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ORIGINAL RESEARCH ARTICLE

Study on the Coniferous Characters of Pinus yunnanensis and Its Clustering Analysis

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ABSTRACT

Pine is a relatively easy genus for intermediate hybridization. It has been widely believed that there should be a natural hybrid population in the distribution of Pinus massoniona Lamb. and Pinus hangshuanensis Hsia, that is, the excessive type of external form between Pinus massoniana and Pinus taiwanensis exist. This paper mainly discusses the traits and clustering analysis of coniferous lozeng in Huangshan scenic area. This study will provide a theoretical basis for the classification of long and outstanding Huangshan Song and so on. At the same time, it will provide reference for the phenomenon of gene seepage between the two species.

KEYWORDS: Pinus taiwanensis Pinus massoniana coniferous seepage clustering

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1. Introduction

1.1. Research background

Huangshan Song distribution in eastern China's subtropical high mountains, more than 700m above sea level. Masson pine is widely distributed in the subtropical regions of China, at the lower reaches of the Yangtze River, vertically distributed below 700m above sea level, the upper reaches of the Yangtze River area, the vertical height of up to 1200 - 1500m or so. In the area of Huangshan Song and Pinus massoniana, an overlapping area of Huangshan Song and Pinus massoniana was formed between 700 - 1000m above sea level. Many of the pine trees in this area grow taller and straight, and their morphological features are more or less between them (1992) [1], with the most representative of the Yungu Temple and Ciyuan Pavilion in Huangshan, Anhui Sex. Li Xuchun observed a similar phenomenon in Wuning, Jiangxi Province, that this pine is still relatively close relationship with the Huangshan Song, and published as a new variant of Huangshan Song - Pinus hodgsonensis (Pinus hangshuanensis Hsia var.wulingensis SCLi) (Li Shuchun, 1981) [2]. According to the specimen of Hunan, it is considered that its morphological characteristics are very similar to those of Huangshan Song, but the resin road is not in the middle and close to Pinus massoniana, and it is used as a new variant of Pinus massoniana. - Wuling Song (P.masoniana Lamb. Var. Wulingensis CJQi et QZLin) (Qi Chengjing et al., 1988). According to the material collected from Huangshan, the results showed that there were natural hybridization and gene seepage between Huangshan Song and Pinus massoniana using Anderson hybrid index method. The species with the morphological characteristics between the Pinus massoniana and Huangshan Songs is called the asymptotic population, and the resin channels of the asymptotic groups are all the same, and the natural hybrids are considered as natural hybrids, but the average index of the infiltration population and its total value tend to Huangshan Song, which is considered a natural hybrid and Huangshan Song repeated back to the results (Chen Zhongyi, 1986).

Luo family [5] marked with RAPD markers of Pinus massoniana, Huangshan Song group and morphological characteristics between the two groups of hypothetical hybrid group group. Ten primers with stable polymorphism were screened out from 480 random primers, and 29 polymorphic loci were detected. Among them, 11 loci were amplified products of Pinus massoniana and there was no amplification product of Pinus taiwanensis. The 9 loci were amplified products of Pinus massoniana and the products of Pinus massoniana did not amplify the product. There were no amplified products in the five loci for Huangshan Song and Pinus massoniana, and the polymorphic loci appeared in the hypothetical population. The four loci have amplified products for Pinus taiwanensis and Pinus massoniana and assume

that there are separate sites in the infiltration population. So as to determine the existence of infiltration groups, and the gene of Pinus massoniana to the population gradually higher than the frequency of Huangshan Song.

1.2. Research Objectives

The spatial pattern, genetic variation characteristics, gene infiltration process and mechanism of Pinus massoniana, Pinus taiwanensis and Aspergillus populations in Huangshan were explored, and germplasm protection and ecological resource protection strategies and hybrid use were proposed.

1.3. Research content

1) The genetic variation characteristics of the morphological characteristics of crown, bark, coniferous, cones and seeds of Pinus taiwanensis, Pinus massoniana and Aspergillus populations were studied.

2) The genetic structure of the infiltrated population was analyzed by isoenzyme and DNA genetic marker (SSR), and the process of gene penetration and its mechanism were analyzed.

3) The seedling performance of the populations of Huangshan Song, Pinus massoniana and the infiltration population in different altitude areas.

