Ayurveda Sahiti Prabha's
International Journal of Ayurvedic Medicine
ISSN No: 0976-5921

Case Report

Effect of *Bala Taila Matra Basti* and *Yoni Pichu* in the ninth month of pregnancy on facilitating normal vaginal delivery: A Case series

Gayatri Hubli[1], Laxmikant S D[2*], Himanshu Binji[3]

1. Associate Professor, Department of Prasooti Tantra and Stree Roga, KAHERs Shri BMK Ayurveda Mahavidyalaya, Belagavi, Karnataka. India.
2. Professor, Department of Shalya Tantra, KAHERs Shri BMK Ayurveda Mahavidyalaya, Belagavi, Karnataka. India.
3. PG scholar, Department of Shalya Tantra, KAHERs Shri BMK Ayurveda Mahavidyalaya, Belagavi, Karnataka. India.

Received: 20-11-2025 Accepted: 17-05-2026 Published: 30-06-2026

Abstract

Background: Global Caesarean section rates are rising with concerns of overuse in pregnancies. *Ayurveda* recommends *Garbhini Paricharya* [Antenatal Care] with *Matra Basti* [Oil Enema] and *Yoni Pichu* [Vaginal Tamponing] with *Bala Taila* in the ninth month of pregnancy to ensure natural delivery. Objective: To evaluate the effect of *Matra Basti* and *Yoni Pichu* with *Bala Taila* in Primigravida on cervical changes, progress of labor, and delivery outcomes. Methods: A Prospective case series was done with four primigravida females (aged 18-35 years) with single live intrauterine gestation > 36 weeks, and willing to participate with written informed consent. All patients received *MatraBasti* (60ml) and *Yoni Pichu* (30ml) with *Bala Taila* for seven days under aseptic conditions on OPD basis. Routine antenatal checkups monitored maternal vitals, obstetric examination, fetal heart monitoring. After 7 days basti, assessment was done when natural labor started. At admission Modified Bishop's score, Cervical changes, Duration of labor stages and delivery outcomes (APGAR score at birth, 5min and 10 min) documented. Results: All demonstrated positive cervical ripening with elevated Bishop's scores. The initial phase of labor extended to 9 hours, whereas subsequent phase lasted for 7-12 minutes. Participants underwent uncomplicated normal vaginal deliveries. Third stage was uneventful with placental delivered within 5-7 minutes. Neonatal results were favorable, with birth weight between 2740 and 3102 grams and good APGAR scores. Conclusion: *Matra Basti* and *Yoni Pichu* with the use of *Bala Taila* appears effective in cervical ripening, improving labor progress, and inducing successful vaginal delivery.

Access this article online

Website: https://ijam.co.in

DOI: https://doi.org/10.47552/ijam.v17i2.6729

Keywords: *Apana Vata, Ayurveda,* Bishop's Score, *Bala Taila, Garbhini paricharya*, *Matra basti*, *Yoni pichu*

Introduction

According to statistical evidence from the World Health Organization, the global rate of C-sections, or Caesarean sections, has risen from 7% in 1990 to 21% currently, significantly surpassing the 10-15% range. Although C-sections are crucial for handling obstetric emergencies, their growing use for non-medical reasons like evading labor pain, enabling scheduling, or preventing vaginal injury during delivery raises concerns. The overuse of cesarean deliveries, especially in low risk pregnancies, is linked to negative effects for both the mother and the child, such as extended recovery periods, higher chances of complications in subsequent pregnancies, and possible harm to the fetus (1).

