

ANTI-SPASMODIC ACTIVITY OF *TAMBULA BHASMA*

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ABSTRACT

The betel plant belongs to the family Piperaceae. Traditionally betel leaf is chewing after taking meal having significant medicinal properties and nutritional values. It contains some vitamins, minerals and produce enzyme that helps indigestion. *Tambula bhasma* is a unique preparation mentioned in *Sahasrayoga*, *Churna prakarana*, provides a promising strategy for many health issue of rooting from *shoola*. As it contains the application of *Arka ksheera* (latex) to the *Tambula patra* for seven times and prepared by giving one *Laghu puta*. Then it is administered with *Ajamoda*, *Saindhava lavana* and *Guda*. These drugs are having *Udara-shoolahara*, *Parinama-shoolahara* action and are indicated in different types of *Shoola*. So the present study is made to know the action of drug with and without *Anupana*. Here experimental work was undertaken to evaluate the anti-spasmodic activity on different isolated tissues by in-vitro method. This study indicates that *Tambula bhasma* with and without *Anupana* showed an effective inhibiting the spasms induced by Acetylcholine.

Keywords: Antispasmodic, *Tambula Bhasma*, Isolated ileum.

INTRODUCTION

Ayurveda describes a wholesome daily routine or day to day conduct as not only prophylactic, but conducive to four *Purusharthas*.

Chewing betel leaves is one of the *Dinacharya* and also it is an ancient practice in India (second century B.C.) and probably the tantric cults encouraged it and made it widespread¹. It has remained obligatory on festive occasion; and large number of Indians are addicted to it even today. The practice is also prevalent in other tropical countries like Thailand, Vietnam, Malaysia, Indonesia; it is also popular in Burma and Srilanka. The betel leaf is predominantly

consumed as betel quid, which is a mixture of substances areca nut, tobacco and lime. Some reports may suggest that betel quid has adverse health effects but most of the findings show that the betel leaf has many medicinal benefits and it has no adverse effects.

Adaptation of available techniques and technologies in search for more efficacious, widely accepted and most feasible therapeutic forms is the need of time. The trails and errors in experiments to fulfil these are being practised in India since time immemorial. *Ayurvedic* drugs are obtained from

natural resources only i.e. from plants, animals, or from minerals.

The heart shaped betel leaves are found in ancient Sanskrit texts, including *Charaka Samhita*, *Sushruta Samhita* and *Astanga Hridayam*. *Piper betel* L. has been used in Chinese, Indian folk medicine for centuries. That the betel leaf contains several vitamins like, vitamin-C, vitamin-A, nicotinic acid, thiamine and riboflavin². The leaf acts as natural antioxidant that is related with different biological activities.³ The leaf produce enzyme that helps in digestion and has a significant antimicrobial activity against broad spectrum micro organisms. *Streptococcus pyogenes*, *staphylococcus aureus*, *Proteus vulgaris*, *Escherichia coli*, *Pseudomonas aeruginosa*.⁴ However, extensively used betel leaf by itself has many medicinal benefits without side effects except carrying mother. The *Alarka* plant is bigger than the *Arka* plant both having almost same properties and action. Commonly *Arka* is taken for medicinal purpose.

Pharmacological Activities of calotropis: Anti cancer, anti-implantation, anti-microbial, nematocidal, high fibrinolytic, anticoagulant, vermifugal, anthelmintic, stimulant, spasmogenic and mild diuretic.⁵ Calotropin showed digitalis like action on heart, but its action was not cumulative and less harmful.

