

# Animals ethnozoology as traditional medicine in the Dayak Tamambaloh Tribe, Labian Ira'ang Village, Kapuas Hulu District, Indonesia

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**Abstract.** Supiandi MI, Syafruddin D, Gandasari A, Mahanal S, Zubaidah S. 2023. *Animals ethnozoology as traditional medicine in the Dayak Tamambaloh Tribe, Labian Ira'ang Village, Kapuas Hulu District, Indonesia. Biodiversitas 24: 26-33.* The Dayak Tamambaloh community in Labian Ira'ang Village, Kapuas Hulu District, Indonesia, is a community that has traditional knowledge of the use of fauna. However, at this time this knowledge has been reduced or relegated by the times and the use of animals and has never had a written document. This study aimed to obtain the types of animals used by the Dayak Tamambaloh people for treatment. The method used was a survey. Data was collected through literature studies, semi-structured interviews, and field observations. Data on using animals as traditional medicine was obtained from main informants, key informants, and recommendation informants. Data analysis was descriptive and qualitative, including data collection, data reduction, data presentation, and conclusions. The results obtained 13 types of animals in 13 families that are used as traditional medicine by the Tamambaloh Dayak people. The types of animals used in traditional medicine were *wanyi* (*Apis cerana*), *asu* (*Canis lupus familiaris*), *kandalak* (*Channa striata*), *panang* (*Clarias* sp.), *bunsok* (*Gekko gecko*), *dingkawat* (*Hipposideros larvatus*), *lati loman* (*Lumbricus terrestris*), *tangkiling* (*Manis javanica*), *takiung* (*Sulcospira testudinaria*), *manuk* (*Gallus gallus domesticus*), *ular sawa* (*Malayopython reticulatus*), *lundung* (*Monopterus albus*), and *beruang* (*Ursus thibetanus*). Animal families used as traditional medicine were Apidae (1 spesies), Canidae (1 spesies), Channidae (1 spesies), Clariidae (1 spesies), Gekkonidae (1 spesies), Hipposideridae (1 spesies), Lumbricidae (1 spesies), Manidae (1 spesies), Pachychilidae (1 spesies), Phasianidae (1 spesies), Pythonidae (1 spesies), Synbranchidae (1 spesies), and Ursidae (1 spesies). The Dayak Tamambaloh people use meat, bile, scales, shells, egg whites, wax, and all parts of animals for traditional medicine.

**Keywords:** Animals, Dayak, ethnozoology, medicinal, Tamambaloh, traditional

## INTRODUCTION

West Kalimantan has a forest area of 8,355,597 hectares (Mwangi et al. 2021) so it has very important and strategic resources and biodiversity for community survival (Nurchayani et al. 2019). West Kalimantan also has ethnic diversity with different social and cultural lives, resulting in various systems of knowledge about nature and the environment (Rizqi 2017). One of the sub-ethnics in West Kalimantan is the Dayak Tamambaloh Tribe in the village of Labian Ira'ang, Batang Lupar Sub-district, Kapuas Hulu District (Rike et al. 2018). The Dayak Tamambaloh people still maintain their customs and traditions of using animals as ingredients for traditional medicine.

All knowledge and traditions regarding using animals as ingredients for traditional medicine are a form of local wisdom of the Dayak Tamambaloh community. Local wisdom is a wealth of local cultural values that contain policies or views of life that shape humans to be wiser (Anggraini and Kusniarti 2015; Sibarani 2018). Local wisdom aims to strengthen human relations with nature, create emotional attachments and increase public awareness of the value and importance of protecting the

environment. Local wisdom will be eternal if people maintain and pass it on to the next generation (Tamalene et al. 2014).

Based on the deductions from previous research, several problems were identified that could threaten local wisdom in the Dayak community, including the Dayak Tamambaloh Tribe, including: (i) not having written documentation (Supiandi et al. 2019a,b; Hussain et al. 2022; Tahir et al. 2021), (ii) delivered orally from generation to generation (Fatima et al. 2019; Supiandi et al. 2019a,b; Lulekal et al. 2013; Nugroho et al. 2022), (iii) influenced by technological advances and foreign cultures (Kustiawan 2007), (iv) land clearing for the development of industrial forests, oil palm plantations, illegal logging, shifting fields to threaten the sustainability of germplasm, as well as existing rare and endemic species (Setyawan 2010).

