

The use of pine resin in the early 20th's century and current status of its damage in Korea

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Introduction

Local people in and around forests have used non-timber forest products (NTFP) such as leaves, seeds, roots, honey, and resin as well as timber (Tickin and Ganesan 2009). They used NTFP for various uses including subsistence, building and tools materials and medicines. NTFP have helped, especially for local people to overcome disturbances. There is a proverb called "As a drought comes in spring, acorns grow well." in Korea. It is the wisdom that has enabled the community to become sustainable by getting energy from NTFP, acorns in response to climate change.

Korean had used pine resin as NTFP. Pine resin was manipulated for edible and medicinal purposes, and also as glue when building houses and tools. As traditional forest knowledge, the use of pine resin exists in various forms such as collecting, compounding and processing it. However, traditional forests knowledge using pine resins remains only in text. Declining traditional knowledge is caused by ecological factors as well as socio-economic factors (Reyes-García *et al.* 2013). Korea has experienced major changes in social-ecological system since the beginning of modernization in the early 1900's. This course of history affected traditional forest knowledge, also the use of pine resin.

This study aims to review the changes of the use of pine resin in the early 1900's with the social and historical contexts and to investigate the status of its traces.

Methods

1. The use of pine resin in the early 20th's century

In the early 1900's, the use of pine resin was reviewed from two perspectives. The first is the social historical background on use of pine resin in the early 1900s, and the second is the trend on the amount of pine resin.

2. Current status of its damage

The physical condition of damage (the lowest and highest height from the ground, height, width, area and ratio of damaged width) and the health status of pine trees (DBH, tree height, vitality) were investigated. Kruskal-Wallis rank sum test and ANOVA (Analysis of variance) was used to compare between plots.

Results and Discussion

1. The use of pine resin in the early 20th's century

Korea was under Japanese colonial rule, from 1909 to 1945. The nature and resources of Korea were dominated by Japan and were greatly influenced by the socio-political circumstances in Japan. In the late 1930s Japan entered the wartime regime and in 1937, it carried out 1st 7 years of artificial petroleum (Iwama 2016). When the amount of artificial oil produced by the company was insufficient, the Governor-General of Colonial Korea's Office planned to extract the pine resin as a government-led production measure (Kim 2010). On January 29, 1938 and February 25, 1938, Donga Ilbo press introduced the method of extracting pine resin, and promoted the pine resin business. On April 17, 1938, Maeil Sinbo press had information to inspect regions where pine resin was available. These historical events show that the government and the media jointly encouraged extracting pine resin.

Statistics on the amount of pine resin in the statistical yearbook of the Government General of Colonial Korea exist from 1933 to 1943. There was no significant change in the amount of pine resin from 1933 to 1937. The amount of pine resin extracted in 1938 increased to about 32 times in 1937 and was increasing until 1943. In 1943, the amount of pine resin, 4074 ton collected from 920,000 50-year-old pine trees for a year, was 1900 times that of 1938.

The government-led pine resin extraction after "1st seven years of artificial petroleum" in 1937 explains the increasing trend of pine resin from 1938. The modernization and social historical context of Korea in the early 1900s led to the collection of pine resin to at national level. In addition, the traditional methods of extracting and using pine resin have disappeared and have changed in a way damaging the pine tree severely.

2. Current status of its damage

We surveyed 172 pine trees in 14 plots. Physical damage condition was significantly different between plots and Tree vitality was generally high.

We would like to suggest a new point of view on trace of pine resin uses, not just surveying the damage and the condition of pine trees. It is plant welfare. Welfare has continued from human to animal, but it was rarely discussed about plant welfare yet. It needs to consider the uses of pine resin and its trace from the perspective that human and plant can be sustainable together.

Conclusion

Pine resin had been widely used as non-timber forest product in Korea. As a socio-historical background with the modernization of the early 1900s, the extraction of pine resin was mass-produced at the national level. At present, the damage of pine trees varies from regions and trees are mostly vigorous. It is necessary to discuss the traces of extracting pine resin in terms of plant welfare.

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