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S 71

SOME BIOCLIMATIC CHARACTERISTICS OF MARTVILI CANYON (WESTERN GEORGIA)

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Introduction

The bioclimatic properties of locality, and especially health resort-tourism zones, are frequently characterized by so-called equivalent-effective temperature of air (EET) [5–7, 9] and content of light ions in atmosphere [1-4, 8]. EET is the combination simultaneously observed air temperature, relative humidity and wind speed. Six basic gradations of EET are separated: < 1° - Sharply coldly, 1-8° - Coldly, 9-16° - Moderately coldly, 17-22° - Comfortably, 23-27° - Warmly, > 27 ° - Hotly [6, 7, 9].

The content of light ions in the atmosphere (n_+ - positive ions concentration, n_- - negative ions concentration) plays important role in molding of the physiological state of population. If sum light ions concentration $n_{+/-}$ is < 600 cm^{-3} (n_+ =300, n_-= 300, less than the minimum level), their physiological action on the human organism is the following: fatigue, weakening attention, retarding of reactions, worsening in the memory, headache, the disturbance of the regime of blood pressure, etc. When $n_{+/-}$ is 1000-8000 cm^{-3} (n_+ =400-3000, n_-= 600-5000, minimally necessary – optimum levels) their physiological action on the human organism is positive and has sanitation-preventive and therapeutic effect: optimization of blood pressure, positive influence on the course of the diseases of respiratory organs, such as: bronchial asthma, antiseptic action, etc. [1, 3, 4].

The data about air equivalent-effective temperature and light ions concentration for the Martvili Canyon (Western Georgia) are presented below.

The region of studies, material and methods

The Martvili Canyon is named after the nearby town of Martvili located in Samegrelo-Zemo Svaneti region of Western Georgia, in 280 km from Tbilisi (fig. 1). Over millions of years the spectacular canyon, reaching a depth of 40 meters, caves and waterfalls were formed by the Abasha River and feature beautiful green and blue colors. The total length of the canyon is one kilometer. In the upper part of the canyon seven meter high powerful waterfall is located (fig. 2).

Fig. 1. Location Martvili town relative to Tbilisi.

Fig. 2. Some places of Martvili Canyon.

For the EET calculation data of Hydrometeorological Service of Georgia about the monthly average values of the air temperature, relative humidity and wind speed was used. Values of EET calculated according to the formula, represented in [9]. Light ions concentration (cm^{-3}) measurements with the aid of the portable ions counter of the production of firm “AlphaLab, Inc.”

are conducted. The single measurements of the light ions concentration in air in the Martvili Canyon in summer 2015 were carried out.

Results and discussion

Information about monthly average values of EET in day hours in fig. 3 is represented.

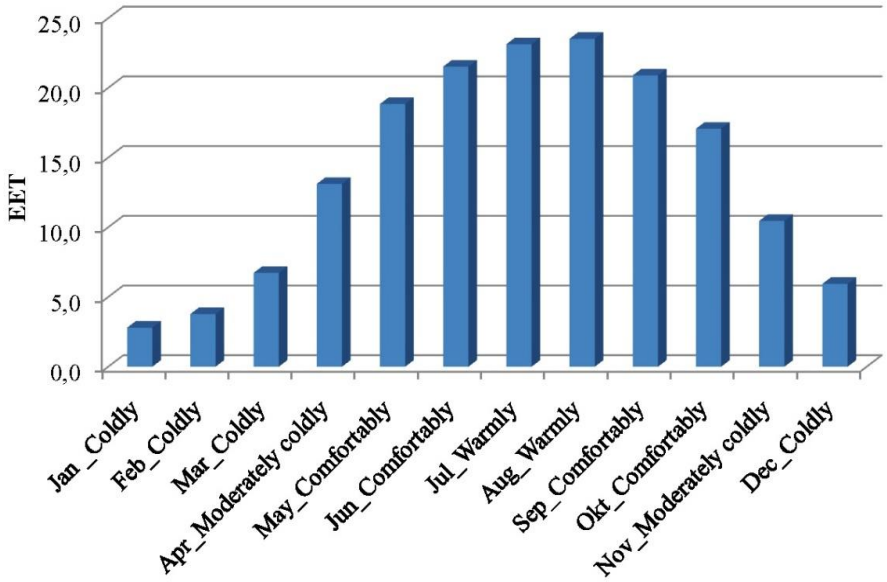

Fig. 3. Monthly average values of EET in day hours in Martvili.

