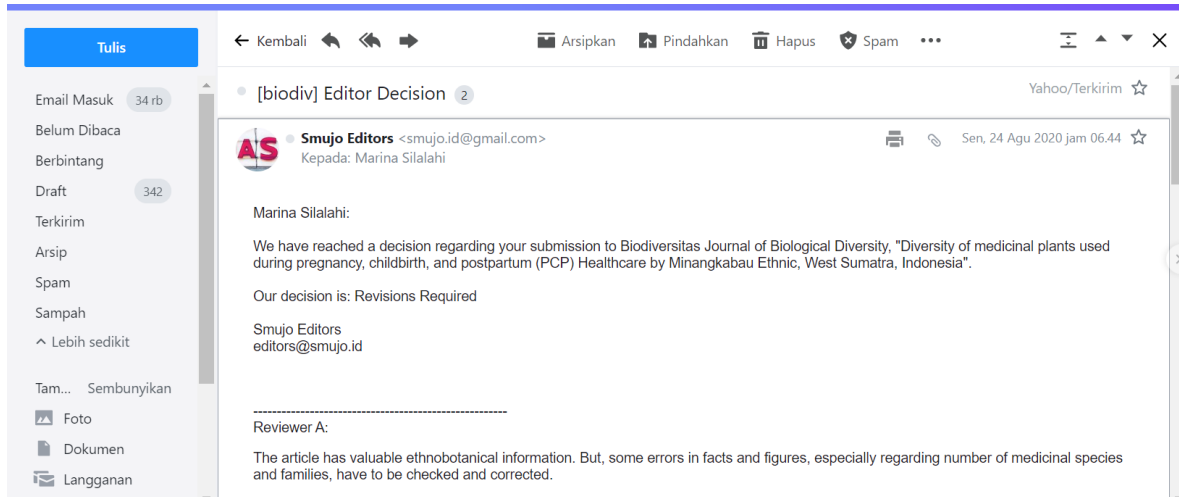


BUKTI KOMUNIKASI

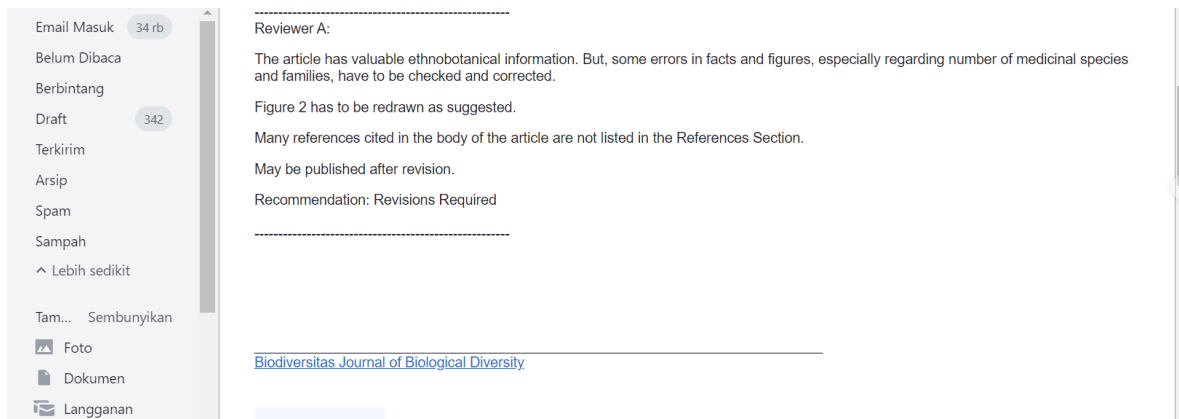
Judul: Ethnomedicinal plants and practices related to pregnancy, childbirth, and postpartum healthcare of Minangkabau ethnic group, West Sumatra, Indonesia

Athor: **Silalahi M, A Khairiah, Nisyawati**

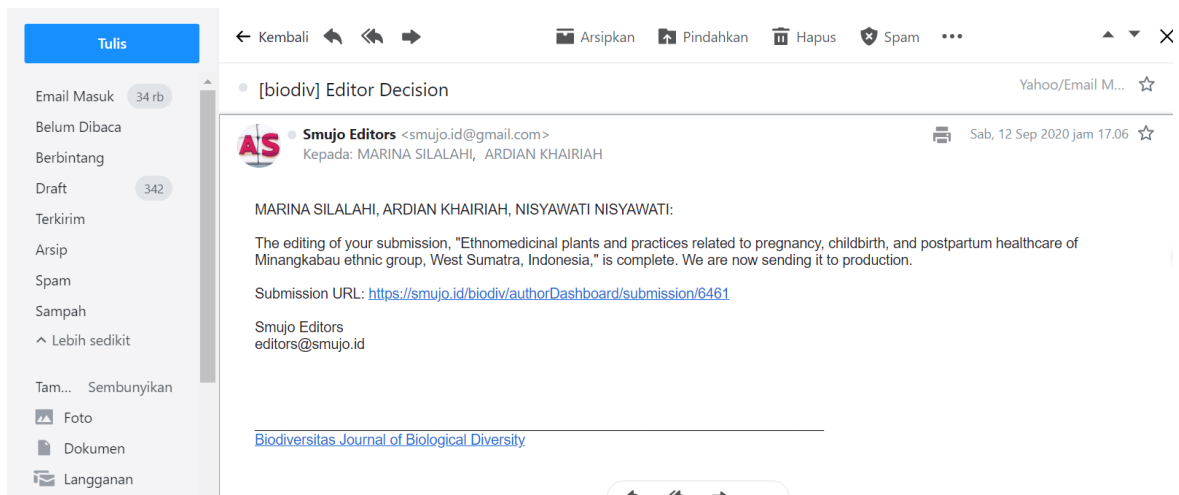
Jurnal : Biodiversitas Journal of Biological Diversity, 21(10), 4597-4605..



This screenshot shows an email from Smujo Editors to Marina Silalahi. The email subject is "[biodiv] Editor Decision". The body of the email states: "We have reached a decision regarding your submission to Biodiversitas Journal of Biological Diversity, 'Diversity of medicinal plants used during pregnancy, childbirth, and postpartum (PCP) Healthcare by Minangkabau Ethnic, West Sumatra, Indonesia'. Our decision is: Revisions Required". It then lists the reviewer's comments: "Reviewer A: The article has valuable ethnobotanical information. But, some errors in facts and figures, especially regarding number of medicinal species and families, have to be checked and corrected."



This screenshot continues the email from Smujo Editors. It provides further details of the reviewer's feedback: "Reviewer A: The article has valuable ethnobotanical information. But, some errors in facts and figures, especially regarding number of medicinal species and families, have to be checked and corrected. Figure 2 has to be redrawn as suggested. Many references cited in the body of the article are not listed in the References Section. May be published after revision. Recommendation: Revisions Required". The email concludes with the journal's name, "Biodiversitas Journal of Biological Diversity".