To prevent the loss of local wisdom in the Dayak Tamambaloh community, we research on using animals as traditional medicine (ethnobiology). Ethnobiology is the study of biological knowledge about certain groups of plants and animals and their relationship by considering ecological components (Sreedevi et al. 2013). Studies in ethnobiology relate to analyzing the use of plants and

animals and the study of local people's perceptions of managing biological resources and the environment (Hurrell and Albuquerque 2012). Ethnobiology studies and gives value to traditional community knowledge systems in utilizing biological natural resources in the surrounding environment as a form of biodiversity and cultural conservation (Vandebroek et al. 2020). Ethnobiology focuses on the list of useful and important natural resources (Santoro et al. 2018). The important role of ethnobiological studies in local communities relates to wise local knowledge that forms the basis for conservation activities (Al Muhdhar et al. 2019).

Ethnobiological studies on the Dayak Tamambaloh community were conducted to determine local knowledge of utilizing animals as ingredients in traditional medicine. The knowledge includes knowledge of various types of animals, the parts of animals used, how to use them, and the uses/efficacy of animals used for traditional medicine. This strategic step is taken to preserve natural resources so that they do not become extinct. In addition, local knowledge and wisdom are important assets in protecting biodiversity knowledge and traditional practices applied by the indigenous Dayak Tamambaloh people are also the keys to preventing the destruction of biodiversity and realizing sustainable development. Ethnobiological data on the Dayak Tamambaloh community is used as the basis for writing articles related to animal ethnozoology in the Tamambaloh Dayak tribe so that they are available in the scientific literature.

The specific purpose of this study is to analyze and synthesize animals as traditional medicine in the

Tamambaloh Dayak community in Labian Ira'ang Village. The urgency of this research is: (i) documenting local knowledge so that it can be passed down from generation to generation so that it is not displaced by the presence of various kinds of drugs from modern medicine, and (ii) become the basis for appreciating remote tribes who think genius in preserving local wisdom which is then published in scientific journals.

