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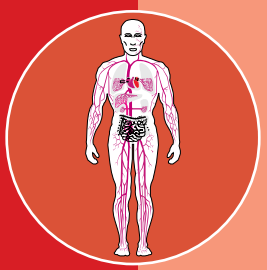
Āryavaidyan

लाभानां श्रेय आरोग्यम्

Of all the gifts,
the most precious is health



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Quarterly journal of Arya Vaidya Sala

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तद्विद्याचार्यसेवा च बुद्धिमेधाकरो गणः ।।

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METRES (CHANDA) IN AṢṬĀṄGAHṚDAYA - A CRITICAL REVIEW

(Part - I)

Vaidya Asit K Panja

Abstract: The ancient scholars maintained the learning and the streamline flow of knowledge by rhythmic recitation even before the era of documentation. Aṣṭāṅgahṛdaya, one of the most important texts in great-triad of āyurveda, is composed in verse form to make it possible to remember easily through rhythmic recitation. This review consists of methods of rhythmic recitation of all verse of Aṣṭāṅgahṛdaya with examples, notations and analysis according to metre (chanda).

Introduction

Chanda:- The Veda is the main sources of knowledge for the realisation of puruṣārtham i.e. duty (dharma), wealth (artha), desire (kāma) and final deliverance (mokṣa). The study of the Vedas is divided by six different varieties widely known as vedāṅga. In early days of Vedic period, study was in the form of oral tradition and methodical rhythmic recitation was mandatory to keep the purity of text. Rhythmic recitation also helped to develop good memory of the text. Chanda was given major importance from the very beginning of Vedic era and considered it as a vedāṅga.[1a] Apart from the classical teaching, chandas were being used in day to day life to remember the verses of worshiping, etc. Āyurveda, the science of life, is origined from Vedic wisdom and is transmitted through the same tradition. Majority of the texts of āyurvedic literature are composed in poetry form to remember the subject purely. The study of metre (chanda) is an integral part of the study and exploration of the āyurvedic literature.

Methods of study

The ācāryas of āyurveda had adopted three steps of learning i.e. adhyayana, adhyāpana and tadvidyasambhāṣa[2a] as the needs of the time to continue the streamline flow of āyurvedic knowledge. The preliminary stage of the study (adhyayana) was adhigatakaraṇa[3a] i.e. grasping and mastering of the text thoroughly. The texts were written mostly in a very concise style known as 'sūtra' and in combined form of both prose and verse. Prose is not tightened by akṣara, mātra, gati and yati on the other hand verse is bound by some rules. The verses were mostly in simple form and were meant to be easy for cramming by the pupils and comprehended in their scope of exposition a vast range of subjects.

Ancient practice of recitation reveals that during the study ācāryas used to recite one or two pāda of

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the verse at first methodically pronunciated with gradual completion of the rest part. Students one after another followed the preceptor blindly reciting the pāda respectively. During this process the main focus was laid on correct pronunciation.[4]

During the study the student should be very careful in maintaining the perfectness instructed in the text.[2b&3b] He should recite neither too fast (that means the letters, words, quarter verses should not be in close succession and as such indistinct) nor too slow i.e. the words, etc. should not be too loosened. He should recite without any hesitation, avoid nasal sounds always, pronounce the letters clearly without compressing them, recite well refined, non-confused letter and should read with medium voice not in very high or very low pitch.[2b]

Most important aspect of ancient system of education was achievement of oral fluency.[3c] The student easily gained oral promptness in the course of study with improvement in their pronunciation and other loops. Suśruta has mentioned that the student should make efforts to attain excellence of speech, for successful management of practical.

The next stage is memorization. With repeating the verse again and again in proper methodical rhythm, the students used to store permanently in memory. The sūtras were studied in different ways like samhitapatha, pādapatha, kramapatha, jātapatha, jñānapatha, etc. for memorization.[5] Samhitapatha is reading of the text as what it actually is. Pādapatha is reading word by word by breaking samāsa-baddhapāda of main samhitapatha. Kramapatha, jātapatha and jñānapatha have same phonation (svaravinyāsa) but the only specialty is repetition. In kramapatha, the frequency of repetition of each word is twice. In jātapatha each pāda is being recited thrice or more. In jñānapatha the frequency of repetition is up to six times with a definite sequential rhythm. Hence, with the help of these glorious methods the āyurvedic literature remains in its pristine form.

Importance of chandajñāna

In Vedic period the scholars used to study āyurveda either after completing their Vedic school or simultaneously. They had to study chanda as a vedāṅga in their Vedic school. Ancient scholars kept the streamline flow of knowledge by rhythmic recitation for thousands of years even before the era of documentation. With the advent of science many technologies have emerged in the field of education and have given us new dimension of study. But most of the current āyurvedic scholars lack practice in classical and rhythmic methods of recitation.

Varieties of chanda[1b]

A verse is consisted of four parts known as pāda. The governing rules and regulation of metres are concerned with each single pāda.

Some metres are composed and ruled by number of letters or akṣaras known as akṣarachanda or varṇachanda. In akṣarachanda only akṣaras are counted and assessment of specific gaṇas is not required; whereas in mātrāchanda, only mātras are measured. Neither gaṇas nor akṣaras are assessed e.g. aupachandaśika, vaitāḷīya, etc. In akṣaragaṇachanda, assessment of both the numbers of akṣara and respective gaṇas are inevitable e.g. indravajra, mālinī, etc. Mātrāgaṇachanda is another variety in

which both mātra and gaṇas (mātra) are assessed; e.g. ārya.

Rhythmically all verses are of three types i.e. samachanda, ardhasamachanda and viṣamachanda. In samavṛttachanda all four pādas contain same numbers of varṇa or letters e.g. indravajra, vamśastha, etc. On the other hand in ardhasamavṛttachanda the odd pāda i.e. 1st and 3rd pāda are composed of same number of letters and the even pāda 2nd and 4th are consisted of same number of letters (not similar to pāda 1st and 3rd) e.g. puṣpitāgra,viyogini. In viṣamavṛttachanda all four pāda are different in terms of letters; e.g. udgata.

Guru and laghu varṇa

Besides associated with dīrghasvara like आ, ई, the following consonants are considered as guru.[1c]

a. Anusvārayukta (a) i.e. associated with anusvāra
b. Visargayukta (:)
c. Just before the conjunct and
d. Last word of the pāda (pādāntaga)

All others are laghu including hrasvasvara. Practically, in śḷokapatha, one mātrāvarṇa is considered as hrasva; whereas two mātras, three mātras and half mātra are counted for dīrgha, pḷuta and vyañjana respectively[1d] but only consonant like क्, ख् and ऽ (avagraha) are not considered as varṇa.

Mātra

Time required for pronunciation of laghu akṣara is counted as one mātra. Mātra of guru letter is two.[1d]

Gaṇa

For making it easy, the scholars of Chandaśāstra have framed different combinations of letters popularly known as gaṇa. Gaṇas are framed by combination of guru and laghu varṇas. The characteristics of eight gaṇas are shown below:[1e]

Sl. No	Name	Character	Symbol	Example
1.	मगण	All three letters are guru	ऽऽऽ	त्रायन्ति, बाधिर्य
2.	नगण	All three letters are laghu	।।।	मधुर, लशुन
3.	भगण	First letter is guru	ऽ।।	नागर, सैन्धव
4.	यगण	First letter is laghu	।ऽऽ	गुडुची, पटोलं
5.	जगण	Middle letter is guru	।ऽ।	कषाय, किलास
6.	रगण	Middle letter is laghu	ऽ।ऽ	पिप्पली, चन्दनं
7.	सगण	Last letter is guru	।।ऽ	अभया, मरिचं
8.	तगण	Last letter is laghu	ऽऽ।	आकाश, उन्माद

ऽ Guru; । Laghu

Chanda in Aṣṭāṅgahṛdaya

Ācārya Vāgbhaṭa has used thirty three chandas viz. anuṣṭup, āryā, aupachandaśika, bhadra, daṇḍaka, dhīralaḷita, dodhaka, drutaviḷambita, hariṇī, indravajrā, kusumitalatāvellitā, mālinī, mandākrāntā, mattamayūra, narkuṭaka, praharṣiṇī, pṛthvī, puṣpitāgrā, rathoddhatā, śālinī, śārdūlavikrīḍita, sragdharā, śuddhavirāṭ, svāgatā, toṭaka, upacitrā, upajāti, upendravajrā, vaiśvadevi, vaitāḷīya, vamśastha, vasantatilakā and viyogini (Table 1). A brief description of chandas along with their examples is given below:

Anuṣṭup

Anuṣṭup[1f] is a varṇavṛttachanda and usually meant for samachanda. Its each pāda consists of eight letters; among them 5th is always laghu whereas 6th is always guru and 7th of even pāda is laghu and of odd pāda is guru. Others have no bar. After each pāda there is slight pause.

Example: कायबालग्रहोर्ध्वाङ्गशल्यदंष्ट्राजरावृषान्।
अष्टावङ्गानि तस्याहुश्चिकित्सा येषु संश्रिता।। (सू., १/५)

Analysis

Pāda 1

1	2	3	4	5	6	7	8
का	य	बा	ल	ग्र	हो	र्ध्वा	ङ्ग

Pāda 2

1	2	3	4	5	6	7	8
श	ल्य	दं	ष्ट्रा	ज	रा	वृ	षान्

Pāda 3

1	2	3	4	5	6	7	8
अ	ष्टा	व	ङ्गा	नि	त	स्या	हु

Pāda 4

1	2	3	4	5	6	7	8
श्चि	कि	त्सा	ये	षु	सं	श्रि	ता

Āryā

Āryā[1g] is a mātrāchanda, where only svaras are counted. Guru letter is considered as of two mātras and laghu letter as of one. There are five different gaṇas. Each gaṇas is composed of four mātras. So gaṇas may be framed by two guru varṇas (ऽऽ), one guru and two laghu (ऽ।।, ।ऽ।, ।।ऽ) and four laghu varṇa.

According to chandaparicaya it is characterised by twelve mātra in 1st pāda, eighteen mātra in 2nd pāda, and fifteen mātra each in 3rd and 4th pāda.[6]

There are five different groups of āryā viz. āryā (12,18,12,15), gīti (12,18,12,18), udgīti (12,15,12,18), upagīti (12,15,12,15) and āryāgīti (12,2012,20). In other words, each two pāda of āryāchanda are generally composed of seven gaṇas and a guru letter. So, total mātra is thirty. According to the position of gaṇas in different position of the verse, āryā is of eighty types such as vipulā, capalā, gīti, udgīti, etc.

Example: जीवन्ती काकोल्यौ मेदे द्वे मुद्गमाषपर्ण्यौ च।
ऋषभकजीवकमधुकं चेति गणो जीवनीयाख्यः।। (सू., १५/८)

TABLE 1
List of chandas in Aṣṭāṇgahṛdaya

Name of Chanda		Chapter
1.	Anuṣṭup	Su., 1/2-48 ṣ;2/1-48; 3/1-58 ṣ; 3/1-58 ṣ;4/1-34; 5/1-84; 6/1-172; 7/1-75; 8/1-55; 9/1-28 ṣ; 10/1 -42; 11/1-44 ; 12/1-77 ṣ; 13/1-41; 14/1-37;15/5,7,10,11,13,14,16,18, 20,22,23,25,27,29,31,32,34-36,39,42,44,46; 16/1-45; 17/1-28 ṣ; 18/1-28,33-59 ṣ; 19/1-84; 20/1-36,39; 21/1-21 ṣ; 22/1-33; 23/1-30 ṣ;24/1-21 ṣ; 25/1-40 ṣ; 26/1-55 ṣ; 27/1-50; 28/1-47 ṣ; 29/1-79; 30/1-39,40-53.
		Sa., 1/1-100 ṣ; 2/1-60; 3/1-84,89,95,103-120; 4/1-70; 5/1-132; 6/1-73 ṣ.
		Ni., 1/1-23 ṣ; 2/1-23,27-78; 3/1-38; 4/1-31; 5/1-57 ṣ; 6/1-41; 7/1-59; 8/1-30; 9/1-40; 10/1-37; 11/1-29,3162; 12/1-46; 13/1-67 ṣ; 14/1-56; 15/1-56 ṣ; 16/1-58ṣ.
		Ci., 1/1-89,94-176 ; 2/1-50; 4/1-59 ṣ; 5/1-83 ṣ; 6/1-84 ṣ; 7/1-74,89-115; 8/1-143 ṣ,155,156,159,160; 9/1- 46 ṣ, 48-75,77-124; 10/1-91; 11/1-63; 12/1-6,9-43 ṣ; 13/1-51; 14/1-30 ṣ,40-129 ṣ; 15/1-131 ṣ; 16/1-57; 17/1-6,9-15 ṣ,17-38,; 19/1-17,21,22,24-27,33-37ṣ, 47-41,53,69,71-75,84; 20/12,19-34; 21/1-31 ṣ, 34-55,62-66,70-81; 22/1-74.
		Ka. Si. 1/1-47; 2/1-61 ṣ; 4/20-69; 5/1-54; 6/1-29 ṣ.
		U., 1/1-49 ṣ; 2/1-77; 3/1-60 ṣ; 4/1-44; 5/1-14,21-53; 6/1-60; 7/1-37; 8/1-27 ṣ; 9/1-41; 10/1-31 ṣ; 11/1-57 ṣ; 12/1-33 ṣ; 13/1-22,26-32 ṣ,36,39-41, 48-73,75-96,; 14/1-30; 15/123; 16/1-4 ṣ,10-33 ṣ, 36-55 ṣ, 58-65; 17/1-26; 18/1-66; 19/1-27; 20/1-25; 21/1-69; 22/1-80 ṣ; 23/1-32; 24/1-59; 25/1-66; 26/1-57 ṣ; 27/1-35; 28/1-33; 29/1-30 ṣ; 30/1-30 ṣ,33-37; 31/1-33; 32/1-5,7-31; 33/1-52 ṣ; 34/1-67; 35/1-32,37-70 ṣ; 36/1-83,86-93; 37/1-39,41,45-81; 38/1-40; 39/1-29,33-40,42,43,52,54,55,58-71,81-102,110,111-125,127-132,136-141,143-146,173,175-181; 40/1-38,60,61,63-79,81,82,87,89.
2.	Āryā	Su., 15/8,33; Ci., 7/85; 8/148,159; 14/39; 19/37,43,44,54-63, 71-74,76-78,82,86-94; 20/1-6,8,13,18; 4/70-73.
		U., 13/23-25,42,44,46,66; 16/5,8,10; 22/84-86,90-94,96, 99-101,108-111; 27/37; 30/40; 37/42,85; 72-74,133-135; 40/45,50-57 ,62;
3.	Aupachandaśika	Sa., 3/87,99;Ci., 8/146; 17/8; 19/19; U., 13/99-100; 27/38; 28/37; 39/46,47,152.
4.	Bhadra	Ci., 8/153
5.	Daṇḍaka	U., 5/19,20
6.	Dhīralaḷitā	Su., 8/55
7.	Dodhaka	Ci., 1/177; 7/82; 14/31; U., 5/19,20; 28/39,40.
8.	Drutaviḷambita	Su., 15/21; Sa., 3/91; Ci., 7/79; 8/157; 21/56; U. , 28/35; 39/171; 40/85.
9.	Hariṇī	Ci., 7/87.

Cont....

10.	Indravajrā	Su., 15/40; 18/–32 ; 19/85-86; 27/51; 29/80 ; Sa., 2/62; 3/88,100;Ni., 11/63; Ci., 8/162,164; 9/47; 19/18,30; 20/16; 4/1,3,10,16,18; U. , 5/17; 16/7; 22/82,95,97; 27/40;30/32,38;37/82; 39/30, 41, 57, 75, 103, 104,106,109,147,160,164; 40/39,47,50.
11.	Kusumitalatāvellitā	Ci., 17/42.
12.	Mālinī	Su., 7/77; 15/1,19,30; Ci., 7/78; 14/35; 19/98; U., 39/78,107,168; 40/84;
13.	Mandākrāntā	Ci., 19/41
14.	Mattamayūra	Ci., 19/40
15.	Narkuṭaka	Ci., 7/88
16.	Praharṣiṇī	Su., 12/78 ,78ṣ; Sa., 3/92,98; U., 13/33,37; 16/6; 22/102.
17.	Pṛthvī	U., 39/80.
18.	Puṣpitāgrā	Su., 15/3 ; 22/34 ; Ci., 8/150 ; 17/41; U., 40/-46.
19.	Rathoddhatā	Ci., 1/92; 7/81; U.,13/74; 16/9; 28/42.
20.	Śālinī	Su., 15/6,28,47; 17/29,29 ṣ; 21/22,22 ṣ; Sa., 3/90,93,96; Ni., 2/26; Ci., 7/83; 8/147; 10/93 ; 14/33; 19/20,32,80,85,96,97; 20/7,9,10; 1/33,69,82; U., 13/35; 15/24; 16/34 ṣ, 35 ṣ; 22/89; 37/86;39/77,167; 40/59,86.
21.	Śārdūlavikrīḍita	Su., 15/43; 20/37; Ci., 7/86 ; 8/149; 14/36; U., 5/18; 25/67; 32/32; 39/169; 40/48.
22.	Sragdharā	Su., 15/45 ; Ci., 8/144; U., 39/172.
23.	Suddhavirāṭ	Su., 15/38.
24.	Svāgatā	Su., 10/44 ; 15/26; Sa., 3/86; Ni., 2/25; Ci., 1/90; 7/76; 21/68; U., 13/38,43; 27/41; 28/44; 37/40,84; 39/51,76,110(1),153;40/41.
25.	Toṭaka	Ci., 8/161
26.	Upacitrā	Su., 15/12
27.	Upajāti	Su., 1/1; 4/35,36; 10/43; 11/45; 15/2,9,37; 16/46 ; 18/29-31,60 ṣ; 19/87 ; 24/22,22 ṣ; 25/42 ṣ; 27/52-53; 30/39(1); Sa., 2/61; 3/94,97,102; Ni., 2/24; 10/38-41 ; 11/30 ; 1/93; 7/77; 8/145,158,163; 9/76; 10/92; 12/7-8; 14/32,37; 17/7,16,39; 19/28,29,38,45,46,65-68,70,; 20/14,15,17,35; 21/32,67; Ka. Si., 2/62 ṣ; 4/2,4-9,11-15,17,19;U., 5/15,16; 11/58 ṣ; 13/45,47,97; 16/56 ṣ,66,67; 22/81,83,87,103,104; 28/43; 29/31; 30/31,39; 32/6 ; 35/33-35; 36/84,85; 37/43,44; 39/31,32,44,45,50-53,56,108,142,148-151,154-159,161-163,166,174,177; 40/40,42,43,49,83;
28.	Upendravajrā	Ci., 19/31; U., 35/36; 39/126.
29.	Vaiśvadevi	Su., 15/4; Sa., 3/101; Ci., 19/79; 20/11; 21/64; U., 13/98; 16/57 ṣ; 22/98; 39/170
30.	Vaitāḷīya	U., 28/38; 37/83.
31.	Vamśastha,	Ci., 19/42.
32.	Vasantatilakā	Su., 7/76; 15/17, 24,41; 20/38 ; 25/41 ṣ; Sa., 3/85; Ni., 2/79; Ci., 7/75; 8/151,152; 14/38; 19/23,81;21/58-61; U., 14/31-32; 27/36; 28/34; 39/48,49,78; 40/80;
33.	Viyogini	Ci., 1/91; 17/40

Su. - Sūtrasthānam; Sa. - Śārīrasthānam; Ni. - Nidānasthānam; Ci. - Cikitsāsthānam; U. - Uttarasthānam; Ka. Si. - Kalpa Siddhisthānam.

