БИОЛОГИЗАЦИЯ ЗАЩИТЫ ОВОЩНЫХ КУЛЬТУР ОТ ВРЕДИТЕЛЕЙ

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Дано обоснование негативных последствии применения пестицидов при производстве сельхоз продукции, в том числе при защите овощных культур защищенного грунта. Проведен мониторинг заселенности овощных культур вредителями в тепличных хозяйствах Юга и Юго-востока Казахстана. Уточнен видовой состав и биологические особенности развития вредителей и их биоагентов, показана степень заселенности овощных культур вредителями.

BIOLOGIZATION OF PEST CONTROL MEASURES
ON VEGETABLE CROPS IN GREENHOUSES

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Negative consequences of pesticide use in agricultural production, including vegetable production in greenhouse, are revealed. Pest monitoring on vegetable crops in greenhouses of South and Southeast Kazakhstan was carried out. Species composition of pests and bioagents were defined and pest distribution on vegetable crops is shown.

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CHARACTERISTICS OF GAS RELEASE DURING COMBUSTION OF BROAD-LEAVED KOREAN PINE (*PINUS KORAIENSIS*) UNDERGROWTH HERBACEOUS FUEL IN XIAOXING'ANLING.

Abstract This article has taken the broad-leaved Korean pine forest of Xiaoxing'anling in Heilongjiang Province as research area, by the method of wild investigation and laboratory control condition burning experiments, measured and computed emission factors and emission quantity of CO_2, CO, C_xH_y, NO and SO_2 within 42 species of herbage in different burning stage, then from the perspective of release speed have analyzed the burning characteristics of different herbage fuels, main content and results are as below: CO_2, CO, C_xH_y, NO and SO_2 emission factors of herbage were 2.9301, 0.4599, 0.0139, 0.0087, and 0.0227, respectively. CO_2, CO, C_xH_y, NO and SO_2 emission quantity of herbage were 1113.46, 174.73, 5.26, 3.29 and 8.60 $mg \cdot g^{-1}$, respectively. CO_2 emission factor and emission quantity were greater than other four kinds of gases obviously. The cluster analysis results showed that the same family of herbs had similar emission characteristics.

Key words: Xiaoxing' anling; herb; combustibles; emission factor

Introduction Forest fire has duality important ecological factor to impact forest ecosystems. On the one hand, it can keep the forest ecosystem balance and stability. On the other hand, it will lead to the destruction of forest ecological balance. Forest fires also release a large amount of flue gas, mainly carbon dioxide and water vapor, and carbon monoxide, hydrocarbons, sulfur and so on, which greatly influences the surrounding environment and the human life. Forest destruction has become the second largest source to increase the concentration of CO_2 in the atmosphere after the fossil fuel. Since the 1980s, the researches of the forest fire on the release of greenhouse gases have been carried out. The researchers in the United States, Canada, Russia and other countries have estimated greenhouse gases released by the forest fires through the indoor simulation experiments and outdoor atmospheric chemistry experiments. The researches in the field of forest fires releasing carbon greenhouse gases are very limited in our country, and they are all based on statistical data. Wang Xiao-Ke et al estimated the amount of carbon gas emission of forest fires in China by the method of emission factors and emissions ratio. Tian Xiao-rui et al calculated the average annual consumption of forest fires on the ground forest biomass and the carbon quantity directly released by forest fires in China, on the basis of the 1999-2000 forest fires statistics data and biomass research; Hu Hai-qing et al estimated the carbon quantity released by the tall tree, bush, herbaceous and ground cover in forests fires according to1980-1999 Great Xingan Mt forest fire data and measured the emission quantity of CO_2, CO, C_xH_y, NO and SO_2 and emission factors of different gases during combustion of the 22 kinds of combustible such as the tall tree, bush, herbaceous and so on. Understory forest herbaceous ecosystems as an important level, the of study release carbon occupies an important position. Herbaceous fuel is the layer of surface forest fire spread into a crown fire an important medium-level and research of herbal fuel type and composition of the gas release is of great significance. 42 kinds of herbals under broad-leaved Korean pine forest studied in this paper. Using field investigation and control of indoor environmental testing the combination of methods, the combustion five gases of the release of (CO_2, CO, C_xH_y, NO and SO_2) were measured. And calculate out the different the gas blow off factor and release amounts. Aim to that the gas calculating forest fire cigarette releases amount, estimate forest fire the effect that the environment brings about to atmosphere provides the certain theory basis.

