BIODIVERSITAS
Volume 25, Number 2, February 2024
Pages: 465-473

ISSN: 1412-033X
E-ISSN: 2085-4722
DOI: 10.13057/biodiv/d250204

Short Communication: Utilization of wild plants in medicinal foods for maternal postpartum recovery among the *Kasepuhan* in rural West Java, Indonesia

MULYANTO[1,4,♥], RIMBO GUNAWAN[1], SAIFULLAH ZAKARIA[1], JOHAN ISKANDAR[2], ATIEK ROSTIKA NOVIYANTI[3], BUDIWATI SUPANGKAT ISKANDAR[1,5]

[1]Department of Anthropology, Faculty of Social and Political Sciences, Universitas Padjadjaran. Jl. Raya Ir. Soekarno Km 21 Sumedang 45363, West Java, Indonesia. Tel./Fax.: +62-227-796416, ♥email: dede.mulyanto@unpad.ac.id

[2]Department of Biology, Faculty of Mathematics and Natural Sciences, Universitas Padjadjaran. Jl. Raya Ir. Soekarno Km 21 Sumedang 45363, West Java, Indonesia

[3]Department of Chemistry, Faculty of Mathematics and Natural Sciences, Universitas Padjadjaran. Jl. Raya Ir. Soekarno Km 21 Sumedang 45363, West Java, Indonesia

[4]Center for Local Culture, Community, and Environment Studies, Universitas Padjadjaran. Jl. Raya Ir. Soekarno Km 21 Sumedang 45363, West Java, Indonesia

[5]Center for Gender and Child Studies, Universitas Padjadjaran. Jl. Raya Ir. Soekarno Km 21 Sumedang 45363, West Java, Indonesia

Manuscript received: 6 January 2024. Revision accepted: 7 February 2024.

Abstract. *Mulyanto, Gunawan R, Zakaria S, Iskandar J, Noviyanti AR, Iskandar BS. 2024. Short Communication: Utilization of wild plants in medicinal foods for maternal postpartum recovery among the* Kasepuhan *in rural West Java, Indonesia. Biodiversitas 25: 465-473.* Puerperium is a critical phase. Barriers to access and resource constraints often hinder Indigenous and local communities, resulting in frequently relying on traditional forms of postpartum care, including the utilization of wild plants from surrounding areas. Snowball sampling was utilized to recognize informants who were considered specialists in perinatal care and medicinal foods for maternal postpartum recovery. In-depth and semi-structured interviews were undertaken to gather ethnobotanical data on medicinal foods specially made for maternal postpartum recovery and the utilization of wild plants in their preparation and other therapeutic applications. Collected information included medicinal foods, vernacular names of the plants, plant cultivation status, utilized parts, preparation, and method of administration. Descriptive data was analyzed using ethnobotanical indices. Six different medicinal foods, traditionally consumed by mothers to aid postpartum recovery, were identified. A total of 83 species belonging to 34 families were utilized for respective applications. Out of these 83 species, 41 (49.4%) were classified as wild plants. *Arenga pinnata* (Wurmb) Merr., *Blumea balsamifera* (L.) DC., *Chloranthus erectus* (Buch.-Ham.) Sweet, *Coleus scutellarioides* (L.) Benth., and *Parkia timoriana* (DC.) Merr. are wild plants with the highest CVI, and are also used to treat fevers in the study area. Investigations have reported that the bioactive components of these wild plants possess potent analgesic, antioxidant, anti-nociceptive, anti-inflammatory, anti-microbial, and gastroprotective properties. It can be concluded that wild plants hold a significant place in the local knowledge system related to maternal postpartum recovery and other therapeutic uses. Additionally, the practices and acquisition of knowledge for medicinal food preparation are traditionally considered the domain of females.

Keywords: Ethnomedicine, medicinal food, postpartum care, Sundanese ethnobotany, uncultivated plant

INTRODUCTION

The postpartum, also known as the puerperium, is a period that begins after placenta expulsion and extends till the full physiological restoration of sundry organ systems. The days and weeks since confinement, during which the reproductive organs get back to the non-pregnant state, are a critical phase due to the associated risk of complications (Zahra et al. 2022). Therefore, postpartum care plays a pivotal role in ensuring the well-being and survival of mothers and newborns. In many societies, this transitional phase is widely recognized as a vulnerable time that is managed with certain cultural practices (Dennis et al. 2007; Eberhard-Gran et al. 2010; Fantaye et al. 2019; Wang et al. 2019; Puddister et al. 2020; Siregar et al. 2021; Kaya 2023).

Indigenous or local communities, particularly in developing countries, frequently depend on traditional forms of postpartum care established in social and cultural traditions due to barriers to accessing modern healthcare and resource constraints (Ali-Shtayeh et al. 2015; Bazzano et al. 2020; Lunkenheimer et al. 2021; Martin and Gurven 2022). Medicinal plants, in particular, have been used discreetly in various ethnic and rural communities around the world to facilitate recovery due to preferable cultural plausibility, conformity with the human body, and fewer side effects (Collins et al. 2016; Goyal 2017; Tripathi 2019). Furthermore, the most commonly reported postpartum plants are also known for their anti-microbial, anti-inflammatory, immunological, and neurophysiological activities, with low toxicity (Goyal 2017; Rohidas and Shaikh 2022; Sibeko et al. 2023).

Most ethnobotanical studies related to postpartum recovery primarily focus on the use of cultivated plants, often overlooking their wild counterparts (Bazzano et al. 2020; Kumawat et al. 2021; Ramulondi et al. 2021; Ridzuan et al. 2021; Sibeko et al. 2021; Magtalas et al.

2023). However, many societies incorporate wild plants into their diets for nutritional and medicinal purposes (Esakkimuthu et al. 2018; Luo et al. 2019; Yang et al. 2020; de Medeiros et al. 2021; Jigme and Yangchen 2023; Mukaila et al. 2023; Yao et al. 2023). Wild plants, which grow and reproduce naturally without cultivation, are commonly found in forests, agroforests, fallow or uncultivated lands, riverbanks, roadsides, and even as weeds on farmland, are often used as natural food-medicine (Bhatia et al. 2018; Duguma 2020; de Medeiros et al. 2021; Motti 2022). Investigations show that the multidimensional overlap between various uses of plants can be challenging to distinguish. While some plants are used exclusively as food or medicine, others serve both purposes, occasionally with the same organ parts and modes of application. These categories of applications need to be viewed as a continuum concept holding significant importance in indigenous and traditional communities (Jiang and Quave 2013; Jennings et al. 2015).

