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## GENETIC POTENTIAL OF MEDICINAL PLANTS AND THEIR ROLE IN IMPROVING COLOSTRUM PRODUCTION IN DAYAK KANAYATN TRIBE, BENGKAYANG REGENCY, INDONESIA

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### SUMMARY

The Dayak Kanayatn tribe is legendary for using medicinal plants based on their grandparent's experience. Therefore, the contemporary study aimed to determine the various plant species used to induce colostrum, carried out in 2023 in the Dayak Kanayatn community, Pasti Jaya Village, Bengkayang Regency, Indonesia. The study comprised four stages: herbarium development, plant sampling, plant identification, and data collection. The informers were 10 persons, comprising eight village shamans and two midwives. The identified plant species totaled 18, used to facilitate colostrum production. These included *Chenopodium* sp., *Ipomoea batatas* (L.) Lam., *Euphorbia thymifolia* L., *Euphorbia hirta* L., *Cnidioscolus aconitifolius* (Mill.) I.M. Johnst., *Manihot esculenta* Crantz, *Arachis hypogaea* L., *Vigna radiata* L. (R.Wilczek), *Grona heterocarpos* (L.) H.Ohashi & K. Ohashi, *Ocimum basilicum* L., *Leonurus japonicus* Houtt., *Artocarpus heterophyllus* Lam., *Moringa oleifera* Lam., *Musa x paradisiaca* L., *Breynia androgyna* (L.) Chakrab & N.P. Balakr., *Zea mays* L., and *Zingiber purpureum* Roscoe. The commonly used plant parts are the leaves, flowers, fruits, and seeds. The plant parts consumed can be by eating and drinking, after processing first through boiling, sautéing, and cooking.

**Keywords:** Colostrum, Dayak Kanayatn, inventory, medicinal plants, method of processing, Pasti Jaya village

**Key findings:** The presented results provide information about the plant types, parts, and the processing method used to facilitate the colostrum. The latest study is useful for both residents of Pasti Jaya Village, Bengkayang Regency, Indonesia, and other communities, serving as a resource to aid mothers in addressing insufficient milk production by using traditional medicinal plants.

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## INTRODUCTION

Indonesian society consists of several tribes spread throughout the vast archipelago. West Kalimantan is one of the provinces with various types of tribes (Subarata *et al.*, 2021), and the Dayak tribe is the most dominant one (Riadi *et al.*, 2019; Yusro *et al.*, 2021). The said tribe also comprises six larger groups, Kayan, Ot Danum, Iban, Murut, Punan, and Klematan, which further divides into 450 subtribes spread throughout West Kalimantan, Indonesia. Each subtribe has almost the same customs, traditions, and culture, according to the unique language based on the region (Zahra *et al.*, 2021).

Kanayatn Dayak is part of the Klematan family in terms of territory, language, and customary laws (Subarata *et al.*, 2021). This tribe is widespread in several districts, such as, Landak, Mempawah, Kubu Raya, and Bengkayang, with several traditions (Dira *et al.*, 2023). These also include 'madah ka bansa' (asking permission from Jubata/God before planting), 'narah padi' (giving thanks for the rice harvest), 'gawe' (feast), 'baa' (closing the door before planting), and 'barobat' (traditional medicines) (Riadi *et al.*, 2019; Zanuardy and Kustanto, 2023).

Traditional medicine is an important element for the Dayak Kanayatn ethnic community (Riconadi *et al.*, 2020; Sari *et al.*, 2021), widely used due to its several advantages, such as, readily available ingredients, low risk of side effects, and relatively low cost (Dianci *et al.*, 2022). Previous studies showed plants used as traditional medicines have considerable diversity, with 40 types of plants applied for treatment by the Dayak Kanayatn community (Riadi *et al.*, 2019). According to Puspita *et al.* (2022), 63 types of medicinal plants serve for healing of humans. Traditional community medicine depends on the belief that healing comes from supernatural power (Riadi *et al.*, 2019; Sari *et al.*, 2021).

