

GOAT MILK: BOON FOR PULMONARY TUBERCULOSIS PATIENTSNishigandha Dandekar¹, Nalin Shah²¹. MD (Ayu.) Scholar, Department of Rasashastra and Bhaishajya kalpana². Lecturer, Department of Rasashastra and Bhaishajya kalpana, Y.M.T. Ayurvedic Medical College.**ABSTRACT**

TB statistics published by WHO in 2015 includes India amongst the 14 TB, MDR TB and TB/HIV high burden countries. Pulmonary tuberculosis is correlated with *Rajayakshma* mentioned in *Ayurvedic* texts. Currently, TB hospital, Shivdi declared that clinical study on goat milk will be carried out on tuberculosis patients as they found remarkable improvement in some patients who received goat milk along with AKT. *Aja kshira* (Goat milk) is important *Ayurvedic* drug in *chikitsa* of *Rajayakshma vyadhi*. Thus review of goat milk according to ayurvedic and modern literature was done. It has efficacy against kshaya, kasa, shwasa, atisara etc. It has deepana, laghu, balya, grahi properties. According to modern research, it has anti-fungal, anti-microbial properties which affect lungs. It also has immunological role in gastrointestinal infections. Also goat milk has higher content of medium chain fatty acids which are easy for digestion and used as medicine for malabsorption syndrome and steatorrhea.

KEYWORDS: Goat milk, pulmonary tuberculosis, *Rajayakshma*, *Chhagaseva*.

INTRODUCTION:

Pulmonary Tuberculosis remains a major public health problem in developing countries. It causes due to infection with *Mycobacterium tuberculosis*. It causes 2 million deaths per year in all over the world. Majority of the cases are likely to occur in the world's poorest nations, who struggle to cover the cost associated with management and control programme. Thus many patients remain untreated or receive incomplete treatment which results in multi drug resistant tuberculosis (MDR TB). TB statistics published by WHO in 2015 includes India amongst the 14 TB, MDR TB

and TB/HIV high burden countries¹. Current estimates suggest that around one third of world's population has latent tuberculosis. Recently, TB hospital, Shivdi declared that clinical study on goat milk will be carried out on tuberculosis patients as they found remarkable improvement in some patients who received goat milk along with AKT². Pulmonary tuberculosis is correlated with *Rajayakshma* mentioned in *Ayurvedic* texts. It is a contagious disease which is transmitted from an infected person to susceptible person in airborne particles that are released when infected person sneezes, cough, laugh, shout etc. According to *Ayurveda*, *Rajayakshma* is included in *aupasargik roga*³. So the infection can also be considered the etiology of *Rajayakshma* and this is the *San-*

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nikrishta cause of the *Rajayakshma*. Modern science describes that *Mycobacterium tuberculosis* does not produce the disease in all the persons, but produces primary tuberculosis. So they described some provoking factors like cigarette smoking, alcoholism, immune-suppressive agent and some diseases like leukemia, lymphoma etc. which may be responsible for the disease. Similarly, there are two type of *ni-dana* in pathogenesis of *Rajayakshma*:

- a) *Sannikrishta nidana* which is the *upasarga* and this may be the infection of *Mycobacterium tuberculosis*.
- b) *Viprakrishta nidana* is 4 typed *sahajanya*, *sandharanajanya*, *kshayajanya* and *vishamashanajanya*. These may act like provoking factors responsible for the dis-

ease. Also, *Trirupa*, *Shadrupa* and *Eka-dashrupa lakshana* of *Rajayakshma* have been correlated to signs and symptoms of pulmonary tuberculosis⁴. *Chikitsa* for *Rajayakshma rogi* according to *Ayurveda* is *Chhagaseva*⁵. Meaning of word *Chhaga & Aja* is Goat. *Sushruta samhita*, *Chakra-datta*, *Vangasena*, *Yogratnakara* have advocated the use of various products obtained from goat. The patients suffering from *Kshaya* i.e. synonym of *Rajayakshma* should stay in the company of goats in the same room, drinks goats milk, use *ghrita* prepared from goat's milk in the *ahara*. The room in which the patient and goats leave should be painted, and tiled with goat's faces and urine. In current study, literature review on goat milk is done.

REVIEW OF GOAT MILK

Ayurveda texts:

SrN.	Text	Rasa	Virya	Vipaka	Dosha ghnata	Uses	Roga Ghnata
1.	<i>Ca. Sa.</i>	<i>Kashay madhur</i>	<i>Shita</i>	-	-	<i>Grahi, Laghu</i>	<i>Kshaya, Kasa, Atisar, Raktapitta, Jwara,</i>
2.	<i>Su. Sa.</i>	-	-	-	-	Properties similar to cow milk. <i>Dipaniya, Laghu, Sangrahi</i>	<i>Shosha, Kasa Shwasa, Raktapitta</i>
3.	<i>A. Hr.</i>	-	-	-	-	<i>Laghu</i>	<i>Shosha, Shwasa Jwara, Atisar, Raktapitta</i>
4	<i>Bha. Pra. Ni.</i>	<i>Kashay Madhur</i>	<i>Shita</i>	<i>Katu</i>		<i>Grahi, Laghu</i>	<i>Kshaya atisar Kasa, Jwara, Raktapitta</i>
5	<i>Yo. Ra.</i>	-	-	-	<i>Tridosha</i>	Properties similar to cow milk, <i>Vishesh dipana,</i>	<i>Kshaya, Arsha, Jwara</i>

