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Phytonym Study in Manuscript *Usada Rare* to Strengthen The Balinese Traditional Medicine System

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Abstract

The *usada rare* manuscript is one of the most important sources of Balinese traditional medicine, focusing on child healthcare and integrating knowledge of medicinal plants with spiritual practices. However, the plant names (phytonyms) present challenges for scientific validation, as many names are locally specific, polysemous, or refer to plant mixtures. This study aims to examine the structure and concept of *usada rare*, analyze phytonyms, and their relevance to modern healthcare. This study employs a qualitative-ethnographic approach through literature studies and interviews. Seven main versions of the *usada rare* and six supplementary *lontar* manuscripts containing plant name synonyms were examined. Phytonyms were extracted, cross-referenced, and matched with scientific names using ethnobotanical literature and herbarium databases. Fieldwork involved interviews with traditional healers or knowledgeable individuals. Observations and photographic documentation were used to verify plant identity and uses. Data were analyzed through editing, classification, tabulation, and interpretation, with quantitative summaries of plant part usage. A total of 275 plant species from 81 families were recorded. Fabaceae, Moraceae, and Zingiberaceae were the most represented families. Leaves were the most frequently used plant part, followed by roots and bark. Certain phytonyms, such as *triketuka* and *sindrong*, refer to herbal combinations whose full species composition remains unidentified. Overall, *usada rare* provides an empirical foundation for integrating local medical knowledge with contemporary, culturally sensitive approaches to child healthcare. The study also strengthens Balinese traditional medicine by reinforcing its epistemological legitimacy while opening pathways for interdisciplinary research and sustainable healthcare development.

Keywords: Balinese Traditional Medicine; Children's Health; Ethnomedicine; Medicinal Plants; *Usada Rare*

Abstrak

Lontar usada rare adalah salah satu sumber terpenting dari pengobatan tradisional Bali, yang berfokus pada perawatan kesehatan anak dan mengintegrasikan pengetahuan tanaman obat dengan praktik spiritual. Namun, nama tanaman (fitonim) menghadirkan tantangan untuk validasi ilmiah, karena banyak nama yang spesifik secara lokal, polisemi, atau berupa campuran beberapa tanaman. Penelitian ini bertujuan untuk mengkaji struktur dan konsep usada rare, menganalisis fitonim, dan relevansinya dengan perawatan kesehatan modern. Penelitian ini menggunakan pendekatan kualitatif-etnografi melalui studi literatur dan wawancara. Tujuh versi lontar usada rare dan enam manuskrip lontar lainya yang berisi sinonim nama tanaman diperiksa. Fitonim diekstraksi, direferensikan silang, dan dicocokkan dengan nama ilmiah menggunakan literatur etnobotani dan database herbarium. Kerja lapangan dilakukan yang melibatkan wawancara dengan balian tradisional atau orang yang berpengetahuan. Pengamatan dan dokumentasi fotografi digunakan untuk memverifikasi identitas dan penggunaan tanaman. Data dianalisis melalui pengeditan, klasifikasi, tabulasi, dan interpretasi,

dengan ringkasan kuantitatif penggunaan bagian tanaman. Hasil penelitian menemukan sebanyak 275 spesies tumbuhan dari 81 keluarga. Fabaceae, Moraceae, dan Zingiberaceae adalah keluarga yang paling terwakili. Daun adalah bagian tanaman yang paling sering digunakan, diikuti oleh akar dan babakan (kulit kayu). Fitonim tertentu, seperti triketuka dan sindrong, berupa kombinasi herbal dengan beberapa spesiesnya yang tidak teridentifikasi membuka peluang penelitian lebih lanjut. Secara keseluruhan, usada rare memberikan landasan empiris untuk mengintegrasikan pengetahuan medis lokal dengan pendekatan kontemporer yang sensitif secara budaya terhadap perawatan kesehatan anak. Studi ini juga memperkuat pengobatan tradisional Bali dengan memperkuat legitimasi epistemologisnya sekaligus membuka jalur untuk penelitian interdisipliner dan pengembangan perawatan kesehatan berkelanjutan.