*** Corresponding Author:**
Laxmikant S D
Professor, Department of Shalya Tantra,
KAHER's Shri BMK Ayurveda Mahavidyalaya,
Belagavi, Karnataka. India.
Email Id: shalyalsd@gmail.com

This highlights the significance of interventions that facilitate the normal labor and delivery process. In *Ayurveda, Garbhini Paricharya* refers to a holistic collection of recommendations encompassing dietary guidance, lifestyle changes, and therapeutic measures to promote a healthy pregnancy and aid during labor and child birth(2)(3)(4). In the previous month, therapies such as *Madhuroushadhi siddha taila Anuvasana Basti* and *Yonipichu* are highly advised to facilitate a smooth, normal with uncomplicated delivery. These treatments help in stabilizing *Vata Dosha*, specifically *Apana Vata* which is crucial for the labor and delivery process.Many studies have been done with the intervention of Ayurvedic therapies including Matra basti and Yoni pichu for Sukhaprasava with the time of intervention from the starting of 9th month of pregnancy which have proven the reduction of 1st stage of labor with no effect in 2nd and 3rd stage of labor. Also the mode of delivery was assisted instrumental normal vaginal delivery in most of the cases. Hence this study was undertaken to assess the efficacy of Matra Basti and Yonipichu with Bala Taila in primigravida in the ninth month of pregnancy. The aim is to evaluate their impact on labor sequelae, cervical alterations, length of each labor phase and delivery results, and to assess their role in aiding straightforward and uncomplicated vaginal births

Diagnostic assessment

In this Case Series, four primigravida women were selected on the basis of:-

Inclusion Criteria: All Primigravida, Single Live Intrauterine Gestation >36 weeks in cephalic presentation, Age ranges between 18-35 years, Pregnant women who are willing for the study, HB% > 9 gms.

Exclusion criteria: Pre-eclampsia, Gestational Diabetes Mellitus, Multiple Pregnancy, Cephalo pelvic disproportion,Pregnant women having known systemic disorders such as HIV, Rheumatoid Arthritis, diabetes, Thyroid, HTN, etc.

Intervention: All the patients were given *Matra Basti*(60 ml) and *Yonipichu* (30ml) with *Bala taila* in the 9th month of pregnancy for a period of 7 days Assessment Criteria: After the administration of *basti* regime completed, we await for the spontaneous onset of labor without any induction of labor or obstetric interventions. With the spontaneous onset of labor, the patient was admitted, during admission assessment was done by checking patient vitals and the Modified Bishop's score by the investigator every second hourly till the patient enters the active stage of labor.

Case Presentation

All the four primigravida women were given *MatraBasti*(60ml) and *Yonipichu* (30ml) with *Bala taila* according to the SOP in the 9th month of pregnancy

Case 1

A 26- year-old, primigravida (G1P0) came for routine antenatal check-up at 37 weeks of gestation on 19 November 2022. She noticed that the fetal movements were normal with no abnormal symptoms. Her last menstrual period (LMP) was on 5th march 2022, according to that her estimated delivery date (EDD) was on 10 December 2022. She had no history of any medical or surgical problem and had no known allergies. Before conception, her menstrual cycle were regular. There was no history of genetic disorders or complications during pregnancy. She had no history of smoking, recreational drug, or alcohol use. She had been visiting her regular appointments for routine checkup at the hospital and was receiving *Ayurveda* treatment as a part of her antenatal care throughout her pregnancy. There was no complications during the progression of antenatal care, showing no indicators of hypertension, diabetes, or other maternal health related problems during pregnancy.All standard examinations, including lab tests and ultrasounds, yielding normal results.

Case 2

On 17th February 2023, a 24- year old primigravida (G1P0) came for routine antenatal check-up at 37 weeks of pregnancy. She observed normal perception of fetal movements and complained of mild lower backache since one week. Herlast menstrual period (LMP) was on 3 June 2022, and Estimated delivery date (EDD) was 10 March 2023. She had no history of medical or surgical condition, no known allergies. She was non-smoker, non-alcoholic and had no history of medical or surgical conditions, no known allergies. She was non-smoker, non-alcoholic and had no history of substance use. Her menstrual cycles was regular prior to her pregnancy, there was no history of genetic disorder or complications associated with pregnancies in her family. She continuously attended her antenatal routine checkup and was receiving *Ayurveda* treatment as a part of her antenatal care throughout her pregnancy. There was no signs of hypertension, diabetes, or other maternal health related concerns, all the investigations including ultrasound and routine lab examinations, showed no abnormality.

