

A Study on the Environmental Change and Cause of the Cave

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Abstract

The cave is similar to living things, because of keeping on changing.

The environment in the cave after developing it change because many factors as followings ; The microbes and the mosses by visitors and inner facilities will grow in the cave, which makes the ecology a lot of change.

The quality of water and air in the cave can lead to the destruction of the ecology by the development. So we do our best to conservate the cave without changing the environment of air, the water and the ground.

I. The outline about the change cause of the cave

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The cave can accommodate appropriately visitors suitable for the inner scale.

If, in the small cave, a lot of visitors come into the inner part, they feel a little headache and giddy as the entrance is so narrow that the air of the inner part circulates with the outer air.

When the quantity of nitrogen contained 23% in the air, the creature can survive. If there is the nitrogen of over 60% density in the air, the obstacle of the liver and the circulation system are likely to happen, The animal in a weak endurance can die within a few days half of them.

And most of the nitrogen acid gas from the fuel are consumed through the assimilation action and are dissolved into the water. And sometimes, that the temperature in the cave increase to 20 C is owing to high density of nitrogen.

When the carbonic acid gas in the air increase in density, and the temperature rise naturally. To go down and up the stairs can be the result to rise the temperature inside the cave.

Keeping appropriate humidity among the environmental condition of the cave plays an absolute role in the generative development of the cave formation part, and the survival of the cave animals

II . Environmental Change and Factors

1. Environmental pollution of the inner cave

The environment in the cave that was , at first, the undeveloped state, and that no one visits there can conserve the old state, on account of the visitors, the environmental change in the cave keep on.

In case that a lot of visitors come into the cave, the temperature of the inner part will rise, the humidity will fall down, and the quantity of the carbon dioxide will increase gradually.

The microbes and the mosses on the mud in the visitors' clothes or shoes grow in the cave, at last which makes the ecology a lot of change and much dust that the visitors left there increase the pollution degree , and influence on living circumstance of the creatives.

The lower creatures like the mosses or the water animals grow in the cave so that the pollution of the cave environment is getting worse.

If the cave is developed, the 2nd products become continuously contaminated, which is related with the visitors and inner facilities.

The second products

that are stalacite, stalagmite, etc., are destroyed by the cause as followings;

The stalacite is first destroyed by the development and the establishment of the facilities, secondly by the visitors, and thirdly by the ground weakness of the ceiling by the gravitation as it grows, and by the falling to the bottom of the upper stone that is composed of board-like, or staire-like one.

But at last after the tour development, as the the life became safer, the staliciteis welcomed as strange stone or decoration goods so that the inner stone is secretly destroyed and stolen.

It is knowned that the cave microbes is growing near the enterance where the sun shines, but in some case the lower plant like the mosses or the ferns lives near the inner part where the electric light shines.

The relation between the electric light and the humidity makes the lower plants grow so that it has the ecology of the cave creatives change greatly.

3. The change factors of the water temperature and the humidity

The environmental change of the inner part is related with the number of visitors, the illuminative facilities, and the scale of the cave.

The stream head of Kosu caveis not clear, but there are many water

veins under the ground, many limpool, and multi-staged coal hills.

The temperature of water is about 14 degree, the outer influence doesn't almost appear. The proper humidity among the cave environment is about 90%, the difference of the humidity change is about 0.7%, and the high humidity are always keeping.

4. The ecological change of the cave creatures

If the cave is developed, the living environment is gradually changed., which is due to the experimental change by visitors and inner light.

The animals of this cave in the early period was knowned as 16mok 20 chong, after that, a lot of changes appear. in this research, animals of only 12chong were founded, especially, the uncommon Kosuglrowa insects, and Kosujangnimjomdajon insects were not founded, maybe, they moved into the deep places owing to the environmental pollution was worse after opening the cave.

The black pollution in the Kosu cave appeared similar Mammulsang area and new developed one. As a rule, this place was comparatively less dark than the black pollution of the other ones. The green pollution appeared near the tour road and the light.

These kinds of change factors is due to a lot of lower plants which cause the green pollution as the light is bright, and the temperature get warmer.

That is to say, because the inner part is dark word, the ecological structure of the cave creatures is consist of the special one without the 1st stage, product level,

■ . The cave pollution

1. The structure analysis of the cave ground level

Most of all caves is formed as the ground level of valued and safe structure. And there are many ground level that is made up to the steep slope, but the ground level does not fall easily.

2. Coal and chemical analysis

The accumulatiom, the second products in the cave, which develop in the opened districts and closed ones within the cave was analysed as followings;

First, the podwder reagent of the definite quantity is heated to the 1,000 degree for 1 hour, and made cold in the desicator.

Second, in order to fix reagent, after decomposing the powder material, evaluating the weight, adding H₂SO₄ and HF, heating it,

and evaporating reagent, and by using the evaporated quantity, the quantity of reagent were evaluated.

Third. Ca was evaluated after melting powder material, adjusting to the degree of Ph13, by evaluating as using EDTA.

Fourth. Ma was evaluated after melting powder material, regulating to the degree of Ph10,, evaluating it by EDTA with all of Ma and Ca, by subtracting the weight of the above Ca.

Table.1 Chemical analysis of cave accumulation

experimental material	CaO	MgO	Fe	SiO ₂	SiO ₂
	%	%	PPm	PPm	%
stalomite	54.51	-	352	520	0.52
stonepillar	53.52	-	242	720	0.22
stalacite	54.27	-	825	450	0.05
stonepipe	54.19	-	543	582	0.12

experimental material	Mn	Sr	P ₂ O ₂	L	H ₂ O
	%	PPm	%	PPm	%
stalomite	-	8.01	0,012	252	1.08
stonepillar	12	-	0.102	358	1.88
stalacite	-	0.52	0.027	416	2.02
stonepipe	-	1.58	0.011	125	1.82

3. The cause about pollution of quantity of water

The cave water are not almost polluted in dry season because the surface water penetrates into the earth, but are polluted in rainy season because a lot of water which is mixed with polluted soil and unclear one infiltrate into the earth.