This screenshot shows a follow-up email from Smujo Editors to Marina Silalahi and Ardiان Khairiah. The email subject is "[biodiv] Editor Decision". The body of the email states: "MARINA SILALAH, ARDIAN KHAIRIAH, NISYAWATI NISYAWATI: The editing of your submission, 'Ethnomedicinal plants and practices related to pregnancy, childbirth, and postpartum healthcare of Minangkabau ethnic group, West Sumatra, Indonesia,' is complete. We are now sending it to production. Submission URL: <https://smujo.id/biodiv/authorDashboard/submission/6461>". It concludes with the journal's name, "Biodiversitas Journal of Biological Diversity".

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[Biodiversitas Journal of Biological Diversity](#)



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Tulis

← Kembali ↶ ↷ → Arsipkan Pindahkan Hapus Spam ⋮

[biodiv] New notification from Biodiversitas Journal of Biological Diversity Yahoo/Email M... ☆

AS DEWI NUR PRATIWI <smujo.id@gmail.com> Rab, 9 Sep 2020 jam 11.01 ☆
Kepada: Marina Silalahi

You have a new notification from Biodiversitas Journal of Biological Diversity:

You have been added to a discussion titled "Uncorrected proof" regarding the submission "Diversity of medicinal plants used during pregnancy, childbirth, and postpartum (PCP) Healthcare by Minangkabau Ethnic, West Sumatra, Indonesia".

Link: <https://smujo.id/biodiv/authorDashboard/submission/6461>

Ahmad Dwi Setyawan

[Biodiversitas Journal of Biological Diversity](#)

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[biodiv] Editor Decision Yahoo/Email M... ☆

AS Smujo Editors <smujo.id@gmail.com> Sab, 12 Sep 2020 jam 17.04 ☆
Kepada: MARINA SILALAH, ARDIAN KHAIIRIAH

MARINA SILALAH, ARDIAN KHAIIRIAH, NISYAWATI NISYAWATI:

We have reached a decision regarding your submission to Biodiversitas Journal of Biological Diversity, "Ethnomedicinal plants and practices related to pregnancy, childbirth, and postpartum healthcare of Minangkabau ethnic group, West Sumatra, Indonesia".

Our decision is to: Accept Submission

Smujo Editors
editors@smujo.id

[Biodiversitas Journal of Biological Diversity](#)

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Notifications ✕

[biodiv] Editor Decision

2020-05-07 09:18 AM

Marina Silalahi:

We have reached a decision regarding your submission to Biodiversitas Journal of Biological Diversity, "In the Minangkabau ethnic cultures, the pregnancy, childbirth, and postpartum period have used of medicinal plants to women's health care. The aim of this research are (1) to identify the use the medicinal plants that have been used during pregnancy, chilb".

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Biodiversitas Journal of Biological Diversity Tasks 1 English View Site marina2609

Notifications ✕

[biodiv] Editor Decision

2020-08-23 11:44 PM

Marina Silalahi:

We have reached a decision regarding your submission to Biodiversitas Journal of Biological Diversity, "Diversity of medicinal plants used during pregnancy, childbirth, and postpartum (PCP) Healthcare by Minangkabau Ethnic, West Sumatra, Indonesia".

Our decision is: Revisions Required

Smujo Editors
editors@smujo.id

🔍 Search

Uncorrected proof

Participants

Smujo Editors (editors)
Marina Silalahi (marina2609)
DEWI NUR PRATIWI (dewinurpratiwi)

Messages

Note	From
Dear Author(s), Pls, find attached file for an uncorrected proof (Copyedited file). The revised manuscript is awaited. Do not worry about layout changes due to revision; our staff will fix it again. Note: Kindly use track change when you make improvements.	dewinurpratiwi 2020-09-09 04:00 AM

[dewinurpratiwi, Childbirth - Silalahi.doc](#)

Review Discussions

Name	From	Last Reply	Replies	Closed
[biodiv]	editors 2020-08-21 06:46 AM	-	0	<input type="checkbox"/>
Uncorrected proof	dewinurpratiwi 2020-09-09 04:00 AM	-	0	<input type="checkbox"/>

Diversity of Ethno-medicinal plants and practices used during related to pregnancy, childbirth, and postpartum (PCP) Healthcare by of Minangkabau Ethnic group, West Sumatra, Indonesia

Abstract. In the Minangkabau ethnic cultures, medicinal plants have been used to treat health problems associated with the pregnancy, childbirth, and postpartum period (PCP). The aim/objectives of this research study were to (1) to identify/document the use of the medicinal plants that have been used during pregnancy, childbirth and postpartum recovery by Minangkabau ethnics and the associated ethnomedicinal practices, and (2) to identify plants that have the potential to be developed as ingredients to increase the production of breast milk. Data were collected in three villages, which are namely Guguak Sarai, Taruang Taruang and Sungai Durianin in West Sumatra, Indonesia, by interviewing a total of 141 informants, consisted of involving 9 key informants and 132 general respondents, were gathered through interviews. A total of 423 species of medicinal plants were found to be used in women's for PCP healthcare during pregnancy and postpartum by Minangkabau people. These medicinal plants are used to facilitate childbirth, alleviate menstruation problems, assist recovery after miscarriage, mitigate postpartum hemorrhage, aid in postpartum recovery, and for infant care. A total of 247 plant species were represented by 89 families i.e. Poaceae (78 species), Arecaceae, Fabaceae, Zingiberaceae (3 species respectively), Euphorbiaceae, Lamiaceae, Meliaceae, Musaceae and Asteraceae (2 species respectively each). The Majority of the used medicinal plants for pregnancy, childbirth and postpartum preparations are used through administered by drinking (as many as 35 species), bathing (4 species), and as a paste (3 species). The medicinal plants by the Minangkabau ethnic have been used to facilitate childbirth, alleviate menstruation problems, assist recovery after miscarriage, mitigate postpartum hemorrhage, aid postpartum recovery, and for use in infant care. Use of *Musa balbisiana*, *Carallia brachiata*, *Lansium domesticum*, and *Toona sureni* used to for treating the problems related to pregnancy, childbirth, and postpartum period would be interesting to study need to be further investigated for their phytochemistry and pharmacological properties. *Plectranthus ambonicus* and *Sauropus androgynus* are used to increase breast milk production, and further research is needed for standardizing processing and commercialization of these species.

Keywords: Minangkabau ethnic, PCP, pregnancy, *Plectranthus ambonicus*, *Sauropus androgynus*

Running title: Medicinal plants used during Pregnancy, Childbirth, and Postpartum

INTRODUCTION

The pregnancy, childbirth, and postpartum (PCP) area period resulted in the mothers' considerable death, especially in the developing countries. The factors that contributed for the death are postnatal bleeding (Tsu et al. 2004), postpartum hemorrhage, and postpartum depression (Abdillahi & Van Staden 2013). The local communities in Asia such as Laos (de Boer & Lamxay 2009; de Boer et al. 2011), Indonesia (Silalahi & Nisyawati 2019), Malaysia (Teoh et al. 2013), Thailand (Panyaphu et al. 2011), India (Jain et al. 2011) use the medicinal plants to reduce the death risk of the PCP mothers. In Malaysia, the prevalence of herbs ingestion during pregnancy was 13.9% with half of the mothers consuming it during the first trimester. A total of 163 mothers (About 52.9% of studied mothers) ingested herbs during the postpartum period in Malaysia (Theo et al. 2013).

