Study on freckle-removing activity of extracts from Sapindus vulgaris on mice

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Keywords: Sapindus extract; mice; freckle activity

Abstract: Sapinia is a plant of Sapinaceae, whose rhizomes, barks, leaves and fruits can be used as medicines. And it has many effects, can be used to treat throat pain, cough and asthma, food stagnation, abnormal leucorrhea, scabies, sores, swelling and poisoning. Therefore, the author carried out a related study on the freckle-removing activity of the extract of Sapinia vulgaris in mice. Therefore, the active freckle component of the Sapindus extract is understood to inhibit the formation of melanin by acting on the formation of melanin in the skin and the corresponding stage of the metabolic pathway, thereby achieving the whitening and freckle action. According to relevant experimental studies, the extract of Sapindus can have a good freckle effect on the skin quality of mice, indicating that the extract of Sapindus has a certain enhancement effect on the freckle activity of mice.

1. Introduction

The natural plant active freckle component is an active ingredient extracted from the roots, stems, skin, leaves, flowers, fruits, etc. of the plant, which acts on the skin tissue to participate in pigment metabolism, thereby achieving whitening purposes [1]. Sapindus mainly contains sapindus saponins, fatty oils, proteins and other ingredients [2]. The sorghum is produced in hillside forests and is produced in all provinces south of the Yangtze River. It is a pan-tropical distribution branch, mainly produced in Southeast Asian countries. It is cultivated in the Yangtze River Basin, southern provinces and Hainan Island in China. It has a wide range of sources and is often used for washing [3]. The free radical theory holds that the human body produces a large amount of free radicals of aerobic elements under normal metabolism or various stress conditions, called superoxide radicals. Excessive aggregation of superoxide radicals in the human body accelerates the aging of cells and reduces the body's immunity [4]. It has the functions of clearing heat, expectorating phlegm, eliminating accumulation and killing insects. It can be used for sore throat, cough and asthma, food stagnation, leucorrhea, scabies and swelling poison [5]. Recent studies have shown that Saposhnikovia vulgaris has a good therapeutic effect on viral hepatitis. Saposhnikovia vulgaris has the effect of reducing cytochrome P450 in liver microsomes of mice, and also has the effect of lowering blood pressure and protecting heart [6]. Saponins and aglycones of Sapindus vulgaris have strong surface activity. These active substances are neutral, easily biodegradable, non-irritating to skin, non-toxic and harmless to human body, and have certain decontamination and foaming properties.

At present, natural plant active freckle-removing ingredients are classified according to freckle-removing mechanism and freckle-removing ingredients. This paper mainly elaborates the freckle-removing ingredients [7]. Because superoxide radicals are very active and highly reactive, they can be oxidized to attack any molecule they encounter. The macromolecule components such as nucleic acids and proteins in cells are damaged randomly, and the damage accumulates continuously, leading to cell senescence and death [8]. Some scholars constructed a mixed culture model of melanocyte in direct contact with keratinocyte to observe the effect of piperidin on tyrosinase activity and melanin synthesis of melanocyte in this model. The results also showed that piperidin inhibited tyrosinase activity and melanin synthesis in a concentration-dependent manner [9]. It is a natural nonionic surfactant. It can reduce the surface tension of water, has good foaming property, and has the characteristics of strong detergency, sterilization, itching, and pure fragrance

  DOI: 10.25236/ibmc.2019.023

[10]. In addition to good foaming and decontamination properties, at the same time, the saponin triterpenoid saponin has been proven to have antibacterial, bactericidal and anti-inflammatory effects on human skin, and has anti-itch effect.

2. Methodology

The dried rhizome of Saussurea vulgaris was 150 g, and the liquid level was 2 cm with double steaming water, soaked for 4 hours, boiled for 3 times, 30 minutes per time, combined with filtrate, and the filtrate was concentrated to 300 mL. The extract was added with double steamed water to 150 ml, making the liquid equivalent to crude drug 1 g/ml, and adjusting the pH to 7.0 with 0.5% NaOH. Keep the refrigerator in reserve. Eighteen mice of similar age and weight were randomly divided into three groups, 6 mice in each group. That is, the blank control group, the model group, the high and low dosage groups of traditional Chinese medicine, respectively, ig5000, 2500mg/kg of the extract of the disease-free seeds, the blank control group and the model group, Ig with the same volume of physiological saline, for 10 days. After the last administration of 1 hour, the model group and the traditional Chinese medicine group were treated with 10 ml/kgip0.1% CCl4 peanut oil solution, the control group IP with the same volume of peanut oil solution, after fasting for 16 hours, blood was taken to separate the serum and determine the alanine aminotransferase. The activity of glutamic oxaloacetic aminotransferase and glutamic oxaloacetic aminotransferase. 200 mL of the test solution was drained from a pore having a height of 900 mm and an inner diameter of 2.9 mm, and poured into a test solution containing 50 mL of the same temperature and the same concentration, and the foam height H immediately after the completion of the 200 mL solution was recorded. The foam height H5 after 5 minutes was used as an evaluation of the foaming ability and foam stability of the foaming agent. The upper and lower surfaces of the foam liquid film formed by the anionic surfactant have the same electric charge, and the liquid film discharge thinning is prevented due to the repulsion of the surface charge, thereby increasing the stability of the foam.

