ĀRYAVAIDYAN

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लाभानां श्रेय आरोग्यम्

Of all the gifts,
the most precious is health

Vaidyaratnam P.S. Varier's
Arya Vaidya Sala, Kottakkal, Kerala

Aryavaidyan, the quarterly journal of Arya Vaidya Sala, Kottakkal, is intended to encourage scientific writing and intellectual interactions among scholars, academicians, practitioners and students of ayurveda and allied subjects.

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VAIDYARATNAM P.S.VARIER'S
ARYA VAIDYA SALA, KOTTAKKAL

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सततायध्ययनं, वादः परतन्त्रावलोकनम् ।
तद्विद्याचार्यसेवा च बुद्धिमेधाकरो गणः ।।

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learning other disciplines and
serving the preceptor - these factors
endow one with intelligence and memory

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PLANT STUDY

Āryavaidyan, Vol. XXXII, No. 1, August - October 2018, Pages 05 - 14

Comparative pharmacognostic standardization of pink and white flower varieties of *Catharanthus roseus* (L.) G. Don.

Rajesh Bolleddu, Mangal A.K., Sama Venkatesh, Rao M.M., Deboleena Paria and Shreya Ghosal

ABSTRACT: This study was conducted to establish the comparative pharmacognostic profile of flower, leaf, stem and root of the pink and white flower varieties of *Catharanthus roseus* due to very few pharmacognostic reports on potent ayurvedic herb. The pharmacognostic studies including parameters such as morphological evaluation, powder microscopy and histological studies of flower, leaf, stem and root of the two varieties of *C. roseus* are established. Root's powder microscopy had shown diagnostic characters like cork, lignified pitted vessels in both varieties. Stem's powder had shown pitted, spiral vessels and stomata. Leaves reported trichomes of different sizes, crystal fibers and oil globules. Pollen grains, scalariform vessels, stomata were observed in both the plants. Lignified fibers, acicular crystals were reported only in white variety roots. Crystal fibers observed only in white variety leaves. Comparative pharmacognostic reports observed in this study provided the scientific data which can serve as a valuable resource for identification and establishment of standards for both varieties of *Catharanthus roseus*.

Key words: Histological studies, Crystal fibers, Pitted vessels, Pollen grains, Powder microscopy.

Introduction

Madagascar periwinkle (*Catharanthus roseus*) is an evergreen bushy perennial shrub which belong to the family Apocynaceae. It has a long history of therapeutic voyage from ancient days till today. It is as an erect, much branched, growing 30-90 cm in height, distributed throughout the country up to an altitude of 1,300 m. It is an indole alkaloidal plant containing more than 100 alkaloids in which vincristine and vinblastine are main components.[1] These are used to treat different types of cancers like skin cancer, breast cancer, lymphoblastic leukemia and Hodgkin's disease. Vincristine, in different combinations, is used in acute leukemia in children and lymphocytic leukemia; and pediatric tumors. Apart from various cancer treatments this plant is also used to treat other diseases from ancient times. Traditionally, it has been used as a tonic, stomachic and as a remedy for diabetes.[2] Various scientific researchers reported different pharmacological actions of whole plant and individual parts of *C. roseus*. Whole plant extracts were reported possessing antitumor avtivity.[3] Antidiabetic activity was detected in twigs, leave's extract, extracted with equal proportions of methanol and dichloromethane.[4] The fresh leaf juice decreases normal blood glucose levels, alloxan induced diabetes in rabbits.[5] In diabetic mice aqueous extract of stem and its fraction which is free from alkaloid reduce blood glucose levels.[6] In human colorectal carcinoma cell lines chloroform fraction of leaves had shown highest cytotoxic activity.[7] Leaf juice was reported possessing hypolipidemic activity.[8] The ethanolic extract of flowers possess wound healing activity.[9] Vinblastin quantity is different in pink, white and purple varities of *C. roseus*. As there is marked variation in active components yield in pink and white flower varieties and till now there are no available detailed reports on pharmacognostic standardization of *C. roseus,* an attempt was made to study the macroscopy, organoleptic characters, powder microscopy and histological studies of both varieties.

Materials and methodes

Collection and identification: The whole plant of both varieties of *C. roseus* was collected from Bidhan

Nagar, Kolkata. The plant authentication and identification was done in Department of Pharmacognosy, Central Ayurveda Research Institute for Drug Development, Kolkata. Voucher specimen of *C. roseus* (CARIDD/DPC/CR07/2018) is maintained in the Department of Pharmacognosy. Individual fresh parts were separated and used to study the macroscopical parameters and histological studies; whereas shade dried powders were used for the microscopical investigations.

Chemicals and instruments

All the solvents and chemical reagents were of analytical grade. Simple microscope, compound microscope, watch glass, microscopic slide and other common glasswares were used in this experiment. Photomicrographs were taken with Olympus CX21i LED microscope attached with Magcam DC14 camera. Chloral hydrate, phloroglucinal, iodine, picric acid were the major chemicals.

Macroscopy

Macroscopy was done by observing the individual parts under simple microscope. The colour, size, texture, organoleptic characters like odour, and taste were noted.[10]

Histological studies

Fresh parts of pink and white variety were used to study the histological parameters. Thin transverse sections were made with razer blade and macerated with chloral hydrate reagent. Macerated sections were treated with phloroglucinol reagent, mounted on microscopic slides and sealed with paraffin wax.[11]

Powder microscopy

The coarse powder of flower, leaf, stem and root of both varieties of *C. roseus* was studied under a compound microscope. The individual powder was treated with chloral hydrate reagent for maceration. Test sample was taken on to a microscopic slide; 1-2 drops phloroglucinol reagent was added and a cover slip was placed above the sample and using paraffin wax microscopic slides were sealed. The prepared slides were mounted and examined under microscope. Tracing of characteristic structures was done.[12]

Photomicrographs

Photomicrographs of the transverse sections and powder microscopy were taken with various magnifications by Magcam DC14 camera attached to microscopic unit. For normal observations 10x magnification, for micro observations 40x magnifications was employed.[13]

Results and Discussion

Macroscopy

Catharanthus roseus roots are glabrous, divided into primary root and secondary root. Primary root is cylindrical, having profuse secondary roots. Secondary roots are 2-8 cm. Stems cylindrical, somewhat woody, longitudinally ridged. Leaves are opposite, 4-8 cm long, rounded at tip and pointed at base. Flowers are with 5 glossy sepals, 2-6 mm long, pubescent green corolla tube, pubescent inside and have five anthers. (Figure 1 and 2)

Figure 1

Morphology of different parts of *Catharanthus roseus* (White variety)

Colour- Cream
Odour- Faint
Taste- Bitter

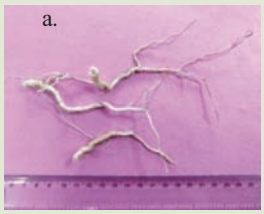
Colour- Greenish white
Odour- Faint
Taste- Bitter

Colour- Glossy green
Odour- Faint
Taste- Bitter

Colour- Petals white colour at dorsal and ventral side. Light green color ring, Odour- Faint, Taste- Tasteless

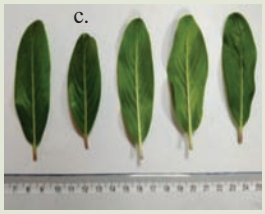
Figure 2

Morphology of different parts of *Catharanthus roseus* (Pink variety)



Colour- White
Odour- Faint
Taste- Bitter

Colour- Light Pink
Odour- Faint
Taste- Bitter



Colour- Glossy green,
Petiole Pink Colour
Odour- Faint
Taste- Bitter

Colour- Petals pink colour at dorsal and white colour at ventral side. Bright pink ring
Odour- Faint, Taste- Tasteless

Histological studies

Transverse section of root: Transverse section of root showed suberised peridermis followed by 6-8 layers of rectangular shaped cork cells with oil globules that were present just below the suberised wall. The cortical region consists of about many layers of tubular parenchymatous cells with numerous starch grains. Beneath the cortex region endodermal layer was present. Lignified xylem consist of medullary rays, tracheidal vessels and xylem fibers. Medullary rays were narrow in xylem region and wider in phloem region. Oil globules, starch grains were observed more in white variety than pink variety. Figure 3 and 4

Figure 3

Transverse section of the root (White variety)

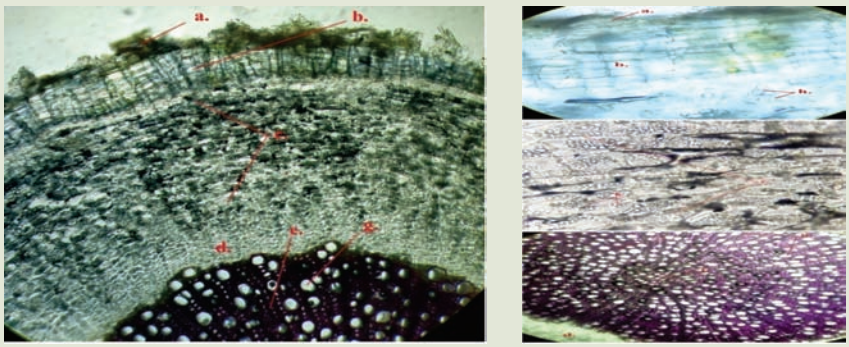
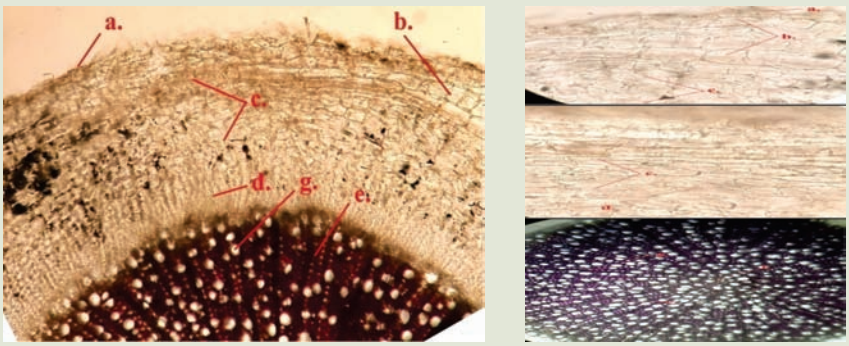


Figure 4

Transverse section of the root (Pink variety)



a. Suberised wall; b. Cork; c. Cortex; d. Endodermis; e. Phloem; f. Proto xylem; g. Meta xylem; h. Oil globule.

Transverse section of stem: Transverse section of stem showed single layered epidermis which is the outermost zone consisting of circular cells. The cortex had many layers of cellulosic collenchyma. Central cylinder was made of bi-collateral vascular bundles and a latex-bearing parenchyma medulla. Lignified xylem consisted of wide vessels present on the outer side representing the metaxylem and narrow vessels present towards inner side representing the protoxylem. Phloem situated in the form of patches of outer phloem and inner phloem. Thin walled pith cells were round to oval shape with intercellular space. In case of stem of pink flower, numerous phloem fibres were observed in the region between external phloem and cortex region but the same was not observed in the white variety. Figure 5 and 6.

Transverse section of leaf

Lamina: Upper epidermis was single layered with more or less rectangular cells and the outer walls of which were cuticularized. Palisade cells were single layered, elongated having numerous oil globules. Many layers of loosely arranged spongy parenchyma with intercellular spaces were also noticed. Lower epidermis was same as upper epidermis.

Midrib: Epidermal layers of lamina were continuous in the midrib region also. Strips of collenchymas

Figure 5
Transverse section of the stem (White variety)

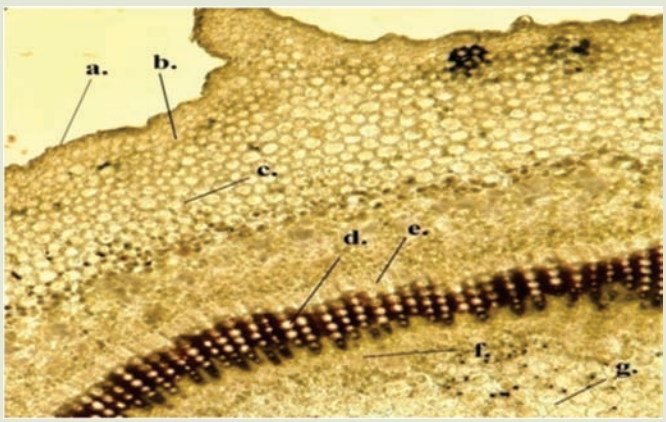
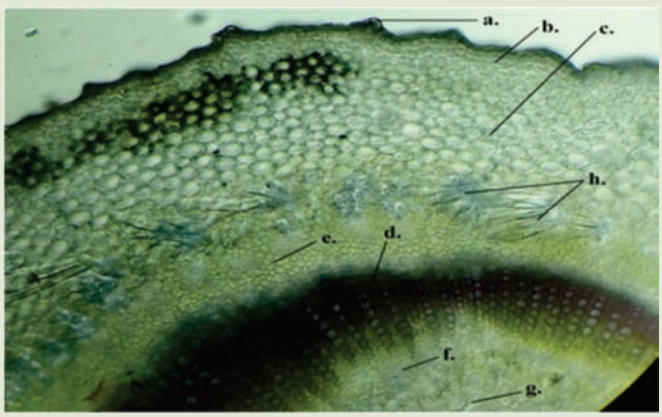


Figure 6
Transverse section of the stem (Pink variety)



a. Upper epidermis; b. Collenchyma; c. Cortex; d. Xylem; e. External phloem; f. Internal phloem; g. Pith; h. Fibres.

(2-3 layered) appeared below the upper epidermis and above the lower epidermis. A well developed vascular bundle was seen in the centre of midrib. Vascular bundles were conjoint, collateral and closed. Xylem was present towards the upper epidermis, while phloem was present towards the lower epidermis. Xylem consisted of metaxylem (towards the lower epidermis) and protoxylem vessels (towards the upper epidermis). Figure 7 and 8.

Transverse section of flower (petal): In both varieties adaxial epidermal region was characterized by elongated cells. Parenchymatous cells were round in shape. Tracheary elements like vessel with spiral thickenings were embedded in parenchyma. Abaxial epidermal cells were irregular to hexagonal in shape, which was covered by the outermost layer called cuticle. Epidermal cells showed pink tinged in pink

Figure 7
Transverse section of the leaf (White variety)

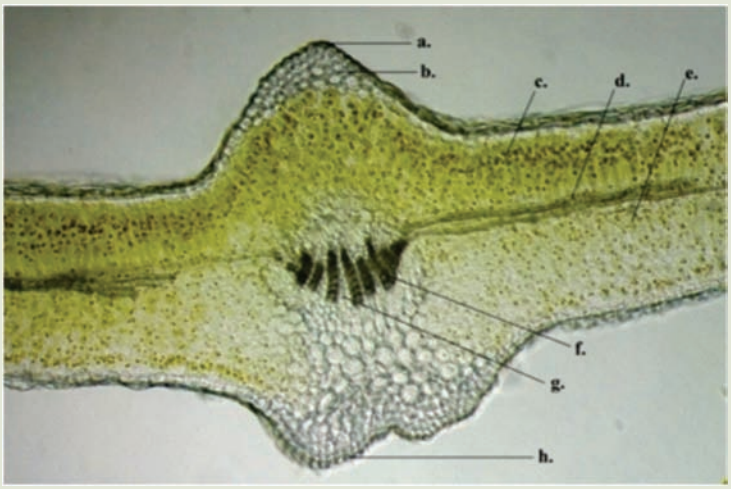
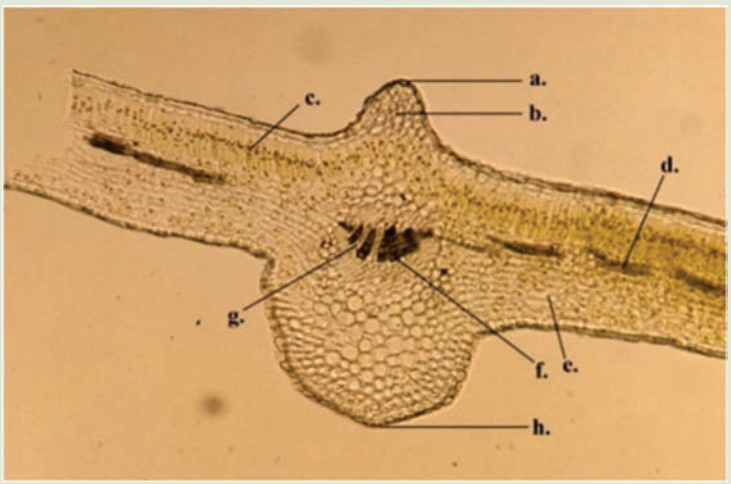


Figure 8
Transverse section of the leaf (Pink variety)



a. Upper epidermis; b. Collenchyma; c. Palisade parenchyma; d. Vascular element; e. Spongy parenchyma; f. Xylem; g. Phloem; h. Lower epidermis.

flower variety whereas white color variety showed colorless epidermal cells. Figure 9 and 10

Powder microscopy

Powder microscopy of root: Thick walled elongated cork cells, lignified pitted vessels, starch grains were observed in both the varieties of *C. roseus* roots. Tracheids with bordered pits, sclerenchymatous cells and unlignified fibers were observed only in pink variety. Lignified fibers and acicular crystals were reported only in white variety. Starch grains size was more in white variety than the pink variety. Figure 11.

Powder microscopy of stem: Annular, lignified pitted vessels, thin walled elongated cork cells with oil globules, thick walled parenchymatous cells with starch grains, bilayered quadrangular cells of epidermis, sunken stomata and bundle of straight fibers were observed in the stem powder of both the

Figure 9
Transverse section of the flower (White variety)

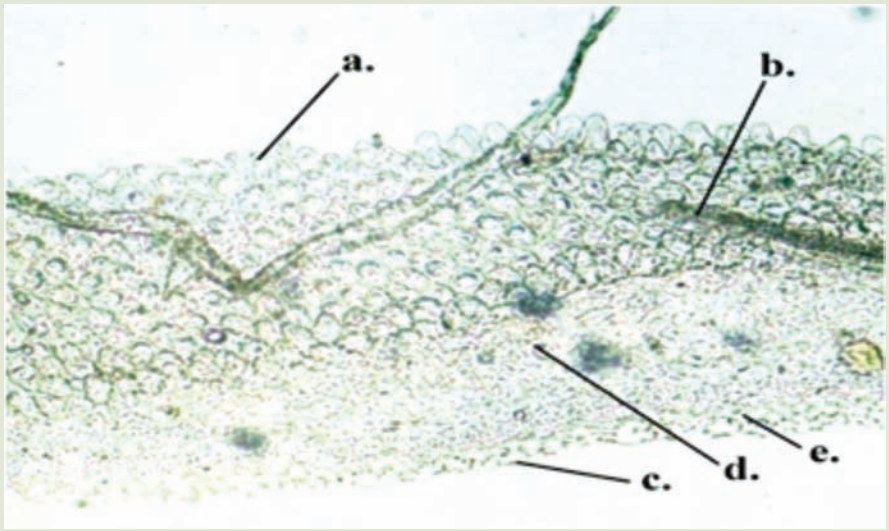
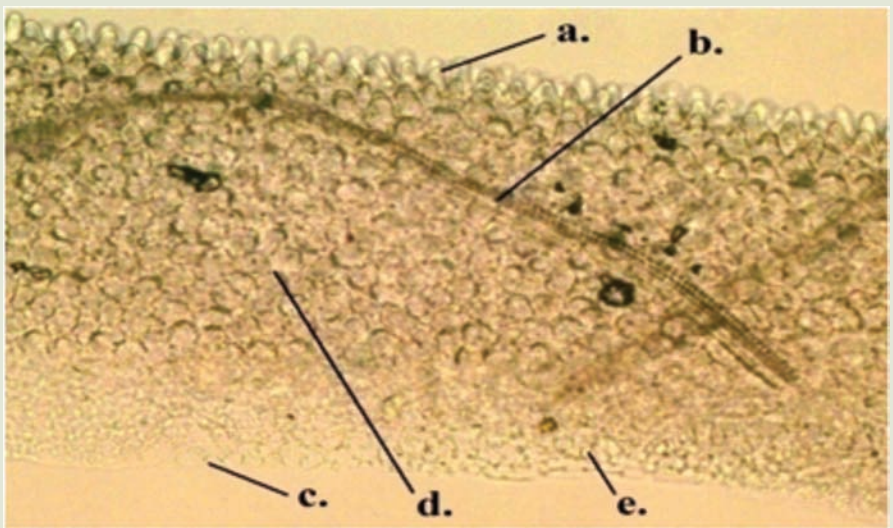
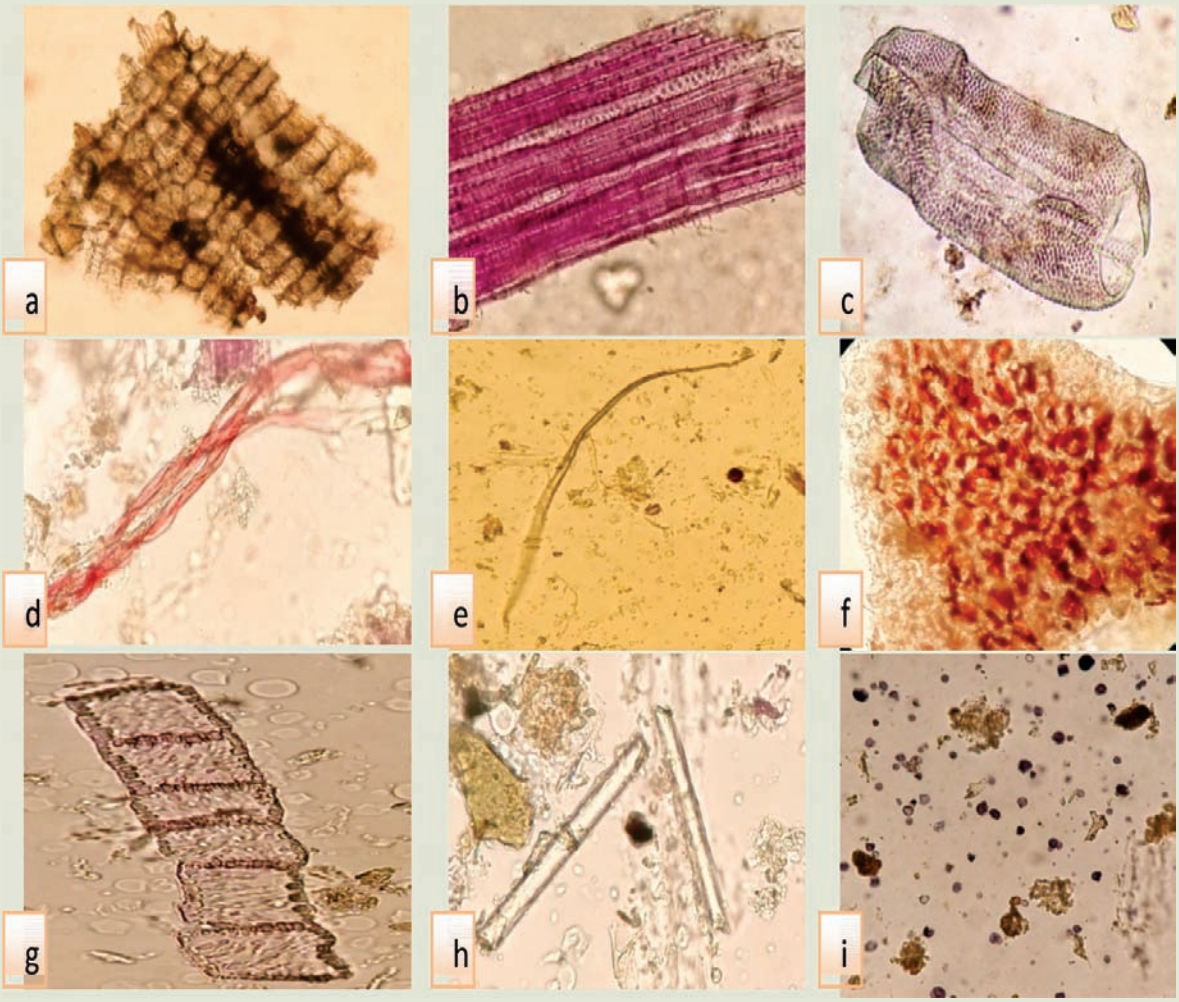


Figure 10
Transverse section of the Flower (Pink variety)



a: Adaxial epidermis; b: Vascular bundle; c: Cuticle; d: Parenchyma cells; e: Abaxial epidermis.

