

A Study on the healing factors of Forest Sound

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Abstract

Where there are all the flowers, the songs of all kinds of insects and birds are put in, the sunshine and shadows flicker The forest through which the water sound flows is an optimum resting space. All living creatures in these spaces will awaken the five senses of humans and perhaps turn the sensibility index (EQ). The forest meditation in the forest, which can be an optimal shelter for the people who need it, needs to feel the reverence of nature, to refine emotions, to be a self-reflection, to have a mind to respect, Have an important meaning. . In this paper, we tried to consider the cause of the influence of forest sounds on human hearing from the acoustical aspect. The type of sound source of forest was divided into four seasons of spring, summer, autumn, winter. And the change in the duration of the sound during the four seasons, so that the general characteristics of the sounds of the four seasons are as follows: It can be seen that the change in the ratio of sub-band energy is almost equal to the change in dB in frequency of the equal-light curve. To compare this phenomenon, the criterion for changing the sound duration of each forest is natural The main forms of the luminance curve, such as the change in the duration of the white signal in the sound, are determined by the minimum, maximum audible frequency and the most sensitive frequency band, and the auditory characteristics of the other three inflection points Determines the overall shape of the equal-light curve.

Keywords: The sensibility index (EQ), The change in the duration, Maximum audible frequency, Minimum audible frequency, Loudness curve , Duration of the white signal

1. Introduction

Meditation can be defined as a state of being concentrated quietly like indoor indulgence and conscious effect. Let a state of unshakable mind obtained through meditation be a samadhi. In this way, while concentrating on one subject, meditation is focused on that subject that you immediately recognized as a target if you thought other thoughts as soon as you concentrate on one subject. If you continue to do so, you can lose your anxiety and get out of anxiety or stress and gain peace of mind. As a result, many modern people get peace of mind from their busy days through meditation, to resolve their bitterness, anxiety, and stress in their minds and bodies, and to try to recognize their own presence [2].

Where there are all the flowers, the songs of all kinds of insects and birds are put in, the sunshine and shadows flicker The forest through which the water sound flows is an optimum resting space. All living creatures in these spaces will awaken the five senses of humans and perhaps turn the sensibility index (EQ)[2].

The forest meditation in the forest, which can be an optimal shelter for the people who need it, needs to feel the reverence of nature, to refine emotions, to be a self-reflection, to have a mind to respect, Have an important meaning.

It is also possible to express the psychological effects of the healing of forests, the forests of depressed trees, the various flowers that make beautiful flowers bloom, the sounds of various insects, birds and animals, The body raises our five senses and improves the sensitivity index (EQ). If you walk in the forest, you can open your eyes, ears, nose, and other sensory organs openly and interact with nature to activate your brain and ease your mind. In addition, the consciousness of life from the resonance of the gigantic heat of all the lives that live in the forest gives a psychological treatment of awe when it is put under the joy of satisfaction[2].

Therefore, we can gain heart stability through sympathy with the forest, good space can be forest to eliminate daily worry and stress

2. Acoustic 7 Bandwidths (A7B)

It is a basic understanding that the frequency of a given sound represents its specific characteristics. However, the lack of system representing the range of pitch creates difficulties in delivering the results of sound analysis in standardized terms. Assuming there is a wide range of sound, for example, a given expression of 'sound with mid tone' does not give us proper information concerning its specific pitch. Furthermore, many scholars and analysts are using different bandwidths and frequency ranges in their researches that may bring research results different from one another. It is true that we may use the unit of Hertz to objectively represent sounds and pitches. However, there is a limitation of the Hertz system. Using Hz to describe any given sound does not provide sufficient information as to how it is related to the audible range of sound to humans. Since Hz tends to be an abstract representative of sound, most people cannot grasp the detailed characteristics of the given sound, having no idea about how high or low tone a given sound is. This paper proposes the implementation of the Acoustic 7 Bandwidths (A7B) system, an extended version of the V7B system [1], in order to cover all the human auditory ranges and convey its relative characteristics of tones in a more effective way.

3. Human Auditory Range

The average range of frequency that we humans can hear is between 20~20,000Hz. However, this range can be expanded depending on age. For example, an infant can hear beyond 20000Hz [2], but as he or she grows, the range drops. Someone in their 20s can hear somewhere around 18,000Hz, but it will continue to drop to 10,000Hz as they become senile. Figure 1 shows the audible spectrum of average musical and vocal range for humans [3]. As seen in the figure, everyday conversation can take place without much difficulty if the vocal range is maintained above 2,500Hz, the minimum of low pass. However, some people may feel uncomfortable at this range, especially from acoustic perspective, due to the insufficient amount of audible

information to distinguish different sounds. A wider frequency range of sound is needed if we want to appreciate the real value of music, basically covering all the ranges of sounds audible to human ears. Therefore, in a piece of music, a listener actually hears sound covering most of the ranges presented in the figure[3][4].

