



IJAPC

Volume 11 Issue 2,
2019

www.ijapc.com

2350-0204

GREENTREE GROUP PUBLISHERS



Traditional Postpartum Food Preparations in Rural Communities of Kerala, India

Sajida. I¹, Vandana Rani. M², Anusree Dileep³ and Delvin .T. Robin^{4*}

¹⁻⁴Department of Swasthavritta, Amrita School of Ayurveda, Amritapuri, Amrita Vishwa Vidyapeetham, India

ABSTRACT

Women need extreme care during postpartum period as they are going through a physically and mentally delicate stage. In Ayurveda this period is referred as *sutikakala*. The basic services and special care for the mother during that period is called *sutikaparicharya*. It is about six to eight weeks as per modern medicine and 1½ months as per Ayurveda, which may exceed up to six months in some cases. *Vata dosha* gets deranged due to the expulsion of foetus, loss of blood and fluids during delivery which leads to deprivation of tissue elements (*dhatukshaya*) and immunity of the mother. The special diet prescribed for the mother mainly focuses on alleviation of *vata*, proper digestion, regular bowel evacuation and nourishment of the tissue elements. From time immemorial, as per tradition and advice of midwives, care takers and elders, women in Kerala during postpartum period eat traditional food preparations having the above qualities. Here we try to explore qualities of such food preparations such as *uluva paalkanji* (fenugreek gruel), fried *moringa* (drumstick) leaves and *kudangal* (Indian pennywort) pudding, popular among women of Kerala and traditionally consumed during postpartum period. The quality such as galactagogue, anti-inflammatory, antioxidant, antibacterial properties are highlighted in their order of importance.

KEYWORDS

Traditional food, postnatal period, *sutika paricharya*, Ayurveda, diet, Kerala



Greentree Group Publishers

[Received 12/07/19](#) [Accepted 08/08/19](#) [Published 10/09/19](#)



INTRODUCTION

Becoming a mother is the happiest event in the life of a woman. But this happiness is debilitated by mental stress and physical strain. The post-partum (postnatal/puerperium) period is a vulnerable period for both mother and baby since they are prone to diseases which may even lead to mortality¹. The postpartum period begins just after delivery and lasts till the reproductive organs have assumed their normal condition and all other systems of the body have returned to the normal physiological state. Usually it is about 6-8 weeks.

In the postpartum period, the expanded uterus involutes to normal position; the tendons, ligaments and muscles associated with uterus and pelvis regain the strength and the mother recovers the mental strength. To achieve the above said requirements, special care is needed and is referred to as 'postnatal care'. The main aim of postnatal care is to prevent the complications of the postpartum period, to provide optimum health care for the mother, to confirm the adequacy of breast feeding, to regulate the menstruation and to provide emotional support to the mother. Studies show that a large number of postpartum women are having health problems like anaemia, low back ache,

postpartum psychosis, urinary incontinence, prolapse etc². These may be due inadequate postpartum care.

In Ayurveda the post-natal period is referred as *sutika kala*, the woman as *sutika* and the care as *sutika paricharya*. The period is one and a half months. Another opinion about *sutika kala* is that, it is the period till the appearance of next menstruation³. *Acharya* Kashyapa considers it as six months because he states that the *dhatu*s (tissue elements) will be returning to normal state only by this time⁴. The *vata*dosh (one among the three *doshas* in Ayurveda) gets aggravated during the expulsion of foetus. This leads to *dhatu kshaya* (deterioration of tissue elements) and thereby reduces the immunity of the mother. This imbalance may lead to constipation, insomnia, lactation problems, psychosis and acute pain all over the body. In order to overcome these health problems, the postpartum care is essential.

Ayurveda suggests the main objectives of *sutika paricharya* are to

- improve the *agni* (digestive fire)
- normalize the vitiated *vata* after delivery
- avoid *srama* (exertion)
- enhance the quantity and quality of breast milk
- regulate the menstruation and
- provide perineal care



So if proper care is not given, the health of both the mother and the baby will get deteriorated. Here the proper postpartum care plays a vital role to avoid these types of morbidities. *Acharya Kashyapa* explains that the management of puerperium should be based on the *desa* (place), *jaati* (caste), *kula* (race) and *satmya* (compatibility)⁵.