1.4. Solve the key issues

The characteristics and regularity of the genetic variation of the infiltration population, the spatial distribution pattern, the process of gene infiltration and its mechanism, the genetic performance and the utilization value of the hybrid progeny.

1.5. Research Progress of Huangshan Song and Pinus massoniana

1.5.1 Overview of Huangshan Song

Huangshan Song distribution range of latitude 22°48 '- 31°48', longitude 112°30 '- 122° 30' (not including Ming Ming Song), the specific range of Anhui Dabie Mountains 600 - 1700m, Huangshan 700 - 1600m [2]. The Huangshan Song for tall trees, trees up to 30 meters, diameter up to 80 cm; bark deep gray brown, irregular scales off. High altitude areas, due to strong ultraviolet radiation, the growth of the top buds were inhibited large branches growth, old trees crown flat. Annual buds yellowish brown or dark reddish brown, glabrous, not white powder; winter buds dark brown, oval or long oval, long 1-1.5 cm, 3-7 mm in diameter, apically pointed, slightly with resin; bud scales apex acute, 5-13 cm long, margin serrulate, with stomatal lines on both sides; leaf sheath long 4-12 mm, initially pale brown or brownish , dark brown or dark gray brown when matured then persistent with the color; male ball flower cylindrical, pale red brown, long 1-1.5 cm, gathered in the lower part of the new branches into a short spike; cones oval, 3-5 cm long , 3-4 cm in diameter, few sessile, downward bent down, mature before the green, cooked brown or dark brown, and gradually become dark brown, often exist, the middle of the scales near the round, long 1-2 cm, 1-1.2 cm wide, thick 2-4 mm, slightly squamous lower part of the scales, the base of the wedge-shaped, scales shield slightly hypertrophy, uplift, near flat diamond-shaped, transverse ridge obvious, sometimes visible 2-3 longitudinal ridge Umbilical with short spines; seed obovate-elliptic, with irregular reddish brown stripes, 4-7 mm long, 2-4 mm wide, 1.8-2.5 mm thick, with long winged 1-2 cm wide 7 mm, the largest width of the wings in the middle of the wings; cotyledons 6-7, 2.8-4.5 cm long, below the no stomatal lines; primary leaves strip, 2-4 cm long, both sides of the veins uplift, the edge of sharp serrated. Its flower season lasts for 4-5 months, fruit mature on October of the second year.

1.5.2 Progress of Huangshan Song

In 1936, Xia Weiying [6] published a new species of Pinus hangshuanensis Hsia according to the specimens collected from Xihai Gate of Huangshan and pointed out its special characteristics. This new species has been supported by Hao Jingsheng [7], Hu Xianxuan [8], Liang Tairan [9], Cheng Junqing [10], NT Mirov (1967) [11]

In 1956, Wu Zhonglun [12] was reorganized as a variant of Ryukyu pine, and the Chinese name was still Huangshan Song. The distribution range was Anhui (Huangshan, Jiuhua Mountain, Dabie Mountain), Jiangxi (Lushan), Zhejiang (Tianmu Mountain, Xianju), in the Dabie Mountains, and Lushan located at an altitude of 400 - 2000m area, southern Zhejiang and Fujian distributed in about 700m above the mountain.

In 1961, Zheng Wanjun et al [13] in the 'Chinese tree science,' a book will be Taiwan pine and Huangshan Song to be combined to P. taiwanensis Hayata for the official scientific name. Shortly thereafter, Ke Shi Fan et al [14] (1962) that

Huangshan Song and Taiwan pine in the external form, wood structure and wood are different, do not agree to merge the two into one.

In 1963, Guiyao Lin, Li Zhengli et al [15] according to the comparison of the conifer that the pine and Huangshan pine in Taiwan, the number of resin channels and the epidermis structure are some differences, but in different areas of the specimen appeared in a certain degree changes, furthermore, materials from Taiwan and Huangshan are significantly different, other such as Fujian, Guizhou and other materials seem to have transitional characteristics, so that the two issues need to be further studied.

