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REVIEW ARTICLE

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Review of Trivrit (Operculina turpethum Linn.) in Ayurvedic literature

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ABSTRACT

Trivrit (Operculina turpethum Linn) was well renouned drug for its wide spectrum of therapeutic benefits. It was considered as Agra Dravya in Samhitha Kala and was used in many preparations. There are number of preparations mentioned in Ayurvedic classics namely Sarangadhara Samhitha, Chakradatta and Bhaishajya Ratnavali where Trivrit was formulated as key ingredient. Even in the Nighantu Kala it was mentioned as important drug in Vargas like Guduchyadi Varga, Pippalyadi Varga, Oshadi Varga etc. by various Nighantukaras.

Key words: Trivrit, Operculina turpethum Linn., Sarangadhara Samhitha, Chakradatta, Bhaishajya Ratnavali, Nighantus.

INTRODUCTION

Trivrit (Operculina turpethum Linn.) is native of tropical climate it's widely distributed and cultivated all over India. It is a large perennial twinned herb with mily juice. Root is long, slender, fleshy, branched and root bark is easily removable. Stem is twisted three angled hence it is known as Trivrit. Leaves are ovate or oblong in shape, simple, alternate. Flowers are funnel shaped and white in colour. It can be easily cultivated with

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seeds or layering. Harvesting of roots recommended after 18 months of plantation.



Figure 1: Trivrit plant



Figure 2: Trivrit Mula

Table 1: References of *Trivrit* in classical *Ayurvedic* texts.

Sarangadhara Samhitha Purva Khanda							
1.	2/137-142	Brihatmanjistadi Kashaya ^[1]					
Sarangadhara Samhitha Madhyama Khanda							
2.	6/95	Narayanachurna, Hapushadya Churna, Panchasamachurna, Naracha Churna, Lavanatritayadya Churna ^[2]					
3.	4/18-20	Trivrit Churna ^[3]					
4.	7/42	Chandraprabhadi Gutika ^[4]					
5.	7/51	Kankayana Gutika ^[5]					
6.	7/75	Kaishora Guggulu ^[6]					
Sarangadha	ıra Samhitha Utt	tara Khanda					
7.	10/88	Abhayamodaka ^[7]					
Chakradatt	g ^[8-10]						
1.	1/71	Rasnadi kwatha, Trivritadi kwatha					
2.	28/6	Trivritadi Gudika					
3.	29/4	Trivritadi Vatika					
4.	30/41	Hingupushkaramuladi Churna					
5.	37/41	Dantyadi Kalka					
6.	37/62	Bindu Ghrita					
7.	37/37	Naracha Ghrita					
8.	40/29	Brihat Saindhavadya Taila					
9.	62/14	Taivruta Sneha					
10.	71/3	Trivritadi Churna					
11.	71/7	Hareetakyadi Churna					
12.	71/21	Hareetakyadi Modaka					
Bhaishajya	Ratnavali ^[11]						
1.	8/77	Mani Bhadra Modaka					
2.	21/16	Ashvagandhadya Arishta					
3.	31/5	Naracha Churnam					
4.	31/7	Pippalyadi Kwatha					

5.	31/11	Trivritadi Gudika
6	31/12	Gudashtakam
7.	31/35	Trivritadi Churnam
8.	32/48	Hingwadi Churna
9.	40/38	Vishaladi Churna
10.	40/43	Patoladya Churna
11.	40/131	Bindu Ghritam
12.	40/141	Naracha Ghritam
13.	43/112	Saindhavadya Tailam
14.	54/208	Maha Bhallataka Ghritam
15.	56/23	Avipattikara Churna
Vangasena	[12]	
1.	6/109	Mahakshara
2.	6/207	Mahakalyanaka Guda
3.	7/199	Sreebahushali Guda
4.	7/242	Agnimukha Lauha
5.	34/42	Naracha Churna
6.	34/44	Gudastaka
7.	35/6	Trivritadya Vatika
8.	35/10	Trivritadya Gutika
9.	43/87	Narayana Churna
9.	43/07	ruarayana channa

Table 2. Classification of *Trivrit* in various texts

SN	Samhitha / Nighantu	Varga / Gana
1.	Charaka Samhitha	Bhedaneeya
		Vishaghna
		Asthapanopaga Gana
2.	Susrutha Samhitha	Shyamadi Gana
		Adhobagahara Gana
		Tiktha Vargam
3.	Astanga Hridaya	Virechana
		Niruhana
		Shyamadi Gana
4.	Bhava Prakasha Nighantu	Guduchyadi Varga