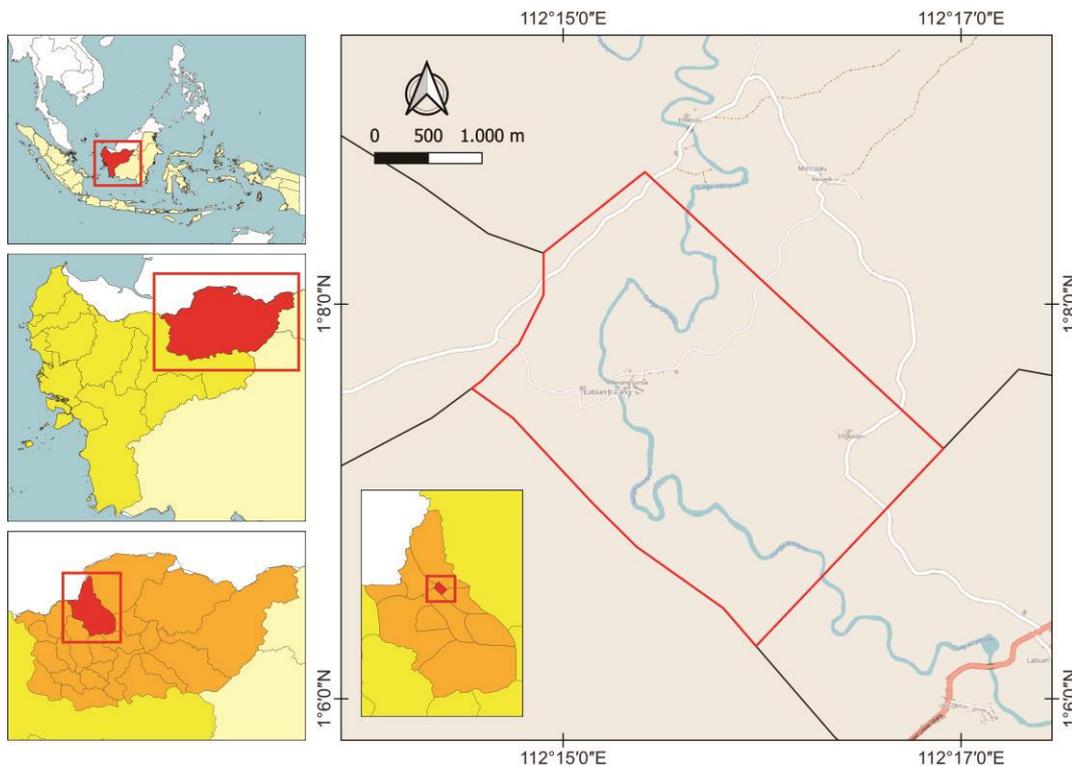
## MATERIALS AND METHODS

### Study area

Labian Ira'ang Village, Batang Lupar Sub-district, Kapuas Hulu District, West Kalimantan Province, Indonesia (Figure 1) is bordered by Mensiau Village (north), bordered by Setulang Village (eastern), bordered by Sungai Abau Village (south), bordered by Labian Village (west). The total area is 2,370 Ha. The total population is 455 people consisting of 242 men and 213 women. The community uses the lowlands for fields, vegetable gardens, and housing for residents. In addition, the highlands are used for rubber and fruit plantations.

### Data collection

This study used a descriptive qualitative approach. The qualitative descriptive approach aims to present facts about the use of animals as ingredients for traditional medicine in the Dayak Tamambaloh Tribe in a systematic and comprehensive and integrated manner. The method used is a survey.



**Figure 1.** Study area of Daya Tinombaloh ethnozoology in Labian Ira'ang Village, Batang Lupar Sub-district, Kapuas Hulu District, West Kalimantan Province, Indonesia

The survey method was used to assess the use of animals as ingredients for traditional medicine in the Dayak Tamambaloh Tribe which was oriented towards the involvement and active role of the community in research so that data were found that had a relationship with the research variables.

Data were collected through: (i) A literature study was conducted to obtain data and information regarding the general condition of the research location. (ii) Interviews were conducted in a semi-structured manner consisting of closed and open-ended questions to obtain data on using animals as traditional medicine. (iii) Field observations are carried out to obtain verification of animal species used by the community as traditional medicines.

Research data on animals as traditional medicine in the Dayak Tamambaloh community were obtained from main informants (traditional healers), key informants (customary leaders, Temanggung, and elders), and recommendation informants (people who know animals as traditional medicine). The main informants were determined by purposive sampling technique. Key informants and recommendations were determined using a snowball sampling technique, namely the selection of informants from the recommendations of previously selected informants. From the key informants, information is sought about the whereabouts of other informants.

### Data analysis

Data analysis used the descriptive qualitative method. Qualitative descriptive data analysis includes (i) data collection (animal data as traditional medicine), (ii) data reduction (grouping the data obtained according to the research objectives), (iii) data presentation (table), (iv) concluding (Supiandi et al. 2019a,b).

## RESULTS AND DISCUSSION

The results of interviews and field observations in the Dayak Tamambaloh community obtained 13 types of

animals used as traditional medicines which are presented in Table 1.

The Dayak Tamambaloh Tribe in Labian Ira'ang Village utilizes 13 animal families for traditional medicine. The family used for treatment are Apidae, Canidae, Channidae, Clariidae, Gekkonidae, Hipposideridae, Lumbricidae, Manidae, Pachychilidae, Phasianidae, Pythonidae, Synbranchidae, and Ursidae. The first family is Apidae. Animals from the Apidae family contain Protocatechuic Acid (PCA), hydroxyphenyl acetic, and cerumen compounds that function as antioxidants (Kakkar and Bais 2014). In addition, the Apidae family has hydrogen peroxide, flavonoids, phenolic compounds, and antibacterial peptides that act as antibacterials (Jalil et al. 2017). The second family is Canidae. Research results report that the Canidae family is used for medicine by the Batak Toba community (Rambey et al. 2020). The third family is Channidae. The Channidae family is rich in albumin and amino acids that are important for human health and have long been known as traditional medicine in accelerating the wound healing process (Muhajirah 2021).

The fourth family is Clariidae. Collado et al. (2022) reported that people in Pamplona, Cagayan, Philippines use animals from the family Clariidae as a source of medicine. The fifth family is Gekkonidae. The research results by Borah and Prasad (2017) report that people in Assam India use animals from the Gekkonidae family for traditional therapeutic purposes.