In 1978, Zheng Wanjun in the 'Chinese Flora Volume VII' in the preparation process, carefully examined the relationship between the population of Huangshan Song, according to 1957 in Tokyo, Japan, the plant specimens room to see Okinawa production Ryukyu pine specimens, that Ryukyu Pine and Huangshan Song (including Taiwan pine) is clearly belong to different populations. At the same time, there are a series of transitional variations of Taiwan pine and Huangshan pine from China's Taiwan to East China and Central and South China. The external morphological and internal anatomical features have a series of transitional variations, which indicate that both belong to a unified population range. These variations have not yet reached a qualitative leap. The two combined to P. taiwanensis Hayata as a formal scientific name, the name is still Huangshan Song. and the distribution range is Taiwan's central mountain elevation of 750 - 2280m, eastern Fujian (Wuyi Mountain), Zhejiang, Anhui, Jiangxi, southeastern Hunan and southwest of Shanxi, eastern Hubei, southern Henan 600 - 1800m above sea level, often composed of simple forest. There is a variant of Ming Ming pine P.taiwanensis Hayata var.damingshanensisChengetLKFu distributed in Guangxi Daming Mountain and Guizhou Fanjingshan.

In 1983, there were differences between Huangshan Song and Taiwan pine, such as Geographical distribution, external morphological characteristics and wood anatomical characteristics, that Huangshan Song should still be an independent germplasm.

In 1993, Tong Yankang et al. [16] confirmed that the distribution range of Huangshan Song was 22°48 '- 31°48' north latitude, 112°30 '- 122°30' (excluding Daxing Song), the specific range of Anhui (Dabie Mountains 600 - 1700m (500 - 1700m), Henan (Dabieshan 600 - 1700m), Zhejiang (Tianmu Mountain 700 - 1300m, Siming Mountain 700 - 900m, Huadingshan 700 - 950m, Dayaoshan 750 - 1400m, 100 Zushan 800 - 1700m), Fujian ((Yushan 750 - 2000m), Jiangxi (Lushan 750 - 1400m, Luo Xiaoshan 1100 - 1800m, curtain Mushan 800 - 1500m), Hubei (Dabie Mountain 600 - 1700m).

In 1997, Li De bang [17] will Huangshan Song and Taiwan pine were reduced to two subspecies of Ryukyu pine, namely P.luchuensis ssp.taiwanensis, P.luchuensis ssp.huangshannensis. In 1998, Luo family using RAPD markers supplemented by morphological, anatomical, wood and other characteristics, support the restoration of Huangshan Song called Pinus hangshuanensis Hsia.

'China Forest' (1998) [18] records the distribution range of latitude 25°30 '- 31°40', longitude 110°25 '- 120°02', that is, north of the Dabie Mountains and Tongbai Mountain north slope, south to Fujian And the southwest border in Guizhou Bijie, west and northwest arrived in western Hubei and Pashan pine (P.henryimast) distribution area connected, the introduction of the scope has been to the north of the mountain, expanded to latitude 36°10 '(Mount Tai). Vertical distribution with latitude and terrain and change, the Yangtze River basin north of the distribution of 500 - 1700m mountain, the south of the Yangtze River in general 800 - 1800m mountain.

Xing Youhua et al. (1985) [19] studied the karyotype of Pinus taiwanensis. The results showed that the number of chromosomes was 2n = 24, and the chromosome composition was k (2n) = 24 = 20M + 4Sm, I-X for the middle of the centromere chromosome, the first XI - XII for the near the centromere chromosome, in Anhui Huangshan, Huoshan, Hunan County, three origin of Huangshan pine chromosome were observed on the secondary constriction, and that the total length of chromosomes in Huangshan Song increased gradually from south to north with latitude. Compared with Taiwan's Kuo Kung-rong's Taiwan-type karyotype, it is concluded that there are differences in the distribution of chromosomes in the pine and Huangshan-song in Taiwan. There are only two pairs of chromosomes (second pair). There are 4 to 5 pairs of chromosomes with secondary constriction.

Zhang Liquan (1990, 1991) [20-21] the age structure and distribution pattern, population density and biomass dynamics of Pinus taiwanensis population in Songyang County, Zhejiang Province were studied. Zhou Yin, Jiang Xiaomei (1992) [22] according to the evolution trend of specialization of wood structure, the system position and grade of gymnosperms, especially the pine and shrimp classes were discussed, and agreed to Zheng Wanchun's proposed merger of Huangshan Song and Taiwan pine the idea.

Fan et al. (1990, 1991, 1993) [23-24-25] has carried on the seedling experiment of Huangshan pine geography seedling, the variation rule of geographical provenance traits of Huangshan pine, provenance selection and genetic stability analysis of Huangshan pine Liu et al. (1993, 1997) [26-27] studied the physiological characteristics of esterase isoenzyme nucleic acid metabolism in five seedling stages of Huangshan pine and the growth of seedlings of Huangshan Song. Tong Yankang et al. (1993) [16] studied the early and late prognosis of Huangshan Song. The above studies

provide a good theoretical basis for provenance selection, and at the same time verify the fact that the population differentiation of Huangshan Song population is obvious.