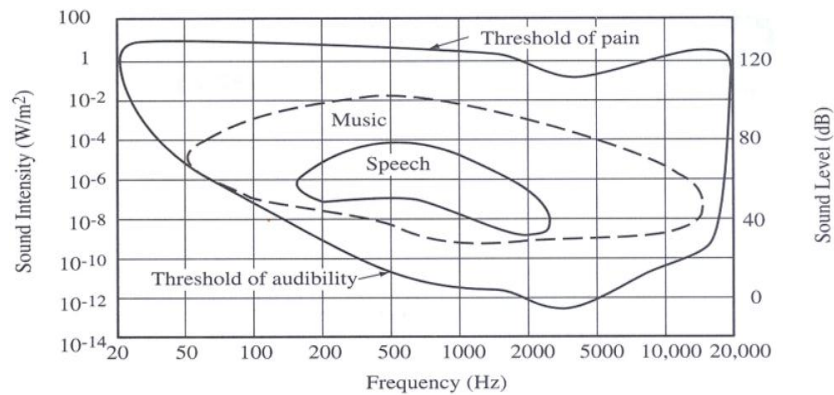


Figure 1. Range of Human Hearing: Sound Intensity, Sound Level vs. Frequency[5][6]

4. Frequency Characteristics of Forests Sounds

Because the sound elements of the forest are very wide, we analyzed the sound elements based on the important acoustic elements in order to derive the overall characteristics. And the change in the acoustic characteristics of the forest, which shows the greatest difference depending on the season, is the most important environment.

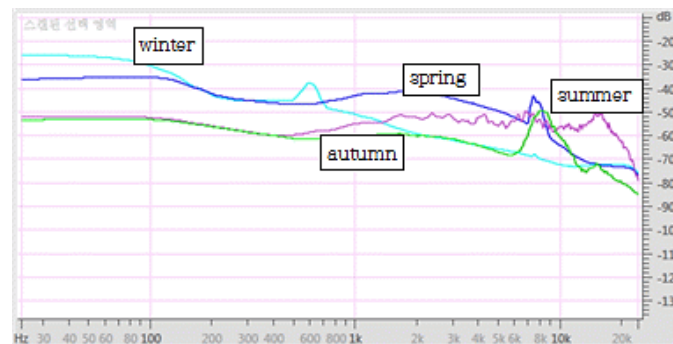


Figure 2. Frequency Characteristics of Sounds of Spring, Summer, Autumn and Winter Forests

The analysis area is centered on the frequency and volume characteristics, and all measurement environments are based on the most general circumstances based on the following criteria.

- 1) Environment that does not rain or snow
- 2) Environment where the wind does not blow hard
- 3) Eliminate all sounds related to people
- 4) Eliminate the voices of birds and insects especially intensively crying especially
- 5) In the case of waterfalls and streams, measured at the distance that can be heard in the general situation
- 6) All numerical values are values obtained by rounding up the decimal point. Therefore the percent total is "100 ± 1".

5. Acoustic Characteristics of Forest Sounds Using Sound Color Markers

5.1 Spring & Summer

The forest and the upper part are similar in overall shape because they are similar to the sounds picked up in the main, but there are few decreases in the forest near the summit and few forest resonances, The proportion of sounds of birds and insects decreases.

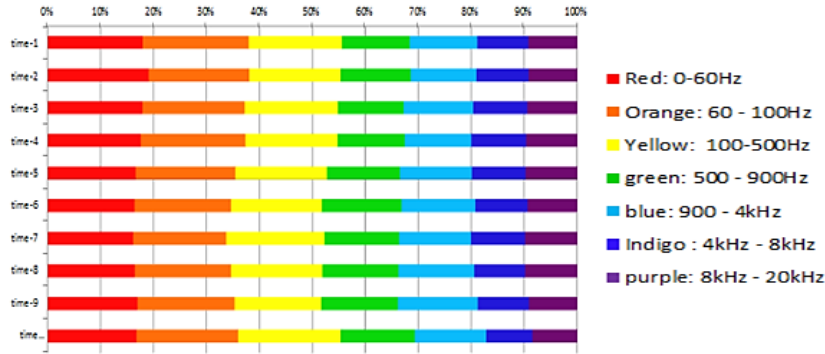


Figure 3. duration ratio in 10 sections of spring forest sound

Table 1. energy ratio of spring forest sound

Sub band	Red	orange	yellow	green	blue	indigo	purple
Energy ratio	16%	21%	17%	15%	12%	11%	9%