The sixth family is Hipposideridae. Tackett et al. (2022) reported that animals from the family Hipposideridae were used to treat diarrhea, male sexual nervous performance, digestion, and reproduction. The seventh family is Lumbricidae. The research results on the people of Kerala, India reported that the Lumbricidae family could heal wounds, chronic cough, diphtheria, and jaundice (Vijayakumar et al. 2015). The eighth family is Manidae. The results of the research by Supiandi et al. (2021) that the Dayak Iban people use animals from the Manidae family to treat internal injuries due to collisions or accidents.

**Table 1.** List of animals for traditional medicine in the Dayak Tamambaloh community, West Kalimantan, Indonesia

Family	Scientific name	Vernacular names	Parts used	Application	Disease
Apidae	<i>Apis cerana</i>	Wanyi	Candle	The candle is heated, pasted	Cracked feet
Canidae	<i>Canis lupus familiaris</i>	Asu	Meat	Make soup	Dengue fever
Channidae	<i>Channa striata</i>	Kandalak	All parts	Make a side dish	Post-surgery wounds
Clariidae	<i>Clarias</i> sp.	Panang	Bile	Bile dripping on the wart	Wart
Gekkonidae	<i>Gekko gecko</i>	Bunsok	Meat	Make a side dish	Cancer
Hipposideridae	<i>Hipposideros larvatus</i>	Dingkawat	All parts	Make a side dish	Asthma
Lumbricidae	<i>Lumbricus terrestris</i>	Lati Loman	All parts	Cleaned, roasted	Typhus
Manidae	<i>Manis javanica</i>	Tangkiling	Squama	Hanging as a necklace	Allergy
Pachychilidae	<i>Sulcospira testudinaria</i>	Takiung	Shell	Lime from the shell is smeared on the part that a venomous animal bites	Snake and scorpion bites
Phasianidae	<i>Gallus gallus domesticus</i>	Manuk	Egg whites	Boiled, egg white, rubbed all over the body	Have a cold
Pythonidae	<i>Malayopython reticulatus</i>	Ular Sawa	Bile	Drink right away	Internal disease due to bumps and falls
Synbranchidae	<i>Monopterus albus</i>	Lundung	All parts	Make a side dish	Asthma, prevent cancer
Ursidae	<i>Ursus thibetanus</i>	Beruang	Bile	Drink right away	Internal disease due to bumps and falls

The ninth family is Pachychilidae. Animals from the gastropod class (family Pachychilidae) are used to treat impotence and for better eye vision (Borah and Prasad 2017). The tenth family is the Phasianidae. Animals from the class Aves (family Phasianidae) are used to treat pneumonia (pneumonia) (Solanki et al. 2016). The eleventh family is Pythonidae. Animals from the reptile class (family Pythonidae) are used to treat malaria, dysentery, cholera, diarrhea, stomach, cough, and asthma (Solanki et al. 2016). The twelfth family is Synbranchidae. The Synbranchidae family is used for typhoid medicine by the Dayak Iban tribe (Supiandi et al. 2021). The thirteenth family is Ursidae. The Dayak Iban people use animals from the Ursidae family to treat internal wounds (Supiandi et al. 2021).

The Dayak Tamambaloh Tribe uses 13 types of animals as traditional medicine. The first animal is *Wanyi* (*Apis cerana*) to treat cracked feet. The results of previous research stated that *A. cerana* has antioxidant and antibacterial activities related to the qualitative and quantitative properties of phenols and flavonoids (Nayaka et al. 2020). *A. cerana* is a native bee species widely used for traditional honey production (Gratzer et al. 2019). Giving *A. cerana* honey prevents liver damage due to antioxidant properties and its ability to prevent oxidative stress (Zhao et al. 2017). In addition, *A. cerana* honey has been widely used for its antimicrobial properties in traditional Chinese medicine (Wang et al. 2021). The second animal is *Asu* (*Canis lupus familiaris*) to treat dengue fever. The results of previous research reported that *C. l. familiaris* was used as an asthma medication (Suaskara 2015). In addition, the meat of *C. l. familiaris* is believed to cure several diseases, namely lungkrah, lack of enthusiasm, and skin diseases. Furthermore, it is believed to cause morale and courage and increase sexual endurance (Sudardi 2011).