The *Kasepuhan* people, a Sundanese-speaking community located in the western part of Java Island, is a community that still adheres to practical Sundanese cultural traditions. Studies have shown that the *Kasepuhan* faces significant challenges. Rapid infrastructure development in recent years has increased the flow of goods and people to and from their traditional areas in the southern valley of Mount Halimun. Through tourism and markets, the *Kasepuhan* people's contact with the modern world will intensify, which can pressure their cultural resilience (Iskandar et al. 2018). The *Kasepuhan* ethnomedicinal repertoire typically involves the use of wild and cultivated plants, often combined with dried porcupine digestion, for postnatal maternal recovery. However, since 2018, hunting and trading Javan porcupine have been prohibited by Indonesian law and perpetrators can be sentenced to up to five years. This new regulation has impacted the practice of making porcupine digest-based medicinal foods, which has also become an illegal practice. At the same time, governmental efforts to modernize perinatal health services are also being intensified by sending midwives with modern medical education backgrounds to traditional communities. In this context, this study aims to collect ethnobotanical information about medicinal foods specifically for the maternal postpartum recovery of postpartum mothers, including the use of wild plants in the preparation process and other therapeutic applications, before the local knowledge fades due to the modernization of perinatal health services and ongoing illegalization.

MATERIALS AND METHODS

Study area

This study was undertaken in two hamlets, viz. Cimapag and Ciptagelar (106°26’52.8’’-106°32’49.2’’ E and 6°44’31.2-6°50’27.6’’ S), are located 14 km apart in the southern valley of Mount Halimun, approximately 170 km south of Jakarta, the capital of Indonesia, and 200 km west of provincial capital of Bandung City, in the District of Sukabumi, West Java Province, Indonesia. In 2012, the administrative village where these two hamlets are located was officially designated as a traditional village by the district government due to the preserved old customs. The two hamlets are located at altitudes of 1200 m and 610 m above sea level, inhabited by around 5900 and 5600 people, with a population density of 165 and 115 people per km^2, respectively. Both hamlets are adjacent to forests that form part of the Halimun-Salak National Park (Figure 1).

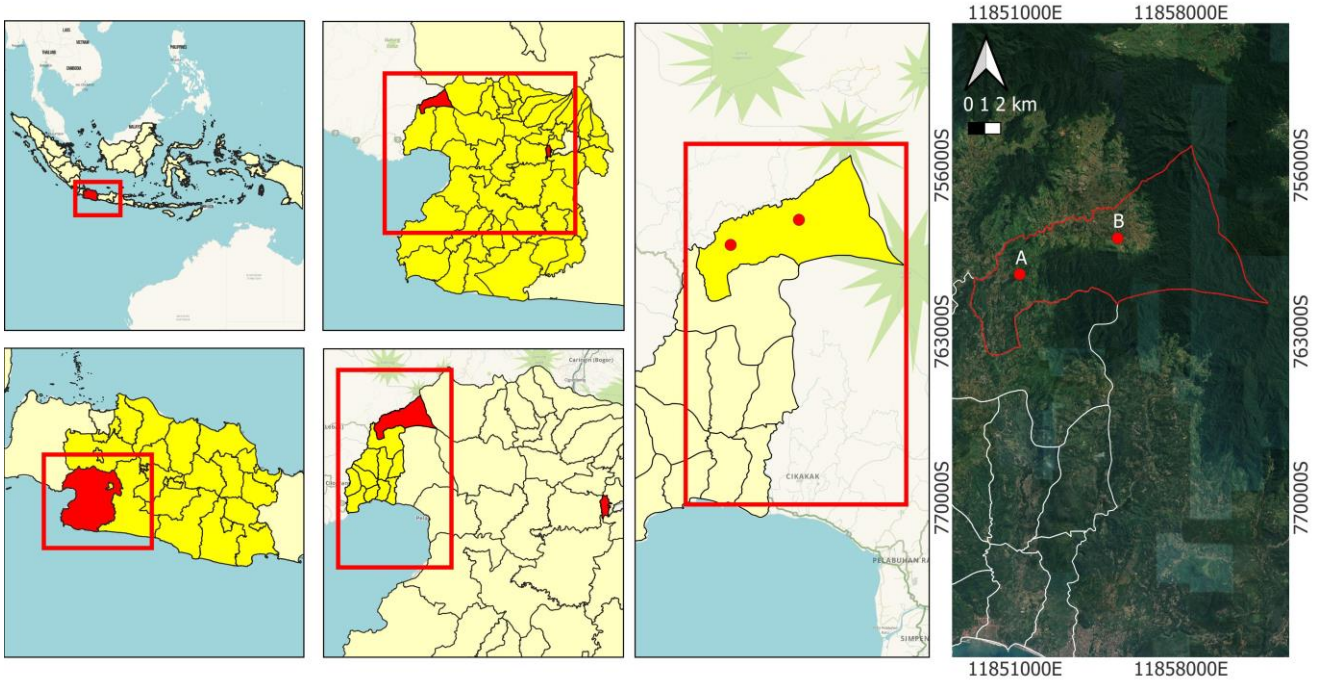

Figure 1. The map of the study area in A. Cimapag and B. Ciptagelar, of Sirnaresmi Village, Cisolok Sub-district, Sukabumi District, West Java Province, Indonesia

Data collection and plant identification

Data were collected through semi-structured interviews to document information related to medicinal food recipes and the wild plants used in these recipes. Considering that knowledge about the perinatal period, particularly postpartum recovery, is a culturally specific domain, specialists were identified by the local inhabitants as the custodians of this knowledge during a reconnaissance survey. A total of 26 local specialists, females aged 25-70, were interviewed using the Sundanese language. These informants included traditional midwives and their apprentices, who were considered the bearers of cultural heritage.

All species and plant parts utilized in the preparation of six different medicinal foods mentioned by the informants were comprehensively recorded. Furthermore, details on their collection and processing methods, along with medicinal properties, were recorded. Specimens of the plants were obtained in the form of vouchers and labeled with the reported vernacular names to verify botanical scientific nomenclature through cross-checking in the field. Subsequently, authentication was sought from taxonomists and biosystematicists at the Department of Biology, Universitas Padjadjaran, Indonesia.

The origin and phytogeographical distribution of each species were investigated to determine whether they are native or exotic to Java Island, consulting Plants of the World Online (https://powo.science.kew.org/).