1 Research areas and research methods

1.1 Research areas survey

The broad-leaved Korean pine forest primarily in Northeast China's mountainous which including eastern part of the Xiaoxing'anling and Changbai Mountains area, Xiaoxing'anling mountain above sea level to 500 ~ 1420 m, the area affected by the maritime climate, moderate and humid climate with an average annual rainfall 600 ~ 1000 mm, mainly concentrated in June-August, the rainfall decreasing from south to north. From north to south temperature was gradually rising trend, annual accumulated temperature above 10 ℃is 1900 ℃ ~ 2800 ℃, The average January temperature is less than - 10 ℃.The average July temperature is greater than 20 ℃.A large different temperature between summer and winter General five months, the minimum temperature is usually in - 30 ℃ ~ - 35 ℃.Soil dark brow forest soil.

1.2 Sample collection and handling

Setting five 20m × 20m-like plots in the broad-leaved Korean pine forestland. According to the terrain, setting representative sample of five 1m × 1m plots or five 1m × 20m transects, Interception of all herbals, weighing fresh weight after bagging mark. Collected outside samples back to the indoor after check in time for a small amount of moisture content determination, and other samples As for the dry back-up Department.

1.3 Methods

1.3.1 Determination of emissions

Environmental control systems included the combustion test KANE British production company KM-9106E-integrated gas analyzer, automatic temperature heating systems, electronic scales, gas collection system, data acquisition and computer components. This study combustion chamber volume of $2.0m^3$ for the vertical devices, laboratory temperature, relative humidity constant, the determination of smoke control officers to move and close the doors and windows to reduce air convection to prevent smoke drift arising as a result of the error. Samples for the quality of 5.0g, heating temperature set at 480 ℃ ~ 500 ℃, samples of each of the burning time of 20 ~ 25min. The flue gas CO_2, CO, C_xH_y, NO and SO_2through the flue gas analyzer probe of the collection, application software, Fire Works, a different record fuel combustion gas emissions volume, a record of every 10s. Each sample test repeated three times, the same gas emissions data access. On average, the data and sort out will be saved.

1.3.2Calculation of emission factor

We can get volume fraction of gas emissions every 10s from fire Works, using of software gas emissions curve fitting, pointing out the area, coming to a variety of gases between the size of the relationship between the ratio, multiplied by the corresponding Score of carbon, the projection of different gas emissions factor. The formula is as follows:

$$EF_i = \frac{M_i}{m_f}$$

In the formula: Mi for a certain quality of the carbon gases; mf for the combustion of carbon total loss.

1.3.3 The method of calculating emissions

Utilizing different gas emission factors, combined with air-drying samples of water and total carbon content, the calculation of the trial process herb samples of different CO_2, CO, C_xH_y, NO and SO_2 emissions. The formula is as follows:

$$m_i = M_i \times C_i \times \frac{(100 - MC_i)}{100} \times EF_i$$

In the formula: mi for a release of gas (g); Mi for the quality of the sample (g); Ci for the whole carbon content (%); MCi to air-dry water content (%); EF for the emission factors.

1.3.3.1 Determination of air-drying moisture content

Keeping samples in a cool dry place indoors, after about 30d, weighing the natural air-dry. The formula is as follows:

$$\text{Air-drying moisture content (\%)} = \frac{\text{Air-drying quality (g) - Dry quality (g)}}{\text{Dry quality (g)}} \times 100\%$$

1.3.3.2 Determination of total carbon content

Checking 0.2g constant access to crush the samples into processed porcelain boat, so that the full oxygen-generating combustion CO_2, with analysis of carbon and nitrogen Multic/N3000 to measure the carbon content of the whole, each measuring 3 kind of parallel, the average check results , The accuracy of (0.01 ± 0.3)%.

1.3.4 Cluster analysis method

Record every kinds appeared which all the number of herbaceous plants, and more, cover, the growth situation, there were 61 kinds of herbs, out of which two lower than the frequency, and more than 19 small to 42 kinds of plants. For the analysis of the number is variable.

In according to the type of plots in the existence in the case, the use of cluster analysis of the law the definition of long-distance category with the distance between the categories. That is, will be based n-k-like divided into categories, G1, G2, ... Gt ... Gk, (k = 1, ... n), the total category with Ward is:

$$s = \sum_{t=1}^{k} \sum_{i=1}^{nt} (x_{it} - \overline{x_t})^k (x_{it} - \overline{x_t})$$

In the formula: nt to a variety of Gt said the number; xit said Gt in the first month I like to targets, xit for the m-dimensional vector; that the focus of Gt. When k was fixed, the categories in the program that the choice of S reached a very small (in the local minimum solution) classification until all kind of have to be a class so far. The result is: the same sample between Ward and smaller, with the type of category between Ward and more.

