Original Article

Lactagogue effects of *Torbangun*, a Bataknese traditional cuisine

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Coleus amboinicus Lour (CA) has been used as a breast milk stimulant (a lactagogue) by Bataknese people in Indonesia for hundreds of years. However, the traditional use of CA is not well documented, and scientific evidence is limited to establish CA as a lactagogue. This investigation was conducted to elucidate the effect of traditional use of CA during the first month of lactation on quantity and quality of the breast milk**.** The results collected from the study show that CA supplementation increased breast milk production without compromising the nutritional quality of the breast milk. Lactating women receiving CA supplementation had a 65% increase in milk volume during the last two weeks of supplementation (from Day 14 to Day 28). This increase was greater than that of lactating women receiving Molocco+B12™ tablets (10%) or Fenugreek seeds (20%). The residual effects of CA supplementation were seen even after the supplementation had ended for one month. Results of the present study confirmed the belief and the practice amongst the Bataknese people that CA can be used as a lactagogue in humans, and the use of CA might be suitable for lactating women in general.

Key Words: Coleus amboinicus Lour, Torbangun, lactagogue, Bataknese Simalungun, traditional cuisine, Indonesia

Introduction

Human breast milk has long been accepted as the gold standard of infant nutrition. It is uniquely suited to the human infants' digestive system because it is perfectly balanced with protein, fat, minerals and vitamins. It is an ideal nutrient composition for the newborn and young infant (WHO, 1993). Breast milk is complex and presents continuous changes. The composition and volume of breast milk varies with each individual mother, the demands made by the infants, the time of the day, and the nutritional status of the mother, so the mother's diet is important (Emmet & Rogers, 1997, Harding, 2001; Mora & Nestel, 2000).

Bataknese lactating women in Simalungun District, North Sumatra, Indonesia, have a tradition to consume Torbangun leaves (*Coleus amboinicus* Lour; CA) after birth. They believe that the consumption of CA for one month after birth increases their breast milk production (Damanik *et al.*, 2001&2004). The present paper reports the effects of consumption of CA leaves for one month after birth on the quantity and quality of breast milk.

Materials and methods

Recruitment Procedures

The study was carried out in Simalungun District, North Sumatra Province, Indonesia. Prospective subjects were identified through midwife practices in the Simalungun District. Pregnant women were recruited for the study if all of the following criteria were met.

1. Aged between 20 and 40 years;
2. Must be in their last trimester of pregnancy;
3. Must be apparently healthy, have no symptoms of malnutrition or chronic diseases, not take any medication on regular basis, or have no medical conditions or complications during previous pregnancies or deliveries;
4. Must not drink or smoke regularly;
5. Must intend to breastfeed their infants exclusively for at least four months;

Additional eligibility criteria were that the infant be delivered at term (gestation of 37-43 weeks), have a birth weight at least 2.5 kg, and the infant should be healthy.

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Intervention procedures

A total of 75 eligible subjects were recruited for this parallel-randomized intervention study. After informed written consent was obtained from each subject, they were then randomly assigned to one of three supplementation groups (25 subjects in each group): a *Coleus amboinicus* (CA) Group, to consume CA leaves; a Fenugreek Group, to take Fenugreek seeds filled in hard capsules and a Reference Group, to take sugar-coated Moloco+B12™ Tablets. Fenugreek Capsules and Moloco+B12™ Tablets are supplements commonly consumed by lactating mothers in Indonesia and Europe countries, respectively.

All subjects took the assigned supplement for one month starting on Day 2 after giving birth. They were asked to maintain their usual food intake and not to use any known or putative lactagogue plant or agent other than that provided by the researchers throughout the two-month intervention study.

After the completion of a 30 days supplementation period, the subjects were followed for another 30 days. Of 75 mothers, 67 participated for the whole two-month study period. Subjects were divided into three groups: Moloco+B12™ (Reference Group, *N* = 22), CA Group (*N* = 23) and Fenugreek Group (*N* = 22). The schematic study design is presented in Figure 1.