Various ethnic groups in Indonesia use plants for PCP management, based on local knowledge and make it an integral part of the PCP process such as oukup (Silalahi and Nisyawati, 2019). The purposes of the use of medicinal plants enduring PCP varies, such as are: to restore stamina, and to increase breast milk (Silalahi & Nisyawati 2019); to heal the wounds, to reduce postpartum hemorrhage, to reduce pain during childbirth, and to keep protect baby away from infection (Silalahi & Nisyawati 2019); to improve the health of their babies, to facilitate labor and delivery (Theo et al. 2013), and to alleviate menstruation problems (De Boer & Lamxay 2009). The process of acculturation, of culture, use of synthetic drugs, and weakening of oral knowledge inheritance systems resulted in the degradation of local knowledge, even though knowledge is an important source of information on biodiversity and cultural conservation (Suryadarma 2010; Emmanuel & Didier 2012; Sujarwo & Cuneva 2016). Knowledge of the use of medicinal plants is derived from experience or inheritance from close family for generations (Emmanuel & Didier 2012).

The problems that postpartum mothers face are maternity blues, depression (Takashi et al. 2014) and stress. Stress has directly or indirectly affected production of breast milk so that some mothers fail to provide good nutrition to the baby.

Commented [J1]: Check the number of species-table 2

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51 The traditional health system develops various therapies to improve PCP of the mother's health through diet and herbs
52 (Jain et al. 2011; Theo et al. 2013) and steam bathing (Silalahi & Nisyawati, 2019). Silalahi and Nisyawati (2019) stated
53 that various plants used in saunas by postpartum mothers have a relaxing effect so that they can reduce postpartum stress.

54 The traditional health systems in local communities develop therapies to treat postpartum mothers through diet and
55 treatment (Jain et al. 2011). The plants used to maintain health varies between one ethnic group and another, which is
56 influenced by various factors such as the biodiversity of the surrounding environment, topography, and culture (Sujarwo &
57 Cuneva 2016; Silalahi et al. 2015). This resulted in the species and number of medicinal plants being recognized
58 differently among ethnic groups. Fifty-four medicinal plant species were used to overcome 15 types of maternal
59 postpartum disorders in the Laos local community (Lundh 2007), while the Batak ethnic group used 63 species as adequate
60 ingredients (Silalahi & Nisyawati 2019) and 88 species for *oke show* ceremony by Halmahera communities (Wahkidah
61 et al. 2017).

62 ~~The researches of the~~Research on medicinal plants ~~have been conducted so far~~ in Sumatra ~~but mostly of them~~
63 ~~only focused on~~ documented their uses in general. ~~Whereas to~~Studies on plants curing PCP, plants are severely limited
64 (Silalahi & Nisyawati 2019), especially in the Minangkabau ethnic group. ~~Minangkabau ethnicity is an ethnic indigenous~~
65 ~~that inhabits the area of West Sumatra, and is estimated at around 91% of the population of West Sumatra. The researchers~~
66 ~~only mentioned the types, benefits of medicinal plants in general, but have not discussed in detail about the use for female~~
67 ~~reproductive organs.~~This study aims (1) to reveal local knowledge of Minangkabau ethnicity in utilizing medicinal plants
68 to improve health during pregnancy, childbirth and postpartum, ~~and~~ (2) to compare the cultural values or CSI values
69 ~~from of these plants used.~~

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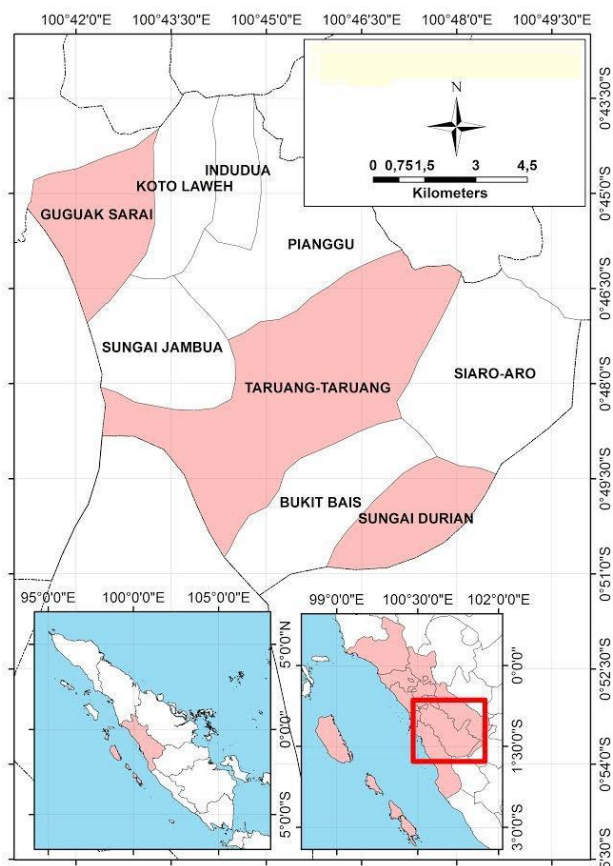
70

MATERIALS AND METHODS

71 The study was conducted in three villages (*nagari*), namely the Guguak Sarai, Taruang Taruang and Sungai Durian, of
72 IX Koto Sungai Lasi Sub-district, Solok District, ~~in the~~ West Sumatra, Indonesia (Figure 1). ~~These nagari's~~ represent the
73 ~~locations of~~ Minangkabau ethnic groups in the West Sumatra. The study ~~took place was conducted~~ from February to June
74 2016. The Minangkabau ethnic connecting the area is called "Minangkabau land" which means a unity between territory,
75 social system, and culture contained within them and has a system of matrilineal kinship. Empirically, the Minangkabau
76 ethnic groups are known to be rich in local knowledge ~~for of~~ using herbs and spices, ~~but and~~ researchers ~~stated have proved~~
77 that they are rich ~~of their~~ traditional medicine (Kairiah 2017).

78 The Minangkabau ~~ethnic~~ is an ethnic group that adheres to the matrilineal kinship ~~system that is according to maternal~~
79 ~~lineage~~. The child in the matrilineal system has a bond with the mother's brother ~~and is called a~~ *mamak* (uncle). The
80 *mamak* in the Minangkabau ethnic group is responsible for all the children of his sisters (*kemenakan*), so there is a
81 complex relationship in one family. ~~The children in matrilineal kinship have family ties with the mother's brother, known~~
82 ~~as mamak (uncle). Mamak is responsible to all of his sister's children (nephew), so he has complex family relationships.~~
83 The ethnic Minangkabau have lived in IX Koto Sungai Lasi Sub-district since the 17th century and have long been using
84 plants in ~~their~~ traditional medicine.

Commented [J7]: Repeated sentences



85
86 **Figure 1.** The research location of Map of the study area - Guguak Sarai, Taruang Taruang and Sungai Durian villages, IX Koto Sungai
87 Lasi Sub-district, Solok District, West Sumatra, Indonesia.

