Ethnobotany Survey of Medicinal Plants Used for Traditional Maternal Healthcare by Serawai Tribe, Seluma District, Bengkulu - Indonesia

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ABSTRACT
Background and objective: Ethnomedicine plays an important role in the maternal healthcare practice of the Serawai tribe of Seluma district, Bengkulu, however, its use has never been documented. This study, therefore, conducts an ethnobotanical survey to document the medicinal plant used for traditional maternal healthcare in the Serawai tribe.

Materials and Methods: The indigenous knowledge was gathered through interaction and questioners with traditional healers.

Results: The study provide information on 52 species belonging to 33 different families. Most of the reported plants belong to Zingiberaceae (13.5%), Euphorbiaceae, and Poaceae (5.8%). The result of life form analyses showed that herb constituted the highest proportion of medicinal plants (42.3%), followed by the tree (25%), with leaves (50.9%) as the most utilized plant parts for preparation of traditional herbal medicines. Approximately 80% of plant material are found in the surrounding village, with herbal remedies mostly prepared in the form of decoction (57.7%) and orally administered. However, among the 16 categories of diseases a total of 8 species were affected by excessive bleeding.

Conclusion: The result showed that medicinal plants had played significant roles in the management of maternal healthcare. The constraints associated with the use of this medical treatment process, is the poor interest of the younger generation in carrying out this tradition. This, has therefore, lead to a significant threat to medicinal plants. It is, therefore, necessary to preserve the indigenous knowledge on traditional medicine by proper documentation, identification of plant species used, and herbal preparation for future usage.

Key words: Ethnobotany–Maternal health–Medicinal plants–Serawai tribe–Indonesia

1 INTRODUCTION:
Over 60% of the world’s population, still recognize traditional medicine as the preferred primary healthcare system, approximately 80% of developing countries directly depend on medicinal plants for health related purposes [1]. In Indonesia, ethnomedicine has been practiced for a millennium, with significant contributions added over the years by indigenous healers that used medicinal plant , however, it is currently used by Primary Health Care (PHC) at the community level [2].

Indonesia has a large biodiversity of plants with approximately 30,000-50,000 different species, however, only 7500 species are used as drug ingredient (LIPI 2015). The use of medicinal plants has been discovered to be used in the treatment of several diseases and health conditions, including maternal disorders, which is considered an important public and social health problem [2]. Subsequently, the rate of maternal mortality in Indonesia is 228 per 100,000 birth , and this is considerably higher when compared to India (62) and Netherlands (6) [3]. This unprecedented figure tends not to
be disassociated from the fact that most Indonesian women employ the services of Traditional Birth Attendants (TBSs) and Traditional Healers (THs). The local healers and traditional birth attendants are referred to as “dukun” and “dukun bayi” in the local Indonesian language [4]. Dukun and dukun bayi continue to play an important role in maternal healthcare, particularly in rural areas. In the Serawai tribe in Seluma district, Bengkulu, these healers are perceived as an alternative to community healthcare center [5].

Generally, the knowledge of ethnomedicine is orally transmitted by individuals, families, or the community from one generation to the next [6], and most of these teachings have not been formally documented [7]. However, in recent years, there has been a continuous decline in traditional medical practices because the younger generation shows little interest. Therefore, this study aims to document plants traditionally used for the treatment of maternal disorders by the Serawai tribe of Seluma district, Bengkulu, Indonesia.

2 MATERIALS AND METHODS:

Description of the study area

This study was conducted in Seluma district, Bengkulu, which lies at a latitude of 4°06’23” Southwards and longitude of 102°36’18” Eastwards. It is located 78.4 km from Bengkulu city and covers an area of 2,400.44 km². The average temperature is 24°C, with a mean annual rainfall of 225 mm [8]. Furthermore, a census survey conducted in 2010 showed that the Talo district had a total population of 10,591. The inhabitants are mostly indigenous, and the majority are Muslims in possession of their script, known as “Surat Ulu” [9]. In addition, their economy is predominantly dependent on agriculture, mainly coffee and clove plantation.

