ULST Timisoara

Multidisciplinary Conference on Sustainable Development

30-31 May 2024

2024 MULTIDISCIPLINARY CONFERENCE ON SUSTAINABLE DEVELOPMENT

BIOCHEMICAL DIVERSITY ANALYSIS BASED ON MINERAL CONTENT IN THYME (*THYMUS* L.) POPULATIONS

Rodica BEICU, Adina BERBECEA*, Sorina POPESCU, Georgeta POP, Giancarla VELICEVICI, Alina NEACȘU, Ana-Mariana DINCU, Ilinca-Merima IMBREA

University of Life Sciences „King Michael I" from Timișoara, Aradului St. 119, Timișoara 300645, România

Abstract. *In the paper, the results regarding the content in microelements are analyzed in 17 wild populations of thyme, compared with a cultivated population (Th. vulgaris). The iron content varied widely, depending on the place of origin and the analyzed species, reaching maximum values in the cultivated population Th. vulgaris (486 mg/kg), exceeding the wild populations, with only one exception, Th dacicus harvested from the Lescovita area (564 mg/kg). Likewise, the chromium content for the cultivated population, reached high values (0.849 mg/kg), compared to the wild populations, being surpassed only by Th. pulegioides (1.250 mg/kg), collected from the Pojejena area. For all the other microelements analyzed, the values recorded for the cultivated population, did not exceed the values of the wild populations.*

Introduction

Mineral elements are inorganic compounds necessary for the optimal functioning of plants, animals and humans. They are needed in small quantities, which differ both according to the nutrient and according to the species. Essential micronutrients were found as constituents in over 1500 proteins where they fulfill catalytic, activating, coactivating and structural functions.

Material and method

The microcroelements were determined by atomic absorption through an official method certified by the AOAC at the wavelength specific to each element.