5.	Dhanvanthari Nighantu	Guduchyadi Varga
6.	Raja Nighantu	Pippalyadi Varga
7.	Kaiyyadeva Nighantu	Oshadhi Varga
8.	Sodhala nighantu	Guduchyadi Varga
9.	Adarsha Nighantu	Vriddhadarvadi varga
10.	Saraswathi Nighantu	Lathadi Varga
11.	Mahaushada Nighantu	Bilvadi Varga
12.	Priya Nighantu	Pippalyadi Varga
13.	Shaligrama Nighantu	Guduchyadi Varga

Table 3: Varieties of *Trivrit* according to various texts

SN	Texts	Types	Names
1.	Charaka Samhitha	2	Shyama, Trivrit
2.	Susrutha Samhitha	2	Swetha Trivrit, Shyama Trivrit
3.	Astanga Hridaya	2	Shyama, Trivrit
4.	Astanga Sangraha	2	Shyama, Trivrit
5.	Dhanvanthari Nighantu	2	Shyama, Shuklabhandee
6.	Sodhala Nighantu	2	Shyama Trivrit, Aruna Trivrit
7.	Madanapala Nighantu	2	Swetha Trivrit, Krishna Trivrit
8.	Kaiyyadeva Nighantu	2	Shyama, Trivrit
9.	Bhavaprakasha Nighantu	2	Sweta Trivrit, Shyama Trivrit
10.	Shankara Nighantu	2	Sweta Trivrit, Krishna Trivrit
11.	Shaligrama Nighantu	3	Sweta, Krishna & Aruna Trivrit
12.	Mahaushada Nighantu	2	Sweta Trivrit, Shyama Trivrit

13.	Priya Nighantu	2	Shyama, Trivrit
14.	Adarsha Nighantu	3	Sweta, Krishna & Aruna Trivrit

Table 4: Synonyms of *Trivrit* in *Nighantus*^[14-22]

S	Synonym	В	R	D	М	К	s	SG	So	N	М
N	Synonym	P	N	N	PN	N	N	N	N	A	N
1.	Trivrit	+	+	+	+	+	+	+	+	+	+
2.	Tribhand ee	+		+		+	+	+		+	+
3.	Triputa	+	+	+	+		+	+		+	+
4.	Sarwanu bhuthi	+		+	+		+	+		+	+
5.	Sarala	+		+	+		+			+	+
6.	Nishotra	+						+			
7.	Rechani	+					+	+		+	
8.	Shyama	+				+	+	+		+	+
9.	Ardacha ndra	+		+	+	+	+	+		+	+
1 0.	Palindee	+		+		+	+	+		+	+
1 1.	Sushenik a	+					+			+	+
1 2.	Masuravi dala	+		+	+	+	+	+		+	+
1 3.	Kalee	+	+			+	+				
1 4.	Kaishika	+									
1 5.	Malavika		+	+	+	+		+			+
1 6.	Masura		+								
1 7.	Vidala		+								
1 8.	Susheni		+	+				+			
1 9.	Kalindika		+								

		1	ı	ı	ı	ı				ı	
2 0.	Trivela		+								
2 1.	Kalindee		+								
2 2.	Tamrapu spika		+			+			+		
2 3.	Kulavarg a		+								
2 4.	Masuree		+						+		
2 5.	Amritha		+						+		
2 6.	Kakanas hika		+					+	+		
2 7.	Kumudag andhi			+							
2 8.	Shuklabh andi			+				+			
2 9.	Tyastra			+		+		+			
3 0.	Kala			+				+		+	
3 1.	Kalames hika			+	+	+	+			+	+
3 2.	Kumbha				+	+					
3 3.	Aruna				+	+			+		
3 4.	Tyastrab handi				+						
3 5.	Kalaparn ee				+						
3 6.	Kutarana					+			+		
3 7.	Kutarana yani					+					
3 8.	Virala					+					
3 9.	Koshaph ala					+	+	_	_		
4 0.	Nihi suthra					+					