The oil of seeds of *Ajamoda* is also used in compounding *Ayurvedic* formulations. While, fatty oil of seeds is antispasmodic and nerve stimulant, seeds of celery are rich in vitamin-B.⁶ *Lavana* to be employed in the treatment of *Gulma*, *Udararogas*, *Shula* etc. It is also beneficial in *Vatarogas*. *Guda* is *Guru*, *Snigdha*, *Vataghna*, *Vrshya*, *Mutrashodhana*, *Medya*, *Kaphaghna*, *Krimighna* and *Balya*. It is one among the daily needs in diet regimen.⁷

Spasms are very common in human beings. Spasms are continuous smooth muscle contractions, may be induced due to endogenous acetylcholine. They can

lead to discomfort, uneasiness and could result into irritation and inflammation of the gastrointestinal tract posing a major health problem to the human being. It could even lead to threatening conditions such as gastritis and inflammatory bowel disorders. Antispasmodics are used to treat such conditions successfully, though they show various side effects such as dry mouth, narrow angle glaucoma, tachycardia, obstructive disease of GI tract.

Objectives:

- To prepare *Tambula Bhasma*.
- To carry out experimental study on antispasmodic activity.

Materials and Methods:

Well grown and cleaned *Tambula patra* is selected and washed with running water. Then freshly collected *Arka Ksheera* is applied on both the sides of the leaves and dried in shades. This procedure is repeated for seven times, and after seven times of applications, then the leaves are kept in *Sharava Samputa* and to prepare *Bhasma one Laghu Puta* is given. Then the equal quantity of *Saindava Lavana*, *Ajamoda* and *Guda* is added to this *Bhasma* and triturated well⁸. In Ayurveda pharmaceuticals, *samskara* play a pivot role without *samskara*, preparation of medicines will be virtually impossible. As *Mardana* is a process of mixing the drug in a homogenous form to have desired action of the drug.

Procurement of drug:

- ❖ *Tambula Patra* was collected from local market of Bengaluru.
- ❖ *Arka Ksheera* was collected from *Dhanvantri* Garden.
- ❖ Remaining drugs like *Ajamoda* and *Saindhava Lavana* was purchased from Amritkesari Ayurveda raw drug depot, Bengaluru.

Place of work: Government Ayurveda Medical College, Bengaluru – 09.



Fig 1: Piper betel



Fig 2: Ksheera applied



Fig 3: Dried in shade



Fig 4: Tambulabhasma.

Materials:

- Standard drug for comparison study: Acetylcholine.
- Isolated muscle preparation: Rat colon.
- Physiological salt solution: Tyrode’s solution.
- Instruments: Student organ’s bath.

Selection of animal spices:

Healthy adult albino rats of either sex weighing between 150 – 250 gm were procured from animal house attached to pharmacology laboratory of Acharya & BM Reddy College of Pharmacy, Soldevanahalli, Bengaluru – 07.

Animals of either sex were fasted for 24 hrs before the study. Then the animals were sacrificed to isolate the ileum pieces.

Procedure is carried by following steps⁹.

The physiological salt solution mixing should be done in proper order. Calcium Chloride is added at last, to prevent the formation of calcium bicarbonate. PSS should be freshly prepared and free from turbidity. Tyrode’s solution is maintained at 37° C. This PSS is maintained at 37° C not more than that or less to make tissue alive as it feels it is body. Arrange the

instrument and adjust the water bath. Kymograph Sherrington – to obtain a graphical amplified measurable response of a muscle tissue by using a rotating drum for the graph to using the Student organs bath. Tissue holder and oxygen supply. Balance the lever, Lever has three basic parts:

- (a) Effort arm – where force is applied
- (b) Load arm –where effect of force is observed
- (c) Fulcrum

Tissue Selection of Rats ileum is done by surgical process and collection of required tissue is selected. Tissue was cut into pieces of 2-3 cm in length. The distal piece was most preferred and used, being the most sensitive to different spasmogens. Animal sacrificed by cervical dislocation. Tissue is attached to the water bath. Relaxation time was given to the tissue. Prepare the standard drug (serial dilution). Prepare DRC for the standard and test drug. A dose response curve was obtained and then percent inhibition of the contractions produced by submaximal dose of the spasmogen was reported. Calculation is done at last¹⁰.

Table 1: Showing DRC of Acetylcholine and *Tambula Bhasma*.