88 **Data collection**

89 Data were collected from a total of 141 informants, consisting of 9 key informants and 132 general respondents,
90 ranging in age from 30 to 80 years old (Table 1). More than 95% of the people living are Minangkabau and the rest are
91 Javanese. The livelihoods of the population of more than 90% of them are farmers, the rest are traders and government
92 employees. Informant who was first interviewed was a traditional healer, then the traditional healer appointed the next
93 respondent. The respondent criteria were respondents who know and utilize plants used in PCP and have children.
94 Respondents were selected with purposive snowball sampling methods. Information on diversity of medicinal plants used
95 as medicinal plants was obtained from the interviews respondents with semi-structured, in-depth interviews, and
96 participative observation methods. Interviews were conducted according to the guides followed with modification of the
97 existing methods (Martin, 1995), with some modifications.

98
99 **Table 1.** The demographic information of PCP respondents in of the Minangkabau ethnic group, West Sumatra, Indonesia

Characteristics	Guguak Sarai village	Sungai Durian village	Taruang-taruang village
Key informants	3 people	3 people	3 people
General respondents	46 people	18 people	68 people

Commented [J8]: Add more data on socio-economic profile of respondents

101 Medicinal plants are collected as voucher specimens and record their local names, parts of used, life forms, uses and
102 process of preparation for use are recorded. The identification of voucher specimens was carried out at Laing's Spice and
103 Drug Plant Research Institute, Solok, specifically in Plant Taxonomy Laboratory, Mathematics and Natural Science
104

105 Faculty, Universitas Indonesia and Herbarium Bogoriense, Cibinong Institute of Sciences (LIPI). The voucher specimens
106 were stored at Laing's Spice and Drug Plant Research Institute, Solok, West Sumatra, Indonesia. The scientific names ~~and~~
107 ~~author~~ are verified ~~to~~with the Plantlist Database (www.theplantlist.org.)

108 Data analysis

109 Data were analyzed using qualitative and quantitative methods. Qualitative analysis used descriptive statistics by
110 grouping plants based on usage category. The ~~value of the~~ cultural significance index (CSI) was calculated using the
111 technique developed by Turner (1988). Assessment of this cultural importance index uses three components namely the
112 quality of use, intensity of use, and the exclusivity of use with the following formula:

$$113 \text{CSI} = \sum_{k=1}^n (q \times i \times e) n_i$$

114
115 CSI is equal to the sum of individual and uses values from 1 to n, with n representing the last use described; ~~and~~ the
116 subscript k represents ~~ing~~ the value 1 through n, consecutively. For each use given, q = quality value, i = intensity value,
117 ~~and~~ e = exclusivity value.

Commented [J9]: Not cited in References section

118 RESULTS AND DISCUSSION

119 Diversity of the Medicinal Plants for Pregnancy, Childbirth, and Postpartum

120 The Minangkabau ethnic ~~group~~ recognizes ~~the~~ pregnancy, childbirth, and postpartum (PCP) as a vulnerable stages
121 which may cause maternal death, ~~so that~~ and they have special treatments and diets to ~~overcome it~~ manage the health
122 ~~adversities of these stages~~. This research found ~~that a total of 423~~ species, belonging to 38 genera and ~~255~~ families, of the
123 medicinal plants ~~that~~ have been used by the Minangkabau ethnics ~~group~~ to treat PCP ~~related health problems~~ (Table 2).
124 ~~Out of these 423 species, A total of 2457~~ species of medicinal plants are represented by ~~8-9~~ families, namely *Poaceae* (7
125 ~~8~~ species), *Arecaceae*, *Fabaceae*, *Zingiberaceae* (3 species ~~respectively each~~), *Euphorbiaceae*, *Lamiaceae*, *Meliaceae*,
126 *Musaceae* and *Asteraceae* (2 species ~~respectively each~~) (Figure 2). ~~The remaining 176 families in this study were~~
127 ~~represented by single species each.~~

128 The ~~number of~~ medicinal plants ~~used by the Minangkabau in this research are~~ less than the numbers ~~medicine~~
129 ~~plants reported for by~~ Batak Karo (Silalahi & Nisyawati 2019). Differences in medicinal plants ~~used~~ by local people are
130 influenced by ~~local factors like~~ the environment, topography, ethnicity, and culture (Sujarwo & Cuneva 2015; Silalahi et
131 al. 2015). On the other hand, the ~~presene~~popularity of modern medicine, directly or indirectly, influences the degradation
132 of local knowledge ~~pertaining to use of plants as food and medicine~~ (Sujarwo and Cuneva 2015, 2016); ~~which has~~
133 ~~implications for the degradation of local knowledge~~ (Sujarwo and Cuneva 2016).

134 Medicinal plants have been used during PCP to reduce the discomforts associated with pregnancy and to "restore" the
135 ~~body condition after delivery~~ (Theo et al. 2013). Both Batak Karo and Minangkabau ethnics ~~use the same species to treat~~
136 PCP, such as *Cymbopogon citratus*, *Sauropus androgynus*, *Cymbopogon nardus*, *Curcuma longa*, *Zingiber officinale*, and
137 *Acorus calamus* (Silalahi & Nisyawati 2019).

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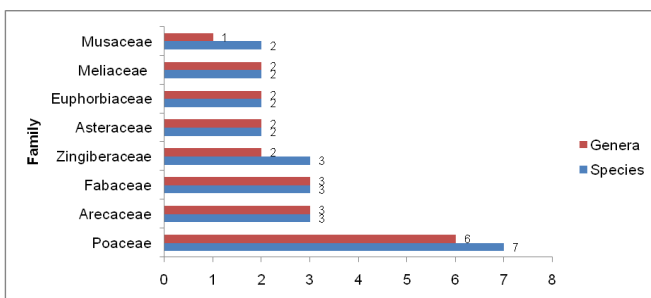
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Commented [J12]: There appears some error in the numbers given. Figures mentioned in Fig. 2 and Table 2, does not match with each other. Table 2 has 43 species. Lamiaceae has 2 species and should be included in Fig 2. Poaceae has a total of 8 species

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139
140
141 **Figure 2.** Families with the highest species number of medicinal plants to treat pregnancy, childbirth and post-partum in the
142 Minangkabau ethnic, West Sumatra, Indonesia

143
144 The ~~18 families in this study were represented by single species.~~ The results of ~~the this study observation~~ show the
145 ~~degradation~~ ~~increasing use~~ of medicinal plants ~~use~~ by Minangkabau ethnic to treat PCP. The reasons ~~for~~ the local
146 community, especially the younger generation, does not use medicinal plants anymore ~~is due to are~~: (1) the traditional
147 medicinal ~~practicee~~ is associated with mysticism ~~and thus so that it~~ is contrary to religion, (2) the process of using

Commented [J13]: Modify the figure to add Lamiaceae (2 species). No of species in Poaceae is 8 and not 7.