As per modern medicine, the puerperal woman can start a normal diet with increased protein and calorie immediately after delivery. The woman needs an additional daily requirement of 500kcal, 25g of protein and fluid for the purpose of lactation⁶. Green leafy vegetables and fresh fruits are mandatory to provide the necessary vitamins. Ayurveda suggests special diet, regimens and medicines in order to overcome the deranged vata. Among these, great emphasis is laid on diet. The diet of the *sutika* depends upon the condition of the *sutika*, the strength of the body, digestive capacity, *satmya* (compatibility) to a food and to the region. The food should be *deepaneeya* (improves digestion), *laghu* (light), facilitates the evacuation of bowel, subdue the vitiated *vata dosha*, nourish the traumatized tissues and also should promote lactation. She should avoid hot, pungent and spicy food recipes as these decrease the milk secretion. Breast milk is the ideal nutrition for the baby. Studies reveal that it is beneficial to

promote health and cognitive development of the child and it also helps to develop immunity against infections⁷. Breast feeding helps to lower the risk of breast cancer, postpartum haemorrhage, delays conception; helps in enhancing mental strength and involution of uterus.

Ayurveda clearly suggests what food has to be given during *sutika kala*. The food taken should be easily digestible and well-cooked like porridge prepared with drugs like *panchakola choorna* (powder of *piper longum*, *Piper longum's root*, *Piper retrofractum*, *Plumbago zeylanica*, and *Zingiber officinal*) for first 3 days to improve the digestion and to get rid of remaining *dosha* from the uterus. Then from 4th–7thday, restorative food like gruel prepared with *Vidaryadi gana* (*Pueraria tuberosa etc.*) can be provided. After that gradually *brimhana* diet (nourishing diet) can be given from 8–12thday according to the season, place etc. followed by meat soup after watching her body strength and digestive capacity carefully⁸.

Throughout India though the culture, climate and customs differs, the basics of post-natal care remains same. In rural areas of Kerala, from the time of delivery to few months, the care of the delivered woman and baby will be taken by an elderly woman. This elderly woman will prepare different types of herbal based traditional



diet recipes having high nutritional values. These food preparations will help to recover the mother from exertion of delivery and provide nutrition and immunity to the mother and baby through breast milk. Nowadays, due to busy life schedule, nuclear family set-up and the inadequate knowledge about the traditional post-partum care, many delivered women cannot follow these food preparations properly. This period is important as it is a vulnerable period for mother and baby's health. So these type of food preparations have a key role in the health of both mother and the child and may differ in different regions of Kerala.

In this article we intended to share some traditional food items such as *uluva paal kanji* (rice gruel prepared with fenugreek), fried *moringa* leaves (drumstick leaves) and *muthil/ kudangal* (*Indian pennywort*) pudding having properties like anti-inflammatory, antioxidant, wound healing, memory boosting, galactagogue etc. The revival of these type of food preparations is the need of the hour. Here we are trying to explain the benefits of such type of food preparations used in the rural areas of Kerala and highlight their importance.

METHODOLOGY

The information for the study were collected through survey from 27

participants including elder women, traditional birth attendants and care takers of postpartum women. The participants were selected from rural areas of Alappuzha, Kollam and Thiruvananthapuram districts in South Kerala. A structured questionnaire was given to collect the data that consists of questions focused on postpartum food recipes, their administration and benefits. Both open ended and closed ended questions were included. The literary review was done to gather information for scientific analysis.

RESULTS AND DISCUSSION

A total of 27 people formed of 15 traditional care takers, 9 elder women, 3 midwives well experienced in mother and child health care for at least 5 years were interviewed. As per the data, 94% post-natal women consumed these types of food recipes. 70% of them collected the ingredients from the surroundings. 30% were taken from the local shops. There was no uniformity for the collection of the ingredients. However, most of the ingredients were available in the vicinity.

All the 27 participants used to give *uluva* (fenugreek) as a main ingredient in diet and provided to the postpartum women (fig: 1).

