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लाभानां श्रेय आरोग्यम्

*Of all the gifts,
the most precious is health*



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FROM THE PAGES OF VĀGBHĀṬA - LXXV

P. Madhavikutty*

Abstract: The 4th Chapter of Śārīrasthāna named Maṛmavibhāga continues. Here, the classification of maṛmas into six groups as per their basis viz. māmsa, asthi, snāyu, dhamani and sirā are explained. The serious consequences when they are injured, the classification of maṛmas according to the severity viz. sudden killers, death in due course of time, causing death if the foreign body is extracted, causing deformities, etc., and the measurements of each maṛmas are also described.

विषमं स्पन्दनं यत्र पीडिते रुक् च मर्म तत् ॥ ३७ ॥
मांसास्थिसनायुधमनीसिरासन्धिसमागमः ।
स्यान्मर्मेति च तेनात्र सुतरां जीवितं स्थितम् ॥ ३८ ॥
बाहुल्येन तु निर्देशः षोढैवं मर्मकल्पना ।
प्राणायतनसामान्यादैक्यं वा मर्मणां मतम् ॥ ३९ ॥

(viṣamaṁ spandanam yatra
pīḍite ruk ca maṛma tat ॥ 37 ॥
māmsāsthisnāyudhamanī-
sirāsandhisamāgama: ।
syānmaṛmeti ca tenātra
sutarāṁ jīvitam sthitam ॥ 38 ॥
bāhulyena tu niṛdeśa:
ṣoḍhaiṣaṁ maṛmakalpanā ।
praṇāyatanasāmānyād-
aikyaṁ vā maṛmaṇām matam ॥ 39 ॥)

Where the vibration of pulse is felt irregularly and where there is pain when pressed, that particular spot is termed as maṛma. Maṛma is also defined as the meeting place of muscles-bones, snāyus, siras, dhamanis and sandhis. Life is depending upon them very well. The grouping of maṛma into six categories is as

per the predominance of muscles, bones, etc. on the particular spots. Or, all the maṛma can be included in one group as they have the common similarity of being the seat of praṇa.

मांसजानि दशेन्द्राख्यतलहृत्स्तनरोहिताः ।
शङ्खौ कटीकतरुणे नितम्बावंसयोः फले ॥ ४० ॥
अस्थनद्यष्टौ, स्नावमर्माणि त्रयोविंशतिराणयः ।
कूर्चकूर्चशिरोऽपाङ्गक्षिप्रोत्क्षेपांसवस्तयः ॥ ४१ ॥

(Māmsajāni daśendraḥkhyata-
talahr̥tstanarohitā: ।
śaṅkhau kaṭīkataruṇe
nitambāvamsayo: phale ॥ 40 ॥
Asthnyaṣṭau, snāvamaṛmāṇi
trayoviṁśatirāṇaya: ।
kūrcakūrcasīroṣpāṅga-
kṣiprotkṣepāmsavastaya: ॥ 41 ॥)

Māmsamaṛmas are ten viz. indravastis(4), talahr̥dayas(4) and stanarohitas(2). Asthi maṛmas are eight. They are: śaṅkhas(2), kaṭīkataruṇas(2), nitambas(2) and amsaphalakas(2). Snāyumaṛmas are twenty-three viz. āṇis(4), kūrcas(4), kūrcasiras(4),

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apāṅgas(2), kṣipras(4), utkṣepas(2), amsas(2)
and vasti(1).

गुदापस्तम्भविधुरशृङ्गाटानि नवादिशेत् ।
मर्माणि धमनीस्थानि.....

(Gudāpastambhavidhura-
śṛṅgātāni navādiśet ।
maṛmāṇi dhamaṇīsthāni.....)

Dhamaṇīmaṛmas are nine viz. guda(1),
apastambhas(2), vidhuras(2) and śṛṅgātakas(4).

.....सप्तत्रिंशत्सिराश्रयाः ॥ ४२ ॥

बृहत्यौ मातृका नीले मन्ये कक्षाधरौ फणौ ।
विटपे हृदयं नाभिः पार्श्वसन्धी स्तनाधरे ॥ ४३ ॥
अपालापौ स्थपन्युर्व्यश्चतस्रो लोहितानि च ।

(.....saptatṛiṃśatsirāśrayāḥ ॥ 42 ॥
Bṛhatyau mātṛkā nīle

manye kakṣādharau phaṇau ।
viṭape hṛdayaṃ nābhiḥ
pārśvasandhī stanādhare ॥ 43 ॥

Apālāpau sthapanyaṛvyā-
ścatasro lohitaṇi ca ।)

Sirāmaṛmas are are thirty-seven: bṛhatī(2),
mātṛkā(8), nīlās(2), manyās(2), kakṣa-
dharās(2), phaṇās(2), viṭapas(2), hṛdaya(1),
nābhi(1), pārśvasandhis(2), stanamūlas(2),
apālāpās(2), sthapanī(1), uṛvis(4) and
lohitaṣ(4).

सन्धौ विंशतिरावर्तौ मणिबन्धौ कुकुन्दरौ ॥ ४४ ॥
सीमन्ताः कूर्परौ गुल्फौ कृकाट्यौ जानुनी पतिः ।

(sandhau viṃśatirāvarttau
maṇibandhau kukundarau ॥ 44 ॥

Śimantāḥ kūrparau gulphau
krkātyau jānūnī patiḥ ।)

Sandhimaṛmas are twenty: āvartas(2),
maṇibandhas(2), kukundaras(2), śimantās(5),

kūrparas(2), gulphas(2), krkātikas(2), jānus(2)
and adhipati(1).

मांसमर्म गुदोऽन्येषां, स्नाञ्चि कक्षाधरौ तथा ॥ ४५ ॥
विटपौ विधुराख्ये च, शृङ्गाटानि सिरासु तु ।

अपस्तम्भावपाङ्गौ च, धमनीस्थं न तैः स्मृतम् ॥ ४६ ॥
(māmsamaṛma gudoḥnyeṣāṃ,

snāvni kakṣadharau tathā ॥ 45 ॥
viṭapau vidhurākhye ca,

śṛṅgātāni sirāsu tu ।
apastambhāvapaṅgau ca,

dhamaṇīstham na taiḥ smṛtam ॥ 46 ॥)

Some ācāryas consider guda as a māmsa
maṛma. They include kakṣadharās, viṭapas and
vidhuras in the group of snāyumaṛma, and
śṛṅgātakas, apastambhas and apāṅgas in
siramaṛma. They have not accepted as dhama-
ṇīmaṛma.

Maṛmas are assorted in six groups as per their
basis as māmsa, asthi, snāyu, dhamaṇi, sira and
sandhi. All the one hundred and seven maṛmas
are included in these six groups. But some
ācāryas (Suśṛuta and Aṣṭāṅgasaṅgrahakāra) do
not agree with this grouping. They accept only
five bases*. Here it is not clear why ācārya
Vāgbhaṭa added dhamaṇī-maṛma to this group
of five.

विद्धेऽजस्रमसृक्सावो मांसधावनवत्तनुः ।

पाण्डुत्वमिन्द्रियाज्ञानं मरणं चाशु मांसजे ॥ ४७ ॥

मज्जान्वितोऽच्छो विच्छिन्नः

सावो रुक् चास्थिमर्माणि ।

(ViddheḥSjasramasṛksṛāvo
māmsadhāvanavattanuḥ ।

*तानि मर्माणि पञ्चात्मकानि भवन्ति; तद्यथा मांसमर्माणि
सिरामर्माणि स्नायुमर्माणि अस्थिमर्माणि सन्धिमर्माणि
चेति । (सु. सं. शा. ६३)

pāṇḍutvamindriyājñānaṁ
 maraṇaṁ cāśu māṁsaje ॥ 47 ॥
 MajjānvitoScho vicchinna:
 sṛāvo ruk cāsthimaṛmaṇi ।)

Injury to māmsamaṛma will cause thin continuous flow of blood just like the water in which meat is washed. There will also occur loss of sense perceptions and sudden death. If asthimaṛma is injured there will be intermittent flow of thin fluid mixed with bone marrow, and severe pain.

आयामाक्षेपकस्तम्भाः स्नावजेऽभ्यधिकं रुजा ॥
 यानस्थानासनाशक्तिवैकल्यमथवाऽन्तकः ।

(āyamākṣepakastambhā:
 snāvajeSbhyadhikaṁ rujā ॥ 48 ॥
 Yānasthānāsanāśaktiḥ-
 vaikalyamathavāSntaka: ।)

Injury to snāyumaṛma will cause spasmodic contractions, convulsion, stiffness, severe pain, inability to walk, stand or sit, deformity of limbs or even death.

रक्तं सशब्दफेनोष्णं धमनीस्थे विचेतसः ॥ ४९ ॥

(Raktaṁ saśabdaphenoṣṇaṁ
 dhamanīsthe vicetasa: ॥ 49 ॥)

When dhamanīmaṛma are injured, the person will be unconscious, and frothy warm blood will flow out with a sound.

सिरामर्मव्यधे सान्द्रमजस्रं बह्वसृक्स्रवेत् ।
 तत्क्षयात्तृड्भ्रमश्वासमोहहिध्माभिरन्तकः ॥ ५० ॥

(sirāmaṛmavyadhe sāndra-
 majasraṁ bahvasṛksṛavet ।
 tatksyāttrḍabhramaśvāsa-
 mohahidhmābhirantaka: ॥ 50 ॥)

When siramaṛmas are injured, thick blood will

flow continuously and copiously. Due to blood loss, the person will suffer from thirst, giddiness, dyspnoea, fainting and hiccup, and succumbs to death.

वस्तु शूकैरिवाकीर्णं रूढे च कुणिखञ्जता ।
 बलचेष्टाक्षयः शोषः पर्वशोफश्च सन्धिजे ॥ ५१ ॥

(Vastu śūkairivākīṛṇaṁ
 rūḍhe ca kuṇikhañjatā ।
 balaceṣṭākṣaya: śoṣa:
 parvaśophaśca sandhije ॥ 51 ॥)

If sandhimaṛmas are injured, the affected spot will be felt as if pervaded by sharp spikes. There will be deformity of hands and legs, loss of strength and movement, emaciation, and swelling of joints in the affected body parts, even after the healing of the injury.

नाभिश्ङ्खाधिपापानहच्छृङ्गाटकवस्तयः ।
 अष्टौ च मातृकाः सद्यो निघ्नन्त्येकोनविंशतिः ५२
 सप्ताहः परमस्तेषां कालः कालस्य कर्षणे ।

(Nābhiśāṅkhādhipāpāna-
 hr̥cchr̥ṅgāṭakavastaya: ।
 aṣṭau ca mātṛkā: sadyo
 nighnantyekonaviṁśati: ॥ 52 ॥
 Saptāha: paramasteṣāṁ
 kāla: kālasya karṣaṇe ।)

There are nineteen maṛmas viz. nābhi, śāṅkhas(2), adhipati, apāna (guda), hr̥daya, śṛṅgāṭakas(4), vasti and mātṛkas(8) which if injured, are sadyoghnamaṛmas (killing at once, or sudden killers). In such cases the maximum limitation of time for death is seven days.

त्रयस्त्रिंशदपस्तम्भतलहृत्पार्श्वसन्धयः ॥ ५३ ॥
 कटीतरुणसीमन्तस्तनमूलेन्द्रवस्तयः ।
 क्षिप्रपालापबृहतीनितम्बस्तनरोहिताः ॥ ५४ ॥

कालान्तरप्राणहरा मासमासार्द्धजीविताः ।

(trayastrīmśadapastambha-
talahrtpārśvasandhayaः ॥ 53 ॥

Kaṭitaruṇasīmanta-
stanamūlendravastayaः ।

kṣiprāpālāpabrhatī-
nitambastanarohitāः ॥ 54 ॥

Kālāntaraprāṇaharā
māsamāsārdhajāvitāः ।)

There are thirty-three maṛmas viz. apastambhas(2), talahrdayas(4), pārśva-sandhīs(2), kaṭikataruṇas(2), sīmantas(5), stanamūlas(2), indravastīs(4), kṣipras(4), apālāpas(2), brhatīs(2) nitambas(2) and stanarohitas(2), which are called kālāntara-prāṇaharas (taking life in due course of time). The duration of time for death may be one or half month.

उत्क्षेपौ स्थपनी त्रीणि विशल्यघ्नानि, तत्र हि ॥ ५५ ॥

वायुर्मासवसामज्जमस्तुलुङ्गानि शोषयन् ।

शल्यपाये विनिर्गच्छन् श्वासात्कासाच्च हन्त्यसून् ॥

(utkṣepau sthapanī trīṇi
viśalyaghnāni, tatra hi ॥ 55 ॥

vāyurmāmsavasāmajja-
mastuḷuṅgāni śoṣayan ।

śalyāpāye vinirgacchan
śvāsātkāsācca hantyasūn ॥ 56 ॥)

There are three maṛmas viz. utkṣepās(2) and stapanī(1), which are called viśalyaghnās - causing death when the śalya (injurious foreign body) is extracted. When the śalya is extracted, vāyu goes out through that exit emaciating māmsa, vasā, majja and mastuḷuṅga, and then producing dyspnoea and cough, and takes away the life.

फणावपाङ्गौ विधुरे नीले मन्ये कृकाटिके ।

असांसफलकावर्तवितपोर्वीकुन्दराः ॥ ५७ ॥

सजानुलोहिताक्षाणिकक्षाधृक्कूर्चकूर्पराः ।

वैकल्यमिति चत्वारि चत्वारिंशच्च कुर्वते ॥ ५८ ॥

हरन्ति तान्यपि प्राणान् कदाचिदभिघाततः ।

(Phaṇāvapāṅgau vidhure
nīle manye kṛkāṭike ।

amsāmsaphalakāvarta-
viṭapoṛvikukundarāः ॥ 57 ॥

Sajānulohitākṣāṇi-
kakṣādhrkkūrçakūrparāः ।

vaikalyamiti catvāri
catvāriṃśacca kuṛvate ॥ 58 ॥

Haranti tānyapi prāṇān
kadācidabhighātataः ।)

There are forty-four maṛmas viz. phaṇas(2), apāṅgas(2), vidhuras(2), nīlās(2), manyās(2), kṛkāṭikas(2), amasas(2), amsaphalakas(2), āvartas(2), viṭapas(2), urvīs(4), kukundaras(2), jānus(2) lohitas(4), āṇis(4), kakṣadharas(2), kūrças(4) and kūrparas(2) which are called vaikalyakaras (causing deformities); sometimes these also may be fatal if the injury is very grave.

अष्टौ कूर्चशिरोगुल्फमणिबन्धा रुजाकराः ॥ ५९ ॥

(aṣṭau kūrçaśirogulpha-
maṇibandhā rujākaraः ॥ 59 ॥)

There are eight rujākara (producing pain) maṛmas viz. kūrçasiras(4), gulphas(2) and maṇibandhas(2).

तेषां वितपकक्षाधृगुर्व्यः कूर्चशिरांसि च ।

द्वादशाङ्गुलमानानि, द्व्यङ्गुले मणिबन्धने ॥ ६० ॥

गुल्फौ च स्तनमूले च, त्र्यङ्गुलं जानुकूर्परम् ।

(Teṣāṃ viṭapakakṣād-
hrguṛvyaः kūrçaśirāṃsi ca ।

dvādaśāṅgulamānāni,

dvyṅgule maṅibandhane ॥ 60 ॥
 Gulphau ca stanamūle ca,
 tryaṅgulaṁ jānukūrparam ।)
 Amongst them, twelve maṅmas i.e. viṭapas(2),
 kakṣadharas(2), urvīs(4) and kūrcasiras(4) are
 of the size of one aṅgula (2.5 cm). Maṅiban-
 dhas, gulphas and stanamūlas are of two
 aṅgulas in size. Jānus and kūrparas are of three
 aṅgulas.

अपानवस्तिह्रन्नाभिनीलाः सीमन्तमातृकाः ॥ ६१ ॥
 कूर्चशृङ्गाटमन्याश्च त्रिंशदेकेन वर्जिताः ।
 आत्मपाणितलोन्मानाः

(apānavastihṛnnābhi-
 nīlā: sīmantaṁmātrkā: ॥ 61 ॥
 kūrcasṛṅgāṭamanyāśca
 tṛiṁśadekena varjitā: ।
 ātmapāṇitalonmānā:.....)

There are twenty-nine maṅmas i.e. guda, vasti,
 hṛdaya, nābhi, nīlās(2), sīmantas(5), mātrkas(8),
 kūrcas(4), śṛṅgāṭakas(4), and manyās(2) which
 are of the size of one's own palm.

.....शेषाण्यर्द्धाङ्गुलं वदेत् ॥ ६२ ॥
 पञ्चाशत्षट् च मर्माणि, तिलव्रीहिसमान्यपि ।
 इष्टानि मर्माण्यन्येषाम्

(.....śeṣāṅyaṛddhāṅgulaṁ vadet ॥ 62 ॥
 Pañcāśatṣaṭ ca maṅmāṇi,
 tilavṛīhisamānyapi ।
 iṣṭāni maṅmāṅyanyeṣām.....)

All the remaining fifty-six maṅmas are of half
 aṅgula in size. Some other ācāryas consider
 the size of some maṅmas are very small, equal
 to the size of sesame seed or a paddy grain.

.....चतुर्द्धोक्ताः सिरास्तु याः ॥ ६३ ॥
 तर्पयन्ति वपुः कृत्स्नं ता मर्माण्याश्रितास्ततः ।

तत्क्षताक्षतजात्यर्थप्रवृत्तेर्धातुसङ्क्षये ॥ ६४ ॥
 वृद्धश्चलो रुजस्तीव्राः प्रतनोति समीरयन् ।
 तेजस्तदुद्धृतं धत्ते तृष्णाशोषमदभ्रमान् ॥ ६५ ॥
 स्विन्नस्रस्तश्छथतनुं हरत्येनं ततोऽन्तकः ।

(.....caturddhoktā: sirāstu yā: ॥ 63 ॥
 Tarpayanti vapu: kṛtsnaṁ
 tā maṅmāṅyāśṛitāstata: ।
 tatṣatātṣatajātyartha-
 pravṛtterdhātusaṅkṣaye ॥ 64 ॥
 Vṛddhaścalo rujastivṛā:
 pratanoti samīrayan ।
 tejastaduddhṛtaṁ dhatte
 tṛṣṇāśoṣamadabhṛamān ॥ 65 ॥
 Svinnasṛastaślathatanuṁ
 haratyenaṁ tatoऽntaka: ।)

In the previous chapter, four types of siras are
 described which are nourishing the whole body.
 These siras are depending on maṅmas, and so,
 when maṅmas are injured, dhātus get decreased
 due to heavy blood loss and vāta becomes
 provoked. It creates severe pain simultaneously
 prompting pitta also. Pitta, thus prompted,
 causes thirst, emaciation, intoxication and
 giddiness. In such cases, the person's body
 perspires, droops, looses, and gradually
 succumbs to death.