Figure 11
Powder microscopy of roots



a) Cork; b, c) Pitted vessels; d, e) Phloem fibers;) f) Sclerenchymatous cells; g) Tracheids with bordered pits; h) Acicular crystals; i) Starch grains

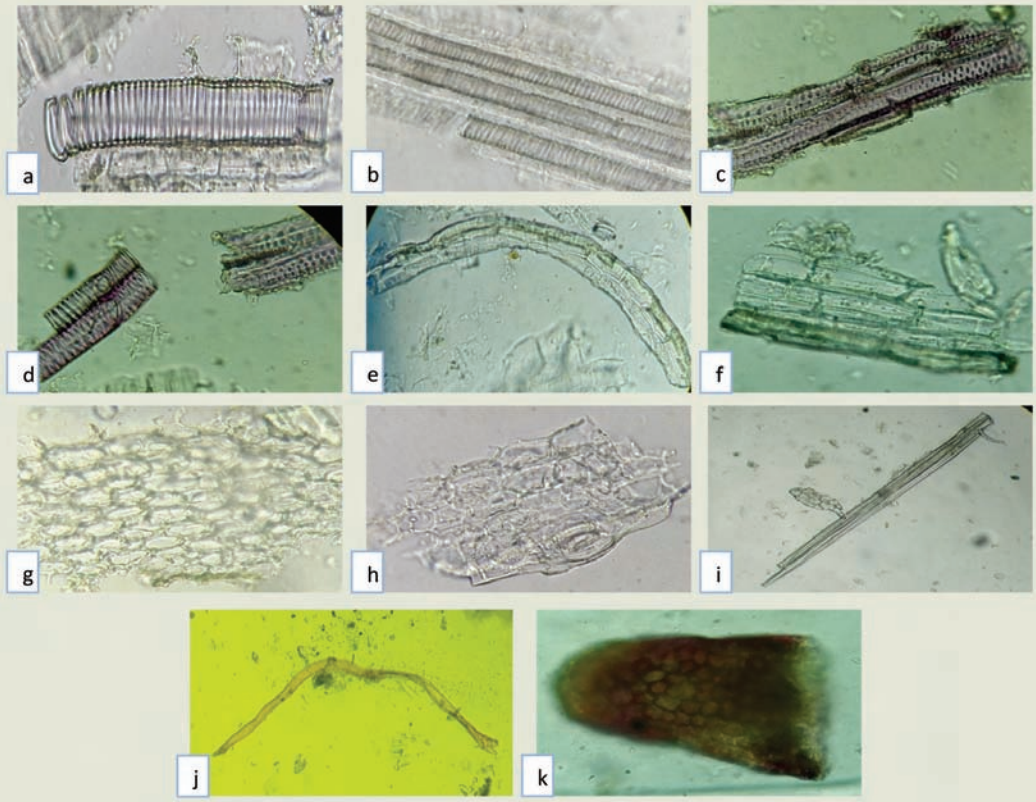
varieties. Lignified fibers and xylem parenchyma were observed only in the pink variety. Figure 12.

Powder microscopy of leaf: Cruciferous stomata, thin walled polygonal epidermal cells, essential oil globules in elongated cells of collenchymas, unicellular thick walled trichomes, lignified scleriform vessels, spiral vessels and phloem fibers were observed in the leaf powder of both varieties. Crystal fibers were observed only in white variety. Figure 13.

Powder microscopy of flower: Round shaped pollen grains in bunch and scattered form, lignified scalariform vessel, unlignified spiral vessels, multi cellular long covering trichomes, group of hairs, thin walled epidermal cells of corolla, lignified and unlignified fibers and epidermal cells of the petals with oil globules and stomata surrounded by guard cells were observed in the flower powder of both varieties. Lignified fibers were observed only in pink variety. Figure 14.

Figure 12

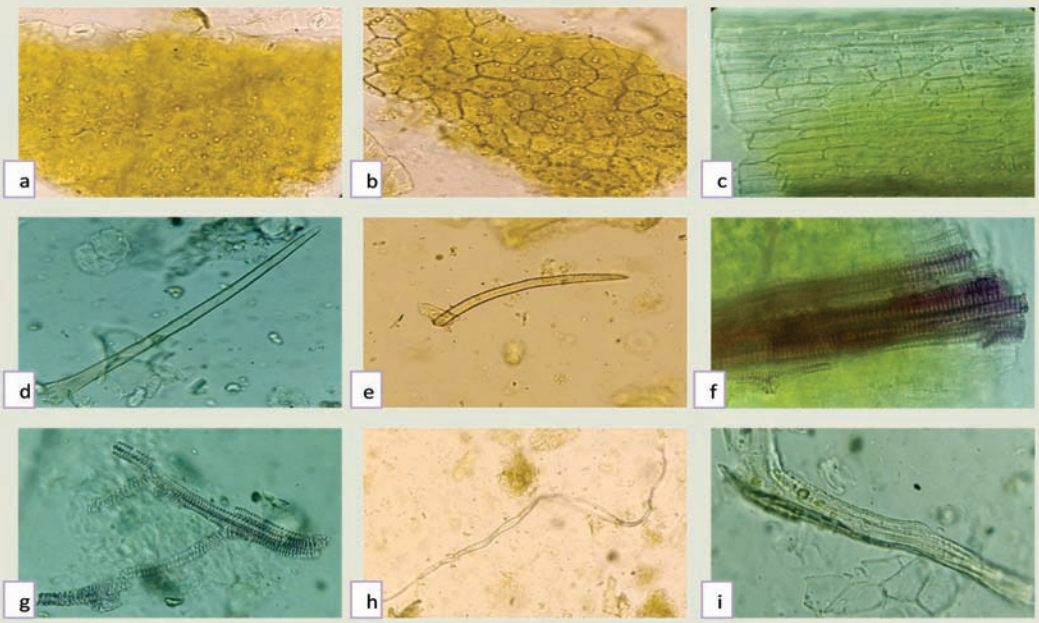
Powder microscopy of stem



a,b, c,d) Pitted annular vessels; e) Epidermis; f) Cork cells g) Parenchyma; h) Stomata; i) Bundle of fibers; j) Lignified fibers; k) Xylem parenchyma

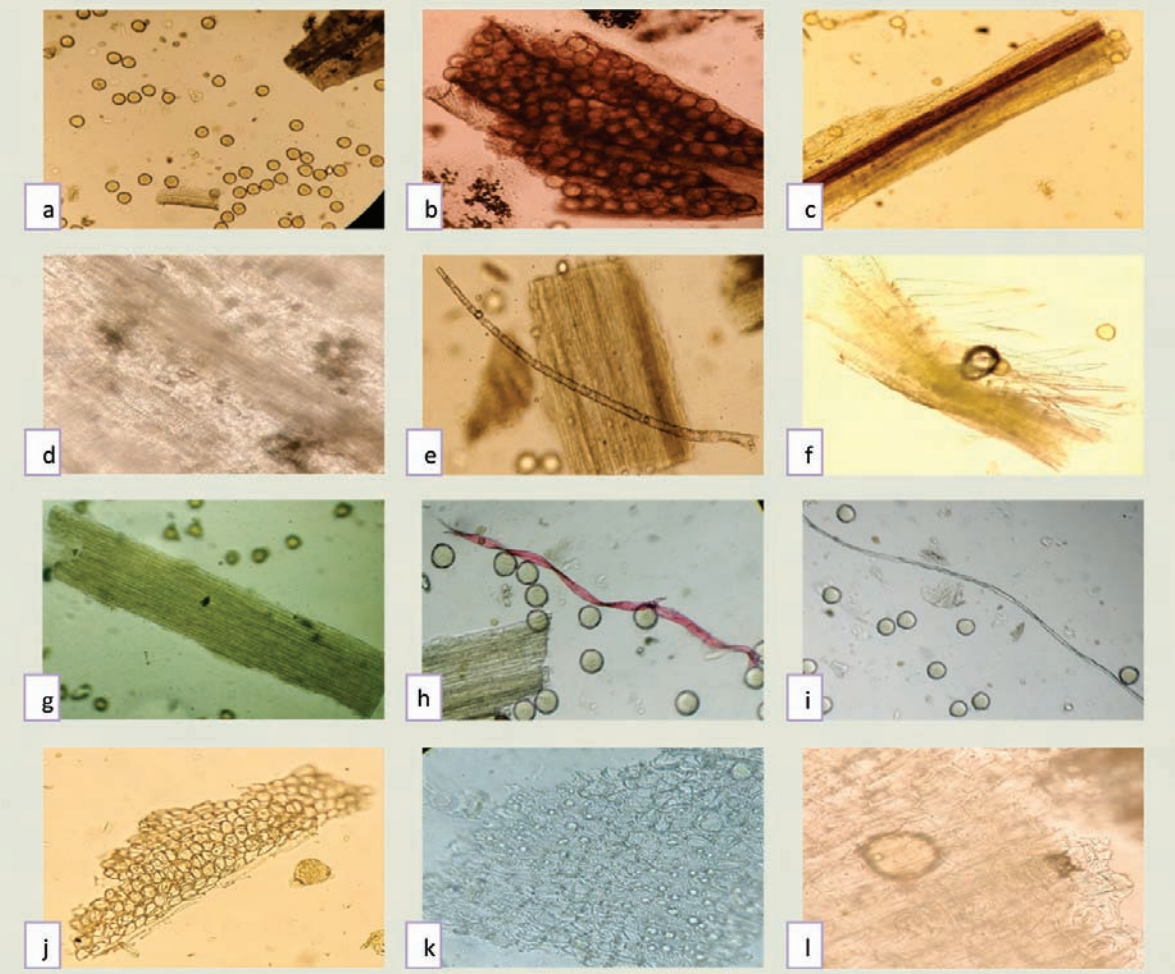
Figure 13

Powder microscopy of leaf



a) Cruciferous Stomata; b) Epidermis; c) Essential oil globules in collenchyma; d, e) Trichomes; f) Scleriform vessel; g) Spiral vessel; h) Phloem fiber; i) Crystal fiber

Figure 14
Powder microscopy of flower



a) Pollen grains; b) Vessel; c) Stomata; d) Group of hairs; e) Multi cellular trichome; f) Group of pollen grains; g) Bundle of fibers; h) Lignified fibers; i) Epidermal cells of petals; j) Epidermal cells with oil globules; k) Unlignified fiber; l) Spiral vessel

Conclusion

Pharmacognostic studies on flower, leaf, stem and root of pink and white flower varieties of *Catharanthus roseus* revelead that almost similar powder microscopical and histological characters were observed in both varieties except few exceptions. Size of the starch grains in root powder of white variety was bit more than the pink one. Numerous phloem fibers were observed in transverse section of stem of pink variety and the same was absent in stem of white variety. Lignified fibers and xylem parenchyma was observed only in the stem powder of pink variety. All these in detailed powder microscopical and histological reports on both the varieties of *Catharanthus roseus* will be further helpful for proper authentication of these two varieties.

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Authors

Rajesh Bolleddu, Central Ayurveda Research Institute for Drug Development, CCRAS, Kolkata, West Bengal-700 091, India.
Mangal A.K., Central Council for Research in Ayurvedic Sciences, New Delhi- 110058, India.
Sama Venkatesh, G. Pulla Reddy College of Pharmacy, Mehdipatnam, Hyderabad-500 028, Telangana, India.
Rao M.M., Central Ayurveda Research Institute for Drug Development, CCRAS, Kolkata, West Bengal-700 091, India.
Deboleena Paria, Central Ayurveda Research Institute for Drug Development, CCRAS, Kolkata, West Bengal-700 091, India.
Shreya Ghosal, Central Ayurveda Research Institute for Drug Development, CCRAS, Kolkata, West Bengal-700 091, India.

CASE STUDY
Āryavaidyan, Vol. XXXII, No. 1, August - October 2018, Pages 15 - 19

Effective treatment response of ayurvedic formulation in Chronic diabetic foot ulcer: a case study

Rohit Kumar Ravte, Chandreyee Ray, Achintya Mitra and Jayram Hazra

ABSTRACT: A female diabetic patient of age 67 years had attended the OPD complaining of non-healing ulcer on right foot. Patient was diagnosed case of Madhumehajavraṇa or Diabetic foot ulcer. Patient was taking oral anti diabetic medication since four years. The present case has revealed the vraṇaropaka effect of some ayurvedic formulation viz anti diabetic formulation ie. a combination of triphala, indrayava, guḍūcī and haridrā, Jātyādi ghṛtam, Mahāmañjiṣṭhādi kvātham, Ṭaṅkaṇa bhasma and Agnituṇḍi vaṭi. The ulcer was healed within two months of treatment. A remarkable improvement in wound healing without any adverse drug reaction was observed with the usage of these vraṇaropaka drugs.

Key words: Diabetic foot ulcer, Vraṇaropaka, Duṣṭavraṇa

Introduction

Sedentary life style, over stress and over nutrition are the major causes of diabetes (madhumeha) which has become the most prevalent disease in the world. The total number of people with diabetes worldwide is projected to be increased to 366 million by 2030. [1]

Patients with long standing diabetes are at risk of developing a variety of complications. In diabetic patients, foot is a frequent site of complications with the doṣas vitiating the dhātus, medas (fat), kḷeda (body fluid), etc., and thus needs serious care.[2] Foot ulceration occurs as a result of trauma in the presence of neuropathy and peripheral vascular disease with infection occurring as a secondary phenomenon following disruption of the protective epidermis. Most ulcers develop at the site of a plaque of callus skin, beneath which tissue necrosis occurs and eventually breads through to the surface.

Foot ulcer and infection are also a major source of morbidity in individual with diabetes mellitus (DM). Reason for the increased incidence of this disorder in DM involves the interaction of several pathogenic factors; neuropathy, abnormal biomechanics and poor wound healing.[3]

In Aṣṭāṅgasaṅgrahaḥ, it has been mentioned that patients of prameha (diabetes) becomes weak by the loss of medas (fat), kḷeda (body fluid), etc. and the doṣas vitiates all the dhātus in the later stages of the disease. These develops piṭikas (eruption/ulcer) in the places predominantly muscles, joints and other vital parts, with complications. Diabetic ulcer is usually manifested in the lower parts of the body as the doṣas are more prone towards the lower parts in prameha.[4] In āyurveda, these ulcers can be compared with duṣṭavraṇa.[5]

Case presentation

A female subject aged about 67 years, widow, house wife by profession was examined in the hospital (OPD) on 29.12.2015 (OPD Registration No. 7178/15-16) for madhumeha (Type II diabetes mellitus) along with chronic ulcer on the ventral surface of right foot at Central Ayurvedic Research Institute for Drug Development, Kolkata. Subject was a case of uncontrolled Type II diabetes mellitus (on oral anti diabetic drugs) since 4 years. She had a previous history of diabetic foot ulcer four years back. She was given conventional treatment for chronic diabetic foot ulcer for the last 6 months but to no

avail. On examination, body proportion was found to be thin and lean belonging to vātapitta prakṛti and asthisāra. There was no significant finding on physical examination.

Local examination

Site - Localized in right foot above the metatarso-phalangeal joints.

Size - Length:5 cm and width 6cm

Depth - 1/2cm

Shape - Irregular/elliptical

Edge/margin - Progressive ulcer at dorsum of right foot above the metatarsophalangeal joints, infected margin found, floor was reddish with foul smell and purulent discharge.

Discharge - After blood discharge, blood mixed with mild pus which needed daily dressing.
Smell - Unpleasant but tolerable.

Surrounding area - Acute inflammation and swelling.

On inspection the surrounding area of wound had inflammatory changes, watery discharge and foul smell.

Treatment advised: She was advised for the following procedures and treatment:

1. Daily wash vraṇa with Ṭaṅkaṇa bhasma.
2. Daily dressing with Jātyādi ghṛtam.
3. Oral anti diabetic drugs were also prescribed.

With the above mentioned treatment, vraṇa started healing within two weeks and got completely healed in 2 months.

The patient had continued the treatment for two months. During this period blood sugar was checked at regular intervals of one month. As a result her report on 01-03-2016 showed a remarkable improvement.

Drug regimen

An anti diabetic formulation (combination of triphala, indrayava, guḍūcī and haridrā in equal proportions) was prepared from the Pharmacy Department of CARIDD, Kolkata (GMP certified by ISM drug control, Govt. of West Bengal). Agnituṇḍi vaṭi and Ṭaṅkaṇa bhasma supplied by the Indian Medicine Pharmaceutical Corporation Limited, Mohan, Uttaranchal. Other medicines like Mahāmañjiṣṭhādi kvātham and Jātyādi ghṛtam was from Arya Vaidya Sala , Kottakkal, Kerala. Table 1.

Diet: She was advised diabetic diet and some life style modification.

Gradation criteria for assessment[6]

The criteria followed is given in Table 2.

Table 1
Drugs of case study

Sl. No.	Name of drugs	Dose	Mode of administration	Anupāna / Sahapāna
1.	Oral antidiabetic formulation (triphala, indrayava, guḍūcī and haridrā)	6 g twice daily before breakfast and dinner	Oral	Water
2.	Mahāmañjiṣṭhādi kvātha	10 ml twice daily after breakfast and dinner	Oral	Luke warm water
3.	Tab. Agnituṇḍi vaṭi	125 mg twice daily after breakfast and dinner	Oral	Luke warm water
4.	Ṭaṅkaṇa bhasma	Quantity sufficient	Wash of wound	-
5.	Jātyādi ghṛtam	Quantity sufficient	Local application	-

Table 2
Gradation criteria for assessment

Parameter for assessment	Gradation criteria			
	0	+	++	+++
Size	No discontinuity of skin/mucous membrane	¼ previous area of the ulcer	½ of previous area of the ulcer	1-½ of previous area of the ulcer
Pain	No pain	Localized pain during movement but relived on rest	Localized pain during rest	Localized pain even during rest and also towards other side
Discharge	No discharge/ Dry dressing	Scanty, occasional discharge/little wet dressing	Often discharge need daily dressing	Profuse, continuous discharge need frequent dressing
Smell	No smelling	Bad smell	Tolerable unpleasant smell	Foul and intolerant smell
Edge	Adhere edge	Smooth even and regular edge	Rough irregular edge	Angry look
Floor	Smooth regular with granulation tissue/No need dressing	Rough, regular, mild discharge, less granulation tissue/ need dressing	Unhealthy, less granulation tissue/ need daily dressing	Unhealthy, no granulation

Observations of the study

Observation of prognosis of the ulcer as per the assessment criteria is given in Table 3.

The characteristics of duṣṭavraṇa like ativivṛta (broad base), bhairavaḥ (ugly look), pūtipūya-mamsa (foul pus discharge), daurgandhya (foul smell), vedana (pain) and dīrghakālānubandhi (chronic) were noted in the wound.