Case 3

A 24- year old primigravida(G1P0) with 37 weeks of pregnancy came to her routine antenatal check-upon 19 February 2023. She had no fresh complaints and appreciated god fetal movements. Her last menstrual period (LMP) was on 5 June 2022, her estimated delivery date was (EDD) was on 12 March 2023. Her antenatal period was uneventful, with no signs of hypertension, diabetes, or other maternal health conditions. She had no any medical or surgical history, or allergy with no history of any risk factors such as smoking or alcohol use. Her menstrual cycles were regular before conception, and there was no family history of genetic or obstetric complications. She routinely attended her antenatal check-up and was receiving *Ayurveda* treatment as a part of her antenatal care throughout her pregnancy.All the routine examinations including ultrasound and laboratory test were normal throughout the pregnancy.

Case 4

On 25 June 2023, a 27-year old primigravida (G1P0) attended her routine antenatal examination at 37 weeks of gestation. She perceived normal fetal movements and complained of mild pain in lower abdomen with lower backache since 3 days. Her last menstrual period (LMP) was on 9 October 2022, with an estimated date of delivery (EDD) on 16 July 2023. There was no sign of hypertension, diabetes, or other maternal health related conditions, with no history of medical or surgical history, and any allergies. Her menstrual cycle was regular before conception. There was no notable family history of genetic or obstetric complications. She routinely attended her ANC visits and was receiving *Ayurveda* treatment as a part of her antenatal care throughout her pregnancy. All the routine investigations, including laboratory tests and ultrasound scans, were in normal limits.

Table 1: Patient Assessment (1st day of Basti)

Patient Assesment		Case 1	Case 2	Case 3	Case 4
Age		26 years	24 years	24 years	27 years
Hb		12.9 g/dl	10.2 g/dl	9.6 g/dl	13 g/dl
BMI		20.0	20.8	21.5	22
Parity		Primigravida	Primigravida	Primigravida	Primigravida
GA		37 w 1 Day	37 w 1 Day	37 w 1 Day	37 w
Vitals	BP	110/70 mm Hg	120/70 mm Hg	120/80 mm Hg	120/70 mm Hg
	Pulse	84 bmp	86 bmp	84 bmp	80 bmp
	RR	18	17	18	18
	Temp	Afebrile	Afebrile	Afebrile	Afebrile

Obstetric Examination	Uterus	corresponding to 36	corresponding to 36	corresponding to 36	corresponding to 36
	SFH	35 cm	36 cm	34 cm	36 cm
	Presentation	Cephalic	Cephalic	Cephalic	Cephalic
	FHR	148 bpm	156 bpm	150 bpm	152 bpm
	Pelvis	Adequate	Adequate	Adequate	Adequate

Therapeutic Intervention

All four patients received Matra Basti with Bala Taila (60ml) and yoni pichu with Bala Taila (30ml) daily for a period of 7 days starting from 37 weeks 1 Day to 38 weeks Gestation on OPD basis.