वर्द्धयेत्सन्धितो गात्रं मर्मण्यभिहते द्रुतम् ॥ ६६ ॥
 छेदनात्सन्धिदेशस्य सङ्कुचन्ति सिरा ह्यतः ।
 जीवितं प्राणिनां तत्र रक्ते तिष्ठति तिष्ठति ॥ ६७ ॥

(vaṛddhayetsandhito gātraṁ
 maṅmaṅyabhīhate drutam ॥ 66 ॥
 Chedanātsandhideśasya
 saṅkucanti sirā hyata: ।
 jīvitam pṛāṅinām tatṛa
 rakte tiṣṭhati tiṣṭhati ॥ 67 ॥)

When maṛma is injured, the limb, on which that maṛma is located, should be cut off from the nearest joint. By this, the siras get contracted and the bleeding is controlled. The existence of life of all living beings depends upon the healthy state of blood.

सुविक्षतोऽप्यतो जीवेदमर्मणि न मर्मणि ।
 प्राणघातिनि जीवेत्तु कश्चिद्वैद्यगुणेन चेत् ॥ ६८ ॥
 असमग्राभिघाताश्च सोऽपि वैकल्यमश्नुते ।
 तस्मात्क्षारविषाग्र्यादीन् यत्नान्मर्मसु वर्जयेत् ॥ ६९ ॥

(suvikṣatoṣpyato jīved-
 amarmaṇi na marmaṇi ।
 prāṇaghātini jivettu
 kaścidvaidyaguṇena cet ॥ 68 ॥
 asamagrābhighātāśca
 soṣpi vaikalyamaśnute ।
 tasmātkṣāraviṣāgnyādīn
 yatnānmarmasu varjayet ॥ 69 ॥)

Though injured seriously on spots, where there are no maṛmas, the person will survive, but not if injured on a lethal maṛma. If somebody survives even after an injury on a lethal maṛma, by the skill of the physician, or by the incompleteness of the injury, the person will suffer from deformity. Therefore application of caustic alkalis or poisonous drugs, and

cauterization with fire, should be avoided on maṛma as far as possible.

मर्माभिघातः स्वल्पोऽपि प्रायशो बाधतेतराम् ।
 रोगा मर्माश्रयास्तद्वत्प्रक्रान्ता यत्नतोऽपि च ॥ ७० ॥

(maṛmābhighāta: svalpoṣpi
 prāyaśo bādhatetarām ।
 rogā maṛmāśrayāstadvat-
 prakṛāntā yatnatoṣpi ca ॥ 70 ॥)

Mostly, even a small injury to maṛma causes several serious troubles. In the same way, diseases, which are connected to maṛmas, torment the person for a long time, even though they are treated very well with much difficulty.

इति श्रीवैद्यपतिसिंहगुप्तसूनुश्रीमद्वाग्भटविरचिता-
 यामष्टाङ्गहृदयसंहितायां द्वितीये शारीरस्थाने
 मर्मविभागो नाम चतुर्थोऽध्यायः ॥ ४ ॥

(iti śrīvaidyapatīsīmhaguptasūnuśrīmad-
 vāgbhaṭaviracitāyāmaṣṭāṅgahr̥dayasamhitāyām
 dvitīye śārīrasthāne maṛmavibhāgo nāma
 caturthoṣdhyāya: ॥ 4 ॥)

Thus ends the chapter Maṛmavibhāga, the fourth in Śārīrasthāna of Aṣṭāṅgahr̥daya samhita, composed by Śrīmad Vāgbhaṭa, son of Śrī Vaidyapati Simhagupta.

**PHARMACOGNOSY OF TĀLA FRUITS
(BORASSUS FLABELLIER L.)**

T.R. Shantha, K.G. Vasanth Kumar and K. Gopakumar*

Abstract: This paper deals with the pharmacognostical studies on the fruits (hyaline edible endosperm) of tāla. It includes macro and microscopical studies, maceration, powder study, diagnostic characters, u-v fluorescence studies, physico-chemical studies, and preliminary phytochemical studies. Studies revealed the presence of brown coloured thick walled cells in between the parenchymatous cells, simple rounded starch grains, fixed oil globules and tannin content. These studies help in laying down the pharmacopoeial standards and in identifying the drug in powder form or as such with or without the outer brown covering.

Introduction

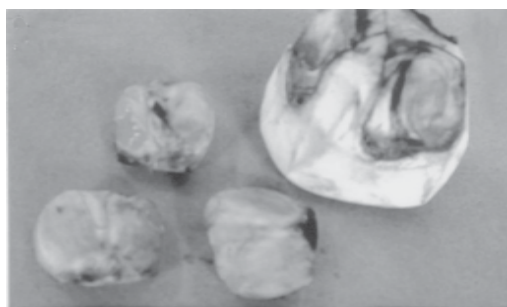
Borassus flabellifer L. of Arecaceae is known as tāla in Āyurveda and tāli/panai in Siddha system of medicine and commonly known as palmyra palm, which is looked upon with veneration by Hindus. The fruits of tāla are sweet, cooling, intoxicating, fattening, aphrodisiac, anthelmintic, tonic, laxative and alexiteric. It is useful in biliousness, burning sensations, thirst, fatigue, rheumatic complaints and blood complaints and increases kapha (phelm). Pulp from the unripe fruit is diuretic, demulcent and nutritive. Milky fluid from the immature fruits is a sweet and cooling energetic drink, checks hiccup and sickness. The pulp from the ripe fruit is applied externally for skin diseases. Tender fruits are much relished during summer and form a cooling, delicious and

nutrient food (Anonymous, 1988; Kirtikar and Basu 1991 and Watt 1972).

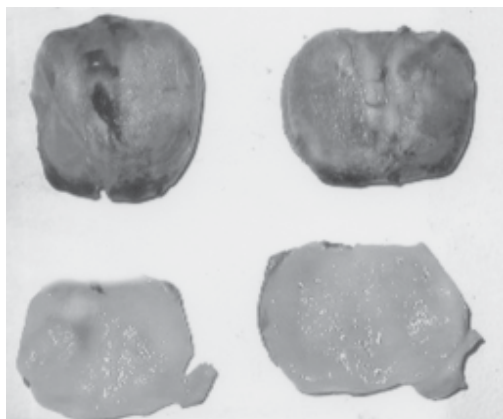
In Āyurvedic system of medicine, different parts of the tree like root, leaves, inflorescence, toddy, fruit and seed are used in bleeding, thirst, edema, burning sensation, constipation, anorexia, disorders of spleen and abdominal and cardiac diseases, amenorrhoea, dysuria, skin diseases, fever and general debility. In Siddha system of medicine, different parts like root, male inflorescence palm, sugar palm candy are used in cooling restorative, anti inflammatory and demulcent, nutritive tonic (S.N.Yoganarasimhan 2000). The fresh sap of palm is called *nira* which has stimulant and antiphlegmatic properties. It is also useful in inflammatory affections and leprosy. When the fruits are tender, seed contains a soft, sweet,

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jelly like endosperm with sap (Nadkarni 1982). The fruit is used in the retention of urine. Tāla fruit (endosperm) cooked with ghee and milk is useful in the discoloration of urine and dysuria (P.V.Sharma 1996). There has been reviews that macro and powder microscopical work on the male inflorescence of tāla has been carried out (Anonymous 2001) and no work has been carried out on the fruits of tāla (Roma Mitra 1985, M.A. Iyengar 1975) hence the present study on the fruits of tāla is carried out.



Fruits of tāla with the outer covering



Fruits of tāla with and without brown covering

Materials and methods

Fresh fruits (tender) were collected locally from the fruit vendor during March - May. Three distinct layers i.e. epicarp or outer skin of the fruit, the mesocarp and fibrous were removed and the shell which spilt open to get the seed; this hyaline edible endosperm or the soft albuminous layer and the jelly like fluid contained within was used as study material. Free hand sections were taken following Johansen (1940) and Wallis (1967). Transverse sections of the fruits were taken for detailed microscopical observations. Fluorescence characters of the powdered fruit were observed under u - v light according to Chase and Pratt (1949). The powdered fruit was studied microscopically and phytochemically with different chemical reagents. Physico-chemical and extractive values were determined as per Indian Pharmacopoeia (1966). TLC studies were carried out according to Igon Stahl, 1969 and preliminary phytochemical studies were carried out according to Kokate, C. K., 1993.

Results

Macroscopical characters

The jelly like portion is white, hyaline in structure, covered by brown sheath, which is easy to remove by hand; measures 5 to 8 cm in length and 3 to 5 cm by width. The jelly like white portion is sweet in taste with pleasant odour; smooth to touch and slips off easily by hand.

Microscopical characters

T.S. of the fruit (hyaline endosperm) along with the brown covering shows following structures (Fig.1a-e):

- Single layered light brown coloured epidermal cells made up of rectangular cells.

- Many layered light brown thin walled, tangentially elongated parenchymatous cells.
- Some of the parenchymatous cells show oil globules and simple starch grains.
- Many layered thin walled, small rounded to polygonal parenchymatous cells with simple starch grains, oil globules and light brown tannin content.
- In between the parenchymatous cells thick walled brown cells are present in groups and vascular strands are also present with Xylem helical vessels. In some places, both Xylem and Phloem cells represent vascular region.
- Followed by parenchymatous cells, many layered thin walled, big to small rounded parenchymatous cells with simple starch grains, oil globules and thick walled rounded cells.

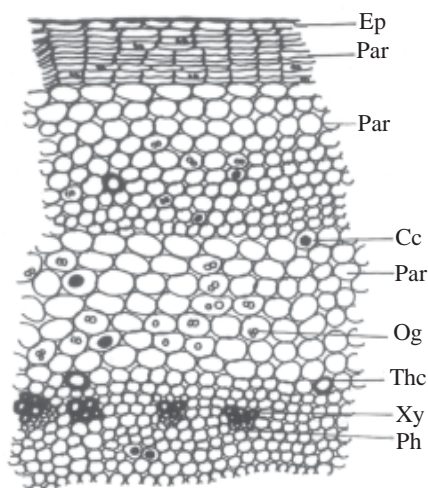


Fig. 1.a: T.S. of the hyaline endosperm portion showing epidermis (single layered) and parenchymatous cells with oil globules, cell content, thick walled cells (brown) and vascular bundle.

Ep Epidermis; **Par** Parenchyma; **Cc** Cell content; **Og** Oil globule; **The** Thick walled cell; **Xy** Xylem; **Ph** Phloem.

Macerate

Macerate of the hyaline endosperm shows following characters (Fig 1e):

- Thin walled elongated parenchyma cells with brown cell content and oil globules.
- Small elongated brown parenchyma cells and thin walled, rounded parenchyma cells with starch grains.
- Polygonal thin walled parenchymatous cells.

Powder study

Powder is light crème in colour, odour pleasant with sweet taste. Microscopically powder shows fragments of thin walled brown coloured parenchyma cells, rounded parenchymatous cells, fragments of polygonal parenchymatous cells with fixed oil globules and starch grains, fragments of helical Xylem vessels and thick walled cells.

Diagnostic characters

- Presence of thick walled brown cells in between the parenchymatous region.
- Presence of simple starch grains and fixed oil globules in the parenchymatous tissue.
- Presence of sweet taste with pleasant odour of the powdered drug.

The measurements of different tissues observed in μ (microns) are detailed below:

TABLE 1

Measurement of different tissues in μ (microns)

Transverse section:

• Epidermis	8-12-20	x	5-10-15
• Parenchyma (small)	20-25-30	x	15-20-25
• Thick walled parenchyma	15-20-25	x	10-15-20
• Helical Xylem vessel	10-18-25	x	8-15-20
• Parenchyma (big)	20-25-35	x	15-20-30

Maceration:

• Parenchyma	20-25-30	x	15-20-25
• Xylem (Helical)	15-20-25	x	10-12-20
• Thick walled cells	10-15-28	x	8-12-20

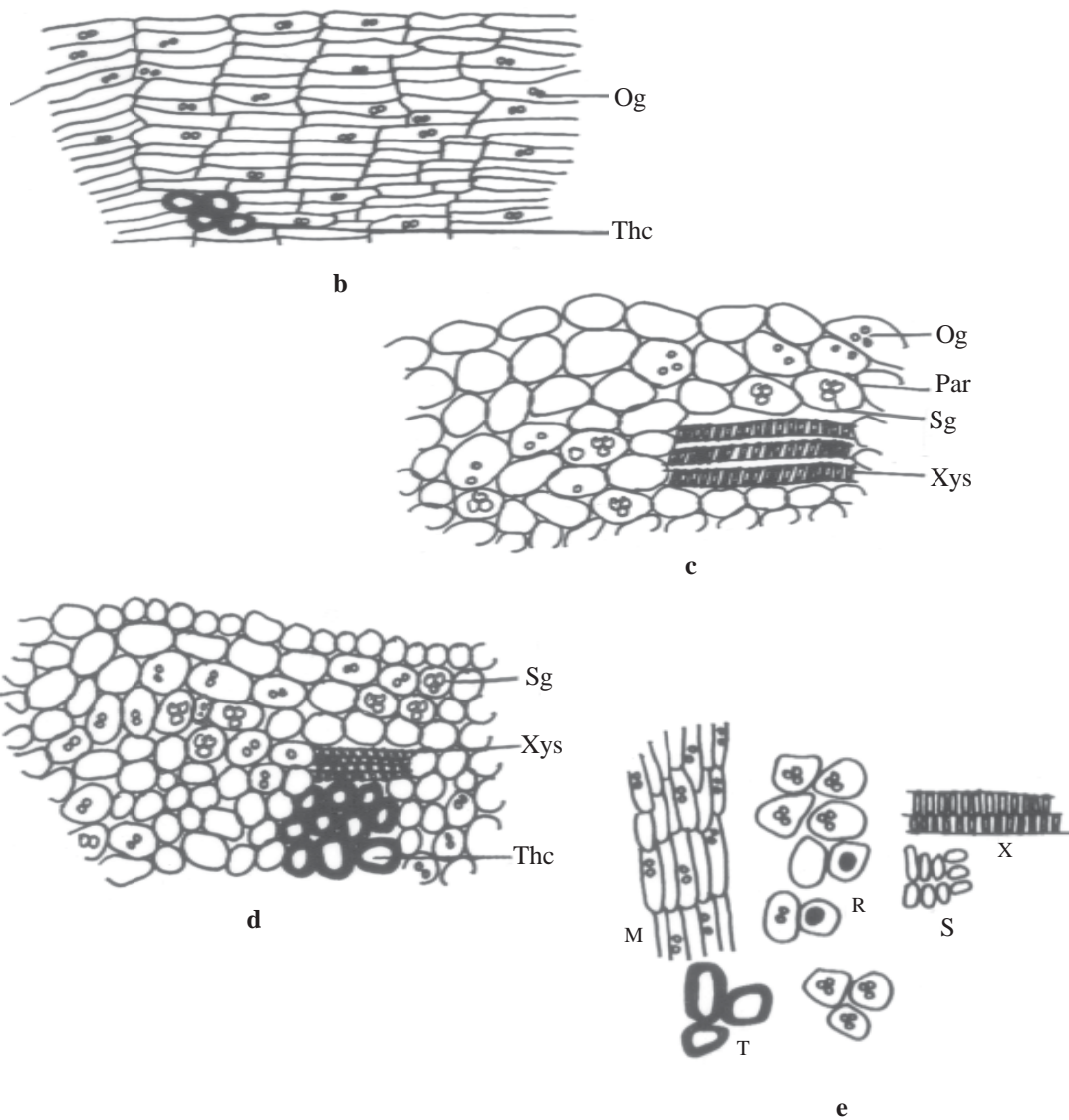


Fig. I.b-e: **b** T.S. of the matured endosperm region showing elongated parenchymatous cells; **c** T.S. of the matured endosperm region showing big, rounded to polygonal parenchyma cells; **d** T.S. of the young hyaline endosperm region showing small rounded parenchymatous region with Xylem strand and thick walled cells; **e** (M) Macerate showing elongated parenchyma cells; (R) Rounded to polygonal parenchymatous cells; (S) Small parenchymatous cells; (X) Xylem helical vessel; (T) Thick Walled cell.

Og Oil globule; **The** Thick walled cell; **Par** Parenchyma; **Sg** Starch grains; **Xys** Xylem strand

Physico and phyto-chemical studies

Powder of the fruit was used for chemical analysis. Physico-chemical studies and preliminary phytochemical screening of the drug were carried out as per the methods and procedures in standard references like Anonymous, 1966, Kokate C.K., 1993 (Table 2&3).

Fluorescence analysis

The fluorescence behavior of the powdered drug in different solutions towards ordinary light and ultra violet light (both long and short wavelengths) were observed (Chase & Pratt, 1949) (Table 4).

TABLE 2
Physico-chemical studies of tāla fruits extract

Sl.No	Parameters	Result
1	% Foreign matter	Nil
2	% Loss on drying at 110°C.	7.84
3	% Ash content	3.69%
4	% Water soluble ash	1.33%
5	% Acid insoluble ash	1.09%
6	% Extractive values:	
	a. Petroleum-ether 60-80°C	14.28%
	b. Benzene	4.17%
	c. Chloroform	3.26%
	d. Ethanol	5.32%
7	% Solubility at room temp.	
	a. Ethanol	28.12%
	b. Water	31.14%
8	Extractable matter (Hot)	36.90%
9	Volatile oil	Nil
10	Swelling index	18.50 ml.
11	Foaming index	Less than 100
12	Inorganic constituents (Qualitative)	*

*Carbonate, Chloride, Sulphate, Magnesium, Calcium, Sodium and Potassium.

TABLE 3

Sl.No.	Phytochemicals screened	Results
1	Steroids	+ve
2	Triterpenoids	+ve
3	Flavonoids	+ve
4	Fixed oils	+ve
5	Amino acids	+ve
6	Anthraquinones	-ve
7	Tannins	+ve
8	Sugar	+ve
9	Saponins	-ve
10	Alkaloids	-ve

TLC studies

The Thin Layer Chromatographic studies of the petroleum ether 60-80°C, benzene, chloroform and ethanol extracts were carried out in various solvent systems at 30°C using silica gel G as adsorbent (Igon Stahl, 1969) (Table 5).

Discussion

The hyaline edible endosperm portion of the fruit constitutes the drug tāla. Pharmacognostical studies on tāla revealed the presence of thick walled cells with helical Xylem vessel, fixed oil globules, brown content and parenchymatous cells which helps in identifying the drug whether it is in powder form or in whole state with or without the outer brown covering of the hyaline region (portion) of both matured as well as tender region (portion) of the fruit. Phytochemical evaluation helps in laying down the pharmacopoeial standards.

Acknowledgements

The authors are thankful to the Director of CCRAS, Delhi for evincing interest on this work and to the Assistant Director, RRI, Bangalore.

