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Voucher Specimens as a Tool to Documenting Traditional Knowledge Medicinal Plants of Jakun People in Endau-Rompin (PETA)

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Abstract: The objective of this research was to document traditional knowledge of Jakun people on medicinal plants by using voucher specimens as a tools. The plants were collected together with biological information as well as how the plants were used. The collected plants than were pressed and dried in the oven. After that, the plants were mounted onto acid-free card and deposited in UTHM repository. A total of 28 plant specimens collected from 2014-2015 and deposited at UTHM were examined. Scientific name, local name, growth form, local use, part used, place of collection, year of collection and herbarium accession number of each species were recorded. A total of 26 species of medicinal plants were documented in this study. Total 26 genera and 24 botanical families were presented indicating that the medicinal plants were much diversified taxonomically. Most of the plants were taken orally by drinking the decoction. The results obtained in this research work indicates that by using a voucher specimens, one can know better about medicinal plants that been used by Jakun people in their daily live. Future investigation and proper documentation need to be done in order to preserve their knowledge from erosion.

Key words: Voucher specimen, traditional knowledge, Jakun people, medicinal plants, UTHM

INTRODUCTION

Documentation of medicinal plants for ethnic minority is very demanding. Their valuable knowledge on ethno botany might be lost forever if it is unrecorded. Dried pressed plant specimens called herbaria and their associated collections data, ancillary collections (e.g., photographs) and library materials are remarkable and irreplaceable sources of information about plants and the world they inhabit. They provide the comparative material that is essential for studies in various field such as taxonomy, systematics, ecology, ethno botany, morphology, conservation biology, biodiversity and anatomy as well as being used for teaching and by the public. According to the updated Website of Index Herbariorum (Holmgren and Holmgren, 1998) there are 3240 herbaria in the world with estimated 350,000,000 specimens that went on documenting the earth's vegetation for the past 400 years. Herbaria and flora document a wealth of plant use information and proper investigation of the data and specimens can be used to develop a preliminary list about the use, distribution and conservation status of plants.

Worldwide well developed herbaria and flora are rich sources of ethnobotanical information accumulated over many years. However, among these millions of herbarium specimens only few percent are inventoried for conservation purposes (Krupnick *et al*., 2009). Herbarium data have many function. To name few, it were used to detection of extinction threats and measuring species decline (Ungricht *et al*., 2005, Case *et al*., 2007), define conservation priorities (MacDougall *et al*., 1998), estimation of temporal frequency changes (Hedenas *et al*., 2002); identifying areas of occupancy (Hernandez and Navaro, 2007) and determining threat categories and threatened species (Krupnick *et al*., 2009; Dolan *et al*., 2011; Rivers *et al*., 2011). Herbarium specimens and floras for recorded local plant use information can be used as a basis to conserve the living cultural knowledge between communities and the environment which is also essential

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in biological conservation (Cotton, 1996). According to Roberts *et al.* (2005), herbarium specimens can be used as a tool for biodiversity monitoring, identification of red list species and other conservation priorities and as a source of genetic materials for the improvement of cultivated stock. Moreover, proper documentation and application of ethnobotanical inventories leads to strengthened cultural diversity, conservation and greater sustainable utilization of plant resources.

Documentation of forest related medicinal plants is important for developing countries. Malaysia, one of the 17 mega-diverse countries in the world have been used by about 3.4 million indigenous peoples and local communities in Malaysia (Sobrevila, 2008) for a long time. Documentation of medicinal plants for ethnic minority is demanding as uses of these forest medicinal plants and resources are still important among the indigineous and local communities.

Jakun or also called Orang Hulu is the dominant population of indigenous people in Johor. They have strong knowledge about the medicinal uses of medicinal plants in their surroundings. The first documentation work about medicinal plants used by the Jakun community in Kampung Peta recorded 52 plants species used for minor common ailments (Taylor and Wong, 1987). However, due to the influence of modernization and socio-economic development most of this knowledge has not been documented and often neglected as the young generations rely on modern medicine in the treatment of illness and diseases. Their valuable knowledge on ethnobotany might be lost forever if it is unrecorded.

