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Literatur Review

The Effect Of Princess Shame Leaves Ethanol Extract On Vitiligo

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Abstract

Background: Vitiligo is a skin disease caused by the destruction of melanocytes with depigmented macular characteristics, multifactorial predisposing factors, and precipitating factors such as trauma, sunburn, stress, and systemic disease. Mimosa Pudica has bioactive compounds that are efficacious for healing wounds, repairing cell tissue, stopping bleeding, asthma, diabetes, jaundice, leprosy, hydrocele, hemorrhoids, fistulas, scrofula, and conjunctivitis.

Method: Based on the results of several studies, the technique of collecting & analyzing the cream of Mimosa Pudica leaf extract was by evaluating the cream of the Mimosa Pudica leaves, testing the pH by dissolving the cream product which was diluted using aquadest and then measured with a pH meter. The production of the Mimosa Pudica leaf extract was done by maceration using 96% ethanol.

Results: Mimosa Pudica extract succeeded in preserving salak fruit, increasing the regeneration and proliferation of liver cells, overcoming hypopigmentation skin disease, and also inhibiting melanosis in shrimp.

Conclusion: Mimosa Pudica (*Mimosa pudica* L.) The five parts of the plant (i.e. panchang) - leaves, flowers, stems, roots, and fruit belong to the category of powerful antioxidants used as medicine in ethnomedical systems of care.

Keywords: Vitiligo, Ethnomedical, Mimosa Pudica

INTRODUCTION

Mimosa Pudica is best known for its rapid plant movement, which undergoes a change in leaf orientation called sleep or nyctinastic movement. The foliage closes during darkness and reopens in the light. [1] Mimosa belongs to the taxonomic group Magnoliopsida and the family Mimosaceae, and is considered a plant of great value because of its highly ethnomedical leaves. In pharmacology, the process of nerve regeneration was higher in mice treated with Mimosa Pudica compared to the group given hydrocortisone. In studies in mice with experimental sciatic nerve injury, the process of nerve regeneration was 30-40% higher in mice treated with mimosa extract, compared with the hydrocortisone-treated group. The extract was administered parenterally 1.

Mimosa Pudica (*Mimosa pudica* L.) is one of the herbal plants that have many pharmacological activities such as anti-diabetic, antitoxin, anti-hepatotoxic, antioxidant, and wound healing (Azmi, Singh & Akhtar, 2011). [3] According to Pendit et al. . (2016), the level and type of solvent polarity determine the type and amount of compounds that can be extracted from the material. Extract yield will tend to increase with increasing ratio of materials and solvents used. [4]

From the results of the phytochemical test of plant extracts M.Pudica, Thoa, Nam, and Nhat (2015) [5], it was found that the flavonoid content in the shy daughter using water was 0.08% while the flavonoid content was 2.43 with ethanol as a solvent. %. According to Lu, Nie, Belton, Tang, and Zhao (2006) [6], gallic acid (GA) is a natural antioxidant phenolic compound extracted from plants, which is widely used in food, medicine, and cosmetics.

Based on the content of the shy daughter, research will be carried out on vitiligo disease (Leucoderma) which, if proven to be effective, can be widely used as a recognized treatment in the medical world.

Vitiligo is a multifactorial polygenic disorder with complex pathogenesis. The theory of the pathogenesis of vitiligo that most plays a role includes autoimmune, cytotoxic, biochemical, oxidant-antioxidant, and neural mechanisms. Several studies have also started a significant genetic role in vitiligo. [7,8] Vitiligo can be found at all ages, but about 50% of cases of vitiligo occur before the age of 20 years and 25% of them occur before the age of 8 years, with an average onset of at the age of 5 years. [9] The study showed increased activity levels of malondialdehyde (MDA), hydroxyproline, and glutathione peroxidase in plasma of

the vitiligo group ($p < 0.05$) compared to controls. [10]

METHODS

Several methods have been developed to induce depigmentation in mice to model vitiligo. In a study of black rat models of monobenzone-induced vitiligo, similarities in histological and pathological characteristics between monobenzone-induced depigmentation and active human vitiligo were found, suggesting the good potential of the mouse model for use in vitiligo research and the development of new therapies for skin disorders. [11]

RESULT

M.Pudica leaf research on vitiligo was based on research conducted by Zhu et al (11) who applied monobenzone to the stomach by shaving 4 weeks old rats; Hair depigmentation initially appears at the application site, but then spreads to distant sites such as the ears and tail. CD8+ T cells infiltrate the affected skin after treatment. The same treatment in RAG-deficient mice resulted in hair depigmentation at the treatment site, but not at distant sites. These findings suggest that the direct toxicity of monobenzone may be responsible for local depigmentation at the site of application, but that an adaptive immune response is required for depigmentation to spread to other sites. This model may help identify the mechanism by which monobenzone-induced stress activates the immune response in vitiligo.