The study protocol was approved by the Monash University Standing Committee on Ethics in Research Involving Humans. The nature of the study including the procedures, requirements, inconveniences, risks and benefits, was explained in Indonesian to the prospective participants. The explanatory statements of the study and consent form were also provided in Indonesian. They were assured that their participation was voluntary, they could choose not to answer some of the questions, and they could withdraw from the study at any time.

Supplements

During the 30-day supplementation period, subjects of the CA Group were provided with 150 g/day of CA leaves served as a soup from Monday to Saturday. A local woman experienced in cooking the CA soup was employed to prepare the soup. The preparation of the soup started early in the morning and finished at about 7 am. The soup was put in a plastic container and a delivery boy then delivered the soup to the subjects' home. On the following delivery day, the boy checked whether the mothers had consumed the soup. The nutrient composition of the CA soup is presented in Table 1.

Table 1. Nutrient composition of the Torbangun soup (150 g sample)

Nutrient	Mean ± SD
Fat (g)	16.3 ± 4.6
Protein (g)	2.4 ± 0.1
Carbohydrate (g)	5.3 ± 0.3
Water (g)	121.5 ± 14.7
Mineral (mg)	
Zinc	2.8 ± 0.1
Iron	6.8 ± 0.1
Calcium	393.1 ± 6.5
Magnesium	124.1 ± 6.3
Potassium	1219.2 ± 80.7

Moloco+B12™ tablets (Kenrose, Jakarta, Indonesia, Batch No D6016449) contain vitamin B12 (20 µg) and a placental extract (15 mg). They were given to subjects in the Reference Group at a dosage of one tablet three times per day. Fenugreek capsules (Bullivant Natural Product, Auckland, New Zealand Batch No BNP708756-3) at a dosage of one capsule three times daily were given to subjects of the Fenugreek Group. One capsule of the Fenugreek contains 600 mg powder of the *Trigonella foenum graecum* Lour seed. The effects of CA and Fenugreek were examined by comparing the percentage change in the volume and nutritional quality of breast milk (using the values of the first measurements as the baseline, i.e. Day 14 for milk volume and Day 8 for milk nutrient contents) with those of the Reference Group.

24-hour Breast milk volume measurements

Breast milk intake measurements were based on Dewey and Lonnerdal (Brown *et al*., 1982). The weight of milk the infants consumed at each feeding was calculated from the difference in infants' weight before and after the feeding. The milk volume was then calculated by summing the net weight differences at each feeding during each 24-hour period recorded, converting the sum into gram, and multiplying by 0.983 mL/g to adjust for the density of breast milk. The weight of the infants was measured using a baby electronic weighing scale accurate to ± 10 g (Seca734, Hamburg, Germany). The scale was periodically checked for its accuracy by a calibration weight. Trained research assistants observed a 24-hour