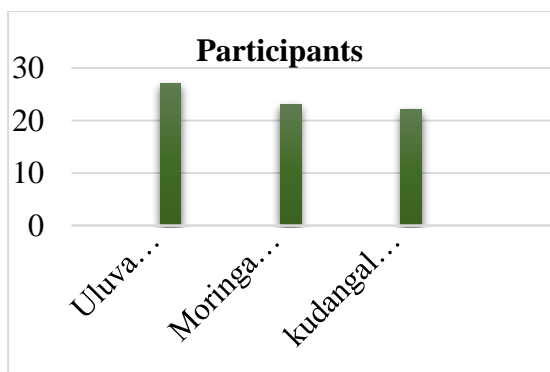


Figure 1 Number of participants and different preparations [*uluva* preparations -27 participants, *Moringa* leaf preparations-23 participants, *Kudangal* preparations- 22 participants]

As the taste of the fenugreek cannot be tolerated by all, 18 participants (66.66%) among the 27 participants used the *uluva* (fenugreek) preparation in the form of *paalkanji* (rice gruel prepared with fenugreek seeds and milk). Out of 27 participants seven people (25.90%) used to give the fenugreek in a lickable form (*lehya*) to make it palatable. The remaining 2 participants (7.41%) used to give milk decoction out of *uluva* (fenugreek) (fig:2).

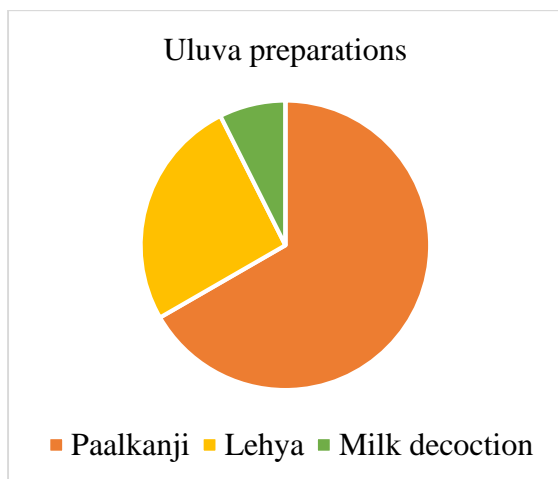


Figure 2 Percentage of *uluva* (fenugreek) preparations [Paalkanji- 18 participants (66.66%), Lehya- 7 participants (25.90%), Milk decoction- 2 participants (7.41%)]

The *moringa* leaf was given by most of the traditional birth attendants in different formulations (n=23) among the 27 participants. Twelve out of the 23 participants prepared *moringa* leaf fry. Considering the desire of the postpartum women, fried *moringa* leaf was prepared along either with coconut scrapings (n=4) or with other food recipes (n=7) (fig: 3).

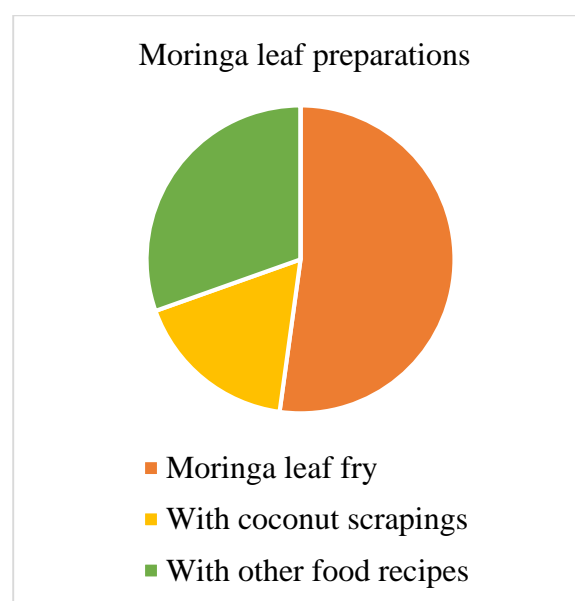


Figure 3 Percentage of *Moringa* (drumstick) leaf preparations [*Moringa* leaf fry- 12 participants (52.71%), with coconut scrapings- 4 participants (17.39%), with other food recipes-7 participants (30.43%)]

The *kudangal* recipes are prepared by 22 out of the 27 participants. Among the 22, *kudangal* pudding was given by 14 participants. 3 of them used pancake made out of *kudangal* grinded with soaked raw rice and coconut, steam cake by 3 participants and in lickable form (*lehya*) by 2 participants (fig:4).



Figure 4 Percentage of *Kudangal/Muthil* (Indian pennywort) preparations [Pudding- 14participants (63.64%), Pancake- 3 participants (13.64%), Steam cake- 3 participants (13.64%), Lehya- 2 participants (9.91%)]

All these recipes possess properties such as galactagogue, anti-inflammatory, antioxidant and relieves low back ache. Three most popular recipes are mentioned below.