Sl.no	Drug	Dose	Response (cm)
1	Acetylcholine + <i>Tambula bhasma</i> (without <i>Anupana</i>)	0.1ml + 0.1 ml	1 cm
2		0.2 ml + 0.2 ml	1 cm
3		0.4 ml + 0.4 ml	1 cm
4		0.8 ml + 0.8 ml	0.9 cm
5		1.6 ml + 1.6 ml	0.9 cm

Fig 1: Showing DRC of drug -1.

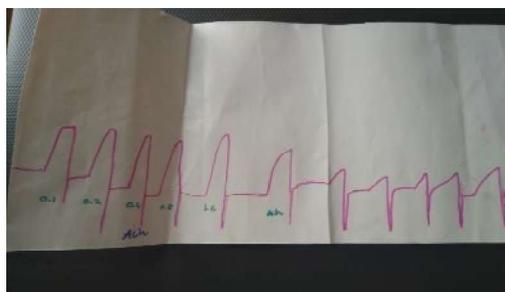
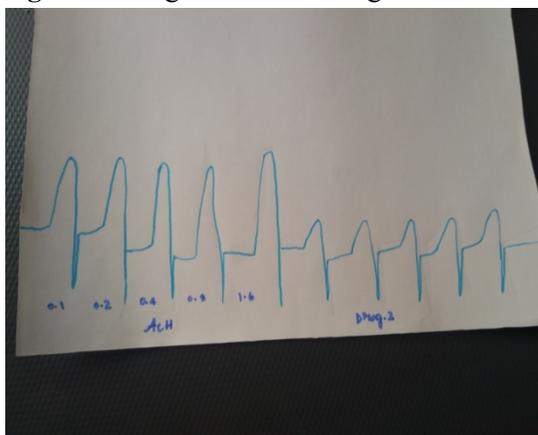


Table 2: Showing DRC of Acetylcholine and *Tambulabhasma* with *Anupana*.

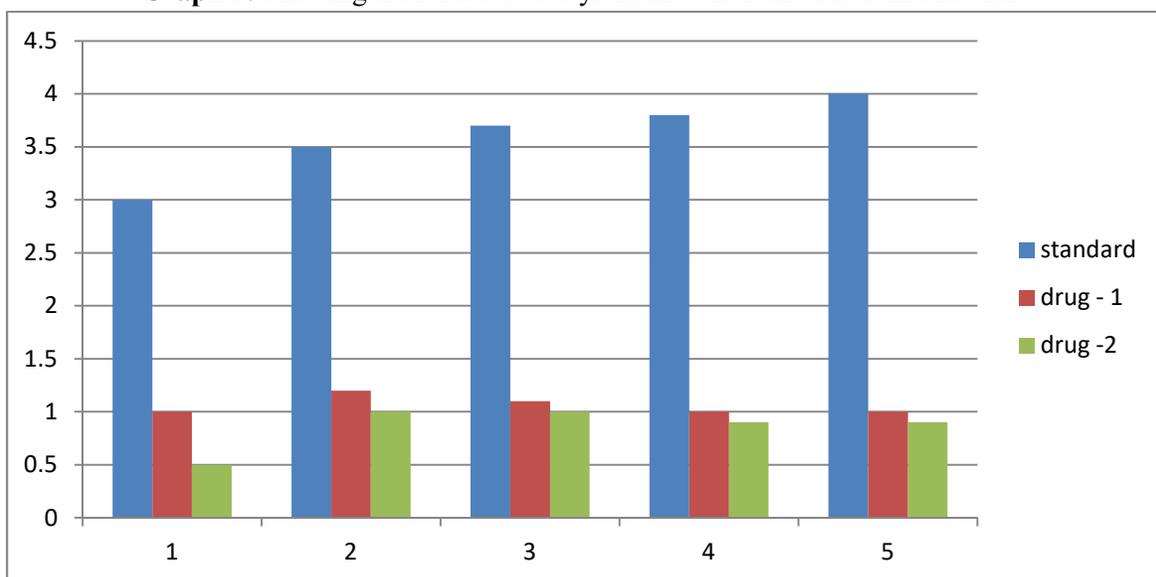
Sl.no	Drug	Dose	Response (cm)
1	Acetylcholine + <i>Tambula bhasma</i> with <i>Anupana</i>	0.1ml + 0.1 ml	0.5 cm
2		0.2 ml + 0.2 ml	1.2 cm
3		0.4 ml + 0.4 ml	1 cm
4		0.8 ml + 0.8 ml	1 cm
5		1.6 ml + 1.6 ml	1 cm