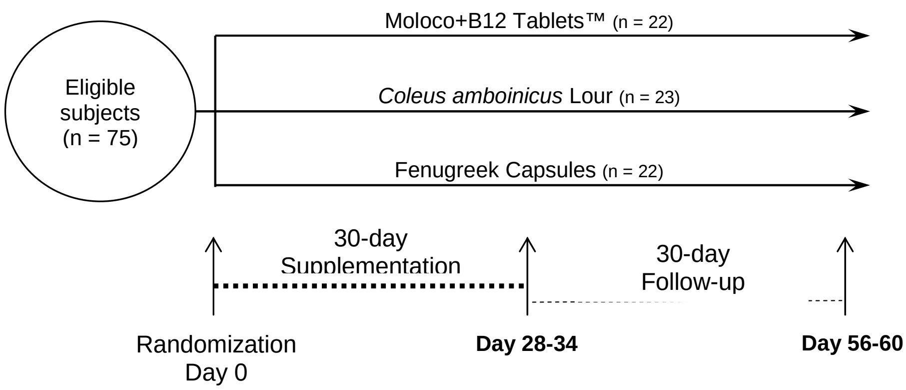

Figure 1. Schematic diagram of study design

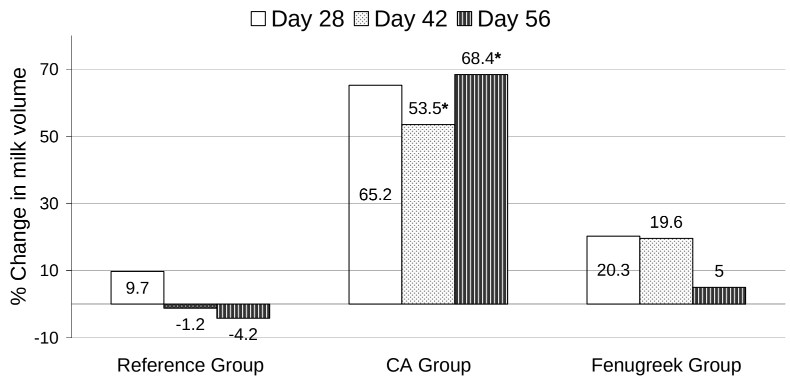

Figure 2. % Change in breast milk intake during the two-month study period. Significant difference from the Reference Group (Moloco+B12™) (ANOVA): *, *P* < 0.05

Table 2. The breast milk intake during the two-month study period (mL)

Parameter	*Reference Group*				*CA Group*				*Fenugreek Group*			
	N	*Mean*	±	*SD*	*N*	*Mean*	±	*SD*	*N*	*Mean*	±	*SD*
Day 14 (baseline)	22	453.8	±	192.6	23	361.1	±	201.1	22	466.9	±	253.0
Day 28	22	385.1	±	201.9	23	478.7	±	157.0 *	22	400.3	±	215.1
Day 42	22	387.4	±	188.3	23	439.8	±	196.7	22	456.6	±	247.1
Day 56	22	385.5	±	170.5	23	478.3	±	265.0	22	358.5	±	135.2

No significant differences from the Reference Group (Moloco+B12™) were observed at Day 14 (ANOVA).
Significant differences from Day 14 within the same group (paired t-test): *, *P* <0.05.

volume checking at the subjects' homes every two weeks. Information on a 24-hour milk volume, feeding frequency, and total time spent on breastfeeding was collected over four sessions: days 14, 28, 42, and 56 after delivery.

Breast milk sample collection

Apart from the 24-h milk volume measurements, milk samples were collected on Days 8, 33 and 60 for macro and micronutrient analysis. A milk sample of about 40 mL was obtained in the morning between 8 to 10 am from each mother by manual expression of both breasts after cleaning with deionized water. The samples were collected in a mineral-free plastic bottle, transported on ice to the laboratory unit at the local hospital and stored at –20°C until analysis. A flame atomic absorption spectrometric method (AOAC, 1999) was used to determine mineral contents in breast milk samples.

Compliance with the supplementation and general health status of the mother and infant subjects

Tablet or capsule count was used to monitor the compliance with Moloco+B12™ or Fenugreek supple-ments. Structured conversations between the subjects and researchers during visits provided information about the general health status of the subjects, both the mother and the infant. Any complaints or concerns were also recorded. For the CA group, the compliance and problems with the CA supplement or feeds was also evaluated through these conversations.

Results

Breast milk quantity

The 24-h breast milk intakes were recorded every 2 weeks over the two-month period, and the results are shown in Table 2.

The information on 24-h breast milk intake was collected for the first time on Day 14 post partum, and was used as the Baseline for comparison with the information subsequently collected on Day 28, 42 and 56. Table 2 shows that although the mean milk volume at Day 14 of the CA Group was 361 mL, and about 100 mL less than that of the Reference and Fenugreek Groups (454 and 467 mL, respectively), statistical analysis showed that there were no significant differences amongst these three groups.

It was observed that during the last two weeks of CA supplementation (from Day 14 to Day 28), the 24-h breast milk intake significantly increased from 361 to 479 mL (*P* <0.05) or the average increase was 65% (Fig. 2). This increase was higher than with the groups receiving Moloco+B12™ Tablets or Fenugreek Capsules which were only 10% and 20% respectively. Additionally, it was found that, even after the completion of supplementation, the increase in breast milk intake of the CA Group still remained higher than the other two groups (Fig. 2).

The nutritional quality of breast milk

Results show that the mean breast milk intake of the Fenugreek Group was the lowest among the three comparison groups. Since Fenugreek seems to have no effect on breast milk quantity, the effect on quality has not been further studied. The macronutrient and mineral contents of breast milk data presented in the following paragraphs are only from the CA and Reference Groups.

