

# ETHNOPHARMACOLOGICAL STUDY OF THE POLYHERBAL FORMULA IN BATURRADEN, INDONESIA

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## Abstract

The present study reports the utilization of polyherbal formulae of medicinal plants for treating diseases/ailments among the Baturraden people. The data of local names and plant parts of the medicinal plants, along with the plant constituents, indications, preparation methods, and administration routes of the polyherbal formulae were collected through semi-structured interviews with 36 informants. The quantitative approach was used to calculate the use-value of each formula. The result showed that a total of 43 plant species distributed in 24 families were utilized to prepare the formula, with leaves as the most commonly used plant parts. There were 33 polyherbal formulae used for the treatment of 18 different diseases/ailments, which mostly prepared in the form of decoction and subsequently orally consumed. The most important polyherbal formula was indicated for treating the menstrual pain and found to be the variation of the well-known *jamu kunyit asam* formula.

**Keywords:** Baturraden, ethnopharmacology, polyherbal formula, medicinal plants

## Introduction

*Jamu*, defined as Indonesian traditional medicine, is still commonly used in Indonesia. Nearly half of Indonesian people consumed *jamu*, and 95.6% of them reported the benefits of their *jamu* intake. Also, the acceptance of the use of *jamu* as the alternative for conventional medicines was nearly 60% in the lower-middle-class (Balitbangkes, 2010; Elfahmi *et al.*, 2014; Andriati and Wahjudi, 2016). The use of *jamu* in the form of the self-made herbal preparations in the household, commonly prepared from plant materials available around the neighborhood, is practiced by about 10% of the respondents (Supardi *et al.*, 2011).

Baturraden is considered as one of the last-remained affluent biodiversity areas in Java (Mandiriati *et al.*, 2016). Baturraden people utilize

abundant plants in their surroundings for medicinal purposes, particularly those in Rosidae sub-class and for treating diarrhea (Permatasari *et al.*, 2011; Suparman *et al.*, 2012).

Ethnopharmacology is commonly associated with folk medicines, in which substances were used for medicinal purposes by a particular ethnic or cultural group (Taylor and Werneke, 2018). The use of medicinal plants as polyherbal formulae is commonly underreported compared to that of a single plant one in the ethnopharmacological studies. Nevertheless, the use of herbal preparations with multiple plant constituents is considered important for increasing the therapeutic effect, as more bioactive compounds are available compared to the single plant one. This better therapeutic

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potential is due to the more potent mixture resulted from the synergy of the compounds in it (Samoisy and Mahomoodally, 2016). The same case is observed in Baturraden, as both earlier reports mainly described the use of single plant preparation.

This study is conducted to explore the knowledge of Baturraden people in the utilization of medicinal plants in the form of the polyherbal formula. The species of plants used to prepare the formula, along with plant parts, are described. Furthermore, the preparation, administration routes, and the dose of those formulae were also narrated. The importance of each polyherbal formula was quantitatively determined by using their use-value. To the best of our knowledge, this is the first ethnopharmacological study with qualitative and quantitative approaches covering the topic of polyherbal formula in Baturraden. As the ethnopharmacological study is the first stage of the science-based *jamu* development program (*saintifikasi jamu* in *Bahasa Indonesia*), the data of important polyherbal formulae in this study could be used as the basis for their further development to enable their future uses in the formal health system

## Materials and Methods

### Study Area

Baturraden is a sub-district of Banyumas located in the southern slope of Gunung Slamet with the position of 7°14'-7°33' north latitude and 109°12'-109°14' east longitude. It covers an area of 45.53 km<sup>2</sup> and is bordered by sub-districts of Kedungbanteng, North Purwokerto, and Sumbang in the west, south, and east, respectively, while it is adjacent to regencies of Pemalang and Tegal in the north (Figure 1).

### Questionnaire Design and Data Collection

The minimum number of informants for this study was calculated using a survey sample calculation formula as follow:

$$n = \frac{Z\alpha^2 \times P \times Q}{d^2}$$

where  $Z\alpha$ : the standard alpha derivative,  $P$ : the proportion of the studied variable category,  $Q$ : the value of  $(1-P)$ , and  $d$ : the precision (Dahlan, 2013). A total of 36 informants were interviewed, which were proportionally sampled from all villages in Baturraden according to the population.