Fig 2: showing the DRC of drug 2.



Results: Here both the drugs had showed an equivalent response. It concluded that compare to standard drug Acetylcholine, *Tambula Bhasma* without *Anupana* and with *Anupana* had shown a excellent results.

Overall results of standard drug (Acetylcholine) and prepared drugs i.e. Drug – 1: *Tambula Bhasma*; and Drug – 2: *Tambula Bhasma+Saindhava+Guda+Ajamoda* had showed in this chart.

Graph 1: Showing the results of acetylcholine TB-1 and TB-2 in one chart.**Table 3:** Showing DRC of standard, Drug – 1, Drug – 2.

Acetylcholine	Drug – 1 (<i>Tambula bhasma</i>)	Drug -2(<i>Tambula bhasma with Anupana</i>)
3 cm	1	0.5
3.5 cm	1.2	1
3.7 cm	1.1	1
3.8 cm	1	0.9
4 cm	1	0.9

DISCUSSION

Tambula Patra have been described as *Katu-Rasa*, *Teekshna-guna*, *Ushna-Veerya*, and valuable for voice, laxative, appetizer, beside this it is a *Vata Shamaka*, and *Pitta Prakopa*. The antioxidant property is correlated with different biological activities like hepato-protective, anti-diabetic and anti-cancer properties, since free radicals are involved in all these diseases. The most predominant of them all has been found to be eugenol. Eugenol is an important phytochemical with analgesic, anti inflammatory and anaesthetic properties. Eugenol can further find lot of applications in cosmetics and food industry. *Arka khseera* carries properties like *Kusta*, *Gulmaroga* and *Udararogahara*¹¹. *Arkaksheera* have effects on *Tridosahara*, it balances *Vata* and *Kapha Doshas*. This latex is useful in abdominal (*Gulmahara*) tumors, bloating, *Udarahara*, *Deepana*, *Sho-*

phahara, *Vranahara*, *Krimihara*³. *Ajamoda* is used in our daily food and more important it is used as medicinal herb. This drug possesses potent anti-spasmodic activity on smooth muscles of the gastrointestinal tract. This drug is very rich in volatile oil (essential oil) and properties of carminatives, antiseptic, diuretic, antihelmintics, analgesic, antirheumatic, aromatic, and counter-irritant¹². Salts are commonly used in the preparations of many numbers of *Ayurvedic* dosage forms and as a routine dietary regimen. *Lavana* is said to be best among all the other *Lavanas* as it is *Tridoshara* (pacifies all the *Doshas*). Most of the *Lavana Kalpana* is mentioned to be employed in the treatment of *Gulma*, *Udararogas*, *Shula* etc. It is also beneficial in *Vatarogas*.

CONCLUSION

These trails included the evaluation of new herbal anti-spasmodic with colicky disorders like nonspecific abdominal colic, irritable bowel syndrome, infective diarrhoea, acute amoebic colitis, pain associated with lower urinary tract infection and painful menstruation.

These herbals have been used to treat various gastrointestinal disorders like abdominal pain, flatulence and colic. An herbal product is safe and effective gastrointestinal remedy to fight against various gastrointestinal problems. So the objective of this review is to provide a consolidated report on traditional use and regular uses of spasmolytic activities of medicinal plants. All these drugs are commonly used in our daily foods which are having more important medicinal values in it.

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