Proximate analysis

The proximate analyses of the breast milk samples during the first two-month lactation period are shown in the Table 3. The macronutrient contents of transitional milk

(Day 8) in both groups studied did not differ. Table 4 shows that with the CA supplement for 30 days (Day 33), the protein content in breast milk of the CA Group showed a decrease from Day 8. It was observed that the decrease in protein content of this group was significantly higher than for the Reference Group (P <0.001). Table 4 shows that the decreases in protein content in breast milk of the CA Group continued until Day 60. The ash content of breast milk in the CA Group showed a slight increase on Day 33 and then decreased until Day 60. The reduction of ash content of breast milk in the CA Group on Day 60 was significantly greater (P<0.0001) than in the Reference Group. The water content of breast milk on Day 33 of the CA Group was lower than Day 8, as evident from the decrease of its content from Day 8 to Day 33. It was observed that decrease of water content in the CA was significantly higher than in the Reference Group (–0.3 vs 0.2, P < 0.01). No significant differences were observed in the milk composition on Day 33 and Day 60 of the two corresponding groups. Nevertheless, it was noted that, during the first two-month lactation elevation of fat content in breast milk of the CA Group remained higher than for the Reference Group (Table 4).

Mineral contents

The mineral contents in breast milk for the CA and the Reference Groups from transitional to mature milk over the two-month post partum period are shown in Table 5. Mineral (iron, zinc, calcium and potassium) content in the transitional milk of two groups studied did not differ, except for magnesium. The contents of iron, zinc, calcium and potassium in the CA Group were 1.4 ppm, 6ppm, 256ppm and 569 ppm respectively. While in the Reference

Table 3. The macronutrient content of breast milk (g /100 g sample) during the two-month study period

Parameter (g/100 g)	*Reference Group*				*CA Group*			
	N	*Mean*	±	*SD*	*N*	*Mean*	±	*SD*
Day 8								
Fat	22	4.3	±	0.9	23	5.0	±	3.0
Protein	22	1.3	±	0.0	23	1.3	±	0.1
Lactose	22	7.2	±	0.1	23	7.1	±	0.2
Water	22	87.0	±	0.4	23	86.9	±	0.3
Ash	22	0.7	±	0.0	23	0.7	±	0.0
Day 33								
Fat	22	5.0	±	1.6 §	23	5.0	±	1.4
Protein	22	1.4	±	0.0	23	1.2	±	0.0 ¶
Lactose	22	7.3	±	0.1 §	23	7.2	±	0.2
Water	22	87.2	±	0.4	23	86.7	±	0.3 Ŧ
Ash	22	0.7	±	0.0 Ŧ	23	0.7	±	0.0
Day 60								
Fat	22	4.7	±	1.7	23	4.6	±	1.3
Protein	22	1.3	±	0.0	23	1.2	±	0.1
Lactose	22	7.3	±	0.1	23	7.1	±	0.1
Water	22	87.1	±	0.3	23	86.9	±	0.4
Ash	22	0.7	±	0.0 Ŧ	23	0.7	±	0.0 Ŧ

Significant difference from Day 8 within the same group (paired t-test): Ŧ, P < 0.01; §, P < 0.001; ¶, P < 0.0001.

Table 4. % Change in % milk composition (g/100g) during the two-month study period

Parameter	*Reference Group*				*CA Group*			
	N	*Mean*	±	*SD*	*N*	*Mean*	±	*SD*
Changes from Day 8 to Day 33								
Fat	22	24.0	±	48.2	23	32.1	±	86.0
Protein	22	3.4	±	3.3	23	–1.2	±	5.3 §
Lactose	22	1.6	±	1.9	23	0.6	±	4.8
Water	22	0.2	±	0.6	23	–0.3	±	0.5 Ŧ
Ash	22	3.1	±	3.9	23	0.5	±	3.7 *
Changes from Day 8 to Day 60								
Fat	22	11.6	±	41.5	23	18.4	±	68.7
Protein	22	0.5	±	3.6	23	–1.4	±	5.0
Lactose	22	1.1	±	2.4	23	–0.1	±	3.8
Water	22	0.0	±	0.7	23	0.0	±	0.5
Ash	22	1.8	±	2.1	23	–2.6	±	3.5 ¶

Significant difference from the Reference Group (Moloco+B12™) (ANOVA): *, P < 0.05; Ŧ, P < 0.01; §, P < 0.001; ¶, P < 0.0001.