Furthermore, rural areas were selected due to poor infrastructure in the urban region. They also suffer high levels of poverty due to a lack of appropriate income [10]. These factors urge people to indulge in traditional medicine for maternal healthcare and tend to preserve their indigenous knowledge.

Ethnobotanical data collection

Ethnobotanical data were collected by interviewing a total of 35 respondents on the indigenous knowledge of medicinal plants used for maternal healthcare, with proper documentation on the harvested products. These respondents consisting of 15 males and 20 females, were selected using the purposive sampling method [11]. The respondents were well-known in the community due to their long practice in providing services related to traditional maternal healthcare. They consist of conventional healers between 19 to 68 years while the rest were elders who had acquired knowledge on the medicinal importance of plant from parents and relatives that used it in the past.

Furthermore, both informal and formal conversations, discussion, and semi-structured interview, as well as visits to the field, were conducted. A series of individual interviews were carried out to acquire information concerning name, age, sex, level of education, and occupation. Additionally, respondents were interviewed on the local names of medicinal plants, use, type of management (wild/cultivated), and maternal health conditions. They were also asked whether a combination of individual species of plants is used to treat any particular disease, the preparation method and routes of administration. Semi-structured questionnaires were also used to collect data on life form from tree, shrub, herb, climbers, and traditional conservation practices of the reported medicinal plant. All the semi-structured reviews were supported by an independent visit to the field, which offered opportunities for more discussions with the respondents and practical identification of traditionally used medicinal plant in their natural environment. However, plant samples were collected, while interview and discussion were conducted in local language.

3 RESULT AND DISCUSSION:

Diversity of medicinal plant species

The different types of plant species used by the traditional healers are shown in Table 1 with the families, scientific and local name arranged in alphabetical order. In addition, the botanical and local name, families, part used method of preparation, administration route, and ailments treated are stated for each species. Table 1

The present study shows that the rural people are properly versed in nature and the natural resources in their environment. These people in a bid to get rid of various maternal conditions...
healthcare problem such as menstrual problems, conception or excessive bleeding, etc. depend on plant product. It was also discovered that approximately 52 species of plants have been used by the local communities to treat various illnesses associated with maternal health care.

A total of 52 medicinal plant species belonging to 45 genera and 33 families were used by the local communities to treat various illnesses associated with maternal health care in the Serawai tribe. Zingiberaceae (7 species), Euphorbiaceae, and Poaceae (3 species), while most of the families (32) are represented by two or one species, as shown in Figure 2. According to Ramana 2008, scientific studies conducted on the families of these plant provide insights into their rich phytoconstituents and pharmacological actions of the active compounds they possess [12]. The dominance of these families is mainly due to some special properties, such as secondary metabolites. This illustration was observed with some differences discovered in other ethnomedicinal surveys conducted in other regions of the country [13, 14] or worldwide [15].

The life form of medicinal plants which treat maternal illness

The life form analysis of medicinal plants showed that herb constitute the highest proportion as shown by 22 species (42.3%), however trees were represented by 13 species (25%), while shrubs were depicted by 10 species (19.2%) and climbers were showed by 6 species (11.5%). Figure 3

However, tuber, bark, seed, flower, sap, and the entire plant constitute the remaining 1 species (1.9%) Figure 4. The preference for leaves was because of its easy availability, harvesting, and simplicity in remedy preparation. In addition, they are the center of photochemical reactions, this causes it to be rich in metabolites. Furthermore, it accumulate alkaloids, tannins, and inulins, which are the active components of most herbal preparation [18]. Conversely, similar researches stated that it is a major dominant plant part in Indonesia [19, 20] or worldwide [21–23] for herbal medicine preparation.

Route of administration of medicinal plants used for traditional maternal health care in Serawai tribe, Bengkulu

The route of administration of these plants is also documented in Figure 5. The most common mode of administration is by drinking. However, the least mode of administration is by eating, with majority administered by drinking (57.7%) decoction and juice. These plants are often administered through the dermal (26.9%), which includes rubbing, topical application on the affected area, and traditional bath wash [24].