148 ~~#medicinal plants~~ is more difficult than ~~that of~~ modern medicine, (3) some medicinal plants are difficult to obtain, and (4)
149 the ~~presence~~easy availability of modern ~~medicinal facilities~~ (midwife). ~~Medicinal plants have been used during PCP to~~
150 ~~reduce the discomforts associated with pregnancy and to “restore” the body condition after delivery (Theo et al. 2013).~~
151 ~~Both Batak Karo and Minangkabau ethnics use the same species to treat PCP such as *Cymbopogon citratus*, *Sauropus*
152 *androgynus*, *Cymbopogon nardus*, *Curcuma longa*, *Zingiber officinale*, and *Acorus calamus* L. (Silalahi & Nisyawati~~
153 ~~2019).~~

Table 2. The medicinal plants used to treat Pregnancy, Childbirth, and Postpartum in the Minangkabau Ethnic, West Sumatra, Indonesia

Family	Scientific name	Specimen Number	Local name	Cultivated/ Wild	Life form	Part of uses	CSI Values	Single or Concoctions	How to use	Uses
Acanthaceae	<i>Graptophyllum pictum</i> Griff.		<i>Pudiang hitam</i>	Cultivated	Shrub	Bark	9	Single	Fresh, Pilis	Headache
Amaranthaceae	<i>Amaranthus hybridus</i> L.		<i>Bayam</i>	Cultivated	Herb	Leaves	25	Concoctions	Fresh, Drink	Restoring the stamina, increasing breast milk production
Araceae	<i>Acorus calamus</i> L.	AK-2016-AK19	<i>Jariangau</i>	Wild	Herb	Rhizomes, Leaves	9	Concoctions	Boil, Drink	Antipyretic
Arecaeae	<i>Areca cathecu</i> Burm.f.		<i>Pinang</i>	Cultivated	Tree	Fruits, Roots	9	Concoctions	Boil, Drink	Antipyretic, healing of woman reproductive
	<i>Cocos nucifera</i> L.		<i>Karambia</i>	Cultivated	Tree	Exocarp	12	Concoctions	Boil, Drink	Cleansing woman reproductive
	<i>Arenga pinnata</i> Merr.		<i>Anau</i>	Wild	Tree	Roots	9	Concoctions	Boil, Drink	Antipyretic, healing of woman reproductive
Asteraceae	<i>Blumea balsamifera</i> DC.	AK-2016-TT8	<i>Capo</i>	Wild	Shrub	Leaves	6	Single	Boil, Drink	Antipyretic
	<i>Pluchea indica</i> (L.) Less.	AK-2016-TT20	<i>Lontas</i>	Wild	Herb	Leaves	3	Concoctions	Fresh, Drink	Antipyretic
Basellaceae	<i>Anredera cordifolia</i> (Ten.) Steenis		<i>Binahong</i>	Cultivated	Herb	Leaves	6	Concoctions	Boil, Drink	Antipyretic
Caricaceae	<i>Carica papaya</i> L.		<i>Sampelo</i>	Cultivated	Herb	Flowers	18	Concoctions	Boil, Drink	Antipyretic, Cleansing woman reproductive, healing of woman reproductive
Cecropiaceae	<i>Poikilospermum suaveolens</i> (Blume) Merr.	Ak-2016-TT13	<i>Lundang</i>	Wild	Tree	Roots	9	Concoctions	Fresh, Drink	Refreshment of body, Restoring the stamina
Convolvulaceae	<i>Ipomea batatas</i> Poir.		<i>Ubi jala</i>	Cultivated	Herb	Leaves	9	Concoctions	Boil, Drink	Healing of woman reproductive
Clusiaceae	<i>Garcinia mangostana</i> L.		<i>Manggis</i>	Cultivated	Tree	Stems	6	Concoctions	Boil, Drink	Cleansing woman reproductive
Euphorbiaceae	<i>Phyllanthus niruri</i> L.	AK-2016-TT35	<i>Dukuang anak</i>	Wild	Herb	Aerial Part	6	Concoctions	Boil, Drink	Antipyretic
	<i>Sauropus androgynus</i> Merr.		<i>Katu</i>	Cultivated	Shrub	Leaves	6	Single	Boil, Drink	Cleansing woman reproductive
Fabaceae	<i>Erythrina fusca</i> Lour.	Ak-2016-TT225	<i>Cangkang</i>	Wild	Tree	Roots	6	Concoctions	Boil, Drink	Antipyretic
	<i>Parkia speciosa</i> Hassk.		<i>Patai</i>	Cultivated	Tree	Seeds	9	Concoctions	Roasted, Drink	Restoring the stamina
	<i>Tamarindus indica</i> L.		<i>Asam jao</i>	Cultivated	Tree	Fruits	9	Concoctions	Boil, Drink	Restoring the stamina
Gleicheniaceae	<i>Gleichenia linearis</i> (Burm.) Clarke.		<i>Pakih ransam, rasam</i>	Wild	Herb	Leaves	6	Concoctions	Boil, Drink	Cleansing woman reproductive
Lamiaceae	<i>Plectranthus amboinicus</i>		<i>Bangun bangun</i>	Cultivated	Herb	Leaves	6	Concoctions	Boil, Drink	Antipyretic

Commented [J14]: Numbers are not provided for all species

Commented [J15]: 2 species in this family. But not included in fig. 2

	Lour. <i>Coleus atropurpureus</i> Benth.	AK-2016-SD4	<i>Pudiang merah</i>	Wild	Herb	Leaves	3	Concoctions	Fresh	Stop of bleeding
Malvaceae	<i>Hibiscus surattensis</i> L.	AK-2016-TT65	<i>Asam ruso-ruso</i>	Wild	Shrub	Leaves	6	Concoctions	Boil, Bathing	Refreshment of body
Meliaceae	<i>Lansium domesticum</i> Jack.		<i>Duku</i>	Cultivated	Tree	Bark	9	Concoctions	Boil, Drink	Cleansing woman reproductive
	<i>Toona sureni</i> Merr.	AK-2016-TT11	<i>Kayu surian</i>	Wild	Tree	Bark	6	Concoctions	Boil, Pilis	Antipyretic and headache
Menispermiaecae	<i>Cyclea barbata</i> Miers.	AK-2016-TT282	<i>Kalimпанang</i>	Wild	Herb	Roots	9	Concoctions	Boil, Drink	Antipyretic and headache
Musaceae	<i>Musa balbisiana</i> Colla.		<i>Pisang batu</i>	Wild	Herb	Roots, Stem	9	Concoctions	Boil, Drink	Cleansing woman reproductive
	<i>Musa paradisiaca</i> L.		<i>Pisang buai</i>	Cultivated	Herb	Roots	9	Concoctions	Boil, Drink	Cleansing woman reproductive
Myrtaceae	<i>Eugenia malaccensis</i> Reinw. ex Blume		<i>Jambak</i>	Cultivated	Tree	Bark	9	Concoctions	Boil, Bathing	Refreshment of body
Piperaceae	<i>Piper betle</i> L.		<i>Siriah</i>	Cultivated	Herb	Leaves	9	Concoctions	Boil, Drink	Antipyretic
Poaceae	<i>Coix lacryma-jobi</i> L.	AK-2016-GS2	<i>Anjalai, Batiah-batiah</i>	Wild	Herb	Seeds	9	Concoctions	Boil, Drink	Cleansing woman reproductive
	<i>Cymbopogon nardus</i> (L.) Rendle.		<i>Sarai harum</i>	Cultivated	Herb	Pseudostem	9	Concoctions	Boil, Bathing	Refreshment of body
	<i>Cymbopogon citratus</i> Stapf		<i>Sarai</i>	Cultivated	Herb	Stem	9	Concoctions	Roasted, Drink	Restoring the stamina
	<i>Imperata cylindrica</i> (L.) P. Beauv	AK-2016-TT5	<i>Lalang</i>	Wild	Herb	Rhizomes	9	Concoctions	Boil, Drink	Cleansing woman reproductive
	<i>Oryza sativa</i> L.		<i>Padi</i>	Cultivated	Herb	Seeds	9	Concoctions	Fresh, Pilis	Refreshment of body
	<i>Oryza sativa</i> var. glutinosa		<i>Sipuluik</i>	Cultivated	Herb	Seeds	9	Concoctions	Roasted, Drink	Restoring the stamina Increasing breast milk production
Poaceae	<i>Zea mays</i> L.		<i>Jaguang</i>	Cultivated	Herb	Seeds	9	Concoctions	Roasted, Drink	Restoring the stamina, Increasing breast milk production
	<i>Saccharum officinarum</i> L.		<i>Tabu udang</i>	Cultivated	Herb	Stems	9	Concoctions	Boil, Drink	Antipyretic
Rhizophoraceae	<i>Carallia brachiata</i> (Lourr) Merr.	AK-2016-SD8	<i>Maransi</i>	Wild	Tree	Stems	6	Concoctions	Boil, Drink	Restoring the stamina
Rubiaceae	<i>Uncaria gambir</i> (W. Hunter) Roxb.		<i>Gambia</i>	Cultivated	Shrub	Sap	9	Concoctions	Boil, Drink	Antipyretic
Sapindaceae	<i>Schleichera oleosa</i> (Lour.) Oken.	AK-2016-SD12	<i>Kasambi</i>	Wild	Tree	Leaves	9	Concoctions	Boil, Bath	Refreshment of body
Zingiberaceae	<i>Curcuma longa</i> L.		<i>Kunyik bona</i>	Cultivated	Herb	Rhizomes	9	Concoctions	Boil, Drink	Antipyretic
	<i>Zingiber officinale</i> Rosc.		<i>Sipadeh</i>	Cultivated	Herb	Rhizomes	6	Concoctions	Boil, Drink	Antipyretic, Restoring the stamina
	<i>Zingiber purpureum</i> Rosc.		<i>Kunyik bolai</i>	Cultivated	Herb	Rhizomes	9	Concoctions	Fresh, Drink	Antipyretic

