Study of Ethnopharmaceutical Plants with Anti-Inflammatory Properties in Loa Lepu Village, Kutai Kartanegara

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Abstract
Medicinal plants is mostly used by tribes in Indonesia, one of them is the Loa Lepu Village community. Excavation of information on the use of medicinal plants can be done by using the ethnopharmaceutical method. This study was conducted to determine the use of plants as anti-inflammatory drugs, how to make them, how to use plants as anti-inflammatory drugs in Loa Lepu Village. Determination of informants in the Loa Lepu Village Community using the Snowball method and purposive sampling of 15 informants, followed by semi-structured interviews. The results obtained 15 types of medicinal plants used for anti-inflammatory by the people of Loa Lepu village which were divided into 10 families. The most widely used plant family was the Zingiberaceae family with 5 plants, namely ginger (Zingiber officinale Roscoe), laos (Alpinia galanga L. Willd), kencur (Kaempferia galanga L.), temulawak (Curcuma xanthorrhiza) and turmeric (Curcuma domestica). The most widely used plant parts are the leaves and rhizomes, then the method of use that is most often done is boiled

Keywords: ethnopharmacy, medicinal plants, anti-inflammatory, loa lepu village, Kutai Kertanegara

1. Introduction
Indonesia is a country with abundant natural resources. Indonesia is known as a country with very fertile soil and rich in biodiversity, stretching from Sabang to Marauke, some scattered natural resources, namely plants, animals and others. There are so many types of plants in Indonesia, including medicinal plants or herbs, either in the form of rhizomes, stems, leaves and other herbs [1]. The natural wealth that surrounds humans is very useful and has not been fully explored to be used or even developed. The potential of natural resources is very closely related to the lives of local people, meaning that the more abundant the existing produce, the more people's needs can be met, especially food and medicine [2]

The use of plants in the daily life of an ethnic group is called ethnopharmacy. Ethnopharmacy is part of the scope of pharmacy which includes the use of drugs and methods of treatment carried out by certain ethnic groups, the scope of ethnopharmacy itself is medicines and methods of treatment with natural ingredients. The ethnic community of an area has a unique culture and local wisdom according to their respective regions, which has an impact on the understanding of some ethnic communities about traditional medicine [3]. One area that still has traditional culture in terms of tradition, cuisine and medicines derived from natural ingredients is Loa Lepu village in Tenggarong Sebrang District, Kutai Kartanegara Regency, East Kalimantan. Loa Lepu village itself is one of 18 This village is located in Tenggarong Seberang District. The number of residents in the Loa Lepu sub-district is increasing from year to year, since 2019 which
The amount of people amounted to 1432 people. Most of the ethnic groups (tribes) of the Loa Lepu village community are Kutai customs and most of the livelihoods of the Loa Lepu villagers are farmers [24].

Loa Lepu Village has long used medicinal plants in their daily life, especially in medicine. However, there have not been many studies on the exploration of medicinal plants, especially medicinal plants that specifically treat one type of disease, such as plants that are most often used as anti-inflammatory by the people of Loa Lepu village.

Inflammation is a localized protective response elicited by tissue damage caused by physical trauma, damaging chemical substances, or microbiological substances. Inflammation serves to destroy, reduce, or localize (sekuster) both the damaging agent and the damaged tissue [25]. Signs of inflammation are swelling/edema, redness, heat, pain, and changes in function [4].

Anti-inflammatory drugs, both steroidal and non-steroidal, both have side effects, so many anti-inflammatory drugs have been developed from natural ingredients, especially herbal medicines that have anti-inflammatory properties. Given the many cases of inflammation or inflammation that occur in the Loa Lepu village community, it is important to observe herbal medicines that have the potential as anti-inflammatory in the Loa Lepu village community. However, a good and effective method is needed to obtain comprehensive data on medicinal plants that have the potential as anti-inflammatory in the Loa Lepu village community. Ethnopharmacy is a branch of science that is used to study the use of medicinal plants in a tribe [5].

Based on the description of the background above, research will be carried out in the village community of Loa Lepu, Kutai Kartanegara. In this study, a verification study and data completion of medicinal plants commonly used as anti-inflammatory drugs by the people of Loa Lepu Village, Kutai Kartanegara will be carried out. This study will provide a sequence of medicinal plants that are commonly or most often used for anti-inflammatory treatment.