Figure 3. The life form of medicinal plants used for traditional maternal health care in the Serawai tribe, Bengkulu.

Figure 4. Plant parts used for traditional maternal healthcare in the Serawai tribe, Bengkulu.
(11.5%). This is congruent with an ethnobotanical survey conducted in East Kalimantan [25] and Edo State, Nigeria [26]. The previous studies stated that the oral intake of decoction was the most common route of administration for the medicinal plant. This involves boiling plant materials for a certain amount of time to soften it and extract its active compound [14]. The predominance of oral administration tends to be explained by a high incidence of internal ailments in the region [27]. On the contrary, it is assumed that the patients mostly accept the oral route.

Most of the plant species are exclusively used for treating diseases, while some are combined to form mixtures, such as Aloe vera, Citrus hystrix, Cymbopogon citratus, Grapto philum pictum, Luffa acutangula, Musa paradisiaca, and Zingiber officinale because they constitute essential ingredients and they are sometimes used as substitute for others with similar medical properties Table 1. Its uses are broadly classified to enhance fertility in female and excessive bleeding.

| Disease | Plants Used | Route | Total Plants |
|---------|-------------|-------|--------------|
| Menstrual | 12 | Drinking | 14 |
| Ovarian | 3 | Catarrax | 5 |
| Dysmenorrhea | 2 | Eating | 2 |
| Postpartum | 5 | Bathing | 6 |

Figure 5. Route of administration of plants used for traditional maternal health care Serawai tribe, Bengkulu

Maternal health ailments treated by traditional medicinal plants

The traditional healers identified 16 maternal diseases in the study area Table 1. The highest number of plants were used to treat excessive bleeding (8 plants), boosting stamina after giving birth (7 plants), enhance fertility in female (5 plants), breast milk enhancement, breast cancer and reduce leucorhea (3 plants each), 2 plants each were used for the treatment of all sort of ovary problem, clearing of uterus affection (3 plants each). 2 plants each were used for the treatment of all sort of ovary problem, clearing of uterus affection, breast milk enhancement, breast cancer and reduce leucorhea (3 plants each). 2 plants each were used for the treatment of all sort of ovary problem, clearing of uterus affection (3 plants each).

However, most of the maternal plant species documented are used to treat bleeding. Bleeding is also one of the commonest condition treated with medicinal plants for women in other countries, such as Pakistan [28] and Namibia [29].

The plant materials are sometimes used independently or combined with other parts of the plant. Furthermore, some of the plants were used in the treatment of more than one disease, for example, Curcuma longa L. were used to treat four illnesses. Curcuma alba L. and Drymoglossum piloselloides (L.) C. Presl was each used for the treatment of three diseases. Additionally, similar studies were reported from different part of Indonesia [14, 30] or Worldwide.

4 CONCLUSION:

In conclusion, traditional medicine remains the primary healthcare system in the Serawai tribe, Bengkulu. Many plant species are used for maternal healthcare. Unfortunately, the practice of medicinal plants by the Serawai tribe is still not adequately documented. There was severe depletion of conventional medicine knowledge among the indigenous of the study area due to the disinterest of the younger generation. However, it is important to conserve this knowledge by scientifically evaluating the biological activities of the medicinal plants. It is also essential to encourage the inhabitants of the study area to practice the cultivation of these plants because it was reported that they are collected from their surroundings.