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Pregnancy care by ethnic Minangkabau is intended to strengthen the fetus, reduce nausea, increase appetite, increase fetal weight, prevent bleeding, and facilitate delivery. The roasted extract of the *Musa balbisiana* roots with *Saccharum officinarum* L. stem have been used to facilitate delivery, whereas the extract of the *Coleus atropurpureus* Benth. (leaves) and *Cocos nucifera* L. (fruits) have been used to prevent bleeding. The extract of *Coleus atropurpureus* leaves is red, so that have it is believed to have similar function similar to blood. The medicinal plants of the Minang ethnicity for women are used for: stamina enhancing, menstruation treatments, after miscarriage recovery, postpartum hemorrhage, aid postpartum recovery, and infant care. The PCP mothers in the Minangkabau ethnic group believe that they are susceptible to interference by evil spirits, but they are protected by the rhizome *Acorus calamus*. The volatile oil acorenone concentration in *A. calamus* rhizome of which is up to 20.86% (Venskutonis & Dagilyte 2003) produces a distinctive aroma that provides a relaxing effect.

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Some ethnic groups in Indonesia utilize plants that contain essential oils, as traditional medicines such as *Cymbopogon nardus*, *Cymbopogon citratus*, *Curcuma longa*, and *Zingiber officinale*, as traditional medicines. Silalahi and Nisyawati (2019) stated that Batak steam-bathing traditional in North Sumatra uses those plants as the main component which provide a relaxing effect. The essential oils in those plants is are terpene: β -pinene, camphor, bornyl acetate, borneol, linalool, D-limonene, fenchone, terpinen-4-ol and α -terpinene (de Boer et al. 2011). The terpenes also function have the role as antimicrobial and analgesic agents (de Boer et al. 2011).

The medicinal plants recorded in this study were also reported to be used by other ethnic groups. S such as plants include *Cymbopogon citratus* Stapf, *Curcuma longa* L., *Zingiber officinale* Rosc, and *Sauropus androgynus* Merr. Other N new medicinal plants that are also used by mothers of Minangkabau ethnic mothers offer PCP include *Musaceae* (*Musa balbisiana* Colla and *Musa paradisiaca* L.) (*Musaceae*), *Rhizophoraceae* (*Carallia brachiata* (Lour) Merr (*Rhizophoraceae*), and *Meliaceae* (*Lansium domesticum* Jack., and *Toona sureni* Merr. (*Meliaceae*). The roots and pseudostem of *Musa balbisiana* and *Musa paradisiaca* have been used to restore stamina of maternal postpartum, while *Lansium domesticum* and *Toona sureni* have been used to cleanse blood during the puerperium. Further research needs to be done to find out bioactive compounds from these plants. *Oryza sativa* L., *Zea mays* L. and *Ipomea batatas* Poir are plants used as a sources of carbohydrates, but when they are used in the treatment of PCP, the processing method is different. For example, *Zea mays* roasted with pseudostems of *Cymbopogon citratus* pseudostems and seeds of *Parkia speciosa* Hassk. seeds and then brewed with hot water and is used to maintain the stamina of pregnant women.

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The medicinal plants for PCP were prepared predominant mode of administration of herbal preparations through was drinking (35 species), which was followed by bathing (4 species), and applying as a mask paste (3 species). The processing of medicinal plants is done through raw materials (3 species), extracted with water (32 species), and roasted (4 species). The thirty-five species were used for as concoctions, while 7 species were used in as single herb use. Fresh extracts are taken collected from fleshy plant parts, such as *Curcuma longa* and *Zingiber officinale* rhizomes and *Saccharum officinarum* stem. The medicinal plants were prepared by boiling such as the leaves of *Blumea balsamifera* DC, *Anredera cordifolia* (Ten.) Steenis, and *Cocos nucifera* were prepared by boiling and then the boiled water was used as herbal drink. The respondent's reason are of the opinion that to process medicinal plants should be processed before consumption is due to for imparting taste, and better benefits that is better, easier to consumption, and more also for ensuring hygiene. Medicinal plants are also boiled and brewed with other additives such as palm sugar (*Arenca pinnata* Merr), honey, and chicken eggs also are to improve the flavor and increase the efficacy.

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The use of medicinal herbs in the treatment of PCP is believed to be beneficial for antipyretics, cleansing the female reproductive organs, restoring stamina, refreshing the body, healing headaches, increasing breast milk production, and stopping bleeding. The number of species used for each of these purposes is shown in (Figure 3). Some medicinal plants have been used for antipyretics such as are *Zingiber purpureum*, *Curcuma longa*, *Uncaria gambir* (W. Hunter) Roxb., *Piper betle* L., *Cyclea barbata* Mierr, and *Toona sureni*. The utilization of *Toona sureni* as an antipyretic is hitherto not reported considered new and therefore needs further research.