Table 5. Mineral content of breast milk during the two-month study period

Mineral content (ppm)	*Reference Group*				*CA Group*			
	N	*Mean*	±	*SD*	*N*	*Mean*	±	*SD*
Day 8								
Iron	22	1.2	±	0.9	23	1.4	±	0.6
Zinc	22	4.9	±	1.8	23	5.9	±	1.8
Calcium	22	287.1	±	58.9	23	255.9	±	60.5
Potassium	22	637.4	±	115.0	23	568.8	±	126.4
Magnesium	22	22.7	±	4.7	23	17.9	±	4.2 [a]
Day 33								
Iron	22	1.2	±	0.6	23	1.3	±	0.7
Zinc	22	3.0	±	1.7 §	23	3.6	±	0.8 ¶
Calcium	22	282.3	±	46.2	23	249.8	±	54.5
Potassium	22	519.4	±	73.7 ¶	23	435.7	±	92.1 §
Magnesium	22	21.7	±	3.6	23	18.4	±	12.6
Day 60								
Iron	22	0.8	±	0.5	22	1.1	±	0.5
Zinc	22	2.0	±	1.0 ¶	23	2.5	±	1.2 ¶
Calcium	22	281.1	±	49.6	23	271.5	±	51.4
Potassium	22	481.4	±	68.0 ¶	23	418.6	±	78.2 ¶
Magnesium	22	22.2	±	4.3	23	15.8	±	3.0 *

Significant difference from the Reference Group (Moloco+B12™) at Day 8 (ANOVA): a, $P < 0.001$.
Significant difference from Day 8 within the same group (paired t-test): *, $P < 0.05$; §, $P < 0.001$; ¶, $P < 0.0001$.

Table 6. Percentage change in mineral content of breast milk during the two-month study period

Parameter	*Reference Group*				*CA Group*			
	N	*Mean*	±	*SD*	*N*	*Mean*	±	*SD*
% Change from Day 8 to Day 33								
Iron	22	68.4	±	148.3	23	24.3	±	138.7
Zinc	22	–34.0	±	44.0	23	–34.4	±	25.9
Calcium	22	0.7	±	18.6	23	-0.5	±	20.3
Potassium	22	–16.8	±	15.3	23	–20.5	±	22.4
Magnesium	22	–2.3	±	16.4	23	9.0	±	92.9
% Change from Day 8 to Day 60								
Iron	22	16.2	±	132.6	22	1.2	±	73.7
Zinc	22	–56.5	±	21.9	23	–55.3	±	22.4
Calcium	22	3.2	±	21.8	23	8.7	±	20.3
Potassium	22	–22.4	±	15.2	23	–23.7	±	18.4
Magnesium	22	1.4	±	19.5	23	–9.0	±	18.8

No significant differences from the Reference Group (Moloco+B12™) were observed (ANOVA).

Group the contents were 1.2 ppm, 5 ppm, 287 ppm and 637 ppm respectively. The magnesium content in breast milk of the CA Group was significantly lower than the Reference Group (17.9 vs 22.7, $P < 0.001$).

The CA soup seemed to have no effect on the mineral content of the breast milk in this group. Table 6 showed no significant elevations observed in the mineral content in the breast milk of the CA Group after the completion of supplementation (Day 33). The mineral content of the breast milk in the CA Group was comparable (iron and magnesium) to or lower (zinc, potassium and calcium) than Day 8.

Discussion

Quantity of breast milk

A key element to define lactation performance is the total amount of milk produced. The finding that the 24-h milk intake of the CA Group increased by 65% from Day 14 to Day 28, while that of Reference and Fenugreek Groups increased by only 10% and 20%, respectively, suggests that breast milk production by Simalungun women was enhanced by the CA soup. Furthermore, even after the supplementation period, the milk intake in the CA Group on Day 56 remained increased while there was a decline in the milk volume in the other two intervention groups, especially in the last two weeks of the follow-up period. During two months of lactation, the milk intake in the Fenugreek Group was lowest amongst the three Groups (358mL vs 385mL vs 478mL, respectively for Fenugreek, Moloco+B12™ and CA Groups).