Table 2: Intervention

	Date	Period of gestation	Intervention	Retention time	Average Retention Time
Case 1	19/11/22	37W1D	Bala Taila Matra basti (60ml) and Bala Taila Yoni Pichu (30ml)	1hr30min	2 hr 27 min
	20/11/22	37W2D		2hr20min	
	21/11/22	37W3D		2hr30min	
	22/11/22	37W4D		3hr10min	
	23/11/22	37W5D		2hr15min	
	24/11/22	37W6D		1hr55min	
	25/11/22	38W		2hr15min	
Case 2	17/02/23	37W1D	Bala Taila Matra basti (60ml) and Bala Taila Yoni Pichu (30ml)	1hr45min	2 hr 20 min
	18/02/23	37W2D		2hr15min	
	19/02/23	37W3D		2hr45min	
	20/02/23	37W4D		2hr10min	
	21/02/23	37W5D		2hr20min	
	22/02/23	37W6D		1hr50min	
	23/02/23	38W		2hr20min	
Case 3	19/02/23	37W1D	Bala Taila Matra basti (60ml) and Bala Taila Yoni Pichu (30ml)	2hr30min	2 hr 44 min
	20/02/23	37W2D		2hr40min	
	21/02/23	37W3D		2hr10min	
	22/02/23	37W4D		2hr45min	
	23/02/23	37W5D		2hr	
	24/02/23	37W6D		1hr50min	
	25/02/23	38W		3hr30min	
Case 4	25/06/23	37W	Bala Taila Matra basti (60ml) and Bala Taila Yoni Pichu (30ml)	1hr40min	2 hr 9 min
	26/06/23	37W1D		2hr30min	
	27/06/23	37W2D		2hr	
	28/06/23	37W3D		2hr10min	
	29/06/23	37W4D		2hr10min	
	30/06/23	37W5D		1hr50min	
	01/07/23	37W6D		2hr20min	

Follow up and Results

After the basti regimen (7 days) was done, we waited for the spontaneous onset of labor without any obstetric intervention. The patients were asked for follow-up until the onset of labor.

Results: The total in general range for 1st stage of labor was 7 to 9 hours with average mean of 8 hours. The second stage of labor was of less duration, which lasted upto 7 to 12 minutes.

All the four women successfully delivered full term normal vaginal delivery without any assistance. The third stage of labor went normally with effortlessly spontaneous placental delivery within 5 to 7 minutes of interval.

Infants exhibited healthy birth weight, ranging in between 2,740 to 3,102 grams, as well as APGAR scores was monitored at birth, 5 min after birth and 10 min after birth by pediatrician which was normal with spontaneous cry after birth and no fetal compromise of infant was seen with no NICU admission. There was no maternal adverse effects such as irritation, infection, vasovagal shock, rectal or vaginal trauma was observed.

Table 3: Progress of labor: Modified Bishop's Score every 2nd hourly

	Modified Bishop's Score	At admission	2nd Hour	4th Hour	6th Hour	8th Hour	10th Hour	12th Hour
Case 1	Cervical	3cm	4cm	6cm	8cm	10cm	-	-
	Cervical length	3cm	2cm	1.5cm	1cm	0.5cm	-	-
	Cervical position	Mid	Anterior	Anterior	Anterior	Anterior	-	-
	Consistency	Moderate	Soft	Soft	Soft	Soft	-	-
	Station	-1	-1	0	1	3	-	-
	Total Score	5	10	11	12	13	-	-
Case 2	Cervical	2cm	4cm	7cm	9cm	10cm	-	-
	Cervical length	2cm	1.5cm	0.5cm	0.5cm	0.5cm	-	-
	Cervical position	Anterior	Anterior	Anterior	Anterior	Anterior	-	-
	Consistency	Soft	Soft	Soft	Soft	Soft	-	-
	Station	-1	-1	0	1	2	-	-
	Total Score	9	10	12	13	13	-	-
Case 3	Cervical	2cm	3cm	5cm	8cm	10 cm	-	-
	Cervical length	2.5cm	2cm	1.5cm	0.5cm	0.5cm	-	-
	Cervical position	Mid	Anterior	Anterior	Anterior	Anterior	-	-
	Consistency	Soft	Soft	Soft	Soft	Soft	-	-
	Station	-2	-1	0	2	3	-	-
	Total Score	6	10	11	13	13	-	-
Case 4	Cervical	2cm	3cm	4cm	6cm	8cm	10cm	-
	Cervical length	3.5cm	2.5cm	1.5cm	1cm	0.5cm	0.5cm	-
	Cervical position	Mid	Anterior	Anterior	Anterior	Anterior	Anterior	-
	Consistency	Moderate	Moderate	Soft	Soft	Soft	Soft	-
	Station	-3	-2	0	0	1	2	-
	Total Score	4	7	10	11	13	13	-