MATERIALS AND METHODS

Materials: A total of 28 plant specimens collected from 2014-2015 and deposited at UTHM were examined. Scientific name, local name, growth form, local use, part used, place of collection, year of collection and herbarium accession number of each species were recorded.

Data collection: Approval from Department of Orang Asli Development (JAKOA) under the Malaysia Ministry of Rural and Regional Development was acquired. Plants were collected under a permit approved by Johor National Parks Corporation (JNPC). Written Prior Informed Consent (PIC) was obtained and Access and Benefit Sharing (ABS) was explained during data collection. Participation of informants was dependent on their self-willingness and acceptance of the terms in PIC and ABS which were specially developed for this research program. Key informants were recruited using snowball sampling method following method used by Fatimah *et al.* (2016).

Preparing voucher specimens: The objective of pressing plants is to extract moisture in the shortest period of time, while preserving the morphological integrity of the plant and yield material that can be readily mounted on herbarium paper (acid-free cardstock) for long-term storage. Specimens collected were pressed using a plant press which of a wooden frame (for rigidity), corrugated cardboard ventilators (to allow air to flow through the press), blotter paper (to absorb moisture) and newspaper (to contain the plant material). The plant press is tightened using straps with buckles.

In order to fit on a standard herbarium sheet a plant specimen should be pressed flat to no >11×16 inches. Any specimen that not fit to that size may be folded or cut into sections. Multiple of smaller plants may be pressed together in order to provide ample material for mounting and study. Small loose pieces such as seeds, may need to be placed in a small paper packet inside of the newspaper. Large fruits or bulbs are often cut in half lengthwise or in slices prior to pressing.

Each specimen should consist of a stem with attached leaves and if it all possible, flowers and/or fruits. The roots of herbaceous plants should be included. The plant press must be kept tight to prevent shrinkage and wrinkling of the plant material and resulting in specimens that are easier to mount securely on herbarium paper. The pressed plants must also be thoroughly dried prior to storage and mounting.

After drying process, the specimen and its label are laid out on the paper to allow maximum observation of diagnostic features as well as the range of variation in vegetative structures, including both sides of the leaves. Plants are positioned in a life-like arrangement. When laying out the plant a space for the specimen label, annotation labels and Institutional accession seal was leave on the sheet. A paper envelope or packet also be attached to the sheet to contain any fragments of the specimen that break off over time. Glue is used sparingly to attach the larger portions of the plant such as stems, large leaves and fruits. Gummed linen mounting strips were applied to reinforce portions of the plant that might be torn loose as the specimen is used. Large or bulky items were sewn onto the sheet with a sturdy linen thread.

RESULTS AND DISCUSSION

The ethnomedical knowledge about the plants was summarized in Table 1. A total of 26 species of medicinal plants were documented in this study. From Table 1, 26 genera and 24 botanical families were presented indicating that the medicinal plants were much diversified taxonomically. Most of the plants were taken orally by drinking the decoction and some were eaten raw.

Table 1: List of voucher specimen collected for medicinal plants used by Jakun People in Endau-Rompin (PETA)