Cream of ethanol extract of Mimosa Pudica leaves on black rats model of vitiligo induced by monobenzone has an anti-depigmentation effect, can reduce MDA activity on the skin of black rats model of vitiligo, besides that, Mimosa Pudica plant extract is also useful for skin health because it contains tannin compounds and is also a good source of antioxidants. is very important to help the process of formation of healthier skin tissue. The shy princess plant contains very important micronutrients such as copper, magnesium, zinc, iron, and manganese, all of which are important for maintaining healthy cells in the body while boosting the immune system.

Mimosa Pudica plant can be extracted from the leaves to obtain quercitin-type flavonoid compounds which have two effects on the body, namely stimulating the enzymatic activity of RNA and protein through DNA biosynthesis. (Kumar et al., 2013). [12] Several types of flavonoids, especially silymarin, were reported to have a stimulating effect on the enzymatic activity of RNA and protein

produced from DNA biosynthesis for liver regeneration when damaged. Silymarin can regulate the permeability and integrity of cell membranes, suppress NF-B, protein kinase depression, and collagen production, inhibit leukotrienes, and clear ROS. ROS harms the body because it can bind to the lipid bilayer membrane on the cell wall so that it disrupts the stability of the wall as a result the cell will be damaged.

The quercitin-type flavonoid compounds in the leaves of Mimosa Pudica are able to overcome cell and tissue damage caused by the induction of ibuprofen, anthocyanin cyanidin 3-OB glucoside (C3G) which can increase cAMP and increase Gclc production, causing a decrease in ROS and proapoptotic signals and activation of protein kinase A (pKA).) which also has an effect on the repair of hepatotoxic liver cells and tissues. (Kumar et al., 2013)(12) From these trials the results showed that liver tissue was regenerating.

In addition to repairing cell tissue, the plant extract of the shy princess can also be applied as an alternative preservative in this case, trials are carried out on salak fruit. Salak is one of the original fruits of Indonesia that is productive because it has a year-round harvest, including horticultural fruit, so it is easily damaged due to physiological, physical, microbiological, and mechanical factors. There are 2 types of preservatives used, namely synthetic and natural preservatives (Adawiyah et al., 1998). [13] The Food and Drug Supervisory Agency (BPOM) does not recommend the use of synthetic preservatives because it is feared that it can cause cancer. Therefore, natural preservatives are the choice because they contain saponin compounds (Tamilarasi & Ananthi, 2012). [14] Saponin compounds can damage the cytoplasmic membrane of bacteria so as to prevent the entry of food ingredients (nutrients) needed by bacteria to produce energy, further inhibiting bacterial growth. and even experience death (Jaya, 2010). [15]

Mimosa Pudica plant has the potential to be used as an antimicrobial for food pathogens (Parhusip et al., 2010). [16] Research by Abirami et al., (2014) [17] shows that the Mimosa Pudica extract can inhibit the activity of pathogenic bacteria and fungi. In addition, phytochemical tests also show the presence of saponin compounds that can inhibit microbes (Ranjan, 2013). [18] The results of Fadlian et al., (2016) [19] study showed that the Mimosa Pudica plant extract was effective in preserving tomatoes at a concentration of 6%. with a storage

time of 11 days.The shy daughter plant is washed with water until it is clean. Then it was dried (ambient temperature 28°C) for 30 days until the moisture content was dry, then mashed using a blender and sieved to obtain a finer powder. The powder was extracted with a mass of 200 grams for 3 x 24 hours using 600 mL of ethanol solvent. Then the extract was put in an oven at a temperature of 30˚C - 40˚C (Fadlian et al., 2016) [19]. After that, make extract solutions with concentrations of 0%, 3%, 5%, and 7%. To preserve the salak fruit is by dip the salak fruit into the extract solution for 5 seconds, then observing for several days. There were 11 salak fruits observed in each sample. Changes in texture and color are parameters that are observed before and after preservation. The technique of making this shy princess plant extract uses the maceration method. From 200 grams it produces 20 grams of dry extract which is divided into 4 types of concentrations, namely 0%, 3%, 5%, and 7%. From this preservation process, different results are obtained for each concentration. After the salak fruit was treated for 18 days with the Mimosa Pudica extract, the results showed changes in color and texture.