Kata Kunci: Etnomedisin; Kesehatan Anak; Pengobatan Tradisional Bali; Tanaman Obat; Usada Rare

Introduction

The traditional Balinese medicine system, known as *usada*, is sourced from an ancient manuscript known as *lontar usada* (Arsana, 2019; Arsana and Juliasih, 2021; Arsana and Suardana, 2020; Rasna and Tantra, 2017; Muderawan et al., 2020). One of the important *lontar* texts that serves as a primary reference in Balinese traditional medicine is *usada rare*. This *lontar* specifically focuses on treating children (*rare* in Balinese, meaning children). However, the modernization of health services and the dominance of biomedical have caused the practice and transmission of *usada rare* to be eroded, so more systematic documentation and revitalization efforts are needed.

Although many studies have addressed *usada* in general, specific studies of *usada rare*, especially related to the documentation of medicinal plants and the spiritual value that accompanies it still very limited in the academic literature. This research gap is an important foundation for conducting a comprehensive study that not only reconstructs the lontar text but also understands its application in the context of today's Balinese families and communities. In addition, not everyone can read the *lontar* because it is written in Balinese script. This situation hinders the dissemination of knowledge contained in the *lontar*.

Although *lontar* has now been transcribed from the Balinese script to the Latin script, making it easier to explore the knowledge it holds, the younger generation is less interested in learning and continuing this tradition. Many practitioners of *usada* are elderly, and there is no adequate effort to pass this knowledge on to the next generation. A study with a philological approach revealed that there are problems in copying texts from Balinese script to Latin letters, which risks causing errors in the identification of medicinal plants, as well as their dosage and use (Suardiana, 2018). Therefore, the study of phytonymy (naming plants) in the context of *usada* is important to avoid errors in modern interpretations of ancient practices.

The close relationship between plant local names and cultural identity is also a focus in phytonymy studies. On the other hand, the practice of using plants as medicinal ingredients still exists and thrives in the Balinese community. The demand for natural medicines continues to increase as public awareness of holistic health and the side effects of chemical medicines increases. People generally prefer herbal medicines for the treatment of mild to moderate diseases. This shows great potential for the development of the *usada* medicinal plant-based herbal industry, which can contribute to the local economy and cultural existence.

The market demand for natural herbal products continues to increase, providing significant economic opportunities for local communities to develop plant-based medicine products. Problems also still arise because the names and documentation, both in the form of photos and plant specimens contained in the *lontar*, are not known or are only known locally. This condition requires further research on plants in the *lontar usada*. This research is important because traditional knowledge about medicinal plants is one of the wealth of the Indonesian nation that needs to be maintained so that it is not claimed and patented by other nations. This knowledge can have superior, competitive, and innovative values for the Balinese people. In addition, preserving culture not only preserves the culture itself but also preserves biodiversity. This study aims to examine the structure and concept of *usada rare,* analyze phytonyms, and their relevance to modern healthcare.

Methods

This study employed a qualitative-ethnographic approach integrating philological analysis, ethnobotanical documentation, and field validation, with primary data sources (*usada rare* manuscripts and an interview with *balian usada*) and secondary sources (literature review and documentation of previous research). Seven main versions of *usada rare* were used, each originating from different villages and traditional houses (*griya*) across Bali, including Jro Kawan Samsam (catalog No. 19.020), Griya Lod Rurung (No. 13.272), Banjar Tegal Sari, Singaraja (No. 13.650), Tegal Ambengan, Tabanan (No. 19.400), Desa Bakung, Sukasada (No. 19.595), Sidemen, Karangasem (No. 24.265), and Jro Kanginan, Karangasem (No. 24.764). To address the complexity of plant naming systems in the manuscripts, supplementary *lontar* texts that specifically list synonyms of plant names were also examined. These included Dasa Namaning Taroe (No. 9232), Paparikan Usada (No. 19.144), Dasa Namaning Tamba (No. 10.056), Kerta Basa (No. 12.714), Kerta Bhasa (HKS 3577), and Paparikan ing Taru (No. 3067). Cross-referencing across these texts allowed for a more precise interpretation of phytonyms, especially for species with multiple local names or overlapping nomenclature across different Balinese regions. All manuscripts were accessed in their transliterated form (Balinese script to Latin script) from the *Lontar* Collection of Leiden University, which was collected previously. The philological stage began with careful reading, transliteration verification, and annotation of plant names within the text. Each phytonym was extracted, recorded, and preliminarily matched to a scientific name using ethnobotanical reference literature, herbarium databases, and previous studies on Balinese medicinal plants. Special attention was given to compound phytonyms, such as *triketuka* and *sindrong*, which denote herbal mixtures rather than single species. In such cases, component plants were identified whenever possible through both textual cross-reference and informant validation. Following textual analysis, field observation was conducted to validate plant identification and collect supplementary ethnobotanical information. Fieldwork involved visiting traditional healers (*balian usada*) or knowledgeable people in various districts in Bali, including Denpasar, Badung, Gianyar, and Karangasem regency. Field information was obtained through purposive sampling of informants consisting of male and female traditional healers (*pengusada*) aged between 40 and 70 years, selected based on their practical experience and knowledge of *Usada*. Semi-structured interviews were conducted to confirm local plant names and associated cultural practices. Interviews were guided by ethical research protocols, including prior informed consent and respect for traditional intellectual property rights. When available, living specimens of the plants mentioned in *usada rare* were observed directly, photographed *in-situ*, and documented for morphological verification. For species that could not be directly observed, high-

