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An Original Study On Black Night Shade/ Kakamachi (Solanum Nigrum Linn.) According To Vedic Kala And Ayurvedic Samhita

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ABSTRACT:

Background: In ayurveda many herbs or medicinal plants are available which help to manage or reduce the sugar. (Diabetic condition), Among those Kakamachi is one of the popular medicinal plant found in abundantly and reported to be useful in diabetes i.e. Madhumeha in Ayurveda. Kakamachi (Solanum nigrum Linn.), Belongs to Solanaceae family.

Aim: The aim of the present study was to review the literature of Kakamachi (Solanum nigrum Linn.) from the Vedic kala And ancient Samhita's and further investigate the therapeutic uses and phyto-pharmacological actions of Solanum nigrum Linn.

Material and methods: Various Ayurvedic texts viz. Charaka Samhita, Sushruta Samhita, Ashtanga Hridaya and research journals just as evidence in a chronological order.

Results: Solanum nigrum Linn. has been found to be beneficial in treating Sotha (inflammation), Kustha (Skin disease), Arsha (Piles), Jwar (Fever), Prameha (Diabetes), Hikka (Hiccough), Chardi (Vomiting), Hridroga (Heart disease). Its notable medical properties include Antitumor, Immuno modulatory, Hepatoprotective, Anti-diabetic, Anti- Convulsant, Anti- Ulcerogenic, Anti-oxidant, Anti-bacterial, Larvicidal activity, Anti- Cholesterol, Neuroprotective.

Conclusion: This review enumerates all of the therapeutic qualities of Kakamachi, and it concludes that Kakamachi will be a great option for future research on a number of disease. Either future researchers working on clinical studies will find this study to be a beacon.

KEYWORDS - Kakamachi, Solanum nigrum Linn., Samhita's, Kustha, Black Night Shade.

INTRODUCTION:

The Role of Aushadha in Ayurveda Treatment:

The drug, known as *Aushadha*, plays a crucial role in the treatment process, particularly in achieving the goals outlined in *Chikitsa*, which is part of the "*Trisutra*" framework of *Ayurveda*. *Aushadha* is recognized as one of the four essential components of *Chikitsa Chatushpada*, and it holds a significant position, being placed right next to the physician in importance. The drug acts as a vital tool that a physician utilizes to help restore balance and harmony within the body's tissues. *Acharya Charaka*, a prominent figure in Ayurvedic medicine, has highlighted several key characteristics of *Aushadha* (Drug) that contribute to its effectiveness

Abundance: The availability of various medicinal herbs.

Effectivity: The ability to produce desired therapeutic outcomes.

Various pharmaceutical forms: Different preparations to suit individual needs.

Normal composition: Consistency in quality and formulation.

बहुता तत्र योग्यत्वमनेकविध कल्पना। सम्पच्चेति चतुष्कोऽयंद्रव्याणां गुण उच्यतें।। च. सू. 9/7 The World Health Organization (W.H.O.) defines a drug as "Any substance or product that is utilized or intended to be utilized to alter or investigate the physiological system or pathological condition for the advantage of the recipient." This definition encompasses a wide range of substances, highlighting their role in both therapeutic and diagnostic contexts, ultimately aiming to improve health outcomes for individuals who use them. SELECTION OF DRUG

तदेवं युक्तं भैषज्यं यदारोग्याय कल्पते। स चैव मिश्रणाम् श्रेष्ठो रोगेभ्यो यः प्रमोचयेत्।। च.सू. 1/134

The Importance of Rational Drug Selection in Treatment:

The rational selection of a drug signifies that half of the treatment process is already accomplished. An ideal drug is one that can effectively reverse or break the pathological process known as *Samprapti*, all while avoiding any adverse side effects. This principle is crucial in ensuring that patients receive the best possible care without the burden of additional health complications. According to *Acharya Charaka*, a prominent figure in ancient medicine, nothing in the world exists that lacks therapeutic utility. This statement underscores the significant role that drugs play in our classical texts and traditional practices.

In recent years, there has been a growing concern regarding the side effects associated with synthetic drugs. As a result, the clinical importance of herbal drugs, particularly in the treatment of diabetes, has garnered considerable attention. Herbal remedies are often viewed as safer alternatives, offering therapeutic benefits without the harsh side effects that can accompany synthetic options. This shift in focus has led to a renewed interest in exploring the potential of various plants in managing health conditions.