Table 4: Duration of each stage of labor

	1st Stage	2nd Stage	3rd Stage
Case 1	8 Hours	7 min	6 min
Case 2	7 Hours	12 min	5min
Case 3	8 Hours	8 min	6 min
Case 4	9 Hours	11 min	7 min

Table 5: Delivery outcome

	Date and Time of Delivery	Mode of Delivery	Baby details				
			Sex	Birth weight	APGAR Score		
					At Birth	5 min after birth	10 min after birth
Case 1	9th Dec 2022 1.15am	Normal vaginal delivery	Male	3020 g	7	9	10
Case 2	1st Mar 2023 7.50am	Normal vaginal delivery	Female	2878 g	8	9	10
Case 3	8th Mar 2023 6.20pm	Normal vaginal delivery	Male	3102 g	7	9	9
Case 4	20th June 2023 7.54am	Normal vaginal delivery	Male	2740 g	8	9	10

Discussion

During the last few weeks of pregnancy, various biochemical and structural adjustments occur to prepare the body for labor and childbirth. These changes involves the change of the cervix, heightened uterine contractions, and relaxation of the perineal tissues. During the ninth month of pregnancy, the intervention of *Ayurvedic* treatment, i.e *Matra Basti* and *Yoni Pichu* with *Bala Taila* (Table 1) may help plays a crucial role in inducing the natural delivery by controlling *Apana Vata,* which controls the *Garbha Nishkramana Kriya*(5), as well as strengthening uterine contractions, cervical ripening, and increased tolerance for maternal pain(6)(7). *Matra Basti* is a special form of *Sneha Basti* where a small amount of *Sneha* is givenrectally(8). This facilitates the systemic absorption of the lipid soluble bio-active molecules, avoiding the hepatic first- pass effect, and affects neuromuscular coordination by modulating calcium ion channels and neurotransmitter function, thus maximizing uterine responsiveness to natural contractile substances such as oxytocin and prostaglandins(9). *Yoni Pichu* allows for localized vaginal mucosal absorption, directly lubricating and softening the cervix

to enhance its elasticity and helps promotes the descents of the fetus.

Bala Taila is noted for its*Madhura*(sweet), guru(heaviness), unctuous, and *ushna*(warm) properties, and serves as a tonic and helps in balancing all three *doshas(*10). Its key ingredients are-*Bala (Sida cordifolia)*(11)*, Guduchi (Tinospora cordifolia)*(12)*, and tila taila* (sesame oil)(13)(14)- gives anti-inflammatory, painkilling, antioxidant, and muscle-toning activities.