Approximately 90% of the people of the Dayak Kanayatn tribe living in Pasti Jaya Village, located in the east of Samalantan District, West Kalimantan Province, Indonesia, believe in traditional medicines (Zanuardy and

Kustanto, 2023). Based on an interview with the Head of the village on January 15, 2023, the community still believes in traditional medicines as used by their ancestors. People who can cure certain diseases with traditional medicines are usually the 'village shamans,' and those assisting in home births are the 'dukun beranak.' Several medicinal plants are beneficial for different treatments, including post-natal care, improving colostrum, diabetes, increasing appetite, high blood pressure, and facilitating menstruation. Based on the interviews with the village shamans in Pasti Jaya Village, Bengkayang Regency, Indonesia, one of the known properties of plants is to increase colostrum production.

Colostrum, an emulsion of fat in a solution of protein, lactose, and inorganic salts secreted by the mammary glands, helps as food for the mother and baby (Wulandari and Wardani, 2020). After giving birth, the process of providing colostrum may experience obstacles due to the difficulty in its production (Kriswiyanti *et al.*, 2021; Handoyo and Atiqah, 2022). Insufficient colostrum production resulted from hormones and nutritional factors found in the food consumed; however, in Indonesia, many plants seemed to increase colostrum production (Handayani *et al.*, 2021). These include 'cangkok' (*Breynia androgyna*), 'klabet' (*Trigonella foenum-graceum*), and 'jinten' (*Coleus amboinicus*) (Juliastuti, 2019). A qualitative review conducted by Monika (2020) showed several plants have been scientifically proven to effectively stimulate colostrum, including 'cangkok,' 'kelor,' and papaya.

The use of plants as colostrum stimulants is an obtained knowledge from generation to generation. However, efforts to train the next generation have not progressed; thus, written documentation is necessary to preserve the knowledge. Efforts to explore the use of traditional medicinal plants and their diversity can succeed by carrying out further studies (Dianci *et al.*, 2022). Therefore, the presented study aimed to determine the colostrum-stimulating plant types used by the Dayak Kanayatn community, in Pasti Jaya Village, Bengkayang Regency, Indonesia.

## MATERIALS AND METHODS

The recent study, commenced in 2023 in Pasti Jaya Village, Bengkayang Regency, West Kalimantan Province, Indonesia, with the said village covering an area of 4,800 ha (Figure 1). A total of six small towns make up the village, namely, Pacong, Aping, Aping Buluh, Serukam, Oyan Tikala, and Anggrek. The total population during the study period was 4,517 people from 1,166 heads of families, with a male population of 2368, and females of 2149.

Applying a qualitative method consisted of four stages. The first stage entailed collecting data on medicinal plants known to improve colostrum flow. Data collection employed triangulation, namely, interviews, observations, and documentation of plants. The selection of informers used a snowball sampling. This method initially identified key informants, with the others relying on information from previous informants (Riadi *et al.*, 2019; Yusro *et al.*, 2021; Dianci *et al.*, 2022). The informants were 10 people, including eight village shamans and two midwives. The conducted interviews sought to identify the plant types, locations found, parts used, and methods of processing colostrum-stimulating plants used by the community in Pasti Jaya Village, Bengkayang Regency, Indonesia.

The tools used were interview sheets and voice recorders, field observations, and documentation of colostrum stimulating plants with a camera. The second stage comprised taking samples of plant species able to stimulate colostrum and the types obtained from the previous interview process. The third stage succeeded by making a herbarium from specimens of colostrum-stimulating plants. The final stage was plant identification, carried out twice at the Laboratory of Biology, Faculty of Mathematics and Natural Sciences, Tanjungpura University, Pontianak, West Kalimantan, Indonesia, with identification letter numbers 044/A/LB/FMIPA/UNTAN/2022 and 057/A/LB/FMIPA/UNTAN/ 2023.

