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Boosting Lactation Naturally: The Role of *Lagerstroemia Indica* Leaf Infusion in Increasing Breast Milk Output

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ABSTRACT

Breastfeeding offers optimal nutrition for infants, yet low milk production remains a frequent concern among postpartum mothers in Indonesia. This study examined the effect of *Lagerstroemia indica* leaf infusion on breast milk quantity among postpartum mothers at Puskesmas Bontomarannu. A quasi-experimental Two-Group Pretest–Posttest design involved 14 mothers assigned to intervention and control groups. The intervention group consumed the infusion twice daily for two weeks, while the control group received standard care. Breast milk volume was measured using standardized pumping techniques.
Paired *t*-tests showed a significant increase in milk volume in the intervention group (66.25 ml to 90.00 ml; p = 0.010) compared with the control group (64.38 ml to 74.38 ml; p = 0.027). Independent *t*-test results confirmed a significant posttest difference between groups, indicating the effectiveness of the infusion in enhancing milk production.
These findings suggest that *Lagerstroemia indica* infusion may serve as a practical and affordable galactagogue for postpartum mothers. However, the small sample size limits generalizability and necessitates further research with larger populations.

Keywords: breastfeeding, *Lagerstroemia indica*, galactagogue, postpartum, milk production

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INTRODUCTION

Breastfeeding is considered one of the most meaningful experiences for mothers, as breast milk provides irreplaceable benefits for infant growth and health. Breast milk contains complete nutrients and protective factors that cannot be substituted by any other type of milk. In Islamic teachings, mothers are encouraged to breastfeed their infants for a full two years to support optimal nurturing and development (HS & Parningsih, 2020). Breast milk functions as a protective and nutritional source that fulfills an infant's nutritional needs, prevents illness, and promotes overall health (Safitri & Puspitasari, 2018).Colostrum, present in early breast milk, offers a 10–17 times higher immune-boosting effect compared to other types of milk (Novansyah et al., 2022).

Global recommendations from UNICEF and the World Health Organization (WHO) emphasize exclusive breastfeeding for the first six months of life (WHO, 2020). Exclusive

breastfeeding means providing only breast milk without introducing additional food or drink, except for medications, vitamins, or expressed breast milk (Kemenkes, 2019). Despite its advantages, the global coverage of exclusive breastfeeding remains low at 38%. In several ASEAN countries, the rates also vary, with India at 46%, the Philippines 34%, Vietnam 27%, Myanmar 24%, and Indonesia 54.3% (Kementerian Kesehatan RI, 2018).

Exclusive breastfeeding coverage for infants aged 0–5 months in Indonesia reached 54.0%, while breastfeeding up to six months was only 29.5%, a figure that remains well below the national target of 80%, indicating that breastfeeding practices still require significant improvement at the population level (Indonesian Health Profile, 2020). Insufficient breast milk production is reported as one of the most common concerns among postpartum mothers, especially during the first days after childbirth when lactation is still being established and mothers may struggle with confidence in their breastfeeding ability (Novansyah et al., 2022). Another study reinforces this finding by showing that many mothers in the early postpartum period encounter difficulties related to low milk supply, often influenced by maternal fatigue, hormonal adjustments, and inadequate breastfeeding techniques (Petrika & Agusanty, 2020). Infants who do not receive sufficient quantities of breast milk are more susceptible to infections, as the absence of maternal antibodies and immune factors reduces their physiological protection against common pathogens (Fadlliyyah, 2019). Furthermore, these infants face a higher risk of mortality compared to those who are exclusively breastfed, demonstrating the critical role of adequate breast milk intake in supporting survival and early growth (Gede et al., 2020).

The use of herbal *galactagogues* has become an alternative approach to overcoming low breast milk production. Lagerstroemia indica (*bungur kecil*) has been empirically recognized to possess antibacterial, lipid-improving, antidiabetic, and lactation-enhancing properties (Rochman et al., 2016).Its leaves also contain essential nutrients such as iron and carotene, which contribute to maternal nutritional support during lactation (Widya Ekayanti et al., 2017). Consumption of these leaves may increase the levels of iron, potassium, zinc, and magnesium in breast milk, while their *galactagogue* bioactive compounds help stimulate the hormones oxytocin and prolactin, thereby improving milk flow and overall production.

Previous studies have demonstrated the effectiveness of bungur leaf extract in increasing breast milk production among postpartum mothers (Husna et al., 2021).However, most applications used boiled extracts, which may be less practical for daily use. Therefore, preparing *Lagerstroemia indica* in a simple infusion form may provide a more convenient option for postpartum mothers.