The alkaloid that is present- ephedrine in *Bala (Sida cordifolia)* is a sympathomimetic agent (15), which possibly stimulating a strong response which activates adrenergic receptors and helps enhance uterine contractability[Table 3], help in promoting efficient and rhythmic contractions. *Tila Taila* has contain high sesamin content, which is a bio-activelignan, which probably act specifically on pro-inflammatory pathways by regulating the main action of the cyclooxygenese(COX) and lipoxygenase(LOX) enzymes and helps ensuring the optimal levels of prostaglandins(PGE1 and PGF2) which is necessary for the cervical softening and helps synchronized and rhythmic uterine contractions[Table 2]. Moreover, sesamin is having analgesic action by giving direct influence on the nociceptive transmission and central pain pathways, thus reducing the pain perception of labor and ensuring comfort(16)(17). Additionally, the linolelic acid content which is present in *Tila taila* may serve as a prostaglandins synthesis precursor, and it initiates collagen breakdown in the cervix, making it more compliant and amenable todilation(18). The lipophilic nature of *Bala Taila* may ensure profound tissue penetration, which increases perineal tissues and pelvic ligament elasticity to easify the passage of the fetus and reduce perineal injuries. The Modified Bishop's Score was observed and performed with proper SOP was followed with aseptic precautions, there was increased in cervical priming which means that the readiness of the cervix had increased. The 1st stage of labor was reduced with an average mean of 8 hours. This implies that the techniques administered could have helped in achieving a more optimal sequence in the initial and active stage of labor, with less risk of increased labour duration. All the four women were delivered full term normal vaginal delivery successfully, that told the possible and potential effects of these Ayurvedic interventions in regulating normal vaginal deliveries reducing the maternal and fetal complications. The second stage of labor was of less duration, There was no history of shoulder dystocia and maternal exhaustion in any of the cases, which means that there was unobstructed descent of the fetus, with no perineal tear degree was noted and without the use of any instruments such as Simpson's forceps, wrigleys forceps and vacuum extractor for the extraction of infant and delivery which made easier may be due to Ayurvedic intervention. The third phase of labour went normally with effortlessly spontaneous placental delivery which reflects normal uterine functions and absence of any uneventful incidence during placental release.:)Combining, these overall effects of Ayurvedic intervention helps provide an ideal physiological environment for natural childbirth, facilitating a normal vaginal delivery and decreasing the likelihood of complications in the form of prolonged labor, complications in the form of prolonged labor, ineffective contractions and intense pain

Conclusion

The use of *Matra Basti* and *Yoni Pichu* with *Bala Taila* in the ninth month of pregnancy showed favourable results on cervical ripening, labor progress, and chances of successful vaginal deliveries. The patients tolerated the procedure with ease and no adverse effectwere reported on either mothers or infants. Although these findings are observational and have potential encouraging effects, trials involving a larger number of participants and using objective outcome measures will be needed to establish their effectiveness and create guidelines for their application of obstetric practice.

Conflict of Interest: There is no conflict of interest

Reference

1. World Health Organization. (2015). WHO Statement on Caesarean Section Rates. https://www.who.int/publications/i/item/WHO-RHR-15.02 Dated 11-11-2025 time 13:57 IST
2. Yadavji Trikamji. Ayurveda-Dipika commentary by Chakrapanidatta on Charaka Samhita of Charak. Chikitsa Sthana; chapter 30. Varanasi; Chaukhamba Orientalia Publisher; 2014. 214p.
3. Yadavji Trikamji. Sushruta Samhita with Nibandhasangraha commentary by Dalhana on Sushruta Samhita. Shareerasthana; chapter 4. Varanasi; Chaukhamba Orientalia Publisher; 2019. 58p.
4. Tiwari P. Textbook of Prasuti Tantra. 2nd edition. ;Varanasi; Chaukhamba Vishvabharati Publisher; 2011. 359p.
5. Subha M, Sorake Rao Ravi. Astanga Hridayam on Vagbhata. Sutra Sutra; Chapter 12. Reprint ed. Varanasi; Chaukhamba Orientalia; 2018. 200p.
6. Priyanka Hajare et al: Role Of Bala Taila Matra Basti And Yoni Pichu In Sukh Prasava: A Case Study. International Ayurvedic Medical Journal. December,2019; 7(12); 75-80 Available from: https://dx.doi.org/10.21474/IJAR01/10127
7. Kapil S et al. Effect of Matra Bastia of Eranda Taila in non-progress of labor and neonatal outcome by umbilical cord blood study – A case report. Journal of Ayurveda and Integrated Medicine. September-October,2023; 14(5); 100780. Available from: https://pmc.ncbi.nlm.nih.gov/articles/PMC10477795/
8. Yadavji Trikamji. Ayurveda-Dipika commentary by Chakrapanidatta on Charaka Samhita. Siddhi Sthana. chapter 4. Varanasi; Chaukhamba Orientalia Publisher; 2014. 52p
9. Asmita. PHARMACODYNAMICS OF BASTI CHIKITSA, AYURVED AND MODERN POINT OF VIEW. World Journal of Pharmaceutical and Medical Research. ISO 9001:2015 Certified Journal. October,2023; 9(10), 288-291. Available from: https://www.wjpmr.com/home/article_abstract/5111
10. Sharma, Priyanka & Nariyal, Vikas & Sharma, Sushila & Sharma, Ashutosh. (2017). REPRODUCTIVE AND CHILD HEALTH CARE THROUGH BALA TAILA: A REVIEW ON AYURVEDA FORMULATION. International Journal of Research in Ayurveda & Pharmacy. July,2017;8(3),1-4. 10.7897/2277-4343.083132. Available from:DOI:10.7897/2277-4343.083132
11. Galal, Ahmed & Raman, Vijayasankar & Khan, Ikhlas. (2015). Sida cordifolia, a Traditional Herb in Modern Perspective – A Review. Current Traditional Medicine. June,2013;1(1). 5-17. 10.2174/2215083801666141226215639. Available from: DOI:10.2174/2215083801666141226215639
12. Rawat, Neha & Roushan, Rakesh. (2018). GUDUCHI; A POTENTIAL DRUG IN AYURVEDA. World Journal Of Pharmaceutical and Medical Research. January,2018; 7(12); 355-361. Available from:DOI:10.20959/wjpr201812-12674
13. Jawanjal, Pravin. (2019). TILA TAILA A REVIEW. ISSN 2455-3301. World Journal Of Pharmaceutical and Medical

