



Anti-inflammatory effects test of ethanol extract of mistletoe leaves coffee *Scurrula ferruginea* (jack) danser with methods granuloma pouch

Dillasamola D.^{1*}, Dharma S.¹, Yufri Aldi¹, Isril Berd², A. Hadyan¹
and Biomechy Oktomali P.³

¹Faculty of Pharmacy Andalas University, West Sumatera, Indonesia

²Faculty of Agricultur Technology Andalas University, Indonesia

³Faculty of Medical Andalas University, West Sumatera, Indonesia

ABSTRACT

Scurrula ferruginea (Jack) Danser commonly found in tropical regions of Asian continent, belonging to the Family Loranthaceae. In Indonesia, this plant is used for the treatment of breast cancer. This study aims to determine the ability of the ethanol extract of the leaves *Scurrula ferruginea* (Jack) Danser in reducing inflammation volume that formed and to know the influence given to the total percentage of leukocytes in the blood. This study was conducted using male white mice 2-3 months old, as many as 30 individuals who were randomly divided into 6 groups; 1 control group, only given vaseline flava only; 4 dosage groups were given ethanol extract at a dose of 1 %, 2 %, 5 % and 10 %; 1 comparison group, given hydrocortisone acetate. The method used is a method of granuloma pouch, the inflammation was produced by subcutan injection of carragen on the backs of the mice. The results showed that the ethanol extract of *Scurrula ferruginea* (Jack) Danser can reduce the volume of edema on the backs of male white mice with $p < (0.05)$. Ethanol extract of *Scurrula ferruginea* (Jack) Danser's leaves dose 10 % had given the highest anti-inflammatory effects (58,55 %). Ethanol extract of *Scurrula ferruginea* (Jack) Danser also can influence the amount of leukocytes in the blood of male white mice. Percentage calculations of the amount of leukocytes from the blood of mice, neutrophils and monocyte cells increases while eosinophils and lymphocytes decreased with the concentration increases.

Keywords: Anti-inflammation, granuloma pouch methods, edema on the backs, total percentage of leukocytes.

INTRODUCTION

Inflammation is a process that occurs when the body is sick. Inflammation is the body's defense efforts to eliminate the cause of the injury [1]. Inflammation or inflammation is characterized by multiple symptoms are swelling (tumor), pain (dolor), heat (calor), and red (rubor), Galen adds a sign of inflammation fifth in the form of loss of function of organs inflamed [2]. Edema formed should be very disturbing patients in performing daily activities - day, because that was necessary to find treatment to lower or reduce edema in the form of alternative treatments such as drugs derived from plants.

From the several pharmacological studies conducted on different alcoholic extracts and fractions of the family Loranthaceae showed hypotensive effects, hypoglycemia, antihyperlipidemia, antioxidant, anti-inflammatory, antimicrobial [3]. One of the species of the family Loranthaceae frequently encountered by the public is a parasite

coffee. On the literature it is stated that the parasite leaves coffee contains compounds - compounds flavonoid quercetin, and rutin kuersitrin [4]. Testing phytochemical against the parasite leaves coffee have shown their components such as flavonoids and high concentrations of condensed tannins, flavonols three natural compounds have been isolated from ethyl acetate fraction of parasite and quercitrin coffee in addition to quercetin, a flavonol glycosides usual 4 -O-acetylquercitrin also be isolated [5].

MATERIALS AND METHODS

Tools

The tools used in this study is the syringe 5 mL, syringe 1 mL, surgical scissors (Yamaco Stainless), mortar and stamfer, spatula, scales, animal cages, drinking and eating animals, labels, glass tools (pipette, measuring cups, glass beaker, flask) (Iwaki Pyrex®), rotary evaporator and water bath, glass objects (Sail Brand), wipes, markers and the microscope (Zeiss).

Materials

The materials used are the leaves of mistletoe coffee *Scurrula ferruginea* (Jack) Danser, 70% ethanol (BRATACO Chemika), karagen, hydrocortisone acetate, petroleum jelly flava, oleum sesame (PT. BRATACO), cream fur thresher (Veet®).

Experimental animals

Experimental animals used were 30 white mice aged 2-3 months with a weight of approximately 20-40 g, healthy (have never experienced treatment of the drug).

Methods

The method used is a method of granuloma pouch, the inflammation was produced by subcutan injection of carragen on the backs of the mice [6].

Antiinflammatory activity test

Before being treated, all the mice were acclimatized for 7 days to familiarize the animals that are in the experimental environment, and fasted for approximately 18 hours.

Inducing of Edema (*Granuloma Pouch*)

- a. Mice were shaved fur backplate, with a shaved area of + 3 cm diameter, at 24 hours before treatment.
- b. On the back are shaved with air injected subcutaneously sebanhyak 5ml forming air pockets and at the same time also injected 0.1 mL karagen.
- c. After 24 hours of air pockets formed, sucked the air with 5 mL syringe, so that the air bag so deflated. Furthermore karagen added a solution of 0.5 mL in any place of the air bag.

Administration of test dosage forms

Test dosage forms administered topically at time 0, 24, 48 and 72 hours after administration karagen

Parameters measurement which is conducted

Volume measurement inflammation on day 4 after the formation of edema pouch exudate taken with spit and then measured its volume.