Botanical information	Application	Part used	Method of preparation	Ways of administrations
Labisia pumila Benth Kacip Fatimah Myrsinaceae	Post-partum recovery (Induce uterus shrinking) fertility and health tonic	Root	Decoction in water	Oral: drink
Rourea mimosoides (Vahl) planch pengesepconnarceae	Post-partum recoveryHealth tonic	Root	Decoction in water	Oral: drink
Microcarpus xanthopus kulat kelentit kering (3k) polyporaceae	Post-partum recovery (induce uterus shrinking)	Fruiting body	Decoction in water (with *L. pumila* and *C. palala*)	Oral: drink
Helminthostachys zeylanica (L.) Hook Paku Tunjuk Langit	Post-partum recovery for beauty purposes	Root flower	Decoction in water raw	Oral: drink topical; applied to skin
Ixonanthes icosandra Jack Pepagar Iconanthaceae	Induce fertility	Root	Decoction in water	Oral: drink
Melastoma sp. Sekenduduk putih Melastomaceae	Post-partum recovery Internal body pain	Leaves flower	Decoction in water raw	Oral: drink eaten raw
Elaeocarpus ferrugineus (Jack) Tampoi burung Elaeocarpaceae	Diarrhea	Stem bark	Decoction in water	Oral: drink
Eurycoma longifolia Jack Tongkat ali putih Simaroubaceae	Dizziness, joint pain, fever, tiredness	Roots	Decoction in water	Oral: drink
Compnosperma auriculatum Habong Anacardiaceae	Dizziness, vomiting	Roots, leaves	Decoction in water raw	Oral: drink eaten raw
Hodgsonia macrocarpa Akar terua Cucurbitaceae	Fever, rigors	Plant sap	Drink directly	Oral: drink
Saprosma carymbrosa Sekentut Rubiaceae	Headache, dizziness	Leaves	Raw	Eaten raw
Tacca integrifolia Pelemah urat Taccaceae	Joint pain, muscle ache, knee pain, swollen, sprain	Leaves	Warm up the leaves on both side and put on affected area	External use only
Tetracera macrophyla Hempelas Dilleniaceae	Fever, rigors	Plant sap	Drink directly once cut	Oral: drink
Rennelia elliptica Sengilur Rubiaceae	Weak body, jaundice, tiredness, facilitate childbirth	Root	Decoction in water	Oral: drink
Strychnos ignatii Berg. Akar Ipoh Loganiaceae	Fever, rheumatism	Stem	Decoction in water	Oral: drink
Calamus scipionum Lour Rotan semambu Arecaceae	Fever	Stem	Sap collected	Oral: drink
Musa gracilis Holttum Pisang sum Musaceae	Cough	Stem, flower	Sap collected	Oral: drink applied on tongue
Thottea praetermissa T.L. Yao Perut Keletong Aristolochiaceae	Cough. cough with sputum	Root	Decoction in water raw	Oral: drink eaten raw
Scaphium macropodum (Miq.) Beumee ex. Heyne Kembang semangkuk Sterculiaceae	Fever (high)	Seed	Infusion in water	Oral: drink mucilage eaten
Polyathia bullata King Tongkat Ali Hitam Annonaceae	Fatigue	Root	Decoction in water	Oral: drink
Dipterocarpus sublamellatus Foxw. Keruing air Dipterocarpaceae	TB	Stem bark	Decoction in water decoction in oil	Oral: drink topical: Massage oil for bathing
Molineria latifolia (Dryand.) Herb ex. Kurz var. latifolia Lemba Hypoxidaceae	Loss of appetite	Fruit	Raw	Eaten raw
Rhodamnia cinerea Jack Pelongot Myrtaceae	Fever, fatigue, tiredness	Plant sap	Sap collected	Oral: drink
Nepenthes ampullaria Jack Sentoyot Nepenthaceae	Asthma, rheumatism	Root	Decoction in water	Oral: drink
Leptaspis urceolata (Roxb.) R. Br.Lapun puyuh Poacceae	Asthma. Cough with sputum	Root	Decoction in water	Oral: drink
Macaranga gigantean (Rhcb. F and Zoll) M.A.Tudung Euphorbiaceae	Cough	Stem	Sap collected	Oral: applied on tongue

Figure 1 shows some of the voucher specimens that had been deposited to UTHM repository. Voucher specimens of medicinal plants recorded were collected and plant identification was verified by experts from the Forest Research Institute Malaysia (FRIM).