In *Puskesmas Bontomarannu*, Gowa Regency, South Sulawesi, preliminary observations suggest that some postpartum mothers face challenges in producing sufficient breast milk, leading to early introduction of infant formula or complementary foods. Interviews with ten postpartum mothers revealed that all respondents believed their breast milk production was inadequate, prompting them to supplement feeding with formula milk. Although local communities often utilize plants such as *katuk* and *lembayung* to support lactation, these efforts have not consistently addressed low milk quantity (Setyowati, 2015). Meanwhile, bungur kecil ocally recognized and widely available remains underutilized, commonly planted as an ornamental plant rather than for its potential benefits in enhancing lactation.

Considering the availability of this plant and the persistent issue of low milk production among postpartum mothers in the area, this study aims to analyze the effect of *Lagerstroemia indica* leaf infusion on breast milk quantity among postpartum mothers at *Puskesmas Bontomarannu*. The findings are expected to provide scientific input for developing practical, locally accessible interventions to improve breastfeeding outcomes in Gowa Regency.

METHOD

This study employed a quantitative quasi-experimental Two-Group Pretest–Posttest Design to evaluate the effect of *Lagerstroemia indica* leaf infusion on breast milk quantity among postpartum mothers at Puskesmas Bontomarannu. A total sampling technique yielded 15 eligible respondents. After accounting for a 10% dropout rate, 14 respondents were included, consisting of 7 in the intervention group and 7 in the control group. Inclusion criteria were postpartum mothers aged 0–42 days, residing within the working area, and actively breastfeeding. Mothers with postpartum complications or unwilling to participate were excluded.

The study was conducted from January to May 2025. The intervention consisted of *Lagerstroemia indica* leaf infusion prepared with water at 45–60°C and consumed twice daily for two weeks. Breast milk quantity was measured in milliliters using standardized breast pumping techniques during pretest and posttest.

Instrument validity and reliability were tested prior to data collection. Primary data were obtained from daily monitoring of breast milk output, while secondary data were collected from postpartum records at Puskesmas Bontomarannu.

Data analysis involved univariate and bivariate procedures. Univariate analysis described respondent characteristics and milk volume. For bivariate analysis, data distribution was first tested for normality using the Shapiro–Wilk test. Because the data met normality assumptions, the paired *t*-test was used to assess pretest–posttest changes within each group, and the independent *t*-test was used to compare posttest differences between groups. If normality had not been met, the Wilcoxon Signed-Rank test and Mann–Whitney U test would have been applied.

RESULT

Table 1: Breast Milk Quantity Before Intervention in the Intervention and Control Groups

Measurement Group	Mean	Standard Deviation	Minimum–Maximum	95% Confidence Interval
Intervention Group	66.25.00	9.161	60–80	54.03–74.72
Control Group	64.38.00	12.374	50–80	58.59–73.91

The results of the pre-intervention measurements show that the average breast milk quantity in the intervention group (mean = 66.25; SD = 9.161) was slightly higher than in the control group (mean = 64.38; SD = 12.374). The range of breast milk quantity was relatively similar between groups, with 60–80 ml in the intervention group and 50–80 ml in the control group, indicating that individual variations remained within normal limits. The 95% confidence intervals for both groups (54.03–74.72 for the intervention group and 58.59–73.91 for the control group) overlap, suggesting that there was no statistically meaningful difference between the two groups before the intervention. These findings confirm that both groups had comparable baseline conditions, making them appropriate for assessing the effectiveness of the intervention.

Table 2: Breast Milk Quantity After Intervention in the Intervention and Control Groups

Measurement Group	Mean	Standard Deviation	Minimum–Maximum	95% Confidence Interval
Intervention Group	90.00.00	9.258	80–100	81.77–95.73
Control Group	72.50.00	11.783	60–90	64.52–84.23

The post-intervention results demonstrate a clear difference between the two groups, with the intervention group showing a markedly higher average breast milk quantity (mean = 90.00; SD = 9.258) compared to the control group (mean = 72.50; SD = 11.783). The intervention group also exhibited a narrower and higher range (80–100 ml) than the control group (60–90 ml), indicating more consistent improvements among participants receiving the intervention. The 95% confidence interval of the intervention group (81.77–95.73) does not overlap with that of the control group (64.52–84.23), suggesting a statistically meaningful and clinically significant enhancement in breast milk production due to the intervention. These findings indicate that the applied treatment contributed effectively to increasing breast milk quantity in postpartum mothers.