The third animal is *Kandalak* (*Channa striata*) to treat internal wounds after childbirth. The results of previous research reported that *C. striata* were used by the Dayak Iban community to treat postpartum wounds (Supiandi et al. 2021). In addition, *C. striata* is used as a postoperative wound medicine, malaria medicine, and typhus (Syafutra et al. 2021). The species has anti-inflammatory properties and high albumin levels, so it has been widely used to accelerate postoperative wound healing (Taslim et al. 2022). In addition, *C. striata* has antimicrobial and antinociceptive effects (Sahid et al. 2018; Ma'rufi et al. 2019). *C. striata* contains essential amino acids such as arginine, threonine, valine, methionine, isoleucine, leucine, phenylalanine, and lysine (Zakaria et al. 2006). The fourth animal is *Panang* (*Clarias* sp.) to treat warts. *Clarias* sp is an effective source of animal protein in increasing albumin levels in hemodialysis patients (Widiany and Astuti 2021). Fish (including *Clarias* sp.) play an important role in medicine because they contain vitamins A and D, calcium, phosphorus, lysine, sulfur, and amino acids (Ohene-Adjei et al. 2007).

The fifth animal is *Bunsok* (*Gekko gecko*) for cancer drugs. The results of previous research stated that *G. gecko* was used to treat shortness of breath and itching of the skin

(Zayadi et al. 2016). *G. gecko* is traditional Chinese medicine to relieve diabetes, asthma, skin diseases, and cancer (Li et al. 2004; Kongbuntad et al. 2016), and to treat respiratory disorders in Korea and Japan (Nam et al. 2022). The species is used to treat symptoms of asthma, tuberculosis, diabetes, and cancer (Bauer 2009). *G. gecko* has antioxidant, anticancer, antiangiogenic properties (Wang et al. 2014; Tang et al. 2015; Bhowmik et al. 2015; Cai et al. 2021), and contains melatonin (Habtemariam et al. 2017). The species exerts an antitumor effect (Jeong et al. 2012), and inhibits the proliferation of Bel-7402 cells (Wang et al. 2017).

The sixth animal is *Dingkawat* (*Hipposideros larvatus*) to treat asthma. The *H. larvatus* liver can be used for asthma medication (Prastikawati and Husain 2020). The species treats diseases such as dissolving bladder stones, curing eye leukemia, tumors, coughs, chronic coughs, toothaches, and diabetes (Emerson and Roark 2007). The feces of *H. larvatus* consists of chitin (Whitaker et al. 2004). Medical applications of chitin and chitin derivatives (chitosan) are antimicrobial, anti-inflammatory, antioxidant, anticancer, antidiabetic, immune effects, blood coagulation effects, neuroprotective activity, and wound healing (Khoushab and Yamabhai 2010; Sarmiento and Das Neves 2012). *H. larvatus* is used as a traditional medicine by people in India, China, Malaysia, Pakistan, and Nepal (Tuladhar-Douglas 2008; Riccucci 2012; Lavery 2017). *H. larvatus* has been used to treat 42 diseases of 11 human body systems in 37 countries and asthma is the most common disease, followed by kidney disease (Tackett et al. 2022). *H. larvatus* is used by people in Bangladesh to treat asthma, arthritis, and fever (Nahar et al. 2020) and to increase female fertility in Nigeria (Vora et al. 2014). Topical feathers of *H. larvatus* to treat burns, and consumption of cooked brains to improve children's intelligence (Paige et al. 2014). The body parts of *H. larvatus* used as medicine are meat, and fluids (blood, bile, and oil) (Tackett et al. 2022).

The seventh animal is *Lati loman* (*Lumbricus terrestris*) for typhoid medicine. The species can treat malaria and typhoid as a febrifuge (Pariyanto et al. 2022). *L. terrestris* has been used for alternative and traditional medicine (therapy) in China, Japan, and Korea (Cooper et al. 2012). The species exhibits inflammatory, oxidative, hematological, biochemical effects (Balamurugan et al. 2008; Balamurugan et al. 2009) and anticancer (Borah and Prasad 2017). *L. terrestris* can treat vocal cord infections, hemorrhoids, cancer, pneumonia, asthma, and epilepsy (Dinesh et al. 2013; Borah and Prasad 2017). The species has been used by the Sukuma in Busega in alternative medicine practices to treat impotence by drying mixed with paste and hot water and then drinking 2 spoons/day for 7 days (Vats and Thomas 2015). People in Northeast India use *L. terrestris* to treat malaria, burns, asthma, and animal/insect bites (Hussain and Tynsong 2021). The eighth animal is *Tangkiling* (*Manis javanica*) to treat allergies. The results of previous research reported that the Dayak Iban tribe used *M. javanica* as a traditional medicine to heal internal injuries due to collisions or accidents (Supiandi et al. 2021). The body parts (flesh, skin, and