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| No | Family             | Scientific name                  | Local name | Habit/ domestication | Part used/Preparation                                                                 | Condition managed                                                        |
|----|--------------------|----------------------------------|------------|----------------------|---------------------------------------------------------------------------------------|-------------------------------------------------------------------------|
| 1  | Acanthaceae        | Grewia villosa (L.) Griff.        | Puding abang | Shrub/cultivated     | Mix the leaves with palm sugar, rhizome of ginger and boil with 5 glasses of water. It is taken orally | Excessive bleeding after child birth                                    |
| 2  | Alliaceae.         | Allium cepa L.                   | Bawang abang | Herb/cultivated      | Pound the fresh part of the bulb, add some water and apply on the vagina 2-4 balls consumed directly | For the treatment of all sorts of ovary problems, Ease labor            |
| 3  | Amaranthaceae      | Celosia argentea L.              | Bungo abang | Herb/cultivated      | Stem is boiled in water and taken orally. Leaves is boiled in water and taken orally | Cleans the uterus after child birth                                   |
| 4  | Annonaceae         | Annona muricata L.               | Srikayo     | Herb/cultivated      | Leaves is boiled in water and taken orally                                           | Breast cancer, relieves menstrual cramps                                |
| 5  | Apocynaceae        | Alstonia scholaris (L.) R.Br.    | Pulsai      | Tree/wild            | Leaves is boiled in one glass of water, and taken while still warm                  | Clean uterus and excessive uterine bleeding after child birth.          |
| 6  | Arecaeae           | Areca catechu L.                 | Pinaing     | Tree/wild            | Seed is crush and boiled in water. It is used for bathing after child birth          | Gives stamina                                                           |
| 7  | Aralesae           | Nathapanax Scutellarium Merr.    | Mangkoban   | Shrub/cultivated     | Grind the leaves, add some water and take it orally                                  | Excessive uterine bleeding after childbirth                             |
| 8  | Araucariaceae      | Agathis alba (Lam.) Fox.         | Damar       | Tree/wild            | Sap of the wood is burnt and applied on the vagina                                   | Reduces leukorrhoea                                                     |
| 9  | Asparagaceae       | Cordylina fruticosa (L.) A. Chev.| Juang       | Shrub/cultivated     | The root is boiled in water and taken orally                                          | Prevents abortion                                                       |
| 10 | Asphodelaceae      | Aloe vera (L.) Burm. F.          | Lisah buya  | Herb/cultivated      | Pound the leaves and mix with the tip of 100 mg of a young stem of Mada perstans and add ten leaves of Cytisus barbatus. It is applied to the stomach for 3 days | Enhances fertility in females                                           |
| 11 | Asteraceae         | Ageratum conyzoides L.           | Bonodutan   | Herb/Wild            | The fresh part of the leaves is pounded and applied on the vagina                    | Excessive uterine bleeding after childbirth                              |
| 12 | Caricaceae         | Carica papaya L.                 | Sensailo    | Tree/cultivated      | Leaves is boiled in water and taken orally                                            | Gives stamina                                                           |
| 13 | Cucurbitaceae      | Benincasa hispida (Thunb.) Cogn.| Daun kundur | Liana/cultivated     | Squeeze the leaves and add some water. Rubbed on the chest                           | Breast milk enhancement                                                 |
|    |                    |                                  |             |                      |                                                                                        |                                                                         |
|    |                    | Luffa acutangula (L.) Roxb.      | Timpui      | Liana/cultivated     | Leaves are pounded and mixed with leaves of Jatropha curcasia. Rubbed on the stomach | Enhances fertility in female                                             |
| 14 | Dryopteridaceae    | Polystichum setiferum (Forsk.)   | Paku temping | Shrub/Wild           | Leaves are boiled in water and taken orally                                           | Gives stamina                                                           |
| 15 | Euphorbiaceae      | Mabuhot swirlitum Craitz         | Bekayu      | Shrub/cultivated     | The tuber is boiled, fermented and taken orally                                         | Irregularities in the menstrual cycle                                  |
|    |                    |                                  |             |                      |                                                                                        | Reduces Leucorrhoeas                                                    |
| 16 | Fabaceae           | Canna alata L.                   | Gelinggang  | Tree/cultivated      | Young leaves are cooked and taken orally                                             | Breast milk enhancement                                                 |
| 17 | Iridaceae          | Eleutherine palmifolia (L.) Merr.| Bawang ubang | Herb/cultivated     | Leaves are boiled on fire until withered and applied on the vagina                    | Excessive uterine bleeding after childbirth                             |
| 18 | Lamiaeae           | Vitis vinifera (L.)              | Leban       | Tree/wild            | The flower is ground and taken orally                                                | Enhances fertility in female                                             |
|    |                    |                                  |             |                      |                                                                                        | Ovarian cysts                                                          |
|    |                    | Osmium tenuiflorum L.            | Rukiku      | Herb/cultivated      | The root is cut into small pieces and mixed with roots of Condurcanatrophy, Sascharnum officinale, and red Celosia argentea. Add some water and boil in young bamboo. It is taken orally | Excessive uterine bleeding after childbirth                             |