Table 3: Effect of *Lagerstroemia indica* Brew on Breast Milk Quantity

Variable	Mean (Pre–Post)	Std. Deviation (Pre–Post)	Minimum Value	Maximum Value	P
Intervention Group	66.25 – 90.00	9.161 – 9.258	60 – 80	80 – 100	0,010
Control Group	64.38 – 74.38	12.374 – 11.783	50 – 60	80 – 90	0,027

The results in Table 3 show that the breast milk quantity in the intervention group increased from a pre-intervention mean of 66.25 ml (SD = 9.161) to a post-intervention mean of 90.00 ml (SD = 9.258), with a statistically significant difference (p = 0.010). In the control group, the mean breast milk quantity increased from 64.38 ml (SD = 12.374) to 74.38 ml (SD = 11.783), also showing a significant difference (p = 0.027). The minimum and maximum values indicate that the intervention group experienced a broader increase in breast milk production (60–100 ml) compared to the control group (50–90 ml), suggesting that the administration of *Lagerstroemia indica* brew effectively enhanced breast milk quantity among postpartum mothers at Puskesmas Bontomarannu.

DISCUSSION

The results of this study show that giving *Lagerstroemia indica* (bungur) leaf infusion significantly increased breast milk volume in postpartum mothers compared with the control group. The average increase from 66.25 ml to 90.00 ml after two weeks of intervention indicates a strong physiological response to the plant's bioactive compounds, especially those involved in regulating prolactin and oxytocin—key hormones in the *lactogenesis II* process. In contrast, the control group only showed a small natural increase from 64.38 ml to 72.50 ml, which is typical during early breastfeeding. The statistically significant difference (p = 0.010) suggests that *Lagerstroemia indica* has the potential to be used as a non-pharmacological intervention in primary healthcare services, particularly for postpartum mothers who face difficulties in producing enough breast milk.

Many herbal plants have galactagogue effects that can increase breast milk production through various mechanisms. A systematic review reported that herbs such as fenugreek, moringa, and milk thistle can increase milk volume, although the quality of evidence varies between studies. However, the consistent results indicate that these herbs contain phytochemicals that act on several biological pathways, including strengthening the let-down reflex, increasing prolactin receptor sensitivity, and reducing oxidative stress that may inhibit milk production. These findings help position the results of this *Lagerstroemia indica* study within the broader scientific context, showing that herbal plants can play an important role in supporting breastfeeding success, especially in developing countries with limited access to modern pharmacological treatments (Mortel and Mehta, 2013).

The international guidelines of the Academy of Breastfeeding Medicine (ABM Protocol #9, 2018).also provide a strong theoretical foundation for the use of herbal galactagogues in clinical practice. ABM explains that the active compounds in galactagogue herbs can stimulate the hormones prolactin and oxytocin, which are essential for milk production and release. However, ABM emphasizes the need for more rigorous clinical trials to ensure the long-term safety and effectiveness of each herbal product. This is important because, although herbs are widely used and generally considered safe, variations in phytochemical content and possible drug interactions must be taken into account when used in community-based interventions. In this context, the positive findings from *Lagerstroemia indica* provide a promising starting point for developing more evidence-based clinical guidelines.

Fenugreek has been found to increase breast milk production while simultaneously supporting infant weight gain, providing dual benefits for both mother and baby (Ravi et al., 2020). Moringa *oleifera* has also been shown to significantly elevate prolactin levels, demonstrating that certain herbs can directly influence the endocrine system (Ammar et al., 2025). A comprehensive review further explains that herbal *galactagogues* exert their effects through multiple bioactive mechanisms, including antioxidant activity, hormonal modulation, and immune regulation (Bazzano et al., 2016). These mechanisms are highly relevant to breastfeeding, particularly for mothers who experience stress, inflammation, or postpartum fatigue. Collectively, these findings support the scientific rationale that *Lagerstroemia indica* may operate through similar biological pathways.

The link between these mechanisms becomes stronger when associated with the bioactive components of *Lagerstroemia indica*, particularly flavonoids, triterpenoids, and alkaloids. Flavonoids are known to increase prolactin release through dopamine modulation, while triterpenoids can improve hormonal balance and stress responses that influence milk production. Certain alkaloids may also enhance parasympathetic nervous system activity, which plays a role in oxytocin release and thus improves the let-down reflex. Therefore, bungur leaves not only increase milk volume but may also support the overall physiological stability of the breastfeeding process through several interconnected biological pathways. These mechanistic explanations provide a strong scientific basis for using this plant in breastfeeding interventions.