MATERIAL AND METHOD:

1. KAKAMACHI -

NIRUKTI OF KAKAMACHI:

काकान् मुच्जचते धारयति, पूजयति, 'मचि, धारणोच्छ्रायपूजनेषु'।

Kakamachi fruits are very much liked by crows.1

Vernacular names:2

Sanskrit: Kakamachi

Botanical Name: Solanum nigrum Linn.

English: Black night shade, Garden night shade

Hindi: Makoya, Gurkamai

Gujarati: Piludi

Marathi: Kamuni, Ghati, Mako, Kakmachi Bengali: Gurkamai, Kakmachi, Tulidun

Malyali: Manattakkali, Karintakali, Manjathakkali
Punjabi: Mako, Kambei, kachmach, Riaungi
Telagu: Kamanchi, Kacci, Kaccipandu, Gajjucettu

Tamil: Manattakkali, Milagutakkali, Manarthakkali, Manitakkali

Kannada: Kakarundi, Ganikayeagida, Ganikegida, Ganike, Ganikesopu, Kage hanninagids

Arabian: Inbussalub, Rubah turbuka
Oriya: Lunlunia, Lunilunika
Urdu: Makoya, Makoh

Assam: Pictkachi, Kakamachi, Datkachu

Taxonomical position3-

Solanum nigrum Linn.

According to Carolus Linnaeus

Kingdom: Plantae Division: Magnoliophyta Subdivision: Spermatophyta Class: Dicotyledons

Class: Dicotyledons
Subclass: Gamopetalae
Series: Bicarpellatae
Order: Polemoniales
Family: Solanaceae
Genus: Solanum
Species: nigrum.

Solanum nigrum, commonly known as black nightshade, is a flowering plant belonging to the Solanaceae family. It is recognized for its small, dark berries and is often found in various habitats, showcasing its adaptability and resilience in different environments.

PANCHBHAUTIK CONSTITUTION OF KAKAMACHI: -

TABLE - SHOWING PANCHBHAUTIK CONSTITUTION OF KAKAMACHI

RASA PANCHAKA	PANCHABHAUTIK CONSTITUTION			
Rasa				
Tikta	Vayu + Aakasha			
Katu	Vayu+ Agni			
Guna				
Laghu	Vayu + Agni + Akasha			
Snigdha	Jala			
Virya				
Anushna	Agni			
Vipaka				
Katu	Vayu+ Agni			

Nutritive value of Solanum nigrum Linn. Leaves⁴

Table: Nutritive values of Kakamachi

Moisture	82.1g
Protein	5.9g
Fat	1.0g
Minerals	2.1g
Carbohydrates	8.9g
Calcium	410mg
Phosphorous	70mg
Iron	20.5mg
Riboflavin	.59mg
Nicotinic acid	.92mg
Beta- carotene	.74mg
Vit C	11mg

CHEMICAL CONSTITUENTS:

Vitamin B and C are essential nutrients that play vital roles in maintaining overall health. Additionally, β -carotene is a powerful antioxidant that helps protect cells from damage. Citric acid, found in citrus fruits, contributes to metabolic processes. A flacokinase is an enzyme involved in various biochemical reactions. Glycoalkaloids, such as Solasonine and α - and β -solanigrine, have notable effects on plant defense mechanisms. Steroidal genin compounds like tiogogenin, solasodine, and solasodine are important for various biological activities. Diosgenin, along with α - and β -solamargine, contributes to health benefits. Other components include uttronin A, uttrosides A and B, five steroidal glycosides (SN-0, SN-1, SN-2, SN-3, and SN-4), and fatty acids like palmitic, stearic, oleic, and linoleic. Additionally, chlorogenic, caffeic, and traces of neochlorogenic and isochlorogenic acids, along with caffeoylglucose, are found in various parts of plants.⁵

The plant contains various steroidal alkaloid glycosides, including solasoline, as well as both alpha and beta-solanigrine. Additionally, it has steroidal sapogenins such as diosgenin and tigogenin, along with solasodine. Notably, solamargine and solasonine can also be found in the leaves. The total alkaloid content in the fruit is measured at 0.101%, while in the leaves, it is 0.431%.

HISTORICAL BACKGROUND:

History is a study of the past. It serves as a blueprint for growth in all spheres of life. A historical perspective helps us decide what actions to take in an upcoming event that we have already encountered in the past. In terms of their quality, distinctiveness, uniqueness, etc., past experience with drugs is quite helpful, making it more beneficial for future generations. We can base our future plans on the *Rigveda*, the earliest source that deals with a variety of medications.