TABLE 4
Fluorescence studies

Sample + Reagent	OBSERVATIONS UNDER		
	Ordinary light	UV long wave 365 nm	UV short wave
Powder as such	Light brown	Brown with white tinge	Grey
Powder + water	Light cream	Light brown	Pale green
Powder + 50% HCl	Brown	Dark brown	Light green
Powder + 50% H ₂ SO ₄	Dark brown	Dark brown	Dark green
Powder + 50% HNO ₃	Light chocolate brown	Dark brown	Dark green
Powder + 4 N. NaOH	Light brown	Light green	Dark green
Powder + NaOH in Methanol	Brown	Light brown	Dark green
Powder + Acetic acid	Green	Cream colour with white tinge	Pale green
Powder + Methanol	Cream	Light brown	Pale green

TABLE 5
T.L.C. Studies

Extractives	Adsorbent	Solvent system	Spray reagent	Rf values
Petroleum ether 60-80°C	Silica gel G Ethanol 95:5	Benzene: in Methanol	50% H ₂ SO ₄	0.09, 0.18, 0.33, .52, 0.63, 0.71, 0.80, 0.85, 0.91.
Benzene	Silica gel G	Benzene: Methanol	50% H ₂ SO ₄ in Methanol	0.07, 0.09, 0.20, 0.30, 0.47, 0.68, 0.76, 0.78, 0.93.
Chloroform	Silica gel G	Chloroform 90:10	50% H ₂ SO ₄ in Methanol	0.08, 0.25, 0.33, 0.41, 0.56, 0.62, 0.77, 0.89.
Ethanol	Silica gel G	Chloroform: 78:22	50% H ₂ SO ₄ in Methanol	0.08, 0.15, 0.16, 0.23, 0.41, 0.56, 0.64, 0.74, 0.82, 0.88, 0.92.

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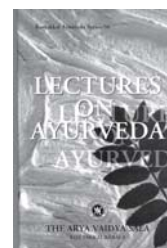
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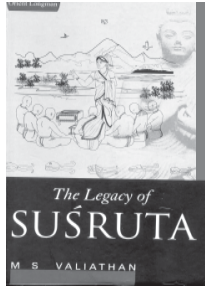
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Book Review

THE CHERISHED LEGACY OF SUŚRUTA



The Legacy of Suśruta

M.S. Valiathan
Orient Longman Pvt. Ltd.,
160 Anna Sali, Chennai.
First Edition: 2007
Pages 830
Price: Rs. 875/-

C.K. Ramachandran*

As civilizations blossomed and flowered in the far corners of the globe, the languages spoken by disparate races also developed concurrently. A unique feature of such languages was that there were a few words from the same linguistic root in use in different tongues. One such word was 'Veda', which was prevalent in many languages with all its connotations of purity of concept, nobility of purpose and depth of meaning; all totally intact. There has never been another word of profounder import since then. The ancients maintained that Veda is like a massive tree, the numerous branches of which incorporate the varied historical happenings,

encompassing all that has gone before in its entirety, through its branches, their offshoots and in turn their tender sprigs.

The branches of Veda were first known as 'samhitas', which literally meant 'compendiums'. Simultaneously with the compilation of Ṛg, Sāma, Yajur and Atharva Vedas, there also came into being Āyurveda which was nothing but anthology of all that pertained to life.

Ṛgvedasāmavedayajurvedātharvavedeṣu pañcamoṣyam āyurveda.

Thus has sage Kaśyapa categorized Āyurveda as the fifth Veda, in no uncertain fashion.

Catuṣṅām ṛgsāmajuratharvavedānām atharvavede bhaktirādeśyā (Ca.sū.a. 3)

Although Caraka acknowledges the debt in the above quotation that Āyurveda owes to Atharva veda, Caraka has pondered over elsewhere the possibility that Āyurveda even predates the other four Vedas. In this context Caraka has posed the basic question of the usefulness of the knowledge in four Vedas, if there be no Āyurveda to sustain life, thereby granting the latter, primacy.

It is widely accepted that the origin of the four Vedas was from the corresponding Samhitas or Ṛg, Sāma, Yajur and Atharva. On the other hand, the origin of Āyurveda is believed to be totally different; in that, the countless types of

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treatment for the multitude of ailments that plague mankind, evolved through different sources and later converged to form Āyurveda. Scholars agree that the first among these was Śalyatantram. The earliest practitioners of medicine had to deal with injuries inflicted in battle between warring tribes and later nation states, wounds caused due to attacks by wild animals and the trauma arising out of accidents, disasters and other acts of God. To tackle these, different branches of Śalyatantra evolved, with Suśrutatantra being perhaps the most prominent.

Historians locate the origin of Suśrutatantra approximately a millennium before Christ. In the following fifteen centuries, practitioners belonging to many schools of treatment, compiled their knowledge acquired from hands on experience and appended the same to the existing Suśrutatantra, which in its present format came into being circa 400 AD.

I do not propose to comment on opinions that have already been expressed by many distinguished scholars and historians including Dr. N.V. Krishnankutty Varier because Dr. Valiathan has already dealt with that aspect quite competently in his book. There is no denying that the Suśrutasamhita came to be compiled when the quadruple caste structure was well entrenched in society, evidence of which is abound in the Samhita itself. It is also obvious that the same is not overly reflected in the Carakasamhita. Among the family of Āyurvedic Samhitas like Kaśyapasamhita, Hārītasamhita, Bheḷasamhita and the like, only two Samhitas viz. those of Caraka and Suśruta have been successful in crossing the frontiers of India and spread their teachings to distant countries.

Over a length of time, there have been innumerable additions and interpolations in Suśrutasamhita but it was mainly during the period of Nāgārjuna that Suśrutasamhita was significantly expanded and metamorphosed into its present format. It was Nāgārjuna who added the Uttaratantra consisting of 66 chapters to the original text of 120 chapters divided into 8 segments. History tells us that there were probably three Āyurvedic sages named Nāgārjuna but we have very limited accurate information about the Nāgārjuna who broadened the ambit of Suśrutasamhita.

By 750 AD, an Arabic translation of the Suśrutasamhita had been taken into use at the University of Baghdad during the reign of Caliph Al Mamoon. Likewise, both Carakasamhita and Aṣṭāṅgahṛdaya had also been rendered into Arabic at about the same time. As Āyurveda spread in the other direction to South East Asian countries like Thailand, Cambodia and Indonesia, the names of Caraka and Suśruta became well known in that part of the world also. Stone inscriptions circa 900 AD found in Cambodia during the time of Yaśoda Varman, carry the name of Suśruta, supporting the foregoing claim.

Earlier this year, the book in English titled 'The Legacy of Suśruta', dealing comprehensively with Suśrutasamhita had been published. Three years prior to this, as a result of Herculean efforts, the earlier book titled 'The Legacy of Caraka' had been brought out. Aside from these two landmark achievements in the field of medical history, Dr. M.S. Valiathan had established his impeccable credentials more than 15 years ago to speak authoritatively on Āyurvedic legends by presenting a scholarly paper titled

‘Colossus of Surgery’ before knowledgeable audiences. ‘The Legacy of Suśruta’ should therefore not merely be seen as an English translation of Suśrutasaṃhita. It is much more because Dr. Valiathan has dealt not only with varied surgical procedures but also with specific surgical solutions to numerous ailments defying cure.

The original 120 chapters and the 66 chapters of Uttaraṅtra have been logically rearranged into 18 segments with 86 chapters. This scientific layout has enhanced the readability and impact of the book. After the introduction, the author has lucidly explained 42 important śloka in the following dozen pages. By just reading this portion of the book one can easily grasp the grandeur and depth of the whole concept of the book. The next 3 pages contain the list of the 44 graphic illustrations, two of which deserve special mention - one being that of Suśruta wearing protective clothing probably due to the biting cold of Uttarakāśi and the other that of Kāśi Rāja Divodāsa Dhanvantari wearing ceremonial headgear. 120 odd surgical equipment used in eight basic types of surgeries for various ailments, as well as 13 types of bandages applied after surgical procedures, have all been discussed in detail in the 4th chapter, which is well supplemented with appropriate illustrations. Apart from this, other procedures like kṣāraprayoga (alkaline treatment), cauterisation, venesection, etc. have also been tackled competently in 4 chapters with suitable illustrations in support.

In the eighth chapter, Suśruta, who could very well be acclaimed as the pioneer in plastic surgery, details the modus operandi of rhinoplasty. It transpires that rhinoplasty is only one among ten kinds of plastic surgery, which

Suśruta had once practiced. Dr. Valiathan painstakingly explains how the technique of rhinoplasty travelled to England, where Dr. Joseph Karpov in 1816, carried out rhinoplasty in the same way Suśruta had once performed it. It may be recalled in this connection that Dr. Valiathan had earlier published the correspondence dating back to 1893, between Captain Irwin, Dr. Scott and Dr. Finlay, on Suśruta’s rhinoplasty technique. The incident that occurred during the war between the British and Tippu Sultan, wherein one of the bullock-cart drivers in the British Army named Kavasuji, came to lose his nose which was chopped off by Tippu, needs to be retold here. Kavasuji was reportedly taken to Pune, where the British surgeons mentioned above were present to witness the rhinoplasty procedure. A surgeon belonging to the potter caste, carried out the actual surgery by borrowing a knife from his neighbour, then obtaining the dimensions of the nose by cutting a leaf to the same size, then removing skin from the forehead of the patient and affixing it on the nose with mud paste, after inserting two small tubes in the nostril. There was neither any stitching up nor anaesthesia used. When a detailed report on this surgery done in Pune, reached London, then Dr. Joseph Karpov was encouraged to revive modern rhinoplasty on the very lines practised by Suśruta 3000 years ago.

Other types of surgery, which have been discussed by Suśruta, include those for haemorrhoids, stone in urinary bladder, fistula in anus, deep abscess, goitre, tumour, swelling of veins and different types of sores. Suśruta has described both the removal of stone from the urinary bladder and fistula in anus in great

detail. For the former procedure, the perineal approach, entry is between the rectum and the urinary tract. One Dr. Gadvi of East Africa is reported to have adopted this procedure after reading Suśrutasaṃhita. He has also utilised the same method for prostate surgery. About five years ago, The British Surgical Journal had carried a write-up on 86 such surgeries carried out by the same doctor. Dr. Valiathan has spared no effort to get such detailed documentation, to support each of his findings.

Although Suśruta had given pride of place to surgery in his Saṃhita, other seven areas like rejuvenation therapy, paediatrics, neurology have also been given adequate importance in the book. All these have been presented scholastically in a brief but telling format.

Any reader of this book who has even a nodding acquaintance with Āyurveda and modern

medicine can easily grasp what Suśrutasaṃhita is all about. This easy access has become possible only because Dr. Valiathan has collated all possible references to Suśrutasaṃhita scattered all over the world, carried out their comparative study and then thoroughly researched the source volume. Unmatched scholastic profundity alone has enabled Dr. Valiathan to bring out 'The Legacy of Suśruta', which feat entitles Dr. Valiathan to be called a modern day Nāgārjuna.

It is only with due respect that a reader should take up this book for perusal. Orient Longman Pvt. Ltd., Chennai has immaculately published it. Dr. Valiathan's 'The Legacy of Caraka' sold out 3 editions in the last 3 years. Going by that track record, 'The Legacy of Suśruta' should find its rightful place in the Library shelves of all Universities. I wish the author all the best.

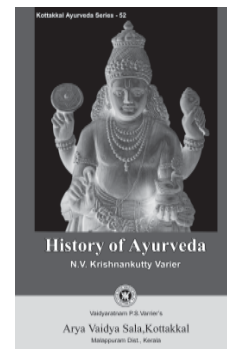
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ĀYURVEDIC MANAGEMENT OF FISSURE - IN - ANO

M. Mruthyumjaya Rao,¹ Anukul Chandra Kar,² P.Bhattacharya³ and Jayram Hazra⁴

Abstract: A single blind clinical trial was carried out to evaluate the efficacy of Kaśīśādi taila vasti, Hot sitz bath, Jātyādi ghṛtam, Abhayāriṣṭam and Tṛiphala cūrṇa in the management of Fissure-in-ano at the Ano-Rectal Clinic, Central Research Institute (Ay.), Kolkata during the period from May 1999 to March 2004. The observations and the results were recorded under various parameters. It is concluded that this drug combination is effective in the management of Fissure-in-ano.

Introduction

Anal fissure is a tear in the skin around the opening of the anus¹. It can cause sharp pain, especially when opening the bowels. It is thought to be a common disorder for which many people do not seek medical advice. The internal anal sphincter plays a key role in the development of an anal fissure². This is one of two muscles that control the opening of the anus. Both muscles need to relax in order to pass the stool. Unlike the exterior anal sphincter, which can be tensed or relaxed voluntarily, there is no voluntary control of the internal sphincter. The internal anal sphincter may go into spasm because of the pain of a fissure causing a raised pressure within the anus. This excess pressure makes it harder to pass the stool, making constipation worse, and contributing to a vicious circle. The spasm of the internal anal sphincter can also restrict the

blood supply to the anal skin, which reduces its ability to heal³.

The condition parikaṛtika is referred to in āyurvedic literature as one of the fifteen kinds of disorders which may result from injudicious use of purgatives owing to the ignorance of the physician or of the patient⁴. Improperly done virecana kaṛma (purgatives) aggravates the vāta and pitta that gives rise to a sort of cutting, sawing pain in the anus, penis, umbilical region and the neck of the bladder (vasti). The omission of flatus is arrested by the vāyu and lies incarcerated in the abdomen, and relish for food vanishes.

Application of creams or ointments that contain local anaesthetics (e.g. lidocaine) or steroids (e.g. hydrocortisone) and an injection of outline toxin (Botox), anal dilatation, sphincterotomy, and fissurectomy (chronic fissure) are usually in practice. But these procedures have

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sometimes associated with some complications like post operative anal stenosis, sphincter incontinence etc.⁵ To overcome such problems and to provide cheap, simple, ambulatory and effective treatment, a combined therapy has been kept on trial on the basis of the treatment mentioned in the ancient literature and also based on the preliminary work done in the management of the said disease⁶. Picchāvasti and anuvāsana vasti are advised in the treatment of parikartika⁷. Taking this view in to consideration, a modified regimen with kāśīśādi taila vasti, jātyādi ghr̥ta per rectal application, hot sitz bath and a laxative was tried on 350 cases of fissure-in-ano and it was found to be quite effective without any complications.

Material and methods

The trial was aimed to evaluate the efficacy of the āyurvedic drug combination in terms of the days taken to check the pain as well as alleviation of associated symptoms and to see whether there is recurrence of pain/bleeding and other symptoms even after complete healing.

Selection of cases

A total number of 350 patients with complaints of pain with or without bleeding per rectum during and/or after the defecation with or without other symptoms like, itching, discharge, constipation, with /or without pain were examined and confirmed by peri-anal examination were admitted for the study. The cases associated with malignancy were excluded from the study. The cases were randomly selected irrespective of age, sex, chronicity, prakriti and type of fissure. The follow-up was made at an interval of 7 days during the study period of 21 days and at an interval of 15 days up to 6 weeks thereafter.

Drug

- Kāśīśādi taila:- 10 ml to be administered per rectally half an hour before defaecation daily once in the morning with the help of a syringe and plain rubber catheter No.7.
- Hot Sitz bath twice daily with warm water
- Jātyādi ghr̥tam (q.s) for per rectal application daily once after sitz bath
- Abhayāriṣṭam 25 ml twice daily with lukewarm water
- Tṛiphala cūrṇa - 5g at bedtime with warm water.

Diet

- Wholesome:- Ghee, milk, rice, plenty of liquids, plenty of fruit, vegetables and wholegrain cereals.
- Unwholesome:- Non-veg. and spicy foods.

Assessment criteria

Since the pain is the main symptom in Fissure-in-ano, the total number of days taken to heal the wound with alleviation of pain and associated symptoms were noted and results were assessed (Table 1).

Observations

General analysis in relation to age, sex, chronicity and condition of fissure, pṛakṛti, etc. of patients were made. About 53% of cases were females and the incidence was found maximum (38%) in the age group of 21-30 years. About 62% of cases had the chronicity of up to one year and almost all cases had constipated bowel habits. The study revealed that a large number of cases (98.28%) had undergone medical treatment and 1.71% of cases underwent Sphincterotomy prior to the study but reported recurrence. Maximum number of cases (62.85%) were pittapṛakṛti.

40.85% of cases suffered moderate pain and 35.14% had severe pain. 57.42% of cases had acute fissure followed by acute on chronic fissure with incidence of 32.57%. The study also revealed that anterior midline fissures were commonly found in females. Out of 350 cases registered for the study 67.71% of cases had itching/pruritis ani, 61.42% had discomfort at anal region, 63.14% had bleeding per rectum and 52.85% of cases complained of discharge (mucoid).

Results and discussion

Out of 350 cases, 37.42 percent had complete relief within seven days of therapy, 26.85 percent had complete relief between 8 and 14 days, 16.57 percent had complete relief between 15 and 21 days, 0.85 percent had complete relief between 22 and 30 days of the therapy while 18.28 percent cases dropped out from the study.

The analysis showed that (i) maximum number of cases (55) found in the age group of 21 – 30 years, (ii) maximum of cases (101) with duration of illness up to one year, (iii) 91 cases who belong to pitta prakṛti and (iv) 93 cases with acute fissures had got complete relief within seven days of therapy (Table 2).

During the study it is observed that anterior midline fissures were noticed in females only (excepting in few male cases), which may be due to some anatomical curvatures of the ano-rectal canal that allows the stool to press on the anterior wall and may give rise to an abrasion in the longitudinal direction. Posterior midline fissures are found maximum in males. If the acute fissure does not heal readily, certain secondary changes may develop. One of the most striking features is swelling at the lower end of the fissure forming the so called sentinel

TABLE 1
Assessment of response

Sl.No	Response duration	Description
1	< 7 days	When there is complete relief in pain during/after defecation without any bleeding within 7 days of the therapy started. No recurrence there after upto 6 weeks of the follow-up.
2	08 - 14 days	When there is complete relief in pain during/after defecation without bleeding after 7 days but before 14 days of the therapy and no recurrence there after up to 6 weeks of the follow-up.
3	15 - 21 days	Complete relief in pain after 14 days but before 21 days of the treatment without bleeding and recurrence there after up to 6 weeks of the follow-up.
4	22 - 30 days	Complete relief in pain after 21 days but 30 days of the therapy without bleeding and recurrence there after up to 6 weeks of the follow-up.
5	Relief after 30 days	When there is any relief in pain or partial relief or relief in pain after 30 days of the therapy and/or recurrence thereafter.
6	Drop-out	Discontinuation of the treatment during the trial due to development of any complications and aggravation of the disease.