Consuming katuk leaves has been shown to significantly increase breast milk production in postpartum mothers, indicating that the cultural use of herbal *galactagogues* has long been recognized in the community (Fajrin, Rosita & Nainggolan, 2023). Katuk leaf decoction has also been reported to effectively increase breast milk volume, strengthening public perception that local herbs are safe and beneficial as breastfeeding supplements (Pebrianthy, 2023). Torbangun (*Coleus amboinicus*) drinks have further been demonstrated to enhance milk production and are widely used as part of postpartum culinary traditions in various regions of Indonesia. (Nency et al., 2023). These local findings support the notion that plant-based interventions such as *Lagerstroemia indica* are likely to be well accepted and effectively integrated into maternal health services.

Research has shown that flavonoids in torbangun can stimulate prolactin release as part of hormonal lactation processes, highlighting that local plants with similar phytochemical content may work through consistent biological mechanisms. Therefore, *Lagerstroemia indica*, which is also rich in flavonoids and triterpenoids, is highly likely to demonstrate galactagogue effects through similar pathways. This consistent mechanistic evidence at the national level provides additional biological support for studies examining traditional plants for improving breast milk production (Marlina, Trianingsih & Sari, 2022).

A study demonstrated that *Silybum marianum* (milk thistle) can increase breast milk volume in breastfeeding mothers, showing that the use of herbal galactagogues is not only a local or traditional practice but has also become a globally accepted approach in modern maternal healthcare. This cross-cultural consistency strengthens the argument that plant-based phytochemicals exert standardized biological effects and can be used to enhance breast milk production across different populations (Azimi et al., 2022).

In terms of public health relevance, the significant increase in ASI among the intervention group underscores the potential of *Lagerstroemia indica* infusion as a low-cost, culturally acceptable galactagogue that could be recommended in community health settings such as Puskesmas Bontomarannu. Given the widespread availability of this plant in Indonesia, integrating it into breastfeeding support programs could strengthen maternal interventions, especially in areas where pharmacological galactagogues are less accessible.

However, several limitations should be acknowledged. First, the sample size was small, limiting generalizability. Second, no hormonal biomarkers (e.g., prolactin, oxytocin levels) were measured, making it difficult to confirm the proposed physiological mechanism. Third, external variables such as maternal nutrition, breastfeeding technique, stress, and social support were not fully controlled, which may have influenced milk production. Future studies should incorporate larger randomized controlled trials, longer follow-up periods, and hormonal measurements to strengthen causal inference.

In terms of clinical application, the significant increase in ASI production suggests that Lagerstroemia indica infusion has potential as a low-cost, evidence-based, and culturally familiar galactagogue that may be integrated into breastfeeding support programs in primary care settings. Its simplicity and accessibility make it suitable for use by midwives and community health workers, particularly in areas with limited access to pharmacological galactagogues.

In conclusion, this study provides preliminary but promising evidence that *Lagerstroemia indica* leaf infusion can enhance breast milk quantity. Given its potential clinical value as an affordable and acceptable galactagogue, further rigorous research is warranted to validate its use and consider scaling it within maternal health programs in Gowa Regency and similar contexts.

CONCLUSION

The results of this study demonstrate that the administration of *Lagerstroemia indica* (bungur kecil) leaf infusion effectively increases breast milk (ASI) quantity among postpartum mothers at Puskesmas Bontomarannu. Before the intervention, the mean ASI volumes of the intervention and control groups were relatively similar, indicating comparable baseline conditions. After two weeks of twice-daily consumption, the intervention group experienced a significant increase in ASI volume (from 66.25 ml to 90.00 ml), while the control group showed a smaller increase (from 64.38 ml to 74.38 ml), confirming the effectiveness of the intervention.

These findings suggest that *Lagerstroemia indica* infusion can serve as a safe, affordable, and culturally acceptable galactagogue to support lactation in postpartum mothers. The increase in ASI production is likely mediated by bioactive compounds in the leaves that stimulate neurohormonal pathways, including prolactin and oxytocin release. Based on this study, incorporating bungur kecil leaf infusion into postpartum care practices may improve breastfeeding outcomes and maternal-infant health in primary care settings.

RECOMMENDATION

Based on the findings of this study, it is recommended that *Lagerstroemia indica* (bungur kecil) leaf infusion be considered as a complementary intervention to increase breast milk production among postpartum mothers at Puskesmas Bontomarannu. Health practitioners, including midwives and nutrition counselors, can educate mothers about the proper preparation and consumption of bungur kecil infusion to support lactation.

It is further recommended that routine postpartum care programs incorporate the use of safe and culturally acceptable galactagogues such as bungur kecil leaves to enhance breastfeeding outcomes. Future research can explore the long-term effects, optimal dosage, and potential benefits of combining bungur kecil with other lactation-supporting practices, as well as its impact on maternal and infant health indicators. Additionally, community-based education on breastfeeding techniques and maternal nutrition should be strengthened to maximize the effectiveness of interventions aimed at improving ASI quantity.

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