Ethnographic data were gathered by means of in-depth interviews with traditional midwives (*indung beurang*), apprentices, and mothers during the postpartum recovery period. Additionally, eight male elders of the community and traditional healers were also interviewed to obtain information about other therapeutic applications of non-cultivated plants used in medicinal foods, and the ritual aspects and beliefs associated with the postpartum period and wild plants. This increased the total number of informants to 34, including 26 midwives and their apprentices from the initial survey.

Data analysis

Quantitative data were organized and analyzed using ethnobotanical indices. In order to assess the most highly valued plants, the Cultural Value Index (CVI) (Reyes-García et al. 2006) was calculated according to the following formula:

$$CVI = \frac{NUe}{NC} x \frac{FCe}{N} x \frac{URui}{N}$$

Where:

NUe represents the number of different utilization denounced for the ethnospecies.

NC signifies the total number of utilization categories considered in the study.

FCe is the relative frequency of citation of the ethnospecies, or the number of informants mentioning an ethnospecies as beneficial, divided by the total number of informants (N). Lastly, URui denotes the sum of the entire use reports across all utilization categories for an ethnospecies divided by N.

To assess the similarity or overlap of species used in the two explored villages, the Sørensen Similarity Coefficient (SC) was used. This coefficient determined the common species existing in the two evaluated areas and the degree of similarity in plant composition. The evaluation results ranged between zero and one, with the SC formula written as follows:

$$SC \frac{2c}{a + b + 2c}$$

Where:

a : the sum of ethnospecies mentioned by informants only in hamlet A

b : the sum of ethnospecies mentioned by informants only in hamlet B

c : the sum of ethnospecies stated by informants in both hamlets A and B

In order to assess the use reports of wild plants utilized to make medicinal foods for maternal postpartum recovery that also have other medicinal uses, data were calculated based on the use value index and fidelity level. The use value (UV), indicating the comparative weightiness of an ethnospecies, was calculated according to the following formula (Phillips and Gentry 1993):

$$UV = \frac{\sum Ui}{N}$$

Where:

Ui : the sum of all citations related to a particular ethnospecies used for a certain ailment by all informants

N : total sum of informants interviewed concerning certain plant species

Fidelity Level (FL) represents the percentage of informants who mentioned the utilization of particular plant species to medicate a particular ill in the study area and is projected with the following formula (Hoffman and Gallaher 2007):

$$FL = \frac{Ip}{Iu} x\ 100$$

Where:

Ip : the sum of informants who at large pointed to the utilization of a species for the same major illness

Iu : the total number that informed the specific plant for any major ill. The FL value range is 0 to 100, where a high FL value indicates that informants' exchange of indigenous knowledge on the use of medicinal plants is a well-described criterion in the community.

Qualitative data was analyzed by cross-checking, summarizing, and synthesizing from different sources, including field observations and in-depth interviews, in order to build up a narrative account.

RESULTS AND DISCUSSION

In the study area, six distinct foods were specially prepared for mothers to consume during different phases of postpartum recovery. On the first and third days after delivery, a salty roasted condiment made from 30 different plants was administered. This medicinal condiment was primarily consumed alongside staple foods, particularly rice. From the third to the seventh day, sweet nuggets made from 51 different plants were provided. On the eighth to the fortieth day, herbal tea produced from 20 distinct plants was given. From the forty-first day after delivery until full recovery of the mother's body, two herbal tea types, each prepared using 14 and 7 different plants respectively, and a medicinal vegetable soup made from 12 plants, were administered once daily.

A total of 83 plant species belonging to 72 genera from 34 families were utilized in the two villages to prepare the six different medicinal foods for maternal postpartum recovery (Table 1). The high similarity coefficient between the information from both villages (SC= 0.98) indicated an even distribution of knowledge on postpartum recovery medicinal foods in these locations. Importantly, out of the 83 species, 42 (50.6%) were classified as cultivated plants and 41 (49.4%) as wild. Among the cultivated, 35 (83.3%) were exotic, and only 7 (16.67%) were native to Java. Conversely, 31 (75.61%) of the wild plants were native to Java, and only 10 (24.39%) were exotic (Table 1). According to Figure 1, the families with the highest number of species utilized in these medicinal foods included Fabaceae (11), Poaceae (8), and Zingiberaceae (8).

Based on Figure 2, the root, leaf, and rhizome of the wild plants were the parts predominantly used, while seeds, fruits, and leaves were sourced from their cultivated counterparts. The informants also believe that the medicinal content of most plants can be found in their roots and leaves.

The highest CVI (>0.4), which measured the cultural importance of plants in the study area, were found in cultivated species, including *Psophocarpus tetragonolobus* (L.) DC., *Cymbopogon citratus* (DC.) Stapf, *Curcuma longa* L., and *Curcuma zanthorrhiza* Roxb.. Meanwhile, this was identified among wild plants comprising *Arenga pinnata* (Wurmb) Merr., *Blumea balsamifera* (L.) DC., *Chloranthus erectus* (Buch.-Ham.) Sweet, *Coleus scutellarioides* (L.) Benth., and *Parkia timoriana* (DC.) Merr. (Table 1).

Several wild plants that were used to make medicinal foods for maternal postpartum recovery, individually or in combined forms, also had other therapeutic applications. Particularly, five wild species with high use values (UV>0.8) and fidelity levels (FL>90) applied for fever treatment included *Ageratum conyzoides*, *Arenga pinnata*, *Blumea balsamifera*, *Chloranthus erectus*, and *Solanum erianthum* (Table 2). The integration of these plants into medicinal foods tends to be influenced by local beliefs and experiences regarding their effectiveness in curing fever. According to local knowledge, the root of *Ageratum conyzoides* is also used to treat dysentery, and the leaf is effective for managing diarrhea and wounds. *Arenga pinnata*, besides its role as a sweet condiment in various traditional dishes, is also applied in treating constipation and dyspepsia. *Blumea balsamifera* leaves are consumed as a raw vegetable, incorporated in epistaxis and cholestasis remedies, and applied in the form of a hemostatic agent following circumcision. *Solanum erianthum* leaves are used to address constipation, oligomenorrhea, and hemorrhoids (Table 2). Most of these wild plants also have high FL values, indicating that informants exchange indigenous knowledge in a well-described criterion in the community.