Different Traditional Food Preparations during Postpartum Period

One of the most commonly recommended food preparation for post-partum women contains fenugreek as an ingredient.

1. *Uluva paal kanji*(rice gruel prepared with fenugreek seeds) (fig.5)



Figure 5 1) *Uluva paal kanji*Ingredients: 2) cumin seed 3) fenugreek seeds 4) water 5) raw rice 6) jaggery 7) milk 8) garlic

Ingredients:for 4 glass

Raw rice	- ¼ cup
Fenugreek seeds	- 2 tbs
Garlic	- 10-12 cloves
Cumin seed	- 1 pinch
Coconut milk	- 3-4 cups
Jaggery	- ½ cup

Method of preparation: Take all the ingredients (except jaggery) and cook them in coconut milk for 12-15 minutes till the rice gets cooked well. To the well cooked rice add melted jaggery and mix well. Then heat it again in a low flame for another five minutes. Then stir it well like porridge. Add more jaggery if required. Two glasses of gruel can be given to the women twice daily for 4-7 days after delivery.

Traditionally this preparation is used as a galactagogue and helps to promote digestion.

1.1) *Uluva*(*Fenugreek seeds*)

Sanskrit: *Methika*

Botanical name: *Trigonella foenum graecum*

Family: Fabaceae

Fenugreek (*methika*) is coming under *simbidhanya* (legumes) in Ayurveda and is used as a spice in India and Persian cuisine. It is used as galactagogue due to the presence of phytoestrogens in it⁹.

Ayurvedic properties: It has *laghu* (light) and *snigdha* (unctuous) properties; *katu* (pungent) in taste; *katu* (pungent) taste after



digestion (*vipaka*), *ushna* (hot) in potency; and in *karma* (action) it is *deepana* (promotes digestion), *vatanulomana* (eliminates *vata dosha*), *sthanyajanana* (promotes the production of breastmilk). It purifies the *garbhasaya* (uterus), gives relief from *soola* (pain) and *sotha* (inflammation)¹⁰.

Fenugreek has the properties like antioxidant, antidiabetic activity, hypocholesterolemic, galactagogue and is a gastric stimulant. It also purifies the blood and provides nutrients to the cells through lymphatic circulation and removes the waste materials, the trapped proteins and the dead cells from the body¹¹.

Since the fenugreek seeds are unctuous, it acts as galactagogue which stimulate the initiation, augmentation and maintenance of breast milk production. They help to increase prolactin secretion which in turn leads to milk production. Breastfeeding not only improves the innate immunity of the baby but also helps to regain the pre-pregnancy stage of uterus by promoting its contraction. A steroid sapogenin called diosgenin and the phyto-oestrogens have been expected to produce oestrogenic activity. The steroid sapogenin is account for the increase in breast milk flow⁹.

1.2) *Veluthulli*(garlic)

Botanical name: *Allium sativum*
Linn

Family: Liliaceae

Sanskrit name: *Rasona / Lasuna*

Ayurvedic properties: It is *pancha rasa* (having five taste) except *amla* (sour), *snigdha* (unctuous), *guru* (heavy), *picchila* (slimy) and *ushna* (hot); *ushna virya* (hot in potency) and *katu* (pungent) after digestion. Different parts have different tastes.

i.e., Root- pungent

Leaf- bitter

Stem- astringent

Tip of the stem – saline

Seed –sweet

It is *vataprasamaka* (pacifies *vata*), alleviates inflammation and pain, increases strength of the body and is rejuvenating in nature. It should be used by persons having low digestive fire as it is able to remove anorexia, kindle the digestive fire, and remove constipation and worms. It is useful in *kapha-vata* conditions if taken in the correct *matra* (dose)¹².

Garlic has antibacterial, antifungal, antiviral, anthelmintic, antioxidants, galactagogue, and anticoagulant therapeutic properties¹³. It also acts as immuno-modulatory and wound healing agent.

Studies show that, the consumption of galactagogue supplementation containing garlic is useful for the promotion and production of breast milk in early post-natal



period¹⁴. The thiosulphate, thiamine present in the garlic is an antioxidant compound¹⁵.

1.3) *Sarkara(Jaggery)*

Sanskrit: *Guda*

Ayurvedic properties: *Sarkara (Guda)* has *snigdha* (unctuous) property, it alleviates *vata dosha*, will not cause much increase of *pitta dosha*, helps in proper elimination of urine and faeces and increases *bala* (strength) of a person¹⁶.