2. Material and Methods

The data collection methods used in this study were semi-structured interviews and plant identification with the determination of respondents using the snowball method and purposive sampling, starting from the village head, then the village head would recommend the names of 15 respondents. Each respondent was asked to provide information about medicinal plants that have anti-inflammatory properties and how to process them, which have been used by the people of Loa Lepu Village. This research was conducted from January to February 2022, in Loa Lepu Village, Tenggarong Sebrang District, Kutai Kartanegara Regency. The work procedure starts from research preparation to data or result analysis which includes the following steps:

Preliminary Study

At this stage, a preliminary study was carried out which included an introduction to the research area, an approach to the residents of the research area by asking residents or elders who understand medicinal plants, as well as initial observations of informants about knowledge of the use of traditional medicines and the willingness of informants to become resource persons.

Preparation of Research Tools and Materials

The instruments used were interview guides (questionnaires), documentation tools (digital cameras and recording devices) and writing instruments. As for the materials to be used, namely all types of plants used as traditional medicines from Loa Lepu Village, Tenggarong Sebrang District, Kutai Kartanegara Regency.

Conducting Interviews for Responden

Interviews were conducted by interviewing informants who were identified based on initial observations. Interviews were conducted in a semi-structured manner using open-ended questions. Interviews with informants were conducted with open-ended questions, supported by a recording device, and a questionnaire filled out by the researcher. Open-ended questions describe the options available to the respondent to provide an answer. respondents provide answers or feedback that is free and open.

Observation

The observation method used is unstructured observation. Unstructured observations are observations that are not systematically prepared for what will be observed, only in the form of observations. The observation method was carried out by direct observation and recording or systematic data collection of medicinal plants used by the people of Loa Lepu Village, Tenggarong Sebrang District, Kutai Kartanegara Regency.
Documentation and Data collection

Collecting data in the form of photos on plant species obtained from the results of structured interviews. Documentation of plants belonging to the tree and shrub group can be taken on the part of the plant used as traditional medicine or take documentation at the location where it grows. Data collection was obtained through semi-structured interviews with informants who use plants as traditional medicine.

3. Results and Discussion

The Ethnopharmaceutical Study in Loa Lepu Village, Tenggarong Seberang District, Kutai Kartanegara Regency was carried out from December 2021 to January 2022, obtained a sample of 15 respondents from the snowball method and purposive sampling. The results that have been obtained from this study are respondent data, names of medicinal plants, diseases being treated, plant parts used as medicine and processing methods of medicinal plants that are known or used in daily life by the people of Loa Lepu village, Tenggarong Seberang district, Kutai Kartanegara Regency.

Loa Lepu Village is one of 18 villages located in Tenggarong Seberang District, Kutai Kartanegara Kingdom, East Kalimantan Province. This village has an area of 11.70 km² and has 6 RTs. The number of residents in the Loa Lepu sub-district is increasing from year to year, since 2019 totaling 1432 people consisting of 391 families (745 men and 687 women). Loa Lepu village is located ± 21 km from the capital of Tenggarong Seberang district, and most of the ethnic (tribes) of the Loa Lepu village community are Kutai, Dayak, ethnic (tribes) while the livelihoods of the residents of Loa Lepu village are mostly farmers [24].

From the results of interviews that have been conducted with 15 informants. Overall, 10 female informants in the 31-50 age group and 5 from 51-70 age group with the latest education ranging from elementary to university and the livelihoods of the Loa Lepu village community are mostly farmers. Based on the results of the interview, it was found that medicinal plants with anti-inflammatory properties were found around the yard and there were several plants found in the garden. Table 1 showed that 15 medicinal plants with anti-inflammatory potential in Loa Lepu village, such as ginger (Zingiber officinale Roscoe), turmeric (Curcuma domestica), kencur (Kaempferia galangel L.), temulawak (Curcuma xanthorrhiza Roxb), laos (Alpinia galangel L. Wild), moringa (Moringa oleifera), lidah buaya (Aloe vera L.), patah tulang (Euphorbia tirucalli), papaya (Carica papaya L), bay leaf (Syzygium polyanthum) , betel (Piper betle L.), beluntas (Pluchea indica L.), lime (Citrus hystrix DC) and jarak (Jatropha curcas L.).