VEDIC KALA:[7][8]

In the ancient texts known as the *Vedas*, the figure of *Kakamachi* is notably referenced in the *Samaveda*. The esteemed author *Sayana* refers to her as "*Nitatni*." This intriguing description is not limited to just one text; it is also found under the same name in the *Atharvana Veda*, which dates back to around 1500 BC. Additionally, *Kakamachi* is mentioned in the *Kaushikasutras* and the *Amarakosha*, further highlighting her significance in these foundational scriptures of Indian culture and spirituality.

SAMHITA KALA:

* CHARAKA SAMHITA: -

References of *Kakamachi* can be well traced in various *Samhitas*, which are ancient texts that compile knowledge on medicine and healing. In the *Charaka Samhita*, a prominent *Ayurvedic* text, the drug is described with numerous synonyms, including *Makoya*, *Vayasi*, and *Kakavha*. These names highlight its significance in traditional medicine. The text indicates its use for treating a range of disorders, showcasing its versatility. Additionally, *Kakamachi* is noted as an important ingredient in formulations such as *Argawadhadi lepa* and *Mahanila tail*, further emphasizing its role in *Ayurvedic* practices and its therapeutic potential in various health conditions. (Table)

Description of Kakamachi in Charaka Samhita -9

Table – Showing description of Kakamachi in charaka samhita.

Sr. No.	Adhyaya- Sloka Used as ingredient	Used as ingredient of			
SUTRA S	THANA				
1.	3 / 17	Paste of leaves made with buttermilk applied on Kushtha (skin diseases).			
2.	26/84	Viruddha Ahara Dravya (dietetic incompatibility): Kakamachi and Honey (Samyogaviruddha), Paryushita (stale) Kakamachi.			
3.	27/ 89	Described in <i>Shakavarga</i> with properties like <i>Tridosha Shamani</i> (pacifies the three <i>Dosha</i>), <i>Vrishya</i> (aphrodisiac), <i>Rasayana</i> (rejuvenator), <i>Sheetavirya</i> (cool by potency), <i>Nati Ushna</i> (not much hot in potency), <i>Bhedani</i> (penetrator) and <i>Kusthaghni</i> (destroys skin diseases).			
NIDAN S	NIDAN STHANA				
4.	5/6	Its excessive usage leads to Kushtha.			
VIMANA	VIMANA STHANA				

5.	8/143 It is classified under <i>Tiktaskandha</i> .				
CHIKITS	CHIKITSA STHANA				
6.	14/124	It is Pathya (indicated) in Arsha (haemorrh	oids).		
7.	16/84	It is <i>Apathya</i> (contra indicated) during the intake of <i>Yogaraja</i> in the treatment of <i>Panduroga</i> (anemia).			
8.	18/81	Vayasi Shaka as a Pathya in Vataja Kasa (o	cough due to Vata).		
9.	29/52	It is Pathya in Vatarakta (gout).			
10.	7/96	For Lepa (external application) along with Shirishatwak (bark of Albizzia lebbeck), Karpasapushpa (flowers of Gossypium herbaceum) and Aragwadha Patra (leaves of Cassia fistula). Kushtha (skin diseases).			
11.	12/73	It triturated in <i>Gomutra</i> (cow urine) along Shopha (edema). with other drugs.			
12.	21/90	For <i>Pradeha</i> (external application). Kaphaja Visarpa (Erysipelas due to Kapha).			
13.	26/269	As a Kalka (paste) Dravya in Mahanila Taila – Pana (internal administration), Nasya (nasal administration), Shira Abhyanga (application on scalp). Chakshushya (good for eyes), Aayush (increases life), Palitya rog, Shirorog (diseases of head).			
14.	27/27	To be taken internally.	Urustambha.		

SUSHRUTA SAMHITA: -10

In the ancient text *Sushruta Samhita*, the drug is referred to by numerous synonyms, including *Kakamachi* and *Makoya*. These terms highlight its significance in traditional medicine. The text indicates its use for treating a variety of disorders, showcasing its versatility. Additionally, it is noted as a key ingredient in several formulations, such as *Sursadi gana*, *Mahanila Ghrita*, *Patoladi Ghrita*, and *Brihatyadi Ghritam*. Each of these preparations utilizes the drug's unique properties to address specific health issues, emphasizing its importance in *Ayurvedic* practices.