At 24 hours after the end of the last administration, the animals were sacrificed by cervical dislocation and the body mass was referred to. The results are shown in Table 1. It can be seen from Table 1 that the plaque activity of the mice after the administration of Sapindus extract increased with the increase of the drug dose, indicating that the extract of Sapindus can significantly increase the ecchymosis activity of the mice.

Table 1 Effect of extract of Sapindus vulgaris on freckle-removing activity in mice

Group	Dose	Freckle-removing activity before administration	Antifreckle activity after administration	Freckle-removing activity added value
Normal saline	-	17.25±0.3	27.3±1.6	7.6
Small dose SMG	3.0	18.35±0.4	28±1.4	10.47
Large dose SMG	6.0	19.24±0.4	31.47±1.7	12.68

Some studies have shown that it has a good therapeutic effect on viral hepatitis. It can reduce the cytochrome P-450 of liver microsomes in mice. It also has antihypertensive and cardioprotective effects. The effect of extract of Sapindus vulgaris on thymus quality and thymus index of mice. The experimental method is the same as the above. 10 days later, the mice were sacrificed by cervical spondylolisthesis, and the thymus was removed. The thymus index was calculated by thymus mass/body mass of mice (mg/10g). 10 days later, the mice were sacrificed by cervical spondylolisthesis. The thoracic cavity of the mice was opened and the spleen was taken out. The spleen mass was weighed. The spleen index was calculated by the spleen mass/the body mass of the mice (mg/10g). In the acidic solution, the extract of the Sapindus extract has poor foam properties, but still foams. This may be because in the lower pH medium, the Sapindus extract is present in non-ionic form and is predominantly in the form of anions in higher pH solutions. Most surfactants have the best foaming ability at 40-60 °C. At higher temperatures, the viscosity of the blowing

agent solution is lowered, the foam is easily broken, and the performance is deteriorated. The foaming ability of the Sapindus extract increased slightly with increasing temperature, and the foam stability was also good, which may be related to the higher surface viscosity of the Sapindus extract solution.

For the Sapindus extract, study its acid and alkali resistance, and experiment with the foaming ability and foam stability of Sapindus extract in different pH aqueous solutions. As can be seen from Figure 1, the foaming ability and foam stability of the Sapindus extract increased as the pH of the solution increased.

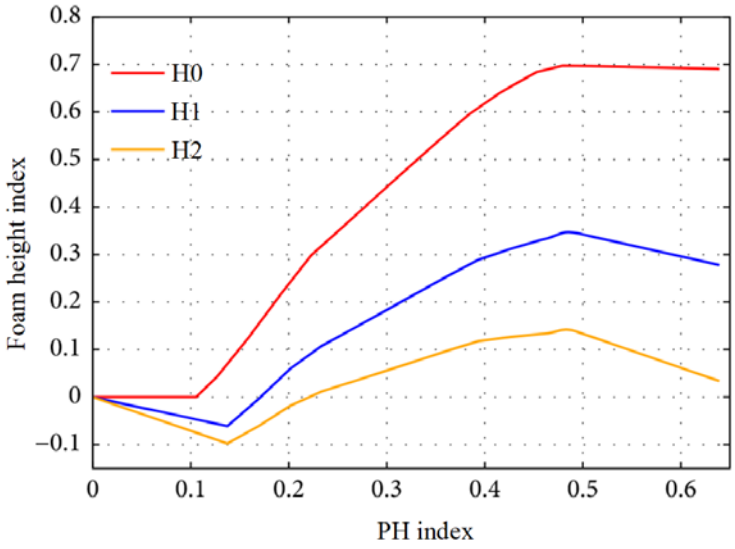

Fig.1. Foam height of Sapindus extract in different pH solutions

3. Result Analysis and Discussion

The results showed that the body weight, thymus and spleen of the mice increased with the increase of the drug dose, and the thymus index was also increased, which indicated that the extract of saxidu can significantly increase the appetite and increase of the mice. Body mass, promote growth and development, the above effects are in a dose-dependent manner. It is generally believed that the mechanism of carbon tetrachloride damage to liver tissue is that carbon tetrachloride is activated by hepatic cytochrome P450 to form trichloromethyl (CCl3) free radicals, which can cause lipid peroxidation of biofilm, resulting in membrane structure and functional damage. , protein and other substances catabolism disorders. In recent years, it has been suggested that SOD has the effect of preventing pigmentation, because pigments are caused by O2 radicals, and SOD is an important free radical scavenger. It can regulate the production of intracellular free radicals, eliminate excess free radicals, and play an important role in preventing the formation of melanin. In addition, the attack of superoxide free radicals on cell membranes can peroxide unsaturated lipids in the membranes and form lipid peroxide. Its final product, malondialdehyde (MD) A, is a strong cross-linking agent, which forms insoluble substances with proteins, nucleic acids and lipids. It is the hardening of biological membranes that leads to the decrease of permeability, affects the exchange of cellular substances, and then breaks down and dies. However, the extract of Sapindus vulgaris could significantly reduce the spleen quality and spleen index of mice, but the spleen quality and spleen index increased with the increase of the dosage of Sapindus vulgaris extract.