Table 3
Observation of prognosis of ulcer as per assessment criteria

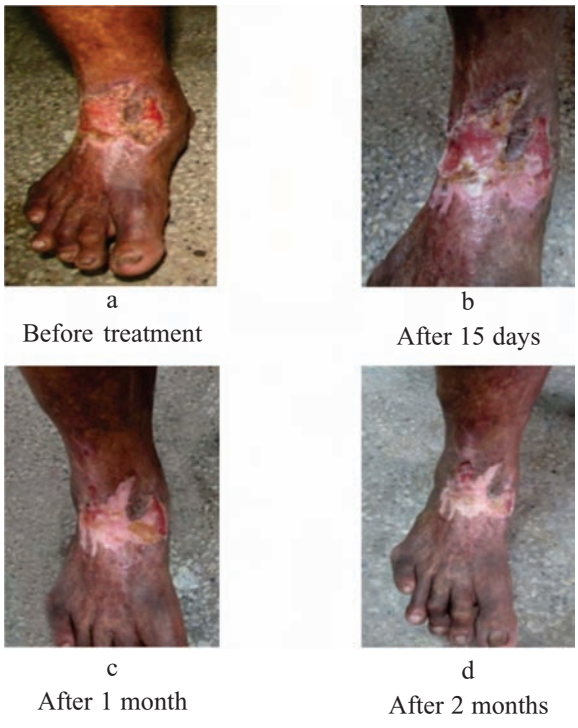
Signs/ Symptoms	Before treatment		After treatment	
	Day 1	15 days	30 days	60 days
Size	+++	++	+	+
Pain	++	++	-	-
Discharge	++	++	+	-
Smell	++	++	-	-
Edge	++	++	-	-
Floor	+++	++	+	-

Swelling and pain was reduced remarkably on the 15th day of medication. Ulcer was cleaned regularly with Ṭaṅkaṇa bhasma and gauze dressing was done with Jātyādi ghṛtam. After 30 days healthy granulation tissue was observed covering the ulcer. Gradually the ulcer size was found reduced showing a remarkable improvement. Figure 1.

Discussion

In ayurvedic classics, it is clearly mentioned that Jātyādi ghṛtam is effective by its local application in marmāśritavraṇa (ulcer in vital points), kḷedivraṇa (Oozing, weeping ulcer), gambhīravraṇa (deep-rooted ulcer), duṣṭavraṇa (non-healing ulcer).[7] Ṭaṅkaṇa bhasma, a commonly available alkali is appreciated as kṣāraśreṣṭha. It has got kaṭurasa and

Figure 1
Different stages of wound healing



a Before treatment
b After 15 days
c After 1 month
d After 2 months

uṣṇa-tīkṣṇa guṇa.[8] In infected wound, alkali water is used for cleaning the wound.[9] It is vraṇaropaka as well as vātakaphaśāmaka. Mahāmañjiṣṭhādi kvātha is used in disorders of skin and non healing wounds to accelerate the healing process.[10] Haridā, one of the ingredient in the antidiabetic formulation also possess vraṇaropaka properties.[11] Agnituṇḍi vaṭi used here enhances the enzyme activities in the GI tract and corrects the metabolism.

The present case study reveals that there is effective management of madhumehavraṇa (diabetic foot ulcer) with āyurveda. Patients with chronic history of madhumeha are more prone to madhumehavraṇa. In the treatment of madhumehajavraṇa both medical and surgical intervention is necessary. Madhumeha vraṇa if not treated properly can reach up to amputation of limb in patients. Marked improvement found in the patient in this study is giving a hope for those suffering from chronic diabetic foot ulcer in the cost effective aspect too. This case was treated at the OPD level with simple wound care procedure without any vigorous surgical intervention and hospital stay.

Conclusion

A multidrug prescription along with care of chronic non healing ulcer with the application of Jātyādi ghṛtam, Mahāmañjiṣṭpaādi kvātha and Ṭaṅkaṇa bhasma are effective and safe treatment for the management of madhumehavraṇa (diabetic ulcer). Improvement through the present approach for diabetic foot ulcer is highly promising, however, a well planned controlled clinical trial is required for validation of the claim.

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Authors

Rohit Kumar Ravte, Research officer (Ay) / Scientist-3, Central Ayurvedic Research Institute for Drug Development (CARIDD), CCRAS, Ministry of AYUSH, Government of India, 4CN Block, Sec-5, Bidhannagar, Kolkata-700091, West Bengal, India.
Chandreyee Ray, Senior Research Fellow (Ayurveda), Central Ayurvedic Research Institute for Drug Development (CARIDD), CCRAS, Ministry of AYUSH, Government of India, 4CN Block, Sec-5, Bidhannagar, Kolkata-700091, West Bengal, India.
Achintya Mitra, Research officer (Ay) / Scientist-3, Central Ayurvedic Research Institute for Drug Development (CARIDD), CCRAS, Ministry of AYUSH, Government of India, 4CN Block, Sec-5, Bidhannagar, Kolkata-700091, West Bengal, India.
Jayram Hazra, Director, Central Ayurvedic Research Institute for Drug Development (CARIDD), CCRAS, Ministry of AYUSH, Government of India, 4CN Block, Sec-5, Bidhannagar, Kolkata-700091, West Bengal, India.

CLINICAL STUDY

Āryavaidyan, Vol. XXXII, No. 1, August - October 2018, Pages 20 - 25

Mass spectrometric fingerprinting of Amṛta abhīrvādi drops: a polyherbal drug

Shubhangi Rathore, Chethan Kumar V.K., Sharashchandra R., Deepa Yadav and Sunil Kumar K.N.

ABSTRACT: Amṛta abhīrvādi drops, a phytoherbal preparation in the form of arka (distillate) consists of amṛta, abhīru, paṭola, nimba, raktacandana and śāriba. This research was designed to explore the chemical constituents as secondary metabolites by Gas Chromatography-Mass Spectrometry (GC-MS). Secondary metabolite screening using GC-MS revealed the presence of 3-pyridinol, 2,6-dimethyl; octadecane, 6-methyl; dodecyl acrylate; imidazole, 2-amino-5-[(2-carboxy)vinyl], Z,Z-2,5-pentadecadien-1-ol; l-gala-l-ido-octose and 4-(3-pyridyl)-4-oxo-butyramide at different retention indices and peak area percentage. Compounds were identified using NIST library. Arka is rich with alkaloids containing alkane hydrocarbon, acrylic acid, terpenoid and monosaccharides as secondary metabolites. It is essential to identify the compounds present in a herbal preparation, as the therapeutic values and efficacy of the herbals depend on many factors such as geographical variations, seasons of collection and method of preparation.

Key words: Amṛta abhīrvādi drops, GC-MS, Alkaloids, Arka

Introduction

Medicinal plants are extensive gift from nature to human. A wide range of medicinal plants are used in the form of raw drugs, out of which the essence is extracted which possess therapeutic efficacy. Medicinal plants play an important role in the drug development process in phytotherapy. Traditional medicines are ancient, well accepted and trusted practice as more than 75% of world population rely on herbal medicine for primary health care system.[1] Plant based active constituents as antioxidant metabolites can be derived from different parts of plant and may be used to treat various ailments. Preservation of herbal preparation is much more difficult than synthetic drugs because of the chemical complexity of the ingredients. Suitable analytical tools are required to establish the presence of phytoconstituents. The determination of phyto-constituents is largely performed by relatively expensive and hyphenated techniques such as gas chromatography coupled with mass spectrometry (GC-MS). GC-MS analysis can identify the pure compounds even at lower concentration in a polyherbal formulation.[2]

Ayurvedic manuscript 'Śāraṅgadharasamhita' dated 1300 AD elucidates the inventive approaches for new drugs to facilitate the development of synergistic botanical formulations as polyherbal therapy.[3] Poly-herbal therapy sounds the therapeutic benefits of multiple drugs in single formulation. Drug combinations produce a promising effect in the treatment of various disorders when compared against single drug therapy. Existing scenario is exploring the renaissance of polyherbal therapy all over the world with better efficacy, less side effects and better acceptability than allopathic drugs.[4] Henceforth, different parts of six medicinal plants were used to prepare a polyherbal formulation i.e. Amṛta abhīrvādi in the form of arka. This research work was aimed to explore the bioactive constituents of Amṛta abhīrvādi using gas chromatography mass spectrometry.

Materials and methodes

Plant materials: Amṛta [*Tinospora cordifolia* (Willd.) Miers], abhīru (*Asparagus racemosus* Willd.), paṭola (*Trichosanthus lobata* Roxb.), nimba (*Azadirachta indica* A. Juss.), raktacandana (*Pterocarpus santalinus* L. f.) and śāriba [*Hemidesmus indicus* (L.) R. Br. ex Schult.] were collected from Shri Dharmasthala Manjunatheshwara Pharmacy, Udupi, Karnataka, India.

Method of preparation

Amṛta abhīrvādi drops were prepared using different parts of medicinal plants such as stem of amṛta, tuberous root of abhīru, leaves of paṭola, bark of nimba, heartwood of raktacandana and root of śāriba. The plant materials were identified morphologically on the basis of Ayurvedic Pharmacopoeia of India and quality standards of Indian Medicinal Plants. Arka was prepared by distillation process. All the drugs in equal proportion were thoroughly cleaned, coarsely powdered and soaked in distilled water for overnight. Next morning drugs were kept for distillation process. Condensed vapors containing volatile oils were collected according to Ayurvedic Formulary of India.[5] Prepared Amṛta abhīrvādi drops were used to analyze the active constituents of drug using Gas chromatography coupled with mass spectrometry.

Mass spectrometric fingerprinting by GC-MS:

Gas chromatography mass spectrometry (GCMS) was performed using 7890 A, MS 5975 [Agilent]. The capillary column [HP5ms Ultra Inert (length: 30.0 m; diameter: 0.25 mm), with a film thickness of 0.25 mm] and carrier gas (helium) at a flow rate of 1.0 ml/min was used. 2µl sample with 36.445 cm/sec average velocity was utilized. The inlet temperature was maintained as 280^{0}C. The oven temperature was programmed at 50^{0}C for 1 min and then increase to 310^{0}C at a rate of 10^{0}C. Total run time was 42 min. The mass transfer line was maintained at a temperature of 240^{0}C. Mass spectrum was recorded using 70eV electron energy. Fragmented compounds were evaluated using total ion count for compound identification and quantification. The spectra of the unknown components were identified and compared using spectral database NIST11 library.[6]

Results

Gas Chromatography Mass Spectrometry:

Compound identification using GC-MS validated the presence of pharmacologically active compounds. Table1 depicting the phytoactive components present in Amṛta abhīrvādi drops with different peak area %, retention time, molecular formula, weight and structures. Identified compounds are 3-pyridinol, 2,6-dimethyl; octadecane, 6-methyl; dodecyl acrylate; imidazole, 2-amino-5-[(2-carboxy)vinyl], Z,Z-2,5-pentadecadien-1-ol; l-Gala-l-ido-octose and 4-(3-pyridyl)-4-oxo-butyramide. Identified compounds were matched with NIST library for confirmation of compounds. The compounds were identified on the basis of mass charge ration (m/z) and retention time. Molecular formula, weight and nature of compound were identified on the basis of literatures available in databases like NIST, NCBI, PubChem and Google scholar. GLC chromatogram represented the peaks of fragmented compounds at different retention indices (Figure.1). Fragmented spectrum of each compound confirmed the presence of above mentioned phytoconstituents. Figure 2.

Table 1.
Mass spectrometric identification of Amṛta abhīrvādi drops

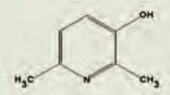
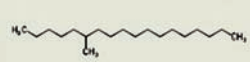
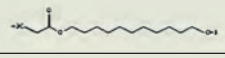
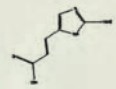
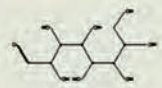
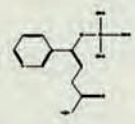
Peak	Retention time	Area %	Identified compound	Molecular formula	Molecular weight (g/mol)	Nature of compound	Structure
1.	4.424	1.8	3-Pyridinol, 2,6-dimethyl	C_7H_9O	123.152	-	
2.	6.356	0.61	Octadecane, 6-methyl	$C_{19}H_{40}$	268.5209	Alkane Hydrocarbon	
3.	7.109	3.86	Dodecyl acrylate	$C_{15}H_{28}O_2$	240.387	Acrylic acid	
4.	10.204	5.78	Imidazole, 2-amino-5-[(2-carboxy)vinyl]	$C_6H_7N_9O_2$	153.141	Alkaloid	
5.	18.587	1.1	Z,Z-2,5-Pentadecadien-1-ol	$C_{15}H_{28}O$	224.388	Alkaloid/ Terpenoid	
6.	21.732	0.75	1-Gala-1-ido-octose	$C_8H_{16}O_8$	240.208	Monosaccharide	
7.	37.403	100	4-(3-Pyridyl)-4-oxo-butyramide tms	-	-	-	
Unidentified: (-)							

Figure.1
GLC Chromatogram of Amṛta abhīrvādi drops

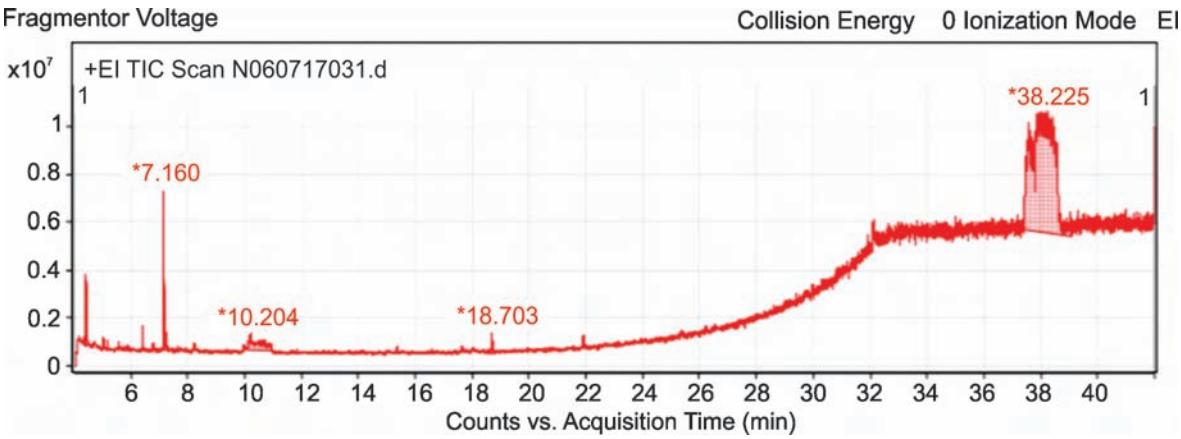
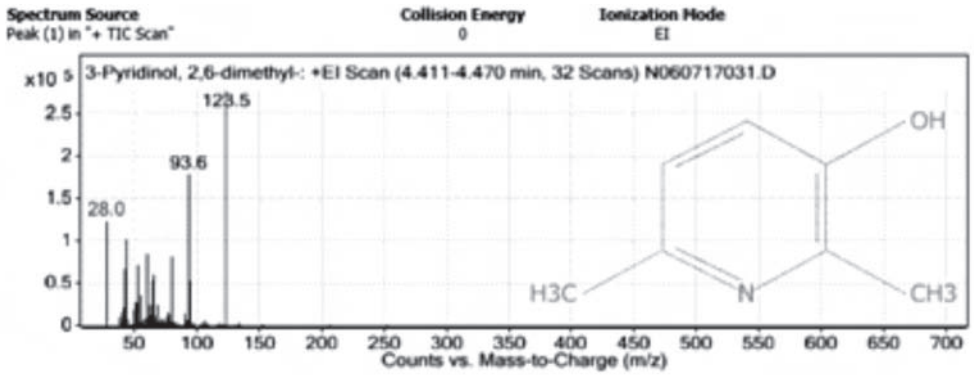


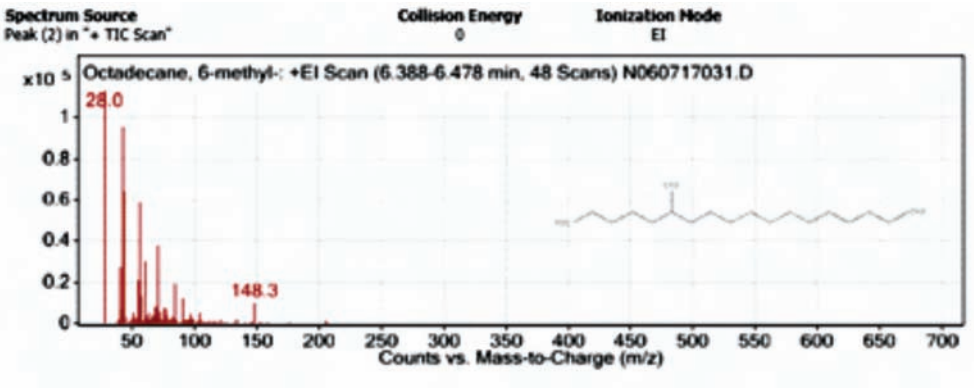
Figure.2

Mass spectrum of identified compounds in Amṛta abhīrvādi drops

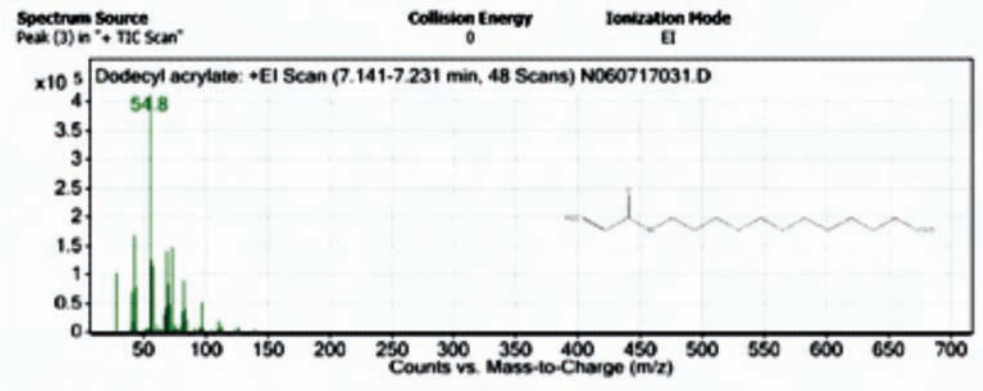
2a



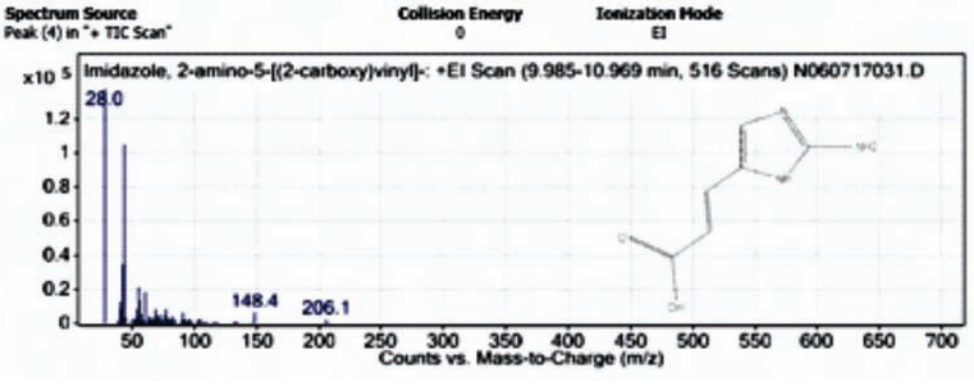
2b

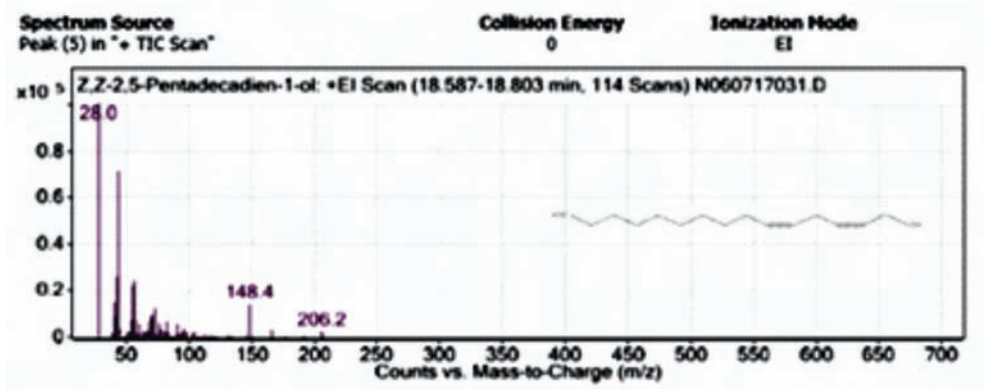


2c

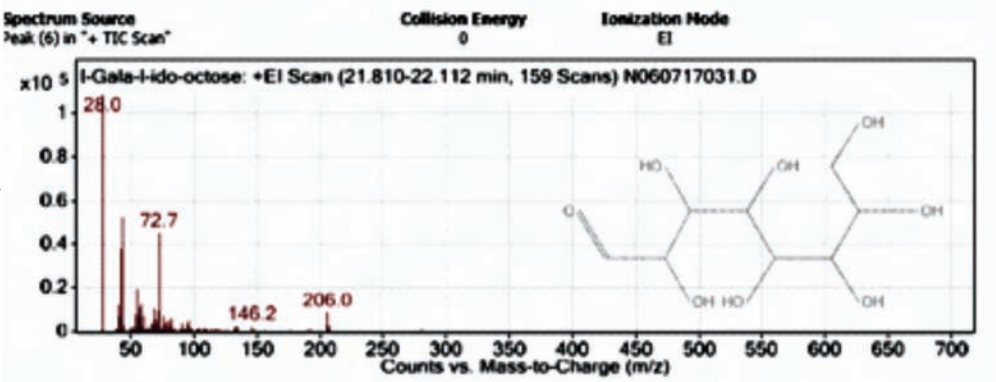


2d

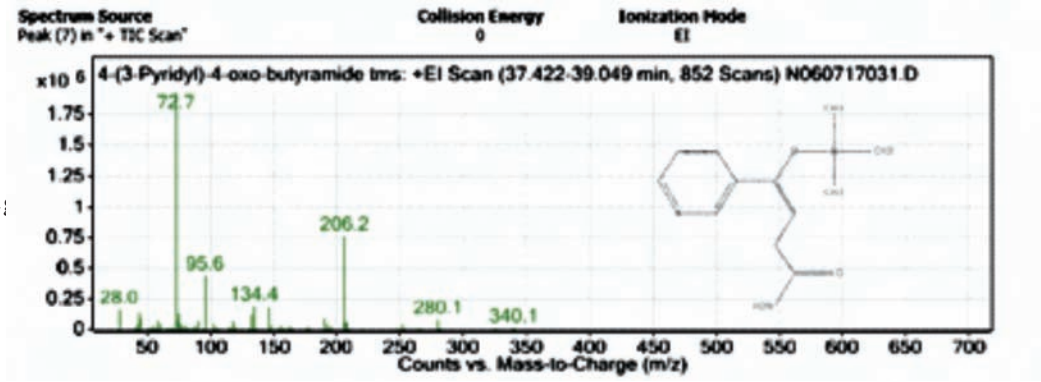




2e



2f



2g

Discussion

The GC-MS profiling confirmed the presence of various components with different retention indices and the compounds fragmented into small compounds represents peaks at different m/z ratios. Mass spectra are the fingerprints of that particular compounds identified from the data library.[7] Chemoprofiling of Amṛta abhīrvādi drops using GC-MS revealed the presence of alkaloids, terpenoid, alkane hydrocarbons, acrylic acid and mono-saccharides. Alkaloids are the major active principles of Amṛta abhīrvādi drops. Alkaloids are the secondary metabolites of plants that are known possess the physiological and biochemical mechanism of pharmacological importance[8] and act as immune-stimulant and antitumor activity.[9] Alkaloids functions as antioxidant metabolites by scavenging free radicals generates in oxidation processes.[10,11]

Conclusion

GC-MS profiling revealed the presence of secondary metabolites which are known to possess antioxidant activity, immunomodulatory effect and hepato-protective efficacy. Thus it can be concluded that Amṛta abhīrvādi drops with phytoactive constituents may help in scavenging of free radical ions that may improve the antioxidant status which further can eliminate the toxic metabolites from the body. Further randomized controlled clinical trials should be performed to determine the efficacy of Amṛta abhīrvādi drops.