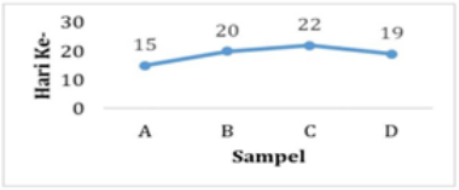

Figure 1. Graph of Salak Fruit Durability After Preservation

(A)Samples with 0% concentration of Mimosa Pudica extract (as a control) had a shelf life of 15 days. (B) Samples with 3% extract concentrate have a shelf life of up to 20 days. (C) Samples with 5% extract concentrate have a durability of up to 22 days. (D) Samples with 7% extract concentrate have a shelf life of up to 19 days. Salak fruit with an extract concentration of 0% (without treatment) experienced the fastest change in texture among other samples. Meanwhile, with a concentration of 5%, the texture changes the longest compared to other samples. In maintaining the freshness of the salak fruit, the extract of the Mimosa Pudica plant succeeded in inhibiting the physiological damage caused by white-rot bacteria.

Mimosa Pudica plant (Mimosa pudica L.) has bioactive compounds that can function as antioxidants such

as flavonoids, phenols, and tannins, which are effective in enzymatic processes (melanosis) in shrimp. Melanosis is common in foodstuffs such as seafood. Melanosis is caused by the enzyme polyphenol oxidase which oxidizes phenol to a quinone. Quinone polymerization causes the appearance of a black pigment that gives shrimp a blackish color (Montero, Martínez-Álvarez, & Gómez-Guillén, 2004). [20]

In this study, the materials used were leaves, stems, roots, and flowers of M. pudica L. which were dried using sunlight for 5 days and then ground into powder, which was extracted by the maceration method for 24 hours with 96% ethanol solvent. During the maceration immersion, the extract was stirred every first 6 hours and then allowed to stand for 18 hours. (Pal, Datta, Basnett, Shrestha, & Mohanty, 2015) [21]. The filtrate was filtered using Whatman filter paper and dried using a rotary evaporator. The extract was then stored at chilling temperature for further use (Lakshmibai, Amirtham, & Radhika, 2016). [22]

For a concentration of 3%, it was prepared by dissolving 15 g of extract in 485 ml of aquadest. For a concentration of 5%, with 25 g of extract in 475 ml of aquadest. For a concentration of 7%, with 35 g of extract in 465 ml of aquadest. The manufacture of this extract refers to the research of Anggraini, Hamidah, and Moehammadi (2013) [23], with the dilution formula N1V1=N2V2.

From 100 white prawns with consumption size (10-18 g/head) were washed, soaked in 500 ml of Mimosa Pudica extract with a concentration of 3.5 and 7% for 30 minutes. There are 25 shrimp in each soaking container according to the concentration and storage time. The samples were packaged and stored at a cold temperature of 5±2 C in the refrigerator, with different storage times, namely 0, 2, 4, 6, 8, and 10 days. The shrimp melanosis test value at the beginning of storage in each treatment was 0, which means that melanosis had not yet appeared in shrimp. Melanosis with a value of 10 then appears and spreads during storage which means it is easy to see in almost all parts of the shrimp and looks heavy. With the addition of 3% and 5% Mimosa Pudica extract, the panelists began to reject it on the 8th day of cold storage with values of 4.8 and 4.3. With a concentration of 7% began to be rejected on the 10th day with a melanosis value of 4.8.

According to Otwell and Marshall (1986) [24] melanosis testing has a standard value of 4 which means it is still feasible to be accepted by consumers. The concentration of 7% of the Mimosa Pudica plant extract is a concentration that can give optimal effect and can maintain the quality of shrimp until the 6th day when viewed from the melanosis test value.

CONCLUSION

Mimosa Pudica plant extract which is effective in preserving salak fruit is at a concentration of 5% with a storage period of 22 days, ethanol extract cream of Mimosa Pudica leaves also has an anti-depigmentation effect, can reduce MDA activity in the skin of black rats model vitiligo, and the content of quercitin-type flavonoid compounds in Mimosa shame plant can overcome cell damage and hepatotoxic liver tissue. The addition of Mimosa Pudica extracts 3%, 5%, and 7% during storage affected the odor characteristics of shrimp and slowed down the decrease in odor value during storage. The addition of the Mimosa Pudica plant extract was able to maintain the texture quality of the shrimp compared to the untreated shrimp. Furthermore, clinical and pathological studies need to be carried out to isolate the characteristics of the bioactive compounds present in the Mimosa Pudica (M. Pudica L) plant.

CONFLICT OF INTEREST

There was no conflict of interest.

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