TABLE 2
Speed of recovery according to various parameters

Parameters	Results of the treatment (%) i.e relief in terms to number of days of therapy					
	< 7 days	8 to 14	15 to 21	22 to 30	DO	Total
According to age						
Up to 20 years	06(1.71)	04(1.14)	03(0.85)	1(0.28)	4(1.14)	18(5.14)
21-30 years	55(15.71)	36(10.28)	23(6.57)	1(0.28)	18(5.14)	133(38.0)
31-40 years	37(10.57)	39(11.14)	21(6.0)	1(0.28)	17(4.85)	117(33.42)
41-50 years	23(6.57)	08(2.28)	08(2.28)	0(0.00)	14(4.00)	52(14.85)
51 & above	10(2.85)	13(3.71)	03(0.85)	0(0.00)	11(3.14)	30(8.57)
Total	131(37.42)	94(26.85)	58(16.57)	3(0.85)	64(18.28)	50(100.00)
Duration of illness						
Up to 1 year	101(28.85)	60(17.17)	34(9.71)	02(0.57)	21(6.000)	218(62.28)
1 - 2 years	23(6.57)	23(6.57)	19(5.42)	0(0.00)	20(5.71)	86(24.57)
2 - 3 years	06(1.71)	09(2.57)	02(0.57)	1(0.28)	20(5.71)	37(10.57)
3 & above	01(0.28)	02(0.57)	03(0.85)	0(0.00)	03(0.85)	09(2.57)
Total	131(37.42)	94(26.85)	58(16.57)	3(0.85)	64(18.28)	50(100.00)
According to prakṛti						
Vāta	26(7.42)	30(8.57)	16(4.57)	02(0.57)	30(8.57)	104(29.71)
Pitta	91(26.0)	61(17.42)	39(11.14)	0(0.00)	29(8.28)	220(62.85)
Kapha	14(4.00)	03(0.85)	03(0.85)	01(0.28)	05(1.42)	26(7.42)
Total	131(37.42)	94(26.85)	58(16.57)	3(0.85)	64(18.28)	50(100.00)
According to condition						
Acute	93(26.57)	43(12.28)	36(10.28)	02(0.57)	27(7.71)	201(57.42)
Acute/chronic	33(9.42)	45(12.85)	21(6.0)	01(0.28)	14(4.0)	114(32.57)
Chronic	05(1.42)	06(1.71)	01(0.28)	0(0.00)	23(8.57)	35(10.0)
Total	131(37.42)	94(26.85)	58(16.57)	3(0.85)	64(18.28)	50(100.00)

>30 days / No relief - 0 (0.00)

pile due to low grade infection and lymphatic edema and often the tag has a very inflamed, tense and edematous appearance. Later it may undergo fibrosis and persist as a permanent fibrous skin tag even if the fissure heals. In addition, long-standing cases develop fibrous indurations in the lateral edges of the fissure. After several months of non-healing, the base of the ulcer becomes fibrous resulting in a rather spastic, fibrotic, tightly contracted internal sphincter. At any stage, frank suppuration may occur and extend into surrounding tissues forming an inter-sphincteric abscess or a peri-anal abscess leading to a low inter-sphincteric fistula.

Hot sitz bath relieves the spasticity and tight contraction of the internal sphincter and allows proper penetration of medicated ghr̥ta through vaso dilatation. Owing to its vṛṇasodhana and ropana properties Jātyādi ghr̥ta heals the wound in due course of time. Inflammation and lymphatic edema are also reduced by the soothing effect of ghr̥ta. Usually taila will help in producing a soothing effect and will help easy descent of the faecal column. The main ingredient of Kaśīśādi taila is Kaśīśa (Cu So₄) and the effect of Kaśīśa is known as śodhana and kṣāraṇa which helps in healing of the eroded portion of the haemorrhoidal vessels and facilitates and promotes quick healing. In most cases of fissure-in-ano, the root cause is constipation, and Triphala cūrṇa was given to relieve the constipation.

Changes in diet and lifestyle will help to encourage healing of a fissure. The main aim is to avoid constipation, so that stools are smaller and softer. This can be achieved by eating a diet that is rich in fibre, including

plenty of fruit, vegetables and wholegrain cereals such as brown rice, bread and pasta. Taking a regular supplement of bulk-forming laxative or a laxative that softens the stool will help the healing process and prevent further tears. Sitting in a warm bath after using the toilet may also relieve the spasm and bring some relief from the discomfort.

Conclusion

The following special observations have been made from the present study:

- The incidence of fissure-in-ano is more common between 21 and 40 years of age.
- The bowel habit of all the patients registered was constipated bowel.
- A large number of patients underwent medical treatment prior to the present study.
- Number of patients of pittaprakṛiti was more in comparison to vāta and kapha pṛakṛtis
- It was observed that the lesser the age and early duration of the illness, faster the response of the therapy.
- It was observed that a maximum number of patients got complete relief within seven days of the therapy.
- Out of 350 cases, 37.42 percent had complete relief within seven days of therapy, 26.85 percent had complete relief between 8 and 14 days of the therapy, 16.57 percent had complete relief between 15 and 21 days of the therapy, 0.85 percent had complete relief between 22 and 30 days of the therapy, while 18.28 percent cases dropped out from the study.

It is concluded that the efficacy of this treatment is highly encouraging and the fissure healed without leaving any scar. And this can be

achieved with minimum expenditure and without any risk.

Acknowledgement

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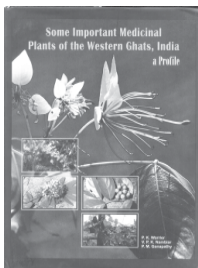
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EFFICACY OF ĀDITYAPĀKA GUGGULU AND AMṚTĀDI KVĀTHA IN THE MANAGEMENT OF SANDHIVĀTA VIS-Ā-VIS OSTEOARTHRITIS - A CLINICAL STUDY

Sangeeta Raikwar¹ and Ram Shankar Gautam²

Abstract: Sandhivāta is a type of joint disorder characterised by pain and swelling. It affects joints of the neck, back (joints of the spine), knees, hips, fingers, thumbs, and big toes. The pathogenesis of sandhivāta reveals the involvement of vāta and hence āyurveda describes it under the category of vātavyādhi. This clinical study evaluates the efficacy of two āyurvedic formulations viz. Ādityapāka guggulu and Amṛtādi kvātha in the management of sandhivāta vis-à-vis osteoarthritis.

Introduction

Mobility is the basic character of life. It is dependant on the structural as well as functional character of the physical as well as psychological body. Body is developed and nourished by food from time to time. Though proper nourishment is available, the body loses its qualitative capacity of structure and function as the age advances.

Sandhis are the junction of bones and are the seat of kapha. According to Śabdakalpadruma, the word sandhi has been derived from *sam + dha + ki*, which means samyoga or union; sandhi helps to keep the body parts together. So, the term sandhi denotes the site of union of different bones that is capable of active and passive movements.

The term vāta is derived from the root 'va'

meaning to move. Its synonyms like vāyu, anila, pṛāṇa, etc, can be found in the Samhitas. Sandhivāta is a type of joint disorder characterised by pain and swelling. The pathogenesis of sandhivāta reveals the involvement of vāta and for that reason it has been included in the category of vātavyādhi.

Caraka describes the disease as sandhigatānila and define it as a disease with the symptoms of śoṭha, which on palpation, reveal as an air filled bag (vātapūṛṇadṛtispaṛśa), and śūla on pṛasāraṇa and ākuñcan (flexion and extension)¹. Suśruta says that when vāta aggravates and goes to sandhi, the condition will lead to sandhivāta, which produces śūla (pain) and śoṭha (swelling).

While describing the pathogenesis (samprāpti ghaṭaka) āyurvedic texts explain that vitiated vyānavāyu, when gets accumulated in the joints,

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causes sandhivāta. The importance of vāta in sandhivāta can be also made out by the fact that the incidence of sandhivāta increases with age and we know that vāta predominates as age advances.

It is accepted that śleṣmadharākalā and śleṣaka kapha are located in the movable joints of the body. The function of these is to lubricate the joint and thereby facilitate the movement of the joint as a lubricant does in the axle of a wheel².

If there is any disturbance in the function of śleṣmadharākalā and śleṣaka kapha, naturally the lubrication of the joint will be affected. In other words, if śleṣaka kapha undergoes kṣaya then not only the smooth functioning of the

joint is affected but also there may have relative vata vṛddhi in the joint, which produces sandhivāta.

Material and methods

Object: - To evaluate the efficacy of an indigenous compound drug in the cases of sandhivāta. Along with this a critical literary and conceptual study has also been done.

Selection of drug: - Considering the derangement of vāta as a major factor in the aetiopathogenesis of sandhivāta, a classical compound trial drug having anti-vāta property was selected. The two formulations viz. Ādityapāka guggulu and Amṛtādi kvātha were selected as the drugs used in these formulations were easily available, cheap and efficacious

TABLE 1
Effect of treatment on pain, swelling and stiffness scores and restriction of movement

Description	Mean + SD				BT - AT (95% Confidential Index)
	BT	F ₁	F ₂	F ₃	
1. Pain score	2.10 + 0.82	1.79 + 0.83	1.15 + 0.73	0.79 + 0.78	1.29 + 0.62 (1.028, 1.555) t = 10.14 p < 0.001
2. Swelling score	1.62 + 1.05	1.04 + 0.92	0.54 + 0.71	0.21 + 0.51	1.21 + 0.83 (0.857, 1.560) t = 7.11 p < 0.001
3. Restriction of Movement	1.93 + 0.70	1.32 + 0.55	0.73 + 0.72	0.42 + 0.50	1.42 + 0.58 (1.170, 1.663) t = 11.89 p < 0.001
4. Stiffness score	1.86 + 0.79	1.32 + 0.61	0.81 + 0.75	0.46 + 0.59	1.33 + 0.70 (1.037, 1.630) t = 9.31 p < 0.001

having no noted side effects. The drugs were prepared from B.H.U. Ayurvedic Pharmacy.

Ādityapāka guggulu³

1. Triphalā cūrṇa - 4 tola*
2. Pippali - 4 tola
3. Ela - 2 tola
4. Tvak - 2 tola
5. Śudha guggulu - 20 tola

The first 4 drugs mentioned above were ground into a fine powder and mixed uniformly with śuddha guggulu. The whole mass then poured into a vessel having two times daśamūla decoction, and the material dried under bright sunlight for 7 times to make it in the pill form. Internal administration of this formulation pacifies vāta and sandhi, asthi and majjagata roga.

Amṛtādi kvātha⁴

1. Guḍūci
2. Eraṇḍamūla
3. Śuṅṭhi
4. Devatāru
5. Rāsna
6. Harītaki

The above drugs in equal quantity (total 12.5g) added to 200 ml water were boiled till it was reduced to ¼th and then filtered.

Selection of patients

A series of 29 patients diagnosed of sandhivāta were randomly selected for the study from OPD and IPD services of Kāyacikitsa, S.S. Hospital, B.H.U., Varanasi, between October 2003-2004.

Exclusion criteria

- Those having history of active presence of other inflammatory diseases such as

rheumatoid arthritis, ankylosing spondilitis, gout, etc.

- Patients of osteoarthritis without knee joint involvement.
- Patient aged below 35 and above 70 years
- Those having treatment history of systemic and intra articular corticosteroid administration within three months prior to enrollment.
- Patients having history of hypertension, diabetes mellitus and renal diseases.

Inclusion criteria

- Patients fulfilling the diagnostic criteria of osteoarthritis.
- Patients aged over 35 years and below 70 years with involvement of knee joint.
- Cases of primary osteoarthritis.

Diagnostic criteria

- Criteria for the diagnosis of osteoarthritis with knee joint involvement.
- Knee pain and radiographic osteophytes or knee pain, age more than 40 years, morning stiffness less than 30 minutes in duration and crepitus on motion.

Drug administration

Out of 29 patients, 24 patients treated with trial drug compound preparation i.e. 250 mg of Ādityapāka guggulu (2 TDS) and 50 ml of Amṛtādikvātha (in the morning) for a total period of three months, and the patients were turned up for follow-ups at regular interval.

Clinical assessment

Clinical assessment of symptoms was objectively done in terms of the gradation of pain score, swelling of joints, restriction of

* 1 tola = 12 g

movement of flexion and extension and morning stiffness. The Algo functional lequesne Index were used for indexing of severity of osteoarthritis of the knee. The relative extent of all these criteria was recorded according to the rating scale in each patient at the initial stage and subsequent follow-ups.

Observation and result

Incidence of age was observed in total 29 patients of sandhivāta. Maximum patients belonged to 35-50 years of age. The aggravating factors of sandhivāta were studied in 29 patients and it was found that exercise was the aggravating factor in 53.16% followed by walking in 24.05% and relaxation in 22.78%.

Therapeutic response: - The trial compound exhibited mild to moderate degree of clinical improvement in terms of relieving individual symptoms as well as in reducing the severity of disease.

The initial pain score mean and SD was 2.10 + 0.82, and after 3 months' of treatment it was reduced to 0.79 + 0.78. The different between BT and F₃ was 1.29 + 0.62 and the improvement was highly significant i.e. p<0.001. The initial swelling score mean and SD observed was 1.62 + 1.05, and in treatment it was found reduced to 0.21 + 0.51 and the difference between BT and F₃ was 1.21 + 0.83. The improvement was statistically highly significant. The initial restriction of movement score mean and SD for Group A was 1.93 + 0.70, and after 3 months' of treatment it was found reduced to 0.42 + 0.50 and the mean difference noticed was 1.42 + 0.58. The improvement in score was highly significant i.e. p<0.001. The initial stiffness score mean and SD was 1.86 + 0.79, and after three

months' treatment it reduced to 0.46 + 0.59. The difference between BT and F₃ was found 1.33 + 0.70 and the improvement was found statistically highly significant (Table 1). The initial severity index score mean and SD was 3.59 + 2.51, and after three months' treatment it was found reduced to 2.17 + 2.12; the difference between BT (before the treatment) and AT (after the treatment) was 1.42 + 0.78. The improvement was statistically highly significant (Table 2).

TABLE 2
Effect of treatment on Severity Index

Mean + SD		BT - AT paired 't'
BT	AT	
3.59 + 2.51	2.17 + 2.12	1.42 + 0.78 t = 9.76 p < 0.001

Discussion

Sandhivāta has become one of the most common health problem for which no successful treatment exists. Osteoarthritis can be taken as the modern counter part for the disease sandhivāta. The degenerative changes in the cartilage lead to reduced joint space and bony ankylosis, which manifests in the form of powerful risk factor for osteoarthritis.

The current treatment strategies of osteoarthritis are not providing satisfactory result and a large number of patients have been left with no alternative other than analgesics. Surgical replacement of the joint is the other alternative but joint replacement is expensive and also has associated complications.

Conclusion

The present stressful lifestyle causes not only discomfort but also sufferings; osteoarthritis or sandhivata is one of such lifestyle problem. The recent technological advancement has shown the basic pathology of osteoarthritis is the degeneration of the cartilaginous structure of the movable weight-bearing joint. To correct this the use of rasāyana drugs are effective⁵. The present study showed that it helps to provide a treatment strategy that not only prevents the pathology in the affected joint but also helps in maintaining the equilibrium of doṣas and dhātus. The overall assessment of the study indicates that the trial drugs investigated having rasāyana property are easily available, cheap and efficacious without any side effects.

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सन्धयः साधु वर्तन्ते संश्लिष्टाः श्लेष्मणा तथा ॥
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NON MALIGNANT NODULE TREATED WITH ĀYURVEDA - A CASE REPORT

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Abstract: In this paper the author probes the underlying cause of epigastric localised mild pain, nausea, sensation of obstruction at Xiphoid process and extreme weight loss in a known case of Seropositive Progressive Rheumatoid Arthritis; it finds the curative effect of āyurvedic drugs prescribed for RA on non malignant distal esophageal nodule.

Introduction

Dravyaguṇa does not deal with active principles. The critical analysis of line of management of āmavāta concludes that āmavāta should be treated with apatarpaṇa (reducing) dravyas. So, patient of seropositive progressive rheumatoid arthritis with non-malignant distal esophageal nodule was prescribed apatarpaṇīya drugs and found curative effect of non-malignant nodule because of unique properties of the drugs.

Clinical presentation

A 56-year-old male, diagnosed with Seropositive Progressive Rheumatoid Arthritis with mild microcytic hypochromic anemia of two and half years duration and treated with NSAIDs, DMARDs and Steroids for two years followed by āyurvedic medicines for 6 months, was admitted in the department of Āyurveda, Kasturba Medical College, Manipal, India on 15th of November 2005 with a 6 months history of aversion towards food; nausea, occasional vomiting, anorexia, epigastric localised mild

pain, sensation of obstruction at Xiphoid process and extreme weight loss (20 kg). In addition, he had sensation of abdominal fullness, generalised itching and regurgitation of food in supine position. Neither fasting nor dietary modifications had provided any relief. No history of Hypertension, Diabetes Mellitus, Jaundice, Tuberculosis, Diarrhea, Coronary Artery Disease, Sexually Transmitted Disorders or Auto Immuno Deficiency Syndrome.

Assessment

On physical examination, the patient was found afebrile with a blood pressure of 110/70 mmHg, pulse of 78 bpm and looked chronically ill. Tenderness, restricted movements and swelling in bilateral MCPJ, IPJ, joints of elbow, shoulder, knee and ankle were observed. Head, neck, pulmonary and cardiac examinations were unremarkable. The abdomen was soft with normal bowel movements, no mass and no hepato-splenomegaly was found. The patient's skin was hyperpigmented on the hands and dry in other areas.

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Laboratory values on admission were significant for leukocytes count of 17,000 cells/cumm with hemoglobin of 10.6 gm% and packed cell volume of 32.2%. The absolute esinophilic count was 2200 cells/cumm with raised level of erythrocyte sedimentation rate of 130 mm/hour. Peripheral blood smear revealed microcytic and hypochromic condition of red blood cells. Random blood sugar, renal function test, electrolytes, lipid profile and liver function tests reports were in normal range; only alkaline phosphate was marginally raised to 152 u/l. Rheumatoid factor test was positive (640 iu/ml). Abdominal ultra sonography showed mild hepatomegaly with grade 2 fatty liver changes and cholelithiasis. Chest radiograph showed crowding of vascular markings, obscured CP angles due to soft tissue overlap and apical haziness bilaterally.

To find out the underlying cause upper gastrointestinal endoscopy was done, which revealed distal esophageal nodule of 3 x 3 cm on the gastric side of the Z line suspicious of inflammatory or neoplastic change. There was no evidence of inflammation, erosions or ulcer in gastric mucosa. Additional tests conducted included a 24-hours' urine test for volume, urea and creatinine, which was normal. The stool sample was positive for roundworm Ova.

Diagnosis

There was a diagnostic dilemma in this case because of the different diagnostic possibilities. The upper gastrointestinal endoscopy punch biopsy report was "No evidence of malignancy". Therefore the patient was diagnosed as suffering from non-malignant distal esophageal nodule. Loss of weight was because of the withdrawal of DMARDs and steroids and due to anorexia and strict diet during six months of āyurvedic treatment. Itching was due to earlier

blood transfusion.