Analysis

Pāda 1

4		4		4		
2	2	2	2	2	2	12
जी	व	न्ती	का	को	ल्यौ	

Pāda 2

4		4		4			4		
2	2	2	2	1	2	1	2	2	2	18
मे	दे	द्वे	मु	द्र	मा	ष	प	ण्यौं	च	

Pāda 3

4				4			4			
1	1	1	1	2	1	1	1	1	2	12
ऋ	ष	भ	क	जी	व	क	म	धु	कं	

Pāda 4

4			4		3		4		
2	1	1	2	2	1	2	2	2	15
चे	ति	ग	णो	जी	व	नी	या	ख्यः	

Aupachandaśika[1h]

It is a mātrāchanda charecterised by sixteen mātra in each odd pāda and eighteen mātra in each even pāda. In each pāda there is a रगण, a laghu and two guru varṇas at the end.

Example: मधुराम्ळपटूष्णसात्म्यकाङ्क्षा: कृशदीर्घाकृतय: सशब्दयाता:।
न दृढा न जितेन्द्रिया न चार्या न च कान्तादयिता बहुप्रजा वा।। (शा., ३/८७)

Analysis

Pāda 1

					रगण			ल	गु	गु	
1	1	2	1	1	2	1	2	1	2	2	16
म	धु	रा	म्ल	प	टू	ष्ण	सा	त्म्य	का	ङ्क्षः	

Pāda 2

						रगण			ल	गु	गु	
1	1	2	2	1	1	2	1	2	1	2	2	18
कृ	श	दी	र्घा	कृ	त	यः	स	श	ब्द	या	ताः	

Pāda 3

					रगण			ल	गु	गु	
1	1	2	1	1	2	1	2	1	2	2	16
न	दृ	ढा	न	जि	ते	न्द्रि	या	न	चा	र्या	

Pāda 4

						रगण			ल	गु	गु	
1	1	2	2	1	1	2	1	2	1	2	2	18
न	च	का	न्ता	द	यि	ता	ब	हु	प्र	जा	वा	

Bhadra

Bhadra[8] is a varṇavṛttasamachanda composed of twelve letters in each pāda. Respective gaṇas are मगण, तगण, जगण and यगण. Pauses are after 4th and after 12th i.e. pādānta.

Example: तोयद्रोणे चित्रकमूलतुलार्धं साध्यं यावत्पाददलस्थमथेदम्।
अष्टौ दत्वा जीर्णगुडस्य पलानि क्काथं भूय: सान्द्रतया सममेतत्।। (चि., ८/१५३)

Analysis

Pāda 1

मगण			तगण			जगण			यगण		
ऽ	ऽ	ऽ	ऽ	ऽ	।	।	ऽ	।	।	ऽ	ऽ
तो	य	द्रो	णे	चि	त्र	क	मू	ल	तु	ला	र्धं

Pāda 2

मगण			तगण			जगण			यगण		
ऽ	ऽ	ऽ	ऽ	ऽ	।	।	ऽ	।	।	ऽ	ऽ
सा	ध्यं	या	व	त्पा	द	द	ल	स्थ	म	थे	दम्

Pāda 3

मगण			तगण			जगण			यगण		
ऽ	ऽ	ऽ	ऽ	ऽ	।	।	ऽ	।	।	ऽ	ऽ
अ	ष्टौ	द	त्वा	जी	र्ण	गु	ड	स्य	प	ला	नि

Pāda 4

मगण			तगण			जगण			यगण		
ऽ	ऽ	ऽ	ऽ	ऽ	।	।	ऽ	।	।	ऽ	ऽ
क्का	थं	भू	यः	सा	न्द्र	त	या	स	म	मे	तत्

Daṇḍaka

Daṇḍaka[1i] is a varṇavṛttasamachanda primarily containing two नगण and eight रगण in each pāda i.e. thirty letters in each pāda. Then gradully one रगण increases in each upper variety. So, number of letters may be thirty, thirty-three, thirty-six etc. Pause is at the end.

Example: त्रिकटुकदलकुङ्कुमग्रन्थिकक्षारसिंहीनिशादारुसिद्धार्थयुग्माम्बुशक्राह्वयैः
सितलशुनफलत्रयोशीरतिक्तावचातुत्थयष्टीबलालोहितैलाशिलापद्मकैः। (उ., ५/१९)

Analysis

Pāda 1

नगण			नगण			रगण			रगण			रगण			रगण			रगण			रगण			रगण			रगण		
।	।	।	।	।	।	ऽ	।	ऽ	ऽ	।	ऽ	ऽ	।	ऽ	ऽ	।	ऽ	ऽ	।	ऽ	ऽ	।	ऽ	ऽ	।	ऽ	ऽ	।	ऽ
त्रि	क	टु	क	द	ल	कुं	कु	म	ग्र	न्थि	क	क्षा	र	सिं	ही	नि	शा	दा	रु	सि	द्धा	र्थ	यु	ग्मा	म्बु	श	क्रा	ह्व	यैः

Pāda 2

नगण			नगण			रगण			रगण			रगण			रगण			रगण			रगण			रगण			रगण		
।	।	।	।	।	।	ऽ	।	ऽ	ऽ	।	ऽ	ऽ	।	ऽ	ऽ	।	ऽ	ऽ	।	ऽ	ऽ	।	ऽ	ऽ	।	ऽ	ऽ	।	ऽ
सि	त	ल	शु	न	फ	ल	त्र	यो	शी	र	ति	क्ता	व	चा	तु	त्थ	य	ष्टी	ब	ला	लो	हि	तै	ला	शि	ला	प	द्म	कैः

Dhīralaḷitā

Dhīralaḷitā[9] is a varṇavṛttasamachanda consisted of eighteen letters in each pāda. The respective gaṇas are यगण, मगण, नगण, सगण, तगण and सगण.

Example: प्रसृष्टे विण्मूत्रे हृदि सुविमले दोषे स्वपथगे विशुद्धे चोद्गारे क्षुदुपगमने वातेऽनुसरति।
तथाग्नावुद्रिक्ते विशदकरणे देहे च सुलघौ प्रयुञ्जीताहारं विधिनियमितं, कालः स हि मतः।। (सू. ८/५५)

Analysis

Pāda 1

यगण			मगण			नगण			सगण			तगण			सगण		
।	ऽ	ऽ	ऽ	ऽ	ऽ	।	।	।	।	।	ऽ	ऽ	ऽ	।	।	।	ऽ
प्र	सृ	ष्टे	वि	ण्मू	त्रे	हृ	दि	सु	वि	म	ले	दो	षे	स्व	प	थ	गे

Pāda 2

यगण			मगण			नगण			सगण			तगण			सगण		
।	ऽ	ऽ	ऽ	ऽ	ऽ	।	।	।	।	।	ऽ	ऽ	ऽ	।	।	।	ऽ
वि	शु	द्धे	चो	द्गा	रे	क्षु	दु	प	ग	म	ने	वा	ते	ऽनु	स	र	ति

Pāda 3

यगण			मगण			नगण			सगण			तगण			सगण		
।	ऽ	ऽ	ऽ	ऽ	ऽ	।	।	।	।	।	ऽ	ऽ	ऽ	।	।	।	ऽ
त	था	ग्रा	वु	द्रि	क्ते	वि	श	द	क	र	णे	दे	हे	च	सु	ल	घौ

Pāda 4

यगण			मगण			नगण			सगण			तगण			सगण		
।	ऽ	ऽ	ऽ	ऽ	ऽ	।	।	।	।	।	ऽ	ऽ	ऽ	।	।	।	ऽ
प्र	यु	ञ्जी	ता	हा	रं	वि	धि	नि	य	मि	तं	का	लः	स	हि	म	तः

Dodhaka[1j]

It is also known as bandhu and characterised by eleven letters in each pāda. Respective gaṇas are three भगण and two-guru letters. Pause at the end.

Example: ओषधयो मणयश्च सुमन्त्राः साधुगुरुद्विजदैवतपूजा।
प्रीतिकरा मनसो विषयाश्च घ्नन्त्यपि विष्णुकृतं ज्वरमुग्रम् ।। (चि., १/१७५)

Analysis

Pāda 1

भगण			भगण			भगण			गु	गु
ऽ	।	।	ऽ	।	।	ऽ	।	।	ऽ	ऽ
ओ	ष	ध	यो	म	ण	य	श्च	सु	म	न्त्राः

Pāda 2

भगण			भगण			भगण			गु	गु
ऽ	।	।	ऽ	।	।	ऽ	।	।	ऽ	ऽ
सा	धु	गु	रु	द्वि	ज	दै	व	त	पू	जा

Pāda 3

भगण			भगण			भगण			गु	गु
ऽ	।	।	ऽ	।	।	ऽ	।	।	ऽ	ऽ
प्री	ति	क	रो	म	न	सो	वि	ष	या	श्च

Pāda 4

भगण			भगण			भगण			गु	गु
ऽ	।	।	ऽ	।	।	ऽ	।	।	ऽ	ऽ
घ्न	न्त्य	पि	वि	ष्णु	कृ	तं	ज्व	र	मु	ग्रम्

Drutaviḷambita[1k]

It is composed of नगण, two भगण and रगण respectively. Pause is after twelve varṇas i.e. pādānta.

Example: स्तननितम्बकृतादतिगौरवादलसमाकुलमीश्वरसम्भ्रमात्।
इति गतं दधतीभिरसंस्थितं तरुणचित्तविलोभनकार्मणम्।। (चि., ७/७९)

Analysis

Pāda 1

नगण			भगण			भगण			रगण		
।	।	।	ऽ	।	।	ऽ	।	।	ऽ	।	ऽ
स्त	न	नि	त	म्ब	कृ	ता	द	ति	गौ	र	वा

Pāda 2

नगण			भगण			भगण			रगण		
।	।	।	ऽ	।	।	ऽ	।	।	ऽ	।	ऽ
द	ल	स	मा	कु	ल	मी	श्व	र	स	म्भ्र	मात्

Pāda 3

नगण			भगण			भगण			रगण		
।	।	।	ऽ	।	।	ऽ	।	।	ऽ	।	ऽ
इ	ति	ग	तं	द	ध	ती	भि	र	सं	स्थि	तम्

Pāda 4

नगण			भगण			भगण			रगण		
।	।	।	ऽ	।	।	ऽ	।	।	ऽ	।	ऽ
त	रु	ण	चि	त्त	वि	लो	भ	न	का	र्म	णम्

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(to be concluded)

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PHARMACOGNOSTICAL STANDARDISATION OF GUḌŪCĪ SATVAM WITH HPTLC PROFILE

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Abstract: Guḍūcī (*Tinospora cordifolia*) is a well recognised plant and its satvam (extract) is used in many āyurvedic formulations. As it is scarcely available in the market, chances for adulteration are high. Identification of the medicine is one of the most imperative criteria for the assurance of quality and reliability. The pharmacognostic investigations were carried out in terms of organoleptic and microscopic examination. Analytical study was done in stipulations of physicochemical and HPTLC study by optimizing the solvent system. The findings give referral information for the correct identification and standardisation of guḍūcī extract.

Introduction

In recent years the demand of herbal medicine has increased globally. The total export of it has increased far above the ground. But we stand at third after Canada and China.[1] The key impediment behind the acceptance of āyurvedic medicines in developed countries is the lack of quality control and proper documentation. Considering the employ and export of āyurvedic drugs, the government of India has specified the rules and regulations related to standardisation of drugs. In the year 2000, Government has issued notification of Good Manufacturing Practices[2] (GMP) specifying authentic, contamination free genuine raw materials and manufacturing processes to ensure the product with desired quality standards.[3] With this background, a study was carried out to standardise guḍūcī extract (extract of *Tinospora cordifolia*) on certain parameters, organoleptic, physicochemical and phyto-chemical assessment with HPTLC profile.

Aims and objectives: - To standardise the identification and purity of guḍūcī extract by pharmacognostic study including organoleptic, microscopic and physicochemical with HPTLC profile.

Materials and methods

Collection and preparation

Fresh stem of guḍūcī was collected from nearby areas of the institute. Stem cuttings were properly identified in the Pharmacognosy division of department of Dravyaguṇa using external morphological and histological characters.[4] The extract was prepared as per the procedure given in Yogaratnākara (Rājayakṣamā Cikitsā) and The Ayurvedic Formulary of India.[5] The yield of guḍūcī extract was found 3 to 4 percent on an average.

**Deptt. of Dravyaguna, V.P.S.V. Ayurveda College, Kottakkal*

Organoleptic characters: - The result of organoleptic evaluation is shown in the Table 1.

TABLE 1
Organoleptic characters

Characters	Characteristics
1. Touch	Fine and smooth
2. Colour	White
3. Taste	Tasteless / sweet
4. Odour	Odourless
5. Consistency	Fine powder

Powder microscopy

Starch grains of guḍūcī showed deep blue colour when mounted with Iodine solution. Every particle of the extract was separated from each other. The shape of the extract particles were not similar and found varied in size from one another. The photographs were taken by using Canon digital camera attached with Zeiss microscope. The size of starch grains of guḍūcī were approximately 5.0 to 11.0 micron in diameter and 6 to 12 micron in length.[6] (Fig. I a&b)

Physicochemical evaluation

The tests were performed as per the guidelines of the Ayurvedic Pharmacopoeia of India[7] and the results are shown in Table 2.

Chromatography

Pre-coated TLC silica gel 60 F_{254} (E. Merck) plates on aluminium sheet were used for chromatographic profile. The HPTLC fingerprinting[9] of methanolic extract of guḍūcī extract was done at QA Division, R&D, Arya Vaidya Sala, Kottakkal.

TABLE 2
Physicochemical standards and % of extractives

Description	%	Remarks
1. Total ash	1.00	
2. Water insoluble ash	0.70	
3. Acid insoluble ash	0.47	
4. Loss on drying	6.0	
5. Hot water soluble	54.50	Colourless /Dry
6. Cold alcohol soluble	22.40	Light lemon /Oily
7. Hot alcohol soluble	39.00	Light lemon /Oily

Selection of mobile phase for HPTLC

Before the application of the methanolic extract of guḍūcī extract to the plate, an appropriate solvent system was selected through trial and error method. Toluene, ethyl acetate and formic acid were used in the ratio 7:5:1.

Application of sample

CAMAG Automatic TLC sampler IV was used for application of sample and the concentration of sample extractive was 0.6 micro litres.

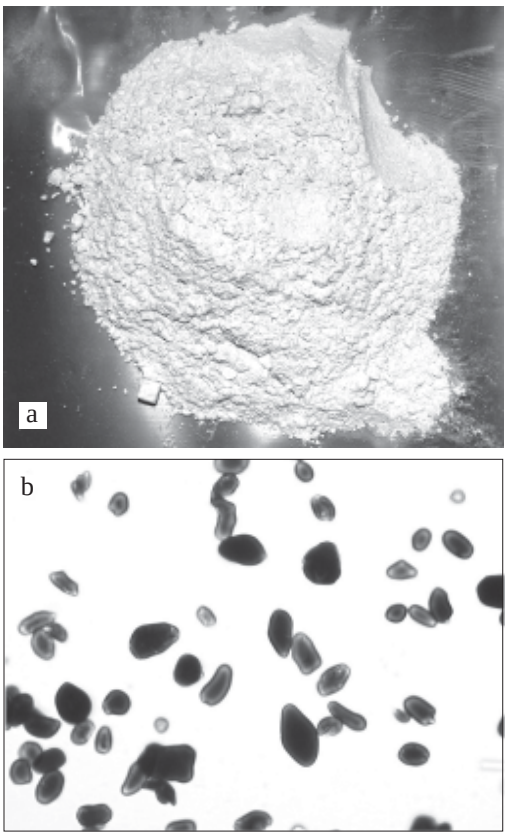

Fig. Ia&b
a - Guḍūcī satvam; b - Microscopy

Pre-conditioning

Saturation of chamber was done by keeping filter paper for 30 minutes prior to the development for getting better Rf values. For this, CAMAG ADC-2 Automatic development chamber was used.

Development and drying

After development, the plates were taken out and the mobile phase was completely removed from the plate by drying in vacuum desiccator.

Detection and visualization

Detection under UV light is the first choice, so the TLC plate was visualized in CAMAG TLC Visualizer and photographs were taken in 365 nm. wave length. Since very dim spots were obtained in visible light, the TLC plate was sprayed with Anasaldehyde sulphuric acid and dried in hot air oven at 110°C (Fig. II). The colours of the spots were recorded and their positions were marked. The distance travelled by band was measured and respective Rf value was calculated (Fig. III & IV). (Rf value: 0.80, Colour: Light orange)

Discussion

The organoleptic evaluation, microscopic characters, physicochemical analysis and HPTLC profile considered here can be used for judging the adulteration and purity of guḍūcī extract. As these parameters are invariable and any alter in these standards are suggestive of substitution and adulteration. No any data related to standardisation of guḍūcī extract is available hence the present effort will be constructive for future research and upholding the quality and purity of drugs.

