Antimalarial Effect of Lemburung Meit (Clerodendrum Inerme Linn) Stew on Malarial Infections at Piru Health Center, West Seram District, Maluku

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Abstract. Antimalarial effect assay from Lemburung meit (Clerodendrum inerme) has been done. Plant have been used as a source of medicine it is commonly known as "lamburung meit" and All parts of the plants is used traditionally as malarial disease. This research was aimed to evaluate the toxicity and antimalarial activity of lamburung meit (Clerodendrum inerme) stew water. It was quasi experiment with clinical observation design and 30 patients using exclusion and inclusion criteria. The result showed that lamburung meit (Clerodendrum inerme Linn) stew water can reduce the density of malaria parasite from day 3 SGOT, SGPT, ureum and creatinine levels do not change after the used of material test. The findings indicated that lamburung meit (Clerodendrum inerme Linn) stew water exhibited potent antimalarial activities and does not cause toxicity effects on the liver and kidneys. Therefore, the compounds are potentially developed into novel antimalarial drugs.

1. Introduction

Malaria is a major global public health problem and is responsible for the death of over 1 million people annually, with more than 90% of cases found in sub-Saharan Africa and 35% in Indonesia. The increasing global spread of drug resistance to most of the available and affordable antimalarial drugs is a major concern and requires innovative strategies to combat. History shows that plants have been an important source of medicines against malaria with two of the major drugs used in malaria treatment, quinine and more recently artemisinin both having derived from traditional medicine and from plants. These two drugs are now the mainstay of the treatment of severe malaria worldwide and the artemisinin derivatives in combination with a second antimalarial drug are now at the heart of the World Health Organisation strategy to control malaria globally [1].

Traditional medicines are a potential rich source of new drugs against malaria and other infectious diseases and given the remarkable contribution this. The goal must be to develop safe and affordable new drug to counter the spread of malaria parasites that are resistant to exiting agent. Lemburung meit (Clerodendrum inerme), belonging to family Verbenaceae is very widely distributed in tropical and subtropical regions of the world and is comprised of small trees, shrubs and herbs. Ethno-medicinal importance of various species of Clerodendron genus has been reported in various indigenous systems of medicine and as folk medicines. Different parts of this plant are traditionally claimed to be used for the treatment of cough, skin rashes boils and fever. C. Inerme (L) belonging to family Verbenaceae is very widely distributed in tropical and subtropical regions of the world and is comprised of small trees, shrubs and herbs. C. inerme (L) is a sun-loving plant and a sunny spot should be chosen for it. The plant produces suckers and seeds. The plant has medicinal
properties [2,14,16]. People who are familiar with this plant use a poultice made of its leaves to suppress buboes and the leaf juice as an alternative. Leaves and roots of the plant are used in rheumatism and skin diseases. *C. Inerme* (L) is one such medicinal plant popularly known as “Sangkupi” in Hindi and “Peechangu” in Tamil. Different parts of the *C. Inerme* (L) plant products are used in the Ayurvedic medicine for the treatment of rheumatism, skin disease, venereal infections, berry and tumours. In India, these plants used to skin disease, *Elephantiasis and Asthma* [3,18,19].

Besides empirically, Lamburung Meit (*C. Inerme* (L)) is one of the sea plant from Piru West Seram Regency that usually used as a remedy for malaria. This research purpose is to observe the *Efficacy* of experiment substance about the slope of malaria parasite density for a medical patient without complication.

2. **Experimental**

2.1. **Research Type**
This type of research using Analytic Observational with Clinic Observation design.

2.2. **Time and Research Location**
This research is held in Piru Village, West Seram Regency, Maluku Province on July - December 2017. Lamburung meit (*C.Inerme* L) stew water were collected from Pengobat Tradisional at Tulehu village, the center of Maluku Regency, Indonesia because of the herbs by a traditional healer that have been widely used in society.

2.3. **Research Plan**
The population is positive malarial infections. Sample (research Subject) is the positive malarial infections without complications at Health centre in Piru West Seram District, Maluku Province.

2.4. **Method of selecting and estimating the subject size**
The research method is conducted to purposive the big subject of 50 people.

   a. **Inclusive criteria**
   - Attain the age of ≥ 12 years old
   - The sufferer of malarial positive with a blood smear.
   - Never consume OAM since 2 weeks ago.
   - Want to join in this research and follow the procedure.

   b. **Exclusive criteria**
   - The sufferer malaria of positive with complications.
   - Pregnancy and give suck.
   - There is interference of level, kidney, or heart disease.
   - Illness in serious condition.

c. **Collecting data**
   
   *Clinical*: The way to observation of clinical indication and laboratory result.

   *Laboratory*: Blood check-up being held in 6 times on day 0, 3, 7, 14 and 28 to the observation of species and density of *Plasmodium*. Furthermore, the SGOT and SGPT levels were an evaluation before and after administering the test ingredients.