Tong (1993) [28] studied the broadening genetic parameters of Huangshan Song, and used the provenance of the two experimental sites of provenance experiments to estimate the broadening phenotypic variance of Huangshancong population from the cooperative matrices and related matrices. Wide genetic variance, broaden the heritability and broaden the genetic path coefficient. In the same year, it was pointed out that the genetic diversity of Huangshan pine population was obvious, and the genetic distance D was clustered. The 17 populations studied could be divided into 7 - 8 classes.

Yuan Ronglan et al. (1996) studied the life table of Pinus koraiensis, the factors that caused the death of female flower and cones and their proportion, mainly for the small moth and the pine borer, mainly occurred in May. Wang Joying [30] et al. (1998) studied the effects of different harvesting stages on the seed quality of Huangshan pine. The results showed that the seed weight, germination rate, germination potential and seed vigor index seeding high 114% - 175 3%, and the more time to adopt the lead, the worse the quality. So the distribution in the high altitude area of Huangshan pine seeding time should be strictly controlled before and after frost, cannot be more than half a month in advance.

Wang et al. (1995) [31] described the pollen morphology of P. taiwanensis Hayata in 'Chinese plant pollen morphology'. Hong Wei (1997) [32] applied the logistic study of the limited spatial population to study the increase of the area of the population of Huangshan pine in Longqi Mountain, and pointed out that Huangshan Song under different forest types and different density the maximum growth rate of the base area of the diameter range, that Huangshan Song more suitable for the altitude of 1400 - 1500m, the density should not be too large, but also mixed with a small amount of broad-leaved trees. In 1998, Wu Chengzhen et al. [33] studied the dynamics of population of Pinus taiwanensis. The generalized logistic curve was used to study the quantitative dynamics of population of Pinus taiwanensis.

In 1999, Luo Shijia et al. [34] showed that the population death peak occurred mainly in the transition period of primary seedling to secondary seedlings, according to the static life table, survival curve and size structure of Huangshancun population. , Huangshan Song population in the site of the conditions of the better low altitude subordinate to evergreen broad-leaved forest, the succession results will be replaced by evergreen broad-leaved trees, and in the site conditions are poor, higher elevation of the mountain, ridge, steep slope can be naturally updated to form a more stable terrain top community. Huang Chenglin et al. (1999) [35] obtained the same conclusion on the main plant community types and the succession rule of Huangshan pine community in the top area of Huangshan Mountain.

2002 Tang Juanjuan et al [36]: RAPD molecular markers were used to analyze the genetic diversity of 10 families of Huangshan Song. 17 primers were screened from 206 random primers (groups) to obtain 38 polymorphic loci. The Shannon diversity index averaged 4,551 and the Shannon diversity range ranged from 0 0102 to 0 0504. The genetic diversity of the family (Yuyao × Aragonite) was the highest, and its Shannon diversity index was 7.9658. Based on these 38 polymorphic loci, the genetic distance was calculated and clustered. At the genetic distance of 0.42, 10 families were clustered into three groups.

1.6. Overview of Pinus massoniana

Pinus massoniona Lamb. is one of the genus Taxus (Pinus) of the genus Pinusia (Pinus), common name mountain pine, pine, fir tree (Guangdong, Guangxi), thorn pine (Hunan), fir (Fujian).

Flowers monochromatic, monoecious, flowering from early March to mid-April, cones mature two years, mature late October to mid-November, late. The fruit is usually falling off after ripening, and the seeds fly out.

Pinus massoniana is the most widely distributed species in the genus Pinus sylvestris in China. It is also a representative coniferous tree species (native tree species) in the humid regions of the subtropical region of China. Its natural distribution, there have been many studies and reports. Geographic location from the latitude 21°41 '- 33°40', longitude 102°10 '- 120°in the vast area. In addition to a few mountains, you can see its trails everywhere, across Jiangsu, Anhui, Henan, Hubei, Shaanxi Sichuan Province, Sichuan, Hunan, Jiangxi, Fujian, Guangdong, Guangxi, Guizhou, Yunnan, Taiwan and other 15 provinces (regions) in China, the natural distribution of Pinus massoniana from the Qinhuai Mountains to the Huaihe River Basin; east of the Baise, the northeastern coast of the Leizhou Peninsula, only the sporadic distribution of the northern part of Hainan Island; the western boundary to the Guizhou Jinsha, Qianxi, Anshun, Huangguoshu line and Sichuan Qingyi River, Daxiangling area; the east can be distributed to Taiwan Province Alishan in the northeast.