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Authors

Shubhangi Rathore, Post Graduate Scholar, Department of Post Graduate Studies in Kaumarabhritya, Sri Dharmasthala Manjunatheshwara College of Ayurveda and Hospital, Kuthpady, Udupi, Karnataka, India.

Chethan Kumar V.K., Associate Professor, Department of Post Graduate Studies in Kaumarabhritya, Sri Dharmasthala Manjunatheshwara College of Ayurveda and Hospital, Kuthpady, Udupi, Karnataka, India.

Sharashchandra R., Assistant Professor, Department of Post Graduate Studies in Kaumarabhritya, Sri Dharmasthala Manjunatheshwara College of Ayurveda and Hospital, Kuthpady, Udupi, Karnataka, India.

Deepa Yadav, PhD Scholar, UNESCO Trace Element and Satellite Center, School of Studies in Zoology, Jiwaji University Gwalior, Madhya Pradesh, India.

Sunil Kumar K.N., Research Officer (Pharmacognosy), Siddha Central Research Institute, Central Council for Research in Siddha, Ministry of AYUSH-Govt. of India, Chennai, India.

CASE REPORT

Āryavaidyan, Vol. XXXII, No. 1, August - October 2018, Pages 26 - 28

Ayurvedic management of Lymphoedema - a case report

Bijima K. and Madhu P.M.

ABSTRACT: Lymphoedema is a condition of localised fluid retention and tissue swelling caused by compromised lymphatic system. Ayurvedic understanding of this clinical condition is done by assessing the status of samprāpti factors involved in individual cases. The decision of treatment option is based on rogabala and rogībala. This concept is validated with the help of evidence in this single case report. The treatment opted intis condition after understanding the samprāptighaṭakas involved roga-rogī bala proved effective.

Key word: Lymphoedema

Introduction

Lymphoedema is a condition of localised fluid retention and tissue swelling caused by compromised lymphatic system. Symptoms includes swelling, pressure effects, asymmetry of limbs, presence of skin changes such as discolouration, verrucous (wart like), hyperkeratinisation, ulcer, etc. Lyphoedema may be inherited or caused by injury to lymphatic vessel. It can also be caused by compromising the lymphatic system resulting from the cellulitis. Diagnosis of lymphoedema is based on history, physical examination, limb measurements and imaging studies. Since lymphoedema is disfiguring it causes difficulties in daily living and brings some limitations in lifestyle. It may also result in psychological distress.

Case description

56 year old male patient, fisherman by profession visited OPD on 23-10-2017 with swelling of left leg below knee up to toe for the last 8 months. The condition started with an attack of fever. Two days later he noticed swelling of left leg below knee which was erythematous and had warmth. The swelling was associated with pain. He consulted an allopathic doctor and underwent medication. A day after that he noticed fluid filled swelling above inner and upper side of ankle joint. It got burst by its own and fluid came out. He was under allopathic medication for about one and a half month. He noticed that the swelling was getting hardened which was previously soft in touch. He also observed that the swelling was less in the morning but was getting increased in the evening. He was shifted for ayurvedic medication and was advised for a peripheral smear for filarial parasite. The test was negative. After 3 months of ayurvedic treatment, he got considerable relief in redness, warmth and pain. Then he came to the OPD for a better management.

Patient was non-hypertensive and non- diabetic. He gave a history of recurrent fever and inguinal lymph-adenopathy.

On examination of the affected limb, it was having a normal hair distribution and skin colour was with hyper pigmented patches above the ankle joint (Initially the swelling was erythematous and non pulsatile). On palpation temperature was within normal limits and had Grade-1 tenderness (initially there was an increase in temperature with Grade-3 tenderness.). Surface of the swelling was smooth with normal hair follicle. Peripheral pulses were palpable.

Biochemical and haematological profile showed normal result except Liver function test (T.Bilirubin-1.5 mg%; D.Bilirubin-0.5 mg%;SGPT-39IU/L; SGOT-40IU/L).

Lymphoedema diagnosis is based on history, physical examination and limb measurements. Deep vein

thrombosis was excluded as there was no intermittent claudication and the edema was geting reduced after rest. Filaria was excluded based on peripheral smear.

Ayurvedic perspective

Lymphedema cannot be mirrored with any particular condition. It can be compared to some extend with śopha. Ayurvedic understanding of any disease is done by the assessment of the samprāptighaṭakas. If we consider the śopha samprāpti it goes through the following stages vātaduṣṭi, rakta-pitta-kapha duṣṭi, bāhyasirāprāpti of duṣṭa rakta, pitta and kapha. Srotorodha by duṣṭa rakta-pitta-kapha, vāta niruddha gati, tvak-māmsasamśraya manifests as śopha. Primarily doṣaduṣṭi occurs in koṣṭa and from there doṣa will be taken to the bahissirā by the vitiated vāta. Dhātus affected are rasa and rakta.

In this case prakṛti of the patient was kapha pitta and he belonged to ānūpadeśa. He had the habit of taking excess fish (which is ānūpamāmsa and kapha-vardhaka) and followed niśājāgaraṇa. Most of the times he ate kaṭvamlalavaṇa pradhāna āhāra. He had a history of recurrent fever suggesting srotoduṣṭi at the level of rasa and derangement at the level of agni. All these conditions together contributed to a kapha pradhāna-tridoṣa duṣṭi with kledādhikya. This duṣṭa doṣa was taken to bahissirā by the vitiated vāta and attained sthānasamśraya (lodges) in between māmsa and tvak resulting in śopha. By analysing the doṣa it can be concluded as a kaphapradhānaśopha.

Doṣas: Sañcitadoṣa kapha and pitta

Prerakadoṣa: Vāta

Dūṣya: Rasa, rakta and māmsa

Srotoduṣṭi: Saṅga and vimārgagamana

Āma: Malasañcaya

Rogamārga: Bāhya and ābhyantara

By considering the bala of roga and rogi, understanding the nidāna, doṣa, ṛtu, etc. laṅghana pācana treatment was adopted in this condition.

Line of management

The patient was provisionally diagnosed as kaphādhikaśopha because of the presence of kaṭhinaḥ guruḥ sthiraḥ śopha, ākrānto na unnamet, kṛchraśama janmā, niśābalaḥ, etc. The treatment was started with internal laṅghana, pācana, anulomana and external rūkṣaṇa therapy. With strict dietary restrictions, Amṛtottaram kaṣāyam with Vaisvānaracūrṇam was given internally and Kolakulatthādicūrṇam was advised for udvarttanam for 14 days. For the next 14 days, Punarnavādi kaṣāyam and Guggulupañcapala cūrṇam was given internally and Dhānyāmlādhāra externally. Along with this straight leg raising was also advised to strengthen the muscles of lower limb. After 28 days of inpatient treatment, patient was discharged and advised to follow śophahara food regimen and Daśamūlaharītakī rasāyana was presscribed for intake. (All the medicines used were collected from the Pharmaceutical Company, Oushadhi)

Observation and analysis

Clinical features like hardness of swelling, measurement of swelling, time taken by skin to regain its normal position after pitting were assessed before treatment, after 14 days of udvarttana, after 14 days of dhānyāmlādhāra and 3 weeks and 6 weeks after completion of the treatment. Table 1.

In this study hardness of swelling was graded as hard (+++), doughy (++), normal (+).

Discussion

General line of treatment of śopha is laṅghana and pācana. By understanding the roga bala as madhyama and rogībala as pravara from daśavida-parīkṣa, laṅghana, pācana and rūkṣaṇa treatments were adopted with the above mentioned drugs. Treatment can be considered as a process of samprāptivighaṭana. Due to the scientific management scheme adopted, the factors involved in the samprāpti may have started reversing gradually. It is evident from the analysis.

Table 1
Assessment of clinical features

Assessing Criteria	Measurement of left leg					
	At the time of admission (23-10-17)	After 14 days Udvartanam (24-11-17)	After 14 days Dhānyāmḷadhāra (8-12-17)	3 weeks after discharge (29-11-17)	6 weeks after discharge (19-1-18)	Measurement of right leg
Circumference around lateral maleoli of ankle	34 cm	33 cm	32cm	31 cm	30 cm	28 cm
Circumference around 10cm above lateral maleoli of ankle	44 cm	41cm	37 cm	34 cm	31 cm	30 cm
Circumference around 20cm above lateral maleoli of ankle	47 cm	44 cm	40 cm	37 cm	36 cm	35 cm
Pitting time	2 minute	100 seconds	60 seconds	45 seconds	25 seconds	No edema
Hardness	+++	++	++	+	+	+

Conclusion

Ayurvedic understanding of every disease known or unknown is based upon the proper understanding of samprāptighaṭakas. But while deciding the treatment rogabala and rogibala also should be considered. This will gave good results and the patient becomes comfortable especially in this disease.

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Authors
Bijima K., Final Year Post Graduate Scholar, Department of Roganidanam, Govt. Ayurveda College, Kannur, Kerala.
Madhu P.M., Assistant Professor, Department of Roganidanam, Govt. Ayurveda College, Kannur, Kerala.

ANALYTICAL STUDY

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Preliminary pharmacognostic and phytochemical analysis of *Viparītalajjālu* [*Biophytum sensitivum* (L.) DC.]

Shree N., Ramadevi R. and Raghunathan A.

ABSTRACT: Viparītalajjālu [*Biophytum sensitivum* (L.) DC.] is one among the devine group of Daśapuṣpa which is traditionally used for the treatment of various diseases. It needs an exposure outside Kerala which will help in protecting our heritage also. The purpose of this work is to give a scientific recognition to viparītalajjālu. This study is an analytical one in which the preliminary pharmacognostic and phytochemical analysis of viparītalajjālu was performed. Along with this, review of classical and scientific literature about viparītalajjālu is also described. Pharmacognostic study has been performed from T.S of stem. Preliminary phytochemical analysis has been performed by determining physicochemical parameters (total ash, water insoluble ash, acid insoluble ash, moisture content, volatile oil content, sugar content total and reducing sugar, fibre content, etc.), qualitative analysis (detection of tannins, phenols, flavanoids, alkaloids and steroids) and TLC (Thin layer chromatography). This study will be helpful for further investigation of its standardization, pharmacological activity, toxicity and clinical trials. It may also help to comprehend the role of viparītalajjālu in different fields.

Key words: Viparītalajjālu, Pharmacognostic, Phytochemical

Introduction

Viparītalajjālu is one among the Daśapuṣpa. In Nāṭṭuvaidyam (Folk medicine), it is mentioned that the ādidevata of viparītalajjālu is 'goddess Pārvati' and iṣṭasiddhi is 'bhartṛsoukhyam' and 'śataputra saubhāgyalābham'. It is an important ingredient of many formulations mentioned in Sahasrayogam and other Malayalam texts. In Rājanighaṇṭu viparītalajjālu is described and placed in the 5th Varga (Parpaṭādi varga). Reference regarding Viparītalajjālu can also be seen in Śāligrāmanighaṇṭu.

Botanical name: *Biophytum sensitivum* (L.) DC.[1]

Family: Oxalidaceae[1]

Vernacular names

Sanskrit: Viparītalajjālu[2]

Malyalam: Mukkūṭṭi, Tiṅḍanāzhi[2]

Tamil: Tiṅḍanāzhi[2]

Bengala: Jhalai[3]

Gujarati: Jharera[3]

Hindi: Lajalu, Lakṣmaṇa[3]

Marathi: Jharera, Jhadjiri, Lahanamulki[3]

Synonyms: The synonyms of viparītalajjālu mentioned in Śāligrāmanighaṇṭu, Rājanighaṇṭu, Bhāvaprakāśa and Indian Medicinal Plants are given in Table 1.

Plant Description

Varieties: *Biophytum reinwardtii* (Zucc.) Klotzsch is other species which differ from *B. sensitivum* chiefly in the number of leaflets which are more in number ie. 10 to 20 pairs and the long pedicellate nature of the flowers. It can be easily distinguished from *B. sensitivum* by its strikingly graceful habit, smaller flowers on long slender pedicels and by the capsule nearly equaling the sepals in length.[2]

Distribution and Habitat: This plant is found throughout the hotter parts of India - ascending to 1800 meters elevation in Himalayas, Bengal, Konkan, Deccan, Circars, Carnatic, East and West coast districts. It is common in somewhat shady moist places, roadsides, riverbanks as well as on cultivated grounds.[2]

Table 1
Synonyms of Viparītalajjālu *B. sensitivum* mentioned in diffenent texts

Synonyms	Śā.Ni.[4]	Raj.Ni.[5]	I.M.P.[1]
Viparītalajjālu		+	
Alpakṣupa		+	
Bṛhaddaḷā		+	
Jhullapuṣpaḥ	+		
Ujvalatpuṣpaḥ	+		
Kṛchhrahā	+		
Laghuvṛkṣakaḥ	+		
Pītapuṣpaḥ	+		
Paṅgtipatraḥ	+		
Lajjālukaḥ	+		
Niṣkaṇḍakā			+
Kṣurapāḍī			+
Niśśākhā			+
Kṣupavṛkṣakā			+
+ means present.			

Habit and general features

Biophytum sensitivum is an annual or occasionally perennial herb with a usually simple or sometimes sparingly branched short or long slender or robust hispidly pubescent stem bearing a crown of small abruptly pinnate crowded sensitive leaves at the end of the main stem or its branches and fairly long peduncled umbellate cymes of small yellow flowers and very small ovoid or oblong capsular fruits enclosing many very small seeds that are enclosed by turgid white membranous arils by the sudden splitting eversion and crumpling of which the latter are short out. The plant is in flower throughout the year.[2]

Macroscopic Description: See Figure 1.

Stem: Mostly simple, very rarely branched.[2]

Leaves: Alternate, very closely crowded into a rosette at the top of the main stem or its branches, 3.8 to about 10 cm long, abruptly pinnate and short-stalked.

Figure 1
Macroscopic description of *B. sensitivum*

Rachis: Slender, glabrous, hispidous or merely ciliate.

Leaflet: Subsessile, many, 6-15 pairs, opposite very variable in size and to some extent in shape, even on the same leaf; the terminal pair the largest, the pairs getting smaller towards the base, less than 6-12 mm in length, oblong, obovate, nearly glabrous or with few scattered hairs, paler beneath, obliquely rounded and apiculate at the apex, most often arched a little upwards, all or at least the terminal leaflets oblique at base with many rather thick oblique and often waved or irregular main as well as secondary nerves.[2]

Peduncles: Long, terminal or axillary many, or various lengths from 2.5 to 10 cm long, hispid pubescent or glabrous often swollen at the top from where the flowers arise.[2]

Flowers: Small, dimorphic, about 8 mm wide when open, pretty, yellow or rarely rose, purple or whitish, in small umbels or umbellate cymes subtended by rigid lanceolate setaceous persistent bracts that occur crowded beneath the flowers.[2]

Pedicels: Very short or absent, when present usually shorter or rarely equal to the sepals.[2]

Sepals: Five, rigid subulate or lanceolate, acute or

acuminate, grooved with parallel nerves, glandular and hispid.[2]

Petals: Five, generally about twice as long as the sepals, yellow or rarely purple rose or whitish, rounded spreading and laterally cohering to form a salver shaped corolla.[2]

Stamens: Ten, distinct, filament free, the five inner ones longer and alternating with the five shorter outer ones.[2]

Pistil: Five carpellary, syncarpous.[2]

Ovary: Five chambered with many ovules in each lobule on axile placenta.[2]

Style - Five, nearly glabrous ending in notched or bifid stigmas.[2]

Fruit: A small, elliptic, apiculate, shining loculicidal capsule slightly exceeding the sepals dehiscing into five spreading valves and enclosing few to several seeds.[2]

Seeds: Minute with fleshy albumin; ovoid acute with many prominent transverse, oblique acute or obtuse striations or ridges. Each seed is completely enclosed when mature by translucent white membranous aril or outer coat which on exposure to air dries, splits everts elastically and crumples, as a result of which the seed is shot out to a considerable distance as from a catapult.[2]

Officinal part: The whole plant[2]

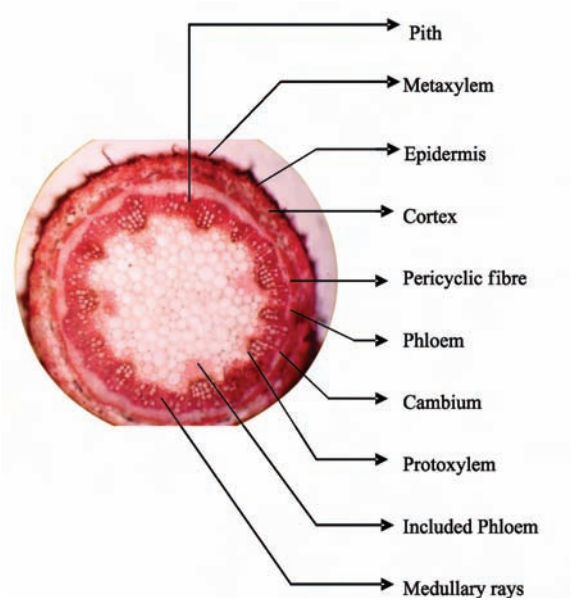
Microscopic Description

Stem: A Transverse section of stem of *Biophytum sensitivum* revealed the following important structures. Figure 2

1. Epidermis: The outermost single layer that is composed of parenchymatous cells.

2. Cortex: It consisted of few layers of loose parenchymatous cells with farely large number of intercellular spaces. The cells were thin walled, oval or rounded.

Figure 2
Microscopic description of *B. sensitivum*



3. Some pericyclic fibres were also present below cortical region.

4. Vascular bundles were arranged in a ring. Each bundle had a patch of xylem towards the centre and phloem towards periphery. A strip of cambium was present between xylem and phloem. The vascular bundle is conjoint collateral and open type. Xylem vessels were arranged in radial rows with protoxylem lying towards centre and metaxylem towards cambium i.e. endarch arrangement of xylem.

5. A mass of light pink coloured included phloem was present towards the centre below xylem.

6. Pith occupied the centre part of the stem which consisted of parenchymatous cells. The cells were rounded or polygonal, thin walled with several intercellular spaces. The cells of pith store food materials.

7. Medullary rays or pith rays were visible between two vascular bundles. These composed of thin walled radially elongated parenchymatous cells which participate in the lateral translocation of food, water and other substances.

Observations of the study : Refer Tables 2 to 6.

Methodology of T.L.C.

For TLC study all (successive) extracts were spotted in one solvent system [toluene : ethyl acetate : diethyl amine (7 : 2 : 1)]. The plate was allowed to develop and the spots were visualized in ordinary light after spraying ethanolic sulphuric acid (Figure 3). The result is given in Table 7.

Petroleum ether extract gave three spots viewed in visible light. First spot was of dark brown colour while second and third spots were brown coloured. Cyclohexane extract gave four spots viewed in visible light in which first, third and fourth spots were brown and second spot was yellow coloured. In acetone extract, six spots were formed. Among those spots first and sixth was green, second and fifth were purple and third and fourth were of brown colour. In alcohol extract, five spots were formed. Among those spots first one was dark grey coloured; second, third and fourth were light grey coloured and fifth one was brown in colour.