In the study area, the perinatal period, as well as the knowledge and practices related to medicinal foods prepared for maternal postpartum recovery, are considered the domain of females. Knowledge about the specific recipes and wild plants utilized is often passed from a traditional midwife to her female apprentices or from mothers to daughters. Community elders, all men, are familiar with six different medicinal foods for maternal postpartum recovery. However, they do not have detailed knowledge regarding the specific wild plants used to make those foods, as well as information on where, when, and how to collect them. They considered that this knowledge was specific knowledge of traditional midwives, just as knowledge about hunting wild animals was the specific knowledge of traditional hunters (*paninggaran*). They also emphasized that the perinatal period is a taboo event for men to handle. Therefore, all knowledge related to its management is passed down exclusively from mother to daughter and from traditional midwives to their apprentices.

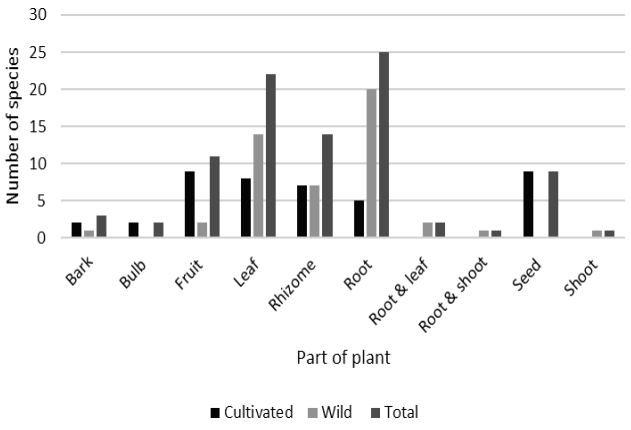

Figure 2. Distribution of plant parts used

Table 1. List of plants used to make medicinal foods for maternal postpartum recovery

Family	Scientific name	Vernacular name	Part used	Cultivation status	Geographical status to Java	Cultural value index
Acanthaceae	*Andrographis paniculata* (Burm.f.) Wall. ex Nees,	*Ki peureut*	Root	Wild	Exotic	0.141
	Clinacanthus nutans (Burm.f.) Lindau	*Ki tajam*	Root	Wild	Native	0.269
	Strobilanthes alternata (Burm.f.) Moylan ex J.R.I.Wood	*Remek daging*	Leaf	Cultivated	Native	0.128
Amaranthaceae	*Achyranthes aspera* L.	*Jarong*	Root	Wild	Native	0.102
	Amaranthus spinosus L.	*Séngang*	Root	Wild	Exotic	0.154
Amaryllidaceae	*Allium cepa* L.	*Bawang beureum*	Bulb	Cultivated	Exotic	0.333
	Allium fistulosum L.	*Bawang daun*	Leaf	Cultivated	Exotic	0.167
	Allium sativum L.,	*Bawang bodas*	Bulb	Cultivated	Exotic	0.167
Annonaceae	*Goniothalamus macrophyllus* (Blume) Zoll.	*Ki cantung*	Root	Wild	Native	0.256
Anacardiaceae	*Spondias dulcis* Parkinson	*Kandondong*	Root	Cultivated	Exotic	0.160
	Spondias mombin L.	*Kandondong cina*	Root	Cultivated	Exotic	0.154
Apiaceae	*Foeniculum vulgare* Mill.	*Hadés*	Bark	Cultivated	Exotic	0.128
Apocynaceae	*Alstonia scholaris* (L.) R.Br.	*Lamé*	Bark	Wild	Native	0.135
	Alyxia reinwardtii Blume	*Pulasari*	Leaf	Cultivated	Native	0.128
	Urceola laevigata (Juss.) D.J.Middleton & Livsh.	*Cukangkang*	Root	Wild	Native	0.256
Arecaceae	*Arenga pinnata* (Wurmb.) Merr.	*Kawung*	Root, shoot	Wild	Exotic	0.5
	Arenga obtusifolia Mart.	*Langkap*	Shoot	Wild	Native	0.064
	Cocos nucifera L.	*Kalapa*	Fruit	Cultivated	Exotic	0.333
Asteraceae	*Ageratum conyzoides* L.	*Babadotan*	Leaf	Wild	Exotic	0.320
	Blumea balsamifera (L.) DC.	*Sembung awéwé*	Leaf, root	Wild	Native	0.564
	Elephantopus scaber L.	*Tapak liman*	Root	Wild	Native	0.128
Bignoniaceae	*Oroxylum indicum* (L.) Kurtz.	*Pongporang*	Root	Wild	Native	0.231
Bromeliaceae	*Ananas comosus* (L.) Merr.	*Ganas*	Leaf	Cultivated	Exotic	0.167
Caricaceae	*Carica papaya* L.	*Gedang katés*	Root	Cultivated	Exotic	0.5
Chloranthaceae	*Chloranthus erectus* (Buch. -Ham.) Wall.	*Kéras tulang*	Root	Wild	Native	0.423
Cucurbitaceae	*Cucumis sativus* L.	*Bonténg*	Seed	Cultivated	Exotic	0.128
	Cucurbita moschata Duchesne	*Waluh*	Seed	Cultivated	Exotic	0.295
Cycadaceae	*Cycas rumphii* Miq.	*Pakis haji*	Root	Wild	Native	0.16
Euphorbiaceae	*Excoecaria agallocha* L.	*Warejit*	Leaf	Wild	Native	0.147
Fabaceae	*Abrus precatorius* L.	*Saga*	Leaf	Wild	Exotic	0.128
	Arachis hypogaea L.	*Su'uk*	Seed	Cultivated	Exotic	0.32
	Entada phaseoloides (L.) Merr.	*Cariu*	Leaf	Wild	Native	0.308
	Millettia sericea (Vent.) Wight & Arn. ex Hassk.	*Kawao*	Root	Wild	Native	0.282
	Phaseolus lunatus L.	*Roay*	Seed	Cultivated	Exotic	0.167
	Phaseolus vulgaris L.	*Buncis*	Seed	Cultivated	Exotic	0.333
	Sindora sumatrana Miq.	*Saparantu*	Leaf	Wild	Exotic	0.141
	Parkia timoriana (DC.) Merr.	*Peundeuy*	Fruit	Wild	Native	0.589
	Psophocarpus tetragonolobus (L.) DC.	*Ja'at*	Fruit	Cultivated	Exotic	0.461
	Tamarindus indica L.	*Asem*	Fruit	Cultivated	Exotic	0.167