Masson pine on the soil is not strict, adaptability is very strong. Resistant to drought and barren, hi acid soil, pH value of 4.5 to 6.5 the best growth; fear of waterlogging, intolerant salt. Because of its roots often symbiotic ectomycorrhiza such as horse bacilli, can promote the root absorption of nutrients, is generally considered a low-nutrient species of Pinus massoniana. Pinus massoniana is an important afforestation tree species in barren, scouring, bare rock,

and large grass on grasses with low coverage of grasses. The low cost of afforestation, forest fast, short rotation period. But also the main pulp and paper raw materials in southern China, in the ecological and economic fields are playing a greater role.

1.7. Research Progress of Masson Pine

Because of the disparity between the ecological environment and the isolation of reproductive geography, after a long natural selection process, resulting in a wide range of genetic and variation, and the formation of genetic structure, ecological adaptation and phenotypic characteristics of different types of geographical provenances. According to the study, most species of species and individuals there is a certain degree of variation, this variation is the main source of variation of traits. Yu Xintao [37] studied the geographical variation of Pinus massoniana in Fujian Province and found that the variation between the provenances of Pinus massoniana was very significant. At the same time many units and scholars have also made different regions of the geographical provenance of the analysis and research, the results consistent with Yu. Chen Yuewu et al. [38] (1988) studied the variation between populations of Pinus massoniana, indicating that there were significant differences between forest stands and families. In the natural population of the natural population genetic variation of the mass distribution of Pinus massoniana, Ge Song et al. [38] (1988) found that there were abundant genetic and variation among the natural populations of Pinus massoniana, and the trend of elevation in different slope directions was detailed and vertical Distribution variation is greater than horizontal distribution variation. (1990). The results showed that the genetic variation of the tree height of Pinus massoniana was multi-level, and the population (geographical provenance) was the highest in the 318 maize tree pollen families in 6 regions of Fujian Province. And the number of trees) is greater than the individual within the population. The heritability of the provenance population, the heritability of the ravages in the provenance population and the heritability of the families were 0.79, 0.49 and 0.01. Therefore, in the genetic improvement of Pinus massoniana growth, the genetic variation of the population should be used first.

The study of the genetic structure of Pinus massoniana population using iso-enzyme analysis can also confirm the variation of natural populations of Pinus massoniana. Hamilton et al. [40] (1981) summarize the results of 20 species of coniferous tree species, indicating that different tree species are different levels of variation (1988). The results showed that the results showed that there were 5 small populations of Pinus massoniana P = 64.5%, A = 1.65, and He = 1.65, and the results were as follows: (1) 0.216. Almost the same as the average of 20 tree species in Hamrick. Zhao et al. [41]

(2001) studied the genetic diversity of three natural populations of Simao sinensis. The results were as follows: P = 66.7%, A = 2.13, He = 0.288. In addition, compared with many other large-scale distribution of tree species, the variation index was smaller or similar than that of the masson pine population. Therefore, the study from the molecular level also shows that the variation of Pinus massoniana is very rich.

2. Materials and Methods

2.1. Material Geography Overview

The research materials were collected from Huangshan.

Huangshan is located in the south of Anhui Province, east longitude 118°09 ‘, latitude 30°08’. From the northeast to the southwest of Yangtze River and Qiantang River in the territory of Anhui watershed. Huangshan north and south 40 km long, east and west width of 30 km, with a total area of 1,200 square kilometers. The center position is 1860m above sea level, and the soil belongs to the yellowish red soil classification system on the northern margin of subtropical zone. Climate is the southeast monsoon, hydrothermal conditions, warm climate and abundant rainfall. The climate changes significantly with altitude.

2.2. material collection

According to the present situation, the general distribution of Huangshan Song and Pinus massoniana and infiltration groups in Huangshan is: at low altitude of 400m - 600m for the masson pine, in the range of 600m - 800m - 1000m complex: Huangshan Song, Pinus massoniana and three kinds of aspergillus groups (partial Pinus massoniana, middle type, partial yellow pine) of various forms of pine trees have emerged in the 1000m or more for the Huangshan Song.