## RESULTS AND DISCUSSION

The Dayak Kanayatn tribe still uses medicinal plants to facilitate colostrum, specifically in Pasti Jaya Village, Bengkayang Regency, Indonesia, with the plant types used presented in Figure 2. The plant stems utilized belong to different families, i.e., Amaranthaceae, Convolvulaceae, Euphorbiaceae, Fabaceae, Lamiaceae, Moraceae, Moringaceae, Musaceae, Phyllanthaceae, Poaceae, and Zingiberaceae (Table 1). The most common plant types tapped belong to the family Euphorbiaceae. Handoyo and Atiqah (2022) also reported plants of the family Euphorbiaceae contain flavonoid compounds capable of increasing colostrum production in women. Based on the results, the most parts used are plant leaves to facilitate colostrum production (Figure 3). According to Handayani *et al.* (2021), plant leaves are readily available to collect, and their use is also relatively easy and simple. Another possibility is the efficacy of the leaves has been known for generations to be greater for healing than other plant parts (Handoyo and Atiqah, 2022).

The medicinal plants' consumption mainly occurs through eating directly (in raw form) and drinking after processing through boiling, sautéing, and cooking (Figure 4). The processing method with transparent cooking is prevalent in Pasti Jaya Village, Bengkayang Regency, Indonesia. According to Handayani *et al.* (2021), the plants handled by the people of Terong Tawah Village to stimulate colostrum have been scientifically proven to increase colostrum production, such as 'cangkok,' 'kelor,' 'turi,' and 'bayam.' Eating these plants can be direct, as well as, processed by cooking to preserve the nutritional content without adding other ingredients. The different parts of the medicinal plants expended with processing methods appear with more details in Table 2.

Medicinal plants to stimulate colostrum also contain various phytochemicals, which help other treatments. Based on a study conducted by Handayani *et al.* (2021), giving



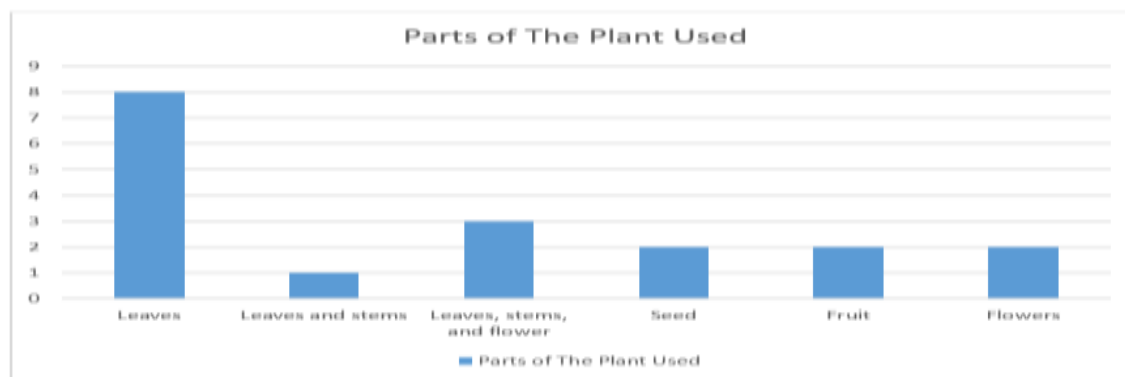
**Figure 1.** Regional map of Bengkayang Regency, Indonesia.



**Figure 2.** Plant species used by the community of Pasti Jaya Village, Indonesia, to facilitate colostrum production: 1. Bayam kampung (*Chenopodium* sp.), 2. Ubi jalar (*Ipomoea batatas* (L.) Lam. ), 3. Siti fatimah (*Euphorbia thymifolia* L.), 4. Susu nabi (*Euphorbia hirta* L.), 5. Pepaya Jepang (*Cnidioscolus aconitifolius* (Mill.) I.M. Johnst.), 6. Cangkok manis (*Breynia androgyna* L.), 7. Singkong (*Manihot esculenta* Crantz), 8. Kacang tanah (*Arachis hypogaea* L.), 9. Kacang hijau (*Vigna radiata* L. (R.Wilczek)), 10. Rumput kacang (*Grona heterocarpos* (L.) H.Ohashi & K. Ohashi), 11. Kemangi (*Ocimum basilicum* L.), 12. Jagung manis (*Zea mays* L.), 13. Kacang ma (*Leonurus japonicus* Houtt.), 14. Nangka (*Artocarpus heterophyllus* Lam.), 15. Kelor (*Moringa oleifera* Lam.), 16. Pisang kepok (*Musa x paradisiaca* L.), 17. Cangkok hutan (*Breynia* sp.), and 18. Rungkanang (*Zingiber purpureum* Roscoe ).