Table - Showing description of Kakamachi in Sushruta Samhita

Adh	yaya - Sloka	Used as ingredient of			
KAI	KAMACHI				
SUT	TRA STHANA-				
1.	1. 20/13 Viruddha Ahara - Kakamachi along with Pippali (Piper longum L.) and Maricha (Piper nigrum L.), Kakamachi with Guda (jaggery).				
2.	38/18	Classification of Kakamachi under Surasa	Classification of Kakamachi under Surasadi Gana.		
3.	46/262	Grouped under Tikta Rasatmaka shaka.			
KAI	LPA STHANA-				
4.	6/12	As an ingredient in Amrita sarpi. Sarv vishanasak (Anti posionous)			
5.	7/31	Ghee cooked with the juice of Kakamachi and Kakadani is useful in rat poisoning.			
CHIKITSA STHANA-					

6.	1/115	Leaf of Kakamachi.	Kaphaja Vrana (wound due to Kapha Dosha).
7.	9/35	As an ingredient in Mahanila Ghrita.	Kushtha
UTTARA TANTRA			
8. 39/228 As an ingredient in <i>Patoladi Ghritam</i> .		As an ingredient in Patoladi Ghritam.	Ulcers in the eyes, ears, nose and mouth are cured by patoladi ghritam.
9.	44/22	As an ingredient in Brihatyadi Ghritam.	Use in Pandu roga (Anemia)

ASTANG HRIDAYAM: - 11

In Astang hridayam, the drug is referred to by numerous synonyms, including Kakamachi and Makoya. These terms highlight its significance in traditional medicine. The text indicates its use for a variety of disorders, showcasing its versatility and therapeutic potential. Additionally, it is noted as a key ingredient in formulations such as Sursadi gana and Vranropan taila, further emphasizing its importance in Ayurvedic practices. This multifaceted approach illustrates the drug's role in promoting health and healing. (Tab-)

Description of Kakamachi in Ashtang hridayam

Table - Showing Description of Kakamachi in Ashtang hridayam

Adhyaya – Sloka	Used as ingredient of				
KAKAMACHI					
SUTRA STHANA					
6/74	Description of Guna of Kakamachi.				
7/35		Viruddha Ahara - Kakamachi along with Pippali (Piper longum L.) and Maricha (Piper nigrum L.), Kakamachi with Guda (jaggery) and Madhu (Honey).			
15/30	Classification of Kakamachi under Su	rasadi Gana.			
CHIKITSA STHANA	CHIKITSA STHANA				
19/63	For Lepa (external application) along with Shirishatwak (bark of Albizzia lebbeck), Karpasapushpa (flowers of Gossypium herbaceum) and Aragwadha Patra (leaves of Cassia fistula).	Kushtha (skin diseases).			
UTTARA STHANA	•				
22/2	As an ingredient in Vranaropan taila.	Vrana (Wound healing).			
39/141	It is <i>Apathya</i> (contra indicated) during the intake of <i>Shilajatu</i> in the use of <i>Rasayan</i> (aphordisiacs).				

CLASSIFICATION: -

TABLE - Showing classification according to samhitas

NAME OF SAMHITA	NAME OF GANA/VARGA
Charaka Samhita	Tiktaskandha

Sushruta Samhita	Sursadi
Astang Samgraha	Sursadi
Astang Hridaya	Sursadi

 $TABLE \ - \ Disease \ wise \ classification \ of \ the \ formulations \ of \ \textit{Kakamachi} \ as \ a \ \textit{Bhavana Dravya}$

Sr.No.	Indication	Formulation	Reference
51.140.			
1.		Indu Vati	
	Karnaroga (diseases of ear)	Makshikadi Vati	Bhaishajya Ratnavali ¹²
		Sarivadi Vati	Kumavan
		Kushthanikruntana Rasa	Rasaratnakara ¹³
		Chandarudra Rasa	
2.	Kushtha (skin diseases)	Chandrashekhara Rasa	Rasakamadhenu ¹⁴
		Charmantaka Rasa	
3.	Pandu, Kamala (jaundice)	Chandrasuryatmaka Rasa	Bhaishajya Ratnavali, Rasendrasarasamgra ha ¹⁵
		Paniya Vatika	Rasarajasundara ¹⁶ Bhaishajya Ratnavali,
		Vishweshwara Rasa	Rasarajasundara Bhaishajya Ratnavali, Rasendrasarasamgra ha,
		Vishamjwarantaka Lauha (Brihat)	Rasarajasundara Rasendrasarasamgra
4.	Arsha (haemorrhoids)	Piyushasindhu Rasa	ha Rasakamadhenu
5.	Yonivyapat (disorders of female reproductive system)	Nashtapushpantaka Rasa	Bhaishajya Ratnavali
6.	Sutikaroga (puerperal diseases)	Rasashardula Rasa	Rasaratnasamuchch aya ¹⁷