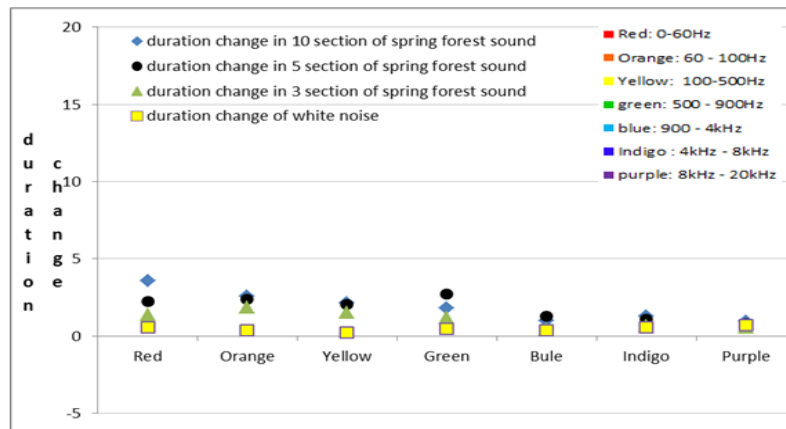


Figure 4. duration ratio envelope of spring forest sound

For example, in the case of the spectacle of Odaesan (Figure 64), there is a marked decrease in energy at around 5000 Hz, near 15000 Hz, where the energy of the new insects is distributed. The reason for showing the same spectra as those of the waterfall / shoreline that goes from the peak of the peak zone to the zone below 5000 Hz is because it directly influenced the influence of the shoreline that flows directly beneath the peak of the measurement zone.

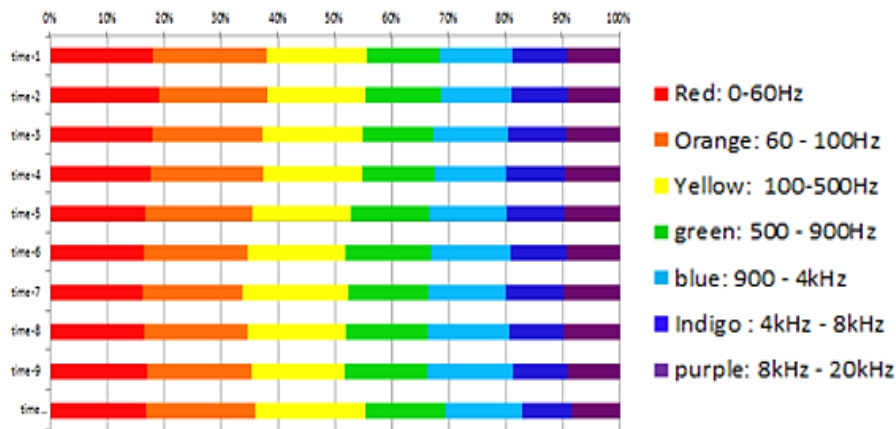


Figure 5. duration ratio in 10 sections of summer forest sound

Table 2. Energy ratio of summer forest sound

Sub band	Red	orange	yellow	green	blue	indigo	purple
Energy ratio	15%	15%	14%	15%	15%	15%	13%