Therefore, this experiment is based on the sampling of the situation at an altitude of 400m - 600m, in the range of 800m - 1400m per 100 meters for an altitude gradient, each gradient selection of 5 - 10 strains of individuals (spacing greater than 30 meters) In the range of 600m - 800m per 10 meters for an altitude gradient, each gradient selected 10 or so individuals. Each harvest of annual branches of the leaves of 30-50 root, as much as possible to collect the fruit. The

main equipment is: altimeter GPS receiver, drug balance, tape, height measuring device, high branch scissors, label, diameter roll, pencil, seed bag or plastic bag, field record clip, vernier caliper and so on. At the same time to observe the observation records: altitude, tree height and diameter, bark color, bark cracking, crown, winter bud shape, needle color and hardness indicators. The total number of samples collected in this experiment, with a collection of bags back to the laboratory measurements.

2.3. Determination of length, width, thickness and dry weight

After the acquisition is complete, the measurement work is done in the laboratory. The main equipment is: vernier caliper. Scale, oven, electronic balance. Fifty needles were randomly selected in each sample, and their length, width, and thickness were measured separately and recorded. The results are as follows:

Sample	Elevation (m)	Needle leaf measurement (average)			Needle dry weight / g
		Long (cm)	Width (mm)	Thick (mm)	
1	450	16.63	1.01	0.72	1.1897
2	458	16.1562	0.9912	0.7412	1.3943
3	479	16.1254	0.9292	0.7	1.5997
4	480	14.826	1.224	0.76	1.8507
5	490	9.521	0.8764	0.5916	1.4465
6	500	12.2774	0.7484	0.5724	1.3592
7	515	13.8876	0.8256	0.5744	1.0482
8	520	15.6516	0.9348	0.6824	1.1065
9	524	14.1234	0.8308	0.5988	0.9505
10	536	13.9608	0.8088	0.552	0.9313
11	541	13.4864	0.8008	0.5636	0.8916
12	550	14.516	1.04	0.6964	1.4151
13	555	15.823	1.1592	0.6904	1.2731
14	573	12.3702	0.8624	0.6242	0.6849
15	576	14.5044	0.8204	0.6096	0.9704
16	580	17.4606	1.2436	0.7436	1.8491
17	594	15.5506	1.1402	0.7144	1.4663
18	611	14.11	0.904	0.552	0.8598
19	635	11.1226	0.769	0.536	0.6993
20	641	15.5276	0.9826	0.6892	1.1143
21	650	15.884	0.802	0.5308	1.0407
22	652	13.3546	0.8468	0.63608	0.8184
23	661	15.293	1.0224	0.704	1.0175
24	681	13.5308	0.8836	0.5992	1.006
25	690	13.01	0.7	0.39	0.8743
26	700	15.18	0.83	0.57	0.6392
27	720	13.99	0.85	0.61	1.1022
28	730	12.65	1.17	0.83	1.6443
29	750	14.25	0.81	0.6	1.1781
30	760	13.75	0.74	0.47	0.9803
31	785	12.9408	0.6738	1.0032	0.736
32	800	14.8	0.74	0.53	0.8408
33	820	12.0446	0.6464	0.5844	1.0254
34	850	10.5288	1.2756	0.7976	1.2873
35	857	11.524	1.0344	0.721	1.4883
36	860	11.752	0.8122	0.6112	1.2283

37	863	11.4406	1.0996	0.6756	1.1135
38	866	11.0434	1.1772	0.7976	1.007
39	905	13.3526	1.1026	0.7738	1.518
40	915	12	0.87	0.58	1.2691
41	920	11.087	1.0588	0.655	1.2413
42	928	13.11	0.98	0.77	1.3531
43	941	9.4	0.87	0.56	0.9507
44	961	9.79	1	0.66	1.262
45	1000	10.47	1.09	0.7	1.1816
46	1030	12.83	0.91	0.62	1.2267
47	1040	11.32	0.94	0.65	1.3353
48	1060	9.1	0.83	0.58	1.1105
49	1110	9.21	0.94	0.65	1.0638
50	1120	9.6878	1.1848	0.7306	1.0572
51	1125	11.8194	1.308	0.7084	1.3501
52	1140	9.7168	1.1571	0.7696	1.2835
53	1220	11.27	1.05	0.73	1.5589
54	1230	10.924	1.026	0.6604	1.2274
55	1250	13.27	1.12	0.72	1.5641
56	1260	9.758	1.2612	0.7898	1.1266
57	1320	9.8816	1.3256	0.798	1.0808
58	1340	10.5	1.08	0.78	1.2855
59	1350	11.1476	1.0212	0.6808	1.3055
60	1405	10.335	1.0676	0.7248	1.1795