quality photographs from trusted sources were used during interviews to aid recognition and confirmation. Field research was carried out from July to September 2024. Data analysis was conducted using the interactive qualitative model proposed by Miles and Huberman, encompassing data condensation, data display, and conclusion drawing and verification. During data condensation, the extracted phytonyms from *usada rare* manuscripts were edited to ensure consistency in transliteration and botanical nomenclature, then classified based on botanical family, life form, and plant parts used. At the data display stage, the condensed data were subsequently organized into tables and matrices to create a structured ethnobotanical database linking local names, scientific identifications, and medicinal applications. To support pattern recognition, quantitative summaries such as the frequency of plant part usage were generated as complementary analytical indicators. Conclusions were drawn through interpretative comparison with ethnobotanical studies from other regions and continuously verified through triangulation of manuscript data, field information, and relevant literature. Ambiguities in phytonym interpretation and unresolved species identifications were documented to maintain analytical transparency and guide future research.

Results and Discussion

1. Structure And Concept Of *Usada Rare*

Usada rare represents a specialized branch within the Balinese traditional medical system (*usada*) that is explicitly dedicated to the treatment of childhood illnesses. Within the broader structure of Balinese ethnomedicine, *usada rare* occupies a distinct position, as it conceptualizes children not merely as smaller versions of adults but as individuals with unique physiological, psychological, and cosmological characteristics that require specific diagnostic and therapeutic approaches (Muderawan et al., 2020). This perspective aligns with global ethnomedical frameworks that recognize pediatric health as a distinct domain within traditional medical systems, shaped by cultural understandings of growth, vulnerability, and spiritual proximity (WHO, 2019).

Conceptually, *usada rare* is grounded in the Balinese worldview that emphasizes balance between the physical (*sekala*) and spiritual (*niskala*) dimensions of existence. Childhood illness is not interpreted solely as a biological malfunction but as a manifestation of disharmony involving the child's body, the surrounding natural environment, and metaphysical forces. Such a holistic etiological model is characteristic of ethnomedical systems worldwide, where disease causation is understood as multi-layered and inseparable from social and spiritual contexts (Bodeker and Kronenberg, 2002).

Usada rare is not only a physical healing system of the body, but also a form of cultural expression that reflects the spiritual relationship between humans, nature, and the cosmos. *Usada rare* not only preserves knowledge of medicinal plants but also complex philosophical values, religious rituals, and linguistic structures, making them a direct manifestation of biocultural diversity in the local context. This aligns closely with the cosmos-corpus-praxis framework developed by Víctor M. Toledo, in which the practice of medicine is not separated from the spiritual dimension (cosmos), knowledge systems (corpus), and daily actions (praxis) (Barrera-Bassols and Toledo, 2005).

An analysis of *usada rare* manuscripts reveals a relatively consistent textual structure, typically consisting of descriptions of specific childhood ailments, observable symptoms, prescribed medicinal substances, methods of preparation and application, and accompanying ritual procedures. Although these manuscripts do not follow modern scientific formats, they demonstrate an internally coherent logic that reflects accumulated experiential knowledge transmitted across generations (Muderawan et al., 2020).