Jaggery helps to produce energy, it contains high amount of iron and selenium, and thus it relaxes the nerves, cures pain and gives sound sleep. It provides energy to post-natal women and removes blood clots from the body. It is a rich source of iron. Jaggery acts as a cleansing agent, and cleanses the internal organs like intestines, stomach, lungs, oesophagus, and respiratory tracts. It helps in digestion and hence is very effective in treating constipation and enhancing the immunity of the body¹⁷.

Cumin seed promotes digestion and the coconut milk helps in the production of breast milk.

2. Fried *moringa / drum stick leaves* (fig.6)



Figure 6 1) Fried moringa (drumstick) leaves
Ingredients: 2) cow's ghee 3) moringa leaves 4) salt

Ingredients: for 1 serving

Fresh <i>moringa</i> leaves	- 2cups
Salt	- to taste
Ghee	- 1 tbs
Water	- sufficient

Method of preparation: Cook the fresh leaves of moringa tree (without leaf stalk) in water by adding little salt for 5-10 minutes. When the leaves are properly cooked filter the preparation, remove the water and take only the cooked leaves. Then stir it well in a pan by adding ghee in low flame for 1-2 minutes till the water content get evaporated. The leaves should not be overcooked. It can be served hot or used along with other postnatal diet recipes. This is given after 2-3 weeks of delivery. The preparation is given to the mother to promote lactation.

2.1) *Moringa leaves / drumstick leaves*

Botanical name: *Moringa oleifera*
Linn.

Family: Moringaceae

Sanskrit name: *Sigru*

Ayurvedic properties: Leaves of moringa is *madhura* (sweet) and *katu* (pungent) in rasa (taste) according to Bhavaprakasha. It is *tikta* (bitter) and *katu* (pungent) in rasa according to Rajanighantu; it is *sheetha*



(cold) in potency, pacifies *vata* and *pitta*, good for eyes, *brimhana* (nourishing), *guru* (heavy), reduces excess fat and relieves *sopha* (inflammation) ¹⁸.

Moringa plant is a local grocery in the rural areas of Kerala. Moringa leaves contain phytosterols (proliferols and sterols) which boosts prolactin levels. High levels of prolactin improve, facilitate and accelerate the production of breast milk. The study reported that moringa leaves improves breast milk production and sleep duration of the baby due to proper breast milk feeding ¹⁹.

3. Muthil /kudangal (Indian pennywort) pudding (fig.7)



Fig 7 1) *muthil /kudangal* (Indian pennywort) pudding Ingredients: 2) Indian pennywort 3) raisins 4) cashew nut 5) jaggery 6) raw rice 7) cow's ghee 8) water

Ingredients: for one serving

<i>Kudangal/ Muthil</i> leaves	- 2 cups
Raw rice	- ¼ cup
Jaggery	- ¼ cup
Water	- sufficient
Cashew nut (chopped)	- 1tbs
Raisins (<i>Vitis vinifera</i>)	- 1tbs

Method of preparation: Rice and *kudangal* (Indian pennywort) leaves are grinded well by adding sufficient water in a mixer grinder till it reaches a creamy consistency. The melted jaggery is added to the grinded ingredients to make a batter. Then the batter is poured into a ghee smeared steel plate and spread evenly. Sprinkle the chopped cashew nuts and raisins above the batter and cook it under steam. When the pudding is properly cooked serve it hot.

It can be consumed 12 days after delivery, twice a day. In Kerala, this traditional preparation is used to strengthen the uterus and bring it into the pre-pregnant state. It provides good source of energy and is rich in nutrients. It also helps in postpartum wound healing, improves immunity and increases the memory.

3.1) *Muthil / kudangal* (Indian pennywort)

Botanical name: *Centella asiatica*

Family: Umbelliferae

Sanskrit name: *Mandooka parni*

Ayurvedic properties: It is *tikta* (bitter) in taste; *laghu* (light); *madhura* (sweet) after digestion; *sheetha* (cold) in potency, *hridya* (cardiotonic), and *medhya* (improves intellect); pacifies *rakta* and *pitta dosha*. It is also *sothahara* (anti-inflammatory), promotes digestive fire, improves complexion and strength, pacifies anorexia and destroys poison, *stanya janana*



(promotes breast milk production) and *stanya sodhana* (purifies breast milk)²⁰.