The questionnaire used in this study was adapted from that of Research on Medicinal Plants and Traditional Indonesian Medicines (*RISTOJA, Riset Tumbuhan Obat dan Jamu in Bahasa*

*Indonesia*) 2015 (Indonesian MoH, 2015). The questionnaire was valid and reliable, which was determined in a smaller size pilot study. The data were collected from January-March 2017 after the ethical approval (Ref: 187/KEPK/XI/2016) was granted from the Ethical Commission of Faculty of Medicine and Health Sciences, Universitas Jendral Soedirman and written informed consent was obtained from the informants. The semi-structured interviews were conducted to address the demographic and traditional utilization of medicinal plant data. The informants were asked to free mention all plant utilizations they were familiar with, but only the usages of polyherbal formula were reported in this study.

### Tabulation, Quantitative Ethnobotanical Index, and Analysis

The data of plant constituents of polyherbal formula, including vernacular name, botanical name, and family are alphabetically tabulated following The Plant List ([www.theplantlist.org](http://www.theplantlist.org)). The polyherbal formulae were grouped according to the major body system where the disorder took place, along with their plant constituents and method of preparation. The use-value (UV) was used as the index to determine the relative importance of each formula to the local community using the formula as follow:

$$UV = \sum U_i / N$$

where  $U_i$ : number of informants cited a given formula, and  $N$ : total number of informants (Zenderland *et al.*, 2019)

## Results and Discussion

### Demographic Profile of Informants

A total of 36 informants participated in the survey (Table 1). They were all self-identified as

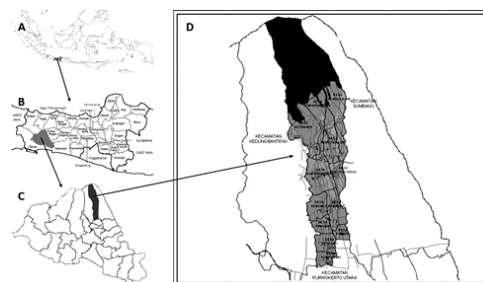


Figure 1. Location of study area shown in (A) Indonesia, (B) Central Java, (C) Banyumas, and (D) Baturraden maps

Javanese. Women, elders, and elementary school-graduated populations were the dominant profile of the informants. Women were found to be more familiar with the uses of medicinal herbals due to their traditional role in providing everyday meals, for some medicinal plants were also food staples (Voeks, 2007). This pattern is also reported in Bogor (West Java) and Merangin (Jambi) (Jalius and Muswita, 2013; Emilda *et al.*, 2017). The elderly population had more experience in using traditional remedies as 61.1% of the informants were aged over 50 years old. The more knowledge about medicinal plants of the elderly was also reported in Bandung (West Java) and Buleleng (Bali) (Kodir *et al.*, 2017; Oktavia *et al.*, 2017). Elementary school-graduates were found to be the majority of the informants. Highly educated people generally preferred the modern healthcare system and less interested in traditional ones (Jan *et al.*, 2020). This phenomenon is also taken place in other regions, including

Kotawaringin Timur (Central Kalimantan) and Buleleng (Herianto *et al.*, 2018).

**Table 1. Demographic profile of informants**

Demographic characteristic	Number	Frequency (%)
Javanese ethnicity	36	100
Gender		
Male	5	13.9
Female	31	86.1
Age (year)		
21-29	5	13.9
30-39	3	8.3
40-49	6	16.7
50-59	11	30.6
60-69	10	27.8
70-79	1	2.8
Education		
Elementary school	20	55.6
Junior high school	2	5.6
High school	11	30.6
University	3	8.3

