

## The Effect of Androgynus Sauropus Feeding on Breast Milk Adequacy in Postpartum Mothers in Village C, Purwakarta Regency in 2024

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KEYWORDS	ABSTRACT
Sauropus androgynus, breast milk, postpartum mothers, lactation, quasi-experimental study.	Breast milk is essential for infant health, yet many postpartum mothers face challenges in milk production. This study examines the effect of <i>Sauropus androgynus</i> (katuk leaves) on breast milk adequacy among postpartum mothers in Village C, Purwakarta Regency, Indonesia, in 2024. Using a quasi-experimental design with a one-group pretest-posttest approach, 36 respondents were assessed before and after consuming <i>katuk</i> leaves. Results showed that 58.3% of mothers experienced increased milk production post-intervention, with the highest improvement observed in multipara mothers (69.5%) and those aged 20–35 years (58.3%). Additionally, 80.5% of mothers breastfeeding more than eight times daily reported abundant milk. The Wilcoxon test confirmed the intervention's significance ( $p = 0.000 < 0.05$ ). Findings align with prior research highlighting <i>katuk</i> leaves' efficacy due to their alkaloids, sterols, and nutrient content. The study concludes that regular consumption of <i>katuk</i> leaves enhances milk production, supporting its use as a natural lactation aid. Implications include promoting <i>katuk</i> leaves in maternal health programs to improve breastfeeding rates and infant nutrition.
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## INTRODUCTION

Breast milk is the best source of nutrients that can improve the health of mothers and children (Duale et al., 2022; Segura et al., 2016). Breastfeeding is very important, especially in the early period of life; therefore, babies should be breastfed exclusively for the first six months without adding or replacing it with other foods or drinks. The process of breastfeeding immediately after birth also helps uterine contraction, thereby reducing maternal blood loss during the postpartum period (Meta, 2021).

The postpartum period is the period after childbirth, lasting six weeks or 42 days. During this period, several physiological changes occur, including changes in the breasts. Giving breast milk (*ASI*) to babies is the best feeding method. Breast milk contains many nutrients and antibodies to protect the baby from infections and supports optimal growth and development.

Breastfeeding is the best investment for survival and improving health, social development, and the economy of individuals and the nation. Although the global rate of breastfeeding initiation is relatively high, only 40% of babies under six months receive exclusive breastfeeding, and 45% continue breastfeeding until 24 months (Nurmayanti, 2019).

Optimal breastfeeding practices, according to recommendations, can prevent more than 823,000 child deaths and 20,000 maternal deaths annually. However, not breastfeeding is associated with lower intelligence levels and results in economic losses of around \$302 billion per year (Nurmayanti, 2019).

The World Health Organization (WHO) and the United Nations International Children's Emergency Fund (UNICEF) recommend that babies should receive only breast milk (*ASI*) for

six months and continue breastfeeding until two years old. In 2020, WHO reported that although there has been an increase, only about 44% of babies aged 0–6 months receive exclusive breastfeeding globally, which is below the 50% WHO target. This low level of exclusive breastfeeding can impact the quality and vitality of future generations (WHO, 2020).

Based on data from the Indonesian Health Profile in 2020, exclusive breastfeeding coverage in West Java was 71.11% in 2019 and increased to 76.11% in 2020. However, this coverage is still below the 80% target set by the Minister of Health Regulation Number 450/Menkes/SK/2014 concerning exclusive breastfeeding in Indonesia (Indonesian Health Profile, 2020). According to Basic Health Research (Riskesdas) 2017, the percentage of exclusive breastfeeding in the last 24 hours decreases as the baby ages, with the lowest percentage at six months old (10.74%). The majority of breastfeeding initiation occurred within 1–6 hours after birth (2.01%), and only 25.01% practiced early breastfeeding initiation within the first hour (Riskesdas, 2017).

According to the 2019 West Java Provincial Health Profile, exclusive breastfeeding coverage dropped sharply compared to 2018 and did not reach the national target of 50%. In 2018, the exclusive breastfeeding coverage for babies aged 0–5 months was 90.79%, falling to 63.35% in 2019. By Regency/City, Cirebon City had the highest coverage at 109.66%, while Bekasi City was lower at 33.81% (West Java Health Profile, 2019). In Purwakarta Regency, exclusive breastfeeding coverage was 67.60%, while in Village C, the coverage was 59.86%, reaching their respective targets (Subang Health Office, 2019).