Originally, The pollution of water divide into natural one and artificial one

And The polluted water is said to change to the wrong direction at the water of public or general area on the physical, biological, and chemical part.

4. The change of air quality in the cave

If a lot of visitors come into a small cave simultaneously, the flow of air is slow, the air condition is not good, and they feel stomache. The air pollution is generally divided into two patterns, which is first CaCO_3 by human beings, and secondly H_2SO_4 emitted in the cave.

5. The stream of air and the press of air.

The atmosphere press of the earth surface two kinds. One is the periodic case which is the temperature difference of day and night for 24 hours.

In the other word, the air temperature of day rise by the sun heat,

but the one of the night fall down, and the atmosphere press rise. Therefore, after the sunset, the air flows in, and after the sunrise, the one rises.

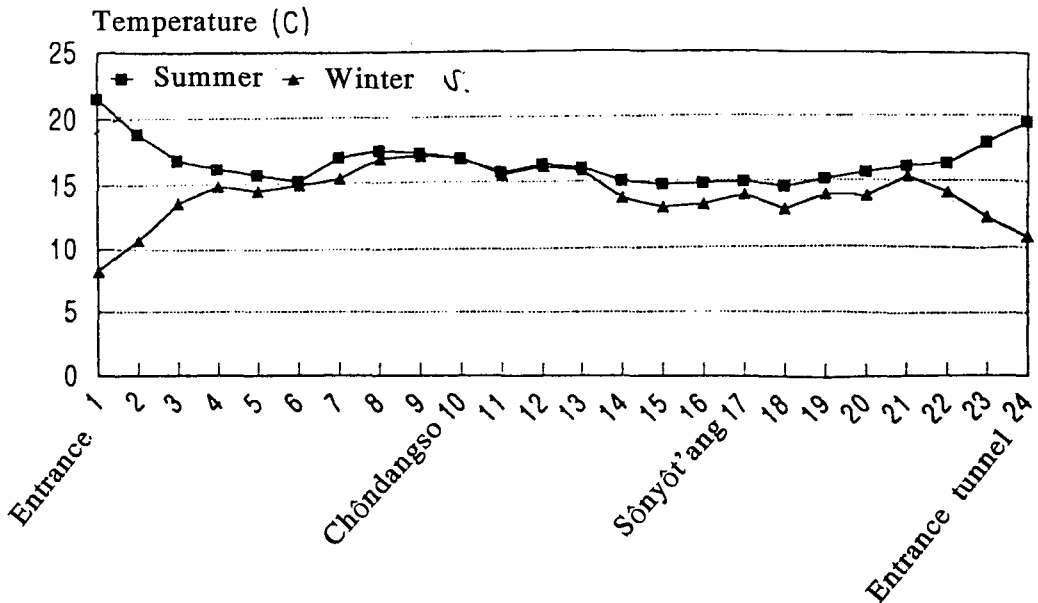


figure 1. The Summer-winter temperature change change of the inner part of kosu cave

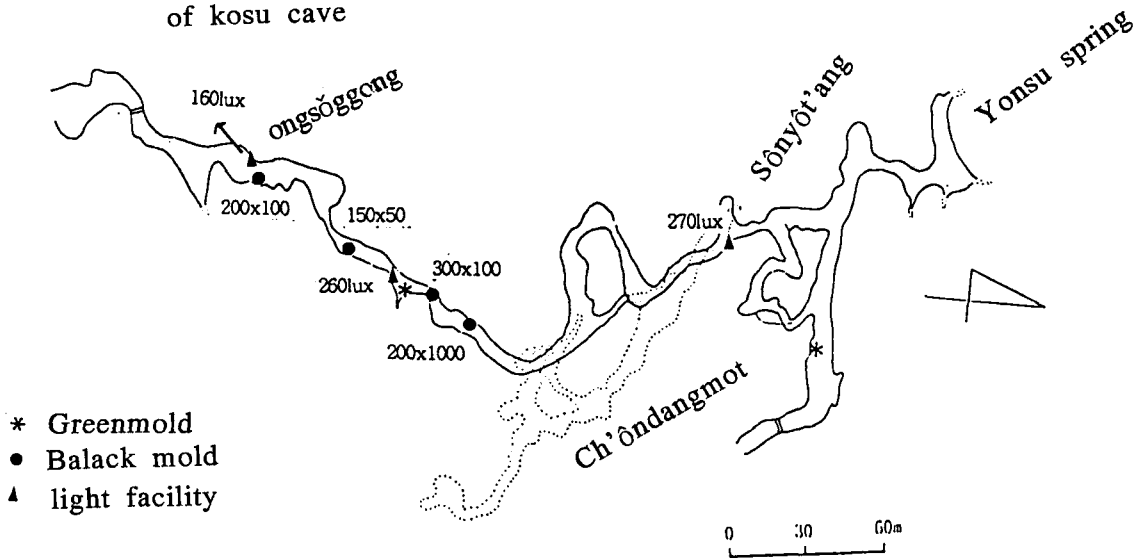


figure 2. The distribution of the inner part kosu (1st layer)

IV. Conclusion

It is natural that the cave dose not change without being open.

How does this phenomen change? What is the cause and motivations? and The deep study must be kept about how we can make the environment change be least.

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