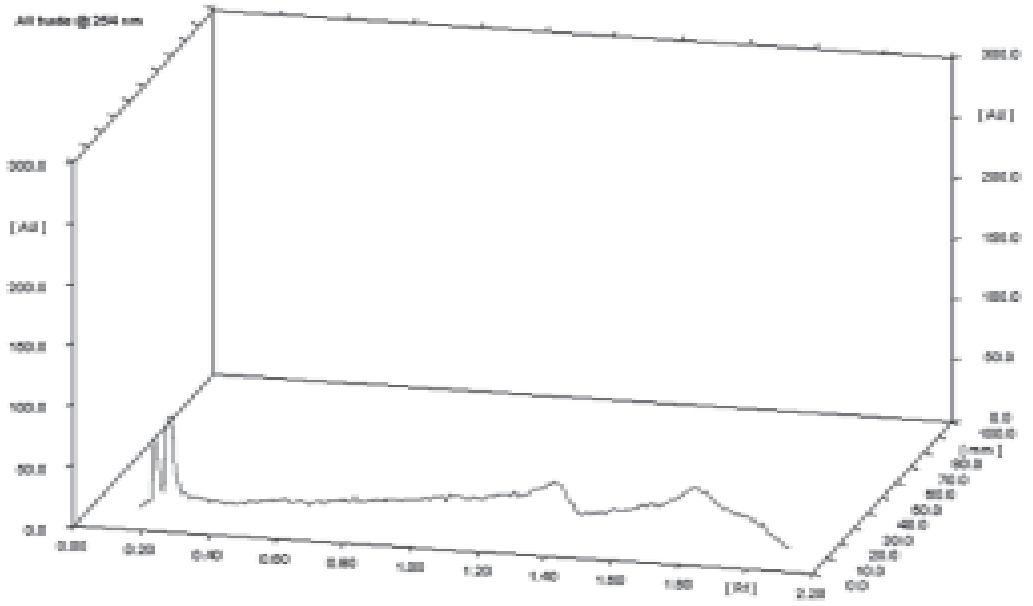

Fig. III
Densitogram of methanolic extract of guduci extract (254 nm)

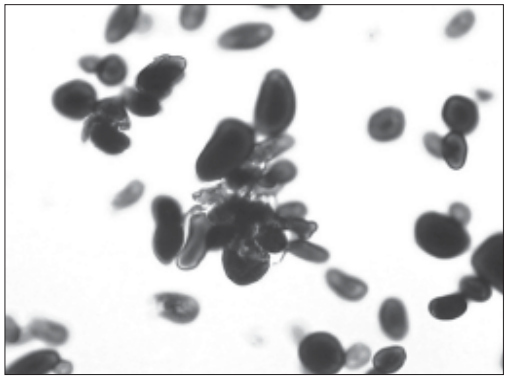

Fig. II
Guduci satvam - Macroscopy

Conclusion

- In the preparation, the yield of guḍūcī extract was found between 3 to 4 percent.
- Starch particles of guḍūcī showed blue colour when mounted with Iodine and size was recorded between 5.0 to 11.0 micron in diameter and 6 to 12 micron in length.
- Physico-chemical standards showed purity and quality of the subjected material.
- TLC of methanolic extract of guḍūcī extract showed one band with Rf value 0.8 cm.

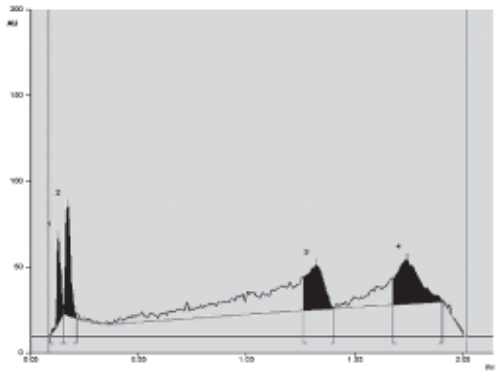

Fig. IV
HPTLC profile of methanolic extract of guḍūcī extract (366 nm.)

- HPTLC finger print showed more than four peaks in methanolic extract of guḍūcī extract.

Acknowledgement
The authors are thankful to Mr. Rajesh S. Mani, Manager, QA, Research and Development, The Arya Vaidya Sala, Kottakkal, Kerala for his guidence.

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SCREENING OF ANTIMICROBIAL ACTIVITY OF ĀNANDABHAIRAVARASA

Manjunath S. Gavimath, P.P. Dindore, R.S. Hiremath and Gaurav Desai*

Abstract: Ānandabhairavarasa is a potent herbo-mineral preparation containing śuddha hiṅguḷa (cinnabar), gandhaka (sulphur), ṭaṅkaṇa (borax), vatsanābha (*Aconitum napellus*) and jambīra svarasa (juice of *Citrus lemon*). Its effectiveness in jvarātisāra, which is roughly correlated to infectious diarrhoea, is well known. We know that *E. coli* causes severe intestinal inflammation, abdominal pain and often high fever and also micro-organisms like *Staphylococcus aureus*, *Entamoeba histolytica*, etc. cause infectious diarrhoea. A physico chemical analysis of Ānandabhairavarasa and a comparative study of its antimicrobial activity with two market samples were carried out by using *S. aureus* and *E.coli* and *C. albicans*. The results showed that Ānandabhairavarasa has a significant anti-bacterial activity.

Introduction

The present day lifestyle of man has made a way for many micro-organisms to invade different systems of his body and cause various diseases. Infectious diarrhoea or what can be correlated to the disease jvarātisāra in āyurveda is also one among such diseases. Injudicious use of antibiotics has further compounded the problem by developing resistant strains of microorganisms. Effective and safe antimicrobial medicines are the need of the present day. In this regard antimicrobial activity of Ānanda-bhairavarasa was evaluated as it is used as a drug of choice in jvarātisāra since long time.

Aims and objectives

- To prepare Ānandabhairavarasa by adopting standard pharmaceutical processing techniques according to classical reference (Rasayogasāgara)
- Physico chemical analysis of the prepared formulation.
- To evaluate the antimicrobial activity of the prepared formulation in comparison with two market samples.

Materials and methods

Ānandabhairavarasa:- Fine powders of purified - i) hiṅguḷa (cinnabar), ii) vatsanābha (*Aconitum napellus*), iii) ṭaṅkaṇa (borax), iv) gandhaka (sulphur) - and v) trikaṭu (*Zingiber officinale*, *Piper longum* and *Piper nigurm*) - each 100 gm - were mixed, to which 600 ml of jambīrasvarasa (juice of *Citrus lemon*) was added. The mixture was then subjected to bhāvana for continuous 6 hours and the guñjapramāṇa vaṭi so prepared

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were dried under shade.

Antimicrobial study: - Standard analytical procedures were adopted to assess the physico chemical characters of the prepared formulation. Two different methods viz. Cup-plate diffusion method and macrodilution broth susceptibility test were adopted for antimicrobial study.

Cup-plate diffusion method

Test organisms used in this study were i) *Staphylococcus aureus* (gram +ve), ii) *Escherichia coli* (gram -ve) and iii) *Candida albicans*.

Test solution: - Solution of two concentrations i.e. 0.1mg/ml and 0.5 mg/ml were prepared; 0.1 mg of drug was taken and dissolved in 1 ml of hot distilled water to get 0.1 mg/ml and 0.5 mg was dissolved in 1 ml of hot water to get 0.5 mg/ml concentration solution.

Culture medium: - About 27 gm of readymade antibiotic medium number 5 (Muller Hinton Agar - Himedia) was dissolved in distilled water (1000ml) by gentle heating

Experimental procedure: - The sterile borer was used to prepare the cups of 8 mm diameter and 0.1 ml of solution of each concentration was added to the cups with the help of micropipette. The plates were kept at room temperature for effecting diffusion of drug dissolved and they were incubated at 37±1°C for 24 hours. The presence of definite zones around the cup of any size indicated antibacterial activity. The control was run simultaneously to assess the activity of hot water which was used as the vehicle for drug powder and the diameter of the zone of inhibition was measured and recorded.

Macrodilution broth susceptibility test

Preparation of stock solution: - Accurately weighed 10 mg of powder sample of prepared standard drug and two market samples were taken in test tubes and 1 ml of distilled water added through a micropipette. The mixture was warmed on a hot water bath and the stock solution of 10 mg/ml was prepared.

Experimental procedure: The sterile tubes were selected and serially labelled as 1 to 7. Mueller Hinton broth (5 ml) was added in tubes No. 2 to 7 and 0.5 ml of stock solution was added in tube No.1. Then 0.5ml solution was discarded from tube No.7 and the bacterial count was adjusted to 105 organisms per ml by comparing with Mac Furlands standards. 0.5 ml of bacterial suspension was added to all 7 tubes through micropipette and the tubes were incubated at 37°C overnight. The turbidity, indicative of resistance, was observed and values recorded. The last tube in the series that showed clearance was considered break point or minimal inhibitory concentration (MIC) value.

Results and discussion

On trituration with the bhāvanadravya i.e. jambīrasvarasa, the mixture of the ingredients turned to reddish brown. The prepared vaṭis were dried in shade to avoid brittleness. The final product was smooth to touch and lavaṇa, kaṭu, kaṣāya rasa were identified on tasting. The percentage of total Hg was 18.73% and that of total Sulphur was 12.30%. The pH was slightly alkaline at 7.34. (Table 1)

The anti-bacterial study was carried out on one gram +ve and one gram -ve strain of bacteria i.e.

TABLE 1
Organoleptic characters and analysis of Ānandabhairavarasa

Parameters	Observations / Values
I. Organoleptic characters	
- Colour	Reddish Orange
- Smell	Pleasant
- Touch	Fine powder
- % of acid insoluble ash	1.47% w/w
- Ash value	15.00% w/w
- % of volatile matter	15.61 % w/w
- pH	7.24
II. Analysis	
- Mercury	12.3% w/w
- Sulphur	18.73% w/w
- Free Sulphur	Nil
- Borax	1.01% w/w
- Iron as Fe_2O_3	0.17% w/w
- Calcium	0.977% w/w
- Phosphate as PO_4	Nil
- Silica	0.95%w/w
- Potassium	0.48% w/w

S. aureus and *E. coli* which are causative organisms for infective diarrhoea. All the three samples showed activity against *S. aureus* and *E. coli*. 0.5 mg/ml solution of prepared standard drug solution showed better results on *S. aureus* and *E. coli* as compared to market samples (Table 2).

The antifungal activity of all three samples was tried at 0.l mg/ml and 0.5 mg/ml concentration on *Candida albicans*. Minimal activity of all three samples was found as compared to standard allopathic drug in both concentrations (Table 3).

All the samples exhibited minimal inhibitory concentration (MIC) against both strains, where

TABLE 3
Result of standard allopathic drugs on organisms

Standard drugs	*Sa*	*Ec*	*Ca*
1. Oflaxacine (2 mcg/ml)	20	22	-
2. Ampicillin (10 mcg/ml)	18	19	-
3. Gresiofulvin	-	-	17

Sa - Staphylococcus aureus; Ec - Escherichia coli; Ca - Candida albicans

the prepared formulation showed MIC at 1.25 mg for *S. aureus* while both the market samples show MIC of 10 mg. For *E. coli*, the prepared sample and one market sample showed MIC at 2.5 mg and other market sample showed MIC at 5 mg. The prepared drug shows better MIC values as compared to the market samples. And Ānandabhairavarasa exhibits better activity against *S. aureus* than *E. coli* (Table 4).

Conclusion

Preparation of Ānandabhairavarasa is easy and

TABLE 2
Results of cup-plate diffusion method

Compound	*S. aureus* (+ve)		*E. coli* (-ve)		*Candida albicans*	
	0.1 mg/ml	0.5 mg/ml	0.1 mg/ml	0.5 mg/ml	0.1 mg/ml	0.5 mg/ml
1. Prepared	12 (0.66)	11 (0.61)	14 (0.64)	14 (0.68)	1 (0.5)	1 (0.5)
2. Market Sample I	8 (0.44)	10 (0.55)	11 (0.50)	13 (0.59)	0 (-)	2 (0.12)
3. Market Sample II	6 (0.33)	11 (0.61)	12 (0.55)	13 (0.59)	1 (0.05)	1 (0.05)

Zone of inhibition in mm

TABLE 4
Result of microbroth susceptibility method

Organism	mg/ml							MIC Value
	10	5	2.5	1.25	0.612	0.3	0.5	
S. aureus	S	R	R	R	R	R	R	10
	S	R	R	R	R	R	R	10
	S	S	S	S	R	R	R	1.25
E. coli	S	S	R	R	R	R	R	5
	S	S	S	R	R	R	R	2.5
	S	S	S	R	R	R	R	2.5

economical as the constituent drugs are easily available. The qualitative and quantitative analysis showed the organoleptic characters within standard values. The prepared formulation has significant antibacterial activity on *S. aureus*. and *E. coli* as compared to market samples. Minimal activity was observed on *Candida albicans*.

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ANDROGRAPHIS PANICULATA (BURM. F.) NEES - A PHYTOPHARMACOLOGICAL REVIEW

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Abstract: *Andrographis paniculata* is one of the most commonly used medicinal herbs in traditional Indian medicine so also in Chinese herbalism. *A. paniculata* is called Creat in English and is known as the "king of bitters." It grows in hedge rows throughout the plains of India and is also cultivated in gardens. Biologically active ingredients of Creat have diverse applications. These compounds belong to the natural products called flavinoids, glycosides, alkaloids, saponins. This review gives a bird's eye view mainly on distribution, phytochemistry and pharmacological activities of *Andrographis paniculata* plant extracts.

Introduction

Andrographis paniculata is well known in India and it is one of the most versatile medicinal plants having a wide spectrum of biological activity. Its taxonomic position is as follows:

Kingdom - Plantae
Subkingdom - Tracheobionta
Division - Magnoliophyta
Class - Magnoliopsida
Subclass - Asterids
Order - Scrophularials
Family - Acanthaceae
Genus - Andrographis
Species - paniculata (Burm. f.) Nees

Morphology

Andrographis paniculata is one of the most important drugs in the traditional system of medicine. The genus contains of 20 species of procumbent herbs or small shrubs. It has common names as king of bitters, the creat (English), qasabhuva (Arabic), kalamegha, mahatikta (Bengal), kalmeg (Hindi), chairayata (Marathi), kariyatu (Gujarati), kiriyātta and nilaveppu (Malayalam) and kirātatikta and bhūnimba (Sanskrit). It is native to tropical Asia, throughout India and Ceylon.

The plant *A. paniculata* is an erect branched, 0.3-0.9 m high, branches sharply quadrangular, often narrowly winged in the upper part; leaves 5-7.5 by 1.2-2.5cm long; lanceolate, acute, glabrous, slightly undulate, pale beneath, base tapering, main nerves 4-6 pairs, slender, petiols 0-6 mm long; flowers are small, solitary, distant, in lax spreading axillary and terminal recemes or panicles; calyx 3 mm long, sepals equal, linear lanceolate, glandular pubescent; corolla rose coloured, 1cm long hairy outside, 2 lipped rather more than half way down, tube 5 mm long,

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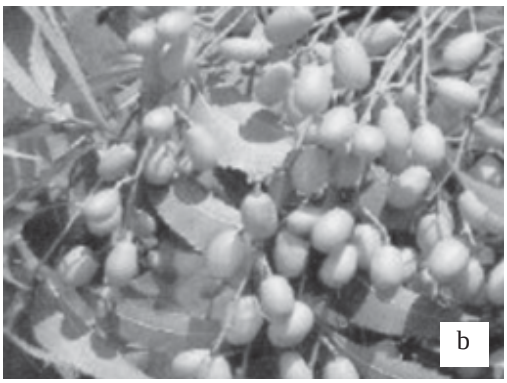
slightly enlarged below the limb; anthers beared at the base; ovary glabrous, style slightly pubescent. Capsule 20 by 3 mm, linear oblong, acute at both ends; seeds numerous, subquadrate, osseous rugosely pitted, glabrous yellowish brown.[1] (Fig. Ia-d)

Ethnobotanical uses

Traditional medical systems: - This bitter shrub is well known as kālamegha and forms the principal ingredient of a household medicine called *Alui,* extensively used in Bengal. The expressed juice of the leaves together with certain spices such as cardamoms, cloves, cinnamon, etc. is dried in the sun and made into little globules which are prescribed for infants to relieve griping, irregular stools and loss of appetite. The plant is very useful in general debility, dysentery and certain forms of dyspepsia. The roots and the leaves are febrifuge, stomachic, tonic, alterative and anthelmintic. Green leaves with the leaves of Indian birthwort (*Aristolochia bracteolata)* and the fresh inner root-bark of country sarsaparilla made into an electuary, is used by Hakims as a tonic and alterative in syphilitic cachexia and foul syphilitic ulcers. The Yanadees, a



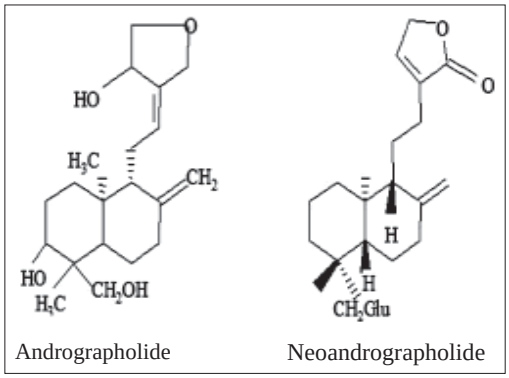


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Fig Ia-d. *Andrographis paniculata*
a) Flower; b) Seeds, c) Leaves; d) Structures of andrographolide and neoandrographolide

wondering gypsy tribe in the Madras presidency, constantly carry a supply of pills made of creat fresh leaves and the pulp of the ripe tamarind, which they consider antidotal to the venom of cobra. A pill made into a paste with water is applied to the bitten part and some of it is put into the eyes, two pills are given for a dose every hour or two internally. A saturated infusion of the whole plant in a dose of about half a pint is administered to fever patients by the *Mundas* of Chota Nagpur. (Encyclopedia mundarica*) A. paniculata* has been reported as having antibacterial, antifungal, antiviral, choleretic, hypoglycemic, hypocholesterolemic and adaptogenic effects.[2]

Modern uses: - A primary use of *A. paniculata* is for the prevention and treatment of the common cold. It has antithrombotic actions, suggesting a possible benefit in cardiovascular disease.[3]

Pharmacological activities

Hepatoprotective activity

Andrographolide, given by oral route, possessed dose-dependent (3-12mg/kg) activity in rats against galactosamine-induced hepatic damage. The hepatoprotective activity in isolated rat hepatocytes (*ex-vivo)* was assessed by observing an increase in the viability and rate of oxygen consumption. Anticholestatic effect was indicated by an increase in bile flow and by the normalisation of its contents (bile salts and bile acids). Andrographolide was found to be slightly more active than silymarin.[4] The paracetamol-induced decrease in volume and contents of bile was prevented significantly by andrographolide pretreatment. It was found to be more potent than silymarin, the clinically used hepato-protective agent.[5] The crude aqueous extract (2%) of the plant showed inactivation of HBsAG positive serum samples in *in vitro* studies in 48-120h at 37°C which was tested by counter immunoelectrophoresis and latex agglutination methods.[6] The extract was reported to increase biliary flow and liver weight and decreased the duration of action of hexobarbitol. When compared with phenobarbitol it was less potent at the doses employed.[7] The LD_{50} of andrographolide in male mice was found to be 11.46 gm/kg *i.p.*[8] Andrographolide was found to be more potent than silymarin, the standard hepatoprotective agent.[9] The liver marker enzymes were found to be lowered in animals supplemented with the extract while there was an increase in the protein content. Further, the aqueous extract of the leaves significantly inhibited BHC-induced hepatotoxicity, as determined by liver weight, liver alkaline phosphatase (AP) and glutamyl transpeptidase, alanine amino transferase (ALT), aspartate amino transferase (AST), glutathione and lipid peroxidise levels. Hepatoprotective activity of the extract was confirmed and suggested to be due to antioxidant action.[10] The paracetamol-induced decrease in volume and contents of bile was prevented significantly by andrographolide pre-treatment. It was found to be more potent than silymarin, the clinically used hepatoprotective agent.[11] The maximum stimulation of these disaccharides were obtained at 6h of either the leaf extract or the andrographolide administration. Further, it was also noticed that the extent of activation of the disaccharides with the leaf extract or the andrographolide, both at higher and lower doses followed the order : a) maltase greater than sucrase greater than lactase in duodenum and

b) maltase greater than lactase greater than sucrase in jejunum and ileum. Long term administration (for 7, 15 and 30 consecutive days) of either the leaf extract (500 mg/kg/day *p.o*.) or andrographolide (5 mg/kg/day *p.o.)* stimulated lactase, maltase and sucrase in all parts of the small intestine. Maximum stimulation of lactase and maltase was noted after 30 concecutive days of treatment while sucrase exhibited maximum activation after 15 consecutive days of treatment with either the leaf extract or andrographolide.[12] The leaves (0.5 g/kg administered orally once a day or for six days) were evaluated in CCl_4- induced liver damage in rabbits. There was a marked clinical recovery from liver damage and significant reduction in AST and ALT enzyme levels was reported. The leaves extract normalised enzyme levels by day 17. Hypoglycaemia and hypercholesterolaemia were also observed in CCl_4-induced toxicity.[13]

Respiratory system benefits

A. paniculata has reviewed to be superior to placebo in alleviating the subjective symptoms of uncomplicated upper respiratory tract infection (URI) and being preliminary evidence of a prevalence effect.[14] There was reasonably strong evidence from clinical trials to suggest that *A. paniculata* was effective in reducing the severity and the duration of URI when treatment was started within the 1st 36-48 hrs of symptoms.[15]

Antihyperglycemic and hypoglycemic effects

Ethanol extract, administered orally twice daily for 14 days to streptozotocin induced diabetic rats found significantly reduced fasting serum glucose and increased body weight in a dose-dependent manner. The extract also significantly lowered levels of thiobarbituric acid-reactive substances in liver and kidney compared to vehicle-treated rats, while significantly increasing the activity of superoxide dismutase and catalase enzymes and hepatic glutathione concentrations in diabetic rats.[16] Andrographolide appears to dose-dependently reduce plasma glucose concentration in streptozotocin-induced diabetic rats and normal rats, with a more marked effect in normal rats than in diabetic rats.[17] *In vitro* experiments (Wibudi *et al*) concluded that the hypoglycemic effect of *A. paniculata* is due to insulin release from pancreatic ß-cells through ATP-sensitive potassium channels, similar to other insulinotropic antidiabetic agents.[18] Available evidence suggests that the hypoglycaemic and antihyperglycemic activities of the extract and andrographolide may involve different mechanisms in normal and diabetic conditions.