Properties and action according to ayurvedic texts

Rasa: Kaṭu[5]

Table 2
Physico chemical analysis of *B. sensitivum*

Sl. No.	Experiments	Percentage(W/W)
1.	Moisture content	16%
2.	Volatile oil content	0.5%
3.	Total ash	6.21%
4.	Water insoluble ash	3.675%
5.	Acid insoluble ash	0.88%
6.	Fibre content	39.28%
7.	Sugar content A.Total sugar B.Reducing sugar	 6.75% 4.6%

Table 3
Percentage of water soluble extractives of *B. sensitivum*

Sl.No.	Name of extract	Colour of extract	% of extract
1.	Hot water extracts	Brown	17.61 %

Table 4
Percentage of Alcohol soluble extractives of *B. sensitivum*

Sl.No.	Name of extract	Colour of extract	% of extract
1.	Cold alcohol extracts	Brown	4.164%
2.	Hot alcohol extracts	Whitish brown	5.36%

Table 5
Successive solvent extraction of *B. sensitivum*

Sl.No.	Experiments	Colour of extract	Percentage
1.	Petroleum ether	Light brown	5.434%
2.	Cyclohexane	Green	5.032%
3.	Acetone	Dark green	3.948%
4.	Alcohol	Brown	2.374%

Table 6
Qualitative chemical examination of *B. sensitivum*

Extract	Chemical constituents					
	Tannin	Phenol	Flavonoids	Alkaloids		Steroids
				Dragendroff's test	Mayer's test	
Petroleum ether	+	_	+	+	_	+
Cyclohexane	+	_	_	_	_	+
Acetone	+	_	+	+	_	_
Alcohol	+	+	+	+	_	+
Cold alcohol	+	+	+	+	_	+
Hot alcohol	+	+	+	_	_	+
Water	_	+	+	_	_	+

'+' Present, '-' absent

Table 7
TLC analysis of successive solvent extracts of *B. sensitivum*

Solvent system	Extract	Spot detection	No. of spots	Rf values
Toluene:ethyl acetate: diethyl amine (7 : 2 : 1)	Petroleum ether	Visible	3	0.05, 0.95, 0.99
	Cyclohexane	Visible	4	0.03, 0.54, 0.77, 0.97
	Acetone	Visible	6	0.05, 0.10, 0.49, 0.55, 0.90, 0.99
	Alcohol	Visible	5	0.03, 0.05, 0.08, 0.10,0.98

Figure 3
TLC of *B. sensitivum* visualised in ordinary light

Guṇa: Laghu

Vīrya: Uṣṇa[5]

Indigenous Therapeutic Uses: Codified Uses:

1. Doṣaghnata: Kaphahara[5]

2. It is considered an effective remedy for vraṇa (ulcer) and śukḷasrava.[2]

3. It reduces the kapha and āmadoṣa. It is rasa niyāmaka and nānāvijñānakāraka.[5]

4. It is useful in kṛmi (worm infestation).

5. It is diauretic and a best remedy for mūtrakṛcchra (dysuria).[4]

6. Its uses are similar to lajjālu and it is hṛdya (cardiac tonic) and śūlahara (analgesic).[1]

Empirical uses

1. The leaves act as diuretic when used internally rubbed with water. They allay thirst in bilious fevers.[3]

2. The seeds are powdered and applied to the wounds, and with butter to abscesses to promote suppuration; the root in decoction is given in gonorrhea and lithiasis.[3]

3. In Phillipines a decoction of the leaves is used as an expectorant and the pounded leaves are applied over wounds and bruises.[3]

4. In Java a decoction of the leaves is given in asthma, phthises and snake bite.[3]

5. In Madagascar, the plant is used as a tonic and mild stimulant.[3]

6. Root paste is applied as a wound healing agent.[6]

7. Dried powder is applied over septic wounds.[6a]

8. Whole plant or leaf is used in malarial fever, giddiness and head ache.[6b]

9. The dried plant of *B. reinwardtii* is put in milk for twelve hours and taken internally once a day for 7-15 days on empty stomach against jaundice.[6c]

Conclusion

The result of the study showed that in T.S. of stem of *B. sensitivum* some pericyclic fibres are present below cortical region. In the vascular bundle a strip of cambium is present between xylem and phloem. A mass of light pink coloured 'included phloem' is present towards centre below xylem.

It gave positive results for many of the chemical constituents like tannins, phenolic extracts, flavanoids, steroids, alkaloids, etc.

TLC analysis of successive solvent extracts of *B. sensitivum*, petroleum ether, cyclohexane, acetone and absolute alcohol extracts gave 3, 4, 6 and 5 spots respectively (Figure 3). All the spots obtained in petroleum ether extracts were brown in colour. Cyclohexane extracts gave 1st, 3rd and 4th spots of brown colour and 2nd of yellow colour. Among the spots of acetone extracts, 1st and 6th were green 2nd and 5th purple and 3rd and 4th of brown colour. Absolute alcohol extracts gave first four grey coloured spots and 5th brown colour. This TLC analysis may be helpful for further investigation of individual chemical constituents present.

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Authors

Shree N., Associate Professor, Major S.D. Singh P.G Ayurvedic Medical College and Hospital, Fatehgarh, Farrukhabad, Uttar Pradesh. E-mail: nitushreedr@gmail.com

Ramadevi R., Former Professor and Head, Department of Dravyagunavijnana,V.P.S.V. Ayurveda College, Kottakkal, Kerala.

Raghunathan A., Senior Medical Officer, Govt. Ayurveda Hospital, Ponnani, Kerala

CLINICAL STUDY

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A comparative clinical study to evaluate the efficacy of Madhumehanāśini guṭika and Dārvyādi kvātha with B-S Patra ghana vaṭi in the management of Madhumeha w.s.r. to Type 2 Diabetes mellitus

Sakshi Negi, Singh O. P., Goyal D. K., Sujatha N., Singh D.C. and Deshraj Singh

ABSTRACT: Diabetes mellitus (Madhumeha in āyurveda) is serious endocrine disorder of pancreas, due to poor metabolic control and is responsible for many long term complications that come from defects in insulin secretion and reduce sensitivity of tissue to insulin (insulin resistance) or combination of both. A world wide survey reported that diabetes affects nearly 10% of the population and is the 3rd leading cause of death (after heart disease and cancer) in many developed countries. This study is intended to evaluate the efficacy of Madhumehanāśini guṭika and Dārvyādi kvātha; to evaluate the efficacy of B-S Patra ghana vaṭi in the management of Madhumeha w.s.r. to Type 2 Diabetes mellitus and to compare the efficacy of B-S Patra ghan vaṭi with Madhumehanāśini guṭika and Dārvyādi kvātha. A sample of 40 patients of Madhumeha were registered from the OPD and IPD of Kayachikitsa, Rishikul Campus UAU, Haridwar, Uttaranchal and divided into two groups. Group-A patients were given Madhumehanāśini guṭika (500mg twice a day) and Dārvyādi kvātha (40 ml twice a day), while Group-B patients were given B-S Patra ghana vaṭi (500 mg twice a day) for 3 months. All the concerned approvals were obtained and the data was analyzed using statistical parameters. Group-A showed 18% improvement in fasting blood sugar (FBS) while 23% in post prandial blood sugar (PPBS). Group-B showed 13.6% improvement in FBS and 18.4% in PPBS. In intergroup comparison, there was almost similar kind improvement in subjective parameters and fasting and postprandial blood sugar levels. So it can be a better drug of choice in Madhumeha. Kaphadoṣa and medodhātu are the prime among the 10 dūṣyas in the pathogenesis of Madhumeha. Both the trial drugs exhibited kaphavātahara, medohara, lekhanīya, rasāyana, etc. properties. So these drugs can be a better choice in the management of Madhumeha.

Key words: Madhumeha, Diabetes mellitus, Madhumehanāśini guṭika, Dārvyādi kvātha, B-S Patra ghana vaṭi

Introduction

The term Diabetes mellitus (DM) describes a metabolic disorder of multiple etiologies characterized by chronic hyperglycemia with disturbances of carbohydrate, fat and protein metabolism resulting from defects in insulin secretion, insulin action, or both.[1] Unhealthy life style factors such as over eating, physical inactivity and obesity can impair the body's ability to use insulin. This is called insulin resistance.

The majority of 382 million people with diabetes are aged between 40-59 years and 80% of them live in low and middle income countries. The rate of diabetes is going on increasing especially Type 2 diabetes. In contrast to other estimates, the IDF states that the number of people with diabetes will increase by 55% by 2030.[2]

In ayurvedic classics prameha is defined on the basis of its common symptoms.

> Tatrāvilaprabhūtamūtralakṣaṇā: sarva eva pramehā bhavanti... |

It states that, frequent and copious micturation with turbidity is seen commonly in all prameha.[3] According to Suśruta all varieties of prameha if not

treated properly can be terminated into madhumeha in course of time.[4] Prameha in āyurveda is described as santarpaṇajanya-rasa-medo dhātu pradoṣaja-ānuṣaṅgika-kulaja-aṣṭamahāgada.

The present study is a humble effort to treat patients of madhumeha as per classics and an indigenous formulation. In this study, Madhumehanāśini guṭika a herbo mineral preparation and Dārvyādi kvātha (both mentioned in ayurvedic texts) and B-S Patra ghanavaṭi (which is an indigenous formulation) were selected for clinical trial.

Madhumehanāśini guṭika, described in Rasāmṛtam contains Trivaṅgabhasma (ie. śuddha nāga,vaṅga and yaśada bhasma), leaf of meṣaśṛṅgī [*Gymnema sylvestre* (Retz.) R.Br. ex Sm.], leaf of nimba (*Azadirachta indica* A.Juss.) and śuddha śilājatu.

Dārvyādi kvātha contains dāruharidra (*Berberis aristata* DC.), devdāru [*Cedrus deodara* (Roxb. ex D.Don) G.Don], āmlaki (*Phyllanthus emblica* L.), harītaki (*Terminalia chebula* Retz.), vibhītaki [*Terminalia bellirica* (Gaertn.) Roxb.] and musta (*Cyperus rotundus* L.). These drugs are having pramehaghna or antidiabetic properties.

Bougainvillea (*Bougainvillea glabra* Choisy) and sītāphala (*Annona squamosa* L.) have not been described in the āyurveda for their pramehaghna properties. But in traditional practices and folklore medicine both of these drugs have been extensively used for diabetes for decades together. B-S Patra ghana vaṭi contains bougainvillea leaf and sītāphala leaf. Many clinical studies support for their potent hypoglycemic properties with validated and authenticated research data. Hence, these two herbs were selected for this study.

Aims and objectives

1. To compare the effect of B-S Patra ghana vaṭi with Madhumehanāśini guṭika and Dārvyādi kvātha.

2. To provide a reliable, safe and cost effective ayurvedic treatment for madhumeha.

Hypothesis

H_0: B-S Patra ghana vaṭi has no effect on madhumeha.

H_1: B-S Patra ghana vaṭi has some effect on madhumeha as compared to Madhumehanāśini guṭika and Dārvyādi kvātha.

Ethical committee approval letter no- UAU/R/C/IEC/2016-17/2

Materials and methods

Selection of patients: The study comprised of a series of 40 patients of madhumeha (Type 2 DM). The patients were selected from the OPD and IPD of Kayachikitsa department of Rishikul Campus, Haridwar, Uttarakhand. These patients were randomly divided in two groups each comprising of 20 patients, on the basis of inclusion and exclusion criteria depending upon fasting and post prandial blood sugar with detailed clinical history, physical examination and other necessary/desired investigation.

Selection of drug: 1. Madhumehanāśini guṭika 500 mg twice a day with luke warm water before meal and Dārvyādi kvātha 40 ml twice a day before meals.

2. B-S Patra ghana vaṭi: 500 mg twice a day before meal with luke warm water.

Method of preparation and dosage:

1. Madhumehanāśini guṭika[5]

Ingredients: Śuddha Trivaṅga bhasma- 1 pala, leaf of meṣaśṛṅgī- 3 pala, leaf of nimba- 3 pala and śuddha śilājatu- 6 pala.

The powder form of contents were taken in the ratio of 1:3:3:6 and mixed with each other, then tablet of 500 mg was made and let it to dry.

Dose: Every tablet of Madhumehanāśini guṭika consisted of 500 mg wt. Patients were asked to take Madhumehanāśini guṭika-1 gm /day in divided dose, i.e. 2 times in a day with luke warm water before meals for 3 months.

2. Dārvyādi kvātha[3a]

Ingredients: Dāruharidra, devdāru, triphala and musta in equal quantity.

The raw form of all the drugs were taken in equal proportion and mixed with each other, and then its yavakūta form was made and packed as 300 gm packets.

Patients were dispensed with Dārvyādi kvātha in raw form and asked to prepare it by the following method: 5 gm of raw kvātha was taken and boiled with 4 cup of water (about 160 ml) till 1 cup of water (about 40 ml) was left. After filtering, it was given to the patients. They were asked to take the kvātha twice a day 30 mins before meal.

3. B-S Patra ghana vaṭi

The leaves of bougainvillea and sītāphala were taken from Rishikul campus garden in equal ratio and washed. Water, equivalent to four times the mixture weight was added, boiled and reduced to ¼. This kvātha was again heated till it was converted to ghana form. Tablet of 500 mg was made from it and allowed to dry. This process was done at Department of Rasashastra, Rishikul campus, Haridwar.

Dose: 1 gm /day in divided dose, i.e. 2 times in a day with luke warm water before meals, for 3 months.

Both the contents of this formulation was verified in the Post Graduate Department of Dravyaguna, Rishikul campus, UAU, Haridwar.

Duration of the study: 90 days

Follow up: Upto 1 month after trial

Inclusion criteria

- Diagnosed diabetic patients of either sex
- Age between 20-60 years.
- Fasting blood sugar level > 110 mg/dl
- Post prandial blood sugar level >140 mg/dl

Exclusion criteria

- Patients having Type 1 DM
- Patients having complications of diabetes or any other serious medical and surgical illness
- Fasting blood sugar level >250mg/dl
- Post prandial blood sugar level >350mg/dl

Investigations

- Hb% , TLC, DLC, ESR
- Serum creatinine
- Blood urea

These investigations were done in all patients before and after the treatment to rule out other pathological condition, if any.

Parameters of assessment

Subjective paramaters: The assessment of the trial drug was done on the basis of improvement in the symtoms during and after the trial and were graded as per the severity. The symptoms assessed were:

i. Pipāsa (Polydipsia)

ii. Prabhūtamūtrata (Polyuria)

iii. Atikṣudha (Polyphagia)

iv. Karapādadāha (Burning sensation of hands and feet)

v. Aṅgagandha (Bad body odor)

vi. Sveda (Excessive sweating)

vii. Śītapriyatvam (Fond of cold)

viii. Mādhuryamāsya (Sweetness of mouth)

ix. Śithilāṅgata (Weakness)

Objective parameters: (Diagnostic criteria)

The assessment was done on the basis of change in blood sugar (FBS and PPBS) in each follow up and at the end of trial.

Criteria for the diagnosis of DM: It was taken as per Harrison's Principles of Internal Medicine[6] which is as follows:

1. Symptoms of diabetes plus random blood glucose concentration ≥ 11.1mmol/L (200 mg/dl) or
2. Fasting plasma glucose ≥ 7.0 mmol/L (126 mg/dl) or
3. A1C > 6.5% or
4. Two-hour plasma glucose ≥ 11.1 mmol/L (200 mg/dl) during an oral glucose tolerance test.

Statistical analysis[7]

All the informations on various parameters were gathered and statistical study was carried out in terms of median (X), standard deviation (S.D.), standard error (S.E.) and Wilcoxn's signed rank test before and after treatment in both groups while Mann-Whitney 'U' test was applied to the statistical data for evaluating the difference in the effect of therapy. Paired 't' test was applied on biochemical parameters and finally, the result was incorporated in terms of probability (p) as:

P> 0.05 Insignificant

P< 0.01&<0.05 Significant

P< 0.001 Highly significant

Observations and results

Among the 40 cases of madhumeha symptomatic distribution of karapādadāha was 80%, i.e. highest, prabhūtamūtrata 75% and pipāsa was 67.5%. Table 1

In Group-A prabhūtamūtrata was relieved by 35%, pipāsa was relieved by 38.1%, śithilāṅgata was relieved by 40%, śītapriyatvam was relieved by 55.6%, mādhuryamāsya was relieved by 55%, atikṣudha was relieved by 18.1%, which were statistically significant i.e. <0.05. Karapādadāha was relieved by 40%, which is highly significant i.e. p<0.001 and atikṣudha was relieved by 18.2%, atisveda was relieved by 9.5%, aṅgagandha was relieved by 21.4% which was statistically non-significant i.e. p>0.05. Table 2.

Table 1
Distribution of signs and symptoms in 40 Patients of Madhumeha

Sl. No.	Symptoms	No. of patients in Group-A	No. of patients in Group-B	Total	Percentage
1.	Prabhūtamūtrata	14	16	30	75%
2.	Pipāsa	12	15	27	67.5%
3.	Atikṣudha	7	9	16	40%
4.	Śithilāṅgata	7	9	16	40%
5.	Atisveda	7	8	15	37.5%
6.	Karapādadāha	17	15	32	80%
7.	Aṅgagandha	6	4	10	25%
8.	Śītapriyatvam	7	6	13	32.5%
9.	Mādhuryamāsye	7	5	12	30%

Table 2
Assessment of result in symptoms of diabetic patients in Group-A

Group-A	Median		Wilcoxon Signed Rank W	P-Value	% Effect	Result
	BT	AT				
Prabhūtamūtrata	3	2	-3.035a	<0.05	34.9	Sig
Pipāsa	3	1.5	-3.025a	<0.05	38.1	Sig
Atikṣudha	0	0	-.957a	>0.05	18.2	NS
Śithilāṅgata	0	0	-1.994a	<0.05	40.0	Sig
Atisveda	0	0	-.687a	>0.05	9.5	NS
Karapādadāha	3	2	-3.255a	<0.001	40.0	HS
Aṅgagandha	0	0	-.687a	>0.05	21.4	NS
Śītapriyatvam	0	0	-2.588a	<0.05	55.6	Sig
Mādhuryamāsye	0	0	-2.428a	<0.05	55.0	Sig

In Group-A FBS was relieved by 18.7% which was statistically significant i.e. <0.05. PPBS was relieved by 23.8% which was also statistically significant i.e. p<0.05. Table 3

In Group-B prabhūtamūtrata was relieved by 25.5%, śithilāṅgata was relieved by 52.5%, atikṣudha was relieved by 56%, karapādadāha was relieved by 41.9%, śītapriyatvam was relieved by 62.5%, and mādhuryamāsya was relieved by 61.5% which were significant i.e.p<0.05. Pipāsa was relieved by 39.1% which is highly significant i.e.p<0.001 and atisveda was relieved by 5.9%, aṅgagandha was relieved by 2% which were statistically non-significant i.e. p>0.05. Table 4

In Group-B FBS was relieved by 13.6% which was statistically significant i.e. p<0.05 and PPBS was relieved by 18.4% which was statistically significant i.e. p<0.05. Table 5

For the comparison in subjective parameters between Group-A and Group-B Mann-Whitney U test was used. From the above it was observed that P-values for all parameters are > 0.05. Hence, we can conclude that there is no significant difference in Group-A and Group-B. Table 6

From above table we can observe that P-values for all parameters are > 0.05. Hence, we conclude that there is no significant difference in Group-A and Group-B. Table 7

P-values for all parameters are > 0.05. Hence, we conclude that there is no significant difference in Group-A and Group-B. Table 8.

Table 9 is showing the comparative assessment of percentage of relief on various symptoms.

Table 3
Assessment of result in fasting and post prandial blood sugar in Group-A

Group-A		Mean	N	SD	SE	t-Value	P-Value	% Effect	Result
FBS	BT	179.7	20	73.24	16.38	2.903	<0.05	18.7	Significant
	AT	146.1	20	41.33	9.24				
PPBS	BT	272.8	20	88.65	19.82	3.845	<0.05	23.8	Significant
	AT	207.8	20	87.40	19.54				

Table 4
Assessment of result in symptoms of diabetic patients in Group-B

Group-B	Median		Wilcoxon Signed Rank W	P-Value	% Effect	Result
	BT	AT				
Prabhūtamūtrata	3	2	-2.972a	<0.05	25.5	Sig
Pipāsa	3	1.5	-3.286a	<0.001	39.1	HS
Atikṣudha	0	0	-2.565a	<0.05	56.0	Sig
Śithilāṅgata	0	0	-2.460a	<0.05	52.9	Sig
Atisveda	0	0	-.707a	>0.05	5.9	NS
Karapādadāha	2	1	-3.145a	<0.05	41.9	Sig
Aṅgagandha	0	0	-.106b	>0.05	2.0	NS
Śītpriyatvam	0	0	-2.236a	<0.05	62.5	Sig
Mādhuryamāsya	0	0	-2.070a	<0.05	61.5	Sig

Table 5
Assessment of result in fasting and post prandial blood sugar in Group-B

Group-B		Mean	N	SD	SE	t-Value	P-Value	% Effect	Result
FBS	BT	176.1	20	59.16	13.23	2.519	<0.05	13.6	Significant
	AT	152.1	20	51.48	11.51				
PPBS	BT	303.0	20	71.83	16.06	3.306	<0.05	18.4	Significant
	AT	247.2	20	104.18	23.30				

Table 6
Comparison between Group-A and Group-B (Subjective criteria)

Parameters	Group	N	Mean Rank	Sum of Ranks	Mann-Whitney U	P-Value
Prabhūtamūtrata	Group-A	20	21.45	429.00	181.000	>0.05
	Group-B	20	19.55	391.00		
Pipāsa	Group-A	20	19.55	391.00	181.000	>0.05
	Group-B	20	21.45	429.00		
Atikṣudha	Group-A	20	19.40	388.00	178.000	>0.05
	Group-B	20	21.60	432.00		
Śithilāṅgata	Group-A	20	20.68	413.50	196.500	>0.05
	Group-B	20	20.33	406.50		
Atisveda	Group-A	20	20.60	412.00	198.000	>0.05
	Group-B	20	20.40	408.00		
Karapādadāha	Group-A	20	22.30	446.00	164.000	>0.05
	Group-B	20	18.70	374.00		
Aṅgagandha	Group-A	20	20.00	400.00	190.000	>0.05
	Group-B	20	21.00	420.00		
Śītpriyatvam	Group-A	20	21.88	437.50	172.500	>0.05
	Group-B	20	19.13	382.50		
Mādhurmāsya	Group-A	20	21.48	429.50	180.500	>0.05
	Group-B	20	19.53	390.50		

Table 8
Comparison between Group-A and Group-B (Investigations)

Parameters	Group	N	Mean	SD	SE	t-Value	P-Value
HB%	Group-A	20	0.6	0.33	0.07	-1.427	>0.05
	Group-B	20	0.8	0.54	0.12		
Total Leucocyte Count	Group-A	20	397.4	368.99	82.51	-0.796	>0.05
(TLC)	Group-B	20	513.9	541.27	121.03		
Polymorphs	Group-A	20	3.3	2.27	0.51	-0.387	>0.05
	Group-B	20	3.7	4.03	0.90		
Lymphocytes	Group-A	20	3.3	2.74	0.61	0.733	>0.05
	Group-B	20	2.8	1.94	0.43		
Eosiniphils	Group-A	20	1.0	0.69	0.15	-0.417	>0.05
	Group-B	20	1.1	0.83	0.18		
Monocytes	Group-A	20	1.3	1.45	0.33	0.115	>0.05
	Group-B	20	1.3	1.29	0.29		
Basophills	Group-A	20	0.4	0.60	0.13	0.000	>0.05
	Group-B	20	0.4	0.50	0.11		
Erythrocyte Sedimentation	Group-A	20	5.8	4.80	1.07	-2.140	>0.05
Rate (ESR)	Group-B	20	13.1	14.37	3.21		
Blood Urea	Group-A	20	2.4	2.02	0.45	-2.460	>0.05
	Group-B	20	4.7	3.74	0.84		
Serum Creatinine	Group-A	20	0.2	0.16	0.04	1.500	>0.05
	Group-B	20	0.1	0.08	0.02		

Table 7
Comparison between Group-A and Group-B (Objective criteria)

Parameters	Group	N	Mean	SD	SE	t-Value	P-Value
FBS	Group-A	20	52.3	31.35	7.01	1.617	>0.05
	Group-B	20	36.0	32.41	7.25		
PPBS	Group-A	20	82.9	54.06	12.09	0.023	>0.05
	Group-B	20	82.5	42.54	9.51		
	Group-B	20	0.1	0.08	0.02		

Table 9
Comparative assessment of % relief on various symptoms

Parameters	% Relief in Group-A	% Relief in Group-B
Prabhūtamūtrata	34.9	25.5
Pipāsa	38.1	39.1
Atikṣudha	18.2	56.0
Śithilāṅgata	40.0	52.9
Atisveda	9.5	5.9
Karapādadāha	40.0	41.9
Aṅgagandha	21.4	2.0
Śītpriyatvam	55.6	62.5
Mādhuryamāsya	55.0	61.5

Discussion

Total 40 patients were registered to complete the goal of study. The LAMA and drop out patients were not considered in this study. All the patients were randomly divided in two groups to evaluate the efficacy of Madhumehanāśini guṭika, Dārvyādi kvātha and B-S Patra ghanavaṭi in the management of madhumeha.

