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CRIMEAN SOUTH COASTAL PARKS SEASONAL MICROCLIMATE PECULARITIES (ON THE EXAMPLE OF MASSANDRA PARK AND ITS TERRENKUR)

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Round-year utilization of the kurort and recreation potential of the Crimea should be considered as an actual task today. Most important role in the recreation is provided by Crimean South coastal parks, occupying in total about 1500 ha. About third out of these parks is represented by old parks, being the protected territories. Unfortunately the microclimate even of these parks is studied insufficiently and is poorly known. We aimed to study seasonal microclimate peculiarities in Massandra park, considering it to be a typical landscape park of the South Coast of Crimea. In particular the microclimate was studied in relation to type of vegetation, microrelief, and meteorological changes during the whole season. These data can be used as a scientific validation of the year-round exploitation of the Crimean South Coast Parks for the rehabilitation of recreants.

Massandra park was studied by excursion method during the whole year. During the excursion we have determined form and species of all tree plants along the itinerary, the number of specimens, approximate age. Photographs of the trees were taken with the help of the CanonPowerShot G15 camera (Japan). We have developed a terrenkur itinerary with 16 control points along it where microclimate data were taken for analysis (detailed description of these points is given in Table 2). Measurements were done approximately at 14:00 what corresponds to the astronomical noon in Yalta. Specifically, the temperature and air humidity were downloaded, as well as insolation in the sun and shadow which was calculated with the help of luxmeters, and filter UVS-3 (the latter allowed to measure the

UV component of radiation), strength and direction of wind were listed as well as atmospheric pressure. The cloudiness of the sky was evaluated visually with 10 points for the full coverage of the sky by clouds and 0 points for the full absence of clouds on the sky.

All data obtained were tabulated and further analyzed by methods of variation statistics. To determine the degree of significance for differences found t-criterion of Student and Z-criterion of Taylor were calculated.

Massandra park founded by German gardener Karl Kebakh in the first half of the XIXth century and belonged to the Comte M. S. Vorontsov. Park was formed by substitution of exotic trees for original oak and hornbeam standings. Originally the park was designed as the nursery to grow up the saplings of the trees intended to be planted in Alupka park complex, but later, it turned out to be itself a picturesque subtropical park. Due to absence of outstanding architectural monuments and absence organization of mass tourist service, the park becomes the ideal place for rest in silence. Park was named as the monument of garden and park art in 1972 and in 1980s it was reconstructed under guidance of the well-known landscape architect M.D. Rodichkyn.

Dendroflora of Massandra park includes about 250 species: steep slopes are occupied with native trees and bushes with *Quercus pubescens*, Crimean black pine *Pinus nigra pallasiana*, *Carpinus orientalis*, *Pistacia mutica*, *Cornus mas*, *Rosa* sp. and others. Quantitative composition of tree stands is given in Table 1.

When planning the terrenkur itinerary we tried to include maximum of different landscape views and plant species along it way. The route included horizontal parts and ascents and descents with up to 20 degrees steepness. In the coniferous part of park the horizontal sand lane for jogging was included. All points where climatic measurements were taken were divided into three categories: "sunny" points that were open to the sun in all seasons, "shadow" that are surrounded by ever-green vegetation and thus are always in the shadow and "variable" or "seasonal" which are surrounded by deciduous trees, which are sunny only in winter when the trees lost their foliage. The microclimate measurements are presented by Table 3, demonstrating that sunny points are somehow warmer, dryer and much more insolated when compared to shadow points and variable points. The variable points are even less insolated in summer compared to shadow points due to more deep shadow provided by the broad-leaved plant species surrounding these points. As it is demonstrated by Table 4, the differences between sunny, shadow and variable points in the terrenkur are less pronounced in the autumn compared to summer; sunny points are still being more warm but also more windy. In the winter, as stated by Table 5 the sunny points are still the most insolated but the shadow points and variable points are significantly more windy compared to sunny points. In the spring as it is demonstrated by Table 6 insolation of all points is higher than in winter, winds in parks become less pronounced despite still more strong in the shadow parts of the terrenkur. To conclude the most significant differences in microclimate between observation points were recorded in the summer and are due to different insolation; all other seasons the microclimate values are less variable and reflects difference in insolation and wind strength (especially in winter). The p-values for different microclimate variables show that most parameters differ statistically significant between four seasons. Microclimate parameters of

Massandra park were compared to data obtained by Nikita State Botanic Garden meteorostation located at altitude of 200 meters above sea level at absolutely open place for the sun and winds. Strength of winds in all seasons is less in the park compared to meteorostation and the insolation, including the UV part of spectrum, is also less in park compared to the meteorostation. In general, the differences are due to trees of the park that form the warmer, more humid and less windy climate in the park compared to the open places. These data confirm the high value of Massandra park as the natural complex with high therapeutic and kurort potential.

Keywords: Massandra park, microclimate, insolation, vegetation, role in rehabilitation, kurort potential.

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