1.4 Data Processing

The use of Table Curve 2D V5.0 Tvial software fitting gas emissions curve, calculating integral area, using SPSS software for data analysis and clustering one-way ANOVA analysis of variance test was significant.

2Results and analysis

2.1 Emission factor of different Herbs plants

Table 1- Emission factor of different herbs species

Species	Emission factor				
	CO_2	CO	C_xH_y	NO	SO_2
1	2	3	4	5	6
Trifolium repens Linn.	3.1257	0.3357	0.005	0.0073	0.0213
Veronica anagllis-aquatica (L.)	3.2177	0.2777	0.0047	0.0053	0.016
Bupleurum chinense DC.	3.2353	0.2563	0.01	0.008	0.0177
Artemisiasievrsiana Willd.	3.3483	0.1937	0.005	0.0037	0.0123
Roegneria nutans	3.057	0.3627	0.0143	0.005	0.0267
Glycyrriza Uralensis Fisch.G.Glabra (L.)	3.186	0.301	0.003	0.0083	0.0213
Artemisa rubripes	2.9413	0.4323	0.017	0.008	0.0173
Sanguisorba officinalis Linn.	2.713	0.5717	0.02	0.011	0.0243
Crepis rigescens Diels	3.1023	0.349	0.0057	0.0063	0.021
Artemisiascoparia Waldst.EtKit.	3.034	0.378	0.014	0.008	0.021
Astragalus membranaceus (Fisch.) Bunge	3.1983	0.2913	0.004	0.0073	0.0173
Potentilla fruticosa	2.929	0.4423	0.0157	0.0123	0.0107
Spiraea sericea	2.434	0.7243	0.0343	0.0157	0.025
Convallaria majalis (L.)	2.6123	0.6207	0.029	0.0103	0.0263
Chamaenerion angustifolium	2.513	0.7083	0.0147	0.0113	0.0317
Spiraea Salicifolia	2.5363	0.6627	0.0323	0.018	0.0217
Pyrola rotundifolia ssp.chinensis	3.014	0.392	0.0133	0.0093	0.0113
Adenophora tetraphylla	2.2623	0.8273	0.0377	0.0087	0.0267
Calamagrostis epigeios (L.) Roth	2.9417	0.435	0.0153	0.0083	0.026
Galium verum(L.)	2.3657	0.7583	0.04	0.0103	0.0463
Etymus nutans Griseb	2.917	0.472	0.003	0.0077	0.0187
Adina rubella Hance	2.916	0.4663	0.0063	0.0057	0.0257
Carex meyeriana Kunth	3.08	0.3463	0.015	0.0053	0.0207
Thalictrum aquilegifolium (L.) var.	3.103	0.345	0.0073	0.003	0.034
Artemisia sacrorum Ledeb.	3.0053	0.3947	0.015	0.0083	0.0263
Filipendula palmata	3.2517	0.245	0.011	0.0087	0.009
Equisetum arvense	2.5703	0.6897	0.0047	0.0133	0.0313
Cephalanoplos segetum (Bunge) Kitam	2.8997	0.4723	0.009	0.0023	0.0093
Deyeuxia angustifolia	3.0887	0.3607	0.004	0.0053	0.0143
Polygonatum humile	2.853	0.4853	0.0187	0.008	0.0217
Veratrum nigrum	2.6153	0.651	0.0103	0.0127	0.024
Picris hieracioides	3.1247	0.339	0.0037	0.005	0.0157
Puccinellia tenuiflora	3.1677	0.3007	0.0097	0.0043	0.0253
Carex schmidtii Meinsh	2.8113	0.5353	0.005	0.0107	0.0297
Saussurea serrata	2.744	1.1417	0.051	0.0167	0.076
Carex callitrichos V. Krecz	2.9933	0.395	0.0193	0.007	0.012
Artemisia lavandulaefolia	3.178	0.2983	0.0073	0.007	0.0213
Vicia japonica	2.7087	0.5923	0.01	0.014	0.012

Прододжение таблицы 1

Species	*Emission factor*				
	CO_2	CO	C_xH_y	NO	SO_2
1	2	3	4	5	6
Leonurus artemisia	3.2367	0.26	0.0077	0.0073	0.02
Polygonatum odoratum	3.2723	0.2363	0.0083	0.0073	0.0177
Poa pratensis	2.9317	0.4583	0.0057	0.0073	0.019
Axyris amaranthoides	2.829	0.5083	0.0143	0.0137	0.0247
Average	2.9301	0.4599	0.0139	0.0087	0.0227