Research. September,2018; 4(10),76-78 Availablefrom:https://www.researchgate.net/publication/336853488_TILA_TAILA_A_REVIEW

14. Alam Zeb, A comprehensive review on different classes of polyphenolic compounds present in edible oils, Food Research International, May,2021;143, 110312. Available From :https://www.sciencedirect.com/science/article/abs/pii/S0963996921002118?via%3Dihub.
15. Wei P, Zhao F, Wang Z, Wang Q, Chai X, Hou G, Meng Q. Sesame (Sesamum indicum L.): A Comprehensive Review of Nutritional Value, Phytochemical Composition, Health Benefits, Development of Food, and Industrial Applications. Nutrients. September, 2022; 30;14(19):4079. Available from: doi: https://doi.org/10.3390/nu14194079
16. Monteiro, É. M. H., Chibli, L. A., Yamamoto, C. H., Pereira, M. C. S., Vilela, F. M. P., Rodarte, M. P., De Oliveira Pinto, M. A., Da Penha Henriques do Amaral, M., Silvério, M. S., De Matos Araújo, A. L. S., Da Luz André de Araújo, A., Del-Vechio-Vieira, G., & De Sousa, O. V. (2014). Antinociceptive and Anti-Inflammatory Activities of the Sesame Oil and Sesamin. Nutrients. January,2014; 6(5); 1931-1944. Available from : **https://www.mdpi.com/2072-6643/6/5/1931/notes**
17. Tunaru S, Althoff T.F, Nüsing R.M, Diener M, & Offermanns S, Castor oil induces laxation and uterus contraction via ricinoleic acid activating prostaglandin EP3 receptors, Proc. Natl. Acad. Sci. U.S.A. June,2012; 109 (23); 9179-9184. Avaiable From: https://doi.org/10.1073/pnas.1201627109
18. Feng W. et al. Natural sesame oil is superior to pre-digested lipid formulations and purified triglycerides in promoting the intestinal lymphatic transport and systemic bioavailability of cannabidiol. European Journal of Pharmaceutics and Biopharmaceutics. May, 2021;162; 43-49. Available from: https://doi.org/10.1016/j.ejpb.2021.02.013.

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