Comparable structural patterns have been documented in traditional medical manuscripts from other parts of Southeast Asia, where medical texts serve as both practical guides and symbolic repositories of cultural values (Yuan et al., 2016).

In terms of disease classification, *usada rare* organizes childhood illnesses into several broad thematic categories, including digestive disorders, febrile conditions, dermatological problems, and disturbances related to behavior or emotional stability. These categories are not always explicitly labeled in the manuscripts but can be inferred through recurring symptom descriptions, therapeutic materials, and ritual prescriptions. This symptom-based and contextual approach to disease classification is consistent with traditional nosological systems, which prioritize experiential and relational indicators over standardized biomedical taxonomy (Kirmayer, 2012).

From a structural perspective, ritual elements within *usada rare* serve multiple functions. They act as symbolic mechanisms that legitimize therapeutic actions, as communicative tools connecting humans with divine or ancestral forces, and as psychosocial interventions that reassure caregivers and reinforce communal trust in the healing process. Cross-cultural research in medical anthropology demonstrates that ritualized healing practices can significantly influence perceived efficacy and emotional well-being, particularly in the context of childhood illness (Kirmayer, 2012).

The structure of *usada rare* also reflects the deeply social nature of traditional pediatric care in Bali. Healing practices are rarely conducted in isolation; instead, they involve family members, elders, and community-based healers (*pengusada*), emphasizing collective responsibility for child health. Knowledge transmission regarding remedies, rituals, and prohibitions occurs primarily through familial and communal channels, reinforcing *usada rare* as a form of shared cultural knowledge rather than individual expertise. This communal orientation corresponds with anthropological perspectives that frame traditional medical systems as socially embedded institutions (Anshari, 2024; WHO, 2019; Benedetti et al., 2025). Analyzing the structure and concepts of *usada rare* not only deepens scholarly understanding of Balinese traditional medicine but also contributes to broader global discussions on the role of indigenous knowledge in child health, integrative medicine, and the preservation of intangible cultural heritage (Yuan et al., 2016).

2. Phytonyms In *Usada Rare*

The defining structure of *usada rare* is the predominant use of natural materials, particularly medicinal plants, as the core therapeutic agents. Ethnobotanical extraction from the manuscripts indicates extensive use of diverse phytonyms referring to locally available plant species, with various plant parts, such as leaves, rhizomes, roots, stems, flowers, and fruits, employed according to specific therapeutic needs. This pattern is consistent with recent ethnopharmacological research in Bali, which highlights the central role of plant-based remedies in traditional pediatric treatments (Widhiantara et al., 2024).

Research shows that a total of 275 plant species from 81 families were identified in the *lontar usada rare* (Appendix 1). Fabaceae is a family with the largest number of species, namely 20 species, followed by Moraceae and Zingiberaceae, which have 16 and 15 species, respectively (Table 1). Some plant names cannot be identified. In addition, some names mentioned are a combination of several plant species, such as *triketuka*, *sindrong nguda*, *sindrong wayah*, and *sindrong biasa. Triketuka* consists of three plant species, namely *Allium sativum L.*, *Acorus calamus* L., and *Cryptocarya massoy* (Oken) Kosterm. Meanwhile, the types of *sindrong* constituents are still not known, so further research is still needed.