Antioxidant activity

The *A. paniculata* and *Tinospora cordifolia* leaf extracts were found to possess enzymatic antioxidants such as catalase, peroxidase, superoxide dismutase, glutathione-s-transferase, and glutathione reductase and polyphenol oxidase activity. *A. paniculata* is highly antimicrobial and its antioxidant potential is maximum when compared to *T. cordifolia.*[19]

Analgesic activity

Andrographolide at 300mg/kg dose administered orally showed significant ($p<0.05$) analgesic activity in acetic acid-induced writhing in mice and Randall Sellito's test in rats. It was devoid of any analgesic activity (at 30, 100 and 300 mg/kg, administered orally) in hot plate test in mice.[20]

Immunostimulant activity

The ethanolic extract and purified diterpene

andrographolide induced significant stimulation of antibody and delayed type hypersensitivity response to sheep red blood cells in mice. The plant preparations also stimulated non specific immune response of the animals measured in terms of macrophage migration index (MMI), phagocytosis of ^{14}C-leucine lebelled *Echerechia coli* and proliferation of splenic lymphocytes. The stimulation of both antigen specific and non specific immune response was however of lower order with andrographolide than with the ethanolic extract, suggesting thereby that substance(s) other than andrographolide present in the extract might also be contributing towards immunostimulation.[21]

Anti-allergic activity

Andrographolide significantly decreased degranulation of mast cells of rats and reduced liberation of histamine from the cells when tested *in vitro* at concentration of 30, 100 and 300 ìg/ml. It was found to produce an increase in delayed hypersensitivity in rats.[22]

Antivenom activity

Methanolic extracts of *A. paniculata* and *Aristolochia indica* plants were tested for antivenom activity against *Daboia russelli* venom. Various pharmacological activities including oedema, haemorrhagic, coagulant, fibrinolytic and phospholipase activities were studied and these pharmacological activities were significantly neutralised by both the plant extracts. The above observations confirmed that *A. paniculata* and *A. indica* plant extracts possess potent snake venom neutralising capacity and could potentially be used for therapeutic purposes in case of snakebite envenomation.[23]

Antipyretic activity

The plant juice (2 ml/100g bw orally) showed antipyretic activity in yeast induced pyrexia in rats. The extract administered even after 5h of yeast also reduced pyrexia. The control rats were fed saline. In another study the watery solution of the ethanolic extract of the plant (500mg/kg bw) produced antipyretic activity against yeast induced pyrexia. The results were comparable in efficacy to that of 200mg/kg aspirin.[24]

Antimalarial activity

The alcoholic extract of the plant was found to possess schizontocidal activity (39.26%) *in vivo* as well as (46.23%) *in vitro* at a dose of 1 g/kg 4d and 100 ìg/ml, respectively against the NK 65 strain of *Plasmodium berghei* in *Mastomys natalensis*.[25] Chloroquine which was used as a positive control, produced 100 per cent inhibition at a dose of 10 mg/kg. The four diterpenes were also tested *in vitro* to examine their direct action against *Plasmodium berghei* using a 25 ìg/ml concentration. All the four compounds showed 40-54% inhibition whereas chloroquine at this concentration produced 61.3±6.7% inhibition. Chemoprophylactic activity of neoandrographolide was tested using different protocols. Fifteen days of therapy with neoandrographolide before infection suppressed the paracitaemia.[26]

Microfilaricidal

The water decoction of the leaves was tested both *in vitro* and *in vivo* against canine filariasis and found the decoction killed *in vitro* the microfilariae *Dipetalonema reconditum* in 40 min. Three injections of the extract into infected dogs at 0.06 ml/kg bw s.c. reduced the number of microfilarae in blood by more than 85%. The larvae were not totally eliminated with more injections but the reduced microfilarial leved persisted. No toxic effect of the extract was

observed in rabbits. The treated dogs became lethargic initially for a week, probably due to the mass killing of microfilariae.[27]

Antidiarrhoeal activity

The activity was further located in n-butanol fraction, which contained four diterpenes, andrographolide, neoandrographolide, deoxyandrograholide and andrographiside. Among the four diterpenes, andrographolide and neoandrographolide showed similar activity to loperamide against *E.coli* enterotoxins. Andrographolide was found to be superior against ST enterotoxin, the most common cause of epidemics of neonatal diarrhoea.[28]

Effects on reproductive systems

A number of animal studies report the effect of *A. paniculata* on male and female reproduction. Early reports of oral administration of powdered stem indicated an antifertility effect in male Wistar mice, but no impact on fertility in female mice.[29&30] It has also been reported that administration of *A. paniculata* resulted in abortion in pregnant rabbits.[31] Burgos *et al* has reported that dried extract of *A. paniculata* induces uterine relaxation by blocking voltage-sensitive calcium channels.[32]

Anti-bacterial effect

The extracts have showed significant antibacterial activities against both Gram-positive and Gram-negative bacterial strains tested. *A. paniculata* extracts have bactericidal characteristic against most of the Gram positive bacteria and bacteriostatic activity against both Gram negative and Gram positive bacteria. *A. paniculata*'s antibacterial potential to treat skin frailties efficaciously has reported.[33]

Anti-inflammatory activity

Study reports that it significantly inhibited carragenin-, kaolin-, and nyastatin- induced paw oedema in rats. Andrographolide at the highest dose significantly inhibited the weight of granuloma induced by cotton pellet and decreased oedema (38.6 %) in Freund's complete adjuvant-induced arthritis. It also reduced the intensity of the peritoneal inflammation produced by acetic acid in mice, indicating it's ability to inhibit the permeability of small blood vessels. Andrographolide did not produce any gastric lesions.[34]

Anthelmintic activity

The aqueous extract of the plant showed nematicidal activity against the root knot nematode *Meloidogyne incognita* on tomato both *in vitro* and in pot.[35]

Ameliorating activity

Immunological and biochemical studies carried out to investigate protective effects of ethanolic extract of *A. paniculata* against cyclophosphamide (CTX) induced toxicity *in vivo* suggests that extract could reduce the CTX-induced intestinal damage. The level of proinflammatory cytokine TNF-á, which was elevated during CTX administration, was significantly reduced by the *A. paniculata* extract administration. The lowered levels of other cytokines like IFN-ã, IL-2, GM-CSF, after CTX treatment were also found to be increased by extract administration.[36]

Conclusion

The empirical data of numerous studies conducted on different parts of *A. paniculata* on various activities such as hepatoprotective, anti-inflammatory, analgesic, antidiabetic, etc. testify its multidimensional use in Indian traditional medicine. Among all, it is widely used as a hepatoprotective, although this plant has

not yet developed as a drug by pharmaceutical industries. This review simply proves the various qualities of *kalamegha.*

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SĀMĀNYA ŚODHANA OF PĀRADA (MERCURY) AND ITS NAMBURI PHASED SPOT TEST

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Abstract: The main ingredient in most of the rasauṣadis is pārada (mercury). It is said that mercury extracted from hiṅguḷa (cinnabar) is the best to use in such preparations. Today natural cinnabar is not available and the market sample of pārada may not be pure as claimed. In this context, the purity of market sample of pārada was checked by Namburi Phased Spot Test at different stages of sāmānyaśodhana (general purification). It was seen that the purity of pārada reduce after sāmānyaśodhana.

Introduction

Pārada (mercury) is the nucleus ingredient in almost all rasauṣadhis. Hiṅguḷotthapārada (mercury extracted from cinnabar) is recommended for almost all rasa-preparations. Extraction of pārada from hiṅguḷa (cinnabar) is a tedious and expensive process, especially in case of large-scale production. Today due to unavailability of natural hiṅguḷa and so also availability of different pārada samples in the market, hiṅguḷotthapārada is out of use. Despite the claim of purity of market sample, it is advised to use only after sāmānyaśodhana as not only to purify but to increase the potency also. In this study, branded pārada was procured from the market and subjected to sāmānyaśodhana using sudhā (lime), laśuna (*Allium sativum*) and saindhava (rock salt). The changes during the śodhana procedure were noted. Namburi Phased Spot Test (NPST) was adopted for the qualitative test of the pārada.

Materials and method

The methodology was divided into two parts viz. 1) sāmānyaśodhana (general purification) of pārada and 2) NPST of pārada.

Sāmānyaśodhana

The sample of pārada of a branded company (which claimed to be of 99.99% pure) was subjected to sāmānayaśodhana.[1] Pārada and sudhācūrṇa (lime powder) - 230 gm each - were subjected to mardana (trituration) in a clean khalvayantra (mortar and pestle). After 17 hours of mardana, the sudhācūrṇa became heavier and the colour was changed from white to gray. Mardana was continued for another 9 hours and stopped when the colour of cūrṇa turned to be completely gray and the pārada homogeneously mixed with sudhācūrṇa. Total hours of mardana done were 26.5 hours. Pārada was then separated from sudhācūrṇa (which weighed 185 gm, with a loss of 45 gm) and 5 gm taken out for analysis. Then the remaining pārada was mixed with saindhava (90 gm) and laśuna (180 gm) and continued the mardana. After two hours of continuous mardana the colour of the kalka (paste) turned to blackish, which was initially

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yellowish. At the end of mardana, shining of the pārada found considerably high. After śodhana procedure, total pārada obtained was 170 gm and 10 gm was lost, which may be due to jalagati (loss with water).

NPST

Raw pārada sample (RP), śudha mardita pārada sample (SMP) and pārada after mardana with saindhava and laśuna i.e śuddha pārada (SP) was subjected to NPST.[2]

Procedure: - 0.5 gm of pārada sample was taken into a centrifuge test tube. 0.5 ml of 5N HNO_3 was added to it drop by drop and heated for one minute. It was kept in the stand for 50 hours, shaken now and then and was then allowed to settle down till a clear supernatant layer was formed. One drop from the clear layer was taken and put on 10% potassium iodide paper (prepared by using Whatman's filter paper No.1) and the colour changes on the papers were observed in 3 phases: (Fig. 1)

1st phase : 0 to 5 minutes
2nd Phase : 5 to 20 minutes
3rd Phase : 20 minutes to 1 day

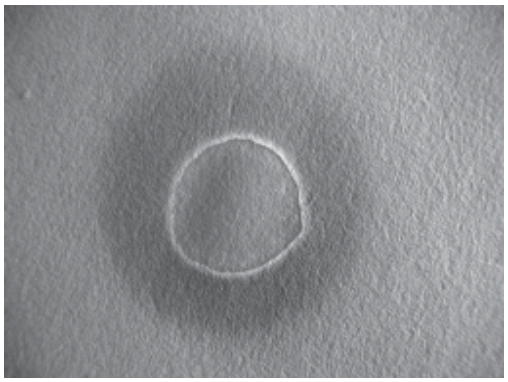
Observations and results

1. Sample RP

- 1st phase (0-5min): On putting the drop on the paper, a wet brown central spot spread outside.
- 2nd phase (5-20min):- Spreading of the drop stopped and it turned to brick red spot with white outer ring.
- 3rd phase (20 min-24 hours):- The brightness of brick red spot reduced slightly but the white ring around remained.

2. Sample SMP

- 1st phase (0-5min):- On dropping on the paper, a wet brown central spot was spread outside.



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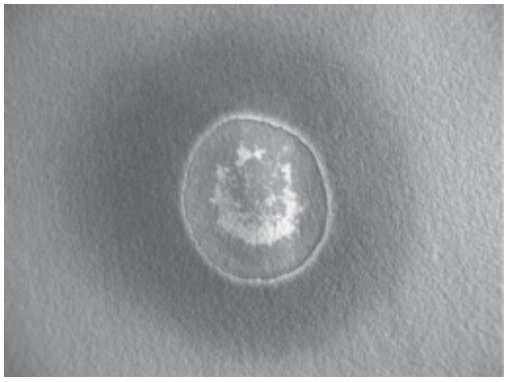

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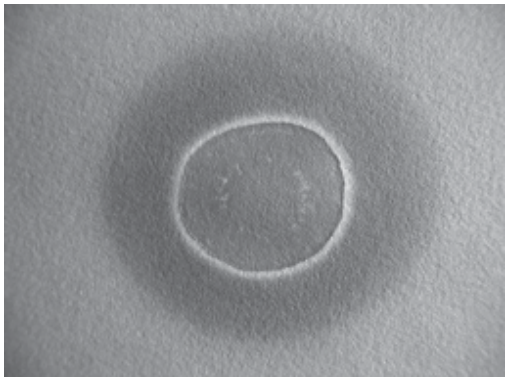

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Fig. I - Different samples of pārada on NPST
a) Raw pārada; b) Śuddha pārada;
c) Śudha mardita pārada

- 2nd phase (5-20min):- Spreading of the drop was stopped and brick red spot was seen at the centre with white outer ring.
- 3rd phase (20 min-24 hours):- The brightness of brick red spot reduced and there were some white bleached areas on the brick red spot.

3. Sample SP

- 1st phase (0-5min):- On putting the drop on the paper, a brown wet central spot spread outside.
- 2nd phase (5-20min):- Spreading of the drop stopped. White outer ring was seen in this sample too. But the important point noted was the considerably big white bleached area on the central brick red spot.
- 3rd phase (20 min-24 hours):- The brightness of brick red spot reduced and the bleached white area was clearer than the 2nd phase.

The Hg% in the raw sample was 99.99% and after śodhana, when it was analyzed by AAS, it was reported to be 93.24% (Table 1)

TABLE 1
Analysis of Hg % in parada samples

Parada	Result (%)
Before sodhana	99.99
After sodhana	93.24

Discussion

The analysis of pārada showed 6.75% reduction in Hg% after śodhana which is due to the prolonged triturating with sudhā (lime), paste of saindhava (rock salt) and laśuna (*Allium sativum*). The NPST results support this finding. Initially, when raw pārada was subjected to the test, brick red spot was seen, but in śudhā mardita pārada, there were few white bleached spots which increased considerably in śuddha pārada sample. Though it seems the purity of pārada is reduced slightly, śodhana step is necessary to increase its potency therapeutically.

Conclusion

NPST is a qualitative test is used for many of the rasauṣadhis today. This test can be used to check the quality of the pārada sample also.

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ĀMALAKĪ AS RASĀYANA - A REVIEW

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Abstract: Āmla or Indian gooseberry holds highly regarded place in āyurvedic texts. The empirical data has testified its multifaceted properties. It is the most concentrated and bio-available source of Vitamin C in nature. It has a high concentration of aminoacids and minerals. Important tannins found in āmalaki are ellagic acid and gallic acid, a naturally occurring major antioxidant polyphenol.

Introduction

Indian gooseberry (*Phyllanthus emblica*), is a medium-sized (8 to 18 m in height) deciduous tree belonging to Euphorbiaceae family, native to India and the Middle East. The fruit is greenish yellow and is usually available from October and finishes up in April. It is known as amṛtphala in Sanskrit, means the fruit of heaven or nectar fruit because it is rich in many desirable qualities.

English names:- Emblic myrobalan-tree, Indian gooseberry. Indian names: amalkamu, uririkai (Andhra Pradesh); amlaki, amluki (Assam); amla, amlaki (Bengal); amali, ambala (Gujrat); amla, aonla (Himachal Pradesh); amla, aonla, onilika (Hindi); amalaka, nelli (Karnatka); nelli (Kerala); alathanda, khondona, anola (Orissa); aonla (Punjab); ādiphala, dhātri, āmalaka, śrīphala, vṛttophala (Sanskrit); nelli (Tamilnadu).

Nomenclature due to its medicinal properties: Āmla - sour in taste; kalpavṛkṣa - the plant which cure all disorders; amṛtaphala - the fruit used for regeneration; rasāyani - that with rasāyana properties; āmalaki - sustainer of health; dhātri - 'nurse' as it nourishes human health; amṛta - 'nectar' because of its nutritive and rejuvenative value.

Nomenclature due to its physical properties: Sūkṣmapatra - the plant with small leaves.

Free radical theory is one of the most important theories of ageing. Free radicals damage the body in many ways. To remove the free radicals antioxidants are the drug of choice. Ageing is caused by chain reaction of free radicals which destroy healthy molecules and in turn convert the healthy molecules into free radicals.

Āmalaki contains plenty of anti-oxidants. Caraka has described (Śā. 25/43) āmalaki as the best vayasthāpaka (that which restore age) drug. Although fruits are reputed to contain high amounts of ascorbic acid (Vitamin C), 445 mg/ 100g,[1] the specific contents are disputed and the overall antioxidant strength of āmla may derive instead from its high density of tannins and other polyphenols.[2] The fruit also contains flavonoids, kaempferol, ellagic acid and gallic

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acid.[2&3] The antioxidants in āmalaki are powerful free radical scavengers thus denuding the cells of harmful toxins.