From study done by Fatimah *et al*. (2016) the significant uses of the climbers in the Jakun ethnomedical knowledge showed a substantial relationship between traditional knowledge and plant conservation. Climbers play an essential role as remedial resource to the local community. At the same time, climbers also are greatly dependent on large trees to grow and survive (Kammesheidt *et al*., 2009). Uncontrolled logging and deforestation could cause threats to the species of climbers and eventually erode local knowledge about medicinal plants (Acharya and Rai, 2011). Therefore, not only is documenting ethnomedical knowledge of plants an inventory but it also contributes to the issue of

Fig. 1: Continue

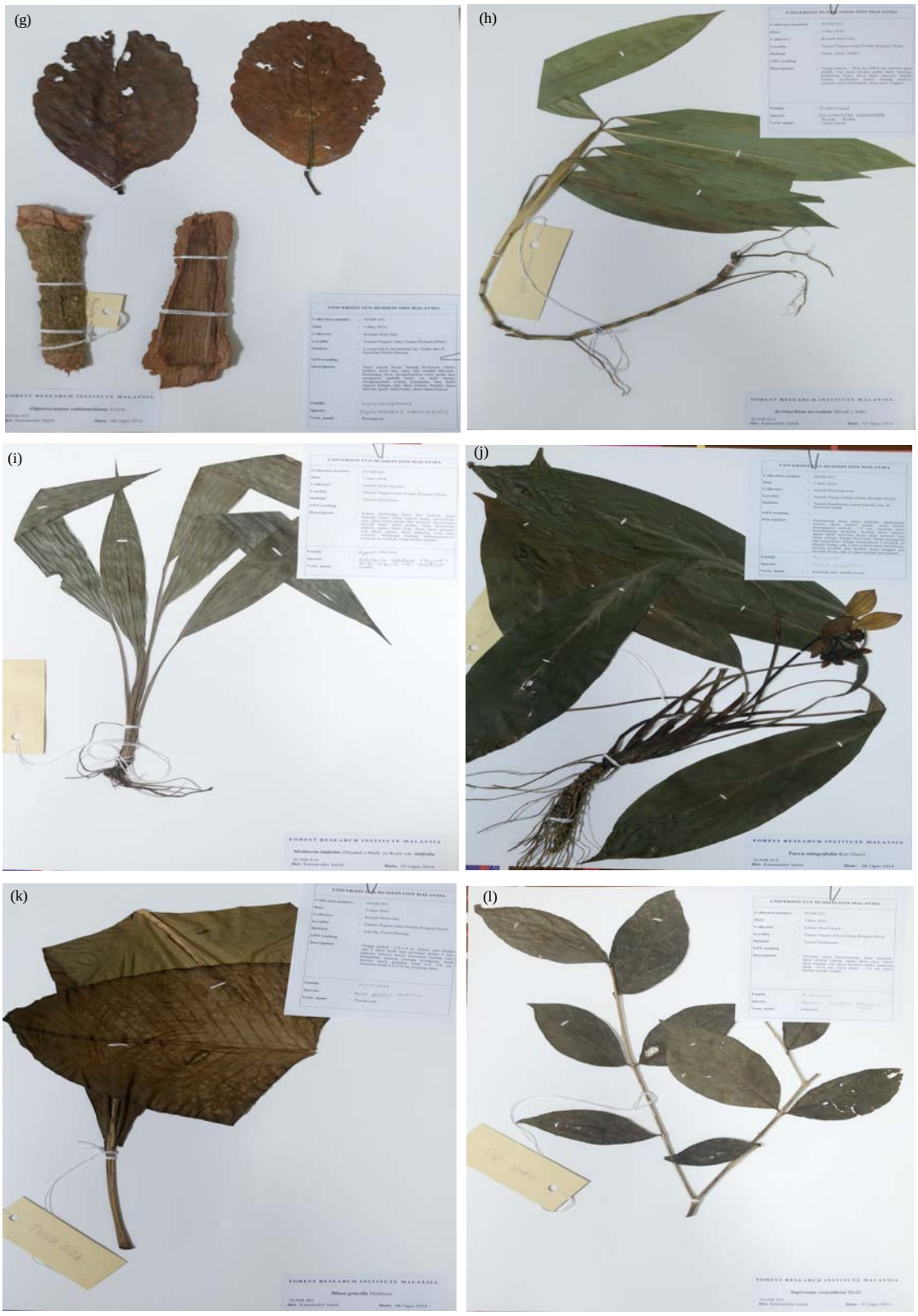

Fig. 1: Continue

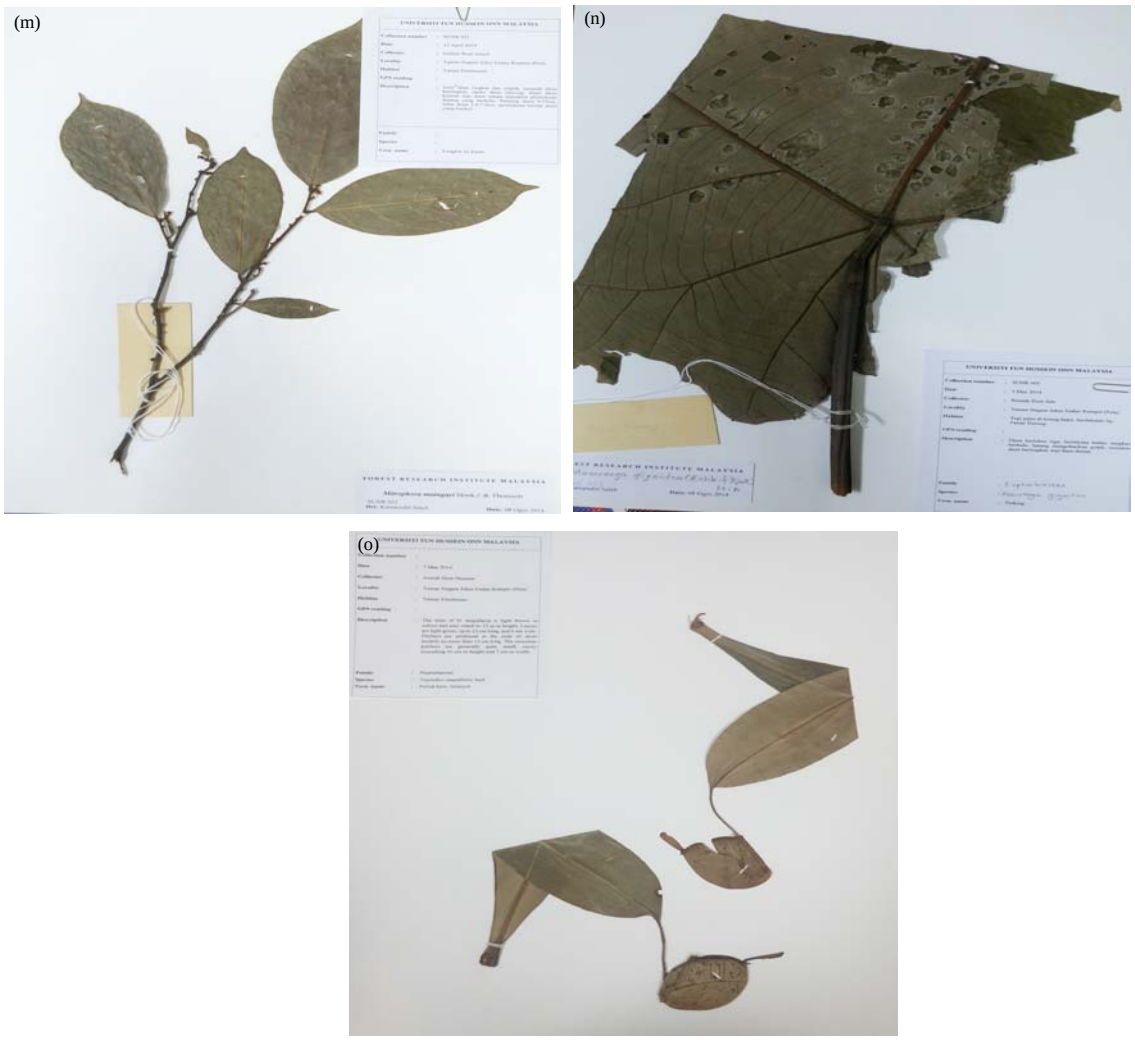

Fig. 1: Some of the voucher specimens for medicinal plants used by Jakun people in Endau-Rompin (PETA): a) *Microcarpus xanthopus*; b) *Labisia pumila* Benth; c) *Eurycoma longifolia* Jack; d) *Compnosperma auriculatum*; e) *Tetracera macrophyla*; f) *Scaphium macropodum* (Miq.) Beumee ex. Heyne; g) *Dipterocarpus sublamellatus* Foxw; h) *Leptaspis urceolata* (Roxb.) R. Br; I) *Molineria latifolia* (Dryand.) Herb ex. Kurz var. latifolia; j) *Tacca integrifolia*; k)Musa gracilis Holttum; l) *Saprosma carymbrosa*; m) *Polyathia bullata* king; n) *Macaranga gigantean* (Rhcb and Zoll) M.A; o) *Nepenthes ampullaria* Jack

biodiversity conservation threats such as unsustainable overexploitation, habitat modification and deforestation. It is interesting to note that Jakun's ethnomedical knowledge reflected their thoughtful conservation efforts and respects towards nature. Even it is a small community, there are variations in the traditional practices of medicinal plants as used by the Jakun people.