Indoor test drawn the different fuel-gas emissions in the herbaceous under the Korean pine broad-leaved (Table 1). Table 1 can be seen that, CO_2 emissions of gases other than the obvious factor, NO emission factor of the smallest. That is, CO_2 emissions factor in the Asteraceae Artemisia's largest seed large, round leaves of Campanulaceae Adenophora minimum; different kinds of CO emission factors and the size of the order of CO_2 emission factor on the contrary; C_xH_y emission factor in the Asteraceae to swallow the largest Saussurea , The grass Elymus minimum; NO and SO_2 emission factor to the rose family Saussurea swallow the biggest, the smallest grass mosquitoes. This shows that different herbal fuel combustion efficiency of a larger difference.

Table2 - Gas emission amounts of different herbs species （mean±SE，$mg{\cdot}g^{-1}$）

Species	**CO_2** $mg{\cdot}g^{-1}$	**CO** $mg{\cdot}g^{-1}$	**C_xH_y** $mg{\cdot}g^{-1}$	**NO** $mg{\cdot}g^{-1}$	**SO_2** $mg{\cdot}g^{-1}$	**Total carbon containing**	**Total** $mg{\cdot}g^{-1}$
1	2	3	4	5	6	7	8
Trifolium repens Linn.	1187.74±32.19	127.48±20.67	1.92±0.26	2.74±0.22	8.13±1.03	1317.13±11.63	1328.01±10.37
Veronica anagllis-aquatica (L.)	1222.69±16.1	105.51±9.16	1.76±0.62	2.05±0.18	5.99±0.86	1329.96±6.32	1338.00±5.62
Bupleurum chinense DC.	1229.46±16.67	97.39±9.59	3.94±0.58	3.03±0.34	6.65±0.31	1330.79±6.50	1340.47±6.17
Artemisiasievrsiana Willd.	1272.34±3.25	73.64±1.32	1.92±0.48	1.32±0.06	4.71±0.29	1347.90±1.52	1353.93±1.27
Roegneria nutans	1161.57±40.75	137.82±24.87	5.53±0.84	1.88±0.21	10.17±2.02	1304.91±15.29	1316.96±13.10
Glycyrriza Uralensis Fisch.G.Glabra (L.)	1210.67±10.98	114.33±6.07	1.09±0.57	3.04±0.19	8.03±0.32	1326.09±4.40	1337.16±4.28
Artemisa rubripes	1117.81±25.08	164.23±14.75	6.35±0.69	3.13±0.03	6.5±0.77	1288.38±9.64	1298.00±8.84
Sanguisorba officinalis Linn.	1030.85±24.14	217.31±15.03	7.64±0.19	4.16±0.05	9.22±0.71	1255.80±8.92	1269.18±8.26
Crepis rigescens Diels	1178.85±15.28	132.6±8.71	2.22±0.61	2.26±0.14	8.04±0.55	1313.68±6.00	1323.98±5.35
Artemisiascoparia Waldst.EtKit.	1152.98±18.53	143.64±10.97	5.32±0.63	3.11±0.28	7.99±0.88	1301.94±7.11	1313.03±5.95
Astragalus membranaceus (Fisch.) Bunge	1215.4±23.68	110.79±13.78	1.39±0.74	2.85±0.31	6.62±1.35	1327.58±9.17	1337.06±8.06
Potentilla fruticosa	1112.99±7.18	168.05±5.63	5.91±0.6	4.61±0.58	4.08±0.13	1286.96±2.16	1295.65±1.45
Spiraea sericea	924.92±10.07	275.22±6.33	13.07±0.05	5.97±0.12	9.41±1.12	1213.20±3.69	1228.58±4.94
Convallaria majalis (L.)	992.78±17.55	235.8±11.5	10.91±0.19	3.97±0.11	9.93±0.53	1239.50±6.24	1253.39±5.6 0
Chamaenerion angustifolium	955.02±26.38	269.17±16.14	5.58±0.37	4.36±0.44	12.08±0.16	1229.76±9.87	1246.21±10.16
Spiraea Salicifolia	963.85±61.33	251.84±35.15	12.27±2.22	6.88±0.06	8.23±1.17	1227.96±23.97	1243.07±22.74
Pyrola rotundifolia ssp.chinensis	1145.45±8.2	148.95±3.5	5.02±0.98	3.6±0.05	4.25±0.29	1299.42±3.72	1307.28±3.37
Adenophora tetraphylla	859.71±37.15	314.41±20.9	14.39±1.56	3.32±0.4	10.11±1.27	1188.50±14.68	1201.92±13.01
Calamagrostis epigeios (L.) Roth	1117.89±19.08	165.25±11.14	5.73±0.68	3.24±0.16	9.83±0.96	1288.87±7.38	1301.94±6.29
Galium verum(L.)	899.01±130.96	288.19±73.36	15.07±5.71	3.85±0.7	17.66±5.65	1202.28±51.90	1223.79±46.01
Etymus nutans Griseb	1108.34±21.1	179.4±14.04	1.12±0.45	2.84±0.74	6.99±0.53	1288.86±7.42	1298.70±7.15
Adina rubella Hance	1108.18±37.75	177.24±22.72	2.41±0.75	2.18±0.11	9.82±2.25	1287.83±14.29	1299.83±12.11
1	2	3	4	5	6	7	8
Carex meyeriana Kunth	1170.78±29.9	131.62±17.41	5.72±0.92	2.06±0.07	7.83±1.47	1308.11±11.57	1318.00±10.03
Thalictrum aquilegifolium (L.) var. sibiricum	1179.11±37.38	131.17±21.94	2.94±1.12	1.2±0.06	12.91±2.7	1313.23±14.39	1327.34±11.64
Artemisia sacrorum Ledeb.	1142.01±25.66	149.91±14.99	5.73±1.1	3.14±0.35	10.01±1.53	1297.65±9.95	1310.79±8.69