Chemical composition

The taste of āmla is sour, bitter and astringent and is quite fibrous. Āmla is highly nutritious and is an important dietary source of Vitamin C, minerals and amino acids. The edible fruit tissue contains protein concentration 3-fold and ascorbic acid concentration 160-fold compared to that of the apple. The fruit also contains considerably higher concentration of most minerals and amino acids than apples. Glutamic acid, proline, aspartic acid, alanine, and lysine are 29.6%, 14.6%, 8.1%, 5.4% and 5.3% respectively of the total amino acids. The pulpy portion of fruit, dried and freed from the nuts contains: gallic acid 1.32%, tannin, sugar 36.10%; gum 13.75%; albumin 13.08%; crude cellulose 17.08%; mineral matter 4.12% and moisture 3.83%. Āmla fruit-ash contains chromium, 2.5 ppm; zinc 4ppm and copper, 3ppm.[4]

Key -active constituents

Emblicanin A&B, Puniglucanin, Pedunculagin, 2-keto-gluconolactone (Vitamin-C equivalents). Ellagic acid, Hexahydroxy-diphenic acid and conjugates.[4&5] (Fig. I)

Pharmacological actions

A pilot study has demonstrated reduction of blood cholesterol levels in both normal and hypercholesterolemic men.[6] Another has probed the effects on a formula containing āmla on memory, total serum cholesterol levels and brain cholinesterase activity in mice. The research concludes that "Āmla cūrṇa is proved to be a useful remedy for the management of Alzheimer's disease on account of its multifarious beneficial effects such as, memory improving property, cholesterol lowering property and anticholinesterase activity".[7] Among other benefits, the study has reported that āmla has *in vitro* antiviral and antimicrobial properties[8], as well as a possible efficacy in relieving or treating inflammation, cancer, age-related renal disease and diabetes.[9-11] Other research has linked āmla to the inhibition of Aldose Reductase (AR) and the possible prevention of secondary complications of diabetes including cataract.[12] According to researchers: "The inhibition of AR by āmalaki tannoids is 100 times higher than its aqueous extract and comparable to or better than quercetin. Furthermore, the isolated tannoids not only prevented the AR activation in rat lens organ culture but also sugar-induced osmotic changes. These results indicate that tannoids of āmalaki are potent inhibitors of AR and suggest that exploring the therapeutic value of natural ingredients that people can

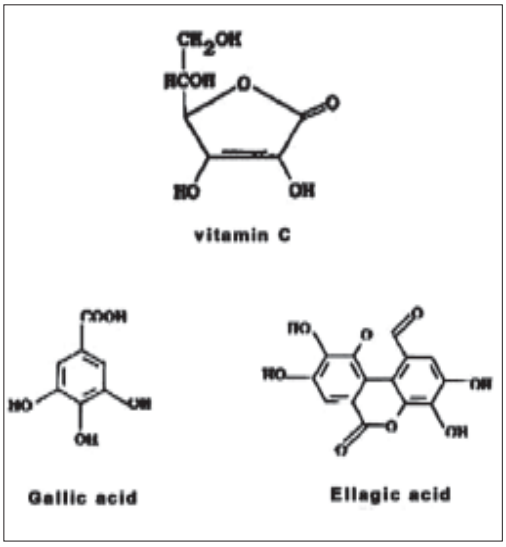

Fig. I
Key-active constituents

incorporate into everyday life may be an effective approach in the management of diabetic complications." Another study has revealed that āmla plays a part in the prevention of dyslipidaemia and oxidative stress in the ageing process.[13] Several animal studies have shown that āmla can help prevent a toxic build-up of heavy metals caused by frequent exposure to metals like aluminium lead and nickel. When vitamin C alone was used equivalent to that found in āmla fruit, only partial protection from heavy metals was provided. However, when whole āmla fruit was used almost complete protection was achieved thus indicating that it is the combined action of various ingredients found in the fruit that effectively helps shield DNA from heavy metal poisoning.[14] The use of āmla as an antioxidant has been examined by a number of authors (Bhattacharya; Chaudhuri). Experiments conducted at the Niwa Institute of Immunology in Japan have shown amla to be a potent scavenger of free radicals. The studies showed that āmla preparations contained high levels of the free-radical scavenger, superoxide dimutase (SOD), in the experimental subjects. (Treadway)

Properties and action

- Rasa: - It contains all the six tastes except lavaṇa (salty) but amḷa (sour) dominate over the others.
- Vipāka (post digestion effect):- madhura (sweet)
- Vīrya (potency): - Śīta (cool and calm)

Rasāyana: - The word for rejuvenation in āyurveda is rasāyana, which literally means the path of rasa. "To walk the path of rasa it is necessary to purify and nourish physical rasadhātu, since rasa is the raw material from which other dhātus are formed. Healthy rasadhātu is the physical production of healthy śukra, from which ojas is directly produced. Careful selection of food tastes (rasas) and control of emotions (rasas) ensures production of healthy rasadhātu and therefore healthy śukra and ojas".[15] Rasa is described as 'one which has the capacity to assimilate and enhance all dhātus and which is praised for the alleviation of old age, disease and death'.[16] Rasāyanas enhance ojas, the most refined product of digestion and metabolism. Ojas is equated with immunity and strength. The more ojas your digestion produces, the greater your immunity to disease. By strength of ojas, the muscle tissue becomes full, all movements become free and perfectly coordinated, voice and complexion become clear, the activity of the organs of action and the sense organs become intelligent and evolutionary (Suśrutasamhita). Rasāyanas convert easily into ojas and infuse qualities of ojas into the body. Rasāyana is a mainstay of āyurveda in prevention and therapy of diseases of old age. Āmla is an example of Vātātapikarasāyana i.e. the rasāyana which can be administered even if the individual is exposed to the wind and the sun.

Therapeutic uses

Āmalaki is specific to pitta due to its sweet taste and cooling energy. However, it balances vāta by virtue of its sour taste, and kapha due to its astringent taste and drying action. It enhances digestion (dīpanapācana), relives constipation alleviates asthma (śvāsahara), strengthens the heart (hṛdya), benefits the eyes (cakṣuṣya) stimulates hair growth (romasañjana), enlivens the body (jivanīya) and enhances intellect (medhya).[19]

- Provides a stronger immune system[20]
- Enhances the body's food absorption
- Balances stomach acids
- Assists liver in elimination of toxins
- Lowers cholesterol
- Reduces fevers
- Acts as a desired aphrodisiac
- Controls blood sugar
- Provides nourishment to the brain and boosts mental functioning
- Acts as a cardiac stimulant
- Nourishes and strengthens the lungs
- Prevents constipation and encourages regular elimination
- Acts on endocrine system
- Acts like a natural diuretic
- Conditioner for the skin and hair[21]
- Increases metabolism
- Increases vitality
- Flushes out toxins from the body.

Āmalaki for active ageing

Active ageing is the process of optimizing opportunities for health, participation and security in order to enhance quality of life as people age. It applies to both individuals and population groups (WHO, Active Ageing: A Policy Framework). Active ageing aims to extend healthy life expectancy and quality of life for all people as they age. Although efforts are being made to increase the average life span of individuals by treating their illnesses with modern medicine, it is still more important to improve the quality of life in elderly by easing their age related symptoms thus maintaining their autonomy and independency. Ayurveda offers new avenues to promote positive health and graceful ageing. Pollution, processed foods, and everyday stress deplete the body of nutrients which need to be replaced. As a rejuvenative herb, āmla nourishes all the body tissues and accelerates the cell regeneration process. It also cleanses the rasadhātu (plasma) and raktadhātu (blood). Āmalaki is given the status of prime rasāyana as "āmalakam vayastāpanānām". At its core, āyurveda aims to empower every individual by placing the ability to heal back into their own hands. Through the use of plant origin medicines, healthy dietary practices, and sensible lifestyle routines, āyurveda embodies an unparalleled "whole health" approach to life and healing. Indian gooseberry is the source of Oxygen free radicals (OFRs) have now been implicated as important pathologic mediators in many clinical disorders. A free radical (oxidant) is an atom or a molecule that contains one or more unpaired electrons. The misbalance between OFRs and antioxidants results in cellular damage. Progressive accumulation of free radical throughout life causes ageing. They cause random damage to DNA, RNA, proteins and enzymes, induce polymeriozation of membranes and are capable of eventually causing cell death.[22]

Thus, it can be concluded that in adults, anabolic and catabolic, that is 'wear and tear' processes, a balance each other is to be maintained. By improving the qualities of tissues, the balance is maintained for a longer period delaying the onset of ageing. In old age the faster catabolism speeds up ageing processes. By improving the qualities of the tissues with rasayana therapy, ageing can be slowed down. These rasāyanas are special gifts of āyurveda to mankind for prolonging life, retaining youthful vigour in old

age and preventing diseases. But rasāyanas are effective only in persons with detoxification of body and mind which can be acquired with the Pañcakarma technique and Ācārarasāyana of āyurveda.

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CONCEPT OF ANXIETY IN UNANI MEDICINE - A REVIEW

M.A. Siddiqui, M.A. Quamri and M. Arshad Jamal*

Abstract: Though anxiety has long been recognised as a prominent symptom of many psychiatric disorders, until the last part of the nineteenth century, it was not classified separately from other disorders of mood. In Unani medicine, psychiatric disorders are dealt in detail under the heading of *amraze nafsaniya* where it is described by various symptoms of psychic faculty and their distortion due to the involvement of vitiated humours. There is no direct description of anxiety disorders in texts but symptoms resembling anxiety are described under various mental disorders.

Introduction

Knowledge of human behavior or mental disorders can be traced back to Greek and Roman sources. As is evident from mythology and the Homeric and other epics, mental illness was often considered due to involvement of gods, especially in early Greece.[1&2] It was the Hippocrates (460-370BC) who firstly postulated the concept of disease due to imbalance of humors and hence emphasised on natural knowledge and at the same time de emphasised the concept that gods were involved in the disease causation.[1-4] He classified mental disorders into three categories as mania, melancholia and hysteria.[5] Rabban Tabri has classified mental disorders into 13 types in his book Firdausul hikmah such as *sa'ra, waswasah, hizyan, fasade khayal, fasade aq'l, nisyan, bedaari, kasrate neend, dawi, duwar* etc.[6] Same number of mental diseases has been mentioned by Rhazes in his book Kitabul Fakhir.[7]

Anxiety disorders are, as such, not mentioned in Unani literature but their symptoms either separate or with cluster of others in different diseases are described under various headings like *malekholia, waswas, mania, sahar, tawahhush, hizyan, ishque* and *khafqan*, etc.[6,8-10]

The term *izterab* is used for anxiety[11] in Arabic and Unani texts and the word *nafsani* is added to *izterab* to specify its psychological state. Literally *izterabe nafsani* stands for worry, fear and excessive thinking. It is also used in the sense of hindrance in routine work.[10]

Aetiopathogenesis

The pathogenesis of diseases has been attributed to three factors viz. *mizaj* (temperament) *tarkeeb* (structure) and *ittesal* (continuity of tissues). Abnormalities of these factors are considered as: *sue mizaj* (altered temperament), *sue tarkeeb* (altered structure), *tafarruqe ittesal* (discontinuity in tissues).[12,13]

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Mizaj is a specific and distinct state of an individual reflecting neuroendocrine, genetometabolic and somatoenvironmental equilibrium at the optimum functional level of adjustment.[14] The harmony of specific *mizaj* results in proper and healthy functioning of the body and derangement in this distinct state consequently becomes the cause of ill health, producing different disease conditions.[15] The derangement of *mizaj*, results from the shift in the equilibrium of four qualities (*kaifiyate arba*) i.e. *haraarat* (hotness), *baroodat* (coldness), *ratoobat* (moistness) and *yaboosat* (dryness) is considered as *sue mizaj sada* and if this imbalance is at the level of *akhlat* (body fluids/ humors) it will be considered as *sue mizaj maddi*.[15]

Unani medicine, as is well known, based on the Hippocratic humoral theory. This theory supposes the presence of four humuors in the body viz. blood, phlegm, yellow bile and black bile. The *mizaj* of individuals are expressed by word *damawi* (sanguine), *balghami* (phlegmatic), *safrawi* (choleric) and *saudawi* (melancholic) according to the preponderance of the humour in them. Every person is supposed to have a unique humoral constitution which represents his healthy state. Any change in this brings about a change in his state of health.[16]

There are three major *quwa* (faculties) which regulate human body viz. *quwwate nafsania* (psychic faculties), *quwwate haivania* (vital faculties) and *quwwate tabiyya* (physical faculties). These *quwa* (faculties) are specific for a particular tissue or organ on which the specific functions of that organ depend. *Quwwate tabiyya* is concerned with *taghzia* (nutrition), *namu* (growth) and *tawleed* (reproduction) and *jigar* is considered *uzwe raees* (epicenter) of this *quwwat*. *Quwwate haivaniya* is concerned with *tadbeer* of *rooh*, which brings life to the part it supplies. *Qalb* is *uzwe raees* of this faculty. *Quwwat nafsania* is concerned with intellect, sensory and motor functions and *dimagh* is supposed to be seat of this faculty.[10,17-19]

Quwae nafsania (psychic or mental faculties) are those faculties which perform intellectual, sensory and motor function of the body,[19] consists of two main faculties and stand as genus for them. These are *quwae mudrikah* (perceptive/cognitive faculties) and *quwae muharrikah* (motor faculties). *Quwae mudrikah* (perceptive/cognitive faculties) is also of two types viz. *quwae mudrikah zahira* (external perceptive faculties) and *quwae mudrikah batinah* (internal perceptive faculties). External perceptive power is sensory and related to five external senses such as vision, hearing, smell, taste and tactile sensation, whereas, internal perceptive faculties are concerned with the intellectual functioning of the brain.[10,13,17-19]

According to Ibn Sina (Avicenna) and his followers, who accepted the views of ancient philosophers rather than the physicians, the internal perceptive faculties are five in number and are as follows: [10,13,17-19]

1. *Al hiss al mushtarak* (faculty of composite sense)
2. *Al khayal* (faculty of imagination)
3. *Al wahimah* (faculty of apprehension)
4. *Al hafizah* (faculty of memory)
5. *Al mutasarrefah* (faculty of ideation)

Al hiss al mushtarak is the faculty where all sensations converge, which reacts to their form and in which their forms combine. Retention and

memorisation of the forms of the things is performed by *quwat al khayal*. *Quawat al wahima* percepts the meaning of things by process of analysis and the storage of the meaning of the things perceived by *Quawat al wahima*, and it is performed by *quwat al hafizah*. Creation of abstract ideas, imagination and thoughts are concern with *quwat al mutasarrefah*.[10,18,19]

Quwae mudrikah batinah (internal perceptive faculties) are also called as *quwae siyasiyah* or *qawae mudabberah* (faculty of planning).[10,19,20] Ali Ibn Abbas Al Majoosi and other physicians classified them only into three categories viz: *quwwate takhayyul* (faculty of thought), *quwwate fikr* (faculty of thinking) and *quwwate zikr* or *hafiza* (retentive faculty), considering first two and last two as a single faculty.[10,13,17-19]

Unani physicians have divided the brain into three functional areas i.e. fore brain (*muqaddam dimagh*), mid brain (*ausat dimagh*) and hind brain (*oakhkhar dimagh*). These areas have particular respective *quwas* (faculties) e.g. the fore brain has the *quwwate takhayyul* (faculty of thought), mid brain has *quwwate* fikr (faculty of thinking) and hind brain has *quwwate zikr* or *hafiza* (retentive faculty).[1,8,18-22]

Ibne Rushd in his book Kitab al kulliyat, states[20] thus:

"If a disease occurs in whole brain all the three faculties along with their functions becomes defective. If disease limits to specific area of the brain, the defect will occur in that particular faculty only. For example, if the disease is in anterior part of the brain then *quwwate takhayyul* (faculty of thought) becomes defective, similarly if mid brain is affected then it has to be counted a defect in *quwwate fikr* (faculty of thinking). *Quwwate zikr* or *hafiza* (retentive faculty) becomes defective if there is an abnormality in hind brain".

Ibn Zuhar mentioned in his book 'Kitab al taiseer' that "whenever any pathology occurs within the fore brain, it tends to delirium, and alteration of thoughts as a result of which the patient starts thinking in an antagonistic way. Minor pathology in the mid brain may results in severe complications such as exaggerated thinking and mental disturbances which make the brain unable to have a proper and specific decision.[23]

Brain gets influenced easily due to its *barid ratab mizaj* (cold and wet temperament). The brain diseases are either primary due to *sue mizaj dimagh* (abnormal temperament of brain) itself or secondary to involvement of its adjacent organs (*aazae musharika*) i.e. heart, stomach, liver, etc. In case of acute fevers the upward movement of gases from stomach can also affects the brain. Sometimes the abnormality of brain may be associated with inflammation of diaphragm or with inflammation of cardiac end of the stomach.[7,20,23]

Abnormalities in the *mizaj* of the brain may be with or without involvement of humours (matter), first one is *sada* and later one is *maddi*. Both conditions produce pathology and affect the *af'ale siyasiyah* and *mudabbirah*.[8]

According to Ibne Rushd:[20]

"Three types of defects are likely to occur in these faculties of brain viz. i) *butlaan* (cessation of faculty), ii) *nuqsaan* (deficiency in faculty) and iii) *tashweesh* (altered and exaggerated functioning of faculty)."

The *butlan* (cessation) or *nuqsaan* (deficiency) of these faculties occurs either due to abnormal

cold and wet temperament (*sue mizaj barid ratab*) or simply due to abnormal cold temperament (*sue mizaj barid sada*) and this abnormal temperament causes obstruction within the vessels and passages, which renders the *rooh* to penetrate in the brain properly.[8,20]

Altered and improper functioning of these faculties occurs due to *safrawi* (bilious) or *saudawi* (black bilious) abnormal temperament. The dominance of bilious temperament in brain results in abnormal/vicious thoughts, sleeplessness, abnormal movements, defect in *quwwate fikr* (faculty of thinking) and *quwwate zikr* or *hafiza* (retentive faculty).[20]

The abnormal temperament due to black bile produces palpitation, anxiety, stress, grief, pain, false perceptions, misconceptions and fear of unknown objects. If this abnormal temperament takes place due to burnt black bile (*saudae mohtreqa*) then the complications will be admired with complications of altered bile (*safra*) like bravery, abnormal movements and features of madness. The disease occurring due to abnormal black bile (*sue mizaj saudawi*) is mainly referred as *malekholia*".[20]

Clinical features

It has been observed that in Unani system various psychiatric disorders manifest such symptoms which are similar up to some extent with anxiety, where as initial stage of *malekholia* is very much similar to the features of anxiety. As mentioned by Ibn Sina:[24]

"Clinical features of initial stage of melancholia are false thinking, unrealistic fear, quick anger, preference to loneliness, palpitation, dizziness and tinnitus".

