Effects of Processing and Storage on effective Components of Pogostemon cablin

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Abstract. The content changes of volatile oil and patchouli ketone under Processing and storage of patchouli were compared. Sweating can increase the accumulation of effective substances in patchouli. The cost of controlled atmosphere storage is low, which can reduce the loss of effective components. To provide scientific reference for the improvement and formulation of the production technical specification of patchouli.

Keywords: Pogostemon cablin, Patchouli ketone, Essential oil

1. Introduction

Pogostemon cablin (Blanco) Benth. (Patchouli) is an important aromatic and medicinal plant and widely used in traditional Chinese medicine as well as in the perfume industry. The research on Patchouli mainly focuses on the resources of various producing areas, the chemical composition of its essential oil, genetic material basis such as gene sequence, antibacterial, anti-inflammatory, anti-virus, anti mutation and anti-tumor pharmacology and pharmacodynamics [1-3]. The biosynthesis and dynamic accumulation of important pharmacodynamic components of patchouli varieties have attracted much attention [4-5]. Traditionally, Patchouli is harvested by sweating, but now it is dried in the field. In this paper, different processing methods and storage methods are used to study the suitable processing methods. The contents of essential oil and patchouli ketone were determined.

2. Methods

2.1. Patchouli harvesting, processing and storaging

Patchouli were grown in Guangzhou, Guangdong, China. Harvest and processing according to the production: in the mature stage of patchouli, cut the branches and leaves in sunny days. There were 4 processing methods patchouli plants. Sweating:The plants are spread out and exposed to the sun, then stacked in layers, covered with straw, compacted and stuffy for one night, and then exposed to the sun again and stuffy the next day, repeated for 3-4 days, until dry. Direct drying(DD):Place Patchouli exposed to the sun until dry. Dry in the shade (DS): Patchouli Herb dry in a cool and ventilated place. Turn it about 3 times a day until the herb is dry. Drying in greenhouse(DG):After collecting patchouli, spread it out in the greenhouse until it is dried.

Patchouli storage methods include the following: normal temperature storage commonly used in production (NT), low temperature storage in cold warehouse (LT) and controlled atmosphere storage (CA). The patchouli were storage about 6 months.

2.2. Essential oil extraction

Patchouli Herb is crushed into coarse powder by traditional Chinese medicine pulverizer. Take about 35g of coarse powder, put it into a distillation flask, add 100ml of distilled water, connect a volatile oil detector and a reflux condensing pipe above the flask, heat it in a heating jacket, boil it until the liquid in the volatile oil extractor overflows and drops back into the distillation flask, adjust the temperature appropriately, and gradually heat it until the amount of volatile oil on the scale of the volatile oil extractor does not increase. After stopping heating and waiting for cooling, rotate the piston at the lower end of the volatile oil tester to discharge the extracted water and volatile oil respectively.

Remove the water in the volatile oil with anhydrous sodium sulfate and calculate the yield (%) [6]. (volatile oil yield (%) = volatile oil amount / sample amount).

2.3. Analysis of patchouli ketone

Weigh about 0.25g of dry sample (dried at 40 ℃, powdered and sieved through No. 4 sieve). Add 75 ml of ethanol, weigh the mass, refluxe and extract in water bath for 3 hours, Cool down, weigh and determine the mass, make up the lost mass with ethanol, shake well, filter, and take the continuous filtrate to 0.45 um microporous membrane filtration, Take the continuous filtrate. Chromatographic column: Alltech C18 chromatographic column (250 mm) ×4.6 mm, 5μm); Mobile phase: acetonitrile - volume fraction 0.4% phosphoric acid solution (volume ratio:75:25), isocratic elution for 15 min; Detection wavelength: 310 nm; Flow rate: 0.8 mL/min; Column temperature: 30 ℃. Under this experimental condition, The number of theoretical plates shall not be less than 4000 based on the peak of patchouli ketone [6].

3. Results

3.1. Patchouli processing

There were Sweating, dry in the shade (DS), drying (DD) and drying in greenhouse (DG) for Patchouli processing. The concentration of essential oil and patchouli ketone were showed in Figure 1. The concentration of essential oil were 0.85% to 1.05%. The concentration of patchouli ketone were 0.48mg/g to 0.83mg/g. The concentration of essential oil and patchouli ketone under Sweating and DS processing were higher than others. The traditional method of sweating is better than direct drying. Direct drying and drying in greenhouse may lead to volatilization of essential oils and patchouli ketone.