Table 1. Plant Family in *Lontar Usada Rare*

Family	Number of Species	Family	Number of Species	Family	Number of Species
Acanthaceae	2	Cyperaceae	1	Ochnaceae	1
Achariaceae	1	Dioscoreaceae	1	Oleaceae	1
Acoraceae	1	Ebenaceae	1	Oxallidaceae	3
Amaranthaceae	8	Euphorbiaceae	9	Pandanaceae	2
Amaryllidaceae	3	Fabaceae	20	Passifloraceae	1
Anacardiaceae	3	Fagaceae	1	Phyllanthaceae	7
Annonaceae	1	Gnetaceae	1	Piperaceae	4
Apiaceae	4	Iridaceae	1	Plumbaginaceae	1
Apocynaceae	6	Lamiaceae	8	Poaceae	14
Araliaceae	2	Lauraceae	3	Portulacaceae	1
Arecaceae	7	Lecythidaceae	1	Primulaceae	1
Asparagaceae	3	Leguminosae	2	Ranunculaceae	1
Aspleniaceae	1	Loranthaceae	1	Rhamnaceae	1
Asteraceae	4	Lythraceae	2	Rosaceae	1
Basellaceae	1	Magnoliaceae	2	Rubiaceae	6
Boraginaceae	3	Malvaceae	10	Rutaceae	11
Bromeliaceae	1	Marantaceae	1	Salicaceae	1
Burseraceae	1	Melastomataceae	1	Santalaceae	1
Calophyllaceae	3	Meliaceae	5	Sapindaceae	2
Cannabaceae	1	Menispermaceae	4	Sapotaceae	2
Caryophyllaceae	1	Moraceae	16	Simaroubaceae	1
Clusiaceae	2	Moringaceae	1	Solanaceae	8
Combretaceae	3	Musaceae	4	Sphenocleaceae	1
Convolvulaceae	1	Myristicaceae	1	Styracaceae	1
Costaceae	1	Myrtaceae	12	Urticaceae	2
Cucurbitaceae	6	Nyctaginaceae	1	Vitaceae	1
Cycadaceae	1	Nymphaeaceae	3	Zingiberaceae	15

Source: Primary Data

Plants in *usada rare* are used as medicinal ingredients to overcome diseases suffered by babies. Diseases suffered by babies, such as heat, canker sores, ulcers, diarrhea, swelling, and other conditions related to physical health and spiritual disorders. Plants that are widely used in the *usada rare* are mainly from the Fabaceae family, which reaches 20 species, then Moraceae and Zingiberaceae, 16 and 15 species respectively (Table 1). Some important species of the Fabaceae family include *dapdap* and *canging* (Appendix 1). *Dapdap* (*Erythrina subumbrans* (Hassk.) Merr. is very well known by the Balinese people as one of the medicinal ingredients to treat various types of diseases, as well as for Hindu religious ceremonies (Sujarwo et al., 2020).

Stem and root extracts of *dapdap* (*Erythrina subumbrans)* have been known to have significant antibacterial effects against gram-positive and gram-negative bacteria (Susilawati et al., 2023). The people of the Balinese traditional village also use *dapdap* leaves as a source of vegetables (Sujarwo and Caneva, 2015). Meanwhile, *canging* (Erythrina fusca Lour) is known as a medicinal plant by the Balinese people (Arsana, 2021). This plant is known to have the potential to be an effective analgesic, antipyretic, and anti-inflammatory agent (Nhung and Quoc, 2024). The phytochemical profile of Erythrina fusca Lour shows the presence of triterpenes, alkaloids, quinones, phenolics,

and flavonoids (Yahya et al., 2024). Fabaceae is known as a provider of traditional food and medicine, with more than 17,500 species worldwide (Shreya et al., 2023). Fabaceae are known as legumes, a large group of covered-seed plants used as food crops, animal feed, and green manure.

Fabaceae is known for its various constituents, which include primary metabolites, including lectins, chitinases, various proteases, and α-amylase inhibitors, as well as secondary metabolites, including flavonoids, alkaloids, terpenoids, tannins, and phenolics. These components have antioxidant, anticancer, antidiabetic, and anti-inflammatory properties (Noviany et al., 2023; Shreya et al., 2023; Usman et al., 2022). The second most abundant family after Fabaceae is Moraceae, which is represented by 16 species, with the most genera being Ficus (Table 1). Moraceae is one of the families with the largest number of species in the world, with the number of species reaching more than 800 species. In addition, the Moraceae family is also known for its extensive use as a medicinal ingredient, while its fruit is a source of feed for fruit-eating animals, so it is very beneficial as a natural succession dynamic (García-Cox et al., 2023; Morante-Carriel et al., 2024; Frodin, 2004; Ngo et al., 2024). The Zingiberaceae family is represented by 15 species, such as *Kaempferia galanga L*, *Curcuma longa* L, and *Kaempferia galanga L* (Table 1). The Zingiberaceae family includes more than 1400 species spread all over the world, mainly in tropical and subtropical regions. This plant is widely used as an ingredient in traditional medicine, as a spice, and as a natural coloring ingredient (Ballester et al., 2023).