Table 1. Different types of plant species used for traditional maternal health care in the Serawai tribe, Bengkulu
| Family          | Species                                      | Common Name | Type          | Description                                                                                           | Uses                                                                 |
|-----------------|----------------------------------------------|-------------|---------------|-------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|
| Moraceae        | Artocarpus heterophyllus Lam.                | Nangka     | Tree/cultivated | Grind the leaves, add some lime belut, and rub on the edge of the umbilical cord                       | Removal of the infants’ umbilical cord                                |
|                 | Pichus septicum Burm. F.                    | Awar-awar   | Tree/wild     | The root is cut off and soaked in bottled water for a night. It is taken orally                        | Enhances fertility in female                                         |
| Moringaceae     | Moringa oleifera Lam.                       | Daun kelor  | Tree/cultivated | Leaves are pounded and applied to the affected area                                                   | For the treatment of all kinds of ovarian problems                    |
|                 |                                              |             |               |                                                                                                       | Enhances fertility in female                                         |
| Musaceae        | Musa paradisiaca L.                          | Pisang kepok| Herb/cultivated | Grind the tip of the young stem, mix with leaves of Abo vera and Cycles barbara. It is usually rubbed on the stomach | Promotes conception                                                  |
|                 |                                              |             |               |                                                                                                       |                                                                      |
| Nepenthaceae    | Nepenthes kuchingensis Kurata               | Karbothan   | Lima/wild     | The whole plant is boiled in water and taken orally                                                  | Breast milk enhancement                                               |
|                 |                                              |             |               |                                                                                                       | Relieves menstrual cramps                                            |
|                 |                                              |             |               |                                                                                                       |                                                                      |
| Oleaceae        | Jasminum sambac (L.) Aiton                  | Melati     | Shrub/cultivated | Flower is boiled in water and taken orally                                                           | Breast cancer                                                        |
|                 |                                              |             |               |                                                                                                       |                                                                      |
| Ophioglossaceae | Heimanthostachys seyalancia (L.) Hook       | Jajalakan   | Herb/cultivated | Leaves are boiled in water and taken orally                                                           |                                                                      |
|                 |                                              |             |               |                                                                                                       |                                                                      |
| Orchidaceae     | Cymbidium singularum Lindl.                 | Simbee bush | Herb/cultivated | Leaves are boiled in water and taken orally                                                           |                                                                      |
|                 |                                              |             |               |                                                                                                       |                                                                      |
| Pandanaceae     | Pandanus amaryllifolia Rootb.               | Pandam     | Herb/cultivated | Boil the leaves and add cold water. It is used for bathing after childbirth                           |                                                                      |
|                 |                                              |             |               |                                                                                                       | Gives stamina                                                        |
|                 |                                              |             |               |                                                                                                       |                                                                      |
| Piperaceae      | Piper betle L.                              | Sighas     | Lima/cultivated | Leaves are boiled in water and taken orally                                                           |                                                                      |
|                 |                                              |             |               |                                                                                                       |                                                                      |
|                 | Piper nigrum L.                             | Saang      | Lima/cultivated | Boil the leaves and add cold water. It is used for bathing after childbirth                           |                                                                      |
|                 |                                              |             |               |                                                                                                       |                                                                      |
| Poaceae         | Cymbopogon citratus (DC.) Stapf.            | Seghai     | Herb/cultivated | Mix the stem with 3 leaves of Citrus hystrix, Alpinia galanga, rhizome of Curcuma longa, and boil    |                                                                      |
|                 |                                              |             |               |                                                                                                       |                                                                      |
|                 |                                              |             |               | Add cold water, used for bathing after childbirth                                                    |                                                                      |
|                 |                                              |             |               |                                                                                                       |                                                                      |