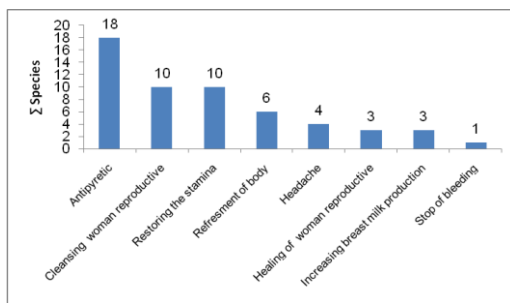


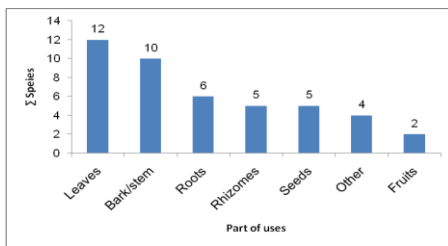
Figure 3. Various bBenefits of medicinal plants in treatment of PCP and species used by Minangkabau ethnic, in West Sumatra, Indonesia.

205 The post-partum maternal bathing method in the Minangkabau ethnic group differs from other ethnic groups such as
 206 the Batak ethnicity (Silalahi & Nisyawati 2019). Postpartum mothers in the Minangkabau ethnic group take water that has
 207 been mixed with freshly sliced medicinal plants for bathing while the Batak ethnic group take a steam bath. The Batak
 208 Karo sub-ethnic used 62 species of medicinal plants, with most of them which belong to *Rutaceae* and *Zingiberaceae*
 209 (Silalahi and Nisyawati 2019). The steam-bathing aims to restore stamina, cleanse the uterus, relaxing, eliminate
 210 headaches, reduce cholesterol and, hypertension (Silalahi & Nisyawati 2019), while the Minangkabau ethnic bath is to
 211 make the body refreshed.

212 One of the goals of using PCP plants during PCP is to increase breast milk production. The plants used are *Sauropus*
 213 *androgynus* Merr and *Plectranthus amboinicus* Lour. And will be discussed further. *Garcinia mangostana* L., *Arenga*
 214 *pinnata* and *Gleichenia linearis* (Burm.) Clarke have been used to clean the female reproductive organs while *Hibiscus*
 215 *surattensis* L., *Gleichenia linearis*, *Eugenia malaccensis* Reinw. ex Blume, *Schleichera oleosa* (Lour.) Oken,
 216 *Cymbopogon nardus* (L.) Rendle and *Curcuma longa* have been used for bathing. The initial period of one month is
 217 considered as Postpartum mothers have a period of 1 month (30 days) of being considered dirty or unhealthy for
 218 postpartum mothers. They are advised to use *Phyllanthus niruri* L., *Gleichenia linearis*, and *Garcinia mangostana* to
 219 cleanse their reproductive system and uterus.

220 Some plants used for antipyretics are: *Zingiber purpureum*, *Curcuma longa*, *Uncaria gambir*, *Piper betle*, *Cyrtia*
 221 *barbata*, and *Toona sureni*. Utilization of *Toona sureni* Merr. as an antipyretic is considered new and therefore needs
 222 further research. Ogbe et al. (2009) stated that the purpose of using medicinal plants after childbirth is to treat bleeding,
 223 contraception, increasing milk, and treat skin diseases. Ogbe et al. (2009) stated, and that *Euphorbia hirta* and *Ocimum*
 224 *gratissimum* were used to increase breast milk by local Africans. Panyaphu et al. (2011) stated opined that plants used in
 225 post-partum also have the role function as antioxidants and antimicrobials.

226 Figure 4 shows the extent of plant parts of plants used as medicinal by Minangkabau ethnic group, which are
 227 Leaves are the predominantly used part (12 species), followed by stems (10 species), roots (6 species), rhizome (5
 228 species) and seeds (5 species). The plants that use leaves (*Cyrtia barbata*, *Piper betle*, *Gleichenia linearis*, *Plectranthus*
 229 *amboinicus*), the stem/bark (*Lansium domesticum*, *Eugenia malaccensis* Reinw. ex Blume, *Carallia brachiata* (Lour.)
 230 Merr.), the roots (*Areca catechu*, *Arenga pinnata* Merr., *Poikilospermum suavolens* (Blume) Merr.), and the seeds (*Cos*
 231 *lacteyma-jobi* L., *Parkia speciosa* Hassk).



233
 234
 235 **Figure 4. Medicinal plant parts of plant used to treat pregnancy, childbirth and post-partum period by Minangkabau ethnic, in the West**
 236 **Sumatra, Indonesia.**

237 **Cultural Significance Index (CSI) of the medicinal plants**

238 The values of cultural significance index (CSI) of medicinal plants to treat pregnancy, childbirth and postpartum
 239 classified as very low (<5), low (6-10), moderate (11-15), and high (> 15)) (Figure 5). Two species, namely *Pluchea*
 240 *indica* (L.) Less and *Coleus atropurpureus* have very low CSI values. More than 88% or 38 species of medicinal plants in
 241 this study have low CSI values, such as: *Graptophyllum pictum* Griff., *Areca catechu*, *Blumea balsamifera* and *Anredera*
 242 *cordifolia* are some species with low CSI values. Medicinal plants; which have low CSI values; are rarely used or have few
 243 resources. The CSI values of medicinal plants are influenced by exclusivity (e) and intensity (I). The values e and i
 244 directly influence the value of CSI. The medicinal plants that have a high CSI values are those that are often frequently
 245 used and easily found in the surrounding environment, such as: In this study, *Amaranthus hybridus* L. and *Carica papaya*
 246 L. have high CSI values. It has been They are cultivated, so that it is and, therefore, easily recognized and used intensively
 247 by the local community. The non-cultivated medicinal plants are rarely used by local people and tend to be forgotten
 248 which has implications for the degradation of local knowledge.

249

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Commented [J22]: Figure 5 shows only one species with high CSI. Check

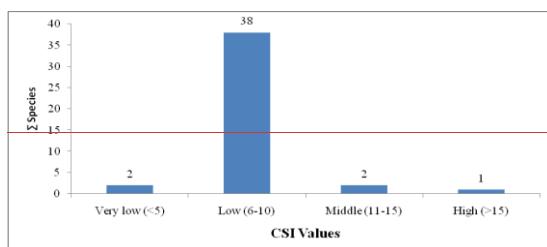


Figure 5. The Cultural Significance Index (CSI) value of the medicinal plants used to treat PCP by Minangkabau ethnic, in the West Sumatra, Indonesia.

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Medicinal plant for increased breast milk production

The problems that are often suffered by postpartum mothers are low milk production, anemia, and being overweight. Adequate milk production is crucial for the growth and development of the baby, therefore post-partum mothers commonly consume vegetables such as: *bangun-bangun* (*Plectranthus amboinicus*) and *katuk* leaves (*Sauropus androgynus*). Both of these plants are believed to increase breast milk production.