As can be seen from Figure 2, the foaming ability of surfactant solution is poor at low temperature. With the increase of temperature, the surface tension of surfactant solution decreases and the foaming ability increases gradually.

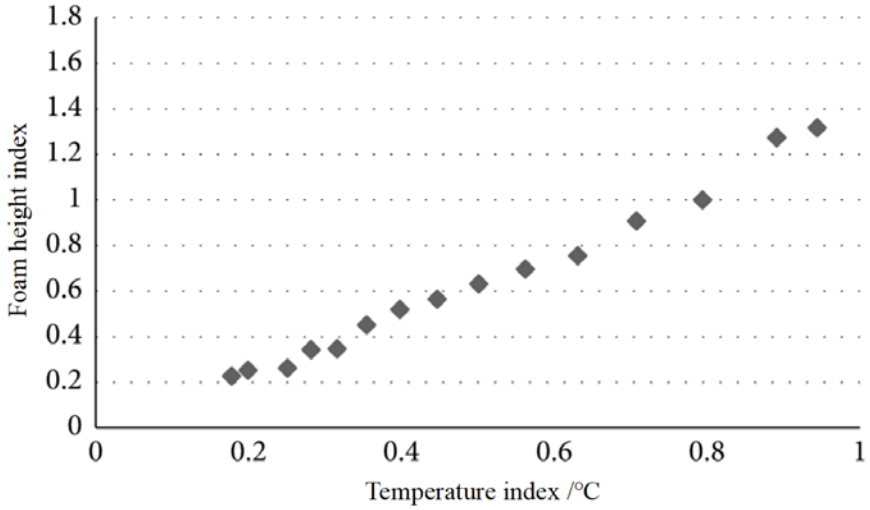

Fig.2. Effect of temperature on foaming properties of foaming agent

The mechanism of thioacetamide damage to hepatocytes may be that thioacetamide impairs the structure and function of cell membranes. After high dose paracetamol was metabolized by hepatocyte cytochrome P450, excessive production of semiquinone free radicals resulted in the consumption of SGH in the liver and covalent binding with hepatocyte proteins, resulting in hepatocyte necrosis. Drugs, food and immune function are closely related. It can directly affect the relative stability of immune function. The body can ensure the stability of its immune system by ingesting drugs and food, thus improving the immunity of the body. Because the solubility of non-ionic surfactants in aqueous solutions above their cloud point is greatly reduced, the new phase is easy to form. At this time, not only the foam performance is very bad, but also the defoaming effect, anionic surfactants. The formed foam liquid film has a surface electric double layer, and the negative electric charges of the two surface electric double layers repel each other, which increases the stability of the saturated foam. Oxygen free radical scavenging can reduce the oxidation of unsaturated lipids, and the oxidation product malondialdehyde (MD) A will also be reduced, restore the normal physiological functions of cells, and make the skin tend to be younger. How does the extract of Sapindus improve the immunity of the body, and its mechanism of action needs further study. This indicates that the extract of Sapindus has triclosan (·CCl3) and semiquinone free radicals, causing lipid peroxidation of biofilm, causing damage to membrane structure and function, obstacles caused by anabolism of proteins and other substances and hepatocyte necrosis. Protective effects.

4. Conclusion

At present, it has become a research hotspot at home and abroad to find natural plant whitening and freckle preparations that are highly efficient and have no side effects or side effects on the human body. Carbon tetrachloride, paracetamol, and thioacetamide have different biochemical mechanisms for liver damage. Sapindus extract has good foaming ability and is comparable to SDS with strong cohesiveness. The stability of the foam of the Sapindus extract is the best, with the longest half-life under the same conditions. Sapindus extract can be used in many fields such as daily chemical industry, foam drilling, foam drainage, etc., and has broad application prospects. With the deep understanding of the melanin formation mechanism and the in-depth study of the effective whitening and freckle ingredients of natural plants, more new generation whitening and freckle cosmetics will be developed. Therefore, drugs that can enhance the activity of anti-aging enzymes, such as superoxide dismutase (SO) D activity and reduce lipid peroxidation, such as malondialdehyde (MD) A content, have anti-aging effect on skin. The extract of Saussurea vulgaris has obvious protective effect on acute liver injury induced by carbon tetrachloride, paracetamol and thioacetamide in mice. It can significantly reduce the activity of serum AST and ALT in mice with acute liver injury and has obvious hepatoprotective effect. As a whitening and freckle-removing

product, natural plant extracts have the advantages of sTable medicinal properties, long-lasting medicinal power, mild skin action, less irritation, high safety and significant curative effect, which are in line with the trend of the development of whitening and freckle-removing cosmetics in the world today.

Acknowledgement

Jilin Province Education Department thirteenth five science and technology project:Screening of active components of traditional Chinese medicine target for stroke-type cerebral ischemia (grant (JJKH20180743KJ)

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