**Table 2. Plant constituents of polyherbal formula in Baturraden**

Family	Botanical name	Vernacular name	Part used
Acanthaceae	<i>Clinacanthus nutans</i> (Burm.f.) Lindau	Ketumpang	Leaves
	<i>Andrographis paniculata</i> (Burm.f.) Nees	Sambiloto	Leaves
Acoraceae	<i>Acorus calamus</i> L.	Dringo	Leaves
Amaryllidaceae	<i>Allium cepa</i> L.	Bawang merah	Bulbs
	<i>Allium sativum</i> L.	Bawang putih	Bulbs
Annonaceae	<i>Annona muricata</i> L.	Sirsak	Leaves
Apiaceae	<i>Centella asiatica</i> (L.) Urb.	Pegagan	Leaves
Apocynaceae	<i>Alyxia reinwardtii</i> Blume	Pulasari	Barks
Asparagaceae	<i>Ophiopogon japonicus</i> (Thunb.) Ker Gawl	Teki bulu ayam	Bulbs
Basellaceae	<i>Anredera cordifolia</i> (Ten.) Steenis	Binahong	Leaves
	<i>Basella rubra</i> L.	Gendola	Leaves
Compositae	<i>Gynura procumbens</i> (Lour.) Merr.	Sambung nyawa	Leaves
Cucurbitaceae	<i>Sechium edule</i> (Jacq.) Sw.	Weloh	Fruits
Euphorbiaceae	<i>Euphorbia tirucalli</i> L.	Tikel balung	Stems
Lamiaceae	<i>Orthosiphon aristatus</i> (Blume) Miq	Kumis kucing	Leaves
Lauraceae	<i>Persea americana</i> L.	Alpukat	Leaves
	<i>Cinnamomum burmanii</i> (Nees & T.Nees) Blume	Kayu manis	Barks
Leguminosae	<i>Tamarindus indica</i> L.	Asam Jawa	Fruits
	<i>Desmodium triflorum</i> (L.) DC	Jarem	Leaves
	<i>Caesalpinia sappan</i> L.	Secang	Woods
Melastomataceae	<i>Miconia acinodendron</i> (L.) Sweet	Senggani	Leaves
Moringaceae	<i>Moringa oleifera</i> Lam.	Kelor	Leaves
Myrtaceae	<i>Syzygium aromaticum</i> (L.) Merr. & L.M.Perry	Cengkih	Flowers
	<i>Psidium guajava</i> L.	Jambu biji	Leaves
	<i>Syzygium polyanthum</i> (Wight) Walp.	Salam	Leaves
Piperaceae	<i>Peperomia pellucida</i> (L.) Kunth	Kangkung-kangkungan	Aerial parts
	<i>Piper nigrum</i> L.	Merica	Fruits
	<i>Piper betle</i> L.	Sirih hijau	Leaves
	<i>Piper ornatum</i> N.E.Br.	Sirih merah	Leaves
Poaceae	<i>Oryza sativa</i> L.	Padi	Starches
	<i>Cymbopogon citratus</i> (DC.) Stapf.	Sereh	Pseudostems
Rubiaceae	<i>Morinda citrifolia</i> L.	Mengkudu	Leaves
Rutaceae	<i>Citrus aurantiaca</i> Swingle	Jeruk nipis	Fruits
Thymelaeaceae	<i>Phaleria macrocarpa</i> (Scheff.) Boerl.	Mahkota dewa	Fruits
Xanthorrhoeaceae	<i>Aloe vera</i> (L.) Burm.f	Lidah buaya	Gels
Zingiberaceae	<i>Zingiber montanum</i> (J.König) Link ex A.Dietr.	Bengle	Rhizomes
	<i>Zingiber officinale</i> Roscoe	Jahe merah	Rhizomes
	<i>Amomum compactum</i> Sol. ex Maton	Kapulaga	Fruits
	<i>Kaempferia galanga</i> L.	Kencur	Rhizomes
	<i>Curcuma longa</i> L.	Kunyit	Rhizomes
	<i>Curcuma mangga</i> Valetton & Zijp	Kunyit putih	Rhizomes
	<i>Alpinia galanga</i> (L.) Willd.	Lengkuas	Rhizomes
	<i>Curcuma zanthorrhiza</i> Roxb	Temulawak	Rhizomes

### The Medicinal Plants Used in the Polyherbal Formula

There were 43 plant species from 24 families used for the preparation of polyherbal formula by Baturraden people. Zingiberaceae and Piperaceae were the families with the most plant species used, while leaves, rhizomes, and fruits were the most commonly used plants part (Table 2). Zingiberaceae plants have been long recognized as the prominent constituents of *jamu* (Widyowati and Agil, 2018). The popular uses of this taxon in traditional medicine practices are also reported in Pidie (Aceh) and West Lombok (West Nusa Tenggara) (Emilasari *et al.*, 2018; Rahayu and Andini, 2019). Besides, Zingiberaceae and Piperaceae were reported as the dominant families in Landak (West Kalimantan) and North Mamuju (West Sulawesi) (Mila *et al.*, 2015; Rusmina *et al.*, 2015). Leaves are popular to use, mainly because of their year-long availability and also practical accessibility (Neamsuvan *et al.*, 2018). The most commonly used part of Indonesian traditional antidiabetic plants were leaves (Hartanti and Budipramana, 2020). Furthermore, the dominant uses of leaves are also reported in Cianjur (West Java) and Wakatobi (Southeast Sulawesi) (Indrayangingsih *et al.*, 2015; Malini *et al.*, 2017).

