were able to understand the strength of Indian tradition and then bring out what is possibly the way that Indian society can move forward. It is unfortunate that this trend did not gain strength. By the beginning of the 20th century such a trend came into an end possibly because political activities overtook this cultural intellectual concern and secondly, of course, all such concerns merged with nationalism in some ways. I believe that it is time to recall that past to our mind; it is time to resurrect that activity and go into the understanding of tradition so that our tradition is not hijacked, so that our tradition is not distorted not so that our tradition is replaced by a mythefied past. If today people are told that this is what is contained in the *Veda*s or *Upanishad*s, 99% of people can't fathom its veracity. So is with Koran, Bible and many sources of India tradition. It is therefore necessary that social knowledge about tradition is created and a proper assessment of what our tradition is and of course more importantly, how do we see ourselves in relation to tradition. No society can live without its tradition. But then tradition should be an organic part of modern life.

.......*it is a time to resurrect that activity and go into the understanding of tradition so that our tradition is not hijacked, so that our tradition is not distorted not so that our tradition is replaced by mythefied past.*