In modern science, Indian pennywort is having properties such as antioxidant, anti-inflammatory, wound healing, antihypertensive and memory enhancing. Saponins (also called triterpenoids) are the primary active constituents present in *Centella asiatica*, which are mainly responsible for the vascular effects and wound healing. A study is reported that the leaf extract of Indian pennywort (*Centella asiatica*) had hepato protective effect by reducing the inflammatory mediators and improving the antioxidant level, on dimethyl nitrosamine-induced liver injury in rats²¹.

In another study the antioxidant mechanism and cognitive enhancing effect of the aqueous extract of *Centella asiatica* are also explained²². In another study, it is demonstrated that the bioactive phytochemicals such as asiatic acid and madecassic acid from the water-methanol extraction of *Centella asiatica* may be responsible for the anti-nociceptive (relieves pain) and anti-inflammatory activities²³.

The same preparation was made out of *karimkurunji* (*sahacara* in Sanskrit) (*Strobilanthes ciliates*), *karinochi* (*nirgundi* in Sanskrit) (*Vitex negundo*) or *thenginpookkula* (inflorescence of coconut tree).

CONCLUSION

Postpartum period (*sutika kala* in Ayurveda) is a tender period in the life of a woman, where she is loaded physiologically and psychologically. So elucidate due importance for the care of mother, so that she can handle the baby and cure herself. Generally, it is about 6-8 weeks and it may exceed to six months or till the appearance of next menstruation according to some ancient Indian scholars. The diet prescribed under *sutika paricarya* (postpartum care) should aid the deranged *vata dosha*, promote digestion, nourishing, helps to restore the lost strength, improve the immune power and to check the adequacy of quantity and quality of breast milk. Altogether 27 traditional birth attendants, care takers and elderly women were interviewed for the study. They provided different preparations of fenugreek, *moringa* leaf, *kudangal*, *karimkurinji*, *karinochi*, *thengin pookkula* etc to the postpartum women. Among these postpartum food recipes used in South Kerala, 3 popular preparations were described in the study. The *uluva paal kanji* (fenugreek gruel) acts as galactagogue, promotes digestion and has antioxidant properties. The *muthil/ kudangal* (*Indian pennywort*) pudding acts as an antioxidant,



galactagogue, relieves pain and postpartum stress of the mother and helps in the cognitive development of the baby. All these ingredients are locally available and the preparations are cost effective. The current study reveals that, these preparations are beneficial to the postpartum women. Nowadays, busy life schedule and inadequate knowledge about such traditional cuisine has resulted in vanishing most of them. These traditional nutraceutical preparations should be revived, preserved and brought to the main stream. There should be a uniform protocol for the preparation and documentation for them. We have to learn more about these kinds of preparations from well experienced traditional birth attendants and other sources. More studies about improving the nutritional and therapeutic efficiencies of these recipes should also be done. In order to avoid the lack of uniformity in their use, proper training should be given to the people. Thus it will help to overcome the commonly seen health problems in postpartum women.

ACKNOWLEDGMENTS

The authors would like to thank care takers, midwives and elders for sharing their knowledge about various food preparations they followed. We sincerely thank our

teachers, and family for their great supports.



