General evaluation of bioclimatic conditions in Cluj-Napoca city, Romania

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Abstract

Biometeorological indices are used to evaluate the influence of weather on human body and health. These indices establish a relationship between weather conditions and the human body's responses to them. The calculation of these indices is very important, especially for extreme weather conditions, like heat waves or cold waves. For the Romanian territory, only few researches on this issue were done so far. In this paper we analyzed the bioclimatic conditions of one of the most important cities in Romania, Cluj-Napoca over a 15-yr period (2001-2015). For their calculation, we used the daily meteorological data. For this study, we focused on calculating 11 bioclimatic indices: the equivalent temperature (Tek), the effective temperature (TE), the air enthalpy (i), the cooling power (H), the wind chill index (WCI), the wind chill temperature (WCT), Bodman's weather severity index (SB), Humidex, the predicted evaporation (pE), the predicted convection (pC), the predicted radiation (pL). These indices are based on linear equation focusing on the impact of air temperature, wind speed and relative humidity. To process the data BioKilma 2.6 software was employed. As main results it is notable that the period of the year when the thermal comfort is high, more exactly, when there is no risk for the hot stress or the cold stress is from March to April, especially the month of April. A slight discomfort is noticed during the cold period of the year, from November to February, and in the summer, in June and July.

Keywords: bioclimatic indices, BioKlima 2.6 software, Cluj Napoca, Romania

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