1	2	3	4	5	6	7	8
Filipendula palmata	1235.61±3.57	93.17±1.87	4.12±0.23	3.24±0.21	3.38±0.46	1332.89±1.47	1339.51±0.79
Equisetum arvense	976.71±109.27	261.95±70.7	1.81±0.85	4.99±2.03	11.96±0.98	1240.48±39.24	1257.42±37.72
Cephalanoplos segetum (Bunge) Kitam	1101.85±14.68	179.44±7.75	3.46±1.1	0.93±0.03	3.69±0.32	1284.75±6.06	1289.36±6.13
Deyeuxia angustifolia	1173.75±19.92	137.03±12.6	1.55±0.34	2.03±0.06	5.46±0.62	1312.32±7.29	1319.81±7.78
Polygonatum humile	1084.13±9.76	184.4±4.47	7.07±0.99	3.12±0.22	8.18±0.32	1275.60±4.29	1286.90±4.19
Veratrum nigrum	993.83±67.5	247.4±41.37	3.9±0.91	4.86±0.32	9.21±1.95	1245.13±25.22	1259.21±22.95
Picris hieracioides	1187.32±15.04	128.81±9.02	1.31±0.32	2±0.04	6.04±0.66	1317.44±5.70	1325.48±5.11
Puccinellia tenuiflora	1203.72±20.18	114.24±12.08	3.67±0.47	1.62±0.14	9.7±0.97	1321.63±7.67	1332.95±6.58
Carex schmidtii Meinsh	1068.29±75.85	203.36±47.7	1.99±0.37	4.03±0.68	11.38±2.82	1273.64±27.82	1289.05±24.41
Saussurea serrata	1042.75±110.73	239.99±20.63	19.39±9.48	6.47±2.65	28.85±13.42	1495.93±260.68	1531.26±275.71
Carex callitrichos V．Krecz	1137.44±17.74	150.05±8.12	7.31±1.81	2.71±0.15	4.52±0.68	1294.80±7.81	1302.03±6.98
Artemisia lavandulaefolia	1207.62±15.18	113.29±8.71	2.8±0.6	2.6±0.04	8.05±1.11	1323.71±5.94	1334.35±4.81
Vicia japonica	1029.28±16.12	225±8.02	3.81±1.28	5.24±0.44	4.57±0.36	1258.09±6.82	1267.90±6.02
Leonurus artemisia	1229.96±21.85	98.71±12.35	3±0.92	2.75±0.3	7.57±1.3	1331.67±8.62	1341.99±7.03
Polygonatum odoratum	1243.44±9.34	89.78±5.15	3.21±0.53	2.81±0.16	6.76±0.62	1336.42±3.75	1345.99±3.18
Poa pratensis	1114.04±21.8	174.15±14	2.05±0.13	2.8±0.48	7.23±0.92	1290.23±7.88	1300.26±8.03
Axyris amaranthoides	1075±29.49	193.13±14.57	5.4±3.92	5.21±0.54	9.4±1.04	1273.53±13.02	1288.13±11.83
Average	1113.46±10.48	174.73±8.08	5.26±0.45	3.29±0.14	8.60±0.49	1293.44±7.79	1305.33±7.91