	Vigna unguiculata sesquipedalis (L.) Verdc.	*Kacang panjang*	Seed	Cultivated	Exotic	0.333
Lamiaceae	*Coleus scutellarioides* (L.) Benth.	*Jawér kotok*	Leaf	Wild	Native	0.589
	Orthosiphon aristatus (Blume) Miq.	*Kumis ucing*	Root	Wild	Native	0.141
	Rotheca serrata (L.) Steane & Mabb.	*Singgugu*	Leaf	Wild	Native	0.135
Lauraceae	*Cinnamomum burmanni* (Nees & T.Nees) Blume	*Kayumanis cina*	Bark	Cultivated	Native	0.115
	Cinnamomum sintoc Blume	*Sintok*	Leaf	Cultivated	Native	0.128
	Cryptocarya massoy (Oken) Kosterm.	*Masoyi*	Leaf	Cultivated	Exotic	0.102
	Litsea tomentosa Blume	*Meuhmal*	Leaf	Wild	Native	0.269
Malvaceae	*Bombax anceps* Pierre	*Randé*	Leaf	Wild	Native	0.128
	Durio zibethinus L	*Kadu*	Root	Cultivated	Exotic	0.115
Melastomataceae	*Melastoma malabathricum* L.,	*Haréndong*	Root	Wild	Native	0.141
Musaceae	*Musa acuminata* Colla	*Kolé*	Leaf	Wild	Native	0.167
Myristicaceae	*Myristica fragrans* Houtt.	*Pala*	Seed	Cultivated	Exotic	0.154
Myrtaceae	*Syzygium aromaticum* (L.) Merr. & L.M.Perry	*Cengkéh*	Fruit	Cultivated	Exotic	0.154
	Syzygium polyanthum (Wight) Walp.	*Salam*	Leaf	Cultivated	Native	0.167
Piperaceae	*Piper nigrum* L.	*Lada*	Fruit	Cultivated	Exotic	0.167
	Piper retrofractum Vahl.	*Cabé areuy*	Fruit	Cultivated	Exotic	0.141
Plantaginaceae	*Plantago major* L.	*Ki urat*	Root	Wild	Exotic	0.384
Poaceae	*Cymbopogon citratus* (DC.) Stapf.	*Séréh*	Root	Cultivated	Exotic	0.5
	Eleusine indica (L.) Gaertn.	*Carulang*	Root	Wild	Native	0.122
	Gigantochloa apus (Schult.f.) Kurz ex Munro	*Awi tali, apus*	Leaf	Cultivated	Native	0.128
	Imperata cylindrica (L.) Raeusch.	*Eurih*	Root	Wild	Exotic	0.231
	Lophatherum gracile Brongn.	*Tangkur gunung*	Root	Wild	Native	0.102
	Oryza sativa L. var. *glutinosa* L.	*Beras ketan*	Seed	Cultivated	Exotic	0.333
	Setaria palmifolia (J.Koenig) Stapf.	*Sauheun*	Root	Wild	Native	0.295
	Zea mays L.	*Jagong*	Seed	Cultivated	Exotic	0.333
Lauraceae	*Litsea eliiptica* Blume	*Tarawas*	Leaf	Wild	Native	0.141
Lythraceae	*Punica granatum* L.	*Dalima*	Fruit	Cultivated	Exotic	0.167
Rubiaceae	*Morinda citrifolia* L.	*Cangkudu*	Fruit	Cultivated	Native	0.160
	Mussaenda frondosa L.	*Kingkilaban*	Leaf	Wild	Native	0.282
	Paederia foetida L.	*Kahitutan*	Leaf	Wild	Native	0.128
Rutaceae	*Murraya paniculata* (L.) Jack	*Kamuning*	Leaf	Wild	Native	0.256
Solanaceae	*Capsicum annuum* L.	*Cabé jawa*	Fruit	Cultivated	Exotic	0.256
	Physalis angulata L	*Cécéndét*	Root	Wild	Exotic	0.230
	Solanum erianthum D.Don	*Tétér*	Root, leaf	Wild	Exotic	0.218
Symplocaceae	*Symplocos odoratissima* (Blume) Choisy ex Zoll.	*Ki sariawan*	Root	Wild	Native	0.128
Zingiberaceae	*Alpinia galanga* (L.) Willd.	*Laja*	Rhizome	Cultivated	Exotic	0.167
	Curcuma longa L.	*Konéng lalab*	Rhizome	Cultivated	Exotic	0.5
	Curcuma zanthorrhiza Roxb.	*Konéng gedé*	Rhizome	Cultivated	Exotic	0.5
	Hedychium roxburghii Blume	*Gandasoli*	Fruit	Wild	Native	0.134
	Kaempferia angustifolia Roscoe.	*Kunci*	Rhizome	Cultivated	Exotic	0.167
	Kaempferia galanga L.	*Cikur*	Rhizome	Cultivated	Exotic	0.167
	Zingiber officinale Roscoe	*Jahé*	Rhizome	Cultivated	Exotic	0.333

Table 2. List of wild plants used for other medicinal purposes (example only)

Species	Part used/product	Preparation	Usage method	Ailment	UV	FL
Ageratum conyzoides L.	Root	Boiled	Drunk	Fever	0.82	90.91
	Root	Boiled	Drunk	Dysentery	0.65	77.27
	Leaf	Boiled	Drunk	Diarrhea	0.59	72.73
	Leaf	Pounded	Taped	Wound	0.91	100
Arenga pinnata (Wurmb.) Merr.	Sugar	Brewed	Drunk	Fever	0.88	93.75
	Sugar	Boiled	Drunk	Constipation	0.65	71.87
	Sugar	Boiled	Drunk	Dyspepsia	0.59	68.75
Blumea balsamifera (L.) DC.	Leaf	Unprocessed	Eaten	Fever	0.91	97.06
	Leaf	Pounded	Taped	Epistaxis	0.71	76.47
	Leaf	Squeezed	Drunk	Cholestasis	0.76	68.75
	Leaf	Squeezed	Drunk	Hemostatic	0.82	82.35
Chloranthus erectus (Buch. -Ham.) Wall.	Leaf	Boiled	Drunk	Fever	0.88	100.00
	Root	Boiled	Rubbed	Fever	0.94	70.83
Clinacanthus nutans (Burm.f.) Lindau	Leaf	Brewed	Drunk	Diabetes	0.88	100.00
Coleus scutellarioides (L.) Benth.	All	Boiled	Drunk	Diabetes	0.85	93.94
	Leaf	Boiled	Drunk	Hemorrhoid	0.76	78.79
	Leaf	Boiled	Drunk	Amenorrhea	0.85	90.91
	Leaf	Baked	Taped	Ulcers	0.67	66.67
	Leaf, stem	Boiled	Drunk	Fever	0.71	72.73
	Leaf, stem	Boiled	Drunk	Constipation	0.64	57.57
	Root	Boiled	Drunk	Dyspepsia	0.79	63.64
Elephantopus scaber L.	All	Steamed	Eaten	Thiamine deficiency	0.82	96.87
	Root	Boiled	Drunk	Hepatitis	0.85	87.50
	Stem	Boiled	Drunk	Dyspepsia	0.64	68.75
Imperata cylindrica (L.) Raeusch.	Rhizome	Boiled	Drunk	Urine laxative	0.62	100.00
Plantago major L.	All	Boiled	Drunk	Urine laxative	0.97	97.06
	All	Squeezed	Drunk	Hematuria	0.62	55.88
	All	Squeezed	Drunk	Bloody diarrhea	0.69	61.76
	All	Boiled	Drunk	Bacillary dysentery	0.76	70.59
	All	Steamed	Drunk	Hemoptysis	0.67	67.65
	Leaf	Brewed	Drunk	Posterior epistaxis	0.82	82.35
Physalis angulata L.	All	Boiled	Drunk	Diabetes	0.62	65.52
	All	Boiled	Drunk	Bronchitis	0.50	58.62
	Fruit	Raw	Eaten	Epilepsy	0.53	62.07
	Leaf	Pounded	Taped	Ulcers	0.88	93.10
Solanum erianthum D.Don	Leaf	Pounded	Drunk	Fever	0.97	100.00
	Leaf	Boiled	Drunk	Constipation	0.76	85.71
	Leaf	Pounded	Drunk	Oligomenorrhea	0.85	89.28
	Leaf	Boiled	Drunk	Hemorrhoid	0.67	67.86