Benign tumors of the esophagus are rare, constituting only 0.5% to 0.8% of all esophageal neoplasm (Sabiston - Text book of surgery, Vol. 1, pp-1115). They may develop anywhere in the esophagus and cause a pedunculated swelling into the lumen, a tumor within the wall or may remain outside the esophagus. They rarely cause symptoms because the esophageal lumen is not narrowed by the tumor and therefore obstruction does not occur (Bailey and Love's Short Practice of Surgery, 22nd Edition, pp-610). Symptoms of dysphagia and vague retrosternal pressure or pain are produced only by large tumors (usually larger than 5 cm), but this patient had localised symptoms.

Management

As there was no evidence of malignancy, treatment was concentrated on rheumatoid arthritis along with lekhanīya (scraping) dravyas for nodule. The patient was advised to take the following medications:

- Pañcakolasādhitajala - 2000 ml per day
- Gomūtrāṅka - 30 ml twice a day
- Bṛhat Saindavādi tailam - 10 ml twice a day
- Rumalaya Forte (Tab) - 1 twice a day
- Nimesulide SOS (Tab) - two months.

After two months of apatarpaṇa cikitsa as per cikitsāsūtra of āmavāta and mamsapṛadoṣaja vyādhis, the patient was once again subjected for upper gastroscopy, which revealed normal esophagus and stomach.

Conclusion

The basic properties of 60 ml of Gomūtrāṅka and 2000 ml of Pañcakolasādhitajala per day for two months have played an important role in the cure of non malignant nodule and the general health of patient improved significantly.

NĀSĀ HI ŚIRASO DVĀRAM - EMBRYOLOGICAL, ANATOMICAL, PHYSIOLOGICAL AND CLINICAL RELEVANCE

Anubha Srivastava and Vijay Kumar Srivastava*

Abstract: The famous verse *nāsā hi śiraso dvāram* (nose is the pathway to enter the brain) referred to in *Aṣṭāṅghṛdayam*, emphasizes the importance of treatment of diseases of head by nasal insufflations of drugs. The drugs given through nasal route acts directly on the brain and heals the lesion. This paper briefly explores the correlation between the nose and brain.

Introduction

Acceptance and rejection of all senses is carried out through the sense organs (indriyas). So it is important to have a knowledge about the microanatomy and physiology of the sense organs. *Āyurveda* describes the sense organs according to their functional and mythological view; but now it is possible to explore them on the basis of modern functional anatomy. The famous verse *nāsā hi śiraso dvāram* referred to in *Aṣṭāṅghṛdayam* emphasizes the importance of treatment of diseases of head by nasal insufflations of drugs. The drugs given through this route acts directly on the brain and heals the lesion; it is also used in the diseases of neck, nose, scalp hair and facial disorders.

Embryological correlation

On the basis of embryological development it is clear that cerebral hemispheres and olfactory tract have same route of development; and both

of them are derivative of the prosencephalon. The prosencephalon is subdivided into a median diencephalon and two lateral telencephalic vesicles. The telencephalic vesicles give origin, on either side, to the cerebral cortex and the corpus striatum. The diencephalon gives rise to the thalamus, hypothalamus and related structures. The cavity of the diencephalon forms the third ventricle, while the cavities of the two telencephalic vesicles form the lateral ventricles. From the developmental point of view the cerebral cortex consists of the hippocampal cortex, the pyriform cortex and the neocortex. The developing telencephalon has a medial wall, a suprolateral wall and a basal striatal region. The hippocampal cortex develops into the medial wall, the pyriform cortex in the marginal layer superficial to the corpus striatum and the neocortex in the superolateral region.

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During development, while the lower part undergoes greater development and becomes the hippocampus and the dentate gyrus, the superior part of the hippocampal cortex becomes separated and remains rudimentary as indusium griseum. The pyriform cortex also remains relatively small; it gives rise to the part of the cerebral cortex that receives olfactory sensations. It forms the uncus, the anterior part of the parahippocampal gyrus and the anterior perforated substance. In contrast to the hippocampal and pyriform cortex the neocortex undergoes very great expansion. It forms the whole of the cerebral cortex seen on the superolateral and medial surfaces of the hemisphere, and the cortex of the inferior surface excluding the pyriform area.

So it can be said that tract of olfaction is directly related to the cerebral cortex, because both of them have the same route of development and are interconnected after development.

Anatomical correlation

From the anatomical point of view the structure of olfactory sensation are described within the parts of the limbic system, and the limbic system is the chief centre for psychic abnormality.

The limbic system

The ring-like cortex of the cerebral hemisphere surrounding the corpus callosum and diencephalon constitutes the 'Limbic system'. Broca in 1878 coined this term to refer to this cortex, limbus means a margin. Its continuity with the olfactory bulb through the olfactory striae at the anterior perforated substance is responsible for its association with olfaction and its older name of 'rhinencephalon' or 'smell brain'. However humans have a limited

olfactory sense, so apart from olfaction it is now known to play a role in functions like behavioral activity, primitive emotions, memory and regulation of viscera and so it is also referred to as 'visceral brain'.

From the evolutionary point of view in the lowest vertebrates the function of cerebral cortex appears to be almost olfactory. In the further evolutionary development of higher mammals the olfactory areas of the cortex have become completely overshadowed by non-olfactory areas, and in humans the former are reduced to almost insignificant proportions but they are capable of influencing different aspects of cortical activity and so rhinencephalon forms a fundamental portion of the limbic system.

Components

1. Olfactory pathways comprising of:
 - olfactory nerves, bulb, tract, trigone and striae
 - anterior olfactory nucleus
 - diagonal band of Broca
2. Anterior perforated substance
3. Pyriform lobe comprising of:
 - uncus
 - limen insulae
 - anterior part of parahippocampal gyrus
4. Septal area comprised of
 - paraterminal gyrus
 - septum pellucidum
5. Amygdaloid body
6. Limbic lobe comprising of:
 - Hippocampal formation which includes indusium griseum and longitudinal striae, gyrus fasciolaris, dentate gyrus and hippocampus.
 - Para hippocampal gyrus
 - Cingulated gyrus

7. Certain elements of diencephalon
 - habenular nucleus of epithalamus
 - anterior nucleus of thalamus
 - Hypothalamus, especially the mammillary bodies Hypothalamus, is supposed to be the executive arm of the Limbic system.
8. Bundles of axons connecting the above regions
 - fornix
 - mammillothalamic tract
 - stria-terminalis
 - stria-medularis thalami
 - medial forebrain bundle

Olfactory pathways

The olfactory pathways comprise of Olfactory nerves, bulbs, tract, trigone, striae, etc.

Olfactory nerves

These are about twenty in number and arise from olfactory mucus membrane situated in the upper part of the nasal cavity above the level of the superior conchae. Bundle of these olfactory nerve fibers pass through the openings of the cribriform plate of the ethmoid bone to enter the olfactory bulb in the cranial cavity.

Olfactory bulb

The olfactory bulb is an oval flattened strip of grey matter lying on the cribriform plate of the ethmoid pressed against the orbital surface of the frontal lobe of the brain. It receives the olfactory nerves from the olfactory zone of the nasal cavity.

Olfactory tract

Olfactory tract lies in the olfactory sulcus on the orbital surface of the frontal lobe and proceeds backwards from each olfactory bulb to the region of the anterior perforated substance on the base of the brain, where it divides into lateral, intermediate and medial olfactory striae.

Anterior olfactory nucleus

It is made up of scattered neurons within the olfactory tract. It sends axons through the anterior commissure to excite the inhibitory neurons on the contralateral bulb.

Olfactory trigone

It is flattened part of the olfactory tract, near the anterior perforated substance, before it divides into striae.

Olfactory striae

Three striae are derived from each olfactory tract; lateral olfactory striae is by far the most important of the three. It skirts the anterior margin of the anterior perforated substance, passes at first laterally on the antero-inferior part of the insula and then makes a sharp kink to turn medially and backwards in the deep depression between the orbital surface of the frontal lobe and the temporal lobe to reach the uncus where it terminates. Olfactory receptive area is located in the uncus and adjacent portion of the hippocampal gyrus. Intermediate olfactory stria terminates in the olfactory tubercle, an area of cortex rostral to the anterior perforated substance. Medial olfactory striae curve medially to reach the medial surface of the cerebral hemisphere, where it blends with the cortex immediately in front of the lamina terminalis. There is no good evidence to indicate that it constitutes a direct pathway for impulses from the olfactory bulb. Impulses from the olfactory bulb are conveyed to olfactory areas for subjective appreciation of odors and aromas.

The limbic system is considered to be the anatomic substrate underlying behavioral and emotional expression. It expresses itself through the hypothalamus via the autonomic nervous

system. Its chief functions are perception of sense of smell (rhinencephalon), food and sex behavior, visceral functions responsible for emotions, memory and behavior.

Physiological correlation

Taste and smell, to some extent are mutually complementary; hence term flavor is used for the combined effect of taste and smell. In some animals the ability to smell is extraordinarily developed. Such animals are called as 'macrosomatic' e.g. dog and by contrast the man and many other mammals are 'microsomatic' animals. The area, which constitutes the fundamental area for smelling is called as the olfactory area.

Microscopic features

The general lining epithelium of the olfactory area is pseudo-stratified columnar epithelium. Lying within these cells, there are receptor cells of olfaction, which are the peripheral most part of the neuron (primary olfactory neuron) that carries the impulse of olfaction towards the brain. The receptor cells are surrounded by supporting cells. The most peripheral part of the receptor cell is called the olfactory rod. From each olfactory rod portion, 15-20 cilia project in to the cavity of the nostril. Within these cilia, lie particles called 'intra membranous particles'. These intra membranous particles belong to the group of particles, called 'molecular receptive apparatus'. Molecules emanating from an odorant are dissolved in the mucus of the olfactory area and then come in contact with the intra membranous particles to produce the sense of odor. There are about 10-20 millions of receptor cells in both the nostrils of a man. The rod of the receptor cell is considered to be the dendron of this neuron, from each receptor cell emerges axon fibers,

which together constitute the olfactory nerve.

The receptor cells of the olfactory area have a short span of life; after a few weeks they die and cast off and are replaced by new receptor cells. This is a very unusual thing for a neuron to shed off and get replaced. Anatomically these receptor cells are the only neurons of our body that project to the external world.

Mechanism of olfaction

Volatile molecules from an odorant substance are carried by air, reach the olfactory area, get dissolved in the mucus, in solution form it comes in contact with the intra membranous particle contained within the cilia of the receptor cells and combine with these particles. Then it will generate a receptor potential, which produces impulses in the axons emerging from the receptor cells and reaches to brain.

Further the olfactory tubercle receives inputs from 2 major sources i.e. one from the olfactory bulb, and the other from the substantia nigra of midbrain via dopaminergic fibers. As substantia nigra is a part of basal ganglia and have dopaminergic fibers, so it is strongly connected with Schizophrenia. Thus olfactory tubercle may be related to abnormal olfactory perceptions in schizophrenia. Efferent fibers from the tubercle goes to limbic system, thus smell is associated with emotion and behavior. Efferent fibers from the tubercle go to the hypothalamus, thus olfaction is associated with appetite and social behavior.

To reach the primary olfactory cortex, only two neurons are required, which is rather exceptional in sensory physiology. Further, from the primary olfactory cortex, nerve impulses go to terminate on secondary olfactory cortex and other parts of limbic system nuclei. Thus

smell sensation influences various behaviors and arouses sex behavior also. To reach the cortex, the neurons do not have to relay at the thalamus, which is exceptional. In fact, this is the only sense which does not relay at the thalamus or metathalamus.

Clinical correlation

An intact limbic system with the hypothalamus and brain stem appears to be necessary for fully integrated and prolonged homeostasis under a wide variety of environmental conditions. It is a centre for emotional integration, so the disorders largely caused by its malfunction are mainly psychogenic in origin such as:

1. Disorders of mood and thought are believed to originate in the limbic system resulting in Schizophrenia, which is characterized by blunting of emotional responses and thought disorders, depression and anxiety, amnesia and phobias.
2. A lesion that affects the uncus and amygdaloid body may cause “uncinate fits” characterized by an unpleasant odor.
3. Lesions involving the hippocampus may lead to an impairment of memory of recent events and also to emotional disturbances. Memory loss should be associated with hippocampal pathology.

Conclusion

Psychic disorders are going to be increasingly challenging and an effective measure must be searched to evaluate their exact pathology and treatment methodology. Psychic abnormalities must be having some connection with the sense of smell as it is a belief that to control mental disorders, strong fetid or pleasant odor must be smelled by the patient. After evaluating the

above embryological, anatomical, physiological and clinical correlation, it is clear that the nose have a strong connection with the brain and is able to play a key role in the generation of psychic disorders. So drugs given as nasal insufflations may heal the pathology effectively. Modern anti-psychotic medicines too can act better if they are used in a nasal drop form. It will be also useful to minimize their side effects.

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THE MANAGEMENT OF ICHTHYOSIS WITH GOMŪTRA AVAGĀHA AND YAṢṬĪMADHUTAILA ABHYAṄGA

Durgaprasad Dash*

Abstract: Ichthyosis is one among the many childhood skin disorders owing to the presence of abnormal ichthyosis gene. There are different varieties of Ichthyosis where scaly skin along with pruritus due to lack of sweat gland is the common feature. In this study, 6 patients diagnosed as ichthyosis were treated with gomūtra avagāha (immersion in cow's urine) for 30 minutes followed by massage with Yaṣṭīmadhutailla twice daily for a period of one month. All patients showed significant improvement with this treatment. The scales over the skin were reduced up to 57% and pruritus reduced up to 80%. There was over all improvement seen in all clinical features viz. roughness, scaleness, pruritus, mal-odor and hair changes.

Introduction

Ichthyosis is a group of disorders that are characterised by a persistent, non-inflammatory scaling disorder of the skin surface. It is an autosomal inherited rare skin disorder causing dry, scaly skin along with pruritis sometimes known as 'fish scale disease'. Non-bullous and bullous types of erythroderma manifest at birth with variable degree. Non-bullous variety manifests as collodian baby with 'sausage-like'¹ skin, ectropion, lip eversion and nasal obstruction whereas bullous form² is superficial blisters with generalised erythema sometimes mistaken with staphylococcal scalded skin syndrome. Ichthyosis are of different varieties according to their presentation viz. ichthyosis vulgaris^{3,4}, X-linked ichthyosis, lamellar

ichthyosis, epidermolytic hyperkeratosis, etc. In ichthyosis, depending on the particular form of the disease, skin cells reproduce much faster than they can be shed, with the result that they build up on the skin surface to form scales, or else they reproduce at a normal rate, but instead of shedding from the skin surface they stick to it and produce a build-up of scales.

There is 50% risk of passing the condition with inherited ichthyosis gene. The incidence of ichthyosis vulgaris is 1 per 3000 live births⁵. Ichthyosis usually appears in early childhood. It may remain throughout life; although ichthyosis vulgaris usually disappears during adulthood⁶ and recur in old age. It is due to disorders of keratinization i.e. defects in keratin metabolism. The scaling is seen only

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over the extensor aspects and the flexor aspect is spared⁷. The biopsy shows retention, hyperkeratosis and thinned granular layer in the epidermis⁸. The scaling may be diminished by the use of bath oil and daily application of emollient or lubricant containing urea, salicylic acid or a α -hydroxyl acid such as lactic acid⁹.

There is no specific treatment in modern medicine¹⁰ for this disease; however, emollients like urea, salicylic acids are used for severe skin scaling regularly to relieve the dryness and itching and to decrease the tendency to skin fissuring as there is no sweating in those cases.

Āyurveda contains ample references to manage almost all skin diseases. In the context of eka kuṣṭha, Caraka has given the description of scales-like appearance which are thick and present over large areas of the skin without sweating¹¹. This condition resembles the description of ichthyosis.

In the present study, all the patients were treated with Gomūṭra avagāha (immersion in cow's urine) and Yaṣṭimadhutaila abhyaṅga (massage) twice daily for a period of one month¹².

Materials and methods

A total number of 6 patients who attended in the OPD and IPD of Kaumārabṛtya, SDM College of Āyurveda and Hospital, Hassan were included under the study in simple random technique. Out of 6 patients, 4 were female and 2 were male, age ranging from 3 to 7 years. All the patients belong to the lower/lower-middle socio-economic group. The cases were recorded from 2004 to 2005.

Selection of drug

Gomūṭra (cow's urine) was collected locally. Gomūṭra has the properties to alleviate kaṇḍu,

kuṣṭha and kilāsa¹³. Its specific property kṛeda vidruti (sweat inducing) is essential in the management of ichthyosis as there is no sweating in this disease. Yaṣṭimadhutaila was collected from SDM Āyurveda Pharmacy, Udipi, prepared according to Anubhūta Yoga. Yaṣṭimadhu (*Glycyrrhiza glabra*) is having balya (strength promoting), bṛmhaṅīya (bulk promoting), vaṛṇya (fairness), tvacya (beneficial for the skin), kaṇḍughna (anti-pruritic) properties; it is a vāta-pitta śamaka (pacifying) and śīta vīrya (cold in potency) drug¹⁴.

Inclusion criteria

Ichthyosis Vulgaris and Lamellar Ichthyosis patients of pediatric age group were included in the study.

Exclusion criteria

Collodian baby, scalded skin syndrome, etc. and other severe ichthyosis conditions were excluded.

Assessment criteria

All cases were assessed the clinical improvement of skin changes viz. roughness, scaleness, pruritus, mal-odor and hair changes.

Treatment

Fresh gomūṭra (5 litres) collected in a plastic bathing tub for avagāha (immersion), and given to the patients twice daily morning and evening for a period of 30 minutes followed by a hot water bath. Massage with Yaṣṭimadhutaila was done to the respective patients twice daily after bath. The entire treatment process continued for a period of one month. The gross improvement was recorded at 15th day and 1 month of treatment.

Observation and results

After one month of treatment there was considerable improvement observed in all the

clinical features (Table 1). There was 60% improvement observed in roughness after one month of treatment. In scaleness, a high range of development i.e. 57% was observed between 15 and 30 days of treatment. In the case of pruritus, there was double improvement found at 30th day of treatment from 15th day. A maximum improvement i.e. 82% found at 30th day in comparison with 15th day of treatment. There was very minimal improvement noticed in the hair changes.

Discussion

Though ichthyosis is an X-linked disease, the maternal diet, particularly diet that vitiates vāta such as radish, bengalgram, brinjal, pea, dry leafy vegetables, etc. during pregnancy, plays an important role in this disease.

As gomūṭṛa is having best vāta alleviating properties, it was used daily for avagāhasveda for a period of 1 month to alleviate pruritus. Gomūṭṛa contains urea, which is an emollient to prevent the skin from roughness and cracks. Gomūṭṛa is indicated for vāta disorders as it produces sweating in the skin. It is having anti-

inflammatory properties also. Avagāhasveda for a duration of 10 minutes twice daily for 1 month period cures skin scratches and increases soothing essential for the management of ichthyosis.