2.2 Different herbs gas emissions

By the experimental data from calculated 42 herbs fuel combustion to release the five major gas emissions (Table 2). Different herbal fuels combustion to release With CO_2, CO-based. C_xH_y, NO and SO_2 emissions is smaller. Make the Different matter herbaceous combustible gas emissions for the analysis of variance which tested the difference was significant. The results show that different herbal combustion gases generated by the five major release there are significant differences ($P < 0.05$). CO_2 emissions in the Asteraceae Artemisia's largest seed large, round leaves of Campanulaceae Adenophora minimum; CO emissions of CO_2 and the law On the contrary, the largest release of Radix Codonopsis, the smallest seed of Artemisia; Saussurea dovetail with the release of licorice C_xH_y the most obvious difference, the former is 17.8 times that of the latter. Herbal between the different fuel emissions NO significant difference to the pattern Rosaceae Spiraea the largest and the smallest Xiaoji of the Asteraceae, the release of the former is 7.4 times that of the latter. SO_2 emissions swallowed the Asteraceae Saussurea largest, rose family of mosquito youngest grass.

Table 3 - The correlation among five gas emission amounts

Species	CO_2	CO	C_xH_y	NO	SO_2
CO_2		P<0.0001	P<0.0001	P<0.0001	P<0.0001
CO	R=-0.997		P<0.0001	P<0.0001	P<0.0001
C_xH_y	R=-0.723	R=0.671		P<0.0001	P<0.0001
NO	R=-0.681	R=0.685	R=0.441		P=0.007
SO_2	R=-0.601	R=0.592	R=0.505	R=0.240	

42 herb fuels combustion to release the five major gas emissions are among the significant correlation (Table 3). CO_2 emissions and CO, C_xH_y, NO, SO_2 there is a very significant negative correlation ($N = 126$, $P < 0.0001$). The CO, C_xH_y, NO, SO_2 emissions between a very significant positive correlation ($N = 126$, $P < 0.01$).

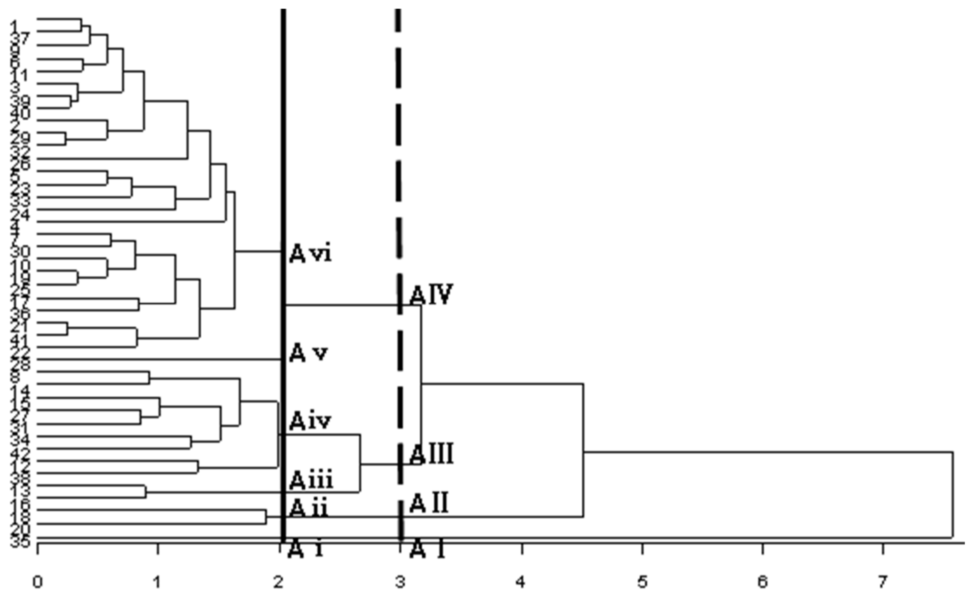

Fig.1 42 kinds of herbs forest burning gas emissions cluster analysis of the map

In broad-leaved Korean pine forest, spring and autumn (that is, in mid-May and mid-September) to investigate conclude of 61 kinds of herbs, is 32 categories, 15 Branch, Division of the largest number of species are Asteraceae, the grass family, Rosa Branch, and Ranunculaceae Liliaceae. Cluster analysis 42 major herbals. The result of cluster analysis can be seen at a distance equal to 3, 42 samples were clustered into four broad categories of A Ⅰ, A Ⅱ, A Ⅲ and A Ⅳ. In the distance was equal to 2 for the six sub-A ⅰ, A ⅱ, A ⅲ, A ⅳ, A ⅴ and A ⅵ (Figure 1). In each category, the same subjects in the majority of the herb, such as sub-A ⅴ Asteraceae in the majority, A ⅵ in sub-accounts for most of the rose family.