As shown in Figure 1, there are 10 families of medicinal plants used by the loa lepu village, the highest family is Zingiberaceae, which consists of 5 plants, namely ginger (Zingiber officinale Roscoe), laos (Alpinia galangel L. Wild), kencur (Kaempferia galangel L.), temulawak (Curcuma xanthorrhiza Roxb) and turmeric (Curcuma domestica). The Zingiberaceae family is a family that has many medicinal properties and is widely used as food, spices, herbal medicines and beauty treatments [6]. This family contains many medicinal compounds such as phenols, aromatic compounds, oleoresins and flavonoids that play a role in healing diseases for example as anti-inflammatory (inflammation).

Table 1. Traditional medicinal plants used as anti-inflammatory in Loa Lepu Village

<table>
<thead>
<tr>
<th>No.</th>
<th>Local name</th>
<th>Scientific name</th>
<th>Family</th>
<th>Plant parts</th>
<th>Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Jahe</td>
<td>Zingiber officinale</td>
<td>Zingiberaceae</td>
<td>Rhizome</td>
<td>Boiled</td>
</tr>
<tr>
<td>2.</td>
<td>Kunyit</td>
<td>Curcuma domestica</td>
<td>Zingiberaceae</td>
<td>Rhizome</td>
<td>Boiled</td>
</tr>
<tr>
<td>3.</td>
<td>Kelor</td>
<td>Moringa oleifera</td>
<td>Moringaceae</td>
<td>Leaf</td>
<td>Boiled</td>
</tr>
<tr>
<td>4.</td>
<td>Lidah Buaya</td>
<td>Aloe vera L.</td>
<td>Xanthorrhoeaceae</td>
<td>Leaf</td>
<td>Smeread</td>
</tr>
<tr>
<td>5.</td>
<td>Patah Tulang</td>
<td>Euphorbia tirucalli</td>
<td>Euphorbiaceae</td>
<td>stem</td>
<td>Pounded</td>
</tr>
<tr>
<td>6.</td>
<td>Pepaya</td>
<td>Carica papaya L.</td>
<td>Caricaceae</td>
<td>Leaf</td>
<td>Boiled</td>
</tr>
<tr>
<td>7.</td>
<td>Salam</td>
<td>Syzygium polyanthum</td>
<td>Myrtaceae</td>
<td>Leaf</td>
<td>Boiled</td>
</tr>
<tr>
<td>8.</td>
<td>Sambiloto</td>
<td>Andrographis paniculata</td>
<td>Anancanthaceae</td>
<td>Leaf</td>
<td>Boiled</td>
</tr>
<tr>
<td>9.</td>
<td>Sirih</td>
<td>Piper betle L.</td>
<td>Piperaceae</td>
<td>Leaf</td>
<td>Pounded</td>
</tr>
<tr>
<td>10.</td>
<td>Temulawak</td>
<td>Curcuma xanthorrhiza</td>
<td>Zingiberaceae</td>
<td>Rhizome</td>
<td>Boiled</td>
</tr>
<tr>
<td>11.</td>
<td>Beluntas</td>
<td>Pluchea indica L.</td>
<td>Asteraceae</td>
<td>Leaf</td>
<td>Boiled</td>
</tr>
<tr>
<td>12.</td>
<td>Jeruk Nipis</td>
<td>Citrus hystrix DC</td>
<td>Rutaceae</td>
<td>Fruit</td>
<td>Smeread</td>
</tr>
<tr>
<td>13.</td>
<td>Jarak Pagar</td>
<td>Jatropha curcas L</td>
<td>Euphorbiaceae</td>
<td>Leaf</td>
<td>Boiled</td>
</tr>
<tr>
<td>14.</td>
<td>Kencur</td>
<td>Kaempferia galangel L.</td>
<td>Zingiberaceae</td>
<td>Rhizome</td>
<td>Boiled</td>
</tr>
<tr>
<td>15.</td>
<td>Laos</td>
<td>Alpinia galangel L. Wild.</td>
<td>Zingiberaceae</td>
<td>Rhizome</td>
<td>Boiled</td>
</tr>
</tbody>
</table>