Massage with Yaṣṭīmadhutaila works as a skin moisturizer. Yaṣṭīmadhu (*Glycyrrhiza glabra*) itself has vāta and pitta alleviating properties. It is cold in potency and that provides cooling effect over the skin. It is varṇya and tvacya i.e. it improves lustre and colours of the skin. In ichthyosis, as there is blackish-brown fish-scale-like skin appearance is seen possibly, Yaṣṭīmadhutaila acts to regain skin colour and prevents keratinization.

All cases were evaluated as per the improvement of the clinical features like roughness, scalyness, pruritus, mal-odor and hair changes. All cases showed improvement at highly significant level after 1 month of treatment except in hair changes. Hence this treatment can be recommended for all types of ichthyosis patients wherever possible for a long period of time.

TABLE 1
Improvement in the symptoms after 15 days' and 30 days' of treatment

Symptoms	Mean Difference		% of Improvement		SD		S.E.		't' value		Mean value BT*
	15 days	30 days	15 days	30 days	15 days	30 days	15 days	30 days	15 days	30 days	
Roughness	0.83	1.5	33	60	0.4	0.54	0.16	0.22	5.20	6.81	2.5
Scaleness	0.5	1.33	21.45	57	0.54	0.51	0.22	0.21	2.27	6.34	2.33
Pruritus	0.83	2	40	80	0.63	0.89	0.25	0.36	4	5.55	2.5
Mal-odor	1	1.5	54.64	82	0.89	0.54	0.36	0.22	2.77	6.81	1.83
Hair changes	0.33	0.5	28.44	43	0.51	0.54	0.21	0.22	1.58	2.27	1.16

*BT - Before treatment

Conclusion

Though there were no exact classical references available for this ailment, the treatment was planned as per experience and classical support of drugs taking consideration of place (deśa), time (kāla), age (vayah), constitution (prakṛti), etc. of the patients. After one month of treatment, a gross improvement was observed in all the patients.

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GENETIC CONCEPTS IN ĀYURVEDA

Ashutosh Kr. Yadav¹, Suman Yadav² and J.S. Tripathi³

Abstract: Genetic causes of pathological states and the genetic transference of different qualities from the parents to offspring are well explained in āyurveda. An in-depth study of āyurvedic literature reveals that the individual variations of their psychosomatic constitution (prakṛti) and psychic personality (satva type) have been ascribed to genetic factors and specific genetic composition of the individual. Thus, the person's psychic, physical, physiological and psychological tendencies are all governed by the genetic specificity as per āyurvedic concepts.

Āyurveda describes the anatomical aspect of the genetics; it propounds that a particular area of the chromosome (gene) is responsible for the formation of a specific organ in the body, and that it is also physiologically related to specific functions. That is why a defect in a particular gene clinically presents specific anatomical defects and disturbed physiology (pathology) in the affected individual. Carakasamhita describes that wherever the defect occurs in the seed (bījaduṣṭi), the consequent defect is seen in the related part or its components, but it would not occur if there were no defect in the components of the seed-chromosomes (bījabhāga or bījabhāgāvayava)¹. While classifying different type of diseases, Suśrutasaṃhita highlights a clear-cut differentiation between purely genetic diseases (adhibalapravṛtta) and the congenital diseases (janmabalapravṛtta). The genetic diseases are known to cause by defects in either the genetic

contents of sperm or ova, and consequently, they are sub-classified into maternal (mātrīja) and paternal (pitṛīja) groups². Severe forms of skin diseases like kuṣṭha and aṛśas are the examples of such diseases.

These hereditary diseases are described by different terms in different texts. For example, Vāgbhaṭa describes it by the term 'kulodbhava' or 'sahaja', Caraka states it 'kulaja', Bheḷa mentions it 'prakṛtiprabhāva' and to Yāñjavalkya it is 'sancāri'.

Āyurveda describes many abnormalities under congenital diseases (janmabalapravṛttavyādhis). The examples given of such diseases are blindness (āndhya), deafness (bādhīrya), dumbness (mūka) and many anatomical defects like anal atresia. It also appreciates that congenital abnormality could be either genetic in origin or may arise as a result of factors in intra-uterine life³.

The appellation of conception is given to that

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union of sperm, ovum and the spirit, which takes place in womb (uterus). Further, the fetus is composed of the four proto elements derived from the four sources, which are the father, the mother, the food taken by the mother during the fetal life and one's past actions. All these exist in everyone's body. Caraka says that malformations of shape, colour and senses are caused by the defects of the sperm, the actions in previous life, the condition of uterus and the season as well as the defects of the mother's diet and behaviour during gestation.

Āyurveda also appreciates the association of consanguinity with increased incidence of congenital defects. Hence, it suggests that, husband and wife should not be blood related and should not belong to same blood (gotra) or family tree for at least seven previous generations.

Caraka has described the contributions made by the mother and father to the development of foetus. One can wonder about the basis on which such conjectures were formulated in ancient times. The parts that genetically pass from mother to embryo during its formation are blood, flesh, fat, the umbilicus, the heart, liver, spleen, kidneys, bladder, pelvic colon and stomach; and the parts which pass from the father to the embryo are the hair, nails, teeth, bones, veins, arteries and the semen. In this manner, the embryo comes into existence from the coming togetherness of these procreative factors, like a tent from the assemblage of various materials or like a chariot from the combination of various parts of the chariot.

The clarity regarding the understanding of genetic concepts in āyurveda can be further explained by quoting the answers of ācārya

Ātreya to the queries of his students. The specific question raised was 'if man is the offspring of man, then why are those springing from the mentally retarded, the blind, the mute, the hunchbacked and the dwarfs are unlike their parents?' The answer given to this question was that only that part or organ of the body becomes defective, whose original representative part in the germplasm is rendered defective. If there is no potential defect, there is no manifestation of deformity either. If again, only a part of the germplasm is vitiated, then the female gives birth to a defective progeny (pūti praja). The physicians should understand both these factors viz. those, which are helpful in the formation and development of the fetus and those, which are inhibitive of such formation and growth. The modern knowledge of the structure and location of genes on the chromosomes to the present state of recombinant D.N.A. technology has indeed come a long way towards the concepts of bījabhāgaduṣṭi and bījabhāgāvayavaduṣṭi.

Carakasamhita describes genetic understanding of the sexual impotency (ṣaṅghatva) in reference to male and female impotents⁴. Suśrūtasamhita mentions different types of impotency like āsekya, saugandhika and kumbhika, and its relation with certain diseases like diabetes mellitus (prameha), piles (arśa) and skin disorder (kuṣṭha).

There are certain reproductive abnormalities in females described in Carakasamhita under yoniroga such as sūcīmukhiyoni, ṣaṅghiyoni, etc., which are better references to understand their genetic pathology⁵. Āyurvedic classics like Carakasamhita and Bheḷasamhita explain the genetic aetiology regarding the aetiopatho-

genesis of diabetes⁶. While describing the prognostic factors of diabetes, Carakasamhita explains the bijadoṣa pṛameha; it also mentions the incurability of genetic type of pṛameha/madhumeha⁷. Similar references are also available regarding genetic aetiology of arśa and kuṣṭha.

Conclusion

Āyurveda had a comprehensive knowledge from the very ancient time, regarding various aspects of genetics starting from the anatomical entity of genes and chromosomes, gene expression, concepts of mutations to chromosomal abnormality, inherited genetic defects and the inborn errors of metabolism to the broad range of clinical spectrum of genetic diseases. The concept of genetic counseling was also prevalent in the traditions as is evident by the advice regarding non-consanguineous marriage advocated by ancient ācāryas.

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(च. शा. ३/१७)
मनुष्य बीजं हि प्रत्यङ्ग बीज भाग समुदायात्मकं स्वसदृशं प्रत्यङ्गसमुदायरूपपुरुषजनकम् ।
(चक्रपाणि)
2. तत्राधिबलप्रवृत्ता ये शुक्रशोणितदोषान्वयाः कुष्ठार्शाः प्रभृतयः । तेऽपिद्विविधाः- मातृजाः पितृजाश्च ।
(सु. सू. २४/५)
3. शुक्रशोणितजीवसंयोगे तु खलु कुक्षिगते गर्भसंज्ञा भवति ॥ (च. शा. ४/५)
शुक्रशोणितं गर्भशयस्थमात्मप्रकृतिविकार-
सम्मूर्च्छितं 'गर्भ' इत्युच्यते । (सु. शा. ५/३)
4. Carakasamhita, Śārīrasthānam, 2/19
5. मिथ्याचारेण ताः स्त्रीणां प्रदुष्टेनार्तवेन च ।
जायन्ते दैवाच्च बीजदोषाच्च शृणु ताः पृथक् ॥
(च. चि. ३०/८)
गर्भस्थायाः स्त्रिया रौक्ष्याद्वायुर्योनिं प्रदूषयन् ॥
मातृदोषादणुद्वारां कुर्यात् सूचीमुखी तु सा ।
(च. चि. ३०/३१)
बीजदोषान्तु गर्भस्यमारुतोपहताशया ॥
नृद्वेषिण्यस्तनी चैव षण्ठी स्यादनुप्रक्रमा ।
(च. चि. ३०/३४)
6. प्रकृतिप्रभवश्चैव नरस्य स्वकृतस्तथा ।
ज्ञेयः प्रमेहो द्विविधस्तस्य वक्ष्यामि लक्षणम् ॥
श्लक्ष्णाङ्गा मूवः स्निग्धा भृशं श्लेष्मळमेदुराः ।
जातप्रमेहा नर्दन्ति मत्स्यमांसोचिता नराः ॥
मातापितृभ्यामीदृग्यां जनितो यस्तु मानव ।
मेदःशिथिलनात्तस्य प्रकृत्या स तु मेहति ॥
(भे. नि. ६/१-३)
7. जातः प्रमेही मधुमेहिनो वा
न साध्य उक्तः स हि बीजदोषात् ।
ये चापि केचित् कुलजा विकारा
भवन्ति तांश्च प्रवदन्त्यसाध्यान् ॥
(च. चि. ६/५७)

PHYTOCHEMICAL STUDIES OF FRUIT EXTRACT OF *PIPER NIGRUM*

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Abstract: The study was carried out for testing the presence of various active principles in 70% alcoholic hot extract of *Piper nigrum* fruit. It revealed that the presence of active principles of *Piper nigrum* fruit are alkaloid, tannin, resin, phenolic compound and sterol.

Introduction

The dried fruit of *Piper nigrum* (Piperaceae) popularly known as 'kali mirch' and pepper, is categorised under spices and condiments. On going through the literature, the plant has found to possess antiperiodic, rubifacient, stimulant, aphrodisiac, anti-inflammatory, anthelmintic, antimalarial, antidiarrhoeal, resolvent, antipyretic and carminative properties and are useful in the treatment of cholera, dyspepsia, flatulence, asthma, biliousness, diseases of throat, night blindness, piles, insomnia, toothache, diseases of spleen, chronic fever, leucoderma, lumbago, paraplegia, diarrhoea and various gastric ailments (Anonymous, 1998; Nadkarni, 1976 and Anjaria, 2002).

Upon screening the antibacterial activity using different hot and cold extracts viz. aqueous, 70% alcohol, acetone, chloroform and petroleum ether, it was observed that the 70% alcoholic hot extract showed potent antibacterial activity. Therefore 70% alcoholic hot extract was subjected for detection of any active

principle that could have above medicinal properties.

Materials and method

The Panniure-1 variety of pepper fruit was procured from Horticulture Division of Balasaheb Sawant Kokan Krishi Vidyapeeth, Dapoli, Dist.Ratnagiri (M.S.) for the investigation. The fine powder of fruit was subjected for preparation of 70% alcoholic hot extract by Soxhlet's method.

Alkaloids detection

A small amount of the extract was taken in a test tube and added with 5 ml of 1.5 % HCl (v/v) and then filtered. The filtrate was used for presence of alkaloids by the following test (Levinson and Mac Fetch, 1956).

Dragendorff's reagent test: - The filtrate was sprayed on a filter paper using chromatographic sprayer and was dried. The reagent was applied on the filter paper using capillary tube; the development of orange to red colour confirmed for the presence of alkaloid.

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Wagner's reagent test: - The little amount of the above extract filtrate was added to this reagent; appearance of brown to flocculent precipitation revealed the presence of alkaloid.

Glycoside detection

Benedict's reagent test: - The extract was added with Benedict's reagent in equal amount and the mixture was heated for 2 minutes; the appearance of brown to red colour indicated presence glycoside.

Folin Wu copper reagent test: - A little amount of the extract was added to few drops of Folin Wu copper reagent; the development of red colour indicated positive reaction for glycoside.

Fehling's reagent test: - Two grams of extract was added with 0.5 ml of Fehling's reagent and 2 ml of 10% sodium hydroxide solution. The mixture was heated on water bath for 10 minutes. Appearance of red precipitate revealed presence of glycoside, to clear the solution few drops of HCl was added and boiled for five minutes. The Fehling's reagent was again added to record any further reduction, which indicated the test positive for glycoside.

Protein detection

Xanthoprotein test: - A small amount of the extract was added with 0.5 ml of concentrated HNO₃; appearance of white or yellow precipitate revealed the presence of protein.

Biurete test: - Few amount of the extract was added to 4% sodium hydroxide solution followed by a drop of 1% copper sulfate solution; the development of violet to pink colour indicated presence of protein.

Reducing sugar detection

Benedict's reagent test: - The extract was added with Benedict's reagent in equal amount and

mixture was heated for 2 minutes; appearance of brown to red colour indicated presence of reducing sugar.

Folin copper reagent test: - Few quantity of the extract was added with few drops of Folin Wu copper reagent, the development of red colour revealed presence of reducing sugar.

Tannin detection

A little quantity of alcohol extract taken in a test tube was warmed and filtered. The filtrate was used to carry out the tests.

Lead acetate test: - Few drops of 5% lead acetate solution were added to the filtrate; the formation of precipitation indicated the presence of tannin.

Ferric chloride test:- Few drops of ferric chloride were added to the little amount of the filtrate; the development of green colour revealed presence of tannin.

Test for detection of resin:- A little amount of alcohol extract was dissolved in 5 ml of alcohol and added with 2 ml of distilled water and petroleum ether respectively. The development of white turbidity indicated the presence of resin.

Sterols detection

Salkowski reaction: - A small amount of extract was added with 2 ml of concentrated H₂SO₄ and was shaken for few minutes and mixed well; the development of red or brown colour indicated the presence of sterols.

Limberman-Burchard test:- A little amount of extract was treated with few drops of acetic anhydride followed by Concentrated H₂SO₄. The transient development of red to blue colour and finally green indicated the presence of sterols.

Test for phenolic compounds: - A small amount of alcoholic extract was treated with 2 ml of ferric chloride solution and shaken for few minutes. The appearance of pale brown colour to the test revealed presence of phenolic compounds.

Saponin detection

Foam test: A small amount of alcoholic extract was treated with 2 ml of sodium bi-carbonate and added with distilled water, the mixture was shaken vigorously. The development of froth to the test indicated presence of saponin.

Anthraquinones detection

Bentrager's test:- Small amount of the extract was added with 5 ml of 10% sulfuric acid and boiled for few minutes, then filtered

immediately. The filtrate was cooled and shaken with benzene, the benzene layer was separated and also shaken with half of its volume of 10% ammonia, and the ammoniacal layer acquiring pink colour indicated the presence of anthraquinones.

Result and discussion

The result of qualitative phytochemical tests employed with 70% alcoholic hot extract of pepper for the presence of active principles such as alkaloid, glycoside, resin, sterol, starch, reducing sugar, tannin, phenolic and anthraquinone compounds are summarized in Table 1. 70% alcoholic hot extract was positive for the presence of alkaloid, sterol, resin, phenolic compound and tannin. The presence

TABLE 1
Phytochemical tests for the presences of antibacterial constituents in 70 % alcoholic hot extract

Phyto-chemical const.	Test applied	Observations	Results
Alkaloid	i. Dragendorff's reagent	Impart Orange color	+ve
	ii. Wagner's reagent	Brown flocculent ppt.	+ve
Glycoside	i. Benedicts reagent	No brown ppt.	-ve
	ii. Fehling's reagent	No red ppt.	-ve
	iii Folin copper reagent	No red color formation	-ve
Tannin	i. Lead acetate	Yellow milky ppt.	+ve
	ii. Ferric chloride	Pale green appearance	+ve
Saponin	i. Foam test	No froth formation	-ve
Protein	i. Xanthoprotein	Impart White pink color	-ve
	ii. Biurete	Absence of violet color	-ve
Sterol	i. Salkowski reaction	Impart brown color	+ve
	ii. Limberman-Burchard	Initial red turn to blue, finally green	+ve
Phenolic compounds	i Ferric chloride test	Impart pale brown color	+ve
Resin	i. Petroleum ether and alcohol	Presence of white turbidity	+ve
Reducing Sugar	i. Benedicts reagent	Absent brown / red color	-ve
	ii. Folin and Wu reagent	Absence of red ppt	-ve
Anthraquinones	i. Bentrager's test	Do not impart pink ring to ammonical layer	-ve

of alkaloids is in agreement with the findings of Kiuchi, 1988., Hu, 1996., Chopra *et al.*, 1998., Sharma, 2003., Chopra *et al.*, 2002 whereas observed resins and tannins is similar to the reports of Kokate *et al.*, 2003.

Conclusion

The present investigation concluded that the qualitative phytochemical tests conducted with the 70% alcoholic hot extract of pepper revealed the presence of alkaloid, tannin, resin, phenolic compound and sterols.

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PAÑCAKARMA PROSPECTIVE IN KĀŚYAPASAMHITA

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Abstract: Kaśyapa's contribution to āyurveda is remarkable especially in the field of pañcakarma. This paper deals with special narrations found in Kāśyapasamhita with reference to pañcakarma.

Introduction

Though Kāśyapasamhita has not get the status of Bṛhatṭrayis, its contribution to āyurveda is remarkable. Pediatricians of āyurveda consider Kāśyapasamhita on par with the Bṛhatṭrayis. Many of the pañcakarma procedures including pūrvakaṛmas have been mentioned in Kāśyapasamhita with slight difference from that of Bṛhatṭrayis. This difference might be due to being a pediatrician Kaśyapa might have thought that the children and infants need special care compared with adults.

Review

Snehādhyāya:- In this chapter we can see the following narrations, which are not found in other āyurvedic texts.

- Mango (cūtā) is considered as one of the sthāvarasnehayoni (plant origin fat)
- While explaining the quality of taila (oil) Kaśyapa adds, it is svaravaṇakaram (that which promotes voice and colour)
- Oil should not be administered in acute skin disease (tīvṛakuṣṭha)

Svedādhyāya:- Kāśyapasamhita describes some

of the svedana techniques that are useful for children, which are not mentioned in any other text. It explains āvastikasveda (a type of sudation) and prescribes this to a child who is emaciated (kṛśa), having medium built and also whose body is seized with the disease of cold.