REFERENCES

- 1 A. Singh, A. Yadav, and A. Singh. (2012). Utilization of postnatal care for newborns and its association with neonatal mortality in India: An analytical appraisal. *BMC Pregnancy and Childbirth*, 12(33), page 2-7.
- 2 P. P. Doke. (2014). Maternal Morbidity and Estimates from Community Studies in India, *MGM J Med Sci*. vol.1 no.2, page 56–64.
- 3 Dr. Bulusu Sitaram, (2012). Bhavaprakasha nighandu of Bhavamisra, vol-1, Chaukhambha Orientalia, Varanasi, page 57.
- 4 Tewari P V. (2008). Kashyapa Smhita with English Transl. Comment. Chaukhambha Viswabharati, Varanasi, India, page 582.
- 5 Tewari P V. (2008). Kashyapa Smhita khilasthana with English translation and commentary, Chaukhambha Viswabharati, Varanasi, India, page 580.
- 6 Dr Sheila Balakrishnan. (2007). Textbook of obstetrics, Paras Medical Publishers, Hyderabad, India, page 510.
- 7 M. S. Kramer, Aboud F, Mironova E, Vanilovich I, Platt R W *et al.* (2008). Promotion of Breastfeeding Intervention Trial (PROBIT) Study Group: Breastfeeding and child cognitive development: new evidence from a large randomized trial. *Arch Gen Psychiatry*, vol. 65(5), page 578-584.
- 8 Pt. Hari Sadasiva. (2016). Ashtanga hridayam of Vagbhata, Ashtanga hridaya utharasthana with commentaries of Sarvanga sundara vyakhyana of Arunadatta and Ayurveda rasayana of Hemadri, Chaukhambha Surbharati Prakashan, Varanasi, page 374–375.
- 9 S. Sreeja, V. S. Anju, and S. Sreeja. (Jun. 2010). In vitro estrogenic activities of fenugreek *Trigonella foenum graecum* seeds. *Indian J. Med. Res.*, vol. 131, page 814–9.
- 10 Dr. Gyanendra Pandey. (2004). Dravyaguna vijnana, English-Sanskrit, Vol-2. Chaukhambha Krishnadas Academy, Varanasi, India, page 575-577.
- 11 S. A. Wani and P. Kumar. (2018). Fenugreek: A review on its nutraceutical properties and utilization in various food products. *Journal of the Saudi Society of Agricultural Sciences*, vol. 17, page 106.
- 12 Dr. Gyanendra Pandey. (2004). Dravyaguna vijnana, English-Sanskrit, Vol-2. Chaukhambha Krishnadas Academy, Varanasi, India, page 239-242
- 13 L. Bayan, P. H. Koulivand, and A. Gorji. (2014). Garlic: a review of potential therapeutic effects. *Avicenna J. phytomedicine*, vol. 4, no. 1, page 1–14.
- 14 R. Srinivas, K. Eagappan, and S. Sasikumar. (2014). The Effect of Naturally



- Formulated Galactagogue Mix on Breast Milk Production, Prolactin Level and Short-Term Catch-Up of Birth Weight in the First Week of Life. *Int. J. Heal. Sci. Res. Int. J. Heal. Sci. Res.*, 4(10), page 242-253.
- 15 L. Y. Chung. (Jun. 2006). The Antioxidant Properties of Garlic Compounds: Allyl Cysteine, Alliin, Allicin, and Allyl Disulfide. *J. Med. Food*, vol. 9, no. 2, page 205–213.
- 16 Dr K C Chunekar.(2006). Bhavaprakasha nighantu of Bhavamisra Hindi Commentary, Chaukhambha Bharati Academy, Varanasi, India. page 792.
- 17 Shrivastav P Kumar Verma A Walia R Parveen R Kumar Singh A. (2016). jaggery: a revolution in the field of natural sweeteners.*ejpmr*, no. 3(3), page 198–202.
- 18 Dr. Gyanendra Pandey. (2004).Dravyaguna vijnana,English-Sanskrit, Vol-2. Chaukhambha Krishnadas Academy, Varanasi, India, page 450-455.
- 19 Y. Sulistiawati, Ari Suwondo, Triana Sri Harjanti, Ariawan Soejoenoes & M.Choiroel *et al.*(2017). effect of moringa oleifera on level of prolactin and breast milk production in postpartum mothers.*Belitung Nurs. J.* vol. 33, no. 2, page 126–133.
- 20 Dr. Gyanendra Pandey. (2004).Dravyaguna vijnana, English-Sanskrit,Vol-2. Chaukhambha Krishnadas Academy, Varanasi, India, page 495-498.
- 21 M.-J. Choi, H.-M. Zheng, J. M. Kim, K. W. Lee, Y. H. Park, and D. H. Lee.(2016). Protective effects of Centella asiatica leaf extract on dimethylnitrosamineinduced liver injury in rats.*Mol. Med. Rep.*, vol. 14, no. 5, page 4521–4528.
- 22 M.Veerendra Kumar and Y.Gupta.(Feb 2002). Effect of different extracts of Centella asiatica on cognition and markers of oxidative stress in rats. *J. Ethnopharmacol*, vol. 79, no. 2, page 253–260.
- 23 M. N. Somchit, M.R. Sulaiman, A.Zuraini, L.Samsuddin & N.Somchit *et al.*(2004). Antinociceptive and anti-inflammatory effects of Centella asiatica.*Indian J Pharmacol*, vol. 36, no. 6, page377–380.