RESULTS

After doing research on testing anti-inflammatory effects of ethanol extract of mistletoe leaves coffee on white male mice by the method of *granuloma pouch*, showed the following results:

The volume of edema on the backs of mice after ethanol extract of leaves of coffee parasite *Scurrula ferruginea* (Jack) Danser with increased concentrations of 1 %; 2 %; 5 % and 10 % by volume measured exudate is 0:51 mL; 0:44 mL; 0.29 mL; 0:25 mL.

| No | Control | 1 % | 2 % | 5 % | 10 % | Comparison |
|---------|---------|------|------|------|-------|------------|
| 1 | 0.7 | 0.56 | 0.5 | 0.32 | 0.2 | 0.18 |
| 2 | 0.6 | 0.7 | 0.35 | 0.28 | 0.25 | 0.2 |
| 3 | 0.55 | 0.9 | 0.55 | 0.25 | 0.28 | 0.08 |
| 4 | 0.49 | 0.19 | 0.3 | 0.32 | 0.28 | 0.25 |
| 5 | 0.7 | 0.2 | 0.5 | 0.28 | 0.25 | 0.25 |
| Total | 3.04 | 2.55 | 2.2 | 1.45 | 1.26 | 0.96 |
| Average | 0.608 | 0.51 | 0.44 | 0.29 | 0.252 | 0.192 |



Figure 1. Graph relationships parasite concentration of ethanol extract of the leaves of coffee *Scurrula ferruginea* (Jack) Danser to the volume of exudate from the backs of mice induced karagen

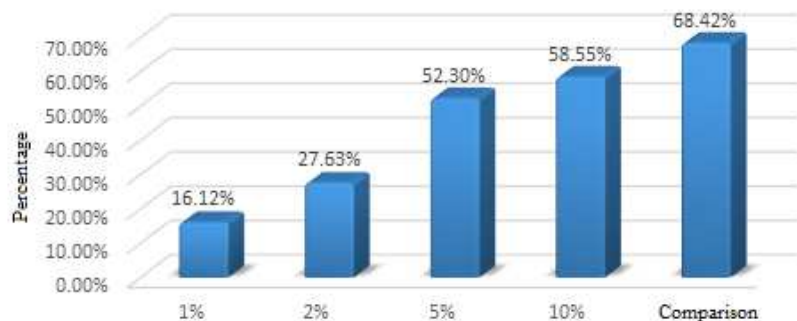


Figure 2. Graph inflammatory emphasis on the backs of mice induced karagen after the ethanol extract of leaves of coffee parasite *Scurrula ferruginea* (Jack) Danser topically to control

DISCUSSION

In this study used a sample of the parasite leaves coffee *Scurrula ferruginea* (Jack) Danser. Experimental animals used in this study were male white mice, due to have a physiological similarity to humans, easy to obtain, easy maintenance and easy handling, besides mice also adaptable. Selection of male sex only of uniform research conditions that do not affect the results obtained. The method used is a method to forming inflammatory granuloma pouch, because it is one manifestation of acute inflammation. Acute inflammation lasts a relatively short, the swelling is caused due to rupture of mast cells release mediators that lysosomal enzymes and mediator, and marked by numerous polymorphonuclear leukocytes, then the migration of inflammatory ketempat plasma fluid

continuously forming a fluid exudate characterized by swelling [7]. This research uses karagen to induce edema. Karagen reconstituted with sesame oleum to strengthen cooperation karagen karagen and does not cause damage to the tissue that helps to release slowly in the blood karagen (Turner, 1965; Cao *et al.*, 1991). Inducing karagen conducted in two phases, the first phase is induced as much as 0.1 mL karagen to help the formation of air pockets as local edema. The second phase karagen administration of 0.5 mL is used to create edema in air pockets that have formed earlier.

The minimum and maximum dose sought in advance in testing is then varied several effective dose based on the formula of this formula Thompson and obtained a dosage of 1 %, 2 %, 5 % and 10 %. Administration of coffee parasite leaf extract (*Scurrula ferruginea* (Jack) Danser) done topically in the form of an ointment with vaseline flava as a carrier. This flava Vaseline besides due to easy in the manufacture of ointments, also because of its consistency is not sticky and does not need to manufacture by way of an amalgamation. On the control vaseline flava only given just to see the effect without being given the active ingredient, while the comparison group was given hydrocortisone acetate with a concentration of 2.8% according to the on the market and commonly used in the community.

Administration of coffee parasite leaf extract (*Scurrula ferruginea* (Jack) Danser) turned out to have an effect on the volume of edema formation. Can be seen a decrease in the volume of edema due to increased concentration given. The decrease is due to edema volume of ethanol extract of mistletoe leaves coffee (*Scurrula ferruginea* (Jack) Danser) which contains flavonoids can help eliminate the attacker agent so that the stimulus to continue exudation of fluid and cells gradually disappears. Flavonoids as antiinflammatory inhibiting the release of arachidonic acid and enzyme secretions from the lysosome membrane to block off the road cyclooxygenase and lipoxxygenase pathways resulting in lower levels of prostaglandin and leukotriene [9]. Saponins contained in coffee parasite leaf extract can inhibit the formation of exudate and inhibiting vascular permeability rise [8]. The blood vessels of the edema area gained semi-permeability, so that the liquid flow is not disrupted, until absorbed by the lymphatic vessels and exudate cells undergo disintegration and out through the lymph vessels. This process can heal the inflamed tissue [10].

At concentration of 1 % can suppress inflammation by 16.12 % of the controls. Concentration of 2% can suppress inflammation by 27.64 % of the controls. At a concentration of 5 % can reduce inflammation up to 52.30 % of the controls. 10 % concentration can suppress inflammation up to 58.55 % of the controls. Along with increased concentrations of the inflammation emphasis was also increased.

CONCLUSION

Ethanol extract of mistletoe leaves coffee *Scurrula ferruginea* (Jack) Danser with a dose of 1 %; 2 %; 5 % and 10 % can reduce the volume of edema on the backs of male white mice with $p < (0,05)$.

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