



Universitatea  
Transilvania  
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# **HABILITATION THESIS**

## **SUMMARY**

**The forestry and game management in climatic context. Opportunities  
of using forestry species in biomonitoring air quality**

**Domein: forestry**

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## (A) Summary

The habilitation thesis "The forestry and game management in climatic context. Opportunities of using forestry species in biomonitoring air quality" emphasizes the professional achievements resulted from both scientific and academic activities, were developed after I obtained my Ph.D degree in 2003, up to date, as well as the plan of the evolution of my academic and scientific career.

The thesis contains the author's most relevant scientific achievements in the field of forest and game management treated in climatic context, and opportunities of using forest species a biomonitoring agents used in assessment of air quality. According to the imposed template, this work is organized in two distinct parts, (A) Summary and (B) Scientific and professional achievements together with Plans for career evolution and development. Thus, the second part includes two subdivisions, (B-i) Scientific and professional a achievements, and (B-ii) Plans for career evolution and development.

Thus, the first part of the second subdivision - (B-i) Scientific and professional achievements - debuts with and introduction, emphasizes the main research results, and it is organized in five chapters. Chapter 1 – "Phytosanitary protection and phytosanitary risk analysis applied to forestry seedlings in climatic conditions specific for nurseries from Transylvania" describe the research on this area and the main results. Taking into account that design and application of the risk analysis, through the specific stages of monitoring, assessment and management, requires an accurate knowledge of the *in situ* climatic peculiarities and phytosanitary protection methods, the most suitable solutions were applied in order to obtain the best performances.

Chapter 2 – "The effect of using modern skidders in forest works upon the biodiversity of the forestry ecosystem, and marginal habitats" emphasizes - using soil, water, air, and biodiversity quality indicators - that before using the above mentioned mechanized tools the marginal habitats are not perturbed, while after using them, some perturbations are recorded, mainly translated in decreased number of plant and animal species, and increased air pollution with PM and noise.

Chapter 3 – "Evaluation of game species in Cluj County, Romania" focuses on changes of population size in four game species – roebuck, wild boar, hare, and deer – the most common ones in 24 hunting areas from Cluj Cuntly, emphasizing the peculiar traits with importance in management activity.

Chapter 4 - "Use of *A. hippocastanum* L. and *T. cordata* Mill. as biomonitoring agents for air quality in urban areas. Case study: the municipality of Cluj-Napoca" shows the opportunity of using the foliar tissue of *A. hippocastanum* L. as a biomonitoring agent for air pollution with

copper, and foliar tissue of *T. cordata* Mill. as a biomonitoring agent for air pollution with lead, cadmium and zinc. Taking into account the concordances identified between the results of our study and those mentioned in the cited literature, we can consider that foliar tissues of *A. hippocastanum* L. and *T. cordata* Mill species, as useful tools for monitoring air quality in urban areas.

Chapter 5 - "Monitoring air pollution with microelements using *Tillia cordata* Mill. in the municipality of Cluj-Napoca" is dedicated to thoroughgoing the former study in the same areal. The results of this research show, on one side, the ability of *Tillia cordata* Mill. to be used as biomonitoring agent for air pollution with microelements, and on the other side, confirms air pollution in experimental areal, with copper and lead.

The evolution of the professional scientific and academic activities, and also the plans of their future development are presented in the second part of the second subdivision of the this habilitation thesis, (B-ii) Plans for career evolution and development, respectively. Thus, the research activity is illustrated by grants, papers, and patents. Since 2006, I coordinated three national research projects, and was team member of other projects, of which 3 national, and 1 international. The publishing activity consists in 78 scientific papers. A number of 70 papers are published in journals mentioned by international databases (Bulletin UASVM-CN, ProEnvironment, Porcine Research, ABAH Bioflux), and 10 ISI indexed, and/or quoted, in national and international journals (Journal of Food, Agriculture and Environment, Romanian Agricultural Research, Environmental Engineering and Management Journal, Journal of Zoology, AgroLife, Notulae Botanicae Horti Agrobotanici, Journal of Environmental Protection and Ecology – *in press* - ). I am co-author of one patent awarded by the Romanian State Office for Inventions and Trademarks, respectively "Methodology for selenium enrichment of cultivated garlic", Patent no. 129527/29.09.2017. The academic activity is sustained by publication of practical guidelines and two textbooks on logging. My future scientific activity is aimed at developing research directions in the following fields: development on scientific basis the degree in which Romania is aligned to the FSC international forestry standardization, integration of the logging within a sustainable and systemic approach of the concept, innovative technologies of wood exploitation and promoting innovative methodologies of supplying the character of forest with high preservation value.