### The Polyherbal Formulae Used in Baturraden

There were 33 polyherbal formulae mentioned during the survey, which were utilized for treating 18 diseases or symptoms in nine major body systems (Table 3). Joint and muscle pain (translated from *pegel-pegel* and *pegel linu*) and *masuk angin* were the indications with the most number of polyherbal formulae to treat with cited by the informants. *Masuk angin* was traditionally described as all of the symptoms of illnesses in a person with an unbalanced body equilibrium condition (Triratnawati, 2011). There were four formulae used for treating *masuk angin*, in which three of them contained *Zingiber officinale*. In this study, the liver problem was treated with *Curcuma mangga*, *Curcuma zanthorrhiza*, and *Cinnamomum burmanii*. This formula was more straightforward than one used by Dayak Lindaye people of Malinau (East Kalimantan). Their formula consisted of *Phaleria macrocarpa* fruits, *Andrographis paniculata* leaves, *Gynura procumbens* leaves and bulbs, *Curcuma mangga* rhizomes, and *Curcuma zanthorrhiza* (BPOM, 2011).

The number of plant constituents in each polyherbal formula was varied from two to seven. For example, the formulae indicated for treating hypercholesterolemia was found to have seven, three, and two plant materials. For comparison, an in-vivo-evaluated *jamu* formula consisted of four plant ingredients; they were *Syzygium polyanthum*,

*Senna alata* (L.) Roxb., *Centella asiatica*, and *Curcuma zanthorrhiza* (Husnawati *et al.*, 2016). The formula used for treating hypertension in Baturraden consisted of three plants, while that of scientific *jamu* contained *Apium graveolens* L., *Orthosiphon aristatus*, *Centella asiatica*, *Curcuma zanthorrhiza*, *Phyllanthus niruri*, and *Curcuma longa* (Triyono and Novianto, 2015).

Those polyherbal formulae were most often prepared into decoctions, which were administrated via oral or topical routes (Table 3). In addition to the commonly used traditional medicine preparations (decoction, infusion, juice, and poultice), Baturraden people also prepared some foods for medicinal purposes. They cooked and ate *Aloe vera* gels and *Sechium edule* young fruits as well as young leaves of *Annona muricata* and *Moringa oleifera* as a soup (*sayur bening*) to alleviate headache and muscle and joint pain, respectively.

Salt, palm sugar, rock sugar, and honey were commonly added to decoction or juice to improve their taste. Both infusion and decoction methods utilized boiling the plant materials in the water. While the water extract in infusion was taken shortly after steam was obtained, the heating process took place longer in decoction that the water reduced to a half or a one-third of the initial volume (Nafiu *et al.*, 2017). The decoction was more commonly practiced than infusion in Baturraden, possibly due to the belief that this method was capable of maximally extracted the phytochemicals in the plant. However, in the term of polyherbal formula, there was no evidence to support this belief. Water extract obtained from steeping (boiling the water until steam was obtained and subsequently pouring it onto plant materials) of scientific *jamu* for hypertension was as effective as that of infusion in lowering blood pressure and improving the quality of life scores of patients (Triyono *et al.*, 2018).

The use of polyherbal preparations via the oral route was superior to the topical one. The poultice was applied topically and indicated for the treatment of muscle and joint pain and *sambetan*. *Sambetan* was the term used by the locals to refer to all symptoms and illnesses caused by supranatural beings (Rostiyati, 2010). The use of poultice to treat *sambetan* was usually performed by a person with such of supranatural power and accompanied by certain rituals.

Extrapolated from the concept of Ayurveda, the use of polyherbal formulae are superior to the single plant ones, as their therapeutic effects are potentiated with synergic effects of the multiple plants. Furthermore, the formulae commonly have a wide therapeutic range and fewer side effects (Parasuraman *et al.*, 2014; Karole *et al.*, 2019). The toxicity reduction in a polyherbal formula was