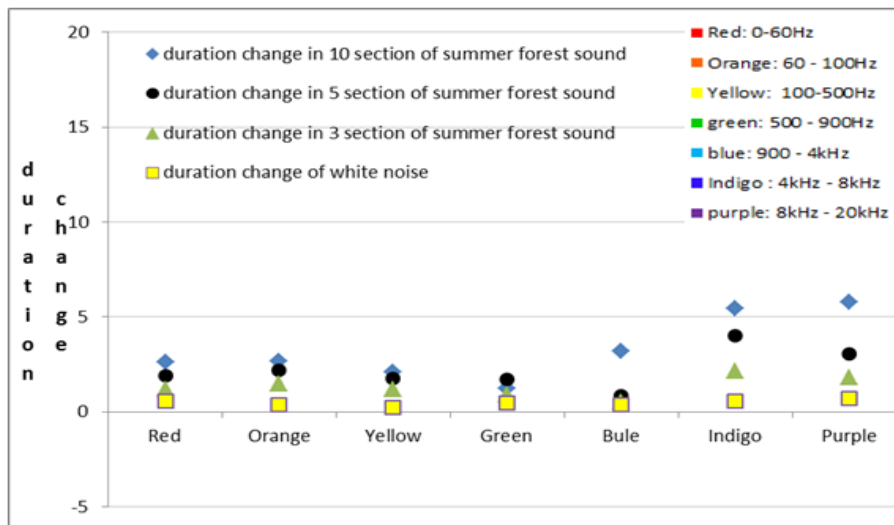


Figure 6. duration ratio envelope of summer forest sound

It is the difference in the activity of life that gives the greatest influence to the change of the sound of the forest in spring and summer. The kind of the bird's voice is observed in five kinds such as spring, However, the sound of insects' voices slightly increased in winter and spring, and it was measured continuously without rest, so that the ratio of the super high sound and high sound band of forests increased dramatically In the evening, the frequency of the bird sounds is reduced to about half, but the voices of the insects are also observed continuously, with the average number of voices of the insects being five.

5.2 Autumn

The number of new sounds and bugs were reduced by about 7%, and the number of new sounds and insects ranged three times, compared with summer, and two types This decreased the frequency of the new voice every minute from eight to six times in the summer, and the insects continued to hear the number of individuals and sound diversity decreased. The greatest feature of autumn forest sounds is the sound of fallen leaves.

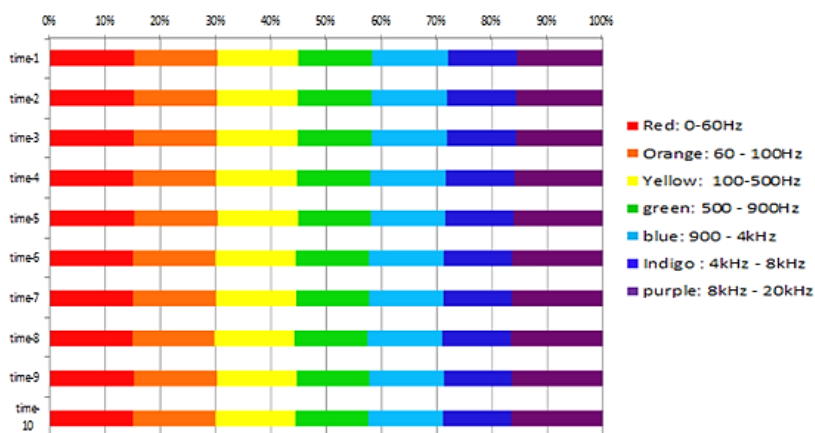


Figure 7. duration ratio in 10sections of autumn forest sound

Table 3. Energy ratio of autumn forest sound

Sub band	Red	orange	yellow	green	blue	indigo	purple
Energy ratio	16%	16%	15%	14%	14%	13%	13%

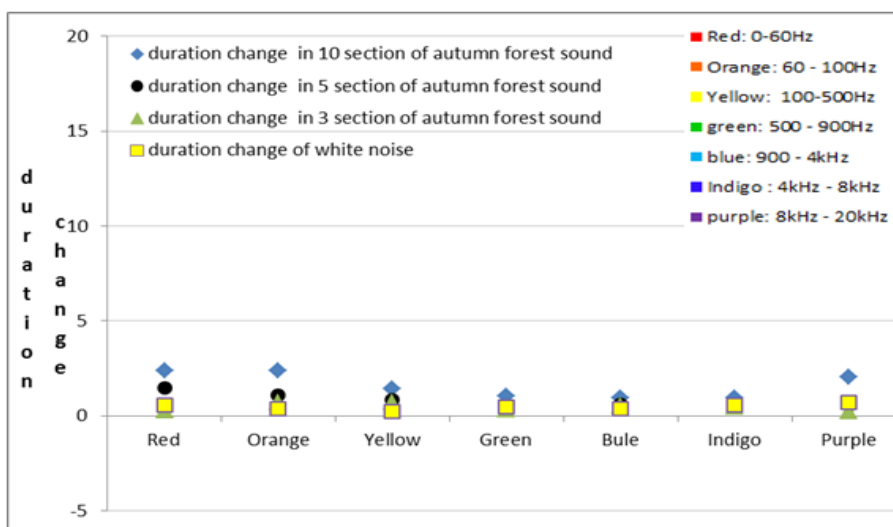


Figure 8. duration ratio envelope of autumn forest sound

The deciduous sound contains 15% of high-frequency components and 45% of high-frequency components, which is the highest number in all seasons and environments of the forest, and 20% Of the remaining 20% of the high, middle, low, and low frequency components are collected.