Kaśyapa describes sukhasveda (pleasurable sudation) can be achieved by holding a camphor piece of sugar candy with sour fruit, etc. It mentions hastasveda (induce sweating by heated palms) and pṛadehasveda (induce sweating by applying thick paste) as special classifications of sveda. It says that hastasveda must be carried out from birth to four months and pṛadehasveda is to be given on gaḷa (throat), kaṛṇa (ears), śiras (head) and manya (neck). Detailed description about pṛadehasveda also has been highlighted.

Vamana and virecana:- The best dose of emetic decoction is 4 añjalis*; medium is three and minimum is 2 añjalis. Kaśyapa mentions half quantity of the above for purgation. Other ācāryas have not mentioned specific dose of decoction.

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*1 añjali = 80 to 90 ml

Only Kāśyapasamhita refers to the symptoms of properly cleansed persons (samyakśuddha lakṣaṇas). It describes that after drinking maṇḍa (gruel), if the person gets perspiration over head, forehead, cardiac region, testicles, etc., he may be considered as properly cleansed person.

The reference to the dietic sequence (samsarjanakarma) to be taken after emesis (vamana) and purgation (virecana) in Caraka, Suśruta and Vāgbhaṭa is almost similar to that of Kāśyapa except the difference in duration. Kāśyapa prescribes cooked rice on 4th day (mudgamaṇḍa odana) and soup of animals (māmsarasa) on 8th day whereas Caraka on the 7th and 10th annakāla i.e. on the 4th and 5th day respectively.

Regarding the benefits of emesis, Kāśyapa explains that the person who receives vamana gets cured from obesity (medoroga) and foul smell. Deficient or improper use of emesis leads to fullness in stomach (āmāśayapūrṇatva), fever with chills (śītajvara) and loss of sleep (anidrata). No other ācāryas have explained these symptoms as ayoga of vamana. Kāśyapa does not include skin disorders among the complication of inadequate use (ayoga) of emesis; others include skin disorders in ayoga.

Kāśyapasamhita highlights śuddha sphaṭika samkāśa i.e. when the person passes only mucus just like pure alum without urine and feces, and if there are no complications, he is said to be the person having received proper cleansing enema (samyak nirūhita lakṣaṇa); this is seen in Kāśyapasamhita only. While explaining the methods of emesis, it says that the leaves of kaṭpala, nicuḷa, sirīṣa, etc. should be made into kaṣāya and mixed with ṭrapusa for doing vamana. No such explanation can be seen in this regard in other texts.

After the administration of vamaṇa drug, Kāśyapa prescribes to wait 5 to 6 kālas, whereas other ācāryas prescribe one muhūrta (48 minutes). Similarly, advises to give ariṣṭa or lukewarm water up to the brim of the throat can be seen only in Kāśyapasamhita. It explains 2-3 bouts of vomiting as adhamāśuddhi (mildly cleansed), 4-5 as madhyamāśuddhi (moderately cleansed) and 6-7 as uttamāśuddhi (properly cleansed). Other ācāryas mention this as 8,6,4 as uttama, madhyama and adhama respectively.

There is a debate between the scholars about the different dose of emetics to be used in different age groups of children with adjuvant (anupāna). Kāśyapa rejects those principles. He mentions that half kaṣa (6 g) of either of dhanti, syāma, kampillaka and viṣāṇika mixed with butter or thick cream of milk should be administered to the child for the purpose of virecana.

Vasti:- Kāśyapa explains 9 types of vasti-putākadoṣas (faults of enema bag), whereas Caraka and Suśruta explain 8 and 5 respectively. He says that bhagandara (fistula-in-ano) is one of the complications arises due to the faulty administration of vastikarma. After anuvāsana, if the person is suffering from ānaha, then 5 to 6 phalavaṛtis (medicated suppositories) should be given; such specific number of usage of phalavaṛtis has not given by any other ācāryas.

Kāśyapa explains that in enema, whatsoever the quantity of oleaginous substance is, nirūha has to be 3 times to that substance. In other words, the decoction used for cleansing enema has to be 3 times to the oil. All other ācāryas say that the quantity of oleaginous substance should be 1/4th, 1/6th and 1/8th to that of decoction in case of vitiation of vata, pitta and kapha respectively.

Kaśyapa does not advise particular dose of nirūha or anuvāsana for children. He says that the renowned sages (without naming them) appreciate the administration of very small quantity of vasti (either nirūha or anuvāsana); whereas Bṛhatṭrayis mention the dose according to the age. Kaśyapa says that uncooked oil can be used for anuvāsana but Caraka has specifically contraindicated the use of uncooked oil in anuvāsana. Kaśyapa explains śaisukasneha (kind of fat preparation) for enema to children. None of the ācāryas has described any recipe by the name of śaisukasneha specifically to be used in children for enema purpose.

Caraka and Vāgbhaṭa classify vasti as kaṛma, kāla and yoga with similar number of enemas. However, in Kāśyapasamhita, there is difference in number of nirūhavasti in kaṛma and kāla: -

- Kaṛmavasti - 24 anuvāsana and 6 nirūha
- Kālavasti - 12 anuvāsana and 3 nirūha
- Yogavasti - 5 anuvāsana and 3 nirūha

Caraka and Vāgbhaṭa prescribe 12 and 6 nirūha in kaṛma and kāla vastis respectively. However, they have not given specific indication for using these kaṛma, kāla and yoga vastis.

No other ācārya has given special indication regarding decrease or increase in kaṛma or kāla vastis. Kaśyapa says that the physician should increase or decrease the number of vastis, considering specific status of doṣa, period (kāla), and also the strength of the person. Or, depending on drugs, one should increase in yoga vasti, decrease in kaṛma and looking into weakness and strength of doṣa, do both (increase or decrease) in kāla vasti.

Kaśyapa explains catur-badra-kalpa-vasti. This type of clubbing of four enemas for unctuous and cleansing purpose cannot be seen in any

other texts. Though other ācāryas prescribe to use odd number of enemas, i.e. 1 or 3 in kapha, 5 or 7 in pitta, 9 or 11 in vāta, the reason have not been explained. Kaśyapa says that the irregularity or abnormality in diseases caused by irregularly of abnormal doṣas is cured by uneven (odd) enema. He prescribes unctuous enema one week before the application of kaṛma or kāla vasti, and nirūha five days before the application of yoga vastis. No other ācārya has given this type of description for kaṛma, kāla and yoga vastis.

Kaśyapa highlights the rationality behind the mixing of māṅṣika lavaṇa, etc. in a specific sequence for the preparation of nirūhavasti, which has not explained in any other texts. Similarly, he explains that uttamamāṭra (maximum quantity) anuvāsana must be given to the persons those indulging in excessive coitus (atīvyavāya) and exercise (vyāyāma); madhyamāṭra (moderate quantity) anuvāsana to vāta aggravated (in the lower part of the body) and vāta prakṛti persons. Adhama dose of anuvā-sana must be used in other cases.

Conclusion

Though Kāśyapasamhita is presumed as a book of pediatrics, the above references prove that this presumption is wrong. It contains each and every matter of āyurveda with lots of innovative ideas. It also provides immense area for research.

Acknowledgement

The Author is thankful to the Principal & Medical Superintendent, Parassinikkadavu Āyurveda Medical College, Kannur, Kerala.

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PHARMACOGNOSTICAL EVALUATION OF *ARTEMISIA PALLENS* WALL ex DC.

J.Suresh, K.Elango, S.P.Dhanabal, N.Paramakrishnan and B.Suresh*

Abstract: *Artemisia pallens* Wall. ex DC belonging to the Asteraceae family commonly known as 'davana' in Tamil, is an aromatic annual herb, erect in habit, upto 60 cm tall, distributed throughout South India. This plant finds use as medicine having anthelmintic, tonic and antipyretic properties. This paper deals with the pharmacognostical studies carried out on the aerial parts of *Artemisia pallens* for identification and differentiation of the plant from other species of *Artemisia*.

Introduction

Artemisia pallens Wall. ex DC (synonym: davana, davanam) belonging to the family Asteraceae is having anthelmintic, tonic and antipyretic properties¹. The essential oil of davana is used for high-grade perfumes and cosmetics. The oil is also employed for flavoring pastries, cakes, beverages and medicines. It is reported that the plant is antihyperglycemic² and that it improves the hormonal balance³, relieves excess gases and painful spasm. Hence, this species has not been scientifically validated for pharmacognostical evaluation. The present study has been aimed to bring this plant under a suitable pharmacognostical scheme.

Materials and methods

The aerial parts of *Artemisia pallens* were collected from Dindigul, Tamil Nadu, India. The plant species were identified and authenti-

cated by comparing with the voucher specimen by a botanist at the Survey of Medicinal Plants and collection unit, Ootacamund.

Macroscopic characters

This perennial herb, native to southern Europe, is compact and woody than most *Artemisia* species. It is strongly aromatic with a bitter lemony scent; the foliage is dense with finely divided grey-green segments; flowers are yellow, small and in loose panicles.

Leaves are finely dissected, repeatedly forked; forking dichotomous or trichotomous; leaflets narrowly oblong and filamentous, pale green (Fig. I).

Histological characters

Sectioning:- The paraffin embedded specimens was sectioned with the help of Rotary Microtome. The thickness of the sections was 10-12 μ m. Dewaxing of the sections was done. The sections were stained with Toluidine blue.

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Since Toluidine blue is a polychromatic stain, the staining results were remarkably good; and some cytochemical reactions were also obtained. The dye rendered pink colour to the cellulose walls, blue to the lignified cells, dark green to suberin, violet to the mucilage, blue to the protein bodies, etc., wherever necessary sections also stained with safranin and fast-green and iodine (for starch).

For studying the Stomatal morphology, venation pattern and trichome distribution, Para dermal sections (sections taken parallel to the surface of leaf) as well as clearing of leaf with 5%



Fig. I.
A shoot showing external features.

sodium hydroxide or epidermal peeling by partial maceration employing Jeffrey's maceration fluid were prepared. Glycerin mounted temporary preparations were made for macerated/cleared materials.⁴⁻¹⁰

Photomicrographs: - Microscopic descriptions of tissue are supplemented with micrographs wherever necessary. Photographs of different magnification were taken with Nikon Labphot 2 microscopic unit. For normal observations bright field was used. For the study of crystals, starch grains, and lignified cells, polarized light was employed. Since these structures have birefringent property, under polarized light they appear bright against dark background. Magnifications of the Figures are indicated by the scale-bars (Fig II-VI).¹¹⁻¹²

Physicochemical constants

Ash values: - Ash values are helpful in determining the quality and purity of crude drugs in powdered form according to the standard procedure. The values observed were: total ash 13.24% w/w, acid-insoluble ash 1.23% w/w, water-insoluble ash 6.33% w/w and sulphated ash 17.37% w/w.¹³⁻¹⁶

Extractive values: - Extractive values are useful for evaluation of crude drugs and give an idea about the nature of chemical constituents present in them. The amount of extractive drug yield to a given solvent is often an approximate measure of a certain constituent or group of related constituents the drug contains. In some cases the amount of drug soluble in a given solvent is an index of its purity. The solvent used for extraction should be in a position to dissolve appreciable quantities of substances

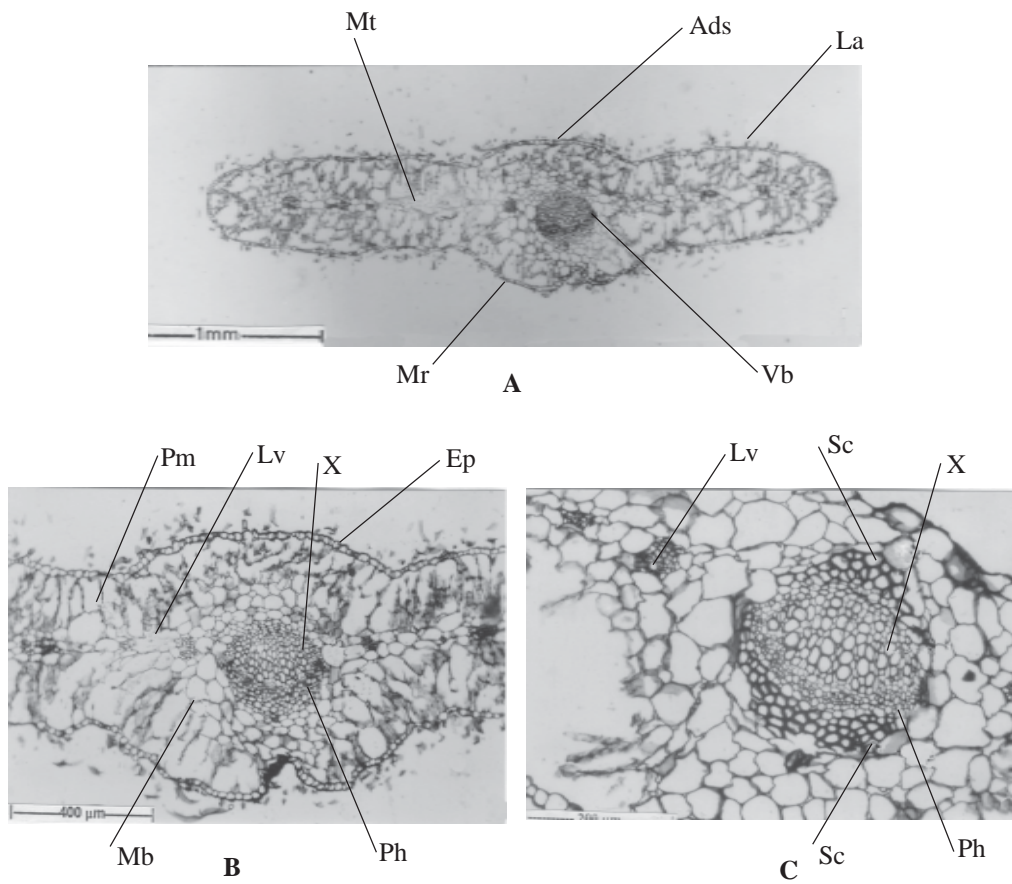


Fig: II.
Anatomy of the leaf

A. T.S. of entire view, **B** T.S. of midrib enlarged **C** Midrib vascular bundle enlarged.

Ads Adaxial side; **Ep** Epidermis; **La** Lamina; **Pm** Palisade mesophyll; **Lv** Lateral vein; **Mr** Midrib;
Mt Mesophyll tissue; **Mb** Midrib vascular bundle; **Ph** Phloem; **Sc** Sclerenchyma;
Vb Vascular bundle; **X** xylem

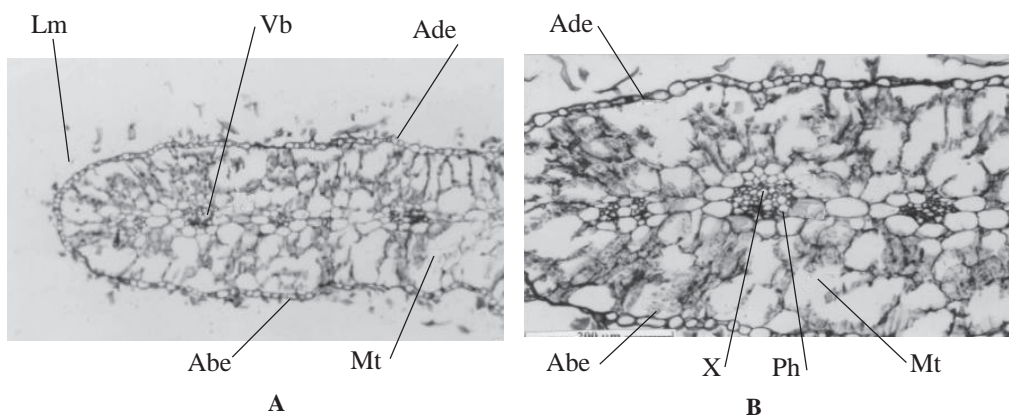


Fig. III
Anatomy of the lateral vein with leaf margin

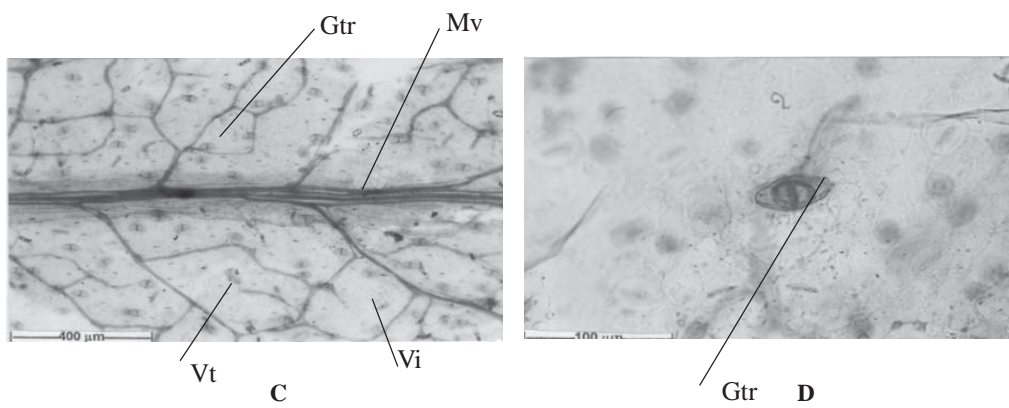


Fig. IV
Trichome morphology in surface view

A T.S. of leaf margin; **B** T.S. of lateral vein enlarged; **C** Distribution of trichome;
D One trichome enlarged

Abe Abaxial epidermis; **Ade** Adaxial epidermis; **Lm** Leaf margin; **Mt** Mesophyll tissue;
Ph Phloem; **Vb** Vascular bundle; **X** xylem; **Gtr** Glandular trichome; **Mv** Mid vein; **Vi** Vein-islets;
Vt Vein termination

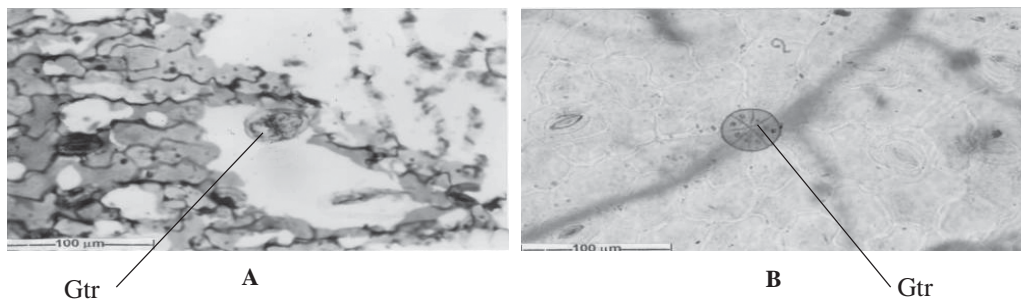


Fig. V.
Structure of trichomes

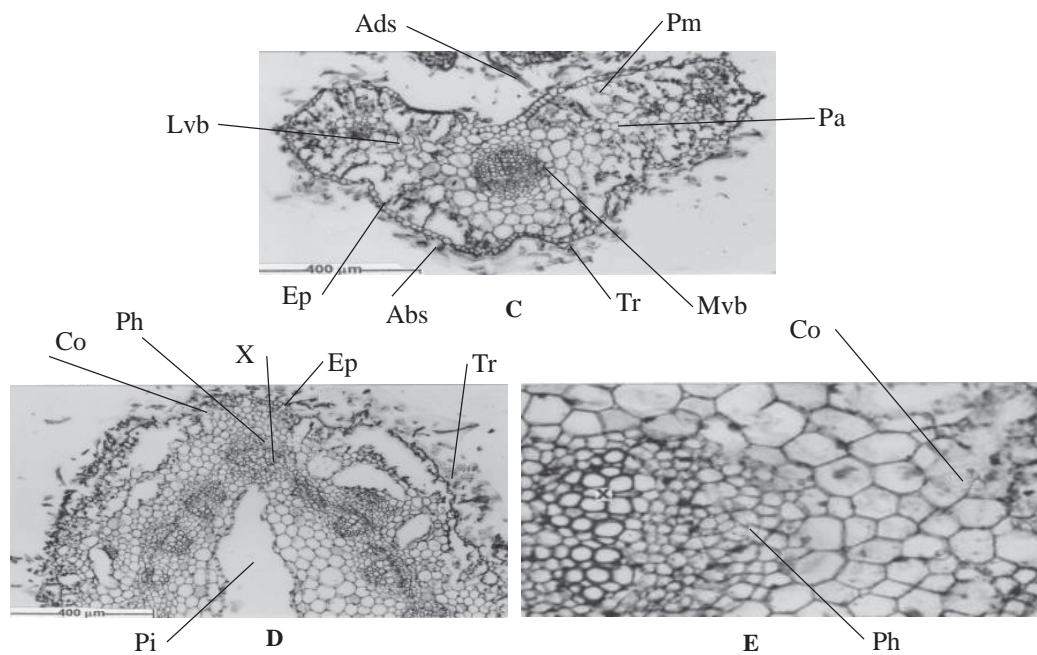


Fig. VI.
Anatomy of the petiole and stem

A Two celled spindle shaped trichome; **B** Circular peltate trichome; **C** T.S. of petiole;
D T.S. of stem; **E** T.S. of stem one vascular bundle enlarged.