2.5. **Analyzing data**
Data processing is doing with univariate, bivariate and multivariate
3. Results and Discussion

3.1. The characteristic of the research subject

This research is doing for 50 people in Piru village with the clinic indication aim to malaria disease. Appropriate result by Rapid Diagnostic Test and blood checkup with thick or thin is determining research subject that fills the inclusive criteria. Based on the gender with the age group shows that the sufferer of man or woman is different than the malarial infection is high infected in man. The age who infection by malaria parasite in Piru village there are group age of 26-40 years old (Fig. 1)

![Figure 1. The age who infection by malaria parasite in Piru village](image1)

Sufferer works are farmers, housewife, and carpenter. Next, the other group classification up to 40 years old, they are 7.14% Man and 14.29% Woman. Generally, the indication by the sufferers of the research subject is variations. Based on the 1st picture visible that clinical indication is starting with 71.4% fever, 71.4% fever with a tremble, 92.9% fever with a headache, 14.3% fever with queasy, 7.4% fever with fade and 14.3% fever with muscle pain. Forty of the 50 people were found positive for malaria parasites throughout the year. They showed a wide individual variation in the number of days positive for parasites. Only *P. vivax* and mix of *Plasmodium* were seen, where the highest percentage of malaria is found in respondents with jobs as farmers (Fig. 2)

![Figure 2. Malaria Sufferers based on the work of respondent](image2)

Microscopy examination of blood smears confirmed species and density of *Plasmodium on positive* people in Piru village. The result showed that the total of parasites from each patient was quite high that is 5.425 – 11.825/ul of blood. Usually, on day 3 the parasite was no longer found in the patient’s blood (contrary of *Plasmodium*) (Fig. 3).
Figure 3. The density of Plasmodium until day 28 of research subject

Figure 3 shows that on the third day the number of parasites in blood looks negative which is suspected due to the inhibition of active compounds in Lamburung meit that can inhibit the growth of parasites. There are two compounds in Lamburung Meit such as Flavonoid and Saponin [4]. Flavonoid appears pathologist effect to impede the growth of malaria parasite. This happens because the nutrition supply is disturbed. According to Hempelmann, the active compound from that plant will change the morphology of parasite ability to get nutrition and protein export to the cell membrane. The condition will make parasite is inflexible, Flavonoid activities supporting with Hidroksil (OH-) active compound rise. Vakuola or parasite food being more alkali, so vacuolar will decrease [5].

Herbal plants are extremely rich in phytochemicals. That is highly efficacious in the treatment of malaria. The compound there are sesquiterpenes and sesquiterpene lactone, chaconnes, flavanones, phenolics, quinones, coumarin and alkaloids. The flavonoid compound from Clerodendrum Inerme is inhibiting malaria parasite growth. This happens to decrease the parasitemia level. Decreasing the level of parasitemia, the smaller number of malaria parasites that infect the host erythrocyte cells in the erythrocytic phase. This will reduce the occurrence of reinfection namely schizont rupture which results in a new ring stage [6].

Furthermore, when reinfection appears common symptoms of malaria sufferers, namely heat and high fever. Besides, anaemia will occur because of the growth and maturation of parasites around 60-80% of Flavonoid haemoglobin can inhibit the growth of malaria parasites at effective doses; the impact also reduces the symptoms of the disease caused by the parasite can be minimized. Some flavonoids increase the level of oxidation of erythrocytes and inhibit protein synthesis in malaria parasites. Furthermore, flavonoids are believed to inhibit fatty acid biosynthesis (FAS II) in Plasmodium [7]. On the other hand, the effect of flavonoid antimalarial on haemoglobin degradation pathway by direct interaction between the hydroxyl groups. The precise mechanism by which this occurs in the parasite food vacuole is still uncertain but the other author suggested that dihydroartemisinin form of artemisinin exhibit hydroxyl group play a relevant role do react to ferrous haemoglobin and also seems to play a role in the antioxidant activity [8-9].

The development of traditional medicine into phytopharmaca and required several preclinic and clinical safety and efficacy testing stages. Besides, to scientific testing the pharmacological effects of these plants. Safety testing is also needed because many people assume that traditional medicines are safe for consumption and do not pose a risk to health, but fact can cause adverse effects if the products used in conjunction with other inappropriate drugs. Many species from the genus Clerodendrum were documented in ancient literature and have shown potent antimalarial, antimicrobial, anti-inflammatory activity and antidiabetic. Plant species such as C. indicum and C. inerme are used for the treatment of coughs, venereal infections, skin diseases, elephantiasis, rheumatism, tropical burns, vermifuge, febrifuge, malaria [10-13]. C. phlomidis, C. colebrookianum, C. calamitosum and C. trichotomum have been used for anti-diabetic, anti-hypertensive and sedative properties [14-19].
4. Conclusions

Boiled water of *Lamburung Meit (Clerodendrum Inerme)* Linn affects reducing the density of malarial parasite from parasitemia of 44.4% to negative on the third day.

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