5.3 Winter

The perimeter of the tree is not constant, and under the bended tree, eyes and fallen leaves are covered. The snow melted in the day and the falling leaves are scattered in the air, and it is not the sound of walking on it, but other sounds

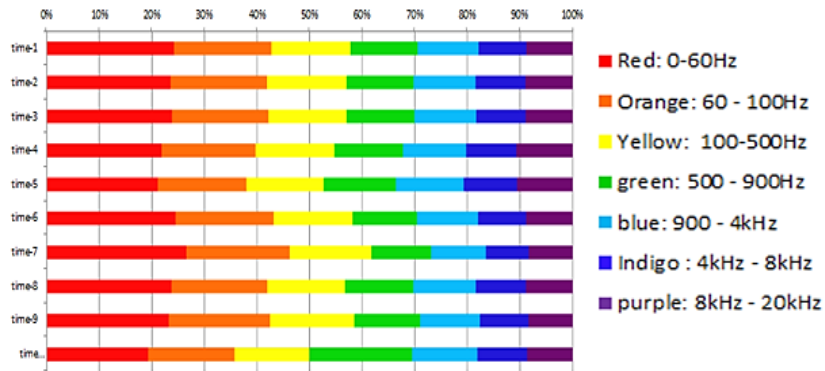


Figure 9. duration ratio change and energy ratio of winter forest sound

Table 4. Energy ratio of winter forest sound

Sub band	Red	orange	yellow	green	Blue	indigo	purple
Energy ratio	24%	19%	14%	14%	11%	10%	8%

When combined with the sounds of winter forests, the rest of the environment, with the exception of waterfalls and streams, is a very lonely acoustical environment, due to the absence of birds, insects and leaves in winter, The sound that exists only in the forest plays a role of complementing the loneliness of these winter forests in a sensible way

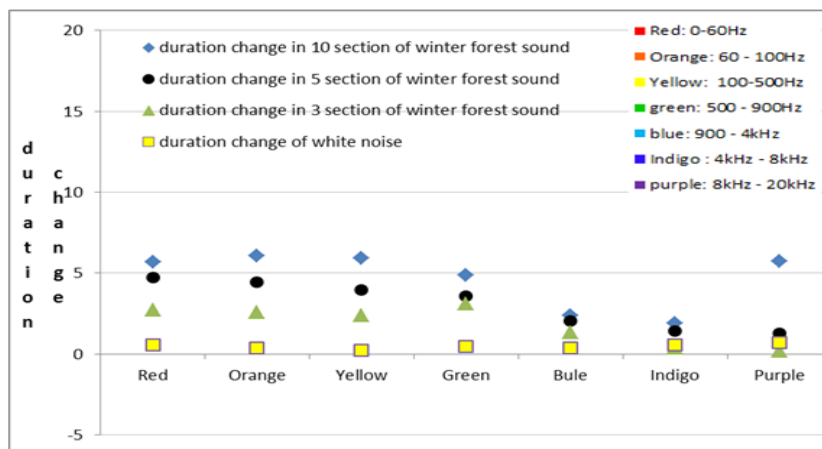


Figure 10. duration ratio envelope of winter forest sound

On average, the average number of birds per observation was 5, and the frequency of the insects' voices was observed only at the Mt. Odaesan, and the frequency of the poorly audible level was shown.

The amount of change in the winter field volume is becoming larger because the sound of water, the

sound of birds, the sound of leaves, etc., which are generated in the surrounding environment, are rarely present, Figure 10 shows that the acoustic characteristics of the sound of the forest in winter are more variable than those of other seasons. I'm getting bigger .

6. Conclusion

It can be seen that the change in the ratio of sub-band energy is almost equal to the change in dB in frequency of the equal-light curve. To compare this phenomenon, the criterion for changing the sound duration of each forest is natural The main forms of the luminance curve, such as the change in the duration of the white signal in the sound, are determined by the minimum, maximum audible frequency and the most sensitive frequency band, and the auditory characteristics of the other three inflection points Determines the overall shape of the equal-light curve.

However, this is also a very significant indication of the change in volume that is displayed very briefly. In the four seasons, the amount of volume change of the sound of the winter forest is changing to the most dynamic.

It was again acoustically clear that the acoustic characteristics of the forest sound gave the people a healing and a source of energy. Therefore, regardless of the season, The envelope, which is very similar to our own auditory characteristics, can be used to visualize the effect of marshaling our ears, which can be considered as the value of this paper.

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