Plectranthus amboinicus (Lour.) Spreng

Plectranthus amboinicus have been used to increase breast milk. *P. amboinicus* leaves are cooked much like a vegetable curry by adding spices, among others such as lemongrass (*Cymbopogon citratus*), ginger (*Zingiber officinale*), coriander (*Corium oriandrum*), onion (*Allium cepa*), garlic (*Allium sativum*) and coconut milk (*Cocos nucifera*). These vegetables are consumed by breastfeeding mothers, while breastfeeding and are consumed as often as possible. The use of *P. amboinicus* to increase milk production by the Minangkabau is caused by cultural acculturation with influence of the Batak ethnic group from North Sumatra. The Batak ethnic is an indigenous ethnic group in North Sumatra that is geographically bordered directly with West Sumatra, resulting in acculturation-cultural exchange between ethnic cultures. Ethnic Batak people, especially the Simalungun Batak, use *P. amboinicus* as a main menu for breastfeeding mothers. To improve the taste, *P. amboinicus* leaves are added with additives like chicken meat and spices are employed. Aside from Besides, increasing breast milk, consumption of *P. amboinicus* also increases stamina (Hasibuan 2014). *Plectranthus amboinicus* is generally cultivated in home gardens, so that it is easily accessible by the local community. It is harvested by cutting branches and young shoots, after that new shoots will appear from branches that have been cut.

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Arumugam et al. (2016) stated that the nutrients in the *P. amboinicus* are protein (0.6%), Calcium (0.158%), Potassium (0.138%) and Ferrum (0.262%). The Ferrum in *P. amboinicus* increases blood and prevent anemia in postpartum mothers. The *P. amboinicus* also contains various secondary metabolites such as tannins, saponins, flavonoids, steroid glycosides and polyuronides (Asiimwe et al. 2014; Sathasivam & Elangovan 2011); alkaloids, cardiac glycosides, terpenoids, and flavonoids (Sathasivam & Elangovan 2011). The major phenolic compounds in *P. amboinicus* are rosmarinic acid (6.160 mg/g), and followed by caffeic acid (0.770 mg/g), routine (0.324 mg/g), gallic acid (0.260 mg/g), quercetin (0.15 mg/g), and p-coumaric acid (0.104 mg/g) (Bhatt et al. 2013). The terpenoid essential oils belongs to terpenoids which are mostly contained in leaves and stems of *P. amboinicus* which results in having providing a distinctive aroma. The main essential oil found in *P. amboinicus* leaves were linalool (50,3%), neryl acetate (11,6%), geranyl acetate (11,7%) and carvacrol (14,3%) (Asiimwe et al. 2014). The other compositions of *P. Amboinicus* were β - Myrcene, 4 - Carene, γ -terpinene, β -ocimene, β -cymene, linalool, α -caryophyllene, neryl acetate, geranyl acetate, and nerol carvacrol (Asiimwe et al. 2014). All of the composition made *P. amboinicus*, owing to its rich nutrients and phytochemicals, to be can be potentially developed as food and nutraceuticals source (Bhatt et al. 2013).

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Plectranthus amboinicus has been reported as anti-bacterial (Wadikar & Patki 2016; El-hawary et al. 2013) and have also has antifungal activities (Wadikar & Patki 2016; Manjamalai et al. 2012). The essential oil of *P. amboinicus* leaves inhibited growth of *Klebsiella pneumoniae* (Goncalves et al. 2012), *Staphylococcus aureus* (Manjamalai et al. 2012; Bhatt et al. 2013; Astuti et al. 2012), *Bacillus cereus*, *Escherichia coli*, *Yersinia enterocolitica* (Bhatt et al., 2013), *Bacillus subtilis* (Bhatt & Negi 2012; Astuti et al. 2012), *Klebsiella planticola* (Vanaja & Annadurai 2013), *Pseudomonas aeruginosa* (Manjamalai et al. 2012; Astuti et al. 2012), and *Salmonella thypi* (Astuti et al. 2012).

Sauropus androgynus Merr.

Sauropus androgynus has been long used as a vegetable to increase breast milk production by Minangkabau ethnic and is more familiar than *P. amboinicus*. The *S. androgynus* is cultivated in home garden and easily found in the surrounding environment. The *S. androgynus* branch is dense and the direction of growth is vertical or almost parallel to the main stem and is therefore suitable for use as a live fence. In addition, its flowers and fruit are beautiful, so they are often used as ornamental plants. Young leaves and shoots of *S. androgynus* are boiled to be made into vegetables. This plant has a slightly sweet taste and a simple way of processing, resulting in its this plant to be often frequent used when compared to

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298 *P. amboinicus*. The high demand for *S. androgynus* as a vegetable making it to be a traded plant in the local
299 markets.

300 The Minangkabau ethnic has been long consuming *S. androgynus*, and they have not reported any
301 poisoning caused by it due to its consumption. In Taiwan and Japan, it is used as an slimming and anti-obesity agent of
302 slimming or anti-obesity (Bunawan et al., 2011). In Taiwan (1995) and China (2005), the consumption of *S. androgynus*
303 were has been reported to cause lung dysfunction called bronchiolitis obliterans (Bunawan et al. 2011; Lai et al. 1996; Yu
304 et al. 2006). Bronchiolitis obliterans is characterized by inflammation of the air ways, broccoli fibrotic lesions and
305 narrowing of the lumen (Cottin and Cordier 2013). Xin et al. (2006) reported that giving juice of *S. androgynus* leaves to
306 cells at certain doses resulted in obliteration of the lysosome and golgi apparatus but did not result in chromosomal
307 changes. Although, the method of *S. Androgynus* processing in Minangkabau ethnic is different from Taiwan and China.
308 In Taiwan, *S. androgynus* leaves and young shoots (Lai et al. 1996; Bunawan et al. 2011; Yu et al. 2006) are used as fresh
309 material (Lai et al. 1996; Bunawan et al. 2011; Yu et al. 2006), while the Minangkabau people use after boiling them.
310 Papaverine is an alkaloid compound of alkaloid group which results in bronchiolitis obliterans (Bunawan et al. 2011), and
311 these this compounds is degraded in the presence of heating (Lai et al. 1996). Thus, boiling of *S. androgynus* by
312 Minangkabau ethnic resulted makes it a relatively safe diet.

313 The use of *S. androgynus* in postpartum mothers, in addition to increasing breast milk production, is thought to reduce
314 weight and also increase the number of red blood cells. Yu et al. (2006) stated that *S. androgynus* leaves contain a
315 chemical compounds called is 3-O-β-D-glucosyl-(1→6)-β-D-glucosyl-kaempferol that has anti-obesity properties,
316 which is 3-O-β-D-glucosyl-(1→6)-β-D-glucosyl-kaempferol. Hasimun et al. (2018) stated reported that the results of the
317 study showed that *S. androgynus* leaves leaf extract in experimental mice at doses of 50, 100 and 200 mg/kg could increase
318 the number of red blood cells and reduce the rate of stretching. *Sauropus androgynus* leaves extract at a doseage of 200
319 mg/kg has an anti-anemic and analgesic effects simultaneously.

320 A total of 42 species medicinal plants are used in women's healthcare during pregnancy, childbirth, and postpartum. A
321 total 24 species belonging 8 families, which are Poaceae (7 species), Arecaceae, Fabaceae, Zingiberaceae (3 species
322 respectively), Euphorbiaceae, Meliaceae, Musaceae and Asteraceae (2 species respectively). The medicinal plants to treat
323 PCP by Minangkabau ethnic are also used to overcome menstrual problems, recovery after miscarriage, reduce postpartum
324 bleeding, assist in postpartum recovery, and for use in baby care. The *Plectranthus amboinicus* and *Sauropus androgynus*
325 have the potential to be developed to increase breast milk production and reduce post-partum body weight.

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