Some types of plants can be easily recognized because they are used in the daily life of the local community, such as for spices and vegetables, or as part of Hindu religious ritual activities in Bali. Nevertheless, some plant names are very uncommon, difficult to trace, or even unknown. This condition is because plants have many names that are only known to local people. The use of plants as medicinal ingredients is generally in the form of polyherbs, which are a combination of several types of plants. Its use can be in the form of *loloh*, *boreh*, *sembar*, *tutuh*, and *tampel*. *Loloh* is an herb in the form of a liquid, the result of grinding plants with or without the addition of liquids such as water, then filtered and drunk.

Boreh is an herb in the form of a liquid powder made by grinding plants with or without the addition of liquid, then applied to the diseased part. *Sembar* is an herb made by chewing plants until they are smooth, then spraying them on the patient's body. *Tutuh* is an herb in the form of a plant essence liquid, used for eye or nose drops. *Tampel* is an herb in the form of an ingredient that is crushed and then attached to the treated part, especially on the baby's crown that has not closed tightly. *Loloh* and *boreh* are herbs that are very well known by the Balinese people; even loloh is an herbal drink that has been widely consumed to prevent or treat various types of diseases (Sujarwo et al., 2015).

Currently, *usada rare*-based medicine is starting to receive attention in the modern context, especially to preserve Balinese local wisdom. This treatment has also begun to be developed as part of health tourism in Bali, providing economic opportunities while maintaining ancient traditions (Putra, 2020). The plant parts that are used include roots, stems, leaves, flowers, fruits, shoots, stem bark, or stem tips. Leaves are the most dominant part of the plant used, with a frequency of 25.29%. This is followed by roots (19.44%), bark (12.18%), shoots (9.60%), fruit (8.67%), and other parts with a lower frequency (Figure 1).

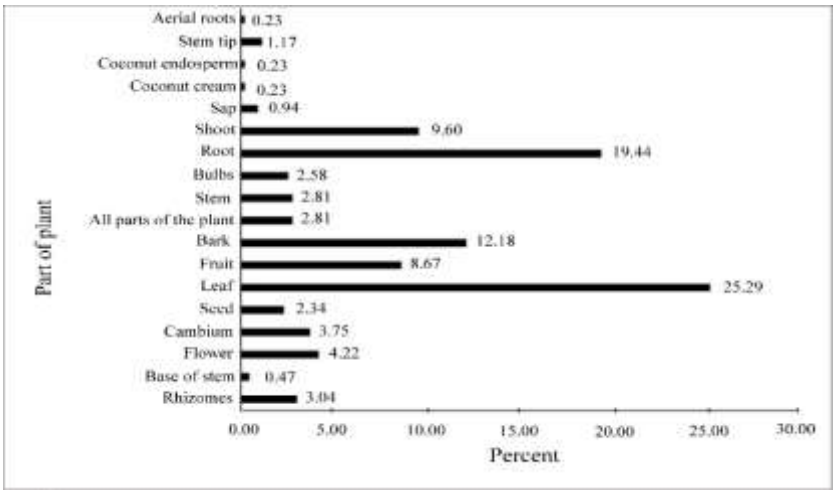

Figure 1. Plant Parts Used as Medicinal Ingredients in *Usada Rare*
(Source: Primary Data)

Numerous studies have highlighted that leaves are among the most frequently used parts for medicinal purposes. For instance, a study indicates that leaves serve as a dominant plant part in the treatment of a variety of diseases in the Eastern Himalayas, which emphasizes their therapeutic significance across cultures (Pala et al., 2019). Similarly, in a study conducted among the Marma community of Bangladesh, many traditional herbs use leaves due to their proven efficacy (Islam et al., 2021). Research on ethnobotanical practices in the Tengger community, Indonesia, also shows a similar pattern: leaves are the most commonly used part due to their ease of access and high content of secondary metabolites such as flavonoids, alkaloids, and terpenoids.