**Table 3. The polyherbal formula from Baturraden**

Indicated for	Formula	Plant constituents	Preparation method and use
Cardiovascular system			
a. Hypercholesterolemia	FC1	<i>Syzygium polyanthum</i> , <i>Piper betle</i> , and <i>Cymbopogon citratus</i>	Decocted, taken orally twice a day
	FC2	<i>Syzygium polyanthum</i> and <i>Anredera cordifolia</i>	Decocted, taken orally 2-3 times a day
	FC3	<i>Piper betle</i> , <i>Morinda citrifolia</i> , <i>Psidium guajava</i> , <i>Ophiopogon japonicus</i> , <i>Allium sativum</i> , <i>Cymbopogon citratus</i> , and <i>Curcuma longa</i>	Decocted, taken orally once a day
b. Hypertension	FC4	<i>Syzygium polyanthum</i> , <i>Annona muricata</i> , and <i>Phaleria macrocarpa</i>	Decocted, taken orally 2-3 times a day
Digestive system			
a. Diarrhea	FD1	<i>Syzygium polyanthum</i> , <i>Psidium guajava</i> , and <i>Phaleria macrocarpa</i>	Decocted with salt, taken orally twice a day
	FD2	<i>Psidium guajava</i> and <i>Curcuma longa</i>	Juiced, taken orally as needed
b. Dyspepsia	FD3	<i>Curcuma longa</i> and <i>Kaempferia galanga</i>	Juiced and mixed with honey and egg yolk, taken orally as needed
	FD4	<i>Curcuma longa</i> and <i>Curcuma zanthorrhiza</i>	Juiced, taken orally as needed
c. Liver problems	FD5	<i>Curcuma mangga</i> , <i>Curcuma zanthorrhiza</i> , and <i>Cinnamomum burmanii</i>	Boiled with palm sugar in water, taken orally twice a day
d. Poor appetite	FD6	<i>Curcuma longa</i> and <i>Kaempferia galanga</i>	Juiced and mixed with honey, taken orally as needed
e. Stomachache	FD7	<i>Miconia acinodendron</i> and <i>Curcuma longa</i>	Boiled with palm sugar in water, taken orally as needed
Integumentary system			
Itching	FI	<i>Curcuma longa</i> and <i>Amomum compactum</i>	Pounded into poultice, applied topically as needed
Lymphatic system			
Fatigue	FL1	<i>Zingiber officinale</i> , <i>Cymbopogon citratus</i> , <i>Piper nigrum</i> , <i>Amomum compactum</i> , <i>Caesalpinia sappan</i> , <i>Syzygium aromaticum</i> , <i>Cinnamomum burmanii</i>	Decocted, taken orally as needed
	FL2	<i>Andrographis paniculata</i> and <i>Aloe vera</i>	Juiced with honey, taken orally 2-3 times a day
Nervous system			
Stroke	FN	<i>Syzygium aromaticum</i> , <i>Amomum compactum</i> , <i>Zingiber officinale</i> , <i>Piper ornatum</i> , and <i>Cymbopogon citratus</i>	Decocted, taken orally three times a day
Reproductive system			
Menstrual pain	FRp	<i>Curcuma longa</i> , <i>Tamarindus indica</i> , <i>Citrus aurantiaca</i> , and <i>Alyxia reinwardtii</i>	Boiled with rock sugar in water, taken orally three times a day
Respiratory system			
Cough	FRs	<i>Citrus aurantiaca</i> and <i>Kaempferia galanga</i>	Juiced and boiled with honey, taken orally 2-3 times a day
Skeletomuscular system			
a. Headache	FS1	<i>Aloe vera</i> and <i>Sechium edule</i>	Cooked as rice side dish, eaten as needed
b. Muscle and joint pain	FS2	<i>Zingiber officinale</i> and <i>Cymbopogon citratus</i>	Decocted with palm or rock sugar, taken orally as needed
	FS3	<i>Orthosiphon aristatus</i> and <i>Syzygium polyanthum</i>	Boiled with salt in water, taken orally twice a day
	FS4	<i>Annona muricata</i> and <i>Moringa oleifera</i>	Cooked as rice side dish, eaten as needed
	FS5	<i>Peperomia pellucida</i> , <i>Annona muricata</i> , and <i>Persea americana</i>	Decocted, taken orally twice a day
	FS6	<i>Euphorbia tirucalli</i> and <i>Zingiber officinale</i>	Pounded into poultice, applied topically as needed
	FS7	<i>Clinacathus nutans</i> , <i>Centella asiatica</i> , <i>Desmodium triflorum</i> , and <i>Cymbopogon citratus</i>	Pounded into poultice, applied topically as needed
	FS8	<i>Curcuma longa</i> and <i>Cymbopogon citratus</i>	Pounded into poultice, applied topically as needed
Others			
a. Dengue fever	FO1	<i>Syzygium polyanthum</i> , <i>Annona muricata</i> , and <i>Phaleria macrocarpa</i>	Decocted, taken orally 2-3 times a day
b. Cancer	FO2	<i>Basella rubra</i> , <i>Gynura procumbens</i> , <i>Curcuma longa</i> , and <i>Kaempferia galanga</i>	Decocted, taken orally once a day
c. <i>Masuk angin</i>	FO3	<i>Zingiber officinale</i> and <i>Cymbopogon citratus</i>	Boiled with palm sugar in water, taken orally as needed
	FO4	<i>Zingiber officinale</i> and <i>Piper betle</i>	Boiled with palm sugar in water, taken orally as needed
	FO5	<i>Curcuma longa</i> and <i>Curcuma zanthorrhiza</i>	Juiced and mixed with salt, palm sugar, or honey, taken orally as needed
	FO6	<i>Oryza sativa</i> , <i>Curcuma longa</i> , <i>Kaempferia galanga</i> , and <i>Zingiber officinale</i>	Boiled in water, taken orally as needed
d. <i>Sambetan</i>	FO7	<i>Andrographis paniculata</i> , <i>Moringa oleifera</i> , and <i>Amomum compactum</i>	Pounded into poultice, applied topically as needed
	FO8	<i>Curcuma longa</i> , <i>Zingiber montanum</i> , <i>Zingiber officinale</i> , <i>Acorus calamus</i> , and <i>Allium cepa</i>	Pounded into poultice, applied topically as needed