Razi has illustrated the features of initial stage of *malekholia* in these words:[22]

"If a person suffers from worry, apprehension, sadness along with appearance of irrational thoughts, it suggests that it is the initial stage of *malekholia*". The symptoms which are mainly present in this disease are:[8,9,21,22,24,25,26]

- Fearfulness
- Excessive worry
- False perceptions
- Low self esteem
- Vague sense of apprehension
- Social isolation and loneliness
- Loss of pleasure in virtually all activities
- Irritability
- Feeling of tightness in chest
- Restlessness
- Sleeplessness
- Irregular small and slow pulse, etc.

Management

Unani system of medicine has described a well organized line of treatment in the management of diseases. The fundamental principle in the treatment is to restore the normalcy of patient, correction of imbalance of *mizaj* and to restore the balance of humors in the body by evacuation of excessive and deranged humors.

In the management of *izterabe nafsani* the following pattern of treatment are prescribed by Unani physicians:

1. Correction of *sue mizaj* and elimination of excessive humour
2. Removal of the predisposing causes
3. Dietary management

Correction of *sue mizaj* and elimination of excessive humors

Sue mizaj is considered as the basic cause of Izterabe Nafsani. This may appears in three different forms:[6,8,11,20-22,27]

i) *sue mizaj haar sada*, ii) *sue mizaj safrawi* and iii) *sue mizaj saudawi*.

In *sue mizaj haar sada* there is excess *hararat* (heat) in the body especially in the brain, so to reduce *haraarate dimagh* some *tadabeer* (regimes) is used to produce *baroodat* (cold) and also some drugs possessing opposite effect on *hararat* such as *musakkinate hararat* (febrifuge) are used.

In *sue mizaj maddi* (*safrawi* and *saudawi*) restoration and normalisation of humors is done by *tanqiya* (*nuzj, istefragh*) and *ta'deele mizaj* with their respective drugs. In *nuzj* (concoction) the *akhlate raddiyah* are altered in order to evacuate conveniently from the diseased organ by using drugs possessing properties of *tahleel, taqtie,* and *talteef*. Once the *akhlate raddiyah* is ready for elimination from the superficial and deeper structure of affected organ after a course of *munzijat, istefragh* (elimination) is brought into action with the help of *mushilat*. *Mushilat* are considered to facilitate the elimination of material out of body.

Ta'deele mizaj is related to restoration and normalisation of physiological functions after eliminating the *akhlate raddiyah* from the affected organ. In this phase of the treatment the altered temperament is brought back to normal along with *muqawwiyate dimagh* drugs by using either alone or with *tadabeer*.[6-8, 21,22,24,28]

Some single and poly herbal drugs generally used by Unani physicians are:-[7,8,21,22,28-32]

Behidana	*Cydonia oblonga*
Khurfa	*Portulaca oleracea*
Tabasheer	*Bambusa arundinacea*
Aalu Bukhara	*Prunus domestica*
Kishneez	*Coriandrum sativum*
Tamar Hindi	*Tamarindus indica*
Kahu	*Lactuca sativa*
Khiyarain	*Cucumis sativus*
Bed Mushk	*Salix capera*
Gule surkh	*Rosa damascena*
Nilofar	*Nymphaea alba*
Bekhe Kasni	*Cichorium intybus*
Unnab	*Zizyphus vulgaris*
Zarishk	*Berberis vulgaris*
Afsanteen	*Artemesia absinthium*
Haleela siyah	*Terminalia arjuna*
Shahtara	*Fumaria parviflora*
Sana Makki	*Cassia angustifolia*
Sibre Zard	*Aloe barbadensis*
Aftemoon	*Cuscuta reflexa*
Badranjboya	*Melissa parviflora*
Maweez Munaqqa	*Vitis vinifera*
Ustukhudoos	*Lavandula stoechas*
Badavard	*Fagonia arabica*
Gaozaban	*Borago officinalis*

Polyherbal formulations used by Unani physicians include *Mufarreh Barid, Dawaul Misk Moatadil, Joshanda Aftimoon, Majoon Najah, Majoon Lana, Itrifal Sagheer, Itrifal Zamani, Sharbat Ahmad Shahi, Sharbat neelofar*, etc.[33-35]

Removal of predisposing causes

It is quite important to remove all the predisposing factors of the disease such as excessive fear, stress, excessive physical exertion, alcoholism, loneliness, etc. For this purpose, the following measures should be adopted:[7,8,21,22,24,27,28]

- A source of recreation should be provided like poetry, music, etc. for keeping patient happy.
- Maintenance of adequate sleeping atmosphere.
- The room should be airy, open and fragrant.
- Correction of liver and spleen disorders.
- Avoidance of alcohol, smoking, etc.

- Abstinence from excess coitus.
- Avoidance of heavy and strenuous work.
- Avoidance of visiting overcrowded, dark and dirty places.
- Avoidance of prolong stay in hot climate.
- Proper care of heart should also be taken into consideration and cardiotonic and *mufarrehe qalb* (exhilarant) drugs should be used.

Dietary management[7,8,21,22,24,28]

- Avoidance of all those items that are *moallide sauda* and *safra* (bile and black bile productive) like stale, salty and astringent food items.
- Intake of light and delicious food items.
- Use of *murattib* (emollient) diet such as barley water, milk, pumpkin, cucumber, leafy vegetables like spinach, lettuce, purslane, etc.
- Use of bilious concoctive fruits such as aalo bukhara, orange, lemon, etc.

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CLINICAL UNDERSTANDING OF ŚUKRADUṢṬI

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Abstract: Śukra, one among the saptadhātus, basically meant for reproduction, also provides the qualities of dhairya, prīti, dehabala, harṣa, etc. Its abnormal state leads to aṣṭaśukraduṣṭi which is associated with niṣpraja, garbhavikṛti, aharṣaṇa and kḷaibya. Male infertility can be defined as an inability to induce conception due to defect in spermatic functions.

Introduction

Āyurveda describes two pathological conditions of śukra viz. śukrakṣaya and śukraduṣṭi. Śukrakṣaya (male hypogonadism) refers to deficiency of one or both of the functions of the testes namely synthesis of testosterone and spermatogenesis, whereas vitiation of śukra is termed as śukraduṣṭi (defects in seminal fluid). All the ācāryas have described 8 types of śukraduṣṭi.

Vataduṣṭi

The śukra vitiated by vāta will have the colour and pain that resembles vātadoṣa; in other words, the śukra will have śyāmavarṇa, aruṇavarṇa or kṛṣṇavarṇa. There will be either delayed ejaculation or ejaculation with pain i.e. specifically toda and bheda. This type of śukra is having the quality of vicchinata. As vātadoṣa does not have specific smell, this variety of śukraduṣṭi also does not have any smell. This type śukra has no potency for fertilization.

The vātajaśukraduṣṭi comprises many clinical conditions such as hemorrhagic injuries, severe oligozoospermia, azoospermia, obstruction of efferent ducts and chronic inflammation of accessory sex glands. Injury to śukravahasrotas or srotomūla may produce semen containing RBC which gives reddish (aruṇa) colour whereas the condition producing blackish semen (kṛṣṇa) cannot be seen in the available literature pertaining to semenology but presence of blood clots may rise to blackish coloured semen. Here in vātajaśukraduṣṭi, the quantity of semen is very low. In a condition where in the blood clots are mixed along with semen, it naturally imparts blackish colour. The rust coloured semen occasionally noticed by patients is often due to congestive seminal vesiculitis.

Another physical character seen is tanu. It means less sperms in semen. Sperm count is directly proportional to opacity of semen i.e. if the sperm count is high then the semen becomes opaque whereas it becomes translucent/transparent with low sperm count (oligozoospermia/azoospermia)

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Rūkṣata is one which may be co-related with increased pH of semen. The normal range of pH of semen is 7.2 to 8.0. Considering alkalinity as kṣāratva and rūkṣa as its property, here increased pH can be considered as rūkṣa. Increase in seminal pH i.e. more than 8.5 indicates chronic inflammatory conditions of prostate, seminal vesicles and epididymis. In vātaja-śukraduṣṭi, alpaśukra or lower ejaculation is due to obstruction in efferent duct system. The block may be either at the level of ejaculatory duct or at vas deferens. If the obstruction is at the level of ejaculatory duct, the volume of ejaculation will be very low i.e. less than 0.5 ml; and the pH will be acidic and associated with the absence of fructose making the fluid almost transparent. If the obstruction is at the level of vas deferens, pH will be alkaline, fructose is present, quality will be within normal limits, but semen will be translucent. Both the above said conditions are azoospermic.

Pittaduṣṭi

The śukra when vitiated by the pittadoṣa, will have the colour and pain that resembles the pitta doṣa i.e. the śukradhātu attains the colours like pīta, nīla and while ejaculation patient experiences burning sensation and pain like oṣa, coṣa, etc.

The above said features resemble acute inflammatory conditions of the testes, where the semen may be yellowish in colour having fetid smell due to the presence of pus cells. The hot nature of semen and burning ejaculation indicates the acute state of inflammation.

Kaphaduṣṭi

The śukra, which is of śukḷavarṇa, atipiccila in consistency, prabhūta (more) in quantity, ejaculated with kaṇḍu, mixed with majjadhātu, that which sinks in water, having viśragandha (unpleasant odour), is said to be vitiated by morbid kapha

The above mentioned features indicate the increased viscosity of semen, which can be seen in case of chronic infections. If the semen is mucoid then some of these features are seen. Presence of antisperm antibodies, higher percentage of morphological abnormal forms may also be equated with this.

Raktauṣṭi

This condition is caused by excessive coitus, injury and wound. It is due to the affliction of rakta. Here the semen contains rakta and will have cadaveric smell (kuṇapa granthi). It reflects the condition hemospermia/hematospermia i.e. blood mixed semen or presence of RBCs in semen. Presence of blood/RBCs can be seen in both vātaja and raktaja śukraduṣṭis. In vātaja śukraduṣṭi only few RBCs may be present which gives aruṇavarṇa and blood clots may also be present that gives blackish (kṛṣṇa) colour to the semen and there may not be change in volume of ejaculation, whereas in raktaduṣṭi semen contains pus cells, precursor cells, macrophages, mucus threads, crystals, gelatinous bodies, bacterial matter and RBCs which are all considered as anyadhātu and the volume of ejaculation is also high. It may be said that in case of vātaja variety the injury may be old whereas in raktaja variety the injury is of recent origin and fresh blood can be seen.

Granthiyukta

Due to suppression of urges śukra gets vitiated by kapha and vāta doṣa and becomes granthiyukta. In this condition, śukra will be incapable of combining with strībīja and progresses slowly and becomes inefficient in

the formation of garbha. This condition can be compared with the unliqufied semen which is found in prostatic dysfunction. The liquefying enzyme seminine is produced by the prostate gland and due to poor prostate lytic activity the seminal coagulum fails to liquefy. Hence the persistent coagulum may trap spermatozoa and restrict sperm motility.

Pūtipūyaśukra

The śukra, when vitiated by the pitta and kapha, leads to foul smell. Here the semen is infected and contains pūya (pus cells). This condition may be seen where there is abundance of leucocytes or positive culture findings, i.e. pyobacteriospermia (pyospermia and bacteriospermia), pus cells>5/HPF, mycoplasma or chlamydia infections. These may be found in urogenital inflammatory disease. Silent infection of semen is triggering factor for asthenospermia and sperm agglutination.

Kṣīṇaśukra

The śukra becomes kṣīṇa when it is vitiated by pitta and vāta. It is explained in Suśrutasamhita (Sūtrasthānam 15 chapter) that the kṣīṇaśukra leads to delayed ejaculation and the ejaculated śukra will be less in quantity associated with little blood. While commenting on this, Ḍalhaṇa has mentioned association of majja also in this variety. Due to dhātukṣaya, vāta is aggravated and leads to mixing of blood with the śukra.

Mūtra-purīṣagandhi śukra

When śukra is vitiated by all the three doṣas simultaneously, it leads to mūtra and purīṣa gandha in śukra (smell of urine and faeces) and it is incurable. The recent literature pertaining to andrology doesn't reveal any such conditions where semen is having the smell of urine or faecal matter. It may be thought that recto-genito-urinary tract fistula may be of this condition.

Other clinical conditions

The other clinical conditions of śukraduṣṭi explained in āyurveda are as follows: -

1. Śukrakṣaya: - It refers to deficiency of one or both the functions of testes namely synthesis of testosterone and spermatogenesis. Suśruta has classified śukrakṣaya into three varieties viz alparetas, kṣīṇaretas and viśuṣkaretas.

Alparetas:- Ḍalhaṇa describes this condition as low level of śukra since birth or below the age of twenty five years. This type of clinical condition is seen in male primary hypogonadism resulted due to chromosomal or congenital causes for e.g., Klinefelters syndrome. Though the level of śukra is below normal since birth, it can be diagnosed only during puberty. In this variety the level of śukra will never touch the normal range.

Kṣīṇaretas: - Here śukra is moderately decreased especially in the middle age due to undefined etiology. In this variety, the growth and pubertal development and the level of śukra may be normal earlier and deficiency occurs later because of etiological factors (other than chromosomal or congenital) such as intake of kaṭu, kaṣāya rasa, chronic debilitating illness, infectons, chemotherapy, etc.

Viśuṣkaretas: - Extremely low level of śukra or the depletion of śukra that occurs physiologically in old age after seventy years. In this condition, pubertal development and the śukra levels are normal and eventually decreased in large. This variety includes two different conditions i.e. severe oligozoospermia irrespective of age and hypo-androgenesity during old age. Spermatogenesis is not severely affected

by ageing whereas androgenic functions of testes are severely affected with the age.

2. Śukrāvṛtavāta & śukragata vāta:- If the vitiated vāta is located in śukrasthāna, then it may cause anejaculation or excessive ejaculation. Here anejaculation can be considered as a result of neurogenic failure of emission and excessive (early or premature) ejaculation due to hyper-sensitivity reflex.

3. Prāṇāvṛtavyāna:- When vyānavayu is covered by apāna, there is excessive discharge of semen, urine and stool. In general, decreased functions of avṛta and increased functions of āvaraka are seen in āvṛtavāta. Similarly, in this particular condition increased function of apānavāta is also seen. Considering the process of ejaculation which is a complex phenomenon involving simultaneous and subsequent sympathetic and parasympathetic stimuli of different organs and structures in the male genital tract and the in co-ordination between sympathetic and para sympathetic nervous systems or rapid ejaculatory reflex, it may be termed as apānāvṛtavyāna.

Conclusion

Śukra vitiated by doṣas is called śukraduṣṭi. A thorough analysis of the aṣṭavidha śukraduṣṭi has referred to in Caraka and Suśruta samhitas. There are subtle differences in naming the type of śukraduṣṭi although the number is same. Caraka has classified śukraduṣṭi on the basis of the characteristics of the pathological semen or abnormal physical characteristics of the semen and Suśruta has clubbed such factors together according to the doṣa vitiation.

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MINOR AILMENTS DURING PREGNANCY AND THEIR ĀYURVEDIC MANAGEMENT

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Abstract: During pregnancy, common problems like nausea, vomiting, constipation, acidity, etc. may encounter which can be managed by simple counselling and treatments. Worries and concerns about the safety of medications prescribed during pregnancy are common in women. Āyurveda provides a number of treatments for these minor ailments which are safe and good for the mother as well as the foetus.

Introduction

During pregnancy, a woman generally faces problems like nausea, vomiting, etc., which can be effectively treated by āyurveda. Ācārya Kaśyapa has devoted two full chapters emphasising proper management of disorders during pregnancy. He says proper management of disorders during pregnancy is helpful for protection and development of both mother and foetus.[1] Hārītasamhita enlists eight disorders during pregnancy viz. śoṣa (emaciation), hṛllāsa (nausea), chardi (vomiting), śopha (oedema), jvara (fever), aruci (anorexia), atisāra (diarrhea) and vivarṇata (discolouration).[2] Here, the following minor problems during pregnancy are considered:

- Nausea/vomiting
- Backache
- Breast discomfort
- Constipation
- Fatigue
- Excessive sweating, feeling of warmth and palpitation
- Leg cramps
- Vaginal discharge
- Groin pain
- Acidity and heart burn
- Varicose vein
- Ankle oedema
- Effects on the urinary tract

Treatment principle

Suśruta and Caraka describe some general principles of treatment of pregnant women[3] such as: They should made use of soft, sweet, cold, pleasant and gentle drugs and dietetics; they should not be given emetics and purgatives; if the disease is acute or serious, emetics should be given followed by use of sweet and sour edibles mixed with anulomaka (carminative) drugs; use of vatsaka (*Holarrhena pubescens*), pipali (*Piper longum*), śuṇṭhi (*Zingiber officinale*) fruit of āmalaki (*Phyllanthus emblica*) and unripened fruit of vilva (*Aegle marmelos*) mixed with curd and sugar are beneficial.

Āyurvedic treatment includes both āhara (diet)

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and vihāra (life-style). Some the minor problems can be managed by both or any one of the above type of treatment. Many of the minor problems during this period are perceived as complications and therefore become matter of concern to the woman. These can be managed by simple medical explanation, counselling, changes in life style, diet and attitudes.

Anaemia

It is one of the most common haematological disorders, some time major, during pregnancy. If it is due to physiological deficiency of iron, then it is a minor ailment, which can be treated by maintaining balanced diet supplemented with oral iron. If it is pathological i.e. due to severe haemorrhage, bleeding disorders, thalassaemias, etc., then it is a major one and needs detailed investigation and proper treatment.

Hb level below 10 gm/dl at any time during pregnancy is considered anaemia. It is of various types, but in obstetrics, deficiency anaemia and haemorrhagic anaemia are more concerned. Deficiency anaemia can be effectively treated by āyurvedic management.

There always remains physiological iron deficiency due to disproportionate increase in plasma volume, RBC volume, Hb mass and extra iron demand especially in the second half of pregnancy. If the Hb% during second half of pregnancy is 10 gm%, RBC - 3.2 milion/mm3, PCV - 30%, peripheral smear shows normal morphology of the RBC with central pallor, it should be maintained by balanced diet i.e. rich in iron, proteins and vitamins, which are easily digestible. Food should preferably be cooked in iron utensils.

Recommended daily intake of iron to pregnant woman is 30 to 60 mg. Foods rich in vitamin C are known to increase iron absorption. Iron from the raw food is absorbed better. (A list of food items that are rich in iron and Vitamin C are shown in Table 1). The diet can be supplemented with āyurvedic preparations consist of iron from second trimester onwards. Daily oral administration of 500 mg of any one of the following, two times daily, is quite effective:

- Punarnavāmaṇḍūr
- Dhātrīlauha
- Saptāmṛtalauha
- Navāyāsalauha
- Tapyādilauha
- Svarṇamākṣikabhasma

Along with this, dīpana pācana (digestive and carminative) drugs should also be given. Oral iron therapy is prescribed from the second trimester of pregnancy. This prophylactic treatment reduces the chances of anaemia in the later part of pregnancy and is also helpful in the management of existing anaemia.