scales) of *M. javanica* are believed to have traditional medicinal properties by the Chinese people (Zhou et al. 2014).

The ninth animal is *Takiung* (*Sulcospira testudinaria*) to treat snake bites and scorpions. The species has chitosan, which can be applied in sewage treatment, medicine, food processing, and biotechnology (Savant and Vivek 2000). In addition, chitosan can be used for detoxification (Lee 2004). The tenth animal is *Manuk* (*Gallus gallus domesticus*) for cold medicine. The results of previous research reported that *G. gallus domesticus* was used for defecation (Nukraheni et al. 2019). The species is used to treat impotence, cough, influenza, sore throat, sinusitis, swelling, tumors, and earache (Alves et al. 2012). In addition, *G. gallus domesticus* has the potential for wound healing, antirheumatic, antipyretic, anxiolytic, antidepressant, and anti-amnesia (Nadeem et al. 2021). The eleventh animal, *Ular sawa* (*Malayopython reticulatus*) treats internal ailments due to bumps and falls. The bile of *M. reticulatus* is used to treat skin pain (Syafutra et al. 2022). The species is believed to cure respiratory, digestive, skin, and musculoskeletal diseases (Mardiastuti et al. 2021). *M. reticulatus* is used to cure skin diseases, prickly heat, burns, allergies, boils, acne, eczema, remove black spots, impotence, diabetes, heart disease, asthma, blood pressure, reduce toxins in the body, and malaria fever (Zulkarnain et al. 2021). The bile of *M. reticulatus* contains bile acids, bile salts, proteins, antioxidants that have the potential to be anti-inflammatory and antibacterial, improve fitness, and treat digestive diseases (Zulkarnain et al. 2021).

The twelfth animal is *Lundung* (*Monopterus albus*) for treating asthma and preventing cancer. The species is believed by the community to increase endurance (Fitriana et al. 2022). *M. albus* can help reduce TNF- $\alpha$  expression and increase epidermal thickness in wounds (Hendrawan et al. 2020). The species has been reported to have bioactive properties such as antiproliferative, antibacterial, and antifungal (Atif et al. 2015). *M. albus* contains vitamins A, B1, B2, B6, C, D, docosahexaenoic acid, eicosapentaenoic acid, and protein (Sasonko et al. 2019). The species is rich in protein, amino acids, and fatty acids that are useful as nutrients to accelerate wound healing (Febriyenti et al. 2021). The thirteenth animal is *Beruang* (*Ursus thibetanus*) to treat internal ailments due to bumps and falls. The species bile is used to treat internal diseases due to falls, whether falling from a motorbike or a tree (Aprillia et al. 2020).

The Dayak Tamambaloh people in Labian Ira'ang use meat, bile, scales, shells, egg whites, wax, and all parts of animals as traditional medicine. People use these parts for traditional medicine because it has been passed down from generation to generation from their ancestors. According to Kumera et al. (2022), traditional medicine is a practice carried out by the community depending on locally available natural resources and indigenous knowledge since ancient times. The results of previous research reported that people in Northern Ethiopia use animal parts such as urine, bile, stomach, milk, whole animals, feces, pancreas, honey, meat, lips, blood, buttocks, and hair (Yirga et al. 2011).

This study concludes that using animals (fauna) for traditional medicine is indigenous knowledge in remote tribes that has been carried out since ancient times by the Dayak tribal community. The community's original knowledge of traditional medicine in remote tribes is obtained from the older generation who interact with each other with nature. Therefore, local knowledge of traditional medicine in remote tribes including the Dayak Tamambaloh Tribe in Labian Ira'ang, must to be maintained and preserved. The contribution of academics in preserving local knowledge of indigenous peoples in using animals as traditional medicine is by conducting research and publications.

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