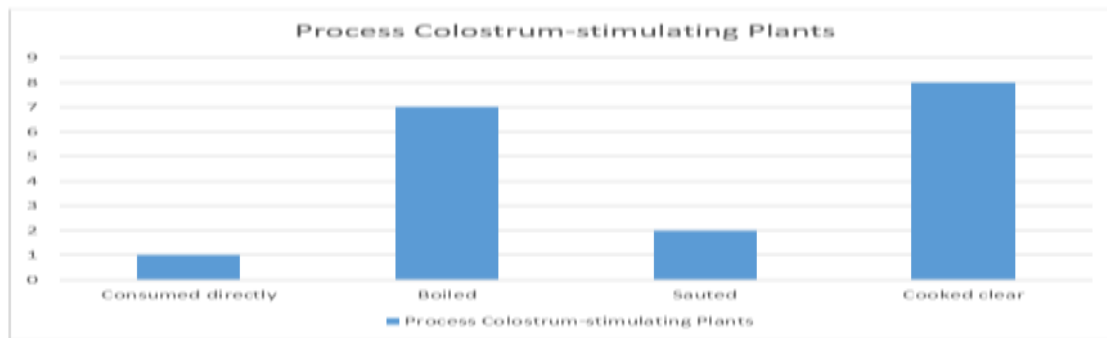
**Table 1.** Plant names, location found, parts used, and processing methods that promote colostrum production in the Dayak Kanayatn community in Pasti Jaya Village, Bengkayang Regency, Indonesia.

No.	Local and scientific names of plants	Family	Location discovered	Part used
1	<i>Bayam kampung (Chenopodium sp.)</i>	Amaranthaceae	Garden	Leaves and stem
2	<i>Ubi jalar (Ipomoea batatas (L.) Lam.)</i>	Convolvulaceae	Garden	Leaves
3	<i>Siti Fatimah (Euphorbia thymifolia L.)</i>	Euphorbiaceae	House yard	Leaves, stem, flowers
4	<i>Susu Nabi (Euphorbia hirta L.)</i>	Euphorbiaceae	House yard	Leaves, stem, flowers
5	<i>Pepaya Jepang (Cnidoscolus aconitifolius (Mill.) I.M. Johnst.)</i>	Euphorbiaceae	House yard	Leaves
6	<i>Singkong (Manihot esculenta Crantz)</i>	Euphorbiaceae	House yard	Leaves
7	<i>Kacang Tanah (Arachis hypogaea L.)</i>	Fabaceae	Garden	Fruit
8	<i>Kacang Hijau (Vigna radiata L. (R.Wilczek))</i>	Fabaceae	Garden	Seed
9	<i>Rumput Kacang (Grona heterocarpos (L.) H.Ohashi &amp; K. Ohashi)</i>	Fabaceae	Field	Leaves
10	<i>Kemangi (Ocimum basilicum L.)</i>	Lamiaceae	House yard	Leaves
11	<i>Kacang ma (Leonurus japonicus Houtt.)</i>	Lamiaceae	House yard	Leaves, stem, flower
12	<i>Nangka (Artocarpus heterophyllus Lam.)</i>	Moraceae	House yard	Fruit
13	<i>Kelor (Moringa oleifera Lam.)</i>	Moringaceae	House yard	Leaves
14	<i>Pisang Kepok (Musa x paradisiaca L.)</i>	Musaceae	House yard	Flower
15	<i>Cangkok Hutan (Breynia sp.)</i>	Phyllanthaceae	Forest	Leaves
16	<i>Cangkok Manis (Breynia androgyna (L.) Chakrab &amp; N.P. Balakr.)</i>	Phyllanthaceae	House yard	Leaves
17	<i>Jagung Manis (Zea mays L.)</i>	Poaceae	Garden	Seed
18	<i>Rungkanang (Zingiber purpureum Roscoe)</i>	Zingiberaceae	Forest	Flower



**Figure 3.** The part of the plant often used to facilitate colostrum production in Pasti Jaya Village, Bengkayang Regency, Indonesia.