4 1.	Kotarava hini				+		
4 2.	Kakakshi				+		
4 3.	Suvaha				+		
4 4.	Rakthap ushpa				+		
4 5.	Raktham ula				+		
4 6.	Kalinga				+		
4 7.	Paripakin i				+		
4 8.	Suthram adhya					+	
4 9.	Vyagrad ani					+	
5 0.	Tyastrav alli						+

Etymology of Synonyms

- 1. Ardachandra: Leaves are semilunar in the shape
- 2. Kaali/Kali: Seeds are black in colour
- 3. Kalingika: Available at Kalinga Desha
- 4. Kutarana: The flowers are funnel shaped
- 5. *Kumbhee*: A reputed drug which is safe and effective
- 6. Kosha Phala: Fruit is covered by Cell like structure
- 7. Laghu Rochana: Creates interest of food & digests the food
- 8. *Masuravidala / Masura* : Seeds resembles like Masura seeds
- 9. Palindi: Which protects from Pitta Jwara
- 10. Rechana: Causes purgation & relieves constipation
- 11. *Sarwanubhuthi*: Experienced by many people, because it is safe purgative
- 12. Suvaha: being creeper it spreads in all directions
- 13. Syama: Colour of root is black

14. Sarala: Having the property of relieving Constipation

15. *Trivrit*: The stem is of triangle shaped / three winged

16. Triputa / Tribhandi: The stem is three winged

Table 5: Rasapanchaka of Trivrit according to different Nighantus

S N	Proper ties	ВР	RN	DN	MPN	KN
1.	Rasa	Madhu ra	Tikta Katu	Madhur- Swetha Katu- Shyama	Tiktha	Katu Tiktha Madhura Kashaya
2.	Guna	Ruksha	Ruksha	Ruksha	Ruksha	Ruksha
3.	Virya	Ushna	Ushna	Ushna	Ushna	Ushna
4.	Vipaka	Katu	Katu	Katu	Katu	Katu
5	Prabha va	Virech ana	Virech ana	Virech ana	Virech ana	Virech ana

Table 6: Karma of Trivrit according to different Nighantu's

SN	Nighantu	Karma
1.	Bhavaprakasa Nighantu	Tridoshahara, Kaphapittahara
2.	Raja Nighantu	Kaphapittahara
3.	Madanapala Nighantu	Kaphapittahara
4.	Madanadi Nighantu	Kaphapittahara
5.	Kaiyyadeva Nighantu	Kaphapittahara

DRUG REVIEW - MODERN

Taxonomical classification of Operculina turpethum^[24]

Kingdom: Plantae

Subkingdom: Tracheobionata, vascular plants

Superdivision: Spermatophyta, seed plants

Division: Angiosperma

Class: Dicotyledons

Order: Solanales

Family: Convolvulaceae

Genus: Operculina

Species: O. turpethum (L.) Silva Manso

Botanical Description

Habitat: It is native to tropical climate. It is widely distributed throughout India, up to an altitude of 1000 meters. Sometimes cultivated.

Habit: It is large perennial twinned herb with milky juice.

Root: The root is long, slender, 1.5 to 5 cm in diameter, fleshy and much branched, bark from the roots easily removable and only the woody portion remains after taking away the root bark. Externally it is deeply striated, brown or dark grey in color and looks like a rope.

Stem: Very long, twinning, much twisted together, tough and brown stem erect with three angled.

Leaves: Vary in shape. Ovate or oblong in shape up to 10 cm long and 7 cm broad. Leaves are simple and having alternative phyllotaxy.

Margin: Entire

Base: Cordate

Tip: Sub acute

Petiole: 2.5cm long, pubescent

Venation: Reticulate type

Flowers: Funnel shaped white colour flowers in cyme inflorescence. Cymes are regular, bisexual, hypogynous.

Peduncles: Stout, 2.5 to 5 cm long.

Bracts: large, lanceolate, pubescent reaching 2.5 cm

long caduceus, often pinkish.

Pedicles: 0.6 to 2.5 cm long, pubescent slightly thickened upwards.

Sepals: Five, usually free Outer sepels upto 2.2 cm long in flower and two in number.

Petels: five united, funnel shaped, Twisted in bud.

Stamens: 5 epipetalous, alternating with petels.

Carpals: 2- ovary superior, disc at the base, with two celled 2 ovules in each cell.

Filament: Filiform.

Anthers: nearly 8 mm long, at length contorted; pollen

not echinulate.

Ovary: 2 celled, glabrous.

Ovules: four in number.

Style: Filiform.