mediated by the modification of pharmacokinetic aspects of the toxic substances. For example, the elimination of the toxic alkaloids of *Tetradium ruticarpum* (A. Juss.) Hartley fruits in rats were altered when it was administered altogether with *Glycyrrhiza glabra* L. roots. The combined administration of *Tetradium ruticarpum* and *Coptis chinensis* Franch. roots resulted in the changes in the distribution profile of the alkaloids in the liver and lungs (Shan *et al.*, 2020). It is interesting to take a look at *Phaleria macrocarpa*, which is used in three different formulae in Baturraden. The fruit contains toxic 29-norcucurbitacin derivatives (Kurnia *et al.*, 2008). The combination of this plant with other plant materials, for example, with *Syzygium polyanthum* and *Annona muricata* for treatment of hypertension, might reduce or minimize its toxic effects. A further study is needed to prove this hypothesis.

### Relative Importance of Polyherbal Formulae in Baturraden

The importance of the formula was determined by using use-value as the index. The polyherbal formula used for treating menstrual pain, hypercholesterolemia, *sambetan*, and dyspepsia were consecutively found to be the most popular ones (Figure 2). The most important formula for the Baturraden people was the variation of *jamu kunyit asam*, one of the popular *jamu* variants. Another important polyherbal formula was FC1, which was indicated for treating hyperlipidemia and consisted of *Syzygium polyanthum*, *Piper betle*, and *Cymbopogon citratus*. An anti-hyperlipidemia formula is clinically used for the scientific-based *jamu* development program. This formula consisted of seven plant materials, including *Guazuma ulmifolia* Lam., *Senna alexandrina* Mill., *Sonchus arvensis* L., *Camellia sinensis* (L.) Kuntze, *Curcuma zanthorrhiza*, *Curcuma longa*, and *Phyllanthus niruri* L. (Zulkarnain *et al.*, 2018). Interestingly, a polyherbal formula for treating *sambetan* was also considered important by the locals. The treatment of

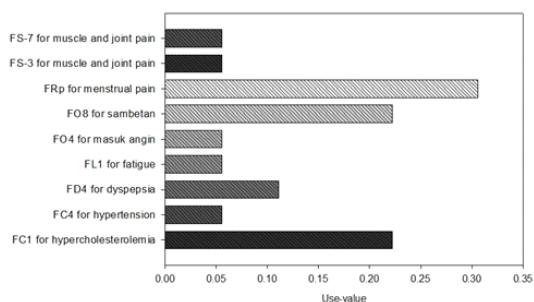
*sambetan* required special skill and ritual, yet many people familiar with the herbal preparation used for it

### Conclusions

The present study has recorded 33 polyherbal formulae used for the treatment of 18 different diseases/ailments in Baturraden. In preparing those formulations, 43 plant species from 24 families were utilized, with leaves as the most commonly used plant parts. The decoction was found as the most commonly performed herbal preparation method, in which was further administrated via the oral route. The most important polyherbal formula in the studied area was indicated for treating menstrual pain, which consisted of *Curcuma longa*, *Tamarindus indica*, *Citrus aurantiaca*, and *Alyxia reinwardtii*. This formula, along with other relatively high important ones, should be evaluated further for the future development of traditional medicines.

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**Figure 2.** The relative importance of some polyherbal formulae used by Baturraden people

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