1. **Nausea and vomiting**

Nausea and vomiting are often considered as an unavoidable part of pregnancy. Most of the pregnant woman (70%) experience nausea in the first trimester, usually common in primigravidae. The cause is not clear, but may be due to increase in chorionic gonadotropin or psychological. Symptom mostly occurs in the early hours of the morning. Certain smells are likely to aggravate the symptom. In some women, it may persist throughout the pregnancy. Emotionally unstable women are more susceptible.

Almost all āyurvedic classics mention excessive salivation and nausea etc., as a symptom of normal pregnancy i.e. vyaktagarbhalakṣaṇa. While describing chardi (vomiting),

TABLE 1
Food items rich in iron and vitamin C

1. Iron rich foods*	
Beef	5.5
Turkey meat	4.8
Tuna fish in oil	1.2
Chicken	0.8
Banana	0.5
Grapes	1.5
Guava	0.27
Mango	1.3
Orange	0.32
Sitaphal	4.31
Amla	1.2
Dates	7.3
Raisins	7.7
Almonds	4.4
Dried figs	4.0
Spinach	3.5
Green peas	1.4
Potato	1.4
Turnip greens	2
Beet, mustard, kale	2
Raw husked rice	4
Raw undermilled rice	2.2
Raw milled rice	2
Jowar	4.1
Bajra	8
Ragi	3.9
Bengal gram	4.6
Black gram	3.8
Red gram	2.7
Soyabean	10.4
2. Foods rich in vitamin C	
Amla	600
Guava	212
Lime	63
Orange	30
Tomato	27
Cabbage	124
Spinach	28
Brinjal	12
Cauliflower	56
Potatoes	17
Raddish	15
Bengal gram (germinated)	16

*Iron (mg) per 100 gm food

Suśrutasamhita enlists pregnancy also as a causative factor under its fifth type i.e. āgantuja chardi, dauhṛda is also enumerated in etiology.[4] Ḍalhaṇa has explained that non-fulfillment of dauhṛda and presence of foetus cause vomiting. In Madhukośa Commentary it is mentioned that vāyu, being pushed upward by foetus, gets provoked and causes vomiting.[5] For its management, assessment of relative predominance of various doṣas should be made.

The above mentioned etiopathogenesis clarify three specific causes for vomiting during pregnancy viz. vātavaiguṇya, dauhṛda avamanana (non-fulfillment of desires) and garbhanimitta (due to foetus).

Vātavaiguṇya:- Vāta denotes nervous system including psychology of individual. Thus its abnormality may cause vomiting by increased or abnormal reflex action. Thus it can be considered as reflex and psychogenic factors for causing vomiting during pregnancy.

Dauhṛda avamanana (non-fulfillment of desires):- Normally, those substances are desired by the woman which she lacks. Non-fulfillment of the desire for such substances may produce certain deficiency and may cause vomiting.

Garbhanimitta (due to foetus):- When there is no other demonstrable cause, then vomiting occurs either due to immune response of woman for trophoblastic hormones or idiopathic.

Treatment

- Āśvāsan cikitsa (counselling)
- Advice to prefer solid food
- Eat a piece of toast or biscuit on awakening (before getting out of bed)
- Take small feeds frequently
- Have desired fruits
- Avoid fried, fatty and distasteful food

- Nausea is relieved by intake of grounded bhūnimba (*Swertia chirayita*) with honey.
- Vomiting is relieved by intake of i) grounded bhūnimba with equal quantity of sugar ii) a paste prepared out of dhānyaka (*Coriandrum sativum*) mixed with kāṭi (rice water) and sugar, iii) cardamom (*Elettaria cardamomum*) along with honey.
- Use of Mayūrpicchabhasma (250-500 mg) along with Sītophalādi cūrṇa (3gm) twice daily is very effective in curing both nausea and vomiting.
- Dāḍimāṣṭakacūrṇa (3-6 gm) twice daily increases appetite and relieves nausea
- Chardiripu vaṭi (250 mg) or Bilvādi lehyam (1 tsp) twice daily is effective.
- Mātuḷuṅga rasāyana is also effective
- Vomiteb syrup (2 tsp) thrice daily is beneficial.
- The diet should be light, sweet with little quantity of fat and salt. It should be taken in the regular intervals in small amounts followed by little quantity of water.

Allopathic anti-emetics drugs like metoclopramide, domperidone, cisapride and ondansetron should be avoided during pregnancy.

2. **Breast discomfort**

Most women often experience heaviness, tingling and discomfort or tenderness in their breasts during early pregnancy. This occurs due to hormonal changes causing hypertrophy and enlargement of the ductal and alveolar system and increased vascularity of breast. With the advancement of pregnancy, breasts progressively increase in size and there is increase in pigmentation, formation of secondary areola and appearance of Montgomery tubercles. Sometimes a clear secretion may be oozing from the nipples.

While describing the formation of placenta, Suśruta and Vāgbhaṭa explain that due to obstruction of orifices of ārtavavahaśrotas by foetus, the ārtava goes upwards, gets accumulated and forms placenta; the left over ārtava moves further upwards and helps in the development of breast and increases black pigmentation of areola, lips, etc.[6]

Treatment

It is a physiological change therefore, it needs no treatment. Only simple explanation and counselling are sufficient. Patient should be advised to wear loose clothes.

3. **Backache**

Nearly 50% of pregnant women suffer from backache. Exaggeration of the lumbosacral lordosis due to protrusion of the abdomen caused by the enlarging gravid uterus leads to backache in pregnancy. With the advancement of pregnancy, there is a steady increase in the load on the abdominal and back muscles causing swaying of the pelvis and flat feet and thus cause backache. Heavy works involving bending, lifting heavy weights and twisting of spine cause backache. Backache will be more in those who have been suffering from it prior to pregnancy.

Backache during pregnancy can be divided into: a) physiological or b) pathological. Physiological backache in pregnancy is located in the lumbosacral region; it is diffuse in distribution and not associated with any sensory or motor deficiency. Pathological causes include - slipped disc, spondylolisthesis, osteoarthritis and osteophytic growths. This gives rise to localized pain. Associated radiating pain to the lower thighs and abdomen may also be present. Point of pain can be localised on palpation.

Treatment

- Avoid bending, lifting heavy weights and strenuous activity.
- Avoid wearing high heeled footwear.
- Muscular spasm, urinary infection and constipation can also cause backache. So treat them accordingly.
- Massaging the back muscles with vatāhara oils like Mahānārāyaṇa tailam or Pañcaguṇa tailam or Daśmūla tailam and taking proper rest relieves pain due to muscle spasm.
- Diet should contain enough green leafy vegetables, grains, fruits and nuts.
- Correct posture, use of hard bed and yoga are also helpful.
- Avoid stress
- All pathological backaches should be referred to an orthopaedic surgeon.

4. **Constipation**

Many women complain of constipation after onset of pregnancy. This occurs due to rising level of progesterone which affects the motility of the smooth muscle of the gut and the reduced level of motilin hormone leads to reduce peristalsis and a greater degree of stasis. Increased fluid absorption due to pregnancy and the effects of medications like haematinics further increase the problem.

Treatment

- Counselling about bowel movements
- Pay attention to bowel urge/do not ignore it.
- Do exercises to tone up body muscles
- Diet should be in adequate quantity and it should be rich in fibre content, green leafy vegetables and fruits.
- Drink plenty of fluids - at least 10 glasses per day
- Eat raw fruits except papaya
- Lemon juice with water before breakfast may be helpful
- Herbal/āyurvedic medicines act as bulk purgatives and are safe during pregnancy (e.g. Isabgol - 1 tsp at night with lukewarm water)
- Avipattikara cūrṇa (5gm) with lukewarm water two times daily after meals is also beneficial.
- Intake of drākṣa (2-4 Nos) added in lukewarm milk at night relieves constipation.
- Tṛphalā cūrṇa (6 gm) with lukewarm water at night relieves constipation.
- Caraka and Vāgbhaṭa have mentioned management of vibandha (constipation) occurring due to udāvarta during pregnancy. It is treated with vātahara and snigdha annapāna along with use of anuvāsana basti with oil prepared with madhuka. If it is not cured by this procedure then nirūhabasti should be given.

5. **Fatigue**

Tiredness, fatigue and disinclination to attend to daily domestic chores are also common in pregnant woman. This problem is further aggravated by emotional factors, sympathy seeking and coping day to day problems along with disturbed food and sleep. These features are similar to the features of sadyograhita garbha (recently conceived pregnancy) described in āyurvedic classics.[7]

The signs and symptoms of recently conceived woman are fatigue, languor, thirst, lassitude of thighs, etc.

Treatment

No specific treatment is required.

- Reassurance
- Advice to take adequate rest
- Avoid stress
- Take proper diet and sleep

6. **Feeling of warmth, excessive sweating and palpitation**

These symptoms often occur and may mimic hyperthyroidism. They occur due to HCG and thermogenic effects of progesterone. Thyroid profile should be done to rule out hyper-thyroidism.

Treatment

No treatment is needed.

- Rest in cool and calm place
- Wear loose cotton clothes

7. **Vaginal discharge**

During pregnancy most women experience vaginal discharge. This is attributed to the increase in vascularity of the vaginal walls during pregnancy. If the discharge is excessive, curdy or yellowish white in nature and accompanied with symptoms like vulval pruritis or dysuria or both then an examination of the discharge for candidal/trichomonal vaginitis should be done and suitable treatment prescribed. In advanced pregnancy, copious watery discharge must raise the suspicion of amniotic fluid leak following premature rupture of membranes. Collection of this fluid on the blade of the speculum and its examination will reveal the fluid to be alkaline with presence of fetal squames in it.

Treatment

- Assurance.
- Advice for local cleanliness.
- If the discharge is non-purulent, non-offensive, without any pain, burning sensation or discomfort it is physiological leucorrhoea of pregnancy and it needs no treatment.
- Āmlakī cūrṇa (3g) mixed with sugar can be taken.
- A combination of Lodhracūrṇa (2g), Puṣyānugacūrṇa (2g), Sītopalādi cūrṇa (2g) and Godantibhasma (250-500 mg) twice daily with milk is also very effective.

8. **Heart burn**

It occurs due to the effect of progesterone on sphincter at gastro-oesophageal junction. The acid contents of the stomach regurgitate into the mouth causing acid discomfort.

Treatment

- Avoid meals at late night
- Avoid spicy and fried items
- Evening walks to facilitate digestion
- Eat small meals rather than large meals
- Avoid liquid with meals. They should be taken at least half an hour before or after meals
- Never lie down after a meal. It is better to sit
- Coconut water is beneficial
- If the problem still persists, i) Śatāvarīcūrṇa (3 g) twice daily with milk and Varāṭikābhasma (250 mg) + Dhātrīlauha (500mg) twice with ghee or honey, ii) Avipattikaracūrṇa (3 g) tiwce daily after meals are to be given.

9. **Ankle oedema**

It may be physiological or pathological. No treatment is required for physiological oedema. It subsides on rest by keeping legs slightly elevated. Pathological ankle oedema needs proper treatment.

10. **Problems of urinary tract**

A) Frequency of micturition: - During early pregnancy, pressure is exerted by the enlarging gravid uterus on the base of the bladder causing bladder irritation leading to increased frequency of micturition. When the enlarging uterus grows out of the pelvis to become an abdominal organ,

this symptom generally disappears. In late pregnancy, when the fetal head gets engaged, this symptom appears again.

No treatment is required.

B) Burning micturition: - Due to the effect of progesterone on the smooth muscle of the pelvicalyceal system, there is dilatation and an increase in capacity, poor peristalsis of the uterus leading to stasis of urine. Thus there is increased tendency of urinary tract infections.

Treatment

- Drink plenty of water
- Drink cold milk mixed with sugar and cardamom.
- Gokṣuracūrṇa (3 g) + Amṛtasatva (500 mg) twice daily with milk is effective
- Decoction of tṛṇapañcamūla with gokṣura (50 ml) twice daily is beneficial
- Candraprabhāvaṭi (500 mg) twice daily is effectual
- Avipattikaracūrṇa (3 g) + Pittāntaka (500 mg) is also effective
- Candanāsava (20 ml) with equal quantity of water daily after meals helps in relieving burning micturition.

Points to remember

- Most of the minor ailments need counselling and simple medical explanation
- Balanced diet and proper life-style helps to overcome these problems
- Self-medication should be avoided. Always consult your obstetrician for appropriate treatment.
- Never ignore vaginal bleeding, persistant pain,fever or any other constitutional symptoms.These should be promptly reported.
- Importance of drugs prescribed by obstetrician must be emphasised
- Importance of regular antenatal checkups should be explained
- Advice on following should be given: i) sleep and rest, ii) care of the breasts, iii) bathing, iv) coitus, v) clothing, vi) travel, vii) dental care, viii) smoking and alcohol drinking and ix) immunisation
- Always avoid stress during pregnancy.

References

1. सूक्ष्मां चिकित्सां वक्ष्याभि गर्भिणीनां विभागशः।
तथा गर्भश्च नारी च वर्धते रक्ष्यतेऽपि च ।।
(का.सं., खि. १०/३)

2. शोषो हृल्लासच्छर्दिश्च शोफो ज्वरस्तथारुचि ।
अतिसारो विवर्णत्वमष्टौ गर्भस्योपद्रवाः।।
(हा. सं. ५१/१)

3. व्याधींश्चास्या मृदुमधुरशिशिरसुखसुकुमार-
प्रायैरौषधाहारोपचारैरुपचरेत्.....।
(च.सं., शा. ८/२२)

अथ गर्भिणीं व्याध्युत्पत्तावत्यये छर्दयेन्मधुराम्लेनान्नोपहितेनानुलोमयेच्च, संशमनीयं च मृदु विदध्यादन्नपानयोः, अग्रनीयाच्च मृदुवीर्ये मधुरप्रायं गर्भविरुद्धं च, गर्भविरुद्धाश्च क्रिया यथायोगं विदधीत मृदुप्रायाः।।
(सु.सं., शा. १०/६७)

4. दौहृदजा दौहृदविमाननाज्जाता, अन्ये दौहृदजां गर्भनिमित्तामाहुः। (सु.सं., उ. ४९/१२)

5. नार्याच्चापन्नासत्वाया इति गर्भिण्याः तस्या गर्भोत्पीडनेन वातवैगुण्याच्छर्दिः।
(मा.नि. १५/३ की मधुकोश व्याख्या)

6. शेषं चोर्ध्वतरमागतं पयोधरावभिप्रतिपद्यते,

तस्माद्गर्भिण्यः पीनोन्नतपयोधरा भवन्ति ।।
(सु. शा. ४/२४)

7. जरायुशेषं चोर्ध्वमसृक् प्रतिपद्यते ।
तस्मात्पीनकपोलपयोधरता
कृष्णौष्ठचूचुकत्वं च ।।
(अ. सं. शा २/१०)

8. तत्र सद्योगृहीतगर्भाया लिङ्गानि – श्रमो ग्लानिः
पिपासा सक्थिसदनं शुक्रशोणितयोरवबन्धः
स्फुरणं च योनेः ।। (सु.सं., शा. ३/१३)

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EXCERPTS FROM CIKITSĀMAÑJARI - LXX

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Abstract: The chapter 'Śirorogacikitsa' (treatment of diseases of the head) concludes with this issue. Here, various formulations and treatment modalities indicated for the diseases of the head are discussed.

Tuṅgadrumādi tailam: - Application of sesame oil medicated with tender coconut water and milk as liquid component, and powder of sugandha (*Kaempferia galanga*) lāmajja (*Vetiveria zizanioides*), yaṣṭīmadhu (*Glycyrrhiza glabra*), utpala (*Kaempferia rotunda*) and candana (*Santalum album*) as solid component cools the head and eyes.

Balāhaṭhādi tailam: - Application of sesame oil medicated with the kaṣāya of bala (*Sida alnifolia*), haṭha (*Phyllanthus emblica*), amṛta (*Tinospora cordifolia*), mudga (*Vigna radiata*) and māṣa (*Vigna mungo*) as liquid component, and powder of candana, āmaya (*Saussurea costus*) and yaṣṭī as solid component relieves headache.

Kayyanyādi tailam:- Sesame oil medicated with the juice of kayyanni (*Eclipta prostrata*), ciṭṭamṛtu (*Tinospora cordifolia*) and nelli (*Phyllanthus emblica*) and milk as liquid component, and madhuka (*Glycyrrhiza glabra*) and añjana (black antimony) as solid component, on application on the head, promotes clarity of vision, teeth and prevents premature graying of hair. It relieves headache also.

Bhujagalatādi tailam: - Sesame oil medicated with the juice of bujagalata (*Piper betel*) and milk as liquid component, and powders of hima (*Santalum album*), madhuka (*Glycyrrhiza glabra*), gada (*Saussurea costus*), ambu (*Plectranthus vettiveroides*) and sevya (*Vetiveria zizanioides*) as solid component, on application on the head, relieves headache, itching and falling of hair.

Mañjiṣṭhādi taila:- Sesame oil medicated with the juice of kumāri (*Aloe barbedensis*) and milk as liquid component and powders of the following as solid component, on application on the head, relieves pain of the head and eyes.

Mañjiṣṭha	*Rubia cordifolia*
Añjana	Black antimony
Śāriba	*Hemidesmus indicus*
Abda	*Cyperus rotundus*
Kaṭuka	*Picrorhiza kurrooa*
Takkola	*Piper cubeba*
Jātīphala	*Myristica fragrans* (nut meg)
Śrīkaṇḍha	*Santalum album*
Triphala	*Terminalia chebula*
	Phyllanthus emblica
	Terminalia bellirica
Jaṭā	*Nardostachys grandiflora*
Tagara	*Valeriana jatamansi*

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Ruk	*Saussurea costus*
Yaṣṭī	*Glycyrrhiza glabra*
Caturjāta	*Elettaria cardamomum*
	Cinnamomum tamala
	Cinnamomum verum
	Mesua nagassarium
Uśīra	*Vetiveria zizanioides*
Agaru	*Aquilaria malaccensis*
Corayugma	*Kaempferia galanga*
	Costus speciosus
Mṛganābhi	Musk
Indu	*Borneo camphor*
Utpala	*Kaempferia rotunda*
Ambha	*Plectranthus vettiveroides*
Bisa	*Nelumbo nucifera*

Application of sesame oil medicated with the juice of ciṙṙamṛtu and karuka (*Cynodon dactylon*) and kaṣāya of nellikka as liquid component, and powders of mañjiṣṭhādi (1 to 28 above) as solid component, is effective. The quantity of powder for 1 nāzhi* oil is 3 or 4 kazhañju*. The solid component (kalka) for medicated oils can be that of Mañjiṣṭādi or Triphalādi. Milk is to be added as liquid component. Medicated oils for specific diseases of the head shall be prepared considering the condition of the patient and diseases.