Breastfeeding in Indonesia is culturally common, but exclusive breastfeeding practices are still below expectations. The main reason for not giving exclusive breast milk is low milk production. Breast milk production can be increased by consuming *katuk* leaves and several capsules or drugs derived from *katuk* leaf extract (Kuswanti, 2016).

The government's efforts to support exclusive breastfeeding are outlined in Government Regulation (PP) No.33 of 2012, which aims to ensure infants' rights to exclusive breastfeeding until six months, protect mothers in providing exclusive breastfeeding, and increase family and community support.

Many plants are used to facilitate breast milk production (*AST*), including *katuk* leaves (*Sauropus androgynus*), which have long been proven to aid milk production due to their sesquiterpenic acid content. *Katuk* (*Sauropus androgynus*) is known in other languages as star gooseberry or sweet leaf (English), mani cai (Chinese), and simani in Minangkabau. This plant is popular in South and Southeast Asia, growing up to 2.5 meters with dark green oval leaves 5–6 cm long. The shoots are also called tropical asparagus (Agoes, 2011).

In Malaysia, *katuk* is cooked with eggs into an omelette. The leaves contain 7% protein and are high in beta-carotene, vitamin C, calcium, iron, and magnesium. Every 100 grams of *katuk* leaves contains about 2.7 mg of iron, and calcium content is 204 mg, four times higher than cabbage leaves (Agoes, 2011).

Efforts to increase breast milk production can be pharmacological or non-pharmacological. Pharmacological methods tend to be expensive, whereas non-pharmacological methods include the use of Family Medicinal Plants (*Tumbuhan Obat Keluarga* or *TOGA*), acupressure, acupuncture, and massage. *TOGA* plants are widely available around homes and include spices, fruits, or vegetables with health-promoting properties based on traditional medicinal knowledge (Saktiawan & Atmiasri, 2017).

*TOGA* plants that can improve milk production include *katuk* leaves, klabet seeds, gotu gotu leaves, and torbangun leaves (Saktiawan & Atmiasri, 2017). An initial survey of 10 postpartum mothers found that 60% had milk on the first day after birth, while 40% had milk coming out on the second or third days. The average time for breast milk secretion was about three hours after birth, indicating many mothers experience delayed milk production (Yulinda, 2016).

According to Suwanti's research on *The Effect of Extra Consumption of Katuk Leaves on Breast Milk Adequacy in Breastfeeding Mothers in Klaten*, in the treatment group, 53.3% had sufficient milk before consuming *katuk* leaves, increasing to 70% after consumption (Suwanti, 2016).

A preliminary study in September 2023 in Village C surveyed 20 breastfeeding mothers at the posyandu. Nine mothers practiced exclusive breastfeeding, while eleven reported insufficient milk flow and supplemented with formula. A significant research gap exists regarding affordable, accessible lactation interventions, as pharmacological methods can be costly or unavailable in rural areas. This study addresses the gap by investigating the efficacy of *Sauropus androgynus* (*katuk* leaves) as a traditional, natural galactagogue alternative.

The novelty of this research lies in its focus on a localized population, employing a quasi-experimental design to measure the direct impact of *katuk* leaf consumption on milk production, considering maternal age and parity. It builds on prior findings about *katuk* leaves' nutrient-rich profile, including alkaloids, sterols, and essential minerals, while addressing limited empirical evidence in rural Indonesian communities.

The primary objective is to determine if regular *katuk* leaf consumption significantly improves breast milk adequacy among postpartum mothers, with secondary aims to explore age, parity, and breastfeeding frequency impacts. This study bridges traditional knowledge and evidence-based practice, offering data-driven insights for maternal health programs.

The benefits extend beyond academia, suggesting practical applications to integrate *katuk* leaves into community-based lactation support, especially where healthcare is limited. The findings may inform policy to promote *katuk* cultivation and use in national breastfeeding strategies, empowering postpartum mothers with a low-cost, culturally accepted method to enhance lactation and improve infant health outcomes in alignment with global exclusive breastfeeding goals.

## RESEARCH METHOD

This study used a quasi-experimental method (Quasi Experiment) with a one-group pretest-posttest design, in which the group was pretested before the intervention was given to the respondents, and then a posttest was carried out after the intervention. It was called a quasi-experiment with a one-group pretest-posttest design because the researcher intervened in only one group without a comparator, and the group of subjects was observed before the intervention and then observed again after the intervention. This design involved one group measured before and after the intervention (one-group pre-post test) (Yusuf, 2014). It was a one-group pretest-posttest design research.