**Figure 4.** Processing colostrum plants in Pasti Jaya Village, Bengkayang Regency, Indonesia.

**Table 2.** Methods for medicinal plant processing for consumption.

No.	Local and scientific names of plants	Processing method	How to use
1	<i>Bayam kampung</i> ( <i>Chenopodium</i> sp.)	Take enough young leaves and stems, then wash them thoroughly. Then, prepare the ingredients mixed with the <i>bayam</i> leaves, such as salt, flavorings, and onions. Afterward, cook it until wilted, add a little water, and then eat.	Eat
2	<i>Ubi jalar</i> ( <i>Ipomoea batatas</i> (L.) Lam.)	Take the young leaves and wash them clean. Then, heat water in a pan until it boils, add a little oil, put the leaves in boiling water until they wilt, and then eat them.	Eat
3	<i>Siti Fatimah</i> ( <i>Euphorbia thymifolia</i> L.)	Take one handful of <i>siti fatimah</i> plants, remove the roots, and wash thoroughly. Then, heat water until it boils, put the <i>siti fatimah</i> plant in boiling water until it wilts, let it sit for five minutes until the water changes color like tea, and then drink it three times a day after meals.	Drink
4	<i>Susu Nabi</i> ( <i>Euphorbia hirta</i> L.)	Take seven plants, remove the roots, and wash them clean. Then, heat one glass of water until it boils, put the plant in the boiling water until it wilts, then take the boiled water and drink it at night after eating.	Drink
5	<i>Pepaya Jepang</i> ( <i>Cnidocolus aconitifolius</i> [Mill.] I.M. Johnst)	Take enough young leaves and wash them clean, then, heat water in a pan until it boils, put the leaves in boiling water until they wilt, and then eat them.	Eat
6	<i>Singkong</i> ( <i>Manihot esculenta</i> Crantz)	Take enough young leaves and wash them clean, then, heat water in a pan until it boils, put the leaves in boiling water until they wilt, and then eat them.	Eat
7	<i>Kacang Tanah</i> ( <i>Arachis hypogaea</i> L.)	Take enough <i>kacang tanah</i> and wash them thoroughly, then, boil them for 30 minutes, add salt to taste, and then eat them.	Eat
8	<i>Kacang Hijau</i> ( <i>Vigna radiata</i> L.)	Wash enough <i>kacang hijau</i> seeds, then, boil until the seeds burst. Afterward, add enough sugar, then eat seeds, and drink the water.	Eat and drink
9	<i>Rumput Kacang</i> ( <i>Grona heterocarpos</i> (L.) H. Ohashi & K. Ohashi)	Take one plate of young leaves and wash them clean, then, boil in water, leaving for 5 minutes, and then take the water and drink 3 times a day after meals.	Drink
10	<i>Kemangi</i> ( <i>Ocimum basilicum</i> L.)	Take enough young <i>kemangi</i> leaves, washing them thoroughly. Afterward, the basil leaves can be eaten as is.	Eat
11	<i>Kacang ma</i> ( <i>Leonurus japonicas</i> Houtt.)	Take five stalks of the <i>kacang ma</i> plant, then, cut or chop all parts of the <i>kacang ma</i> plant, drying in the sun totally for approximately 3 to 5 days, then, roast for 5 minutes over low heat. Cut 1 free-range chicken and chop it into small pieces. Then boil the chicken that has been chopped with 1 kg of <i>arak</i> (Dayak Kanayatn language), then add the roasted <i>kacang ma</i> plant. Finally, wait until the chicken meat is cooked, drink the water, and eat the chicken after (can be consumed for a maximum of 3 days).	Drink
12	<i>Nangka</i> ( <i>Artocarpus heterophyllus</i> Lam.)	Take the young parts of the <i>nangka</i> ( <i>cibabal</i> ), then wash them clean. Afterward, boil it for about 30 minutes until soft, add a tablespoon of oil to remove the fruit sap, then, it is eaten.	Eat
13	<i>Kelor</i> ( <i>Moringa oleifera</i> L.)	Take the young leaves and wash them clean. Then, prepare the mixed ingredients, such as salt, seasonings, and onions. Afterward, it is cooked when wilted, and then consume.	Eat
14	<i>Pisang Kepok</i> ( <i>Musa x paradisiaca</i> L.)	Take one flower (heart) of a <i>pisang kepok</i> , wash it clean, and boil it in oil for 5 minutes, then drain it, sautéing it according to taste, then eat it.	Eat