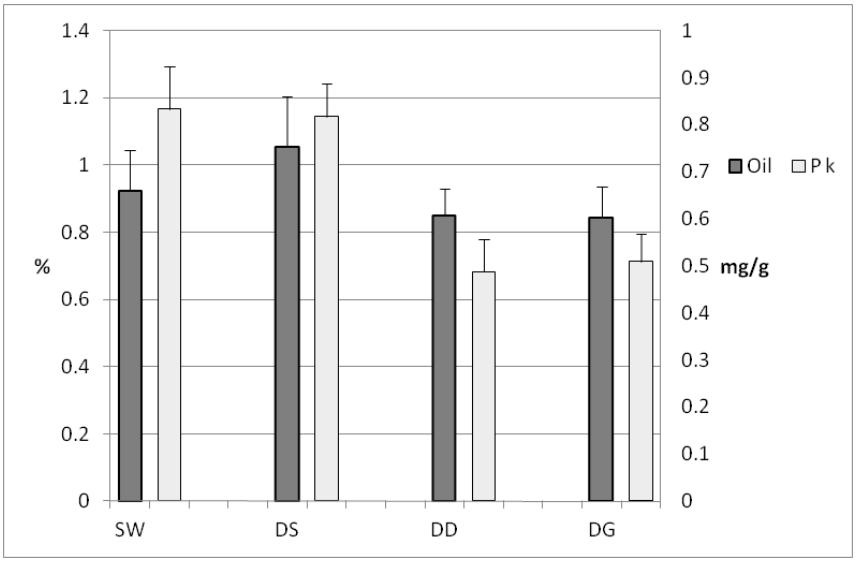


Figure 1 The concentration of essential oil and patchouli ketone in different processing

3.2. Patchouli storaging

After Sweating processing, Patchouli were storage in normal temperature storage, low temperature and controlled atmosphere storage, separately. The patchouli were storage about 6 months. The concentration of essential oil and patchouli ketone were showed in Figure2. The concentration of essential oil were 0.75% to 0.92 %. The concentration of patchouli ketone were 0.63 mg/g to 0.75 mg/g. The contents of essential oil and patchouli ketone in low temperature were higher than those of other treatments. In normal temperature storage commonly used in production, essential oil and patchouli ketone were lost. Patchouli in controlled atmosphere storage reduced the non respiratory effect, reduced the loss of active ingredients and had low cost.

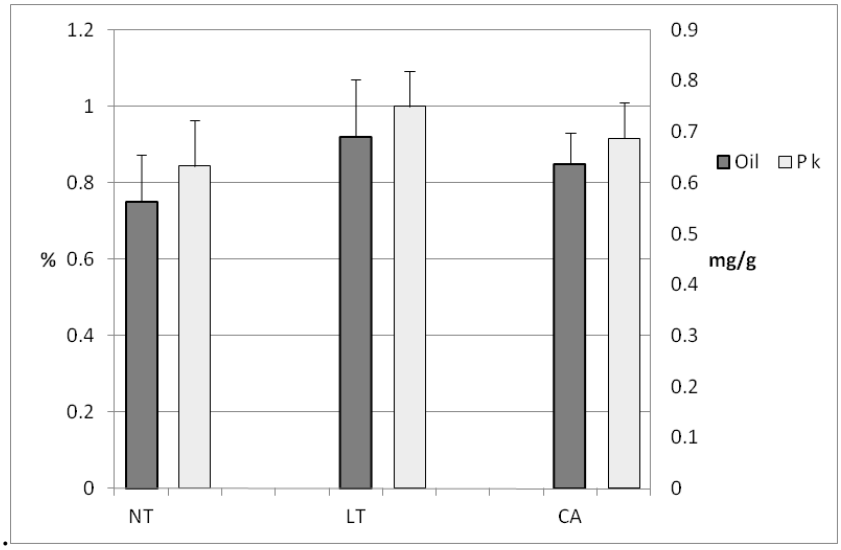


Figure 2 The concentration of essential oil and patchouli ketone in different processing

4. Conclusions

In this study, The traditional method of sweating is better than direct drying. Sweating can increase the accumulation of effective substances in patchouli. The cost of controlled atmosphere storage is low, which can reduce the loss of effective components. To provide scientific reference for the improvement and formulation of the production technical specification of patchouli.

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