						<i>Grahi, Laghu</i>	<i>Atisara, Raktadosh Bhrama,</i>
6	<i>Kai. Ni.</i>	<i>Madhur Kashay</i>	<i>Shita</i>	-	<i>Kapha</i>	Properties similar to cow milk, <i>Dipana, Laghu Sangrahi, Snigdha, Mrudu, Balya Shukrala,</i>	<i>Kshaya, Kasa Arsha, Jwara Shwasa, Atisara, Trushna, Vatarakt Raktapitt</i>
7	<i>Dha. Ni.</i>	<i>Kashay Madhur</i>	<i>Shita</i>	-	-	<i>Grahitara, Laghu</i>	<i>Kshaya, Kasa Jwara, Atisar, Rak-tapitta.</i>
8	<i>Ni. Ra.</i>	<i>Kashay Madhur</i>	<i>Shita</i>	-	-	<i>Grahi, Laghu</i>	<i>Kshaya, Kasa Jwara, Atisar, Rak-tapitta</i>
9	<i>Ra. Ni</i>	-	-	-	-	More potent than cow milk, Diet for weak person.	<i>Sarva Vyadhi hara</i>

Table No. 1: Properties of goat milk according to Ayurvedic literature.

Modern research papers:

Sr. N	Drug	Journal/Article	Proved activity/ Findings
1.	Goat milk	Ancient Science of Life 1993 January; 12 (3-4) :335-337 Pub-med ID: 22556611	87.06 per cent inhibition in the spore germination of fungi <i>Absidia corymbifera</i> .(third-most-common cause of invasive fungal infection in immunocompromised patients.)
2.	Goat milk lactoperoxidase	Indian journal of experimental biology 1998 Aug;36 (8):808-10. PMID: 9838883	Anti bacterial property
3.	Goat milk lactoperoxidase	<u>Life Sciences</u> .2000;66(25):2433-9.PMID -10894086	antifungal and antibacterial property
4.	Goat Milk-Serum Amyloid A-3 Protein	International Conference on Antimicrobial Research (ICAR2010) Valladolid (Spain), 3-5 November 2010	1) Antimicrobial activity S. Aureus Enteropathogenic E. coli. 2) Gastrointestinal protection and immunological role
5.	Goat milk	Asian journal of animal sci-	Anti bacterial property:

	lacto peroxidase	ences · January 2011 DOI:10.3923/ajas.2011.56.63	<ul style="list-style-type: none"> • Vibrio cholerae, • Salmonella typhi, • klebsiella pneumoniae, • Shigella dysenteriae.
6.	Goat milk	Indian J. Dairy Sci. 65(4), 2012	<ul style="list-style-type: none"> • Size of fat globules - less than 5 microns is 83% thus easy digestion. • Higher values of Caprylic acid, capric acid, Medium chain triglyceride than cow milk which are used in treatment for Malabsorption syndrome, and Steatorrhea.
7.	Goat milk	Journal of Dairy Research. 2001; (Barrionuevo et al 2002; Alferez et al, 2003; Campos et al, 2003; Lopez-Aliaga et al, 2003).	In vivo study - Animals with symptoms of malabsorption show more efficient absorption of calcium, phosphorus, iron, copper, zinc, magnesium and selenium from goat milk compared to cow milk

Table No. 2: Properties of goat milk according to Modern research work.

RESULTS AND DISCUSSION:

- According to review of Ayurvedic literature, goat milk is beneficial in Kshaya, Shosha which are synonyms of Rajayakshma.
- Main symptom of rajayakshma is cough, breathlessness, and fever.
Goat milk has efficacy on Kasa, shwasa and jwara. According to research work, goat milk causes inhibition in the spore germination of fungi Absidia corymibifera which affects lungs. Also, goat milk has anti bacterial and anti fungal properties. It has anti microbial activity against S. Aurius which causes diseases like pneumonia, UTI, sinusitis, infective endocarditis, osteomyelitis etc. which induce fever.
- According to Charaka samhita⁶, Purisha rakshan is very important in case of rajayakshma rogi. Goat milk has efficacy on atisara. According to modern research,

- It has anti bacterial properties against E. coli, Vibrio cholerae, Salmonella typhi, klebsiella pneumoniae, Shigella dysenteriae which cause diarrhea and dysentery. It shows immunological role in gastrointestinal protection.
- In Rajayakshma rogi, samprapti⁷ (pathophysiology) starts with *agnimandya* (diminished digestive activity) and *rasavaha strotas avarodha* which causes *kshaya* of further *dhatu*. Goat milk has *deepana, grahi, laghu, balya, shukrala* properties which can cause *samprapti bhanga*. It has 83% fat globules which are less than 5 microns' size. Thus it is easy for digestion. Also, it has higher values of Caprylic acid, capric acid, Medium chain triglyceride which are used in treatment for Malabsorption syndrome, and Steatorrhea. Animal study shows that absorption of micro nutrients is more efficient from goat milk in comparison with cow milk.
- It has properties similar to cow milk which is best amongst all milks according to *Ayurveda*.

CONCLUSION:

- Pulmonary tuberculosis is correlated with *Rajayakshma*.
- Ayurvedic literature review concludes that goat milk can break pathophysiology of *Rajayakshma*.
- Modern research papers support the properties of goat milk mentioned in *ayurvedic* texts.
- Thus, goat milk can be an effective medicine in Pulmonary tuberculosis patients.

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