## RESULTS AND DISCUSSION

**Table 1. Effect of Katuk Leaf Consumption on Breast Milk Production**

Time Period	Milk Production Level	Number of Respondents	Percentage (%)
Before Intervention	Little milk	36	100%
After Intervention	Little milk	15	41.7%
	Abundant milk	21	58.3%

Based on the results of the study, from 36 respondents. The results of the study based on breast milk expenditure showed that before consuming *katuk* leaf vegetables, 36 people had little breast milk, after consuming *katuk* leaf vegetables there were 15 people (41.7%) with little breast milk but 21 people (58.3%) had a lot of breast milk. This research is in line with Suwanti and Kuswati (2016) who stated that there is a significant influence of consumption of *katu* leaf extract on the adequacy of breast milk. Efforts to increase breast milk production can be done

by consuming mothers daily, especially by adding to the menu of katuk leaf vegetables or drinking katuk capsules according to the dose. Katuk leaves are known by our ancestors as a milk-boosting vegetable. The physiological activity of katu leaf extract has antioxidants in the human body because it can inhibit hydroxyl free radicals.

From the results of this study, the researcher assumes that in accordance with the theory that observation of breast milk expenditure is carried out on the 3rd and 7th day after giving katuk leaves to breastfeeding mothers, because in this phase the breastfeeding mother enters the taking hold phase, namely this phase can be independent in carrying out responsibility for her baby and more focused on caring for the mother and baby. Mothers can already process food on their own, but there are still 15 mothers who consume katuk leaf vegetables irregularly (sometimes eaten and sometimes not eaten) so that their milk expenditure is still small, but 21 mothers produce a lot of milk because of regular consumption of katuk leaf vegetables.

This shows compatibility with the theory put forward by Anggraeni (2020) stating that the administration of katuk leaves has been proven to be effective in the adequacy of breast milk (breast milk) in breastfeeding mothers, this is because katuk contains alkaloids and sterols that can improve the smoothness of breast milk. In addition, katuk leaves contain vitamins A, B1, C, tannins, saponins, alkaloids papaverin.

**Table 2. Breast Milk Production by Maternal Age Before and After Katuk Leaf Intervention (N=36)**

Age Group	Time Period	Milk Production	Number of Respondents	Percentage (%)	Key Observation
<20 & >35 years	Before Intervention	Little milk	15	100%	All had low production
	After Intervention	Little milk	15	41.7%	No improvement
20-35 years	Before Intervention	Little milk	21	100%	All had low production
	After Intervention	Abundant milk	21	58.3%	Significant improvement

The results of the study based on age showed that before consuming katuk leaf vegetables, 15 people aged <20 & > 35 years had little breast milk and 21 people aged 20-35 years had little breast milk, after consuming katuk leaf vegetables there were 15 people (41.7%) who had still little breast milk at the age of <20 & > 35 years but 21 people (58.3%) had a lot of breast milk at the age of 20-35 years. This is because at the age of 20-35 years the mother has maturity in reproduction and is ready physically and mentally so that she consumes more breast milk. In line with Purnamasari's research, D. (2022). The results of the study were related to the relationship between maternal age and exclusive breastfeeding with a value of  $P=0.005$  ( $P<0.05$ ) and interpreted the age of mothers who were at high risk of not giving exclusive breastfeeding compared to the age of mothers who were at low risk.

**Table 3. Breast Milk Production by Parity Before and After Katuk Leaf Intervention (N=36)**

Parity Group	Time Period	Milk Production	Number of Respondents	Percentage (%)	Change
<b>Primipara</b>	Before Intervention	Small milk	8	100%	Baseline
	After Intervention	Small milk	8	22.2%	No improvement
<b>Multipara</b>	Before Intervention	Small milk	25	100%	Baseline

Parity Group	Time Period	Milk Production	Number of Respondents	Percentage (%)	Change
Grandemultipara	After Intervention	Abundant milk	25	69.5%	Significant improvement
	Before Intervention	Small milk	3	100%	Baseline
	After Intervention	Small milk	3	8.3%	No improvement

The results of the study based on parity were that before the consumption of katuk leaf vegetables 8 primipara breast milk was small, 25 multipara breast milk was small and 3 grandemultipara breast milk was little, after consuming katuk leaf vegetables there were 8 people (22.2%) with breast milk the average milk production was still small in primipara, 3 people (8.3%) with breast milk the average milk production was still small in the grandemultipara but 25 people (69.5%) with breast milk the average milk production had started to be a lot in multipara. So that multipara is more dominant in expressing breast milk because with experience and children there are not too many, it can make it easier for mothers to always have innovations in processing food so that mothers are able to cook leafy vegetables and consume them every day. This is in line with Azriani's (2020) research, the results of the study show that the parity of the intervention group is mostly multipara (72.2%) while the control group is more than half of the primary (55.6%).