Discussion

The application of various wild or non-cultivated plants, which were part of the ingredients for making medicinal foods for maternal postpartum recovery as medicinal ingredients to cure other illnesses, shows that the plant selection is not random (Arias et al. 2020; Gaoue et al. 2021). *Blumea balsamifera* leaves, for example, have been applied among various ethnic groups or traditional communities in the Indonesian archipelago to create alternative medications for diarrhea, malnutrition, kidney stones, headache, gastric disorders, and rheumatism (Silalahi et al. 2015; Sujarwo et al. 2015; Siregar et al. 2021). In other words, the Sundanese people in the study area share a common knowledge with other ethnic groups in Indonesia, and this knowledge probably has deep roots in their common history. The Sundanese name of this plant, *sembung*, along with several names for other plants such as *A. reinwardtii* (*pulasari*), *A. pinnata* (*kawung*), *C. nucifera* (*kalapa*), *C. sativus* (*bonténg*), *D. zibethinus* (*kadu*), *G. apus* (*apus*), *M. citrifoli*a (*cangkudu*), and *M. paniculata* (*kamuning*), is recorded in an Old Sundanese text from 15th century (Mulyanto et al. 2023).

Other ethnobotanical investigations suggest that gender is a significant variable influencing the distribution of local knowledge concerning medicinal plants (Garibay-Orijel et al. 2012; Díaz-Reviriego et al. 2016; Smucker and Wangui 2016; Torres-Avilez et al. 2016; Alqethami et al. 2017; Jones 2022). In certain regions, females are closer to the identification and medicinal uses of local flora than males (Tuler and da Silva 2014; Acosta-Naranjo et al. 2021; Teixidor-Toneu et al. 2021). In other regions, there are no significant gender differences in plant knowledge (de Santana et al. 2022). A study in a Caribbean horticultural village reported that males acquired a stronger grasp of tree-related knowledge, while females excelled in learning about medicinal plants (Quinlan et al. 2016). These trends may be attributed to the common consideration of healthcare as a domain associated with females.

Comparative studies indicate that variations in the gendered nature of knowledge about plants are dependent on specific cultural contexts (Torres-Avilez et al. 2016).

The study documented 83 plants utilized to make six distinct medicinal foods specially made for maternal postpartum recovery, of which 41 are wild plants. Out of the 41 wild plants, 31 (75.61%) were native to Java, and only 10 (24.39%) were exotic. Our findings show the significance of gender roles in the use, processing, preservation and transmission of medicinal plant knowledge. The gendered aspects of plant knowledge differ depending on the cultural context. These differences are not innate or natural but rather influenced by the cultural norms and values of each society. In some cultures, health care is regarded as a female domain, while in others, it is shared or divided among genders. The transmission and learning of plant knowledge also varies according to gender roles and relations. The results indicate that the perinatal period and the knowledge and practice of medicinal food for postpartum mothers are seen as a female domain. This knowledge has been transmitted from midwives to apprentices or from mothers to daughters.

REFERENCES

Acosta-Naranjo R, Rodriquez-Franco R, Guzman-Troncoso AJ, Pardo-de-Santanaya M, Aceituno-Mata L, Gomez-Melara L, Dominguez P, Diaz-Reviriego I, Gonzalez-Nateras J, Reyes-Garcia P. 2021. Gender differences in knowledge, use, and collection of wild edible plants in three Spanish Areas. Sustainability 13 (5): 2639. DOI: 10.3390/su13052639.

Ali-Shtayeh M, Jamous RM, Jamous RM. 2015. Plants used during pregnancy, childbirth, postpartum, and infant healthcare in Palestine. Complement Ther Clin Pract 3 (4): 004. DOI: 10.101/jctcp.2015.03.004.

Alqethami A, Hawkins JA, Teixidor-Toneu I. 2017. Medicinal plants used by women in Mecca: Urban, muslim and gendered knowledge. J Ethnobiol Ethnomed 13 (1): 1-24. DOI: 10.1186/s13002-017-0193-4.

Arias DMR, Daniela M, Cevallos D, Gaoue OG, Fadiman MG, Hindle T. 2020. Non-random medicinal plants selection in the Kichwa community of the Ecuadorian Amazon. J Ethnopharmacol 246: 112220. DOI: 10.1016/j.jep.2019.112220.

Bazzano AN, Stolow JA, Duggal R, Oberhelman RA, Chivorn Var. 2020. Warming the postpartum body as a form of postnatal care: An ethnographic study of medical injections and traditional health practices in Cambodia. PLoS ONE 15 (2): 1-16. DOI: 10.1371/journal.pone.0228529.

Bhatia H, Sharma YP, and Manhas RK. 2018. Traditionally used wild edible plants of District Udhampur, J&K, India. J Ethnobiol Ethnomed 1: 1-13. DOI: 10.1186/s13002-018-0272-1.