Table 1. Needle determination table

3. Analysis of Results

3.1. Clustering analysis

According to Table 1, DPS data analysis software was used to cluster the Huangshan pine trees. Because of the large error of the width and thickness of the conifer, the Euclidean distance and the intermediate distance method are used to classify the samples with the length and fresh weight of the conifer. The clustering diagram is as follows:

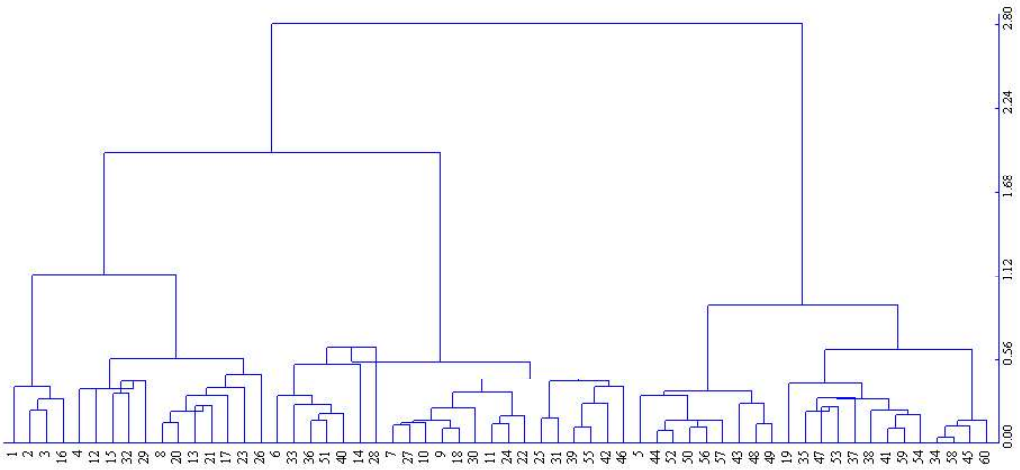

Figure 1. Huangshan pine tree classification map

3.2. Discussion

Figure 1 can be 450m to 1400m above sea level Huangshan pine is divided into four categories:

Category	one categories	two categories	three categories	four categories
Sample Number	Elevation 1, 2, 3, 4, 8, Increase the corresponding elevation 12、13、15、16、 Increase the corresponding elevation 17、20、21、23、26、29、32	6、7、9、10、11、increase the corresponding elevation 14、18、22、24、increase the corresponding elevation 25、27、28、30、increase the corresponding elevation 31、33、36、39、40、42、46、51、 55	5、43、44、48、increase the corresponding elevation 49、50、52、56、increase the corresponding elevation 57、	19、34、35、37、increase the corresponding elevation 38、41、45、47、increase the corresponding elevation 53、54、58、59、 60

Table 2. Clustering results

Table 2 shows the results

The first category is mainly distributed between 450m and 700m above sea level. From the field investigation and the available information, the distribution of the altitude gradient is mainly Pinus massoniana,

The fourth category is mainly distributed at an altitude of 800m to 1400m, from the field pedal and the existing information we can see that the distribution of this gradient is mainly Huangshan Song, that is, Huangshan Song type.

The second type of distribution is relatively wide, from 500m-1100m have, this gradient gradient pine trees both pine and pine, and even between the two types of - infiltration groups.

The third category is mainly distributed at altitudes of 950m-1200 m, according to field investigation records, its shape is close to Huangshan Song, can be called the type of Huangshan pine type. Therefore, the conclusion of this experiment is that there are four types of Pinus massoniana, Pinus taiwanensis and Pinus massoniana, such as Pinus massoniana and Pinus massoniana, and Huangshan Song type.

Which provides a reference for the spatial distribution of Pinus taiwanensis and Pinus massoniana and provides information for the study of the seepage between the two.

This article is mainly morphological research is affected by many factors (???) but for future generations to find a breakthrough in the next experiment and provide (?????).

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