15	<i>Cangkok Hutan (Breynia sp.)</i>	Take enough young leaves and wash them thoroughly. Then, prepare the ingredients to mix with the <i>cangkok</i> leaves, such as salt, seasonings, and onions. Afterward, saute the leaves until wilted, add a little water, and then eat.	Eat
16	<i>Cangkok Manis (Breynia androgyna (L.) Chakrab &amp; N.P. Balakr.)</i>	Take enough young leaves and wash them thoroughly, preparing the ingredients to mix with the sweet <i>cangkok</i> leaves, such as salt, seasonings, and onions. Afterward, add the water until it boils, then, add the sweet graft leaves until they wilt, and then, ready to eat.	Eat
17	<i>Jagung Manis (Zea mays L.)</i>	Boil sweet <i>corn</i> kernels for approximately 30 minutes, once cooked, add salt to taste, drain, and eat.	Eat
18	<i>Rungkanang (Zingiber purpureum Roscoe)</i>	Take enough parts of the <i>rungkanang</i> flower, then, wash them clean and cut them. Then, boil them in water until they wilt. Then, place them on a plate or bowl, then add salt according to taste when eating them.	Eat

capsules of the 'bayam' leaf extract, reaching 1400 mg per day in the morning, afternoon, and evening increased the prolactin levels and colostrum production in postpartum mothers. Kriswiyanti *et al.* (2021) reported increase in colostrum production is due to the 'bayam' plants, which contain polyphenol compounds, vital in raising the prolactin level. This important plant reportedly also contains vitamin A, vitamin C, niacin, thiamine, sodium, potassium, and magnesium (Handayani *et al.*, 2021).

A study conducted on 'ubi jalar' (*Ipomoea batatas* L. Lam.) leaves, possessing lactagogue polyphenolic compounds and amino acids, influence the hormone prolactin to produce colostrum (Purnani, 2017). The plant leaves have antioxidant activity due to the high levels of anthocyanins, such as, cyanidin and peonidin, resulting in a medicine for ulcers and to reduce dengue fever (Irawan *et al.*, 2020). Nasrollahzadeh *et al.* (2015) revealed 'siti fatimah' (*Euphorbia thymifolia* L.) has antiseptic, anti-inflammatory, antifungal, and antibacterial properties attributed to the secondary metabolite compounds, including steroids, phenolics, flavonoids, tannins, and alkaloids. According to Shrivastava and Mishra (2019), 'siti fatimah' leaves consisted of flavonoid compounds, phenolic acids, and anthocyanins traditionally used to treating dysentery, hemorrhoids, gonorrhoea, dysmenorrhoea, amenorrhoea, ringworm, cough, asthma, heart disease, and bronchitis.