2.3 Fuel gas emissions of cluster analysis

(1) A Ⅰ included in the sub-A ⅰ: only consists of a species that is the axis Chenopodiaceae quinoa (Axyris amaranthoides); (2) A Ⅱ include A ⅱ categories: Rubiaceae, including the sub-canopy vegetables (Galium verum L.) and Campanulaceae of Radix Codonopsis (Adenophora tetraphylla); (3) A Ⅲ, including A ⅲ and A ⅳ sub-categories: A ⅲ categories, including the Equisetaceae Equisetum (Equisetum arvense) and willow branches of the food Chamaenerion angustifolium (Chamaenerion angustifolium), and so on; A ⅳ categories, including the Liliaceae Veratrum (Veratrum nigrum), lily of the valley (Convallaria majalis L.), Polygonatum (Polygonatum odoratum), small odoratum (Polygonatum humile), the Rosaceae Sanguisorba (Sanguisorba officinalis Linn.) And Lufthansa Caoke of Carex grass (Carex schmidtii Meinsh), Carex grass (Carex callitricho s V. Krecz), and so on; (4) A Ⅳ included in the sub-A ⅴ and A ⅵ categories: A ⅴ Asteraceae, including sub-field of mugwort (Artemisia lavandulaefolia), Xiao Ji (Cephalanoplos segetum Kitam), swallow-tailed Saussurea (Saussurea serrata), Red Terrier Artemisia (Artemisa rubripes), Huang Artemisia (Artemisiascoparia Waldst.EtKit.), Crepis (Crepis rigescens Diels), Mao even vegetables (Picris hieracioides), large seed Artemisia (Artemisiasievrsiana Willd.), Pyrola Caoke deer Incarnata (Pyrola rotundifolia ssp.chinensis) and Cyperaceae of the tread in the first (grass ul) (Carex meyeriana Kunth), and so on; A ⅵ categories, including Rosaceae pattern of Spiraea (Spiraea Salicifolia), sericea Spiraea (Spiraea sericea), mosquito grass (Filipendula palmata), Kim Laomei (Potentilla fruticosa), Water Yangmei (Adina rubella Hance), Labiatae Leonuri's (Leonurus Artemisia), the Umbelliferae Bupleurum (Bupleurum chinense DC.) North Scrophulariaceae Veronica (Veronica anagllis-aquatica L.), The leguminous Astragalus (Astragalus membranaceus (Fisch.) Bunge), the East Vicia (Vicia japonica), licorice (Glycyrriza Uralensis Fisch.G.Glabra L.), white clover (Trifolium repens Linn.), Ranunculaceae of Thalictrum (Thalictrum aquilegifolium L. var. Sibiricum Regel) and lobular Chapter grass (Deyeuxia angustifolia), goose grass crown (Roegneria nutans), Calamagrostis (Calamagrostis epigeios (L.) Roth), Kentucky bluegrass (Poa pratensis), Elymus (Etymus nutans Griseb), star grass (Puccinellia tenuiflora), and so on.

3Discussion

Emission factor is the ratio of forest fires in the release of some of the carbon content of the volume of gas and combustion of carbon, the total amount of the loss ratio, the total amount of the loss ratio is estimated forest fires and other toxic gases carbon content of harmful gases released by the necessary parameters. This study has been 42 major herbal of the CO_2, CO, C_xH_y, NO_2 and SO_2 emission factors were 2.26 ~ 3.35,0.19 ~ 1.14,0.002 ~ 0.018,0.009 ~ 0.076,0.003 ~ 0.051, Zhuang Yahui and so on are different from the results of the study, the value obtained in this article are smaller than the results of the study. This may be due to different calculation methods and the result of this study in a variety of trace gases emissions by the value of flue gas analyzer from the measured emission factor is calculated by a certain amount of carbon gases C burning biomass burning The total loss in the process of carbon; Zhuang Yahui and some, such as carbon gases in the amount of carbon / combustion process of burning material losses to calculate the total amount of carbon emission factors. Foreign forest fires release of trace gases in the research on a variety of carbon gases and other trace gases emission factor has been the determination of indoor micro-environment to test air samples directly to the fire in the measured test data.

