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STATEMENT

by Assoc. Prof. Dr. **Mihaela Nikolova Ilieva**

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Subject: the dissertation work of full-time doctoral student **Kristina Rashkova Panova** on the topic "*Passive acoustic monitoring of birds in beech forests affected to varying degrees by human activity*" for the award of the educational and scientific degree "Doctor" in the scientific speciality "Ecology and Environmental Protection"

In her dissertation, Kristina Panova analyses data from passive acoustic monitoring of bird communities in beech forests of different ages and degrees of anthropogenic interference. The dissertation work is presented in the form of bound publications (in total 2), the first focusing on comparing communities using acoustic indices, and the second examining the habitat preferences of a conservation-important species – the semicollared flycatcher (*Ficedula semitorquata*).

The PhD student has successfully completed all the initial tasks, including characterising bird communities by calculating several acoustic indices and comparing communities between undisturbed beech forests and managed mature forests, as well as between managed mature and young forests. In addition, the PhD student has separately analysed acoustic data for the semicollared flycatcher, in order to describe the specific nesting preferences of the species in the study area.

The method used, passive acoustic monitoring with sound recording devices, on the basis of which acoustic indices are calculated, is a promising and modern tool for characterising bird communities. It has a number of advantages, but also some disadvantages, described in detail by the doctoral student in the introductory part and the summary.

Based on the conducted research, it was found that passive acoustic monitoring can be used for long-term monitoring studies in mountain beech forests, as well as for assessing and comparing bird species richness using four acoustic indices. As expected, the doctoral student recorded more species in mature forests, including some protected cavity-nesting ones. Such a species is the semicollared flycatcher, which is found only in mature forests. Two main parameters of forest structure, canopy cover and the presence of cavities, are indicated by the doctoral student in article 2 as explaining the frequency of vocal activity of the species.

The doctoral student's work has a number of contributions to the field of ecology and can be a valuable tool in the long-term management of forest areas. The use of acoustic indices validated in this study allows for an objective comparison of bird communities in forests of different ages and management, including those from other parts of Europe. The comparison of the vocal activity of individual rare and endangered species with the parameters of the forest is the basis for better targeting of forestry activities with the aim of their conservation. The results of the dissertation clearly demonstrate the importance of conserving old-growth forests.

In this regard, I believe that it would be good to analyse and discuss in more detail the data on the presence of other typical forest species.

As the doctoral student himself notes, some of the recorded songs may belong to migratory birds that pass through the study area at the beginning of the breeding season. To what extent do the values of the studied indices differ if the beginning and end of the breeding season are compared?

Kristina Panova is the lead author in both publications on her dissertation, and both articles were published in journals with an impact factor (Q2 and Q4). She participated in two scientific forums for doctoral students with poster presentations.

Based on the above, it is clear that Kristina Panova has successfully applied modern methods in her research, developed skills in publishing the results obtained and gained valuable research experience, which will be useful to her in the future. The results of the dissertation are well presented, analysed and discussed, and her contributions are of important scientific and applied significance. I believe that the experience gained in this new scientific topic for Bulgaria will be of great benefit to her future successful scientific development.

All of this gives me a reason to confidently support the awarding of the scientific and educational degree "Doctor" to Kristina Panova.

Sofia, 19.03.2025

Assoc. Prof. Dr. Mihaela Nikolova Ilieva