This content is closely related to pharmacological activities such as antioxidants, anti-inflammatories, and antibacterials, which are very relevant for the treatment of childhood diseases. The use of leaves is also considered more environmentally friendly because it does not cause plant death, thus supporting the principle of sustainability (Jadid et al., 2020). The second most commonly used part of the plant is the roots. The use of roots in traditional medicine is deeply embedded in various cultural practices worldwide. Roots are often valued for their bioactive constituents, which exhibit therapeutic properties beneficial for treating a wide range of ailments. One prominent example is the use of *Glycyrrhiza glabra* (licorice).

The roots of this plant are extensively used in traditional Chinese medicine for their anti-inflammatory and anti-ulcer properties, primarily due to glycyrrhetinic acid, an active compound extracted from the roots (Sun et al., 2019). This research shows that licorice roots serve not only as a sweetener but also as a critical ingredient in numerous medicinal formulations, making them integral to various therapeutic applications. The roots are employed to enhance the effectiveness of other herbal remedies and alleviate symptoms related to gastrointestinal issues, highlighting their dual role in both medicinal and culinary contexts.

The percentage of use of parts such as seeds (2.34%), flowers (4.22%), cambium (3.75%), and rhizomes (3.04%) shows the diversity of empirical knowledge that has been accumulated over the centuries by *usada* practitioners. Although the frequency is lower, these parts are still important. In many cultures, the cumulative expertise regarding the therapeutic benefits of these specific plant parts is crucial for addressing various health conditions, thus demonstrating their herbal efficacy despite lower overall usage rates (Pareek and Maheshwari, 2021; Kassa et al., 2020). Empirical knowledge surrounding herbal medicines often derives from extensive traditional practices, where different parts of plants are utilized based on historical significance, therapeutic properties, and cultural

beliefs (Utomo et al., 2022). Flowers are valuable for their medicinal properties; for instance, flowers of *Alpinia malaccensis* (Burm.f.) contain phytochemicals beneficial, such as antioxidants and antifungals, providing a bridge between traditional knowledge and scientific validation (Sethi et al., 2022).

3. Relevance to Modern Healthcare

In the global discourse on ethnomedicine, traditional medical systems are increasingly recognized as dynamic and context-sensitive forms of healthcare, rather than static cultural remnants. The World Health Organization emphasizes that Traditional, Complementary, and Integrative Medicine (TCIM) plays a significant role in primary healthcare worldwide, particularly in culturally rooted communities and in child health contexts where holistic care is essential (WHO, 2019; WHO, 2025). Within this framework, *usada rare* can be positioned as a localized system of traditional pediatric medicine that aligns with global efforts to promote people-centred and culturally responsive healthcare.

This study demonstrates that *usada rare* embodies a coherent medical structure, integrating symptom-based diagnosis (*tatenger*), plant-based remedies, preparation methods, and ritual elements (Sugata et al., 2025). Such characteristics correspond with ethnomedical principles that conceptualize health as an interaction between biological, psychological, social, and spiritual dimensions (Kirmayer, 2012). In modern pediatric care, these dimensions are increasingly acknowledged, particularly in family-centred and psychosocially informed approaches to child health.

The relevance of *usada rare* to contemporary healthcare is further strengthened through systematic documentation of phytonyms and medicinal plant usage (*Appendix* 1). One of the main barriers to integrating traditional medicine into formal health systems is the lack of standardized and verifiable documentation regarding plant identity, preparation, and indication (Wang et al., 2025). By translating manuscript-based knowledge into structured ethnobotanical data, this study contributes to transforming *usada rare* into evidence-ready knowledge that can support further ethnopharmacological and safety-oriented research.

The analysis of phytonyms recorded in *usada rare* manuscripts demonstrates that plant names constitute a fundamental component of Balinese traditional medical knowledge, particularly in the context of pediatric healthcare. In *usada rare* phytonyms function not merely as vernacular labels for plants but as accumulated empirical experience, cultural meaning, and therapeutic knowledge transmitted through manuscript traditions (Muderawan et al., 2020). This finding is consistent with ethnobotanical theory, which emphasizes that local plant nomenclature reflects how communities conceptualize, categorize, and utilize biological resources based on lived experience rather than formal botanical taxonomy (Berlin, 1992).