An effect of CA on the proliferation of mammary secretory cells, which is used an indicator for the activity of the secretory cells in secreting milk (Knight *et al*., 1984; Nagasawa & Yanai, 1976; Traurig, 1967), has been demonstrated in an animal study (Silitonga, 1993). In that study, lactating mice were supplemented with various doses of a CA extract from Day 2 post partum for 28 days. The 75% and 75.3% increases in DNA and RNA levels in the mice receiving the CA extract 60 g/kg body weight, compared to the 22.5% decrease in DNA and 26% increase in the RNA observed in the mice receiving Moloco + B12™ supplement (P <0.05), indicating that CA could increase the proliferation of mammary secretory cells. The effect of CA on the proliferation of secretory cells in the mammary gland was dose-dependent (Silitonga, 1993).

Nutritional quality of breast milk

The composition of human milk varies with the stage of lactation, gestation and the amount of milk secreted. However, the overall content of human milk is moderately consistent (Lawrence, 1999; Worthington *et al.*, 1989). The initial substance produced by the alveolar secretory cells is colostrum, which is present during the first few days following delivery. After the first few days, colostrum is gradually replaced with a transitional form of milk, which contains greater quantities of fat and lactose, and in turn is replaced by mature milk over the first one to two weeks as lactation is established. In the present study, the transitional milk was represented by the milk samples collected on Day 8, and those collected on Days 33 and 60 represented the mature milk at the end of the one-month supplementation period and at the end of the two-month study period, respectively.

Macronutrient content

Fat in breast milk is generally a major source of energy (Madden, 1997). The major proportion of milk fat is derived from maternal circulating lipids (from diet) and stores (especially of polyunsaturated fatty acids) (Neville & Picciano, 1997). While the fat concentrations in human milk vary during the day, over a feeding, between breast and over time, as well as between women (Neville & Picciano, 1997), the lactose concentrations are constant and independent of maternal nutritional status (Worthington *et al.*, 1989). In general, the major difference between transitional and mature milk is seen in fat content, especially in the first month of lactation, as observed in both the Reference and CA Groups. At the same time, protein and lactose contents change slightly. The small differences between the Reference and CA Groups in the changes of macronutrient content over the study period suggest that, while the milk production was enhanced as the results of galactagogue CA supplementation, the nutritional quality of milk in terms of macronutrient content was not compromised.

Mineral content

Adequate amounts of essential vitamins, mineral and trace elements are required for the infant to have normal growth and development. The concentrations of most minerals, except for zinc and iron, in breast milk remain fairly constant throughout the course of lactation (Krachler *et al*., 1998). Both zinc and iron have their highest concentrations immediately after parturition, and fall for several weeks afterwards (Lamounier *et al*., 1989; Nagra, 1989). This seems to be the case for zinc in the present study, where there was a 34% decline in Day 33 from Day 8 and 55% decline in Day 60 for both the Reference and CA Groups. However, there was only a small and insignificant change in iron content in breast milk over the two-month study period.

It was observed in the present study that there were significant increases in mineral intake in the CA Group due to consumption of the CA supplement (Data are not presented). The mean intake of calcium, magnesium, and iron of this group exhibited a greater rise, resulting in the mean intakes being above the recommendations during the first two-month lactation. These values were significantly higher than in the other two groups. However, the increase in the mineral intake of this group did not appear to affect the mineral content of the breast milk. These findings were in agreement with previous reports that suggest that the concentrations of these minerals in human milk are not affected by diet (Bates & Prentice, 1994; Donangelo *et al*., 1989; Garg *et al*., 1988; Moser *et al*., 1988; Moser & Reynolds, 1983; Nagra, 1989).

Garg and colleagues (1988) reported that there was no significant difference in the iron and zinc content of the colostrum of well-nourished and undernourished Indian mothers. Similar results from various studies confirmed that the mother's iron and zinc status does not influence the mineral concentration in breast milk (Dallman, 1986, Feeley *et al*., 1983; Moser & Reynolds, 1983; Siimes *et al*., 1984).