Collins L, Mmari K, Mullany LC, Gruber CW, Favero R. 2016. An exploration of village-level uterotonic practices in Fenerive-Est, Madagascar. BMC Pregnancy Childbirth 16 (1): 1-10. DOI: 10.1186/s12884-016-0858-3.

de Medeiros PM, Figueiredo KF, Gonçalves PHS, Caetano RdeA, da Costa Santos EM, Maria Cota dos Santos G, Barbosa DM, de Paula M, Mapeli AM. 2021. Wild plants and the food-medicine continuum-An ethnobotanical survey in Chapada Diamantina (Northeastern Brazil). J Ethnobiol Ethnomed 17 (1): 1-11. DOI: 10.1186/s13002-021-00463-y.

de Santana BF, Voeks RA, Funch LS. 2022. Quilombola ethnomedicine: The role of age, gender, and culture change. Acta Bot Bras 36: 1-18. DOI: 10.1590/0102-33062020abb0500.

Dennis CL, Kenneth F, Grigoriadis S, Robinson GE, Romans S, Ross L. 2007. Traditional postpartum practices and rituals: A qualitative systematic review. Women's Health 3 (4): 487-52. DOI: 10.2217/17455057.3.4.487.

Díaz-Reviriego I, Fernández-Llamazares A, Salpeteur M, Howard PL, Reyes-García V. 2016. Gendered medicinal plant knowledge contributions to adaptive capacity and health sovereignty in Amazonia. Ambio 45: 263-275. DOI: 10.1007/s13280-016-0826-1.

Duguma HT. 2020. Wild edible plant nutritional contribution and consumer perception in Ethiopia. Intl J Food Sci 2020: 1-16. DOI: 10.1155/2020/2958623.

Eberhard-Gran M, Garthus-Niegel S, Garthus-Niegel K, Eskild A. 2010. Postnatal care: A cross-cultural and historical perspective. Arch Womens Ment Health 13 (6): 459-466. DOI: 10.1007/s00737-010-0175-1.

Esakkimuthu S, Darvin S, Mutheeswaran S, Gabriel Paulraj M, Pandikumar P, Ignacimuthu S, Al-Dhabi NA. 2018. A study on food-medicine continuum among the non-institutionally trained siddha practitioners of Tiruvallur District, Tamil Nadu, India. J Ethnobiol Ethnomed 14 (1): 1-29. DOI: 10.1186/s13002-018-0240-9.

Fantaye AW, Gunawardena N, Yaya S 2019. Preferences for formal and traditional sources of childbirth and postnatal care among women in rural Africa: A systematic review. PLoS ONE 14 (9): e0222110.14. DOI: 10.1371/journal.pone.0222110.

Gaoue OG, Yessoufou K, Mankga L, Vodouhe F. 2021. Phylogeny reveals non-random medicinal plant organ selection by local people in Benin. Plants People Planet 3 (6): 710-20. DOI: 10.1002/ppp3.10202.

Garibay-Orijel R, Ramírez-Terrazo A, Ordaz-Velázquez M. 2012. Women care about local knowledge, experiences from ethnomycology. J Ethnobiol Ethnomed 8 (1): 1-13. DOI: 10.1186/1746-4269-8-25.

Goyal M. 2017. Use of ethnomedicinal plants for prophylaxis and management of postpartum complications among the marwari community of Jodhpur District of Rajasthan. Food Qual Saf 1 (3): 203-209. DOI: 10.1093/fqsafe/fyx013.

Hoffman B, Gallaher T. 2007. Importance indices in ethnobotany. Ethnobot Res Appl 5: 201-218. DOI: 10.17348/era.5.0.201-218.

Iskandar J, Iskandar BS, Partasasmita R. 2018. Review: The impact of social and economic change on domesticated plant diversity with special reference to wet rice field and home-garden farming of West Java, Indonesia. Biodiversitas 19 (2): 565-577. DOI: 10.13057/biodiv/d190227.

Jennings HM, Merrell J, Thompson JL, Heinrich M. 2015. Food or medicine? The food-medicine interface in households in Sylhet. J Ethnopharmacol 167: 97-104. DOI: 10.1016/j.jep.2014.09.011.

Jiang S, Quave CL. 2013. A comparison of traditional food and health strategies among taiwanese and chinese immigrants in Atlanta, Georgia, USA. J Ethnobiol Ethnomed 9 (1): 1. DOI: 10.1186/1746-4269-9-61.

Jigme J, Yangchen K. 2023. Ethnobotanical study of the wild edible plants used by the indigenous people of Merak in Bhutan. Asian J Ethnobiol 6 (1): 1-6. DOI: 10.13057/asianjethnobiol/y060101.

Jones F. 2022. Gendered, embodied knowledge within a welsh agricultural context and the importance of listening to farmers in the rewilding debate. Area 2022: 1-9. DOI: 10.1111/area.12808.

Kaya GD. 2023. A critical review: Traditional practices surrounding postpartum period impact on breastfeeding in Turkey and the UK. J Midwifery Health Sci 5 (3): 131-138. DOI: 10.5152/jmhs.2022.930630.

Kumawat K, Jain S, Arora A. 2021. Ethnomedicinal studies of postpartum recipes used by rural and tribal women of Southern Rajasthan, India. Plant Sci 10 (2): 4151-4161. DOI: 10.21746/aps.2021.10.2.2.

Lunkenheimer HG, Oskar Burger, Akhauri S, Chaudhuri I, Dibbell L, Hashmi FA, Johnson T, Little EE, Mondal S, Mor N, Saldanha N, Schooley J, Legare CH. 2021. Tradition, taste and taboo: The gastroecology of maternal perinatal diet. BMJ Nutr Prev Health 4 (2): 385-396. DOI: 10.1136/bmjnph-2021-000252.

Luo B, Feifei L, Ahmed S, Long C. 2019. Diversity and use of medicinal plants for soup making in traditional diets of the Hakka in West Fujian, China. J Ethnobiol Ethnomed 15 (1): 1-16. DOI: 10.1186/s13002-019-0335-y.

Magtalas MC., Balbin PT, Cruz EC, Guevarra RC, Rominia D.PA, Silverio CCE, Lee KY, Tantengco OAG. 2023. A Systematic review of ethnomedicinal plants used for pregnancy, childbirth, and postpartum care in the Philippines. Phytomed Plus 3 (1): 100407. DOI: 10.1016/j.phyplu.2023.100407.

Martin MA, Gurven M. 2022. Traditional and biomedical maternal and neonatal care practices in a rural indigenous population of the Bolivian Amazon. Glob Publ Health 17 (6): 971-985. DOI: 10.1080/17441692.2021.1882531.

