



Differences between CEC determination methods used for different types of soil

Lazar Kaluđerović (1), Maja Milošević (2), Nataša Nikolić (1), and Zorica Tomić (1)

(1) Faculty of Agriculture, Belgrade University, 11080 Belgrade, Serbia, (2) Faculty of Mining and Geology, Belgrade University, 11000 Belgrade, Serbia

Several methods for cation exchange capacity determination were already established, all having advantages and disadvantages. Application of the methylene blue methods for testing some soil properties, such as specific surface area (SSA), cation exchange capacity (CEC), are investigated on soils with different chemical properties. Methylene blue method is more dependent on type of exchangeable ions and it can be applied on soils that have widely different mineralogy. It was suggested that methylene blue method could be used as adequate method when soil contains sodium ions. External and internal surface areas of soils could also be measured using the methylene blue method. Ammonium acetate method was for long time used as referent method for cation exchange capacity determination. This method gives overestimations when soils are rich in CaCO_3 content. The results also show that the methylene blue values are generally lower than values obtained by the ammonium acetate method. Aim of this work was to investigate correlation between these two methods used for CEC determination. Different types of soil were used in experiments: calcareous Rendzina, decarbonated Rendzina, brownized Rendzina and eutric Cambisol. The correlation coefficient between the methylene blue method and ammonium acetate method was moderate indicating that methylene blue method cannot be used effectively to measure CEC for all listed types of soils. This is probable because different types of soil were used in experiments. However, when the difference in CEC values collected using these two methods was correlated with content of Ca in soil, correlation coefficient was almost perfect, which indicated that ammonium acetate method was highly dependable on Ca content in soil and could be used for CEC determination in soils poor in Ca.