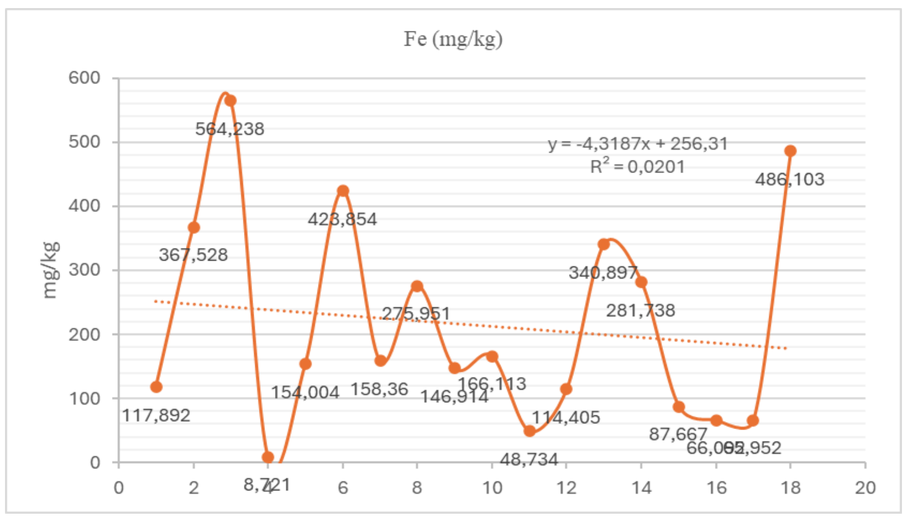

Figure 1. Distribution of iron in the analyzed thyme populations

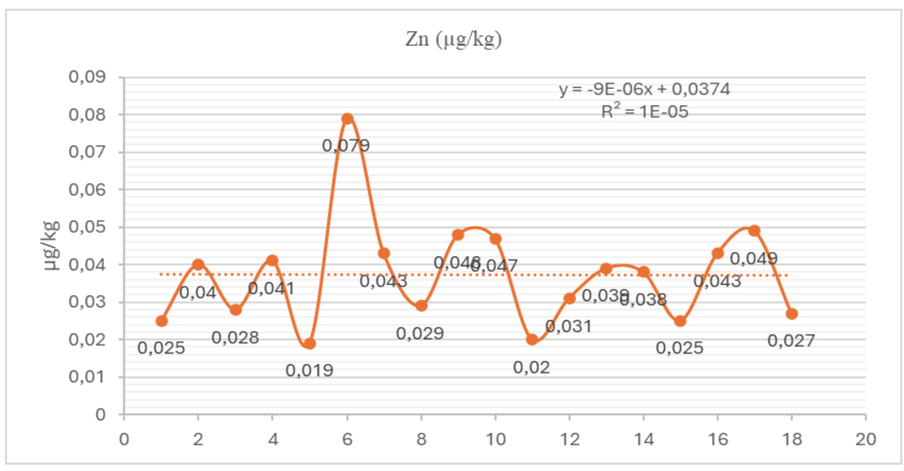

Figure 2. Distribution of zinc in the analyzed thyme populations

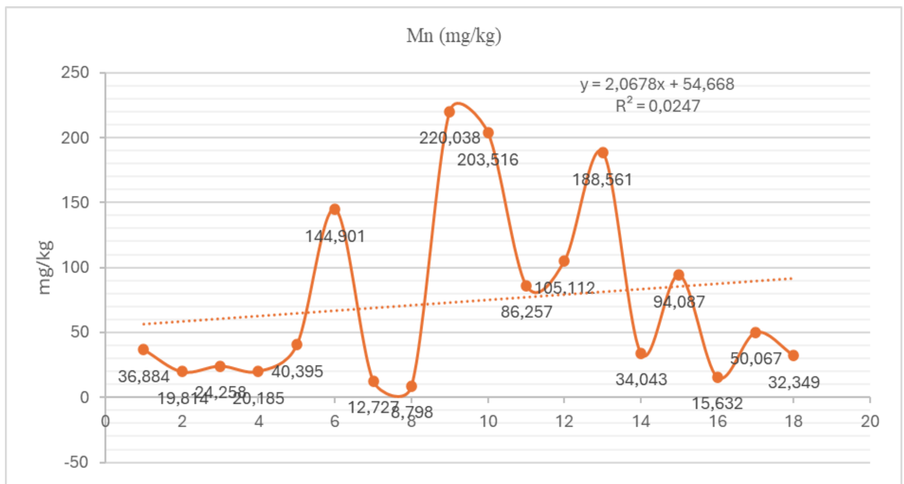

Figure 3. Distribution of manganese in the analyzed thyme populations

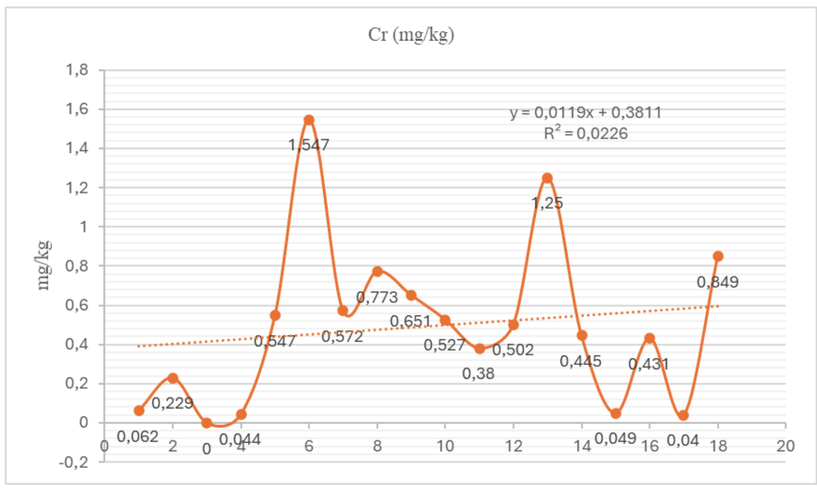

Figure 4. Distribution of chromium in the analyzed thyme populations

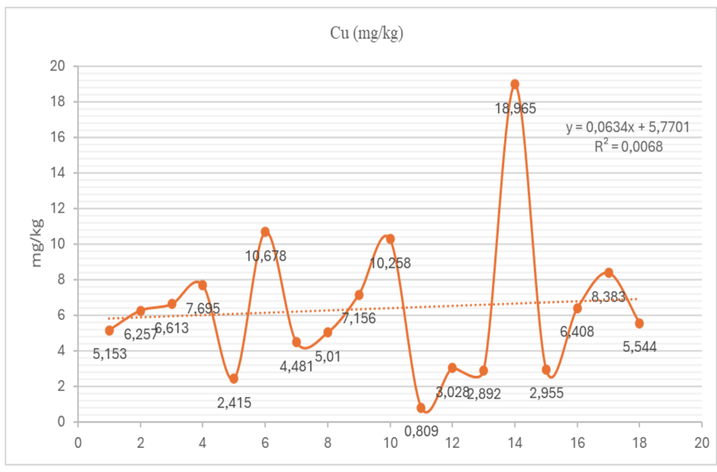

Figure 5. Distribution of copper in the analyzed thyme populations

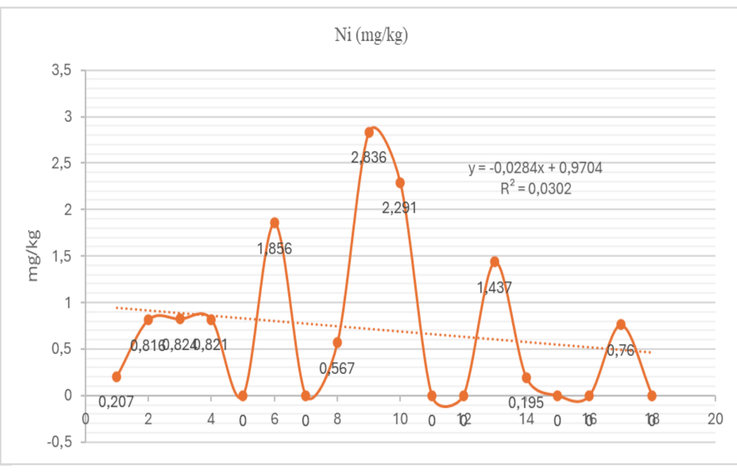

Figure 6. Distribution of nickel in the analyzed thyme populations

Results and discussions

The maximum amount of iron (Fe), was detected in the population of *Th. dacicus* from the Lescovita area (564.238 mg/kg), and the minimum amount was detected in the population of Th. glabrescens harvested from the Silagiu area (8.721mg/kg) (figure 1).

The maximum amount of zinc (Zn), at the individual level, was detected in the population of *Th. pannonicus ssp. auctus* from the Silagiu area (0.079 µg/kg), and the minimum amount was detected in the population of Th. dacicus from the Ostrov area (0.019µg/kg) (figure 2).

For manganese (Mn), the maximum amount was detected in the population of *Th. praecox ssp. polytrichus*, from the Semenic area (220.038 mg/kg), and the minimum amount was detected in the population of *Th. praecox ssp. janke*, from the Domogled area (8.798mg/kg) respectively in the population of *Th. praecox ssp. janke* from the Coronini area (12.727 mg/kg) (figure 3).