Assessment of subjective symptoms:

In the subjective assessment of Group-A, symptomatically the result was stastically highly significant ($p<0.001$) in lowering karapādadāha, while significant ($p<0.01$) result in prabhūtamūtrata, pipāsa, śithilāṅgata, śītapriyatvam and mādhuryamāsya and showing non significant result ($p>0.05$) in atikṣudha, aṅgagandha and atisveda.

In the subjective assessment of Group-B, symptomatically the result was stastically highly significant ($p<0.001$) in lowering pipāsa, while significant ($p<0.01$) result in prabhūtamūtrata, atikṣudha, śithilāṅgata, śītapriyatvam, karapādadāha and mādhuryamāsya, and showing non significant result ($p>0.05$) in aṅgagandha and atisveda.

Assessment of objective symptoms

In Group-A, FBS result showed statistically significant changes i.e. $p<.001$. PPBS also showed statistically significant changes i.e. $p<.001$.

Assessment of investigations

In Group-B trial drug provided statistically significant reduction in eosinophils. It has provided statistically non significant reduction in other biochemical value i.e Hb%, TLC, Polymorphs, lymphocytes, basophills, ESR, Blood urea, Serum creatinine.

Not any kind of side effect was detected after the end of the trial of 60 days.

Discussion on intergroup comparison on symptoms:

For comparison between Group-A and Group-B in subjective parameters we have used Mann Whitney U test. From Table 6 it can be observed that P-values for all parameters are greater than 0.05. Hence, we concluded that there was no significant difference in Group-A and Group-B.

For comparison between Group-A and Group-B in objective parameters we had used unpaired t-test. From Table 8 we can observe that P-values for all parameters are >0.05 hence we concluded that there was no significant difference in Group-A and Group-B.

Probable mode of action of Madhumehanāśini guṭika and Dārvyādi kvātha

The first trial drug Madhumehanāśini guṭika was a herbo-mineral formulation, described in the ayurvedic text Rasāmṛta. The constituents are śilājatu, Trivaṅga bhasma, nimba and meṣaśṛṅgī. All these

ingredients have documented hypoglycemic activity and have been extensively studied in diabetic patients.

Trivaṅga bhasma[8] is kaphamedohara, having tikta-kaṣāya rasa by which it corrects the vitiation of kapha and pitta. These three metals of Trivaṅga bhasma also reduce the general weakness of body.

The second constituent is meṣaśṛṅgī,[9] which is kapha-vātahara and having tikta-kaṣāya rasa. It contains alkaloids like gymnemagenin, gypenosides etc. Its dried leaf powder increases the circulating insulin level and exhibited hypoglycemic activity.

The third constituent is nimba,[9a] which is kapha-pittahara and having tiktakaṣāya rasa. Its leaves have chemicals like azadirachtin, azadirone, nimbolide, etc. which effectively decreases blood sugar level and prevents hyperglycemia.

The fourth constitute is śilājatu.[8a] It reduces kapha due to tikta rasa, kaṭuvipāka, uṣṇavīrya, śoṣaka and chedaka properties and checks mandāgni and reduces the medas, which is the major factor (medoduṣṭi) in the pathogenesis of madhumeha.

Due to its chedana property it expels the kaphādi doṣa from the srotas with the force due to prabhāva of the drug. Chedana drugs usually belong to amḷa-kaṭu rasa and tīkṣṇa guṇa. On the other hand chedana serves two fold functions.

All these properties enable śilājatu to act effectively against the disease prameha. In praise of śilājatu, ācārya Vāgbhaṭa has mentioned that when all other treatments are ineffective to improve the condition of a patient of prameha, śilājatu must be used. It improves the condition in such patients.

The second trial drug was Dārvyādi kvātha consisting devadāru,[9b] dāruhridra,[9c] triphala (āmalaki,[9d] vibhītakī[9e] and harītakī[9f]) and musta[9g]. Basically these drugs are having the dominance of kaṣāya and tiktarasa, uṣṇavīrya and laghu-rūkṣa guṇa, which helps in eliminating the vitiated kapha. It also corrects the vitiated medas and kapha, the main entity in the samprāpti of madhumeha. Thus by breaking the samprāpti it cures the disease. As the drug is uṣṇa in nature it also improves the dhātvagni.

Probable mode of action of B-S Patra ghana vaṭi

This is a clinical study performed in bougainvillea and sītāphala leaves. Many clinical and experimental studies on antidiabetic property of bougainvillea have been widely published with authenticated data. Several pharmacological activities like analgesic, antidiabetic, anti-inflammatory, etc. are also been proven. Many phytoconstituents like terpenoid, alkaloids 3-O-Methyle-D-glucose, Tetradecanoic acid, Phytol, fatty acid and flavonoids have been reported in this plant. Bougainvillea has a source of Pinitol which is used in the treatment of insulin resistant diabetes.[10, 11, 12]

Sītāphala is very useful in controlling blood sugar level, improving plasma insulin and lipid metabolism.[13] As per āyurveda it has the properties like balya, vātapitta śāmaka, bṛmhaṇa, etc.[9b]

Conclusion

The conclusions drawn from present work are as follows:

- Madhumeha is a tridoṣajavyādhi with the dominanace of kapha and vāta doṣa.
- Madhumeha has some similarities with Type 2 Diabetes mellitus mentioned in modern medical science.
- In reduction of the blood sugar level both drugs showed result up to some extent, but Madhumehanāśinī vaṭi and Dārvyādi kvātha a showed a rapid reduction in the blood sugar level while B-S Patra ghana vaṭi showed a lesser relief.
- Both group has showed a significant result in relieving the symptoms of madhumeha.
- No side effects were observed during the treatment.
- While framing the treatment modalities vitiated kapha, meda and vāta should be considered and drugs having properties like śḷeṣmamedohara, pramehaghna and kaphavātaśāmaka may be used.

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Authors

Sakshi Negi, Post Graduate Scholar, Department of Post Graduate studies in Kayachikitsa, Rishikul Campus, Uttrakhand Ayurved University, Haridwar, Uttrakhand, India. E-mail: skshnegi1@gmail.com

Singh O. P., Professor and Head, Department of Post Graduate studies in Kayachikitsa, Rishikul Campus, Uttrakhand Ayurved University, Haridwar, Uttrakhand, India.

Goyal D. K., Medical Officer, Rishikul campus, Uttarakhand Ayurved University, Haridwar, Uttarakhand, India.

Sujatha N., Professor, Department of Post Graduate studies in Kayachikitsa, Gurukul Campus, Uttrakhand Ayurved University, Haridwar, Uttrakhand, India.

Singh D. C., Professor and Head, Department of Post Graduate studies in Darvyaguna, Rishikul Campus, Uttrakhand Ayurved University, Haridwar, Uttrakhand, India.

Deshraj Singh, Assistant Professor, Department of Post Graduate studies in Kayachikitsa, Rishikul Campus, Uttrakhand Ayurved University, Haridwar, Uttrakhand, India.

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Role of mithyācāra (faulty diet and lifestyle) in causation of Udāvartinī yonīvyāpat (dysmenorrhoea)

Varma Lakshmi K., Tripathy T. B. and Gayathri Bhat N. V.

ABSTRACT: The quality of life of women is being affected to a great extent by painful menstruation. Food and lifestyle play an important role in causation and management of these diseases. This retrospective cross-sectional case control observational study was done to analyse the diet and lifestyle of patients of udāvartinī yonīvyāpat w.s.r to primary dysmenorrhoea through a survey. A questionnaire based on the common food and lifestyle of the people in and around Hassan was formulated and validated. This was given to females between 13 to 30 yrs visiting the OPD and IPD of SDMCA and H, Hassan, and in colleges in and around Hassan, under two groups of 175 each based on the presence of painful menstruation. The data collected was entered into SPSS software version 20. After application of Chi-square test and Cramer's 'V' coefficient, it was seen that 40 items in the food domain and 22 items in the lifestyle domain came significant. Even though the number of food items were more as many food items were of the same type, it was seen that lifestyle had more causative effect than food. In general it was noted that the women suffering from dysmenorrhoea ate vātaprakopaka food in less quantity. Lifestyles that increase vāta like excessive intake of spicy food, less sleep, exposure to cold, suppression of urges, mental factors, etc. were found to be the risk factors. Exercise was found to be a relieving factor for the symptoms of dysmenorrhea. Thus research hypothesis was accepted i.e. the diet and lifestyle of women has significant effect in causation of udāvartinī yonīvyāpat.

Key words: Āhara, Dysmenorrhoea, Food and lifestyle, Painful menstruation, Vihāra, Udāvartinī yonīvyāpat

Introduction

Women's health is a prime factor that has to be considered for the wellbeing of family, society and nation. Any physical or mental ailment would disturb her educational, social and economic life. Among the factors affecting the daily chores of a woman, menstrual cycle is the most important one. The period of her life in which she has these cycles covers almost more than half of her entire life span. Any abnormality in this cycle may lead to discomfort, other diseases or even infertility. Due to a number of reasons like burden of responsibilities, lack of confidence, social stigma or embarrassment, the problem of such gynaecological diseases has become an iceberg phenomenon with a large number of cases going unreported.

Dysmenorrhoea or painful menstruation is one such condition that commonly hampers the day-to-day activities of women. It is estimated that 87.8 % of Indian women suffer from dysmenorrhoea.[1] Whereas in the global scenario 25- 50% adults and 75% of adolescent girls suffer from this condition.[2] This situation has a deleterious effect on the quality of life of the person. Moreover it results in loss of working hours and causes depression; thereby affecting the progress of the nation. About 13-15% of women have been absent at least once and 5-14% of them are often absent owing to severity of the symptoms.[3] Some of them even drop out of the school. Even though the main feature of this disease is severe pain in abdomen, it can also be associated with symptoms like low back ache, nausea, giddiness and fatigue. In āyurveda, the disease that can be considered as having similar features to this condition is udāvartinī yonīvyāpat.

Udāvartinī is one among the twenty yonīvyāpat enumerated in the classics.[4] It is said to be primarily

caused due to the suppression of natural urges[5] along with other etiological factors told for yonīvyāpat in general; like the improper lifestyle. It is a vātadoṣa pradhāna condition where pain or difficulty in menstruation is the main symptom.[4a] The knowledge of the causative factors of this condition will help to prevent the disease and to manage the symptoms to some extent by following the things that are opposite in quality.

Food and daily activities have been explained not only as preventive measures for any conditions but also as a cause and in the management of most of the diseases. Improper food and lifestyle leads to the imbalance in the equilibrium of doṣa and manifests different diseases. Many such diseases have been explained in ayurvedic classics. Improper food and activities have been enumerated as a general causative factor for the different yonīvyāpat.[5a] In this study, an attempt was made to find out the role of improper diet and lifestyle (mithyācāra) of a woman in causing udāvartinī yonīvyāpat.

Materials and methodes

Aim of the study: To analyse the diet and lifestyle of patients of udāvartinī yonīvyāpat w.s.r primary dysmenorrhoea through a survey.

Source of data: Subjects fulfilling the inclusion and exclusion criteria, visiting the OPD and IPD of SDM College of Ayurveda and Hospital, Hassan and students from different colleges in Hassan have been included in the study.

Study design: Retrospective cross-sectional case control observational study.

Plan of the study: A questionnaire having two domains of food and lifestyle was formulated and validated. This was given to 350 subjects aged between 13 to 30 years among whom 175 had the symptoms of dysmenorrhoea and the other 175 had normal menstrual cycle. The data was then collected and analysed.

Observation and results

A total of 368 subjects participated in the survey, but due to incomplete filling of the questionnaire 18 were not considered for the study. The rest 350 subjects were such that 175 were in the control group and 175 where cases.

Observation on demographic data: It was observed that majority of the subjects where aged between 19 to 22 years (52.6% cases and 42.3% control). Majority of the subjects were unmarried. When the number of married subjects was considered it was seen that the percentage of married women were more in the control group (10.9%) in comparison to the cases (2.3%). Middle class was the socio-economic status of majority of the subjects in both groups. Presence of both rich and poor class people was seen among the cases.

Observation on presence of symptoms: Since it was a diagnostic criteria, all the cases had pelvic pain during all their cycles. Among the subjects in the control group only 22.9% never experienced any pain whereas the rest of the subjects had slight pain but inconsistent. Low back pain was found to be the most common symptom that came associated with the pelvic pain (45/1%). It was observed that the presence of frothy menstrual blood was not necessarily associated with pelvic pain. Even though the number of cases having discharge of clots was somewhat equally distributed in its frequency, it was seen that compared to the control group (0.6%) the number of subjects regularly having clots were very high (24.6%). Giddiness was also observed to be a symptom sometimes seen (10.9%) in association with pelvic pain in the cases. The feeling of tiredness or fatigue was observed to be the second most common symptom associated with the pelvic pain after low backache. It was present in a regular basis in 29.1% of the cases. Most of the subjects in the control group (39.4%) never had fatigue during menstruation or only had it rarely (30.9%).

Observation of diet domain: The Food Frequency Questionnaire format was adopted to know the frequency along with quantity of intake of each food item. The list of food items was formulated based on foods that were commonly eaten by people in and around Hassan.

It was observed that among the food items that form the bulk of food and the major portion of a meal e.g. avalaki, savige bhat, ghee rice, nan, puri, etc., the subjects with dysmenorrhoea most often never responded for the frequency of intake. They also ate less quantity in comparison to the control group. In total, it was observed that the cases ate less food than the control in this aspect. On the other hand, it was seen that the number of people consuming curd rice more often and in larger quantity was higher among the cases as compared to the subjects of control group. It was seen that subjects in the case group ate Chinese items like packet noodles and gobi manchurian more often than the subjects in the control group.

Among the vegetables, it was observed that in the case group a larger number of people consumed potato more often than in the control group. Some other vegetables like turnip, carrot, ivy gourd, ridge gourd, cucumber, tomato, coconut and leafy vegetables were also observed to be eaten slightly more frequently by the subjects in the case group than those in the control group. Among the legume group of foods the consumption of beans, horse gram and flat beans was noted to be more often done by the subjects suffering from dysmenorrhoea in comparison to the subjects of control group.

Among the non-vegetarian food items, it was seen that the subjects of the case group consumed eggs, chicken and mutton more often and in a larger amount. And also the subjects of the case group consumed different snacks and bakery products more frequently and in much higher quantity than the other group.

Among the liquids, the frequency of intake of ice creams, carbonated drinks and coffee was noted to be more in the subjects of case group. The water-drinking pattern of the cases was also observed to be different from the control group. It was seen that the proportion of subjects who never drank normal water was higher in the case group and a majority of cases drank chilled water daily in a larger quantity.

Observation of lifestyle domain: It was observed that subjects suffering from painful menstruation had a habit of consuming kaṭurasa predominant food on a daily basis (45.7%) more as compared to control group (18.9 %). The number of people eating lavaṇarasa predominant and amḷarasa predominant food daily followed this. It was also observed that the subjects in the case group more often skipped a meal than the control group. Similarly, a higher percentage of subjects who did not eat when hungry and did not drink when thirsty often were found to be among the cases. Supporting this was also the higher number of subjects in the control group never doing this.

Looking at the sleeping habits of the subjects it was found that the people suffering from painful menstruation had lesser amount of sleep. They had disturbed sleep and stayed awake at night and slept late at night more frequently. The total time they slept was mostly less than six hours. Interestingly, it was seen that the percentages of people who slept during the day time and who slept immediately after food were also higher among the cases as compared to the control subjects.

The proportion of subjects who indulged in vāta aggravating activities like excessive talking, laughing, walking, travelling, etc. going out in cold/wind and sitting uncomfortably for a long time more frequently were found to be higher in the case group for all the questions. Interestingly, it was observed that there is a lack of exercise in the case group.

On observation of the response to natural urges by the subjects it was observed that the people in case group did suppression of urges like defecation, flatus, micturition and eructation more frequently than the people in control group. The frequency of people forcefully inducing urges like defecation, flatus and vomiting more often was also slightly higher among cases.

Mental status of the subjects when observed showed that the people who did excessive thinking, take stress, cry for long time, get irritated for long time and had mood swings on a daily basis were more among the cases.

Results

Cronbach's Alpha value of questionnaire was found to be 0.966, which showed high internal consistency. After the application of Chi-square test and Cramer's V Coefficient in the diet domain, different staple food preparations like godhi dosa (p- 0.000), rava idli (p- 0.000), avalaki (p- 0.000), etc. came highly significant and it was noted to be consumed in a lesser frequency by the cases. Gobi manchurian (p- 0.000), curd rice (p- 0.001), potato (p- 0.000), beans (p- 0.000), flat beans (p- 0.000), chat items (p- 0.000) and chilled water (p- 0.000) came highly significant in the items consumed more by the subjects in the case group. Among them, it was again seen that potato (V- 0.306) and chilled water (V- 0.314) had a moderate association to the presence of symptoms, the rest had low association.

In the lifestyle domain it was noted that consumption of spicy food (p- 0.000), not drinking when thirsty (p- 0.001), not eating when hungry (p- 0.000), staying wake at night (p- 0.001), sleeping late night (p- 0.000), talking and laughing for a long time (p- 0.001) and going out in cold (p- 0.000) had a p-value that showed high significance. The subjects of case group did these more frequently. Even among those, eating spicy food (V- 0.310) and going out in cold (V- 0.320) were more important due to its moderate association. Table 1 and 2

Table 2
List of items significant in life style domain

Sl. No.	Life style	p-value	V-value	Significance	Association
1.	Spicy food	0.000	0.310	HS	MA
2.	Astringent food *	0.004	0.250	S	LA
3.	Previous day's food	0.044	0.186	S	LA
4.	Re-heated food	0.003	0.202	S	LA
5.	Skip one meal	0.028	0.243	S	LA
6.	Not eat when hungry	0.000	0.216	HS	LA
7.	Not drink when thirsty	0.001	0.197	HS	LA
8.	Stay awake at night	0.001	0.204	HS	LA
9.	Sleep late night	0.000	0.252	HS	LA
10.	Sleep during day	0.003	0.226	S	LA
11.	Talk for long time	0.001	0.252	HS	LA
12.	Laugh for long time	0.001	0.260	HS	LA
13.	Walk for long time	0.040	0.200	S	LA
14.	Go out in cold wind	0.000	0.320	HS	MA
15.	Sit in uncomfortable position	0.040	0.208	S	LA
16.	Exercise but not till sweating *	0.012	0.222	S	LA
17.	Exercise till sweating *	0.002	0.272	S	LA
18.	Exercise even after sweating *	0.025	0.273	S	LA
19.	Exercise in morning *	0.014	0.275	S	LA
20.	Exercise in evening *	0.018	0.259	S	LA
21.	Supress defecation	0.050	0.217	S	LA
22.	Supress flatus	0.014	0.193	S	LA

(* for those which were less frequent in cases) MA- Moderate association, LA- Low association

Table 1
List of items significant in diet domain

Sl. No.	Food item	p-value	V-value	Significance	Association
1.	Godhi dosha *	0.000	0.285	HS	LA
2.	Rava idli *	0.000	0.279	HS	LA
3.	Shavige bhat *	0.003	0.190	S	LA
4.	Avalaki *	0.000	0.289	HS	LA
5.	Puliogare *	0.002	0.232	S	LA
6.	Chitranna *	0.024	0.205	S	LA
7.	Pulav *	0.001	0.265	S	LA
8.	Curd rice	0.001	0.233	HS	LA
9.	Jeera rice *	0.000	0.289	HS	LA
10.	Nan / Kulcha *	0.001	0.333	HS	MA
11.	Alu porota *	0.021	0.225	HS	LA
12.	Gobi manchurian	0.000	0.250	HS	LA
13.	Sambar	0.001	0.296	HS	LA
14.	Dal *	0.000	0.350	HS	MA
15.	Potato	0.000	0.306	HS	MA
16.	Turnip	0.003	0.178	S	LA
17.	Carrot	0.002	0.203	S	LA
18.	Radish	0.022	0.198	S	LA
19.	Ivy gourd	0.023	0.163	S	LA
20.	Ridge gourd	0.010	0.148	S	LA
21.	Cucumber	0.032	0161	S	LA
22.	Tomato	0.003	0.277	S	LA
23.	Coconut	0.000	0.297	S	LA
24.	Leafy vegetables	0.015	0.194	S	LA
25.	Beans	0.000	0.221	HS	LA
26.	Flat beans	0.000	0.276	HS	LA
27.	Nuts *	0.014	0.263	S	LA
28.	Eggs	0.009	0.162	S	LA
29.	Chicken	0.034	0.195	S	LA
30.	Paneer *	0.020	0.195	S	LA
31.	Namkeen	0.024	0.208	S	LA
32.	Bajji / Pakoda	0.003	0.175	S	LA
33.	Cutlet	0.033	0.279	S	LA
34.	Puffs	0.013	0.200	S	LA
35.	Chat items	0.000	0.270	HS	LA
37.	Pizza *	0.004	0.230	S	LA
38.	Burger *	0.003	0.231	S	LA
39.	Ice cream	0.039	0.200	S	LA
40.	Chilled water	0.000	0.314	HS	MA

(* for those which were less frequent in cases) HS- Highly significant, S-Significant

Discussion

Discussion on the demographic data: Dysmenorrhoea is a menstrual problem common in adolescent girls.[6] Many studies suggest that it may be due to the fact that the hormones that regulate the menstruation, contraction of uterine muscles, etc. require some time to adjust and come to equilibrium. Sometimes young girls may also have a lower pain threshold and the pain may have a psychological component as a cause in them.