As follows from fig. 3 the average monthly values of EET for the day hours vary from 2.8º (category "Coldly", January) to 23.5º (category "Warmly", August). Comfortable thermal regime during May, June, September and October is observed.

The concentration of sum light ions in air on the surface of river and waterfall inside the canyon varies from 1410 to 2460 cm^{-3} (n_+ = 180÷730, n_- =1100÷1730 cm^{-3}), which is above the standard minimally necessary for the health of people [1, 3, 4].

Conclusion

Comfortable thermal conditions in the day hours in Martvili Canyon during May, June, September and October observed. The preliminary data of the measurements of the content of light ions in air in Canyon showed, that in the calm weather the ionization level of air above minimally of necessary, that favourably for the health of people. At present vigorously is developed the infrastructure around the Canyon, which facilitates the use of this place for leisure and tourism the year round. Therefore it is important to maximally use bioclimatic resources of Canyon for expanding its health resort-tourist potential.

Key words:

Equivalent Effective Temperature, small ions, health resort- tourism potential

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უაკ 615.834 + 551.58
მ 29

რეზიუმე

მარტვილის კანიონის (დასავლეთ საქართველო) ზოგიერთი ბიოკლიმატური მახასიათებლებელი

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მოყვანილია მონაცემები ჰაერის ეკვივალენტურ-ეფექტური ტემპერატურის (ეეტ) და ჰაერში მსუბუქი იონების შემცველობის შესახებ მარტვილის კანიონის (დასავლეთ საქართველო) მიდამოებში. ნაჩვენებია, რომ დღის სააათებში ეეტ-ის საშუალო-თვიური მონაცემები იცვლება 2.8°-დან (კატეგორია “ცივა”, იანვარი) 23.5°-დე (კატეგორია “თბილა”, აგვისტო). კომფორტული თერმული რეჟიმი დაიკვირვება მაისში, ივნისში, სექტემბერსა და ოქტომბერში.

ჰაერში მსუბუქი იონების შემცველობა კანიონში მდინარის ზედაპირთან და ჩანჩქერთან იცვლებოდა 1410-დან 2460-დე ერთ კუბიკურ სანტიმეტრში, რაც აჭარბებს ადამიანის ჯანმრთელობისათვის მინიმალურად საჭირო ნორმას.

საკვანძო სიტყვები: ექვივალენტურ–ეფექტური ტემპერატურა, მსუბუქი იონები, კურორტის ტურისტული პოტენციალი.

UDC 615.834 + 551.58
S 71

SUMMARY

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The data about air Equivalent-Effective Temperature (EET) and content of light ions in air in the Martvili Canyon environments (Western Georgia) are represented. It is shown that the average monthly values of EET for the day hours vary from 2.8º (category "Coldly", January) to 23.5º (category "Warmly", August). Comfortable thermal regime during May, June, September and October is observed. The concentration of light ions in air on the surface of river and waterfall inside the canyon varies from 1410 to 2460 cm^{-3}, which is above the standard minimally necessary for the health of people.

Key words: equivalent effective temperature, small ions, health resort-tourism potencial.

УДК 615.834 + 551.58

Н 479

РЕЗЮМЕ

НЕКОТОРЫЕ БИКЛИМАТИЧЕСКИЕ ХАРАКТЕРИСТИКИ МАРТВИЛЬСКОГО КАНЬОНА (ЗАПАДНАЯ ГРУЗИЯ)

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Представлены данные об эквивалентно-эффективной температуре воздуха (EET) и содержании легких ионов в воздухе в окрестностях Мартвильского каньона (Западная Грузия). Показано, что среднемесячные значения EET для дневных часов изменяются от 2.8º (категория “Холодно”, январь) до 23.5º (категория “Тепло”, август). Комфортный термический режим наблюдается в мае, июне, сентябре и октябре.

Концентрация легких ионов в воздухе у поверхности реки и водопада внутри каньона изменяется от 1410 до 2460 $см^{-3}$, что выше минимально необходимой для здоровья людей нормы.

Ключевые слова: эквивалентно-эффективная температура, легкие ионы, курортно-туристический потенциал.