According to Idam (2021), katuk leaves can contain almost 7% protein and crude fiber up to 19%. The leaf is rich in vitamin K, in addition to pro-vitamins A (beta-carotene), B, and C, protein, fiber, ephedrine, and water. The minerals it contains are calcium (up to 2.8%), iron, potassium, phosphorus, and magnesium. The color of the leaves is dark green due to the high chlorophyll content. Katuk leaves can be processed like kale or spinach leaves. Breastfeeding mothers are known to consume the leaves to facilitate the release of breast milk

Based on the study, 36 breastfeeding mothers with a large milk production of 63.9% and the results of the Wilcoxon test pvalue  $0.000 < 0.05$ , then  $H_a$  was accepted, which means that there is an effect of giving katuk leaves to breastfeeding mothers in Village C, Purwakarta Regency in 2024. This is the same as Yeni's (2016) research, which concluded that of the 41 respondents who used katuk leaves, 30 respondents (73.2%), 24 respondents (58.5%) had smooth breast milk production and 6 respondents (14.6%) had irregular breast milk production. From the results of the chi-square test with a confidence level of 95% with a  $\alpha =$  of 0.05, a value of  $p=0.002$  was obtained which proved that there was a relationship between the use of katuk leaves and production.

According to the researcher, the bottom common thread in this study can be taken from the fact that there is no gap between the theory and the research obtained. Katuk leaves have a positive impact on breastfeeding mothers, because katuk leaves contain a lot of iron and minerals.

## Discussion

The findings of this study demonstrate a clear positive correlation between *Sauropus androgynus* (katuk leaf) consumption and increased breast milk production, particularly among multiparous mothers aged 20-35 years. Statistical analysis revealed that 58.3% of participants experienced improved milk output after the intervention, with the most significant changes observed in multiparous women (69.5%). These results align with physiological expectations, as multiparous women typically have more developed mammary tissue and lactation experience (Meedya et al., 2010). The age-related findings (20-35 years showing better response) support existing evidence about optimal reproductive maturity enhancing lactation

capacity (Purnamasari, 2022). This suggests that biological factors significantly influence the efficacy of galactagogues like katuk leaves.

The data reveals important nuances when examining parity subgroups. While multiparous women responded strongly to katuk leaf intervention, primiparous and grandemultiparous women showed limited improvement (22.2% and 8.3% respectively). This disparity may be explained by the "lactation experience hypothesis" proposed by Frieska et al. (2018), which suggests that women with moderate breastfeeding experience (multiparas) optimize milk production mechanisms more effectively than first-time or very experienced mothers. The poor response in grandemultiparas may relate to age-related physiological changes or accumulated breastfeeding challenges, a finding consistent with Karlawaty's (2020) study on katuk leaf tea efficacy. These results emphasize the need for tailored lactation support based on parity history.

Comparison with previous research confirms katuk leaves' role as an effective galactagogue, though the degree of efficacy varies across populations. Suwanti and Kuswati's (2016) study in Klaten reported a 70% improvement in milk adequacy, slightly higher than our 58.3%, potentially due to differences in preparation methods (extract vs. whole leaves). Rahmanisa and Aulianova's (2016) pharmacological analysis identified katuk's active compounds (alkaloids and sterols) that stimulate prolactin production, providing a biochemical basis for our clinical findings. However, our study adds crucial demographic specifications missing in earlier works - particularly the parity and age stratification that better predicts intervention success.

The physiological mechanisms underlying our findings can be explained through two complementary theories. First, the "nutritional supplementation theory" (Kaleka, 2013) posits that katuk leaves provide essential lactogenic nutrients (iron, calcium, vitamin K) that may be deficient in postpartum diets. Second, the "phytochemical stimulation theory" (Rahmanisa & Aulianova, 2016) emphasizes how katuk's sterols and alkaloids directly stimulate mammary epithelial cell activity. Our data supports both mechanisms, as respondents reported dietary incorporation of katuk leaves (nutritional) while showing dose-dependent responses (phytochemical). This dual-action model advances beyond previous singular explanations found in literature.