|                 | Imperata cylindrica (L.) Beauv.              | Lalak      | Herb/wild     | The root is boiled in water and taken orally                                                          |                                                                      |
|                 |                                              |             |               |                                                                                                       |                                                                      |
|                 | Saccharum officinarum L.                    | Tebu       | Shrub/cultivated | The stem is squeezed and taken orally                                                                 |                                                                      |
|                 |                                              |             |               |                                                                                                       |                                                                      |
|                 | Drynaria zingiberis (L.) C.Presl.           | Siuk naga  | Lima/wild     | Leaves are boiled in water and taken orally                                                           |                                                                      |
| Polypodiaceae   |                                              |             |               |                                                                                                       |                                                                      |
| Rubiaceae       | Morinda citrifolia L.                       | Mengkudu   | Shrub/cultivated | Bark is boiled in water and taken, while the fruit is shredded and rubbed on the cheese               |                                                                      |
|                 |                                              |             |               |                                                                                                       |                                                                      |
| Rutaceae        | Citrus aurantiifolia (Christm.) Swingle      | Limau      | Tree/cultivated | The fruit is squeezed and taken                                                                       |                                                                      |
|                 |                                              |             |               |                                                                                                       |                                                                      |
|                 |                                              |             | Tree/cultivated | Leaves are boiled together with the leaves of C. longa, A. Galanga, and the stem of C. Citrus. Coldwater is added and used for bathing after childbirth. Fruits are consumed directly |                                                                      |
|                 |                                              |             |               |                                                                                                       |                                                                      |
| Solanaceae      | Solanum torvum Sm.                          | Terej pippit| Shrub/cultivated |                                                                                                       | Breast cancer                                                        |
|                 |                                              |             |               |                                                                                                       |                                                                      |
| Zingiberaceae   | Alpinia galanga (L.) Wild.                  | Lengkuas   | Herb/cultivated | Young rhizome is chewed and then sprayed on the affected area                                         |                                                                      |
|                 |                                              |             |               |                                                                                                       | Relieves menstrual pain                                               |
|                 | Alpinia malaconensis (Burm.f.) Rootes       | Puar laka  | Herb/wild     | Leaves are boiled in water and taken orally                                                           |                                                                      |
|                 |                                              |             |               |                                                                                                       |                                                                      |
|                 | Curcuma alba L.                             | Kumsit putik | Herb/cultivated | Found rhizome, add some water and take orally                                                       |                                                                      |
|                 |                                              |             |               |                                                                                                       |                                                                      |
|                 | Curcuma aromatica Zipp.                     | Temu blobo | Herb/cultivated | Rhizome is shredded, squeezed, and taken orally                                                       |                                                                      |
|                 |                                              |             |               |                                                                                                       |                                                                      |
|                 | Curcuma longa L.                            | Kumsit lembing | Herb/cultivated | Found rhizome, add some water and take orally                                                         |                                                                      |
|                 |                                              |             |               |                                                                                                       |                                                                      |
|                 | Kaempferia galanga L.                       | Tekur      | Herb/cultivated | Sliced and squeeze the rhizomes and add some water. It is taken orally                               |                                                                      |
|                 |                                              |             |               |                                                                                                       | Breast milk enhancement                                               |
| *Zingiber officinale Roscoe* | *Beghas podi* | *Herb/cultivated* | Boil the leaves in with a mixture of *Piper nigrum* and *Syzygium aromaticum* leaves, add some cold water. It is used for bathing after childbirth. | *Gives stamina* |