Motti R. 2022. Wild edible plants: A challenge for future diet and health. Plants 11 (3): 10-12. DOI: 10.3390/plants11030344.

Mukaila YO, Oladipo OT, Arogundade OO, Ajao AA. 2023. Traditional knowledge of medicinal plants used in Ile-Ife, Southwestern Nigeria Asian J Ethnobiol 5 (2): 71-83. DOI: 10.13057/asianjethnobiol/y050201.

Mulyanto D, Iskandar BS, Iskandar J, Indrawardana I, Aufa AA. 2023. Ethnobotanical analysis of phytonyms and plant-related glosses mentioned in Bujangga Manik, a pre-islamic Sundanese text (15th Century Java, Indonesia). Reinwardtia 22 (2): 131-43. DOI: 10.55981/reinwardtia.2023/4608.

Phillips O, Gentry AH. 1993. The useful plants of Tambopata, Peru: I. Statistical hypotheses tests with a new quantitative technique. Econ Bot 47 (1): 15-32. DOI: 10.1007/BF02862203.

Puddister S, Ali-Saleh O, Cohen-Dar M, Baron-Epel O. 2020. Health may be compromised by social interactions depending on culture among postpartum Arab and Jewish Israeli women. BMC Pregnancy Childbirth 20 (1): 1-11. DOI: 10.1186/s12884-020-03168-4.

Quinlan MB., Quinlan RJ, Council SK, Roulette JW. 2016. Children's acquisition of ethnobotanical knowledge in a Caribbean Horticultural Village. J Ethnobiol 36 (2): 433-456. DOI: 10.2993/0278-0771-36.2.433.

Ramulondi M, de Wet H, Ntuli NR. 2021. Traditional food taboos and practices during pregnancy, postpartum recovery, and infant care of Zulu Women in Northern KwaZulu-Natal. J Ethnobiol Ethnomed 17 (1): 1-27. DOI: 10.1186/s13002-021-00451-2.

Reyes-García V, Huanca T, Vadez V, Leonard W, Wilkie D. 2006. Cultural, practical, and economic value of wild plants: A quantitative study in the Bolivian Amazon. Econ Bot 60 (1): 62-74. DOI: 10.1663/0013-0001(2006)60[62:CPAEVO]2.0.CO;2.

Ridzuan MH, Ali MF, Tan C, Aziz AFA. 2021. Traditional and complementary medicine use during postpartum period: A cross-sectional analysis at a rural, public maternal and child health clinic in West Malaysia. Cureus 13 (6): e15410. DOI: 10.7759/cureus.15410.

Rohidas UA, Shaikh AMS. 2022. Ethnobotanical assessment of indigenous knowledge of plants used as uterotonic: An overview. I Indo Am J Pharm Sci 09 (7): 260-272.

Sibeko L, Johns T, Cordeiro LS. 2021. Traditional plant use during lactation and postpartum recovery: Infant development and maternal health roles. J Ethnopharmacol 279 (February): 114377. DOI: 10.1016/j.jep.2021.114377.

Sibeko L, Johns T, Hsiao B. 2023. Traditional perinatal plant knowledge in Sub-Saharan Africa: Comprehensive compilation and secondary analysis. S Afr J Bot 154: 120-139. DOI: 10.1016/j.sajb.2023.01.007.

Silalahi M, Supriatna J, Walujo EB, Nisyawati. 2015. local knowledge of medicinal plants in sub-ethnic Batak Simalungun of North Sumatra, Indonesia. Biodiversitas 16 (1): 44-54. DOI: 10.13057/biodiv/d160106.

Siregar M, Aritonang SM, Simbolon JL, Panggabean HWA, Silalahi RH. 2021. Traditional practices in post-partum care among Indonesian and Filipino mothers: A comparative study. Bionatura 6 (4): 2257-2264. DOI: 10.21931/RB/2021.06.04.19.

Smucker TA, Wangui ED. 2016. Gendered knowledge and adaptive practices: Differentiation and change in Mwanga District, Tanzania. Ambio 45: 276-286. DOI: 10.1007/s13280-016-0828-z.

Sujarwo W, Keim AP, Savo V, Guarrera PM, Caneva G. 2015. Ethnobotanical study of Loloh: Traditional herbal drinks from Bali (Indonesia). J Ethnopharmacol 169 (April 2015): 34-48. DOI: 10.1016/j.jep.2015.03.079.

Teixidor-Toneu I, Elgadi S, Zine H, Manzanilla V, Ouhammou A, D'ambrosio U. 2021. Medicines in the kitchen: Gender roles shape ethnobotanical knowledge in Marrakshi Households. Foods 10 (10): 1-15. DOI: 10.3390/foods10102332.

Torres-Avilez W, Medeiros PM, Albuquerque UP. 2016. Effect of gender on the knowledge of medicinal plants: Systematic review and meta-analysis. J Evid-Based Complement Altern Med 2016: 12-15. DOI: 10.1155/2016/6592363.

Tripathi S. 2019. Ethnomedicine and future challenges. Glob J Archaeol Anthropol 10 (5): 87-90. DOI: 10.19080/gjaa.2019.10.555796.

Tuler AC, da Silva NCB. 2014. Women's ethnomedicinal knowledge in the rural community of São José Da Figueira, Durandé, Minas Gerais, Brazil. Rev Bras Farmacogn 24 (2): 159-170. DOI: 10.1016/j.bjp.2014.03.004.

Wang Q, Fongkaew W, Petrini WM, Kantaruksa K, Chaloumsuk N, Wang S. 2019. An ethnographic study of traditional postpartum beliefs and practices among Chinese women. Pac Rim Intl J Nursing Res 23 (2): 142-55.

Yang JWY, Yao Fu WY, Yang T, Luo XD, Wang YH, Wang YH. 2020. Medicinal and edible plants used by the Lhoba People in Medog County, Tibet, China. J Ethnopharmacol 249: 112430. DOI: 10.1016/j.jep.2019.112430.

Yao R, He C, Xiao P. 2023. Food and medicine continuum' in the east and west: Old tradition and current regulation. Chin Herb Med 15 (1): 6-14. DOI: 10.1016/j.chmed.2022.12.002.

Zahra K, Dousrey K, Nahid G, Zohre F, Sadat HS, Ali M. 2022. The effects of rectal suppositories of plantago major and *Anetheum graveolens* on postpartum hemorrhage: A randomized triple blinded clinical trial. J Herb Med 31: 100526. DOI: 10.1016/j.hermed.2021.100526.