The 'susu nabi' (*Euphorbia hirta* L.) plant is effective to treat hemorrhoids used by the community living in the Kletek Village,

Malaka Regency (Seuk *et al.*, 2023). Dianci *et al.* (2022) cited 'susu nabi' plant can serve as a vomiting stimulant, normalizing menstrual cycles, stopping bleeding (hemostasis), accelerating the healing of broken bones, eliminating swelling, and increasing colostrum flow. Furthermore, they mentioned the plant also contains secondary metabolites, such as, flavonoids, alkaloids, saponins, and tannins (Seuk *et al.*, 2023). The findings of Sari *et al.* (2021) revealed 'Pepaya jepang' (*Cnidioscolus aconitifolius* (Mill.) I.M. Johnst) leaves can be a food ingredient due to the high nutritional value, effective in enhancing the colostrum flow, blood flow, uric acid, and antibacterial. Monika (2020) reported 'Pepaya jepang' leaves also contain several active compounds, including stearic, oleic, and palmitic acid, acyclic terpene alcohol, linoleic ester, pyrrolidone derivatives, palmitic ketones, and phenolics. They have a greater potential to act as anti-hyperlipidemia to reduce the blood fat levels.

'Singkong' (*Manihot esculenta* L. Crantz) leaves can increase the hormone prolactin and colostrum production (Subagio, 2019). Moreover, it is proven that the leaves have higher content of fibers and proteins, while containing various secondary metabolite compounds, including alkaloids, tannins, saponins, flavonoids, and flavonols (Subagio, 2019). These components are responsible for health benefits, preventing a decrease in serum albumin, lowering blood sugar, and acting as antioxidants (Subagio, 2019). Nasution *et al.* (2022) mentioned 'kacang tanah' (*Arachis hypogaea* L.) seeds contain carbohydrates, protein, and fats, which can

help the fetal growth process in pregnant women and optimize the production, as well as, color density of colostrum in breastfeeding mothers. The 'kacang tanah' seeds also have polyphenolic compounds, effective to act as antioxidants, anti-inflammatories, and anticancer (Chen *et al.*, 2017).

The 'kacang hijau' (*Vigna radiata* L.) seeds contain lactagogum, a substance capable of increasing and facilitating colostrum production (Barus, 2021). Moreover, the said plant also has vitamin B natural complex, which can help improve the health of breastfeeding mothers and facilitate colostrum production. Sufiani *et al.* (2022) observed protein in raw 'kacang hijau' plant has a digestibility estimated at 77%. This low digestibility comes from the presence of anti-nutrients, such as, antitrypsin and tannins (polyphenols). 'Rumput kacang' (*Grona heterocarpos* (L.) H. Ohashi & K. Ohashi) plant leaves have anti-oxidative and anti-inflammatory activities (Hyeon *et al.*, 2018). The said plant also contains flavonoids, lipids, alkaloids, isoflavones, and saponins, favorable to treat the diseases, viz., typhus, asthma, bronchitis, hemorrhoids, coughs, diarrhea, dysentery, and bleeding (Hyeon *et al.*, 2018).

'Kemangi' (*Ocimum basilicum* L.) plant leaves contain essential oils, carbohydrates, phytosterols, alkaloids, phenolics, lignin, starch, terpenoids, and anthraquinones, useful in treating fever, mouth ulcers, poor colostrum production, and nausea (Panjaitan *et al.*, 2021). The said plant also has other compounds, including flavonoids, alkaloids, saponins, and tannins, which function as antipyretic, antifungal, antiseptic, antibacterial, hepatoprotector, immunomodulator, anti-repellent, and anti-expectorant (Kumalasari and Adriana, 2020). 'Kacang ma' (*Leonurus japonicas* Houtt.) contains alkaloids, diterpenes, and flavones, with a great potential as anticancer and cardio-protection (Lee *et al.*, 2023). The said plant's content also includes polyphenols, which are beneficial for reproductive health in women and reducing heart risks (Lee *et al.*, 2023).

The 'nangka' (*Artocarpus heterophyllus* Lam.) is beneficial in the community in Pecoro Village, Jember Regency, Indonesia to treat

diarrhea (Paramitha, 2022). The said plant also serves to prevent anemia, constipation, give healthy hair, fight wrinkles, and cancer. Furthermore, 'nangka' can help stimulate colostrum in breastfeeding mothers by having carbohydrates, vitamins A, B, and C, as well as, calcium, potassium, and iron contents (Paramitha, 2022). 'Kelor' (*Moringa oleifera* L.) plant leaves contain phytosterol compounds, including stigmaterol,  $\beta$ -sitosterol, and campesterol, which have lactagogum activity in enhancing colostrum production (Monika, 2020). Handoyo and Atiqah (2022) reported breastfeeding mothers who consume 'kelor' plant leaves (2 to 3 times a day) had elevated prolactin levels in the blood, thereby, increasing colostrum production.