One prastha* of sesame oil medicated with six prastha of cow's milk as liquid component and a paste of the following as solid component, used for nasya relieves diseases of the head caused by deranged vāta or pitta, deafness, ear ache, cataract (timira) and gaḷagaṇda. Diseases of the teeth, tremor of head and facial palsy (ardita) are also relieved by this. This oil is specially indicated in ardhāvabhedaka.

1 nāzhi = 192 ml; 1 kazhaṅju = 4gm; 1 prastha = 768 ml; 1 āḍhaka = 3.072 ml; 1 pala = 48 g.

Jīvaka	*Malaxis acuminata*
Ṛṣabhaka	*Malaxis muscifera*
Drākṣa	*Vitis vinifera*
Madhukam	*Glycyrrhiza glabra*
Śāriba	*Hemidesmus indicus*
Balā	*Sida alnifolia*
Nīlotpalam	*Monochoria vaginalis*
Uśīram	*Vetiveria zizanioides*
Candanam	*Santalum album*
Śarkara	Sugar
Vaca	*Acorus calamus*

In severe headache, the above oil filtered in mṛdu (soft) state of kalka (i.e. the filtrate is decanted when the state of kalka is soft) is used.

Bhṛṅgāmalakādi taila:- One prastha of sesame oil medicated with the juice of bhṛṅga (*Eclipta prostrata*) and āmalaka - one prastha each - and one āḍhaka* of milk as liquid component, and one pala* powder of madhuka as solid component, on application on head, will turn husky voice to that of cuckoo and the blind will be restored sight and loosened teeth will be fixed; the chest will become fleshy simply by using the oil for one month.

Asanavilvādi taila: - Sesame oil medicated with milk as liquid component and fine paste of the following as solid component, on application on the head, relieves diseases of the face, ears, head and eyes.

Asana	*Pterocarpus marsupium*
Vilva	*Aegle marmelos*
Bala	*Sida alnifolia*
Amṛta	*Tinospora cordifolia*
Madhuka	*Glycyrrhiza glabra*
Nāgaraka	*Zingiber officinale*
Triphala	*Terminalia chebula*
	Phyllanthus emblica
	Terminalia bellirica

A variation of the above oil, where the quantity of milk is doubled and the solid components are changed to that of Thriphalādi (refer verse given below), is also effective.

Thriphalādi taila:- Oil medicated with triphala (*Terminalia chebula, Phyllanthus emblica*, *Terminalia bellirica*) amṛtavalli (*Tinospora cordifolia),* ketaki (*Pandanus odoratissimus*), asanaka (*Pterocarpus marsupium*), balā, eraṇḍa (*Ricinus communis*), and indravalli (*Cardiospermum halicacabum*) boiled in one droṇa* of water added with the juice of tekarāja (*Eclipta prostrata*) and fruit juice of haṭha (*Phyllanthus emblica*) and two prastha of cow's milk - as liquid components and one prastha of sesame oil as the lipid component and a fine paste prepared from the following drugs as the solid component, is termed as Triphalādi. Application of this oil on the head relieves diseases of the head, catarrhal secretions from the nose (pratisyāya), baldness and premature graying of hair. It also gives black color to the hair.

Kuṣṭha	*Saussurea costus*
Yaṣṭyāhva	*Glycyrrhiza glabra*
Padmaka	*Prunus cerasoides*
Uśīra	*Vetiveria zizanioides*
Candanam	*Santalum album*
Musta	*Cyperus rotundus*
Ela	*Elettaria cardamomum*
Patra	*Cinnamomum tamala*
Māmsī	*Nardostachys grandiflora*
Hayagandha	*Withania somnifera*
Bala	*Sida alnifolia*
Amṛta	*Tinospora cordifolia*
Śāriba	*Hemidesmus indicus*
Amarakaṣṭha	*Cedrus deodara*
Lavaṅga	*Syzygium aromaticum*
Nata	*Valeriana jatamansi*
Coraka	*Kaempferia galanga*
Utpala	*Kaempferia rotunda*
Añjana	Black antimony
Nīlī	*Indigofera tinctorea*

1 droṇa = 12.288 litre

Balādhātryādi tailam:- Prepare a kaṣāya from the following drugs in one droṇa of water and reduce to one fourth; add equal quantities of milk and juices of āmalaka and śatāvari (*Asparagus racemosus*) i.e. one part kaṣāya and three parts juices.

Bala (*Sida alnifolia*)	- 16 parts
Dhātri (*Phyllanthus emblica*)	- 16 parts
Guḷūci (*Tinospora cordifolia*)	- 8 parts
Uśīra (*Vetiveria zizanioides*)	- 4 parts
Hīruverakam (*Plectranthus vettiveroides*)	- 2 parts
Candanam (*Santalum album*)	- 1 part
Yaṣṭī (*Glycyrrhiza glabra*)	- 1 part
Bakuḷaprasūna (*Mimusops elangi*)	- 1 part

Add two prastha of sesame oil and the fine paste prepared from the following to the above as solid component. Medicated oil so prepared, on application, relieves burning sensation of the head, body and eyes. It nurture blood and flesh and is indicated in all diseases of the head. Fecundity is increased and debility and injury of the head is repaired.

Madhukam	*Glycyrrhiza glabra*
Candanadvayam	*Santalum album*
	Pterocarpus santalinus
Kuṣṭha	*Saussurea costus*
Utpala	*Kaempferia rotunda*
Abda	*Cyperus rotundus*
Śāriba	*Hemidesmus indicus*
Trijāta	*Elettaria cardamomum*
	Cinnamomum verum
	Cinnamomum tamala
Jātīphalam	*Myristica fragrans* (nut meg)
Takkolakam	*Piper cubeba*
Karpūram	*Cinnamomum camphora*

Śatāvari	*Asparagus racemosus*
Jīvakam	*Malaxis acuminata*
Ṛṣabhakam	*Malaxis muscifera*
Mede	*Polygonatum cirrhifolium*
	Polygonatum verticillatum
Mṛdvīka	*Vitis vinifera*
Kuṅkumam	*Crocus sativus*
Lāmajjaka	*Vetiveria zizanioides*
Śālūka	*Nelumbo nucifera*
Corakadvaya	*Kaempferia galanga*
	Costus speciosus
Puṣkaram	*Inula racemosa*
Nāgpuṣpam	*Mesua ferrea*
Nakham	*Helix aspera*
Spṛkka	*Schizachyrum exile*
Mañjiṣṭha	*Rubia cordifolia*
Katurohiṇī	*Picrorhiza kurrooa*
Añajnam	Black antimony
Saraḷam	*Pinus roxburghii*
Dāru	*Cedrus deodara*
Campakam	*Magnolia champaca*
Mṛganābhika	Musk
Madhūkapuṣpam	*Madhuca longifolia*
Śyonākam	*Oroxylum indicum*
Triphala	*Terminalia chebula*
	Phyllanthus emblica
	Terminalia bellirica
Phalinī	*Callicarpa macrophylla*
Misi	*Anethum graveolens*
Musta	*Cyperus rotundus*
Agaru	*Aquilaria malaccensis*
Māmsī	*Nardostachys grandiflora*
Tagaram	*Valeriana jatamansi*
Padmakesaram	*Nelumbo nucifera*

8 nāzhi (dviprastham - 1536 ml) oil may be used for this preparation. The solid component like madhuka, candanadvaya, etc. may be taken increased by one kazhañju (4 g) in successive order. Karpūra, kuṅkuma (*Crocus sativus*) and kastūri (musk) may be taken 1 to 2 paṇamiṭa (500 mg to 1000 mg) and put it in the vessel before the filtrated oil is poured. Añjana may be used like this. The oil may be filtered in cikkaṇapāka. When preparing this oil, especially for headache, 96 ml of ghee may be added. Kaññjuṇṇni (*Eclipta prostrata*), ponnāṅgaṇi (*Alternanthera sessilis*), eccilkkurunnu (?) and kāñjirakkurunnu (tender leaves of *Strychnos nux-vomica*) - one muṛam (24.576 kg) each; śatāvari and nellikka - ½ muṛam (12.288 kg) each; express the juice with tender coconut water and the filterate so obtained is to be used for preparation of the oil.

Sesame oil medicated with kaṣāya prepared from balā and guḍūcī, and milk as liquid component, and the following as solid component, on application on the head, relieves headache.

Abja	*Nelumbo nucifera*
Coraka	*Angelica glauca*
Śaṭhī	*Kaempferia galanga*
Takkola	*Piper cubeba*
Jāthī	*Myristica fragrans* (Nut meg)
Hima	*Santalum album*
Kākolyādi	*Fritillaria roylei*
	Lilium polyphyllum
Meda	*Polygonatum cirrhifolium*
Mahāmeda	*Polygonatum verticillatum*
Ṛṣabhaka	*Malaxis muscifera*
Jīvaka	*Malaxis acuminata*
Ṛddhi	*Habenaria edgeworthii*
Vṛddhi	*Habenaria intermedia*
Madhuka	*Madhuca longifolia*
Dāru	*Cedrus deodara*
Saraḷa	*Pinus roxburghii*
Śreṣṭha	*Terminalia chebula*
	Phyllanthus emblica
	Terminalia bellirica
Caturjāta	*Elettaria cardamomum*
	Cinnamomum tamalam

	Cinnamomum verum
	Mesua nagassarium
Yaṣṭī	*Glycyrrhiza glabra*
Sevya	*Vetiveria zizanioides*
Jala	*Cyperus rotundus*
Utpala	*Kaempferia rotunda*
Agaru	*Aquilaria malaccensis*
Varī	*Asparagus racemosus*
Karpūra	*Cinnamomum camphora*
Kuṣṭhta	*Saussurea costus*
Ambu	*Plectranthus vettiveroides*

While preparing the above oil, a kaṣāya prepared from nellikka also can be added. Application of Ārukālādi medicated oil on the head is prescribed. Tṛmiśratailam is also effective. Here also, kaṣāya prepared from nellikka can be added as liquid component. In the preparation of Ārukālādi medicated oil, one sixth medicated ghee can be added as lipid component. 'Kāññannīmārukālādiyil, the oil detailed earlier in treatment of ardita [Vātavyādhi ardita - A combination of ghee and sesame oil medicated with kañjuṇṇinīr (juice of *Eclipta prostrata),* āñjil (*Artocarpus hirsutus*), tender leaves of kāñjiram (*Strychnos nux-vomica)* and taṇḍulodakam (first washing of rice) as liquid component; and the fine paste of puṅginver (root of *Pongamia pinnata*), kuṣṭha (*Saussurea costus*), yaṣṭi (*Glycyrrhiza glabra*), taru (*Cedrus deodara)* misi (*Anethum graveolens)* and bala as solid components. This preparation is good for application of the body and irrigation] can be applied on the head. Irrigation of head with this medicated oil is also beneficial for relief of burning of the head.

Sesame oil medicated with the kaṣāya of cerupayar (*Vigna radiata*), uzhunnu (*Vigna mungo*), nelli, cinnaroha (*Tinospora cordifolia*) bala and cow's milk - four times than that of oil - as liquid component, and the paste of madhuka, gada (*Saussurea costus*) and paṭīra (*Santalum album*) as solid component, on application, relieves head ache.

Sesame oil medicated with kaṣāya of veṅgākkātal (heart-wood of *Pterocarpus marsupium*), kuruntoṭṭi (*Sida alnifolia*) amṛtu, and vilva (*Aegle marmelos*) and milk equal to the quantity of oil as liquid component, and a paste prepared from mukka (*Terminalia chebula, Phyllanthus emblica, Terminalia bellirica*), yaṣṭi (*Glycyrrhiza glabra*) and amṛta as solid component, on application on the head, relieves head ache and diseases of the nose, eyes, ear and mouth caused by deranged kapha.

Mukkāmukkaṭukādi powder:

Mukka	*Terminalia chebula*	
	Phyllanthus emblica	
	Terminalia bellirica	
Mukkaṭu	*Zingiber officinale*	
	Piper longum	
	Piper nigurm	
Jirakatraya	*Cuminum cyminum*	
	Foeniculum vulgare	
	Nigella sativa	
Niśadvaya	*Curcuma longa*	
	Berberis aristata	- 1 part each
Uluva	*Trigonella foen-um-graecum*	- 11 parts
Cīnappāvu	*Smilax china*	- 22 parts

Fine powder prepared from the above, mixed together with honey, is suggested to lick in the morning and evening. Application of medicated sesame oil (prepared from the above) on the head and bathing once in every four days is very effective.

Abhraka (mica), suitably purified (mārita), kaṭuphalam (*Piper nigrum*), musta (*Cyperus*

rotundus), aśvagandha (*Withania somnifera*), amṛta, meda, mahāmeda, mocarasa (juice of *Bombax ceiba*), vidāri (*Pueraria tuberosa*), musalī (*Curculigo orchioides*), gokṣura (*Tribulus terrestris*), ikṣura (*Hygrophyla auriculata*), rambhākanda (*Musa paradisiaca*), śatāvari, tila (*Sesamum orientale*), bala, māṣa (*Vigna mungo*), dhānyakam (*Coriandrum sativum*), yaṣṭī, dīpyakam (*Trachyspermum ammi*), nāga (*Mesua ferrea*), candra (*Cinnamomum camphora*), madanam (*Catunaregum spinosa*), drākṣa (*Vitis vinifera*), śila (bitumen), rohiṇī (*Picrorhiza kurrooa*), markaṭabījam (seed of *Eleusine coracana*), śālmalabījam (seed of *Bombax ceiba*) - all equal parts; madayantika (*Jasminum sambac*) - 28 parts, matsyāṇḍika (sugar candy) - 56 parts; all finely powdered and mixed together..... (*Rest of the verse is incomplete*).

The diseases of the head are as follows:

Diseases of the scalp are nine viz: i) upaśīrṣa, ii) piṭakā, iii) arbuda, iv) vidradhi, v) ārūmṣika, vi) dāraṇaka, vii) indralupta, viii) khalati and ix) palitam.

Vāta, deranged in scalp, even at intra-uterine life, causes bidy coloured painless swelling is called upaśīrṣaka. Piṭaka, arbuda and vidradhi are to be treated based on the doṣa vitiated. Pitta, rakta, śḷeṣma and small worms or micro-organisms may cause small or large abscesses in the scalp with several openings from which exudates flow profusely is called ārūmṣika. Itching, numbness, alopecia, roughness and cracking of skin of the scalp, caused by vitiated kapha and vāta is dāraṇaka. As the lesions are small in size, only a thorough examination can confirm the disease. Indralupta (alopecia areata) is a condition where deranged pitta combines with vāta and sheds away the hair from follicles. Kapha and rakta blocks the orifices and there is no further sprouting of hair from the follicles. This disease is also known as cāca. The pathogenesis for khalati (baldness) is also the same but here, the fall of hair is gradual.

Sorrow, anger, physical exercise in excess, etc. increase the temperature of the body and is transferred to head and thereby transforms the black hair to white, termed palita (graying). Upaśīrṣaka after birth is treated as per vātavyādhi. Chronic cases are treated like vidradhi. Ārūmṣika in which the abscesses are in different stages, [unripe (āma) and ripe (pakva)]

Treatment is based on that of vidradhi, abscess (piṭaka) and arbuda depending upon the stage of disease. Contaminated blood in ārūmṣika is drained by leeches and irrigated with water medicated with the leaves or bark of nimba (*Azadirachta indica*). Fresh horse dung, mixed with an excess quantity of salt can also be applied on the scalp. Frequent shaving of hair and tying the scalp up with cloth or leaves to prevent exposure to air is advised in kapālāruss (diseases of the scalp).

Fine powder of dry kuṣṭha (*Saussurea costus*) fried in an earth vessel, mixed with oil, on application on the scalp relieves itching, exudation, burning and painful lesions. Tender shoots of konna (*Cassia fistula*), seeds of takara (*Cassia tora*) and dry nellikka fried in an earth pot, powdered and mixed with oil to a paste, is prescribed to apply on the scalp.

In cāca and ārūmṣika, after shaving the scalp, application of oil is prescribed. In cases where there is no relief, cleansing of the head by inducing emesis and other purification

measures, bloodletting by venesection is indicated. In dāraṇaka, vein of the forehead is done. Nasya and śirovasṭi are also prescribed.

Application of paste prepared from fine powder of priyāḷabīja (*Buchanania lanzan*), madhuka, kuṣṭha, māṣa (*Vigna mungo*) and sarṣapa (*Brassica juncea*) mixed honey on the scalp is recommended. Powder of madhuka, kuṣṭha, māṣa and sarṣapa mixed in sour buttermilk is advised to rub on the scalp.

Paruvattol (bark of *Streblus asper*) ground to a paste in the juice of parpaṭaka (*Oldenlandia corymbosa*), on application on the head, relieves diseases of the scalp. Powdered harītakī (*Terminalia chebula*) made to a paste in sour buttermilk, on application on the scalp, relieves dāraṇaka.

Treatment modalities of kuṣṭha, earlier detailed, is applicable in the treatment of diseases of the head. Dūrvādi taila, earlier detailed in the treatment of kuṣṭha can also be applied.

Equal combination of oil and ghee medicated with the expressed juices of the following, on application on the scalp is very effective.

Dūrvā	*Cynodon dactylon*
Guḷūcī	*Tinospora cordifolia*
Tulasī	*Ocimum sanctum*
Kumārī	*Aloe barbedensis*
Nīlī	*Indigofera tinctorea*
Viṣaghna	*Albizia lebbeck*
Munivṛkṣa	*Sesbania grandiflora*
Bhṛṅgi	*Eclipta prostrata*
	Milk

Consumption of 'Karintumpacāroṭi' kaṣāya is prescribed. A kaṣāya prepared from the barks of nālpāmara (The four fig trees) and vempāṭa (*Ventilago maderaspatana*) is added to sesame oil (three parts), Nīraṭṭi oil (chaulmugra oil), one part, and coconut milk (equal to the quantity of oils) to prepare a mixture. This mixture is reduced in fire to become dense and is applied on the scalp. (The medicine has to be heated daily.)

Sesame oil medicated with juices of pannakkizhaṅgu (*Drynaria quercifolia*), parpaṭam (*Oldenlandia corymbosa*), kāñjirattila (leaf of *Strychnos nux-vomica*) and ānayaṭi (*Elephantopus scaber*) as liquid component and paste of the following as solid component is very effective.

Veḷḷilaver	*Mussaenda frondosa*
Kampippālaver	*Mallotus philippensis*
Koṭṭam	*Saussurea costus*
Iraṭṭimadhuram	*Glycyrrhiza glabra*
Candanam	*Santalum album*

Sesame oil and a small quantity of Nīraṭṭi oil (chaulmugra oil) medicated with kaṣāya prepared from nālpāmara and juices of kāñjirattila, ānayaṭi and parpaṭam as liquid component, and drugs included in Elādi group as solid component is prescribed to apply on the scalp.

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