Gtr Glandular trichome; **Abs** Abaxial side; **Ads** Adaxial side; **Co** Cortex; **Ep** Epidermis; **Lvb** Lateral vascular bundle; **Mvb** Median vascular bundle; **Pa** Parenchyma; **Ph** Phloem; **Pi** Pith; **Pm** Palisade Mesophyll; **Tr** Trichome; **X** Xylem

desired. 95% ethanolic-soluble extractive values and water-soluble extractive values were determined and found to be 6.35% w/w and 25.49 % w/w.

Results and discussion

Microscopic characters

The leaf is dorsiventral with isolateral mesophyll tissue. The surface of the leaf is even and uniform; midrib fairly prominent and spindle shaped in cross sectional view, projecting equally on the upper and lower sides. There is a small furrow on the lower side of the midrib. The epidermal layer of the midrib is thin and distinct with squarish cells and smooth cuticle. There is a single large vascular bundle which is surrounded by compact parenchymatous tissue; the vascular bundle is collateral with adaxial parallel rows of xylem and abaxial are of phloem. Thick mass of sclerenchyma cells occurs both on the upper and lower sides of the vascular bundle. The midrib is 550µm thick. The lamina is 350 µm thick, and has even upper and lower surfaces. It has wide, semicircular margin. The epidermal layers are thin with spindle shaped fairly thick walled cells. The epidermis is stomatiferous both on the upper and lower sides. The mesophyll consists of a central horizontal layer of two or three rows of cells. On the upper and lower sides of the central row are wide, thin walled palisade cells. The vascular bundles of the lateral veins are located in the median part of the lamina. The bundles become smaller towards the margin. They are collateral with adaxial xylem cluster and abaxial phloem.

The quality parameters of the crude drugs as raw materials were established with the help of

several official determinations based on physical and physico-chemical studies. These studies were aimed at ensuring standardisation of herbal drugs under investigations.

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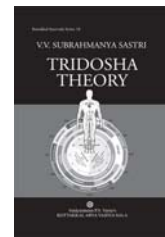
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Kottakkal Ayurveda Series: 18

TRIDOSHA THEORY

A Study on the Fundamental Principles of Ayurveda

Dr. V.V. Subrahmanya Sastri



The theory of *tridosha* forms the foundation of ayurveda. In this text the learned author scientifically explains the physiology of human body through the principles of *vata*, *pitta* and *kapha* keeping in view some of the processes as explained by modern science without detriment to the main concept postulated in ayurveda.

The author, late Sri. V.V. Subrahmanya Sastri, is well known in the world of ayurveda. He was Professor of Ayurveda, Deputy Director and Research Officer under CCRAS. He was also a successful practitioner, an erudite scholar and an eminent pundit deeply immersed in the study of classical texts.

- Dr. P.K. Warriar in his preface to the new edition

EXCERPTS FROM CIKITSĀMAÑJARI - LIV

P. Unnikrishnan*

Abstract: The chapter on 'Treatment of pregnant woman' starts here. In this issue, the fundamentals of sub-fertility, its treatment, regimen for the pregnant woman, intake of medicines for an easy delivery and administration of medicines for the expulsion of placenta and dead fetus are explained.

GARBHIÑ CIKITSĀ

(TREATMENT OF PREGNANT WOMAN)

The chapter begins with the fundamentals of sub-fertility; the disorders and diseases that affect the menstrual cycle including the process of menstruation, diseases of female genitals and the effect of her evil deeds in the past and present causing her incapable for conception, as well as diseases affecting the semen of the male.

Tila (*Sesamum indicum*) and kṣīriṅkamūla (root of kinikinippālla - *Euphorbia thymifolia*) ground well, taken with warm water causes menstruation. Consumption of āmḷikāmūla (root of *Garcinia gummi-gutta*) ground and mixed with milk also precipitates menstruation. Irregularity in menstruation and insufficient flow during periods may result in sub-fertility. Such patients shall consume Puḷimkuzhampu to have free menstrual flow. This preparation also relieves flatulence (gulma). Consumption of Phalasarpiṣ after an initial purgation also increases chances of conception.

Phalasarpiṣ:

One praṣtha (768g) of ghee medicated with fine powders of the following [each one akṣa

(12g)] as solid component, and four praṣtha (3.072 l) of milk as liquid component, is indicated in diseases of the reproductive system both in males and females.

Mañjiṣṭha	<i>Rubia cordifolia</i>
Kuṣṭha	<i>Saussurea lappa</i>
Tagara	<i>Valeriana jatamansi</i>
Triphala	<i>Terminalia chebula</i> <i>Emblica officinalis</i> <i>Terminalia bellirica</i>
Śarṅkara	Sugar
Vaca	<i>Acorus calamus</i>
Dviniśā	<i>Curcuma longa</i> <i>Coscinium fenestratum</i>
Madhuka	<i>Glycyrrhiza glabra</i>
Meda	<i>Polygonatum cirrhifolium</i>
Dīpyaka	<i>Trachyspermum ammi</i>
Kaṭurohiṇi	<i>Picrorhiza scrophulariiflora</i>
Payasyā	<i>Ipomoea mauritiana</i>
Hiṅgu	<i>Ferula asafoetida</i>
Kākoḷi	<i>Fritillaria roylei</i>
Vājigandhā	<i>Withania somnifera</i>
Śatāvāri	<i>Asparagus racemosus</i>

Consumption of the above increases life-span, provides nutrition, enhances memory and aids in the conception of a male child. Consumption

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of this during the period of ovulation reduces chances of stillbirth. This preparation is effective in seizures and convulsive disorders of children and promotes weight gain.

Hima kaṣāya (a preparation where powdered drugs are put in hot water, kept overnight for cooling and consumed next day) prepared from the following on consumption during pregnancy aids in the formation of a male child. Intake of Kalyāṇaka ghr̥ta also gives similar effect.

Varā	<i>Terminalia chebula</i>
	<i>Emblica officinalis</i>
	<i>Terminalia bellirica</i>
Aśvagandhā	<i>Withania somnifera</i>
Yaṣṭī	<i>Glycyrrhiza glabra</i>

Pumsavana:

Wherever the term 'māsi' (month) is used, lunar month of twenty-eight days are to be reckoned.

Pumsavana is a system of treatment intended to give birth to a male offspring. During the first lunar month, the shape of the infant is not clear and within the first seven days, the fertilized ovum attains the form of a mass. The treatment to get a male offspring (pumsavana) shall be initiated before elapsing the first 28 days. The female shall consume butter, ghee and milk.

During pregnancy, the female should neither undertake strenuous physical exercise nor indulge in sexual union excessively. Thick blankets are to be avoided. Sleep during day and remaining awake during the night is also banned. She should not sit on hard surfaces and do crouch or squat. Ideally, she should remain free from sorrow, anger, fear, anxiety and excessive involvement in anything that may affect her mind. Negligence and suppression of the calls of nature are also forbidden. Fasting,

walking long distances, wearing red coloured garments, looking into deep wells or dark caves and consumption of alcoholic beverages, meat and other things that are disliked by the female are also not preferred. Consumption of hot, pungent or indigestible food is to be avoided. Do not assume supine posture while sleeping or lying down. Blood letting, purification therapies such as purgation, induction of emesis, etc., and administration of medicated liquids per rectum (vasti) before 8th month are also prohibited. These may cause abortion or miscarriage; the fetus may become emaciated or may die in the uterus.

Diseases during pregnancy are to be managed with soft and non-irritant medicines. In the second month fertilized ovum assumes the shape of a globular mass, thick muscle or hardened irregular mass. Male, female or eunuch may develop from these structures respectively.

There is periodical movement of ojus from mother to child and vice versa during eighth month. The presence and absence of ojus in the body of the fetus or mother renders them excited and weak respectively. As ojus is not stabilised, fetus delivered during this period is likely to die. The condition of the mother will also be critical if ojus is totally depleted from her body. Here, consumption of a kañji medicated with milk, and administration of oil-enema (anuvāsana) with liquids medicated with drugs of the sweet (madhura) group with ghee are indicated to relieve the accumulated faeces. The next day onwards, it is time for delivery. Retention of fetus in the uterus for twelve lunar months, as a result of deranged vāta, is a disease.

From the ninth month onwards, anointed soup

can be given. Thick kañji (yavāgu) mixed with oily materials and application of oily materials on the genitals on a pad of cotton is advised. The pregnant woman shall never be restricted from oily foods from the ninth month onwards.

A kaṣāya prepared from the roots of kuṟuntōṭṭi (*Sida rhombifolia* ssp. *retusa*) consumed with milk during the eighth month aids easy delivery.

Consumption of a kaṣāya prepared from the following added with fine powder of tṛikolppakkonna (*Operculina turpethum*) once in every four days relieves constipation during pregnancy.

Karimpu	<i>Saccharum officinarum</i>
Āvaṇakkinner	<i>Ricinus communis</i> (root)
Mukkā	<i>Terminalia chebula</i> <i>Embllica officinalis</i> <i>Terminalia bellirica</i>
Mukkolppakkonna	<i>Operculina turpethum</i>
Mṛdvīka	<i>Vitis vinifera</i>

Iraṭṭimadhuram (*Glycyrrhiza glabra*) can also be added to the kaṣāya if necessary.

During the ninth month, a kaṣāya prepared with ūram (*Abutilon indicum*) and ceṟupūḷaver (*Aerva lanata* - root) shall be consumed added with milk. The kaṣāya detailed above relieves constipation. Intake of milk medicated with the roots of ceṟupūḷa (*Aerva lanata*) added with ghee is preferred. Application of a mixture of oil and ghee on the body below the neck is advised. Intake of Ūṟvāru gṛṭa detailed below is effective.

Intake of a medicated ghee with vellarippazham (*Cucumis sativus*) in ūpodakarasa (*Basella alba* var. *rubra*) added with the powders of bhadrīka (*Aerva lanata*) and madhūkayaṣṭi (*Glycyrrhiza glabra*) as solid component, and milk as additional liquid component aids easy delivery.

Prepare a medicated ghee from the expressed juices of vaṣāḷa (*Basella alba* var. *rubra*), muḷayila (*Bambusa arundinacea* - leaf) and vellarippzham (*Cucumis sativus*) with fine powder of yaṣṭi as solid component. The quantity of the juices and ghee is equal. The preparation shall be in soft (mṛdu) pāka. One plāvila (30 ml) of the medicine shall be warmed in hot water and consumed in the morning.

When the delivery date comes closer, consumption of the following medicated ghee termed Noṇṇaṇampulluzhiñjādi is also effective. Add expressed juices of the following with fine powders of kottambāleri (*Coriandrum sativum*), varā (*Terminalia chebula*, *Embllica officinalis* and *Terminalia bellirica*), yavāni (*Trachyspermum ammi*), madhukam (*Glycyrrhiza glabra*) sindhūtbhavam (rock salt) and mañjaḷ (*Curcuma longa*) as solid component, and ghee as lipid component. This medication also facilitates easy delivery. It can be applied on the abdomen also.

Noṇṇa- ṇampullu	<i>Heydyotis herbacea</i>
Uzhiñja	<i>Cardiospermum halicacabum</i>
Kamukumori	<i>Areca catechu</i> (bark)
ḷamteṅguver	<i>Cocos nucifera</i> (tender root)
Ajjhaṭa	<i>Phyllanthus amarus</i>
Lakṣmīṭali	<i>Ipomoea sepiaria</i>
Bala	<i>Sida rhombifolia</i> ssp. <i>retusa</i>
Ūpodaka	<i>Basella alba</i> var. <i>rubra</i>
ḷamuḷantōḷ	<i>Bambusa arundinacea</i> – tender bark

Prepare medicated sesame oil with the juice of noṇṇaṇampullu (*Hedyotis herbacea*) - 2 parts and kāṭi - 4 parts as liquid component. Preparation of the oil shall be terminated only on Sundays or Wednesdays. Application of this

oil on the abdomen, hip and lower back during later stages of pregnancy aids in painless delivery. While bathing, portions below the neck shall be irrigated with warm water. Intake of expressed juice of pāṭa (*Cyclea peltata*) with sesame oil is suggested.

Application of sesame oil medicated with śānmalittoli (*Bombax ceiba* - bark) mixed with ghee on the body is advised. Consumption of oil medicated with noṅganampullu is also effective. During delivery, as the head of the baby appears, intake of the expressed juice of kākattirutālī (*Ipomoea sepiaria*) mixed with oil is advised.

Consumption of oil mixed with fine paste of pirakinver (*Clerodendrum viscosum* - root) is prescribed. These measures ease the process of childbirth. Application of expressed juice of scraped pūḷattoli (*Bombax ceiba* - bark) mixed with ghee on the hands and vaginal region relieves muscular stiffness and thereby aids easy delivery. Expressed juice of talanīḷi (*Merremia tridentata* ssp. *tridentata*) mixed with oil can also be consumed. When the fetus head appears, the roots of piraku (*Clerodendrum viscosum*) ground well and mixed with oil may be consumed for easy delivery.

Consumption of sesame oil medicated with juice of ūṟvāruka (*Cucumis melo* var. *utilissimus*) as liquid component and vṛṣa (*Justicia beddomei*) as solid component is recommended. If there is inordinate delay in delivery after the appearance of head, straining may be necessary. Application of fresh lāṅgalika (*Gloriosa superba*) on clean soles is effective.

Application of a paste made out of the roots of kūñjirikka (*Putranjiva roxburghii*) in water on

the vagina and abdomen is effective. Consumption of scrapings of the sixth segment of a bamboo mixed with oil is recommended. The lower segments are not to be used as it may result grave complications. Chant the hymn 'mukhamazhi mukhamazhi' one hundred and eight times and give sesame oil for consumption. Intake of expressed juice of tender shoots of piraku (*Clerodendrum viscosum*) mixed with water by chanting the hymn 'pṛatilomamātṛka' is prescribed. Perālttoli (*Ficus benghalensis*) ground on cāṇa (a hard material used for making paste) and ēlattari (*Elettaria cardamomum*) ground on ammi (granite grindstone) mixed with ghee, well moistened, may be given. All the medicines prescribed are to be taken by chanting the 'pṛatilomamātṛka' hymn. These measures can result in easy delivery.

Grind kūñjirikka (*Putranjiva roxburghii* - whole plant) and paste on the shadow of the pregnant woman. Take water in a pot measured by a ceṟunāzhi (small measuring ladle) counted equal to the number of age of the pregnant woman. Drop the water on the shadow of the pregnant woman through the hole of the pot by chanting the hymn 'hṛūm hṛīm kalilīm pṛthvī asyā yonimārdrikuruṣvā svāhā'.

Pannittēṭṭa (jawbone of pig) ground in water shall be applied downward i.e. from the level of neck to that of vagina. Immediately after delivery, the same paste is to be applied in the upward direction i.e. from the level of vagina to that of neck.

Application of pannittēṭṭa ground in water on the lower eyelid as collyrium, without disclosing the secret of the medicine, results in fast delivery. In cases where placenta is

NOTE TO THE CONTRIBUTORS

Contributions to Āryavaidyān are requested to be made in the following format:

- The article should be authentic and not published earlier.
- Contributions in the form of a research paper, review article, clinical observation or a book review are welcome from the fields of Āyurveda and allied subjects, naturopathy, Siddha, Unani, Homoeopathy, Yoga, Modern medicine, drug research, pharmacognosy, botany, phytochemistry and pharmacology. Publication will be made on the basis of the recommendation of an expert body.
- The main title, indicative of the content, should be brief. An abstract, not exceeding two hundred words, be prefixed to the article. English equivalents may be provided to Sanskrit terms [e.g. vīrya (potency), guṇa (property), etc]. Correspondence address including e-mail, and affiliations, if any, of the author be attached to the text.
- Tables, minimized to the extent possible, with suitable reference to the context can be attached to the matter.
- Line drawings/pictures accompanied by descriptive legends may be submitted in original. Figures may be numbered and referred to in the text as “Fig 1” etc. (In the case of e-mail, the figures have to be attached as JPEG images)
- Reference matter may be arranged in the following order - Author, Text, Edition, Publisher, Pages and Year, etc. Example:
 1. John Bernar Hentory, *Clinical diagnosis and management by laboratory methods*, 17th Ed., WB Saunders Company, Philadelphia, pp 172-175, 1989.
- Matter can be sent by surface mail prepared in Laser Jet print or e-mail. Devanagiri scripts/diacritical marks may please be avoided in e-mail.