Like iron, the maximum amount of chromium (Cr), was detected in the population of *Th. pannonicus ssp. auctus* from the Silagiu area (1.547 mg/kg), and the minimum amount was detected in the population of *Th. pulegioides ssp. pulegioides* from the Nemet area (0.040mg/kg). In the population of *Th. dacicus* from the Lescovita area, chromium was below the detection limit and could not be determined (figure 4).

The maximum amount of copper (Cu) was detected in the population of *Th. pulegioides ssp. montanus* from the Carașova area (564.238 mg/kg), and the minimum amount was detected in the population of *Th. pulegioides ssp. chamaedrys* from the Pojejena area (0.809 mg/kg) (figure 5).

Regarding the maximum amount of nickel (Ni), it was detected in the population of *Th. praecox ssp. polytrichus*, from the Semenic area (2.836 mg/kg), and the minimum amount was detected in the population of *Th. pulegioides ssp. montanus* from the Carașova area (0.195mg/kg) (figure 6).

Conclusions

The microelements identified in the eighteen *Thymus* populations studied were the following: iron (Fe), with an average value of 215.287±162.819 mg/kg; zinc (Zn), with an average value of 0.037±0.014 µg/kg; manganese (Mn), with an average value of 74.312±70.253 mg/kg; chromium (Cr), with an average value of 0.523±0.417 mg/kg; copper (Cu), with an average value of 6.372±4.115 mg/kg and nickel (Ni), with an average value of 1.146±0.857 mg/kg.

We can observe the influence of the place of harvest, the chemical composition of the soil as well as the interconnection between the mineral elements, on the content of microelements in thyme population, as mentioned in previous studies.