Stigma: 2, globose

Fruit: Capsule, 12 to 18mm diameter globosely enclosed in the enlarged, imbricate, Brittle calyx segments.

Seeds: four or less round shaped seeds, dull black in colour, glabrous and one in each cell.

Chemical constituents^[23]

Root bark of *Trivrit* is rich in turpeth resin consisting of 10% 'turpethin' which is a glycoside. *Trivrit* also contains Turpethinic acids - A, B, C, D, & E, some ether soluble resin, volatile oil, albumin, starch, lignin salts, ferric oxide, Scopoleptin, Betulin, lupiol & beta-sitosterol.

Propagation and Cultivation^[23]

Trivrit can be easily propagated seeds or layering. Hot water treatment of seeds is recommended for better germination. The seedlings are transplanted in June to July. Harvesting of roots recommended 18 months after plantation, when the resin reaches to its optimum.

Substitutes and Adulterants: *Marsdenia tenacissima* W.A. Besides this some other rhizome, roots, barks than those of O. turpethum are reported to be sold in the market under the name of *Trivrit*.

Pharmacological activities^[23]

Anti-bacterialactivity, Anti-inflammatory activity, Anti-secretory activity, Anti-microbial activity, Anti-diabetic activity, Hepato-protective activity, Cytotoxic activity.

Chemical Constituents

An ether insoluble glycoside-turpethin, 2 other soluble glycosides- α , β turpetheins Coumarin scopoletin along with sugars glucose, rhamnose, fructose 4^1 –0-methyl apigenin, luteolin & its derivative, gentisic, protocatechuic, v anillic, p-coumaric, metiolitic, ferulic acids, turpethinic acids A,B,C,D & E, saponins are major components derived from various parts of this plant.

Toxicology

The LD₅₀ of the alcoholic extract was 1000mg/kg i.p in mice

Useful part: Root of the Trivrit is the useful part.

Dose: 1 to 3 grams of Trivrit root powder.

Anupana: Jala, Usna Jala, Sarkara and Guda etc.

DISCUSSION

Trivrit is Madhura, Tikta, Katu Rasa, Ruksha Guna, Ushna Virya and Katu Vipaka. Madhura Tikta and Kashaya Rasas are Pitta Shamaka in nature they are Soumya Rasas. Katu, Tikta and Kashaya Rasas will cause Kapha Shamana and Trivrit being Sukha Virechana Dravya it causes Vata Anulomana, thus its mainly Kapha Pitta Hara and at the same time Tridoshashamaka. It has got broad spectrum of therapeutic utility indicated in many diseases like Kusta (Skin Diseases), Visarpa (Erysipelas), Krimi (Worms), Vibandha (Constipation), Vrana (Wounds), Visha Rogas (Poisoning), Kamala (Jaundice), Arbuda (Abscess), Galaganda (Thyroid Goiter), Granthi (Cysts), Daha (Burning Sensation), Udara (Abdominal Diseases), Bhagandhara (Fistula In Ano), Nadivrana (Sinus), Pandu (Anemia), Raktapitta (Bleeding Disorders), Vata Rakta (Gouty Arthritis), Prameha (Diabetis), Stoulya (Obesity), Jwara (Pyrexia), Kasa (Cough), Swasa (Dyspnea), Yakrit Rogas (Liver Disorders), Plihavriddhi (Spleen Disorders), Yoni Rogas (Gynecological Problems), Shotha (Edema), Grahani (Irritable Bowel Syndrome).

It is main component in many important preparations like Churnas namely Naracha Churna, Hapushadi Churna, Panchasamachurna, Trivritchurna, Haritakyadichurna, Hinguvadi Churna, Avipattikara Churna etc., Vati/Gutika like Candraprabhavati, Kankayana Vati, Abhayadi Modaka, Trivritadi Vati, Haritakyadi Modaka, Manibhadra Modaka. Ghritas like Bindu Ghrita, Naracha Ghrita, Maha Bhallataka Ghrita and Saindhavadi Taila. Kashaya like Brihat Manjistadi Kashaya, Rasnadi Kashaya, Trivritadi Kashaya, Pippalyadi Kashaya and in Kaishora Guggulu etc.

CONCLUSION

Thus, from above references it can be inferred that *Trivrit* is a potent *Ayurvedic* drug which is being used from *Vedic* period to present era it can be used as single drug and also as a compound formulation for treating many diseases

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