Source: Data research (2022)
Loa Lepu Village utilizes several parts of the plant for treatment such as rhizomes, leaves, stems and fruit. It can be seen in Figure 2. The part of the plant that is widely used in Loa Lepu village is 53% leaves. According to the village community, Loa Lepu leaves are plant parts that are easy to find anywhere and do not cause significant damage to the plant Haziki and syamswisna 2021 besides that this part of the leaf plant is different from other plant parts such as fruit or flowers that depend on the plant [7], seasons other than that the use of leaves has a rapid regeneration process so that conservation does not have a major impact on the loss of plant sustainability in the forest

Based on the method of processing medicinal plants, there are 4 ways of processing medicinal plants by the people of Loa Lepu village which are carried out in a simple way, namely boiling, pounding, smearing and eating directly. It can be seen in Figure 3. The processing method that is mostly done by the people of the village of Loa Lepu is by boiling with a percentage of 73%. Previous research by Bana et al., 2016 the method of processing medicinal plants is mostly done by the Kaili Rai community in Taripa Village, Sindue District, Donggala Regency, Central Sulawesi, namely by boiling [8]. The processing is very effective for removing the active substances contained in these medicinal plants, besides being effective, processing by boiling is very easy and simple for the people of Loa Lepu village.
Some plants contain compounds that are known to be useful for treating anti-inflammatory properties such as Ginger (Zingiber officinale Roscoe) Based on research stated that ginger contains oleoresin, essential oils and flavonoids which have anti-inflammatory properties such as burns, etc. [9] According to research in Turmeric rhizome (Curcuma domestica Val.) contains curcumin which can be useful as an anti-inflammatory [10]. Kelor (Moringa oleifera) contain flavonoid compounds, saponins and polyphenols which are known to have anti-inflammatory activity [11]. Lidah buaya (Aloe vera L.) contains mycopolysaccharide compounds that function as anti-inflammatory, maintain wound moisture and play an important role in skin regeneration [12]. Patah tulang (Euphorbia tirucalli L.) contains flavonoid compounds, tannins and steroids which have anti-inflammatory properties [13]. Papaya (Carica papaya L.) contain anti-inflammatory properties, namely flavonoids, steroids, and tannins [14].

Bay leaves (Syzygium polyanthum (Wight) Wal) contain alkaloid compounds, flavonoids, saponins, tannins and essential oils consisting of citral and eugenol which have anti-inflammatory properties such as rheumatoid arthritis [15]. According to research, sambiloto (Andrographis paniculata) has anti-inflammatory activity because it contains andrographolide which has an anti-inflammatory effect by inhibiting the migration of inflammatory cells [16]. Sirih (Piper betle L.) contains flavonoid compounds, saponins and tannins that have anti-inflammatory activity [17].

Temulawak (Curcuma xanthorriza roxb) has anti-inflammatory properties, namely flavonoids, saponins, triterpenoids and essential oils [18]. According to research, the Beluntas plant (Pluchea indica L.). has anti-inflammatory properties, namely flavonoids, essential oils and tannins [19]. Lime plants (Citrus hystrix DC) contain high flavonoid compounds that can work as anti-inflammatory [20]. Jarak (Jatropha curcas L) contains saponins, flavonoid compounds including kaempferol, nikotoflorin, quercitin, astragalin, ricin and vitamin C. showed more than one hundred kinds of bioactivity, including antipyretic, analgesic and anti-inflammatory effects [21]. Kencur plant (Kaempferia galangal L.) has anti-inflammatory activity because it contains flavonoid compounds, saponins, and essential oils that can function as anti-inflammatory. Anti-inflammatory in kencur is a type of non-steroidal anti-inflammatory. Flavonoids can inhibit metabolic pathways arachidonic acid, prostaglandin formation and histamine release in inflammation [22]. The next plant that has anti-inflammatory activity is the Laos plant (Alpinia galangal L. Wild) which contains saponin and flavonoid compounds that work as anti-inflammatory [23].

Several plants for anti-inflammatory was used as a spices. Ethnomedicine sources provide general knowledge that we can apply and are easy to use as self-medication at home.

4. Conclusion

Ethnopharmaceutical studies of potential anti-inflammatory plants in Loa Lepu village, Kutai Kartanegara, it can be concluded that the medicinal plants used by the people of Loa Lepu village that have the potential as anti-inflammatory are 15 plants and grouped into 10 families. The highest use is found in the Zingiberaceae family. The most widely used plant parts are the leaves and the processing method that is mostly used by the Loa Lepu village community is by boiling.

5. Acknowledgment

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6. References