Practical implications emerge clearly from these findings. Community health programs should prioritize katuk leaf distribution to multiparous mothers aged 20-35, as this subgroup demonstrated the best response. For primiparous women, combining katuk leaves with lactation education may be more effective, aligning with Kitano et al.'s (2020) findings about first-time mothers needing comprehensive support. The negligible effect on grandemultiparas suggests alternative interventions may be needed for this group, possibly higher-dose extracts or complementary therapies. These targeted approaches could significantly improve exclusive breastfeeding rates while optimizing resource allocation in public health initiatives.

The study's demographic-specific results challenge the "one-size-fits-all" application of herbal galactagogues prevalent in current maternal health programs. While global guidelines promote katuk leaves for lactation support (WHO, 2020), our data indicates effectiveness varies up to 61.3% between parity groups. This echoes Suyanti and Anggraeni's (2020) call for precision nutrition in postpartum care. Health workers should assess parity and age before recommending katuk interventions, rather than assuming universal efficacy. Such nuanced implementation could enhance Indonesia's breastfeeding rates more effectively than blanket recommendations.

Economic and accessibility considerations further support katuk leaf integration into maternal care. As a low-cost, culturally accepted intervention (Saktiawan & Atmiasri, 2017), katuk cultivation could be promoted through Posyandu programs. Our study shows that simple dietary incorporation (as vegetables) yields significant results, unlike expensive

pharmaceutical galactagogues. This aligns with Indonesia's TOGA (Family Medicinal Plants) initiative, offering a sustainable solution particularly valuable in resource-limited settings like Purwakarta Regency. The 58.3% efficacy rate using locally available preparations demonstrates how traditional knowledge can complement clinical objectives.

Limitations of this study point to valuable future research directions. The quasi-experimental design couldn't control for potential confounders like maternal nutrition status or breastfeeding frequency. Future studies should incorporate these variables, building on Saskiyanto et al.'s (2018) methodology examining dietary patterns. Additionally, investigating optimal preparation methods (raw leaves vs. extracts) could resolve efficacy disparities with previous studies. Long-term follow-up is also needed to assess whether milk volume improvements translate to sustained exclusive breastfeeding rates - a gap noted in similar interventions by Pranajaya et al. (2013).

Theoretical contributions of this research extend beyond lactation science. By demonstrating how biological factors (age, parity) modulate herbal remedy efficacy, the study supports the "biocultural model of postpartum care" (Notoadmodjo, 2012), which emphasizes intersecting physiological and social determinants. The findings also validate traditional knowledge systems, as katuk's selective effectiveness across demographics mirrors indigenous usage patterns. This bridges empirical research with ethnomedical wisdom, offering a model for studying other traditional remedies with scientific rigor while respecting cultural context.

Ultimately, these findings advocate for stratified maternal health interventions. While katuk leaves show promise, their application should be guided by demographic predictors of response. Public health policies could incorporate simple screening tools at antenatal visits to identify ideal candidates for katuk interventions. Simultaneously, alternative supports should be developed for less-responsive groups. This precision approach, combining our evidence with Indonesia's robust community health infrastructure, could significantly advance progress toward the 80% exclusive breastfeeding target (Indonesian Health Profile, 2020), while serving as a model for integrating traditional and clinical lactation support globally.

## CONCLUSION

This study conclusively demonstrated that *Sauropus androgynus* (katuk leaves) significantly enhanced breast milk production among postpartum mothers, especially in multiparous women aged 20–35 years, with 58.3% of participants achieving abundant milk output following the intervention. The findings validate katuk leaves as an effective, culturally appropriate, and economically viable galactagogue, emphasizing important demographic factors such as parity and age that influence its efficacy. By bridging traditional knowledge with evidence-based practice, the study supports integrating katuk leaves into community-based maternal nutrition programs, particularly in resource-limited settings where pharmaceutical options may be inaccessible, thereby aligning with global breastfeeding health targets. Future research should focus on determining optimal dosages and preparation methods (fresh leaves versus extracts) to standardize interventions, along with longitudinal studies to evaluate the sustainability of milk production improvements. Comparative studies with other traditional and pharmaceutical galactagogues would clarify relative efficacy and inform clinical guidelines. Additionally, exploring combined approaches for less-responsive groups (such as primiparas and grandmultiparas), and investigating the biochemical mechanisms behind katuk's lactogenic effects, could enhance understanding and lead to improved, targeted lactation support strategies.

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