During present study, it was found that the knowledge about utilization of medicinal plant species is generally accumulated by observation and experiences and transferred orally to the next generation without any systematic process. However, it is certain that such knowledge system is at the risk of fading in the future (Cox, 2000). Lack of interest from the youth is one of the main concerns among the elderly. The young generation of Jakun shows less attention and are not keen on learning their traditional knowledge from the elder generation. Assimilation to modern lifestyle by the young generation most probably contributes to the huge impact on transfer of knowledge. At the time, this study was conducted in 2013, the community in Kampung Peta had already gained access to modern medical treatment that was frequently used. Moreover, it takes only two hours by car or motorcycle from the village to Mersing Hospital,

where doctors are available (Fatimah *et al*., 2016). The elder generation uses traditional herbal medicine as the primary source of healthcare while the younger generation uses traditional herbal medicine as the alternative source of healthcare if the modern medicine seems not effective. Consequently, all of these lessen the exposure to ethnomedical knowledge as a source of remedies (Khuankaew *et al*., 2014). Despite, the challenges in transferring the knowledge having a family and being a parent lead to the awareness in learning about traditional herbal medicine. Medicinal plants have traditionally been used at home to treat family sickness. In this case, women have particular roles in transferring the ethnomedical knowledge in their capacities as mothers (Fassil, 2003). Even Jakun women still rely on the medicinal plants to treat women's disorder.This indicates the rich traditional knowledge that they possess which passed down by their ancestors to the younger generations. This also needs for further scientific validations as one claim is said to be effective as the other. Members of the Jakun community were born and raised in the area and had lived there for most of their lives. However, as the young generations attend school and obtain employment outside their local community, the reliance to traditional practices has been significantly declining. Hence, there is an immediate need to document this valuable traditional knowledge to prevent it from being forgotten. The possible impact of not documenting this herbal remedies or not passing it on to the young generations would eventually lead to this beautiful knowledge being lost forever and also lost opportunity for future drug discovery.

CONCLUSION

Jakun's ethnomedical knowledge needs to be conserved as the larger percentage of the traditional practitioners is older generation and some of the knowledge was apparently eroded in this study. Future investigation and proper documentation need to be done in order to preserve their knowledge from erosion and voucher specimens can definitely be one of the tools to document the knowledge for future references.

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