The milk concentrations of calcium and magnesium also do not generally correspond to their respective values in maternal serum (Garg *et al*., 1988; Moser *et al*., 1988; Nagra, 1989). The close control of the concentrations of calcium and magnesium in maternal serum would make it seem unlikely that maternal nutrition would significantly affect their concentration in human milk. Garg and colleagues (1988) found no effect of maternal nutritional status on the milk concentration of calcium and magnesium. While the milk of Pakistani women tended to have a lower mineral content than that of women in the UK (potassium and magnesium) the calcium content was the same (Nagra, 1989). Moser and colleagues (1988) found the milk of Nepalese mothers to have similar calcium content to that of American mothers despite a considerably lower dietary intake (482 vs 114 mg/day).

In human milk, calcium and magnesium are present throughout lactation and their concentration declines gradually in late lactation (Laskey *et al*., 1990; Prentice & Barclay, 1991). Nevertheless, there appears to be some disagreement about changes in the calcium and magnesium milk content during the course of lactation. Several studies recorded virtually no changes between early and mature milk (Gross *et al*., 1980; Sann *et al*., 1981). However, in other studies, Karra & Kirksey (1988) and Karra and colleagues (1988) recorded a moderate increase between the first and sixth month of lactation in two dissimilar communities. The present study showed there was no change in calcium content of the breast milk during the first two-month lactation.

The concentrations of electrolytes (sodium, potassium, and chloride) in milk are determined by an electrical potential gradient in the secretory cells rather than by maternal nutritional status (Naylor, 1981; Picciano *et al*., 1981). The average concentrations of sodium, potassium and chloride in mature human milk are lower than their levels in colostrum (Macy 1979; Picciano *et al*., 1981). Although some investigators have reported that 5- to 40-fold increases in sodium and potassium levels in human milk are associated with emotional stress, mastitis and diminished milk production in the mother (Anand *et al*., 1980; Arboit & Gildengers, 1980; Seale *et al*., 1982), a common cause of high electrolyte levels of the milk appears to be due to lack of suckling or inadequate suckling (Naylor, 1981). Inadequate stimulation from suckling leads to involution of the mammary glands, which is characterized by reduction in lactose synthesis and elevated electrolyte concentration in milk (Hartmann & Kulski, 1978). In the present study the average reduction of 20-25% was observed in the potassium content in the breast milk during the first two months of lactation period. This may indicate that the mothers receive adequate stimulation from the suckling of their infants.

The finding that no differences between the Reference and CA Groups in the changes of mineral contents, again suggests that CA enhanced the production of breast milk without compromising its nutritional quality of milk.

Conclusion

In the present study, milk production increase without compromise to the nutritional quality in the CA Group. This confirms the belief amongst Bataknese people that CA can be used as a lactagogue in humans. The effects of CA supplementation are seen even after the supplementation was ended for one month.

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Original Article

Lactagogue effects of *Torbangun*, a Bataknese traditional cuisine

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Torbangun—一种传统的 Bataknese 烹饪的催乳作用

Coleus amboinicus Lour (CA)被 Bataknese 用于增加乳汁分泌，已有几百年的历史了。但是，除了一小部分资料记载 CA 用于催乳剂，历史上并没有记载 CA 的其他用途。本项目是为了研究 CA 的传统上的使用，即在泌乳初期第一个月对母乳的质与量的影响。结果表明，给泌乳期的妇女服用 CA 后，她们所分泌的乳汁量不仅增加了，而且没有影响母乳的营养质量。泌乳期的妇女在服用 CA 的最后两周内，她们所分泌的乳汁量比对照组增加了 65%（从第 14 天到第 28 天），与服用 Molocco+B12™ 片剂（增加 10%）组和服用胡芦巴子组（增加 20%）相比，CA 的催乳作用显然要强的多。并且，停药一个月后，CA 的催乳作用还依存。本研究证实了 CA 确实有催乳作用，并且验证了这种治疗作用的可行性，以及 CA 适合用于一般泌乳期的妇女。

关键词：Coleus amboinicus Lour、Torbangun、催乳药、Bataknese Simalungun、传统烹饪、印尼。