According to the results of the cluster analysis, within the same family of herbs with similar emission characteristics of the different branches of the plant because of its physical and chemical properties of plants and C (N, S), and other elements of the difference may be led to their release in the combustion reaction A variety of different amount of the trace gases. In addition, fuel moisture content, size crushed, heated outside temperature in the external factors of fuel combustion in the flue gas emissions will have to varying degrees.

Korean pine broad-leaved small Hinggan Mountains area is the most widely distributed of a forest types, forest through its Combustion herbal product analysis showed that the different fuel CO_2, CO, C_xH_y, NO_2 and SO_2 emission factor release and there are significant The difference, Therefore, forest fires in toxic and harmful gas emissions estimates, taking into account the different fuel gas emissions differences. A unified approach to obtain a representative of the different types of forest fuel combustion gas emissions on the basis of the data is to reduce forest fires, carbon and other toxic and harmful gas emissions to estimate the uncertainty of the necessary research.

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ХАЙОХИНГАНЛИНГ ЖАЛПАҚ ЖАПЫРАҚТЫ ОРМАНДАРЫНДАҒЫ КОРЕЙ ҚАРАҒАЙЫ (*PINUS KORAIENSIS*) ШӨП ЖАМЫЛҒЫСЫНЫҢ ЖАНУ КЕЗІНДЕГІ ГАЗДАРДЫ БӨЛУ СИПАТТАМАСЫ

Ху Хай-гинг, Ванг Вей-ю, Сан Лонг, Лиу Фей

Мақалада Хэйлунцзян провинциясындағы Хайохинганлинг жалпақ жапырақты ормандарында өскен корей қарағайы мәліметтері келтірілген, табиғи және бақылау зертханасы жағдайында экспериментальді өртеу зерттеу әдісін қолданып, CO_2, CO, C_xH_y, NO және SO_2 бөлінген мөлшерін өлшенген және есептелген коэффициенттерін, 42 шөп түрін түрлі жану кезеңдерінде зерттеп, содан кейін әр түрлі шөптердің жану жағдайындағы бөліну жылдамдағын талдап, негізгі құрамы мен қорытындысы төменде келтірілген: CO_2, CO, C_xH_y, NO және бөлінген SO_2 шөптерде 2.9301, 0.4599, 0.0139, 0.0087, және 0.0227 сәйкес келген, CO_2, CO, C_xH_y, NO және SO_2 шөптермен тасталған санмен 1113.46, 174.73, 5.26, 3.29 және 8.60 $мг·г^{-1}$ сәйкес келген. Нақтысы, CO_2 бөліну коэффициенті, басқа төрт газдың мөлшерінен жоғары. Кластерлік талдаудың нәтижесі көрсеткендей, бір тұқымдасқа жататын шөп түрі аналогиялық сипатымен ерекшеленеді.

ХАРАКТЕРИСТИКА ГАЗОВЫДЕЛЕНИЯ ПРИ ГОРЕНИИ ТРАВЯНОГО ПОКРОВА В ШИРОКОЛИСТВЕННЫХ ЛЕСАХ КОРЕЙСКОЙ СОСНЫ (PINUS KORAIENSIS) В XIAOXING'ANLING.

Ху Хай-гинг, Ванг Вей-ю, Сан Лонг, Лиу Фей

В статье приведены сведения о корейской сосне в широколиственных лесах Хайохинганлинг провинции Хэйлунцзян как района исследований методом изучения в природе и контролируемых лабораторных условиях экспериментальным сжиганием, измеренных и вычисленных коэффициентов выделений и выделенное количество CO_2, CO, CxHy, NO и SO_2 среди 42 видов трав в различных стадиях горения, затем с точки зрения скорости выделения проанализировали характеристики сжигания различных видов трав, основное содержание и результаты, как показано ниже: CO_2, CO, CxHy, NO и выделений SO_2 травами были 2,9301, 0,4599, 0,0139, 0,0087 и 0,0227, соответственно. CO_2, CO, CxHy, NO и SO_2 количество выбросов травами были 1113,46, 174,73, 5,26, 3,29 и 8,60 $мг/ г^{-1}$, соответственно. Очевидно, что коэффициент выбросов CO_2 и количество выбросов больше, чем у четырех других видов газов. Результаты кластерного анализа показали, что одно и то же семейство трав характеризуется аналогичными излучениями.