According to Manalu *et al.* (2020), 'pisang' blossoms (*Musa X paradisiaca* L.), helping to enhance the colostrum production, are prevalent in the community of Tanap Village, Sanggau Regency, Indonesia. The said plant contains lactagogum, with high potential to stimulate oxytocin and prolactin (Utami and Ghozaly, 2017). This refers to the presence of alkaloids, polyphenols, steroids, flavonoids, and other substances, which are most effective in increasing and facilitating colostrum production. Likewise, the said plant has several benefits as an anti-inflammatory and antibiotic agent, as well as, for preventing bone loss (Utami and Ghozaly, 2017).

Pratiwi and Wiadnyani (2018) stated 'cangkok hutan' (*Breynia* sp.) plant leaves can treat wounds and constipation. According to Budiana *et al.* (2022), the plant's leaves have secondary metabolite compounds, i.e., alkaloids, triterpenoids, tannins, polyphenols, flavonoids, glycosides, and saponins, which can boost the colostrum flow, and also act as antioxidants. Handoyo and Atiqah (2022) disclosed 'cangkok' (*Breynia androgyna* (L.) Chakrab & N.P. Balakr.) leaves effectively heal wounds, treat difficulty in urinating, increase sexual vitality in men, as well as, reduce and relieve fever. 'Cangkok' leaves contain steroids and polyphenols, crucial in increasing prolactin and facilitating colostrum production (Juliastruti, 2019).

The 'jagung' fruit (*Zea mays* L.) dominates in the community in Batu Village,



Hamparan, Southeast Aceh Regency, Indonesia, in treating chicken pox (Yassir and Asnah, 2018). Accordingly, the said plant contains carbohydrates, vitamins, potassium, linoleic acid, folic acid, flavonoids, beta carotene, minerals, and protein, resulting in its effectiveness for preventing several diseases, improving colostrum, fighting cancer, combating anemia, and strengthening the immune system (Yassir and Asnah, 2018).

'Rungkanang' (*Zingiber purpureum* Roscoe) flowers are effective in the community of Masbangun Village, Teluk Batang District, North Kayong Regency, Indonesia, as a powder after childbirth due to the high content of phenolic compounds, terpenoids, flavonoids, and essential oils (Citradewi *et al.*, 2019). The said plant also contains saponin and tannin compounds, useful to prevent inflammation, treat asthma, as well as, possess carminative, antibacterial, anti-obesity, anti-allergic, and antioxidant effects (Citradewi *et al.*, 2019; Al-Nema and Abdullah, 2023).

In this study area, rare breastfeeding plants include 'bayam kampung' (*Chenopodium* sp.), 'siti fatimah' (*Euphorbia thymifolia* L.), 'susu nabi' (*Euphorbia hirta* L.), 'rumpit kacang' (*Grona heterocarpos* (L.) H. Ohashi & K. Ohashi), and 'rungkanang' (*Zingiber purpureum* Roscoe). These plants need preservation and cultivation, specifically to maintain their availability. So far, efforts for their conservation have not progressed. This is because the colostrum-stimulating plants used in this study indicated that if one plant is unavailable, the community still has alternatives plants to use, replacing the unavailable ones (Khedr *et al.*, 2024; Panjaitan *et al.*, 2024).

## CONCLUSIONS

The study examined the diverse species and plant parts used by the Dayak Kanayatn ethnic community in Pasti Jaya Village, Bengkayang Regency, Indonesia, to facilitate colostrum production. From the identified total of 18 plant species, the research found most parts used were leaves, flowers, fruits, and seeds. Additionally, the most common method of

consumption was through eating in raw form and drinking after boiling. Further studies are necessary to assess the lactagogum activity in each identified plant type.

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