The phytonyms identified in *usada rare* are closely tied to the local ecological and cultural landscape of Bali, indicating that the traditional medical system developed in direct interaction with its surrounding environment. Such contextualized naming systems are widely recognized as key indicators of resilient and sustainable ethnomedical traditions, as they encode information about plant function, availability, and cultural significance (Yuan et al., 2016). In this sense, *usada rare* manuscripts serve as important textual archives preserving localized ethnobotanical knowledge that might otherwise be lost through oral transmission alone.

Moreover, phytonyms in *usada rare* act as a critical bridge between manuscript-based knowledge and contemporary healing practices. Many plant names documented in the manuscripts remain in use among practicing *pengusada*, although variations and

ambiguities in plant identification persist. Similar dynamics have been reported in other manuscript-based medical traditions, where written sources both stabilize and transform ethnobotanical knowledge over time (Leonti, 2011). Recognizing and documenting these ambiguities is therefore essential to maintaining scientific rigor while respecting the complexity of traditional knowledge systems. Systematic analysis of phytonyms, from a broader perspective, contributes directly to strengthening the Balinese traditional medicine system. The World Health Organization identifies inadequate documentation as a major challenge in the recognition and integration of traditional medicine into national health systems.

By clarifying plant identities and usage contexts within *usada rare*, phytonym studies provide a textual and ethnobotanical baseline that supports knowledge preservation, cross-generational transmission, and future ethnopharmacological research (WHO, 2019). Mapping of traditional phytonyms to scientific botanical identities does not aim to replace indigenous naming systems but to facilitate dialogue between local knowledge and modern science. Ethnopharmacological literature emphasizes that such integrative approaches are essential for ensuring the safe, ethical, and culturally sensitive development of traditional medicine (Heinrich, 2014). In this regard, the study of phytonyms in *usada rare* strengthens Balinese traditional medicine by reinforcing its epistemological legitimacy while opening pathways for interdisciplinary research and sustainable healthcare development (Bodeker and Kronenberg, 2002; Bhagawan et al., 2023). The philosophical and spiritual dimension of the selection of plant parts is also important to note. In Balinese cosmology, the harmony between the elements of the body and the elements of nature is very well maintained.

Therefore, the selection of plant parts in usada is not only based on pharmacological functions, but also on symbolic value and conformity with the principle *of rwa bhineda* (duality), such as the selection of plant types that have hot or cold properties. Balinese people's knowledge of medicinal plants is also reflected in the classification of plant properties based on their characteristics, such as warm (hot), cold, and moderate (*dumalada*) properties. These properties are associated with the physical properties of the plant, especially those that come from its sap. For example, plants with sticky reddish-white or red sap are considered hot, plants with greenish-white sap have moderate properties (*dumalada*), while plants with greenish-black or blue sap are considered cold (Arsana, 2019).

Overall, the integration of *usada rare* into global ethnomedicine discourse illustrates how traditional pediatric medical systems can contribute meaningfully to culturally sensitive and holistic healthcare models. *Usada rare* can be understood as a structured, holistic, and culturally embedded pediatric medical system that integrates ethnobotanical knowledge, therapeutic practices, and spiritual principles into a unified conceptual framework. *usada rare* provides complementary knowledge that enhances preventive care, psychosocial support, and ecological awareness. With rigorous documentation and interdisciplinary research, *usada rare* may serve as a viable model for the responsible integration of local medical knowledge into contemporary child healthcare.

Conclusion

The study demonstrates that *usada rare* constitutes a structured system of Balinese traditional pediatric medicine, grounded in the balance of spiritual, ecological, and bodily dimensions. The documentation of 275 plant species across 81 families, with leaves as the most frequently used plant part, reflects a well-developed pharmacopeia shaped by experiential and environmental knowledge. The diversity of phytonyms

recorded in the manuscript indicates a complex local classification system that links therapeutic practice with cultural and ecological contexts. At the same time, the presence of compound and partially unidentified phytonyms, such as *triketuka* and *sindrong*, highlights the dynamic nature of traditional medical knowledge and the need for further ethnobotanical and philological studies. Overall, *usada rare* provides an empirical foundation for integrating local medical knowledge with contemporary, culturally sensitive approaches to child healthcare. The study also strengthens Balinese traditional medicine by reinforcing its epistemological legitimacy while opening pathways for interdisciplinary research and sustainable healthcare development.

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