In control group number of married women was high. Marriage does not mean a formal function, it is indicative of an active sexual life which might have helped them to get relived of dysmenorrhea. The act of intercourse may strengthen the pelvic muscles and make them resistant to pain. Sexual intercourse may also increase the release of endorphins that are released when one is happy.[7] They act as natural pain relievers. Childbirth through normal delivery is also a major contributor in reliving the dysmenorrhoea caused due to constricted internal os.

The pain during menstruation may be due to under nutrition[8] or due to hormonal imbalance resulting from over nutrition.[9] This justifies the presence of cases in other two groups of classes also.

Discussion on diet domain

Staple food dishes: The staple food of the people of South India especially Karnataka includes rice, wheat and barley. Different dishes prepared from these form the main course of meals of the common people living here. The inclination of the cases to eat other food articles like bajji more than the rice and wheat items may also be a reason for different deficiencies. Rice dishes like avalaki, puliogare, chitranna, jeera rice, etc. were significantly seen to be consumed less often by the cases. Rice is a very good source of energy, which is very important to tolerate pain. It also contains many micro nutrients. According to āyurveda it is bṛmhaṇa (nourishing), balya (gives strength) and reduces pitta and vāta.[10] The only rice dish that was seen eaten more by the cases was curd rice. The reason for the increased incidence of pain in those who ate curd rice might be that it is a very abhiṣyandi(obstruct the channels of circulation) food which when eaten can cause the blockage of channels of the body.

Wheat is an excellent source of different micro nutrients like zinc, copper, iron, magnesium, manganese, selenium, vitamin B3, vitamin E etc.[11] Among them magnesium, vitamin B3 and vitamin E are very important factors that reduce the menstrual cramps and other symptoms of dysmenorrhoea.[12] These dietary components are even used as a complementary therapy in dysmenorrhoea. It was seen that the cases ate the wheat product like godhi dosha, rava idli, shavige bhat, etc. very less, most of it showing very high statistical significance. In āyurveda godhūma (wheat) is similar to rice and is jīvana (enlivening), bṛmhaṇa (nourishing), ruciprada (taste enhancing), balya (strengthening), sthairyakara (providing stability) and vātapittahara;[10a] which are all good in dysmenorrhoea.

Chinese items: The incidence of people eating fast foods like noodles, gobi manchurian, babycorn manchurian, etc. has increased drastically in the recent years. They are usually added with a lot of preservatives, artificial colours and flavours. Some common chemicals found in these foods are monosodium glutamate, ajinomoto, etc. which are both alkaline and salty in nature. These chemicals are said to cause many harmful adverse effects in the body as severe as cancer. The oil in which such things are prepared in hotels and by street vendors are also repeatedly heated which is harmful to the body. This process leads to the formation of free radicals and thus causes oxidative stress in different organs of the body and the resultant damages in the cellular level.[13] Where ever there is pain there is also presence of cellular inflammation, which can be aggravated by these chemicals.

In āyurveda there is specific explanation of effects of excessive intake of alkaline and salty substances.[5b] It is told that excessive alkaline food hampers the fertility of the person and may cause hormonal imbalance. Excessive salty food is contraindicated in āyurveda. It is said to cause tiredness, looseness of muscles and intolerance to difficult situations.[5b] The loose muscles may also be the muscles of the uterus which again can cause atonic contractions and thus dysmenorrhoea.

Vegetables: All the tubers are considered to be heavy for digestion. Among the tubers it was found that potato has a very high significance in causing the painful menstruation with moderate association. It is a rich source of starch. All the starches except rice

creates gas during digestion and many people suffer from bloating. It is mentioned as the worst kind of tuber since it is viṣṭambhi (constipating), durjarā (difficult to digest), rūkṣa (dry) and increases kapha and vāta.[14] The increased vāta and constipation lead to blotting of abdomen, which increases the pain. During menstruation it is necessary to keep the bowel moving smoothly.

Leafy vegetables like amaranthus, palak, etc. are mainly prised for their high fibre content which again if consumed in large quantities without proper water intake is constipating. Āyurveda advocates the consumption of leafy vegetables only after properly steaming it and along with unctuous substances like ghee.[4b]

Pulses/legumes: Legumes are also a major part of the food of Indians. They come second after the cereals as a major food. Even though they are good sources of protein, they also have some negative effects when consumed in a larger quantity. They come under the śimbī dhānya in āyurveda. They are generally said to cause formation of vāta and bloating of abdomen.[14a] Among them, beans (rājamāṣa) and flat beans (niṣpāva) were found to be more significantly consumed by the case group. Rājamāṣa is specifically told as constipating the bowel.[10b] Niṣpāva has the extra property of causing raktapitta along with other vāta symptoms.[10c] Even though when kidney beans were asked separately the response was not so significant, it may be because when raw beans are consumed it may also have the added effects of fibre.

Non-vegetarian food: Non-vegetarian are very heavy for digestion and if one's digestive power is not so good, it can cause constipation and bloating. Another thing to be noted is that the non-vegetarian foods are predominantly very spicy in nature, which again leads to vātaprakopa. Eggs and chicken contain a fatty acid named Arachidonic acid which has a property of exaggerating the inflammatory process in the body. Since there is a condition of inflammation in the cellular level causing the pain during menstruation, it may be a cause for increased pain.[15] The quality of eggs and meat that is available now is also a matter of concern. Most of the chicken that is available in market is injected with different chemicals e.g. human antibiotics[16] for business purposes, which may have an adverse effect on the natural hormones in the body.

Snacks and bakery items: In this study it was found that people with dysmenorrhoea had the habit of taking chips, bajji, cutlet, puffs and chat items more often than the other groups. Most of the snacks are deep fried items that are predominantly salty and spicy. Frying also makes the food very rūkṣa (dry) and durjara (difficult to digest) which aggrevates vāta.[14b] Though these foods are of high calorific value they do not give satiety but tend to eat more, this leads to obesity which is one among the risk factors of dysmenorrhoea.[17]

Beverages and water: Ice creams and carbonated drinks apart from being very cold, contain a large amount of sugars in them. Eating high glucose diet increases the risk of prostaglandin production.[18] Prostaglandins as discussed earlier, is a major causative factor of dysmenorrhoea. Cold temperature of these also increases the cramps. According to āyurveda cold is a potential factor that increases vāta doṣa and inturn the pain.

Coffee is a very common everyday drink that is used to increase the brain stimulation by the increase in production of adrenaline. Sometimes it is also taken to refresh after a long day of work or stress. But its effects are only short lived. When taken in slightly more quantity, it can cause anxiety, restlessness, insomnia, etc. It is a vasoconstrictor and during menstruation, it can cause the constriction of the uterine vessels thus leading to more ischemia and cramps. It was also seen in different studies that coffee increased inflammatory response of the body[19] and decreased the levels of calcium and magnesium[20] which are both essential in reducing cramps. Coffee has been used since olden times as a way of stopping

bleeding owing to its kaṣāyarasa. Kaṣāyarasa has the property of increasing vātadoṣa also.

There was large difference seen in frequency and quantity of chilled water being consumed by both the groups. The people with dysmenorrhoea consumed cold water way more than those did not suffer from it. Cold food and drinks have a drastic effect on the digestive system, circulatory system and the musclular system. Cold water is a vasoconstrictor which increases muscle spasm. According to āyurveda, cold water is contraindicated in abdominal pains, vātaja vyādhis, abdominal bloating, etc.[14c]

Discussion on lifestyle domain

Food habits: Many aspects of the food habits were included in the questionnaire like the taste preferences, type of food processing, time of food intake, etc.

It was noted that the people who had the problem of dysmenorrhoea took the tastes lavaṇa (salty), amḷa (sour) and kaṭu (spicy) in a very higher frequency. Excessive use of kaṭurasa is enumerated as a cause of vitiation of vātadoṣa. They are also told among the grāmyāhāra, which produce looseness of muscles, vitiation of blood and results in problems of śukra.[5c] Kaṭurasa if used excessively is said to cause decrease in strength, fainting, tremors and pain in the back.[21] The excessive use of salty food has already been discussed. Sour foods if consumed in a large quantity are told to cause giddiness and dehydration.[21a]

Among different types of food processing it was observed that the people with menstrual cramps ate previous day's food and re-heated food in a significantly higher frequency than those who do not. These type of foods i.e, paryuṣita and punaruṣṇīkṛta are enumerated under duṣṭabhojana is a cause for yonīvyāpad as per Vāgbhaṭa.[22] Even though the property of the foods may depend on the type of food, the previous day's food and reheated food may hamper the metabolism and result in hormonal imbalance.

Considering the time of food intake it was seen that skipping one meal, not eating when hungry and not drinking when thirsty were found to be done in a significantly higher frequency by those subjects having dysmenorrhoea. Skipping of one meal, especially breakfast was seen in most of the cases. Eating breakfast is an important factor in resetting the body's biological clock. Skipping breakfast causes a shift in the phase of expression of the clock gene resulting in a nocturnal lifestyle pattern, may be associated with obesity,[23] which is a risk factor in dysmenorrhoea. Skipping of meal is also a cause for vātaprakopa. Another cause of vātaprakopa is the suppression of hunger and thirst. Less food and water intake leads to debility, dehydration, less strength, malnutrition, etc. these can increase the pain.

Sleeping habits: Improper sleep leads to many psychological and somatic disorders. In this study it was seen that subjects who had disturbed sleep very often, stayed awake at night and who slept for less than 6 hours a day were more in the case group. Rātrijāgaraṇa(awake at night) was significantly present in them. It is considered to be very rūkṣa in nature and aggravates vātadoṣa and *vice versa*. Lack of sleep is also a cause for hormonal imbalance. There is a disruption of the circadian rhythm and metabolism. It can also be that both lack of sleep and dysmenorrhea is caused by the same factor. It has been noted in some studies that lack of magnesium can cause reduced sleep[24] and can be responsible for menstrual cramps. Reduced sleep during night may lead to the habit of sleeping during daytime. It may cause in the aggrevation of kapha. This can also lead to obesity and hormonal imbalance. Sleeping during day time may also affect the night sleep.

Vāta aggravating activities: Different activities that are excessively done rather than food is the reason for the aggravation vāta. These include excessive talking, walking, laughing, exposure to cold, etc. Cold temperatures may cause vasoconstriction leading to ischemia in the uterine muscles and increases the pain.

The relation between exposure to cold and prevalence of dysmenorrhoea has been also seen in many epidemiological studies.[25]

Exercising habits: Even though exercise is also considered to increase vāta, it has been found in many studies that adequate physical activity helped in preventing menstrual cramps.[26] This study had also showed similar results. The number of people who never did exercise or did less amount of exercise were more in the case group than in the control group. Proper exercise helps to increase circulation and relives cramps due to ischemia. If done during the periods, exercise leads to faster diffusion of prostaglandin away from the uterus.[27] It can also reduce the activity of sympathetic nervous system and increase that of parasympathetic nervous system during rest, reducing stress and thereby the menstrual symptoms.[28] It has been seen practically and through research that doing optimum exercise is very essential to maintain proper flow and in reducing pain.[29] Exercise produces endorphins which are the natural pain killers of the body.[30] According to āyurveda, it is considered that exercise brings back the proper downward movement of vāta and this results in the proper expulsion of menstrual blood.

Suppression of natural urges: Vegadhāraṇa (suppression of natural urges) is the the specific cause told for dysmenorrhoea in āyurveda. It is similar to that of defecation, flatus, micturition, etc. When the vega is supressed, the vāta that should move in the downward direction goes up in the reverse path and causes difficult menstruation.[5d] Forceful induction of vomiting may also cause the upward movement of vāta. The natural urges are body's way of expelling waste out of the body. They come in bouts and they should not be supressed or forcefully induced. These natural urges are controlled by the central nervous system. So its suppression may affect the brain functions, leading to imbalance in the hormone levels. The hypothalamo-pituitary-ovarian axis gets disrupted, leading to low levels of oestrogen and hence lesser or difficult menstruation with pain. Withholding of defecation, micturition, etc. repeatedly may also lead to the accumulation of waste products in the blood, leading to conditions of electrolyte imbalances like metabolic acidosis that may increase the pain.[31]

Mental factors: The mental factor like stress was not found to be significantly different in both the groups after the statistical test but it was observed to be more frequent among the cases. These psychological factors have also been enumerated as causes for vātaprakopa[4c] thus leading to painful menstruation. Mental factors may also affect a person's pain tolerance capacity. The relation between psychological factors and dysmenorrhoea has also been proved by different epidemiological studies.[32] Mood swings and other mental factors can also be a result of different hormonal imbalances specially oestrogen.[33]

Conclusion

It was seen that in this particular geographical area, people suffering from dysmenorrhoea were mostly adolescents and the most common associated symptoms were low back ache followed by fatigue and discharge of clots.

The results on the diet domain in this study suggests that most of the cases did not eat nutritious food or they ate in a lesser quantity as compared to the other group. They also ate more of food that caused bloating of abdomen, constipation and inflammation and which are unhealthy. The practices of eating predominantly spicy, reheated and previous day's food at improper times were noted to be hazardous.

Proper sleep and physical exercise regularly were found to be the factors that prevented the occurrence of painful menstruation. Other vāta aggrevating activities, suppression of natural urges and mental factors were all found to be significantly associated with dysmenorrhoea. The effect of lifestyle was noted to be more than that of food.

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Authors

Varma Lakshmi K., Post Graduate Scholar, Department of Swasthavritta, Sree Dharmasthala Manjunatheswara College of Ayurveda and Hospital, Hassan, Karnataka, India.

Tripathy T. B., Professor and Head, Department of Swasthavritta, Sree Dharmasthala Manjunatheswara College of Ayurveda and Hospital, Hassan, Karnataka, India.

Gayathri Bhat N. V., Professor and Head, Department of Prasuthitantra and Striroga, Sree Dharmasthala Manjunatheswara College of Ayurveda and Hospital, Hassan, Karnataka, India.

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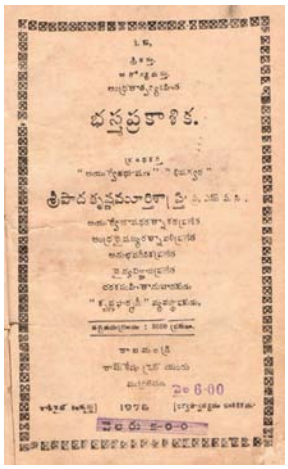
'Bhasmaprakāśika'- an important ayurveda text in Telugu language

Dutta Sharma Ganti K.S.

ABSTRACT: India is a treasure house of ayurvedic literatures. Many āyurveda books were written in regional languages like Telugu, Kannada, Bengali, Malayalam, Orissa, Gujarati, etc. Though some of them are very useful, due to lack of maintenance, improper care and negligence by individuals many of them have become extinct or partially available and some of them are on the verge of extinction. 'Bhasmaprakāśika' is one among such books in Telugu, which is on the verge of extinction. This Book deals in detail about various herbomineral compounds, their purification, formulation and therapeutic indications. This book throws light on various Pharmaceutical preparations of Āyurveda used in last century by physicians to treat various illnesses. They were discussed in detail and some unique formulations were highlighted in this paper.

Key words: Bhasmaprakāśika, Kṣāra, Rasabhasmaparīkṣa, Gandhapuṣpam, Surakṣāra kāsīsam



Bhasmaprakāśika

Vaidya Sripada Krishnamurthy Sastry

Vaidya Sripada Krishnamurthy Sastry the author of this book was born on 11th January 1894. He belonged to the Brahmin sect of Kauśikasagotra and bearing the family name 'Sripada'. He is the son of Somayaji and Subbamamba, and grandson of Venkatesvara. He was a native of Modekurru Agraharam of Konasima region of East Godavari District, Andhra Pradesh. He held academic qualifications such as 'Āyurveda Bhūṣaṇa' and 'Bhisagvara' and is a direct disciple of Pandit D. Gopalacharyulu of Madras. He was famous among the physicians of Andhra Pradesh as a renowned practitioner and scholar of ayurveda.[1] He was also the founder of 'Sri Krishna Pharmacy' and practiced in Rajahmundry.

About D. Gopalacharylu

Ayurveda Marthanda, Vaidyaratna, Pandit D. Gopalacharyulu was the founder of Ayurveda Asramam Madras and Reviver of Ayurveda Education in South India. He wrote commentaries on Suśrutasamhita Sareera Sthana, Madhava Nidana. He was the founder Principal of Madras Ayurveda College and a Resource person and Visiting professor Emeritus to many princely states on Ayurveda education and Chaired many Ayurveda Conferences.

Other works of the author

Other works of the author includes 'Ayurveda Auṣadha Ratnākaram', 'Andhra Bhaiṣajya Ratnāvali', Anubhava Dīpika', 'Vaidyavigñānam' and Carakasamhita (in 3 Volumes) in Telugu language.[1]

Editions and Publisher: Bhasmaprakāśika was first published by Box Press Publishers in the year 1925. Consecutively it took 5 reprints in the years 1930, 1935, 1944, 1948 and 1976. This book was lastly reprinted by Ramaseshu Press, Rajahmundry, in 1976. This denotes the popularity of this book among

physicians.But at present the text is not available. No commentaries were written on this book.[2]

In the introduction to the text (maṅgaḷācaraṇa) the author states that this book is a collection of various medicinal formulae from Sanskrit texts by ancient physicians which impart elaborate knowledge on manufacturing and therapeutic usage of various herbo mineral preperations.[2a] Herbomineral/metallic preparations were compiled into a hand book/guide for usage of fellow physicians in their day to day medical practice.

Arrangement of the text[2a]: Though this book bears the name 'Bhasmaprakāśika', the presentation of this book resembles Rasaratnasamuccaya as the author himself states that this is a compendium from various sources. In maṅgaḷācaraṇa (auspicious invocation) the author pays regards to Patañjali and Lord Dhanvantari. He states that this text is being presented in the form of Sanskrit verses in Telugu script followed by an explanation in Telugu language. All the contents were taken from various Rasaśāstra texts in Sanskrit like Rasaratnasamuccaya, Yogaratnākara, Bhaiṣajyaratnāvali, Cikitsāsārasaṅgraha, etc. comprising famous and effective yogas. He also mentions about a rare book 'Mahāyogānanda Amṛta Kalpavalli' available at his time only in the personal library of Kings of his region and he made a copy of it in hand writing as it was out of print. This book is entirely different from the above books as it mentions only the auṣadhayogas and mānaparibhṣa, their manufacturing methods and therapeutic indications but willingly omitted doṣa-dhātu-mala, aṣṭasthāna parīkṣa, vyādhilakṣaṇa, cikitsāsūtra and pañcakarma.

Content[2b]: The contents of the book were systematically classified in 21 gaṇa (chapters) which deal with medicinal formulations, preparation and therapeutic indications. Under each chapter Auṣadhānukramaṇika (list of medicines) were arranged as index in Telugu alphabetical order (Akārādikramam- starting from A to Kṣa). These alphabets denote the chapter and the contents also started with the same alphabet. The sequential arrangement of the chapters in the text is as follows. Table 1.

Table 1
Auṣadhānukramaṇika (Contents)

Sl. No.	Name of Varga	English	Description
1.	अ	A	Añjana śuddhi, Abhraka bhasma
2.	इ	i	Iṅgilia bhasma
3.	उ	u	Ulli pāṣāṇa
4.	क	ka	Karpūa śilājau, Kāntaloha bhasma
5.	ग	ga	Gandhaka śuddhi, Gandhaka bhasma
6.	ज	ja	Jaśada, Jayapāla
7.	ट	ṭa	Ṭaṅkaṇa
8.	त	ta	Tāmra, Tāḷaka, Tuttha
9.	द	da	Dadruharataila
10.	ध	Dha	Dhānyābhraka
11.	न	na	Navasāra, Nārikela
12.	प	Pa	Pravāḷa, Patika
13.	भ	bha	Bhaṅga, Bhallātaka
14.	म	ma	Maṇḍūra, Manaśśila
15.	र	ra	Rasa, Rajata
16.	ल	la	Loha
17.	व	va	Vaṅga, Vasanābha
18.	श	śa	Śaṅkha, Śukti
19.	स	sa	Sarvaratna, Sphaṭika
20.	ह	ha	Hiṅgu, Hemamākṣika
21.	क्ष	kṣa	Kṣārakalpa

Tabulation and description of mineral and metallic preparations in Bhasmaprakāśika is similar to that in Rasaratnasamuccaya.[3]

Bhasmavarṇa (colour of bhasma)[2c]: The author states that the colour of bhasma is not definite and there is difference of opinion among scholars regarding the colour of bhasma as it is influenced by the procedure and ingredients used during the process of manufacturing. This was compared with the

Standardisation and Preparation of Bhasma at Institute of Medical Sciences, Banaras Hindu University, Department of Rasasastra and they were different in outcome with that of the author.