7.	Striroga (gynaecological diseases)	Ratnaprabha Vatika	Bhaishajya Ratnavali
8.	Vatavyadhi (diseases due to Vata Dosha)	Rasaraja	Bhaishajya Ratnavali
9.	Shwitra (leucoderma)	Shwetari Rasa	Brihat Yoga Tarangini ¹⁸
10.	Vatatisara (diarrhea due to Vata Dosha)	Maharasa	Rasarajasundara

TABLE -List of formulations containing Kakamachi as an ingredient from Bharata Bhaishajya Ratnakara - for external application (Lepana)

Sr.	Name	Indication	Remarks	Reference
No.				
1.	Chaturangulparnadi Lepa	Kushtha	Leaves of <i>Kakamachi</i> are bruised in buttermilk for external application	Gadnigrah, Vrinda madhav
2.	Chandraprabha Guti	Netraroga	Rubbed with Kakamachi Swarasa for Anjana (to be used as collyrium) – for treatment of Kamala	Gadnigrah
3.	Ankolabeejadi Lepa	Kushtha	Triturated with <i>Kakamachi</i> Swarasa for external application	Vaidyamaniratnamala.
4.	Aaragvadhadi Lepa	Visarpa (erysepalas)	For external application	Vrinda madhav

TABLE - Uses of Kakamachi as Bhavana for Parada Shodhana and to Kajjali and other uses.

As Bhavana for Parada Shodhana					
Sr. No.	Name	Indication	Reference		
1.	Mahakalpa Rasa	Vatarakta	Rasakamadhenu		
2.	Rasendra Gutika	Rajayakshma (tuberculosis)	Bhaishajya Ratnavali		
3.	Suryasiddha Rasa	Rajayakshma (tuberculosis)	Rasa Chintamani		
4.	Rasaparpati	Rajayakshma (tuberculosis)	Rasaprakashasudhakara		
	1	As Bhavana to Kajjali			
1.	Rudra Parpati	Kasa	Rasaratnakara		
2.	Varisagara Rasa	Jwara	Rasarajasundara		
	For Gandhaka (s	ulphur) Shodhana for preparation of F	Parpati		
1.	GandhashmaParpati Rasa	Grahani	Rasakamadhenu		
	Swea	lana (boiling) (in form Swarasa)			

1.	Putraprada Rasa	Vandhyatva (infertility)	Rasasamketkalika
	As Kwatha	a Dravya (decoction material)	
1.	Mahaneela Ghrita	Kushtha	Gadnigrah
2.	Mahavishagarbha Taila	Vatavyadhi	Brihat Nighantu Ratnakara
3.	Amruta Ghrita	Garavisha, Visha (poison)	Gadnigrah, Vangsen
	Swara	sa as Anupana (adjuvent)	
1.	Someshwara Rasa	Kushtha	Rasarajasundara

RESULT AND DISCUSSION:

Numerous Ayurvedic texts mention Kakamachi in relation to a variety of aliments, including *Kushtha* (skin diseases), *Vrishya* (aphrodisiac), *Rasayana* (rejuvenator), *Arsha* (haemorrhoids), *Vataja Kasa* (cough due to *Vata*), *Shopha* (edema), *Kaphaja Visarpa* (Erysipelas due to *Kapha*), *Chakshushya* (good for eyes), *Aayushya* (increases life), *Palitya rog*, *Shiroroga* (diseases of head), *Urustambha*, *Vrana* (Wound healing), *Karnaroga* (diseases of ear). It is a well known herb with promising medicinal properties. It contains Vitamin B and C are essential nutrients that play vital roles in maintaining overall health. Additionally, β-carotene is a powerful antioxidant that helps protect cells from damage. The plant contains various steroidal alkaloid glycosides, including solasoline, as well as both alpha and beta-solanigrine.

CONCLUSION:

"Invention originates because of necessity." In my opinion, review papers based on Ayurvedic medications always serve as a beacon for upcoming researchers, whether they are working on clinical or experimental studies. Kakamachi's therapeutic qualities are compiled in this review from Vedic kala and variety of Ayurvedic texts, and other published research. Despite being an ancient remedy, research into novel advantages is ongoing. This is an attempt to gather all of the traditional sources pertaining to Kakamachi's phyto-pharmacological effect. This study serves as a lighthouse for future researchers, whether they are working on clinical or experimental studies.

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