Bhasmaviśeṣa parīkṣa[2d] (specific tests to confirm purity of bhasma): All prepared bhasma has special tests to identify their safety, proper preparation and purity, also generalised tests for individual bhasma should be considered here. Table 2.

Table 2
Bhasmaviśeṣaparīkṣa

Sl. No.	Bhasma	Property showing the purity of bhasma
1.	Svarṇa bhasma	Kapotakaṅṭha varṇa
2.	Abhrakabhasma	Non-lusturous/Non-shiny
3.	Tāmra bhasma	Does not cause nausea and vomiting
4.	Loha bhasma	Floats on water

Siddha bhasma parīkṣa[2e]:Specific tests to confirm proper preparation of bhasma. Author has mentioned generalised tests to examine the proper preparation of bhasma. Table 3.

Accessories of bhasma preparation

Puṭa: In continuation with the etymological meaning, puṭa is the measure of the amount of heat required to convert or transform any metal or mineral. This amount is substance specific and measured in terms of number or weight of fuel.

Śarāva: Earthen Petri dish having specific measurements.

Bhāvana: Trituration of the drug with liquid medium, e.g., hiṅguḷa with juice of fresh ārdraka (*Zingiber officinale* Roscoe), Lemon juice, etc.,

Bhasma pramāṇa/Dose[2f]: Svarṇa, rajata and tāmra bhasma dosage should be 1 1/2 guñja (1/2 valla) 1-9 ratti. Loha bhasma,Vaṅga Nāga Yaśada 1 1/2 valla 4 1/2 guñja. Also dosage of bhasma is to be decided by vaidya based on doṣa, roga, bala, deśa, kāla, avastha, etc. after considering the above factors.

Anupāna[2g]: Bhasma can be taken with or without anupāna. Anupāna can be liquid (water/kaṣāya, fruit juice/svarasa/honey, butter milk/milk) or solid (sugar/cūrṇa) or semisolid (butter/ghee) and quantity can be equal twice thrice or 4 times depending on condition. Also bhasma's can also be used in combination based on yukti of vaidya. Effects of anupāna taken along with bhasma are as follows:

a. Enhances efficacy/guṇa of bhasma
b. Acts as vyādhi hara
c. Adds its guṇa to bhasma (yogavāhi)
d. Negates the adverse guṇa and effects of bhasma

Table 3
Specific tests to confirm proper preparation of bhasma

Sl. No.	Property	Tests done
1.	Vāritara	Bhasma if properly prepared floats on water is termed as vāritara.
2.	Apunarbhava	Bhasma when mixed with mitrapañcaka and heated at high temperature should not undergo any change in its physical properties and bhasma should not regain its original state.
3.	Niruttha	Bhasma is heated at high temperature in a kiln along with measured quantity of silver. At the end of the process, the quantity of silver should not increase.
4.	Nisvādu	Bhasma should be tasteless. If bhasma has any taste, it is considered as semi-finished and should be subjected to puṭa again.
5.	Niścandra	The sparkling particles (candrika) in a bhasma indicate a semi-finished product.
6.	Avāmi	The bhasma should not produce nausea on administration.

Examples: Loha bhasma should be taken with Elādi cūrṇa for nātyuṣṇaśīta effect, with bhṛṅgarāja svarasa in kāmala, with Tālīsādi cūrṇa in kāsa and kṣaya, with Candanādi cūrṇa in śukrakṣaya and mūtradāha and with tṛvṛtcūrṇa to avoid vibandha.

Pathyāpathya[2g]: During therapeutic usage of bhasma, pathyāpathya in accordance to vyādhi are to be used under supervision of a vaidya. For example during Lohabhasma sevana the pathy-āhāra should be anuṣṇaśīta (neither uṣṇa nor śīta).

Kṣārakalpana[2h]: Kṣārakalpana was mentioned in detail. Explanation regarding various kṣāra made from apāmārga, cinca, palāśa, punarnava, etc. and their therapeutic indications both internal and external were explained.

Unique formulations in Bhasmaprakīśika[2i]: The following are some special preparations given in the book at the end as an attachment by the author. Table 5.

Table 5
Unique formulations in Bhasmaprakāśika*

Sl.No.	Formulation	Ingredients	Method of Preperation	Indications
1.	Vaṅganavanītam	Vaṅga+pārada+citraka svarasa	Kūpipakva	Pradara(sveta/ rakta), śukrakṣaya, Sexually transmitted disorders
2.	Tāmravaṅgam	Vaṅga, tāmra, apāmārga	Sandhibandhana + puṭa	Kuṣṭha,śvitra
3.	Rajatanavanītam	Rajata+pārada+akārakarabha +ahiphena+dālcini+lavaṅga+ jātīphala	Bhāvana	Vātavyādhi, vājikaraṇa pradara, sandhiśūla
4.	Tāmramainam	Tāmra+gandhaka +nimbūsvarasa	Bhāvana	Bhagandara, udara, carmavyādhi, kuṣṭha
5.	Hāratikarpūrapuṣpam	Abhraka+karpūra	Puṭa	bhrama, pittavyādhi
6.	Haritāla tablets	Kāravellaka, haritālabhasma	Laghupuṭa	All types of jvara
7.	Manaśśilā vaṭakam	Kukkuṭāṇḍa, manaśśilābhasma	Laghupuṭa	Sexually transmitted disorders, vraṇa
8.	Nārikela rasāyanam	Haratāla, pārada, gandhaka, rasakarpūra, hiṅguḷa, pippali, manashila, śuṅṭhi, nārikela	Sandhi Bandha/puṭa	Prameha
9.	Narikela Taila	Haratāla, hiṅguḷa, rasasindūra, manaśśila, danti, coconut milk	Tailapāka	Vraṇaropaṇa, vraṇaśodhana
10.	Sūryakṣāra Kāsīsa	Surakṣāra kāsīsa, nimbasvarasa	Puṭa	Mūtrakṛchra, mūtravyādhi
11.	Gandhaka Puṣpa	Gandhaka, eraṇḍa taila	Pāka	Bhagandara,virecaka, tvakvikāra
12.	Mayūratuttha bhasma	Mayuratuttha, durālabhā patra	Puṭa	Kāsa, śvāsa, hikka,śūla, ajīrṇa
13.	Sphaṭika bhasma	Sphaṭika, navanīta	Bharjana	Raktapradara, svetapradara raktātisāra, raktapitta
14.	Samudralavaṇabhasma	Lavaṇa, arkakṣīra,bhṛṅgarāja svarasa	Gajaputa	Dantakṛmi
15.	Rasakarpūra	Pārada, gandhaka, saindhavalavaṇa	Kūpīpakva	Diarrohea, dysentery Skin diseases
16.	Sūryakṣāra sindūra	Sūryakṣāra, bilva, aśvattha	Laghupuṭa	Mūtravyādhi, aśmari

Other important formulations found at the end of the book as an annexure are Sauvīra maina, Sauvīra pāṣaṇana, Sauvira tablets, Śaṅkha and gaurīpāṣāṇa bhasma, Nārikela Rasāyana, Hiṅguḷa sindūra, Hiṅguḷa bhasma. Pāṣāṇa prayoga in hemorroids, Duṣṭavraṇahara bandha(bandage),Vraṇaśodhana and ropaṇa bandha. Navasāra bhasma, Sphaṭika bhasma, Gandhakapuṣpa, Dadruhara taila, etc.[2j]

The author himself has manufactured all these medicines and had discussed the practical difficulties faced during their preparation and the techniques to be adopted to overcome them in another book named 'Anubhavadīpika'.

Discussion[4]

From Vedic period to the earlier part of 18th century Indian education was through Gurukula in Sanskrit. Due to educational reforms by British and introduction of English, Gurukula system and Sanskrit lost their glory. Āyurveda also faced serious neglect. India has an extensive ayurvedic literature in Sanskrit. Though āyurveda was prevalent as a medical and health care system, there was scarcity of scholars who can read and understand the original scriptures in Sanskrit. Also non availability of medical literatures in regional language paved way for translation of ayurvedic texts into regional languages like Telugu, Bengali, Oriya, Gujarati, Tamil, Malayalam, etc., for easy understanding. Along with translation of texts many scholars have contributed for systemic documentation of their clinical experiences, medicinal formulations and therapeutic indications. These documented evidences are based on geographical, traditional and linguistic variations were termed as sampradāya (Andhra sampradāya, Siddha sampradāya, Kerala samprādaya, etc). From 18th century to earlier part of 20th century these sampradāya granthas (texts based on tradition) became hand books for practicing ayurvedic physicians. Sarvauṣadhiguṇakalpam, Cikitsārṇavam,Vaidyacintāmaṇi, Basavarājīyam, Bhiṣaksudhārṇavam, Sahasrayogam, were a few among such reputed books. Even today many traditional vaidyas follow these in their ayurvedic practice. Though such books are very useful, due to lack of maintenance and improper protection and neglect many of them are extinct or partially available and some of them are on the verge of extinction. Only references or few verses from such texts are mentioned in later texts. Unfortunately, a large number of ayurvedic texts are unexplored till today are likely to exist in palm-leaf manuscripts, which are decaying or undergoing permanent annihilation. As such unique and valuable information contained in these texts is being lost. Though several Institutions have taken up work on literary research, only few texts have been published till date. Language is a major barrier in understanding books written in local languages. So it is the need of the hour to translate such books into english so that the fruits of ayurvedic knowledge reaches far and wide.

Conclusion

As mentioned by the author, this book is a compendium of useful medicinal preparations that are time tested and effective for the use of practicing physicians. Pharmaceutical industry can utilize the knowledge of Bhasmaprakāśika for the development of safe, cost effective, quality assured and clinically proven drugs for sub acute and chronic diseases and to promote utilization of ayurvedic medicines for the benefit of humanity.

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Author

Dutta Sharma Ganti K.S., Associate Professor, Department of Samhita, Sanskrit and Siddhanta, SASSAS Ayurveda Medical College, Guntakal - 515 801, Ananthapuram Dist., Andhra Pradesh

* Scientific names of the drugs mentioned in this article.

Citraka - *Plumbago indica* L.
Akārakarabha - *Anacyclus pyrethrum* (L.) Lag.
Dālcini - *Cinnamomum verum* J.Presl.
Jātīphala - *Myristica fragrans* Houtt. [seed]
Nimbū - *Citrus limon* (L.) Osbeck
Pippali - *Piper longum* L.
Nārikela - *Cocos nucifera* L.
Danti - *Baliospermum montanum* (willd.) Mull. Arg.
Bilva - *Aegle marmelos* (L.) Correa
tṛvṛt - *Operculina turpethum* (L.) Silva Manso
Apāmārga - *Achyrantes aspera* L.
Ahiphena - *Papaver somniferum* L.
Lavaṅga - *Syzygium aromaticum* (L.) Merr. & L.M.Perry
Kāravellaka - *Momordica charantia* L.
Śuṅṭhi - *Zingiber officinale* Roscoe
Nimba - *Azadirachta indica* A. Juss.
Duralābha - *Tragia involucrata* L.
Arka - *Calotropis gigantea* (L.) Dryand
Aśvattha - *Ficus religiosa* L.
Bhṛṅgarāja - *Eclipta prostrata* (L.) L.

Editor

Āryavaidyan, Vol. XXXII, No. 1, August - October 2018, Pages 61 - 62

Need to take regular bath

P.S. Varier, Kottakkal

Dhanvantari is the first medical journal in Malayalam published every month by Vaidyaratnam P. S. Varier from Arya Vaidya Sala uninterruptedly for 23 years from 1903 to 1926 . This clinical note was published in its column on Book No. 2, 1080 Karkitakam Malayalam Era (1905 CE), Article No. 7, Page 262.

Recently I went on a house visit. The patient was a three year old boy from a well off family in Trivandrum named Krishnan. He was suffering from indigestion and diarrhoea or we can say that these were the first symptoms. Sometimes his face as well as the feet were puffed up. There was no lack of appetite. He was very weak and fatigued when I met him. He looked unkempt and had bad breath and ulcers in the mouth. He was anaemic and his teeth were blackened. His eyes were botched and rheumed. Even though I was worried, I went ahead with the treatment. The first stage was at his home and the second here at Kottakkal. But the first stage got extended for another week and the medicines were sent to them during these three weeks. They asked whether the boy could be bathed and I gave my consent to do so once a day. The indigestion had stopped, he had regained his strength a bit and the eyes too looked better. He was brought to Kottakkal but his recovery was not upto my expectations, or it was my belief, rather an instinct, then. Inorder to confirm it, I debriefed the parents since his birth. I was shocked to learn that they have not oiled the baby till date! Not even the household oils! Not only that, they had only bathed him twice, in hot water, since the start of the ailments. When asked about this peculiar behaviour, they said that it was according to a physician's advise. He constantly quoted that an oiled bath would cause 'irakkam' and a normal one would cause 'grahaṇi'. He threatened them that he would not be responsible and neither would he treat the resulting ailments because of their digression/disobedience. He is a senior and one of the popular physicians at Trivandrum. It is not a surprise that they followed his order to the letter as he was their only solace. There are countless such souls who have not had an oiled bath till their deaths. Anyway I concluded that a systematic oiled bath would benefit the boy. Boiled

virgin coconut oil mixed with smashed mustards for external application followed by a bath with boiled water mixed with smashed 'nīrculḷi' [kokilākṣa or *Hygrophila auriculata* (Schumach.) Heine] in a luke warm heat for the body and the cold version for the head. By the grace of God the results were instantaneous. It was evident on the first day itself. Everybody felt it. The procedure was repeated every fourth day. His face became radiant as the days passed. The hemoglobin levels increased and the indigestion too was reduced. He became strong and active. He was fully recovered in three weeks. There was no change in the internal medicines but its effects were subdued and it started acting only when the oiled bath was initiated. They returned home along with some medicines for future use.

I would like to remind everyone that it would be ludicrous to recommend someone to change their daily routine and the customary practices without close scrutiny. No matter what the prognosis is, if you are not aware of his daily routine, the medicines would tend useless. Sometimes the effects of this ignorance could be adverse. It was a serious mistake that the boy was never bathed with oil. It is an irreplaceable element in our daily routine. We cannot even imagine it. But to abstain someone from even having a bath is even worse! I could digest the claim if it is logical and according to the science but the science too does not prescribe you to forsake cleanliness, which is inevitable. If a cold shower is forbidden in certain cases, the use of hot shower can be prescribed because very rarely did the saints forbid it.

Translated by: Rati Vijayan, Publication Department, Arya Vaidya Sala, Kottakkal, Kerala, India.

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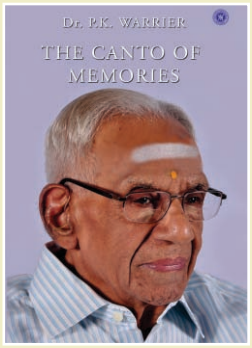

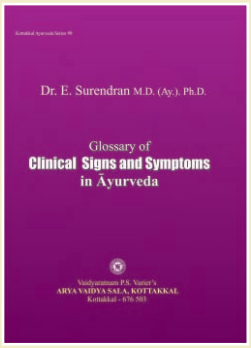

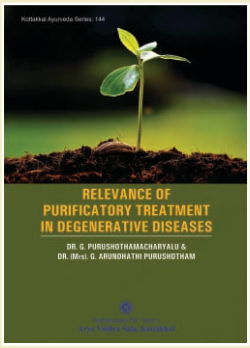

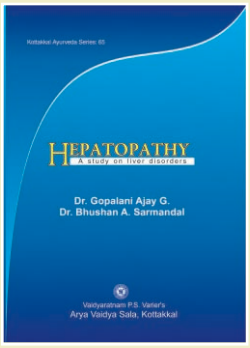

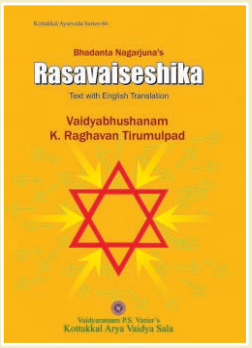

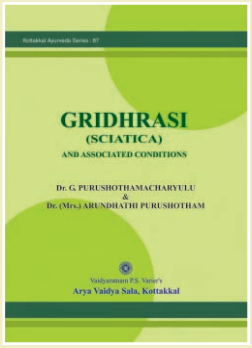

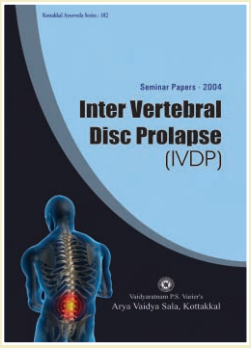

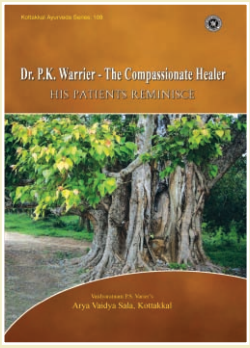

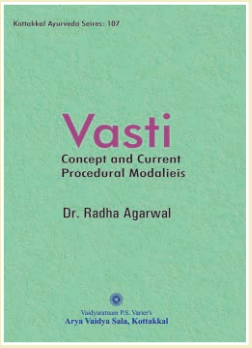

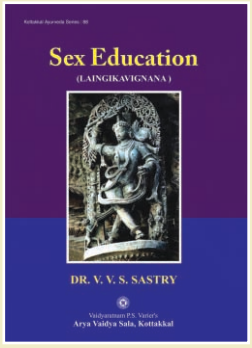

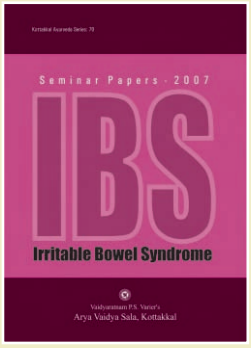

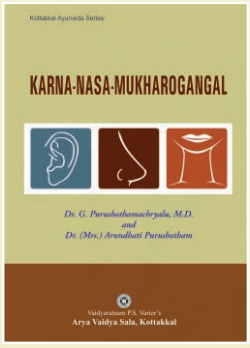

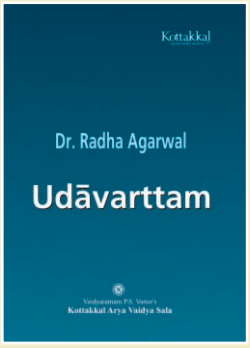

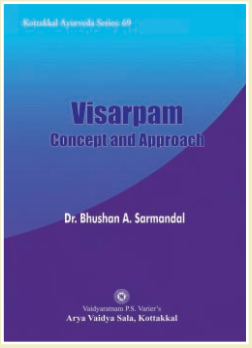

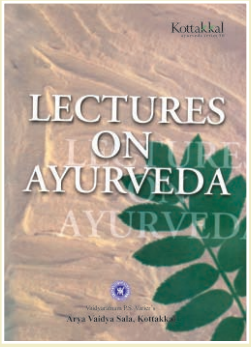

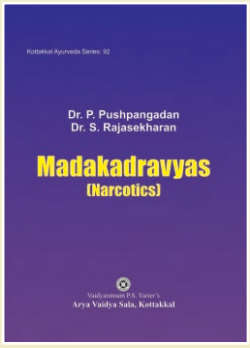

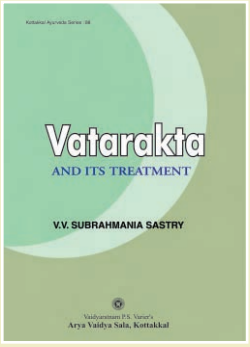

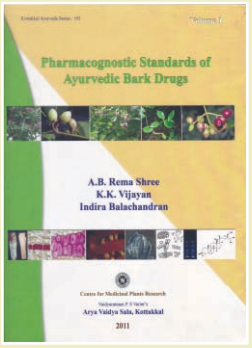

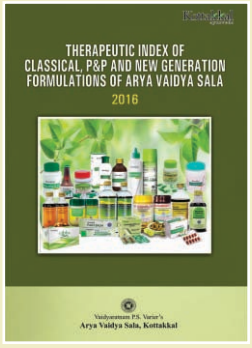

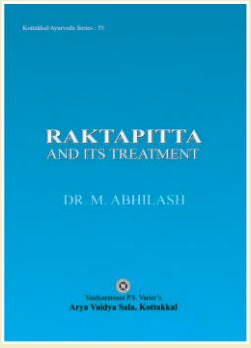

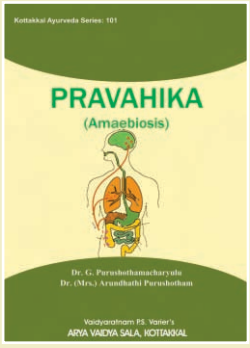

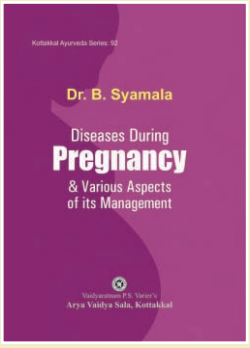

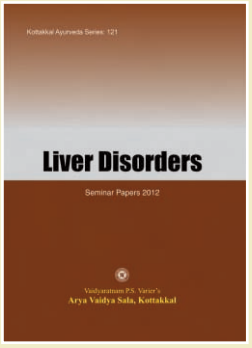

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